New Constraints on Temperature, Oxygen Fugacity and H_2O of Subduction Zone Basalts Based on Olivine-Melt Equilibrium

by

Xiaofei Pu

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Earth and Environmental Sciences)
in The University of Michigan
2018

Doctoral Committee:

Professor Rebecca A. Lange, Chair
Professor Nuria P. Calvet
Dr. Gordon M. Moore, University of California, Davis
Associate Professor Adam C. Simon
Professor Youxue Zhang

Xiaofei Pu

pux@umich.edu

ORCID ID: 0000-0003-2120-7054

DEDICATION

To my late grandma and grandpa, who led me to appreciate the power of higher education since I was a small child.

To mom and dad, for all the unconditional love and support.

ACKNOWLEDGEMENTS

This dissertation would not have happened without the help and support from a village of people.

Almost eight years ago, Jim Brophy at Indiana University took a chance at this foreign rookie geologist, and that's how it all started. I will always be grateful to Jim, who introduced me to the fascinating world of igneous petrology, with great passion and patience. And off he sent me to get a Ph.D with Becky at Michigan. As it turned out, I couldn't be luckier with this pack of people all on my dissertation committee.

Becky, thank you for all the intellectual power, breadth of vision, invaluable time, passion, curiosity and so many enlightening moments you have shared with me, and most importantly, for your extraordinary expectations since the beginning of this journey. The past almost-six years has not always been sunshine and flowers, but undoubtedly it has made me a better scientist and a better person. It is a spectacular gift for me to work on the Mexico samples with you. I, too, wish Ian Carmichael were still around to see our work. I often wonder what he would say. Gordon, thank you for generously sharing your incredible knowledge, experience, time, life advice and excellent sense of humor with me over your 5 years at Michigan. Growing up I tend to view the world as black and white; perhaps the most important thing I learned from you is how to put things in perspectives and not to oversimplify, both in science and in life. And of course thank you for training me to be a better experimentalist and probe user. You made me wish I worked as a plumber in high school, in all seriousness.

For the rest of my dissertation committee, I am grateful for your generous support over the past 4+ years since my candidacy. Nuria, obviously this dissertation could never happen without your support, thank you very much! Adam, thank you for letting me use your lab more than your own students over the past year, and for generous sharing your knowledge on the ore deposit literature (among other things) that I had often missed. Youxue, thank you for the valuable lectures on geochemistry and kinetics, for your constructive and honest critique to my work over the years, and certainly your generosity to let me use your preparation lab over this past year.

My gratitude also goes to many other incredible individuals who helped me to achieve my research goals during my Ph.D study: Zhengjiu Xu, Owen Neill, Bill Wilcox, Craig Delap, Nancy Kingsbury, Paula Frank, Jerry Li, Jamie Gleason, Aaron Wolf, Dale Austin from our department; Jim Windak from UM Chemistry, Tracy Paul from Depths of the Earth Company; JC Barrett and Joel Gagnon from University of Windsor; Adam Kent, Richard Bradshaw and Andy Ungerer from Oregon State University. I owe special thanks to Anne Hudon, who has been an incredible source of support, encouragement, resources, and insightful life advice to me.

The research projects in this dissertation have been supported financially by National Science Foundation grants to R. Lange and G. Moore; the UM Dept. Earth and Environmental Sciences Turner Grant; and the UM Rackham Graduate School Graduate Student Research Grant & Travel Grant.

To Laura Waters, my academic big sister, you are my hero, thank you for all the advice and support! To Jack Touran, you taught me more about experiments than what I taught you about petrology, thank you for being the best experimentalist partner! To the rest of my loving and supportive lab family (James, Sarah, Juliana, Sean, Ryan, Mary Catherine, Xuan) and lab cousins (Laura, Liz, Peng, Tom, Adrian, Jaayke, Brian, Chenghuan, Yi), I learned a great deal and shared some of the most heartwarming moments with you, thank you for always having my back! I have been supported, entertained, and kept in my best sanity during my Ph.D, thanks to many incredible friends from both in the department (Sulgi, Sarah, Tiffany, Ian, Joe, Pam, Ross, Ben, Kyle, Samantha, Yi N., Sam, Mark, Erin, Alyssa, Will, Tristan (Ravi & Norah), Phoebe, Sharon, Alex, Nikita, Yi W., Xiaojing, Bian, Ran, Meghan, Yi-Wei, Tao, Ke, Sha) and outside the department (Hanyu, Zed, Katie, Kriss, Ziyong, Yuwen, Binbin). Thank you all from the bottom of my heart. It's been a great pleasure!

The Brophy family has given me so much love and support over the years, thank you Jim, Lyn, Sarah and Jennie for being my family in the U.S.! The support from my grandparents for my education has always inspired me to succeed, even though I lost two of them while pursuing this Ph.D. Mom and Dad gave me all the best they have and made me who I am today. I live more than 10,000 km from home and have missed 8 Chinese New Years, many other holidays, birthdays, and anniversaries. Yet, they take so much pride and have so much faith in me, even though they understand very little of what I do. Thank you for everything!

Table of Contents

LIST OF TABLES

Chapter II

Chapter III

Chapter IV

Chapter V

Appendices

LIST OF FIGURES

Chapter I

Chapter II

Chapter III

Chapter IV

Chapter V

Appendices

LIST OF APPENDICES

ABSTRACT

Erupted basalts are windows into the deep Earth. This dissertation provides evidence that mantle-derived basalts grow their phenocrysts during rapid ascent to the surface, and that the most Mg-rich olivine in erupted samples approximates the first mineral to crystallize from a liquid with a composition of the whole rock. This presents opportunities to constrain the temperature, oxidation state and water content of these basalts on the basis of olivine-melt equilibrium.

Chapter II develops a new olivine-melt thermometer based on the partitioning of Ni ($D_{Ni}^{ol/liq}$), and provides evidence that it is far less sensitive to the effects of pressure and dissolved H_2O in the melt than $D_{Mg}^{ol/liq}$, which is the basis of most olivine-melt thermometers in the literature. The application of both thermometers to a set of subduction-zone basalts allows the depression of the olivine liquidus due to the effect of dissolved water to be determined based on the different temperatures calculated from the two thermometers; a minimum H_2O content in the melt at the onset of olivine crystallization can be determined.

Chapter III investigates the sensitivity of $D_{Ni}^{ol/liq}$ to dissolved H_2O in basaltic melts through a series of olivine-melt equilibrium experiments. Four 1-bar experiments, one anhydrous experiment at 0.5 GPa, and five hydrous experiments at 0.5 GPa are presented. The Ni-thermometer developed in Chapter II recovers the experimental temperature for all ten experiments within 14˚C on average, including

those where the melt contained at least 4.4 wt% H_2O. In contrast, the Mg-thermometer (Chapter II) recovers the T_{expt} of the anhydrous experiments within error (±26˚C), but overestimates T_{expt} by 88-141˚C for the hydrous experiments. The results shows a negligible dependence of $D_{Ni}^{ol/liq}$ on pressure and dissolved water under crustal conditions, which confirms that the olivine-melt Ni-thermometer can be applied to hydrous basalts at <1 GPa without corrections for H_2O content in the melt and pressure.

Chapter IV applies the new Ni-based olivine-melt thermometer developed and tested in Chapter II and III to a set of mantle-derived, high-K melts that erupted within the Colima rift in western Mexico, where a mid-ocean spreading ridge is interacting with a subduction zone. Application of the Ni-thermometer, together with phase-equilibrium experiments on phlogopite lherzolite from the literature, shows that the K-rich Colima melts segregated near the base of the relatively thick lithosphere of the Jalisco block at relatively high pressures (~2.5 GPa) compared to most subduction-zone melts (~1.5 GPa). These temperatures and pressures of melt segregation provide key constraints on geodynamic models of this complex tectonic setting.

Chapter V investigates the cause of the relatively high oxygen fugacity (fO_2) of the pristine K-rich Colima lavas (Chapter IV). The pre-eruptive oxidation state (Fe^{3+}/Fe^{2+} ratio), derived from olivine-melt Fe^{2+}-Mg exchange equilibrium, indicate fO_2 values that are ~2 log units lower than the post-eruptive value; yet they are still significantly higher than those found in most terrestrial basalts. This elevated pre-eruptive fO_2 leads to higher solubility of sulfate in the melt, which degasses as SO_2

and H_2S, and drives melt oxidation. This is the first documentation of sulfur degassing-induced oxidation observed in natural samples.

Chapter I

Introduction

1.1 Primitive basalt: a storyteller of deep arc processes

Subduction is one of the major driving forces for plate tectonics and the manufacturer of the highly differentiated and stratified continental crust, which is crucial to the evolution of life and human habitation Earth. In subduction zones, the introduction of H_2O and fluid-mobile components from the descending slab to the overlying mantle wedge facilitates mantle melting at lower temperature, and leads to the production of mafic melts that are more oxidized and volatile-rich than those generated at mid-ocean ridges and intraplate settings (Carmichael, 1991; Grove et al., 2012). Flux of volatiles (H_2O, CO_2, SO_2, H_2S, etc.) in subduction zones contributes to the water, carbon and sulfur cycle among lithosphere, atmosphere and ocean. The volatile-rich and high-viscosity nature of subduction zone lavas leads to substantial risks of volcanic hazards in the vicinity of some of the most populated area on Earth. A better understanding of subduction zone volcanic processes is critical to both the Earth Science community and the global population with broad implications.

One of the major challenges for solid Earth research is to use samples and observations from near-surface level to understand the composition, physical properties, conditions and processes in the interior of the Earth, over geological timescales. Primitive subduction zone (arc) basalt, which is believed to be the direct mantle melt that was segregated from the mantle source and successfully ascended to the surface of the Earth, preserves valuable information about the composition, pressure-temperature condition and processes at depths. Primitive basalts have been identified in a variety of subduction zones, including Cascades (e.g. Donnelly-Nolan et al., 1991; Baker et al., 1994), Mexico (e.g. Luhr et al., 1989; Lange and Carmichael, 1990; Carmichael et al., 1996), Japan (e.g. Tatsumi et al., 1983), Aleutian (e.g. Nye and Reid, 1986; Yogodzinski et al., 1995), Lesser Antilles (e.g. Pichavant and MacDonald, 2003), Tonga (Falloon and Crawford, 1991). With increasing number of identified primitive basalt samples across the world, as well as experimental studies focused on their genesis mechanism (e.g. Bartels et al., 1991; Draper and Johnston, 1992; Elkins-Tanton et al., 2001; Hesse and Grove, 2003), it has been widely recognized that primitive basalts usually have Mg# of 0.73 or above (Mg# = XMg/(XMg+XFe^{2+}) by molar), with olivine phenocrysts of Fo90 or above. The natural compositional heterogeneity of the global arc mantle, and the interaction of subduction with other regional tectonic components, leads to a range of compositions of primitive arc basalts from different regions.

The importance of obtaining information on the temperature of primitive arc basalts has long been recognized. Temperature strongly affects many deep Earth properties and processes, including phase equilibrium, diffusion, isotopic fractionation, partitioning, density, elasticity, seismic velocity, etc. Our understanding of Earth’s secular cooling, global heat distribution and mantle convection and many regional magmatic processes, rely on the quality of temperature estimates. The published thermometry studies in the literature have been largely focused on anhydrous basaltic systems (e.g. Beattie, 1993; Herzburg and O'Hara, 2002). It has been recognized that these thermometers overestimate temperature in hydrous systems (Putirka et al., 2007; Putirka, 2008). Putirka et al., (2007) provided a new olivine-melt thermometer that provides an H_2O correction term for hydrous systems. The accuracy of the temperature calculation of primitive arc basalts relies on prior knowledge of melt H_2O content.

It is a major challenge for the petrological community to constrain pre-eruptive volatile contents for arc magmas, since magma ascent leads to almost complete degassing of most volatile phases (especially H_2O and CO_2). One of the most important parameters recorded in primitive basalts, comes from measurements of the volatile (H_2O, CO_2, sulfur, halogens, noble gases etc.) contents in the olivine-hosted melt inclusions (e.g. Sisson and Layne, 1993; Roggensack et al., 1997; Wallace, 2005; Benjamin et al., 2007; Plank et al., 2013). Melt inclusion volatile studies over the past two decades have advanced our understandings about subduction volatile flux (e.g. Sadofsky et al., 2008; Ruscitto et al., 2012; Walowski et al., 2015), melting of the subduction zone mantle (e.g. Portnyagin et al., 2007; Johnson et al., 2009; Ruscitto et al., 2010), and across arc variation of water contents (Walker et al., 2003). However, estimates of pre-eruptive melt H_2O content of hydrous basalt is still scarce outside the melt inclusion literature. The occurrence of melt inclusions is not universal, and melt inclusions found in larger bomb-sized volcanic samples, where slow post-eruptive cooling causes significant post-eruption hydrogen loss and crystallization (e.g. Chen et al., 2011; 2013; Lloyd et al., 2012; Ni et al., 2017), cannot provide high quality information on pre-eruptive melt H_2O content. The samples that are without available or reliable melt inclusion volatile measurements are underrepresented in the existing literature for information on their temperature and melt H_2O content at depth.

In addition to temperature and melt H_2O content, the oxidation state of primitive basalt is another important property that provides insight to subduction zone mantle conditions and processes. The oxidation state of iron (ferric/ferrous ratio) in a primitive basalt is directely related to the oxygen fugacity of the solid mantle from which it derived (e.g. Kress and Carmichael, 1991; Jayasuriya et al., 2004). One way to quantify the ferric/ferrous ratio of primitive basalts is to use X-ray absorption near edge spectroscopy (XANES) to measure the Fe^{3+}/Fe^{T} ratio of pristine glassy melt inclusions (e.g. Kelley and Cottrell, 2012; Brounce et al., 2014). Unlike some of the more evolved melts, arc basaltic samples are usually not co-saturated with ilmenite and magnetite, therefore the widely used Fe-Ti oxide oxybarometry cannot be applied.

Alternative methods independent of melt inclusion measurements will help shed light on these samples. One of the goals of this dissertation is to explore and test new methods to constrain olivine crystallization temperature, pre-eruptive H_2O content and oxygen fugacity of hydrous basaltic systems, that do not require melt inclusion measurements.

1.2 Crystal growth during ascent: a rare case or rarely evoked case?

Instead of using melt inclusions, the new methods discussed in this dissertation to constrain the temperature, melt H_2O content and oxygen fugacity of natural basaltic samples, all rely on olivine-melt equilibrium. Therefore, it is most important to first identify the equilibrium olivine and melt pair in a natural sample. If the most Mg-rich olivine composition and the whole rock composition (as the melt) are in equilibrium, then this pair can be used to estimate the conditions at the onset of olivine crystallization. This is a hypothesis that needs to be tested and evaluated before the application of any models based on olivine-melt equilibrium.

There are two major implications when a piece of bulk volcanic sample that was picked up in the field is determined to be “primitive basalt”. Firstly, the whole rock composition represents a liquid that was the direct partial melt of peridotitic mantle under flux melting, without any crystal fractionation after its complete segregation from the mantle source. Secondly, all the phenocrysts in this volcanic sample grew from this primitive mantle melt, most likely during some rapid and dynamic processes, like degassing induced crystallization of a fluid-saturated melt. As a result, the most Fo-rich olivine phenocryst composition should be (a close approximate to the one) in equilibrium with a liquid represented by the whole rock composition.

For an olivine-bearing volcanic sample that is not necessarily a primitive arc basalt, a set of tests, based on the traverse measurements of many olivine phenocrysts across the sample, has been developed in this dissertation, to test if all phenocrysts grew in a liquid represented by their whole rock composition. An investigation of the compositional distribution of all olivine phenocrysts in each sample is accomplished by extensive microprobe traverse analyses on 20-30 olivine phenocrysts distributed across the thin section of each sample. These tests are also discussed in details in Chapter II and Chapter IV of this dissertation.

An important implication from a sample in which all olivine phenocrysts observed in the sample (with a range of compositions) grew from a liquid represented by the whole rock composition, is that this crystallization process has to happen very fast to refrain from any crystal-liquid separation. This cannot be achieved in a slowly cooling magma chamber, where mixing and assimilation commonly occur to change the bulk liquid composition, the first crystallized olivine compositions are not preserved, and significant crystal settling could take place. Instead, a dynamic process, like degassing-induced crystallization in an H_2O-saturated melt, is a far more likely scenario to explain the observations in the sample.

Phenocryst (not microlite) growth as a result of degassing-induced crystallization of basaltic liquid has not been commonly recognized in the literature. Among the very few of them, Vigouroux et al., (2008) and Johnson et al., (2008) both focused on basaltic samples from the Mexican Volcanic Belt, the same field areas for all the studies in this dissertation.

1.3 Trans-Mexican Volcanic Belt: a unique arc

The Trans-Mexican Volcanic Belt (TMVB) is located in western-central Mexico (Fig. I-1), resulted from the active subduction of the Rivera Plate and the

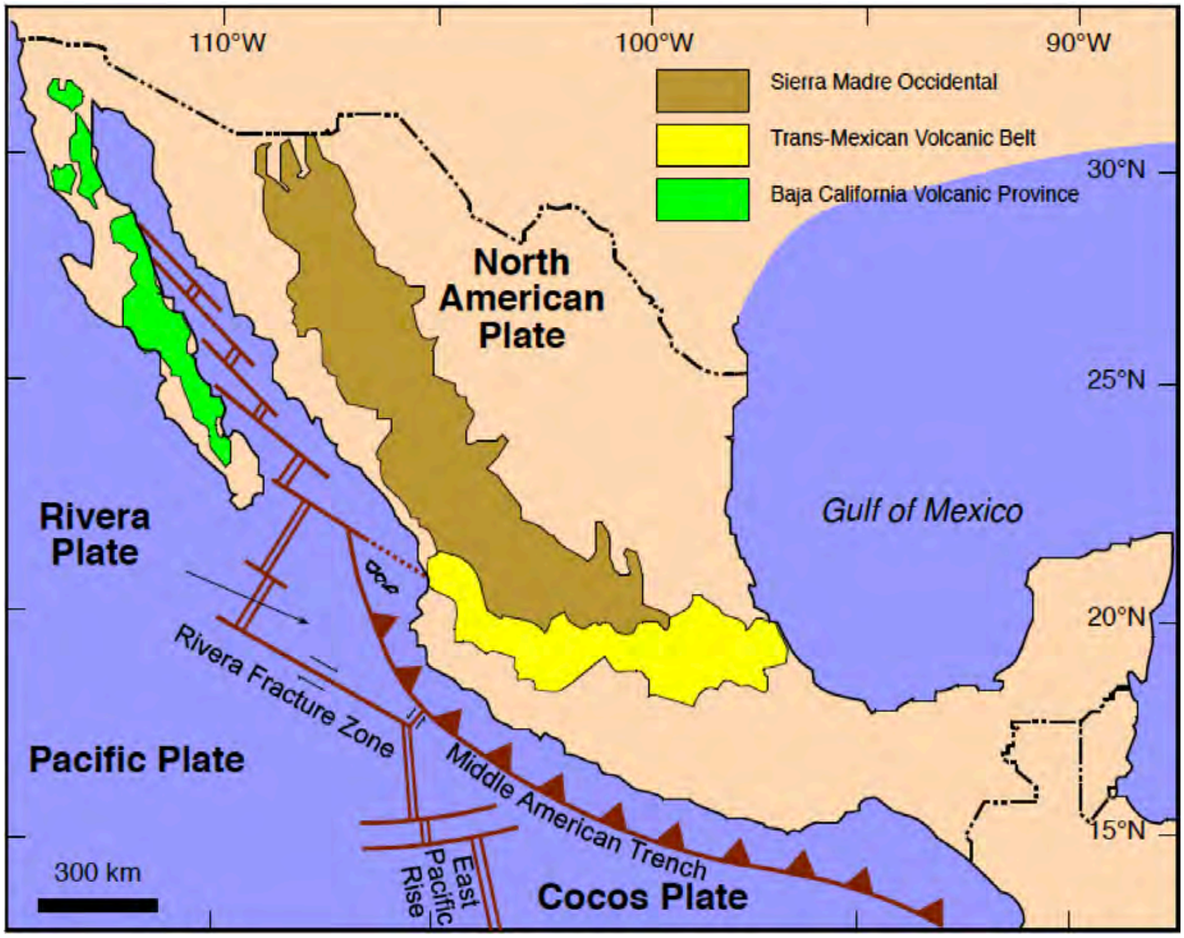


Figure I-1 Map of the Mexican Arc

Cocos Plate underneath the southern edge of the North America Plate along the Middle American Trench. TMVB is unique due to the subduction from two plates (Rivera and Cocos plate) at different angles (Pardo and Suarez, 1995; Yang et al., 2009; Manea et al., 2013); as well as an early stage continental rifting system defined by three intersecting rifts (the N-S trending Colima rift, the N-W trending Tepic-Zacoalco rift, and the E-W trending Chapala rift) superimposed over the active subduction. The unique geological context of TMVB leads to large compositional variability in the eruption products from this region (Wallace et al., 1992; Luhr, 1997), which provides incredible opportunities for subduction zone research.

The samples in this study are from two different regions in TMVB (Fig. I-2). The first field area is the Miochoacan-Guanajuato Volcanic Field (MGVF) in Central Mexico, formed from the subduction of Cocos Plate beneath North American Plate. It is 200-350km from the Middle American Trench, and the slab depth underneath MGVF is between 80km to 170km (Johnson et al., 2009). As a result of the subduction of the young (about 13Ma) and hot part of the Cocos plate (Pardo and Suarez, 1995), over 900 Holocene cinder cones and shield volcanoes are widely distributed across MGVF, and the eruption products are predominately basalt and basaltic andesite in composition (Hasenaka and Carmichael, 1985). Johnson et al., (2008, 2010) have reported up to 6% H_2O in olivine-hosted melt inclusion from basaltic samples across this region, and suggested degassing-induced crystallization of the basaltic liquid at <400MPa. Flux melting of asthenospheric mantle wedge has been evoked to generate the calc-alkaline basalts in the MGVF (Johnson et al., 2009). In this dissertation, new constraints on the temperature, oxygen fugacity and H_2O of MGVF basalts and basaltic andesites are provided.

The three intersecting rifts are located to the west of MGVF closer to the subduction front (Fig. I-2). Among them, the N-S Colima Rift is located just above where Rivera Plate and Cocos Plate are torn apart at depth, defining the eastern margin of the Jalisco Block, which is composed of Cretaceous crystalline basements (Frey et al., 2007; Aranda-Gomez and McDowell, 1998). A group of eleven Pleistocene scoria cones located on the northern margin of the Colima-Nevado Volcanic Complex erupts predominately high MgO (up to 13 wt%), high K_2O (up to 4.6 wt%) minettes and absarokites (with the exception of 2 oldest cones where calc-alkaline basalts and basaltic andesites erupted). Melt inclusion study (Vigouroux et al., 2008; Maria and Luhr, 2008) reported up to 6.7 wt% H_2O and 6700ppm total sulfur in the high-K samples. Whole rock wet chemistry analyses onthe fresh, pristine minette and absarokites samples yield oxygen fugacity of up to NNO+4 (Carmichael et al., 2006). With regard to the generation of these primitive high-K melts, Vigouroux et al. (2008) suggested partial melting of phlogopite-bearing asthenospheric mantle generated these primitive melts from the Colima cones. However, minettes and absarokites of similar compositions that erupted northwest to these Colima cones in the Mascota Volcanic Field, which is also located on the

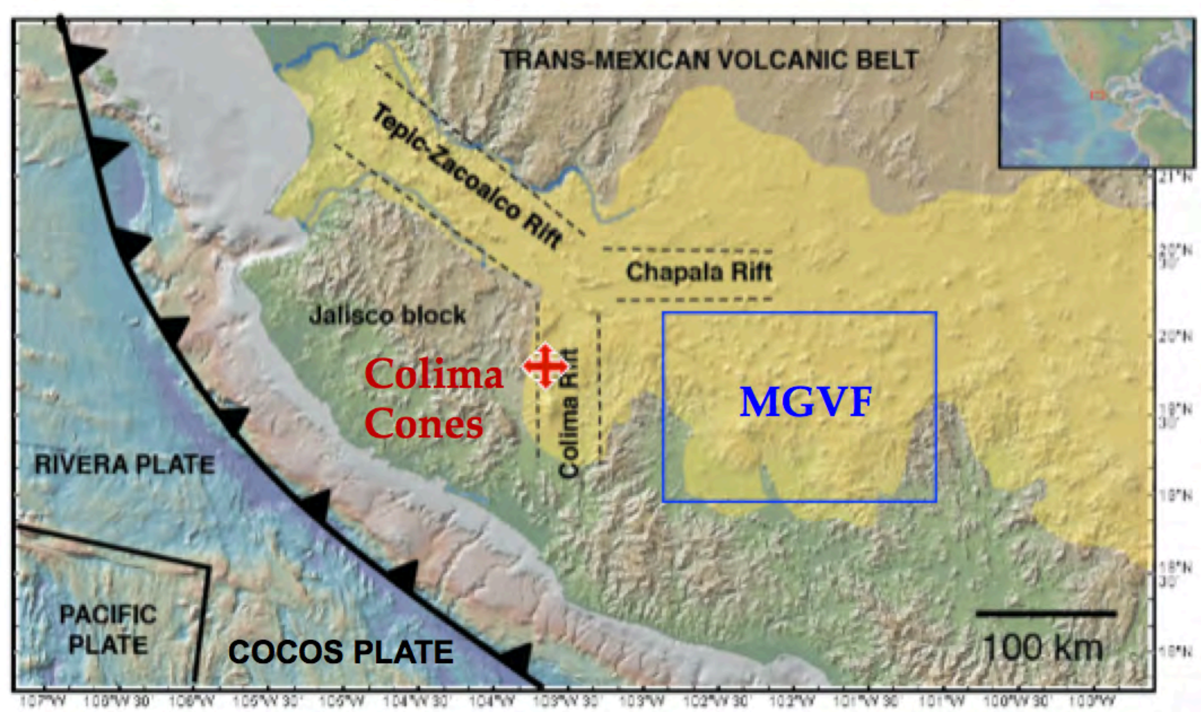


Figure I-2 Enlarged map to show the sample locations in this dissertation

Jalisco block, has been suggested to be generated from partial melting of phlogopite-bearing lithospheric mantle (Ownby et al., 2008). The origin of the minettes and absarokites in TMVB remains as an open question. This dissertation revisits this debate with new constraints on the temperature, oxygen fugacity and H_2O of the Colima Cone high-K melts at the onset of their olivine crystallization. Results of MGVF samples from the same constraint provide illuminating comparisons that help unravel the controversy.

1.4 New olivine-melt thermometry based on Mg and Ni partitioning

There is a vast literature on olivine-melt thermometry based on Mg partitioning (e.g. Ford et al., 1983; Beattie, 1993;Sugawara, 2000), and they all require a correction term with known melt H_2O content when applied to hydrous systems (Putirka et al., 2007; Putirka, 2008). It is challenging to constrain the temperature of hydrous basalts without information about pre-eruptive melt H_2O contents from melt inclusion studies.

Chapter II presents a new olivine-melt thermometer that is based on Ni partitioning, and evaluated its dependence on melt H_2O content under 1GPa, in comparison to an olivine-melt thermometer based on Mg-partitioning. Both thermometers were calibrated on a set of 1-bar experiments from the literature, with a wide range of melt and olivine composition and temperature. Application of the two thermometers to a set of MORB samples (close to anhydrous) and a set of calc-alkaline basalt, basaltic andesite and andesites from MGVF in Mexico compares the effect of dissolved H_2O in the melt on Mg and Ni partitioning between olivine and melt. Based on the effect of dissolved H_2O in the melt on the depression of olivine crystallization temperature, a new ΔT – H_2O relation ($\Delta T = T_{anhydrous} - T_{hydrous}$, can be obtained through T_{Mg} -T_{Ni}) was also calibrated in Chapter II. This relation estimates the minimum dissolved H_2O in the melt at the onset of olivine crystallization. The temperature and H_2O results on the MGVF samples obtained from the new thermometers were then compared with the melt inclusion data from Johnson et al. (2008, 2010).

In ***Chapter III***, 1-bar experiments and both hydrous and anhydrous piston cylinder experiments at 0.5GPa are presented, to evaluate the effect of pressure (at <1GPa) and dissolved H_2O in the melt on olivine-melt Ni partitioning. Besides the hydrous experiments from Moore and Carmichael (1998) that were reanalyzed for their glass Ni concentration in the experimental charges, there was no available experimental data in the literature on olivine-melt Ni partitioning in hydrous systems. With successful experimental confirmation, the olivine-melt Ni thermometer could be applied to hydrous arc basalts without prior knowledge of melt H_2O content.

Chapter IV applies the Ni-thermometer to the Colima Cone samples, aiming at investigating the mantle condition where these high K primitive melts were generated, in this highly unique tectonic setting characterized by the interaction of a mid-ocean ridge and an active subduction zone, which has caused fragmentation of Rivera and Cocos plate, and their different subduction angles (Yang et al., 2009). A combination of phase equilibrium partial melting experiments of phlogopite bearing lherzolite in the literature, with the temperature result from the Ni-thermometer provides critical constraints of the melt segregation depth and temperature. A comparison of the temperature results for the MGVF primitive basalts (Chapter II) and the Colima Cone basalts helps illuminate details about the mantle melting, melt segregation and ascent in this highly unique tectonic setting underneath the Colima Cones. The results are compared with the melt inclusion study by Vigouroux et al. (2008) and Maria and Luhr (2008) on the Colima Cone samples.

1.5 Constraining the pre-eruptive oxygen fugacity of arc basalt

In ***Chapter V***, upon the establishment that the most Fo-rich olivine phenocryst composition is in equilibrium with a liquid represented by the whole rock composition, the Fe^{3+}/Fe^{T} ratio of the melt at the onset of olivine crystallization was determined using the most Mg-rich olivine compostion with a proper olivine-melt Fe-Mg exchange coefficient (K_D) value. This proxy is first evaluated on the MGVF samples, to compare whether the calculated pre-eruptive Fe^{3+}/Fe^{T} ratio agrees with the range of global arc basalt, which is around Ni-NiO (NNO) buffer (Kelley and Cottrell, 2009).

Upon the successful application on the MGVF samples, the same method was applied to the Colima Cone samples. The calculated fO_2 are on average 1-1.5 log units lower than that obtained from whole rock wet chemistry analyses (Carmichael et al., 2006), which is up to 4 log units above the NNO buffer. This result is also consistent with those estimated by Vigouroux et al. (2008), using Cr-in-spinel oxybarometry (Ballhause et al., 1991) and S^{6+}/S^{total} ratio (Jugo et al., 2005).

It has been commonly evoked in the literatures (Metrich et al., 2009; Gaillard et al., 2015) that under oxidized condition (NNO+1 or above), the sulfur solubility in the melt increases exponentially and the dominant dissolved species is sulfate (SO_4^{2-}, where the valence state of sulfur is S^{6+}); degassing of these oxidized sulfur species (6+) in the melt into SO_2 (4+) and H_2S (2-) in the gas phase induces melt oxidation. Given the extremely high sulfur content reported in Colima Cone melt inclusions (Maria and Lurh, 2008; Vigouroux et al., 2008), the viability of sulfur degassing induced oxidation for the Colima Cone samples is also investigated in this study. While there are a handful of studies suggesting sulfur degassing induced melt reduction in Hawaii (e.g. Moussallam et al., 2016; Helz et al., 2017; Brounce et al., 2017) and Mt. Erebus (Moussallam et al., 2014) due to the dissolved sulfide (S^{2-}) in the melt degassed into S_2 or SO_2 in the gas phase, there hasn't been documentation of the sulfur degassing induced oxidation based on observations from natural samples in the literature.

1.6 References

Aranda-Gómez, J.J., and Mcdowell, F.W. (1998) Paleogene Extension in the Southern Basin and Range Province of Mexico: Syndepositional Tilting of Eocene Red Beds and Oligocene Volcanic Rocks in the Guanajuato Mining District. International Geology Review, 40, 116–134.

Ballhaus, C., Berry, R.F., and Green, D.H. (1991) High pressure experimental calibration of the olivine-orthopyroxene-spinel oxygen geobarometer: implications for the oxidation state of the upper mantle. Contributions to Mineralogy and Petrology, 107, 27–40.

Baker, M.B., Grove, T.L., and Price, R. (1994) Primitive basalts and andesites from the Mt. Shasta region, N. California: products of varying melt fraction and water content. Contributions to Mineralogy and Petrology, 111–129.

Bartel, K.S., Kinzler, R.J., and Grove, T.L. (1991) High pressure phase relations of primitive high-alumina basalts from Medicine Lake volcano, northern California. Contributions to Mineralogy and Petrology, 253–270.

Beattie, P. (1993) Olivine-melt and orthopyroxene-melt equilibria. Contributions to Mineralogy and Petrology, 115, 103-111.

Benjamin, E.R., Plank, T., Wade, J.A., Kelley, K.A., Hauri, E.H., and Alvarado, G.E. (2007) High water contents in basaltic magmas from Irazú Volcano, Costa Rica. Journal of Volcanology and Geothermal Research, 168, 68–92.

Brounce, M.N., Kelley, K.A., and Cottrell, E. (2014) Variations in Fe3+/∑Fe of Mariana Arc Basalts and Mantle Wedge fO_2. Journal of Petrology, 55, 2513–2536.

Brounce, M.N., Stolper, E.M., and Eiler, J.M. (2017) Redox variations in Mauna Kea lavas, the oxygen fugacity of the Hawaiian plume, and the role of volcanic gases in Earth's oxygenation. pnas, 1–34.

Carmichael, I.S.E. (1991) The redox states of basic and silicic magmas: a reflection of their source regions? Contributions to Mineralogy and Petrology, 106, 129–141.

Carmichael, I.S.E., Lange, R.A., and Luhr, J.F. (1996) Quaternary minettes and associated volcanic rocks of Mascota, western Mexico: a consequence of plate extension above a subduction modified mantle wedge. Contributions to Mineralogy and Petrology, 302–333.

Carmichael, I.S.E., Frey, H.M., Lange, R.A., and Hall, C.M. (2006) The Pleistocene cinder cones surrounding Volcán Colima, Mexico re-visited: eruption ages and volumes, oxidation states, and sulfur content. Bulletin of Volcanology, 68, 407–419.

Chen, Y., Provost, A., Schiano, P., and Cluzel, N. (2011) The rate of water loss from olivine-hosted melt inclusions. Contributions to Mineralogy and Petrology, 162, 625–636.

Chen, Y., Provost, A., Schiano, P., and Cluzel, N. (2013) Magma ascent rate and initial water concentration inferred from diffusive water loss from olivine-hosted melt inclusions. Contributions to Mineralogy and Petrology, 165, 525–541.

Donnelly-Nolan, J.M., Champion, D.E., Grove, T.L., Baker, M.B., Taggart, J.E., Jr., and Bruggman, P.E. (2012) The Giant Crater Lava Field: Geology and geochemistry of a compositionally zoned, high-alumina basalt to basaltic andesite eruption at Medicine Lake Volcano, California. Journal of Geophysical Research: Solid Earth, 96, 21843–21863.

Draper, D.S., and Johnston, A.D. (1992) Anhydrous PT phase relations of an Aleutian high-MgO basalt: an investigation of the role of olivine-liquid reaction in the generation of arc high-alumina basalts. Contributions to Mineralogy and Petrology, 112, 501–519.

Elkins-Tanton, L.T., Grove, T.L., and Donnelly-Nolan, J. (2001) Hot, shallow mantle melting under the Cascades volcanic arc. Geology, 29, 631.

Falloon, T.J., and Crawford, A.J. (1991) The petrogenesis of high-calcium boninite lavas dredged from the northern Tonga ridge. Earth and Planetary Science Letters, 102, 375–394.

Frey, H.M., Lange, R.A., Hall, C.M., Delgado-Granados, H., and Carmichael, I.S.E. (2007) A Pliocene ignimbrite flare-up along the Tepic-Zacoalco rift: Evidence for the initial stages of rifting between the Jalisco block (Mexico) and North America. Geological Society of America Bulletin, 119, 49–64.

Ford, C. E., D. G. Russell, J. A. Craven, and M. R. Fisk (1983), Olivine-liquid equilibria: Temperature, pressure and composition dependence of the crystal/liquid cation partition coefficients for Mg, Fe^{2+}, Ca and Mn, Journal of Petrology, 24, 256–265.

Gaillard, F., Scaillet, B., Pichavant, M., and Iacono-Marziano, G. (2015) The redox geodynamics linking basalts and their mantle sources through space and time. Chemical Geology, 217–233.

Grove, T.L., Till, C.B., and Krawczynski, M.J. (2012) The Role of H 2O in Subduction Zone Magmatism. Annual Review of Earth and Planetary Sciences, 40, 413–439.

Hasenaka, T., and Carmichael, I.S.E. (1985) The cinder cones of Michoacán—Guanajuato, central Mexico: their age, volume and distribution, and magma discharge rate. Journal of Volcanology and Geothermal Research, 25, 105–124.

Hesse, M., and Grove, T.L. (2003) Absarokites from the western Mexican Volcanic Belt: constraints on mantle wedge conditions. Contributions to Mineralogy and Petrology, 146, 10–27.

Helz, R.T., Cottrell, E., Brounce, M.N., and Kelley, K.A. (2017) Olivine-melt relationships and syn-eruptive redox variations in the 1959 eruption of Kilauea Volcano as revealed by XANES. Journal of Volcanology and Geothermal Research, 333-334, 1–14.

Herzberg, C., and O’Hara, M.J. (2002) Plume-associated ultramafic magmas off Phanerozoic age. Journal of Petrology, 43, 1857-1883.

Jayasuriya, K. D., O’Neill, H. St. C., Berry, A. J., Campbell, S. J. (2004) A Mössbauer study of the oxidation state of Fe in silicate melts. American Mineralogist, 89, 1597-1609.

Johnson, E.R., Wallace, P.J., Cashman, K.V., Granados, H.D., and Kent, A.J.R. (2008) Magmatic volatile contents and degassing-induced crystallization at Volcán Jorullo, Mexico: Implications for melt evolution and the plumbing systems of monogenetic volcanoes. Earth and Planetary Science Letters, 269, 478–487.

Johnson, E.R., Wallace, P.J., Delgado-Granados, H., Manea, V.C., Kent, A.J.R., Bindeman, I.N., and Donegan, C.S. (2009) Subduction-related Volatile Recycling and Magma Generation beneath Central Mexico: Insights from Melt Inclusions, Oxygen Isotopes and Geodynamic Models. Journal of Petrology, 50, 1729–1764.

Johnson, E.R., Wallace, P.J., Cashman, K.V., and Granados, H.D. (2010) Degassing of volatiles (H_2O, CO_2, S, Cl) during ascent, crystallization, and eruption at mafic monogenetic volcanoes in central Mexico. Journal of Volcanology and Geothermal Research, 197, 225–238.

Jugo, P.J., Luth, R.W., Richards, J.P. (2005) Experimental data on the speciation of sulfur as a function of oxygen fugacity in basaltic melts. Geochim Cosmochim Acta 69:477-503

Kelley, K.A., and Cottrell, E. (2009) Water and the Oxidation State of Subduction Zone Magmas. Science, 325, 605–607.

Kelley, K.A., and Cottrell, E. (2012) The influence of magmatic differentiation on the oxidation state of Fe in a basaltic arc magma. Earth and Planetary Science Letters, 109–121.

Kress, V.C. and Carmichael, I.S.E. (1991) The compressibility of silicate liquids containing Fe2 O3 and the effect of composition, temperature, oxygen fugacity and pressure on their redox states. Contributions to Mineralogy and Petrology, 108:82-92

Lange, R.A., and Carmichael, I.S.E. (1990) Hydrous Basaltic Andesites Associated with Minette and Related Lavas in Western Mexico. Journal of Petrology, 31, 1225–1259.

Lloyd, A.S., Plank, T., Ruprecht, P., Hauri, E., Rose, W. (2013) Volatile loss from melt inclusions in pyroclasts of differing sizes. Contributions to Mineralogy and Petrology, 165, 129-153

Luhr, J.F., Aranda-Gómez, J.J., and Pier, J.G. (1989) Spinel-lherzolite-bearing quaternary volcanic centers in San Luis Potosí, Mexico: 1. Geology, mineralology, and petrology. Journal of Geophysical Research, 94, 7916–7940.

Luhr, J.F. (1997) Extensional tectonics and the diverse primitive volcanic rocks in the western Mexican volcanic belt. The Canadian Mineralogist, 35, 473–500.

Manea, V.C., Manea, M., and Ferrari, L. (2013) A geodynamical perspective on the subduction of Cocos and Rivera plates beneath Mexico and Central America. Tectonophysics, 609, 56–81.

Maria, A.H., and Luhr, J.F. (2008) Lamprophyres, Basanites, and Basalts of the Western Mexican Volcanic Belt: Volatile Contents and a Vein–Wallrock Melting Relationship. Journal of Petrology, 49, 2123–2156.

Matzen et al. (2013) Matzen, A.K., Baker, M.B., Beckett, J.R., Stolper, E.M. (2013) The temperature and pressure dependence of Nickel partitioning between olivine and silicate melt. Journal of Petrology, 54, 2521-2545.

Métrich, N., Berry, A.J., O'Neill, H.S.C., and Susini, J. (2009) The oxidation state of sulfur in synthetic and natural glasses determined by X-ray absorption spectroscopy, 1–18.

Moore, G., and Carmichael, I.S.E. (1998) The hydrous phase equilibria (to 3 kbar) of an andesite and basaltic andesite from western Mexico: constraints on water content and conditions of phenocryst growth. Contributions to Mineralogy and Petrology, 130:304-319.

Moussallam, Y., Oppenheimer, C., Scaillet, B., Gaillard, F., Kyle, P., Peters, N., Hartley, M., Berlo, K., and Donovan, A. (2014) Tracking the changing oxidation state of Erebus magmas, from mantle to surface, driven by magma ascent and degassing, 1–10.

Moussallam, Y., Edmonds, M., Scaillet, B., Peters, N., Gennaro, E., Sides, I., and Oppenheimer, C. (2016) The impact of degassing on the oxidation state of basaltic magmas: A case study of Kīlauea volcano. Earth and Planetary Science Letters, 450, 317–325.

Ni, P., Zhang, Y., and Guan, Y. (2017) Volatile loss during homogenization of lunar melt inclusions. Earth and Planetary Science Letters, 478, 214–224.

Nye, C.J., and Reid, M.R. (1986) Geochemistry of primary and least fractionated lavas from Okmok Volcano, Central Aleutians: Implications for arc magmagenesis. Journal of Geophysical Research, 91, 10271–10287.

Ownby, S.E., Lange, R.A., and Hall, C.M. (2008) The eruptive history of the Mascota volcanic field, western Mexico: Age and volume constraints on the origin of andesite among a diverse suite of lamprophyric and calc-alkaline lavas. Journal of Volcanology and Geothermal Research, 177, 1077–1091.

Pardo, M., and Suárez, G. (1995) Shape of the subducted Rivera and Cocos plates in southern Mexico: Seismic and tectonic implications. Journal of Geophysical Research: Solid Earth, 100, 12357–12373.

Pichavant, M., and MacDonald, R. (2018) Mantle genesis and crustal evolution of primitive calc-alkaline basaltic magma from the Lesser Antilles arc. Geological Society of London, Special Publication, Intra-Oceanic Subduction systems Tectonics and Magmatic Processes, 219, 239–254.

Plank, T., Kelley, K.A., Zimmer, M.M., Hauri, E.H., and Wallace, P.J. (2013) Why do mafic arc magmas contain ~4wt% water on average? Earth and Planetary Science Letters, 364, 168–179.

Portnyagin, M., Hoernle, K., Plechov, P., Mirono, N., Khubunaya, S. (2007) Constraints on mantle melting and composition and nature of slab components in volcanic arcs from volatiles (H_2O, S, Cl, F) and trace elements in melt inclusions from the Kamtchatka Arc. Earth and Planetary Science Letters, 255, 53-69.

Putirka, K.D., Perfit, M., Ryerson, F.J., Jackson, M.G. (2007) Ambient and excess mantle temperatures, olivine thermometry, and active vs. passive upwelling. Chemical Geology, 241, 177-206.

Putirka, K.D. (2008) Thermometers and Barometers for Volcanic Systems. In K.D. Putirka and F.J. Tepley III, Eds., Minerals, Inclusions and Volcanic Processes, 69, 61-120. Reviews in Mineralogy and Geochemistry, Mineralogical Society of America, Chantilly, Virginia.

Roggensack, K. (1997) Explosive Basaltic Volcanism from Cerro Negro Volcano: Influence of Volatiles on Eruptive Style. Science, 277, 1639–1642.

Ruscitto, D.M., Wallace, P.J., Johnson, E.R., Kent, A.J.R., and Bindeman, I.N. (2010) Volatile contents of mafic magmas from cinder cones in the Central Oregon High Cascades: Implications for magma formation and mantle conditions in a hot arc. Earth and Planetary Science Letters, 298, 153–161.

Ruscitto, D.M., Wallace, P.J., Cooper, L.B., and Plank, T. (2012) Global variations in H 2O/Ce: 2. Relationships to arc magma geochemistry and volatile fluxes. Geochemistry, Geophysics, Geosystems, 13, n/a–n/a.

Sadofsky, S.J., Portnyagin, M., Hoernle, K., and van den Bogaard, P. (2008) Subduction cycling of volatiles and trace elements through the Central American volcanic arc: evidence from melt inclusions. Contributions to Mineralogy and Petrology, 155, 433–456.

Sisson, T.W., and Layne, G.D. (1993) H_2O in basalt and basaltic andesite glass inclusions from four seduction-related volcanoes. Earth and Planetary Science Letters, 117, 619-635.

Sugawara, T. (2000) Empirical relationships between temperature, pressure, and MgO content in olivine and pyroxene saturated liquid. Journal of Geophysical Research: Solid Earth, 105, 8457–8472.

Tatsumi, Y., Sakuyama, M., H, F., and I, K. (1983) Generation of arc basalt magmas and thermal structure of the mantle wedge in subduction zones. Journal of Geophysical Research, 5815=5825.

Vigouroux, N., Wallace, P.J., and Kent, A.J.R. (2008) Volatiles in High-K Magmas from the Western Trans-Mexican Volcanic Belt: Evidence for Fluid Fluxing and Extreme Enrichment of the Mantle Wedge by Subduction Processes. Journal of Petrology, 49, 1589–1618.

Walker, J.A., Roggensack, K., Patino, L.C., Cameron, B.I., and Matías, O. (2003) The water and trace element contents of melt inclusions across an active subduction zone. Contributions to Mineralogy and Petrology, 146, 62–77.

Wallace, P., Carmichael, I.S.E., Righter, K., and Becker, T.A. (1992) Volcanism and tectonism in western Mexico: A contrast of style and substance. Geology, 20, 625.

Wallace, P.J. (2005) Volatiles in subduction zone magmas: concentrations and fluxes based on melt inclusion and volcanic gas data. Journal of Volcanology and Geothermal Research, 140, 217–240.

Walowski K.J., Wallace P.J., Hauri E.H., Wada I. and Clynne M.A. (2015) Slab melting beneath the Cascade Arc driven by dehydration of altered oceanic peridotite. Nature Geoscience, Vol. 8, p 404-408.

Yang, T., Grand, S.P., Wilson, D., Guzman-Speziale, M., Gomez-Gonzalez, J.M., Dominguez-Reyes, T., and Ni, J. (2009) Seismic structure beneath the Rivera subduction zone from finite-frequency seismic tomography. Journal of Geophysical Research: Solid Earth, 114, 277–12.

Yogodzinski, G.M., Kay, R.W., Volynets, O.N., Koloskov, A.V., and Kay, S.M. (1995) Magnesian andesite in the western Aleutian Komandorsky region: Implications for slab melting and processes in the mantle wedge. Geological Society of America Bulletin, 107, 505–519.

Chapter II

A comparison of olivine-melt thermometers based on D_{Mg} and D_{Ni}: the effects of melt composition, temperature and pressure with applications to MORBs and hydrous arc basalts

2.1 Abstract

A new olivine-melt thermometer based on the partitioning of Ni ($D_{Ni}^{oliv/liq}$), with a form similar to the Beattie (1993) $D_{Mg}^{oliv/liq}$ thermometer, is presented in this study. It is calibrated on a dataset of 123 olivine-melt equilibrium experiments from 16 studies in the literature that pass the following five filters: (1) 1-bar only, (2) analyzed totals between 99.0-101.0 wt% for olivine and 98.5-101.0 wt% for quenched glasses, (3) olivine is the only silicate phase in equilibrium with the melt, (4) the NiO concentration is ≥ 0.1 wt% in olivine and ≥ 0.01 wt% in quenched glass, and (5) no metallic phase is present other than the capsule. The final dataset spans a wide range of temperature (1170-1650 °C), liquid composition (37-66 wt% SiO_2; 4-40 wt% MgO; 107-11087 ppm Ni), and olivine composition (Fo_{36-100}; 0.10-15.7 wt% NiO). The Ni-thermometer recovers the 123 experimental temperatures within ± 29 °C (1σ), with an average residual of 0 °C. A re-fitted version of the Mg-thermometer of Beattie (1993), calibrated on the same 123 experiments as for the Ni-thermometer, results in an average residual of 1 ± 26 °C (1σ). When both thermometers are

applied to the same 123 experiments, the average ΔT (T_{Mg}-T_{Ni}) is 1 ± 29°C (1σ), which confirms that the Mg- and Ni-thermometers perform equally well over a wide range of anhydrous melt composition and temperature at 1 bar. The pressure dependence of the Ni-thermometer under crustal conditions (≤ 1 GPa) is shown to be negligible through comparison with experimental results from Matzen et al. (2013), whereas the pressure dependence of the Mg-thermometer is up to 52°C at ≤ 1 GPa (Herzberg and O'Hara, 2002). Therefore, neglecting the effect of pressure when applying both thermometers to basalts that crystallized olivine at crustal depths (≤ 1 GPa) is expected to lead to negative ΔT (T_{Mg}-T_{Ni}) values (≤ -52 °C). Application of the two thermometers to nine mid-ocean ridge basalts results in an average ΔT of -3 degrees, consistent with shallow crystallization of olivine under nearly anhydrous conditions. In contrast, application of the two thermometers to 18 subduction-zone basalts leads to an average ΔT of +112 degrees; this large positive ΔT value cannot be explained by the effect of pressure, temperature or anhydrous melt composition. It is well documented in the literature that $D_{Mg}^{oliv/liq}$ is affected by dissolved water in the melt and that Mg-thermometers overestimate the temperature of hydrous basalts if an H_2O correction is not applied (e.g., Putirka et al., 2007). Therefore, the reason why hydrous arc basalts have higher ΔT (T_{Mg}-T_{Ni}) values than MORBs may be because $D_{Ni}^{oliv/liq}$ is less sensitivite to water in the melt, which is supported by new Ni-partitioning results on three olivine-melt equilibrium experiments on a basaltic andesite with up to 5 wt% H_2O. More hydrous experiments are needed to confirm that the Ni-thermometer can be applied to hydrous melts without a correction for H_2O in the melt.

2.2 Introduction

The importance of obtaining the magmatic temperatures of basalts has long been recognized and pursued by Earth scientists. Numerous researchers have mapped global variations in mantle temperature by applying olivine-melt thermometers based on Mg-partitioning ($D_{Mg}^{oliv/liq}$) to basalts from mid-ocean spreading ridges (e.g. Falloon et al., 2007; Genske et al., 2012) and the Iceland and Hawaiian plumes (e.g. Neave et al., 2015; Xu et al., 2014). These efforts not only constrain conditions for mantle melting at different tectonic settings, including depth of melting (e.g., Lee et al., 2009) and thermal anomalies associated with mantle plumes (e.g., Herzberg et al., 2007; Falloon et al., 2007; Putirka et al., 2007), but also have contributed substantially to our understanding of how the Earth's mantle has cooled through time (e.g., Herzberg and Gazel, 2009).

The reliability of these results largely depends on the accuracy of applied olivine-melt thermometers. There is general agreement (e.g., Herzberg et al., 2007; Falloon et al., 2007; Putirka, 2008; Herzberg and Asimow, 2015) that the Beattie (1993) form of the thermometer recovers experimental temperatures the best under anhydrous conditions (e.g., standard error estimate of ± 44°C; Putirka, 2008) and produces temperatures similar to the model of Ford et al. (1983) and those obtained by the MELTS program (Ghiorso and Sack, 1995; Asimow et al., 2001) for anhydrous natural samples. When applied to hydrous liquids, however, all thermometers based on $D_{Mg}^{oliv/liq}$ (e.g., Ford et al., 1983; Beattie, 1993), require a major correction for the dissolved H_2O content when applied to hydrous liquids, possibly because hydroxyl groups complex with Mg^{2+} to lower its activity in hydrous melts (e.g., Waters and Lange, 2013). Putirka et al. (2007) provides a modified thermometer (Eq. 4 in that study) that includes an H_2O term, which reproduces experimental temperatures with a high overall precision (standard error estimate of 29˚C; Putirka, 2008). Thus, the application of any currently available olivine-melt thermometer based on Mg-partitioning to hydrous basalts requires that melt H_2O concentration be known a priori.

In this study, the potential of a new olivine-melt thermometer based on the partitioning of Ni ($D_{Ni}^{oliv/liq}$) is evaluated in comparison to the best available $D_{Mg}^{oliv/liq}$ thermometer as a function of anhydrous melt composition, temperature and pressure through a common set of phase-equilibrium experiments from the literature. Both the $D_{Ni}^{oliv/liq}$ and $D_{Mg}^{oliv/liq}$ thermometers are applied to a set of nine mid-ocean ridge basalts (MORBs) and 18 subduction-zone basalts to test whether there is any difference in the results for samples that are relatively anhydrous (i.e., MORBs) vs. hydrous (i.e., arc basalts). In light of the large systematic difference in the Ni- and Mg-thermometers for arc basalts, but not for MORBs, new Ni-partitioning results for olivine-melt equilibrium experiments on a hydrous basaltic andesite are presented to test the relative sensitivity of $D_{Ni}^{oliv/liq}$ and $D_{Mg}^{oliv/liq}$ to up to 5 wt% H_2O in the melt phase.

2.3 Analytical Methods

Olivine compositions were measured with a five-spectrometer Cameca SX-100 electron microprobe at the University of Michigan. The analyses were made with a focused beam, with an acceleration voltage of 15kV and a beam current of 20nA.

Eight elements were measured (Mg, Fe, Si, Ni, Al, Mn, Cr, Ca). The peak and background counting times were 30s each for Si, Mg, Fe and Ni, and 20 s each for Al, Mn, Cr and Ca. The 1σ precision based on counting statistics is ± 0.32 wt% SiO_2, ± 0.25 wt% MgO, ± 0.54 wt% FeO, and ± 0.05 wt% NiO, and < 0.1 wt% for Cr_2O_3, Al_2O_3, MnO and CaO. The standards used for all analyses are from the University of Michigan collection for the electron microprobe and are described in Table A1. Oxygen was calculated by cation stoichiometry and used in the Cameca PAP correction program. Traverses across 20-30 olivine crystals were conducted in all natural samples. Traverses along the darker (Mg-rich) region on the back-scattered electron (BSE) image of each crystal were made, with an analysis every 20-30 μm, leading to approximately 200-500 effective olivine analyses for each sample. Plagioclase crystals in two natural samples (UR-60, UR-61) were also analyzed using the Cameca SX-100, but in this case seven elements were analyzed (Si, Al, Fe, Ca, Na, K, Ba) using an accelerating voltage of 15 kV and a focused beam current of 4 nA. The peak and background counting times were 30s each for all elements. The 1σ precision based on counting statistics is < 2% for SiO_2 and Al_2O_3, < 4% for CaO, and < 5% for Na_2O. Traverse analyses across plagioclase phenocrysts were performed in the same way as for olivine phenocrysts.

The Ni concentrations (ppm) in the quenched glass of experimental run products were analyzed by laser ablation using a Photon Machines Analyte G2 193 nm Ar-F excimer laser coupled with a Thermo Scientific X series 2 Quadrapole inductively coupled plasma mass spectrometer (ICP-MS) at Oregon State University. The beam size was 50 μm and the counting time was 30s. GSE-1G was used as the reference standard while monitoring standards BCR-2G and TI-G. The Ni content of the glass was calculated relative to the reference standard GSE-1G, which was measured under identical conditions throughout the same analytical session. To reduce the matrix effect, ^{43}Ca was used as an internal standard, in conjunction with the CaO contents in the experimental glasses, which were measured independently with an electron microprobe and reported in Moore and Carmichael (1998). The 1σ uncertainty is 8%, which includes the error from the reference standard GSE-1G. The procedures and protocols that were followed are described more fully in Kent et al. (2004).

2.4 Olivine-Melt Thermometry

2.4.1 An Olivine-Melt Thermometer Based on Ni Partitioning at 1 bar

Nickel partitioning between olivine and basaltic melts has been extensively studied as a function of anhydrous melt composition, temperature, and pressure by a large number of researchers. Here, attention is first focused on the effect of anhydrous melt composition and temperature on the partition coefficient for Ni between olivine and melt ($D_{Ni}^{oliv/liq}$) at 1 bar; the effect of pressure is evaluated separately in another section below. On the basis of nine experimental studies published over the last four decades (Arndt, 1977; Hart and Davis, 1978; Leeman and Lundstrom, 1978; Agee and Walker, 1990; Kelemen et al., 1998; Wang and Gaetani, 2008; Li and Ripley, 2010; Putirka et al., 2011; Matzen et al., 2013) thirteen different models were proposed to describe $D_{Ni}^{oliv/liq}$ as a function of temperature and melt composition (Table II-1).

To test the relative effectiveness of these different model equations at 1-bar, an initial dataset of 328 1-bar experiments were compiled, which includes those that were used to calibrate the Matzen et al. (2013) and Li and Ripley (2010) models, as well those in the Library of Experimental Phase Relations (LEPR) (Hirschmann et al., 2008). Four filters were then applied: (1) analyzed totals of olivine between 99.0-101.0 wt% and of glass between 98.5-101.0 wt%; (2) olivine is the only silicate phase in equilibrium with the melt; (3) the NiO concentration is ≥ 0.1 wt% in olivine and ≥ 0.1wt% in quenched glass (given the detection limits of the electron microprobe used to analyze the Ni contents in both phases); (4) no metallic phase is present other than the capsule. The purpose of these four filters is to exclude experiments where analytical uncertainties may have been too high and/or where equilibrium may not have been attained among several phases in crystal-rich experiments. Although some experiments that had small analytical uncertainties and/or achieved equilibrium may have been excluded, the uniform application of all four filters allowed a high-quality dataset to be compiled in an unbiased manner. The final dataset includes 123 olivine-melt experiments at 1 bar from 16 studies (Bird, 1971; Arndt, 1977; Takahashi, 1978; Nabelek, 1980; Kinzler et al., 1990; Ehlers et al., 1992; Snyder and Carmichael, 1992; Jurewicz et al., 1993; Parman et al., 1997; Gaetani and Grove, 1997; Tuff et al., 2005; Mysen, 2006; Mysen, 2007a; Mysen, 2007b; Mysen, 2008; Wang and Gaetani, 2008; Matzen et al., 2013). The final dataset (compiled in Table A2) spans a wide range of liquid composition (37-66 wt% SiO_2; 4-40 wt% MgO; 107-11087 ppm Ni), olivine composition (Fo_{36-100}; 0.13-15.7 wt% NiO), and temperature (1170-1650 °C).

Table II-1 The equations and average residual for 13 $DNi^{ol/liq}$ models from the literature applied to data in Table A2

Studies		Rearranged Equations[1]	Average Residual I (± 1σ)
Matzen et al., 2013		$T(K) = \frac{4338}{\ln D_{Ni}^{oliv/melt}(mol\%) - \ln D_{Mg}^{oliv/melt}(mol\%) + 1.956}$	19 ± 98 ˚C
Putirka et al., 2011	Eqn. 2a	$T(°C) = \frac{6800}{\ln D_{Ni}^{oliv/liq}(wt\%) + 3.257}$	-16 ± 70 ˚C
	Eqn. 2b	$T(°C) = \frac{6829}{\ln D_{Ni}^{oliv/liq}(wt\%) - 0.033 * SiO_2{}^{liq}(wt\%) + 4.75}$	58 ± 75 ˚C
	Eqn. 2c	$T(°C) = 3236 / [\ln D_{Ni}^{oliv/liq}(wt\%) - 0.04 * SiO_2{}^{liq}(wt\%) + 0.04 * MgO^{liq}(wt\%) + 1.78]$	144 ± 119 ˚C
	Eqn. 2c'[2]	$T(°C) = 3235.6 / [\ln D_{Ni}^{oliv/liq}(wt\%) - 0.038 * SiO_2{}^{liq}(wt\%) + 0.045 * MgO^{liq}(wt\%) + 1.783]$	4 ± 49˚C
Li and Ripley, 2010[3]		$T(K) = \frac{9250}{\ln D_{Ni}^{oliv/liq}(wt\%) 0.618 * X_{div}^{liq} / X_{SiO2}^{liq} + 4.02}$	-9 ± 30 ˚C
Wang and Gaetani, 2008		$T(K) = \frac{7100}{\ln D_{Ni}^{oliv/melt}(wt\%) + 0.71 * \ln(NBO/T) + 2.5}$	-39 ± 75 ˚C
Keleman et al., 1998		$T(K) = \frac{15850}{\ln D_{Ni}^{oliv/liq}(wt\%) + 7.69}$	29 ± 54˚C

Agee and Walker, 1990	SiO_2	$T(K) = \frac{10800}{\ln D_{Ni}^{oliv/liq}(wt\%) - 0.04 * {SiO_2}^{liq}(wt\%) + 6.66}$	60 ± 59˚C
	MgO	$T(K) = \frac{93000}{D_{Ni}^{oliv/liq}(wt\%) + \frac{45}{MgO^{liq}(wt\%)} + 45}$	40 ± 86˚C
Hart and Davis, 1978		$T(K) = \frac{12345}{\ln D_{Ni}^{oliv/liq}(wt\%) + 5.593}$	30 ± 57˚C
Leeman and Lundstrom, 1978	wt%	$T(K) = \frac{13376}{\ln D_{Ni}^{oliv/liq}(wt\%) + 6.34}$	3 ± 54˚C
	mole%	$T(K) = \frac{14298}{\ln D_{Ni}^{oliv/liq}(mole\%) + 6.99}$	15 ± 54˚C
Arndt, 1977		$T(K) = \frac{10430}{\ln D_{Ni}^{oliv/liq}(mole\%) + 4.79}$	-17 ± 60˚C

Notes:
1. All the models were originally fit with $\ln D_{Ni}$ or D_{Ni} as the dependent variable. They were rearranged to calculate temperature from analyzed D_{Ni} and melt compositions.
2. Eqn. 2c' is Eqn. 2c from Putirka et al. (2011) with one more significant digit on each of the fit parameters than what is reported (determined by trial and error to obtain a better residual for the 123 experiments).
3. In the equation of Li and Ripley (2010), $X_{div}^{liq} = X_{FeO}^{liq} + X_{MgO}^{liq} + X_{MnO}^{liq} + X_{CaO}^{liq} + X_{CoO}^{liq} + X_{NiO}^{liq}$.

The thirteen $D_{Ni}^{oliv/liq}$ models in Table II-1 were used to calculate temperature for the 123 experiments in Table A2. Plots of the temperature residuals (= $T_{calc} - T_{expt}$) for each model are shown in Figure A1. Among the thirteen models, the one presented in Li and Ripley (2010) yields the best result with an average residual of -9 ± 30˚C (1σ), while the others have 1σ residuals that range from ± 54 to ±119°C (Table II-1; Fig. A1). Although the most recently published model of Matzen et al.

(2013) has an average residual of only 19 °C, the 1σ standard deviation is ± 98°C (Table II-1; Fig. A1). Note that the Ni-partitioning experiments conducted by Matzen et al. (2013) are of the highest quality, and both the Li and Ripley model (2010) and the Matzen et al. (2013) models recovers the two 1-bar experiments from Matzen et al. (2013) within 22 and 35 °C, respectively.

The next step is to recalibrate all of the $D_{Ni}^{oliv/liq}$ thermometers in Table II-1, using the dataset of 123 olivine-melt experiments in Table A2. The 13 models in Table II-1 can be reduced to eight different forms of model equations, and the results of those re-calibrations are shown in Table II-2 and Figure A2 (plots of the temperature residuals for each model). The effect of recalibrating the model equations in Table II-2 with 10000/T as the dependent variable (instead of $\ln D_{Ni}^{oliv/liq}$) leads to temperature-dependent residuals (Table A3, Figure A3) and is therefore not recommended.

The best model in Table II-2 is obtained from the equation used by Li and Ripley (2010), which is based on the simplified thermodynamic formulation of Beattie et al. (1991) where the effect of melt composition (and polymerization) is modeled through the term, $X_{Div}^{melt} / X_{SiO_2}^{melt}$, where X_{Div}^{melt} is equal to $X_{MgO}^{melt} + X_{FeO}^{melt} + X_{CaO}^{melt} + X_{MnO}^{melt} + X_{CoO}^{melt} + X_{NiO}^{melt}$ (X_i^{melt} refers to the mole fraction of component i in the melt) and $X_{SiO_2}^{melt}$ is the mole fraction of SiO_2 in the melt. To first order, this compositional term tracks the degree of melt polymerization, which has been shown to increase the value of $D_{Ni}^{oliv/liq}$ (e.g., Hart and Davis, 1978; Wang and Gaetani, 2008). Interestingly, this simplified compositional parameter leads to a better model equation than one that is based on the parameter NBO/T (non-bridging oxygens over tetrahedral units), which was introduced by Mysen et al. (1985) to model the degree of melt polymerization. The NBO/T parameter is included in Model D (Table II-2), the form used by Wang and Gaetani (2008), and results in a higher 1σ standard deviation (± 60 °C) than that (± 31 °C) for the Li and Ripley (2010) form (Model A in Table II-2) when calibrated on the 123 1-bar experiments.

A final model equation for the Ni-thermometer is based on the general form of the Beattie (1993) Mg-thermometer. In this empirical version (Eq. 1), $D_{Ni}^{oliv/liq}$ is substituted for $D_{Mg}^{oliv/liq}$ (both constructed on a molar basis) and the coefficients in front of the molar compositional terms are fitted parameters. In this equation, the effect of melt polymerization is incorporated with the combined terms X_{NM} and X_{SiO2}, which are defined below. Although the original Beattie (1993) model equation uses cation fractions instead of mole fractions, the results of a calibration on the 123 experiments in Table A2 have lower residuals if mole fractions are used. The generalized form of the equation is given here:

$$\ln D_i^{ol/melt} = a + \frac{b}{T} + c\ln\left(X_{NM}^{liq}\right) + d\ln\left(X_{SiO_2}^{liq}\right) + e\left(NF\right) \qquad (1)$$

where T is in Kelvin, $X_{NM}^{liq} = X_{FeO}^{liq} + X_{MgO}^{liq} + X_{MnO}^{liq} + X_{CaO}^{liq} + X_{CoO}^{liq} + X_{NiO}^{liq}$ (mole fraction components), $X_{SiO_2}^{liq}$ is the mole fraction of SiO_2 in the melt, and NF = $3.5\ln\left(1 - X_{Al_2O_3}\right) + 7\ln\left(1 - X_{TiO_2}\right)$. The results of the calibration of Equation 1 (for i=Ni) on the 123 experiments in Table A2 are given in Table II-3, with residuals plotted in Figure II-1a. This model provides the best overall fit to the data, with an average residual of 0 ± 29°C and a R^2 of 0.96, and it is the Ni-thermometer recommended in this study (Table II-3)

Table II-2 The average residual for eight model equations from Table II-1 recalibrated on the 123 1-bar experiments in Table A2.

Model #	Rearranged Equations	Avg. $T_{calc} - T_{expt}$ (with 1σ)	R^2
Model A	$T(K) = 9090(\pm 24))/\ [\ln D_{Ni}^{oliv/liq}(wt\%) + 0.677\ (\pm 0.026) * (X_{FeO}^{liq} + X_{MgO}^{liq} + X_{MnO}^{liq} + X_{CaO}^{liq} + X_{CoO}^{liq} + X_{NiO}^{liq})/X_{SiO2}^{liq} + 3.904\ (\pm 0.147)]$	-1 ± 31 ˚C	0.961
Model B	$T(K) = 6902\ (\pm 35)/[\ln D_{Ni}^{oliv/liq}(wt\%) - 0.029\ (\pm 0.001) * (SiO_2{}^{liq}(wt\%) - MgO^{liq}(wt\%)) + 3.442\ (\pm 0.189)]$	-1 ± 49 ˚C	0.942
Model C	$T(K) = 12958(\pm 373)/[\ln D_{Ni}^{oliv/liq}(wt\%) - 0.0371\ (\pm 0.0025) * SiO_2{}^{liq}(wt\%) + 8.042\ (\pm 0.298)]$	1 ± 33 ˚C	0.911
Model D	$T(K) = 7965\ (\pm 48) /[\ln D_{Ni}^{oliv/liq}(wt\%) + 0.492(\pm 0.041)) * (NBO/T) + 2.957\ (\pm 0.295)]$	2 ± 60 ˚C	0.863
Model E	$T(K) = 17841\ (\pm 871)/[\ln D_{Ni}^{oliv/melt}(mol\%) + \ln D_{Mg}^{oliv/melt}(mol\%) + 8.254\ (\pm 0.535)]$	2 ± 56 ˚C	0.776
Model F	$T(K) = 10517(\pm 560)/[\ln D_{Ni}^{oliv/liq}(mol\%) + 4.768(\pm 0.344)]$	-3 ± 61˚C	0.745
Model G	$T(K) = 11070\ (\pm 592)/[\ln D_{Ni}^{oliv/liq}(wt\%) + 4.946\ (\pm 0.363)]$	3 ± 62˚C	0.743
Model H	$T(K) = 66644\ (\pm 5083)/[D_{Ni}^{oliv/liq}(wt\%) - 1/MgO^{liq}(wt\%) + 33.745 \pm 3.118]$	4 ± 83˚C	0.696

Model A is based on the Li and Ripley (2010) model.
Model B is based on Eq. 2c in Putirka et al. (2011).
Model C is based on Eq. 2b in Putirka et al. (2011) and the SiO_2 model in Agee and Walker (1990).
Model D is based on the Wang and Gaetani (2008) model.

Model E is based on the Matzen et al. (2013) model.
Model F is based on the mole% model in Leeman and Lundstrom (1978) and the model in Arndt (1977),
Model G is based on Eq. 2a in Putirka et al. (2011), Leeman and Lundstrom (1978), Keleman et al. (1998), and Hart and Davis, (1978).
Model H is based on the MgO equation in Agee and Walker (1990).
$\ln D_{Ni}$ or D_{Ni} was the dependent variable in all fits, except D_{Ni} – 1/MgO for Model H, and $\ln D_{Ni} + \ln D_{Mg}$ for Model E.

Table II-3 Fitted parameters and statistics for calibration of Equation 1 for Ni and Mg

	T_{Ni}	T_{Mg}
	fitted value ± 1σ	
a	-4.32 ± 0.33	-4.74 ± 0.20
b	9416 ± 296	6701 ± 182
c	-0.71 ± 0.13	-1.12 ± 0.08
d	0.53 ± 0.24	-1.08 ± 0.15
e	0.35 ± 0.11	0.64 ± 0.07
	statistics	
SEE	29	26
R^2	0.96	0.96

2.4.2 An Updated Olivine-Melt Thermometer Based on Mg Partitioning at 1 bar

Since the publication of the landmark study by Roeder and Emslie (1970), numerous geothermometers based on the partitioning of Mg between olivine and silicate melt have been proposed. In a review of olivine-melt thermometers, Putirka (2008) showed that the general form of the Beattie (1993) model (Eq.1) leads to the most accurate results. When the Beattie (1993) and Putirka et al. (2007) Mg-thermometers are applied to the 123 olivine-melt 1-bar experiments in Table A2 (used to calibrate the Ni-thermometer in Eq. 1), the average residuals are 17 ± 30 (1σ) and 0 ± 31 (1σ), respectively (Table II-4; Figure A4**)**. Here, we perform a recalibration of the general form of the Beattie (1993) Mg-thermometer on the 123 experiments in Table A2, using the empirical form shown in Equation 1. The results of the regression are given in Table II-3, with residuals plotted in Figure II-1b. This model provides an excellent fit to the 123 olivine-melt experiments, with an average residual of 1 ± 26°C and a R^2 of 0.96, and it is the Mg-thermometer recommended in this study.

Table II-4 The average residuals for the Mg-thermometers of Beattie (1993) and Putirka et al. (2007) re-calibrated on the 123 experiments in Table A2

Study	Equations	Average Residual (with 1σ)
Beattie, 1993	$T(K)) = \dfrac{[13603.6 + 4.943 * 10^{-7} * (P(Pa) - 10^5)]}{[6.26 + 2 * ln\left(D_{Mg}^{\frac{oliv}{liq}}\right) + 2\, ln(1.5 * C_{NM}^{liq}) + 2 * ln\,(3 * C_{SiO2}^{liq}) - NF]}$	17 ± 30 ˚C
Putirka et al., 2007	$T(˚C) = \dfrac{[15294.6 + 1318.8 * P(GPa) + 2.4834 * P(GPa)^2]}{[8.048 + 2.8352 * lnD_{Mg}^{\frac{oliv}{liq}} + 2.097 * ln(1.5 * C_{NM}^{liq}) + 2.575 * ln(3 * C_{SiO2}^{liq}) - 1.41 * NF + 0.222 * H_2O + 0.5 * P\,(GPa)]}$	0 ± 31˚C

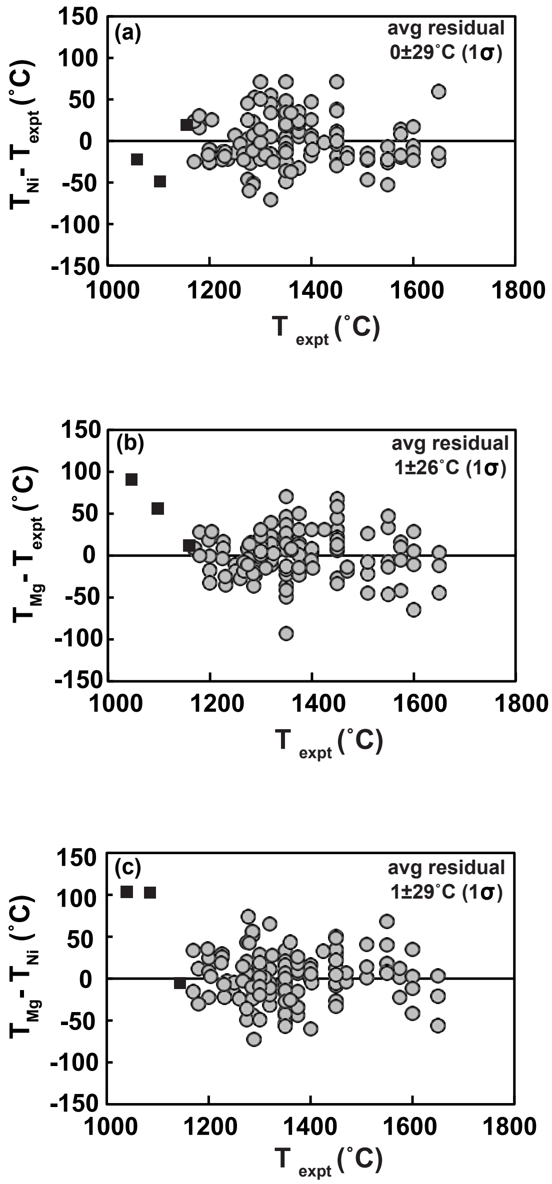


Figure II-1 Plot of T_{expt} –T_{Ni} (temperature calculated from Ni-thermometer; Eq. 1, Table II-3) vs T_{expt} for the 123 olivine-melt experiments in Table A2; vs. T_{expt} for the 123 olivine-melt experiments in Appendix II- B; (b) Plot of T_{expt}-T_{Mg} (temperature calculated from Mg-thermometer; Eq.1, Table II-3) vs. T_{expt} (c) same as (a), but ΔT (= T_{Mg}-T_{Ni}) vs. T_{expt}. The results show no systematic difference between the two thermometers over a wide range of temperature and anhydrous melt composition (Table A2). The solid squares are results from the hydrous olivine-melt equilibrium experiments of Moore and Carmichael (1998; Table II-7) and show that the Ni-thermometer more accurately recovers experimental temperatures under hydrous conditions than the Mg-thermometer.

2.4.3 A comparison of the Ni- and Mg-Thermometers at 1 bar

In order to directly compare the results of the Ni-thermometer (T_{Ni}) with those of the Mg-thermometer (T_{Mg}) on the 123 experiments, a parameter ΔT (= $T_{Mg} - T_{Ni}$) was constructed for this dataset. A plot of ΔT as a function of experimental temperature is shown in Figure II-1c; the average ΔT is 1 ± 29°C (1σ). This result confirms that the Ni-thermometer and the Mg-thermometer (Table II-3, Eq. 1) perform equally well over a wide range of anhydrous melt composition (SiO_2 = 37-66 wt%; MgO = 4-40 wt%) and temperature (1160-1650 °C) at 1 bar. Therefore, if the two thermometers are applied to a series of basalts that crystallized at shallow depths and contained little dissolved H_2O (e.g., MORBs), ΔT (= $T_{Mg} - T_{Ni}$) is expected to be close to zero. A test of whether or not this is the case is presented below in an application to mid-ocean ridge basalts, but first the effect of pressure on both the Mg- and Ni-thermometers is evaluated.

2.4.4 The Effect of Pressure on the Mg- and Ni-Thermometers

Herzberg and O'Hara (2002) examined the effect of pressure on the Beattie (1993) $D_{Mg}^{oliv/liq}$ thermometer and proposed the following pressure correction:

$$T(P) = T_{1\text{-bar}} + 54P(GPa) - 2P(GPa)^2 \qquad (2)$$

This pressure correction can be tested against the high-quality experimental results of Matzen et al. (2013), where olivine-melt equilibrium experiments were performed on a MORB sample between 1 bar and 3 GPa. Application of the updated Mg-thermometer (Table II-3, Eq. 1) to the Matzen et al. (2013) experiments allows the residuals ($T_{experimental}$ - T_{Mg}) to be plotted as a function of pressure. In Figure 2, the solid curve shows the Herzberg and O'Hara (2002) pressure correction (Eq. 2), which agrees well with the Matzen experiments.

The exchange of Mg between olivine and liquid can be described by the following reaction:

$$Mg_2SiO_4 \text{ (melt)} = Mg_2SiO_4 \text{ (olivine)} \qquad (3)$$

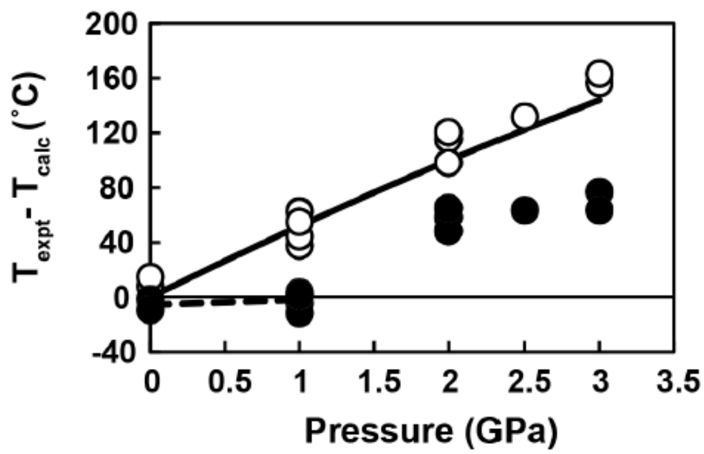


Figure II-2 Plot of residual vs pressure for the Mg-thermometer and Ni-thermometer (Eq.1 and Table II-3), when applied to olivine-melt equilibrium experiments from Matzen et al. (2013). Open and solid circles are residuals (T_{calc} – T_{expt}) of the Mg-thermometer and Ni-thermometer (Eq. 1 and Table 3), respectively. The solid line shows the Herzberg and O'Hara (2002) pressure correction (Eq. 2 in text); the solid line closely matches the the difference in the experimental temperatures of Matzen et al. (2013) and the temperature calculated from the Mg-thermometer in this study. The dashed line is a linear fit to the solid circles between 0 and 1 GPa (slope is 4°C/GPa) and shows that the Ni-thermometer has a negligible pressure correction over this interval. However, the Ni-thermometer has a strong dependence on pressure at ≥ 2 GPa. The step-wise behavior for the Ni-thermometer between 1bar to 3 GPa is explained in the text.

In Equation 3, the lower volume (olivine) side of the reaction is favored with higher pressure. Therefore, increasing pressure (while holding all other parameters constant) will result in higher $D_{Mg}^{oliv/liq}$ values, which leads to lower calculated temperatures (Eq. 1). Thus, the effect of not including a pressure correction to the Mg-thermometer will lead to underestimates of temperature (by ≤ 52°C for melts that crystallize olivine at ≤ 1 GPa, according to Eq. 2). The Matzen et al. (2013) experiments can also be used to evaluate the pressure dependence to $D_{Ni}^{oliv/liq}$. In this case, application of the Ni-thermometer (Table II-3, Eq. 1) leads to residuals (T_{expt} - T_{Ni}) that show a step-like distribution with pressure, with little dependence between 1 bar and 1 GPa, and then a marked pressure dependence between 2 and 3 GPa. At 1 bar, the two Matzen et al. (2013) experiments have residuals of -2 and -9 degrees. At 1 GPa, the five Matzen et al. (2013) experiments all give a similar result, with an average residual of -2 ± 6 °C. A linear fit to all seven residuals (dashed line in Fig. II-2) leads to an increase of only 4°C between 0 and 1 GPa.

A plausible explanation for the step-like behavior in Figure II-2 is related to the coordination of Ni^{2+} in the melt as a function of pressure. X-ray Absorption Near-Edge Structure (XANES) spectroscopy shows that Ni^{2+} in silicate liquids is largely in 4- and 5-fold coordination over a range of melt composition at 1 bar (Galoisy and Calas, 1993). Moreover, Ni^{2+} is not abundant in 6-fold coordination at depths ≤ 1 GPa, but does undergo a complete conversion to octahedral coordination by 4 GPa (Jones et al., 2011). Therefore, we suggest two reactions to describe the effect of pressure on the Ni_2SiO_4 liquid component:

$$^{[4\text{-}5]}Ni_2SiO_4\,(melt) = {}^{[6]}Ni_2SiO_4\,(melt) \qquad (4a)$$

$$^{[6]}Ni_2SiO_4\,(melt) = {}^{[6]}Ni_2SiO_4\,(crystal) \qquad (4b)$$

At crustal pressures (<1 GPa), the predominant effect of increasing pressure is expressed by the reaction in Equation 4a, where 4- and 5-fold coordinated Ni^{2+} in the melt is gradually converted to 6-fold coordinated Ni^{2+}, whereas once 6-fold Ni^{2+} is abundant (≥ 2 GPa), the predominant effect of pressure is shown by the reaction in Equation 4b.

In contrast to the case for Ni^{2+}, evidence from nuclear magnetic resonance (NMR) spectroscopy show that CaO-MgO-Al_2O_3-SiO_2 (CMAS) liquids (model basalts) at one bar contain Mg^{2+} with an average coordination that is close to 6-fold, with minor amounts that are 5-fold (George and Stebbins, 1998). This result is consistent with density measurements on CaO-MgO-FeO-Al_2O_3-SiO_2 liquids, including $CaMgSi_2O_6$ (diopside) and $CaFeSi_2O_6$ (hedenbergite) liquids, that result in partial molar volumes for CaO, MgO and FeO at 1723 K that are within 0%, 5%, and 28%, respectively, of the crystalline volumes of lime ($^{[6]}$CaO), periclase ($^{[6]}$MgO) and wustite ($^{6]}$FeO) at 298 K, consistent with of an average coordination for Ca^{2+}, Mg^{2+} and Fe^{2+} in these melts of ~6, ~5.8, and ~4.7 (Guo et al., 2013; 2014). George and Stebbins (1998) point out that although Ni^{2+}, Fe^{2+} and Mg^{2+} share a similar ionic size and valence, the lower average coordination for Ni^{2+} and Fe^{2+} in contrast to the higher average coordination for Mg^{2+}, may reflect a difference in the bonding behavior between transition metal cations (e.g., Ni^{2+}, Fe^{2+}) and alkaline earth cations (e.g., Mg^{2+}).

The most important conclusion to be drawn from the results in Figure II-2, irrespective of the cause, is that if the effect of pressure is neglected when the Mg-thermometer and Ni-thermometer are both applied to a basalt that crystallized olivine at < 1 GPa, the expectation is that the Mg-thermometer will give a temperature that is too low, whereas the Ni-thermometer will not (within 1σ uncertainty). Therefore, the value of ΔT ($T_{Mg} - T_{Ni}$) is expected to be close to zero or negative, and the magnitude of ΔT will scale with the depth of olivine crystallization (≤ -52°C for depths ≤ 1 GPa).

2.5 Applications of the Mg- and Ni-thermometers

2.5.1 Application to Mid-Ocean Ridge Basalts

An opportunity to test the application of both the Mg- and Ni-thermometers (Table II-3, Eq. 1) on mid-ocean ridge basalt (MORB) samples is provided by the petrological study of Allan et al. (1989) on a series of glassy MORB samples erupted from the Lamont Seamount Chain, associated with the East Pacific Rise. Only those samples from the margins of rapidly quenched pillow basalts, with a glassy groundmass and sparse phenocrysts + microphenocrysts (0.4-5.4%) of olivine + plagioclase are examined here (Table II-5). Reported melt (glass) compositions are used to obtain temperature from the Mg-thermometer (Eq.1 and Table II-3), and the results range from 1189-1149°C.

The Ni contents of both the olivine phenocrysts and glass were also analyzed and reported by Allan et al. (1989), enabling application of the Ni thermometer (Eq. 1 and Table II-3). The observed compositional range of the olivine phenocrysts within each sample is narrow (~1-2% Fo) and the most Fo-rich and Ni-rich olivine composition reported for each sample was used. Resulting temperatures range from 1214 to 1143°C.

Table II-5 Compositions and modes for MORB samples reported in Allan et al. (1989); temperatures from this study

Sample Name	F9-1	1570-1949	1572-1755-2	1559-2058	1567-1816	F1-1	1562-1941	1569-1901	F7-4
melt (glass) composition (wt%)									
SiO_2	49.6	49.4	49.0	49.5	50.1	50.4	49.0	50.3	50.5
TiO_2	1.21	0.96	1.14	1.08	1.16	1.18	1.55	1.18	1.54
Al_2O_3	16.9	16.6	16.9	16.1	16.2	15.5	16.6	14.4	14.3
FeO^T	8.59	8.83	8.84	9.21	8.82	9.3	9.44	10.55	11.02
MgO	8.97	8.78	8.51	8.30	8.28	8.14	7.80	7.56	7.05
CaO	12.4	12.7	12.3	13.0	12.5	13.0	11.2	12.9	12.2
Na_2O	2.46	2.43	2.71	2.51	2.46	2.41	2.84	2.47	2.87
K_2O	0.10	0.04	0.06	0.04	0.11	0.06	0.04	0.07	0.09
P2O5	0.10	0.08	0.13	0.10	0.14	0.11	0.17	0.11	0.14
Ni(ppm)	189	140	142	72	162	124	106	55	80
Total	100.2	99.8	99.5	99.8	99.7	100.1	98.6	99.6	99.8
phenocryst information									
oliv ph vol%	0.4	0.1[a]	0.4	0.5[a]	0.3	0.5	0.2	0.1	0.1
plag ph vol%	0.0	0.5	0.6	0.8	1.0	2.0	1.1	0.7	3.4
cpx ph vol%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.2
total vol%	0.4	0.5	1.0	0.8	1.3	2.5	1.3	1.0	5.7
max. oliv Fo	90.6	88.0	87.8	87.5	86.9	86.6	86.1	83.5	82.1
oliv NiO (wt%)	0.4	0.23	0.28	0.15	0.26	0.19	0.18	0.11	0.14
D(Ni) oliv/liq	16.5	13.0	15.6	16.6	12.8	12.3	13.6	15.8	14.2
calculated temperature and H_2O									
T_{Mg} (°C)	1188	1189	1186	1173	1180	1168	1170	1160	1149
T_{Ni} (°C)	1143	1194	1156	1143	1205	1214	1196	1153	1187
ΔT (T_{Mg}-T_{Ni})[b]	45	-5	30	31	-25	-45	-27	6	-39

a. olivine crystals ≤ 250 microns (in other cases only crystals ≥ 250 micron are counted).
b. The average ΔT value for the 9 samples is -3 degrees, which indicates a minimum melt water content of 0 wt% using Eq. 6

The results of the two thermometers applied to the nine MORB samples from Allan et al (1989) are summarized in Table II-5, and the resulting values for ΔT (=

T_{Mg}– T_{Ni}) are compared to those for the 123 1-bar experimental dataset in Figure II-3. The

values of ΔT range from +45 to -45 °C with an average of -3 ± 33˚C. The 1σ variance in the calculated ΔT values for the MORB samples broadly matches that (1σ = 29°C) for the 123 anhydrous experiments (Fig. II-3).

2.5.2 Application to Subduction-Zone Basalts

2.5.2.1 Geological Context of Michoacán-Guanajuato Volcanic Field (MGVF)

The Ni- and Mg-thermometers from this study (Table II-3, Eq. 1) were also applied to a series of subduction-zone lavas that may have crystallized olivine at greater crustal depths than most MORBs and contained higher melt H_2O concentrations. For this application, 18 olivine-bearing lavas from the Michoacán-Guanajuato volcanic field (MGVF) in the Mexican arc were chosen. The whole-rock compositions and mineral modes of 16 basalt and basaltic andesite samples from a 4400 km^2 segment of the MGVF, referred to as the Tancitaro-Nueva Italia region, were obtained from the study of Ownby et al. (2011) and are presented in Table II-6. Two additional samples from the MGVF, one from Volcán Jorullo and one from Cerro La Pilita, from the study of Luhr and Carmichael (1985), are also included in Table II-6. Three of the 18 samples (Jor-44, TAN-19 and APA-6) are from cinder cones (Volcán Jorullo, Cerro el Astillero and Cerro el Hungaro, respectively) that also have been sampled by Johnson et al. (2008; 2009) in their study of the volatile contents in olivine-hosted melt inclusions.

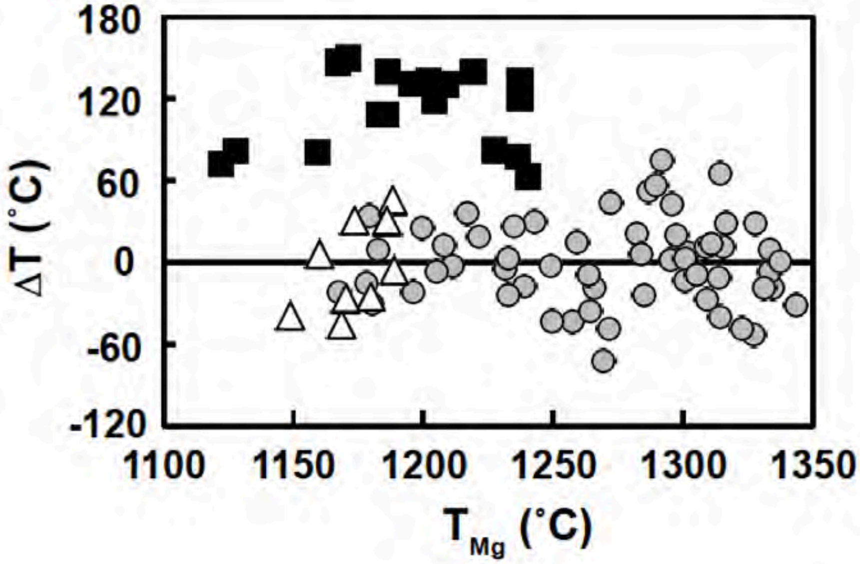


Figure II-3 Plot of ΔT (=T_{Mg} - T_{Ni}) values for nine MORB samples (open triangles; Table II-5) and 18 subduction-zone lavas (solid squares; Table II-6), vs. T_{Mg}. Also shown are the ΔT for the 123 1-bar experiments in Table A2 up to 1350˚C (grey circles). The MORBs have ΔT values that fall within the range of those for the experiments in Table A2, whereas the subduction-zone samples have ΔT values that are systematically larger (and always positive) relative to the MORBs and the anhydrous experiments. It is hypothesized that the reason why the subduction-zone samples have large, positive ΔT values is because the Ni-thermometer more accurately calculates the temperature of olivine crystallization in a hydrous melt (and does not require a correction for H_2O in the melt), whereas the Mg-thermometer overestimates the temperature if a separate correction for H_2O in the melt is not applied.

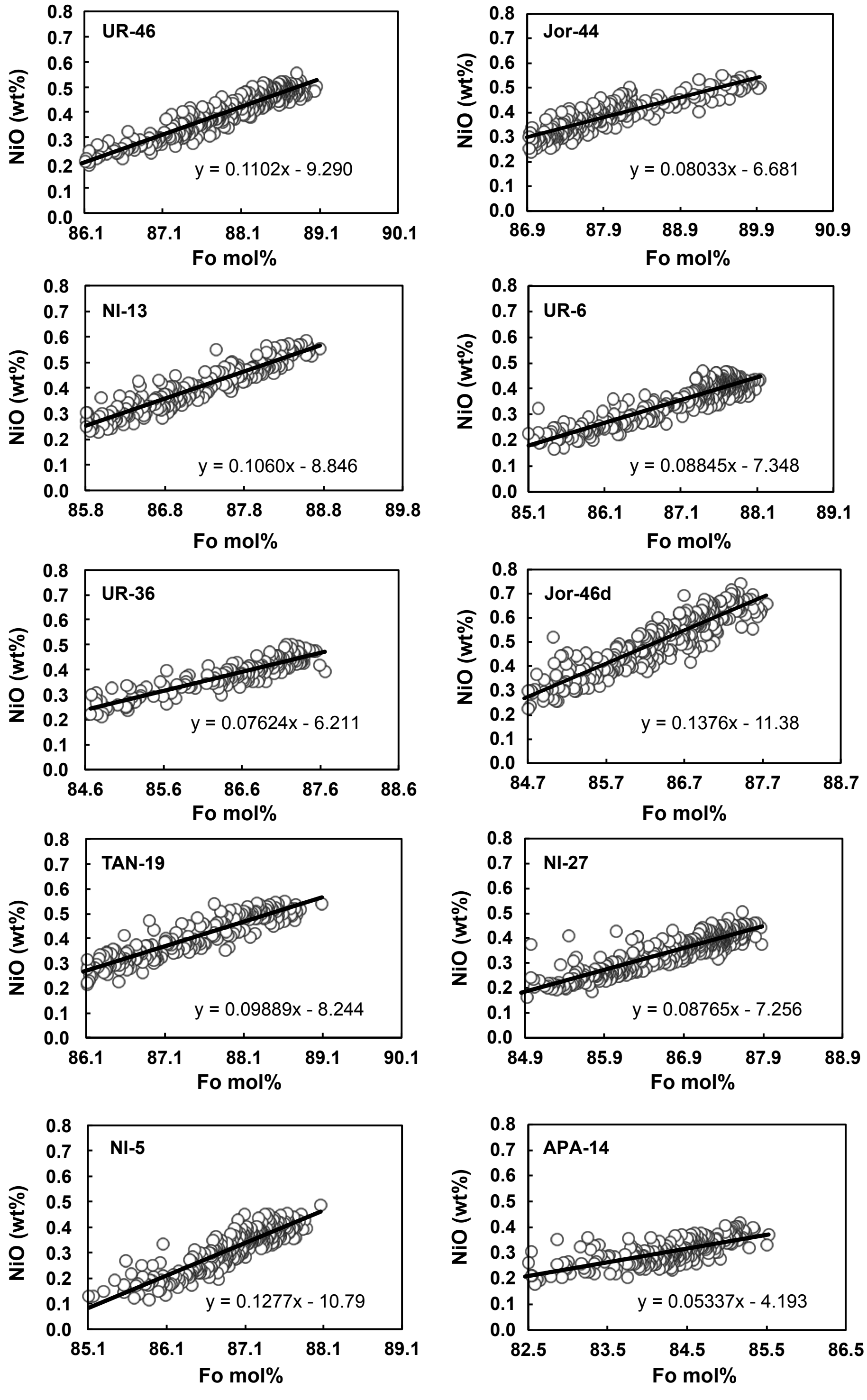
2.5.2.2 Sample Description and Strategy

The 18 samples in Table II-6 contain 2-10% olivine phenocrysts (defined to include all crystals ≥ 300 μm), and olivine is the most abundant phenocryst in all samples. Two of the samples contain a notable abundance of plagioclase phenocrysts (TAN-19 and UR-2) at 4 and 5%, respectively, and they have similar compositions to NI-27 and NI-21, respectively, which are free of plagioclase phenocrysts (Table II-6). By including these two compositional pairs of phenocryst-rich (plagioclase-bearing) and phenocryst-poor (plagioclase-free) samples, any systematic difference in the thermometry results can be evaluated as a function of overall phenocryst abundance.

In order to apply the $D_{Mg}^{oliv/liq}$ and $D_{Ni}^{oliv/liq}$ thermometers to a set of natural samples for which no prior petrological information is available, the first task is to analyze the olivine phenocrysts in each sample and evaluate whether the most Fo-rich olivine in each sample could be the equilibrium composition to first crystallize from the bulk liquid. A test of equilibrium is made using appropriate ${}^{Fe^{2+}-Mg}K_D$ (olivine-melt) values from experiments in the literature. If confirmed, the most Fo-rich olivine can be used to calculate temperature with the Mg-thermometer (Eq.1 and Table II-3). Next, a fitted relationship between Ni and Fo content in the olivines in each sample is obtained. This allows an evaluation of the mean value of Ni (and its variation) in the most Fo-rich olivine in each sample, which is used to calculate temperature, together with melt composition, using the Ni-thermometer (Eq.1 and Table II-3).

2.5.2.3. Microprobe Analyses of Olivine Phenocrysts

Electron microprobe traverses across 20-30 olivine crystals were conducted in each of the 18 samples in Table II-6. Traverses along the long axes of each


UR-46
y = 0.1102x - 9.290
Jor-44
y = 0.08033x - 6.681
NI-13
y = 0.1060x - 8.846
UR-6
y = 0.08845x - 7.348
UR-36
y = 0.07624x - 6.211
Jor-46d
y = 0.1376x - 11.38
TAN-19
y = 0.09889x - 8.244
NI-27
y = 0.08765x - 7.256
NI-5
y = 0.1277x - 10.79
APA-14
y = 0.05337x - 4.193
NiO (wt%)
Fo mol%

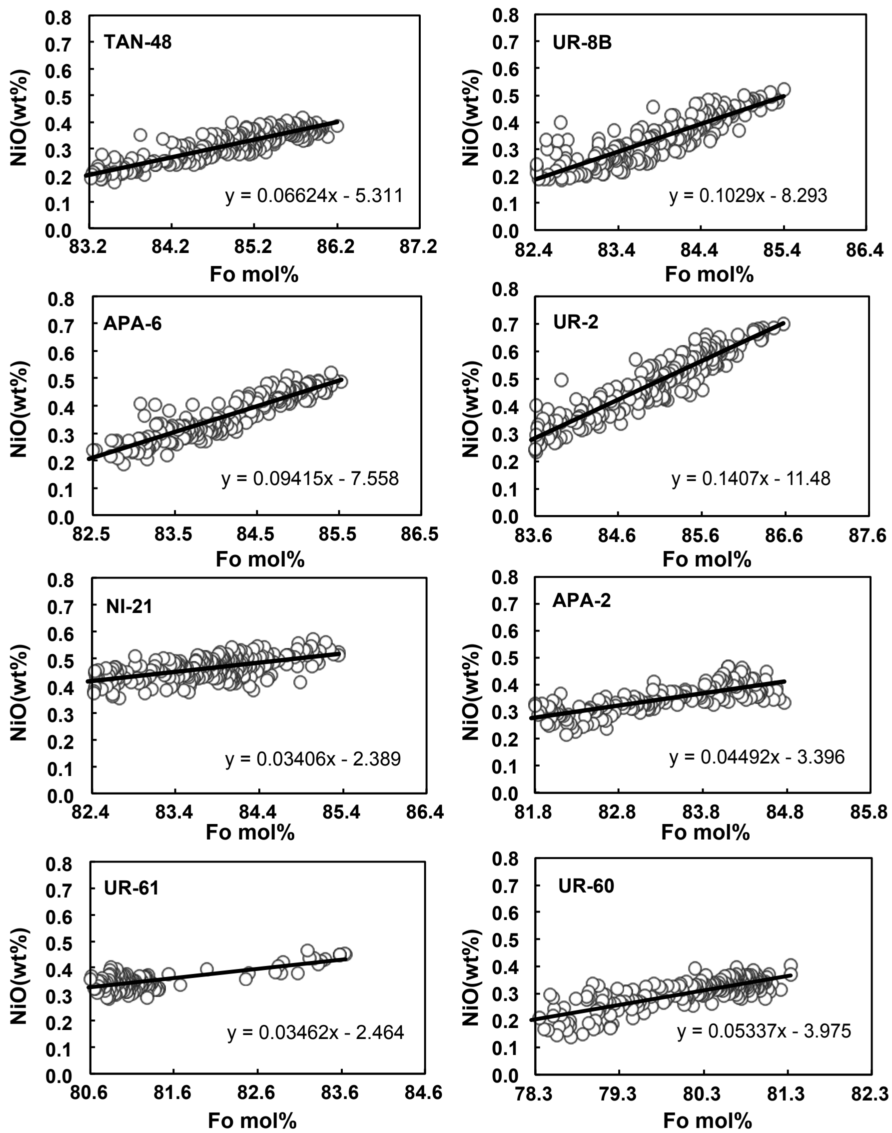


Figure II-4 Plots of wt% NiO vs. mol% Fo (= XMgO/(XMgO+XFeO) x 100) for the most Mg-rich olivine analyses (highest 3 mol% Fo) in each of the 18 subduction-zone samples from the Mexican arc (Table II-6). A linear fit to the data (equation in each plot) enables calculation of wt% NiO in the most Fo-rich olivine analyzed in each sample (Table 6). This value of wt% NiO is used to apply the Ni-thermometer (Eq. 1; Table 3) to these 18 samples.

crystal were made, with an analysis every 20-30 μm, leading to approximately 300-500olivine analyses for each sample. These analyses are tabulated in the supplementary material (Table A4) and are summarized in a histogram of forsterite (Fo) content for each sample (Figure A5); all samples show a continuous range of olivine compositions, with no breaks. The most Fo-rich olivine composition for each sample is listed in Table II-6.

2.5.2.4. A Test of Olivine-Melt Equilibrium Using ${}^{Fe^{2+}-Mg}K_D$ Values.

To evaluate whether the most Mg-rich olivine in each sample represents the first olivine to crystallize from the whole-rock melt composition, the ferric-ferrous ratio (and fO_2 condition) in the melt at the onset of olivine crystallization is calculated to see if reasonable results are obtained. An initial estimate for the ${}^{Fe^{2+}-Mg}K_D$ between olivine and melt is 0.34, which is the value Matzen et al. (2011) reports on the basis of 446 anhydrous 1-bar experiments in the literature, using the equation provided by Jayasuriya et al. (2004) to relate melt composition, temperature and oxygen fugacity to a melt ferric-ferrous ratio. The resulting Fe^{3+}/Fe^T ratios in the 18 samples in Table II-6 range from 0.12 to 0.27 and correspond to ΔNNO values from -1.5 to +0.8 (=logfO_2[sample] – logfO_2[Ni-NiO buffer] at the same temperature from the Ni-thermometer). These Fe^{3+}/Fe^T values (average = 0.20) and ΔNNO values (average = -0.1) are slightly higher relative to mid-ocean ridge basalts, which is expected for subduction-zone magmas.

There is evidence, however, that the ${}^{Fe^{2+}-Mg}K_D$ between olivine and melt may be affected by melt H_2O concentration, and a compilation of 108 hydrous experiments on basalts, for which fO_2 is buffered or monitored, from eight studies (Sisson and Grove, 1993a, 1993b; Wagner et al., 1995; Righter and Carmichael, 1996; Moore and Carmichael, 1998; Almeev et al., 2007; Médard and Grove, 2008; Parman et al., 2011), leads to an average K_D = 0.37 ± 0.04 (Figure A6; Table A5), using the model equation of Jayasuirya et al. (2004) to calculate melt ferric-ferrous ratios in the experimental melts. When this higher ${}^{Fe^{2+}-Mg}K_D$ value is applied to the most Mg-rich olivine in each of the 18 samples in Table II-6, the resulting Fe^{3+}/Fe^T ratios range from 0.19-0.32 and correspond to ΔNNO values of -0.2 to +1.4. These results lead to a higher average Fe^{3+}/Fe^T ratio (0.26) and a higher average ΔNNO value (+0.7) relative to those when a value of 0.34 is used, and fully overlap with the range of Fe^{3+}/Fe^T values (0.19-0.28) directly analyzed in olivine-hosted melt inclusions in arc basalts (e.g., Kelley and Cottrell, 2009; Brounce et al., 2014). Therefore, there is no reason to conclude that the most Mg-rich olivine composition in each sample in Table II-6 is not close to the first olivine to crystallize from the whole-rock liquid composition. Nonetheless, the effect of underestimating the mol% Fo of the first olivine to crystallize from the melt on the thermometry results is discussed below.

2.5.2.5 Ni Concentrations in Olivine as a Function of Fo-Content

The next step in applying the Ni- thermometer (Table II-3) is to determine the Ni concentration in olivine at the onset of crystallization from a liquid that is represented by the whole-rock composition. This can be calculated from a plot of wt% NiO as a function of mol% Fo for all olivine analyses in each sample, and a linear fit to the data that span the highest 3 mol% Fo content for the olivine population in each sample (Fig. II-4). The fitted linear equation for each sample is then used to calculate the average Ni content in the most Fo-rich olivine (value reported in Table II-6). The minimum and maximum standard deviation (1σ) in wt% NiO for the most Fo-rich olivine among the 18 samples is ±0.03 and ±0.05, respectively.

2.5.2.6. Temperatures (and uncertainties) Calculated from the Mg- and Ni-Thermometers

Application of the Mg-thermometer (Eq. 1 and Table II-3), using the most Fo-rich olivine analyzed in each sample together with their whole-rock composition (Table II-6), leads to temperatures that range from 1122 to 1240 °C for samples that range from 4.3 to 9.4 wt% MgO (Table II-6). For application of the Ni-thermometer (Eq. 1 and Table II-3), the Ni contents in olivine at the onset of crystallization were combined with the Ni contents in the whole-rock samples to calculate the value of $D_{Ni}^{oliv/liq}$ at the onset of olivine crystallization for each sample in Table II-6. This value was then incorporated into the Ni-thermometer (Eq. 1, Table II-3) to calculate the temperature at which olivine first began to crystallize in these 18 subduction-zone magmas. Temperatures range from 1020 to 1159 °C for these basalt and basaltic andesite samples (52-59 wt% SiO_2) and are 112°C cooler, on average, than the temperatures calculated with the updated Mg-thermometer (Table II-6). The uncertainties on these temperatures are estimated to be ± 29°C at the 1σ level, on the basis of the calibration results for ΔT on 123 experiments (Table II-3 and Fig. II-

1c). An additional uncertainty of ± 11 and ± 6 °C, respectively, is added owing to an average 1σ uncertainty of ± 0.05 wt% NiO in olivine and ± 4 ppm uncertainty in the average whole-rock Ni concentration.

Another source of error is that the first Mg-rich olivine to crystallize from the melt may not be exposed on the thin-section surface and the microprobe traverse may not have crossed it. It is also possible that some diffusive re-equilibration of the initial Mg-rich olivine may have occurred as well. Therefore, the highest Fo content analyzed in each sample may be a minimum value, and therefore the resulting temperatures derived from both the Ni- and Mg-thermometer may be maximum values. The combined effect on both thermometers is to cause ΔT values (=T_{Mg}-T_{Ni}) to increase by 13-46 degrees per 1 mol% Fo increase in olivine composition for the samples in Table II-6. Therefore, the reported ΔT values in Table II-6 are minimum values if the most Mg-rich olivine to have crystallized in each sample is not captured in the analyses.

2.5.3. A Comparison of ΔT (= T_{Mg}-T_{Ni}) Values between Hydrous Basalts and MORBs

The values of ΔT (= T_{Mg}– T_{Ni}) for the 18 subduction-zone samples in Table II-6 range from 63 to 150 °C and are systematically higher than the ΔT values calculated for the nine mid-ocean ridge basalts in Table II-5. The comparison of these two sets of

ΔT values to those for the 123 experiments are illustrated in Figure II-3. As discussed above, neglecting the effect of pressure on the two thermometers is expected to lead to underestimation of ΔT (=T_{Mg} - T_{Ni}). Therefore, the large, positive

Table II-6 Compositions and modes for 18 samples from the Mexican arc reported in Ownby et al. (2010) and Luhr and Carmichael (1985); temperatures from this study

sample name	UR-46	Jor-44	NI-13	UR-6	UR-36	Jor-46d	TAN-19	NI-27	NI-5
Whole-rock composition									
SiO_2 (wt%)	52.2	52.1	53.7	53.5	52.3	51.72	54.5	54.0	53.2
TiO_2 (wt%)	0.8	0.81	0.87	0.91	0.96	1.22	0.83	0.81	1.28
Al_2O_3 (wt%)	16.7	16.4	16.7	16.9	17.1	15.1	17.2	17.6	15.2
FeO^T (wt%)	7.39	7.45	7.20	7.46	7.76	7.32	6.82	7.08	7.00
MnO (wt%)	0.13	0	0.12	0.13	0.13	0.12	0.12	0.12	0.12
MgO (wt%)	9.38	9.29	8.98	8.62	8.52	8.03	7.92	7.68	7.59
CaO (wt%)	9.26	8.46	7.99	8.27	8.7	7.45	7.98	8.23	8.84
Na_2O (wt%)	3.37	3.47	3.33	3.37	3.52	4.55	3.68	3.59	3.19
K_2O (wt%)	0.56	0.74	0.89	0.67	0.79	2.54	0.77	0.65	2.88
P_2O_5 (wt%)	0.14	0.14	0.18	0.19	0.18	0.9	0.18	0.15	0.68
Ni (ppm)	231	261	201	178	145	221	156	130	124
Total	99.9	98.9	100.0	100.0	100.0	99.0	100.0	99.9	100.0
Phenocryst (ph) information									
oliv ph[a] (vol%)	5.1	5.8	8.6	5.8	6.7	8.3	6.1	4.8	2.9
plag ph[a] (vol%)	0.0	0	0.0	0.0	0.0	0.0	3.7	0.5	0.0
cpx pht[a] (vol%)	0.0	0	0.0	2.0	0.0	0.2	0.0	0.0	0.6
total ph (vol%)	5.1	5.8	8.6	7.8	6.7	8.5	9.8	5.3	3.5
Olivine composition, calculated Fe^{3+}/Fe^T and ΔNNO									
max. Fo content[b]	89.1	89.9	88.8	88.1	87.7	87.7	89.1	87.9	88.1
Fe^{3+}/Fe^T(K_D=0.34)	0.19	0.27	0.17	0.18	0.19	0.19	0.25	0.21	0.23
[c]ΔNNO (KD=0.34)	-0.2	0.8	-0.4	-0.2	-0.1	-0.2	0.6	0.2	0.3
Fe^{3+}/Fe^T(KD=0.37)	0.25	0.32	0.24	0.25	0.26	0.26	0.32	0.27	0.29
[c]ΔNNO (KD=0.37)	0.6	1.3	0.5	0.6	0.7	0.7	1.4	0.9	1.1
olivine NiO(wt%)[d]	0.53	0.54	0.57	0.44	0.48	0.69	0.57	0.45	0.46
D(Ni) oliv/liq	17.3	16.3	22.3	19.9	26.0	21.9	26.7	27.8	28.5
Calculated temperature and minimum wt% H_2O									
T_{Mg} (°C)	1236	1240	1237	1227	1219	1237	1209	1204	1202
T_{Ni} (°C)	1159	1177	1117	1145	1079	1105	1078	1086	1069
ΔT (T_{Mg}-T_{Ni})[e]	78	63	120	82	140	133	130	118	133
Min. wt% H_2O[f]	2.4	1.9	4.2	2.6	5.0	4.7	4.6	4.1	4.7

sample name	APA-14	TAN-48	UR-8B	APA-6	UR-2	NI-21	APA-2	UR-61
Whole-rock composition								
SiO_2 (wt%)	52.7	53.9	55.0	56.0	56.9	57.3	56.2	59.4
TiO_2 (wt%)	1.14	1.13	1.07	0.88	0.78	0.85	0.93	0.80
Al_2O_3 (wt%)	17.5	17.1	16.1	17.6	17.7	17.3	17.4	17.2
FeO^T (wt%)	7.89	7.44	7.13	6.69	6.36	6.26	6.73	5.87
MnO (wt%)	0.14	0.13	0.12	0.11	0.11	0.11	0.12	0.10
MgO (wt%)	7.46	7.04	6.52	6.35	5.87	5.83	5.70	4.31
CaO (wt%)	8.60	8.36	7.76	7.28	7.12	7.06	7.56	6.71
Na_2O (wt%)	3.60	3.76	4.06	3.84	3.95	3.96	3.77	4.03
K_2O (wt%)	0.71	0.89	1.66	1.07	0.97	1.10	1.28	1.40
P_2O_5 (wt%)	0.24	0.28	0.50	0.23	0.20	0.23	0.26	0.25
Ni (ppm)	100	110	108	120	122	90	100	77
Total	100.0	100.0	99.9	100.1	100.0	100.0	100.0	100.1
Phenocryst (ph) information								
oliv ph[a] (vol%)	3.6	4.4	4.2	3.5	5.2	3.9	5.7	1.5
plag ph[a] (vol%)	0.0	0.7	0.0	0.0	5.1	0.0	0.6	0.4
cpx pht[a] (vol%)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
total ph (vol%)	3.6	5.1	5.8	3.5	10.3	3.9	6.3	1.9
Olivine composition, calculated Fe^{3+}/Fe^T and ΔNNO								
max. Fo content[b]	85.5	86.2	85.4	85.5	86.6	85.4	84.8	83.6
$Fe^{3+}/Fe^T(K_D=0.34)$	0.16	0.21	0.18	0.16	0.25	0.17	0.21	0.24
[c]ΔNNO(K_D=0.34)	-0.6	0	-0.3	-0.7	0.6	-0.5	0.0	0.2
$Fe^{3+}/Fe^T(K_D=0.37)$	0.23	0.27	0.25	0.24	0.31	0.23	0.27	0.31
[c]ΔNNO(K_D=0.37)	0.3	0.8	0.6	0.5	1.2	0.4	0.8	1.2
olivine NiO(wt%)[d]	0.37	0.40	0.49	0.49	0.70	0.52	0.41	0.43
$D_{Ni}^{oliv/liq}$	31.4	27.9	35.7	32.1	43.8	47.1	33.8	45.4
Calculated temperature and minimum wt% H_2O								
T_{Mg} (°C)	1195	1186	1186	1183	1167	1171	1159	1122
T_{Ni} (°C)	1065	1077	1047	1075	1020	1021	1079	1050
ΔT (T_{Mg}-T_{Ni})[e]	131	109	140	108	147	150	81	72
minimum wt% H_2O[f]	4.6	3.7	5.0	3.6	5.3	5.5	2.6	2.2

a. phenocryst are crystals ≥300μm.
b. Fo =XMgO/(XMgO+XFeO) *100; the Fo content from olivine stoichiometry (XMgO/(XMgO+XFeO+XMnO+XCaO+XNiO)) in Table A4
c. calculated with Jayasuriya et al., (2004)
d. calculated for max Fo olivine from linear fits in Fig. II-4.
e. the average ΔT of 18 samples is 112 degrees.
f. minimum H_2O calculated based on Eq. 6; avg. of 18 samples is 3.8wt%.

values of ΔT obtained for the subduction-zone magmas in Table II-6 cannot be attributed to the effect of pressure. Nor can they be attributed to the effects of temperature and/or anhydrous melt composition (Fig. II-1c). Instead, it appears that the large positive values of ΔT reflect a difference in the sensitivity of $D_{Mg}^{oliv/liq}$ and $D_{Ni}^{oliv/liq}$ to dissolved water in basaltic liquids.

2.5.4 Different Sensitivity of $D_{Mg}^{oliv/liq}$ and $D_{Ni}^{oliv/liq}$ to Dissolved Water in the Melt?

As noted in the introduction, all thermometers based on $D_{Mg}^{oliv/liq}$ (e.g., Beattie, 1993) require a major correction for dissolved H_2O in the melt, possibly because hydroxyl groups complex with Mg^{2+} to lower the activity of the MgO component in hydrous melts (e.g, Waters and Lange, 2013). The strong dependence of Mg- thermometers on melt H_2O concentration was reviewed by Putrika et al. (2007), and the effect is illustrated in Figure II-5 using the experimental datasets of Almeev et al. (2007) and Médard and Grove (2008) at ≤ 200 MPa. In these two studies, detailed experimental approaches were applied to precisely locate the depression of the olivine liquidus with increasing melt H_2O concentration. Application of the updated Mg-thermometer (Table II-3, Eq.1) gives the anhydrous temperature for each experiment, whereas the Putirka et al. (2007) thermometer (with an H_2O correction, Table II-4) gives the hydrous temperature. The differences between the two thermometers lead to ΔT values ($=T_{anhydrous}-T_{hydrous}$) that are consistently positive and increase with the amount of dissolved water in the experimental melt (Fig. II-5). This result illustrates that $D_{Mg}^{oliv/liq}$ has a strong sensitivity to dissolved water in basaltic melts, and it suggests that the reason why the Ni-thermometer gives lower temperatures than the Mg-thermometer when applied to hydrous samples (Table II-6, Fig. II-3) is because $D_{Ni}^{oliv/liq}$ is less sensitive to water. The question that arises is whether the Ni-thermometer (Table II-3, Eq. 1),

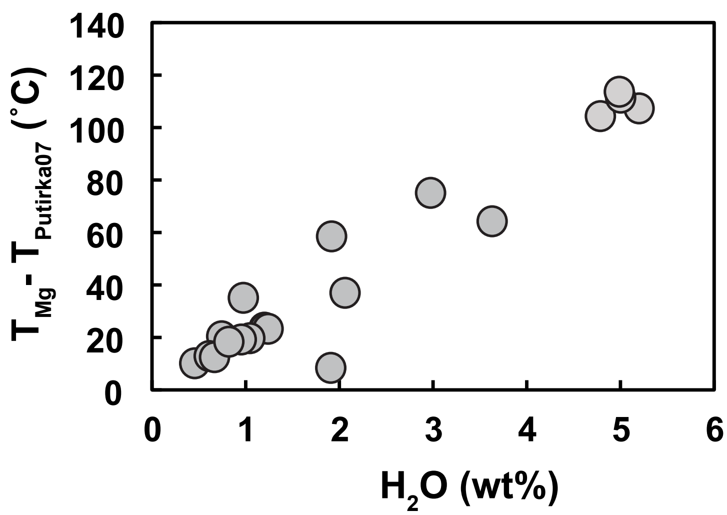


Figure II-5 Plot of the difference in calculated temperatures from the Mg-thermometer in this study (Eq. 1 and Table II-3; corrected for pressure with Eq. 2) and those from the Putirka et al. (2007) Mg-thermometer (which includes a correction for pressure and H_2O in the melt) applied to the hydrous experiments of Almeev et al. (2007) and Médard and Grove (2008), as a function of melt H_2O content. The results illustrate that any thermometer based on DMgol/liq requires a large correction for H_2O content in the melt.

which has no H_2O correction, gives similar temperatures as the Mg-thermometer of Putirka et al. (2007), which has an H_2O correction.

This question is addressed with three of the 18 samples in Table II-6 (Jor-44, TAN-19 and APA-6), for which melt H_2O concentrations were directly analyzed in olivine-hosted melt inclusions (Johnson et al., 2008; 2009). The maximum H_2O concentrations reported for these three samples (5.7, 4.6 and 3.9 wt%, respectively) can be used in the Mg-thermometer of Putirka et al. (2007; their Eq. 4), which incorporates the compositional effect of melt H_2O, to obtain the temperature of these magmas at the onset of olivine crystallization. The results are 1139, 1116 and 1099°C, respectively, for the Jor-44, TAN-19 and APA-6 melts with 5.7, 4.6 and 3.9 wt% H_2O, respectively, at minimum entrapment pressures of 0.4, 0.15 and 0.1 GPa (Johnson et al., 2008; 2009). These temperatures are within -38, +38 and +24°C, respectively, of the temperatures obtained in this study using the Ni-thermometer (Table II-3, Eq. 1). These differences are well within the combined 1σ uncertainty of the two thermometers (± 29 °C for Ni-thermometer, Table II-3, Eq. 1; ± 31°C for Putirka et al., 2007; Table II-4). This result supports the inference that D_{Ni} is less sensitive than D_{Mg} to dissolved water in the melt, which can be further tested with a set of hydrous olivine-melt equilibrium experiments.

2.5.5 Ni-Partitioning Results on Hydrous Olivine-Melt Experiments

Although Almeev et al. (2007) and Médard and Grove (2008) did not report Ni concentrations in olivine and melt, a preliminary evaluation of how melt H_2O content affects the Ni-based thermometer is made in this study through new Ni- study on a basaltic andesite (MAS-22; Moore and Carmichael, 1998). In that study, there were three experimental run products that contain glass + olivine only (runs 22-2, 22-7 and 22-12), with olivine abundance reported to be ≤3% (run conditions are summarized in Table II-7). The olivine crystals and quenched liquid (glass) from these three experiments were analyzed in this study for their Ni contents. The results are tabulated in Table II-7.

These values of $D_{Ni}^{oliv/liq}$ were calculated from the newly obtained Ni data from the three experimental charges, and were used to calculate the amount of olivine that crystallized during each of these phase-equilibrium runs, as a check on internal consistency, using the equilibrium crystallization equation:

$$\frac{C_L}{C_O} = \frac{1}{D_{Ni}^{ol/melt}\left(1-F\right)+F} \tag{5}$$

Table II-7 Compositions and experimental conditions for three experiments in Moore and Carmichael (1998); temperatures from this study

Sample	MAS-22[a]	Expt 22-7	Expt 22-2	Expt 22-12
Melt composition[b]				
SiO_2 (wt%)	55.25	55.9	56.25	57.31
TiO_2 (wt%)	0.74	0.71	0.82	0.7
Al_2O_3 (wt%)	17.4	19.1	18.7	19.4
FeO^T (wt%)	5.98	5.77	5.40	4.94
MgO (wt%)	6.68	5.70	5.65	5.75
CaO (wt%)	7.28	6.68	7.31	7.08
Na_2O (wt%)	3.97	4.87	4.62	3.43
K_2O (wt%)	1.18	1.29	1.27	1.44
Ni (ppm)[c]	106	82.0	53.0	40.0
Totals	98.49	100.02	100.00	100.05
Olivine composition[d]				
olivine Fo#[e]	-	85.4	88.1	95.2
olivine NiO (wt%)	-	0.23	0.27	0.24
D(Ni) olivine-liquid	-	22.0	40.0	47.1
% olivine[f]	-	1.4	2.6	3.6
Experimental conditions and thermometry results				
ΔNNO	-	2.2	2.6	5.6
$P(H_2O)$ (MPa)	-	73.1	107.2	208.2
Expt. T(°C)	-	1150	1100	1050
H_2O (wt%)[g]	-	2.5	3.1	5.0
T_{Mg} (°C)	-	1165	1155	1136
T_{Mg} - T_{expt} (˚C)	-	15	55	86
T_{Ni} (°C)	-	1174	1050	1029
T_{Ni} - T_{expt} (˚C)	-	24	-50	-21

Notes:

a. whole-rock composition (Lange and Carmichael, 1990)
b. experimental glass compositions normalized to 100% anhydrous
c. measured by laser ablation ICP-MS
d. the average of the olivine compositions for each experiment measured in this study using EMPA
e. Fo # = XMgO/(XMgO+XFeO);
f. calculated from Eq. 5 in text.
g. calculated from Zhang et al. (2007) water solubility model.

partitioning results on the run products from a hydrous phase-equilibrium

In Equation 5, C_L is the analyzed concentration of Ni in the quenched liquid phase, C_O is the initial concentration of Ni in the liquid prior to olivine crystallization (106 ppm in the MAS-22 whole rock; Lange and Carmichael, 1990) and F is the melt fraction. On the basis of this equation and the $D_{Ni}^{oliv/liq}$ values for each experiment, the abundance of olivine ranges from 1.4 to 3.6%, which is consistent with the values reported by Moore and Carmichael (1998).

Using the compositional data reported in Table II-7, the calculated Ni-temperatures (Table II-3, Eq.1) for the three experiments lead to residuals (T_{Ni} -T_{expt}) of +24, -50, and -21 °C for melt H_2O contents of 2.5, 3.2 and 5.0 wt%, respectively (Table II-7). When these residuals are plotted in Figure II-1a, they are well within the range of the residuals for the 123 1-bar experiments upon which the Ni-thermometer (Table II-3, Eq. 1) is calibrated on. This result strongly suggests that the Ni-based olivine-melt thermometer has a relatively weak dependence on melt H_2O contents.

Understanding the underlying cause for why $D_{Ni}^{oliv/liq}$ appears to have a lower sensitivity than $D_{Mg}^{oliv/liq}$ to dissolved water in the melt is of key importance. However, it is beyond the scope of the present study to answer this question because it requires a spectroscopic study of the coordination environments for both Ni and Mg in the same basaltic melts under hydrous conditions, which are not yet available. Nonetheless, available spectroscopic evidence (e.g., Galoisy and Calas, 1993; George and Stebbins, 1998), supported by liquid density measurements (Guo et al., 2013; 2014), show that alkaline earth cations, such as Mg^{2+}, and transition metal cations, such as Fe^{2+} and Ni^{2+}, display different bonding behavior despite their similar size, and these differences may extend to hydrous melts. Additionally, the olivine-melt partition for Mn^{2+} and Co^{2+}, two other transition metals with an ionic radius similar to that for Ni^{2+}, can also be useful olivine-melt thermometers that are weakly dependent on water in the melt phase. In the meantime, the dependence on melt H_2O content of the Ni-thermometer, can be evaluated through a comparison of its results to experimentally determined hydrous phase diagrams.

2.5.6 Consistency with hydrous phase-equilibrium experiments on basaltic andesite

The results from the Ni-thermometer (Table II-3, Eq.1) for APA-6 (Table II-6) can be compared to the hydrous phase-equilibrium experimental results from Moore and Carmichael (1998) on the MAS-22 basaltic andesite (Table II-7), which has a similar composition to APA-6. In Figure II-6, a simplified plot of the phase stability fields for olivine, plagioclase, and hornblende are shown on a plot of P_{H2O} vs. temperature based on the results of Moore and Carmichael (1998). Also shown are isopleths of melt H_2O concentration based on the H_2O solubility model of Zhang et al. (2007). The calculated temperature for APA-6 at the onset of olivine crystallization is 1075 (± 29) °C, which is projected onto the phase diagram in Figure

II-6 (the phase diagram of MAS-22 with all individual experiments plotted is shown in Figure A7).

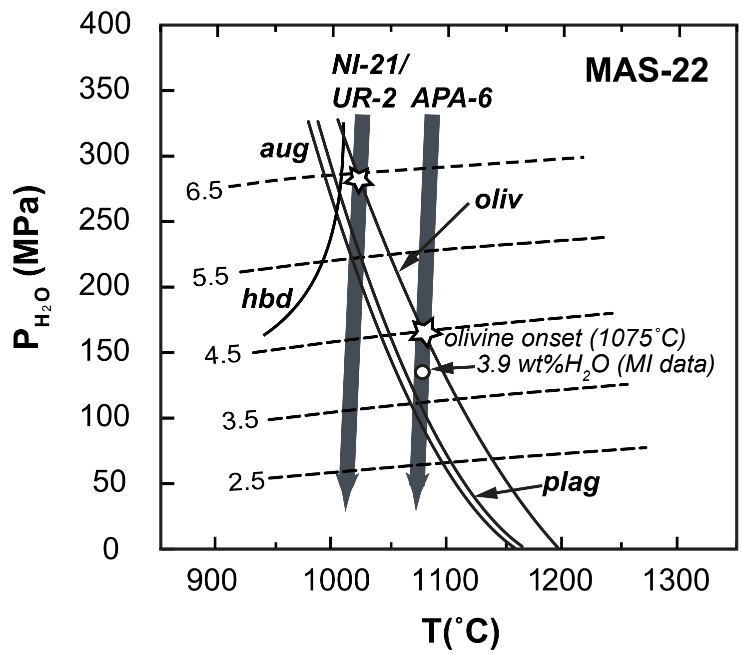


Figure II-6 Simplified phase diagram based on the phase-equilibrium experiments of Moore and Carmichael (1998) on a basaltic andesitic composition (MAS-22, Table II-7) under pure-H_2O fluid-saturated conditions. (A more detailed figure in Fig.A7 shows the experimental results that constrain the placement of mineral-in curves.) Abbreviations in the plot: hbd (hornblende); oliv (olivine); plag (plagioclase); aug (augite). The dashed lines are isopleths of maximum H_2O solubility in the melt from the model in Zhang et al. (2007). A plausible adiabatic ascent path (arrow) is shown for APA-6 (intersects olivine-in curve at 1075 °C based on Ni-thermometry results; Table 6), which has a bulk composition similar to that for MAS-22 (Table II-7). Shown on this ascent path is the maximum H_2O content of 3.9 wt% analyzed in olivine-hosted melt inclusions from scoria erupted from the same cinder cone as APA-6 (Cerro el Hungaro; Johnson et al., 2009).

The occurrence of large, sparse phenocrysts of olivine in APA-6 with diffusion-limited (i.e., rapid-growth) textures (Fig. II-7) indicates that this basaltic andesite liquid experienced significant effective undercooling ($\Delta T_{eff} = T_{liquidus}-T_{melt}$)

during phenocryst growth (e.g., Lofgren, 1974; Welsch et al., 2014). It is difficult for a melt to develop an undercooling during slow cooling and crystallization in a magma chamber. In contrast, an effective undercooling during phenocryst growth readily develops during rapid ascent under fluid-saturated conditions, owing to the effect of H_2O degassing from the melt (e.g., Waters et al., 2015). A projected ascent path for APA-6 under fluid-saturated conditions is illustrated in Figure II-6, and it is consistent with the P_{H2O}-T location for the entrapment of the olivine-hosted melt inclusion with 3.9 wt% H_2O from Johnson et al. (2008).

The results for two additional samples (UR-2 and NI-21) can also be projected onto this experimental phase diagram, as their compositions only differ from MAS-22 (Table II-7) and APA-6 by having slightly lower MgO concentrations (Table II-6). The results for UR-2 and NI-21 are particularly noteworthy, as the samples have nearly identical bulk compositions (despite being erupted from separate vents located tens of km apart; Ownby et al., 2011) and give similar temperatures (1020 and 1021 °C) at the onset of olivine crystallization, suggestive of similar melt H_2O contents. However, they contain very different phenocryst abundances. UR-2 contains ~5% olivine and ~5% plagioclase, whereas NI-21 only contains ~4% olivine with diffusion-limited (i.e., rapid growth) textures (Fig. II-7). The absence of plagioclase phenocrysts could reflect a kinetic delay to its nucleation and growth in NI-21 during its fluid-saturated ascent, similar to what has been documented for various phenocryst-poor andesite, dacite and rhyolite melts (e.g., Frey and Lange, 2011; Crabtree and Lange, 2011; Waters and Lange, 2013; Waters et al., 2015). The inference, therefore, is that NI-21 ascended more rapidly than UR-

2 to the surface. A similar difference in ascent rate and timescale for phenocryst growth may explain the difference in phenocryst abundance between TAN-19 and NI-27, which have similar bulk compositions (Table II-6). The absence of plagioclase phenocrysts in NI-27, together with the abundance of olivine phenocrysts with diffusion-limited growth textures (Fig. II-7), is consistent with a kinetic delay to plagioclase nucleation and growth during rapid ascent under fluid-saturated conditions (e.g., Waters et al., 2015).

2.5.7 Consistency with phase-equilibrium experiments on hornblende-bearing basalt

Another comparison of thermometry results with hydrous phase-equilibrium experiments can be made for lava flow sample Jor-46d, which is the only sample among the 18 samples in Table II-6 to have hornblende in its phenocryst assemblage. In Figure II-8, a simplified plot of the phase stability fields for olivine, clinopyroxene, and hornblende are shown on a plot of P_{H2O} vs. temperature based on the experimental results of Barclay and Carmichael (2004) on Jor-46, a scoria sample from the same cinder cone as the lava flow sample Jor-46d; Luhr and Carmichael, 1985. The phase diagram of Jor-46 with all individual experiments plotted is shown in Figure A7 The extrapolated dT/dP_{H2O} slope of the hornblende-in curve in Figure II-8 between P_{H2O} = 200 and 500 MPa is estimated from the experimentally established hornblende-in curve over this P_{H2O} interval by Krawczynski et al. (2012) for a high-Mg andesite. Also shown in this phase diagram is the calculated temperature (1105 ± 29 °C; gray shaded rectangle) at the onset of olivine crystallization from the Ni-thermometer (Table II-3, Eq. 1). Within the

1σ uncertainty of the Ni-thermometer, the onset of olivine crystallization and the stability field of hornblende overlap, which shows that it is plausible that the phenocryst assemblage in Jor-46d crystallized during fluid-saturated ascent, with undercooling driven by degassing of dissolved H_2O. An alternative model is that the phenocryst assemblage grew during cooling at $P_{H2O} \geq 200$ MPa. Either way, the results of the Ni-thermometer are consistent with the observed phenocryst assemblage and the phase-equilibrium results of Barclay and Carmichael (2004) and indicate that the onset of phenocryst crystallization in Jor-46d occurred at melt H_2O contents ≥ 5.5 wt% H_2O, and possibly higher (>7 wt% H_2O; Fig. II-8).

2.6 Minimum Melt H_2O Content

2.6.1 Relationship between ΔT and dissolved H_2O in the melt

There is an opportunity to use the difference in calculated temperatures from the Mg- and Ni-thermometers, when applied to hydrous samples, as a proxy for an estimate of $\Delta T = T_{anhydrous}-T_{hydrous}$. This, in turn, allows broad constraints to be placed on the minimum melt H_2O concentrations in hydrous magmas at the onset of olivine crystallization. As discussed above, Almeev et al. (2007) and Médard and Grove (2008) conducted experiments to carefully quantify the depression of the olivine liquidus temperature ($\Delta T = T_{anhydrous}-T_{hydrous}$) as a function of melt H_2O concentration. In Figure II-9, their experimental results are plotted together with several additional hydrous olivine-melt equilibrium experiments from the literature (Sisson and Grove, 1993a and 1993b; Parman et al., 2011; Wagner et al., 1995;

Berndt et al., 2005; Moore and Carmichael 1998) under near-liquidus conditions (≤ 5% olivine). Note that there is a wide range of ΔT values for melt H_2O concentration

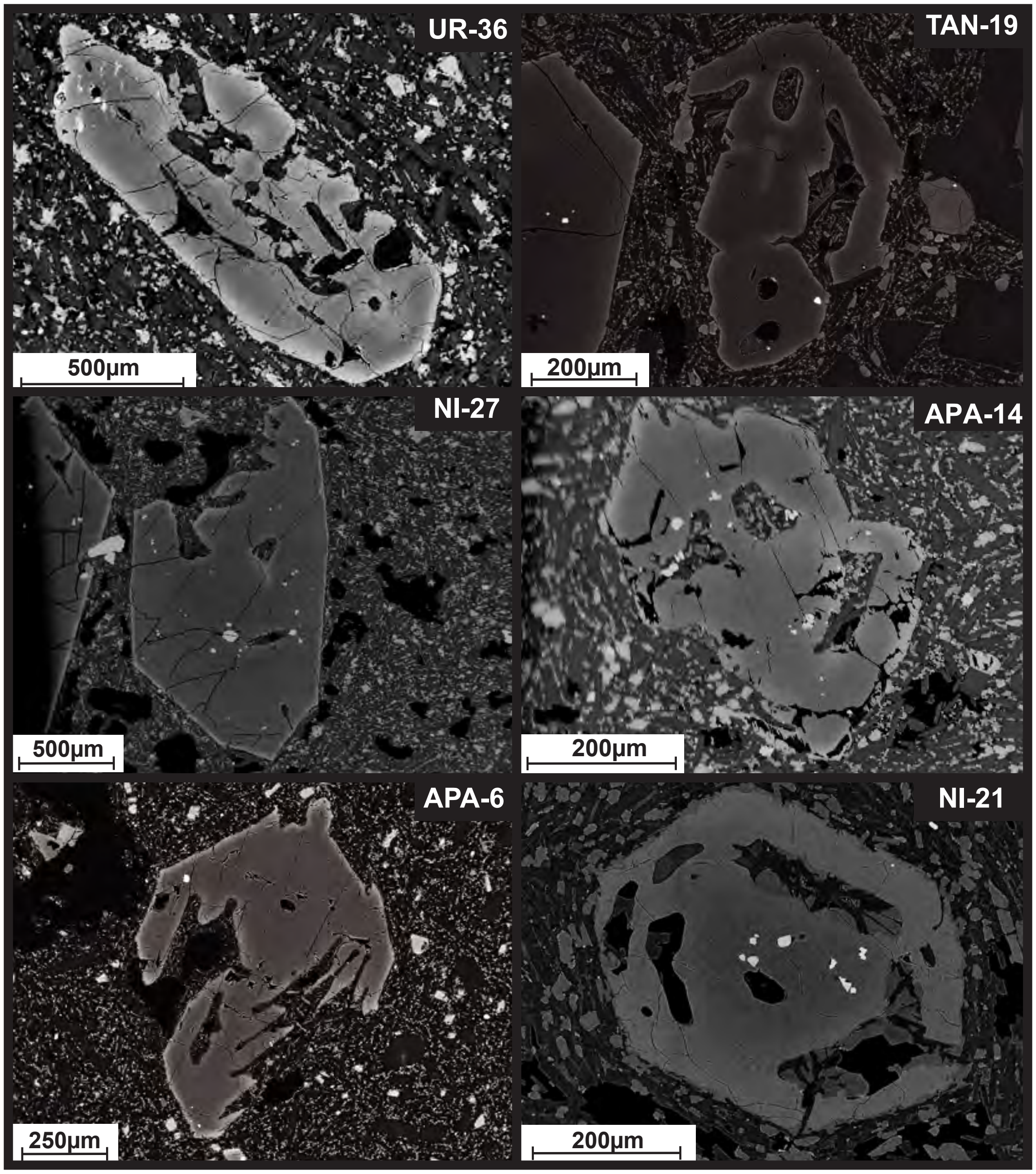


Figure II-7 Back-scattered electron (BSE) images of representative olivine phenocrysts in six of the subduction-zone samples in Table II-6. In each case, the olivine phenocryst displays a hopper texture, which forms when the crystal grows rapidly under diffusion-limited conditions, which is consistent with large effective under-coolings ($\Delta T_{eff} = T_{liquidus} - T_{melt}$) caused by rapid H_2O degassing during magma ascent (e.g., Welsch et al., 2014).

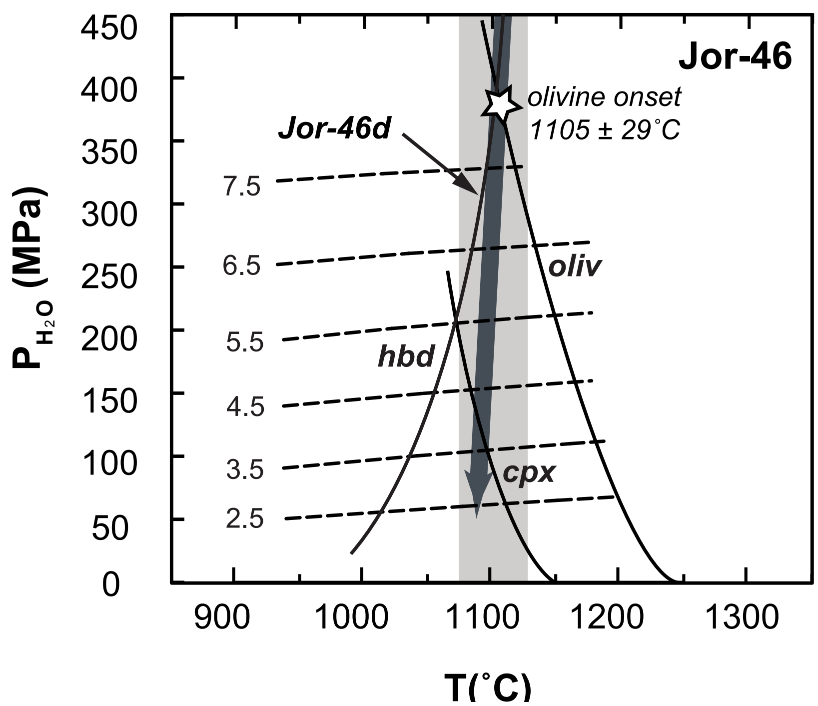


Figure II-8 Simplified phase diagram based on the phase-equilibrium experiments of Barclay and Carmichael (2004) on sample JOR-46 (scoria from the same cinder cone as JOR-46d; Luhr and Carmichael, 1985) under pure-H_2O fluid-saturated conditions. (A more detailed figure in Appendix K shows the experimental results that constrain the placement of mineral-in curves.) Abbreviations in the plot: hbd (hornblende); oliv (olivine); aug (augite). Dashed lines are isopleths of maximum H_2O solubility in the melt from the model in Zhang et al. (2007). A plausible adiabatic ascent path (arrow) is shown for JOR-46d, within the constraints of the Ni-thermometer (gray box; 1105 ± 29 °C) for the onset of olivine crystallization and the experimentally constrained stability field for hornblende. JOR-46d is the only sample in Table 6 that contains hornblende in its phenocryst assemblage (Luhr and Carmichael, 1985).

of ~5 wt% recorded by these experiments (Fig. II-9). Detailed information for these 36 olivine-melt equilibrium experiments are reported in Table II-A6. For the purposes of internal consistency, the anhydrous liquidus temperature ($T_{anhydrous}$) for each experiment was calculated with the Mg- thermometer (Table II-3 and Eq.1) and the pressure correction of Herzberg and O'Hara (2002) as shown in Eq. 2. The experimental temperature is treated as a close approximation to the hydrous liquidus solubility model (1σ = ±0.34 experiments of Almeev et al. (2007), the H_2O contents measured by Karl Fischer Titration (KFT) were used, and when unavailable, the H_2O contents measured by FTIR (Fourier transform infrared) spectroscopy were used. Phase-equilibrium experiments at P_{H2O} ≥ 500 MPa were not included in this compilation (e.g., Hamilton, 1964) because the calculated water concentrations in those melts have a relatively high uncertainty (Zhang et al., 2007).

The goal in this study is to provide a simple polynomial equation that describes the lower limit of the data in Figure II-9 and allows a minimum melt H_2O

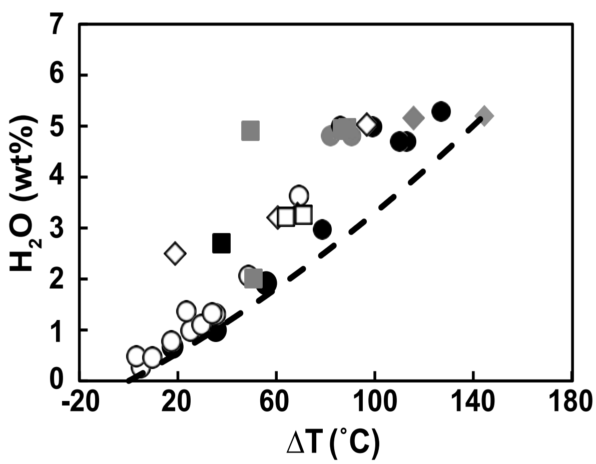


Figure II-9 Plot of wt% H_2O in the melt phase from 36 olivine-melt equilibrum experiments from the literature (Parman et al., 2011 - open circle; Médard and Grove, 2008 - solid circle; Almeev et al., 2007 - open triangle; Berndt et al., 2005 - solid triangle; Moore and Carmicheal, 1998 - open diamond; Wagner et al., 1995 - solid diamond; Sisson and Grove, 1993a - empty square; Sisson and Grove, 1993b - solid square) plotted as a function of ΔT (= $T_{anhydrous}$-$T_{hydrous}$ = T_{Mg}-T_{expt}). The anhydrous temperature for each experiment is calculated using the Mg-thermometer (Eq. 1 and Table II-3; corrected for pressure with Eq. 2), whereas the hydrous temperature is the reported experimental temperature. Run conditions for all 36 experiments are reported in Table A6. The dashed curve is a second order polynomial equation (Eq. 6), which is a fit to the experiments at the bottom of the data cloud only. Equation 6 allows the minimum concentration of water in the melt to be calculated from ΔT(=$T_{anhydrous}$-$T_{hydrous}$).

content to be calculated from values of ΔT (= $T_{anhydrous}$-$T_{hydrous}$ = T_{Mg}-T_{Ni}). The second order polynomial curve fit to data points with the lowest melt H_2O content for their ΔT is:

$$\text{wt\% } H_2O = 6.92 \times 10^{-5} \times \Delta T^2 - 2.62 \times 10^{-2} \times \Delta T \qquad (6)$$

The application of Equation 6 to the average ΔT result (-3°C) for the nine MORBs in Table II-5 leads to a melt H_2O content of 0 wt%, which is consistent with previous work that documents relatively low melt H_2O contents in mid-ocean ridge basalts (e.g., Danyushevsky, 2001). The application of Equation 6 to the average ΔT result (112°C) for the 18 subduction-zone magmas in Table II-6 leads to an average minimum H_2O melt content of 3.8 wt%. This result is consistent with direct measurements of H_2O concentrations in olivine-hosted melt inclusions in arc basalts (e.g., Sisson and Layne, 1993; Cervantes and Wallace, 2003; Walker et al., 2003; Wade et al., 2006; Benjamin et al., 2007; Portnyagin et al., 2007; Sadofsky et al., 2008; Shaw et al., 2008; Johnson et al., 2009; Kelley et al., 2010; Zimmer et al, 2010; Ruscitto et al., 2010, 2011, Lloyd et al., 2013), which show that they contain up to 7 wt% H_2O, with an average that is close to ~4 wt% H_2O (Plank et al., 2013).

2.6.2 Application of plagioclase-liquid hygrometry to two olivine-bearing andesites

There may be an opportunity to extend the plagioclase-liquid hygrometer, which requires an independent assessment of temperature, to olivine-bearing andesites when used in conjunction with the Ni-thermometer (Table II-3, Eq.1).

Many phenocryst-poor low-SiO_2 andesites do not contain ilmenite, and therefore temperatures cannot be obtained from two Fe-Ti oxides (e.g. Ghiorso and Evans, 2008). Two of the 18 samples in Table II-6 are olivine-bearing andesites with 59 wt% SiO_2 and 4.3 wt% MgO (UR-60 and UR-61). In comparison to the phase relations for the basaltic andesite MAS-22 (Fig. II-6), which has 55.5 wt% SiO_2 and 6.5 wt% MgO, it is probable that the positions of the plagioclase-in and olivine-in curves for these two andesites are relatively close in P_{H2O}-T space.

In order to apply the plagioclase-liquid hygrometer, the compositions of the plagioclase phenocrysts in the two samples were analyzed in this study. The microprobe results are given in Table A7 and Figure A8. The most calcic plagioclase crystals in UR-60 and UR-61 are An_{83} and An_{82}, respectively, which results in calculated melt water contents of ~2.9 and ~2.5 wt%, respectively, at the onset of plagioclase crystallization in each sample, at temperatures of 1046 and 1050 °C, respectively. In this case, an uncertainty ± 29°C in temperature propagates to an uncertainty in melt H_2O of ± 0.4 wt% from the plagioclase hygrometer, and the results are consistent with the minimum estimates of melt H_2O content for these two samples using Equation 6 (Table II-6; 2.6 and 2.2 wt%, respectively).

2.7 Implications

Currently, all olivine-melt thermometers that are based on $D_{Mg}^{oliv/liq}$ need a correction for the H_2O content in the melt, which in turn requires that it be measured. Unfortunately, the process of obtaining high-quality H_2O analyses from olivine-hosted melt inclusions is labor and time intensive, at least compared to microprobe analyses of olivine. Moreover, magmas that erupt explosively (i.e., scoria) vs. effusively (i.e., lavas) are more likely to contain olivine-hosted melt inclusions that preserve maximum pre-eruptive H_2O contents, but they are generally less well preserved in the field (e.g., Lloyd et al., 2012). Therefore, in order to compile large global data sets on the temperatures of hydrous basalts, it is desirable to develop an olivine-melt thermometer that only requires microprobe analyses to apply and has a negligible dependence on water.

In some arcs, it has been shown that the amount of dissolved H_2O in erupted basalts decreases with increasing distance from the trench, which is inferred to reflect a shift from H_2O-induced flux melting beneath the volcanic front to decompressional melting in the back arc (Walker et al., 2003, Johnson et al, 2009). An olivine-melt thermometer that has a small dependence on dissolved H_2O in the melt allows a test of whether there is a corresponding systematic change in the temperature of basaltic melts with distance from the trench, which will enhance our understanding of the interplay between flux melting and decompressional melting at subduction zones. The Ni-thermometer in this study (Table II-3, Eq. 1) requires relatively routine whole rock analyses combined with microprobe analyses on olivine, and thus it can be used to generate relatively large datasets to examine temperature variations in mantle-derived arc basalts on a global basis.

Application of the Ni-thermometer can also be made to olivine-bearing lavas associated with plumes, including Yellowstone and Iceland, for which there is evidence of dissolved H_2O contents up to 3.3 and 1.0 wt% H_2O, respectively, (e.g., Stefano et al. 2011; Nichols et al., 2002), and therefore a thermometer is needed that does not require prior information on water concentrations in the melt. It may also be possible to apply the Ni-thermometer to Archean komatiites, for which there is ongoing debate about whether they erupted at very high temperatures (>1500 °C) (e.g., Herzberg et al., 2007; Sobolev et al., 2016), or whether they erupted at significantly lower temperatures owing to relatively high melt H_2O concentrations (e.g., Grove and Parman, 2004; Parman et al., 2004). The results from this study suggest that an olivine-melt thermometer based on D_{Ni} has considerable promise to help resolve this controversy, after additional Ni-partitioning olivine-melt equilibrium experiments are obtained under hydrous conditions.

2.8 References

Agee, C. B., and Walker, D. (1990) Aluminum partitioning between olivine and ultrabasic silicate liquid to 6 GPa. Contributions to Mineralogy and Petrology, 105, 243-254.

Allan, J.F., Batiza, R., Perfit, M.R., Fornari, D.J., Sack, R.O. (1989) Petrology of lavas from the Lamont Seamount Chain and adjacent East Pacific Rise, 10˚N. Journal of Petrology, 30, 1245-1298.

Almeev, R.A., Holtz, F., Koepke, J., Parat, F., Botcharnikov, R.E. (2007) The effect of H_2O on olivine crystallization in MORB: experimental calibration at 200 MPa. American Mineralogist, 92, 670-674.

Arndt, N.T. (1977) Partitioning of nickel between olivine and ultrabasic and basic komatiite liquids. Carnegie Institution of Washington Yearbook, 76, 553-557.

Asimow, P.D., Hirschmann, M.M., Stolper, E.M. (2001). Calculation of peridotite partial melting from thermodynamic models of minerals and melts, IV. Adiabatic decompression and the composition and mean properties of mid-ocean ridge basalts. Journal of Petrology, 42, 963-998.

Barclay, J., and Carmichael, I.S.E. (2004) A hornblende basalt from western Mexico: water-saturated phase relations constrain a pressure-temperature window of eruptibility. Journal of Petrology, 45, 485-506.

Beattie, P., Ford, C., Russell, D. (1991) Partition coefficients for olivine-melt and orthopyroxene-melt systems. Contributions to Mineralogy and Petrology, 109, 212-224.

Beattie, P. (1993) Olivine-melt and orthopyroxene-melt equilibria. Contributions to Mineralogy and Petrology, 115, 103-111.

Benjamin, E.R., Plank, T., Wade, J.A., Kelley, K.A., Hauri, E.H., Alvarado, G.E. (2007) High water contents in basaltic magmas from Irazu Volcano, Costa Rica. Journal of Volcanology and Geothermal Research, 168, 68-92.

Berndt, J., Koepke, J., Holtz, F. (2005) An experimental investigation of the influence of water and oxygen fugacity on differentiation of MORB at 200 MPa. Journal of Petrology, 46, 135-167.

Bird, M.L. (1971) Distribution of trace elements in olivine and pyroxenes – An experimental study. Ph.D. Thesis, University of Missouri, Rolla.

Brounce, M.N., Kelley, K.A., Cottrell E. (2014) Variations in $Fe^{3+}/\Sigma Fe$ of Mariana Arc basalts and mantle wedge fO_2. Journal of Petrology, 55, 2513-2536.

Cervantes, P., and Wallace, P.H. (2003) Role of H_2O in subduction-zone magmatism: new insights from melt inclusions in high-Mg basalts from central Mexico. Geology, 31, 235-238.

Crabtree, S.M., and Lange, R.A. (2011) Complex phenocryst textures and zoning patterns in andesites and dacites: evidence of degassing induced rapid crystallization? Journal of Petrology, 52, 3–38.

Danyushevsky, L.V. (2001) The effect of small amounts of H_2O crystallisation of mid-ocean ridge and backarc basin magmas. Journal of Volcanology and Geothermal Research, 110, 265-280.

Ehlers, K., Grove, T.L., Sisson, T.W., Recca, S.I., Zervas, D.A. (1992) The effect of oxygen fugacity on the partitioning of nickel and cobalt between olivine, silicate melt, and metal. Geochimica et Cosmochimica Acta, 56, 3733–3743.

Falloon, T.J., Danyushevsky, L.V., Ariskin, A., Green, D.H., Ford, C.E. (2007) The application of olivine geothermometry to infer crystallization temperature of parental liquids: Implications for the temperature of MORB magmas. Chemical Geology, 241, 207-233.

Frey, H.M., and Lange, R.A. (2011) Phenocryst complexity in andesites and dacites from the Tequila volcanic field, Mexico: resolving the effects of degassing vs. magma mixing. Contributions to Mineralogy and Petrology, 162, 415–445.

Ford, C. E., D. G. Russell, J. A. Craven, and M. R. Fisk (1983), Olivine-liquid equilibria: Temperature, pressure and composition dependence of the crystal/liquid cation partition coefficients for Mg, Fe^{2+}, Ca and Mn. Journal of Petrology, 24, 256–265.

Gaetani, G.A., and Grove, T.L. (1997) Partitioning of moderately siderophile elements among olivine, silicate melt, and sulfide melt: constraints on core formation in the Earth and Mars. Geochimica et Cosmochimica Acta, 61, 1829-1846.

Galoisy, L., and Calas G. (1993) Structural environment of nickel in silicate glass/melt system: Part 1. Spectroscopic determination of coordination states. Geochimica et Cosmochimica Acta, 57, 3613-3626.

George, A.M., and Stebbins, J.F. (1998) Structure and dynamics of magnesium in silicate melts: A high-temperature ^{25}Mg NMR study. American Mineralogist, 83, 1022-1029.

Genske, F.S., Turner, S.P., Beier, C., Schaefer, B.F. (2012) The petrology and geochemistry of lavas from the Western Asores Islands of Flores and Corvo. Journal of Petrology, 53, 1673-1708.

Ghiorso, M.S., and Sack, R.O. (1995) Chemical mass-transfer in magmatic processes IV. A revised and internally consistent thermodynamic model for the interpolation and extrapotion of liquid-solid equilibria in magmatic systems at elevated temperatures and pressures. Contributions to Mineralogy and Petrology, 119, 197-212.

Ghiorso, M.S., and Evans, B.W. (2008) Thermodynamics of rhombohedral oxide solid solutions and a revision of the Fe-Ti two oxides geothermometers and oxygen-barometer. Americal Journal of Science, 308, 957-1039.

Grove, T. L., and Parman, S.W. (2004) Thermal evolution of the Earth as recorded by komatiites. Earth and Planetary Science Letters, 219, 173-187.

Guo, X., Lange, R.A., Ai, Y. (2013) The density and compressibility of CaO-FeO-SiO_2 liquids at one bar: Evidence for four-coordinated Fe^{2+} in the $CaFeO_2$ component. Geochimica et Cosmochimica Acta, 120, 206-219.

Guo, X., Lange, R.A., Ai, Y. (2014) Density and sound speed measurements on model basalt (An-Di-Hd) liquids at one bar: New constraints on the partial molar volume and compressibility of the FeO component. Geochimica et Cosmochimica Acta, 388, 283-292.

Hamilton, D.L., Burnham, C.W., Osbom, E.F. (1964) The solubility of water and effects of oxygen fugacity and water content on crystallization in mafic magmas. Journal of Petrology, 5, 21-39.

Hart, S.R., and Davis, K.E. (1978) Nickel partitioning between olivine and silicate melt. Earth and Planetary Science Letters, 40, 203–219.

Herzberg, C., and O'Hara, M.J. (2002) Plume-associated ultramafic magmas off Phanerozoic age. Journal of Petrology, 43, 1857-1883.

Herzberg, C., Asimow, P.D., Arndt, N., Niu, Y., Lesher, C.M., Fitton, J.G., Cheadle, M.J., Saunders, A.D. (2007) Temperatures in ambient mantle and plumes: constraints from basalts, picrites, and komatiites. Geochmistry, Geophysics, Geosystems, 8, Q02006.

Herzberg, C., and Gazel, E. (2009) Petrological evidence for secular cooling in mantle plumes. Nature, 458, 619-623.

Herzberg, C., and Asimow, P.D. (2015) PRIMELT3 MEGA.XLSM software for primary magma calculation: peridotite primary magma MgO contents from the liquidus to the solidus. Geochemistry, Geophysics, Geosystems, 16, 563-578.

Hirschmann, M.M., Ghiorso, M.S., Davis, F.A., Gordon, S.M., Mukherjee, S., Grove, T.L., Krawczynski, M., Médard, E., Till, C.B. (2008) Library of Experimental Phase Relations (LEPR): a database and web portal for experimental magmatic phase equilibria data. Geochemistry, Geophysics, Geosystems, 9, Q03011.

Jayasuriya, K. D., O'Neill, H. St. C., Berry, A. J., Campbell, S. J. (2004) A Mössbauer study of the oxidation state of Fe in silicate melts. American Mineralogist, 89, 1597-1609.

Johnson, E.R., Wallace, P.J., Cashman, K.V., Delgado-Granados, H., Kent, A.J.R. (2008) Magmatic volatile contents and degassing-induced crystallization at Volcán Jorullo, Mexico: Implications for melt evolution and the plumbing systems of monogenetic volcanoes. Earth and Planetary Science Letters, 269, 478-487.

Johnson, E.R., Wallace, P.J., Granados, H.D., Manea, V.C., Kent, A.J.R., Bindeman, I.N., Donegan, C.S. (2009) Subduction-related volatile recycling and magma generation beneath Central Mexico: Insights from melt inclusions, oxygen isotopes and geodynamic models. Journal of Petrology, 50, 1729-1764.

Jones, J., O'Neill, H.S., Berry, A. (2011) Differential changes in Ni^{2+}, Co^{2+} and Fe^{2+} coordination in silicate melt with pressure. Goldschmidt Conference Abstract, Mineralogical Magazine, 75, 1124.

Jurewicz, A.J.G., Mittlefehldt, D.W., Jones, J.H. (1993) Experimental partial melting of the Allende (CV) and Murchison (CM) chondrites and the origin of asteroidal basalts. Geochimica et Cosmochimica Acta, 57, 2123-2139.

Kelemen, P.B., Hart, S.R., Bernstein, S. (1998) Silica enrichment in the continental upper mantle via melt/rock reaction. Earth and Planetary Science Letters, 164, 387–406.

Kelley, K.A., and Cottrell E. (2009) Water and the oxidation state of subduction zone magmas. Science, 325, 605-607.

Kelley, K.A., Plank, T., Newman, S., Stolper, E., Grove, T.L., Parman, S., Hauri, E. (2010) Mantle melting as a function of water content beneath the Mariana arc. Journal of Petrology, 51, 1711-1738.

Kent, A.J.R., Stolper, E.M., Francis, D., Woodhead, J., Frei, R., Eiler, J. (2004) Mantle heterogeneity during the formation of the North Atlantic Igneous Province: Constraints from trace element and Sr-Ni-Os-O isotope systematics of Baffin Island picrites. Geochemistry Geophysics Geosystems, 5, Q11004.

Kinzler, R.J., Grove, T.L., Recca, S.I. (1990) An experimental study on the effect of temperature and melt composition on the partitioning of nickel between olivine and silicate melt. Geochimica et Cosmochimica Acta, 54, 1255–1265.

Krawczynski, M.J., Grove, T.L., Behrens, H. (2012) Amphibole stability in primitive arc magmas: effects of temperature, H_2O content and oxygen fugacity. Contributions to Mineralogy and Petrology, 164, 317-339

Lange, R.A., and Carmichael, I.S.E. (1990) Hydrous basaltic andesites associated with minette and related lavas in Western Mexico. Journal of Petrology, 31, 1225-1259.

Lee, C.T., Luffi, P., Plank, T., Dalton, H., Leeman, W.P. (2009) Constraints on the depths and temperatures of basaltic magma generation on Earth and other terrestrial planets using new thermobarometers for mafic magmas. Earth and Planetary Science Letters, 279, 20-33.

Leeman, W.P., and Lindstrom, D.J. (1978). Partitioning of Ni^{2+} between basaltic and synthetic melts and olivines: an experimental study. Geochimica et Cosmochimica Acta, 42, 801–806.

Li, C., and Ripley, E.M. (2010) The relative effects of composition and temperature on olivine-liquid Ni partitioning: statistical deconvolution and implications for petrologic modeling. Chemical Geology, 275, 99–104.

Lloyd, A.S., Plank, T., Ruprecht, P., Hauri, E., Rose, W. (2013) Volatile loss from melt inclusions in pyroclasts of differing sizes. Contributions to Mineralogy and Petrology, 165, 129-153.

Lofgren, G. (1974) An experimental study of plagioclase crystal morphology: isothermal crystallization. American Journal of Science, 274, 243-273.

Luhr, J.F., and Carmichael, I.S.E. (1985) Jorullo Volcano, Michoacán, Mexico (1759-1774): The earliest stages of fractionation in calc-alkaline magmas. Contributions to Mineralogy and Petrology, 90, 142-161.

Matzen, A. K., Baker, M. B., Beckett, J. R., Stolper, E. M. (2011) Fe-Mg partitioning between olivine and high-magnesian melts and the nature of Hawaiian parental liquids. Journal of Petrology, 52,1243-1263.

Matzen, A.K., Baker, M.B., Beckett, J.R., Stolper, E.M. (2013) The temperature and pressure dependence of nickel partitioning between olivine and silicate melt. Journal of Petrology, 54, 2521-2545.

Médard, E., and Grove, T.L. (2008) The effect of H_2O on the olivine liquidus of basaltic melts: experiments and thermodynamic models. Contributions to Mineralogy and Petrology, 155, 417-432.

Moore, G., and Carmichael, I.S.E. (1998) The hydrous phase equilibria (to 3 kbar) of an andesite and basaltic andesite from western Mexico: constraints on water content and conditions of phenocryst growth. Contributions to Mineralogy and Petrology, 130:304-319.

Mysen, B.O., Virgo, D., Seifert, F.A. (1985) Relationships between properties and structure of aluminosilicate melts. American Mineralogist, 70, 88-105.

Mysen, B.O. (2006) Redox equilibria of Iron and silicate melt structure: Implications for olivine/melt element partitioning. Geochimica et Cosmochimica Acta, 70, 3121-3138.

Mysen, B.O. (2007a) Olivine/melt transition metal partitioning, melt composition, and melt structure—influence of Al^{3+} for Si^{4+} substitution in the tetrahedral network of silicate melts. Geochimica et Cosmochimica Acta, 71, 5500–5513.

Mysen, B.O. (2007b) Partitioning of calcium, magnesium, and transition metals between olivine and melt governed by the structure of the silicate melt at ambient pressure. American Mineralogist, 92, 844–862.

Mysen, B.O. (2008) Olivine/melt transition metal partitioning, melt composition, and melt structure — melt polymerization and Q^n-speciation in alkaline earth silicate systems. Geochimica et Cosmochimica Acta, 72, 4796–4812.

Nabelek, P.I. (1980) Nickel partitioning between olivine and liquid in natural basalts: Henry's Law behavior. Earth and Planetary Science Letters, 48, 293–302.

Neave, D.A., Maclennan, J., Thordarson, T., Hartley, M.E. (2015) The evolution and storage of primitive melts in the Eastern Volcanic Zone of Iceland: the 10ka

Grímstötn tephra series (i.e. the Saksunarvatn ash). Contributions to Mineralogy and Petrology, 170, 21.

Nichols, A.R.L., Carroll, M.R., Höskuldsson, Á. (2002) Is the Iceland hot spot also wet? Evidence from the water contents of undegassed submarine and subglacial pillow basalts. Earth and Planetary Science Letters, 202, 77-87.

Ownby, S.E., Lange, R.A., Hall, C.M., Delgado-Granados, H. (2011) Origin of andesite in the deep crust and eruption rates in the Tancítaro-Nueva Italia region of the central Mexican arc. Geological Society of America Bulletin, 123, 274-294.

Parman, S.W., Dann, J.C., Grove, T.L., de Wit, M.J. (1997) Emplacement conditions of komatiite magmas from the 3.49Ga Komati Formation, Barberton Greenstone Belt, South Africa. Earth and Planetary Science Letters, 150, 303-323.

Parman, S.W., Grove, T.L., Dann, J.C. (2004) A subduction origin for komatiites and cratonic lithospheric mantle. South African Journal of Geology, 107, 107-118.

Parman, S.W., Grove, T.L., Kelley, K.A., Plank, T. (2011) Along-arc variations in the pre-eruptive H_2O contents of Mariana Arc magma inferred from fractionation paths. Journal of Petrology, 52, 257-278.

Plank, T., Kelley, K.A., Zimmer, M.M., Hauri, E.K., Wallace, P.J. (2013) Why do mafic magmas contain ~4 wt% water on average? Earth and Planetary Science Letters, 364, 168-179.

Portnyagin, M., Hoernle, K., Plechov, P., Mirono, N., Khubunaya, S. (2007) Constraints on mantle melting and composition and nature of slab components in volcanic arcs from volatiles (H_2O, S, Cl, F) and trace elements in melt inclusions from the Kamtchatka Arc. Earth and Planetary Science Letters, 255, 53-69.

Putirka, K.D., Perfit, M., Ryerson, F.J., Jackson, M.G. (2007) Ambient and excess mantle temperatures, olivine thermometry, and active vs. passive upwelling. Chemical Geology, 241, 177-206.

Putirka, K.D. (2008) Thermometers and barometers for volcanic systems. Reviews in Mineralogy and Geochemistry, 69, 61-120.

Putirka, K., Ryerson, F.J., Perfit, M., Ridley, W.I. (2011) Mineralogy and composition of the oceanic mantle. Journal of Petrology, 52, 279-313.

Righter, K., and Carmichael, I.S.E. (1996) Phase equilibria of phlogopite lamprophyres from western Mexico: biotite-liquid equilibria and P-T estimates for biotite-bearing igneous rocks. Contributions to Mineralogy and Petrology, 123, 1-21.

Roeder, P.L., and Emslie, R.F. (1970) Olivine-liquid equilibrium. Contributions to Mineralogy and Petrology, 29, 275-289.

Ruscitto, D.M., Wallace, P.J., Johnson, E.R., Kent, A.J.R., Bindeman, I.N. (2010) Volatile contents of mafic magmas from cinder cones in the Central Oregon High Cascades: implications for magma formation and mantle conditions in a hot arc. Earth and Planetary Science Letters, 298, 253-161.

Ruscitto, D.M., Wallace, P.J., Kent, A.J.R. (2011) Revisiting the compositions and volatile contents of olivine-hosted melt inclusions from the Mount Shasta region: implications for the formation of high-Mg andesites. Contributions to Mineralogy and Petrology, 162, 109-132.

Sadofsky, S. J., Portnyagin, M., Hoernle, K., van den Bogaard, P. (2008) Subduction cycling of volatiles and trace elements through the Central American volcanic arc: evidence from melt inclusions. Contributions to Mineralogy and Petrology, 155, 433-456.

Shaw, A.M., Hauri, E.H., Fischer, T.P., Hilton, D.R., Kelley, K.A. (2008) Hydrogen isotopes in Mariana arc melt inclusions: implications for subduction dehydration and the deep-Earth water cycle. Earth and Planetary Science Letters, 275, 138-145.

Sisson, T.W., and Layne, G.D. (1993) H_2O in basalt and basaltic andesite glass inclusions from four seduction-related volcanoes. Earth and Planetary Science Letters, 117, 619-635.

Sisson, T.W., and Grove, T.L. (1993a) Experimental investigations of the role of H_2O in calc-alkaline differentiation and subduction zone magmatism. Contributions to Mineralogy and Petrology, 113,143-166.

Sisson, T.W., and Grove, T.L. (1993b) Temperatures and H_2O contents of low-MgO high-alumina basalts. Contributions to Mineralogy and Petrology, 113, 167-184.

Snyder, D.A., and Carmichael, I.S.E. (1992) Olivine-liquid equilibria and the chemical activities of FeO, NiO, Fe_2O_3, and MgO in natural basic melts. Geochimica et Cosmochimica Acta, 56, 303–318.

Sobolev, A.V., Asafov, E.V., Gurenko, A.A., Arndt, N.T., Batanova, V.G., Portnyagin, M.V., Garbe-Schönberg, E., Krasheninnikov, S.P. (2016) Komatiites reveal a hydrous Archaean deep-mantle reservoir. Nature, 531, 628-632.

Stefano, C.J., Mukasa, S.B., Andronikov A., Leeman, W.P. (2011) Water and other volatile systematics of olivine-hosted melt inclusions from Yellowstone hotspot track. Contributions to Mineralogy and Petrology, 161, 615-633.

Takahashi, E. (1978) Partitioning of Ni^{2+}, Co^{2+}, Fe^{2+}, Mn^{2+} and Mg^{2+} between olivine and silicate melts: compositional dependence of partition coefficient. Geochimica et Cosmochimica Acta, 42, 1829–1844.

Tuff, J., Takahashi, E., Gibson, S.A. (2005) Experimental constraints on the role of garnet pyroxenite in the genesis of high-Fe mantle plume derived melts. Journal of Petrology, 46, 2023-2058.

Wade, J.A., Plank, T., Melson, W.G., Soto, G.J., Hauri, E. (2006) The volatile content of magmas from Arenal volcano. Journal of Volcanology and Geothermal Research, 157, 94-120.

Wagner, T.P., Donnelly-Nolan, J.M., Grove, T.L. (1995) Evidence of hydrous differentiation and crystal accumulation in the low-MgO, high Al_2O_3 Lake Basalt from Medicine Lake volcano, California. Contributions to Mineralogy and Petrology, 121, 201-216.

Walker, J.A., Roggensack, K., Patino, L.C., Cameron, B.I., Matias, O. (2003) The water and trace element contents of melt inclusions across an active subduction zone. Contributions to Mineralogy and Petrology, 146, 62-77.

Wang, Z., and Gaetani, G.A. (2008) Partitioning of Ni between olivine and siliceous eclogite partial melt: experimental constraints on the mantle source of Hawaiian basalts. Contributions to Mineralogy and Petrology, 156, 661–678.

Waters, L.E., and Lange, R.A. (2013) Crystal-poor, multiply saturated rhyolites (obsidians) from the Cascades and Mexican arcs: evidence of degassing-induced crystallization of phenocrysts. Contributions to Mineralogy and Petrology, 166, 731-754.

Waters, L.E., and Lange, R.A. (2015) An updated calibration of the plagioclase-liquid hygrometer-thermometer applicable to basalts through rhyolites. American Mineralogist, 100, 2172-2184.

Waters, L.E., Andrews, B.J., Lange, R.A. (2015) Rapid crystallization of plagioclase phenocrysts in silicic melts during fluid-saturated ascent: phase equilibrium and decompression experiments. Journal of Petrology, 56, 981-1006.

Welsch, B., Hammer, J., Hellebrand, E. (2014) Phosphorus zoning reveals dentritic architecture of olivine. Geology, 42, 867-870.

Xu, G., Huang, S., Frey, F.A., Blichert-Toft, J., Abouchami, W., Clague, D.A., Cousens, B., Moore J., Beeson, M.H. (2014) The distribution of geochemical heterogeneities in the source of Hawaiian shield lavas as revealed by a transect across the strike of the Loa and Kea spatial trends: East Molokai to West Molokai to Penguin Bank. Geochimica et Cosmocimica Acta, 132, 214-237.

Zhang, Y., Xu, Z., Zhu, M., Wang, H. (2007). Silicate melt properties and volcanic eruptions. Reviews of Geophysics, 45, RG4004.

Zimmer, M.M., Plank, T., Hauri, E.H., Yogodzinksi, G.M., Stelling, P., Larsen, J., Singer. B., Jicha, B., Mandeville, C., Nye, C.J. (2010) The role of water in generating the calc-alkaline trend: new volatile data for Aleutian magmas and a new tholeiitic index. Journal of Petrology, 51, 2411-2444.

Chapter III

An experimental study of Ni partitioning between olivine and basaltic melt: negligibles effect of dissolved H_2O in melt

3.1 Abstract

The new olivine-melt thermometer introduced in Pu et al. (2017), which is based on the partitioning of Ni ($D_{Ni}^{ol/liq}$), was hypothesized to have a negligible dependence on pressure under crustal condtions (<1 GPa) and dissolved H_2O content in the melt, in marked contrast to thermometers based on $D_{Mg}^{ol/liq}$. In this study, ten olivine-melt equilibrium experiments were conducted on a basaltic glass starting material (9.6 wt% MgO; 352 ppm Ni) to compare the effect of dissolved H_2O in the melt on $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ on the same set of experiments. Results are presented for four anhydrous experiments at 1 bar, one anhydrous experiment at 0.5 GPa and five hydrous experiments at 0.5 GPa. Olivine and melt compositions were used to construct values for $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ from each experiment, which in turn permit temperature to be calculated with the Mg- and Ni-thermometers calibrated by Pu et al. (2017). The Ni-thermometer recovers the experimental temperatures for all ten experiments, including those where the melt contained at least 4.4 wt% H_2O. In contrast, the Mg-thermometer recovers the anhydrous experimental temperatures within error, but shows significant deviations for the hydrous experiments. The Mg-

thermometer overestimates the experimental temperatures under hydrous conditions by +88 to +141 degrees, whereas the Ni-thermometer recovers these experimental temperatures within 14 degrees, on average. This result underscores that $D_{Ni}^{ol/liq}$ has a negligible dependence to dissolved water in the melt (up to at least 4.4 wt% H_2O), in marked contrast to $D_{Mg}^{ol/liq}$, which displays a strong dependence. It is proposed that the olivine-melt thermometer based on $D_{Ni}^{ol/liq}$ can be applied to hydrous arc basalts at depths < 1 GPa without corrections for water or pressure.

3.2 Introduction

In magmatic systems, temperature has a strong control over a variety of processes including phase equilibria, diffusion, partitioning, convection, etc. Knowledge of the magmatic temperature of arc basalts is critical to our understanding of subduction zone processes. There has been a profusion of effort in the literature to constrain olivine crystallization temperature through olivine-melt Mg partitioning in basaltic systems (e.g. Beattie, 1993; Herzburg and O'Hara, 2002; Putirka et al., 2007), and many have been shown to recover the experimental temperatures with high precision, in anhydrous systems. However, when applied to hydrous systems, like arc basalt, these Mg-thermometers require a correction term based on melt H_2O content because olivine-melt Mg partitioning is strongly dependent on the dissolved H_2O content in the melt (Putirka et al., 2007; Putirka, 2008).

A new olivine-melt thermometer based on the partitioning of Ni has been proposed to be independent of dissolved H_2O in the melt (Pu et al., 2017). This new

Ni-thermometer was calibrated on a dataset of 123 1-bar olivine-melt experiments from the literature. It was tested in comparison to a similar olivine-melt thermometer based on the partitioning of Mg by comparing the results of both to a set of mid-ocean ridge basalts (MORB) and a set of subduction-zone basalts. The average difference between the two thermometers is -3˚C for a set of MORB samples (nominally dry) and +112˚C for the hydrous arc samples. The Ni-thermometer was also applied to three hydrous olivine-melt experiments (Moore and Carmichael, 1998) and the residuals (T_{Ni} – T_{Expt}) are all within 2-sigma error of the 1-bar experiment dataset that the Ni-thermometer was calibrated on. These results support the hypothesis that the dependence on melt H_2O content of olivine-melt Ni partitioning, if not completely negligible, is much less than that of olivine-melt Mg partitioning.

Outside of the three hydrous experiments from Moore and Carmichael (1998), for which the Ni content in the melt was analyzed in Pu et al. (2017), there are no hydrous olivine-melt equilibrium experiments available in the literature where the Ni contents in both olivine and melt reported. In this study, we are presenting new olivine-melt Ni partitioning experiments in hydrous systems, with three goals: 1) to further evaluate the dependence of melt H_2O content on olivine-melt Ni partitioning; 2) to test the Ni-thermometer under both hydrous and anhydrous systems; 3) to compare the Mg-thermometer and the Ni thermometer with and without the presence of H_2O in the melt.

3.3 Experimental Methods

3.3.1 Synthesis of Starting Material

The starting material for all experiments in this study is a calc-alkaline basalt sample from the Mexican arc (UR-46, Ownby et al., 2011; Pu et al., 2017), with 9.4 wt% MgO and 231 ppm Ni (Table III-1). Pieces of the natural sample were crushed in a tungsten-carbide shatter box into a fine powder. Reagent grade NiO powder was mixed with the natural rock powder in a ceramic mortar and pestle set, in order to increase the Ni content of the starting material for all experiments. The mixed powder was placed in a platinum crucible and heated in air to 1450°C for two hours. The sample was then quenched in deionized water at room temperature, producing a crystal-free glass.

Table III-1 Composition of the natural sample UR-46 (Ownby et al., 2011) and the synthesized glass in this study

sample name	UR-46	UR46Ni*
SiO_2 (wt%)	52.2	51.63 (±0.35)
TiO_2 (wt%)	0.80	0.78 (±0.02)
Al_2O_3 (wt%)	16.7	17.32 (±0.14)
FeO^T (wt%)	7.39	7.49 (±0.13)
MnO (wt%)	0.13	0.14 (±0.02)
MgO (wt%)	9.38	9.55 (±0.08)
CaO (wt%)	9.26	8.64 (±0.06)
Na_2O (wt%)	3.37	3.47 (±0.06)
K_2O (wt%)	0.56	0.59 (±0.03)
P_2O_5 (wt%)	0.14	0.37 (±0.03)
Ni (ppm)	231	352 (±20)
Total	99.9	100.5

*** UR-46 glass was synthesized with added NiO powder. Reported value is after normalized to 100%.**

3.3.2 Analytical Methods

3.3.2.1 Electron Microprobe Analysis (EMPA)

Compositional analyses of olivine and glass were conducted with a five-spectrometer Cameca SX-100 Electron Microprobe at the University of Michigan Electron MicroAnalysis Laboratory (EMAL). Olivine crystals were analyzed under a focused beam, with an acceleration voltage of 15kV and a beam current of 20nA. Eight elements were measured (Mg, Al, Si, Ca, Mn, Fe, Cr, Ni) with peak and background counting time of 30s for each element. Oxygen was calculated by cation stoichiometry, which was input into the Cameca PAP correction program. The standards used for olivine microprobe analyses are the same as those described in Pu et al. (2017). A second standard (Bolten Forsterite; $Fo_{98.5}$) was used as an additional check of the olivine analyses. When the olivine crystals were larger than 20μm in size, more than one analysis was conducted per crystal, with an effort to analyze areas both near and far from the rim. The 1σ precision based on counting statistics is ± 0.32 wt% SiO_2, ± 0.25 wt% MgO, ± 0.54 wt% FeO, and ± 0.05 wt% NiO.

Glass was analyzed with an acceleration voltage of 15 kV and a beam current of 10 nA; in addition the beam was defocused to 10μm. Ten elements were measured (Na, Mg, Al, Si, P, K, Ca, Ti, Fe), with peak and background counting times of 30 s for each element. The standards used for the glass analyses are shown in Table B1. A second standard (NHNM-113716-1; Smithsonian Indian Ocean Basaltic Glass) was used to evaluate the quality of the basalt glass analyses. Glass was analyzed in areas both adjacent to and relatively far from olivine crystals in each experimental run product. The 1σ precision based on counting statistics is ± 0.4 wt% SiO_2, ± 0.1 wt% MgO, ± 0.15 wt% FeO, all within 3% relative.

3.3.2.2 Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS)

The concentration of Ni in the starting glass material and in all experimental glasses were analyzed by Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) at the University of Windsor. The instrument is a PhotonMachines Analyte Exicite 193nm, short-pulse-width Ar-F excimer laser ablation system coupled with an Agilent 7900, fast-scanning quadrupole ICP-MS. For each LA-ICP-MS analysis, 30s background counts with the laser off and 40s counts of the ablation signal with the laser on were used. A 50μm spot size was used for all glass analyses.

The NIST glass standard 610 was analyzed every 40-60 min during the analytical session; it was used as the reference standard and kept track of any beam drift over time. ^{25}Mg, ^{43}Ca, ^{44}Ca were used as internal standards; ^{60}Ni and ^{62}Ni were both measured. For each spot analysis, the reported Ni concentration is the average of six values calculated from ^{60}Ni and ^{62}Ni that are each paired with three internal standards, relatively to NIST 610. The concentrations of the internal standards are those obtained from microprobe analyses on the glass.

The data processing was conducted using the software package SILLS, which accounts for any beam drift over time. The trace element concentrations of NIST 610 are those adopted from the recommended average values in Pearce et al.

(1997). The analytical uncertainties for both ^{60}Ni and ^{62}Ni analyses are 5% (1σ) for all glass analyses.

3.3.2.3. Fourier Transform Infrared spectroscopy (FTIR)

For all hydrous experiments conducted in a piston-cylinder apparatus, the quenched glasses in the run products were analyzed for H_2O concentration with a Perkin-Elmer GX Fourier Transform Infrared Spectrometer (FTIR) at the University of Michigan. A mid-IR source and KBr beamsplitter was used, with the apture size of 100x100μm. Samples were mounted in epoxy and polished on both sides down to a thickness of 200-400μm. For each FTIR spectrum, the baseline was fit with a flexi curve, similar to that describe in Zhang et al. (1997). The molar absorptivity is 0.67 (L•cm/mol) for the 5200cm^{-1} band of molecular H_2O and 0.62 (L•cm/mol) for the 4500 cm^{-1} band of hydroxyl group (OH), following Dixon et al. (1995). The total H_2O content was determined by the summation of molecular H_2O and hydroxyl group (OH) concentration in the melt. The density of the hydrous glass was calculated from Lange and Carmichael (1990), Lange (1997) and Ochs and Lange (1999). A second-order iteration was applied so that the final calculation of H_2O content, which depends on glass density, matched the value calculated based on Beer-Lambert Law for the FTIR spectrum. For the nominally anhydrous experiment conducted in the piston-cylinder apparatus, analysis of the quenched glass used the 3550cm^{-1} band with a molar absorptivity of 63 (L□cm/mol), following Dixon et al. (1995).

3.4 One-bar olivine-melt equilibrium experiments

3.4.1. Experimental setup

One-bar (1-bar) experiments were conducted in a vertical Deltech furnace with the oxygen fugacity controlled by a mixture of CO-CO_2 gases. Temperature was monitored by an S-type thermocouple, placed at the hot spot of the furnace, which has an uncertainty at temperatures >1200°C of ± 2 degrees. The thermocouple was calibrated at the melting temperature of gold, and found to be within ±1˚C of the accepted value (1064˚C at 1 bar). The combined uncertainty in temperature is ±3°C.

Oxygen fugacity (fO_2) of the CO-CO_2 gas mixture was monitored with a yttria-stabilized zirconia oxygen sensor (SIRO2; Ceramic Oxide Fabricators, Eaglehawk, Australia) that was placed in the hot zone of the furnace adjacent to the location of the thermocouple and samples. The oxygen sensor measures the electrochemical potential (EMV) between the atmosphere outside (air) and inside the furnace (CO-CO_2 gas mixture); the EMV allows the fO_2 inside the furnace to be calculated with the Nernst Equation. The oxygen sensor was calibrated against the Ni-NiO buffer by measuring the EMV when an adjacent Ni wire inside the furnace became oxidized (detected by a change in its electrical conductivity). This calibration of the oxygen sensor was performed at 1200, 1250 and 1270˚C; it was found to be accurate within 0.1 log unit of the accepted value based on the empirical equations from O'Neill and Pownceby (1993) and Frost (1990). All 1-bar experiments in this study were conducted at fO_2-temperature conditions along the Ni-NiO buffer (NNO).

The glass starting material was crushed to a powder and mixed with a poly-vinyl alcohol (PVA) solution to make a paste, which was placed on $Au_{60}Pd_{40}$ wire loops that were hung, in duplicate, from a Pt wire cage. The Pt cage was suspended into the furnace so that the wire-loop samples were located in the hot spot of the furnace, adjacent to the thermocouple and oxygen sensor. Samples were quenched when a 110 V was run across a thin (0.127 mm) Pt wire that held the Pt cage between two thicker (0.502 mm Pt) wires; this caused the thin wire to melt and the Pt cage to drop into a cup of cold, distilled water at the base of the furnace. The experimental run products consisted of glass beads attached to the $Au_{60}Pd_{40}$ wire loops; the glass beads were readily removed and embedded in epoxy grain mounts for compositional analysis. Multiple glass chips from the two beads per experiment were mounted for analysis.

All $Au_{60}Pd_{40}$ wire used in the experiments were first pre-saturated to minimize loss of Fe and Ni to the wire loop. Pre-saturation runs were conducted under identical conditions (temperature, fO_2, duration of equilibration) as the final experimental runs. The glass attached to the pre-saturation run products was mechanically removed, and the wires were re-used in the final experiments.

3.4.2. Two experimental temperature-path trajectories

In the four 1-bar experiments, two different temperature-path trajectories were undertaken (Table III-2; Fig. II-1). All experiments began with a crystal-free glass. However, for three of the four experiments, the temperature path that was employed took the glass to a temperature *above* the liquidus (1275 °C), where it was held for

Table III-2a Conditions of 1-atmosphere experiments in gas mixing furnace

Expt #	Wire material	P (MPa)	T_1 (˚C)	t_1 (h)	T_{final} (˚C)	t_{final} (h)	phases	ΔNNO
22	Au60 Pd40	0.1	-	-	1225	12	olivine + spinel	0
20-1	Au60 Pd40	0.1	1275	2	1225	24	olivine + spinel	0
21	Au60 Pd40	0.1	1275	2	1200	8	olivine + spinel	0
21-1	Au60 Pd40	0.1	1275	2	1200	24	olivine + spinel	0

Table III-2b Conditions of experiments in piston cylinder

Expt #	Capsule material	P (MPa)	T_1 (˚C)	t_1 (h)	T_{final} (˚C)	t_{final} (h)	phases	H_2O (wt%) by FTIR
PC33	Au75 Pd25	500	-	-	1180	48	olivine + plagioclase	0.2
PC10	Au75 Pd25	500	-	-	1125	12	olivine + spinel	4.0
PC12	Au75 Pd25	500	-	-	1115	12	olivine + spinel	4.4
PC13	Au75 Pd25	500	1200	4	1115	12	olivine + spinel + opx(tr)	2.0
PC14	Au75 Pd25	500	1225	1	1115	8	olivine+oxide	2.9
PC17	Au75 Pd25	500	1225	1	1090	8	olivine+oxide	3.1

two hours, at an fO_2 along the Ni-NiO buffer. The sample was then abruptly dropped to the final equilibration temperature (1225 or 1200°C) and fO_2 (to keep it on the Ni-NiO buffer) and held for 8-24 hours prior to quench. In a fourth experiment, a different temperature path was undertaken. In this case, the glass (initially at room temperature) was rapidly brought up to the final run temperature (1225 °C) and held for 12 hours prior to quench.

The purpose of conducting these two different temperature-path trajectories is to evaluate if there is any difference in the olivine composition and/or attainment of olivine-melt equilibrium based on whether the experiment was initiated from above or below the liquidus. It is anticipated that samples that are first taken above their liquidus, where all nuclei are purged, and then rapidly dropped to a lower temperature will experience a kinetic lag to olivine nucleation, which induces a state of undercooling ($\Delta T_{uc} = T_{melt}-T_{liquidus}$). The advantage of a moderate undercooling is that it leads to relatively high crystal growth rates and low nucleation rates (Fig. III-1), which enables large, sparse crystals to form (e.g, Lofgren et al., 1974).

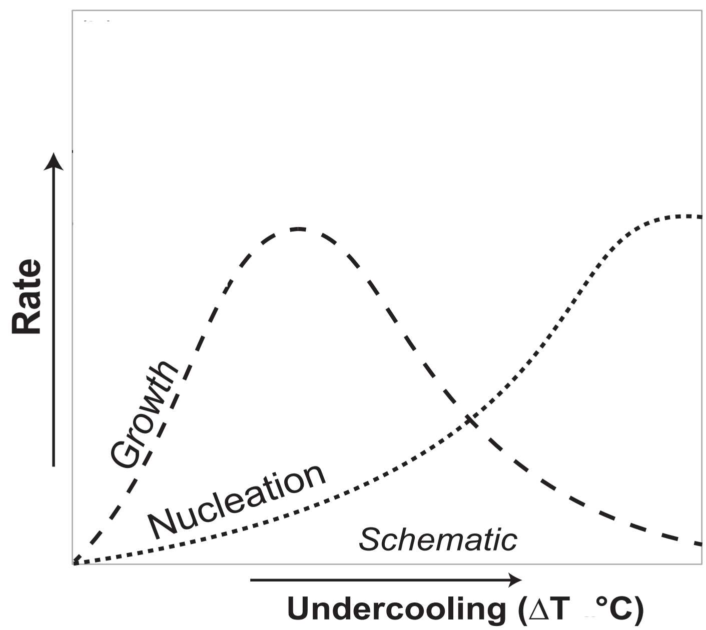


Figure III-1 The change in crystal growth rate and nucleation rate with increasing undercooling. Undercooling is defined as the difference between the liquidus temperature and the melt temperature. Undercooling could be induced by cooling and degassing of H_2O.

The primary purpose in performing experiments that start *above* the liquidus is that this trajectory may closely approximate conditions in nature, where an undercooling develops during magma ascent due to rapid loss of dissolved water and/or temperature (e.g., Waters et al., 2015; Pu et al., 2017). The outstanding question, however, is whether the kinetic delay in nucleation, followed by rapid phenocryst crystallization, leads to olivine compositions that deviate from equilibrium. Therefore, tests of olivine-melt equilibrium are needed, including a comparison to experiments where the starting material is never taken above the liquidus.

In cases where a crystal-free glass is the starting material and is rapidly taken up to its final temperature of equilibrium, the sample briefly transits the supercooled liquid region (between the glass transition temperature and final equilibration temperature) where relatively large undercoolings (ΔT_{uc}) occur, leading to high nucleation rates and low crystal growth rates (Fig. III-1). Thus, when the sample reaches the final equilibration temperature, it contains numerous tiny nuclei and there is no kinetic delay to nucleation. Experiments run in this manner have demonstrated mineral-melt equilibrium in relatively viscous melts like rhyolite. For example, Waters and Lange (2017) showed that orthopyroxene-rhyolite liquid equilibrium was attained within <24 hours (melt viscosity of ~10^{4-5} Pa-s; Hui and Zhang, 2007). Therefore, experiments on anhydrous basalt liquids with lower melt viscosity (~10^3 Pa-s; Hui and Zhang, 2007), which follows this second temperature path (designed to prevent kinetic delay to nucleation), are expected to crystallize equilibrium olivine compositions, which can be tested.

3.4.3. Proposed tests of olivine-melt equilibrium

The 1-bar experiments were designed so that olivine-liquid equilibrium in the run products could be tested in four ways. (1) The analyzed compositions of glass and olivine in each experimental charge should be broadly homogenous, especially for MgO and NiO. (2) Calculated values of $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol}/^{liq}$ from the analysis of olivine and glass in each experimental charge should lead to calculated temperatures, when input into the Mg- and Ni-thermometers of Pu et al. (2017), that match the experimental temperature within error. (3) Calculation of the mass of olivine that crystallized (1-F), where F is the melt fraction, should be consistent between values calculated with $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$. The equation that is used is:

$$F = (\frac{Co}{Cl} - D)/(1 - D). \qquad (1)$$

where F is melt fraction, C_0 and C_l is the concentration of Ni or Mg in the liquid prior to and after olivine crystallization, respectively, and D is the partition coefficient between olivine and melt for Ni and Mg. (4) Since the 1-bar experiments were conducted under gas-mixing conditions along the Ni-NiO buffer, the melt ferric-ferrous ratio in each experiment can be calculated for all analyzed glass compositions, using the model of Jayasuriya et al. (2004). With melt ferrous iron content known, the Fe^{2+}-Mg exchange coefficient between olivine and melt (K_D) can be calculated for each experiment and compared to the value of 0.34 ± 0.04, which is recommended in Matzen et al. (2011) based on a compilation of 446 anhydrous experiments on tholeiitic basalts, where the model of Jayasuriya et al. (2004) was also used. The calculated $Fe^{2+\text{-}Mg}K_D$ from each experimental charge should match the value recommended by Matzen et al. (2011) within error.

3.5 Piston-cylinder experiments

3.5.1. Piston-cylinder assembly

Experiments under both anhydrous and hydrous conditions at 500 MPa were conducted in a piston-cylinder apparatus (PC) at the University of Michigan. A 19mm (3/4 inch) PC assembly was used. The construction of the assembly closely followed that described in Moore et al. (2007), except our assembly is inverted (upside down) because of the different configuration between the Rockland press at the University of Michigan and the Quickpress (manufactured by Depths of the Earth Co.) used in Moore et al. (2007).

An S-type thermocouple was used to measure the temperature of the PC experiments, and a Eurotherm controller was used to monitor the temperature and keep it within 5˚C of the targeted temperature for each experiment by adjusting the electrical output accordingly. The hotspot and thermal gradient of the furnace were mapped out using the same method as described in Tenner et al. (2007) at 2.0 GPa, with a 13mm PC assembly. In each of the four calibration experiments, there were two thermocouple measurements, with one always at the mid-point of the furnace (15mm from the bottom of the base plug), and the other placed at different locations (11.5, 12.5, 13.5, and 19mm). The hotspot was determined to be at 13.5 (±0.5) mm from the bottom of the base plug, and the temperature difference is less than 8˚C between this hotspot and 2 mm above and below it. For each PC experiment, the center of the capsule was placed 13.5 mm from the bottom of the base plug. The length of the capsule was around 4mm to minimize the temperature difference between the thermocouple and the capsule. The estimated uncertainty in temperature, when the effects of correcting for a thermal gradient are considered, is ± 6 °C (approximately twice that of the 1-bar experiments).

3.5.2. Construction and pre-saturation of AuPd capsules

$Au_{75}Pd_{25}$ capsules of 5mm diameter were used for all PC experiments. Trash-can-style welding with a PUK welder was used to construct the capsule lids. To minimize loss of Fe and Ni from the basalt melt to the capsule in the PC experiments, the capsules were first subjected to pre-saturation runs. Each capsule was welded on one end first, filled with the glass starting powder, and then the lid placed on top, but not welded. This capsule assembly was then heated in the 1-bar Deltech furnace at the targeted experimental temperature at an oxygen fugacity that is one log unit below the Ni-NiO buffer (to broadly match the fO_2 of the PC assembly). After this pre-saturation run, all sample material was removed from the capsule and lid through a soak in hydrofluoric acid at room temperature for 4-8 hours, followed by 10 minutes in an ultrasonic bath. After this pre-saturation procedure, the weight gain of the capsule was within 0.3% of its total weight. The pre-saturated capsules and lids were then used for the PC experiments.

For the anhydrous PC experiment, the pre-saturated capsule was loaded with chips of the glass starting material, and the top lid welded shut. The use of glass chips over powder was to reduce absorption of moisture from the air into the powder. For the hydrous PC experiments, deionized water was first added to the pre-saturated capsule with a micro-syringe, followed by the powdered glass starting material. The amount of water added was designed to achieve ~5 wt% H_2O in basalt melt. The capsules were weighed after each step of loading, as well as before and after the PC experiment. The loss of mass (mostly H_2O) during welding was within 0.3mg (<0.5 wt% error for the added H_2O). The weight of all water-bearing capsules was monitored before and after a 10-minute dwell in a drying oven at 120˚C, to test the final seal on the capsule.

3.5.3. Quench and preparation of samples for analyses

At the end of each PC experiment (duration ranging from 8 - 48 hours), isobaric quenching was achieved by shutting off the power supply while maintaining the pressure by a hydraulic oil pump. During the quench, the thermocouple recorded temperatures below 600˚C after 5 seconds, and below 300˚C after 10 seconds. After the quench, the capsule was retrieved and checked for any signs of melting or leaking by examination under a stereoscope. The quenched capsule was then soaked overnight in hydrofluoric acid to remove any pyrex powder around the capsule derived from the PC assemblage. The capsule was then weighed, to check for any change before and after the experiment. The entire capsule was then mounted in epoxy and polished until the experimental run product (quenched glass and olivine crystals) was exposed.

3.5.4. Temperature-path trajectories and tests of equilibrium

The same two trajectories used in the 1-bar experiments were also applied to the hydrous PC experiments (Table III-2). For the nominally anhydrous experiment, the glass starting material was taken up to the final temperature and held for 48 hours at 1180°C. For two of the five hydrous experiments, the glass was taken up to the final equilibration temperature (1125 and 1115 °C) and held for 12 hours, whereas for the other three hydrous experiments the glass samples were first taken above their liquidus (>1200 °C) and held for 1-4 hours, and then the temperature was rapidly dropped to the final equilibration temperature (1115 and 1090 °C) and held for 8-12 hours.

Similar to the case for the 1-bar experiments, tests of whether olivine-melt equilibrium was attained in the experiments were applied. However, the tests differ from those at 1-bar in a few key ways. First, because of the possible effect of dissolved water on $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol}/^{liq}$, these values cannot be used as a test of equilibrium through input into the Pu et al. (2017) thermometers. Second, because oxygen fugacity was not controlled or monitored in the PC experiments, calculations of $Fe^{2+\text{-}Mg}$ KD values are also not possible. This leaves two remaining tests: (1) homogeneity of olivine and glass analyses within analytical error, and (2) application of calculated D_{Ni} and D_{Mg} to melt fraction calculations (i.e., the amount of olivine that crystallized in the experimental charge; Eq 1) should give consistent results.

3.6 Results

3.6.1. Composition of starting glass material

Electron microprobe analyses of four glass chips synthesized at 1-bar in air confirms chemical homogeneity among all major elements, with no Fe or alkali loss (Table III-1). Back-scattered electron images confirm that the glass is free of crystals. Laser ablation ICP-MS analyses for 16 spots on four separate glass chips lead to an average (± 1σ) Ni content of 352 (± 11) ppm. The small standard deviation (3% relative) is less than the analytical error (5% relative), which indicates the Ni content is homogenous in the starting material glass.

3.6.2 1-bar experimental run products

3.6.2.1. Assessment of olivine and glass homogeneity

Four 1-bar experiments were conducted in this study; the run conditions are reported in Table III-2. The average glass and olivine compositions, together with 1σ standard deviations in the oxide analyses, are reported for each run in Table III-3. The first test of olivine-melt equilibrium is an assessment of homogeneity. For olivine, the compositional variation is small (0.1-0.3 mol% Fo). For the glass, the variation in wt% MgO (± 0.24 wt% absolute, on average) is larger than the analyzed variation in the starting glass material (Table III-1). This demonstrates real compositional variability within the glass, which is expected given the growth of olivine crystals. All microprobe analyses on olivine and glass in all ten experimental charges are reported in Table B2 and B3.

Table III-3 Olivine and melt compositions in all Ni partitioning experiments

Expt #	T (˚C)	phase	n	SiO_2	TiO_2	Al_2O_3	FeO^T	MnO	MgO	CaO
1-bar										
22	1225	gl	28	52.29	0.76	17.53	7.47	0.13	8.99	8.72
			±1σ	0.26	0.01	0.16	0.09	0.01	0.28	0.06
		oliv	6	41.25	-	0.09	10.98	0.17	46.7	0.22
			±1σ	0.22		0.02	0.20	0.03	0.38	0.03
20-1	1225	gl	24	52.02	0.76	17.48	7.55	0.13	9.29	8.74
			±1σ	0.21	0.01	0.19	0.04	0.02	0.13	0.06
		oliv	7	40.47	-	0.09	11.02	0.17	46.9	0.23
			±1σ	0.15		0.04	0.10	0.03	0.21	0.03
21	1200	gl	26	52.74	0.79	18.15	7.39	0.13	8.05	8.98
			±1σ	0.49	0.02	0.35	0.22	0.02	0.35	0.12
		oliv	10	40.81	-	0.08	11.91	0.18	46.37	0.21
			±1σ	0.36		0.02	0.23	0.02	0.40	0.02
21-1	1200	gl	31	52.36	0.78	18.02	7.34	0.13	7.99	8.91
			±1σ	0.36	0.01	0.24	0.10	0.01	0.20	0.08
		oliv	40	40.83	-	0.08	11.47	0.17	46.71	0.22
			±1σ	0.31		0.05	0.18	0.03	0.37	0.01

Expt #	Na_2O	K_2O	P_2O_5	NiO	Cr_2O_3	$Total^{\#}$	Ni* (n)	oliv Fo#	$Total^{\&}$
1-bar									
22	3.34	0.64	0.13	-	-	100.5	283 (11)	-	100.5
	0.08	0.03	0.05			0.48	26		
	-	-	-	0.52	0.06	99.4	-	88.3	
				0.09	0.01	0.34		0.25	
20-1	3.30	0.62	0.13	-	-	100.4	271 (15)	-	100.4
	0.09	0.04	0.03			0.36	15		
	-	-	-	0.45	0.06	98.9	-	88.4	
				0.05	0.00	0.32		0.10	
21	3.48	0.65	0.15	-	-	100.5	201 (16)	-	100.5
	0.14	0.04	0.04			0.49	12		
	-	-	-	0.43	0.06	99.6	-	87.4	
				0.06	0.02	0.58		0.26	
21-1	3.45	0.65	0.15	-	-	100.2	270 (24)	-	100.22

	0.08	0.03	0.04			0.36	28		
	-	-	-	0.47	0.05	99.5	-	87.9	
				0.04	0.01	0.49		0.22	

Expt #	T (˚C)	phase	n	SiO_2	TiO_2	Al_2O_3	FeO^T	MnO	MgO	CaO
anhydrous high pressure										
PC33	1180	gl	20	51.18	0.90	17.34	8.80	0.14	7.66	9.07
			±1σ	0.43	0.09	0.28	0.13	0.01	0.10	0.14
		oliv	36	40.51	-	0.08	13.06	0.19	44.69	0.23
			±1σ	0.16		0.03	0.33	0.03	0.41	0.02
hydrous										
PC10	1125	gl	10	52.35	0.78	17.89	7.39	0.16	7.86	9.13
			±1σ	0.15	0.01	0.86	0.05	0.03	0.26	0.09
		oliv	15	41.74	-	0.08	7.82	0.17	49.44	0.18
			±1σ	0.50		0.11	0.38	0.04	0.46	0.01
PC12	1115	gl	12	52.75	0.79	17.78	7.70	0.13	7.54	9.21
			±1σ	0.25	0.02	0.57	0.07	0.02	0.64	0.20
		oliv	5	41.32	-	0.09	8.85	0.17	48.18	0.19
			±1σ	0.34		0.08	0.19	0.01	0.18	0.02
PC13	1115	gl	40	52.75	0.77	17.61	7.74	0.14	7.66	8.87
			±1σ	0.22	0.02	0.36	0.11	0.03	0.35	0.11
		oliv	34	41.28	-	0.14	11.03	0.18	46.54	0.17
			±1σ	0.24		0.56	0.28	0.03	0.36	0.02
PC14	1115	gl	37	51.88	0.78	17.88	7.90	0.13	8.05	8.84
			±1σ	0.63	0.02	0.41	0.13	0.04	0.27	0.08
		oliv	28	41.06	-	0.05	10.58	0.17	47.54	0.16
			±1σ	0.40		0.01	0.28	0.03	0.52	0.01
PC17	1090	glass	29	52.66	0.76	17.77	7.60	0.13	8.24	8.65
			±1σ	0.25	0.01	0.19	0.06	0.02	0.30	0.12
		oliv	36	42.21	-	0.05	8.41	0.16	48.16	0.15
			±1σ	0.35		0.01	0.19	0.03	0.28	0.02

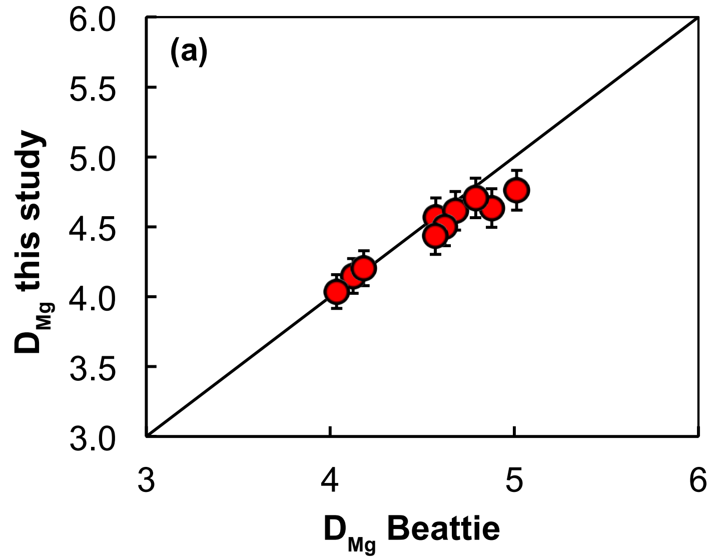
Expt #	Na_2O	K_2O	P_2O_5	NiO	Cr_2O_3	Total[#]	Ni* (n)	H_2O (FTIR)	oliv Fo#	Total[&]
anhydrous high pressure										
PC33	4.06	0.69	0.17	-	-	98.5	174 (16)	0.2	-	98.7
	0.08	0.05	0.04			0.43	14			
	-	-	-	0.33	0.03	99.4	-	-	85.9	
				0.05	0.01	0.47			0.37	

hydrous										
PC10	3.47	0.64	0.31	-	-	95.5	191 (15)	4.0	-	99.5
	0.07	0.02	0.03			0.95	19			
	-	-	-	0.54	0.04	100.01	-	-	91.9	
				0.05	0.10	0.59			0.42	
PC12	3.15	0.60	0.32	-	-	95.1	255 (14)	4.4	-	99.5
	0.35	0.02	0.03			0.58	23			
	-	-	-	0.64	0.03	99.46	-	-	90.7	
				0.02	0.02	0.49			0.20	
PC13	3.47	0.63	0.33	-	-	97.7	134 (15)	2.0	-	99.7
	0.09	0.02	0.03			0.50	7			
	-	-	-	0.38	0.02	99.73	-	-	88.3	
				0.02	0.01	0.30			0.30	
PC14	3.57	0.61	0.35	-	-	96.7	204 (15)	2.9	-	99.6
	0.11	0.02	0.03			0.50	22			
	-	-	-	0.59	0.04	100.18	-	-	88.9	
				0.06	0.02	0.69			0.33	
PC17	3.21	0.59	0.36	-	-	96.7	278 (14)	3.1	-	99.8
	0.10	0.02	0.02			0.50	24			
	-	-	-	0.71	0.05	99.9	-	-	91.1	
				0.05	0.03	0.45			0.19	

* in ppm; measured by laser ablation ICP-MS
# reported oxide content is after normalization to anhydrous 100%, reported total is the average of the analytical total
& sum of reported oxide total measured from EMPA + measured H_2O

3.6.2.2. Calculation of $D_{Mg}^{ol/liq}$ and tests of its accuracy

The variability in the analyzed glass composition contributes a ±3% relative uncertainty to $D_{Mg}^{ol/liq}$ in the 1-bar experiments. The accuracy of the average value for $D_{Mg}^{ol/liq}$ is evaluated through a comparison to values calculated with the Beattie (1993) model (Eq. 20 in Putirka, 2008), which depends only on melt composition. When the glass compositions in Table III-3 are input into the Beattie (1993) model, calculated values are in excellent agreement with the values of $D_{Mg}^{ol/liq}$ from the 1-bar experiments, with an average difference of 0.3% (Fig. III-2a).



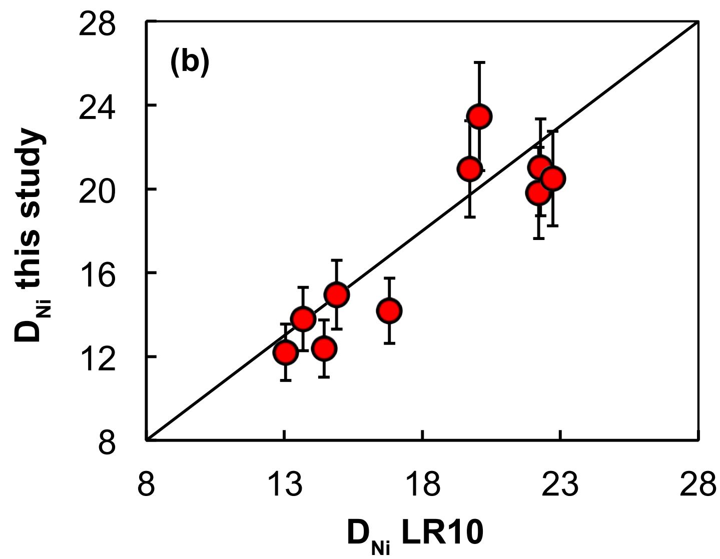


Figure III-2 olivine/melt partition coefficient of Mg and Ni calculated based on experimental compositions vs calculated with Li and Ripley (2010) and Beattie (1993) models with experimental temperature

-

3.6.2.3. Calculation of $D_{Ni}^{ol}/^{liq}$ and tests of its accuracy

A similar assessment of homogeneity with respect to Ni contents in olivine and glass can also be made (Table III-3). As seen for MgO, there is little variability in the NiO content that is outside analytical error, confirming that the olivine crystals grown in the experiments are homogenous. In the glass, the Ni concentrations in each run product vary by 5-10% relative, which is within two standard deviations of the ICP-MS analytical error. It is expected that at least some of this variability reflect real compositional gradients caused by crystal growth. The calculated uncertainties in the 1-bar experimental values of $D_{Ni}^{ol/liq}$ that arise from these analyzed variations are ~11% relative, on average. To evaluate the accuracy of the $D_{Ni}^{ol/liq}$ values in Table III-4 based on the average analyses of glass and olivine (Table III-3), comparisons are made to values calculated with the Li and Ripley (2010) model (±12% error), which is calibrated on 300 1-bar experiments. When the experimental glass compositions and temperatures for all 1-bar experiments in Table III-3 are input into this published model, the resulting Ni partition coefficients are in excellent agreement with those measured in this study, within error (Fig. III-2b).

3.6.2.4. Experimental temperatures vs. calculated temperatures from $D_{Ni}^{ol/liq}$ and $D_{Mg}^{ol/liq}$

A second test of olivine-melt equilibrium is obtained when the values of $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ for each experiment (Table III-4) are used to calculate temperature with the two olivine-melt thermometers calibrated by Pu et al. (2017). The calculated and experimental temperatures match within +6 to -27 degrees for the Ni-thermometer, and within +7 to +31 for the Mg-thermometer (Table III-4; Figure III-3). The 1σ uncertainty in the two thermometers are ± 29 and ± 26 °C, respectively, and the uncertainty in the experimental temperature is ± 3 °C, which indicates excellent overall agreement. The results are fully consistent with the 2σ uncertainty of the two thermometers, and therefore the hypothesis of olivine-melt equilibrium remains viable.

3.6.2.5. Comparison of melt fraction calculations from $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$

The third test of olivine-melt equilibrium is obtained when values of $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ are used to compare the calculated melt fractions in each experiment, and to evaluate if the results are consistent. The 1-bar melt fraction results calculated with $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ are consistent within ± 0.01 for each experiment (Table III-4). The calculated mass of olivine that crystallized in each experiment varies from 1-4%.

3.6.2.6. Calculation of ${}^{Fe2+\text{-}Mg}K_D$ (olivine-melt)

The fourth and final assessment of olivine-melt equilibrium is based on values of ${}^{Fe2+\text{-}Mg}K_D$ calculated for each of the four 1-bar experiments (Table III-4). For the experiment that followed the second trajectory path, which ensured no kinetic lag to olivine nucleation, ${}^{Fe2+\text{-}Mg}K_D$ is 0.34 and exactly matches the value recommended by Matzen et al. (2011). For the remaining three experiments that were first taken above the liquidus and then rapidly dropped down in temperature, their ${}^{Fe2+\text{-}Mg}K_D$.

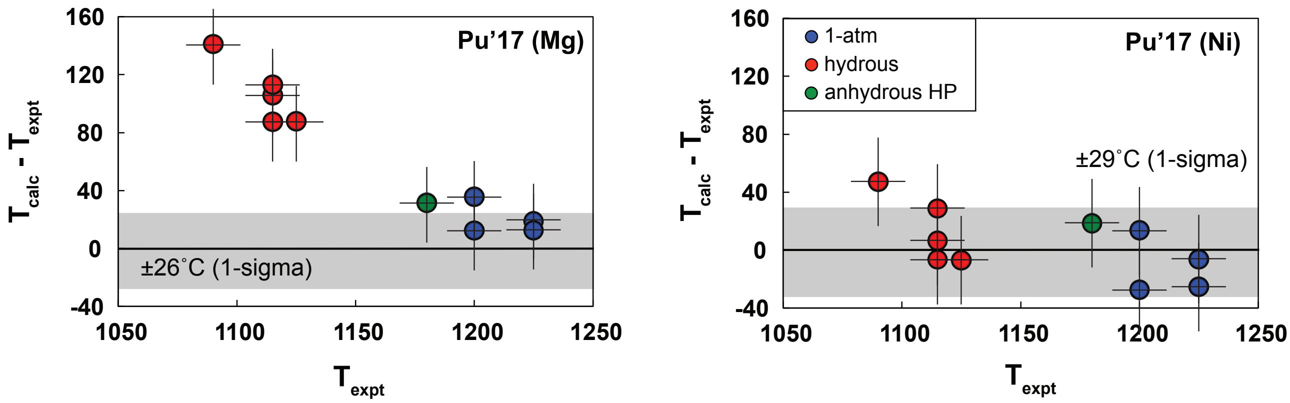


Figure III-3 Residual (=T_{calc} – T_{expt}) of Mg- and Ni- thermometers when applied to experiments in this study. The legend is shown in the upper right plot. The grey regions are the ±1 sigma based on the calibration of the two thermometers on a 1-atm experimental dataset in Pu et al. (2017)

Table III-4a Temperature results from Mg- and Ni- thermometers in Pu et al. (2017) applied to experiments in this study

Experiment #	T(˚C)	P (MPa)	H_2O (wt%) by FTIR	T_{Ni} (˚C)	T_{Ni} - T_{expt}(˚C)	T_{Mg} (˚C)*	T_{Mg^*} - T_{expt}(˚C)	ΔT = T_{Mg^*} - T_{Ni}
22	1225	0.1	-	1200	-25	1234	9	34
20-1	1225	0.1	-	1219	-6	1238	13	20
21	1200	0.1	-	1173	-27	1207	7	34
21-1	1200	0.1	-	1214	14	1231	31	18
PC33	1180	500	0.2	1191	11	1225	45	34
PC10	1125	500	4.0	1118	-7	1213	88	95
PC12	1115	500	4.4	1144	29	1203	88	59
PC13	1115	500	2.0	1121	6	1221	106	99
PC14	1115	500	2.9	1108	-7	1228	113	120
PC17	1090	500	3.1	1137	47	1231	141	94

*T_{Mg} is corrected for pressure (Herzberg and O'Hara, 2002)

values range from 0.35-0.37, which are systematically higher, but only by a small dropping it to a final experimental temperature introduces a significant problem in achieving olivine-melt equilibrium.amount that is fully within analytical error. Therefore, the hypothesis that olivine-melt equilibrium was achieved in all four experiments remains viable within experimental error. Importantly, there is no evidence that taking a sample above the liquidus and

Table III-4b Partition coefficient and melt fraction of experiments in this study

Expt #	D_{Ni} (mole%) this study	D_{Ni} (wt%) this study	D_{Ni}(wt%) with expt T LR10	% difference	D_{Mg} (mole %) this study	$D_{Mg\ (cat)}$ with expt T Beattie'93	% difference	F_{Ni}	F_{Mg}	oliv-liq Fe/Mg KD
22	11.52	14.4	12.38	14.0	4.12	4.42	-7.3	0.99	0.99	0.34
20-1	10.46	13.0	12.20	6.2	4.03	4.39	-8.9	0.99	0.99	0.36
21	10.88	16.8	13.79	17.9	4.18	4.80	-14.8	0.97	0.96	0.37
21-1	13.35	13.7	14.18	-3.5	4.57	4.87	-6.6	0.99	0.98	0.35
PC33	11.94	14.9	14.95	-0.3	4.68	5.18	-10.7	0.95	0.95	-
PC10	17.22	22.2	19.81	10.8	4.88	6.25	-28.1	0.98	0.96	-
PC12	15.34	19.7	20.95	-6.3	5.01	6.44	-28.5	0.99	0.95	-
PC13	17.18	22.3	21.02	5.7	4.79	6.50	-35.7	0.95	0.95	-
PC14	17.79	22.7	20.49	9.7	4.62	6.44	-39.4	0.98	0.96	-
PC17	15.70	20.1	23.46	-16.7	4.57	7.02	-53.6	0.99	0.97	-

3.6.2.7. Crystal textures: variations based on temperature-path trajectories

Although there are no major differences in the attainment of olivine-melt equilibrium on the basis of the temperature-path trajectories followed in the 1-bar experiments, there are notable difference in the size and textures of the olivine crystals that grew during the experiments. For the experiments that were first taken above their liquidus, removing any nuclei from the melt, and then rapidly dropped down to the final experimental temperature, the size and texture of the crystals are consistent with conditions of low nucleation rates and high crystal growth rates. In the BSE images of these experiments (Fig. III-4a-b), the crystals are large and sparse, and some display evidence of diffusion-limited rapid growth (Faura and Schiano, 2005; Ni et al., 2014).

3.7 PC experimental run products

3.7.1. Analyzed H_2O concentrations in quenched glasses

The H_2O concentrations in the quenched glasses from the high-pressure experiments, which were analyzed by FTIR spectroscopy, are tabulated in Table III-4. The results confirm that the glass in the nominally anhydrous PC experimental run product only contained 0.2 wt% H_2O. In contrast, the PC experiments designed to contain ~5 wt% H_2O, all have quenched glass with substantial concentrations of H_2O (2.0-4.4 wt%; average of 3.3 wt%). However, these water concentrations are lower than the amounts weighed into the capsules (designed to be ~5 wt%, well below the water solubility limit at 0.5 GPa), which indicates that water was lost during the experiments. This is not unexpected because the experiments were not buffered with respect to H_2O or fO_2, and therefore it is possible that there was progressive loss of H_2 through the metal capsule walls. It is also possible that H_2O was lost during quench, and therefore quantitative assessment of the exact concentration of H_2O dissolved in the melt during olivine-liquid equilibration is not possible. What is unequivocal, however, is that all five of these hydrous experiments were conducted with significant amounts of dissolved water in the melt (typically > 3 wt%) compared to its absence in the melts from the anhydrous high-pressure and 1-bar experiments.

3.7.2. Assessment of olivine and glass homogeneity

A total of six successful high-pressure experiments were obtained, of which five were conducted under hydrous conditions. The run conditions are reported in Table III-2, and the average glass and olivine compositions for each run are reported in Table III-3. All the microprobe analyses on olivine and glass in all 10 experimental charges are reported in Table B2 and B3. A similar assessment of olivine and glass homogeneity can be made for these high-pressure run products as those obtained at 1-bar. There is slightly more variability in the Mg-content in the olivine in the PC experiments, with variations in Fo contents of ± 0.2-0.4 (vs. 0.1-0.3 at 1-bar). For NiO concentrations in olivine, the analyzed variations are the same as those from the 1-bar experiments. For the glass, the average MgO concentration varies by ± 0.32 wt% in the PC run products, compared to ± 0.24 wt% in the 1-bar runs. For Ni contents, there is no difference in the variability in the PC glasses compared to the 1-bar glasses. Thus, the test of homogeneity is satisfied equally for the Ni contents in olivine and glass between the high-pressure and 1-bar experiments, and the variability for MgO is only slightly higher in olivine and glass for the high-pressure experiments. Therefore, the hypothesis that olivine-melt equilibrium was closely approached in these high-pressure PC experiments is supported.

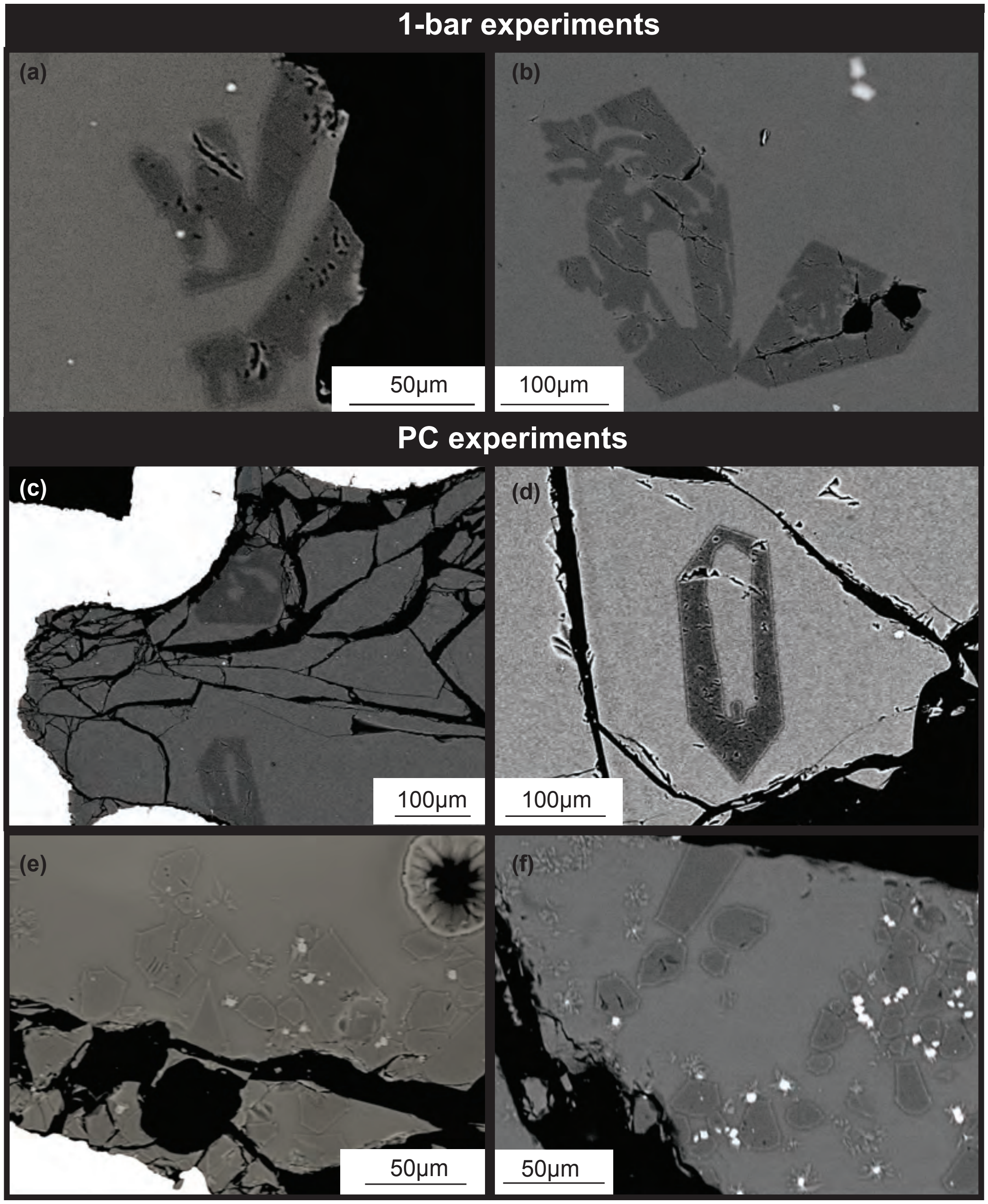


Figure III-4 olivine crystal textures in experiments of two different trajectories. a is from 21, b is from 21-1, c is from PC13; d is from PC14; e is from PC10; f is from PC12.

3.7.3. Comparison of melt fraction calculations from $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$

The second test of olivine-melt equilibrium is obtained when values of $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ are used to compare the calculated melt fractions in each experiment (using Eq. 1), and to evaluate if the results are consistent. The high-pressure melt fraction results calculated with $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ are within 0.00-0.04 of each other, with an average deviation of 0.02. Although these differences are higher than those calculated at 1-bar (±0.01), they are still small. The calculated mass of olivine that crystallized in each experiment varies from 1-5%.

3.7.4. $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ from PC experiments and comparison to 1-bar calculated values

The measured $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ values from the high-pressure PC experiments are compared to those calculated with the 1-bar models of Beattie (1993) and Li and Ripley (2010), respectively. Any systematic differences between measured and calculated values may be due to the effects of pressure and/or dissolved water in the melt. The results are tabulated in Table III-4 and plotted in Figure 2. The measured $D_{Mg}^{ol/liq}$ are systematically higher, especially for the five hydrous runs, than those calculated by the 1-bar, anhydrous model of Beattie (1993). In contrast, there is no systematic difference in $D_{Ni}^{ol}/^{liq}$ between the measured values from the high-pressure PC experiments and the calculated values from the 1-bar Li and Ripley (2010) model. Any differences are within error and are similar in magnitude to those seen among the 1-bar dataset (Fig. III-2a).

3.7.5. Calculated 1-bar temperatures from $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ of PC experiments

For comparative purposes, the measured $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ values from the high-pressure PC experiments are used to calculate temperature with the Mg- and Ni-thermometers of Pu et al. (2017); the results are tabulated in Table III-4 and plotted in Figure III-3. The calculated temperatures based on the Mg-thermometer are systematically higher than the experimental temperatures by 62-115 degrees for the hydrous experiments and by 19 degrees for the anhydrous experiment. In contrast, the calculated temperatures based on the Ni-thermometer differ from the experimental temperatures by -7 to +47, with an average deviation of only 13 °C.

3.7.6. Textures of crystals in quenched run products from hydrous PC experiments

The textures of crystals that grew in the hydrous PC experiments vary according to the temperature-path trajectory of the starting glass material. As seen with the 1-bar experimental run products, those PC experiments (e.g., PC-13 and -14; Table III-2) that were taken above the liquidus and rapidly dropped to a final equilibration temperature had run products characterized by large, sparse olivine crystals with large pools of glass nearby (Fig. III-4c-d). In contrast, those PC experiments that were taken up to the final liquidus temperature, and never exceeded their liquidus (e.g., PC10; Table III-2), had run products that featured quench crystals (≤ 3 micron olivines with snowflake shape; Fig. III-4e-f). Fortunately, these quench crystals do not appear to have affected the glass compositions. For example, the application of the Ni-thermometer to all three of these hydrous PC samples (-10, -13, 14) lead to calculated temperatures that match the experimental temperatures within -7, +6 and -7 °C, respectively.

3.8 Discussion

The olivine-melt equilibrium experiments on the basalt glass starting material in this study gives results for $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ under 1-bar anhydrous conditions that are fully consistent with existing models in the literature. Moreover, measured values of $D_{Mg}^{ol/liq}$ and $D_{Ni}^{ol/liq}$ in the four 1-bar experiments (Table III-4) lead to calculated temperatures, based on the Mg- and Ni-thermometers of Pu et al. (2017), that match experimental temperatures (Figure III-3). This confirms that application of these two olivine-melt thermometers gives accurate olivine crystallization temperatures under anhydrous conditions at 1 bar for basalts with a composition typical of volcanic arcs. However, arc basalts do not crystallize olivine at surface conditions, but at depth and under hydrous conditions.

3.8.1 The effect of pressure

The olivine-melt equilibration experiment conducted at 500 MPa under anhydrous conditions shows that temperatures calculated with the 1-bar Mg- and Ni-thermometers of Pu et al. (2017) match experimental temperatures within 19 and 11 °C, respectively, which is well within experimental and model uncertainties. Nonetheless, the need for a pressure correction to the 1-bar Mg-thermometer has been demonstrated in the literature, and the model of Herzberg and O'Hara (2002) gives a correction of +26 °C to the calculated temperature for the anhydrous PC experiment performed at 0.5 GPa (Table III-4). The pressure-corrected temperature from the Mg-thermometer deviates from the anhydrous PC experimental temperature by 45 degrees, which is outside the 1σ uncertainty of the calibrated Mg-based thermometer (± 26 °C), but within its 2σ uncertainty. Thus, at the 95% confidence level (± 52 °C), there is no discrepancy.

In contrast to the case for $D_{Mg}^{ol/liq}$, there is no need for a pressure correction to $D_{Ni}^{ol/liq}$ under crustal conditions (<1 GPa), as discussed in Pu et al. (2017) on the basis of the experimental results of Matzen et al. (2013). Therefore, for the experiments in this study at 0.5 GPa, no pressure correction to temperatures calculated with the Ni-thermometer is required. This conclusion is verified by the small difference (11 °C; Table III-4) between the experimental temperature of the anhydrous PC experiment and that calculated with the 1-bar Ni-thermometer of Pu et al (2017)

3.8.2. The effect of dissolved water in the melt

For the five hydrous olivine-melt experiments conducted at 500 MPa, it is necessary to isolate the effect of dissolved water from the effect of pressure. Therefore, a pressure correction of +26 degrees is applied to all calculated temperatures from the Mg-thermometer of Pu et al. (2017). This leads to differences between the hydrous PC experimental temperatures and those calculated with the pressure-corrected Mg-thermometer ($\Delta T = T_{Mg} - T_{exp}$) of +88 to +141 degrees (Table III-4; Fig. III-3). This is a substantial temperature difference that exceeds analytical and model uncertainties. These results clearly reflect what has long been established in the literature, namely that olivine-melt thermometers based on Mg-partitioning are strongly dependent on dissolved water concentrations in the melt (e.g., Putrika et al., 2007). The FTIR results (Table III-2) demonstrate that the hydrous PC experiments contained melt with water contents that ranged from at least 2-4.4 wt% during olivine-melt equilibration. The effect of dissolved hydroxyl groups is to preferentially complex with Mg^{2+} in the melt, which causes the activity of MgO to decrease in hydrous melts (e.g., Waters and Lange, 2017).

In contrast to the strong dependence of $D_{Mg}^{ol/liq}$ on dissolved water in the melt, a comparison of hydrous PC experimental temperatures to those calculated with the 1-bar Ni-thermometer of Pu et al. (2017) range from -7 to +47 (Table III-4; Fig. III-3). The average deviation of 14 °C is well within analytical and model uncertainties. These results clearly support the hypothesis that dissolved water in the melt has little effect on partitioning of Ni^{2+} between olivine and melt at pressures ≤ 0.5 GPa (and perhaps <1 GPa). It is the lack of any dependence of $D_{Ni}^{ol/liq}$ on dissolved water that allows the Ni-thermometer of Pu et al. (2017) to be applied to hydrous arc basalts without requiring *a priori* information on concentrations of water in the melt during olivine crystallization.

3.8.3. Possible cause for negligible dependence of $D_{Ni}^{ol/liq}$ on dissolved water in the melt

Pu et al. (2017) proposed that the reason why Ni^{2+} is less sensitive than Mg^{2+} to dissolved water in the melt is due to the same underlying cause for why $D_{Ni}^{ol/liq}$ does not require a pressure correction at crustal conditions, but does at greater depth (> 1 GPa). It is well established in the spectroscopic literature that the average coordination of Mg^{2+}, an alkaline earth metal, in model basalt liquids is close to six-fold with oxygen (e.g., George and Stebbins, 1998). In contrast, transition metals like Ni^{2+} and Fe^{2+}, despite having the same valence and similar ionic radii as Mg^{2+}, have a systematically lower coordination number (between 4- and 5-fold) with oxygen in model basalt melts (Galoisy and Calas, 1993). Pu et al. (2017) proposed that when transition metals are 4- and 5-fold coordinated, there is limited speciation with hydroxyl groups in the melt. This hypothesis has also been advanced in Waters and Lange (2017) to explain the relative reduction in the activity of Mg^{2+} relative to Fe^{2+} in hydrous rhyolite melts. In that study, it was shown that increased concentrations of dissolved water in rhyolite melts causes the ${}^{Fe2+\text{-}Mg}K_D$ between orthopyroxene and melt to increase systematically. Similarly, Pu et al. (2017) point to the fact that it is not until the effect of increasing pressure causes Ni^{2+} in basaltic melts to develop six-fold oxygen coordination, which occurs > 1 GPa (e.g., Jones et al., 2011), that $D_{Ni}^{ol/liq}$ develops a sensitivity to pressure. This pressure sensitivity to $D_{Ni}^{ol/liq}$ between 2.0-3.5 GPa was demonstrated in the experiments of Matzen et al. (2013). The prediction of Pu et al. (2017) that $D_{Ni}^{ol/liq}$ will develop a sensitivity to dissolved water over this same pressure interval, owing to the presence of six-fold coordinated Ni^{2+}, is a testable hypothesis.

3.9 Conclusions

Olivine-melt equilibrium experiments in this study show that $D_{Ni}^{ol/liq}$ has no resolvable dependence on dissolved water contents (up to at least 4.4 wt%) in the basaltic melt. Over the same melt H_2O concentrations, $D_{Mg}^{ol/liq}$ displays a strong dependence on water content, which is a fully consistent with what has previously been reported in the literature (e.g., Putirka et al., 2007). The results from this study further show that the olivine-melt thermometer of Pu et al. (2017) based on $D_{Ni}^{ol/liq}$, which was calibrated under 1-bar, anhydrous conditions, recovers all hydrous, high-pressure (0.5 GPa) experimental temperatures when applied to the olivine and glass compositions in the quenched run products. This result shows that the Ni-thermometer in Pu et al (2017) can be applied to hydrous arc basalts to obtain the crystallization temperature of olivine under crustal conditions (< 1GPa). The negligible dependence of the Ni-based olivine-melt thermometer to pressure and dissolved water in the melt is not expected to extend to pressures > 1 GPa.

3.10 References

Almeev, R.A., Holtz, F., Koepke, J., Parat, F., Botcharnikov, R.E. (2007) The effect of H_2O on olivine crystallization in MORB: experimental calibration at 200 MPa. American Mineralogist, 92, 670-674.

Beattie, P. (1993) Olivine-melt and orthopyroxene-melt equilibria. Contributions to Mineralogy and Petrology, 115, 103-111.

Dixon, J.E., Stolper, E.M., and Holloway, J.R. (1995) An Experimental Study of Water and Carbon Dioxide Solubilities in Mid-Ocean Ridge Basaltic Liquids. Part I: Calibration and Solubility Models. Journal of Petrology, 36, 1607–1631.

Faure, F., and Schiano, P. (2005) Experimental investigation of equilibration conditions during forsterite growth and melt inclusion formation. Earth and Planetary Science Letters, 236, 882–898.

Frost, B.R. (1990) Introduction to oxygen fugacity and its petrologic importance. Reviews in Mineralogy and Geochemistry, 25, 1–9.

Galoisy, L., and Calas G. (1993) Structural environment of nickel in silicate glass/melt system: Part 1. Spectroscopic determination of coordination states. Geochimica et Cosmochimica Acta, 57, 3613-3626.

George, A.M., and Stebbins, J.F. (1998) Structure and dynamics of magnesium in silicate melts: A high-temperature ^{25}Mg NMR study. American Mineralogist, 83, 1022-1029.

Herzberg, C., and O'Hara, M.J. (2002) Plume-associated ultramafic magmas off Phanerozoic age. Journal of Petrology, 43, 1857-1883.

Hui, H., and Zhang, Y. (2007) Toward a general viscosity equation for natural anhydrous and hydrous silicate melts. Geochimica et Cosmochimica Acta, 71, 403–416.

Jayasuriya, K. D., O'Neill, H. St. C., Berry, A. J., Campbell, S. J. (2004) A Mössbauer study of the oxidation state of Fe in silicate melts. American Mineralogist, 89, 1597-1609.

Lange, R. A. Temperature independent thermal expansitivities of sodium aluminosilicate melts between 713 and 1835 K: Erratum to R. A. Lange (1996) Geochimica et Cosmochimica Acta 60, 4989–4996 (1997) Temperature independent thermal expansitivities of sodium aluminosilicate melts between 713 and 1835 K: Erratum to R. A. Lange (1996) Geochimica et Cosmochimica Acta 60, 4989–4996, 61, 3275–3276.

Lange, R. A. and Carmichael, I. S. E. (1990) Thermodynamic properties of silicate liquids with an emphasis on density, thermal expansion and compressibility. Reviews of Mineralogy, 24 25-64.

Li, C., and Ripley, E.M. (2010) The relative effects of composition and temperature on olivine-liquid Ni partitioning: statistical deconvolution and implications for petrologic modeling. Chemical Geology, 275, 99–104.

Lofgren, G. (1974) An experimental study of plagioclase crystal morphology: isothermal crystallization. American Journal of Science, 274, 243-273.

Matzen, A. K., Baker, M. B., Beckett, J. R., Stolper, E. M. (2011) Fe-Mg partitioning between olivine and high-magnesian melts and the nature of Hawaiian parental liquids. Journal of Petrology, 52,1243-1263.

Matzen, A.K., Baker, M.B., Beckett, J.R., Stolper, E.M. (2013) The temperature and pressure dependence of nickel partitioning between olivine and silicate melt. Journal of Petrology, 54, 2521-2545.

Médard, E., and Grove, T.L. (2008) The effect of H_2O on the olivine liquidus of basaltic melts: experiments and thermodynamic models. Contributions to Mineralogy and Petrology, 155, 417-432.

Moore, G., and Carmichael, I.S.E. (1998) The hydrous phase equilibria (to 3 kbar) of an andesite and basaltic andesite from western Mexico: constraints on water content and conditions of phenocryst growth. Contributions to Mineralogy and Petrology, 130:304-319.

Ni, H., Keppler, H., Walte, N., Schiavi, F., Chen, Y., Masotta, M., and Li, Z. (2014) In situ observation of crystal growth in a basalt melt and the development of crystal size distribution in igneous rocks. Contributions to Mineralogy and Petrology, 167, 243–13.

Ochs, F.A., III, and Lange, R.A. (1999) The Density of Hydrous Magmatic Liquids. Science, 283, 1314–1317.

O'Neill, H.St.C., and Pownceby, M.I. (2016) Thermodynamic data from redox reactions at high temperatures. I. An experimental and theoretical assessment of the electrochemical method using stabilized zirconia electrolytes, with revised values for the Fe - FeO, Co- CoO, Ni - NiO and Cu-Cu2O oxygen buffers, and new data for the W-WO2. Contributions to Mineralogy and Petrology, 114, 296–314.

Ownby, S.E., Lange, R.A., Hall, C.M., Delgado-Granados, H. (2011) Origin of andesite in the deep crust and eruption rates in the Tancítaro-Nueva Italia region of the central Mexican arc. Geological Society of America Bulletin, 123, 274-294.

Pearce, N.J.G., Perkins, W.T., Westgate, J.A., Gorton, M.P., Jackson, S.E., Neal, C.R., and Chenery, S.P. (1997) A compliation of new and published major and trace elmeent data for NIST SRM 610 and NIST SRM 612 glass reference materials. Geostandards Newsletter, 21, 115–144.

Pu, X., Lange, R.A., and Moore, G. (2017) A comparison of olivine-melt thermometers based on DMgand DNi: The effects of melt composition, temperature, and pressure with applications to MORBs and hydrous arc basalts. American Mineralogist, 102, 750–765.

Putirka, K.D., Perfit, M., Ryerson, F.J., Jackson, M.G. (2007) Ambient and excess mantle temperatures, olivine thermometry, and active vs. passive upwelling. Chemical Geology, 241, 177-206.

Putirka, K.D. (2008) Thermometers and barometers for volcanic systems. Reviews in Mineralogy and Geochemistry, 69, 61-120.

Tenner, T.J., Lange, R.A., and Downs, R.T. (2007) The albite fusion curve re-examined: New experiments and the high-pressure density and compressibility of high albite and NaAlSi3O8 liquid. American Mineralogist, 92, 1573–1585.

Waters, L.E., and Lange, R.A. (2017) An experimental study of between orthopyroxene and rhyolite: a strong dependence on H2O in the melt. Contributions to Mineralogy and Petrology, 172, 1–13.

Zhang, Y., Belcher, R., Ihinger, P.D., Wang, L., Xu, Z., and Newman, S. (1997) New calibration of infrared measurement of dissolved water in rhyolite glass. Geochimica et Cosmochimica Acta, 61, 3089–3100.

Chapter IV

The origin of Colima Cone minettes and absarokites, Western Mexico: new temperature and pressure constraints

4.1 Abstract

A suite of mantle-derived (≤ 15 wt% MgO) K-rich melts, with an enhanced arc geochemical signature, erupted from the Colima rift in western Mexico, and have compositions that are distinctly different from the calc-alkaline basalts erupted to the east along the Mexican volcanic arc. The Colima rift overlies a tear between the subducting Rivera and Cocos plates beneath North America, which raises questions about the mantle origin of these distinctive melts. In this study, a new olivine-melt thermometer based on the partitioning of Ni, which is independent of the effect of dissolved water is applied to these nine K-rich Colima melts to determine the temperature at the onset of olivine growth (1060-1223°C) during their rapid ascent to the surface. Several lines of evidence demonstrate that the most Mg-rich olivine in each sample closely approximates the liquidus olivine and that the whole-rock composition represents the initial liquid composition. Depths of melt segregation from the mantle (~80 km) are tightly constrained from a comparison to experimental partial melts of phlogopite-bearing lherzolite. These depths permit temperature corrections for adiabatic ascent during transit to the surface, allow temperatures at

the time of melt segregation to be constrained (~1120-1285 °C). The combined P-T conditions of melt segregation for the K-rich Colima melts are compared to those for the calc-alkaline basalts erupted to the east, along the volcanic front associated with subduction of the Cocos plate. The comparison demonstrates that the K-rich Colima melts segregated beneath a much thicker lithosphere, and it is proposed that they were formed beneath the Jalisco block of western Mexico. It is proposed that the suture between the older (Cretaceous) Jalisco block to the west, and the younger (Oligocene) lithosphere to the east, has a NE-SW orientation that is located beneath the N-S Colima rift, and that the different thickness of these two lithosphere blocks is the cause for the different dips in the Rivera and Cocos plates and the location of their tear.

4.2 Introduction

The tectonic setting of western Mexico is unique owing to the close interaction of a mid-ocean spreading ridge with an active subduction zone. This has led to fragmentation of the subducting lithosphere into the Rivera and Cocos microplates, as well as the development of extensional rifts and atypical volcanism in the overriding North American plate (Fig. IV-1). The most prominent extensional features in the upper plate are three intersecting rifts: (1) the N-S trending Colima rift, (2) the N-W trending Tepic-Zacoalco rift, and (3) the E-W trending Chapala rift, all of which intersect the volcanic arc in western Mexico (Fig. IV-1).

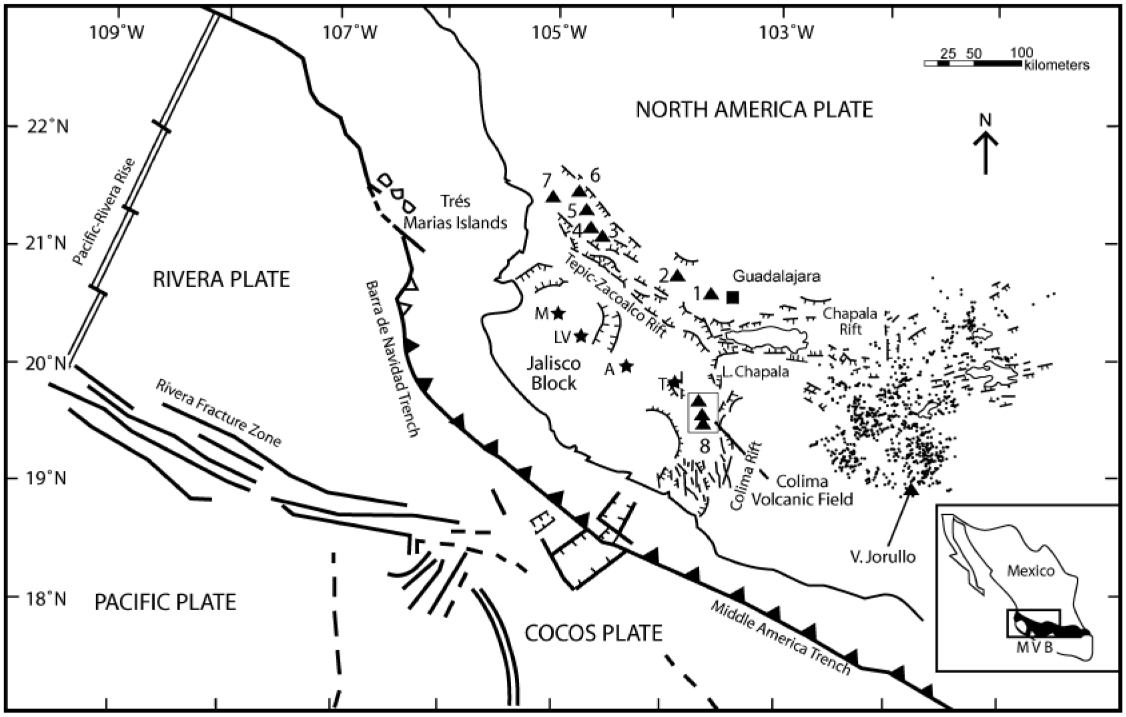


Figure IV-1 General tectonic and geological map of Western Mexico from Carmichael et al. (2006).

Within the Colima rift, which overlies the tear between the subducting Rivera and Cocos plates beneath North America (Fig. IV-1), is a group of eleven Pleistocene scoria and lava cones along the northern margin of the large andesitic Colima-Nevado volcanic complex (Fig 2). Nine of the scoria cones erupted an unusual suite of mantle-derived (≤ 15 wt% MgO) K-rich basanites and minettes, whereas the other two erupted calc-alkaline basalt and basaltic andesite (Luhr and Carmichael, 1981). The Colima cones have compositions that contrast with calc-alkaline basalts that are common to volcanic arcs. Instead, the K-rich Colima lavas are most similar to the absarokite and minette magmas erupted in the Jalisco block, west of the Colima rift (Fig. IV-1; e.g., Carmichael et al., 1996).

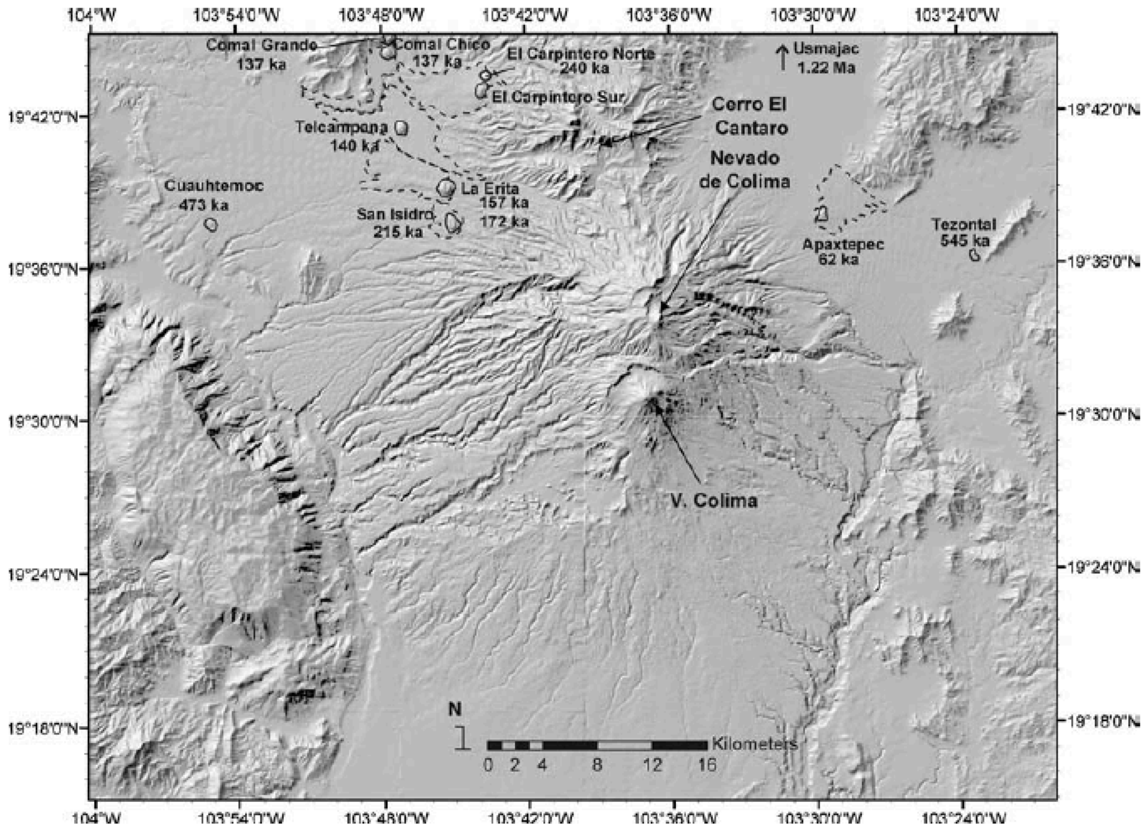


Figure IV-2 Shaded hillside digital elevation map of the Colima Volcanic Field (Carmichael et al., 2006). Cinder cones are outlined by dark black lines, whereas lava flows are marked by dashed lines.

The unusual compositions and tectonic setting of the Colima cones raise questions about their origin. Analyses of their olivine-hosted melt inclusions show that they contained at least as much water, if not more (≤ 6.7 wt% H_2O; Vigouroux et al., 2008; Maria and Luhr, 2008) than calc-alkaline basalts (≤ 5.7 wt% H_2O; Johnson et al., 2009) erupted east of the Colima rift, along the volcanic front of the Michoacan-Guanajuato volcanic field (MGVF) in association with subduction of the Cocos plate (Fig. IV-1). The hydrous character of both these magmas points to direct involvement of slab-derived fluids. For the MGVF calc-alkaline basalts, an origin by H_2O-flux melting of the asthenospheric mantle wedge has been demonstrated (e.g., Johnson et al., 2009). For the K-rich Colima cones, however, their mantle origin remains an open question.

Two primary questions addressed in this study are: (1) what were the mantle conditions (i.e., temperatures and pressures) during melt segregation of K-rich Colima melts, and (2) did they originate from the asthenosphere (Luhr, 1997; Vigoreaux et al., 2008) or lithosphere (e.g., Ownby et al., 2008). Given the location of the Colima rift above the tear in the Rivera and Cocos plates, there is a possible role for upwelling asthenosphere and thermal erosion (i.e., heating) of lithosphere. A related question is how does the mantle origin of the K-rich Colima melts compare to that for the calc-alkaline basalts erupted from the MGVF?

In this study, a new olivine-melt thermometer based on the partitioning of Ni ($D_{Ni}^{ol/liq}$), which is independent of the effects of dissolved water (Pu et al., 2017, 2018), is applied to the K-rich Colima melts. Vigoreux et al. (2008) present evidence that the olivine phenocrysts in these melts grew over a range of depths during fluid-saturated ascent, with crystallization driven by degassing. Application of olivine-melt thermometry to the most Fo-rich olivine in each sample provides the temperature at the onset of olivine growth (Pu et al., 2017). Results obtained in this study on the K-rich Colima melts can be compared to those obtained on several calc-alkaline basalts from the MGVF (Pu et al., 2017) to evaluate if there are systematic differences. In addition, the distinctly different compositions of the two suites of magmas, in comparison with partial-melting experiments of lherzolite from the literature, allow constraints on the depths of melt segregation from their respective mantle sources. The results are used to identify whether the K-rich Colima cones were generating in the asthenosphere or lithosphere, and what role their unique tectonic setting played in their formation and successful eruption at Earth's surface.

4.3 Tectonic Setting

The Rivera and Cocos microplates are actively subducting beneath western Mexico along the Middle America trench. Seismic tomography shows that these two plates may be contiguous at depths shallower than 100 km, but are separated by ~150 km, with a gap that increases with depth (Yang et al., 2009). The tear between the Rivera and Cocos plates is located directly beneath the northern Colima rift (Fig. IV-1), which may permit warm asthenospheric mantle to rise to shallower depths and thermally erode the overlying lithosphere. Thus the gap between the Rivera and Cocos microplates appears to control the location of the Colima rift, which has undergone significant extension (> 1.5 km of vertical offset) over the last 5 Myrs (Allan, 1986).

The N-S Colima rift is part of a triple-rift system that also includes the E-W Chapala rift and the NW-SE Tepic-Zacoalco rift (TZR). The Colima and Tepic-Zacoalco rifts, together with the Middle America trench define the boundaries of the Jalisco block, which may be moving southwestwards relative to the North America plate (Rosas-Elguera et al., 1996; Ferrair and Rosas-Elguera, 2000). The Rivera plate is actively subducting beneath the Jalisco block at a dip of 60-65° below 100 km, but it cannot be traced deeper than 350 km (Yang et al., 2009). It is possible that the Rivera plate tore at depth ~5-10 Ma, as postulated by DeMets and Traylen (2000), leading to slab rollback and subsequent steeping of its dip.

Within the Jalisco block is a series of small volcanic fields between the towns of Mascota and Talpapa, which are notable for their K-rich mantle-derived lavas (Wallace and Carmichael, 1989; Lange and Carmichael, 1991; Carmichael et al., 1996; Righter and Rosas-Elguera, 2001). Collectively, they define the Central Jalisco volcanic lineament (CJVL) with a clear northwest migration in the timing of the volcanism (Bandy et al., 2001; Ownby et al., 2008). The Cretaceous basement of the Jalisco block differs from the North American plate immediately to the north and to the east. The Jalisco block was unaffected by extensive Eocene-Miocene (40-18 Ma) volcanism that marks the Sierra Madre Occidental province to the north and its extension to the southeast (Frey et al., 2007; Aranda-Gomez and McDowell, 1998).

On the east side of the Colima rift is the Michoacán-Guanajuato volcanic field (MGVF), associated with subduction of the Cocos plate (Fig. IV-1). The MGVF covers an area of ~40,000 km^2, corresponding to ~200 km of arc length. Seismic constraints show that the dip of the Cocos plate below 100 km depth is ~55° near the Colima rift, but gradually shallows to the southwest (Yang et al., 2009; Pardo and Suarez, 1995). The Cocos plate is located ~140 km beneath the volcanic front (~200 km inland from the Middle America Trench) in the region of the Tancítaro-Nueva Italia volcanic field, which comprises the southwest corner of the MGVF (Ownby et al., 2011). Basement rocks in the MGVF include plutonic and volcanic rocks of Oligocene age (Aranda-Gomez and McDowell, 1998; McBirney et al., 1987; McDowell and Clabaugh, 1979).

4.4 Previous Petrological Studies

The Colima cones were first mapped and described in Luhr and Carmichael (1981). They report concentrations of major and trace elements in whole-rock samples, as well as microprobe analyses of representative phenocryst and groundmass phases. All nine K-rich cones erupted olivine-bearing lavas with minor augite; three of these cones erupted lavas that contain phlogopite, leading to their classification as minettes. Luhr and Carmichael (1981) named the phlogopite-free samples basanites, based on the occurrence of normative nepheline, although they note the absence of modal nepheline.

Carmichael et al. (2006) re-sampled the 11 Colima cones and report whole-rock major-element analyses, as well as $^{40}Ar/^{39}Ar$ ages and erupted volumes (Table C1). The two oldest cones are calc-alkaline (0.5 and 1.2 Ma; < 0.006 km^3), whereas the remaining nine K-rich cones and lavas (~1.2 km^3) are younger (450 and 60 ka). On the basis of whole-rock Fe^{3+}/Fe^T analyses, these authors inferred that the K-rich Colima cones had oxygen fugacities up to 2-4 log units higher than the Ni-NiO buffer.

Maria and Luhr (2008) and Vigouroux et al. (2008) report volatile analyses in olivine-hosted melt inclusions for several of the K-rich Colima cones. The highest volatile contents are found in a minette sample from La Erita cone (6.7 wt% H_2O; 1460 ppm CO_2; Maria and Luhr, 2008) and a basanite sample from Apaxtepec cone

(6.2 wt% H_2O, 5300 ppm CO_2; Vigouroux et al., 2008), corresponding to entrapment pressures of ≤ 750 MPa. In addition, sulfur contents as high as 7850 ppm (Maria and Luhr, 2008) and 6700 ppm (Vigouroux et al., 2008) were measured in melt inclusions in La Erita samples. Both studies used the Sugawara (2000) thermometer, based on $D_{Mg}^{ol/liq}$, to estimate entrapment temperatures for olivine-hosted melt inclusions, which requires a correction for dissolved water contents. With analyzed H_2O analyses in hand, Vigoroux et al. (2008) report temperatures of 1228-1150°C, whereas Maria and Luhr report temperatures of 1180-1059 °C. In addition to volatile contents and temperatures, Vigouroux et al. (2008) applied the spinel-olivine oxybarometer of Ballhaus et al. (1991) to estimate fO_2 values 1-2 log units above the Ni-NiO buffer (ΔNNO ≤ +2).

A reconnaissance of the basaltic cinder cones erupted across the volcanic front of the Michoacan-Guanajuato volcanic field (MGVF) was presented in Hasenaka and Carmichael (1985). A detailed petrological study of lavas from Volcán Jorullo, which erupted historically (1759-1774), and from an adjacent cone (La Pilita) was presented in Luhr and Carmichael (1985). La Pilita is notable for erupting trachybasalt with hornblende phenocrysts, and both cones are located along the volcanic front of the MGVF (Fig. IV-1). Johnson et al. (2008, 2009) report volatile analyses (≤ 5.7 wt% H_2O, ≤ 1150 ppm CO_2, ≤ 2110 ppm S) in various olivine-hosted melt inclusions for several samples across the MGVF; the sample with the highest H_2O content is from V. Jorullo. Ownby et al. (2011) report $^{40}Ar/^{39}Ar$ ages and estimates of erupted volumes across the southwest corner of the MGVF, an area of ~4400 km^2 along the volcanic front called the Tancitaro-Nueva-Italia volcanic field. Pu et al. (2017) analyzed olivine phenocrysts and applied olivine-melt thermometry to 16 samples from the Ownby et al. (2011) study and two samples (V. Jorullo and La Pilita) from the Luhr and Carmichael (1985) study. For the 11 samples that contain 7.0-9.4 wt% MgO, temperatures at the onset of olivine crystallization range from 1047-1177°C (Pu et al., 2017).

4.5 Whole-Rock Geochemistry

4.5.1 Methods

The samples used in this study are those from Carmichael et al. (2006). They report major element concentrations obtained by X-ray fluorescence spectrometry at the University of California, Berkeley (Table C1). In this study, the samples were re-crushed and re-powdered using a steel jaw crusher and a tungsten carbide shatter box, and then re-analyzed at Activation Laboratories of Ancaster, Ontario, Canada, for major and trace elements by inductively coupled plasma-mass spectrometry (ICP-MS).

The new major- and trace-element compositions are reported in Tables 1 and 2, respectively. For the major elements, the results from XRF and ICP-MS are broadly consistent, whereas for several trace elements there are differences that likely reflect real variations in the compositions of erupted lavas from each cone (documented in Luhr and Carmichael, 1981). Therefore, the whole-rock analyses used in this study are those obtained on the same rock pieces from which the thin sections were cut for microprobe analyses.

Table IV-1 Whole rock major element concentrations for the Colima Cone samples measured in this study

sample name	1001 B	1003 B	1005 A	1006 B	1007 A	1007 B	1008 B	1013	1015	1016
Whole Rock Major Element Composition wt%										
SiO_2 (wt%)	50.2	48.22	48.15	48.99	48.28	49.24	50.12	48.47	48.78	48.76
TiO_2 (wt%)	1.731	1.117	1.039	1.374	1.636	1.631	1.357	1.549	1.299	1.114
Al_2O_3 (wt%)	16.2	11.42	12.24	12.13	11.26	11.52	14.35	11.04	11.13	14.45
FeO^T (wt%)	9.58	7.19	7.26	7.59	6.99	7.00	8.08	7.54	7.43	8.19
MnO (wt%)	0.156	0.127	0.133	0.133	0.12	0.122	0.147	0.128	0.132	0.146
MgO (wt%)	6.16	12.86	13	11.78	11.24	11.63	9.11	12.91	13.18	10
CaO (wt%)	9.31	9.1	9.16	8.56	8.06	8.17	9.16	8.45	9.35	10.3
Na_2O (wt%)	3.3	2.82	2.45	2.93	3.34	3.64	2.49	2.28	2.2	2.35
K_2O (wt%)	2.15	2.88	3.33	3.35	3.25	2.8	3.3	4.6	3.94	2.58
P_2O_5 (wt%)	0.52	0.99	0.82	1.12	1.29	1.28	0.87	1.18	0.87	0.64
LOI	-0.28	1.17	0.52	1.23	2.54	1.51	0.35	0.58	0.28	0.3
Total	100.1	98.69	98.92	100	98.79	99.32	100.2	99.55	99.43	99.73

Table IV-2 Whole rock trace element concentrations for the Colima Cone samples measured in this study.

	1001 B	1003 B	1005 A	1006 B	1007 A	1007 B	1008 B	1013	1015	1016
Whole Rock Trace Element Composition (ppm)										
Sc	26	23	25	27	24	24	32	24	28	36
Be	3	3	3	5	6	6	4	4	4	2
V	251	193	189	216	215	215	228	214	218	268
Ba	954	1926	1728	2053	4004	4094	1817	2247	1871	1113
Sr	1063	2328	1988	2244	3003	3089	1771	2364	1842	1553
Y	22	16	15	15	21	21	17	16	14	15
Zr	306	333	261	362	343	305	369	399	336	215
Cr	130	830	820	570	590	590	430	740	880	540
Co	80	72	107	76	72	71	72	79	85	67
Ni	58	432	378	272	366	365	136	427	363	190
Cu	40	60	30	45	100	90	40	100	80	70
Zn	90	80	80	70	70	90	80	100	80	80
Ga	21	16	15	16	16	16	17	16	15	16
Ge	1	1	1	1	1	2	1	1	1	2
As	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Rb	26	43	29	32	83	84	34	44	36	14

Nb	8	7	5	8	11	10	7	9	8	6
Mo	< 2	< 2	< 2	< 2	2	< 2	< 2	< 2	< 2	< 2
Ag	< 0.5	1.4	1.3	0.4	5.1	1.2	1.7	1.5	1	0.6
In	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Sn	2	2	2	2	4	3	2	2	2	2
Sb	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.7	< 0.5	< 0.5	< 0.5	0.7
Cs	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
La	21.6	51.7	37.7	39.8	75.1	78.4	28.5	52.8	41.2	27.9
Ce	49.5	125	92.3	89.7	180	174	70.1	131	102	63
Pr	6.63	15.8	11.9	11.8	22.3	22.6	9.06	16.4	12.7	8.27
Nd	28.5	64.5	49	48.7	87.9	91	37.6	65.9	51.2	34.1
Sm	6.3	11.2	9.3	8.8	15.3	16	7.4	11.3	8.9	6.3
Eu	1.96	3.02	2.56	2.42	4.01	4.02	2.21	3.08	2.39	1.76
Gd	5.6	7.2	6.2	6	9.5	10.1	5.2	6.8	5.7	4.5
Tb	0.8	0.8	0.7	0.7	1.1	1.1	0.7	0.8	0.7	0.6
Dy	4.4	3.8	3.4	3.7	4.7	5	3.4	3.6	3.1	3.1
Ho	0.8	0.6	0.6	0.6	0.8	0.8	0.7	0.6	0.6	0.6
Er	2.3	1.7	1.6	1.7	2	2.1	1.8	1.7	1.5	1.7
Tm	0.33	0.24	0.22	0.23	0.26	0.25	0.26	0.23	0.21	0.25
Yb	2	1.4	1.4	1.5	1.5	1.5	1.7	1.4	1.3	1.6
Lu	0.34	0.22	0.2	0.22	0.22	0.25	0.25	0.23	0.19	0.28
Hf	7.5	7.9	6.5	9.6	8.4	8.5	9.2	10.3	8.5	6.1
Ta	0.5	0.3	0.3	0.4	0.5	0.6	0.4	0.4	0.4	0.4
W	302	240	442	269	244	231	291	280	355	234
Tl	< 0.1	0.1	< 0.1	< 0.1	0.2	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pb	7	23	11	12	40	41	15	20	16	10
Bi	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4	< 0.4
Th	2.3	5.7	5	4.1	6.8	6.6	3.3	5.3	3.8	2
U	0.9	1.9	1.6	1.3	2.4	2.3	1	1.8	1.4	0.6

4.5.2 Results

The potassic character of the Colima suite in comparison to calc-alkaline lavas erupted along the volcanic front of the MGVF is illustrated in a plot of K_2O vs. SiO_2 (Fig. IV-3a). Conversely, a plot Na_2O vs. SiO_2 shows the opposite trend, with Na_2O relatively depleted in the potassic vs. calc-alkaline samples (Fig. IV-3b). This

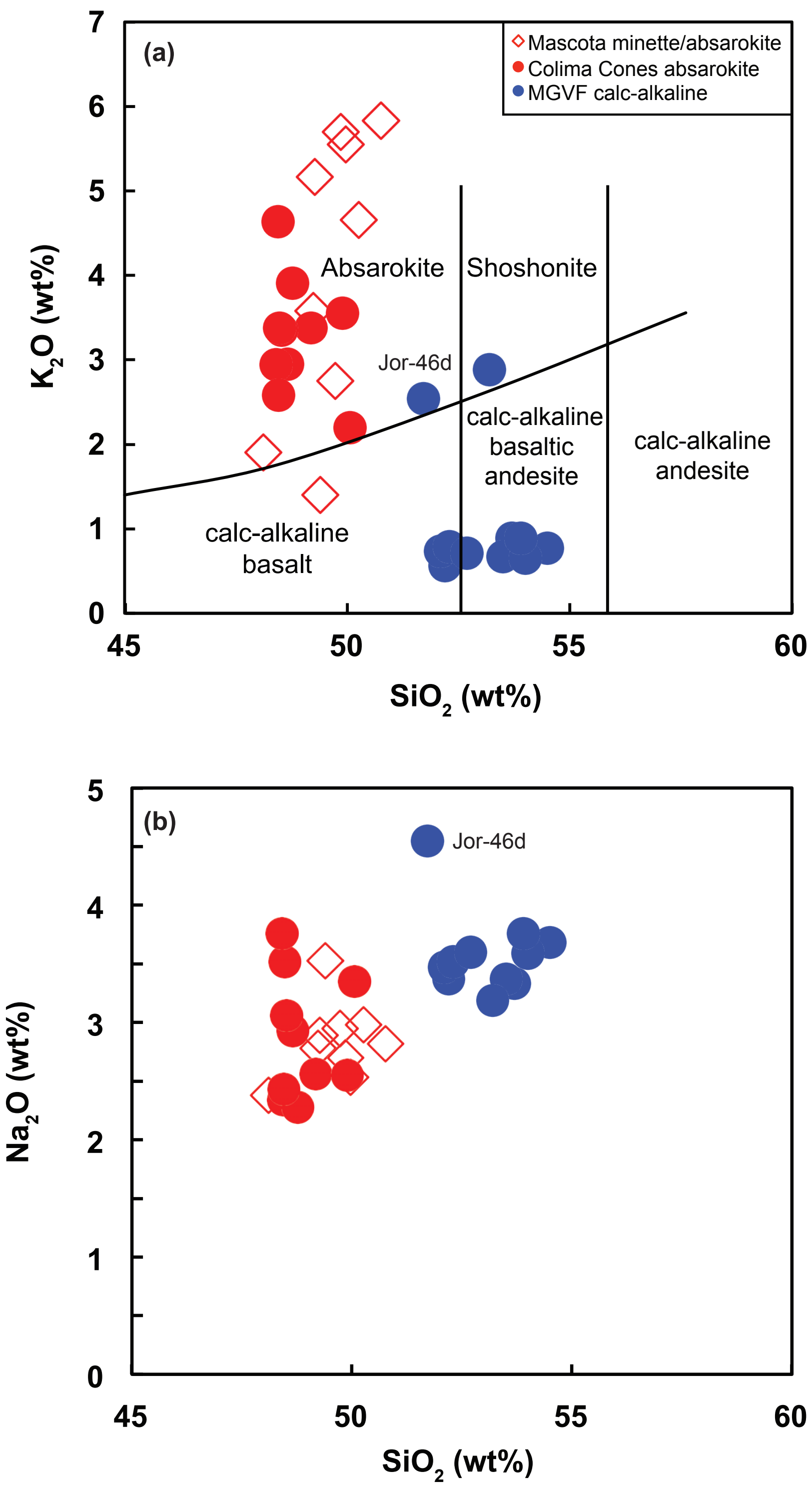


Figure IV-3 Whole rock (a) K_2O and (b) Na_2O plotted against whole rock SiO_2, for Colima Cones minettes and absarokites, Mascota minettes and absarokites and MGVF calc-alkaline basalt and basaltic andesites.

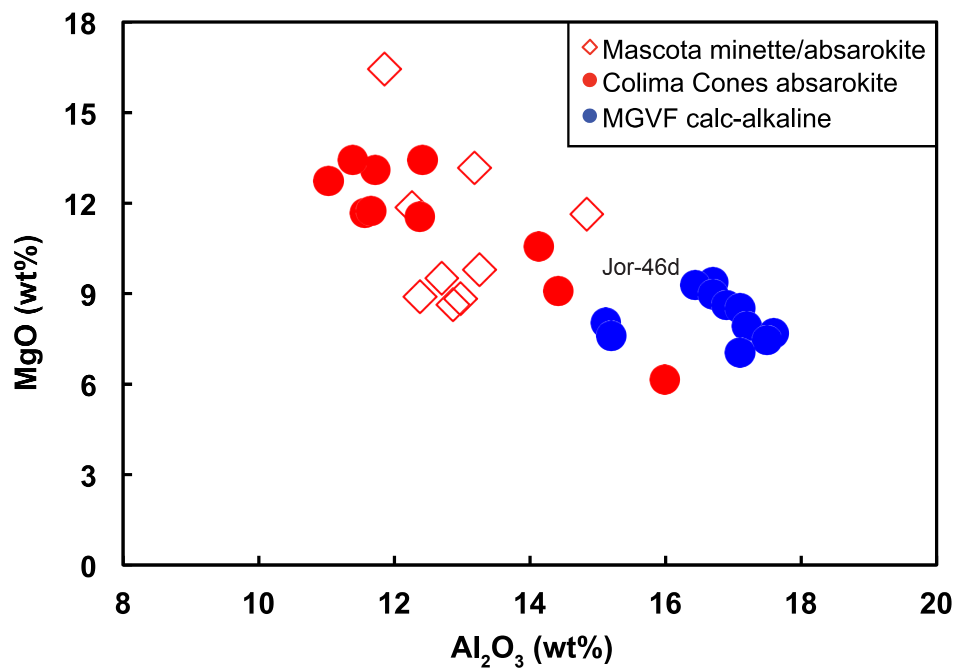


Figure IV-4 Whole rock MgO vs Al_2O_3 of Colima Cones minettes and absarokites, Mascota minettes and absarokites and MGVF calc-alkaline basalt and basaltic andesites.

observation suggests that the name “absarokite” may be preferable to “basanite” for the phlogopite-free K-rich Colima samples, which are compositionally similar to the absarokites from the Mascota volcanic field (Carmichael et al., 1996). Another distinguishing feature of the K-rich Colima cones is their high MgO contents (mostly 9-13 wt%; Table IV-1), which can range up to 15 wt% (Luhr and Carmichael, 1981), and their relatively low Al_2O_3 contents (11-13 wt%) in comparison to those in the MGVF calc-alkaline suite (mostly 16-17 wt%); again this is a feature shared with absarokites and minettes from the Mascota volcanic field (Fig. IV-4). A plot of chondrite-normalized incompatible elements (Fig. IV-5) shows that the K-rich Colima cones display an enhanced arc geochemical signature relative to the calc-alkaline basalts from the MGVF, a point previously emphasized by Luhr (1997). The Colima cones contain higher concentrations of all incompatible elements except the heavy rare-earth elements (HREE), which are broadly similar between the two suites.

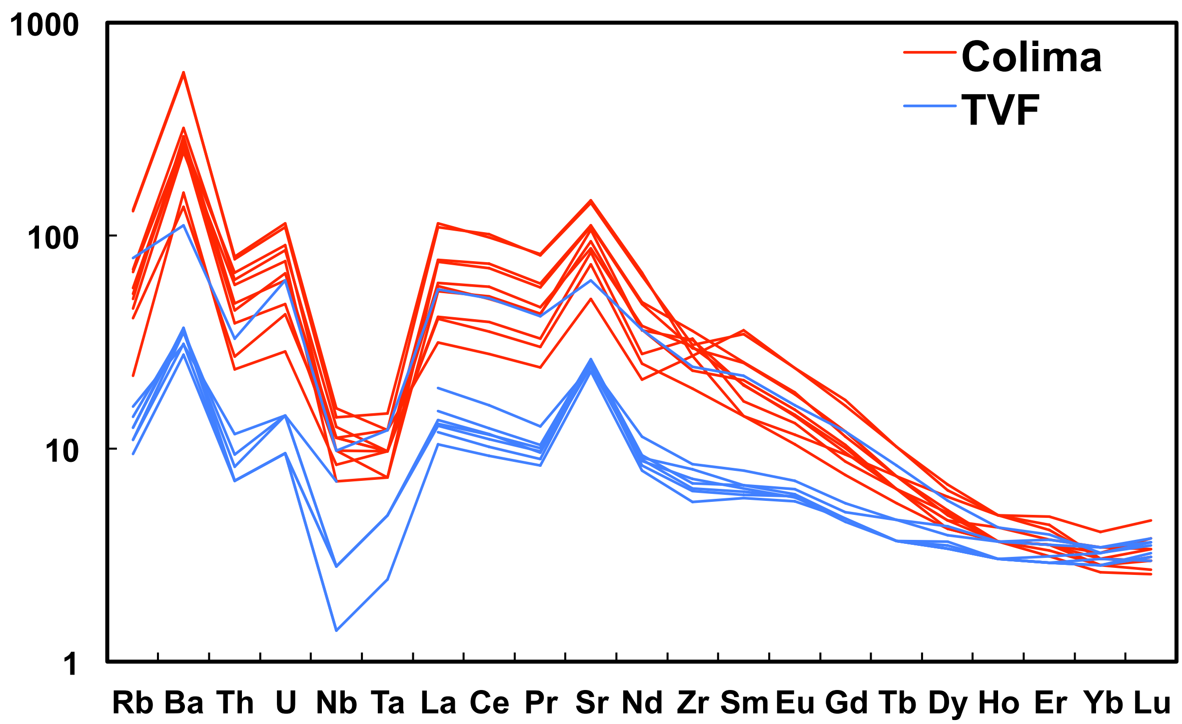


Figure IV-5 Trace element spider diagram (normalized by primitive mantle, McDonough and Sun,1995) for Colima Cone minettes and absarokites (red) and MGVF calc-alkaline basalts and basaltic andesites (blue).

4.6 Olivine Compositions

4.6.1 Methods

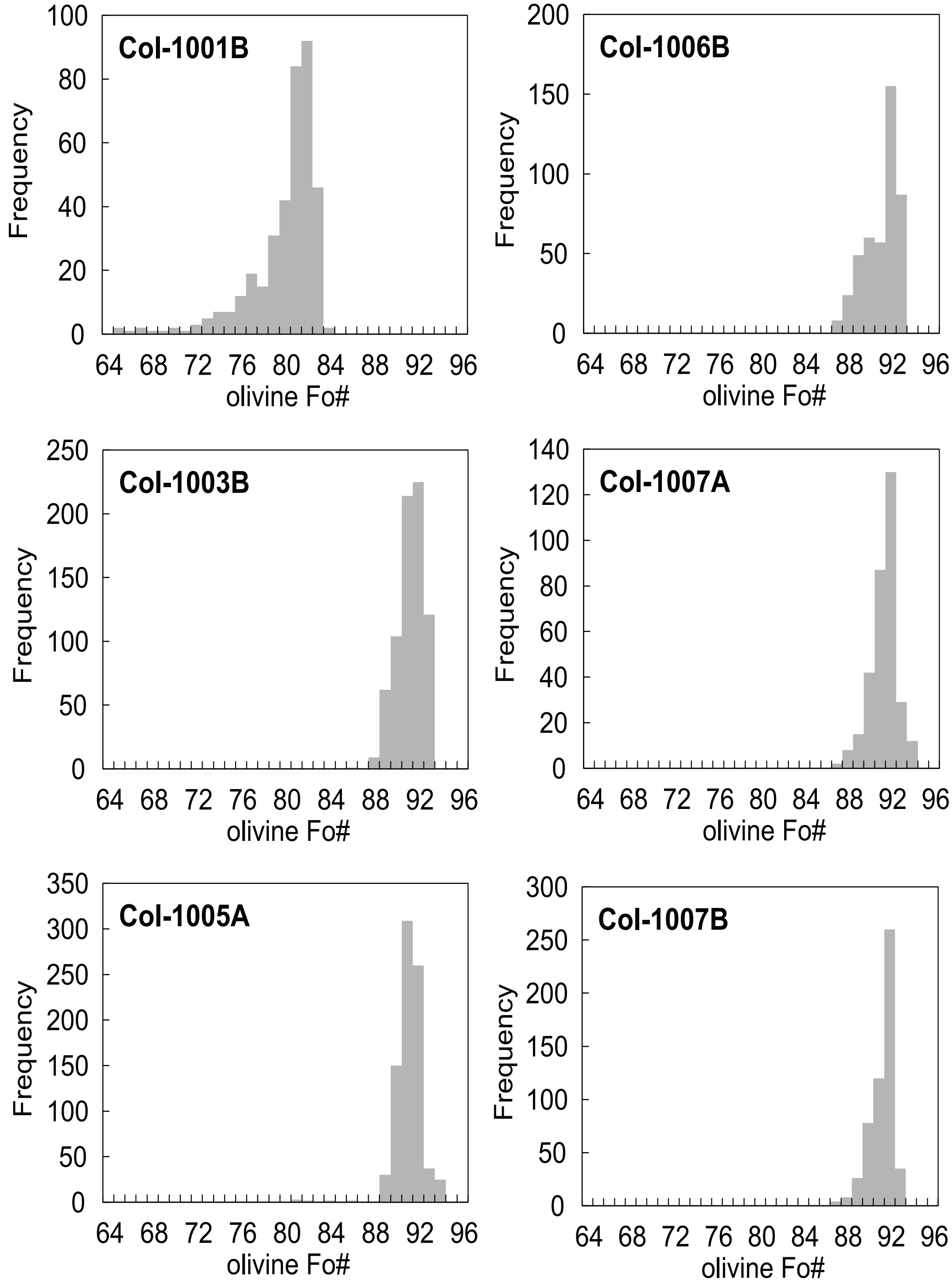
For each sample, two new thin sections were prepared from the same hand specimen that was re-crushed and re-analyzed for all samples in Table IV-1. The compositions of olivine phenocrysts in these thin sections were analyzed using a

Cameca SX100 electron microprobe. A focused beam with an accelerating voltage of 15 kV and a current of 20 nA was used. Eight elements (Mg, Al, Si, Ca, Cr, Mn, Fe, and Ni) were analyzed, and the peak and background counting times were 30s each for Si, Mg, Fe and Ni, and 20 s each for Al, Mn, Cr and Ca. The 1s precision based on counting statistics is ± 0.32 wt% SiO_2, ± 0.25 wt% MgO, ± 0.54 wt% FeO, and ± 0.05 wt% NiO, and < 0.1 wt% for Cr_2O_3, Al_2O_3, MnO and CaO. The standards used for all analyses are from the University of Michigan collection for the electron microprobe and are described in Table A1. Oxygen was calculated by cation stoichiometry and used in the Cameca PAP correction program.

For each sample, microprobe analyses were performed on two thin sections in order to increase the chances of finding the most Mg-rich olivine. Between 20-30 olivine phenocrysts were analyzed in each sample. Most analyses were conducted along a traverse line, with approximately 20-30-μm spacing between points. This resulted in 10-40 analyses per olivine crystal, and a range of 300-500 analyses per sample. For the most Fo-rich olivine crystals in each sample (top 3% Fo#), a second round of analyses were made using an accelerating voltage of 20 kV and a current of 40 nA in order to improve the analytical precision on the Ni analyses in the olivine crystals. A filter was applied to all data, where only analyses with totals of 99-100.9 were used.

4.6.2 Results

All olivine analyses for each sample are provided in Table C2. Results are summarized for each sample in histograms of olivine composition


Col-1001B
Col-1006B
Col-1003B
Col-1007A
Col-1005A
Col-1007B
Frequency
olivine Fo#
64 68 72 76 80 84 88 92 96

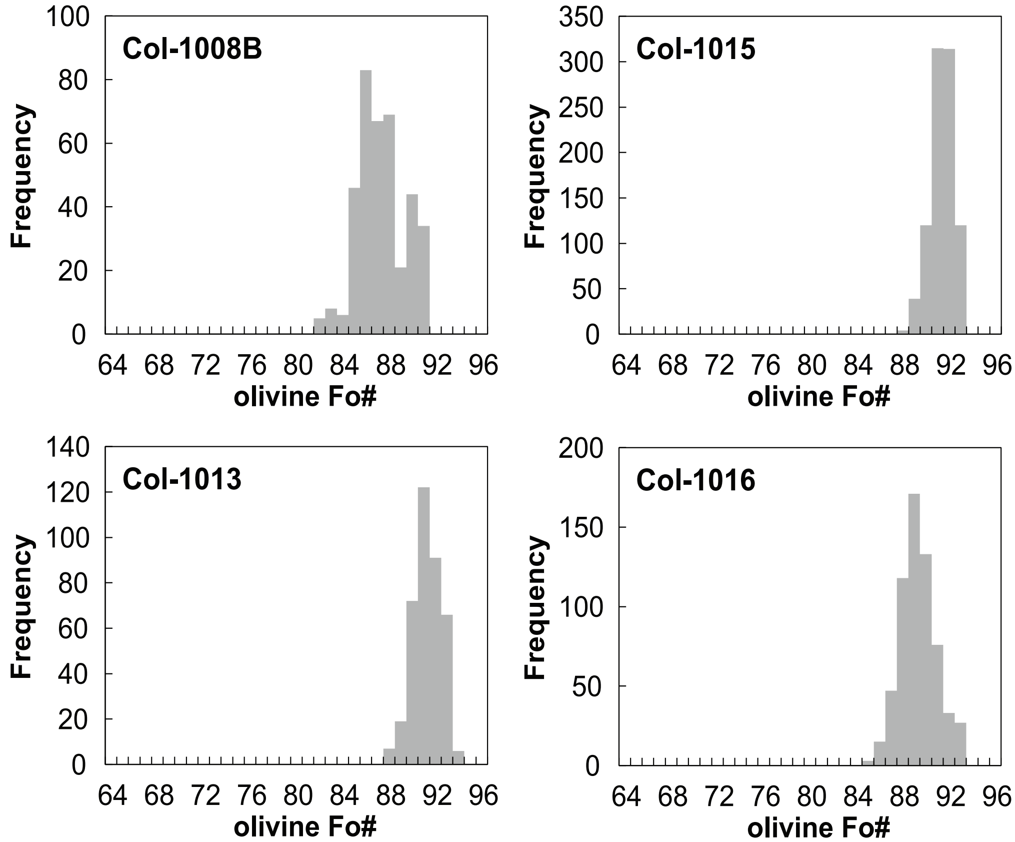


Figure IV-6 Histogram of olivine Fo# for each Colima cone samples (continued from the last page)

(Fo mol%; Fig. IV-6), which show no break in composition up to the most Fo-rich olivine analyzed in each sample (Table IV-3). A plot of NiO (wt%) in olivine as a function of Fo content (mol%) is shown in Figure IV-7 for each sample. A linear fit to the olivines with the highest 3 mol% Fo allows the NiO content to be calculated for the most Fo-rich olivine in each sample.

4.7 Conditions of Phenocryst Growth

Before applying the olivine-melt thermometer, it is necessary to determine what pair of olivine and melt composition was in equilibrium in each sample. In a typical thin section, there is often a wide range of compositions preserved among the olivine phenocrysts, and there is a wide compositional range among analyses of olivine-hosted melt inclusions as well. In this study, the most Mg-rich olivine analyzed in each thin section is assumed to closely approximate the first olivine to crystallize from a liquid represented by the whole-rock composition of each sample. This assumption requires that phenocryst growth occurred relatively rapidly during ascent and not in a stalled magma chamber. Several lines of evidence support this hypothesis.

First, Vigouroux et al. (2008) point to varying volatile contents and entrapment pressures within individual olivine crystals as evidence for degassing-induced phenocryst growth during ascent of these mantle-derived melts. Second, many of the olivine phenocrysts in the Colima cones exhibit diffusion-limited growth textures (Fig. IV-8), which are consistent with those produced from large effective undercoolings caused by rapid H_2O degassing during magma ascent (e.g., Welsch et al., 2014; Waters et al., 2015). Third, histograms of olivine compositions (Fig. IV-6) do not show a bimodal pattern indicative of mixing of magmas and/or olivine accumulation within a stalled crustal chamber.

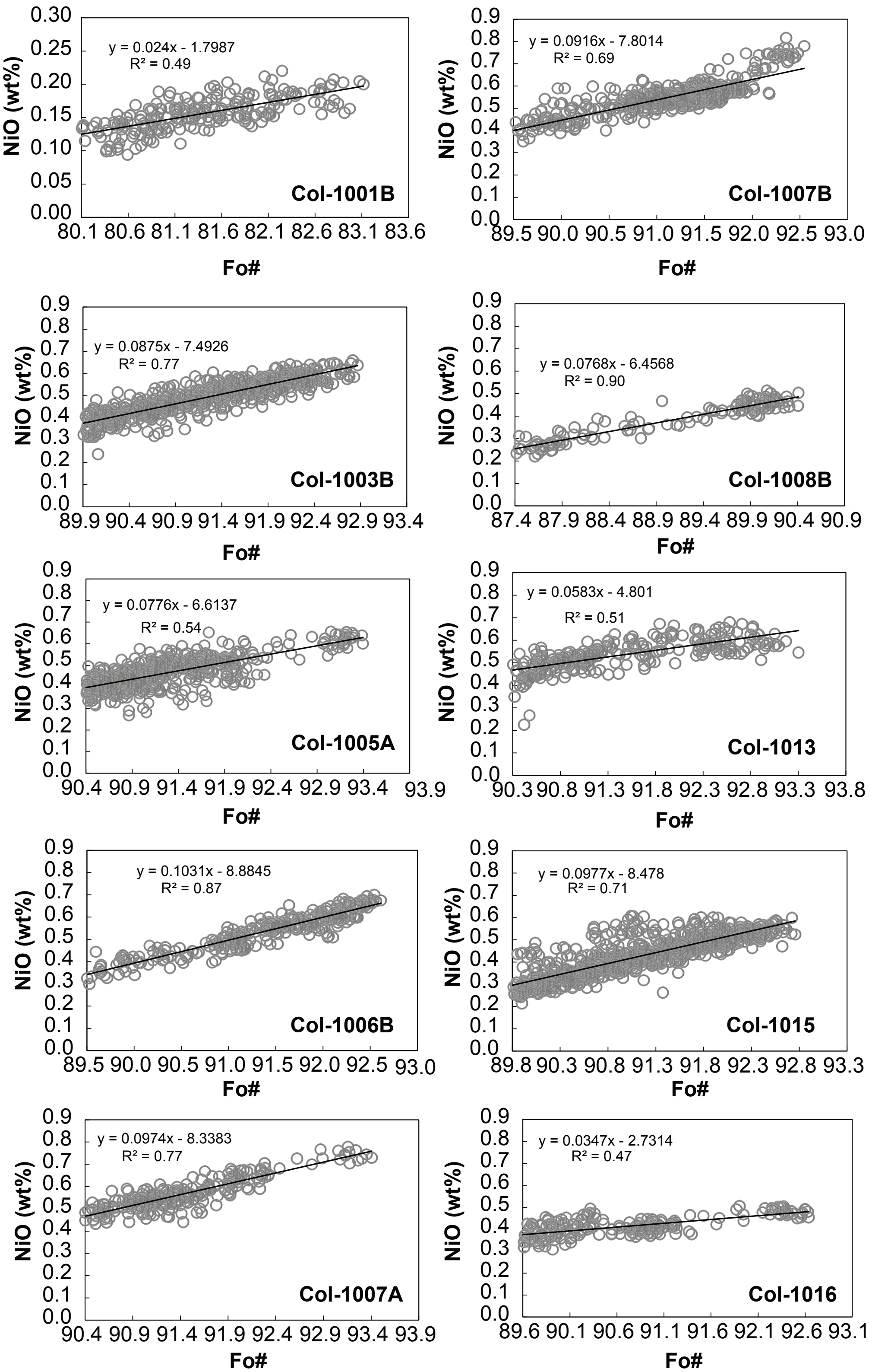


Figure IV-7 NiO vs Fo plots for each sample used to calculate the olivine NiO content used for the Ni thermometer based on the fit linear equation applied to the highest Fo#

Table IV-3 The most Fo-rich olivine composition analyzed in each Colima cone sample.

Sample	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Fo#
1001B	43.71	0.04	40.18	0.18	15.83	0.19	0.20	0.04	100.4	83.1
1003B	50.44	0.02	41.96	0.14	6.90	0.09	0.64	0.05	100.2	92.9
1005A	50.58	0.05	41.88	0.12	7.50	0.18	0.54	0.03	100.9	92.3
1006B	49.54	0.02	41.31	0.13	7.52	0.01	0.56	0.06	99.1	92.2
1007A	50.89	0.01	42.17	0.11	6.40	0.12	0.73	0.08	100.5	93.4
1007B	49.75	0.02	41.38	0.08	7.15	0.11	0.78	0.10	99.4	92.5
1008B	48.93	0.03	41.36	0.12	9.25	0.11	0.50	0.07	100.4	90.4
1013	50.68	0.03	42.01	0.15	6.49	0.16	0.55	0.09	100.2	93.3
1015	50.74	0.02	41.82	0.16	7.06	0.11	0.52	0.07	100.5	92.8
1016	48.46	0.04	41.33	0.18	9.44	0.21	0.37	0.07	100.1	90.1

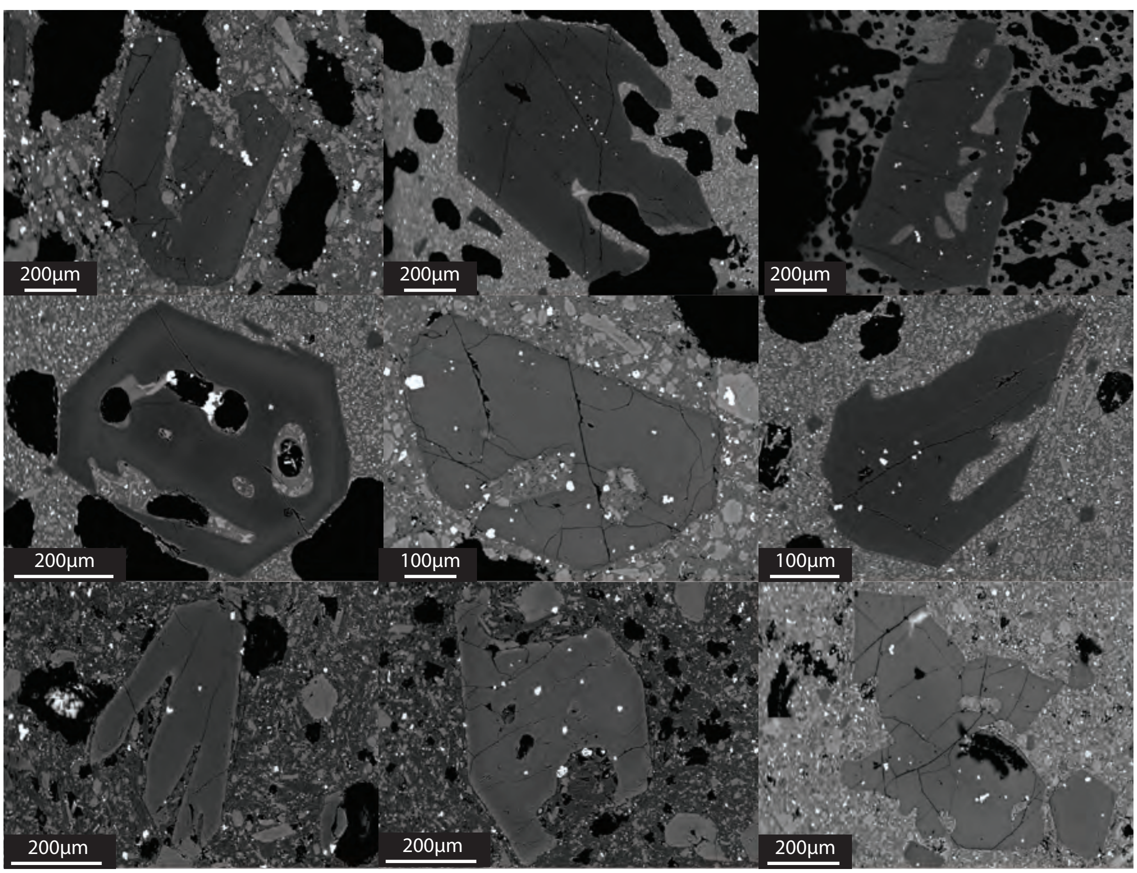


Figure IV-8 Back-scattered images of olivine phenocrysts with diffusion limited (rapid growth) texture.

A fourth line of evidence is found in a plot of the most Mg-rich olivine in each sample as a function of the whole-rock molar Mg#* (=MgO/(MgO+FeO^T), which illustrates a broad linear correlation (Fig. IV-9). A similar linear trend is found for the MGVF calc-alkaline basalts and basaltic andesites studied by Pu et al. (2017).

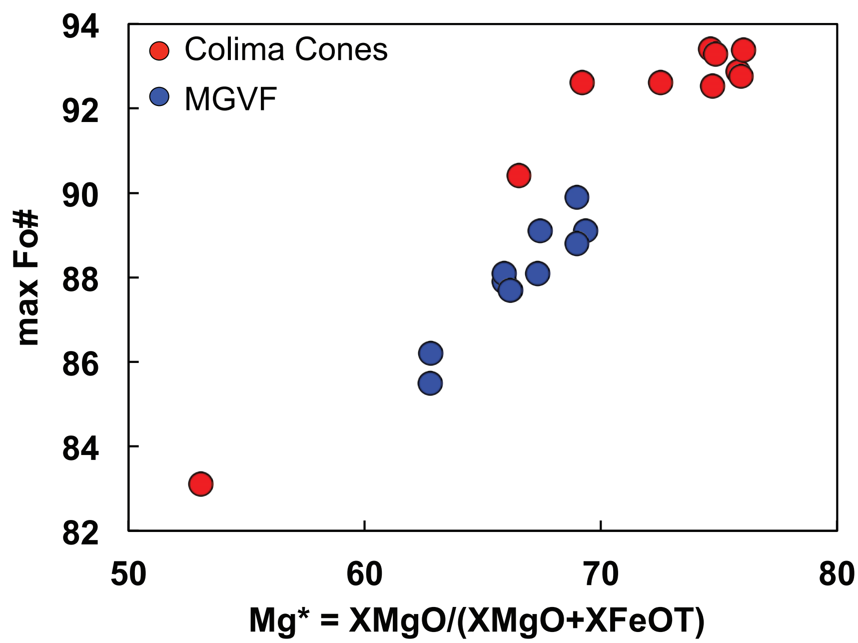


Figure IV-9 Plot of the Fo# of the most Mg-rich olivine phenocryst composition against the Mg#* of the whole roclk. Mg# was calculated with total FeO instead of true FeO in the whole rock.

Representative BSE images of the most Mg-rich olivine (ranging up to Fo_{93}) in six Colima samples show that they have textures (e.g., faceted edges) consistent with phenocryst growth from a melt (Fig. IV-10). An additional test of whether the most Mg-rich olivine in each sample represents the first olivine to crystallize from the whole-rock melt composition is presented below through application of the Fe^{2+}-Mg exchange equilibrium coefficient, which in turn can be used to calculated melt ferric-ferrous ratios.

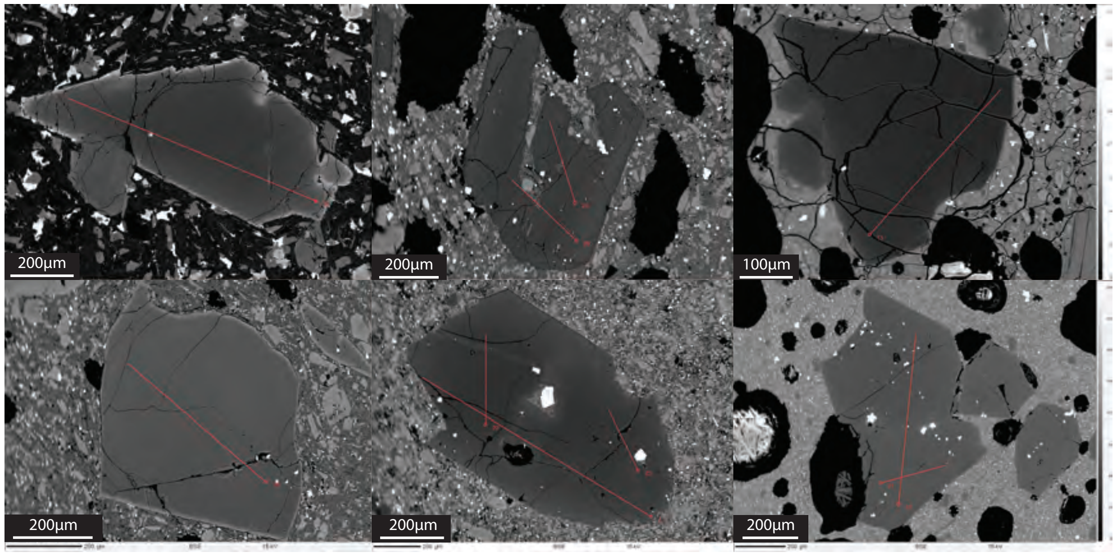


Figure IV-10 The olivine phenocryst with the most Fo-rich composition found in 6 of the Colima Cone samples.

4.8 Olivine-melt oxybarometry

4.8.1 Method

Application of the Fe^{2+}-Mg equilibrium exchange coefficient ($^{Fe2+\text{-}Mg}K_D$) between olivine and melt, obtained from the experimental literature, permits the melt ferric-ferrous ratio (and thus oxygen fugacity) to be calculated at the onset of olivine crystallization. Resulting $Fe^{3+/}Fe^{T}$ ratios can be compared between the K-rich Colima cones and the calc-alkaline MGVF basalts to evaluate if reasonable results are obtained. Pu et al. (2017) compiled a set of 108 hydrous phase-equilibrium experiments on olivine-bearing basalts from eight studies (Sisson and Grove, 1993a, 1993b, Wagner et al., 1995; Righter and Carmichael, 1996; Moore and Carmichael, 1998; Almeev et al., 2007; Medard and Grove, 2008; Parman et al., 2011), where fO_2 was either buffered or monitored. Owing to the evidence for high water contents

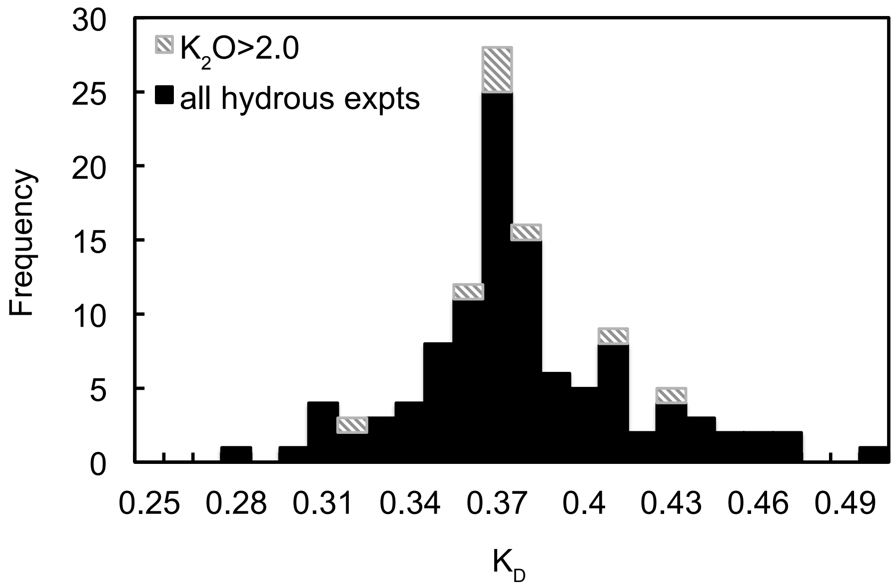


Figure IV-11 The histogram of calculated K_D for 108 hydrous olivine-melt equilibrium experiments (black). The lined blocks on top are showing experiments with >2% K_2O in the melt.

in all of the Colima and MGVF samples from olivine-hosted melt inclusion data (Vigouroux et al., 2008; Maria and Luhr, 2008; Johnson et al., 2008, 2009), only hydrous experiments were considered. Olivine and glass (quenched melt) analyses of the run products, as well as melt ferric-ferrous ratios based on reported temperatures and fO_2 conditions and the model of Jayarasuriya et al. (2004), were used to calculate ${}^{Fe2+\text{-}Mg}K_D$ values. A histogram of the results from all 108 experiments (Fig. IV-11) shows the average value is 0.37 (± 0.04). It has been suggested in the literature that the H_2O and alkali contents of the melt have strong effects on the ${}^{Fe2+\text{-}Mg}K_D$ values (Gee and Sack, 1988; Toplis et al., 2005). A subset of the 108 hydrous experiments (Fig. IV-11), with only experimental melt K_2O contents to be >2 wt% K_2O (n=6), also leads to an average K_D of 0.37 (± 0.04). Therefore, this is the ${}^{Fe2+\text{-}Mg}K_D$ value that was applied to all samples in Fig. IV-9 to calculate melt Fe^{3+}/Fe^T ratios.

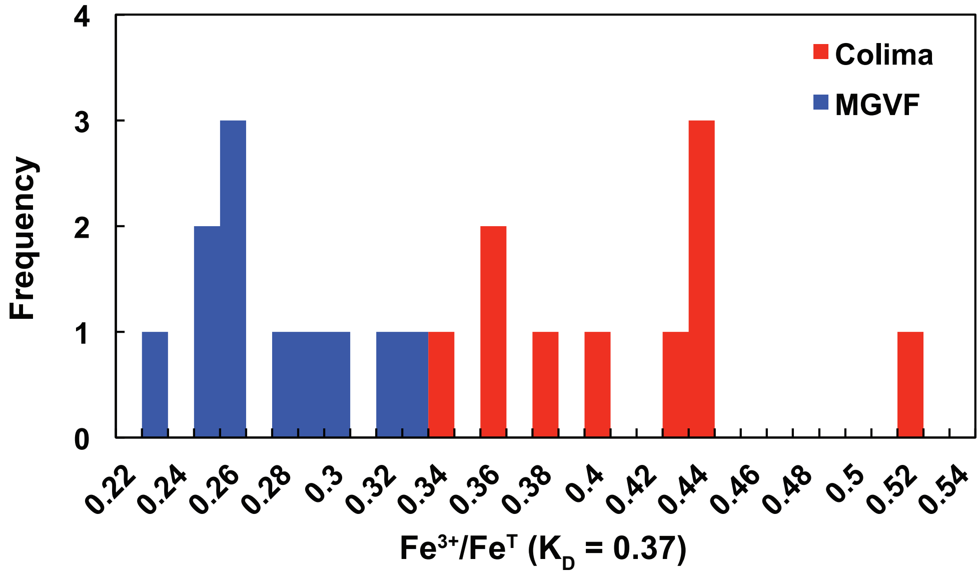


Figure IV-12 Histogram of the calculated whole rock Fe^{3+}/Fe^T based on the most Fo-rich olivine composition, using a K_D value of 0.37. The Colima samples have much higher Fe^{3+}/Fe^T ratio (corresponding to higher oxygen fugacity) than the MGVF samples.

4.8.2 Results

For the calc-alkaline samples from the MGVF studied by Pu et al. (2017), melt Fe^{3+}/Fe^T ratios range from 0.23-0.32, which overlaps those directly analyzed by micro-XANES in olivine-hosted melt inclusions in arc basalts (0.19-0.28; Kelley and Cottrell, 2009; Brounce et al., 2014). These Fe^{3+}/Fe^T ratios correspond to ΔNNO values (calculated with the model of Jayasuriya et al., 2004) of +0.4 to +1.4. For the K-rich Colima cones, melt Fe^{3+}/Fe^T ratios range from 0.33-0.52, which correspond to ΔNNO values of +1.6 to +3.1. A histogram of all Fe^{3+}/Fe^T ratios is presented in Figure IV-12. In summary, when a ${}^{Fe2+\text{-}Mg}K_D$ value of 0.37 is applied to all samples, the average Fe^{3+}/Fe^T ratio is 0.26 (ΔNNO = +0.7) for the MGVF calc-alkaline basalts and 0.41 (ΔNNO = +2.2) for the K-rich Colima suite.

Note that when samples undergo olivine accumulation, the effect on the calculation above results in lower Fe^{3+}/Fe^{T} ratios. Also, any re-equilibration of the first olivine to crystallize on the liquidus, driving it to lower MgO contents, will also lead to lower calculated Fe^{3+}/Fe^{T} ratios. Thus, the higher Fe^{3+}/Fe^{T} ratios obtained for the high-MgO Colima samples (Fig. IV-12) cannot be attributed to the effects of olivine accumulation and/or re-equilibration. Instead, the evidence compiled in Figure IV-12 shows that the K-rich Colima cones were systematically more oxidized than the calc-alkaline MGVF basalts. Because there is an enhanced solubility of the sulfate component (S6+) with increasing fO_2 (e.g., Backnaes and Deubener, 2011; Baker and Moretti, 2011), the higher oxidation state of the Colima cones explains their higher S contents in olivine-hosted melt inclusions (≤ 7800 ppm; Maria and Luhr, 2008; Vigouroux et al., 2008) compared to those in MGVF samples (≤ 2100 ppm S; Johnson et al., 2009). It is also worth noting that the Fe^{3+}/Fe^{T} ratios in the K-rich Colima suite and the MGVF calc-alkaline basalts display a strong positive correlation with Ba/La ratios, a geochemical indicator of slab-derived fluids (Fig. IV-13).

The emerging view is that the K-rich Colima melts were systematically more oxidized than the MGVF calc-alkaline basalts (by ~1.5 fO_2 log units), and all lines of evidence support the hypothesis that the most Mg-rich olivine in each sample closely approximates the first olivine to crystallize from a liquid with a composition that corresponds to that for the whole rock. The latter conclusion permits application of olivine-melt thermometry to the most Mg-rich olivine in each sample to obtain the temperature at the onset of olivine growth.

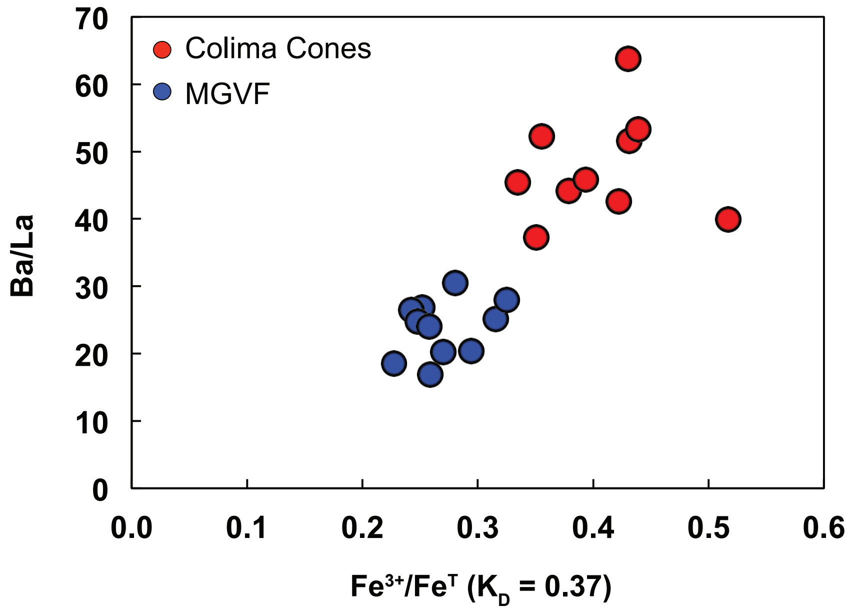


Figure IV-13 Ba/La ratio of the whole rock plotted against the Fe^{3+}/Fe^{T} ratio calculated from the most Fo-rich olivine composition in each sample and a K_D of 0.37. Colima Cone samples have higher oxidation state and more enriched subduction zone signature (higher Ba/La ratio) than the calc-alkaline basalts/basaltic andesites from MGVF.

4.9 Olivine-melt thermometry

4.9.1 Method

The partitioning of both Mg and Ni between olivine and melt is known to vary strongly with temperature (e.g., Beattie, 1993; Li and Ripley, 2010), and therefore values of $D_{Mg}^{oliv/liq}$ and $D_{Ni}^{oliv/liq}$ can be used as a thermometer. Pu et al. (2017) demonstrate that both Mg- and Ni-based olivine-melt thermometers perform equally well at 1 bar over a wide range of anhydrous melt compositions and temperatures, with a 1σ error on T_{Mg} and T_{Ni} of ± 26 and ± 29 °C, respectively. The critical limitations of olivine-melt thermometers based on the partitioning of Mg are their sensitivity to dissolved H_2O in the melt (Putirka et al., 2007) and pressure (Herzberg and O'Hara, 2002). Therefore, all thermometers that use $D_{Mg}^{oliv/liq}$ require adjustments for H_2O and pressure. In the absence of these corrections, temperatures calculated from the Mg-based thermometer (T_{Mg}) represent olivine crystallization temperatures at one bar under anhydrous conditions. In contrast, the DNioliv/liq thermometer (Pu et al., 2017) has a negligible dependence on both dissolved water in the melt (Pu et al., 2018) and on pressure under crustal conditions (≤ 1 GPa; Matzen et al., 2013). Therefore, T_{Ni} records the temperature at the onset of olivine growth, irrespective of depth and/or dissolved water content in the melt.

In this study, the Ni-based thermometer of Pu et al. (2017) is applied to all of the Colima cone samples in Table IV-1. The Ni content in the most Mg-rich olivine analyzed in each sample is calculated from the linear relationship between NiO wt% and Fo mol% (Fig. IV-7), which is then combined with the whole-rock Ni concentration to calculate DNioliv/liq. This parameter is input into the Ni-thermometer and allows the temperature at the onset of olivine crystallization to be calculated. Because TNi is based on the partitioning of a trace element, analytical uncertainties in the measurement of Ni contents in olivine and the whole rock contribute to the uncertainty in TNi. For example, for the K-rich Colima cones, an average analytical uncertainty of ± 0.04 wt% NiO in olivine and ± 5 ppm in the average whole-rock Ni concentration leads to an additional uncertainty of ± 17 and ± 3 °C, respectively.

Another source of error, previously discussed in Pu et al. (2017), arises from the possibility that the first olivine to crystallize in each sample during ascent may not have been analyzed during microprobe analysis. The liquidus olivine may have been lost during transit, undergone some diffusive re-equilibration, or is not exposed on the surface of the thin section that was used. Therefore, the most Mg-rich olivine composition analyzed in each thin section is a minimum estimate of the Fo content of the liquidus olivine. Thus, calculated temperatures from both the Mg- and Ni-thermometer are both maximum values for each sample, although the uncertainty is smaller for T_{Mg} than for T_{Ni}. For example, the effect of underestimating the liquidus olivine composition by 1 mol% Fo leads to an overestimate of T_{Mg} of only ~4 degrees. For T_{Ni}, the uncertainty depends on the slope of the NiO vs. mol% Fo fits for each sample (Fig. IV-7). For the samples with the highest and lowest slopes (COL-1006 and -1001, respectively), the effect of using an olivine composition that is 1 mol% Fo too low causes TNi to be too high by 38 and 25°C, respectively. As a consequence, all T_{Ni} reported in Table IV-1 are maximum values. Because T_{Ni} is expected to be overestimated by a larger amount than T_{Mg}, calculated values of ΔT ($=T_{Mg}-T_{Ni}$) are expected to be underestimated; in this case (olivine composition too low by 1 mol% Fo), ΔT for COL-1006 and -1001 will be too low by 34 and 21°C, respectively.

4.9.2 Results

Temperatures calculated with both the Mg- and Ni-thermometers of Pu et al. (2017) are tabulated in Table IV-1 and plotted in Figure IV-14. The Mg-based thermometer calculates the 1-bar, anhydrous liquidus (olivine-in) temperature (T_{Mg}) of each sample, and the results show T_{Mg} increases linearly with MgO content. Also

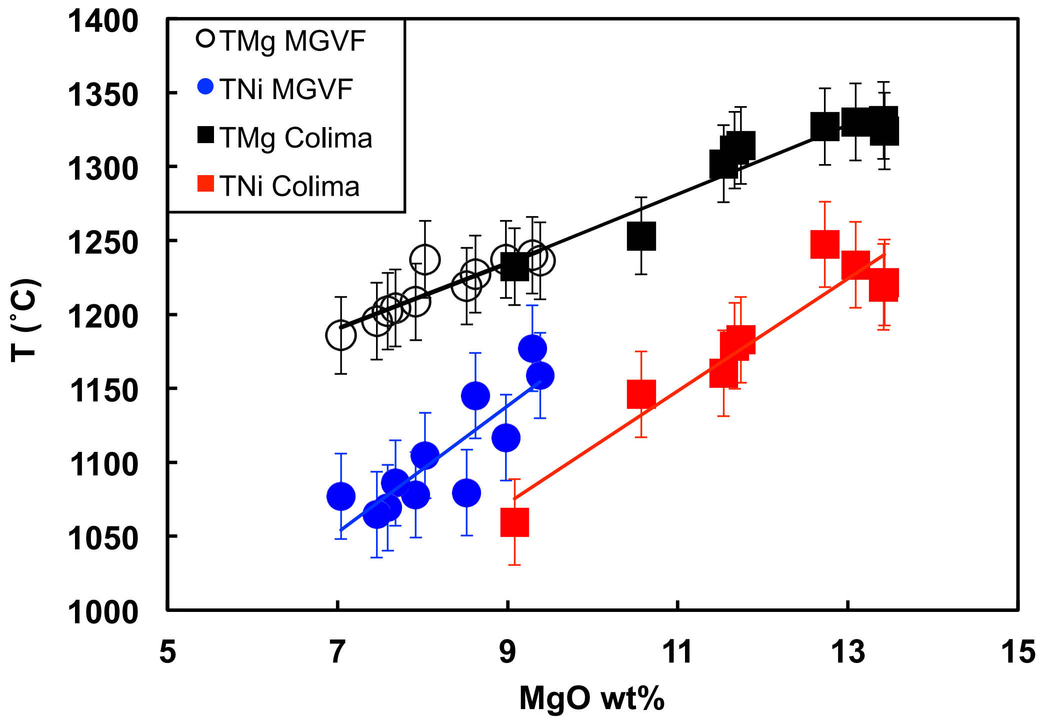


Figure IV-14 Whole rock MgO (wt%) and temperature results from the olivine-melt Mg-thermometer (T_{Mg}) and Ni-thermometer (T_{Ni}) (Pu et al., 2017) for the Colima cone samples and the MGVF samples. The error bars are the standard deviation of the calibration of each thermometer, which is 26˚C for T_{Mg} and 29˚C for T_{Ni}.

shown in Figure IV-14 are the T_{Mg} calculated for the MGVF samples from Pu et al. (2017). Note that the two data sets overlap, and linear fits to T_{Mg} vs. MgO for each suite are indistinguishable from a single linear fit to the combined data.

Temperatures calculated from $D_{Ni}^{oliv/liq}$ (T_{Ni}) are also plotted as a function of MgO in Figure IV-14; T_{Ni} reflects the temperature at the onset of olivine crystallization during ascent. In all cases, T_{Ni} are consistently lower than T_{Mg}, which can be attributed to the effect of dissolved water in the melt lowering olivine crystallization temperatures. Note that the effect of correcting for pressure leads to higher T_{Mg} values.

A comparison of T_{Ni} results for the K-rich Colima suite (Table IV-1) and the MGVF calc-alkaline samples (Pu et al., 2017), plotted as a function of MgO content in the melts, display two distinct linear trends, which are sub-parallel. Not surprisingly, higher T_{Ni} is associated with higher MgO for each group. However, for a fixed MgO content in the melt (e.g., 9 wt%), the K-rich Colima melts are significantly cooler by ~100 °C.

4.9.3 Test of olivine-melt thermometry: consistency of results from different Colima cones

The accuracy and reproducibility of the olivine-melt thermometry applied in this study are demonstrated by the consistency in the calculated temperatures (both T_{Mg} and T_{Ni}) obtained for various samples from different Colima cones. For example, four samples with ~13 wt% MgO were collected from three different cinder cones (San Isidro, La Erita, and Telecampano; Table IV-1 and Fig. IV-2). Similarly, three samples with ~11 wt% MgO were collected from two different cinder cones (Comal Chico and El Carpintero; Table IV-1 and Fig. IV-2). The T_{Mg} and T_{Ni} values obtained for each of these seven samples is based on seven separate whole-rock analyses and separate microprobe analyses of olivine in seven different thin sections. The consistency of the results among the four samples with ~13 wt% MgO, and among the three samples with ~11 wt% MgO, strongly supports the hypothesis that the most Fo-rich olivine analyzed in each sample closely approximates the first olivine to crystallize from a liquid with a composition close to that of the whole rock.

4.10 Olivine-melt hygrometry and barometry: broad constraints

One of the most striking features of the temperature data plotted in Figure IV-14 is the contrast between T_{Mg} and T_{Ni}, which decreases systematically with increasing MgO content for each group of melts. Because T_{Mg} is sensitive to both dissolved water in the melt and pressure, the magnitude of the difference between the T_{Mg} and T_{Ni} reflects their combined effects. For example, the effect of dissolved water is to strongly lower the olivine crystallization temperature, leading to positive values for ΔT ($=T_{Mg} - T_{Ni}$) in hydrous basalts (Almeev et al., 2007; Medard and Grove 2008; Pu et al., 2017). Therefore, the progressive decrease in ΔT ($=T_{Mg} - T_{Ni}$) with increasing MgO content may reflect the effect of lower water contents in the melt at the onset of olivine crystallization. If so, this suggests that melts that formed at higher temperatures and with higher MgO contents contained lower amounts of dissolved water. However, this is inconsistent with the observation that the highest H_2O concentrations (5.7 and 6.7 wt%) were analyzed in olivine-hosted melt inclusions in those samples from the MGVF and Colima cones with the highest MgO contents, 9.4 and 13.2 wt% MgO, respectively (Johnson et al., 2009; Maria and Luhr, 2008).

Another possibility is that the systematic decrease in ΔT ($=T_{Mg} - T_{Ni}$) with higher MgO content reflects progressively deeper depths for the onset of olivine crystallization during ascent. The effect of increasing pressure requires a correction to T_{Mg}. If the depth at which olivine began to crystallize in each melt during its ascent were known, the pressure correction of Herzberg and O'Hara (2002) could be applied and T_{Mg} values would increase accordingly. For example, the highest entrapment pressure calculated for an olivine-hosted melt inclusion in the sample from La Erita is 750 MPa (Maria and Luhr, 2008). At this depth the correction to T_{Mg} is +39°C, and the revised difference between T_{Mg} and T_{Ni} (ΔT) is ~148°C), which infers a relatively high water content in the melt to suppress the olivine liquidus by this amount.

The effect of dissolved water and pressure are not mutually exclusive and both may contribute to the systematic shift in ΔT observed for both the K-rich Colima cones and calc-alkaline MGVF basalts. Returning to the case of the La Erita sample studied by Maria and Luhr (2008), the maximum water content analyzed in that sample is 6.7 wt%. This corresponds to a calculated depression of the olivine liquidus of ~160 degrees, according to the model of Medard and Grove (2008). However, the pressure-corrected ΔT at 750 MPa is only ~148°C, which suggests that olivine may have began to crystallize deeper than 750 MPa, perhaps closer to 1 GPa. The pressure correction at 1 GPa adds 52°C to T_{Mg}, leading to a revised ΔT of 161 °C, which predicts a water content of ~6.7 wt% in the melt according to the model of Medard and Grove (2008), as well as the analyzed H_2O content of Maria and Luhr (2008). Therefore, the systematic decrease in ΔT (T_{Mg}-T_{Ni}) with increasing MgO content (Fig. IV-14) appears to primarily reflect the effect of increasing depth at the onset of olivine crystallization rather than lower melt H_2O contents.

4.11 Temperatures and depths of melt segregation from mantle source

4.11.1 Conditions of melt segregation vs. melt formation in the mantle

One of the primary objectives of this study is to place constraints on the mantle conditions (i.e., temperatures and depths) that led to the origin of the K-rich Colima melts and to make comparisons to those for the calc-alkaline MGVF basalts. Experimental studies relevant to hydrous partial melting in the arc mantle wedge (asthenosphere) of subduction zones are numerous (e.g., Grove et al., 2006 and references therein), and there is abundant evidence that partial melting occurs over a broad interval of depth, melt water content and temperature (Fig. IV-15). The partial melts within the wedge form an interconnected network, and undergo buoyant flow through the lherzolite matrix (e.g., Hewitt and Fowler, 2008). Prior to segregation, final equilibration of the partial melt with the mantle occurs at shallow depths near the top of the asthenospheric wedge (Grove et al., 2006). Therefore, erupted mantle-derived melts have compositions that record the pressure-temperature conditions of their *segregation*, which is distinct from the conditions of their formation.

4.11.2 Temperatures of melt segregation vs. onset of olivine growth during ascent

The Ni-thermometer applied to the most Mg-rich olivine in each sample provides the temperature at the onset of olivine crystallization during ascent through the crustal column, which is different from the temperature of the melt when it segregated from the mantle. Nonetheless, a melt segregation temperature can be estimated if it is assumed that the melt subsequently followed an adiabatic ascent path along a fracture through the lithosphere to the surface, which allows a correction to T_{Ni} to be calculated using the adiabat for the melt. It is defined as:

$$\left(\frac{dT}{dP}\right)_S = \frac{TV\alpha}{C_p} \tag{1}$$

where T is temperature in Kelvin, V and a are the molar volume and coefficient of thermal expansion, respectively (Lange, 1997; Ochs and Lange, 1997; Guo et al., 2014), and C_p is the molar heat capacity (calculated from model of Lange and Navrotsky, 1993; the partial molar C_p of the H_2O component from Bouhifd et al., 2006). For a K-rich Colima melt with ~7 wt% H_2O, the calculated adiabat is ~40 K/GPa, which means that a correction of 40-80 degrees is required if the melt segregated from 2-3 GPa and began to crystallize olivine at ~1 GPa. Therefore, in order to apply this adiabatic correction to T_{Ni} it is first necessary to constrain the depth of melt segregation.

4.11.3 Depth of segregation from the mantle: MGVF calc-alkaline melts

There are a large number of high-quality phase-equilibrium experiments in the literature that have been performed on spinel lherzolite (both depleted and fertile) over a range of temperature, pressure and water contents, which Till et al. (2012) have compiled to calibrate a predictive model of mantle melting. Depth of mantle-melt equilibration is particularly well constrained as pressure strongly affects melt composition. When the model of Till et al. (2012) is applied to the nine MGVF calc-alkaline melts studied by Pu et al. (2017) with Mg# values ≥73 (the criterion for direct partial melts of the mantle), calculated depths at the time of melt segregation under hydrous conditions (~6 wt% H_2O) are 1.3-1.7 GPa (~42-54 km), with an average at

1.5 GPa. The effect of dissolved water in the melt introduces a small correction of 0.1-0.2 GPa for 4 - 8 wt% H_2O, respectively. This average pressure of melt segregation for the MGVF calc-alkaline suite is consistent with depths of final melt equilibration and segregation inferred for mantle-derived melts from other volcanic arcs (e.g., Grove et al., 2006; Fig. IV-15).

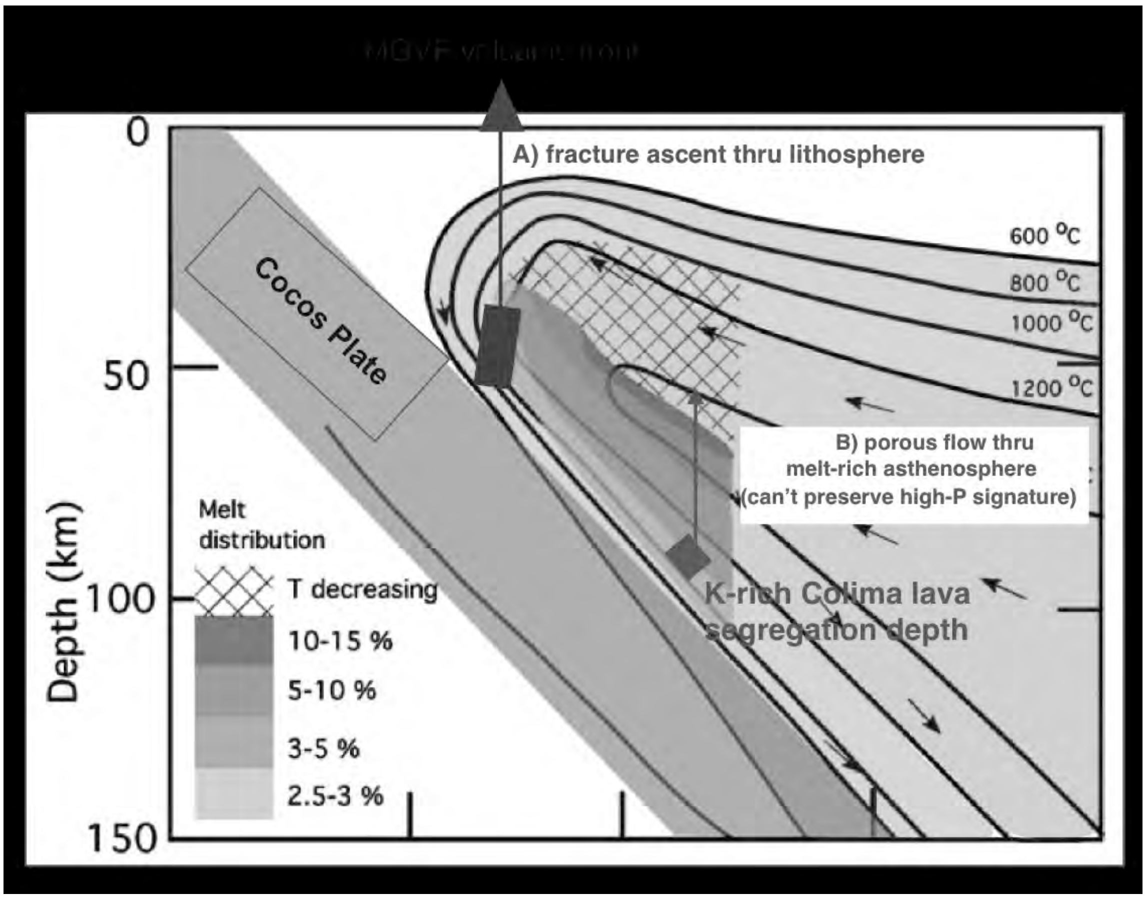


Figure IV-15 Modified from Grove et al. (2006), a subduction zone cross section showing the temperature distribution and H_2O fluxed melting processes in the mantle wedge. The thermal structure was taken from Kelemen et al. (2003). Melting fraction is calculated with the solidus parameterization presented in Grove et al. (2006). The Colima cone melts and the MGVF melts are plotted on this figure based on estimates of the temperature and pressure when they were segregated from their mantle source. This is an unlikely scenario for the Colima lava to preserve the high pressure mantle melting signatures observed in the samples.

A melt segregation depth of ~1.5 GPa, followed by adiabatic ascent along a fracture, allows temperature corrections to T_{Ni} (the onset of olivine crystallization at ≤ 1 GPa) to be made. In this case, a pressure difference between melt segregation and the onset of olivine crystallization of ~0.5-1.0 GPa leads to temperature adjustments of 20-40 degrees. These corrections lead to melt-segregation temperatures of ~1100-1220 °C for the MGVF suite. When these temperature-pressure conditions for melt segregation are mapped on to the arc mantle wedge (Fig. IV-15), the results are fully consistent with available models of the thermal structure of subduction zones (Kelemen et al., 2003; Johnson et al., 2009).

4.11.4 Experimental constraints on depth of melt segregation: K-rich Colima cones

The compositional characteristics of the Colima cones, combined with experimental phase-equilibrium experiments on relevant mantle rocks from the literature, also allow constraints to be placed on their depth of mantle segregation, prior to ascent along fractures. The K-rich character of the Colima cones (Fig. IV-3) shows that phlogopite was a likely mineral phase in their mantle source prior to partial melting, as argued in several previous studies (Luhr and Carmichael, 1981; Carmichael et al., 1996; Luhr, 1997; Carmichael et al., 2006; Vigouroux et al., 2008). Based on the experimentally-determined bulk partition coefficient for K_2O between melt and phlogopite-free lherzolite of 0.0019 ± 0.003 (Davis and Hirschmann, 2013), in order to form the K-rich Colima melts (K_2O ≤ 4.6 wt%), assuming an average melt fraction of ~5 %, the mantle source must have contained ~0.24 wt% K_2O, which is >40 times higher than average (depleted) upper mantle (Workman and Hart, 2005) and ~10 times higher than primitive mantle (McDonough and Sun, 1995). At these K_2O concentrations, phlogopite forms under all pressure-temperature conditions in the mantle lithosphere (Modreski and Boetther, 1972; 1973; Sato et al., 1997; Wendlandt and Eggler, 1980), and ≤ 1300°C in the asthenosphere if some fluorine is present (Codnamine et al., 2016). Thus, a phlogopite-bearing mantle source for the Colima cones is clearly implicated. The only open question is whether phlogopite was residual or had melted out at the time of melt segregation of the Colima melts. This question can be evaluated through a comparison of Colima melt compositions with those of experimental partial melts on a phlogopite-bearing lherzolite at 1 and 3 GPa (Condamine and Medard, 2014; Condamine et al., 2016).

The K_2O content of the experimental partial melts are plotted as a function of melt fraction (Fig. IV-16), which varies with temperature and H_2O content at a fixed depth. At a fixed pressure, the most important control on the experimental melt K_2O composition is melt fraction, irrespective of whether it increases due to increasing temperature and/or increasing H_2O content in the melt (e.g., Tenner et al., 2012). The experimental melts from the phlogopite-lherzolite of Condamine and Medard (2014) and Condamine et al. (2016) have K_2O contents that are buffered at ~6 and ~4 wt%, respectively, at 3 and 1 GPa, if phlogopite is residual. However, after phlogopite melts out, continued partial melting of the lherzolite progressively dilutes the K_2O concentration in the melts (Fig. IV-16). Only two Colima samples (COL-1013 and 1015; Table IV-1) have K_2O contents (4.6 and 3.9 wt%) consistent with residual phlogopite at the time of melt segregation, but only under shallow conditions

(~1 GPa). If melt segregation was deeper (e.g., 3 GPa), then phlogopite could not have been residual for any of the melt compositions.

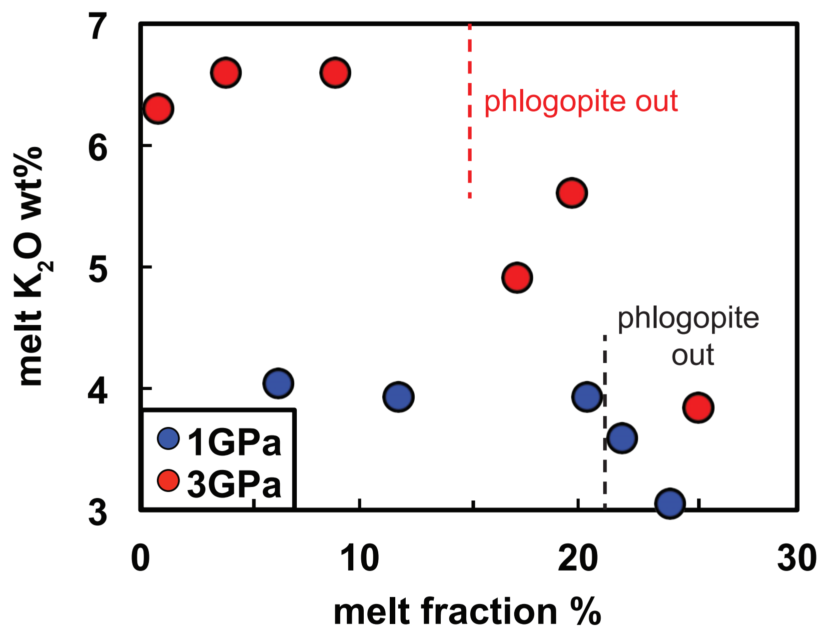


Figure IV-16 K_2O vs melt fraction (%) plot of phlogopite bearing lherzolite melting experiments at 1GPa (blue) and 3GPa (red) from Tenner et al. (2012).

The experiments of Condamine and Medard (2014) and Condamine et al. (2016) additionally permit constraints on the depths of partial melting, since melt compositions vary strongly with pressure. For example, MgO vs. SiO_2 trends are markedly different for the experimental melts at 1 vs. 3 GPa (Fig. IV-17a). The K-rich Colima melts plot at intermediate MgO and SiO_2 contents, but closer to the 3 GPa results, which suggests segregation at depths of ~2.5 GPa. A similar plot is shown for Al_2O_3 vs. SiO_2 (Fig. IV-17b), which again illustrates different trend lines for experimental melts produced at 1 and 3 GPa, and the Colima melt compositions are again consistent with segregation depths of ~2.5 GPa. This pressure places the mantle in the garnet stability field, consistent with the conclusion reached by Luhr (1997) and Vigouroux et al. (2008) that the K-rich Colima melts originated from a mantle source in the garnet-stability field.

Melt segregation at ~2.5 GPa (~80 km) requires a relatively large temperature correction to T_{Ni} (the onset of olivine crystallization at ≤ 1 GPa) of ~60+ degrees to account for adiabatic ascent between ~2.5 and ≤ 1.0 GPa. This correction leads to melt segregation temperatures for the K-rich Colima melts at ~2.5 GPa (~80 km depth) that range from ~1120-1285°C. These segregation temperatures largely overlap with those inferred for the MGVF calc-alkaline basalts (~1100-1220 °C), but extend to higher values for the melts with ~13 wt% MgO. Nonetheless, to first order, the temperatures at the time of melt segregation are broadly similar between the calc-alkaline MGVF basalts and the K-rich Colima melts. What is different is their respective depths of melt segregation.

When the temperature-pressure conditions for melt segregation for the K-rich Colima melts are mapped on to the arc mantle wedge (Fig. IV-15), it is readily seen that they plot immediately above the subducted slab at depths of ~80-100 km. This is where Luhr (1997) and Vigouroux et al. (2008) infer the K-rich Colima melts are formed in asthenospheric mantle wedge beneath the Colima rift. However, the diagram in Figure IV-15 illustrates why this placement for the T-P region where the Colima melts segregated from the mantle cannot be accurate. The ascent of these melts is necessarily through porous flow in a melt-rich asthenosphere, which will

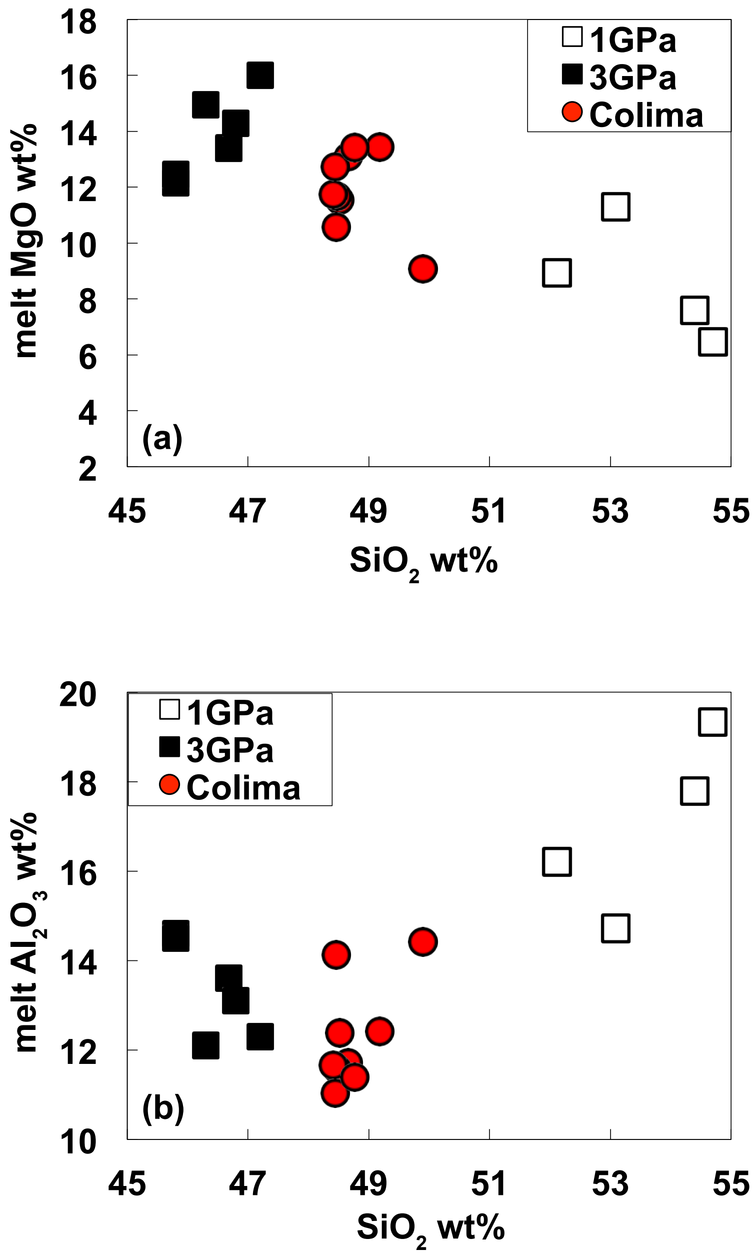


Figure IV-17 a) MgO; b) Al_2O_3, vs SiO_2 plots of phlogopite bearing lherzolite melting experiments at 1GPa (white) and 3GPa (black) from Tenner et al. (2012). The Colima primitive melts are also plotted there, indicating a melting depth between 1GPa and 3GPa, at approximately 2.5GPa.

cause the K-rich melts to mix with larger degree melt of the asthenosphere at shallower depths. It will not be possible for the Colima melts to preserve the high-pressure (~80 km depth) compositional signature of their melt segregation. Thus, there must be an entirely different source region for the K-rich Colima cones than depicted in Figure IV-15.

4.12 Evidence that the Colima rift overlies a pre-existing suture between two lithospheric blocks of different age and thickness: implications for origin of K-rich Colima cones

The relatively shallow depth of segregation for the MGVF mantle-derived melts, prior to rapid ascent along a fracture through the lithosphere to the surface, constrains the thickness of the lithosphere to be < 50 km beneath the volcanic front of the MGVF. This relatively thin lithosphere is consistent with thermal models of Keleman et al. (2003) and Johnson et al. (2009) that show a similar thickness for the lithosphere in the overriding plate at the location of a volcanic front (Fig. IV-15). In contrast, the deeper depth of segregation for the Colima melts, prior to their rapid ascent along a fracture through the lithosphere, indicates a significantly thicker lithosphere (~80 km) beneath the K-rich Colima cones in the Colima rift. At first glance, this appears counter-intuitive since the Colima rift is presumably undergoing lithosphere extension and perhaps thermal erosion associated with upwelling asthenosphere through the tear in the Rivera and Cocos plates. However, this apparent contradiction can be explained by the location of the Colima rift along a major boundary between the Cretaceous lithosphere of the Jalisco block to the west and younger (Eocene-Oligocene) lithosphere to the east. A pre-existing suture beneath the Colima rift that juxtaposes relatively thick (~80 km) Jalisco lithosphere and relatively thin (<50 km) younger lithosphere may explain the eruption of the K-rich Colima cones within the Colima rift northwest of the voluminous Nevado-Colima andesite edifice (Fig. IV-2).

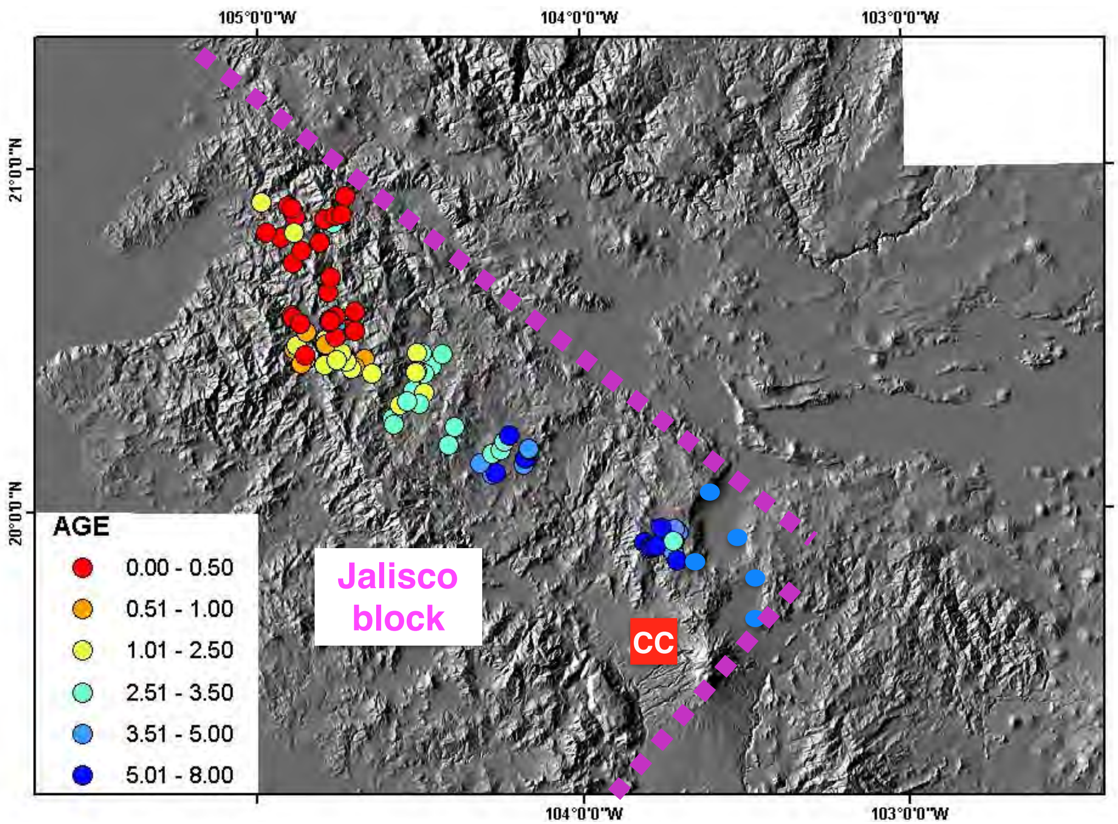


Figure IV-18 A plot of $^{40}Ar/^{39}Ar$ ages for K-rich minette and absarokite melts (and associated lavas) across the Jalisco block of western Mexico from the unpublished Ph.D. thesis of Ownby (2007). Also shown are the locations of the Pliocene lamprophyre lavas from Allan and Carmichael (1984) in the northern Colima rift, as well as the location of the young (<0.5 Ma) K-rich Colima melts in the large red box (labeled CC for Colima cones). Importantly, the proposed outline of the Cretaceous Jalisco block is presented in the dashed purple line. The northern boundary along the Rio Ameca was established in Frey et al. (2007), whereas the NE-SW location of the eastern boundary, such that cuts the N-S Colima rift at an angle, is proposed in this study.

All of the K-rich absarokites and minettes in western Mexico that follow the CJVL (^{40}Ar-^{39}Ar ages from Ownby, 2007), as well as the K-rich Colima cones, appear to have erupted through the Cretaceous Jalisco block (Fig. IV-18). In Figure IV-18, a digital elevation model for west-central Mexico is shown with a proposed eastern boundary of the Cretaceous Jalisco block, which was completely unaffected by the intense Eocene-Miocene volcanism of the Sierra Madre Occidental province that affected the lithosphere underneath the MGVF (e.g., Aranda-Gomez and McDowell, 1998; McBirney et al., 1987). Here we propose that the suture between the two lithospheric blocks (of different age and magmatic history) has a NE orientation that cuts the N-S Colima rift at an angle, such that the northern Colima rift is underlain by Jalisco lithosphere and the Colima-Nevado andesitic edifice is on the suture.

We further propose that it was the juxtaposition of two distinctly different lithospheric blocks of different thickness that led to a steeper slab dip beneath the Jalisco block and the eventual tear between the Rivera and Cocos plate. In other words, the greater thickness of the Jalisco lithosphere may explain the steeper dip of the Rivera plate, which subducts beneath it, relative to the shallower dip of the Cocos plate, which subducts beneath the younger and thinner lithosphere to the east. The pre-existing location of the suture between these two lithospheric blocks may have determined the location of the tear between the Rivera and Cocos plates, which in turn controlled the location of the Colima rift.

4.13 Mantle origin of K-rich Colima melts: asthenosphere vs. lithosphere?

If the K-rich Colima melts originated in close association with the Jalisco block, a remaining open question is whether they formed in the asthenosphere immediately beneath the lithosphere or along the base of the lithosphere, where it is in contact with hot asthenosphere. In either case, the evidence of ≤ 6.7 wt% H_2O in the K-rich Colima melts shows the direct involvement of slab-derived fluid from the active subduction of the Rivera plate. As pointed out by Vigouroux et al. (2008), such high water concentrations cannot be obtained by fluid-absent melting of phlogopite-bearing peridotite. However, active involvement of a slab-derived fluid does not preclude an origin within the lithosphere, as illustrated in Figure IV-19.

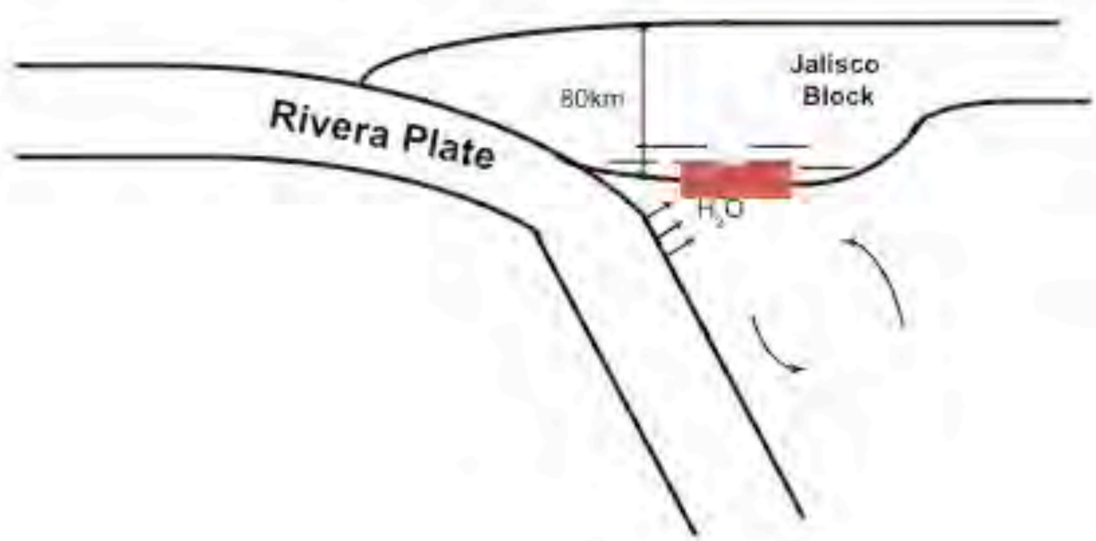


Figure IV-19 A sketch of the subduction of Rivera plate underneath the thickend Jalisco Block.

It is through comparison of the K-rich Colima cones to other potassic lavas around the world that leads to the hypothesis of a lithospheric mantle source, previously hydrated by slab-derived fluids in an earlier episode of subduction. In fact, the most common tectonic setting for K-rich mantle-derived lavas, especially those that display extreme enrichments of the “arc signature” (e.g., Ba/La ratios), is a post-subduction setting in an active extensional environment. Well-documented examples in the United States include the Pliocene absarokites and minettes erupted through the Cretaceous Sierra Nevada lithosphere (e.g., Van Kooten, 1980; Feldstein and Lange, 1999; Farmer et al., 2002; Elkins-Tanton and Grove, 2003) in broad association with deep lithosphere delamination as well as Basin and Range extension. In the case of the Sierra Nevada K-rich melts, there was no active subduction at the time of their eruption at ~3 Ma, and their isotopic signatures require that subduction-related metasomatism of the sub-continental lithosphere occurred during the Mesozoic or older. In the case of the K-rich Colima cones, it is difficult to unequivocally locate their mantle source, except to conclude that they were probably formed and segregated close to the lithosphere/asthenosphere boundary of the Jalisco block at ~80 km depth (Fig. IV-19).

4.15 Conclusions and implications

In this study, multiple lines of evidence from olivine mineral chemistry and texture demonstrate that in each of the high-K absarokites and minettes from the Colima Cones, the most Fo-rich olivine composition is in equilibrium with a liquid represented by the whole rock composition. Therefore, a new olivine-melt Ni thermometer could be applied to calculated the temperature at the onset of olivine crystallization. The result suggests a range between 1060 – 1223˚C for these samples.

For the primitive samples from the Colima Cones (MgO>11 wt%), the depth of melt segregation from the mantle is determined to be ~80km (2.5GPa), based on comparison with the experimental literature on phlogpite-bearning lherzolite melting. This is also consistent with the conclusion reached by Luhr et al. (1997) and Vigouroux et al., 2008 that these melt formed in garnet stability field. In addition, results from this study suggests that the melts were segregated at the bottom of the lithosphere, and rapidly ascended through fractures, so that they preserved the geochemical signature from mantle melting at depths (2.5GPa). In comparsion, the primitive MGVF samples to the east of the Colima Cones were segregated at depths of ~50km (1.5GPa) in the asthenosphere. The seemingly dilemmatic result is consistent with an old (Crateceous), thicker lithosphere of the Jalisco block beneath the Colima Cones; whereas the Oligocene lithosphere under MGVF was thinned during the Eocene-Miocene ignimbright flare-up in the Sierra Madre Occidental Province. The suture between the two blocks is located beneath the Colima Rift with a slightly different orientation, and is related to the different dipping angle of the Rivera and Cocos plate subduction.

4.16 References

Allan, J.F. (1986) Geology of the Northern Colima and Zacoalco Grabens, southwest Mexico: Late Cenozoic rifting in the Mexican Volcanic Belt. Geological Society of America Bulletin, 97, 473.

Almeev, R.A., Holtz, F., Koepke, J., Parat, F., Botcharnikov, R.E. (2007) The effect of H_2O on olivine crystallization in MORB: experimental calibration at 200 MPa. American Mineralogist, 92, 670-674.

Aranda-Gómez, J.J., and Mcdowell, F.W. (1998) Paleogene Extension in the Southern Basin and Range Province of Mexico: Syndepositional Tilting of Eocene Red Beds and Oligocene Volcanic Rocks in the Guanajuato Mining District. International Geology Review, 40, 116–134.

Backnaes, L., and Deubener, J. (2011). Experimental Studies on Sulfur Solubility in Silicate Melts at Near-Atmospheric Pressure. Reviews in Mineralogy and Geochemistry, 73, 143–165.

Baker, D.R., and Moretti, R. (2011) Modeling the Solubility of Sulfur in Magmas: A 50-Year Old Geochemical Challenge. Reviews in Mineralogy and Geochemistry, 73, 167–213.

Ballhaus, C., Berry, R.F., and Green, D.H. (1991) High pressure experimental calibration of the olivine-orthopyroxene-spinel oxygen geobarometer: implications for the oxidation state of the upper mantle. Contributions to Mineralogy and Petrology, 107, 27–40.

Bandy, W.L., Mortera-Gutierrez, C.A., Urrutia-Fucugauchi, J., (1991) Gravity survey of the Colima graben, Mexico. EOS Trans. American. Geophysical. Union 72, 469.

Beattie, P. (1993) Olivine-melt and orthopyroxene-melt equilibria. Contributions to Mineralogy and Petrology, 115, 103-111.

Bouhifd, M.A., Besson, P., Courtial, P., Gérardin, C., Navrotsky, A., and Richet, P. (2006) Thermochemistry and melting properties of basalt. Contributions to Mineralogy and Petrology, 153, 689–698.

Brounce, M.N., Kelley, K.A., Cottrell E. (2014) Variations in Fe3+/∑Fe of Mariana Arc basalts and mantle wedge fO_2. Journal of Petrology, 55, 2513-2536.

Carmichael, I.S.E., Lange, R.A., and Luhr, J.F. (1996) Quaternary minettes and associated volcanic rocks of Mascota, western Mexico: a consequence of plate extension above a subduction modified mantle wedge. Contributions to Mineralogy and Petrology, 302–333.

Carmichael, I. S. E., Frey, H. M., Lange, R. A., & Hall, C. M. (2006). The Pleistocene cinder cones surrounding Volcán Colima, Mexico re-visited: eruption ages and volumes, oxidation states, and sulfur content. Bulletin of Volcanology, 68(5), 407–419.

Condamine, P., Médard, E., and Devidal, J.-L. (2016) Experimental melting of phlogopite-peridotite in the garnet stability field. Contributions to Mineralogy and Petrology, 171, 1–26.

Condamine, P., and Médard, E. (2014) Experimental melting of phlogopite-bearing mantle at 1 GPa: Implications for potassic magmatism. Earth and Planetary Science Letters, 397, 80–92.

Davis, F.A., and Hirschmann, M.M. (2013) The effects of K2O on the compositions of near-solidus melts of garnet peridotite at 3 GPa and the origin of basalts from enriched mantle. Contributions to Mineralogy and Petrology, 166, 1029–1046.

DeMets, C., and Traylen, S. (2000) Motion of the Rivera plate since 10 Ma relative to the Pacific and North American plates and the mantle. Tectonophysics, 318, 119–159.

Elkins-Tanton, L.T., Chatterjee, N., and Grove, T.L. (2003) Experimental and petrological constraints on lunar differentiation from the Apollo 15 green picritic glasses. Meteoritics & Planetary Science, 38, 515–527.

Farmer, G. L., Glazner, A.F., and Manley, C.R. (2002) Did lithospheric delamination trigger late Cenozoic potassic volcanism in the southern Sierra Nevada, California? Geological Society of America Bulletin, 114, 754–768.

Feldstein, S.N., and Lange, R.A. (1999) Pliocene Potassic Magmas from the Kings River Region, Sierra Nevada, California: Evidence for Melting of a Subduction-Modified Mantle. Journal of Petrology, 40, 1301–1320.

Ferrari, L., and Rosas-Elguera, J. (2000) Late Miocene to Quaternary extension at the northern boundary of the Jalisco Block, western Mexico: The Tepic-Zacoalco Rift revised. In Cenozoic tectonics and volcanism of Mexico Vol. 334, pp. 41–63. Geological Society of America.

Frey, H.M., Lange, R.A., Hall, C.M., Delgado-Granados, H., and Carmichael, I.S.E. (2007) A Pliocene ignimbrite flare-up along the Tepic-Zacoalco rift: Evidence for the initial stages of rifting between the Jalisco block (Mexico) and North America. Geological Society of America Bulletin, 119, 49–64.

Grove, T.L., Chatterjee, N., Parman, S.W., and Médard, E. (2006) The influence of H2O on mantle wedge melting. Earth and Planetary Science Letters, 249, 74–89.

Guo, X., Lange, R.A., Ai, Y. (2014) Density and sound speed measurements on model basalt (An-Di-Hd) liquids at one bar: New constraints on the partial molar volume and compressibility of the FeO component. Geochimica et Cosmochimica Acta, 388, 283-292.

Hasenaka, T., and Carmichael, I.S.E. (1985) The cinder cones of Michoacán—Guanajuato, central Mexico: their age, volume and distribution, and magma discharge rate. Journal of Volcanology and Geothermal Research, 25, 105–124.

Herzberg, C., and O'Hara, M.J. (2002) Plume-associated ultramafic magmas off Phanerozoic age. Journal of Petrology, 43, 1857-1883.

Hewitt, I.J., and Fowler, A.C. (2008) Partial melting in an upwelling mantle column. Proceedings of the Royal Society of London A: Mathematical, Physical and Engineering Sciences, 464, 2467–2491.

Jayasuriya, K. D., O'Neill, H. St. C., Berry, A. J., Campbell, S. J. (2004) A Mössbauer study of the oxidation state of Fe in silicate melts. American Mineralogist, 89, 1597-1609.

Johnson, E.R., Wallace, P.J., Cashman, K.V., Delgado-Granados, H., Kent, A.J.R. (2008) Magmatic volatile contents and degassing-induced crystallization at Volcán Jorullo, Mexico: Implications for melt evolution and the plumbing systems of monogenetic volcanoes. Earth and Planetary Science Letters, 269, 478-487.

Johnson, E.R., Wallace, P.J., Granados, H.D., Manea, V.C., Kent, A.J.R., Bindeman, I.N., Donegan, C.S. (2009) Subduction-related volatile recycling and magma generation beneath Central Mexico: Insights from melt inclusions, oxygen isotopes and geodynamic models. Journal of Petrology, 50, 1729-1764.

Kelemen, P.B., Rilling, J.L., Parmentier, E.M., Mehl, L., and Hacker, B.R. (2003) Thermal structure due to solid-state flow in the mantle wedge beneath arcs. In Inside the Subduction Factory Vol. 138, pp. 293–311. American Geophysical Union, Washington, D. C.

Kelley, K.A., and Cottrell, E. (2009) Water and the Oxidation State of Subduction Zone Magmas. Science, 325, 605–607.

Lange, R.A. (1997) Temperature independent thermal expansivities of sodium aluminosilicate melts between 713 and 1835 K: Erratum to R. A. Lange (1996) Geochimica et Cosmochimica Acta 60, 4989–4996. Geochimica et Cosmochimica Acta, 61, 3275–3276.

Lange, R.A., and Carmichael, I.S.E. (1990) Hydrous basaltic andesites associated with minette and related lavas in Western Mexico. Journal of Petrology, 31, 1225-1259.

Lange, R.A., and Navrotsky, A. (1993) Heat capacities of TiO2-bearing silicate liquids: Evidence for anomalous changes in configurational entropy with temperature. Geochimica et Cosmochimica Acta, 57, 3001–3011.

Li, C., and Ripley, E.M. (2010) The relative effects of composition and temperature on olivine-liquid Ni partitioning: statistical deconvolution and implications for petrologic modeling. Chemical Geology, 275, 99–104.

Luhr, J.F., Aranda-Gómez, J.J., and Pier, J.G. (1989) Spinel-lherzolite-bearing quaternary volcanic centers in San Luis Potosí, Mexico: 1. Geology, mineralology, and petrology. Journal of Geophysical Research, 94, 7916–7940.

Luhr, J.F. (1997) Extensional tectonics and the diverse primitive volcanic rocks in the western Mexican volcanic belt. The Canadian Mineralogist, 35, 473–500.

Luhr, J.F., and Carmichael, I.S.E. (1981) The Colima volcanic complex, Mexico: Part II. Late-quaternary cinder cones. Contributions to Mineralogy and Petrology, 76,127–147

Luhr, J.F., and Carmichael, I.S.E. (1985) Jorullo Volcano, Michoacán, Mexico (1759-1774): The earliest stages of fractionation in calc-alkaline magmas. Contributions to Mineralogy and Petrology, 90, 142-161.

Maria, A.H., and Luhr, J.F. (2008) Lamprophyres, Basanites, and Basalts of the Western Mexican Volcanic Belt: Volatile Contents and a Vein–Wallrock Melting Relationship. Journal of Petrology, 49, 2123–2156.

Matzen, A.K., Baker, M.B., Beckett, J.R., Stolper, E.M. (2013) The temperature and pressure dependence of nickel partitioning between olivine and silicate melt. Journal of Petrology, 54, 2521-2545.

McBirney, A.R., Taylor, H.P., and Armstrong, R.L. (1987) Paricutin re-examined: a classic example of crustal assimilation in calc-alkaline magma. Contributions to Mineralogy and Petrology, 95, 4–20.

Mcdowell, F.W., and Clabaugh, S.E. (1979) Ignimbrites of the Sierra Madre Occidental and their relation to the tectonic history of western Mexico. In Ash-Flow Tuffs Vol. 180, pp. 113–124. Geological Society of America.

Mcdonough, W.F., and Sun, S.-s. (1995) The composition of the Earth. Chemical Geology, 223–253.

Médard, E., and Grove, T.L. (2008) The effect of H2O on the olivine liquidus of basaltic melts: experiments and thermodynamic models. Contributions to Mineralogy and Petrology, 155, 417-432.

Modreski, P.J., and Boettcher, A.L. (1972) The stability of phlogopite + enstatite at high pressures; a model for micas in the interior of the Earth. American Journal of Science, 272, 852–869.

Modreski, P.J., and Boettcher, A.L. (1973) Phase relationships of phlogopite in the system K2O-MgO-CaO-Al2O3 -SiO2 -H2O to 35 kilobars; a better model for micas in the interior of the Earth. American Journal of Science, 273, 385–414.

Moore, G., and Carmichael, I.S.E. (1998) The hydrous phase equilibria (to 3 kbar) of an andesite and basaltic andesite from western Mexico: constraints on water content and conditions of phenocryst growth. Contributions to Mineralogy and Petrology, 130:304-319.

Ochs, F.A., III, and Lange, R.A. (1997) The partial molar volume, thermal expansivity, and compressibility of H 2 O in NaAlSi 3 O 8 liquid: new measurements and an internally consistent model. Contributions to Mineralogy and Petrology, 129, 155–165.

Ownby, S.E. (2007) The detailed eruptive histories of contrasting volcanic fields in western Mexico: implications for the origin and evolution of continental crust. University of Michigan Ph.D. thesis, 206 pp.

Ownby, S.E., Lange, R.A., and Hall, C.M. (2008) The eruptive history of the Mascota volcanic field, western Mexico: Age and volume constraints on the origin of andesite among a diverse suite of lamprophyric and calc-alkaline lavas. Journal of Volcanology and Geothermal Research, 177, 1077–1091.

Ownby, S.E., Lange, R.A., Hall, C.M., Delgado-Granados, H. (2011) Origin of andesite in the deep crust and eruption rates in the Tancítaro-Nueva Italia region of the central Mexican arc. Geological Society of America Bulletin, 123, 274-294.

Pardo, M., and Suárez, G. (1995) Shape of the subducted Rivera and Cocos plates in southern Mexico: Seismic and tectonic implications. Journal of Geophysical Research: Solid Earth, 100, 12357–12373.

Parman, S.W., Grove, T.L., Kelley, K.A., Plank, T. (2011) Along-arc variations in the pre-eruptive H2O contents of Mariana Arc magma inferred from fractionation paths. Journal of Petrology, 52, 257-278.

Pu, X., Lange, R.A., and Moore, G. (2017) A comparison of olivine-melt thermometers based on DMg and DNi: The effects of melt composition, temperature, and pressure with applications to MORBs and hydrous arc basalts. American Mineralogist, 102, 750–765.

Putirka, K.D., Perfit, M., Ryerson, F.J., Jackson, M.G. (2007) Ambient and excess mantle temperatures, olivine thermometry, and active vs. passive upwelling. Chemical Geology, 241, 177-206.

Righter, K., and Rosas-Elguera, J. (2001) Alkaline Lavas in the Volcanic Front of the Western Mexican Volcanic Belt: Geology and Petrology of the Ayutla and Tapalpa Volcanic Fields. Journal of Petrology, 42, 2333–2361.

Righter, K., and Carmichael, I.S.E. (1996) Phase equilibria of phlogopite lamprophyres from western Mexico: biotite-liquid equilibria and P-T estimates for biotite-bearing igneous rocks. Contributions to Mineralogy and Petrology, 123, 1-21.

Rosas-Elguera, J., Ferrari, L., Garduño-Monroy, V.H., and Urrutia-Fucugauchi, J. (1996) Continental boundaries of the Jalisco block and their influence in the Pliocene-Quaternary kinematics of western Mexico. Geology, 24, 921.

Sato, K., Katsura, T., and Ito, E. (1997) Phase relations of natural phlogopite with and without enstatite up to 8 GPa: implication for mantle metasomatism. Earth and Planetary Science Letters, 146, 511–526.

Sisson, T.W., and Grove, T.L. (1993a) Experimental investigations of the role of H2O in calc-alkaline differentiation and subduction zone magmatism. Contributions to Mineralogy and Petrology, 113,143-166.

Sisson, T.W., and Grove, T.L. (1993b) Temperatures and H2O contents of low-MgO high-alumina basalts. Contributions to Mineralogy and Petrology, 113, 167-184.

Sugawara, T. (2000) Empirical relationships between temperature, pressure, and MgO content in olivine and pyroxene saturated liquid. Journal of Geophysical Research: Solid Earth, 105, 8457–8472.

Tenner, T.J., Hirschmann, M.M., and Humayun, M. (2012) The effect of H 2O on partial melting of garnet peridotite at 3.5 GPa. Geochemistry, Geophysics, Geosystems, 13,Q03016.

van Kooten, G.K. (1980) Mineralogy, Petrology, and Geochemistry of an Ultrapotassic Basaltic Suite, Central Sierra Nevada, California, U.S.A. Journal of Petrology, 21, 651–684.

Vigouroux, N., Wallace, P.J., and Kent, A.J.R. (2008) Volatiles in High-K Magmas from the Western Trans-Mexican Volcanic Belt: Evidence for Fluid Fluxing and Extreme Enrichment of the Mantle Wedge by Subduction Processes. Journal of Petrology, 49, 1589–1618.

Wagner, T.P., Donnelly-Nolan, J.M., Grove, T.L. (1995) Evidence of hydrous differentiation and crystal accumulation in the low-MgO, high Al2O3 Lake

Basalt from Medicine Lake volcano, California. Contributions to Mineralogy and Petrology, 121, 201-216.

Wallace, P., and Carmichael, I.S.E. (1989) Minette lavas and associated leucitites from the western front of the Mexican Volcanic Belt: petrology, chemistry, and origin. Contributions to Mineralogy and Petrology, 103, 470–492.

Waters, L.E., Andrews, B.J., Lange, R.A. (2015) Rapid crystallization of plagioclase phenocrysts in silicic melts during fluid-saturated ascent: phase equilibrium and decompression experiments. Journal of Petrology, 56, 981-1006.

Welsch, B., Hammer, J., Hellebrand, E. (2014) Phosphorus zoning reveals dentritic architecture of olivine. Geology, 42, 867-870.

Wendlandt, R.F., and Eggler, D.H. (1980) Stability of sanidine + forsterite and its bearing on the genesis of potassic magmas and the distribution of potassium in the upper mantle. Earth and Planetary Science Letters, 51, 215–220.

Workman, R.K., and Hart, S.R. (2005) Major and trace element composition of the depleted MORB mantle (DMM). Earth and Planetary Science Letters, 231, 53–72.

Yang, T., Grand, S.P., Wilson, D., Guzman-Speziale, M., Gomez-Gonzalez, J.M., Dominguez-Reyes, T., and Ni, J. (2009) Seismic structure beneath the Rivera subduction zone from finite-frequency seismic tomography. Journal of Geophysical Research: Solid Earth, 114, 277–12.

Chapter V

Evidence for degassing-induced oxidation of sulfate-rich hydrous high-Mg magmas with enhanced arc geochemical signatures from Colima Volcanic Field, Mexico

5.1 Abstract

In this chapter, a new proxy is developed to constrain pre-eruptive oxidation state based on olivine-melt exchange coefficient ${}^{Fe\text{-}Mg}K_D$, and the most Mg-rich olivine in the sample. This new proxy provides constraints on the oxidation states of the magma at the onset of olivine crystallization. When it is applied to the calc-alkaline basalts and basaltic andesites from MGVF (Michoachan Guanajuato Volcanic Field) in the Mexican Arc, the Fe^{3+}/Fe^{T} ratios range from 0.23 to 0.32, with an average ΔNNO of +0.6, within the general range of global arc basalts. When this method was applied to the Colima Cone minettes and absarokites (Chapter IV of this dissertation), the calculated Fe^{3+}/Fe^{T} ratio of the melt at the onset of olivine crystallization ranges from 0.33 to 0.52, corresponding to a range of ΔNNO value of +1.9 to +3.1. However, these results are, on average, 1 log unit lower than that obtained from direct ferric-ferrous analyses of the pristine whole rock samples.

The high oxidation state of these Colima Cone samples is consistent with the high sulfur content measured from melt inclusions (up to 7800ppm) and the whole

rock (up to 1000ppm), since the solubility of sulfur increase exponentially at higher oxygen fugacity (from NNO to NNO+2). It has been proposed in the literature that degassing of this dissolved sulfate in the melt to SO_2 and H_2S components in the gas phase could drive syn-degassing oxidation, but there hasn't been observation of such process from natural samples. This is the first documentation of sulfur degassing induced oxidation of the melt, due to the stabilization of sulfate species and higher total sulfur solubility in the melt at higher oxygen fugacity prior to the ascent and degassing of these primitive melts.

5.2 Introduction

Global volcanic gas fluxes estimates have shown that over 1 million tons of H_2O, 145 kT of CO_2, and 30kT of sulfur are released to Earth atmosphere every day (Hilton et al., 2002; Fischer, 2008; Shinohara 2013). It has long been understood that the degassing of H-C-S-O-Cl volatiles from in magmatic systems could induce change in the oxidation state of magmas (e.g. Mathez, 1984; Candela, 1986; Carmichael, 1991; Gerlach, 1993; Holloway, 2004; Burgisser and Scaillet, 2007; Metrich et al., 2009; Bell and Simon, 2011; Moussallam et al., 2014, 2016; Gaillard et al., 2015; Brounce et al., 2017). The redox change caused by volcanic degassing is essential to our understanding of the secular evolution of Earth atmosphere (e.g. Gaillard et al., 2011; Brounce et al., 2017) as well as the origin of the oxidation state variation of terrestrial magma in different tectonic settings (Carmichael, 1991, Frost and McCammon, 2008; Kelley and Cottrell, 2012).

It is generally agreed in the literature that the degassing of sulfur species plays a significant role in changing the oxidation state of the melt (e.g. Metrich et al., 2009; Kelley and Cottrell, 2012; Gaillard et al., 2015; Moussallam et al., 2014, 2016) because of its multiple valence states both in the gas phase and as dissolved species in silicate melt. The change can go both ways, as the reduction of the melt accompanied by S^{2-} in the melt turning into SO_2 (S^{4+}) in the gas phase, and the oxidation of the melt accompanied by SO_4^{2-} (S^{6+}) in the melt turning into SO_2 (S^{4+}) in the gas phase. Since S^{2-} is the dominant sulfur species in the melt under reduced conditions (NNO-1 or lower) and SO_4^{2-} is the dominant sulfur species in the melt under oxidized conditions (NNO+1 or above; Jugo et al., 2005), the degassing of sulfur has a diverging effect on the melt oxidation state, depending on the initial sulfur species, which makes oxidized systems more oxidized and reduced systems more reduced (Metrich et al., 2009).

Although both sulfur-degassing-induced oxidation and reduction of the magma have been shown theoretically (e.g. Burgisser and Scaillet, 2007; Gaillard et al., 2015), observations in natural samples from Kilauea (Anderson and Wright, 1972; Carmichael and Ghiorso, 1986; Moussallam et al., 2016; Helz et al., 2017), Mauna Kea (Brounce et al., 2017), Mariana Arc (Kelley and Cottrell, 2012), and Mt. Erebus (Moussallam et al., 2014), have only documented reduction in the melt driven by the sulfur degassing. Sulfur-degassing-induced oxidation of the magma has not been documented in natural terrestrial samples.

In this study, we present evidence for significant degassing-induced oxidation of melts in samples from the Colima cones in the Mexican Volcanic Arc. Based on a previous melt inclusion study (Vigouroux et al., 2008), these samples initially contained significant amount of S^{6+} (S^{6+}/S^T = 0.63-0.91) for total sulfur contents up to 6000ppm, under highly hydrous conditions (up to 6.2wt% H_2O). This study uses ${}^{Fe\text{-}Mg}{}_{oliv/liq}K_D$ and the most Mg-rich olivine grown in the melt to obtain the pre-eruptive melt FeO content, and ferric/ferrous ratio. The ferric/ferrous ratio is then used to calculate an oxygen fugacity using the empiral relation from Jayasuriya et al., (2004).

5.3 Previous work

5.3.1 Constraints on pre-eruptive vs post-eruptive oxidation state

Many previous studies that examined the redox change during degassing used glassy melt inclusions and matrix glasses as the time capsules that track different stages of magma ascent and degassing, usually after deliberate corrections for volatile loss and post-entrapment crystallizations (e.g. Kelley and Cottrell, 2012; Moussallam et al., 2014; Moussallam et al., 2016; Helz et al., 2017; Brounce et al., 2017). For each melt inclusion or glass sample, the entrapment pressure was estimated by applying the measured H_2O and CO_2 contents in the melt inclusions to solubility models (e.g. Papale et al., 2006; Iacano-Marziano et al., 2012); and the fO_2 of the melt is calculated (e.g. Kress and Carmichael, 1991; Jayasuriya et al., 2004) through Fe^{3+}/Fe^T ratio measured by the XANES technique (calibration by Cottrell et al., 2009). For studies that suggest sulfur degassing induced redox change, sulfur content in the glass and sometimes S^{6+}/S^T are also measured by S Kα wavelength by Electron Microprobe (Carroll and Rutherford, 1988 for calibration) or XANES technique (e.g. Metrich et al., 2009 for calibration). When volcanic gas data are available, the fO_2 recorded in the gas (H_2S/SO_2 ratio) is also used for comparisons with those recorded in the melt inclusions and matrix glasses. This well developed and calibrated method, however, is restricted to samples with glassy matrix and/or melt inclusions that record the volatile content at a series of depths during ascent.

An alternative approach is to constrain the pre-eruptive oxidation state with proxies preserved in the phenocrysts during magma ascent and eruption, and to compare them with the post-eruptive oxidation state determined by whole-rock titration of pristine samples. One example is to use the Fe-Ti oxide thermometry and oxybarometry (Ghiorso and Evans, 2008) to estimate the temperature and fO_2 conditions where a magnetite-ilmenite pair observed in the same sample is in equilibrium. For post-eruptive fO_2, the Fe^{3+}/Fe^T ratio of whole rock can be measured by wet chemistry (Wilson, 1960) and applied to parameterizations (e.g. Kilinc et al., 1983; Kress and Carmichael, 1991; Jayasuriya et al., 2004) to calculate the fO_2. This method has been used to demonstrate no oxidation state change during degassing and crystallization of subduction zone andesite and dacite samples (Crabtree and Lange, 2012) and a group of obsidian samples from subduction zones and extensional settings (Waters and Lange, 2016). This method requires the presence of both magnetite and ilmenite in the sample, which is generally less common in mafic volcanic samples.

5.3.2. Geological context of the Colima cone samples

The superimposition of the Colima Rift on the Western-Central Mexican Volcanic Arc leads to the production of alkaline lavas (mostly high potassium) with enriched subduction zone signature in the Colima-Nevado Volcanic Complex (CNVC). Scoria samples from eight cinder cones on the northern margin of CNVC were documented by Luhr and Carmichael (1981) and Carmichael et al. (2006). These samples have high K_2O contents (up to 4.6 wt%) and high Ba/Zr ratios (up to 8.8). Wet chemistry analyses on these highly pristine minette and basanite samples indicate whole-rock Fe^{3+}/Fe^{T} ratio of up to 0.63, which correspond to oxidation states of 2-4 log unit above the Nickel-Nickel Oxide (NNO) buffer, much higher than typical subduction zone lavas. Carmichael et al. (2006) suggested that the extraordinarily high oxidation state of the melts was inherited from interaction with subduction-modified fluid. However, Vigouroux et al. (2008) estimated the pre-eruptive oxygen fugacity (fO_2) of this set of samples based on Cr-spinel oxybarometry (Ballhaus et al., 1991) and S^{6+}/S_{total} ratio (Jugo et al., 2005), and suggested the pre-eruptive fO_2 is lower than the measured value from whole rock wet chemistry. Further investigation is needed.

Melt inclusions from these lavas have been reported to contain up to 6700ppm sulfur (Vigouroux et al., 2008). Sulfur content recorded in melt inclusions from typical arc magma ranges between 900-2500ppm (Wallace and Edmonds, 2011). One of the basaltic eruptions with the highest sulfur release in human history, at Mt Etna, has been reported to contain up to 3200ppm sulfur in the melt inclusions (Metrich et al., 1993). In comparison, the Colima Cones lavas have extremely high sulfur contents. Therefore, the motivation of this study is to examine whether the high oxidation state of the Colima cone samples was solely inherited from the mantle source (modified by subduction zone related oxidizing fluid), or was elevated due to sulfur degassing induced oxidation process.

5.4 Strategy

5.4.1. Using $^{Fe\text{-}Mg}{}_{oliv/melt}K_D$ to constrain pre-eruptive oxidation state

The olivine-melt Fe-Mg partitioning coefficient K_D is defined by the following equation:

$$^{Fe-Mg}_{oliv/melt}K_D = \frac{XMgO_{melt}}{XMgO_{olivine}} \times \frac{XFeO_{olivine}}{XFeO_{melt}} \qquad (1)$$

where, X_i^a is the mole fraction of component i (i = MgO or FeO) in phase a (a = olivine or melt). With a proper K_D value, known MgO and FeO in the olivine and MgO in the melt, the FeO content in the melt can be calculated; with known FeO_T of the liquid, Fe^{2+}/Fe^T of the liquid can then be calculated, and the pre-eruptive fO_2 constrained with models like Kress and Carmichael (1991) or Jayasuriya et al. (2004).

The key using this method to constrain pre-eruptive fO_2 is to: 1) establish olivine-melt equilibrium; and 2) select a K_D value that is appropriate for the system of interest. The hypothesis that the whole rock composition represents a liquid where all the observed olivine phenocrysts in the sample grew from has been tested in chapter IV of this dissertation, and been supported with multiple lines of evidence.

The landmark study of Roeder and Emslie (1970) first established that the Fe-Mg exchange coefficient between olivine and melt ($^{Fe\text{-}Mg}{}_{oliv/liq}K_D$) is independent of temperature and melt composition, and is around 0.30 within their calibration based on some 1-atm experiments on Hawaiian basalts. A few subsequent studies have shown that K_D could actually vary with liquid composition, mostly SiO_2, alkalis and H_2O, and some attempts of formulations were made (e.g. Ford et al., 1983; Gee and Sack, 1988; Snyder and Carmichael, 1992; Toplis, 2005; Putirka, 2016). However, there is no general consensus for an equation that accurately recovers the K_D value of all melt compositions. Therefore, the experimental literature was consulted in search for a proper K_D for these high-K hydrous and oxidized samples from the Colima cones.

An average K_D of 0.37 (±0.04, 1-sigma) was presented for a total of 108 hydrous olivine-melt phase equilibrium experiments in Pu et al. (2017). Among them, 36 experiments have olivine as the only silicate phase (<5 vol.%) besides the melt, and their average K_D is 0.38 (±0.04, 1-sigma), confirming that the 0.37 from the bigger dataset is representative of K_D under equilibrium condition. Among the 108 experiments, there are 6 experiments with melt K_2O and H_2O content both above 2 wt%, representative of the composition of the Colima cone samples. Their average K_D is also 0.37. This is reasonable considering the contradicting effect of melt alkali and H_2O content on K_D: increasing alkali content in the melt leads to lower KD (Gee and Sack, 1988; Toplis, 2005) and increasing H_2O content in the melt leads to higher KD (Toplis, 2005).

5.4.2. Arc basalts and basaltic andesites from MGVF as comparison

The Colima cone samples were also studied in comparison to a set of arc basalt and basaltic andesite samples from Tancitaro Volcanic Field (MGVF), Mexico, with regard to degassing induced oxidation. The comparison of temperature, H_2O content and other geochemical signatures of these two sets of samples have been discussed in Chapter 4 of this dissertation. The method to use olivine-melt K_D to estimate pre-eruptive oxidation state of the melt, and compare it with that obtained by whole rock titration of pristine samples was also applied to the MGVF samples to check for any systematic bias of this new method.

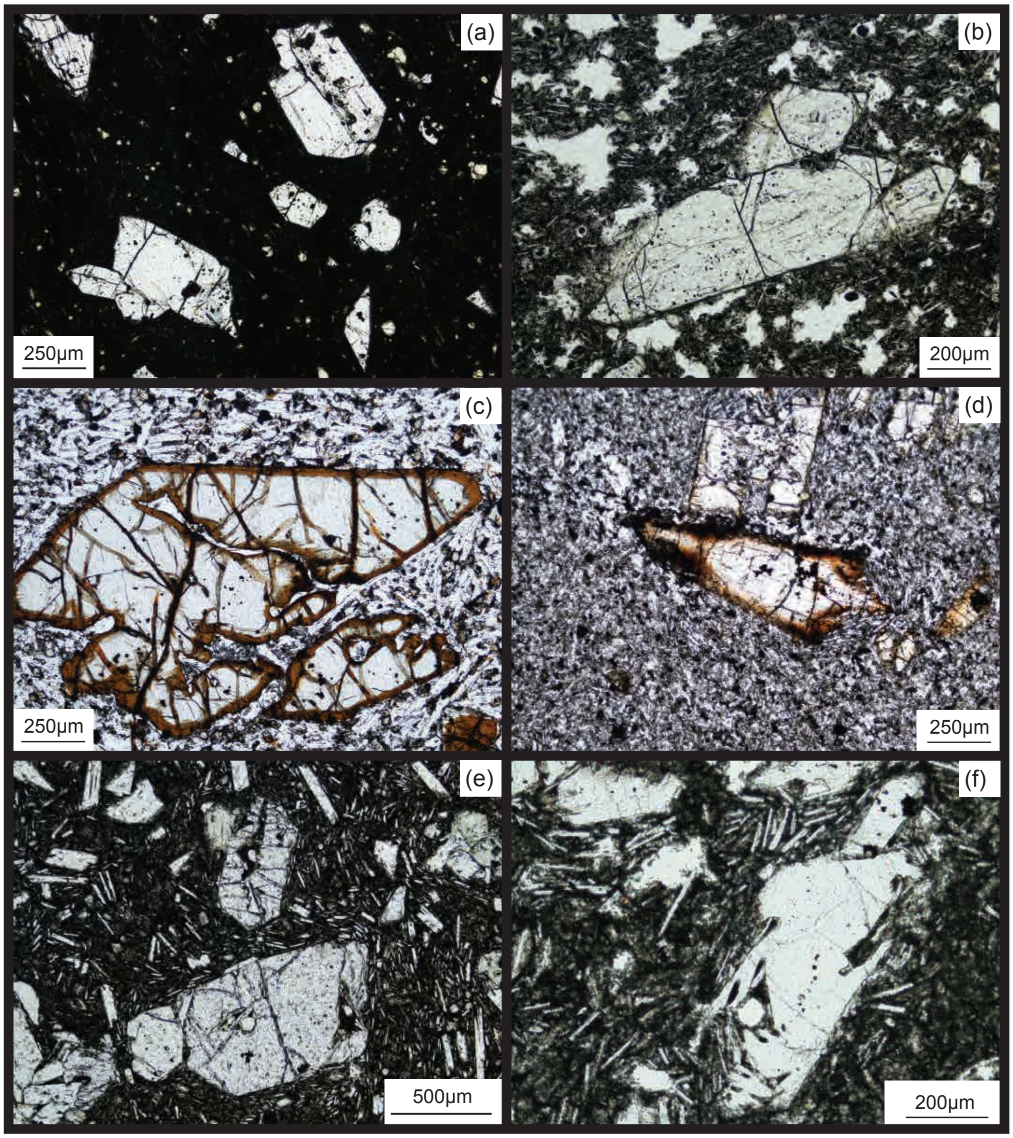


Figure V-1 Photomicroscopic images of olivine phenocrysts in Colima Cone samples (a,b); altered MGVF samples (c,d) and fresh MGVF samples (e,f). The altered MGVF samples have distinct iddingsite rims, which are not observed in any olivine phenocrysts in the Colima Cone samples.

5.5 Results

5.5.1 Whole-rock titration of Fe^{3+}/Fe^T of pristine samples

Whole rock titration results of the 10 Colima Cone samples show a range of Fe^{3+}/Fe^T from 0.27 to 0.63, with the average of 0.52, corresponding to ∆NNO value from +0.7 to +4.0, with an average of +3.0 (Table V-1). The Colima cone samples were fresh with pale green olivine phenocrysts, free of iddingsite on the rim (Fig. V-1). The whole rock X-ray fluorescence (XRF) analyses conducted by Carmichael et al. (2006) showed the total loss of ignition (LOI) for most samples are under 1% with only two samples (Col-1007A, Col-1007B) just a little over 2%. However, there are significant amount of bound water in these minette samples due to the presence of phlogopite. The moisture absorbed to the sample (H_2O- content) is less than 0.5% for all the Colima Cone samples, indicating minimum alteration and oxidation on the surface.

The 14 MGVF samples in this study, on the contrary, have a range of ∆NNO from -1.1 to +1.2, with an average ∆NNO of +0.1. They also have pristine olivine phenocrysts (Fig. V-1) and low LOI (mostly <0.5%, with APA-6 as the highest at 0.83).

To compare the effect of surface alteration and oxidation, whole rock analyses and titration have also been conducted on a set of MGVF samples that has been altered, with visible iddingsite rims on some olivine phenocrysts (Fig.1). The average ∆NNO of these samples are +1.3. The LOI is up to 1%.

The comparisons suggest that even with some surficial alteration and oxidation, the observed high oxidation state in the Colima Cone whole rocks cannot be explained.

Table V-1 Fe^{3+}/Fe^{T} and ΔNNO of Colima Cone samples based on whole rock titration and olivine K_D calculation

Sample #	Col-1003 B	Col-1005 A	Col-1006 B	Col-1007 A	Col-1007 B	Col-1008 B	Col-1013	Col-1015	Col-1016
Whole Rock									
SiO2 (wt%)	48.7	49.2	48.5	48.5	48.4	49.9	48.4	48.8	48.5
FeO^{T}(wt%)	7.45	7.55	7.79	7.07	7.08	8.15	7.63	7.58	8.39
MgO (wt%)	13.09	13.43	11.54	11.67	11.74	9.08	12.73	13.42	10.57
Fe_2O_3 (titration)	5.25	5.29	4.3	4.07	4.63	3.54	5.21	4.47	5.08
FeO (titration)	2.73	2.79	3.92	3.41	2.91	4.96	2.94	3.56	3.82
Fe^{3+}/Fe^{T} (titration)	0.63	0.63	0.50	0.52	0.59	0.39	0.61	0.53	0.54
Mg/Fe (mole)	8.55	8.58	5.25	6.10	7.19	3.26	7.72	6.72	4.93
ΔNNO	4.0	4.0	2.7	2.9	3.6	1.9	3.7	3.0	3.2
Calculation based on olivine KD = 0.37									
max Fo in sample	92.9	93.4	92.6	93.4	92.5	90.4	93.3	92.8	92.6
olivine Mg/Fe	13.0	14.1	12.5	14.2	12.4	9.4	13.9	12.8	12.6
melt Mg/Fe	4.82	5.23	4.64	5.24	4.59	3.49	5.15	4.74	4.65
FeO (melt)	4.84	4.58	4.43	3.97	4.56	4.64	4.41	5.05	4.05
Fe_2O_3 (melt)	2.91	3.30	3.73	3.45	2.80	3.90	3.58	2.82	4.82
Fe^{2+}/Fe^{3+} (melt)	1.85	1.54	1.32	1.28	1.81	1.32	1.37	1.99	0.93
Fe3+/FeT	0.35	0.39	0.43	0.44	0.36	0.43	0.42	0.33	0.52
ΔNNO	1.8	2.1	2.5	2.6	1.9	2.2	2.5	1.6	3.1
ΔfO_2 (post - pre eruption)	2.2	1.9	0.2	0.3	1.7	-0.3	1.2	1.4	0.1
ΔFe3+/FeT (post - pre eruption)	0.28	0.24	0.07	0.08	0.23	-0.04	0.19	0.20	0.03

5.5.2 Pre-eruptive fO_2 constrained from olivine-melt KD

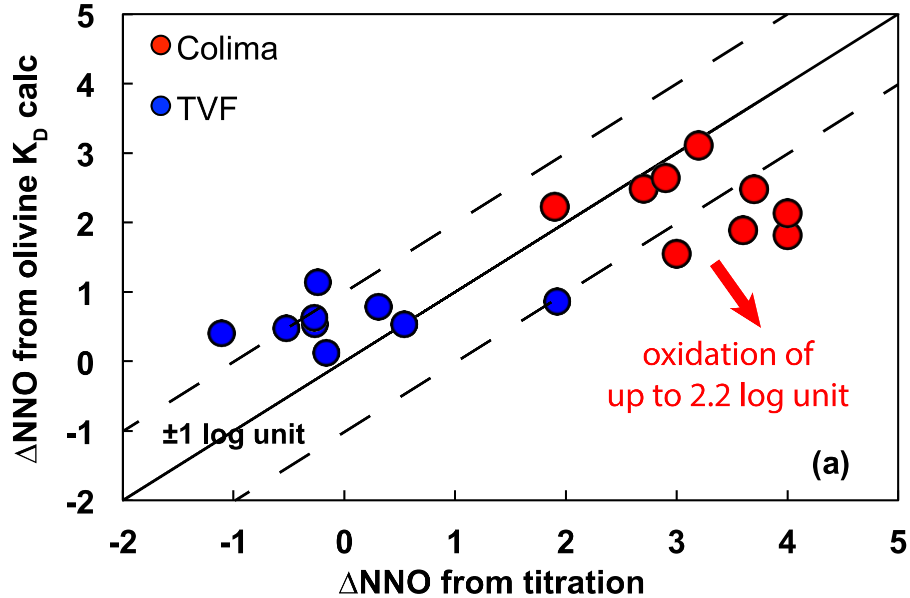
In chapter IV of this dissertation, it has been established that all the olivine phenocrysts in each of the Colima cone samples grew from a liquid represented by the whole rock composition, based on comparison with results from MELTS software (Ghiorso and Sack, 1995; Asimow et al., 2001), diffusion-limited rapid growth textures observed in the olivine phenocrysts and continuous distribution of the olivine composition in each sample (without breaks or bimodal pattern). Therefore, the fO_2 at the onset of olivine crystallization in these samples can be calculated using K_D = 0.37 (see section 3.1 for the reasons to choose this value), the most Mg-rich olivine composition observed in each sample, and the measured FeO_T of the whole rock sample. The results are shown in Table V-1.

The average Fe^{3+}/Fe^T for the 10 Colima Cone samples range from 0.33 to 0.52, with an average of 0.41 (0.52 from the titration results). The average ΔNNO at their respective T_{Ni} (chapter 4) is +2.2 (+3.0 from the titration results). The difference between the calculated and measured fO_2 from the whole rock was significant, beyond uncertainties of the models and analytical methods. For half of samples the difference is higher than 1 log unit. All Colima cone samples have a calculated pre-eruptive fO_2 lower than that based on whole rock titration, except for Col-1001B, which has a whole rock titration result of NNO+0.7, which is not particularly oxidized (Fig.2).

The same calculation of pre-eruptive fO_2 was also conducted on the MGVF samples (Table V-2). It has been established in Pu et al. (2017) that the olivine phenocrysts in these arc basalts and basaltic andesites grew from a liquid represented by the whole rock composition. The K_D value of 0.37 was also chosen based on the average from 108 hydrous olivine-melt phase equilibrium experiments. The pre-eruptive ΔNNO ratio for the MGVF samples range from 0.1 to 1.1 with an average of 0.5 (compared to 0.1 of the whole rock titration result), insignificant within the range of analytical and model uncertainties, especially compared to the difference in the Colima Cone samples (Fig.2).

Table V-2 Fe^{3+}/Fe^T and ΔNNO of MGVF samples based on whole rock titration and olivine K_D calculation

Sample #	UR-46	NI-13	UR-6	UR-36	TAN-19	NI-27	NI-5	APA-14	TAN-48
Whole Rock									
SiO_2 (wt%)	52.2	53.7	53.5	52.3	54.5	54.0	53.2	52.7	53.9
FeO (total) (wt%)	7.39	7.20	7.46	7.76	6.82	7.08	7.00	7.89	7.44
MgO (wt%)	9.38	8.98	8.62	8.52	7.92	7.68	7.59	7.46	7.04
Fe_2O_3 (titration)	3.85	2.78	2.55	2.16	2.45	2.29	3.41	1.19	1.07
FeO (titration)	5.53	6.20	6.07	6.36	5.47	5.39	4.18	6.27	5.97
Fe^{3+}/Fe^T (titration)	0.25	0.14	0.19	0.18	0.20	0.24	0.40	0.21	0.20
Mg/Fe (mole)	3.03	2.58	2.53	2.39	2.58	2.54	3.24	2.12	2.10
ΔNNO	0.5	-1.1	-0.3	-0.5	-0.2	0.3	1.9	-0.2	-0.3
Calculation based on olivine KD = 0.37									
max Fo	89.1	88.8	88.1	87.7	89.1	87.9	88.1	85.5	86.2
olivine Mg/Fe	8.2	7.9	7.4	7.1	8.2	7.3	7.4	5.9	6.2
melt Mg/Fe	3.02	2.93	2.74	2.64	3.02	2.69	2.74	2.18	2.31
FeO (melt)	5.53	5.46	5.61	5.76	4.67	5.09	4.94	6.10	5.43
Fe2O3 (melt)	2.07	1.94	2.06	2.23	2.39	2.21	2.29	1.99	2.23
Fe^{2+}/Fe^{3+} (melt)	2.97	3.13	3.03	2.87	2.17	2.56	2.40	3.40	2.70
Fe^{3+}/Fe^T	0.25	0.24	0.25	0.26	0.32	0.28	0.29	0.23	0.27
ΔNNO	0.5	0.4	0.5	0.5	1.1	0.8	0.9	0.1	0.6
$\Delta logfO_2$ (post - pre eruption)	0.0	-1.5	-0.8	-1.0	-1.4	-0.5	1.1	-0.3	-0.9
$\Delta Fe^{3+}/Fe^T$ (post - pre eruption)	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.0	-0.1



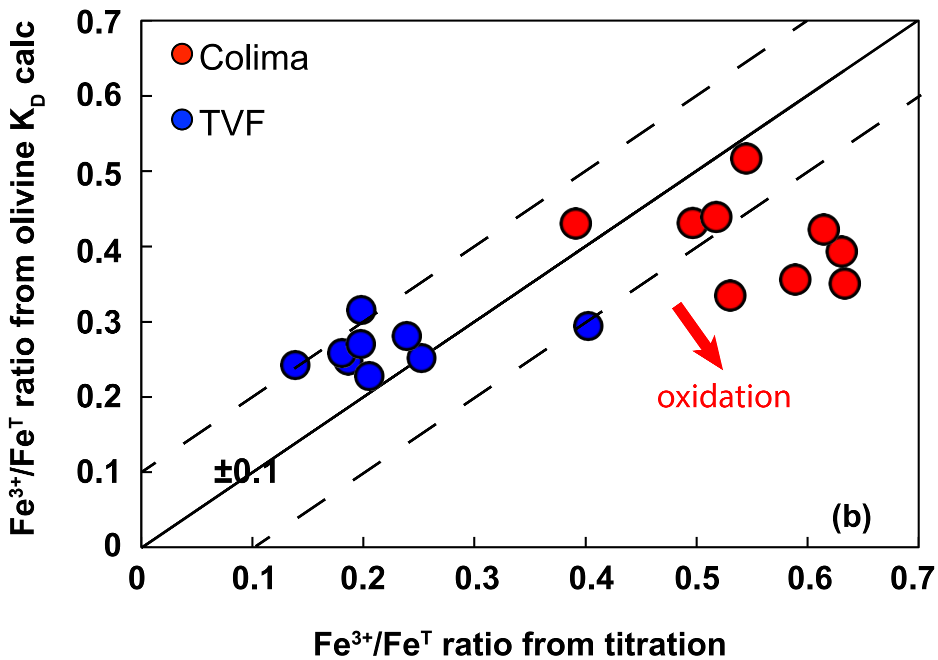


Figure V-2 Plots of (a) ΔNNO values; (b) Fe^{3+}/Fe^T ratio from whole rock titration vs. from the olivine K_D calculation for Colima Cones vs MGVF samples. The black line in both plot is the 1:1 line. The oxidation state change of the Colima Cone samples is much more substantial than the MGVF sample.

5.6 Discussion

5.6.1 Comparing pre- and post- eruptive fO_2 in Colima cone and MGVF samples

It has been well documented that typical arc volcanic samples have an oxygen fugacity around NNO (e.g. Carmichael, 1991; Kelley et al., 2009;). It is not surprising the whole titration results of the MGVF samples are consistent with the observations from global arc studies as well as andesite and dacite samples from other segments of the Mexican arc (Frey and Lange, 2011; Crabtree and Lange, 2012). However, it is telling when the oxygen fugacity calculated from the olivine K_D method also places the MGVF samples within the range of NNO to NNO+1. To first order, this agreement supports the hypotheses that all olivine phenocrysts grew from the whole rock liquid of each of the MGVF samples, and that the most Fo-rich olivine composition has been captured (in close proximity) in the olivine traverse analyses conducted across each sample.

If the same hypotheses are viable for the Colima Cone samples (see the previous chapter of this dissertation for other supporting lines of evidence), then the fO_2 calculated from the KD method is representative of the fO_2 at the onset of olivine crystallization. Therefore, there is a distinct difference (up to 2.2 log unit of oxidation, Table V-2) between the oxygen fugacity at the onset of olivine crystallization (pre-eruptive) and that in the whole rock samples being analyzed 100-450ky after the eruption to the surface (Carmichael et al., 2006).

5.6.2. Possible mechanism for the oxidation of the Colima Cone lavas

There are a few potential processes that could be responsible for the oxidation of these Colima Cones samples.

1) Post-eruption alteration: there is a large gradient of oxygen fugacity between the modern atmosphere (fO_2 = 0.21bar) and the Earth mantle in present days, where fO_2 is up to QFM+1.5 (Frost and McCammon, 2008), which is about $10^{-7.7}$ bar at 1200˚C (Jayasuriya et al., 2004). This gradient could lead to oxidation of the volcanic samples after their eruption to the surface. One indicator for this oxidation reaction is the transition from olivine to reddish brown colored iddingsite. Firstly, no reddish brown colored rim was observed on any olivine phenocrysts among these Colima Cone samples (Fig.1). Secondly, the whole rock titration result of a set of oxidized MGVF basaltic andesite samples (with severely replacement of olivine by iddingsite; Fig.1) shows an average elevation of 1.3 log unit in fO_2. Even if there were some slight post-eruption oxidation to these Colima cone samples, it is not sufficient to explain the observed discrepancy (up to 2.2 log unit) between the pre- and post- eruptive fO_2.

2) Crystallization of olivine and ilmenite: it has been proposed by Lee et al. (2010) that the crystallization of minerals that strongly prefer Fe^{2+} over Fe^{3+} in their structure (e.g. olivine and ilmenite) could lead to the overall oxidation of the residual liquid in the differentiation of arc volcanic rocks. Studies on the oxidation state of arc samples with a range of SiO2 content and at various stages of differentiation (e.g. Kelley and Cottrell, 2012; Crabtree and Lange, 2012, Waters and Lange, 2016) have demonstrated that there is no change in oxidation state associated with differentiation of subduction zone samples from Mariana, Cascades and Mexico. In addition, there is no evidence for significant fractionation to the Colima Cone samples. Their high whole-rock MgO contents (up to 13.4 wt% MgO) and Fo-rich

olivine composition (up to Fo93) are strongly indicative of their origin as primitive mantle melt.

3) The most Fo-rich olivines were inherited from a cumulate: if that is the case, by using an olivine more Fo-rich than what is in equilibrium with the whole rock liquid composition, the KD method yields a higher Mg/Fe^{2+} ratio, and subsequently higher Fe^{2+}/Fe^{3+} ratio (corresponding to lower oxidation state) of the liquid. This hypothesis does not explain the gap of the estimated fO_2 from olivine KD and the measured fO_2 from the whole rock titration, but if it is true, the oxidation effect is even larger than currently presented.

4) H_2O-degassing induced oxidation: it has been demonstrated by Waters and Lange (2016) that equilibrium H_2O degassing does not lead to net change of oxygen fugacity in the melt, and there is a lack of observations for H_2O degassing induced oxidation in natural subduction zone samples. Furthermore, the melt inclusion study on the Colima Cone samples by Vigouroux et al. (2008) have shown no correlation between S^{6+}/S^{T} ratio (an indicator of melt oxidation state, more sensitive than the Fe^{2+}/Fe^{3+} ratio; Carmichael and Ghiorso, 1986) and the H_2O content in the melt inclusions, which strongly suggests against H_2O degassing induced oxidation for these Colima Cone samples.

The only remaining hypothesis to explain the oxidation is sulfur degassing induced oxidation, when the melt is oxidized as sulfate species (sulfur valence state of 6+) in the melt exsolves to be SO_2 or H_2S in the fluid/gas phase. This hypothesis will be evaluated in the following section.

5.6.3 Sulfur degassing induced oxidation

In comparison to the typical range of 900-2500ppm of total sulfur observed in olivine-hosted melt inclusions from arc basaltic samples globally, at up to 6700ppm (Vigouroux et al., 2008), melt inclusions from these Colima Cone samples are considered to be the most sulfur-rich melt inclusion from arc basaltic sample reported in the literature. Whole rock sulfur content of these Colima Cone samples was also measured by Carmichael et al. (2006) and the highest value is 1000ppm. Significant sulfur degassing had taken place in these samples. As a comparison, the max sulfur content measured in the TVF samples is 2100ppm (Johnson et al., 2009), much lower than those from the Colima Cone samples.

At oxidizing condition, the dominant species of sulfur dissolves in the melt is sulfate (Nilsson and Peach, 1993; Wallace and Carmichael, 1994; Metrich and Clocchiatti, 1996; Moretti and Ottonello, 2003; Jugo et al., 2005). Degassing of sulfate in the melt into SO_2, S_2 or H_2S in the gas phase leads to oxidation of the melt (Metrich et al., 2009; Gaillard et al., 2015). The solubility of sulfur also increases by a few orders of magnitude from NNO to NNO+2 (Baker and Moretti, 2011). The higher pre-eruptive fO_2 in these Colima Cone samples (NNO+2.3 on average) enables more dissolved sulfur in the melt, and the effect of oxidation is more prominent during the degassing of a significant amount of sulfur in the melt (from 6700ppm to 1000ppm, at least; varied between samples). This explains the lack of observation on sulfur degassing induced oxidation in the MGVF samples: at their pre-eruptive (and post-eruptive) fO_2, which is around NNO, there are far less dissolved sulfur in the melt for the degassing induced oxidation to be significant enough to exceed the analytical uncertainties.

Another observation is that, the compositional range of the olivine phenocrysts in the Colima Cone samples is, on average, about half the range of the MGVF samples (around 10% Fo range for the Colima Cone samples and usually more than 20mol% Fo range for the MGVF samples; see Fig. IV-6 vs Fig. A5). With constantly increasing fO_2, equilibrium olivine shifts to higher Fo# (less FeO in the melt, therefore olivine is less Fe-rich), therefore there is a delay in Fo# decrease down the crystallization line when the oxygen fugacity is constantly increasing, resulting in more restricted range of olivine compositions.

5.6.4 Source of highly oxidized pre-eruptive conditions

As it was previously discussed in Chapter 4 of this dissertation, these primitive Colima Cone samples formed from partial melting of phlogipite-bearing lithospheric mantle that had been heavily metasomatized by previous subduction zone processes in the region. The metasomatism leads to elevated oxygen fugacity and enriched arc geochemical signature (e.g. higher Ba/La ratio). The Colima Cone samples were generated in a unique geological setting, with active subduction zone taking place under the Jalisco block which is mostly composed of crystalline rocks formed during the Crateceous subduction processes, and with the rift-induced fractures in the lithospheric column, facilitating the ascent and eruption of the liquid generated at depth. That explains the higher oxygen fugacity of these liquids at depths, which enables significantly higher dissolved sulfur in the melt, and more prominent effect of sulfur degassing induced oxidation upon the ascent and eruption of these lavas.

5.6 Implications

This study presents the first documentation of sulfur degassing induced oxidation in natural samples from the Colima Cones in the Trans-Mexican Volcanic Belt. A novel method using olivine K_D to constrain the oxygen fugacity of the melt at the onset of olivine crystallization is shown to be effective in the Colima Cone samples. Future work to measure the Fe^{3+}/Fe^T ratio, S^{6+}/S^T ratio (with XANES technique), along with total S and H_2O contents (SIMS or FTIR) of the melt inclusions from these samples could further evaluate the effect of sulfur degassing induced oxidation for the Colima Cone samples.

5.7 References

Anderson, A.T., and Wright, T.L. (1972) Phenocryst and glass inclusions and their bearing on oxidation and mixing of basaltic magmas, Kilauea Volcano, Hawaii. American Mineralogist, 57, 188–216.

Asimow, P.D., Hirschmann, M.M., Stolper, E.M. (2001). Calculation of peridotite partial melting from thermodynamic models of minerals and melts, IV. Adiabatic decompression and the composition and mean properties of mid-ocean ridge basalts. Journal of Petrology, 42, 963-998.

Baker, D.R., and Moretti, R. (2011) Modeling the Solubility of Sulfur in Magmas: A 50-Year Old Geochemical Challenge. Reviews in Mineralogy and Geochemistry, 73, 167–213.

Ballhaus, C., Berry, R.F., and Green, D.H. (1991) High pressure experimental calibration of the olivine-orthopyroxene-spinel oxygen geobarometer: implications for the oxidation state of the upper mantle. Contributions to Mineralogy and Petrology, 107, 27–40.

Bell, A.S., and Simon, A. (2011) Experimental evidence for the alteration of the Fe3+/ΣFe of silicate melt caused by the degassing of chlorine-bearing aqueous volatiles. Geology, 39, 499–502.

Brounce, M.N., Stolper, E.M., and Eiler, J.M. (2017) Redox variations in Mauna Kea lavas, the oxygen fugacity of the Hawaiian plume, and the role of volcanic gases in Earth's oxygenation. Proceedings of the National Academy of Sciences, 1–34.

Burgisser A. and Scaillet, B. (2007) Redox evolution of a degassing magma rising to the surface. Nature 445:194-197

Candela, P.A. (1986) The evolution of aqueous vapor from silicate melts: efffect on oxygen fugacity. Geochimica et Cosmochimica Acta, 50, 1205–1211.

Carmichael, I.S.E. (1991) The redox states of basic and silicic magmas: a reflection of their source regions? Contributions to Mineralogy and Petrology, 106, 129–141.

Carmichael, I.S.E., and Ghiorso, M.S. (1986) Oxidation-reduction relations in basic magma: a case for homogeneous equilibria. Earth and Planetary Science Letters, 78, 200–210.

Carmichael, I. S. E., Frey, H. M., Lange, R. A., and Hall, C. M. (2006). The Pleistocene cinder cones surrounding Volcán Colima, Mexico re-visited: eruption ages and volumes, oxidation states, and sulfur content. Bulletin of Volcanology, 68(5), 407–419.

Carroll, M.R. and Rutherford, M.J. (1988) Sulfur speciation in hydrous experimental glasses of varying oxidation state: results from measured wavelength shifts of sulfur X-rays. American Mineralogist 73:845-849

Cottrell, E., Kelley, K. A., Lanzirotti, A. and Fischer, R. A. (2009). High-precision determination of iron oxidation state in silicate glasses using XANES. Chemical Geology 268, 167^179.

Crabtree, S.M., and Lange, R.A. (2012) An evaluation of the effect of degassing on the oxidation state of hydrous andesite and dacite magmas: a comparison of pre- and post-eruptive Fe2+ concentrations. Contributions to Mineralogy and Petrology, 163, 209–224.

Fischer, T.P. (2008) Fluxes of volatiles (H_2O, CO_2, N2, Cl, F) from arc volcanoes. Geochemical Journal, 42, 21–38.

Ford, C. E., D. G. Russell, J. A. Craven, and M. R. Fisk (1983), Olivine-liquid equilibria: Temperature, pressure and composition dependence of the crystal/liquid cation partition coefficients for Mg, Fe^{2+}, Ca and Mn. Journal of Petrology, 24, 256–265.

Frey, H.M., and Lange, R.A. (2011) Phenocryst complexity in andesites and dacites from the Tequila volcanic field, Mexico: resolving the effects of degassing vs. magma mixing. Contributions to Mineralogy and Petrology, 162, 415–445.

Frost, D.J., and McCammon, C.A. (2008) The Redox State of Earth's Mantle. Annual Review of Earth and Planetary Sciences, 36, 389–420.

Gaillard, F., Scaillet, B., and Arndt, N.T. (2011) Atmospheric oxygenation caused by a change in volcanic degassing pressure. Nature, 478, 229–233.

Gaillard, F., Scaillet, B., Pichavant, M., and Iacono-Marziano, G. (2015) The redox geodynamics linking basalts and their mantle sources through space and time. Chemical Geology, 217–233.

Gee, L. L. and Sack, R. O. (1988). Experimental petrology of melilite nephelinites. Journal of Petrology 29, 1233-1255.

Gerlach, T. (1993) Oxygen buffering of Kilauea volcanic gases and oxygen fugacity of Kilauea basalt. Geochimica et Cosmochimica Acta, 57, 795–814.

Ghiorso, M.S., and Sack, R.O. (1995) Chemical mass-transfer in magmatic processes IV. A revised and internally consistent thermodynamic model for the interpolation and extrapotion of liquid-solid equilibria in magmatic systems at elevated temperatures and pressures. Contributions to Mineralogy and Petrology, 119, 197-212.

Ghiorso, M.S., and Evans, B.W. (2008) Thermodynamics of rhombohedral oxide solid solutions and a revision of the Fe-Ti two oxides geothermometers and oxygen-barometer. Americal Journal of Science, 308, 957-1039.

Helz, R.T., Cottrell, E., Brounce, M.N., and Kelley, K.A. (2017) Olivine-melt relationships and syneruptive redox variations in the 1959 eruption of Kilauea Volcano as revealed by XANES. Journal of Volcanology and Geothermal Research, 333-334, 1–14.

Hilton, D.R., Fischer, T.P. and Marty, B. (2002) Noble gases and volatile recycling at subduction zones. Reviews in Mineralogy and Geochemistry, 47, 319–370.

Holloway, J.R. (2004) Redox reactions in seafloor basalts: possible insights into silicic hydrothermal systems. Chemical Geology, 210, 225–230.

Iacono-Marziano, G., Morizet, Y., Le Trong, E., and Gaillard, F. (2012) New experimental data and semi-empirical parameterization of H_2O-CO_2 solubility in mafic melts. Geochimica et Cosmochimica Acta, 97, 1–23.

Jayasuriya, K. D., O'Neill, H. St. C., Berry, A. J., Campbell, S. J. (2004) A Mössbauer study of the oxidation state of Fe in silicate melts. American Mineralogist, 89, 1597-1609.

Johnson, E.R., Wallace, P.J., Granados, H.D., Manea, V.C., Kent, A.J.R., Bindeman, I.N., Donegan, C.S. (2009) Subduction-related volatile recycling and magma generation beneath Central Mexico: Insights from melt inclusions, oxygen isotopes and geodynamic models. Journal of Petrology, 50, 1729-1764.

Jugo PJ, Luth RW, Richards JP (2005) Experimental data on the speciation of sulfur as a function of oxygen fugacity in basaltic melts. Geochim Cosmochim Acta 69:477-503

Kelley, K.A., and Cottrell, E. (2009) Water and the Oxidation State of Subduction Zone Magmas. Science, 325, 605–607.

Kelley, K.A., and Cottrell, E. (2012) The influence of magmatic differentiation on the oxidation state of Fe in a basaltic arc magma. Earth and Planetary Science Letters, 109–121.

Kilinc, A., Carmichael, I. S. E., Rivers, M. L. & Sack, R. O. (1983). The ferric-ferrous ratio of natural silicate liquids equilibrated in air. Contributions to Mineralogy and Petrology 83, 136-140.

Kress, V.C. and Carmichael, I.S.E. (1991) The compressibility of silicate liquids containing Fe2 O3 and the effect of composition, temperature, oxygen fugacity and pressure on their redox states. Contributions to Mineralogy and Petrology, 108:82-92

Lee, C.-T.A., Luffi, P., Le Roux, V., Dasgupta, R., Albaréde, F., and Leeman, W.P. (2010) The redox state of arc mantle using Zn/Fe systematics. Nature, 468, 681–685.

Luhr, J.F., and Carmichael, I.S.E. (1981) The Colima volcanic complex, Mexico: Part II. Late-quaternary cinder cones. Contributions to Mineralogy and Petrology, 76,127–147.

Mathez, E. (2004) Influence of degassing on oxidation states of basaltic magmas. Nature, 310, 371–375.

Métrich, N., Clocchiatti, R., M, M., and Chaussidon, M. (1993) The 1989-1990 activity of Etna magma mingling and ascent of HzO-C1-S-rich basaltic magma. Evidence from melt inclusions. Journal of Volcanology and Geothermal Research, 131–144.

Metrich N, Clocchiatti R (1996) Sulfur abundance and its speciation in oxidized alkaline melts. Geochim Cosmochim Acta 60:4151-4160

Métrich, N., Berry, A.J., O'Neill, H.S.C., and Susini, J. (2009) The oxidation state of sulfur in synthetic and natural glasses determined by X-ray absorption spectroscopy, 1–18.

Moretti R, Ottonello G (2003a) Polymerization and disproportionation of iron and sulfur in silicate melts: Insights from an optical basicity-based approach. J Non-Cryst Sol 323:111-119

Moussallam, Y., Oppenheimer, C., Scaillet, B., Gaillard, F., Kyle, P., Peters, N., Hartley, M., Berlo, K., and Donovan, A. (2014) Tracking the changing oxidation state of Erebus magmas, from mantle to surface, driven by magma ascent and degassing, 1–10.

Moussallam, Y., Edmonds, M., Scaillet, B., Peters, N., Gennaro, E., Sides, I., and Oppenheimer, C. (2016) The impact of degassing on the oxidation state of basaltic magmas: A case study of Kīlauea volcano. Earth and Planetary Science Letters, 450, 317–325.

Nilsson, K. and Peach, C.L. (1993) Sulfur speciation, oxidation state and sulfur concentration in backarc magmas. Geochimica Cosmochimica Acta 57:3807-3813.

Papale, P., Moretti, R., Barbato, D. (2006) The compositional dependence of the saturation surface of H_2O + CO_2 fluids in silicate melts. Chemical Geology, 229, 78-95.

Pu, X., Lange, R.A., and Moore, G. (2017) A comparison of olivine-melt thermometers based on DMg and DNi: The effects of melt composition, temperature, and pressure with applications to MORBs and hydrous arc basalts. American Mineralogist, 102, 750–765.

Putirka, K. (2016) Rates and styles of planetary cooling on Earth, Moon, Mars, and Vesta, using new models for oxygen fugacity, ferric-ferrous ratios, olivine-liquid Fe-Mg exchange, and mantle potential temperature. American Mineralogist, 101, 819–840.

Roeder, P. L. & Emslie, R. F. (1970). Olivine-liquid equilibrium. Contributions to Mineralogy and Petrology 29, 275-289.

Shinohara, H. (2013) Volatile flux from subduction zone volcanoes: Insights from a detailed evaluation of the fluxes from volcanoes in Japan. Journal of Volcanology and Geothermal Research, 268, 46–63.

Snyder, D.A., and Carmichael, I.S.E. (1992) Olivine-liquid equilibria and the chemical activities of FeO, NiO, Fe_2O_3, and MgO in natural basic melts. Geochimica et Cosmochimica Acta, 56, 303–318.

Toplis, M. J. (2005). The thermodynamics of iron and magnesium partitioning between olivine and liquid: criteria for assessing and predicting equilibrium in natural and experimental systems. Contributions to Mineralogy and Petrology 149, 22^39.

Vigouroux, N., Wallace, P.J., and Kent, A.J.R. (2008) Volatiles in High-K Magmas from the Western Trans-Mexican Volcanic Belt: Evidence for Fluid Fluxing and Extreme Enrichment of the Mantle Wedge by Subduction Processes. Journal of Petrology, 49, 1589–1618.

Wallace PJ, Carmichael ISE (1994) Sulfur speciation in submarine basaltic glasses as determined by measurements of SKa X-ray wavelength shifts. Am Mineral 79:161-167

Waters, L.E., and Lange, R.A. (2016) No effect of H_2O degassing on the oxidation state of magmatic liquids. Earth and Planetary Science Letters, 447, 48–59.

Wallace, P.J., and Edmonds, M. (2011) The Sulfur Budget in Magmas: Evidence from Melt Inclusions, Submarine Glasses, and Volcanic Gas Emissions. Reviews in Mineralogy and Geochemistry, 73, 215–246.

Chapter VI

Conclusion

6.1 Concluding Remarks

For all the samples from the Mexican Volcanic Belt that are presented in this dissertation, multiple lines of evidence support that all olivine phenocrysts grew from a liquid represented by the whole rock composition during ascent. This requires rapid ascent and H_2O degassing-induced crystallization in the crustal column. The fundamental premise of primitive basalts requires this to be the case, even though there haven't been a lot of such discussions in the primitive basalt literature about degassing-induced crystallization during rapid ascent. Among the samples presented in this dissertation, there are basaltic andesites and andesites that were not primitive mantle melts. Nonetheless, they have been tested and proved to grow all the phenocrysts from the whole rock liquid as well. In that regard, this dissertation has developed a road map to identify olivine-bearing natural samples where all phenocrysts grew during ascent. An extensive investigation of the compositional distribution of olivine phenocrysts with the electron microprobe is required for these tests. It is recommended for in-depth petrological research on the origin and genesis mechanism of arc basalts, especially considering the wide availability and relatively low costs of electron microprobe analyses. For any samples where the most Fo-rich olivine and the whole rock liquid are in equilibrium, the newly developed methods to constrain temperature, melt H_2O content and oxygen fugacity at the onset of olivine crystallization could be applied.

Chapter II and III presented multiple lines of evidence for the negligible dependence of olivine-melt Ni partitioning on melt H_2O content and pressure when under 1GPa, with comparison to olivine-melt Mg partitioning, which has been widely established in the literature to have a major dependence on dissolved H_2O in the melt (Putirka, 2008). Firstly, the comparison between the temperature results from the two thermometers on MORB and MGVF hydrous samples indicates Ni partitioning is a lot less affected by melt H_2O content than Mg partitioning, yet Ni-thermometer could predict temperature in anhydrous system just as well as Mg-thermometer. Secondly, the excellent agreement between the estimated minimum melt H_2O content at the onset of olivine crystallization and the measured H_2O content in pristine melt inclusions from the same field area in the literature (Johnson et al., 2009), as well as phase equilibrium experiments on samples of similar compositions (Moore and Carmichael, 1998; Barclay and Carmichael, 2004), further suggests the lesser dependence of Ni partitioning on melt H_2O content; and also indicates the good quality of the ΔT-H_2O relation calibrated in Chapter II. Lastly, the experimental calibration under both anhydrous and hydrous conditions puts in the final nail to the coffin, and directly confirms that olivine-melt Ni partitioning is mostly independent of dissolved H_2O in the melt at crustal pressure (<1GPa).

Benefited from the application of the two thermometers, as well as constraints adopted from the mantle melting literature (Tenner et al., 2012), Chapter IV was able to provide insights into the mantle melting condition under the Colima Cone, adding an illuminative new perspectives to the controversy of the generation of high-K primitive melts in Mexico (Luhr, 1997; Vigouroux et al., 2008; Ownby et al., 2008). Although the Colima Cones samples were derived from lithospheric mantle and the MGVF calc-alkaline basalts were derived from asthenospheric mantle; the thicker lithosphere in the Jalisco Block leads to a deeper level of melt segregation from the mantle, compared to MGVF basalts.

Finally, Chapter V presented a new method to constrain pre-eruptive oxygen fugacity (fO_2) based on olivine-melt Fe-Mg exchange coefficient (K_D). The reasonable estimate at around NNO for the calc-alkaline basalts in MGVF demonstrates the good quality of this method. The pre-eruptive fO_2 of Colima Cone samples constrained from this method is lower than that of the pristine whole rock samples, but still fairly oxidized (NNO+1 to +2) compared to most terrestrial basalts. This provides a line of supportive evidence for sulfur degassing induced oxidation in these sulfur-rich samples based on melt inclusion studies (Maria and Luhr, 2008; Vigouroux et al., 2008), and is the first documentation of sulfur degassing induced oxidation in natural samples.

6.2 Future work

One of the most exciting parts of this dissertation comes from the several directions of perspective work that can be carried on from here.

1) The new methods developed in this dissertation could be applied to olivine-bearing samples globally, especially for samples that don't have melt inclusions

available. There are other unique subduction zones where controversy still exists for the processes and conditions related to mantle melting and olivine crystallization in mafic melts. For example, Basin and Range active extension is superimposed to the active subduction in the Southern Cascades. As a result, there are two types of basalt with distinctively different compositions, generated from decompression melting and flux melting. It has been an active area of experimental and melt inclusion studies (e.g. Hildreth et al., 2007; Walowski et al., 2015). New constraints from methods based on olivine-melt equilibrium could provide new insights to the subduction processes in this region.

2) One uncertainty for the new pre-eruptive fO_2 constraint comes from the choice of the appropriate K_D value based on melt composition, H_2O content and oxygen fugacity. There is still a large range of spread between various proposed K_D models in the literature. Further experimental investigations under water-saturated and buffered condition, or with an independent fO_2 measurments, will allow for precise K_D to be calculated, and will help advance our knowledge about the dependent variables that affects K_D values.

3) Degassing induced phenocryst crystallization of basaltic liquid has not been commonly evoked in the literature, even though it is almost a fundamental premise for primitive arc basalts. Extensive olivine compositional distribution investigations of arc basalts, basaltic andesites and olivine andesites from different arcs will help with our understanding about how common it is for basalt to go through adiabatic ascent after its segregation from the mantle source, followed by degassing-induced crystallization during rapid ascent across the crustal column.

6.3 References

Barclay, J., and Carmichael, I.S.E. (2004) A hornblende basalt from western Mexico: water-saturated phase relations constrain a pressure-temperature window of eruptibility. Journal of Petrology, 45, 485-506.

Hildreth W. (2007). Quaternary magmatism in the Cascades – Geological Perspectives. USGS Professional paper 1744.

Johnson, E.R., Wallace, P.J., Granados, H.D., Manea, V.C., Kent, A.J.R., Bindeman, I.N., Donegan, C.S. (2009) Subduction-related volatile recycling and magma generation beneath Central Mexico: Insights from melt inclusions, oxygen isotopes and geodynamic models. Journal of Petrology, 50, 1729-1764.

Luhr, J.F. (1997) Extensional tectonics and the diverse primitive volcanic rocks in the western Mexican volcanic belt. The Canadian Mineralogist, 35, 473–500.

Maria, A.H., and Luhr, J.F. (2008) Lamprophyres, Basanites, and Basalts of the Western Mexican Volcanic Belt: Volatile Contents and a Vein–Wallrock Melting Relationship. Journal of Petrology, 49, 2123–2156.

Moore, G., and Carmichael, I.S.E. (1998) The hydrous phase equilibria (to 3 kbar) of an andesite and basaltic andesite from western Mexico: constraints on water content and conditions of phenocryst growth. Contributions to Mineralogy and Petrology, 130:304-319.

Ownby, S.E., Lange, R.A., and Hall, C.M. (2008) The eruptive history of the Mascota volcanic field, western Mexico: Age and volume constraints on the origin of andesite among a diverse suite of lamprophyric and calc-alkaline lavas. Journal of Volcanology and Geothermal Research, 177, 1077–1091.

Putirka, K.D. (2008) Thermometers and barometers for volcanic systems. Reviews in Mineralogy and Geochemistry, 69, 61-120.

Tenner, T.J., Hirschmann, M.M., and Humayun, M. (2012) The effect of H 2O on partial melting of garnet peridotite at 3.5 GPa. Geochemistry, Geophysics, Geosystems, 13,Q03016.

Vigouroux, N., Wallace, P.J., and Kent, A.J.R. (2008) Volatiles in High-K Magmas from the Western Trans-Mexican Volcanic Belt: Evidence for Fluid Fluxing and Extreme Enrichment of the Mantle Wedge by Subduction Processes. Journal of Petrology, 49, 1589–1618.

Walowski K.J., Wallace P.J., Hauri E.H., Wada I. and Clynne M.A. (2015) Slab melting beneath the Cascade Arc driven by dehydration of altered oceanic peridotite. Nature Geoscience, Vol. 8, p 404-408.

APPENDICES

Appendix A

Table A1 Standards employed for electron microprobe analyses of olivine and plagioclase.

Element (target mineral)	Standard name (standard block)	Mineral name of the standard
Mg, Si (olivine)	FOBO	Bolten Forsterite
Fe (olivine,plagioclase)	FESI	Bohlen Ferrosilite
Ni (olivine)	NIOL	Ni-olivine
Al (olivine)	JADE	JD-1 Jadeite
Mn (olivine)	BHRH	Broken Hill Rhodonite
Cr (olivine)	CR2O3	Cr2O3
Ca (olivine, plagioclase)	WOLL	Wollastonite
K, Si (plagioclase)	GKFS	St. Gothard Adularia
Na (plagioclase)	ALBA	Amelia Albite
Al (plagioclase)	TANZ	Tanzanite
Ba (plagioclase)	BACL	Alforsite (Ba-Cl apatite)

Note: all mineral standards are from University of Michigan collection.

Table A2 Experimental conditions and melt and olivine compositions of 123 1-bar experiments

Study	sample #	P (GPa)	T(˚C)	T(K)	fO2	xtal %	xtal phases	analytical method	melt SiO2	melt Al2O3	melt FeOT	melt MnO
Wang and Gaetani, 2008	GW-18	0.0001	1236	1509.15	5.62341E-09	-	gl+ol	EMPA	61.32	13.92	5.25	0.071
Wang and Gaetani, 2008	GW-12	0.0001	1250	1523.15	5.12861E-09	-	gl+ol	EMPA	60.15	13.14	5.49	0.083
Wang and Gaetani, 2008	GW-19	0.0001	1260	1533.15	7.4131E-09	-	gl+ol	EMPA	60.33	13.57	5.71	0.079
Wang and Gaetani, 2008	GW-21	0.0001	1285	1558.15	1.09648E-08	-	gl+ol	EMPA	60.8	13.47	5.68	0.084
Wang and Gaetani, 2008	GW-22	0.0001	1310	1583.15	2.0893E-08	-	gl+ol	EMPA	59.88	12.79	5.79	0.083
Wang and Gaetani, 2008	OMED-3	0.0001	1275	1548.15	1.7378E-08	-	gl+ol	EMPA	47.07	17.62	8.4	0.142
Wang and Gaetani, 2008	OMED-10	0.0001	1325	1598.15	2.23872E-07	-	gl+ol	EMPA	47.86	15.87	9.24	0.15
Mysen, 2008	FDS-6	0.0001	1470	1743.15	0.2	-	gl+ol	EMPA	52.65	0	0	1.15
Mysen, 2008	FDS-5	0.0001	1470	1743.15	0.2	-	gl+ol	EMPA	54.41	0	0	1.11
Mysen, 2008	FDS-3	0.0001	1510	1783.15	0.2	-	gl+ol	EMPA	57.59	0	0	1.24
Mysen, 2008	FDS-4	0.0001	1510	1783.15	0.2	-	gl+ol	EMPA	55.23	0	0	1.23
Mysen, 2008	FDS-5	0.0001	1510	1783.15	0.2	-	gl+ol	EMPA	53.8	0	0	1.1
Mysen, 2008	FDS-6	0.0001	1510	1783.15	0.2	-	gl+ol	EMPA	51.09	0	0	1.06
Mysen, 2008	FDS-1	0.0001	1550	1823.15	0.2	-	gl+ol	EMPA	60.1	0	0	1.5
Mysen, 2008	FDS-2	0.0001	1550	1823.15	0.2	-	gl+ol	EMPA	58.42	0	0	1.14
Mysen, 2008	FDS-4	0.0001	1550	1823.15	0.2	-	gl+ol	EMPA	54.15	0	0	1.19
Mysen, 2008	FDS-6	0.0001	1550	1823.15	0.2	-	gl+ol	EMPA	50.37	0	0	1.12
Mysen, 2008	FDS-2	0.0001	1575	1848.15	0.2	-	gl+ol	EMPA	57.53	0	0	1.13
Mysen, 2008	FDS-3	0.0001	1575	1848.15	0.2	-	gl+ol	EMPA	56.11	0	0	1.12
Mysen, 2008	FDS-4	0.0001	1575	1848.15	0.2	-	gl+ol	EMPA	54.19	0	0	1.08
Mysen, 2008	FDS-5	0.0001	1575	1848.15	0.2	-	gl+ol	EMPA	52.2	0	0	1.07
Mysen, 2008	FDS-6	0.0001	1600	1873.15	0.2	-	gl+ol	EMPA	50.74	0	0	1.11
Mysen, 2008	FDS-1	0.0001	1600	1873.15	0.2	-	gl+ol	EMPA	57.96	0	0	1.16
Mysen, 2008	FDS-2	0.0001	1600	1873.15	0.2	-	gl+ol	EMPA	58.04	0	0	1.12
Mysen, 2008	FDS-3	0.0001	1600	1873.15	0.2	-	gl+ol	EMPA	55.84	0	0	1.19
Mysen, 2008	FDS-1	0.0001	1650	1923.15	0.2	-	gl+ol	EMPA	56.77	0	0	1.09
Mysen, 2008	FDS-2	0.0001	1650	1923.15	0.2	-	gl+ol	EMPA	54.92	0	0	1.02
Mysen, 2008	FDS-4	0.0001	1650	1923.15	0.2	-	gl+ol	EMPA	52.5	0	0	1.04
Mysen, 2007a	AFS-6	0.0001	1550	1823.15	0.2	-	gl+ol	EMPA	49.81	10.95	0	1.06
Mysen, 2007a	AFS-7	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	46.37	17.06	0	1.12
Mysen, 2007a	AFS-9	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	44.44	19.72	0	1.11
Mysen, 2007a	NFS-1	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	47.31	22	0	1.06
Mysen, 2007a	NFS-2	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	50.28	21.47	0	1.14
Mysen, 2007a	NFS-3	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	54.15	19.36	0	1.09
Mysen, 2007a	NFS-4	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	55.41	15.16	0	1.07
Mysen, 2007a	NFS-5	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	60.22	13.9	0	1.01
Mysen, 2007a	NFS-6	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	63.12	12.68	0	1
Mysen, 2007a	NFS-7	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	66.16	9.98	0	1.02
Mysen, 2007b	FDMC-NC0.5	0.0001	1360	1633.15	0.2	-	gl+ol	EMPA	50.9	0.046	9.3	0.6
Mysen, 2007b	FDMC-NC1.5	0.0001	1360	1633.15	0.2	-	gl+ol	EMPA	49.4	0.041	9.12	1.76
Mysen, 2007b	FLQ1MC-NC	0.0001	1350	1623.15	0.2	-	gl+ol	EMPA	57.3	14.43	3.2	0.83
Mysen, 2007b	FLQ2MC-NC	0.0001	1350	1623.15	0.2	-	gl+ol	EMPA	59.1	7.09	6.07	0.94
Mysen, 2007b	FLQ2MC2-NC	0.0001	1350	1623.15	0.2	-	gl+ol	EMPA	62.1	7.77	6.5	0.89
Mysen, 2007b	FNQMC-NC	0.0001	1350	1623.15	0.2	-	gl+ol	EMPA	47.33	11.16	8.77	1.08
Mysen, 2007b	FNQMC1-NC	0.0001	1350	1623.15	0.2	-	gl+ol	EMPA	47.57	12.04	8.7	1.03
Mysen, 2007b	FNQMC3-NC	0.0001	1350	1623.15	0.2	-	gl+ol	EMPA	46.78	11.23	8.25	1.03
Mysen, 2007b	FNQMC3-1-NC	0.0001	1350	1623.15	0.2	-	gl+ol	EMPA	45.4	8.8	7.03	0.96
Mysen, 2007b	FDMC1-NC	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	51.7	0.071	8.3	1.12
Mysen, 2007b	FDAKMC2-NC	0.0001	1375	1648.15	0.2	-	gl+ol	EMPA	51.5	0.027	5.3	1.11
Mysen, 2007b	FDAKMC1-NC	0.0001	1375	1648.15	0.2	-	gl+ol	EMPA	48.4	0.047	4.94	1.05
Mysen, 2007b	FDAQMC-NC	0.0001	1375	1648.15	0.2	-	gl+ol	EMPA	49.4	7.3	9.4	1.13
Mysen, 2007b	FDMC3-NC	0.0001	1375	1648.15	0.2	-	gl+ol	EMPA	57.9	0.083	10.07	1.16
Mysen, 2007b	FDMC3-NC	0.0001	1425	1698.15	0.2	-	gl+ol	EMPA	56.7	0.1	9.9	1.22
Mysen, 2007b	FDMC1-NC	0.0001	1375	1648.15	0.2	-	gl+ol	EMPA	52.2	0.09	9.58	1.19
Mysen, 2007b	FDMC1-NC	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	51.7	0.07	8.3	1.12
Mysen, 2007b	FDAKM-NC	0.0001	1375	1648.15	0.2	-	gl+ol	EMPA	45.3	0.02	4.97	1.04
Mysen, 2007b	FDAKM-NC	0.0001	1450	1723.15	0.2	-	gl+ol	EMPA	45.4	0.01	4.51	0.98
Mysen, 2006	FDA3-0.5	0.0001	1300	1573.15	0.208929613	-	gl+ol+/-sp	EMPA	45.56	11.55	14.15	0.529
Mysen, 2006	FDA3-1.5	0.0001	1300	1573.15	0.208929613	-	gl+ol+/-sp	EMPA	46.51	11.69	12.06	1.45
Mysen, 2006	FDA-3	0.0001	1300	1573.15	0.001	-	gl+ol+/-sp	EMPA	43.5	12.01	15.94	0.99
Mysen, 2006	FDA-3	0.0001	1300	1573.15	0.00001	-	gl+ol+/-sp	EMPA	41.14	12.54	19.39	0.97
Mysen, 2006	FDA-3	0.0001	1300	1573.15	0.0000001	-	gl+ol+/-sp	EMPA	40.51	13.5	18.91	1.02
Mysen, 2006	FDA-3	0.0001	1300	1573.15	0.00000001	-	gl+ol+/-sp	EMPA	42.52	14.05	16.98	1.03
Gaetani and Grove, 1997	Fo86-8s	0.0001	1350	1623.15	1.25893E-08	-	gl+ol+sp+sulfide	EMPA	60.9	11.3	9.1	0
Gaetani and Grove, 1997	Fo86-5s	0.0001	1350	1623.15	1.25893E-08	-	gl+ol+sp+sulfide	EMPA	61.6	11.7	7.9	0
Gaetani and Grove, 1997	KOM-1s	0.0001	1350	1623.15	1.25893E-08	-	gl+ol+sp+sulfide	EMPA	51.4	10.9	11.2	0.314
Gaetani and Grove, 1997	KOM-15s	0.0001	1350	1623.15	1.58489E-09	-	gl+ol+sp+sulfide	EMPA	51.5	10.47	9.4	0.3
Gaetani and Grove, 1997	KOM-16s	0.0001	1350	1623.15	1.25893E-08	-	gl+ol+sp+sulfide	EMPA	49.1	10.59	11.7	0.279
Gaetani and Grove, 1997	KOM-19s	0.0001	1350	1623.15	1.25893E-08	-	gl+ol+sp+sulfide	EMPA	50	10.6	11.4	0.288
Gaetani and Grove, 1997	KOM-23s	0.0001	1350	1623.15	0.00000001	-	gl+ol+sp+sulfide	EMPA	49.6	10.64	11.9	0.293
nyder and Carmichael, 199	44-51	0.0001	1289	1562.15	3.98107E-08	<10%	gl+ol	EMPA	51.4	16.4	8.170762	0.122
nyder and Carmichael, 199	44-64	0.0001	1230	1503.15	1.07152E-08	<10%	gl+ol	EMPA	53.4	17.5	7.100802	0.13
nyder and Carmichael, 199	48-48	0.0001	1289	1562.15	4.0738E-12	<10%	gl+ol	EMPA	52.1	13.3	9.393968	0.125
nyder and Carmichael, 199	48-56	0.0001	1286	1559.15	4.36516E-11	<10%	gl+ol	EMPA	54.3	13.3	7.368958	0.127
nyder and Carmichael, 199	50-56	0.0001	1286	1559.15	4.36516E-11	<10%	gl+ol	EMPA	45.4	8.56	11.80491	0.21
nyder and Carmichael, 199	77-52	0.0001	1231	1504.15	1.58489E-10	<10%	gl+ol	EMPA	54	13.9	6.9499	0.111
Ehlers et al., 1992	Fo60-45K	0.0001	1275	1548.15	2.51189E-06	-	gl+ol	EMPA	47.97	13.63	17.71	0
Ehlers et al., 1992	Fo86-11K	0.0001	1350	1623.15	1.25893E-07	-	gl+ol	EMPA	55.65	11.89	9.55	0
Ehlers et al., 1992	Fo86-20K	0.0001	1350	1623.15	7.94328E-06	-	gl+ol	EMPA	56.46	11.55	10.66	0
Ehlers et al., 1992	Fo86-48K	0.0001	1350	1623.15	3.98107E-10	-	gl+ol	EMPA	57.51	13.21	9.38	0
Kinzler et al., 1990	Fo20-20	0.0001	1204	1477.15	1.7378E-09	-	gl+ol	EMPA	45.2	8.72	37.2	0
Kinzler et al., 1990	Fo40-10	0.0001	1226	1499.15	3.01995E-10	-	gl+ol	EMPA	53.2	12.4	21.7	0
Kinzler et al., 1990	Fo40-20	0.0001	1226	1499.15	3.01995E-10	-	gl+ol	EMPA	45.9	12.1	27.3	0
Kinzler et al., 1990	Fo40-40	0.0001	1198	1471.15	1.7378E-09	-	gl+ol	EMPA	47.4	13.3	24.7	0
Kinzler et al., 1990	Fo60-100	0.0001	1286	1559.15	4.57088E-08	-	gl+ol	EMPA	48.3	14.8	17.6	0
Kinzler et al., 1990	Fo60-20	0.0001	1280	1553.15	1.14815E-08	-	gl+ol	EMPA	50.5	14.3	16.8	0
Kinzler et al., 1990	Fo60-40	0.0001	1278	1551.15	1.31826E-08	-	gl+ol	EMPA	53.1	15	13.8	0
Kinzler et al., 1990	Fo60-50	0.0001	1286	1559.15	4.57088E-08	-	gl+ol	EMPA	58.1	14.3	13.7	0
Takahashi, 1978	27	0.0001	1400	1673.15	CO2/H2 = 10/1	-	gl+ol	EMPA	58.21	0.00	16.11	2.07
Takahashi, 1978	28	0.0001	1375	1648.15	CO2/H2 = 10/1	-	gl+ol	EMPA	55.53	0.00	21.81	2.96
Takahashi, 1978	29	0.0001	1375	1648.15	CO2/H2 = 10/1	-	gl+ol	EMPA	58.39	0.00	15.80	1.90
Takahashi, 1978	30	0.0001	1350	1623.15	CO2/H2 = 10/1	-	gl+ol	EMPA	61.72	0.00	16.26	1.93
Takahashi, 1978	36	0.0001	1320	1593.15	CO2/H2 = 10/1	-	gl+ol	EMPA	59.88	0.00	19.57	1.47
Takahashi, 1978	37	0.0001	1320	1593.15	CO2/H2 = 10/1	-	gl+ol	EMPA	59.82	0.00	20.16	1.45

sample #	melt composition (wt%)													
	melt MgO	melt CaO	melt Na2O	melt K2O	melt CoO	melt NiO	melt H2O	melt S	melt Cu2O	melt P2O5	melt Cr2O3	melt TiO2	melt V2O5	melt WO3
GW-18	6.2	4.45	3.86	1.39	0.00	0.258		0	0	0.01	0.05	2.96	0	0
GW-12	7.54	4.41	3.49	1.4	0.00	0.195		0	0	0.003	0.03	2.79	0	0
GW-19	7.16	4.41	3.76	1.43	0.00	0.276		0	0	0.03	0.05	2.86	0	0
GW-21	8.12	4.2	3.36	1.44	0.00	0.390		0	0	0.01	0.03	2.78	0	0
GW-22	9.66	4.08	3.5	1.25	0.00	0.491		0	0	0.001	0.05	2.68	0	0
OMED-3	11.86	11.18	1.96	0.1	0.00	0.032		0	0	0.03	0.04	0.57	0	0
OMED-10	15.01	10.16	1.69	0.06	0.00	0.046		0	0	0.04	0.07	0.52	0	0
FDS-6	24.73	19.47	0	0	0.76	0.450		0	0	0	0	0	0	0
FDS-5	25.08	17.67	0	0	0.81	0.470		0	0	0	0	0	0	0
FDS-3	30.47	8.43	0	0	0.84	0.460		0	0	0	0	0	0	0
FDS-4	28.25	13.69	0	0	0.81	0.480		0	0	0	0	0	0	0
FDS-5	27.31	16.5	0	0	0.85	0.530		0	0	0	0	0	0	0
FDS-6	25.41	20.09	0	0	0.75	0.430		0	0	0	0	0	0	0
FDS-1	35	1.97	0	0	0.86	0.500		0	0	0	0	0	0	0
FDS-2	34.21	4.15	0	0	0.79	0.530		0	0	0	0	0	0	0
FDS-4	30.58	12.02	0	0	0.78	0.510		0	0	0	0	0	0	0
FDS-6	28.19	18.45	0	0	0.77	0.490		0	0	0	0	0	0	0
FDS-2	34.12	4.38	0	0	0.91	0.690		0	0	0	0	0	0	0
FDS-3	34.07	7.47	0	0	0.90	0.690		0	0	0	0	0	0	0
FDS-4	32.7	10.27	0	0	0.88	0.670		0	0	0	0	0	0	0
FDS-5	29.76	14.74	0	0	0.90	0.730		0	0	0	0	0	0	0
FDS-6	30.26	16.86	0	0	0.92	0.720		0	0	0	0	0	0	0
FDS-1	37.34	1.09	0	0	0.94	0.670		0	0	0	0	0	0	0
FDS-2	36.14	3.93	0	0	0.95	0.720		0	0	0	0	0	0	0
FDS-3	34.9	7.27	0	0	0.89	0.680		0	0	0	0	0	0	0
FDS-1	40.11	1.01	0	0	0.81	0.940		0	0	0	0	0	0	0
FDS-2	38.2	3.47	0	0	1.02	0.940		0	0	0	0	0	0	0
FDS-4	35.52	9.6	0	0	0.96	0.880		0	0	0	0	0	0	0
AFS-6	29.49	6.33	0.024	0	0.72	0.480		0	0	0	0	0	0	0
AFS-7	23.22	9.9	0.05	0	0.71	0.420		0	0	0	0	0	0	0
AFS-9	21.14	11.34	0.046	0	0.65	0.390		0	0	0	0	0	0	0
NFS-1	15.88	0.12	12.53	0	0.79	0.500		0	0	0	0	0	0	0
NFS-2	15.23	0.029	11.11	0	0.76	0.520		0	0	0	0	0	0	0
NFS-3	13.86	0.03	10.86	0	0.71	0.350		0	0	0	0	0	0	0
NFS-4	17.26	0.03	9.49	0	0.75	0.480		0	0	0	0	0	0	0
NFS-5	14.67	0.02	8	0	0.69	0.320		0	0	0	0	0	0	0
NFS-6	13.8	0.013	7.24	0	0.60	0.310		0	0	0	0	0	0	0
NFS-7	15.94	0.026	5.05	0	0.66	0.300		0	0	0	0	0	0	0
FDMC-NC0.5	19.5	18.5	0.014	0.018	0.35	0.190		0	0	0	0	0	0	0
FDMC-NC1.5	18.4	18.82	0.02	0.038	0.98	0.460		0	0	0	0	0	0	0
FLQ1MC-NC	7.57	5.91	0.058	9.49	0.74	0.480		0	0	0	0	0	0	0
FLQ2MC-NC	12.2	6.93	0.12	5.29	0.70	0.410		0	0	0	0	0	0	0
FLQ2MC2-NC	8.88	2.79	3.5	6.25	0.54	0.250		0	0	0	0	0	0	0
FNQMC-NC	15.99	8.94	4.38	0.04	0.66	0.370		0	0	0	0	0	0	0
FNQMC1-NC	15.02	10.39	3.97	0.065	0.58	0.290		0	0	0	0	0	0	0
FNQMC3-NC	16.54	14.36	0.011	0.02	0.66	0.330		0	0	0	0	0	0	0
FNQMC3-1-NC	15.55	20.2	0.046	0.035	0.62	0.500		0	0	0	0	0	0	0
FDMC1-NC	23.1	11.63	1.77	0.099	0.67	0.390		0	0	0	0	0	0	0
FDAKMC2-NC	19.6	17.4	3.51	0.02	0.84	0.520		0	0	0	0	0	0	0
FDAKMC1-NC	18.7	22.1	2.66	0.016	0.76	0.490		0	0	0	0	0	0	0
FDAQMC-NC	17.8	12.54	0.06	0.045	0.63	0.350		0	0	0	0	0	0	0
FDMC3-NC	17.82	4.14	7.1	0.089	0.65	0.290		0	0	0	0	0	0	0
FDMC3-NC	19.9	3.79	6.11	0.028	0.68	0.260		0	0	0	0	0	0	0
FDMC1-NC	18.7	13.19	2.73	0.148	0.67	0.400		0	0	0	0	0	0	0
FDMC1-NC	23.1	11.63	1.77	0.099	0.67	0.390		0	0	0	0	0	0	0
FDAKM-NC	17.8	29.1	0.02	0.019	0.71	0.570		0	0	0	0	0	0	0
FDAKM-NC	21.2	26.1	0.02	0.019	0.70	0.490		0	0	0	0	0	0	0
FDA3-0.5	15.82	10.9	0	0	0.34	0.180		0	0	0	0	0	0	0
FDA3-1.5	14	11.48	0	0	0.90	0.450		0	0	0	0	0	0	0
FDA-3	14.14	10.84	0	0	0.75	0.410		0	0	0	0	0	0	0
FDA-3	12.85	10.59	0	0	0.76	0.490		0	0	0	0	0	0	0
FDA-3	11.93	11.93	0	0	0.65	0.230		0	0	0	0	0	0	0
FDA-3	12.25	12.17	0	0	0.48	0.080		0	0	0	0	0	0	0
Fo86-8s	13.5	2.5	2.4	0	0.00	0.130		0.031	0	0	0	0	0	0
Fo86-5s	13.2	2.34	3.2	0	0.00	0.116		0.028	0	0	0	0	0	0
KOM-1s	15.2	10	0.23	0.06	0.00	0.086		0.065	0.073	0	0.246	0.38	0	0
KOM-15s	17.65	9.32	0.08	0.01	0.00	0.024		0.131	0.011	0	0.53	0.34	0	0
KOM-16s	16	9.03	0.13	0.02	0.48	0.121		0.064	0	0	0.226	0.35	0	1.03
KOM-19s	16.6	9.37	0.14	0.03	0.00	0.176		0.062	0	0	0.24	0.346	1	0
KOM-23s	17.2	8.81	0.15	0.02	0.00	0.095		0.101	0	0	0.25	0.347	1.048	0
44-51	8.3	8.39	3.12	1.12	0.00	1.400		0	0	0	0	0.78	0	0
44-64	6.69	9.06	2.56	1.18	0.00	0.897		0	0	0	0	0.85	0	0
48-48	11.8	8.68	0.39	1.38	0.00	0.042		0	0	0	0	1.86	0	0
48-56	12.6	8.85	0.24	0.91	0.00	0.208		0	0	0	0	1.93	0	0
50-56	12.7	14.4	0.09	0.11	0.00	0.204		0	0	0	0	5.74	0	0
77-52	7.01	8.77	2.06	4.76	0.00	0.326		0	0	0	0	1.85	0	0
Fo60-45K	10.32	6.26	2.61	0	0.00	0.343		0	0	0	0	0	0	0
Fo86-11K	18.2	2.51	1.68	0	0.00	0.134		0	0	0	0	0	0	0
Fo86-20K	15.56	2.24	3.1	0	0.00	0.181		0	0	0	0	0	0	0
Fo86-48K	16.49	2.52	1.41	0	0.00	0.192		0	0	0	0	0	0	0
Fo20-20	3.83	1.54	3	0	0.00	0.420		0	0	0	0	0	0	0
Fo40-10	5.26	1.56	5.51	0	0.00	0.210		0	0	0	0	0	0	0
Fo40-20	6.35	4.38	3.49	0	0.00	0.310		0	0	0	0	0	0	0
Fo40-40	5.67	4.75	2.58	0	0.00	0.310		0	0	0	0	0	0	0
Fo60-100	9.62	5.49	2.69	0	0.00	0.540		0	0	0	0	0	0	0
Fo60-20	9.79	4.64	3.25	0	0.00	0.340		0	0	0	0	0	0	0
Fo60-40	8.65	3.14	4.75	0	0.00	0.340		0	0	0	0	0	0	0
Fo60-50	7.33	1.01	5.07	0	0.00	0.350		0	0	0	0	0	0	0
27	11.47	0.00	0.00	9.51	1.62	0.950								
28	9.99	0.00	0.00	7.17	1.74	0.802								
29	10.09	0.00	0.00	11.14	1.63	1.042								
30	8.61	0.00	0.00	9.35	1.41	0.581								
36	7.71	0.00	0.00	10.20	0.87	0.300								
37	7.65	0.00	0.00	9.46	1.02	0.432								

sample #	melt ZnO	melt CuO	Total	olivine SiO2	olivine Al2O3	olivine FeO	olivine MnO	olivine MgO	olivine CaO	olivine CoO	olivine NiO	olivine TiO2	olivine Cr2O3
										olivine composition (wt%)			
GW-18			99.74	39.27	0.03	9.67	0.114	45.47	0.14	0.00	5.160	0.06	0.08
GW-12			98.72	40.08	0.015	9	0.106	47.51	0.13	0.00	3.065	0.04	0.043
GW-19			99.67	39.69	0.03	9.42	0.111	46.16	0.14	0.00	4.330	0.07	0.08
GW-21			100.36	40.31	0.038	8.48	0.093	45.37	0.12	0.00	5.466	0.06	0.67
GW-22			100.26	40.13	0.03	7.76	0.09	46.4	0.12	0.00	5.910	0.06	0.05
OMED-3			99.00	40.49	0.06	9.63	0.14	48.63	0.32	0.00	0.330	0.001	0.004
OMED-10			100.72	40.46	0.1	8.4	0.122	50.9	0.28	0.00	0.336	0.02	0.02
FDS-6			99.21	41.5	0	0	0.71	54.56	0.86	1.09	1.640	0	0
FDS-5			99.55	41.66	0	0	0.68	54.39	0.65	1.21	1.800	0	0
FDS-3			99.03	41.62	0	0	0.65	55.29	0.24	1.10	1.600	0	0
FDS-4			99.69	41.78	0	0	0.69	54.95	0.46	1.09	1.620	0	0
FDS-5			100.09	41.6	0	0	0.64	54.56	0.65	1.10	1.730	0	0
FDS-6			98.83	41.58	0	0	0.63	54.36	0.89	0.98	1.470	0	0
FDS-1			99.93	41.79	0	0	0.66	54.72	0.048	1.02	1.570	0	0
FDS-2			99.24	41.03	0	0	0.53	55.06	0.12	0.91	1.560	0	0
FDS-4			99.23	41.7	0	0	0.64	55.19	0.41	0.93	1.480	0	0
FDS-6			99.39	41.19	0	0	0.63	55.28	0.9	0.93	1.450	0	0
FDS-2			98.76	41.76	0	0	0.55	54.26	0.12	1.06	1.770	0	0
FDS-3			100.36	42.25	0	0	0.54	54.13	0.23	1.03	1.690	0	0
FDS-4			99.79	42.34	0	0	0.54	54.27	0.36	0.94	1.730	0	0
FDS-5			99.40	41.77	0	0	0.57	53.46	0.62	1.04	1.850	0	0
FDS-6			100.61	42.08	0	0	0.57	54.8	0.84	0.95	1.650	0	0
FDS-1			99.16	42.36	0	0	0.54	55.27	0.03	0.97	1.680	0	0
FDS-2			100.90	42.35	0	0	0.53	55.31	0.11	0.97	1.660	0	0
FDS-3			100.77	42.08	0	0	0.57	55.38	0.23	0.98	1.640	0	0
FDS-1			100.73	42.18	0	0	0.47	55.3	0.03	0.90	1.620	0	0
FDS-2			99.57	42.17	0	0	0.46	55.3	0.12	0.94	1.950	0	0
FDS-4			100.50	42.2	0	0	0.49	54.61	0.39	0.89	1.760	0	0
AFS-6			98.86	41.77	0.09	0	0.53	54.77	0.18	0.90	1.430	0	0
AFS-7			98.85	41.36	0.14	0	0.65	54.1	0.28	1.07	1.550	0	0
AFS-9			98.84	41.28	0.18	0	0.67	53.96	0.32	1.02	1.570	0	0
NFS-1			100.19	41.28	0.24	0	0.71	53.37	0.003	1.42	2.620	0	0
NFS-2			100.54	41.31	0.17	0	0.86	53.5	0.011	1.56	2.640	0	0
NFS-3			100.41	41.58	0.1	0	0.89	53.11	0.01	1.59	2.520	0	0
NFS-4			99.65	41.74	0.09	0	0.81	53.94	0.01	1.57	2.740	0	0
NFS-5			98.83	41.11	0.06	0	0.8	53.72	0.05	1.60	2.660	0	0
NFS-6			98.76	41.68	0.06	0	0.98	53.54	0.001	1.77	2.480	0	0
NFS-7			99.14	41.65	0.04	0	0.79	53.35	0.004	1.79	2.520	0	0
FDMC-NC0.5			99.42	42.1	0	1.95	0.39	54.4	0.65	0.57	0.880	0	0
FDMC-NC1.5			99.04	41.2	0	1.83	1.22	51.3	0.74	1.77	2.660	0	0
FLQ1MC-NC			100.01	40.2	0.05	0.94	1.15	47.3	0.32	2.81	6.210	0	0
FLQ2MC-NC			98.85	41.3	0.02	1.76	0.9	50	0.26	1.85	3.510	0	0
FLQ2MC2-NC			99.47	41.2	0.03	1.6	1.21	51.1	0.17	2.01	3.310	0	0
FNQMC-NC			98.72	41.5	0.096	1.84	0.79	51.3	0.33	1.20	1.990	0	0
FNQMC1-NC			99.66	41.4	0.08	1.87	0.8	53	0.36	1.21	1.890	0	0
FNQMC3-NC			99.21	41.4	0.1	1.88	0.736	52.7	0.44	1.28	1.900	0	0
FNQMC3-1-NC			99.14	41.2	0.04	1.39	0.72	52.6	0.85	1.14	2.760	0	0
FDMC1-NC			98.85	41.6	0.003	1.97	0.66	52.8	0.42	0.93	1.540	0	0
FDAKMC2-NC			99.83	41.7	0.002	0.92	0.77	52.4	0.97	1.35	2.460	0	0
FDAKMC1-NC			99.16	41.6	0.01	0.78	0.75	51.7	1.57	1.19	2.270	0	0
FDAQMC-NC			98.66	41.7	0.06	2.26	0.74	52.3	0.34	1.14	2.070	0	0
FDMC3-NC			99.30	41.61	0	2.13	0.86	52.9	0.16	1.28	1.810	0	0
FDMC3-NC			98.69	42.1	0	2.23	0.79	52.7	0.123	1.20	1.410	0	0
FDMC1-NC			98.90	41.22	0.005	1.91	0.81	51.7	0.49	1.14	1.920	0	0
FDMC1-NC			98.85	41.6	0.003	1.97	0.66	52.8	0.42	0.93	1.540	0	0
FDAKM-NC			99.55	41.3	0	0.75	0.76	50.9	2.35	1.04	2.200	0	0
FDAKM-NC			99.43	42.1	0.03	0.71	0.64	52.6	2.04	0.87	1.590	0	0
FDA3-0.5			99.03	40.58	0.09	3.27	0.34	53.55	0.24	0.70	1.270	0	0
FDA3-1.5			98.54	40.36	0.17	3.9	1.06	48.71	0.6	1.97	3.180	0	0
FDA-3			98.58	39.78	0.12	6.86	0.73	48.16	0.36	1.43	2.670	0	0
FDA-3			98.73	39.29	0.13	11.37	0.76	44.46	0.36	1.54	2.850	0	0
FDA-3			98.68	38.28	0.14	16.89	0.87	41.26	0.5	1.33	1.390	0	0
FDA-3			99.56	38.4	0.079	16.73	0.92	42.19	0.47	1.05	0.540	0	0
Fo86-8s			99.86	40.5	0.05	9.7	0	49.2	0.04	0.00	0.970	0	0
Fo86-5s			100.08	40.7	0.08	9.5	0	49.5	0.04	0.00	0.840	0	0
KOM-1s			100.15	39.7	0.07	10.89	0.266	47.8	0.23	0.00	0.580	0	0.158
KOM-15s			99.77	40.4	0.12	8.44	0.214	49.8	0.21	0.00	0.134	0	0.324
KOM-16s			99.12	39.8	0.07	11.2	0.191	46.2	0.22	0.87	0.670	0	0.13
KOM-19s			100.25	40.1	0.07	10	0.212	47.9	0.24	0.00	1.050	0.005	0.148
KOM-23s			100.45	40.4	0.06	10.2	0.217	48.7	0.22	0.00	0.520	0.004	0.145
44-51			99.20	37.8	0	11.1	0.133	37.1	0.19	0.00	13.480	0	0
44-64			99.37	38.1	0	11.3	0.163	37.8	0.21	0.00	12.830	0	0
48-48			99.07	40.1	0	11.5	0.12	47.9	0.22	0.00	0.308	0	0
48-56			99.83	40.5	0	9.17	0.121	48.1	0.21	0.00	1.740	0	0
50-56			99.22	40.1	0	12.4	0.187	45.9	0.49	0.00	1.320	0	0
77-52			99.74	39.9	0	11.2	0.154	43.9	0.33	0.00	4.840	0	0
Fo60-45K			98.84	38.17	0.06	17.51	0	40.62	0.19	0.00	3.115	0	0
Fo86-11K			99.61	40.44	0.05	8.59	0	49.8	0.05	0.00	0.835	0	0
Fo86-20K			99.75	40.37	0.05	8.96	0	49.15	0.04	0.00	1.302	0	0
Fo86-48K			100.71	40.47	0.12	9.45	0	48.63	0.05	0.00	1.292	0	0
Fo20-20			99.91	32.8	0.06	48.7	0	15.5	0.09	0.00	3.760	0	0
Fo40-10			99.84	35.5	0.07	34.6	0	26.6	0.06	0.00	2.900	0	0
Fo40-20			99.83	35.3	0.1	34.2	0	26.6	0.15	0.00	3.160	0	0
Fo40-40			98.71	35.2	0.05	34.8	0	26	0.17	0.00	3.910	0	0
Fo60-100			99.04	37.5	0.06	19.7	0	37.2	0.14	0.00	5.600	0	0
Fo60-20			99.62	38.2	0.09	20	0	38.4	0.15	0.00	3.450	0	0
Fo60-40			98.78	37.8	0.06	18.7	0	39	0.1	0.00	4.720	0	0
Fo60-50			99.86	37.7	0.07	20.2	0	36.9	0.04	0.00	5.280	0	0
27	0.07	0.00	100.00	37.52	0	13.63	1.93	37.82	0	3.46	5.57		
28	0.00	0.00	100.00	36.09	0	19.51	2.86	32.75	0	3.60	5.13		
29	0.00	0.00	100.00	36.88	0	13.99	2.05	35.95	0	3.79	7.25		
30	0.15	0.00	100.00	37.17	0	16.33	2.27	35.52	0	3.63	4.85		
36	0.00	0.00	100.00	36.88	0	21.94	1.82	32.55	0	2.75	3.95		
37	0.00	0.00	100.00	36.65	0	22.70	1.84	31.27	0	2.99	4.48		

sample #	olivine composition (wt%)								
	olivine Na2O	olivine K2O	olivine WO3	olivine V2O5	olivine ZnO	olivine CuO	olivine P2O5	Total	Mg#
GW-18	0	0	0	0				99.99	89.3
GW-12	0	0	0	0				99.99	90.4
GW-19	0	0	0	0				100.03	89.7
GW-21	0	0	0	0				100.61	90.5
GW-22	0	0	0	0				100.55	91.4
OMED-3	0	0	0	0				99.61	90.0
OMED-10	0	0	0	0				100.64	91.5
FDS-6	0	0	0	0				100.36	100.0
FDS-5	0	0	0	0				100.39	100.0
FDS-3	0	0	0	0				100.50	100.0
FDS-4	0	0	0	0				100.59	100.0
FDS-5	0	0	0	0				100.28	100.0
FDS-6	0	0	0	0				99.91	100.0
FDS-1	0	0	0	0				99.81	100.0
FDS-2	0	0	0	0				99.21	100.0
FDS-4	0	0	0	0				100.35	100.0
FDS-6	0	0	0	0				100.38	100.0
FDS-2	0	0	0	0				99.52	100.0
FDS-3	0	0	0	0				99.87	100.0
FDS-4	0	0	0	0				100.18	100.0
FDS-5	0	0	0	0				99.31	100.0
FDS-6	0	0	0	0				100.89	100.0
FDS-1	0	0	0	0				100.85	100.0
FDS-2	0	0	0	0				100.93	100.0
FDS-3	0	0	0	0				100.88	100.0
FDS-1	0	0	0	0				100.50	100.0
FDS-2	0	0	0	0				100.94	100.0
FDS-4	0	0	0	0				100.34	100.0
AFS-6	0.006	0	0	0				99.68	100.0
AFS-7	0.004	0	0	0				99.15	100.0
AFS-9	0.01	0	0	0				99.01	100.0
NFS-1	0	0	0	0				99.64	100.0
NFS-2	0.02	0	0	0				100.07	100.0
NFS-3	0.01	0	0	0				99.81	100.0
NFS-4	0.01	0	0	0				100.91	100.0
NFS-5	0.012	0	0	0				100.01	100.0
NFS-6	0.01	0	0	0				100.52	100.0
NFS-7	0.008	0	0	0				100.15	100.0
FDMC-NC0.5	0.003	0.014	0	0				100.96	98.0
FDMC-NC1.5	0.002	0.014	0	0				100.74	98.0
FLQ1MC-NC	0.005	0.06	0	0				99.05	98.9
FLQ2MC-NC	0.062	0.033	0	0				99.70	98.1
FLQ2MC2-NC	0.02	0.05	0	0				100.70	98.3
FNQMC-NC	0.04	0.019	0	0				99.11	98.0
FNQMC1-NC	0.014	0.017	0	0				100.64	98.1
FNQMC3-NC	0	0.017	0	0				100.45	98.0
FNQMC3-1-NC	0.001	0.014	0	0				100.72	98.5
FDMC1-NC	0.012	0.016	0	0				99.95	97.9
FDAKMC2-NC	0.021	0.018	0	0				100.61	99.0
FDAKMC1-NC	0.016	0.014	0	0				99.90	99.2
FDAQMC-NC	0.03	0.015	0	0				100.66	97.6
FDMC3-NC	0.03	0.017	0	0				100.80	97.8
FDMC3-NC	0.03	0.018	0	0				100.60	97.7
FDMC1-NC	0.021	0.016	0	0				99.23	98.0
FDMC1-NC	0.012	0.016	0	0				99.95	97.9
FDAKM-NC	0.009	0.017	0	0				99.33	99.2
FDAKM-NC	0.007	0.019	0	0				100.61	99.2
FDA3-0.5	0	0	0	0				100.04	96.7
FDA3-1.5	0	0	0	0				99.95	95.7
FDA-3	0	0	0	0				100.11	92.6
FDA-3	0	0	0	0				100.76	87.5
FDA-3	0	0	0	0				100.66	81.3
FDA-3	0	0	0	0				100.38	81.8
Fo86-8s	0	0	0	0				100.46	90.0
Fo86-5s	0	0	0	0				100.66	90.3
KOM-1s	0	0	0	0				99.69	88.7
KOM-15s	0	0	0	0				99.64	91.3
KOM-16s	0	0	0.016	0				99.37	88.0
KOM-19s	0	0	0	0.096				99.82	89.5
KOM-23s	0	0	0	0.104				100.57	89.5
44-51	0	0	0	0				99.80	85.6
44-64	0	0	0	0				100.40	85.6
48-48	0	0	0	0				100.15	88.1
48-56	0	0	0	0				99.84	90.3
50-56	0	0	0	0				100.40	86.8
77-52	0	0	0	0				100.32	87.5
Fo60-45K	0	0	0	0	0			99.67	80.5
Fo86-11K	0	0	0	0	0			99.77	91.2
Fo86-20K	0	0	0	0	0			99.87	90.7
Fo86-48K	0	0	0	0	0			100.01	90.2
Fo20-20	0	0	0	0	0			100.91	36.2
Fo40-10	0	0	0	0	0			99.73	57.8
Fo40-20	0	0	0	0	0			99.51	58.1
Fo40-40	0	0	0	0	0			100.13	57.1
Fo60-100	0	0	0	0	0			100.20	77.1
Fo60-20	0	0	0	0	0			100.29	77.4
Fo60-40	0	0	0	0	0			100.38	78.8
Fo60-50	0	0	0	0	0			100.19	76.5
27		0.07			0.00	0.00		100.00	83.2
28		0.05			0.00	0.00		100.00	74.9
29		0.09			0.00	0.00		100.00	82.1
30		0.09			0.14	0.00		100.00	79.5
36		0.10			0.00	0.00		100.00	72.6
37		0.07			0.00	0.00		100.00	71.1

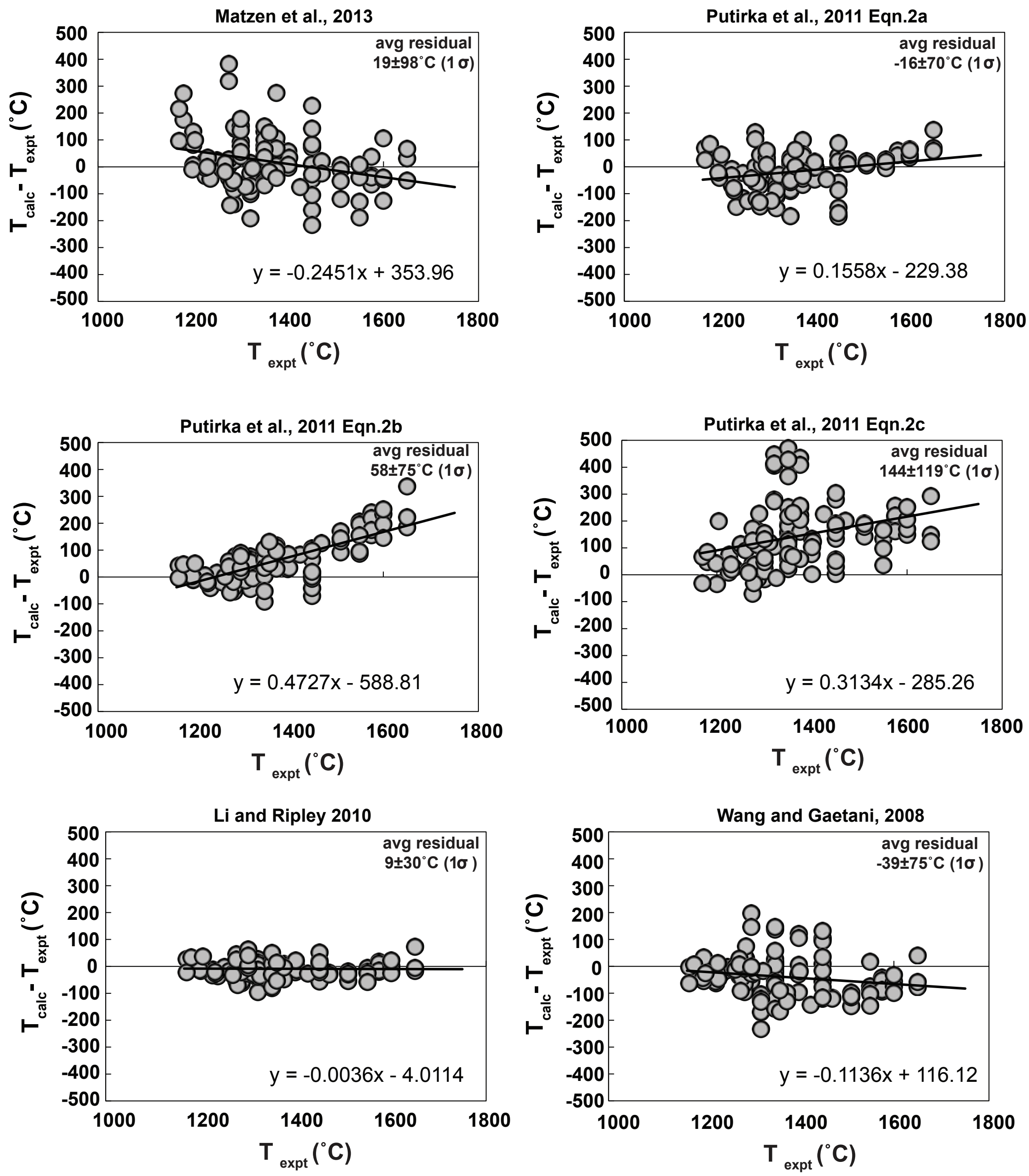
Study	sample #	P (GPa)	T(˚C)	T(K)	fO2	xtal %	xtal phases	analytical method	melt SiO2	melt Al2O3	melt FeOT	melt MnO
Takahashi, 1978	38	0.0001	1320	1593.15	CO2/H2 = 10/1	-	gl+ol	EMPA	60.57	0.00	20.25	1.39
Takahashi, 1978	39	0.0001	1320	1593.15	CO2/H2 = 10/1	-	gl+ol	EMPA	62.08	0.00	20.09	1.44
Takahashi, 1978	40	0.0001	1320	1593.15	CO2/H2 = 10/1	-	gl+ol	EMPA	62.74	0.00	13.31	1.71
Takahashi, 1978	41	0.0001	1320	1593.15	CO2/H2 = 10/1	-	gl+ol	EMPA	61.22	0.00	17.30	1.16
Takahashi, 1978	42	0.0001	1320	1593.15	CO2/H2 = 10/1	-	gl+ol	EMPA	60.53	0.00	17.20	1.21
Takahashi, 1978	47	0.0001	1400	1673.15	CO2/H2 = 10/1	-	gl+ol+sp	EMPA	48.79	9.84	10.04	1.02
Takahashi, 1978	48	0.0001	1400	1673.15	CO2/H2 = 1/1	-	gl+ol	EMPA	48.88	10.00	9.48	1.04
Takahashi, 1978	50	0.0001	1250	1523.15	CO2/H2 = 10/1	-	gl+ol	EMPA	49.70	12.57	9.69	2.41
Takahashi, 1978	53	0.0001	1200	1473.15	CO2/H2 = 10/1	-	gl+ol+sp	EMPA	49.56	13.91	9.53	2.31
Takahashi, 1978	54	0.0001	1200	1473.15	CO2/H2 = 10/1	-	gl+ol+sp	EMPA	39.16	12.77	12.90	2.76
Takahashi, 1978	56	0.0001	1200	1473.15	CO2/H2 = 10/1	-	gl+ol	EMPA	48.89	17.53	7.04	1.53
Arndt, 1977	SA3091-1275	0.0001	1275	1548.15	ertain CO2/H2 rati	-	gl+ol	EMPA	49.60	12.00	12.20	0.30
Arndt, 1977	SA3091-1225	0.0001	1225	1498.15	ertain CO2/H2 rati	-	gl+ol	EMPA	50.00	13.20	11.50	0.15
Bird, 1971	Comp 2, 1400	0.0001	1400	1673.15	unbuffered	-	gl+ol	EMPA	50.96	16.86	0.00	0.00
Bird, 1971	Comp 2, 1350	0.0001	1350	1623.15	unbuffered	-	gl+ol	EMPA	50.92	18.23	0.00	0.00
Bird, 1971	Comp 2, 1300	0.0001	1300	1573.15	unbuffered	-	gl+ol	EMPA	52.01	19.65	0.00	0.00
Bird, 1971	Comp 3, 1400	0.0001	1400	1673.15	unbuffered	-	gl+ol+sp	EMPA	45.75	20.72	0.00	0.00
Bird, 1971	Comp 3, 1350	0.0001	1350	1623.15	unbuffered	-	gl+ol+sp	EMPA	47.13	20.74	0.00	0.00
Bird, 1971	Comp 3, 1300	0.0001	1300	1573.15	unbuffered	-	gl+ol+sp	EMPA	50.21	21.11	0.00	0.00
Jurewicz et al., 1993	A2	0.0001	1275	1548.15	-9.04	-	gl+ol+sp	EMPA	36.60	10.60	31.10	0.19
Jurewicz et al., 1993	A4	0.0001	1180	1453.15	-10.1	-	gl+ol+sp	EMPA	39.40	12.40	23.60	0.15
Jurewicz et al., 1993	A5	0.0001	1170	1443.15	-10.29	-	gl+ol+sp	EMPA	40.10	12.60	22.50	0.16
Jurewicz et al., 1993	M2	0.0001	1275	1548.15	-9.04	-	gl+ol+sp	EMPA	37.30	11.00	30.70	0.21
Jurewicz et al., 1993	M5	0.0001	1180	1453.15	-10.1	-	gl+ol+sp	EMPA	39.30	12.40	22.40	0.12
Jurewicz et al., 1993	M6	0.0001	1170	1443.15	-10.29	-	gl+ol+sp	EMPA	40.60	12.60	24.20	0.21
Matzen et al., 2013	25	0.0001	1399	1672.15	QFM-1.7	37%	gl+ol	EMPA	48.26	10.51	11.55	0.200
Matzen et al., 2013	32R	0.0001	1402	1675.15	QFM-1.7	3%	gl+ol	EMPA	48.82	10.69	11.51	0.200
Nabelek, 1980	P2-12	0.0001	1267	1540.15	unbuffered	-	gl+ol	EMPA	50	16.5	6.6	0.13
Nabelek, 1980	P4-16	0.0001	1267	1540.15	unbuffered	-	gl+ol	EMPA	50	16.1	7.44	0.11

sample #	melt composition (wt%)													
	melt MgO	melt CaO	melt Na2O	melt K2O	melt CoO	melt NiO	melt H2O	melt S	melt Cu2O	melt P2O5	melt Cr2O3	melt TiO2	melt V2O5	melt WO3
38	7.44	0.00	0.00	8.73	1.22	0.408								
39	7.62	0.00	0.00	7.07	1.29	0.424								
40	8.87	0.00	0.00	11.48	1.31	0.569								
41	7.93	0.00	0.00	10.54	1.17	0.685								
42	8.38	0.00	0.00	11.00	1.09	0.601								
47	18.09	7.54	1.33	0.26	0.81	0.447					0.31	1.53		
48	18.61	7.59	0.91	0.24	0.60	0.204					0.86	1.58		
50	7.40	10.12	2.26	0.44	1.77	1.334					0.05	2.26		
53	5.62	10.84	2.51	0.55	1.59	1.092					0.07	2.41		
54	7.07	15.11	3.18	0.74	2.94	0.508					0.02	2.84		
56	4.24	8.59	3.74	1.74	2.96	1.154					0.00	2.58		
SA3091-1275	12.60	11.80	0.44	0.00	0.00	0.020					0.23	0.61		
SA3091-1225	10.10	13.50	0.71	0.00	0.00	0.020					0.12	0.67		
Comp 2, 1400	21.93	9.40	0.00	0.00	0.00	0.432								
Comp 2, 1350	19.01	10.07	0.00	0.00	0.00	0.344								
Comp 2, 1300	15.87	11.11	0.00	0.00	0.00	0.250								
Comp 3, 1400	20.79	11.57	0.00	0.00	0.00	0.332								
Comp 3, 1350	18.54	12.69	0.00	0.00	0.00	0.266								
Comp 3, 1300	15.73	11.68	0.00	0.00	0.00	0.198								
A2	8.55	10.70	0.00	0.00	0.00	0.320				0.9		0.46		
A4	6.10	15.00	0.62	0.00	0.00	0.260				1.37		0.67		
A5	6.01	15.50	0.58	0.00	0.00	0.170				1.68		0.7		
M2	8.59	10.50	0.05	0.00	0.00	0.280				0.55	0.14	0.51		
M5	6.69	14.90	0.66	0.00	0.00	0.220				1.41		0.84		
M6	5.90	13.60	0.74	0.00	0.00	0.230				1.35		0.62		
25	18.09	8.32	1.55	0.10		0.081				0.12	0.018	1.44		
32R	17.06	8.46	2.09	0.11		0.418				0.12	0	1.44		
P2-12	11.6	12	0.89	0.12		0.027						0.68		
P4-16	11.9	11.9	0.56	0.05		0.030						0.64		

sample #										olivine composition (wt%)			
	melt ZnO	melt CuO	Total	olivine SiO2	olivine Al2O3	olivine FeO	olivine MnO	olivine MgO	olivine CaO	olivine CoO	olivine NiO	olivine TiO2	olivine Cr2O3
38	0.00	0.00	100.00	36.56	0	23.19	1.80	30.65	0	3.41	4.37		
39	0.00	0.00	100.00	36.54	0	24.01	1.76	30.04	0	3.54	4.08		
40	0.00	0.00	100.00	37.62	0	14.49	2.09	36.50	0	3.85	5.40		
41	0.00	0.00	100.00	37.33	0	18.92	1.49	32.67	0	3.19	6.32		
42	0.00	0.00	100.00	37.40	0	19.00	1.54	33.79	0	3.08	5.09		
47			100.00	40.26324893	0.06155468	7.8651541	0.67092878	47.098353	0.3046981	1.33	2.210	0.02	0.18351398
48			100.00	40.05537581	0.04125823	8.1838478	0.70325925	48.290656	0.2496143	1.02	0.952	0.02	0.492015398
50			100.00	35.50464764	0.50054239	11.652268	2.5408677	31.159065	0.4384416	5.08	13.105	0.00	0
53			100.00	35.32928348	0.07278044	13.397984	2.91152972	28.014068	0.4503326	5.39	14.435	0.00	0
54			100.00	35.89430444	0.13159937	14.346724	3.28297997	32.705532	1.230464	7.43	4.958	0.00	0
56			100.00	34.31520647	0.0711448	10.903626	2.2026319	25.001094	0.401082	11.37	15.700	0.00	0
SA3091-1275			99.80	38.70	0.72	14.00	0.27	45.50	0.43		0.16		0.47
SA3091-1225			99.97	39.50	0.05	15.30	0.18	45.10	0.41		0.23		0.07
Comp 2, 1400			99.59	42.89	0.12	0.00	0.00	55.36	0.23	0.00	2.03		
Comp 2, 1350			98.58	42.75	0.11	0.00	0.00	55.34	0.20	0.00	1.92		
Comp 2, 1300			98.89	43.15	0.14	0.00	0.00	55.60	0.21	0.00	1.78		
Comp 3, 1400			99.16	42.09	0.10	0.00	0.00	56.11	0.32	0.00	1.56		
Comp 3, 1350			99.37	42.45	0.21	0.00	0.00	56.18	0.30	0.00	1.41		
Comp 3, 1300			98.92	42.86	0.03	0.00	0.00	56.30	0.26	0.00	1.26		
A2			99.42	36.40		30.20	0.18	31.60	0.57	0.00	1.58		
A4			99.57	35.90		32.20	0.21	29.30	0.87	0.00	2.18		
A5			100.00	36.20		32.30	0.23	28.80	1.08	0.00	1.93		
M2			99.83	35.60		30.70	0.19	32.10	0.55	0.00	1.51		
M5			98.94	35.40		31.60	0.28	29.10	0.88	0.00	1.94		
M6			100.05	35.20		33.70	0.28	28.30	0.88	0.00	2.13		
25			100.24	41.07	0.04	9.38	0.140	48.84	0.27		0.408	0.02	0.018
32R			100.92	41.16	0.03	9.68	0.147	47.13	0.26		2.063	0.022	0.018
P2-12			98.55	40.5		8.66		50.8			0.277		
P4-16			98.73	41.2		9.64		49.5			0.308		

sample #	olivine composition (wt%)								
	olivine Na2O	olivine K2O	olivine WO3	olivine V2O5	olivine ZnO	olivine CuO	olivine P2O5	Total	Mg#
38		0.03			0.00	0.00		100.00	70.2
39		0.03			0.00	0.00		100.00	69.0
40		0.05			0.00	0.00		100.00	81.8
41		0.07			0.00	0.00		100.00	75.5
42		0.10			0.00	0.00		100.00	76.0
47	0	0						100.00	91.4
48	0	0						100.00	91.3
50	0	0.01712659						100.00	82.7
53	0	0						100.00	78.8
54	0	0.01736799						100.00	80.3
56	0	0.03286298						100.00	80.3
SA3091-1275	0.02							100.27	
SA3091-1225	0.03							100.87	
Comp 2, 1400								100.64	100.0
Comp 2, 1350								100.32	100.0
Comp 2, 1300								100.88	100.0
Comp 3, 1400								100.18	100.0
Comp 3, 1350								100.54	100.0
Comp 3, 1300								100.71	100.0
A2								100.53	65.1
A4								100.66	61.9
A5								100.54	61.4
M2								100.65	65.1
M5								99.20	62.1
M6								100.49	60.0
25								100.19	90.3
32R								100.51	89.7
P2-12								100.24	91.3
P4-16								100.65	90.2

Figure A1 Plots of temperature residuals for the 13 D_{Ni} models from the literature (Table II-1) on the 123 experiments (Table A2).



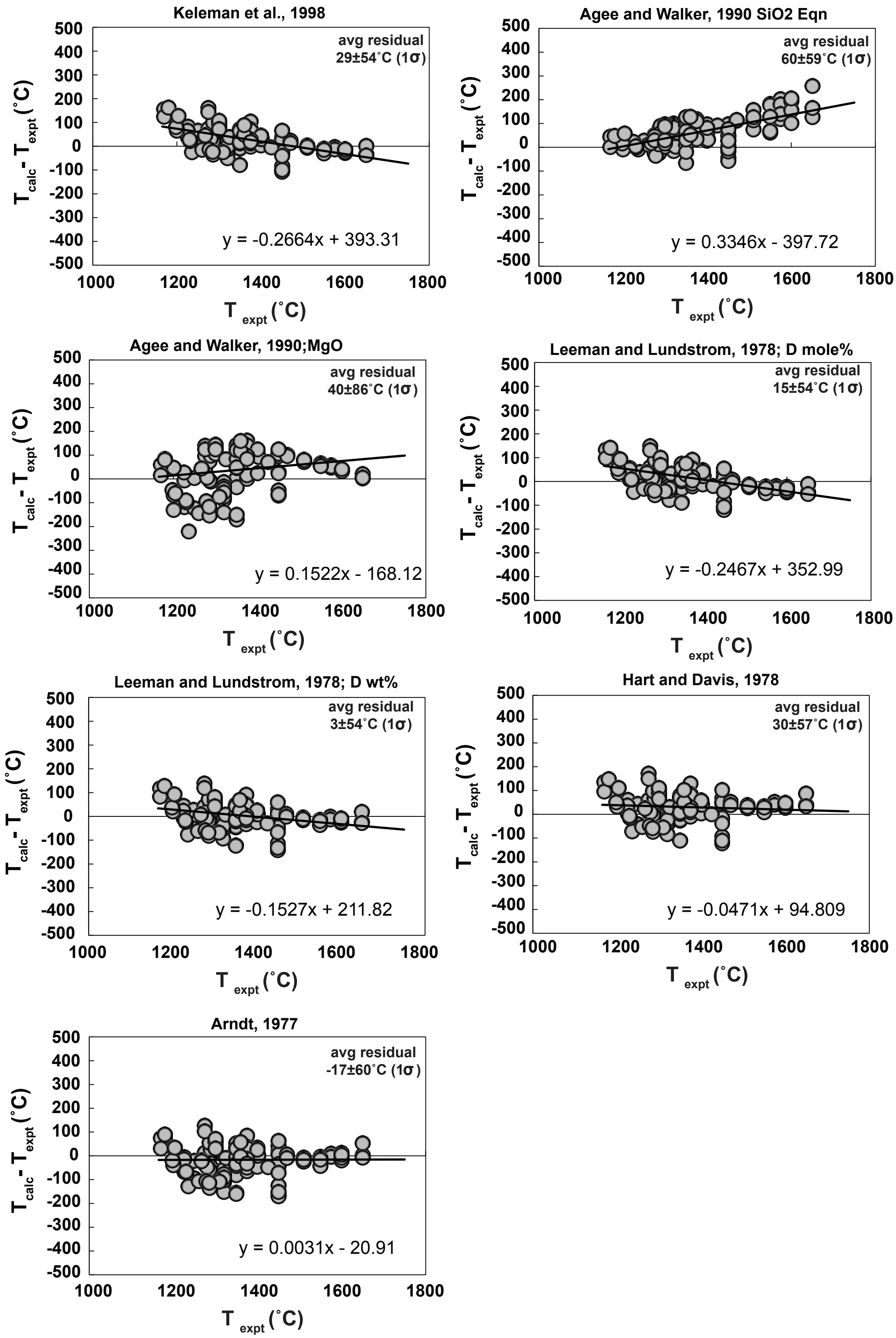

Keleman et al., 1998
avg residual
29±54˚C (1σ)
y = -0.2664x + 393.31
Agee and Walker, 1990 SiO2 Eqn
avg residual
60±59˚C (1σ)
y = 0.3346x - 397.72
Agee and Walker, 1990;MgO
avg residual
40±86˚C (1σ)
y = 0.1522x - 168.12
Leeman and Lundstrom, 1978; D mole%
avg residual
15±54˚C (1σ)
y = -0.2467x + 352.99
Leeman and Lundstrom, 1978; D wt%
avg residual
3±54˚C (1σ)
y = -0.1527x + 211.82
Hart and Davis, 1978
avg residual
30±57˚C (1σ)
y = -0.0471x + 94.809
Arndt, 1977
avg residual
-17±60˚C (1σ)
y = 0.0031x - 20.91
T calc - T expt (˚C)
T expt (˚C)
500
400
300
200
100
0
-100
-200
-300
-400
-500
1000
1200
1400
1600
1800

Figure A2 Plots of temperature residuals for the 8 recalibrated D_{Ni} models (A-H in Table II-2) with $\ln D_{Ni}$ as dependent variable.

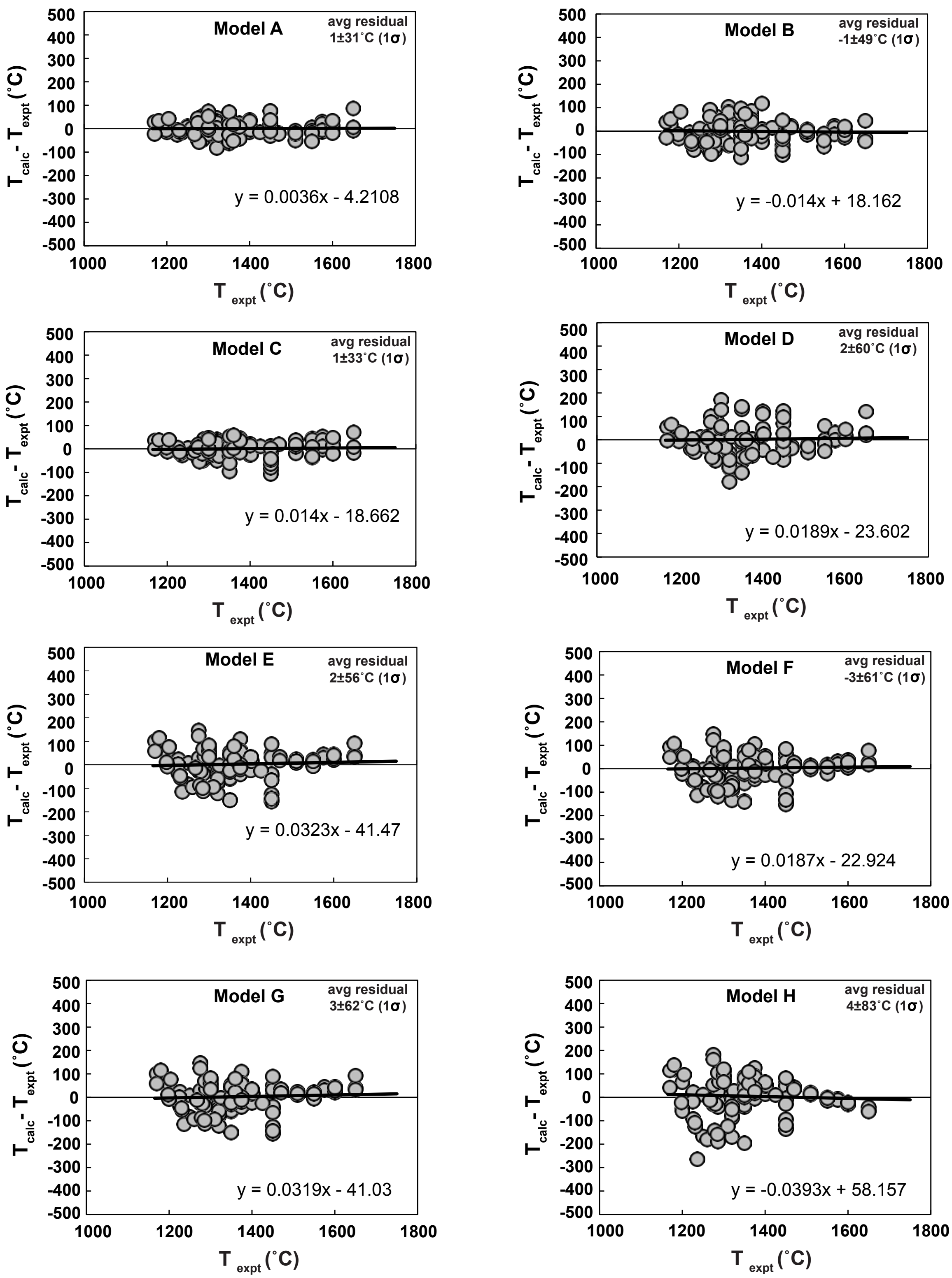


Table A3 The average residual for eight model equations (same as Table II-2) calibrated on 123 experiments in Table A2, but 10000/T(K) is the dependent variable in all cases.

Studies	Equations	Average T_{calc} - T_{expt} (with 1σ)	R^2
Model A	$10000/T(K) = 1.013\ (\pm 0.027) * \ln D_{Ni}^{oliv/liq}(wt\%) + 0.659\ (\pm 0.037) * (X_{FeO}^{liq} + X_{MgO}^{liq} + X_{MnO}^{liq} + X_{CaO}^{liq} + X_{CoO}^{liq} + X_{NiO}^{liq})/X_{SiO2}^{liq} + 4.432\ (\pm 0.044)$	0 ± 29 °C	0.929
Model B	$10000/T(K) = 0.540\ (\pm 0.064) * \ln D_{Ni}^{oliv/liq}(wt\%) - 0.0248(\pm 0.0021) * SiO_2{}^{liq}(wt\%) - 0.0104\ (\pm 0.0039) * MgO^{liq}(wt\%) + 6.598\ (\pm 0.144)$	0 ± 31 °C	0.925
Model C	$10000/T(K) = 0.702\ (\pm 0.020) * \ln D_{Ni}^{oliv/liq}(wt\%) - 0.0281\ (\pm 0.0017) * SiO_2{}^{liq}(wt\%) + 6.304\ (\pm 0.095)$	0 ± 32 °C	0.920
Model D	$10000/T(K) = 0.294\ (\pm 0.058) * \ln(NBO/T) + 0.880\ (\pm 0.052) * \ln D_{Ni}^{oliv/liq}(wt\%)\% + 4.459\ (\pm 0.106)$	-2 ± 49 °C	0.788
Model E	$10000/T(K) = 0.435\ (\pm 0.021) * (\ln D_{Ni}^{oliv/liq}(mol\%) + \ln D_{Mg}^{oliv/melt}(mol\%)) + 4.961\ (\pm 0.059)$	-2 ± 51 °C	0.776
Model F	$10000/T(K) = 0.708\ (\pm 0.038) * \ln D_{Ni}^{oliv/liq}(mole\%) + 4.939\ (0.066)$	-2 ± 54°C	0.716
Model G	$10000/T(K) = 0.671\ (\pm 0.036) * \ln D_{Ni}^{oliv/liq}(wt\%) + 4.892\ (\pm 0.068)$	-2 ± 54°C	0.789
Model H	$10000/T(K) = 0.0341\ (\pm 0.0098) * D_{Ni}^{oliv/liq}(wt\%) + 5.175\ (\pm 0.779)/MgO^{liq}(wt\%) + 5.454\ (0.046)$	-3 ± 63°C	0.701

Model A is based on the Li and Ripley (2010) model.
Model B is based on Eqn. 2c in Putirka et al. (2011).
Model C is based on Eqn. 2b in Putirka et al. (2011) and the SiO_2 equation in Agee and Walker (1990).
Model D is based on the Wang and Gaetani (2008) model.
Model E is based on the Matzen et al. (2013) model.
Model F is based on the mole% model in Leeman and Lundstrom (1978) and the model in Arndt (1977).
Model G is based on Eqn. 2a in Putirka et al. (2011), the wt% model in Leeman and Lundstrom (1978); and the models in Keleman et al. (1998), Hart and Davis, (1978).
Model H is based on the MgO equation in Agee and Walker (1990).
*The average residuals are for T, whereas the dependent variable was 10000/T for all models, which is why the average residual is not 0 in all cases.

Figure A3 Plots of temperature residuals for the 8 recalibrated D_{Ni} models with 10000/T(K) as dependent variable.

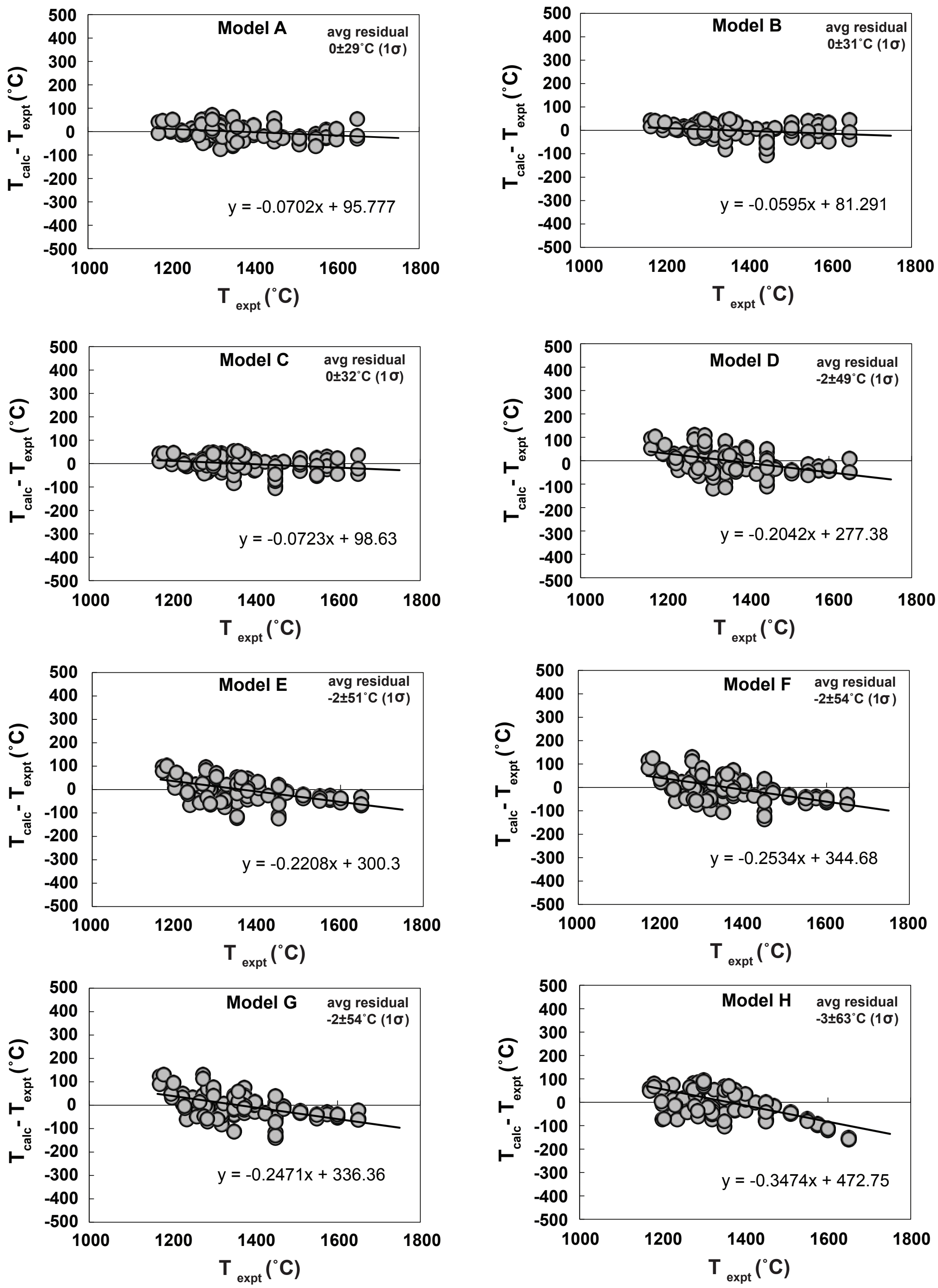
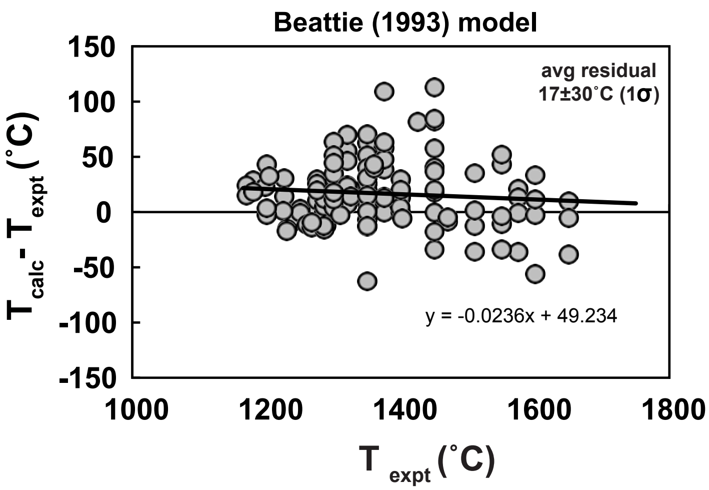


Figure A4 Plots of residuals for the Beattie (1993) and Putirka et al. (2007) Mg-thermometers applied to the 123 experiments in Table A2.



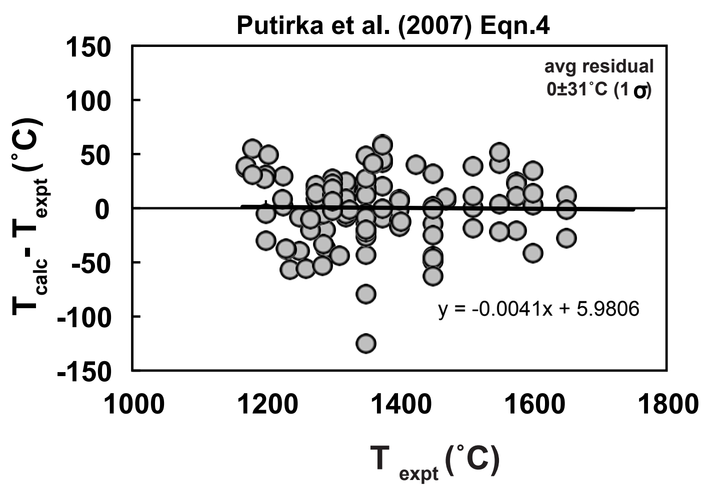


Table A4 TVF olivine compositions

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-N	40.8	0.04	10.4	0.15	47.5	0.13	0.05	0.50	99.6	89.1
UR-46-N	41.6	0.06	10.5	0.17	47.8	0.11	0.05	0.48	100.8	89.0
UR-46-N	40.9	0.04	10.6	0.15	47.8	0.13	0.03	0.47	100.2	88.9
UR-46-N	40.9	0.02	10.6	0.10	47.5	0.12	0.06	0.50	99.7	88.9
UR-46-N	41.2	0.04	10.5	0.21	47.4	0.13	0.05	0.46	100.0	88.9
UR-46-N	41.0	0.06	10.6	0.15	47.5	0.12	0.04	0.51	100.0	88.9
UR-46-N	40.8	0.03	10.6	0.17	47.5	0.13	0.07	0.48	99.8	88.9
UR-46-N	41.0	0.03	10.7	0.16	48.1	0.13	n.d.	0.46	100.7	88.9
UR-46-N	40.9	0.03	10.6	0.13	47.6	0.13	0.04	0.52	100.0	88.9
UR-46-N	40.3	0.55	10.7	0.13	47.7	0.14	0.04	0.45	99.9	88.9
UR-46-N	41.4	0.04	10.6	0.09	47.6	0.12	0.04	0.46	100.4	88.8
UR-46-N	41.1	0.05	10.6	0.19	47.3	0.13	0.07	0.49	100.0	88.8
UR-46-N	41.1	0.03	10.7	0.15	47.7	0.13	0.06	0.49	100.4	88.8
UR-46-N	41.0	0.04	10.7	0.12	47.5	0.12	0.06	0.49	100.1	88.8
UR-46-N	41.0	0.04	10.6	0.21	47.4	0.13	0.05	0.52	100.0	88.8
UR-46-N	41.1	0.03	10.7	0.17	47.5	0.13	n.d.	0.48	100.2	88.8
UR-46-N	41.1	0.02	10.7	0.13	47.5	0.13	0.03	0.51	100.0	88.8
UR-46-N	40.9	0.04	10.7	0.12	47.7	0.12	0.05	0.49	100.2	88.8
UR-46-N	41.2	0.03	10.7	0.13	47.6	0.13	0.06	0.56	100.4	88.8
UR-46-N	41.0	0.05	10.7	0.15	47.5	0.12	0.04	0.49	100.0	88.8
UR-46-N	41.1	0.05	10.7	0.12	47.8	0.13	0.06	0.51	100.5	88.8
UR-46-N	41.4	0.03	10.7	0.12	47.6	0.13	0.06	0.47	100.5	88.8
UR-46-N	41.0	0.04	10.7	0.21	47.5	0.12	0.04	0.48	100.0	88.8
UR-46-N	41.4	0.09	10.7	0.08	47.5	0.14	0.04	0.47	100.4	88.8
UR-46-N	41.0	0.03	10.6	0.16	47.2	0.12	0.07	0.49	99.7	88.8
UR-46-N	41.0	0.03	10.7	0.17	47.5	0.13	0.05	0.46	100.0	88.8
UR-46-N	40.7	0.04	10.7	0.12	47.4	0.12	0.05	0.46	99.6	88.8
UR-46-N	40.9	0.03	10.7	0.10	47.6	0.12	0.07	0.49	100.1	88.8
UR-46-N	41.0	0.03	10.7	0.18	47.4	0.12	0.06	0.49	100.0	88.7
UR-46-N	41.3	0.04	10.8	0.17	47.7	0.12	0.06	0.46	100.6	88.7
UR-46-N	41.0	0.03	10.7	0.12	47.3	0.12	0.06	0.47	99.8	88.7
UR-46-N	40.6	0.03	10.8	0.22	47.6	0.12	0.07	0.50	99.9	88.7
UR-46-N	41.0	0.04	10.8	0.19	47.7	0.11	0.06	0.47	100.3	88.7
UR-46-N	40.5	0.06	10.7	0.14	47.1	0.13	0.05	0.51	99.2	88.7
UR-46-N	41.1	0.04	10.8	0.21	47.5	0.13	0.05	0.49	100.3	88.7
UR-46-N	40.9	0.02	10.8	0.13	47.5	0.13	0.05	0.49	100.1	88.7
UR-46-N	40.9	0.04	10.8	0.23	47.6	0.14	0.06	0.48	100.2	88.7
UR-46-N	41.3	0.03	10.8	0.08	47.9	0.13	0.05	0.50	100.8	88.7
UR-46-N	41.2	0.02	10.8	0.17	47.5	0.11	n.d.	0.49	100.3	88.7
UR-46-N	41.2	0.04	10.8	0.16	47.6	0.12	0.05	0.51	100.5	88.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-N	41.2	0.03	10.8	0.11	47.5	0.12	0.06	0.49	100.2	88.7
UR-46-N	40.9	0.04	10.8	0.19	47.4	0.13	0.05	0.44	99.9	88.7
UR-46-N	40.6	0.03	10.8	0.17	47.4	0.12	0.08	0.48	99.7	88.7
UR-46-N	41.2	0.04	10.8	0.10	47.3	0.14	0.06	0.48	100.1	88.7
UR-46-N	41.1	0.05	10.8	0.13	47.7	0.13	0.04	0.48	100.5	88.7
UR-46-N	41.2	0.04	10.8	0.14	47.6	0.13	0.05	0.46	100.4	88.7
UR-46-N	41.0	0.03	10.8	0.16	47.5	0.12	0.05	0.51	100.1	88.7
UR-46-N	41.1	0.03	10.7	0.16	47.2	0.11	0.04	0.48	99.8	88.7
UR-46-N	41.1	0.03	10.8	0.16	47.5	0.13	0.05	0.48	100.3	88.7
UR-46-N	40.8	0.03	10.8	0.12	47.5	0.13	0.05	0.51	100.0	88.7
UR-46-N	41.0	0.03	10.8	0.17	47.4	0.13	0.04	0.49	100.1	88.7
UR-46-N	41.3	0.03	10.8	0.12	47.6	0.13	0.05	0.50	100.6	88.7
UR-46-N	41.0	0.02	10.8	0.16	47.6	0.12	0.04	0.49	100.3	88.7
UR-46-N	41.4	0.03	10.8	0.17	47.5	0.13	0.05	0.46	100.6	88.7
UR-46-N	41.0	n.d.	10.8	0.08	47.5	0.13	0.04	0.49	100.1	88.7
UR-46-N	40.7	0.04	10.8	0.09	47.3	0.12	0.06	0.52	99.7	88.7
UR-46-N	40.9	0.04	10.9	0.12	47.7	0.12	n.d.	0.51	100.3	88.6
UR-46-N	41.2	0.05	10.9	0.16	47.6	0.12	n.d.	0.50	100.6	88.6
UR-46-N	40.6	0.04	10.7	0.12	47.1	0.13	0.05	0.46	99.3	88.6
UR-46-N	41.2	0.05	10.9	0.17	47.5	0.14	0.04	0.50	100.5	88.6
UR-46-N	41.2	0.04	10.9	0.13	47.6	0.12	0.06	0.51	100.5	88.6
UR-46-N	40.9	0.02	10.8	0.14	47.3	0.14	n.d.	0.46	99.8	88.6
UR-46-N	41.1	0.04	10.9	0.13	47.6	0.12	0.04	0.48	100.3	88.6
UR-46-N	41.3	0.05	10.9	0.14	47.7	0.12	0.05	0.49	100.7	88.6
UR-46-N	41.0	0.03	10.9	0.14	47.5	0.11	0.04	0.48	100.2	88.6
UR-46-N	40.8	0.04	10.8	0.13	47.4	0.14	0.03	0.45	99.9	88.6
UR-46-N	41.4	0.04	10.9	0.16	47.7	0.13	0.05	0.52	100.9	88.6
UR-46-N	41.1	0.04	10.9	0.10	47.5	0.14	0.04	0.49	100.2	88.6
UR-46-N	41.0	0.04	10.9	0.13	47.6	0.13	0.05	0.49	100.3	88.6
UR-46-N	41.4	0.04	10.9	0.17	47.5	0.12	0.04	0.49	100.6	88.6
UR-46-N	41.1	0.02	10.9	0.14	47.7	0.12	0.04	0.51	100.5	88.6
UR-46-N	41.1	0.03	10.9	0.16	47.4	0.13	0.04	0.44	100.2	88.6
UR-46-N	40.9	0.04	10.9	0.15	47.5	0.13	0.04	0.43	100.0	88.6
UR-46-N	40.9	0.03	10.9	0.14	47.5	0.12	0.04	0.50	100.1	88.6
UR-46-N	41.2	0.04	10.9	0.16	47.6	0.13	0.04	0.52	100.6	88.6
UR-46-N	41.0	0.02	10.9	0.13	47.4	0.13	0.04	0.47	100.1	88.6
UR-46-N	41.1	0.02	10.9	0.12	47.6	0.12	0.07	0.50	100.5	88.6
UR-46-N	41.2	0.02	10.9	0.18	47.7	0.13	0.06	0.51	100.7	88.6
UR-46-N	41.3	0.02	10.9	0.07	47.6	0.14	n.d.	0.49	100.5	88.6
UR-46-N	41.3	0.03	10.9	0.17	47.6	0.11	0.05	0.46	100.6	88.6
UR-46-N	40.9	0.03	10.9	0.16	47.3	0.13	n.d.	0.48	99.9	88.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-N	41.2	0.02	11.0	0.14	47.8	0.12	0.05	0.47	100.8	88.6
UR-46-N	40.8	0.04	10.8	0.12	47.1	0.13	0.06	0.43	99.4	88.6
UR-46-N	41.3	0.03	11.0	0.15	47.7	0.12	0.04	0.51	100.8	88.6
UR-46-N	40.9	0.05	10.8	0.18	47.1	0.13	n.d.	0.44	99.5	88.6
UR-46-N	41.0	0.04	10.9	0.23	47.2	0.13	0.07	0.51	100.1	88.6
UR-46-N	40.8	0.14	10.9	0.11	47.4	0.15	0.05	0.49	100.1	88.6
UR-46-N	41.1	0.05	10.9	0.20	47.3	0.13	0.06	0.46	100.2	88.6
UR-46-N	40.7	0.02	10.8	0.16	46.9	0.13	0.03	0.44	99.1	88.6
UR-46-N	40.9	0.03	10.9	0.15	47.4	0.11	0.06	0.48	100.1	88.6
UR-46-N	41.1	0.03	11.0	0.13	47.8	0.12	0.04	0.47	100.7	88.6
UR-46-N	41.1	0.04	11.0	0.10	47.6	0.12	0.03	0.47	100.4	88.5
UR-46-N	41.3	0.37	10.9	0.16	47.1	0.13	0.04	0.49	100.4	88.5
UR-46-N	40.6	0.04	10.9	0.17	47.2	0.13	0.04	0.47	99.6	88.5
UR-46-N	40.8	0.03	10.9	0.11	47.2	0.13	0.05	0.48	99.7	88.5
UR-46-N	41.1	0.03	11.0	0.20	47.4	0.13	0.05	0.46	100.4	88.5
UR-46-N	41.0	0.03	11.0	0.16	47.4	0.11	0.05	0.50	100.2	88.5
UR-46-N	41.0	0.03	11.0	0.11	47.6	0.13	0.05	0.50	100.3	88.5
UR-46-N	41.0	0.01	10.9	0.15	47.4	0.13	0.08	0.46	100.1	88.5
UR-46-N	40.9	0.03	11.0	0.14	47.5	0.11	0.03	0.48	100.2	88.5
UR-46-N	40.5	0.03	11.0	n.d.	47.4	0.12	0.06	0.46	99.6	88.5
UR-46-N	41.1	0.05	10.9	0.16	47.3	0.12	0.03	0.49	100.2	88.5
UR-46-N	40.9	0.04	11.0	0.18	47.4	0.13	0.05	0.48	100.0	88.5
UR-46-N	41.3	0.06	11.0	0.23	47.5	0.12	0.05	0.46	100.7	88.5
UR-46-N	41.2	0.04	11.0	0.13	47.6	0.12	0.04	0.49	100.6	88.5
UR-46-N	41.0	0.04	11.0	0.13	47.6	0.13	0.04	0.50	100.5	88.5
UR-46-N	40.9	0.03	11.0	0.09	47.3	0.13	0.08	0.45	100.1	88.5
UR-46-N	41.0	0.04	11.0	0.17	47.2	0.14	0.06	0.50	100.0	88.5
UR-46-N	41.2	0.03	11.1	0.16	47.6	0.13	0.05	0.49	100.8	88.5
UR-46-N	41.5	0.04	11.0	0.16	47.2	0.13	0.05	0.43	100.5	88.5
UR-46-N	40.9	0.03	11.0	0.13	47.3	0.13	0.07	0.45	100.0	88.4
UR-46-N	41.1	0.04	11.1	0.18	47.5	0.11	0.06	0.49	100.6	88.4
UR-46-N	40.9	0.03	11.0	0.15	47.2	0.13	0.04	0.49	99.9	88.4
UR-46-N	40.9	0.02	11.0	0.12	47.4	0.14	0.03	0.48	100.2	88.4
UR-46-N	40.6	0.04	11.0	0.13	47.2	0.14	0.03	0.51	99.7	88.4
UR-46-N	41.3	0.04	11.1	0.18	47.5	0.12	n.d.	0.50	100.7	88.4
UR-46-N	40.8	0.05	10.9	0.15	46.9	0.17	0.06	0.48	99.6	88.4
UR-46-N	40.6	0.04	11.0	0.14	47.1	0.13	n.d.	0.44	99.4	88.4
UR-46-N	40.9	0.03	11.1	0.20	47.3	0.13	0.10	0.43	100.1	88.4
UR-46-N	40.8	0.03	11.1	0.13	47.4	0.12	0.04	0.51	100.1	88.4
UR-46-N	40.9	0.02	11.1	0.21	47.7	0.13	0.06	0.43	100.5	88.4
UR-46-N	41.2	0.04	11.1	0.16	47.5	0.12	n.d.	0.46	100.6	88.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-I	41.2	0.04	11.1	0.20	47.4	0.13	0.04	0.48	100.5	88.4
UR-46-I	41.0	0.04	11.1	0.19	47.5	0.12	0.04	0.49	100.5	88.4
UR-46-I	41.1	0.04	11.1	0.18	47.5	0.12	0.05	0.49	100.5	88.4
UR-46-I	41.3	0.02	11.1	0.22	47.7	0.13	0.04	0.43	101.0	88.4
UR-46-I	40.5	0.05	11.0	0.13	47.1	0.12	0.04	0.45	99.4	88.4
UR-46-I	41.1	0.03	11.2	0.13	47.7	0.12	0.06	0.51	100.8	88.4
UR-46-I	41.0	0.03	11.1	0.16	47.6	0.12	0.04	0.48	100.5	88.4
UR-46-I	41.4	0.05	11.0	0.15	47.1	0.13	0.07	0.48	100.4	88.4
UR-46-I	40.8	0.02	11.1	0.13	47.3	0.13	0.06	0.52	100.0	88.4
UR-46-I	40.8	0.05	11.2	0.17	47.7	0.12	0.05	0.45	100.5	88.4
UR-46-I	40.7	0.02	11.0	0.14	46.8	0.12	0.04	0.43	99.2	88.4
UR-46-I	41.0	0.03	11.0	0.21	47.1	0.12	0.04	0.42	99.9	88.4
UR-46-I	40.8	0.04	11.1	0.18	47.2	0.13	0.03	0.42	99.8	88.4
UR-46-I	41.0	0.02	11.1	0.15	47.2	0.13	0.05	0.42	100.1	88.4
UR-46-I	40.8	0.04	11.1	0.17	47.3	0.12	0.04	0.48	100.1	88.4
UR-46-I	41.2	0.02	11.1	0.11	47.5	0.14	0.04	0.48	100.7	88.4
UR-46-I	40.9	0.02	11.1	0.15	47.5	0.13	0.04	0.48	100.3	88.4
UR-46-I	40.8	0.04	11.1	0.14	47.2	0.12	0.05	0.49	99.8	88.4
UR-46-I	41.1	0.02	11.2	0.13	47.7	0.11	0.05	0.48	100.8	88.4
UR-46-I	41.1	0.04	11.1	0.09	47.4	0.13	n.d.	0.50	100.4	88.4
UR-46-I	40.9	0.03	11.1	0.20	47.2	0.12	0.08	0.47	100.1	88.4
UR-46-I	40.9	0.04	11.2	0.17	47.5	0.13	0.05	0.44	100.3	88.3
UR-46-I	41.1	0.03	11.2	0.21	47.8	0.12	0.04	0.44	101.0	88.3
UR-46-I	41.1	0.03	11.2	0.12	47.5	0.13	n.d.	0.46	100.5	88.3
UR-46-I	40.9	0.03	11.1	0.12	47.2	0.12	0.05	0.45	100.0	88.3
UR-46-I	40.7	0.03	11.1	0.17	47.3	0.12	n.d.	0.44	99.9	88.3
UR-46-I	40.9	0.02	11.2	0.14	47.4	0.13	0.07	0.43	100.3	88.3
UR-46-I	40.7	0.05	11.1	0.12	47.2	0.13	n.d.	0.42	99.7	88.3
UR-46-I	40.9	0.03	11.2	0.17	47.4	0.13	n.d.	0.48	100.4	88.3
UR-46-I	41.0	0.02	11.1	0.17	47.0	0.12	0.09	0.42	99.9	88.3
UR-46-I	40.6	0.03	11.0	0.12	46.6	0.14	0.05	0.45	99.0	88.3
UR-46-I	40.4	0.21	11.2	0.18	47.5	0.14	n.d.	0.44	100.1	88.3
UR-46-I	40.9	0.04	11.2	0.14	47.2	0.12	0.03	0.46	100.1	88.3
UR-46-I	41.0	0.03	11.2	0.14	47.3	0.12	0.05	0.43	100.2	88.3
UR-46-I	40.9	0.03	11.2	0.16	47.4	0.11	0.04	0.47	100.4	88.3
UR-46-I	40.9	0.03	11.1	0.18	46.7	0.14	0.05	0.40	99.5	88.3
UR-46-I	41.2	0.03	11.2	0.13	47.4	0.13	0.04	0.47	100.5	88.3
UR-46-I	40.7	0.20	11.1	0.18	46.9	0.15	0.24	0.43	99.9	88.3
UR-46-I	41.2	0.03	11.2	0.20	47.2	0.13	n.d.	0.46	100.5	88.3
UR-46-I	40.8	0.03	11.2	0.15	47.4	0.11	0.03	0.49	100.2	88.3
UR-46-I	40.9	0.04	11.1	0.16	46.8	0.14	0.05	0.42	99.6	88.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-	40.4	0.06	11.1	0.13	46.8	0.13	0.09	0.43	99.2	88.3
UR-46-	40.8	0.04	11.2	0.17	47.1	0.12	0.04	0.49	99.9	88.2
UR-46-	40.8	0.02	11.2	0.11	47.2	0.12	n.d.	0.42	99.9	88.2
UR-46-	40.9	0.04	11.2	0.14	47.2	0.11	n.d.	0.41	100.0	88.2
UR-46-	41.1	0.04	11.3	0.16	47.6	0.13	0.05	0.50	101.0	88.2
UR-46-	41.0	0.02	11.2	0.19	47.1	0.13	0.07	0.38	100.1	88.2
UR-46-	41.1	0.02	11.2	0.19	47.1	0.14	0.05	0.44	100.2	88.2
UR-46-	41.0	0.02	11.2	0.18	46.9	0.13	n.d.	0.38	99.9	88.2
UR-46-	40.8	0.02	11.2	0.16	47.0	0.13	0.04	0.47	99.9	88.2
UR-46-	40.3	0.02	11.2	0.14	47.1	0.13	0.05	0.43	99.4	88.2
UR-46-	41.1	0.04	11.3	0.15	47.5	0.14	0.04	0.41	100.7	88.2
UR-46-	40.7	0.02	11.3	0.16	47.2	0.13	0.07	0.43	99.9	88.2
UR-46-	41.0	0.03	11.3	0.14	47.3	0.13	n.d.	0.46	100.4	88.2
UR-46-	41.2	0.04	11.4	0.16	47.5	0.13	0.04	0.48	100.9	88.2
UR-46-	41.0	0.03	11.3	0.19	47.2	0.12	0.17	0.48	100.5	88.1
UR-46-	41.0	0.02	11.3	0.14	47.3	0.13	0.05	0.41	100.4	88.1
UR-46-	40.5	0.06	11.3	0.18	47.2	0.14	0.05	0.44	99.8	88.1
UR-46-	40.7	0.03	11.3	0.16	47.0	0.12	n.d.	0.39	99.7	88.1
UR-46-	41.0	0.04	11.2	0.12	46.8	0.13	n.d.	0.43	99.7	88.1
UR-46-	41.1	0.03	11.4	0.15	47.3	0.12	0.04	0.46	100.6	88.1
UR-46-	41.0	0.02	11.3	0.23	46.8	0.11	n.d.	0.39	99.9	88.1
UR-46-	41.2	0.04	11.4	0.11	47.3	0.13	0.03	0.41	100.6	88.1
UR-46-	41.0	0.03	11.4	0.18	47.3	0.13	0.07	0.47	100.6	88.1
UR-46-	41.0	0.03	11.4	0.10	47.1	0.13	0.05	0.43	100.2	88.1
UR-46-	40.9	0.03	11.4	0.18	47.2	0.13	0.08	0.43	100.3	88.1
UR-46-	41.2	0.04	11.4	0.17	47.3	0.13	0.03	0.45	100.8	88.0
UR-46-	41.0	0.04	11.4	0.21	47.2	0.14	0.07	0.42	100.5	88.0
UR-46-	40.8	0.02	11.4	0.17	47.2	0.14	0.04	0.42	100.2	88.0
UR-46-	41.0	0.03	11.5	0.23	47.2	0.12	0.05	0.40	100.5	88.0
UR-46-	41.4	0.05	11.4	0.18	46.8	0.13	0.05	0.37	100.4	88.0
UR-46-	41.0	0.04	11.5	0.14	47.2	0.13	0.05	0.45	100.5	88.0
UR-46-	40.8	0.04	11.4	0.19	46.9	0.13	0.03	0.38	99.9	88.0
UR-46-	40.6	0.04	11.3	0.13	46.6	0.13	0.05	0.43	99.3	88.0
UR-46-	41.0	0.02	11.5	0.21	47.2	0.14	0.06	0.43	100.6	88.0
UR-46-	41.2	0.03	11.5	0.16	47.0	0.13	0.05	0.37	100.4	88.0
UR-46-	40.8	0.03	11.5	0.20	47.1	0.12	0.05	0.40	100.2	88.0
UR-46-	41.1	0.06	11.6	0.15	47.4	0.16	n.d.	0.40	100.9	88.0
UR-46-	41.2	0.03	11.5	0.13	47.1	0.15	0.04	0.39	100.5	88.0
UR-46-	40.9	0.03	11.5	0.15	47.1	0.12	0.04	0.41	100.3	88.0
UR-46-	41.1	0.03	11.5	0.18	47.1	0.12	0.03	0.36	100.4	87.9
UR-46-	40.8	0.03	11.4	0.22	46.7	0.13	n.d.	0.34	99.7	87.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-M	40.7	0.03	11.5	0.11	47.1	0.14	n.d.	0.42	100.0	87.9
UR-46-M	40.6	0.03	11.5	0.15	46.7	0.13	0.06	0.44	99.5	87.9
UR-46-M	41.0	0.03	11.5	0.15	47.0	0.12	n.d.	0.40	100.2	87.9
UR-46-M	40.9	0.03	11.5	0.15	46.8	0.12	0.04	0.34	99.9	87.9
UR-46-M	40.7	0.02	11.5	0.17	47.0	0.14	0.03	0.40	100.0	87.9
UR-46-M	40.5	0.03	11.6	0.11	47.0	0.13	0.05	0.39	99.8	87.9
UR-46-M	40.6	0.03	11.5	0.17	46.8	0.13	0.05	0.36	99.6	87.9
UR-46-M	40.8	0.03	11.6	0.18	47.1	0.12	0.15	0.39	100.4	87.9
UR-46-M	40.7	0.04	11.5	0.19	46.8	0.15	0.04	0.37	99.9	87.9
UR-46-M	40.8	0.04	11.7	0.13	47.3	0.12	0.05	0.41	100.5	87.9
UR-46-M	41.0	0.08	11.5	0.24	46.5	0.13	0.05	0.46	99.9	87.9
UR-46-M	40.6	0.03	11.6	0.19	47.2	0.14	0.06	0.38	100.3	87.8
UR-46-M	40.7	0.03	11.6	0.17	47.2	0.13	0.03	0.42	100.3	87.8
UR-46-M	41.3	0.04	11.7	0.15	47.2	0.13	0.07	0.42	100.9	87.8
UR-46-M	40.8	0.03	11.6	0.19	47.0	0.12	0.05	0.39	100.1	87.8
UR-46-M	41.0	0.02	11.6	0.13	47.1	0.14	0.06	0.38	100.4	87.8
UR-46-M	40.7	0.14	11.4	0.21	46.3	0.15	0.05	0.37	99.3	87.8
UR-46-M	40.8	0.05	11.5	0.23	46.6	0.13	0.04	0.38	99.8	87.8
UR-46-M	40.8	0.02	11.6	0.15	46.9	0.12	0.07	0.39	100.1	87.8
UR-46-M	41.2	0.03	11.6	0.11	46.9	0.13	n.d.	0.39	100.4	87.8
UR-46-M	41.0	0.03	11.7	0.14	47.1	0.12	0.05	0.36	100.5	87.8
UR-46-M	40.9	0.02	11.6	0.16	47.0	0.13	0.06	0.38	100.2	87.8
UR-46-M	40.8	0.02	11.6	0.16	46.7	0.14	n.d.	0.42	99.8	87.8
UR-46-M	41.2	0.15	11.6	0.15	46.9	0.14	0.05	0.37	100.6	87.8
UR-46-M	40.3	0.04	11.6	0.21	46.7	0.14	0.03	0.44	99.4	87.8
UR-46-M	40.8	0.04	11.5	0.22	46.3	0.13	0.06	0.32	99.4	87.8
UR-46-M	41.0	0.02	11.6	0.10	46.7	0.15	0.07	0.37	100.1	87.7
UR-46-M	40.8	0.02	11.7	0.13	46.9	0.13	0.04	0.38	100.1	87.7
UR-46-M	41.0	0.03	11.7	0.15	46.9	0.13	0.04	0.37	100.4	87.7
UR-46-M	40.9	0.03	11.7	0.15	46.9	0.13	0.04	0.38	100.2	87.7
UR-46-M	41.0	0.03	11.7	0.15	46.7	0.14	0.04	0.33	100.1	87.7
UR-46-M	40.7	0.03	11.7	0.21	46.8	0.14	0.04	0.37	100.0	87.7
UR-46-M	40.8	0.03	11.6	0.15	46.4	0.13	n.d.	0.31	99.4	87.7
UR-46-M	40.7	0.02	11.7	0.20	46.6	0.14	n.d.	0.36	99.8	87.7
UR-46-M	40.9	0.03	11.8	0.20	47.1	0.13	n.d.	0.41	100.6	87.7
UR-46-M	41.0	0.03	11.7	0.19	46.7	0.14	0.05	0.39	100.3	87.6
UR-46-M	40.7	0.02	11.8	0.20	46.8	0.14	0.05	0.35	100.0	87.6
UR-46-M	40.3	0.04	11.8	0.13	46.7	0.14	0.07	0.36	99.6	87.6
UR-46-M	40.9	0.03	11.8	0.20	46.7	0.15	n.d.	0.40	100.2	87.6
UR-46-M	40.5	0.04	11.7	0.17	46.5	0.14	0.06	0.38	99.5	87.6
UR-46-M	40.2	0.37	11.7	0.15	46.2	0.14	0.10	0.42	99.2	87.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-N	41.0	0.01	11.9	0.17	47.0	0.13	0.04	0.34	100.6	87.6
UR-46-N	40.1	0.02	11.7	0.15	46.5	0.14	0.05	0.36	99.0	87.6
UR-46-N	41.2	0.02	11.8	0.11	46.8	0.14	n.d.	0.36	100.5	87.6
UR-46-N	41.1	0.01	11.8	0.17	46.7	0.14	0.04	0.35	100.4	87.6
UR-46-N	41.1	0.03	11.9	0.19	47.0	0.13	0.05	0.37	100.7	87.6
UR-46-N	40.9	0.03	12.0	0.20	47.3	0.13	0.05	0.36	100.9	87.6
UR-46-N	40.6	0.02	11.9	0.18	47.0	0.13	n.d.	0.38	100.2	87.6
UR-46-N	40.7	0.02	11.8	0.11	46.8	0.13	0.04	0.30	99.9	87.6
UR-46-N	40.9	0.02	11.9	0.18	46.8	0.13	n.d.	0.35	100.2	87.6
UR-46-N	41.1	0.05	11.8	0.19	46.5	0.13	n.d.	0.35	100.1	87.5
UR-46-N	40.9	0.02	11.9	0.21	46.7	0.14	0.05	0.29	100.2	87.5
UR-46-N	40.7	0.02	12.0	0.15	47.0	0.12	0.04	0.39	100.4	87.5
UR-46-N	40.8	0.03	11.9	0.14	46.8	0.14	n.d.	0.33	100.2	87.5
UR-46-N	40.9	0.03	11.9	0.16	46.6	0.13	0.05	0.28	100.1	87.5
UR-46-N	40.7	0.03	11.9	0.15	46.6	0.12	n.d.	0.32	99.9	87.5
UR-46-N	41.0	0.03	12.0	0.18	46.9	0.17	0.06	0.39	100.7	87.5
UR-46-N	41.1	0.03	12.1	0.11	47.2	0.12	0.05	0.37	101.0	87.5
UR-46-N	40.5	0.04	12.0	0.18	46.7	0.13	0.03	0.42	100.0	87.4
UR-46-N	41.2	0.04	11.8	0.21	46.1	0.14	0.05	0.40	100.0	87.4
UR-46-N	41.0	0.04	12.1	0.11	47.1	0.14	n.d.	0.36	100.9	87.4
UR-46-N	40.3	0.02	11.9	0.15	46.6	0.14	0.04	0.31	99.5	87.4
UR-46-N	40.8	0.02	11.9	0.21	46.6	0.14	0.05	0.33	100.0	87.4
UR-46-N	40.9	n.d.	11.9	0.18	46.6	0.13	0.08	0.37	100.1	87.4
UR-46-N	40.9	0.02	11.9	0.15	46.4	0.14	0.04	0.33	100.0	87.4
UR-46-N	40.3	0.01	12.0	0.24	46.9	0.14	0.04	0.34	100.0	87.4
UR-46-N	41.2	0.07	12.0	0.22	46.7	0.14	n.d.	0.33	100.7	87.4
UR-46-N	40.8	0.03	12.0	0.19	46.8	0.13	0.03	0.32	100.4	87.4
UR-46-N	40.6	0.03	11.9	0.16	46.3	0.12	0.04	0.37	99.6	87.4
UR-46-N	41.0	0.04	12.1	0.16	46.9	0.14	0.05	0.35	100.7	87.4
UR-46-N	40.8	n.d.	12.0	0.19	46.5	0.13	0.03	0.31	99.9	87.4
UR-46-N	40.7	0.02	12.0	0.13	46.6	0.15	0.06	0.32	100.0	87.4
UR-46-N	40.4	0.04	12.1	0.10	46.8	0.13	0.07	0.30	99.9	87.4
UR-46-N	41.0	0.02	12.0	0.20	46.7	0.14	0.04	0.32	100.4	87.4
UR-46-N	40.9	0.02	12.1	0.19	46.8	0.15	0.04	0.36	100.5	87.4
UR-46-N	40.8	0.02	12.0	0.16	46.6	0.14	n.d.	0.30	100.1	87.4
UR-46-N	41.0	0.04	12.1	0.17	46.8	0.14	0.03	0.40	100.7	87.4
UR-46-N	40.4	0.03	12.1	0.16	46.8	0.14	0.04	0.31	100.0	87.3
UR-46-N	40.6	0.06	12.0	0.19	46.3	0.16	0.05	0.35	99.7	87.3
UR-46-N	41.0	0.02	11.9	0.15	46.2	0.14	0.05	0.35	99.8	87.3
UR-46-N	40.6	0.03	12.0	0.20	46.3	0.15	n.d.	0.32	99.6	87.3
UR-46-N	40.5	0.02	12.0	0.20	46.4	0.15	n.d.	0.29	99.5	87.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-N	40.6	0.04	12.0	0.19	46.0	0.15	0.07	0.29	99.3	87.3
UR-46-N	40.7	0.04	12.1	0.15	46.4	0.14	0.05	0.31	99.8	87.3
UR-46-N	40.9	0.02	12.1	0.14	46.5	0.14	n.d.	0.30	100.2	87.3
UR-46-N	41.1	0.03	12.1	0.17	46.5	0.16	n.d.	0.29	100.3	87.3
UR-46-N	40.4	0.02	12.1	0.17	46.3	0.14	0.11	0.26	99.5	87.3
UR-46-N	41.5	0.03	12.1	0.19	46.4	0.13	n.d.	0.31	100.6	87.3
UR-46-N	40.6	0.28	12.2	0.19	46.7	0.15	0.04	0.34	100.5	87.3
UR-46-N	41.1	0.03	12.2	0.20	46.8	0.14	n.d.	0.36	100.8	87.2
UR-46-N	40.8	0.03	12.2	0.20	46.8	0.14	0.07	0.35	100.6	87.2
UR-46-N	40.5	0.03	12.1	0.17	46.3	0.14	0.06	0.32	99.7	87.2
UR-46-N	40.8	0.04	12.2	0.21	46.7	0.13	0.06	0.30	100.4	87.2
UR-46-N	40.7	0.02	12.2	0.18	46.7	0.14	0.04	0.33	100.3	87.2
UR-46-N	40.6	0.02	12.1	0.17	46.5	0.16	0.04	0.39	100.0	87.2
UR-46-N	40.2	0.06	12.1	0.14	46.3	0.14	0.03	0.30	99.2	87.2
UR-46-N	40.7	0.02	12.2	0.15	46.6	0.15	0.04	0.30	100.2	87.2
UR-46-N	40.5	0.51	12.0	0.14	45.5	0.19	0.04	0.37	99.2	87.1
UR-46-N	40.6	0.08	12.2	0.21	46.4	0.16	n.d.	0.31	100.0	87.1
UR-46-N	41.0	0.02	12.2	0.13	46.3	0.13	0.06	0.31	100.1	87.1
UR-46-N	40.6	0.05	12.3	0.16	46.6	0.15	0.06	0.32	100.1	87.1
UR-46-N	40.7	0.01	12.3	0.21	46.4	0.15	0.03	0.27	100.0	87.1
UR-46-N	41.0	0.02	12.4	0.17	46.7	0.14	0.04	0.29	100.7	87.1
UR-46-N	40.8	0.02	12.4	0.21	46.7	0.14	0.05	0.30	100.6	87.1
UR-46-N	41.0	0.03	12.4	0.10	46.6	0.15	n.d.	0.30	100.5	87.1
UR-46-N	40.7	0.03	12.4	0.17	46.7	0.15	0.08	0.29	100.6	87.0
UR-46-N	40.8	0.02	12.5	0.17	46.9	0.16	0.04	0.27	100.9	87.0
UR-46-N	40.7	0.01	12.4	0.14	46.5	0.15	n.d.	0.28	100.2	87.0
UR-46-N	40.9	0.02	12.3	0.20	46.3	0.15	0.06	0.30	100.3	87.0
UR-46-N	40.8	0.02	12.3	0.14	46.2	0.14	0.10	0.30	100.0	87.0
UR-46-N	40.7	0.04	12.4	0.16	46.2	0.16	0.08	0.31	100.1	87.0
UR-46-N	40.8	0.03	12.4	0.18	46.5	0.14	0.04	0.31	100.4	87.0
UR-46-N	40.4	0.02	12.3	0.14	46.0	0.15	0.06	0.27	99.4	87.0
UR-46-N	40.8	0.02	12.4	0.20	46.2	0.15	0.04	0.24	100.1	87.0
UR-46-N	40.3	0.01	12.3	0.20	46.1	0.15	n.d.	0.32	99.5	86.9
UR-46-N	40.8	0.02	12.4	0.13	46.4	0.14	0.06	0.30	100.2	86.9
UR-46-N	40.7	0.03	12.4	0.17	46.2	0.17	0.03	0.25	100.0	86.9
UR-46-N	40.7	0.02	12.5	0.27	46.5	0.16	0.04	0.28	100.5	86.9
UR-46-N	40.6	0.03	12.5	0.17	46.3	0.15	n.d.	0.28	100.1	86.8
UR-46-N	40.2	0.03	12.4	0.18	46.0	0.15	n.d.	0.26	99.3	86.8
UR-46-N	40.8	0.04	12.5	0.20	46.3	0.15	n.d.	0.27	100.3	86.8
UR-46-N	40.7	0.03	12.5	0.20	46.2	0.14	n.d.	0.29	100.1	86.8
UR-46-N	40.8	0.01	12.7	0.20	46.5	0.16	0.23	0.25	100.8	86.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-M	40.7	0.02	12.7	0.21	46.5	0.14	0.03	0.29	100.6	86.7
UR-46-M	40.6	0.03	12.7	0.24	46.6	0.16	n.d.	0.29	100.7	86.7
UR-46-M	40.8	0.04	12.7	0.21	46.4	0.15	0.03	0.30	100.5	86.7
UR-46-M	40.6	0.03	12.6	0.23	46.3	0.15	n.d.	0.26	100.2	86.7
UR-46-M	40.1	0.03	12.6	0.19	46.1	0.17	0.04	0.26	99.6	86.7
UR-46-M	41.0	0.02	12.8	0.20	46.5	0.14	0.04	0.25	100.9	86.7
UR-46-M	40.7	0.01	12.6	0.19	46.0	0.15	0.04	0.32	100.1	86.7
UR-46-M	40.8	0.02	12.7	0.19	46.2	0.14	0.04	0.25	100.4	86.6
UR-46-M	41.0	0.02	12.7	0.23	46.0	0.15	0.05	0.28	100.4	86.6
UR-46-M	40.3	0.02	12.7	0.22	45.9	0.16	n.d.	0.24	99.5	86.6
UR-46-M	40.0	0.03	12.8	0.12	46.3	0.16	0.05	0.21	99.7	86.6
UR-46-M	40.7	0.02	12.8	0.12	46.2	0.15	0.05	0.26	100.2	86.6
UR-46-M	40.4	0.02	12.8	0.20	46.0	0.18	0.03	0.24	99.8	86.5
UR-46-M	40.6	0.02	12.8	0.19	45.9	0.17	0.04	0.24	99.9	86.5
UR-46-M	40.2	0.03	12.8	0.16	45.9	0.15	0.04	0.26	99.5	86.5
UR-46-M	40.6	0.02	12.8	0.16	46.0	0.14	0.06	0.25	100.1	86.5
UR-46-M	40.7	0.02	12.9	0.16	46.1	0.14	n.d.	0.29	100.4	86.4
UR-46-M	40.7	0.03	12.9	0.20	46.0	0.15	0.04	0.24	100.2	86.4
UR-46-M	40.7	0.02	12.9	0.23	46.0	0.16	0.03	0.23	100.4	86.4
UR-46-M	40.6	0.02	13.0	0.14	46.0	0.15	n.d.	0.27	100.2	86.3
UR-46-M	40.9	0.03	13.0	0.19	45.9	0.17	n.d.	0.22	100.3	86.3
UR-46-M	40.6	0.01	13.1	0.17	46.3	0.15	0.03	0.27	100.6	86.3
UR-46-M	40.6	0.03	13.0	0.21	45.7	0.17	0.04	0.22	99.9	86.3
UR-46-M	40.5	0.02	13.1	0.22	45.6	0.15	0.03	0.23	99.8	86.2
UR-46-M	40.4	0.03	13.1	0.15	45.7	0.16	0.03	0.19	99.7	86.2
UR-46-M	41.0	0.01	13.2	0.23	46.0	0.15	n.d.	0.24	100.9	86.2
UR-46-M	40.7	0.03	13.1	0.23	45.7	0.16	n.d.	0.20	100.1	86.2
UR-46-M	40.0	0.02	13.1	0.11	45.6	0.16	0.04	0.22	99.2	86.1
UR-46-M	40.4	0.02	13.2	0.24	45.8	0.15	n.d.	0.21	100.0	86.1
UR-46-M	40.8	0.02	13.2	0.18	45.6	0.17	0.03	0.21	100.2	86.1
UR-46-M	40.5	0.02	13.2	0.20	45.6	0.15	0.06	0.22	100.0	86.0
UR-46-M	40.4	0.03	13.1	0.19	45.4	0.16	n.d.	0.21	99.6	86.0
UR-46-M	40.1	0.04	13.3	0.18	45.7	0.16	0.04	0.20	99.7	85.9
UR-46-M	40.6	0.02	13.2	0.19	45.3	0.17	0.04	0.17	99.7	85.9
UR-46-M	40.4	0.04	13.4	0.19	45.7	0.19	n.d.	0.21	100.2	85.9
UR-46-M	40.5	0.02	13.4	0.21	45.7	0.17	n.d.	0.20	100.3	85.9
UR-46-M	40.4	0.03	13.4	0.22	45.2	0.18	0.04	0.20	99.6	85.8
UR-46-M	40.5	0.02	13.5	0.18	45.4	0.18	0.04	0.20	100.0	85.7
UR-46-M	40.8	0.02	13.6	0.26	45.4	0.17	n.d.	0.19	100.4	85.6
UR-46-M	40.5	0.03	13.5	0.21	45.1	0.17	0.04	0.20	99.8	85.6
UR-46-M	40.5	0.02	13.8	0.19	45.6	0.17	n.d.	0.17	100.5	85.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-46-N	40.5	0.03	13.6	0.23	45.1	0.19	n.d.	0.17	99.9	85.5
UR-46-N	40.4	0.01	13.7	0.23	45.4	0.17	n.d.	0.17	100.1	85.5
UR-46-N	40.7	0.01	13.7	0.19	45.3	0.16	n.d.	0.19	100.3	85.5
UR-46-N	40.6	0.02	13.8	0.25	45.6	0.17	n.d.	0.17	100.6	85.5
UR-46-N	40.4	0.01	13.8	0.21	45.6	0.17	n.d.	0.19	100.4	85.4
UR-46-N	40.2	0.01	13.7	0.22	45.0	0.20	0.03	0.22	99.6	85.4
UR-46-N	40.4	0.03	13.8	0.17	45.1	0.17	n.d.	0.15	99.9	85.4
UR-46-N	40.4	0.02	13.9	0.20	45.0	0.17	n.d.	0.13	99.8	85.3
UR-46-N	40.4	0.01	13.9	0.19	44.9	0.17	0.04	0.17	99.8	85.2
UR-46-N	40.3	0.04	14.0	0.22	45.0	0.16	n.d.	0.16	99.9	85.2
UR-46-N	40.8	0.02	14.1	0.20	45.3	0.17	n.d.	0.21	100.8	85.1
UR-46-N	40.3	0.02	14.0	0.16	44.8	0.16	n.d.	0.14	99.6	85.1
UR-46-N	40.2	0.03	14.2	0.19	45.3	0.20	n.d.	0.18	100.3	85.1
UR-46-N	40.3	0.03	14.2	0.23	45.2	0.17	n.d.	0.15	100.3	85.1
UR-46-N	40.0	0.04	14.2	0.27	44.7	0.19	0.06	0.16	99.7	84.9
UR-46-N	40.6	0.03	14.4	0.18	44.6	0.18	0.04	0.23	100.2	84.7
UR-46-N	40.4	0.03	14.6	0.21	44.7	0.16	n.d.	0.14	100.3	84.5
UR-46-N	39.7	0.15	14.7	0.24	44.4	0.18	0.19	0.13	99.8	84.3
UR-46-N	40.5	0.01	14.8	0.23	44.3	0.19	n.d.	0.12	100.2	84.3
UR-46-N	40.2	0.03	14.7	0.26	44.2	0.19	0.05	0.13	99.8	84.2
UR-46-N	40.3	0.03	14.9	0.17	44.5	0.20	n.d.	0.12	100.2	84.2
UR-46-N	40.9	0.15	14.8	0.24	44.0	0.19	0.42	0.17	100.8	84.1
UR-46-N	40.0	0.02	15.0	0.28	44.0	0.21	n.d.	0.12	99.6	83.9
UR-46-N	40.1	0.02	15.3	0.21	44.4	0.20	0.04	0.12	100.4	83.8
UR-46-N	39.8	0.02	16.1	0.26	43.4	0.20	0.04	0.10	99.9	82.8
Jor-44-N	41.5	0.04	9.6	0.17	48.1	0.13	0.07	0.50	100.1	89.9
Jor-44-N	40.8	0.03	9.6	0.17	47.9	0.12	0.06	0.50	99.1	89.9
Jor-44-N	41.1	0.04	9.7	0.12	48.0	0.11	0.08	0.52	99.6	89.9
Jor-44-N	40.9	0.04	9.7	0.11	47.9	0.12	0.06	0.52	99.3	89.8
Jor-44-N	41.6	0.03	9.6	0.11	47.6	0.12	0.07	0.53	99.7	89.8
Jor-44-N	41.3	0.03	9.7	0.16	47.8	0.13	0.08	0.55	99.6	89.8
Jor-44-N	41.0	0.03	9.7	n.d.	47.9	0.12	0.07	0.51	99.4	89.8
Jor-44-N	41.6	0.04	9.8	0.16	47.9	0.13	0.06	0.50	100.1	89.7
Jor-44-N	41.3	0.04	9.7	0.19	47.6	0.12	0.07	0.50	99.5	89.7
Jor-44-N	41.5	0.04	9.8	0.19	48.1	0.12	0.06	0.53	100.4	89.7
Jor-44-N	41.4	0.04	9.8	0.15	48.1	0.12	0.08	0.50	100.2	89.7
Jor-44-N	41.0	0.03	9.8	0.14	47.9	0.12	0.05	0.54	99.5	89.7
Jor-44-N	41.3	0.04	9.7	0.13	47.6	0.13	0.06	0.48	99.5	89.7
Jor-44-N	40.9	0.02	9.8	0.13	47.7	0.12	0.06	0.53	99.2	89.7
Jor-44-N	41.1	0.03	9.8	n.d.	47.7	0.12	0.03	0.49	99.3	89.7
Jor-44-N	41.1	0.03	9.9	0.16	47.9	0.11	0.07	0.53	99.9	89.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-44-N	41.0	0.05	9.9	0.15	47.7	0.12	0.08	0.52	99.5	89.6
Jor-44-N	41.1	0.04	9.9	0.17	47.7	0.12	0.05	0.49	99.5	89.6
Jor-44-N	41.3	0.04	9.9	0.11	47.6	0.12	0.06	0.51	99.5	89.6
Jor-44-N	41.3	0.03	10.0	0.16	48.0	0.12	0.07	0.50	100.2	89.6
Jor-44-N	41.2	0.03	9.9	n.d.	47.6	0.13	0.06	0.45	99.5	89.6
Jor-44-N	41.5	0.05	10.0	0.15	47.9	0.13	0.08	0.51	100.4	89.5
Jor-44-N	40.7	0.02	10.0	0.18	47.6	0.12	0.06	0.54	99.2	89.5
Jor-44-N	41.3	0.03	10.1	0.16	48.1	0.12	0.07	0.55	100.5	89.5
Jor-44-N	41.0	0.03	10.1	0.18	47.7	0.13	0.11	0.45	99.6	89.4
Jor-44-N	41.0	0.02	10.1	0.12	47.4	0.11	0.07	0.51	99.3	89.3
Jor-44-N	40.4	0.04	10.2	n.d.	47.9	0.11	0.07	0.44	99.3	89.3
Jor-44-N	41.3	0.03	10.2	0.14	47.6	0.13	0.07	0.49	99.9	89.3
Jor-44-N	40.9	0.02	10.2	0.18	47.7	0.12	0.08	0.51	99.7	89.3
Jor-44-N	40.9	0.10	10.1	0.15	47.2	0.13	0.08	0.48	99.2	89.3
Jor-44-N	41.1	0.03	10.2	0.15	47.5	0.12	0.04	0.46	99.6	89.2
Jor-44-N	41.2	0.04	10.3	0.15	47.4	0.13	0.08	0.45	99.7	89.2
Jor-44-N	40.5	0.02	10.3	0.15	47.5	0.12	0.04	0.47	99.2	89.2
Jor-44-N	41.1	0.03	10.4	n.d.	47.8	0.12	0.10	0.53	100.1	89.1
Jor-44-N	40.7	0.01	10.3	0.17	47.3	0.13	0.04	0.40	99.1	89.1
Jor-44-N	41.1	0.04	10.3	0.12	47.3	0.12	0.12	0.46	99.6	89.1
Jor-44-N	40.8	0.06	10.3	0.18	47.0	0.11	0.07	0.48	99.1	89.1
Jor-44-N	41.4	0.04	10.5	n.d.	47.5	0.12	0.08	0.50	100.2	89.0
Jor-44-N	40.6	0.13	10.4	0.19	47.1	0.13	0.07	0.44	99.1	89.0
Jor-44-N	40.7	0.02	10.5	0.14	47.1	0.12	0.06	0.45	99.0	88.9
Jor-44-N	40.9	0.02	10.5	0.14	47.3	0.11	0.05	0.48	99.6	88.9
Jor-44-N	41.0	0.01	10.5	0.16	47.0	0.12	0.08	0.45	99.3	88.9
Jor-44-N	41.5	0.03	10.6	0.17	47.4	0.12	0.03	0.42	100.3	88.8
Jor-44-N	41.2	0.02	10.6	0.18	47.2	0.12	0.12	0.45	99.9	88.8
Jor-44-N	41.0	0.06	10.6	n.d.	47.1	0.13	0.07	0.44	99.4	88.8
Jor-44-N	40.6	0.03	10.6	0.19	47.2	0.13	0.05	0.44	99.2	88.8
Jor-44-N	40.9	0.02	10.7	0.14	47.2	0.13	0.10	0.42	99.6	88.7
Jor-44-N	40.7	0.04	10.7	0.12	47.1	0.13	0.08	0.44	99.3	88.7
Jor-44-N	41.1	0.04	10.7	0.17	47.1	0.15	n.d.	0.45	99.8	88.7
Jor-44-N	41.1	0.02	10.8	0.11	47.1	0.12	0.06	0.47	99.8	88.6
Jor-44-N	40.5	0.04	10.8	0.11	47.1	0.13	0.05	0.40	99.1	88.6
Jor-44-N	41.0	0.03	10.7	0.17	46.6	0.14	0.37	0.45	99.5	88.6
Jor-44-N	41.1	0.02	10.7	0.19	46.7	0.14	0.05	0.37	99.3	88.6
Jor-44-N	40.9	0.02	10.7	0.10	46.6	0.13	0.06	0.42	99.0	88.6
Jor-44-N	40.8	0.03	10.9	0.18	47.0	0.13	0.07	0.44	99.5	88.5
Jor-44-N	41.3	0.02	10.9	0.16	47.1	0.13	n.d.	0.39	100.0	88.5
Jor-44-N	40.8	0.03	11.0	0.15	47.2	0.14	0.05	0.43	99.8	88.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-44-N	40.5	0.03	11.0	0.12	47.0	0.12	0.06	0.45	99.3	88.4
Jor-44-N	40.8	0.04	11.0	0.17	46.9	0.13	0.07	0.43	99.4	88.4
Jor-44-N	40.9	0.02	11.0	n.d.	47.1	0.14	0.05	0.40	99.7	88.4
Jor-44-N	40.5	0.04	11.0	0.24	46.8	0.13	0.03	0.39	99.1	88.4
Jor-44-N	40.6	0.03	11.0	0.17	46.6	0.12	0.05	0.43	99.1	88.3
Jor-44-N	40.9	0.06	11.0	0.21	46.4	0.13	0.11	0.38	99.2	88.3
Jor-44-N	40.6	0.03	11.1	0.14	46.8	0.12	0.05	0.41	99.3	88.2
Jor-44-N	40.2	0.02	11.2	0.16	46.9	0.15	0.04	0.36	99.0	88.2
Jor-44-N	40.6	0.02	11.1	0.22	46.7	0.13	0.06	0.40	99.3	88.2
Jor-44-N	41.1	0.03	11.4	0.20	47.0	0.12	0.09	0.34	100.3	88.1
Jor-44-N	40.8	0.03	11.4	0.15	46.8	0.13	0.04	0.39	99.7	88.0
Jor-44-N	40.9	0.04	11.3	0.15	46.5	0.12	0.07	0.38	99.4	88.0
Jor-44-N	41.1	0.02	11.6	0.12	46.6	0.14	0.06	0.36	100.0	87.8
Jor-44-N	41.2	0.03	11.6	0.22	46.5	0.13	0.05	0.34	100.1	87.7
Jor-44-N	40.9	0.03	11.6	0.11	46.3	0.14	0.05	0.40	99.5	87.7
Jor-44-N	41.2	0.03	11.6	0.15	45.9	0.13	0.05	0.33	99.3	87.6
Jor-44-N	40.6	0.02	11.7	0.12	46.1	0.12	0.04	0.33	99.0	87.6
Jor-44-N	40.7	0.01	11.8	0.19	46.4	0.12	0.07	0.32	99.5	87.5
Jor-44-N	40.9	0.03	11.8	0.13	46.3	0.13	0.05	0.35	99.6	87.5
Jor-44-N	40.6	0.03	11.7	0.24	46.0	0.13	0.05	0.30	99.1	87.5
Jor-44-N	41.2	0.04	11.9	0.16	46.5	0.14	n.d.	0.34	100.3	87.5
Jor-44-N	40.9	0.02	11.9	0.14	46.4	0.12	0.04	0.34	99.8	87.4
Jor-44-N	40.0	0.03	12.1	0.14	46.5	0.15	0.04	0.29	99.3	87.3
Jor-44-N	40.8	0.02	12.0	0.14	46.1	0.12	0.06	0.30	99.6	87.3
Jor-44-N	40.2	0.02	12.0	0.20	46.1	0.14	0.05	0.33	99.0	87.2
Jor-44-N	40.5	0.04	12.0	0.11	45.9	0.15	0.04	0.30	99.0	87.2
Jor-44-N	40.5	0.02	12.0	0.15	46.0	0.13	0.04	0.25	99.1	87.2
Jor-44-N	40.7	0.03	12.0	0.16	45.8	0.13	n.d.	0.29	99.2	87.2
Jor-44-N	41.0	0.02	12.1	0.16	46.0	0.12	n.d.	0.32	99.6	87.2
Jor-44-N	40.3	0.02	12.1	0.21	46.0	0.13	0.07	0.35	99.1	87.2
Jor-44-N	40.5	0.04	12.1	0.18	46.1	0.14	0.04	0.28	99.3	87.2
Jor-44-N	40.4	0.02	12.1	0.11	45.9	0.14	n.d.	0.29	99.0	87.1
Jor-44-N	40.8	0.01	12.2	0.17	46.1	0.13	0.04	0.29	99.7	87.1
Jor-44-N	40.3	0.03	12.2	0.20	46.0	0.13	0.03	0.27	99.2	87.1
Jor-44-N	40.6	0.02	12.2	0.17	45.8	0.13	0.06	0.25	99.3	87.0
Jor-44-N	40.6	0.03	12.3	0.16	45.9	0.12	0.07	0.34	99.6	87.0
Jor-44-N	41.1	0.02	12.4	0.16	46.2	0.14	0.04	0.29	100.3	87.0
Jor-44-N	41.0	0.01	12.4	0.19	46.2	0.13	0.06	0.32	100.3	86.9
Jor-44-N	40.5	0.03	12.4	0.19	45.7	0.15	0.03	0.29	99.3	86.8
Jor-44-N	40.3	0.03	12.4	0.18	45.8	0.14	0.06	0.30	99.2	86.8
Jor-44-N	40.4	n.d.	12.4	0.11	45.6	0.14	n.d.	0.26	99.0	86.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-44-N	40.4	0.03	12.4	0.16	45.5	0.16	n.d.	0.32	99.0	86.7
Jor-44-N	40.4	0.19	12.5	0.20	45.6	0.14	n.d.	0.28	99.3	86.7
Jor-44-N	40.3	0.05	12.5	0.17	45.5	0.15	n.d.	0.29	99.0	86.7
Jor-44-N	41.0	0.03	12.5	0.18	45.6	0.13	n.d.	0.24	99.7	86.7
Jor-44-N	40.8	0.03	12.5	0.20	45.5	0.13	0.05	0.28	99.4	86.6
Jor-44-N	40.4	0.03	12.6	0.16	45.7	0.15	n.d.	0.29	99.3	86.6
Jor-44-N	40.7	0.05	12.7	0.17	46.0	0.14	0.05	0.26	100.2	86.6
Jor-44-N	40.7	0.02	12.7	0.24	45.7	0.13	0.04	0.27	99.8	86.6
Jor-44-N	40.7	0.02	12.6	0.14	45.5	0.13	0.04	0.23	99.4	86.5
Jor-44-N	40.7	0.02	12.6	0.17	45.3	0.14	0.08	0.26	99.2	86.5
Jor-44-N	40.4	0.02	12.7	0.14	45.4	0.13	n.d.	0.29	99.1	86.4
Jor-44-N	41.0	0.02	12.9	0.19	45.8	0.14	0.05	0.25	100.2	86.4
Jor-44-N	40.5	0.06	12.8	0.14	45.6	0.14	n.d.	0.22	99.5	86.4
Jor-44-N	41.0	0.01	12.8	0.24	45.5	0.14	n.d.	0.25	100.0	86.3
Jor-44-N	40.4	0.02	12.8	0.18	45.5	0.16	0.05	0.25	99.4	86.3
Jor-44-N	40.4	0.01	12.9	0.17	45.6	0.13	n.d.	0.27	99.5	86.3
Jor-44-N	40.5	0.04	12.8	0.18	45.3	0.13	n.d.	0.23	99.2	86.3
Jor-44-N	40.5	0.02	13.0	0.19	45.4	0.14	0.03	0.25	99.5	86.2
Jor-44-N	40.1	0.02	13.1	0.20	45.2	0.15	0.04	0.25	99.0	86.1
Jor-44-N	40.3	0.03	13.1	0.17	45.4	0.14	0.04	0.25	99.4	86.0
Jor-44-N	40.2	0.02	13.1	0.12	45.3	0.14	0.04	0.26	99.1	86.0
Jor-44-N	40.2	0.02	13.2	0.17	45.3	0.14	0.04	0.22	99.2	86.0
Jor-44-N	40.3	0.02	13.2	0.23	45.3	0.15	0.06	0.22	99.5	86.0
Jor-44-N	40.5	0.02	13.2	0.19	45.4	0.13	n.d.	0.23	99.7	86.0
Jor-44-N	40.0	0.02	13.2	0.19	45.2	0.14	0.03	0.25	99.0	85.9
Jor-44-N	40.7	n.d.	13.3	0.20	45.3	0.14	0.05	0.23	100.0	85.9
Jor-44-N	40.0	0.02	13.3	0.14	45.2	0.13	0.03	0.23	99.1	85.9
Jor-44-N	40.1	0.03	13.3	0.21	44.7	0.13	0.14	0.30	99.0	85.7
Jor-44-N	40.4	0.02	13.4	0.23	44.9	0.14	0.03	0.22	99.4	85.6
Jor-44-N	40.4	0.02	13.4	0.18	44.8	0.14	n.d.	0.17	99.2	85.6
Jor-44-N	40.3	0.02	13.4	0.23	44.7	0.14	0.06	0.22	99.1	85.6
Jor-44-N	40.7	0.03	13.6	0.16	45.4	0.13	0.04	0.26	100.4	85.6
Jor-44-N	40.2	0.03	13.4	0.22	44.7	0.15	n.d.	0.20	99.0	85.6
Jor-44-N	40.2	0.02	13.5	0.19	44.8	0.13	n.d.	0.21	99.0	85.5
Jor-44-N	40.2	0.03	13.5	0.25	44.8	0.16	0.04	0.28	99.3	85.5
Jor-44-N	40.9	0.02	13.7	0.13	45.1	0.15	0.03	0.21	100.3	85.5
Jor-44-N	40.1	0.03	13.6	0.18	44.8	0.13	0.05	0.24	99.2	85.4
Jor-44-N	40.1	0.04	13.6	0.25	44.8	0.16	n.d.	0.19	99.2	85.4
Jor-44-N	40.2	0.01	13.6	0.16	44.8	0.14	0.06	0.18	99.2	85.4
Jor-44-N	40.4	0.02	13.7	0.27	44.8	0.16	0.04	0.21	99.5	85.4
Jor-44-N	40.2	n.d.	13.7	0.16	44.6	0.15	n.d.	0.19	99.1	85.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-44-N	40.6	0.02	13.8	0.26	44.8	0.15	0.03	0.21	99.9	85.3
Jor-44-N	40.2	0.02	13.9	0.18	45.0	0.16	n.d.	0.19	99.6	85.2
Jor-44-N	40.7	0.02	13.9	0.23	44.8	0.14	0.04	0.23	100.0	85.2
Jor-44-N	40.2	0.18	13.7	0.32	44.2	0.16	n.d.	0.19	99.0	85.2
Jor-44-N	40.0	0.01	14.0	0.23	44.8	0.16	0.05	0.18	99.4	85.1
Jor-44-N	39.9	0.03	14.0	0.22	44.6	0.14	0.05	0.21	99.2	85.0
Jor-44-N	40.4	0.02	14.0	0.18	44.4	0.16	n.d.	0.17	99.5	85.0
Jor-44-N	40.0	0.02	14.1	0.19	44.6	0.16	n.d.	0.19	99.2	84.9
Jor-44-N	40.3	0.01	14.2	0.13	44.8	0.15	n.d.	0.16	99.8	84.9
Jor-44-N	39.7	0.03	14.1	0.20	44.4	0.17	0.18	0.16	99.0	84.9
Jor-44-N	40.0	0.03	14.2	0.19	44.4	0.16	0.05	0.18	99.2	84.8
Jor-44-N	41.4	0.02	14.3	0.12	44.6	0.15	n.d.	0.18	100.9	84.8
Jor-44-N	40.3	0.03	14.3	0.20	44.6	0.13	0.05	0.25	99.9	84.8
Jor-44-N	40.4	0.03	14.3	0.23	44.4	0.13	n.d.	0.18	99.7	84.7
Jor-44-N	39.9	0.02	14.5	0.19	44.0	0.13	0.03	0.16	99.0	84.4
Jor-44-N	40.1	0.02	14.7	0.22	44.1	0.16	n.d.	0.15	99.5	84.3
Jor-44-N	40.4	0.02	14.6	0.26	43.6	0.15	n.d.	0.25	99.3	84.2
Jor-44-N	40.3	0.02	14.9	0.22	43.6	0.15	n.d.	0.17	99.4	83.9
Jor-44-N	39.9	0.02	15.4	0.25	43.4	0.15	0.04	0.12	99.3	83.4
Jor-44-N	40.3	0.01	15.5	0.35	43.3	0.14	0.04	0.23	99.9	83.2
Jor-44-N	40.3	n.d.	15.8	0.20	43.3	0.17	n.d.	0.13	99.9	83.0
Jor-44-N	39.6	0.02	15.8	0.27	43.2	0.14	0.03	0.17	99.3	83.0
Jor-44-N	40.0	n.d.	15.9	0.23	42.9	0.13	n.d.	0.20	99.4	82.8
Jor-44-N	40.2	0.02	16.1	0.22	43.2	0.16	0.04	0.17	100.1	82.7
Jor-44-N	39.6	0.03	16.2	0.30	42.6	0.17	n.d.	0.15	99.1	82.4
Jor-44-N	40.1	0.02	16.4	0.30	42.8	0.17	n.d.	0.19	100.0	82.3
Jor-44-N	41.0	0.02	16.1	0.28	41.8	0.17	0.03	0.19	99.6	82.2
Jor-44-N	39.8	0.02	16.6	0.27	42.3	0.16	n.d.	0.15	99.3	81.9
Jor-44-N	39.6	0.03	16.7	0.29	42.2	0.17	n.d.	0.14	99.1	81.9
Jor-44-N	39.5	0.01	17.4	0.28	41.6	0.18	n.d.	0.12	99.1	81.0
Jor-44-N	39.5	n.d.	17.7	0.25	41.7	0.16	n.d.	0.11	99.5	80.8
Jor-44-N	38.9	n.d.	18.3	0.37	41.1	0.18	n.d.	0.09	99.0	80.0
Jor-44-N	39.5	0.02	18.4	0.34	40.8	0.14	n.d.	0.15	99.4	79.8
Jor-44-N	39.3	0.02	18.7	0.34	40.8	0.21	0.07	0.26	99.7	79.5
Jor-44-N	39.7	0.02	18.6	0.28	40.3	0.16	n.d.	0.19	99.3	79.4
Jor-44-N	40.0	0.01	19.1	0.32	41.1	0.18	n.d.	0.08	100.8	79.3
Jor-44-N	39.2	0.01	19.6	0.28	40.0	0.17	n.d.	0.10	99.3	78.5
Jor-44-N	39.2	0.02	21.3	0.27	38.4	0.18	n.d.	0.08	99.5	76.3
Jor-44-N	38.5	0.03	21.6	0.36	38.5	0.19	n.d.	0.09	99.3	76.1
Jor-44-N	39.0	0.02	21.5	0.32	38.3	0.22	n.d.	0.09	99.5	76.0
Jor-44-N	38.3	0.02	22.8	0.41	37.5	0.24	n.d.	0.08	99.4	74.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-44-N	35.9	0.03	35.2	0.54	27.4	0.30	n.d.	n.d.	99.4	58.1
NI-13ne	40.9	0.03	10.7	0.14	47.4	0.12	0.06	0.55	100.0	88.8
NI-13ne	40.8	0.02	10.8	0.13	47.3	0.10	0.06	0.53	99.7	88.7
NI-13ne	40.8	0.34	10.8	0.16	47.2	0.11	0.06	0.55	100.0	88.6
NI-13ne	41.1	0.02	10.8	0.12	47.3	0.10	0.06	0.54	100.0	88.6
NI-13ne	40.9	0.02	10.8	0.14	47.3	0.11	0.08	0.56	99.9	88.6
NI-13ne	40.8	0.02	10.8	0.16	47.3	0.11	0.04	0.57	99.8	88.6
NI-13ne	40.8	0.03	10.9	0.14	47.3	0.10	0.05	0.59	99.9	88.6
NI-13ne	40.9	0.02	10.8	0.14	47.2	0.10	0.05	0.53	99.8	88.6
NI-13ne	40.7	0.02	10.9	0.15	47.1	0.11	0.04	0.57	99.6	88.5
NI-13ne	40.8	0.03	10.8	0.12	46.5	0.11	0.04	0.57	99.0	88.5
NI-13ne	41.0	0.03	11.0	0.14	47.2	0.11	0.20	0.54	100.1	88.5
NI-13ne	40.9	0.04	11.0	0.14	47.1	0.11	0.06	0.56	99.9	88.4
NI-13ne	41.0	0.04	11.0	0.12	47.1	0.10	0.04	0.54	100.0	88.4
NI-13ne	41.2	0.04	11.0	0.15	47.1	0.11	0.05	0.54	100.2	88.4
NI-13ne	41.1	0.03	11.0	0.17	47.2	0.12	0.05	0.53	100.2	88.4
NI-13ne	40.6	0.02	11.1	0.13	47.2	0.11	0.06	0.55	99.7	88.4
NI-13ne	40.8	0.02	11.1	0.14	47.1	0.12	0.06	0.55	99.9	88.4
NI-13ne	41.0	0.03	11.0	0.15	46.9	0.11	0.06	0.57	99.9	88.4
NI-13ne	40.9	n.d.	11.0	0.14	46.9	0.13	0.03	0.51	99.6	88.3
NI-13ne	41.1	0.02	11.1	0.15	47.3	0.12	0.05	0.49	100.3	88.3
NI-13ne	41.0	0.02	11.1	0.14	47.0	0.12	n.d.	0.56	100.0	88.3
NI-13ne	41.2	0.03	11.3	0.14	47.5	0.10	0.06	0.54	100.9	88.3
NI-13ne	41.3	0.03	11.2	0.17	47.3	0.12	0.06	0.50	100.7	88.3
NI-13ne	41.5	0.02	11.2	0.14	47.3	0.11	0.04	0.48	100.8	88.3
NI-13ne	40.9	0.02	11.2	0.13	47.2	0.11	0.05	0.57	100.1	88.3
NI-13ne	40.6	0.03	11.2	0.16	47.2	0.11	0.05	0.53	99.9	88.3
NI-13ne	40.7	0.02	11.2	0.16	47.1	0.12	0.06	0.48	99.9	88.2
NI-13ne	40.7	0.02	11.2	0.14	47.0	0.12	n.d.	0.51	99.8	88.2
NI-13ne	41.6	0.02	11.3	0.16	47.3	0.12	0.05	0.49	101.0	88.2
NI-13ne	40.9	0.01	11.3	0.16	47.1	0.10	0.04	0.56	100.2	88.2
NI-13ne	41.2	0.02	11.2	0.16	47.0	0.10	0.03	0.46	100.1	88.2
NI-13ne	41.4	0.03	11.3	0.15	47.2	0.11	0.07	0.48	100.7	88.2
NI-13ne	40.7	0.03	11.3	0.13	46.9	0.13	0.04	0.54	99.7	88.1
NI-13ne	41.1	0.02	11.3	0.15	47.0	0.11	0.05	0.53	100.3	88.1
NI-13ne	41.1	0.06	11.3	0.15	47.1	0.11	0.05	0.48	100.3	88.1
NI-13ne	41.0	0.02	11.4	0.15	47.2	0.12	0.04	0.49	100.3	88.1
NI-13ne	40.8	0.03	11.4	0.15	47.1	0.11	0.23	0.47	100.3	88.1
NI-13ne	40.7	0.05	11.3	0.14	47.0	0.11	0.05	0.56	99.9	88.1
NI-13ne	40.9	0.03	11.3	0.17	47.0	0.11	0.05	0.54	100.1	88.1
NI-13ne	40.8	0.14	11.3	0.15	46.9	0.11	0.05	0.48	99.9	88.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-13ne	41.4	0.03	11.4	0.16	47.1	0.12	0.05	0.47	100.7	88.1
NI-13ne	41.4	0.13	11.4	0.16	47.2	0.11	0.04	0.48	101.0	88.1
NI-13ne	40.6	0.02	11.4	0.13	47.0	0.12	0.04	0.48	99.9	88.0
NI-13ne	40.6	0.02	11.3	0.14	46.8	0.13	0.07	0.45	99.5	88.0
NI-13ne	40.8	0.02	11.4	0.12	47.1	0.11	0.05	0.49	100.1	88.0
NI-13ne	40.5	0.02	11.4	0.15	46.8	0.11	0.04	0.45	99.5	88.0
NI-13ne	41.1	0.03	11.4	0.13	46.7	0.10	0.05	0.50	100.0	88.0
NI-13ne	41.1	0.02	11.5	0.18	47.2	0.11	0.04	0.46	100.6	88.0
NI-13ne	41.0	0.01	11.5	0.15	47.2	0.11	0.03	0.47	100.5	88.0
NI-13ne	41.2	0.03	11.5	0.17	47.0	0.11	0.06	0.53	100.5	88.0
NI-13ne	40.7	0.03	11.4	0.16	46.8	0.11	0.04	0.44	99.8	87.9
NI-13ne	41.1	0.02	11.5	0.16	47.0	0.11	0.07	0.48	100.5	87.9
NI-13ne	40.9	0.02	11.5	0.12	47.1	0.11	0.08	0.48	100.3	87.9
NI-13ne	41.0	0.01	11.5	0.17	46.9	0.11	0.03	0.48	100.2	87.9
NI-13ne	41.1	0.02	11.5	0.13	47.0	0.12	0.06	0.48	100.5	87.9
NI-13ne	40.8	0.02	11.6	0.17	47.3	0.11	n.d.	0.47	100.4	87.9
NI-13ne	40.7	0.03	11.6	0.16	47.3	0.12	0.06	0.44	100.4	87.9
NI-13ne	41.5	0.02	11.6	0.15	47.1	0.13	n.d.	0.48	101.0	87.9
NI-13ne	41.4	0.02	11.6	0.17	47.0	0.10	0.06	0.45	100.7	87.8
NI-13ne	41.3	0.02	11.6	0.13	47.2	0.12	0.06	0.47	100.9	87.8
NI-13ne	40.6	0.01	11.6	0.17	47.0	0.13	n.d.	0.43	100.0	87.8
NI-13ne	41.0	0.02	11.7	0.18	47.2	0.12	0.04	0.44	100.7	87.8
NI-13ne	40.6	0.02	11.6	0.14	46.7	0.09	0.04	0.42	99.7	87.8
NI-13ne	40.9	0.02	11.7	0.17	46.9	0.12	0.05	0.44	100.3	87.8
NI-13ne	41.1	0.02	11.7	0.18	47.0	0.11	n.d.	0.45	100.6	87.8
NI-13ne	40.8	0.03	11.7	0.17	47.0	0.11	0.04	0.45	100.3	87.8
NI-13ne	40.8	0.02	11.6	0.16	46.7	0.11	0.05	0.44	99.9	87.7
NI-13ne	41.3	0.02	11.7	0.17	47.0	0.11	0.08	0.49	100.9	87.7
NI-13ne	40.8	0.03	11.6	0.13	46.5	0.09	0.04	0.48	99.7	87.7
NI-13ne	40.6	0.02	11.7	0.16	46.9	0.11	0.04	0.47	100.1	87.7
NI-13ne	40.8	0.03	11.7	0.16	46.8	0.10	0.10	0.46	100.2	87.7
NI-13ne	41.5	0.08	11.8	0.17	46.9	0.11	0.05	0.40	101.0	87.7
NI-13ne	40.9	0.11	11.8	0.15	46.8	0.13	n.d.	0.41	100.3	87.6
NI-13ne	40.8	0.04	11.8	0.16	47.1	0.11	0.06	0.50	100.6	87.6
NI-13ne	40.8	0.02	11.8	0.15	46.8	0.13	0.07	0.43	100.2	87.6
NI-13ne	41.3	0.03	11.8	0.16	46.9	0.12	0.07	0.39	100.8	87.6
NI-13ne	41.5	0.03	11.8	0.17	46.8	0.12	0.05	0.50	100.9	87.6
NI-13ne	41.3	0.02	11.9	0.16	47.1	0.12	0.04	0.47	101.0	87.6
NI-13ne	40.6	0.03	11.8	0.16	46.7	0.11	0.03	0.41	99.9	87.6
NI-13ne	40.8	n.d.	11.8	0.16	46.8	0.11	0.04	0.40	100.2	87.6
NI-13ne	40.6	0.01	11.8	0.16	46.6	0.11	0.05	0.42	99.8	87.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-13ne	40.7	0.03	11.8	0.14	46.4	0.13	0.17	0.48	99.8	87.5
NI-13ne	40.8	0.02	11.8	0.16	46.7	0.11	0.04	0.41	100.0	87.5
NI-13ne	40.5	0.01	11.9	0.15	46.7	0.12	0.04	0.46	99.9	87.5
NI-13ne	41.3	0.02	11.9	0.15	46.8	0.11	n.d.	0.46	100.8	87.5
NI-13ne	40.8	0.02	11.9	0.16	46.7	0.11	0.04	0.55	100.4	87.5
NI-13ne	40.6	0.02	11.9	0.18	46.7	0.11	0.06	0.46	100.1	87.4
NI-13ne	41.2	0.02	12.0	0.16	47.0	0.11	0.05	0.42	101.0	87.4
NI-13ne	40.8	0.10	12.1	0.15	46.9	0.12	0.05	0.44	100.6	87.4
NI-13ne	41.0	0.02	11.9	0.16	46.3	0.11	n.d.	0.40	99.9	87.4
NI-13ne	40.7	0.02	12.0	0.19	46.5	0.12	0.05	0.42	100.0	87.3
NI-13ne	41.3	0.02	12.1	0.18	46.7	0.12	0.05	0.38	100.9	87.3
NI-13ne	40.5	0.04	12.0	0.17	46.3	0.13	0.05	0.43	99.5	87.3
NI-13ne	40.6	0.02	12.0	0.17	46.2	0.13	0.04	0.38	99.5	87.3
NI-13ne	40.8	0.03	12.0	0.16	46.5	0.12	0.06	0.46	100.1	87.3
NI-13ne	40.7	0.02	12.1	0.13	46.6	0.12	0.08	0.36	100.1	87.3
NI-13ne	41.1	0.01	12.2	0.18	46.7	0.12	0.04	0.41	100.7	87.2
NI-13ne	40.5	0.02	12.2	0.16	46.6	0.11	0.04	0.37	100.0	87.2
NI-13ne	40.5	0.02	12.1	0.16	46.2	0.13	0.03	0.40	99.5	87.2
NI-13ne	41.4	0.02	12.2	0.16	46.8	0.12	0.04	0.35	101.0	87.2
NI-13ne	40.8	0.02	12.1	0.15	46.3	0.12	n.d.	0.38	100.0	87.2
NI-13ne	40.4	0.02	12.2	0.17	46.4	0.11	0.06	0.40	99.8	87.1
NI-13ne	40.0	0.21	12.1	0.19	46.2	0.11	0.04	0.42	99.4	87.1
NI-13ne	40.9	0.02	12.2	0.15	46.2	0.13	0.04	0.37	100.0	87.1
NI-13ne	40.5	0.02	12.3	0.16	46.6	0.12	0.04	0.40	100.0	87.1
NI-13ne	40.9	0.01	12.1	0.18	46.0	0.12	0.05	0.36	99.8	87.1
NI-13ne	40.5	0.03	12.3	0.17	46.4	0.12	0.06	0.42	100.0	87.1
NI-13ne	40.6	0.02	12.2	0.13	46.3	0.11	0.04	0.35	99.8	87.1
NI-13ne	40.7	0.04	12.3	0.15	46.4	0.14	0.07	0.39	100.3	87.1
NI-13ne	40.6	0.11	12.1	0.16	45.6	0.14	0.13	0.36	99.2	87.0
NI-13ne	40.8	0.03	12.3	0.16	46.5	0.12	0.05	0.40	100.4	87.0
NI-13ne	40.5	0.02	12.3	0.13	46.2	0.13	0.05	0.33	99.6	87.0
NI-13ne	40.7	0.01	12.3	0.16	46.4	0.12	0.05	0.36	100.1	87.0
NI-13ne	40.6	0.02	12.4	0.19	46.6	0.12	n.d.	0.38	100.3	87.0
NI-13ne	40.8	n.d.	12.3	0.18	46.1	0.11	0.04	0.35	99.9	87.0
NI-13ne	40.5	0.04	12.3	0.17	46.1	0.12	0.03	0.35	99.6	87.0
NI-13ne	40.7	0.16	12.2	0.19	45.8	0.13	0.04	0.36	99.6	87.0
NI-13ne	40.8	0.02	12.4	0.17	46.2	0.12	0.09	0.40	100.2	86.9
NI-13ne	40.8	0.02	12.4	0.17	46.1	0.12	0.08	0.45	100.1	86.9
NI-13ne	40.4	0.02	12.4	0.18	46.2	0.12	n.d.	0.34	99.6	86.9
NI-13ne	40.7	0.02	12.4	0.16	46.2	0.12	0.05	0.33	100.0	86.9
NI-13ne	41.0	0.03	12.4	0.17	46.3	0.12	n.d.	0.37	100.5	86.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-13ne	41.0	0.02	12.5	0.18	46.5	0.11	0.04	0.40	100.7	86.9
NI-13ne	40.7	0.02	12.4	0.17	46.3	0.12	0.09	0.35	100.2	86.9
NI-13ne	40.5	0.02	12.3	0.15	45.6	0.11	0.04	0.39	99.1	86.9
NI-13ne	40.7	0.22	12.4	0.19	46.1	0.12	0.04	0.32	100.1	86.9
NI-13ne	40.5	0.03	12.4	0.16	46.1	0.12	n.d.	0.34	99.8	86.9
NI-13ne	40.7	0.03	12.5	0.17	46.3	0.13	0.03	0.32	100.1	86.9
NI-13ne	40.6	0.03	12.5	0.15	46.3	0.12	n.d.	0.41	100.1	86.9
NI-13ne	40.5	0.02	12.5	0.16	46.4	0.11	0.06	0.39	100.1	86.9
NI-13ne	40.5	0.11	12.4	0.17	46.0	0.11	0.05	0.40	99.7	86.8
NI-13ne	40.5	0.01	12.5	0.16	46.3	0.12	n.d.	0.35	99.9	86.8
NI-13ne	40.4	0.03	12.4	0.18	46.0	0.12	0.06	0.35	99.5	86.8
NI-13ne	40.4	0.03	12.5	0.14	46.2	0.12	0.03	0.31	99.8	86.8
NI-13ne	41.0	0.02	12.4	0.17	46.0	0.12	0.05	0.33	100.0	86.8
NI-13ne	41.0	0.03	12.5	0.16	46.4	0.12	0.04	0.36	100.6	86.8
NI-13ne	41.0	0.01	12.6	0.17	46.5	0.12	n.d.	0.37	100.8	86.8
NI-13ne	40.2	0.20	12.4	0.17	45.7	0.13	0.03	0.36	99.2	86.8
NI-13ne	40.5	0.02	12.5	0.17	46.1	0.12	0.04	0.38	99.8	86.8
NI-13ne	40.6	0.02	12.6	0.16	46.4	0.12	n.d.	0.33	100.2	86.8
NI-13ne	40.2	0.03	12.6	0.17	46.3	0.12	0.08	0.32	99.8	86.8
NI-13ne	40.4	0.02	12.5	0.14	46.1	0.11	n.d.	0.31	99.7	86.8
NI-13ne	40.9	0.02	12.6	0.15	46.3	0.14	0.03	0.28	100.4	86.8
NI-13ne	40.8	0.02	12.6	0.17	46.1	0.12	0.07	0.37	100.2	86.8
NI-13ne	41.0	0.02	12.6	0.17	46.2	0.12	0.04	0.42	100.5	86.8
NI-13ne	40.5	0.02	12.6	0.17	46.3	0.11	0.03	0.32	100.0	86.8
NI-13ne	40.5	0.02	12.6	0.17	46.2	0.13	n.d.	0.32	99.9	86.7
NI-13ne	40.4	0.01	12.5	0.19	46.0	0.11	0.04	0.35	99.7	86.7
NI-13ne	41.1	0.03	12.6	0.19	46.3	0.13	0.05	0.43	100.8	86.7
NI-13ne	40.7	0.02	12.6	0.20	46.0	0.13	0.03	0.32	100.0	86.7
NI-13ne	40.6	0.02	12.6	0.20	45.9	0.12	0.04	0.36	99.8	86.7
NI-13ne	40.5	0.01	12.7	0.16	46.2	0.11	0.04	0.36	100.1	86.7
NI-13ne	41.1	0.02	12.7	0.16	46.2	0.12	n.d.	0.34	100.7	86.7
NI-13ne	40.3	0.02	12.6	0.17	46.0	0.12	0.07	0.35	99.7	86.7
NI-13ne	40.6	0.02	12.6	0.21	45.9	0.13	0.04	0.33	99.9	86.6
NI-13ne	40.8	0.01	12.7	0.18	45.9	0.14	0.04	0.30	100.1	86.6
NI-13ne	40.3	0.01	12.7	0.16	45.9	0.13	0.04	0.33	99.6	86.6
NI-13ne	40.8	0.02	12.8	0.17	46.1	0.12	n.d.	0.33	100.4	86.5
NI-13ne	40.8	0.03	12.8	0.18	46.0	0.12	0.05	0.31	100.3	86.5
NI-13ne	40.7	0.01	12.8	0.17	46.0	0.12	n.d.	0.28	100.0	86.5
NI-13ne	40.5	0.01	12.7	0.16	45.9	0.13	0.05	0.29	99.9	86.5
NI-13ne	40.4	0.02	12.8	0.18	46.0	0.12	0.05	0.33	99.9	86.5
NI-13ne	40.4	0.02	12.8	0.18	45.9	0.12	0.06	0.37	99.8	86.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-13ne	41.0	0.02	12.8	0.17	45.9	0.12	0.06	0.41	100.5	86.5
NI-13ne	41.0	n.d.	12.8	0.18	46.0	0.12	n.d.	0.43	100.6	86.5
NI-13ne	40.3	0.02	12.8	0.19	46.0	0.11	0.05	0.34	99.9	86.5
NI-13ne	40.1	0.02	12.9	0.17	46.0	0.13	n.d.	0.30	99.6	86.5
NI-13ne	40.4	0.02	12.9	0.17	46.1	0.13	0.05	0.36	100.1	86.4
NI-13ne	40.6	n.d.	12.9	0.15	45.8	0.13	n.d.	0.29	99.9	86.4
NI-13ne	40.5	n.d.	12.9	0.15	46.1	0.13	0.04	0.35	100.2	86.4
NI-13ne	40.8	0.01	12.8	0.16	45.8	0.11	0.08	0.26	100.0	86.4
NI-13ne	40.6	0.04	12.9	0.19	46.0	0.12	0.05	0.33	100.2	86.4
NI-13ne	40.4	0.05	12.8	0.16	45.5	0.13	0.04	0.36	99.5	86.4
NI-13ne	40.5	0.02	12.8	0.17	45.3	0.13	0.04	0.29	99.2	86.3
NI-13ne	40.4	0.07	12.9	0.18	45.7	0.13	0.03	0.34	99.7	86.3
NI-13ne	40.3	0.03	12.9	0.14	45.7	0.13	0.06	0.34	99.5	86.3
NI-13ne	40.6	0.02	12.9	0.18	45.7	0.12	n.d.	0.34	99.9	86.3
NI-13ne	41.0	0.02	13.0	0.19	45.9	0.12	0.05	0.30	100.5	86.3
NI-13ne	40.7	0.04	13.0	0.19	45.9	0.13	0.11	0.29	100.3	86.3
NI-13ne	40.5	0.02	12.9	0.17	45.8	0.12	0.08	0.30	99.9	86.3
NI-13ne	40.5	0.02	13.0	0.20	46.0	0.12	0.05	0.32	100.1	86.3
NI-13ne	40.2	0.02	12.9	0.17	45.7	0.13	0.03	0.29	99.5	86.3
NI-13ne	40.5	0.02	12.9	0.16	45.6	0.12	0.06	0.26	99.7	86.3
NI-13ne	41.1	0.02	13.1	0.19	46.1	0.12	n.d.	0.30	100.9	86.3
NI-13ne	40.9	0.03	13.0	0.16	45.8	0.13	n.d.	0.27	100.4	86.2
NI-13ne	40.6	0.03	13.0	0.14	45.8	0.12	n.d.	0.37	100.1	86.2
NI-13ne	40.5	0.01	13.0	0.20	45.7	0.12	0.07	0.31	100.0	86.2
NI-13ne	41.0	n.d.	13.2	0.18	46.0	0.12	n.d.	0.33	100.9	86.2
NI-13ne	40.5	0.02	13.2	0.20	46.1	0.13	0.03	0.29	100.4	86.2
NI-13ne	40.6	0.01	13.1	0.21	45.7	0.12	n.d.	0.28	100.0	86.2
NI-13ne	40.3	0.02	13.0	0.16	45.6	0.12	0.05	0.27	99.6	86.2
NI-13ne	40.6	0.02	13.2	0.18	46.0	0.13	0.04	0.29	100.5	86.2
NI-13ne	40.3	0.02	13.2	0.19	45.9	0.13	n.d.	0.28	100.1	86.2
NI-13ne	40.4	n.d.	13.1	0.17	45.8	0.12	n.d.	0.30	99.9	86.2
NI-13ne	40.4	0.04	13.1	0.20	45.8	0.13	n.d.	0.24	100.0	86.1
NI-13ne	40.7	0.02	13.2	0.19	45.9	0.14	n.d.	0.31	100.5	86.1
NI-13ne	40.3	0.02	13.1	0.19	45.7	0.12	0.04	0.26	99.8	86.1
NI-13ne	41.1	0.01	13.2	0.17	45.9	0.13	n.d.	0.28	100.8	86.1
NI-13ne	40.8	0.02	13.2	0.18	45.9	0.15	0.03	0.29	100.7	86.1
NI-13ne	40.5	0.03	13.3	0.21	46.0	0.13	n.d.	0.26	100.4	86.1
NI-13ne	40.4	0.09	13.2	0.14	45.8	0.13	n.d.	0.24	100.0	86.1
NI-13ne	41.2	0.02	13.3	0.20	45.7	0.12	0.08	0.28	100.9	86.0
NI-13ne	40.5	0.02	13.2	0.19	45.7	0.12	n.d.	0.26	100.0	86.0
NI-13ne	40.5	0.01	13.2	0.19	45.4	0.13	n.d.	0.30	99.7	86.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-13ne	39.5	0.53	12.9	0.15	44.6	0.13	2.34	0.36	100.6	86.0
NI-13ne	40.0	0.01	13.2	0.15	45.5	0.13	0.04	0.29	99.4	86.0
NI-13ne	40.8	0.02	13.3	0.18	45.6	0.13	0.03	0.23	100.2	86.0
NI-13ne	40.3	0.03	13.2	0.18	45.3	0.13	0.03	0.28	99.5	85.9
NI-13ne	40.2	0.02	13.4	0.20	45.7	0.13	n.d.	0.24	99.9	85.9
NI-13ne	40.7	0.01	13.3	0.19	45.4	0.12	n.d.	0.25	100.1	85.9
NI-13ne	40.5	0.01	13.4	0.18	45.7	0.12	0.03	0.25	100.2	85.9
NI-13ne	40.4	0.02	13.3	0.20	45.4	0.13	n.d.	0.23	99.7	85.9
NI-13ne	41.2	0.02	13.4	0.16	45.7	0.12	0.04	0.27	100.9	85.8
NI-13ne	40.8	0.02	13.5	0.21	45.7	0.14	n.d.	0.27	100.6	85.8
NI-13ne	40.4	0.06	13.4	0.17	45.7	0.11	0.16	0.29	100.3	85.8
NI-13ne	40.3	0.02	13.3	0.21	45.2	0.17	0.04	0.30	99.6	85.8
NI-13ne	40.1	0.01	13.4	0.19	45.5	0.14	0.05	0.27	99.7	85.8
NI-13ne	40.6	0.02	13.5	0.18	45.7	0.12	n.d.	0.27	100.4	85.8
NI-13ne	41.0	0.02	13.5	0.20	45.7	0.14	n.d.	0.25	100.7	85.8
NI-13ne	40.9	0.08	13.4	0.19	45.4	0.13	n.d.	0.30	100.3	85.8
NI-13ne	40.6	n.d.	13.5	0.20	45.5	0.13	0.07	0.22	100.2	85.7
NI-13ne	40.6	n.d.	13.5	0.19	45.5	0.13	n.d.	0.25	100.2	85.7
NI-13ne	40.1	0.02	13.4	0.18	45.1	0.13	n.d.	0.27	99.3	85.7
NI-13ne	40.2	0.02	13.5	0.20	45.5	0.14	n.d.	0.29	99.9	85.7
NI-13ne	40.8	0.02	13.7	0.18	45.8	0.13	0.09	0.26	101.0	85.6
NI-13ne	40.4	0.02	13.7	0.17	45.7	0.13	n.d.	0.23	100.4	85.6
NI-13ne	40.7	0.01	13.6	0.17	45.3	0.13	n.d.	0.24	100.1	85.5
NI-13ne	40.5	0.02	13.7	0.19	45.3	0.13	0.03	0.24	100.1	85.5
NI-13ne	40.3	0.04	13.8	0.21	45.6	0.13	0.11	0.25	100.4	85.5
NI-13ne	40.5	0.03	13.8	0.16	45.6	0.11	0.04	0.41	100.7	85.5
NI-13ne	40.8	0.02	13.7	0.19	45.2	0.13	0.06	0.26	100.3	85.5
NI-13ne	40.7	0.02	13.8	0.18	45.3	0.14	n.d.	0.25	100.4	85.5
NI-13ne	40.1	0.05	13.7	0.19	44.9	0.14	0.05	0.28	99.4	85.4
NI-13ne	40.6	0.02	13.8	0.21	45.3	0.14	0.11	0.37	100.6	85.4
NI-13ne	41.0	0.02	13.8	0.18	45.1	0.14	n.d.	0.24	100.4	85.4
NI-13ne	40.5	0.02	13.8	0.19	45.3	0.15	n.d.	0.25	100.2	85.4
NI-13ne	40.2	0.06	13.6	0.18	44.6	0.13	n.d.	0.22	99.0	85.4
NI-13ne	40.0	0.02	13.9	0.21	45.2	0.13	n.d.	0.26	99.7	85.3
NI-13ne	40.4	0.02	13.8	0.20	44.8	0.13	n.d.	0.20	99.6	85.3
NI-13ne	40.9	0.02	14.0	0.19	45.5	0.12	n.d.	0.23	101.0	85.3
NI-13ne	40.4	0.02	14.0	0.21	45.3	0.13	0.03	0.26	100.3	85.2
NI-13ne	40.9	0.02	14.0	0.19	45.3	0.13	0.04	0.23	100.7	85.2
NI-13ne	40.8	0.01	14.0	0.20	45.1	0.13	n.d.	0.22	100.5	85.2
NI-13ne	40.9	0.01	14.1	0.22	45.2	0.13	0.04	0.27	101.0	85.1
NI-13ne	40.6	0.02	14.1	0.19	45.2	0.15	0.05	0.19	100.5	85.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-13ne	40.3	0.04	14.2	0.17	45.0	0.12	n.d.	0.21	100.0	85.0
NI-13ne	40.8	0.05	14.3	0.22	44.8	0.17	0.04	0.20	100.6	84.8
NI-13ne	40.1	0.16	14.4	0.18	44.8	0.14	n.d.	0.23	100.0	84.7
NI-13ne	40.4	0.02	14.5	0.17	45.0	0.11	0.04	0.31	100.5	84.7
NI-13ne	40.1	0.01	14.5	0.22	44.9	0.13	0.03	0.18	100.1	84.6
NI-13ne	40.2	0.08	14.5	0.19	44.7	0.13	n.d.	0.18	100.0	84.6
NI-13ne	40.0	0.10	14.5	0.19	44.8	0.13	0.03	0.23	100.0	84.6
NI-13ne	40.3	0.02	14.5	0.20	44.8	0.14	0.06	0.19	100.2	84.6
NI-13ne	39.9	0.17	14.5	0.22	44.5	0.16	n.d.	0.19	99.7	84.6
NI-13ne	40.3	0.01	14.5	0.20	44.7	0.14	n.d.	0.22	100.2	84.6
NI-13ne	40.3	0.14	14.5	0.19	44.4	0.13	n.d.	0.19	99.9	84.5
NI-13ne	40.4	0.01	14.7	0.20	44.8	0.14	0.03	0.21	100.5	84.5
NI-13ne	40.1	0.01	14.8	0.18	44.7	0.14	0.04	0.17	100.1	84.4
NI-13ne	40.2	0.42	14.6	0.22	44.2	0.14	0.33	0.15	100.3	84.4
NI-13ne	40.4	n.d.	14.8	0.24	44.5	0.13	0.04	0.24	100.4	84.3
NI-13ne	39.9	0.02	14.8	0.21	44.4	0.15	0.04	0.23	99.8	84.2
NI-13ne	40.5	0.01	15.0	0.18	44.7	0.14	0.04	0.19	100.7	84.2
NI-13ne	40.1	0.13	14.9	0.20	44.5	0.15	n.d.	0.18	100.2	84.2
NI-13ne	40.0	0.02	14.9	0.22	44.4	0.15	n.d.	0.15	99.9	84.2
NI-13ne	40.0	0.02	14.9	0.23	44.3	0.13	n.d.	0.31	99.8	84.1
NI-13ne	40.4	0.02	14.9	0.22	44.3	0.14	n.d.	0.18	100.2	84.1
NI-13ne	40.7	n.d.	15.0	0.20	44.5	0.14	0.03	0.21	100.8	84.1
NI-13ne	40.2	n.d.	15.1	0.22	44.4	0.15	n.d.	0.19	100.3	84.0
NI-13ne	40.0	n.d.	15.1	0.22	44.3	0.15	n.d.	0.20	99.9	84.0
NI-13ne	40.0	n.d.	15.2	0.22	44.5	0.14	n.d.	0.23	100.3	83.9
NI-13ne	40.2	0.12	15.0	0.22	44.0	0.14	0.04	0.17	99.9	83.9
NI-13ne	40.2	0.01	15.2	0.20	44.4	0.15	n.d.	0.18	100.3	83.9
NI-13ne	40.2	0.02	15.1	0.23	44.1	0.14	0.04	0.22	100.1	83.8
NI-13ne	40.3	n.d.	15.2	0.22	44.2	0.14	n.d.	0.22	100.3	83.8
NI-13ne	40.1	0.14	15.2	0.21	44.1	0.15	n.d.	0.18	100.1	83.8
NI-13ne	40.3	0.01	15.3	0.17	44.1	0.13	n.d.	0.27	100.4	83.7
NI-13ne	40.6	0.02	15.3	0.24	44.1	0.13	0.04	0.16	100.6	83.7
NI-13ne	40.3	n.d.	15.4	0.23	43.8	0.14	0.03	0.20	100.1	83.5
NI-13ne	40.1	0.33	15.5	0.24	43.9	0.14	n.d.	0.13	100.4	83.5
NI-13ne	39.6	0.01	15.5	0.26	43.8	0.15	n.d.	0.15	99.6	83.4
NI-13ne	40.4	0.01	15.6	0.25	43.7	0.15	n.d.	0.13	100.3	83.3
NI-13ne	39.8	0.01	15.6	0.21	43.6	0.14	n.d.	0.16	99.6	83.3
NI-13ne	40.5	0.01	15.8	0.24	43.9	0.14	0.03	0.20	100.8	83.3
NI-13ne	40.8	0.21	15.6	0.21	43.3	0.18	n.d.	0.16	100.4	83.2
NI-13ne	39.6	0.19	15.7	0.21	43.6	0.18	n.d.	0.11	99.6	83.2
NI-13ne	40.0	0.01	16.0	0.23	43.4	0.15	n.d.	0.15	99.9	82.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-13ne	40.2	0.02	16.1	0.21	43.3	0.14	n.d.	0.19	100.2	82.7
NI-13ne	39.9	n.d.	16.4	0.22	43.5	0.15	n.d.	0.17	100.3	82.5
NI-13ne	40.0	0.02	16.3	0.26	43.3	0.15	n.d.	0.13	100.1	82.5
NI-13ne	40.0	0.02	16.4	0.22	43.4	0.17	n.d.	0.11	100.4	82.5
NI-13ne	39.9	0.01	16.4	0.26	43.2	0.15	0.04	0.20	100.2	82.5
NI-13ne	39.9	0.18	16.4	0.25	43.0	0.15	n.d.	0.15	100.0	82.4
NI-13ne	39.9	0.01	16.6	0.22	43.7	0.13	n.d.	0.26	100.8	82.4
NI-13ne	40.4	0.02	16.6	0.25	43.1	0.12	n.d.	0.19	100.7	82.2
NI-13ne	39.6	n.d.	16.6	0.25	43.1	0.15	n.d.	0.10	99.8	82.2
NI-13ne	39.6	0.10	16.9	0.23	42.7	0.17	0.05	0.14	99.9	81.8
NI-13ne	39.9	0.32	16.8	0.28	42.4	0.24	0.04	0.13	100.2	81.8
NI-13ne	40.1	0.01	17.1	0.25	42.6	0.18	n.d.	0.13	100.4	81.6
NI-13ne	39.7	n.d.	17.1	0.26	42.6	0.17	n.d.	0.13	100.0	81.6
NI-13ne	40.4	0.01	17.2	0.28	42.7	0.14	n.d.	0.22	101.0	81.5
NI-13ne	40.2	n.d.	17.5	0.28	42.7	0.14	n.d.	0.18	101.0	81.3
NI-13ne	40.0	0.01	17.8	0.27	42.6	0.15	n.d.	0.13	100.9	81.0
NI-13ne	40.0	0.03	18.0	0.29	41.7	0.18	0.04	0.08	100.4	80.5
NI-13ne	39.5	n.d.	18.2	0.28	42.2	0.14	0.05	0.21	100.6	80.5
NI-13ne	39.5	0.11	18.0	0.27	41.5	0.18	n.d.	0.10	99.7	80.4
NI-13ne	39.3	0.09	18.0	0.26	41.2	0.16	n.d.	0.14	99.1	80.3
NI-13ne	42.6	0.03	17.5	0.30	38.8	0.16	n.d.	0.11	99.6	79.8
NI-13ne	39.3	0.02	18.8	0.29	41.3	0.20	0.05	0.12	100.1	79.6
NI-13ne	39.4	0.01	19.0	0.31	41.2	0.17	n.d.	0.13	100.2	79.4
NI-13ne	39.3	0.01	19.1	0.29	41.3	0.18	n.d.	0.10	100.4	79.4
NI-13ne	39.3	0.01	19.0	0.27	41.0	0.22	n.d.	0.10	100.0	79.3
NI-13ne	39.5	0.05	19.2	0.29	41.0	0.19	0.03	0.08	100.4	79.2
NI-13ne	39.5	0.10	19.2	0.31	40.7	0.28	n.d.	0.09	100.2	79.1
NI-13ne	39.4	0.16	19.0	0.31	40.3	0.19	0.05	0.12	99.5	79.1
NI-13ne	39.3	0.01	19.4	0.28	41.2	0.15	n.d.	0.20	100.6	79.1
NI-13ne	40.1	0.03	19.4	0.29	40.7	0.18	0.04	0.10	100.8	79.0
NI-13ne	39.4	0.01	19.6	0.27	40.9	0.16	n.d.	0.14	100.4	78.8
NI-13ne	39.2	n.d.	19.5	0.29	40.6	0.16	n.d.	0.11	99.9	78.8
NI-13ne	39.1	0.02	19.6	0.29	40.6	0.15	n.d.	0.14	100.0	78.7
NI-13ne	40.1	0.02	19.7	0.32	40.0	0.19	0.03	0.07	100.4	78.4
NI-13ne	39.5	0.03	20.6	0.29	40.2	0.17	n.d.	0.10	100.9	77.7
NI-13ne	39.6	0.01	21.3	0.36	39.5	0.19	n.d.	0.08	101.0	76.8
NI-13ne	39.3	0.22	21.3	0.32	38.3	0.21	n.d.	0.15	99.8	76.2
NI-13ne	39.0	0.10	21.5	0.37	38.7	0.27	n.d.	0.07	100.0	76.2
NI-13ne	38.5	0.12	21.8	0.31	38.2	0.15	n.d.	0.24	99.4	75.7
NI-13ne	39.2	0.11	23.0	0.34	37.2	0.24	0.05	0.10	100.3	74.2
NI-13ne	38.6	0.02	23.9	0.38	37.1	0.20	n.d.	0.08	100.3	73.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-13ne	37.8	0.46	26.2	0.40	35.5	0.23	0.04	0.05	100.7	70.7
UR-6n-1	41.6	0.03	11.2	0.22	46.9	0.13	0.05	0.44	100.5	88.1
UR-6ne	41.0	0.03	11.3	0.15	46.9	0.14	0.07	0.43	100.0	88.1
UR-6ne	41.1	0.03	11.3	0.14	46.9	0.13	0.05	0.40	100.1	88.1
UR-6ne	41.1	0.03	11.4	0.18	47.2	0.15	0.43	0.44	100.8	88.1
UR-6ne	41.3	0.03	11.3	0.18	46.6	0.13	0.05	0.43	100.0	88.0
UR-6ne	41.3	0.03	11.4	0.14	46.9	0.13	0.05	0.42	100.4	88.0
UR-6ne	41.3	0.03	11.4	0.19	46.9	0.12	0.03	0.38	100.3	88.0
UR-6n-1	41.3	0.03	11.3	0.19	46.6	0.12	n.d.	0.40	100.0	88.0
UR-6ne	40.8	0.03	11.4	0.13	46.8	0.13	0.04	0.37	99.8	88.0
UR-6ne	41.0	0.03	11.4	0.16	46.8	0.13	n.d.	0.42	99.9	88.0
UR-6ne	41.1	0.02	11.4	0.18	46.7	0.13	0.07	0.39	100.0	88.0
UR-6ne	41.3	0.03	11.4	0.16	46.9	0.13	0.04	0.43	100.5	88.0
UR-6ne	40.7	0.03	11.4	0.15	46.7	0.13	0.04	0.38	99.5	87.9
UR-6ne	40.8	0.03	11.5	0.16	46.8	0.13	0.04	0.40	99.8	87.9
UR-6n-1	41.4	0.03	11.5	0.19	46.8	0.13	n.d.	0.42	100.5	87.9
UR-6n-1	41.3	0.03	11.5	0.15	46.7	0.14	0.04	0.41	100.3	87.9
UR-6ne	41.1	0.02	11.5	0.13	46.7	0.14	0.04	0.42	100.0	87.9
UR-6n-1	41.5	0.03	11.5	0.14	47.0	0.14	0.04	0.41	100.8	87.9
UR-6ne	40.7	0.03	11.5	0.20	46.8	0.13	0.03	0.41	99.9	87.9
UR-6ne	41.0	0.03	11.4	0.14	46.6	0.13	0.04	0.40	99.7	87.9
UR-6n-1	41.3	0.02	11.5	0.19	46.9	0.13	0.06	0.45	100.7	87.9
UR-6ne	40.9	0.02	11.5	0.15	46.9	0.13	0.05	0.41	100.1	87.9
UR-6ne	41.6	0.02	11.3	0.15	46.1	0.17	0.03	0.37	99.8	87.9
UR-6ne	40.9	0.03	11.5	0.16	46.7	0.12	0.06	0.40	99.9	87.9
UR-6n-1	41.4	0.02	11.6	0.12	47.0	0.14	n.d.	0.42	100.7	87.9
UR-6ne	41.2	0.03	11.5	0.17	46.6	0.13	0.09	0.42	100.1	87.9
UR-6ne	40.9	0.03	11.5	0.18	46.7	0.12	0.04	0.39	99.9	87.9
UR-6ne	41.0	0.03	11.5	0.14	46.8	0.13	0.09	0.44	100.1	87.9
UR-6ne	41.4	0.03	11.5	0.19	46.8	0.12	0.04	0.43	100.5	87.9
UR-6n-1	41.1	0.03	11.5	0.20	46.8	0.12	0.04	0.44	100.3	87.9
UR-6n-1	41.0	0.03	11.5	0.13	46.5	0.12	0.04	0.39	99.7	87.9
UR-6n-1	41.5	0.03	11.6	0.15	47.0	0.13	0.07	0.40	100.8	87.9
UR-6n-1	41.5	0.03	11.6	0.11	47.0	0.13	n.d.	0.44	100.8	87.9
UR-6ne	40.6	0.03	11.5	0.17	46.6	0.13	0.07	0.39	99.6	87.8
UR-6ne	41.2	0.03	11.6	0.16	46.9	0.12	0.05	0.40	100.3	87.8
UR-6n-1	41.2	0.03	11.5	0.14	46.6	0.14	0.04	0.38	100.0	87.8
UR-6ne	40.5	0.03	11.5	0.12	46.8	0.14	0.13	0.43	99.6	87.8
UR-6ne	41.1	0.02	11.6	0.17	47.0	0.12	n.d.	0.39	100.4	87.8
UR-6ne	41.3	0.04	11.5	0.18	46.8	0.12	0.05	0.37	100.4	87.8
UR-6ne	40.8	0.02	11.6	0.13	46.8	0.13	0.05	0.39	99.9	87.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-6n-1	41.6	0.03	11.6	0.19	46.8	0.13	n.d.	0.43	100.7	87.8
UR-6new	41.2	0.03	11.5	0.26	46.4	0.14	0.04	0.42	100.0	87.8
UR-6n-1	41.3	0.03	11.6	0.16	46.9	0.13	0.04	0.42	100.6	87.8
UR-6n-1	41.5	0.04	11.6	0.21	46.9	0.12	0.06	0.42	100.7	87.8
UR-6new	40.5	0.02	11.6	0.14	46.8	0.14	0.03	0.44	99.6	87.8
UR-6new	41.0	0.02	11.6	0.20	46.7	0.14	0.08	0.40	100.1	87.8
UR-6n-1	41.4	0.03	11.6	0.20	46.8	0.12	0.06	0.44	100.6	87.8
UR-6new	40.2	0.02	11.5	0.17	46.6	0.14	0.05	0.45	99.2	87.8
UR-6new	41.1	0.02	11.6	n.d.	46.8	0.12	0.04	0.41	100.1	87.8
UR-6new	40.9	0.03	11.7	0.16	47.3	0.12	0.03	0.42	100.7	87.8
UR-6new	40.3	0.02	11.6	0.21	46.7	0.14	0.04	0.37	99.4	87.8
UR-6new	41.0	0.03	11.6	0.14	46.7	0.12	0.04	0.42	100.1	87.8
UR-6new	40.8	0.03	11.5	0.16	46.6	0.13	0.10	0.43	99.8	87.8
UR-6n-1	41.4	0.03	11.6	0.19	46.9	0.14	n.d.	0.43	100.8	87.8
UR-6new	40.3	0.02	11.6	0.19	46.9	0.13	0.04	0.43	99.6	87.8
UR-6new	41.0	0.02	11.6	0.19	46.7	0.12	n.d.	0.41	100.0	87.8
UR-6new	41.2	0.03	11.6	0.13	46.9	0.13	0.05	0.38	100.4	87.8
UR-6new	40.9	0.03	11.6	0.17	46.7	0.14	n.d.	0.44	99.9	87.8
UR-6n-1	40.9	0.02	11.6	0.13	46.8	0.13	n.d.	0.40	100.1	87.8
UR-6new	41.4	0.03	11.6	0.21	46.8	0.12	0.04	0.41	100.6	87.8
UR-6new	40.9	0.03	11.6	0.18	46.8	0.13	0.04	0.46	100.1	87.8
UR-6n-1	41.3	0.03	11.6	0.17	46.7	0.14	0.03	0.41	100.4	87.8
UR-6n-1	41.3	0.02	11.7	0.16	47.1	0.13	0.05	0.43	101.0	87.8
UR-6n-1	41.1	0.02	11.7	0.15	47.1	0.13	0.06	0.44	100.8	87.8
UR-6n-1	41.2	0.03	11.6	0.11	46.7	0.13	0.04	0.41	100.2	87.8
UR-6n-1	41.4	0.03	11.7	0.20	46.8	0.13	0.05	0.45	100.8	87.8
UR-6new	40.9	0.03	11.6	0.14	46.8	0.12	0.08	0.44	100.2	87.7
UR-6new	40.3	0.02	11.6	0.16	46.5	0.13	0.03	0.42	99.2	87.7
UR-6n-1	41.3	0.02	11.6	0.18	46.7	0.13	0.04	0.43	100.4	87.7
UR-6new	40.7	0.03	11.7	0.15	47.0	0.14	0.05	0.43	100.3	87.7
UR-6new	41.0	0.03	11.6	0.19	46.6	0.13	0.03	0.43	100.0	87.7
UR-6n-1	41.4	0.03	11.7	0.15	46.8	0.13	n.d.	0.39	100.6	87.7
UR-6n-1	41.4	0.03	11.7	0.23	46.8	0.13	0.06	0.41	100.7	87.7
UR-6n-1	41.4	0.03	11.7	0.22	47.0	0.12	0.03	0.40	100.9	87.7
UR-6n-1	41.4	0.02	11.7	0.11	46.8	0.13	n.d.	0.41	100.5	87.7
UR-6n-1	41.5	0.03	11.6	0.20	46.7	0.13	0.04	0.43	100.7	87.7
UR-6new	41.2	0.03	11.6	0.15	46.7	0.14	0.05	0.36	100.2	87.7
UR-6n-1	41.5	0.03	11.7	0.19	46.8	0.14	0.04	0.41	100.7	87.7
UR-6new	40.8	0.02	11.6	0.17	46.5	0.12	n.d.	0.40	99.6	87.7
UR-6new	40.8	0.02	11.6	0.15	46.7	0.13	0.04	0.42	99.9	87.7
UR-6n-1	41.2	0.03	11.7	0.19	46.8	0.12	0.05	0.43	100.5	87.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-6n-T	41.3	0.03	11.7	0.21	47.0	0.13	0.04	0.45	100.8	87.7
UR-6n-T	41.0	0.01	11.7	0.18	46.8	0.14	0.06	0.42	100.2	87.7
UR-6n-T	41.2	0.02	11.7	0.21	46.8	0.13	n.d.	0.43	100.4	87.7
UR-6n-T	41.0	0.05	11.7	0.15	47.1	0.13	0.03	0.44	100.6	87.7
UR-6new	41.0	0.03	11.7	0.16	46.7	0.13	0.04	0.41	100.1	87.7
UR-6new	40.4	0.02	11.6	0.13	46.6	0.13	n.d.	0.46	99.4	87.7
UR-6n-T	41.3	0.03	11.7	0.20	47.0	0.12	0.04	0.47	100.8	87.7
UR-6new	41.0	0.02	11.7	0.14	46.9	0.13	0.03	0.42	100.4	87.7
UR-6n-T	41.4	0.03	11.7	0.16	46.9	0.14	n.d.	0.43	100.8	87.7
UR-6new	41.4	0.03	11.7	0.15	46.8	0.13	n.d.	0.43	100.7	87.7
UR-6n-T	41.1	0.03	11.6	n.d.	46.6	0.11	n.d.	0.41	100.0	87.7
UR-6n-T	41.3	0.03	11.7	0.18	46.8	0.13	n.d.	0.40	100.5	87.7
UR-6n-T	40.9	0.03	11.7	0.20	46.6	0.13	0.04	0.42	100.0	87.7
UR-6n-T	41.1	0.03	11.6	0.22	46.5	0.12	0.03	0.42	100.1	87.7
UR-6new	40.7	0.03	11.9	0.12	47.4	0.13	n.d.	0.45	100.7	87.7
UR-6n-T	41.5	0.03	11.7	0.11	46.6	0.13	0.03	0.39	100.4	87.7
UR-6n-T	41.4	0.03	11.7	0.19	46.9	0.12	0.06	0.45	100.9	87.7
UR-6n-T	41.1	0.03	11.7	0.20	46.8	0.12	0.05	0.47	100.5	87.7
UR-6new	40.8	0.03	11.7	0.12	46.9	0.13	0.36	0.41	100.5	87.7
UR-6n-T	41.2	0.03	11.7	0.19	46.5	0.13	0.05	0.39	100.2	87.7
UR-6n-T	41.3	0.03	11.7	0.20	46.8	0.14	0.04	0.40	100.6	87.7
UR-6new	41.3	0.03	11.8	0.16	47.0	0.12	0.04	0.40	100.8	87.7
UR-6n-T	41.0	0.02	11.7	0.22	46.8	0.14	0.04	0.42	100.4	87.7
UR-6new	41.1	0.02	11.8	0.17	46.9	0.12	0.04	0.41	100.5	87.7
UR-6new	40.9	0.03	11.7	0.17	46.6	0.12	0.04	0.41	100.0	87.7
UR-6new	40.6	0.03	11.8	0.13	46.8	0.12	0.04	0.43	99.9	87.7
UR-6n-T	41.4	0.03	11.7	0.22	46.7	0.13	0.04	0.38	100.7	87.7
UR-6n-T	41.2	0.04	11.7	0.14	46.8	0.13	0.04	0.40	100.5	87.7
UR-6n-T	41.5	0.02	11.7	0.13	46.6	0.13	n.d.	0.38	100.5	87.7
UR-6n-T	41.1	0.02	11.7	0.18	46.8	0.13	0.07	0.43	100.5	87.7
UR-6n-T	41.2	0.04	11.8	0.18	47.0	0.13	0.04	0.43	100.8	87.7
UR-6n-T	41.6	0.03	11.7	0.13	46.4	0.13	0.04	0.45	100.4	87.7
UR-6new	40.7	0.02	11.7	0.18	46.7	0.14	0.05	0.39	99.9	87.7
UR-6new	41.1	0.02	11.8	0.20	46.9	0.12	0.04	0.43	100.6	87.7
UR-6n-T	41.0	0.02	11.7	n.d.	46.7	0.14	n.d.	0.40	100.2	87.6
UR-6n-T	41.3	0.04	11.7	0.21	46.5	0.12	0.04	0.42	100.4	87.6
UR-6new	41.3	0.03	11.8	0.18	47.0	0.13	n.d.	0.43	100.8	87.6
UR-6n-T	41.3	0.03	11.8	0.15	46.8	0.14	n.d.	0.41	100.6	87.6
UR-6new	41.2	0.03	11.7	0.17	46.5	0.13	0.05	0.44	100.2	87.6
UR-6new	41.3	0.04	11.6	0.16	46.4	0.14	0.05	0.37	100.1	87.6
UR-6n-T	40.9	0.03	11.8	0.17	46.8	0.13	0.05	0.42	100.3	87.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-6ne	41.0	0.03	11.7	0.18	46.7	0.13	n.d.	0.39	100.1	87.6
UR-6n-1	41.3	0.02	11.7	0.17	46.5	0.13	n.d.	0.41	100.2	87.6
UR-6n-1	41.4	0.03	11.8	0.25	46.8	0.12	0.05	0.44	100.9	87.6
UR-6n-1	41.5	0.04	11.8	0.14	46.8	0.13	0.06	0.42	100.8	87.6
UR-6ne	41.2	0.02	11.8	0.21	46.7	0.13	0.04	0.44	100.5	87.6
UR-6n-1	41.4	0.03	11.8	0.15	47.0	0.12	0.05	0.42	101.0	87.6
UR-6n-1	41.4	0.03	11.8	0.15	46.9	0.12	0.08	0.43	100.9	87.6
UR-6n-1	41.0	0.03	11.7	0.21	46.6	0.13	0.04	0.42	100.2	87.6
UR-6n-1	41.3	0.03	11.7	0.19	46.6	0.13	n.d.	0.44	100.5	87.6
UR-6ne	41.4	0.03	11.8	0.14	46.8	0.13	0.03	0.39	100.7	87.6
UR-6ne	41.3	0.03	11.7	0.16	46.5	0.14	0.04	0.34	100.2	87.6
UR-6n-1	41.3	0.02	11.8	0.19	46.8	0.14	0.05	0.39	100.7	87.6
UR-6ne	40.6	0.02	11.8	0.19	46.9	0.12	0.04	0.44	100.1	87.6
UR-6n-1	41.6	0.03	11.8	n.d.	46.7	0.15	0.03	0.44	100.7	87.6
UR-6n-1	41.3	0.03	11.8	0.20	46.8	0.14	n.d.	0.44	100.7	87.6
UR-6n-1	41.4	0.03	11.8	0.15	46.8	0.14	0.04	0.44	100.9	87.6
UR-6n-1	41.5	0.03	11.8	0.16	46.9	0.13	0.03	0.39	101.0	87.6
UR-6ne	40.9	0.03	11.8	0.14	46.9	0.13	n.d.	0.40	100.3	87.6
UR-6n-1	41.3	0.02	11.8	0.17	46.6	0.13	n.d.	0.43	100.5	87.6
UR-6ne	41.2	0.03	11.8	0.20	46.6	0.15	n.d.	0.36	100.4	87.6
UR-6n-1	41.2	0.03	11.8	0.23	46.9	0.13	0.05	0.43	100.8	87.6
UR-6ne	41.1	0.03	11.8	0.16	46.7	0.13	n.d.	0.42	100.3	87.6
UR-6n-1	41.5	0.02	11.8	0.20	46.7	0.13	n.d.	0.43	100.8	87.6
UR-6ne	41.0	0.03	11.9	0.19	47.0	0.13	0.04	0.41	100.6	87.6
UR-6ne	40.7	0.03	11.8	0.18	46.6	0.13	0.04	0.45	99.9	87.6
UR-6n-1	41.5	0.03	11.8	0.10	46.8	0.13	0.05	0.43	100.9	87.6
UR-6ne	41.2	0.03	11.8	0.14	46.7	0.13	0.04	0.38	100.4	87.6
UR-6n-1	41.4	0.04	11.8	0.12	46.8	0.12	0.05	0.45	100.9	87.6
UR-6ne	40.4	0.03	11.9	0.17	46.9	0.12	n.d.	0.43	100.0	87.6
UR-6ne	41.4	0.03	11.8	0.18	46.6	0.14	0.03	0.37	100.5	87.6
UR-6n-1	41.3	0.04	11.7	n.d.	46.3	0.14	0.03	0.34	100.0	87.6
UR-6n-1	41.4	0.04	11.9	0.11	46.9	0.12	n.d.	0.47	101.0	87.6
UR-6n-1	40.9	0.02	11.8	0.10	46.6	0.13	n.d.	0.41	100.1	87.6
UR-6n-1	41.3	0.02	11.8	n.d.	46.7	0.13	n.d.	0.41	100.5	87.6
UR-6n-1	41.2	0.02	11.8	0.12	46.4	0.12	0.05	0.39	100.1	87.6
UR-6ne	41.5	0.03	11.8	0.17	46.7	0.14	0.03	0.41	100.8	87.6
UR-6n-1	41.4	0.03	11.8	0.21	46.7	0.13	0.05	0.38	100.7	87.6
UR-6n-1	41.1	0.03	11.8	0.14	46.6	0.15	0.04	0.41	100.3	87.5
UR-6n-1	41.5	0.03	11.9	0.15	46.8	0.13	0.05	0.43	100.9	87.5
UR-6ne	41.1	0.03	11.9	0.11	46.8	0.12	n.d.	0.40	100.4	87.5
UR-6n-1	41.2	0.03	11.9	0.19	46.8	0.13	0.05	0.41	100.7	87.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-6n-1	41.4	0.03	11.9	0.18	46.8	0.11	0.05	0.43	100.8	87.5
UR-6n-1	41.2	0.03	11.9	0.16	46.8	0.13	0.04	0.43	100.7	87.5
UR-6n-1	41.3	0.02	11.9	0.22	46.8	0.11	n.d.	0.40	100.8	87.5
UR-6n-1	40.8	0.02	11.9	0.12	46.7	0.14	0.05	0.42	100.2	87.5
UR-6n-1	41.5	0.02	11.9	0.15	46.9	0.13	0.05	0.39	101.0	87.5
UR-6ne	40.8	0.02	11.8	0.23	46.6	0.13	0.04	0.36	100.0	87.5
UR-6n-1	41.1	0.02	11.9	0.14	46.7	0.14	0.04	0.43	100.4	87.5
UR-6n-1	40.9	0.02	11.9	0.21	46.8	0.13	0.05	0.42	100.5	87.5
UR-6n-1	41.4	0.03	11.9	0.16	46.8	0.11	n.d.	0.41	100.9	87.5
UR-6ne	41.9	0.02	11.8	0.18	46.3	0.14	0.04	0.33	100.7	87.5
UR-6ne	41.3	0.03	11.9	0.14	46.8	0.14	0.04	0.44	100.8	87.5
UR-6n-1	41.4	0.02	12.0	0.18	46.8	0.13	0.06	0.40	101.0	87.5
UR-6ne	40.9	0.03	11.9	0.19	46.6	0.13	0.03	0.36	100.2	87.5
UR-6n-1	41.4	0.03	11.8	0.16	46.1	0.15	0.07	0.36	100.0	87.5
UR-6n-1	41.3	0.03	11.9	0.22	46.6	0.13	0.06	0.36	100.7	87.5
UR-6ne	40.4	0.03	11.9	0.19	46.5	0.14	0.05	0.35	99.5	87.5
UR-6n-1	41.5	0.02	11.9	0.13	46.7	0.14	0.04	0.39	100.9	87.5
UR-6n-1	41.2	0.04	12.0	0.16	46.9	0.12	0.05	0.40	100.9	87.5
UR-6n-1	41.0	0.03	11.9	0.14	46.7	0.13	n.d.	0.41	100.4	87.5
UR-6ne	40.5	0.02	11.9	0.17	46.4	0.14	0.19	0.37	99.7	87.4
UR-6ne	40.8	0.02	11.9	0.19	46.4	0.12	0.06	0.32	99.8	87.4
UR-6n-1	41.2	0.02	12.0	0.22	46.8	0.12	0.06	0.43	100.9	87.4
UR-6ne	41.4	0.01	12.0	0.21	46.7	0.13	n.d.	0.39	100.8	87.4
UR-6ne	41.6	0.02	11.9	0.22	46.4	0.14	0.03	0.36	100.6	87.4
UR-6n-1	41.3	0.02	12.0	0.13	46.6	0.13	0.05	0.38	100.5	87.4
UR-6n-1	41.4	0.03	11.8	0.16	46.0	0.15	0.05	0.38	100.0	87.4
UR-6ne	40.8	0.02	11.9	0.17	46.5	0.13	0.04	0.39	99.9	87.4
UR-6n-1	40.9	0.02	12.0	0.14	46.6	0.14	0.05	0.38	100.2	87.4
UR-6ne	41.3	0.03	11.9	0.20	46.3	0.15	0.04	0.38	100.3	87.4
UR-6n-1	40.9	0.02	12.0	0.17	46.6	0.12	0.03	0.42	100.2	87.4
UR-6n-1	40.9	0.02	12.0	0.15	46.7	0.13	n.d.	0.41	100.3	87.4
UR-6n-1	41.2	0.03	12.0	0.19	46.8	0.12	n.d.	0.39	100.7	87.4
UR-6ne	40.9	0.02	12.0	0.20	46.6	0.13	n.d.	0.35	100.2	87.4
UR-6n-1	41.2	0.03	12.0	0.23	46.7	0.12	0.04	0.43	100.8	87.4
UR-6ne	41.4	0.02	12.0	0.23	46.6	0.12	0.04	0.34	100.8	87.4
UR-6ne	41.2	0.02	12.0	0.19	46.5	0.13	0.03	0.37	100.4	87.4
UR-6ne	41.0	0.03	11.9	0.16	46.3	0.15	0.06	0.33	100.0	87.4
UR-6n-1	40.8	0.02	12.0	0.23	46.4	0.14	n.d.	0.36	99.9	87.4
UR-6n-1	41.0	0.02	12.0	0.13	46.6	0.14	0.04	0.41	100.3	87.4
UR-6ne	40.4	0.02	12.0	0.18	46.5	0.13	n.d.	0.35	99.5	87.4
UR-6n-1	41.1	0.02	11.9	0.18	46.2	0.14	0.03	0.40	100.1	87.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-6n-T	41.0	0.02	12.1	0.19	46.7	0.13	n.d.	0.38	100.5	87.3
UR-6n-T	41.0	0.02	12.0	0.21	46.5	0.14	n.d.	0.36	100.2	87.3
UR-6nev	40.4	0.03	12.0	0.27	46.5	0.14	n.d.	0.37	99.7	87.3
UR-6nev	40.9	0.02	12.1	0.18	46.7	0.14	0.07	0.36	100.4	87.3
UR-6nev	41.2	0.03	12.0	0.15	46.6	0.13	0.04	0.40	100.5	87.3
UR-6n-T	41.1	0.03	12.0	0.22	46.3	0.13	0.03	0.35	100.1	87.3
UR-6nev	41.3	0.02	12.0	0.22	46.3	0.15	n.d.	0.34	100.4	87.3
UR-6n-T	41.4	0.03	11.9	0.13	46.0	0.15	0.03	0.39	100.1	87.3
UR-6n-T	41.4	0.03	12.1	0.14	46.7	0.14	0.03	0.39	100.9	87.3
UR-6nev	40.9	0.02	12.0	0.17	46.5	0.14	0.04	0.35	100.2	87.3
UR-6n-T	41.3	0.03	12.1	0.15	46.8	0.13	n.d.	0.45	101.0	87.3
UR-6n-T	40.9	0.03	12.1	0.16	46.8	0.12	n.d.	0.44	100.5	87.3
UR-6nev	41.6	0.03	11.9	0.19	45.9	0.15	0.04	0.35	100.2	87.3
UR-6n-T	41.3	0.03	12.1	0.15	46.8	0.14	n.d.	0.40	101.0	87.3
UR-6n-T	41.4	0.03	12.1	0.18	46.5	0.15	n.d.	0.39	100.7	87.3
UR-6n-T	40.9	0.01	12.1	0.16	46.6	0.14	0.04	0.38	100.4	87.3
UR-6nev	40.8	0.03	12.2	0.20	47.0	0.14	0.03	0.32	100.8	87.3
UR-6n-T	41.0	0.03	12.0	0.20	46.3	0.13	0.04	0.36	100.1	87.3
UR-6nev	41.9	0.02	12.1	0.18	46.3	0.15	n.d.	0.39	101.0	87.3
UR-6n-T	41.2	0.01	12.1	0.21	46.6	0.14	n.d.	0.36	100.7	87.3
UR-6nev	40.8	0.03	12.1	0.17	46.5	0.13	n.d.	0.36	100.2	87.2
UR-6nev	40.2	0.03	12.1	0.18	46.4	0.13	0.04	0.33	99.5	87.2
UR-6nev	40.7	0.03	12.2	0.17	46.5	0.13	n.d.	0.35	100.0	87.2
UR-6n-T	41.4	0.02	12.1	0.17	46.1	0.16	n.d.	0.39	100.4	87.2
UR-6nev	40.7	0.02	12.2	0.14	46.4	0.14	0.05	0.38	100.1	87.2
UR-6nev	40.8	0.02	12.2	0.18	46.3	0.14	n.d.	0.37	100.0	87.1
UR-6nev	40.7	0.02	12.1	0.18	46.1	0.14	0.04	0.29	99.6	87.1
UR-6nev	41.3	0.02	12.3	0.19	46.6	0.13	0.06	0.33	100.9	87.1
UR-6nev	41.3	0.03	12.3	0.18	46.4	0.15	n.d.	0.34	100.6	87.1
UR-6n-T	40.9	0.02	12.3	0.22	46.4	0.13	0.04	0.36	100.4	87.1
UR-6nev	41.1	0.02	12.3	0.25	46.4	0.13	n.d.	0.33	100.6	87.0
UR-6n-T	41.1	0.02	12.3	0.19	46.4	0.14	0.04	0.34	100.6	87.0
UR-6nev	41.1	0.02	12.4	0.19	46.5	0.13	0.04	0.34	100.6	87.0
UR-6nev	41.3	0.02	12.4	0.17	46.2	0.14	0.05	0.33	100.7	86.9
UR-6nev	41.0	0.03	12.4	0.18	46.4	0.14	0.03	0.33	100.6	86.9
UR-6nev	40.5	0.02	12.4	0.16	46.3	0.14	0.05	0.33	100.0	86.9
UR-6nev	40.8	0.03	12.5	0.17	46.6	0.15	0.23	0.37	100.9	86.9
UR-6nev	40.4	0.02	12.4	0.17	46.4	0.14	0.04	0.26	99.8	86.9
UR-6n-T	41.2	0.03	12.4	0.13	46.2	0.14	0.05	0.37	100.5	86.9
UR-6nev	40.4	0.02	12.4	0.21	46.3	0.13	0.04	0.33	99.8	86.9
UR-6nev	40.9	0.03	12.4	0.18	46.3	0.13	0.03	0.34	100.3	86.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-6ne	40.7	0.02	12.4	0.19	46.0	0.14	0.04	0.33	99.9	86.9
UR-6ne	41.3	0.02	12.4	0.21	46.1	0.14	0.10	0.33	100.6	86.9
UR-6ne	41.0	0.02	12.4	0.16	46.1	0.14	n.d.	0.32	100.2	86.9
UR-6n-1	40.8	0.02	12.5	0.19	46.1	0.13	n.d.	0.29	100.0	86.8
UR-6ne	40.8	0.03	12.5	0.14	46.0	0.13	0.04	0.33	99.8	86.8
UR-6ne	41.0	0.02	12.5	0.16	46.1	0.13	0.04	0.29	100.2	86.8
UR-6ne	40.7	0.03	12.5	0.22	46.0	0.14	0.04	0.36	100.0	86.8
UR-6ne	41.1	0.03	12.5	0.21	45.9	0.15	n.d.	0.30	100.2	86.8
UR-6ne	40.9	0.02	12.5	0.21	46.0	0.15	n.d.	0.28	100.1	86.7
UR-6ne	40.8	0.02	12.7	0.15	46.5	0.15	0.07	0.35	100.7	86.7
UR-6ne	40.2	0.02	12.6	0.18	46.3	0.14	0.07	0.29	99.8	86.7
UR-6ne	41.0	0.03	12.6	0.21	46.1	0.15	0.04	0.27	100.4	86.7
UR-6ne	41.2	0.02	12.6	0.25	46.1	0.14	n.d.	0.30	100.7	86.7
UR-6ne	41.1	0.03	12.7	0.18	46.3	0.15	n.d.	0.34	100.7	86.7
UR-6ne	40.9	0.01	12.6	0.17	46.0	0.14	n.d.	0.28	100.1	86.7
UR-6ne	41.2	0.02	12.6	0.22	46.0	0.14	0.04	0.28	100.6	86.7
UR-6ne	41.1	0.02	12.7	0.16	46.2	0.14	n.d.	0.33	100.6	86.7
UR-6n-1	41.3	0.03	12.6	0.17	45.6	0.16	0.04	0.38	100.2	86.6
UR-6ne	41.1	0.03	12.7	0.21	46.0	0.14	n.d.	0.33	100.5	86.6
UR-6ne	40.8	0.03	12.7	0.17	45.8	0.13	0.03	0.27	99.9	86.6
UR-6ne	40.1	0.03	12.7	0.23	46.1	0.14	n.d.	0.31	99.6	86.6
UR-6ne	41.1	0.03	12.9	0.23	46.3	0.14	0.03	0.28	101.0	86.5
UR-6ne	41.0	0.24	12.7	0.19	45.6	0.17	0.04	0.27	100.1	86.5
UR-6ne	41.1	0.01	12.9	0.20	46.2	0.14	n.d.	0.29	100.8	86.5
UR-6ne	40.9	0.02	12.7	0.24	45.5	0.13	0.05	0.26	99.8	86.5
UR-6ne	41.1	0.02	12.8	0.16	45.8	0.13	n.d.	0.30	100.3	86.5
UR-6ne	40.5	0.02	12.8	0.17	45.8	0.16	0.03	0.29	99.8	86.4
UR-6ne	40.5	0.03	12.8	0.19	45.8	0.13	0.27	0.36	100.1	86.4
UR-6ne	41.0	0.02	12.9	0.18	45.9	0.14	0.05	0.26	100.4	86.4
UR-6ne	41.0	0.03	12.8	0.17	45.6	0.16	n.d.	0.26	100.1	86.4
UR-6ne	40.9	0.03	12.8	0.21	45.6	0.15	n.d.	0.27	100.0	86.4
UR-6ne	40.9	0.02	13.0	0.11	45.9	0.14	0.05	0.33	100.5	86.3
UR-6ne	40.6	0.02	12.9	0.18	45.7	0.15	n.d.	0.26	99.8	86.3
UR-6ne	40.7	0.03	13.0	0.20	45.8	0.14	n.d.	0.22	100.1	86.3
UR-6ne	41.3	0.03	12.9	0.22	45.6	0.15	0.06	0.22	100.5	86.3
UR-6ne	40.3	0.02	12.9	0.16	45.5	0.15	n.d.	0.25	99.4	86.3
UR-6ne	40.4	0.02	12.9	0.19	45.5	0.14	0.05	0.25	99.5	86.2
UR-6ne	41.1	0.02	13.0	0.17	45.6	0.14	n.d.	0.26	100.2	86.2
UR-6ne	40.4	0.02	12.9	0.19	45.4	0.16	n.d.	0.27	99.3	86.2
UR-6ne	41.0	0.02	13.1	0.19	46.0	0.14	n.d.	0.27	100.7	86.2
UR-6n-1	41.1	0.03	13.1	0.20	45.8	0.13	0.05	0.30	100.7	86.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-6ne	40.4	0.02	13.0	0.14	45.5	0.15	n.d.	0.26	99.5	86.2
UR-6n-T	41.1	0.03	12.9	0.20	45.1	0.16	0.03	0.36	99.8	86.2
UR-6ne	41.1	0.03	13.0	0.18	45.6	0.15	0.04	0.25	100.4	86.2
UR-6ne	40.3	0.03	13.1	0.25	45.7	0.15	n.d.	0.25	99.8	86.2
UR-6ne	41.0	0.03	13.1	0.21	45.6	0.15	n.d.	0.28	100.4	86.1
UR-6ne	40.4	0.02	13.1	0.25	45.5	0.15	n.d.	0.27	99.7	86.1
UR-6ne	40.5	0.02	13.1	0.15	45.6	0.14	n.d.	0.25	99.8	86.1
UR-6n-T	40.8	0.02	13.2	0.24	45.8	0.13	n.d.	0.25	100.4	86.1
UR-6ne	41.1	0.03	13.2	0.19	45.9	0.14	0.03	0.29	100.9	86.1
UR-6ne	41.1	0.02	13.2	0.15	45.9	0.14	0.04	0.31	100.8	86.1
UR-6ne	40.5	0.02	13.1	0.17	45.2	0.14	n.d.	0.26	99.5	86.0
UR-6ne	41.2	0.03	13.2	0.18	45.7	0.15	0.06	0.24	100.7	86.0
UR-6ne	40.2	0.02	13.2	0.21	45.5	0.14	0.13	0.24	99.6	86.0
UR-6ne	40.6	0.02	13.2	0.20	45.5	0.16	n.d.	0.23	100.0	86.0
UR-6ne	40.9	0.02	13.2	0.15	45.5	0.16	n.d.	0.23	100.3	86.0
UR-6ne	40.7	0.02	13.2	0.18	45.3	0.18	n.d.	0.25	99.8	86.0
UR-6ne	41.0	0.02	13.3	0.19	45.5	0.16	n.d.	0.20	100.3	85.9
UR-6ne	40.6	0.02	13.3	0.19	45.6	0.15	0.04	0.24	100.1	85.9
UR-6ne	41.1	0.02	13.4	0.18	45.7	0.15	n.d.	0.21	100.7	85.9
UR-6ne	40.4	0.02	13.3	0.12	45.4	0.17	0.18	0.25	99.9	85.9
UR-6ne	40.6	0.02	13.3	0.14	45.5	0.15	0.06	0.29	100.0	85.9
UR-6ne	40.8	0.03	13.4	0.12	45.8	0.15	n.d.	0.23	100.6	85.9
UR-6ne	40.6	0.02	13.3	0.22	45.5	0.15	0.03	0.23	100.1	85.9
UR-6ne	41.0	0.02	13.3	0.13	45.3	0.16	0.04	0.24	100.1	85.9
UR-6ne	40.9	0.02	13.3	0.23	45.3	0.15	0.03	0.24	100.2	85.8
UR-6ne	39.9	0.02	13.4	0.22	45.3	0.15	n.d.	0.26	99.2	85.8
UR-6ne	40.9	0.02	13.5	0.24	45.6	0.14	0.03	0.25	100.7	85.8
UR-6ne	40.8	0.03	13.5	0.22	45.6	0.14	n.d.	0.25	100.6	85.8
UR-6ne	41.0	0.03	13.4	0.15	45.4	0.15	0.03	0.22	100.4	85.8
UR-6ne	40.4	0.02	13.4	0.16	45.2	0.16	n.d.	0.21	99.5	85.8
UR-6ne	40.9	0.02	13.4	0.24	45.3	0.15	n.d.	0.20	100.2	85.8
UR-6ne	41.0	0.02	13.4	0.19	45.2	0.15	n.d.	0.20	100.1	85.7
UR-6ne	40.5	0.02	13.5	0.25	45.4	0.15	n.d.	0.24	100.0	85.7
UR-6ne	40.1	0.02	13.5	0.18	45.4	0.16	n.d.	0.21	99.5	85.7
UR-6ne	40.8	0.02	13.6	0.20	45.6	0.15	n.d.	0.27	100.6	85.6
UR-6ne	40.9	0.02	13.5	0.24	45.0	0.16	n.d.	0.20	100.0	85.6
UR-6ne	41.0	0.02	13.5	0.21	45.1	0.17	0.03	0.22	100.2	85.6
UR-6ne	40.8	0.02	13.7	0.19	45.4	0.16	0.04	0.17	100.5	85.6
UR-6ne	41.0	0.03	13.6	0.22	45.3	0.14	n.d.	0.27	100.7	85.6
UR-6ne	40.4	0.02	13.6	0.22	45.3	0.15	n.d.	0.24	100.0	85.6
UR-6ne	40.9	0.05	13.4	0.22	44.6	0.16	n.d.	0.22	99.6	85.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-6ne	40.8	0.02	13.6	0.24	44.9	0.18	n.d.	0.22	99.9	85.5
UR-6ne	40.6	0.02	13.7	0.20	45.3	0.17	n.d.	0.21	100.3	85.5
UR-6ne	40.6	0.03	13.7	0.20	45.5	0.16	0.04	0.23	100.5	85.5
UR-6ne	40.3	0.02	13.6	0.25	45.1	0.17	0.03	0.20	99.7	85.5
UR-6ne	40.9	0.02	13.7	0.19	45.3	0.15	n.d.	0.22	100.4	85.5
UR-6ne	40.6	0.02	13.6	0.24	45.0	0.15	0.03	0.20	99.9	85.5
UR-6ne	40.3	0.02	13.8	0.20	45.5	0.15	n.d.	0.25	100.2	85.5
UR-6ne	40.7	0.02	13.8	0.22	45.4	0.15	0.04	0.17	100.5	85.4
UR-6ne	40.7	0.02	13.8	0.18	45.3	0.17	0.03	0.25	100.4	85.4
UR-6ne	40.7	0.02	13.8	0.23	45.2	0.16	0.03	0.23	100.4	85.4
UR-6ne	41.0	0.02	13.7	0.18	45.0	0.17	0.03	0.22	100.3	85.4
UR-6ne	40.7	0.02	13.8	0.18	45.1	0.17	0.05	0.23	100.2	85.3
UR-6ne	40.6	0.02	13.7	0.13	44.6	0.18	n.d.	0.19	99.6	85.3
UR-6ne	40.8	0.03	13.8	0.17	44.8	0.16	0.03	0.19	100.1	85.2
UR-6n-T	41.0	0.03	13.9	0.14	44.9	0.16	n.d.	0.33	100.4	85.2
UR-6ne	40.1	0.01	13.9	0.17	45.0	0.15	n.d.	0.23	99.6	85.2
UR-6ne	39.9	0.02	13.9	0.26	44.7	0.18	0.04	0.20	99.2	85.2
UR-6ne	40.9	0.03	14.0	0.26	44.9	0.17	n.d.	0.23	100.5	85.1
UR-6ne	41.0	0.02	14.2	0.19	45.0	0.15	n.d.	0.23	100.7	85.0
UR-6ne	40.9	0.02	14.1	0.23	44.8	0.18	0.03	0.21	100.4	85.0
UR-6ne	40.7	0.02	14.1	0.24	44.5	0.17	n.d.	0.19	99.9	84.9
UR-6ne	40.7	0.03	14.3	0.21	44.7	0.16	n.d.	0.17	100.3	84.8
UR-6ne	40.1	0.02	14.4	0.22	44.6	0.17	0.09	0.21	99.8	84.7
UR-6ne	40.9	0.01	14.4	0.23	44.5	0.15	n.d.	0.21	100.4	84.6
UR-6ne	40.2	0.03	14.7	0.23	44.2	0.20	0.04	0.17	99.7	84.3
UR-6ne	40.7	0.03	14.8	0.23	44.4	0.17	n.d.	0.19	100.6	84.3
UR-6ne	40.4	0.03	14.8	0.25	44.3	0.17	0.03	0.22	100.2	84.2
UR-6ne	40.1	0.01	14.8	0.27	44.5	0.18	0.03	0.19	100.1	84.2
UR-6ne	40.4	0.02	14.8	0.23	44.1	0.16	n.d.	0.22	100.0	84.2
UR-6ne	40.3	0.02	14.9	0.23	44.2	0.15	0.43	0.21	100.5	84.1
UR-6ne	40.3	0.02	15.0	0.23	44.4	0.18	n.d.	0.17	100.3	84.1
UR-6ne	40.2	0.03	15.1	0.23	43.9	0.19	n.d.	0.16	99.8	83.8
UR-6ne	40.4	0.02	15.4	0.26	44.1	0.18	n.d.	0.17	100.6	83.6
UR-6ne	40.2	0.02	15.4	0.16	43.8	0.18	n.d.	0.19	100.0	83.5
UR-6ne	40.1	0.02	15.5	0.14	44.0	0.18	n.d.	0.15	100.1	83.5
UR-6ne	40.4	0.03	15.5	0.31	43.7	0.18	n.d.	0.24	100.4	83.4
UR-6ne	40.7	0.02	15.7	0.23	43.8	0.18	n.d.	0.20	100.8	83.2
UR-6ne	40.5	0.02	15.8	0.32	43.5	0.17	n.d.	0.17	100.6	83.1
UR-6ne	40.7	0.03	15.9	0.28	43.4	0.21	0.03	0.13	100.6	83.0
UR-6ne	40.3	0.02	16.0	0.23	43.2	0.17	0.04	0.15	100.2	82.8
UR-6ne	40.5	0.04	16.1	0.20	43.2	0.20	n.d.	0.13	100.4	82.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-6nev	39.7	0.05	16.2	0.24	42.9	0.22	0.04	0.13	99.6	82.5
UR-6nev	40.4	0.02	16.3	0.26	43.1	0.18	n.d.	0.15	100.5	82.5
UR-6nev	40.4	0.02	16.1	0.20	42.3	0.20	n.d.	0.30	99.4	82.4
UR-6nev	40.2	0.09	16.3	0.20	42.3	0.22	n.d.	0.24	99.6	82.2
UR-6nev	40.1	0.02	16.7	0.24	43.0	0.24	n.d.	0.13	100.5	82.1
UR-6nev	39.9	0.03	16.5	0.34	42.4	0.22	0.05	0.14	99.6	82.0
UR-6nev	40.4	0.02	16.8	0.26	42.7	0.16	n.d.	0.16	100.6	82.0
UR-6nev	40.5	0.03	16.9	0.31	42.5	0.22	n.d.	0.08	100.5	81.8
UR-6nev	40.4	0.01	17.0	0.26	42.7	0.20	n.d.	0.15	100.8	81.8
UR-6nev	39.7	0.02	17.2	0.24	42.3	0.17	n.d.	0.20	99.8	81.4
UR-6nev	40.0	0.02	17.3	0.23	42.3	0.17	n.d.	0.15	100.3	81.3
UR-6nev	40.0	0.02	17.4	0.33	42.2	0.18	n.d.	0.13	100.3	81.2
UR-6nev	39.6	0.03	17.3	0.28	41.9	0.19	0.05	0.10	99.5	81.1
UR-6nev	40.5	0.03	17.3	0.25	41.6	0.23	n.d.	0.05	100.0	81.1
UR-6nev	39.6	0.02	17.6	0.27	41.8	0.18	n.d.	0.17	99.6	80.9
UR-6nev	40.0	0.02	17.8	0.29	41.8	0.19	0.04	0.12	100.2	80.7
UR-6nev	39.6	0.03	17.9	0.31	41.3	0.18	0.03	0.20	99.5	80.4
UR-6nev	39.6	0.02	18.2	0.25	41.4	0.16	n.d.	0.12	99.7	80.3
UR-6nev	39.2	0.04	18.2	0.33	41.1	0.26	n.d.	0.11	99.4	80.1
UR-6nev	39.7	0.03	18.7	0.28	40.8	0.24	n.d.	0.09	99.8	79.6
UR-6nev	39.4	0.03	18.7	0.28	40.8	0.22	n.d.	0.14	99.5	79.6
UR-6nev	39.6	0.02	18.9	0.31	41.1	0.20	n.d.	0.10	100.2	79.5
UR-6nev	39.7	0.04	18.9	0.31	40.9	0.26	0.05	0.08	100.3	79.5
UR-6nev	39.1	0.03	19.3	0.31	39.9	0.28	0.03	0.07	99.1	78.6
UR-6nev	39.7	0.03	19.7	0.35	40.4	0.23	0.04	n.d.	100.6	78.5
UR-6nev	39.6	0.03	19.6	0.34	40.1	0.22	n.d.	0.04	100.0	78.5
UR-6nev	39.2	0.02	20.6	0.32	39.3	0.21	n.d.	0.12	99.8	77.2
UR-6nev	39.3	0.04	20.8	0.29	39.1	0.25	0.03	0.09	99.9	77.0
UR-6nev	39.4	0.03	21.2	0.39	38.8	0.23	n.d.	0.11	100.2	76.6
UR-6nev	39.2	0.06	21.9	0.37	38.8	0.23	n.d.	0.12	100.8	76.0
UR-6nev	38.9	0.03	22.5	0.45	37.9	0.28	0.04	0.07	100.1	75.0
UR-6nev	39.0	0.03	22.5	0.38	37.8	0.21	n.d.	0.12	100.1	75.0
UR-6nev	38.7	0.03	23.4	0.44	37.4	0.29	n.d.	0.05	100.3	74.0
UR-36_l	40.5	0.06	11.8	0.22	47.0	0.12	n.d.	0.39	100.0	87.7
UR-36_l	39.1	0.30	11.9	0.15	47.3	0.12	n.d.	0.42	99.4	87.6
UR-36_l	40.5	0.07	11.8	0.13	46.6	0.12	n.d.	0.47	99.8	87.5
UR-36_l	40.3	0.04	11.8	0.17	46.5	0.11	0.04	0.47	99.5	87.5
UR-36_l	40.4	0.03	11.8	0.18	46.4	0.13	0.04	0.48	99.5	87.5
UR-36_l	41.1	0.06	12.0	0.19	46.7	0.12	0.05	0.48	100.7	87.4
UR-36_l	41.1	0.04	11.9	0.13	46.3	0.13	0.04	0.45	100.1	87.4
UR-36_l	40.9	0.04	11.9	0.22	46.1	0.12	0.06	0.43	99.7	87.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-36_	40.4	0.04	11.9	0.17	46.3	0.13	0.06	0.43	99.6	87.4
UR-36_	40.8	0.02	11.9	0.16	46.3	0.13	0.05	0.46	99.8	87.4
UR-36_	40.5	0.05	11.9	0.20	46.2	0.14	0.07	0.45	99.5	87.4
UR-36_	40.5	0.19	11.9	0.15	46.2	0.13	0.05	0.46	99.5	87.4
UR-36-I	41.5	0.03	12.0	0.19	46.6	0.12	0.09	0.43	101.0	87.4
UR-36_	40.8	0.03	11.9	n.d.	46.1	0.13	0.04	0.44	99.5	87.3
UR-36-I	40.6	0.19	11.9	0.27	45.9	0.12	n.d.	0.43	99.4	87.3
UR-36_	40.7	0.03	12.0	0.20	46.6	0.12	0.03	0.46	100.1	87.3
UR-36-I	41.4	0.03	12.0	n.d.	46.5	0.13	0.07	0.50	100.7	87.3
UR-36-I	41.2	0.04	12.0	0.19	46.6	0.12	n.d.	0.46	100.6	87.3
UR-36-I	41.4	0.06	12.0	0.15	46.3	0.16	n.d.	0.47	100.5	87.3
UR-36_	40.7	0.03	12.0	0.15	46.4	0.13	0.05	0.49	99.9	87.3
UR-36-I	41.2	0.31	12.0	0.16	46.3	0.14	n.d.	0.47	100.5	87.3
UR-36_	40.6	0.05	12.0	0.24	46.2	0.14	0.04	0.44	99.7	87.3
UR-36-I	41.7	0.03	12.0	0.19	46.4	0.15	n.d.	0.42	101.0	87.3
UR-36-I	41.5	0.10	12.0	0.12	46.3	0.13	0.12	0.44	100.7	87.3
UR-36_	41.0	0.04	12.1	0.16	46.4	0.14	0.04	0.45	100.2	87.3
UR-36_	40.6	0.04	12.1	0.13	46.5	0.14	n.d.	0.46	100.0	87.3
UR-36-I	41.6	0.04	12.1	0.16	46.5	0.15	0.07	0.45	101.0	87.3
UR-36-I	41.5	0.05	12.0	0.24	46.3	0.12	0.06	0.47	100.7	87.3
UR-36-I	41.6	0.07	12.1	0.18	46.3	0.13	0.04	0.43	100.8	87.3
UR-36_	40.4	0.05	12.0	n.d.	46.1	0.14	n.d.	0.50	99.4	87.2
UR-36-I	41.1	0.14	11.9	0.16	45.8	0.15	n.d.	0.49	99.8	87.2
UR-36-I	41.0	0.09	12.0	0.17	46.0	0.19	0.12	0.44	100.0	87.2
UR-36_	40.9	0.04	12.1	0.13	46.3	0.12	0.05	0.41	100.0	87.2
UR-36_	40.8	0.04	12.1	0.11	46.2	0.13	0.04	0.45	99.8	87.2
UR-36_	40.9	0.03	12.1	n.d.	46.0	0.13	0.05	0.45	99.7	87.2
UR-36-I	41.1	0.04	12.1	0.16	46.2	0.16	0.06	0.45	100.3	87.2
UR-36-I	41.4	0.06	12.1	0.12	46.3	0.15	n.d.	0.48	100.7	87.2
UR-36_	40.6	0.03	12.2	n.d.	46.3	0.12	0.08	0.45	99.9	87.2
UR-36_	40.4	0.03	12.0	0.16	45.9	0.13	n.d.	0.41	99.1	87.2
UR-36_	40.8	0.03	12.2	0.17	46.4	0.14	0.04	0.50	100.2	87.2
UR-36_	41.0	0.04	12.2	0.18	46.3	0.12	0.04	0.45	100.4	87.2
UR-36_	40.6	0.03	12.1	0.17	46.1	0.13	0.05	0.42	99.7	87.1
UR-36_	40.5	0.06	12.1	0.20	46.1	0.15	0.05	0.49	99.7	87.1
UR-36-I	41.5	0.03	12.2	0.21	46.3	0.13	0.06	0.40	100.8	87.1
UR-36_	40.5	0.17	12.1	0.16	45.8	0.13	0.04	0.45	99.4	87.1
UR-36_	40.2	0.05	12.3	0.18	46.6	0.14	n.d.	0.39	99.8	87.1
UR-36_	40.4	0.05	12.2	0.20	46.2	0.13	0.04	0.45	99.7	87.1
UR-36_	40.7	0.03	12.2	0.19	46.2	0.13	0.05	0.42	100.0	87.1
UR-36-I	41.3	0.05	12.1	0.22	45.9	0.14	0.06	0.43	100.2	87.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-36_	40.4	0.04	12.2	0.14	46.0	0.13	n.d.	0.45	99.4	87.1
UR-36-N	41.0	0.04	12.2	0.14	46.2	0.13	n.d.	0.41	100.2	87.1
UR-36_	40.6	0.02	12.3	0.19	46.3	0.12	n.d.	0.42	100.0	87.1
UR-36_	40.7	0.03	12.3	n.d.	46.3	0.13	0.04	0.46	100.0	87.1
UR-36-N	41.2	0.04	12.2	0.16	46.1	0.13	0.05	0.43	100.4	87.0
UR-36-N	41.5	0.05	12.3	0.18	46.2	0.13	n.d.	0.46	100.8	87.0
UR-36-N	40.6	0.04	12.3	0.19	46.1	0.14	n.d.	0.39	99.8	87.0
UR-36_	40.5	0.03	12.3	0.15	46.2	0.13	n.d.	0.45	99.8	87.0
UR-36_	40.6	0.03	12.3	0.19	46.0	0.14	0.06	0.41	99.8	87.0
UR-36_	40.8	0.05	12.4	0.21	46.5	0.13	0.05	0.46	100.6	87.0
UR-36_	40.5	0.05	12.3	0.15	46.2	0.13	n.d.	0.43	99.8	87.0
UR-36_	40.5	0.04	12.4	0.20	46.3	0.12	n.d.	0.45	100.0	87.0
UR-36_	40.7	0.05	12.3	0.13	46.1	0.11	0.03	0.47	99.9	87.0
UR-36_	40.6	0.03	12.4	0.16	46.2	0.14	0.10	0.42	100.0	86.9
UR-36-N	41.6	0.05	12.4	0.17	46.2	0.14	0.05	0.41	101.0	86.9
UR-36_	40.7	0.02	12.4	0.12	46.2	0.13	n.d.	0.40	100.0	86.9
UR-36-N	41.4	0.04	12.5	0.20	46.4	0.12	n.d.	0.35	100.9	86.9
UR-36-N	41.4	0.05	12.4	0.22	46.1	0.14	0.04	0.42	100.7	86.9
UR-36_	40.7	0.03	12.4	0.19	46.3	0.13	n.d.	0.44	100.2	86.9
UR-36_	40.3	0.02	12.4	0.14	46.1	0.14	0.03	0.39	99.5	86.9
UR-36_	40.4	0.03	12.4	0.14	46.0	0.13	0.06	0.42	99.6	86.9
UR-36-N	41.6	0.02	12.4	0.22	46.1	0.15	n.d.	0.41	101.0	86.9
UR-36_	40.5	0.03	12.4	0.22	46.0	0.14	0.04	0.40	99.7	86.9
UR-36-N	41.6	0.03	12.4	0.16	46.1	0.16	0.10	0.40	100.9	86.9
UR-36_	40.4	0.04	12.3	0.14	45.6	0.13	n.d.	0.41	99.1	86.8
UR-36_	40.3	0.46	12.3	0.17	45.5	0.14	n.d.	0.36	99.3	86.8
UR-36_	40.7	0.02	12.4	0.14	46.0	0.13	0.04	0.39	99.8	86.8
UR-36-N	41.3	0.12	12.4	0.15	46.0	0.15	n.d.	0.40	100.6	86.8
UR-36-N	41.0	0.03	12.5	0.26	46.2	0.15	n.d.	0.35	100.6	86.8
UR-36_	40.7	0.03	12.5	n.d.	46.0	0.14	0.21	0.43	100.0	86.8
UR-36_	40.6	0.03	12.5	0.12	46.1	0.14	n.d.	0.41	99.9	86.8
UR-36_	40.4	0.09	12.4	0.24	45.7	0.13	n.d.	0.46	99.5	86.8
UR-36_	40.8	0.04	12.6	0.16	46.1	0.14	0.04	0.35	100.2	86.7
UR-36_	40.5	0.04	12.5	0.12	45.8	0.13	0.03	0.41	99.5	86.7
UR-36-N	40.6	0.58	12.3	0.14	45.2	0.14	n.d.	0.39	99.4	86.7
UR-36_	40.3	0.37	12.6	0.24	46.0	0.18	0.57	0.42	100.6	86.7
UR-36-N	40.8	0.22	12.4	0.22	45.5	0.13	0.06	0.40	99.8	86.7
UR-36_	40.5	0.03	12.7	0.15	46.2	0.13	0.03	0.39	100.2	86.7
UR-36_	40.7	0.03	12.6	n.d.	45.9	0.15	0.04	0.36	99.8	86.7
UR-36-N	41.2	0.10	12.6	0.18	46.2	0.18	0.07	0.37	100.9	86.7
UR-36-N	41.2	0.03	12.7	0.18	46.3	0.13	n.d.	0.39	100.9	86.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-36-I	41.4	0.02	12.6	0.10	46.0	0.12	0.04	0.41	100.6	86.7
UR-36-I	41.1	0.05	12.6	0.18	45.8	0.13	n.d.	0.35	100.2	86.6
UR-36_I	40.6	0.02	12.7	0.21	46.1	0.19	0.09	0.38	100.3	86.6
UR-36_I	40.2	0.03	12.6	0.22	45.8	0.13	0.04	0.36	99.4	86.6
UR-36_I	40.6	0.02	12.7	0.15	46.2	0.14	n.d.	0.40	100.3	86.6
UR-36-I	41.3	0.02	12.7	0.22	46.0	0.14	0.05	0.37	100.7	86.6
UR-36-I	41.4	0.05	12.6	0.16	45.9	0.13	0.06	0.39	100.7	86.6
UR-36-I	40.8	0.10	12.7	0.20	46.0	0.12	0.05	0.38	100.3	86.6
UR-36_I	40.6	0.03	12.7	0.19	46.0	0.14	0.05	0.33	100.1	86.6
UR-36-I	41.3	0.02	12.7	0.14	46.0	0.13	n.d.	0.37	100.6	86.6
UR-36_I	40.2	0.03	12.7	0.24	46.0	0.13	n.d.	0.38	99.7	86.5
UR-36-I	41.0	0.03	12.7	0.22	46.0	0.15	n.d.	0.43	100.6	86.5
UR-36-I	41.2	0.03	12.8	0.21	46.0	0.13	0.05	0.38	100.7	86.5
UR-36-I	41.3	0.03	12.8	0.18	46.1	0.13	n.d.	0.43	101.0	86.5
UR-36_I	40.6	0.03	12.8	0.19	45.8	0.13	n.d.	0.36	100.0	86.5
UR-36-I	41.0	0.08	12.8	0.21	45.9	0.15	0.08	0.37	100.6	86.5
UR-36-I	40.9	0.03	12.8	0.17	45.8	0.15	0.04	0.40	100.4	86.5
UR-36_I	40.5	0.04	12.8	0.18	46.0	0.15	0.04	0.40	100.1	86.5
UR-36-I	41.2	0.02	12.8	0.18	45.7	0.13	n.d.	0.37	100.4	86.4
UR-36_I	40.4	0.02	12.9	0.14	46.1	0.12	0.03	0.36	100.1	86.4
UR-36_I	40.6	0.03	12.9	0.21	46.0	0.13	0.03	0.34	100.2	86.4
UR-36-I	41.1	0.02	12.9	0.21	46.1	0.15	0.03	0.39	100.8	86.4
UR-36-I	41.1	0.03	12.9	0.23	45.9	0.12	n.d.	0.39	100.5	86.4
UR-36-I	40.2	0.59	12.6	0.19	45.1	0.12	0.10	0.40	99.3	86.4
UR-36-I	41.2	0.02	12.9	0.13	45.9	0.14	n.d.	0.39	100.8	86.4
UR-36_I	40.4	0.15	12.9	0.21	45.8	0.14	n.d.	0.38	100.0	86.4
UR-36-I	40.7	0.04	12.8	0.13	45.7	0.15	0.06	0.38	100.0	86.4
UR-36-I	41.0	0.08	12.8	0.18	45.6	0.15	0.29	0.36	100.4	86.4
UR-36-I	40.5	0.25	12.7	0.20	44.9	0.15	n.d.	0.38	99.0	86.4
UR-36-I	41.1	0.01	12.9	0.20	45.9	0.15	n.d.	0.36	100.7	86.3
UR-36-I	40.9	0.04	13.0	0.20	46.1	0.15	n.d.	0.34	100.7	86.3
UR-36_I	40.5	0.03	12.8	0.19	45.5	0.13	n.d.	0.30	99.4	86.3
UR-36-I	41.2	0.03	13.0	0.13	46.0	0.13	n.d.	0.35	100.8	86.3
UR-36_I	40.6	0.02	13.1	0.21	46.3	0.14	0.04	0.32	100.8	86.3
UR-36_I	40.4	0.03	13.0	0.12	45.9	0.14	n.d.	0.35	100.0	86.3
UR-36_I	42.4	0.04	12.7	0.14	44.9	0.15	0.07	0.39	100.8	86.3
UR-36_I	41.0	0.03	13.0	0.20	45.7	0.15	0.13	0.37	100.6	86.3
UR-36-I	41.2	0.04	13.0	0.24	45.5	0.13	0.05	0.35	100.5	86.2
UR-36-I	40.4	0.92	12.9	0.16	45.3	0.16	0.17	0.36	100.3	86.2
UR-36-I	40.7	0.03	13.2	0.17	46.1	0.13	n.d.	0.37	100.7	86.2
UR-36-I	41.0	0.03	13.1	0.20	45.7	0.12	0.04	0.42	100.6	86.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-36-N	41.2	0.06	13.1	0.25	45.7	0.14	n.d.	0.38	100.9	86.2
UR-36-N	41.1	0.04	13.1	0.20	45.7	0.14	n.d.	0.35	100.6	86.2
UR-36-N	41.1	0.03	13.3	0.14	45.7	0.14	0.10	0.33	100.7	86.0
UR-36-N	41.2	0.03	13.3	0.19	45.6	0.15	0.05	0.34	100.8	85.9
UR-36-N	41.1	0.03	13.3	0.22	45.5	0.13	n.d.	0.38	100.6	85.9
UR-36-N	41.1	0.03	13.3	0.13	45.5	0.14	0.05	0.33	100.5	85.9
UR-36-N	41.0	0.03	13.3	0.17	45.4	0.14	0.13	0.37	100.5	85.9
UR-36_	40.5	0.02	13.3	0.16	45.5	0.14	n.d.	0.35	100.0	85.9
UR-36-N	41.0	0.02	13.3	0.18	45.5	0.14	0.12	0.34	100.7	85.9
UR-36-N	40.9	0.01	13.4	0.25	45.5	0.13	0.04	0.33	100.5	85.8
UR-36-N	40.7	0.05	13.5	0.22	45.6	0.14	0.04	0.34	100.5	85.8
UR-36_	40.5	0.03	13.4	0.13	45.1	0.16	n.d.	0.28	99.7	85.8
UR-36-N	41.0	0.01	13.5	0.22	45.4	0.13	0.04	0.31	100.6	85.7
UR-36-N	41.1	0.02	13.6	0.24	45.3	0.14	n.d.	0.40	100.9	85.6
UR-36_	40.5	0.03	13.5	0.21	45.3	0.15	n.d.	0.26	100.1	85.6
UR-36-N	40.5	0.05	13.6	0.25	45.2	0.19	0.32	0.34	100.5	85.6
UR-36-N	41.5	0.04	13.5	0.20	45.1	0.16	0.04	0.29	100.9	85.6
UR-36-N	40.9	0.05	13.7	0.25	45.6	0.15	0.04	0.35	101.0	85.6
UR-36-N	40.6	0.03	13.6	0.15	45.0	0.16	n.d.	0.29	99.9	85.5
UR-36-N	41.0	0.03	13.8	0.13	45.3	0.12	0.06	0.33	100.8	85.4
UR-36-N	41.1	0.02	13.7	0.24	44.6	0.23	0.03	0.32	100.3	85.3
UR-36-N	40.9	0.04	13.8	0.14	45.1	0.16	0.03	0.29	100.5	85.3
UR-36-N	40.7	0.04	13.7	0.18	44.7	0.14	n.d.	0.29	99.8	85.3
UR-36-N	41.0	0.02	13.9	0.21	45.0	0.15	0.06	0.28	100.7	85.2
UR-36-N	41.0	0.03	14.0	0.22	45.3	0.13	n.d.	0.27	100.9	85.2
UR-36-N	41.1	0.04	13.9	0.20	44.9	0.14	0.11	0.29	100.6	85.2
UR-36_	40.5	0.03	14.0	0.24	45.1	0.16	n.d.	0.33	100.3	85.2
UR-36-N	40.9	0.03	14.0	0.19	45.1	0.18	n.d.	0.27	100.6	85.2
UR-36-N	41.2	0.02	14.0	0.17	45.1	0.13	n.d.	0.24	100.9	85.1
UR-36-N	41.0	0.04	14.0	0.19	45.1	0.13	0.05	0.25	100.8	85.1
UR-36-N	40.7	0.40	14.0	0.19	44.8	0.13	n.d.	0.34	100.6	85.1
UR-36-N	41.0	0.01	14.1	0.19	45.1	0.19	0.05	0.25	100.8	85.1
UR-36-N	41.0	0.05	14.0	0.20	45.0	0.14	0.06	0.25	100.8	85.1
UR-36-N	40.8	0.03	14.1	0.13	45.0	0.15	n.d.	0.26	100.5	85.0
UR-36-N	41.0	0.10	14.1	0.16	44.6	0.16	0.08	0.33	100.5	84.9
UR-36-N	41.0	0.03	14.2	0.16	44.8	0.14	0.05	0.24	100.7	84.9
UR-36-N	40.9	0.03	14.2	0.25	44.7	0.16	n.d.	0.25	100.5	84.9
UR-36_	40.4	0.04	14.3	0.22	44.7	0.15	n.d.	0.23	100.0	84.8
UR-36-N	40.6	0.03	14.3	0.21	44.7	0.17	0.05	0.21	100.2	84.8
UR-36-N	40.7	0.15	14.3	0.22	44.8	0.18	0.08	0.28	100.8	84.8
UR-36-N	40.5	0.02	14.3	0.21	44.5	0.15	n.d.	0.22	99.8	84.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-36-N	41.0	0.03	14.3	0.24	44.6	0.13	n.d.	0.31	100.6	84.7
UR-36-N	41.0	0.02	14.3	0.30	44.7	0.16	0.05	0.28	100.8	84.7
UR-36-N	40.8	0.50	14.1	0.15	44.0	0.20	n.d.	0.27	99.9	84.7
UR-36-N	41.0	0.02	14.4	0.24	44.7	0.15	0.07	0.30	100.8	84.7
UR-36-N	40.6	0.04	14.4	0.24	44.6	0.12	n.d.	0.22	100.3	84.7
UR-36-N	40.9	0.03	14.5	0.22	44.6	0.20	n.d.	0.26	100.7	84.6
UR-36-N	40.5	0.02	14.7	0.25	45.0	0.13	n.d.	0.24	100.7	84.5
UR-36-N	41.1	0.03	14.6	0.18	44.4	0.13	0.13	0.29	100.8	84.5
UR-36-N	40.7	0.02	14.6	0.21	44.6	0.16	n.d.	0.21	100.6	84.5
UR-36_I	40.3	0.03	14.5	0.21	44.3	0.14	0.03	0.29	99.9	84.4
UR-36-N	40.6	0.02	14.6	0.21	44.5	0.15	n.d.	0.26	100.4	84.4
UR-36-N	41.3	0.03	14.6	0.14	44.5	0.18	0.06	0.23	101.0	84.4
UR-36-N	39.6	0.48	14.5	0.25	44.2	0.18	0.09	0.28	99.6	84.4
UR-36-N	40.8	0.02	14.8	0.19	44.7	0.17	n.d.	0.26	100.9	84.4
UR-36-N	40.6	0.02	14.8	0.21	44.3	0.15	n.d.	0.35	100.5	84.2
UR-36-N	40.7	0.02	14.8	0.17	44.4	0.17	n.d.	0.22	100.5	84.2
UR-36-N	40.8	0.03	14.8	0.18	44.3	0.18	n.d.	0.26	100.5	84.2
UR-36-N	40.7	0.02	14.9	0.22	44.4	0.16	0.03	0.22	100.6	84.2
UR-36-N	40.6	0.02	14.9	0.17	44.2	0.16	0.03	0.25	100.3	84.2
UR-36-N	40.9	0.02	14.8	0.21	44.1	0.15	0.05	0.31	100.6	84.1
UR-36-N	40.9	0.02	14.9	0.24	44.3	0.15	0.04	0.23	100.8	84.1
UR-36-N	41.1	0.02	14.9	0.23	44.1	0.16	n.d.	0.20	100.7	84.0
UR-36-N	40.5	0.03	15.1	0.20	44.1	0.14	0.05	0.21	100.3	83.9
UR-36-N	40.2	0.04	15.0	0.23	43.8	0.19	n.d.	0.23	99.7	83.9
UR-36-N	40.9	0.03	15.2	0.25	44.0	0.18	0.04	0.27	100.8	83.8
UR-36-N	40.7	0.02	15.2	0.25	44.1	0.22	n.d.	0.26	100.7	83.8
UR-36-N	40.9	0.02	15.3	0.23	44.1	0.15	n.d.	0.26	100.9	83.7
UR-36-N	40.2	0.04	15.3	0.22	43.9	0.16	0.06	0.28	100.2	83.7
UR-36-N	40.5	0.11	15.2	0.16	43.5	0.15	n.d.	0.23	99.9	83.6
UR-36-N	40.7	0.01	15.6	0.16	43.7	0.18	0.05	0.20	100.6	83.3
UR-36-N	40.7	0.04	15.7	0.23	43.5	0.19	0.03	0.19	100.6	83.2
UR-36-N	43.6	0.30	14.3	0.24	39.7	1.10	n.d.	0.22	99.5	83.1
UR-36-N	40.4	0.02	15.8	0.26	43.5	0.18	0.05	0.22	100.4	83.1
UR-36-N	40.5	0.02	15.9	0.21	43.8	0.12	0.04	0.24	100.8	83.1
UR-36-N	40.6	0.33	15.8	0.38	43.4	0.18	n.d.	0.18	100.8	83.1
UR-36-N	40.1	0.03	15.9	0.29	43.3	0.14	n.d.	0.27	100.1	82.9
UR-36-N	40.5	0.02	16.1	0.20	43.6	0.14	0.09	0.24	100.8	82.9
UR-36-N	40.8	0.02	16.0	0.30	43.4	0.17	n.d.	0.22	101.0	82.8
UR-36-N	40.2	0.04	16.0	0.13	43.0	0.17	0.08	0.27	99.9	82.8
UR-36-N	39.9	0.10	16.1	0.36	43.0	0.17	n.d.	0.26	99.9	82.6
UR-36-N	40.5	0.05	16.3	0.28	43.2	0.19	n.d.	0.19	100.7	82.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-36-I	40.0	0.31	16.1	0.26	42.7	0.16	0.04	0.24	99.8	82.5
UR-36-I	40.7	0.02	16.3	0.27	42.9	0.17	n.d.	0.20	100.5	82.5
UR-36-I	40.6	0.03	16.3	0.21	43.1	0.16	n.d.	0.23	100.7	82.4
UR-36-I	40.5	0.03	16.4	0.26	43.0	0.19	n.d.	0.25	100.6	82.4
UR-36-I	40.5	0.02	16.5	0.21	43.1	0.19	n.d.	0.20	100.6	82.3
UR-36-I	40.5	0.03	16.5	0.21	43.0	0.16	n.d.	0.21	100.5	82.3
UR-36-I	40.5	0.04	16.5	0.25	42.9	0.13	0.08	0.27	100.6	82.3
UR-36-I	40.8	0.05	16.7	0.27	42.8	0.16	n.d.	0.27	101.0	82.1
UR-36-I	40.6	0.02	16.7	0.23	42.7	0.17	n.d.	0.22	100.6	82.0
UR-36-I	40.0	0.03	16.8	0.27	42.6	0.15	n.d.	0.21	99.9	81.9
UR-36-I	40.6	0.02	16.8	0.31	42.7	0.14	n.d.	0.20	100.8	81.9
UR-36-I	40.3	0.02	16.9	0.32	42.7	0.16	0.03	0.24	100.6	81.8
UR-36-I	40.5	0.03	16.9	0.30	42.4	0.17	n.d.	0.28	100.7	81.7
UR-36-I	40.4	0.03	17.1	0.29	42.6	0.15	0.04	0.21	100.9	81.6
UR-36-I	40.3	0.01	17.2	0.26	42.5	0.20	n.d.	0.21	100.7	81.5
UR-36-I	40.6	0.03	17.2	0.25	42.3	0.15	n.d.	0.32	100.7	81.4
UR-36-I	39.9	0.10	17.2	0.24	42.0	0.17	0.04	0.24	99.9	81.3
UR-36-I	39.6	0.21	17.2	0.34	41.6	0.16	0.03	0.24	99.3	81.2
UR-36_	39.5	0.02	17.4	0.26	42.1	0.13	0.05	0.26	99.8	81.2
UR-36_	39.8	0.03	17.7	0.24	42.3	0.15	0.04	0.22	100.5	81.0
UR-36-I	39.9	0.33	17.5	0.30	41.8	0.17	0.08	0.21	100.2	81.0
UR-36-I	40.0	0.03	17.8	0.26	42.1	0.16	n.d.	0.20	100.6	80.8
UR-36-I	40.5	0.03	17.7	0.21	41.8	0.17	n.d.	0.19	100.7	80.8
UR-36-I	40.1	0.02	18.0	0.27	42.0	0.16	n.d.	0.21	100.8	80.6
UR-36-I	40.1	0.02	18.1	0.31	41.8	0.15	n.d.	0.24	100.7	80.4
UR-36-I	40.1	0.03	18.7	0.29	41.4	0.14	0.08	0.25	101.0	79.8
UR-36-I	40.3	0.02	18.9	0.36	40.9	0.15	n.d.	0.30	100.9	79.4
UR-36-I	40.0	0.02	19.1	0.42	40.8	0.17	n.d.	0.20	100.8	79.2
UR-36_	39.2	0.01	19.3	0.32	40.9	0.15	0.03	0.19	100.1	79.1
UR-36-I	39.4	0.04	19.4	0.34	40.5	0.18	0.09	0.21	100.2	78.8
UR-36-I	39.9	0.02	19.8	0.41	40.2	0.17	n.d.	0.19	100.8	78.3
UR-36-I	39.7	0.02	20.0	0.38	40.1	0.17	0.06	0.14	100.6	78.1
UR-36-I	39.3	0.32	19.4	0.28	38.9	0.61	n.d.	0.21	99.0	78.1
UR-36_	38.9	0.02	20.0	0.32	40.0	0.16	n.d.	0.19	99.6	78.1
UR-36-I	39.7	0.03	20.3	0.30	39.9	0.18	n.d.	0.19	100.7	77.8
UR-36_	38.8	0.04	20.2	0.40	39.3	0.17	n.d.	0.16	99.1	77.6
UR-36-I	39.7	0.02	20.8	0.30	39.4	0.22	0.05	0.18	100.7	77.1
UR-36_	38.9	0.03	20.8	0.35	39.3	0.17	n.d.	0.18	99.7	77.1
UR-36-I	39.8	0.02	21.0	0.38	39.4	0.16	n.d.	0.15	100.9	77.0
UR-36-I	39.4	0.02	20.9	0.33	39.2	0.18	0.03	0.22	100.3	76.9
UR-36_	38.8	n.d.	21.3	0.28	38.8	0.16	n.d.	0.15	99.5	76.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-36-N	39.3	0.03	21.5	0.41	38.9	0.17	0.05	0.16	100.6	76.4
UR-36_	38.9	0.19	21.2	0.29	38.3	0.18	n.d.	0.15	99.2	76.3
UR-36-N	39.5	0.03	21.5	0.36	38.6	0.19	0.04	0.14	100.4	76.2
UR-36-N	39.2	0.06	21.7	0.35	38.8	0.21	n.d.	0.15	100.4	76.1
UR-36_	38.9	0.04	21.8	0.30	38.6	0.17	n.d.	0.18	100.0	75.9
UR-36-N	39.3	0.01	22.0	0.43	38.6	0.17	n.d.	0.13	100.6	75.7
UR-36_	39.1	0.25	22.0	0.37	38.4	0.20	n.d.	0.14	100.4	75.7
UR-36_	38.4	0.02	22.0	0.35	38.4	0.19	0.04	0.15	99.5	75.7
UR-36_	38.5	0.05	22.4	0.34	38.4	0.18	n.d.	0.14	100.0	75.3
UR-36_	38.5	0.07	22.4	0.35	38.2	0.17	n.d.	0.15	99.9	75.3
UR-36-N	39.7	0.03	22.5	0.38	38.1	0.18	n.d.	0.17	101.0	75.1
UR-36_	38.5	0.03	22.9	0.37	37.7	0.17	n.d.	0.18	99.8	74.6
UR-36-N	38.9	0.04	22.9	0.36	37.7	0.23	n.d.	0.11	100.3	74.6
UR-36-N	39.5	0.02	22.9	0.43	36.8	0.22	0.07	0.12	100.0	74.1
UR-36-N	39.3	0.02	23.3	0.36	37.5	0.15	n.d.	0.16	100.7	74.1
UR-36-N	39.0	0.02	23.5	0.30	37.1	0.24	0.03	0.17	100.3	73.8
UR-36-N	39.2	0.04	24.2	0.33	36.6	0.21	n.d.	0.15	100.8	72.9
UR-36-N	38.8	0.02	24.6	0.44	36.4	0.18	0.10	0.17	100.7	72.5
UR-36-N	38.8	0.11	25.0	0.38	35.8	0.18	n.d.	0.16	100.3	71.8
UR-36-N	38.5	0.02	25.4	0.50	35.8	0.24	n.d.	0.10	100.5	71.6
UR-36-N	38.8	n.d.	26.0	0.45	35.2	0.20	0.05	0.08	100.8	70.7
UR-36-N	38.7	0.02	26.3	0.49	34.8	0.22	0.06	0.12	100.7	70.2
UR-36-N	38.5	0.03	26.4	0.48	34.7	0.22	n.d.	0.08	100.4	70.1
UR-36-N	38.4	0.02	26.9	0.40	34.6	0.23	n.d.	0.09	100.7	69.6
UR-36-N	38.2	0.02	26.9	0.47	34.6	0.18	n.d.	0.05	100.4	69.6
UR-36-N	38.4	0.04	27.6	0.41	33.5	0.24	n.d.	0.11	100.2	68.5
Jor-46-N	40.6	0.02	11.6	0.14	46.5	0.10	0.04	0.65	99.7	87.7
Jor-46-N	40.8	n.d.	11.6	0.14	46.3	0.10	0.08	0.63	99.6	87.7
Jor-46-N	40.6	0.01	11.7	0.16	46.5	0.10	0.07	0.62	99.8	87.7
Jor-46-N	40.6	n.d.	11.6	0.12	45.9	0.10	n.d.	0.63	99.0	87.6
Jor-46-N	40.7	0.01	11.6	0.10	46.1	0.10	0.07	0.60	99.4	87.6
Jor-46-N	40.7	0.02	11.5	0.26	45.7	0.10	n.d.	0.67	99.0	87.6
Jor-46-N	40.8	n.d.	11.7	0.20	46.1	0.12	0.10	0.62	99.7	87.6
Jor-46-N	40.7	n.d.	11.7	0.16	46.2	0.10	0.09	0.64	99.6	87.6
Jor-46-N	40.5	n.d.	11.7	0.16	46.3	0.10	0.08	0.69	99.5	87.6
Jor-46-N	40.8	0.02	11.7	0.12	46.1	0.12	0.03	0.55	99.4	87.6
Jor-46-N	40.5	0.02	11.7	0.13	46.2	0.11	0.03	0.67	99.4	87.5
Jor-46-N	40.6	0.02	11.7	0.15	45.9	0.10	n.d.	0.67	99.2	87.5
Jor-46-N	40.5	0.04	11.7	0.17	46.0	0.10	0.04	0.61	99.2	87.5
Jor-46-N	41.1	0.01	11.8	0.13	46.3	0.10	n.d.	0.68	100.2	87.5
Jor-46-N	40.7	0.03	11.8	0.14	46.2	0.11	0.04	0.65	99.7	87.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-46-N	41.1	0.01	11.8	0.14	46.2	0.11	0.04	0.56	99.9	87.4
Jor-46-N	40.5	0.01	11.8	n.d.	46.1	0.12	0.05	0.62	99.3	87.4
Jor-46-N	40.9	0.01	11.9	0.17	46.4	0.10	0.05	0.74	100.3	87.4
Jor-46-N	40.8	0.01	11.9	0.11	46.4	0.10	0.10	0.64	100.1	87.4
Jor-46-N	40.7	0.01	11.8	0.14	45.9	0.10	0.04	0.65	99.3	87.4
Jor-46-N	40.6	0.03	11.8	0.13	46.0	0.11	0.04	0.68	99.4	87.4
Jor-46-N	40.7	0.02	11.9	0.19	46.2	0.10	0.05	0.70	99.8	87.4
Jor-46-N	40.3	0.02	11.8	0.12	45.7	0.10	0.07	0.63	98.7	87.4
Jor-46-N	40.6	0.02	11.8	0.17	45.9	0.10	0.05	0.67	99.4	87.4
Jor-46-N	40.8	n.d.	11.9	0.13	46.0	0.10	0.03	0.62	99.5	87.4
Jor-46-N	40.9	0.02	12.0	0.13	46.5	0.10	0.04	0.70	100.4	87.3
Jor-46-N	40.5	n.d.	12.0	0.12	46.3	0.10	0.12	0.68	99.7	87.3
Jor-46-N	40.8	0.01	11.9	0.17	45.9	0.09	0.05	0.66	99.5	87.3
Jor-46-N	40.7	0.02	12.0	n.d.	46.2	0.12	0.06	0.67	99.8	87.3
Jor-46-N	40.9	0.02	12.0	0.22	46.2	0.11	0.04	0.66	100.2	87.3
Jor-46-N	40.9	0.01	12.0	n.d.	46.1	0.10	n.d.	0.68	99.9	87.3
Jor-46-N	40.7	0.02	11.9	n.d.	46.0	0.09	0.06	0.70	99.6	87.3
Jor-46-N	41.0	0.01	12.0	0.13	46.2	0.10	0.04	0.72	100.2	87.3
Jor-46-N	40.8	0.02	11.9	0.15	45.9	0.10	n.d.	0.68	99.5	87.3
Jor-46-N	40.8	0.02	12.0	0.15	46.2	0.10	n.d.	0.70	100.0	87.3
Jor-46-N	41.1	n.d.	12.2	0.16	46.9	0.10	0.05	0.68	101.1	87.3
Jor-46-N	40.8	0.02	12.1	0.16	46.5	0.11	0.10	0.60	100.3	87.3
Jor-46-N	40.8	0.04	12.1	0.13	46.5	0.11	0.04	0.67	100.4	87.3
Jor-46-N	40.7	0.02	11.9	0.12	45.8	0.12	0.03	0.59	99.3	87.2
Jor-46-N	40.8	n.d.	11.9	0.12	45.8	0.10	0.04	0.68	99.5	87.2
Jor-46-N	40.5	0.01	12.0	0.18	45.8	0.11	0.03	0.59	99.2	87.2
Jor-46-N	40.7	0.01	12.1	0.15	46.3	0.10	0.10	0.63	100.1	87.2
Jor-46-N	40.5	0.01	12.1	0.16	46.0	0.11	0.03	0.60	99.5	87.2
Jor-46-N	40.6	n.d.	12.1	0.14	46.1	0.11	0.04	0.65	99.7	87.2
Jor-46-N	40.7	0.02	12.1	0.13	46.3	0.10	0.03	0.67	100.1	87.2
Jor-46-N	40.6	n.d.	12.0	0.13	45.9	0.10	0.04	0.66	99.4	87.2
Jor-46-N	40.7	0.01	12.0	0.17	45.7	0.11	0.04	0.58	99.3	87.1
Jor-46-N	40.7	n.d.	12.1	0.20	46.0	0.11	0.03	0.54	99.8	87.1
Jor-46-N	40.6	0.08	12.1	0.23	45.8	0.13	0.06	0.54	99.5	87.1
Jor-46-N	40.8	0.03	12.2	0.15	46.3	0.11	0.05	0.56	100.3	87.1
Jor-46-N	40.6	n.d.	12.2	0.16	45.9	0.10	0.05	0.66	99.7	87.1
Jor-46-N	40.9	0.02	12.2	0.11	46.0	0.10	0.06	0.60	99.9	87.1
Jor-46-N	40.7	0.01	12.1	0.15	45.9	0.11	0.04	0.58	99.6	87.1
Jor-46-N	40.7	0.03	12.2	0.19	46.1	0.12	0.06	0.50	99.9	87.1
Jor-46-N	40.9	0.01	12.1	0.14	45.9	0.12	0.03	0.63	99.8	87.1
Jor-46-N	40.7	n.d.	12.1	n.d.	45.9	0.11	0.04	0.60	99.5	87.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-46-N	40.9	n.d.	12.2	0.12	46.0	0.09	0.07	0.59	99.9	87.1
Jor-46-N	41.2	0.01	12.1	0.14	45.8	0.11	n.d.	0.63	100.1	87.1
Jor-46-N	40.9	n.d.	12.2	0.19	46.1	0.12	0.03	0.66	100.2	87.1
Jor-46-N	40.4	0.02	12.1	0.14	45.5	0.11	0.03	0.56	98.9	87.0
Jor-46-N	40.6	0.03	12.1	0.14	45.5	0.10	0.06	0.65	99.2	87.0
Jor-46-N	41.0	0.03	12.4	0.11	46.6	0.11	n.d.	0.49	100.8	87.0
Jor-46-N	40.3	0.02	12.1	0.19	45.6	0.10	0.05	0.65	99.0	87.0
Jor-46-N	40.5	0.01	12.1	n.d.	45.5	0.12	0.06	0.63	99.1	87.0
Jor-46-N	40.8	0.01	12.2	0.14	45.8	0.11	0.06	0.61	99.7	87.0
Jor-46-N	40.6	0.02	12.2	0.13	45.8	0.10	0.04	0.67	99.6	87.0
Jor-46-N	40.7	0.03	12.2	0.16	45.7	0.12	0.04	0.53	99.5	87.0
Jor-46-N	40.9	0.02	12.2	0.15	45.9	0.11	0.06	0.61	100.0	87.0
Jor-46-N	40.7	0.02	12.2	0.12	45.9	0.12	0.05	0.66	99.8	87.0
Jor-46-N	40.1	0.03	12.2	0.13	45.8	0.15	0.13	0.53	99.0	87.0
Jor-46-N	40.9	n.d.	12.3	0.16	46.2	0.11	n.d.	0.63	100.3	87.0
Jor-46-N	40.9	0.01	12.2	0.15	45.7	0.11	0.03	0.57	99.8	87.0
Jor-46-N	40.5	0.02	12.3	0.16	45.9	0.11	0.06	0.67	99.6	87.0
Jor-46-N	40.9	0.01	12.3	0.20	45.9	0.11	0.04	0.63	100.0	86.9
Jor-46-N	41.0	0.01	12.4	0.13	46.4	0.11	0.04	0.57	100.7	86.9
Jor-46-N	41.6	0.03	12.3	0.18	46.1	0.10	0.06	0.62	101.0	86.9
Jor-46-N	40.5	0.01	12.3	0.14	45.9	0.10	0.04	0.65	99.7	86.9
Jor-46-N	40.7	0.01	12.3	0.19	45.9	0.11	0.04	0.59	99.8	86.9
Jor-46-N	40.7	n.d.	12.3	0.14	45.9	0.10	0.07	0.63	99.8	86.9
Jor-46-N	40.9	0.02	12.4	0.13	46.1	0.10	0.06	0.63	100.3	86.9
Jor-46-N	40.4	0.02	12.3	0.15	45.9	0.11	n.d.	0.48	99.4	86.9
Jor-46-N	40.9	0.02	12.3	0.12	45.9	0.10	0.05	0.58	100.0	86.9
Jor-46-N	40.9	0.01	12.3	0.13	45.7	0.12	0.07	0.57	99.8	86.9
Jor-46-N	41.2	0.02	12.4	0.16	46.2	0.11	0.03	0.61	100.8	86.9
Jor-46-N	40.4	0.02	12.3	0.12	45.7	0.11	0.07	0.59	99.4	86.9
Jor-46-N	40.8	0.02	12.4	0.16	46.0	0.11	n.d.	0.57	100.1	86.9
Jor-46-N	40.5	0.01	12.4	n.d.	45.9	0.12	0.04	0.57	99.6	86.9
Jor-46-N	40.6	0.02	12.4	0.18	46.1	0.11	0.05	0.61	100.2	86.9
Jor-46-N	40.8	0.01	12.4	0.13	45.8	0.11	0.04	0.58	99.8	86.9
Jor-46-N	41.0	0.03	12.3	n.d.	45.7	0.11	0.04	0.62	99.9	86.9
Jor-46-N	40.6	0.03	12.4	0.13	46.0	0.12	n.d.	0.57	99.9	86.8
Jor-46-N	40.3	0.02	12.2	0.14	45.2	0.11	0.04	0.46	98.5	86.8
Jor-46-N	40.6	n.d.	12.4	0.13	45.8	0.10	0.05	0.56	99.6	86.8
Jor-46-N	40.5	0.02	12.4	0.18	45.8	0.12	0.07	0.57	99.6	86.8
Jor-46-N	40.8	0.02	12.3	0.15	45.4	0.11	0.04	0.60	99.4	86.8
Jor-46-N	40.8	0.01	12.5	0.12	46.0	0.12	n.d.	0.49	100.1	86.8
Jor-46-N	40.9	0.02	12.4	0.13	45.8	0.12	0.03	0.46	99.8	86.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-46-N	41.2	n.d.	12.4	0.12	45.6	0.12	0.07	0.51	100.0	86.8
Jor-46-N	40.6	n.d.	12.4	0.16	45.8	0.10	n.d.	0.57	99.7	86.8
Jor-46-N	40.7	n.d.	12.4	0.15	45.8	0.10	0.04	0.60	99.8	86.8
Jor-46-N	41.0	0.02	12.4	0.14	45.8	0.11	0.07	0.53	100.1	86.8
Jor-46-N	41.0	0.02	12.8	0.18	47.3	0.12	0.07	0.54	102.0	86.8
Jor-46-N	40.7	0.01	12.5	0.13	45.9	0.14	0.04	0.49	99.9	86.8
Jor-46-N	41.1	0.02	12.3	0.12	45.3	0.12	0.04	0.41	99.3	86.8
Jor-46-N	41.1	0.02	12.5	0.14	45.9	0.11	n.d.	0.59	100.4	86.8
Jor-46-N	40.9	0.02	12.5	0.16	45.8	0.11	n.d.	0.59	100.1	86.8
Jor-46-N	40.6	n.d.	12.5	0.17	46.0	0.12	0.08	0.61	100.1	86.8
Jor-46-N	40.7	0.02	12.4	0.16	45.5	0.11	0.04	0.49	99.4	86.8
Jor-46-N	40.5	n.d.	12.3	0.19	45.3	0.12	0.04	0.52	99.0	86.8
Jor-46-N	41.0	0.02	12.5	0.17	46.1	0.10	0.06	0.61	100.7	86.8
Jor-46-N	40.9	0.02	12.5	0.16	46.1	0.11	n.d.	0.48	100.3	86.7
Jor-46-N	40.6	0.02	12.5	n.d.	45.8	0.12	0.06	0.49	99.6	86.7
Jor-46-N	40.6	0.02	12.4	0.18	45.6	0.11	0.05	0.63	99.6	86.7
Jor-46-N	40.6	0.03	12.4	0.14	45.5	0.09	n.d.	0.62	99.5	86.7
Jor-46-N	40.7	0.01	12.6	n.d.	46.0	0.11	0.05	0.59	100.2	86.7
Jor-46-N	40.6	0.02	12.4	0.18	45.5	0.11	0.04	0.69	99.6	86.7
Jor-46-N	41.4	0.01	12.6	0.19	46.1	0.11	n.d.	0.54	101.0	86.7
Jor-46-N	40.6	0.01	12.5	0.14	45.8	0.11	0.03	0.51	99.7	86.7
Jor-46-N	40.9	0.02	12.5	0.18	45.8	0.10	0.06	0.59	100.3	86.7
Jor-46-N	40.9	0.02	12.5	0.12	45.7	0.10	n.d.	0.55	99.9	86.7
Jor-46-N	40.8	0.02	12.4	0.14	45.2	0.10	n.d.	0.52	99.2	86.7
Jor-46-N	40.5	0.01	12.5	0.16	45.6	0.12	0.03	0.50	99.5	86.7
Jor-46-N	40.7	n.d.	12.6	0.22	45.8	0.10	0.03	0.55	100.0	86.7
Jor-46-N	40.0	0.07	12.5	0.13	45.5	0.12	n.d.	0.51	98.8	86.7
Jor-46-N	41.0	n.d.	12.6	0.14	46.0	0.11	0.04	0.49	100.5	86.7
Jor-46-N	40.5	n.d.	12.5	0.12	45.6	0.11	n.d.	0.59	99.5	86.6
Jor-46-N	40.7	0.02	12.6	0.17	45.7	0.11	0.04	0.62	99.9	86.6
Jor-46-N	40.6	0.03	12.5	0.13	45.6	0.10	0.05	0.62	99.6	86.6
Jor-46-N	40.4	0.02	12.6	0.17	45.6	0.11	0.03	0.51	99.5	86.6
Jor-46-N	40.7	n.d.	12.6	0.21	45.8	0.11	n.d.	0.54	100.0	86.6
Jor-46-N	40.7	0.01	12.7	0.19	46.0	0.12	n.d.	0.58	100.4	86.6
Jor-46-N	40.2	n.d.	12.5	0.13	45.0	0.10	0.07	0.52	98.5	86.6
Jor-46-N	40.8	0.01	12.7	0.18	45.7	0.11	0.04	0.55	100.0	86.6
Jor-46-N	40.9	0.03	12.6	n.d.	45.6	0.11	0.04	0.54	99.8	86.5
Jor-46-N	40.4	0.01	12.6	0.10	45.5	0.11	0.05	0.50	99.3	86.5
Jor-46-N	40.6	n.d.	12.7	0.19	45.7	0.10	0.03	0.47	99.8	86.5
Jor-46-N	40.8	0.04	12.6	0.11	45.5	0.12	0.05	0.45	99.7	86.5
Jor-46-N	40.6	0.02	12.7	0.13	45.7	0.11	0.06	0.53	99.8	86.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-46-N	40.8	0.02	12.8	0.17	45.9	0.11	0.04	0.43	100.3	86.5
Jor-46-N	41.0	0.07	12.6	0.16	45.3	0.12	0.04	0.55	99.8	86.5
Jor-46-N	40.7	n.d.	12.6	0.17	45.4	0.11	n.d.	0.46	99.6	86.5
Jor-46-N	40.6	0.02	12.7	0.14	45.5	0.10	0.08	0.56	99.7	86.5
Jor-46-N	40.4	0.02	12.6	n.d.	45.4	0.10	0.05	0.55	99.3	86.5
Jor-46-N	40.5	0.02	12.7	0.13	45.6	0.11	0.03	0.57	99.6	86.5
Jor-46-N	40.9	0.12	12.6	0.16	45.2	0.10	0.06	0.52	99.6	86.5
Jor-46-N	39.8	0.21	12.5	0.12	44.7	0.11	0.06	0.56	98.1	86.4
Jor-46-N	40.4	n.d.	12.8	0.19	45.6	0.12	0.04	0.55	99.6	86.4
Jor-46-N	40.7	0.02	12.7	0.17	45.4	0.11	n.d.	0.48	99.7	86.4
Jor-46-N	40.5	0.03	12.8	0.12	45.6	0.11	0.05	0.50	99.7	86.4
Jor-46-N	41.1	0.02	12.8	0.21	45.6	0.11	n.d.	0.56	100.4	86.4
Jor-46-N	40.6	0.02	12.8	0.18	45.6	0.12	0.03	0.44	99.8	86.4
Jor-46-N	41.2	0.01	13.0	0.13	46.2	0.11	0.04	0.49	101.1	86.4
Jor-46-N	40.5	0.02	12.8	0.12	45.5	0.09	0.04	0.51	99.7	86.4
Jor-46-N	41.1	0.04	12.6	0.16	44.8	0.12	n.d.	0.46	99.3	86.4
Jor-46-N	40.5	n.d.	12.8	0.17	45.5	0.12	0.06	0.54	99.7	86.4
Jor-46-N	41.1	n.d.	12.9	n.d.	46.0	0.12	n.d.	0.47	100.8	86.4
Jor-46-N	40.7	0.02	12.8	0.13	45.4	0.10	0.05	0.60	99.8	86.4
Jor-46-N	39.9	0.34	12.7	n.d.	45.0	0.11	0.07	0.53	98.7	86.4
Jor-46-N	40.3	0.01	12.8	0.17	45.3	0.12	0.06	0.47	99.2	86.4
Jor-46-N	40.4	0.02	12.7	0.18	45.0	0.13	0.03	0.44	98.8	86.4
Jor-46-N	40.7	0.02	12.8	0.19	45.5	0.13	0.04	0.43	99.8	86.4
Jor-46-N	40.7	0.02	12.9	0.15	45.7	0.11	n.d.	0.50	100.1	86.4
Jor-46-N	40.4	0.02	12.7	n.d.	45.2	0.12	0.10	0.49	99.1	86.4
Jor-46-N	41.0	n.d.	13.0	0.24	46.0	0.12	0.07	0.51	100.9	86.3
Jor-46-N	40.4	0.01	12.9	0.16	45.5	0.10	0.04	0.51	99.5	86.3
Jor-46-N	40.2	0.01	12.8	0.13	45.3	0.10	0.06	0.52	99.1	86.3
Jor-46-N	40.8	0.01	12.9	0.15	45.6	0.11	n.d.	0.40	100.0	86.3
Jor-46-N	40.8	0.01	12.8	0.16	45.4	0.11	0.04	0.48	99.8	86.3
Jor-46-N	40.3	0.56	12.9	0.15	45.7	0.12	n.d.	0.44	100.3	86.3
Jor-46-N	40.2	0.01	12.8	0.19	45.3	0.10	0.05	0.50	99.3	86.3
Jor-46-N	40.2	0.01	12.8	n.d.	45.3	0.12	0.04	0.56	99.1	86.3
Jor-46-N	40.3	0.01	12.8	0.14	45.2	0.13	0.06	0.55	99.2	86.3
Jor-46-N	40.3	0.02	13.0	0.13	45.9	0.11	0.04	0.52	100.1	86.3
Jor-46-N	40.5	0.02	12.9	0.14	45.6	0.10	n.d.	0.41	99.7	86.3
Jor-46-N	39.6	0.20	12.7	n.d.	44.6	0.12	0.05	0.45	97.7	86.3
Jor-46-N	40.9	0.01	13.0	0.12	45.6	0.12	n.d.	0.47	100.2	86.3
Jor-46-N	40.7	0.01	12.9	0.11	45.5	0.11	0.04	0.53	99.9	86.3
Jor-46-N	40.8	n.d.	12.9	0.17	45.5	0.12	n.d.	0.42	100.0	86.3
Jor-46-N	40.5	0.03	12.9	0.19	45.4	0.12	n.d.	0.43	99.7	86.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-46-N	40.8	n.d.	12.9	0.17	45.3	0.13	n.d.	0.38	99.7	86.2
Jor-46-N	40.1	0.02	12.9	0.18	45.2	0.11	0.05	0.49	99.1	86.2
Jor-46-N	42.4	0.04	12.3	0.19	43.3	0.11	n.d.	0.50	98.9	86.2
Jor-46-N	40.6	0.02	13.0	0.12	45.7	0.11	0.04	0.45	100.2	86.2
Jor-46-N	40.5	n.d.	12.9	0.19	45.3	0.11	n.d.	0.52	99.6	86.2
Jor-46-N	40.7	0.02	13.0	0.18	45.4	0.12	0.07	0.46	99.9	86.2
Jor-46-N	40.7	0.01	13.1	0.18	45.7	0.12	0.05	0.46	100.2	86.2
Jor-46-N	41.0	0.03	13.1	0.23	45.9	0.12	0.05	0.41	100.9	86.2
Jor-46-N	40.0	0.01	12.9	0.15	45.2	0.10	0.04	0.52	99.0	86.2
Jor-46-N	40.3	0.02	13.0	0.15	45.3	0.12	0.05	0.46	99.3	86.2
Jor-46-N	40.5	0.02	12.9	n.d.	45.2	0.11	n.d.	0.39	99.3	86.2
Jor-46-N	40.6	0.01	13.0	0.17	45.2	0.12	0.04	0.53	99.6	86.1
Jor-46-N	40.0	0.02	13.1	0.13	45.3	0.13	0.03	0.52	99.2	86.1
Jor-46-N	40.5	0.03	13.2	0.18	45.7	0.11	0.05	0.46	100.2	86.1
Jor-46-N	40.5	0.01	13.2	0.13	45.5	0.13	0.05	0.40	99.8	86.0
Jor-46-N	40.3	0.02	13.1	0.14	45.1	0.13	0.05	0.46	99.3	86.0
Jor-46-N	40.6	n.d.	13.2	0.20	45.4	0.12	0.04	0.43	100.0	86.0
Jor-46-N	40.5	0.01	13.1	0.22	45.2	0.11	n.d.	0.42	99.6	86.0
Jor-46-N	40.6	0.01	13.1	0.15	45.3	0.12	0.05	0.49	99.8	86.0
Jor-46-N	40.4	0.01	13.0	n.d.	44.9	0.11	n.d.	0.39	98.9	86.0
Jor-46-N	40.5	n.d.	13.2	0.21	45.5	0.13	n.d.	0.40	100.0	86.0
Jor-46-N	40.4	n.d.	13.2	0.12	45.3	0.11	0.05	0.48	99.6	86.0
Jor-46-N	40.4	0.02	13.0	0.16	44.6	0.13	0.05	0.46	98.9	86.0
Jor-46-N	40.4	0.02	13.2	0.10	45.2	0.11	0.04	0.47	99.5	86.0
Jor-46-N	40.4	0.03	13.1	0.14	45.0	0.14	0.05	0.43	99.2	85.9
Jor-46-N	40.5	0.02	13.2	0.14	45.2	0.12	0.04	0.38	99.5	85.9
Jor-46-N	40.7	0.01	13.2	0.12	45.2	0.12	0.04	0.43	99.8	85.9
Jor-46-N	40.6	0.02	13.3	0.19	45.4	0.11	0.04	0.45	100.1	85.9
Jor-46-N	40.0	0.02	13.2	0.16	45.1	0.11	0.05	0.47	99.2	85.9
Jor-46-N	40.6	n.d.	13.2	0.21	45.1	0.13	n.d.	0.44	99.7	85.9
Jor-46-N	40.6	0.01	13.2	0.17	45.1	0.12	n.d.	0.42	99.6	85.9
Jor-46-N	40.1	n.d.	13.3	0.14	45.2	0.12	n.d.	0.49	99.4	85.9
Jor-46-N	40.4	0.02	13.2	0.11	45.0	0.12	n.d.	0.38	99.3	85.8
Jor-46-N	40.7	0.02	13.4	0.20	45.5	0.12	n.d.	0.39	100.4	85.8
Jor-46-N	39.8	0.02	13.2	n.d.	44.9	0.13	0.03	0.38	98.6	85.8
Jor-46-N	40.8	n.d.	13.3	0.17	45.2	0.11	0.06	0.48	100.1	85.8
Jor-46-N	40.5	0.02	13.3	0.18	45.3	0.13	n.d.	0.47	99.9	85.8
Jor-46-N	40.6	0.02	13.2	0.12	44.8	0.13	0.03	0.44	99.4	85.8
Jor-46-N	40.0	0.07	13.2	0.26	44.7	0.12	n.d.	0.40	98.8	85.8
Jor-46-N	40.6	0.02	13.4	0.17	45.5	0.13	n.d.	0.38	100.2	85.8
Jor-46-N	40.7	0.01	13.3	0.11	45.1	0.13	0.04	0.44	99.9	85.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-46-N	40.4	0.01	13.2	0.18	44.7	0.14	n.d.	0.42	99.0	85.8
Jor-46-N	40.7	0.01	13.3	0.19	44.9	0.12	n.d.	0.37	99.6	85.8
Jor-46-N	40.9	0.02	13.4	0.16	45.2	0.13	0.06	0.42	100.2	85.8
Jor-46-N	40.3	0.02	13.3	0.17	45.0	0.12	0.08	0.42	99.4	85.8
Jor-46-N	40.7	0.03	13.5	0.13	45.5	0.10	n.d.	0.37	100.3	85.8
Jor-46-N	40.2	n.d.	13.4	0.11	45.2	0.12	n.d.	0.37	99.5	85.7
Jor-46-N	41.2	0.01	13.5	0.25	45.4	0.15	0.03	0.34	100.9	85.7
Jor-46-N	40.9	n.d.	13.5	0.22	45.3	0.12	0.04	0.40	100.5	85.7
Jor-46-N	40.2	0.03	13.4	0.25	45.1	0.12	0.04	0.39	99.5	85.7
Jor-46-N	40.5	0.02	13.5	0.17	45.4	0.13	0.03	0.45	100.2	85.7
Jor-46-N	40.4	0.02	13.3	0.22	44.8	0.13	0.04	0.38	99.3	85.7
Jor-46-N	40.5	n.d.	13.5	0.21	45.2	0.13	0.05	0.42	100.1	85.7
Jor-46-N	40.4	n.d.	13.5	n.d.	45.1	0.13	n.d.	0.32	99.6	85.6
Jor-46-N	40.2	n.d.	13.4	0.20	44.8	0.13	n.d.	0.35	99.0	85.6
Jor-46-N	41.1	0.01	13.5	0.14	45.0	0.13	n.d.	0.38	100.3	85.6
Jor-46-N	40.1	n.d.	13.5	0.22	45.0	0.11	0.05	0.43	99.4	85.6
Jor-46-N	40.7	0.05	13.3	0.13	44.4	0.12	0.04	0.39	99.1	85.6
Jor-46-N	40.4	n.d.	13.5	0.18	44.9	0.14	n.d.	0.37	99.5	85.6
Jor-46-N	41.0	n.d.	13.6	0.21	45.2	0.14	n.d.	0.35	100.5	85.5
Jor-46-N	40.3	0.02	13.6	0.13	44.9	0.11	0.04	0.37	99.4	85.5
Jor-46-N	40.2	0.01	13.6	0.17	45.0	0.13	0.06	0.35	99.6	85.5
Jor-46-N	40.9	0.02	13.6	0.16	44.9	0.14	0.07	0.31	100.1	85.5
Jor-46-N	40.1	n.d.	13.6	0.19	44.8	0.13	0.04	0.41	99.4	85.5
Jor-46-N	40.9	n.d.	13.7	0.15	45.0	0.13	0.05	0.46	100.3	85.4
Jor-46-N	41.5	n.d.	13.7	0.22	45.0	0.12	0.05	0.39	100.9	85.4
Jor-46-N	40.6	n.d.	13.7	0.17	45.0	0.13	n.d.	0.39	100.1	85.4
Jor-46-N	40.2	0.05	13.6	0.11	44.8	0.13	0.04	0.34	99.3	85.4
Jor-46-N	40.8	0.02	13.8	0.19	45.2	0.12	n.d.	0.31	100.4	85.4
Jor-46-N	40.7	n.d.	13.8	0.13	45.2	0.13	n.d.	0.35	100.4	85.4
Jor-46-N	40.5	n.d.	13.7	0.11	44.9	0.13	n.d.	0.38	99.8	85.4
Jor-46-N	40.8	0.01	13.7	0.18	44.7	0.12	0.03	0.43	99.9	85.4
Jor-46-N	40.7	n.d.	13.8	0.15	45.0	0.14	n.d.	0.45	100.2	85.3
Jor-46-N	40.8	0.01	13.7	0.18	44.8	0.13	n.d.	0.30	100.0	85.3
Jor-46-N	40.5	n.d.	13.8	0.20	44.9	0.13	n.d.	0.30	99.8	85.3
Jor-46-N	40.5	n.d.	13.8	0.20	45.1	0.14	n.d.	0.32	100.1	85.3
Jor-46-N	40.8	0.02	13.8	0.21	45.0	0.13	n.d.	0.34	100.4	85.3
Jor-46-N	40.6	0.02	13.8	0.15	44.9	0.14	n.d.	0.30	100.0	85.3
Jor-46-N	41.1	0.02	13.9	0.11	45.0	0.13	n.d.	0.31	100.6	85.3
Jor-46-N	40.8	0.02	13.8	0.17	44.9	0.12	0.05	0.39	100.3	85.2
Jor-46-N	40.5	0.02	13.7	0.14	44.4	0.13	n.d.	0.37	99.3	85.2
Jor-46-N	40.5	0.01	14.0	0.21	45.1	0.11	0.04	0.46	100.4	85.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-46-N	40.4	n.d.	13.8	0.18	44.6	0.12	0.05	0.41	99.6	85.2
Jor-46-N	40.7	0.02	13.9	0.13	44.9	0.12	0.09	0.34	100.2	85.2
Jor-46-N	40.4	0.02	14.0	0.14	45.1	0.12	n.d.	0.33	100.1	85.2
Jor-46-N	40.5	0.01	13.9	0.21	44.9	0.12	0.04	0.30	100.1	85.2
Jor-46-N	40.6	0.02	13.8	0.16	44.4	0.13	0.04	0.30	99.4	85.2
Jor-46-N	40.5	0.02	14.0	0.19	44.9	0.12	n.d.	0.44	100.2	85.1
Jor-46-N	40.7	0.01	14.0	0.21	44.9	0.12	n.d.	0.44	100.4	85.1
Jor-46-N	40.9	n.d.	14.0	0.23	45.0	0.13	n.d.	0.31	100.6	85.1
Jor-46-N	40.2	0.02	14.0	0.24	44.8	0.13	n.d.	0.25	99.7	85.1
Jor-46-N	39.6	0.03	13.8	0.17	44.1	0.12	0.04	0.36	98.3	85.1
Jor-46-N	40.6	n.d.	14.0	0.14	44.8	0.14	0.05	0.25	100.1	85.1
Jor-46-N	40.1	0.17	13.7	0.18	43.7	0.54	0.05	0.41	98.8	85.0
Jor-46-N	38.4	0.20	13.2	0.16	42.0	1.22	n.d.	0.50	95.7	85.0
Jor-46-N	40.5	n.d.	13.9	0.23	44.3	0.14	n.d.	0.26	99.4	85.0
Jor-46-N	41.0	0.01	14.1	0.14	44.8	0.14	0.05	0.31	100.5	85.0
Jor-46-N	40.2	0.01	14.2	0.19	44.8	0.13	n.d.	0.32	99.9	85.0
Jor-46-N	40.5	n.d.	14.2	0.16	44.9	0.14	n.d.	0.27	100.1	85.0
Jor-46-N	40.2	n.d.	14.1	0.18	44.6	0.12	0.05	0.30	99.6	84.9
Jor-46-N	40.4	0.01	14.1	0.17	44.4	0.12	n.d.	0.32	99.5	84.9
Jor-46-N	40.4	0.01	14.0	0.13	44.2	0.14	0.09	0.29	99.3	84.9
Jor-46-N	40.4	0.01	14.2	0.19	44.7	0.13	0.04	0.34	100.1	84.9
Jor-46-N	40.5	n.d.	14.2	0.25	44.8	0.13	0.04	0.25	100.1	84.9
Jor-46-N	40.2	0.02	14.1	0.16	44.6	0.11	n.d.	0.28	99.6	84.9
Jor-46-N	40.2	0.04	14.2	0.15	44.5	0.12	n.d.	0.37	99.6	84.8
Jor-46-N	40.3	n.d.	14.3	0.22	44.6	0.14	n.d.	0.31	99.9	84.8
Jor-46-N	40.3	0.03	14.3	0.18	44.6	0.14	n.d.	0.29	99.8	84.8
Jor-46-N	40.2	0.02	14.3	0.22	44.6	0.14	0.04	0.30	99.8	84.7
Jor-46-N	41.1	n.d.	14.4	0.17	44.9	0.13	0.04	0.24	101.1	84.7
Jor-46-N	39.7	0.02	14.3	0.18	44.4	0.12	0.04	0.29	99.1	84.7
Jor-46-N	40.7	n.d.	14.4	0.12	44.7	0.15	n.d.	0.23	100.3	84.7
Jor-46-N	40.5	0.02	14.4	0.26	44.6	0.14	n.d.	0.27	100.3	84.7
Jor-46-N	41.0	0.01	14.6	0.13	45.2	0.14	n.d.	0.29	101.4	84.7
Jor-46-N	40.5	n.d.	14.4	0.15	44.7	0.13	n.d.	0.28	100.2	84.7
Jor-46-N	41.0	0.13	14.2	0.17	44.0	0.15	n.d.	0.28	99.9	84.7
Jor-46-N	40.3	0.01	14.3	0.16	44.4	0.12	0.03	0.35	99.7	84.7
Jor-46-N	40.4	n.d.	14.2	0.23	43.9	0.14	0.04	0.24	99.2	84.6
Jor-46-N	39.9	n.d.	14.2	0.15	44.0	0.10	0.04	0.46	98.9	84.6
Jor-46-N	40.8	n.d.	14.5	0.13	44.7	0.14	0.03	0.30	100.6	84.6
Jor-46-N	40.2	n.d.	14.4	0.18	44.4	0.12	n.d.	0.29	99.7	84.6
Jor-46-N	40.3	n.d.	14.5	0.27	44.8	0.14	n.d.	0.24	100.2	84.6
Jor-46-N	40.5	0.01	14.4	0.20	44.4	0.14	0.04	0.25	100.0	84.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-46-N	40.3	0.03	14.3	0.18	44.2	0.12	0.04	0.39	99.6	84.6
Jor-46-N	40.6	n.d.	14.4	0.16	44.2	0.13	n.d.	0.30	99.8	84.6
Jor-46-N	39.5	0.01	14.4	0.12	44.3	0.13	n.d.	0.35	98.7	84.6
Jor-46-N	40.5	n.d.	14.3	0.19	44.1	0.14	n.d.	0.26	99.5	84.6
Jor-46-N	40.1	n.d.	14.4	0.21	44.1	0.13	n.d.	0.24	99.2	84.6
Jor-46-N	40.8	0.02	14.5	0.20	44.6	0.14	n.d.	0.25	100.5	84.6
Jor-46-N	40.3	0.02	14.5	0.20	44.3	0.14	n.d.	0.28	99.8	84.5
Jor-46-N	40.1	n.d.	14.4	0.26	44.1	0.14	n.d.	0.24	99.3	84.5
Jor-46-N	40.7	n.d.	14.6	0.15	44.4	0.12	n.d.	0.30	100.2	84.4
Jor-46-N	40.6	n.d.	14.7	0.21	44.5	0.14	n.d.	0.22	100.4	84.4
Jor-46-N	40.5	n.d.	14.5	0.30	44.1	0.11	n.d.	0.34	99.9	84.4
Jor-46-N	40.2	n.d.	14.6	0.19	44.2	0.14	n.d.	0.21	99.6	84.4
Jor-46-N	40.3	n.d.	14.6	0.19	44.0	0.13	n.d.	0.26	99.5	84.3
Jor-46-N	40.4	n.d.	14.8	0.23	44.5	0.13	0.23	0.32	100.5	84.3
Jor-46-N	40.3	0.03	14.6	0.20	44.0	0.14	n.d.	0.24	99.6	84.3
Jor-46-N	40.4	0.02	14.8	0.17	44.4	0.14	0.03	0.22	100.2	84.3
Jor-46-N	40.6	n.d.	14.8	0.13	44.5	0.12	n.d.	0.35	100.6	84.3
Jor-46-N	40.4	n.d.	14.8	0.18	44.3	0.13	n.d.	0.24	100.0	84.3
Jor-46-N	40.4	n.d.	14.6	0.16	43.7	0.14	0.05	0.22	99.3	84.2
Jor-46-N	40.4	0.02	14.8	0.15	44.4	0.14	n.d.	0.22	100.1	84.2
Jor-46-N	40.3	n.d.	14.8	0.17	44.1	0.14	n.d.	0.27	99.7	84.2
Jor-46-N	40.7	n.d.	15.0	0.12	44.7	0.14	n.d.	0.24	100.8	84.2
Jor-46-N	40.5	0.01	14.9	0.19	44.4	0.14	0.05	0.23	100.4	84.2
Jor-46-N	40.4	n.d.	14.9	0.16	44.1	0.16	0.03	0.19	100.0	84.1
Jor-46-N	40.4	0.02	14.9	0.19	44.1	0.15	n.d.	0.30	100.0	84.1
Jor-46-N	44.0	0.08	16.1	0.21	47.4	0.15	n.d.	0.16	108.1	84.0
Jor-46-N	40.4	n.d.	15.0	0.18	44.0	0.15	0.05	0.24	100.0	84.0
Jor-46-N	40.2	0.02	14.9	0.20	43.7	0.15	n.d.	0.22	99.3	83.9
Jor-46-N	40.0	0.01	15.0	0.23	43.9	0.16	n.d.	0.20	99.6	83.9
Jor-46-N	40.2	0.01	15.1	0.23	44.3	0.15	0.17	0.24	100.4	83.9
Jor-46-N	40.4	n.d.	15.1	0.22	43.9	0.14	0.03	0.19	100.0	83.8
Jor-46-N	40.0	0.01	15.0	0.14	43.5	0.16	0.03	0.18	99.0	83.8
Jor-46-N	40.2	0.02	15.1	0.18	43.5	0.10	n.d.	0.35	99.5	83.7
Jor-46-N	40.0	0.01	15.2	0.22	43.4	0.14	n.d.	0.22	99.2	83.6
Jor-46-N	40.0	0.01	15.3	0.21	43.7	0.13	0.08	0.25	99.6	83.6
Jor-46-N	40.3	n.d.	15.3	0.21	43.6	0.16	n.d.	0.20	99.7	83.6
Jor-46-N	40.2	n.d.	15.4	0.20	43.6	0.15	n.d.	0.17	99.8	83.5
Jor-46-N	40.2	n.d.	15.3	0.18	43.3	0.17	0.04	0.14	99.3	83.5
Jor-46-N	39.9	0.02	15.5	0.13	43.7	0.15	n.d.	0.20	99.6	83.4
Jor-46-N	40.8	0.01	15.7	0.21	43.7	0.18	n.d.	0.17	100.8	83.2
Jor-46-N	37.6	0.03	16.4	0.24	45.1	0.19	0.03	0.11	99.8	83.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
Jor-46-N	40.0	n.d.	15.6	0.23	42.9	0.17	n.d.	0.17	99.1	83.0
Jor-46-N	39.8	n.d.	15.9	0.16	43.4	0.15	n.d.	0.17	99.6	82.9
Jor-46-N	40.2	0.01	16.1	0.23	43.2	0.15	n.d.	0.19	100.1	82.7
Jor-46-N	39.9	0.02	15.9	0.21	42.8	0.16	n.d.	0.15	99.1	82.7
Jor-46-N	40.4	n.d.	16.2	0.21	43.2	0.18	0.07	0.15	100.3	82.6
Jor-46-N	40.1	0.04	16.0	0.20	42.6	0.18	n.d.	0.12	99.2	82.6
Jor-46-N	40.1	n.d.	16.2	0.20	43.1	0.16	n.d.	0.14	99.9	82.5
Jor-46-N	39.9	n.d.	16.4	0.17	43.2	0.17	n.d.	0.12	100.0	82.4
Jor-46-N	40.8	0.01	16.5	0.20	43.0	0.19	n.d.	0.15	100.9	82.3
Jor-46-N	40.2	0.01	16.5	0.15	42.7	0.19	n.d.	0.12	99.8	82.2
Jor-46-N	39.9	0.02	16.5	0.19	42.7	0.21	n.d.	0.11	99.7	82.2
Jor-46-N	40.1	0.01	16.5	0.26	42.5	0.18	n.d.	0.06	99.6	82.1
Jor-46-N	40.0	0.01	17.1	0.28	42.6	0.18	n.d.	0.12	100.2	81.7
Jor-46-N	40.0	0.02	17.2	0.31	42.4	0.18	n.d.	0.09	100.1	81.5
TAN-19I	40.3	0.05	10.4	0.16	47.5	0.12	0.04	0.54	99.2	89.1
TAN-19I	40.9	0.02	10.5	0.19	46.8	0.11	0.05	0.51	99.0	88.8
TAN-19I	41.5	0.03	10.7	0.11	47.5	0.10	0.06	0.50	100.5	88.8
TAN-19I	40.9	0.02	10.8	0.14	47.6	0.11	n.d.	0.51	100.1	88.8
TAN-19I	40.9	n.d.	10.6	0.21	47.0	0.12	0.05	0.53	99.4	88.8
TAN-19I	41.0	0.01	10.6	n.d.	47.0	0.10	n.d.	0.52	99.4	88.7
TAN-19I	40.8	0.02	10.6	0.17	46.9	0.11	n.d.	0.47	99.1	88.7
TAN-19I	41.4	0.02	10.8	0.19	47.7	0.11	0.09	0.49	100.7	88.7
TAN-19I	41.0	0.02	10.7	0.20	47.1	0.12	0.04	0.49	99.6	88.7
TAN-19I	41.1	0.03	10.7	n.d.	47.0	0.10	0.06	0.52	99.5	88.7
TAN-19I	40.7	0.02	10.7	0.15	47.0	0.10	0.03	0.53	99.3	88.6
TAN-19I	40.3	0.04	10.8	0.13	47.4	0.10	n.d.	0.55	99.4	88.6
TAN-19I	41.2	0.02	10.8	0.11	47.1	0.12	0.08	0.47	99.9	88.6
TAN-19I	40.9	0.01	10.8	0.14	47.2	0.10	0.07	0.47	99.7	88.6
TAN-19I	40.9	0.03	10.8	0.19	47.2	0.11	0.04	0.50	99.8	88.6
TAN-19I	41.6	0.03	10.9	0.13	47.3	0.11	0.06	0.52	100.6	88.5
TAN-19I	40.8	0.03	10.8	0.10	46.8	0.12	0.04	0.49	99.2	88.5
TAN-19I	40.8	0.02	10.9	0.13	47.1	0.12	0.04	0.54	99.6	88.5
TAN-19I	41.2	0.02	10.9	n.d.	47.2	0.13	0.04	0.46	100.1	88.5
TAN-19I	40.6	0.01	10.9	0.12	47.0	0.11	0.03	0.51	99.2	88.5
TAN-19I	40.9	0.02	10.9	0.16	47.1	0.11	n.d.	0.50	99.7	88.5
TAN-19I	41.0	0.01	10.8	0.18	46.8	0.10	n.d.	0.52	99.5	88.5
TAN-19I	41.1	0.02	10.9	n.d.	47.0	0.11	0.05	0.48	99.7	88.5
TAN-19I	40.5	0.02	10.9	0.15	47.1	0.11	0.03	0.51	99.3	88.5
TAN-19I	40.5	0.02	10.9	0.15	47.2	0.11	0.04	0.54	99.5	88.5
TAN-19I	40.6	0.02	10.9	0.14	46.9	0.10	n.d.	0.52	99.2	88.5
TAN-19I	40.9	0.01	10.9	0.11	47.1	0.11	n.d.	0.51	99.6	88.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	41.3	0.02	10.9	0.15	46.9	0.11	0.04	0.45	99.8	88.5
TAN-19I	40.6	0.02	11.0	0.16	47.1	0.11	n.d.	0.51	99.5	88.5
TAN-19I	40.5	0.02	11.0	0.24	47.1	0.11	0.03	0.52	99.5	88.4
TAN-19I	40.6	0.02	11.0	0.15	47.0	0.11	0.04	0.48	99.4	88.4
TAN-19I	41.4	0.03	11.0	0.16	47.1	0.13	0.03	0.48	100.2	88.4
TAN-19I	41.3	0.03	11.0	0.13	47.2	0.11	n.d.	0.46	100.2	88.4
TAN-19I	41.0	0.02	10.9	0.13	47.0	0.11	0.08	0.53	99.8	88.4
TAN-19I	41.2	0.03	11.0	0.16	47.0	0.12	n.d.	0.49	100.1	88.4
TAN-19I	40.7	0.03	10.9	0.15	46.8	0.11	0.04	0.52	99.3	88.4
TAN-19I	40.7	0.02	11.0	0.20	47.1	0.10	0.05	0.53	99.7	88.4
TAN-19I	40.7	0.02	11.0	0.15	47.0	0.12	n.d.	0.51	99.5	88.4
TAN-19I	40.9	0.01	11.0	0.17	47.1	0.11	0.03	0.49	99.8	88.4
TAN-19I	40.9	0.02	11.0	n.d.	47.0	0.11	0.05	0.51	99.7	88.4
TAN-19I	40.8	n.d.	11.0	n.d.	46.9	0.11	n.d.	0.48	99.4	88.4
TAN-19I	41.0	0.02	11.1	0.14	47.2	0.12	0.03	0.48	100.1	88.4
TAN-19I	40.8	0.02	11.0	0.17	46.9	0.10	0.04	0.50	99.5	88.3
TAN-19I	40.9	0.02	11.1	0.12	47.0	0.12	0.05	0.51	99.8	88.3
TAN-19I	41.0	0.03	11.1	0.14	47.1	0.10	n.d.	0.52	100.1	88.3
TAN-19I	41.0	0.02	11.1	0.13	46.9	0.13	0.03	0.53	99.8	88.3
TAN-19I	40.7	n.d.	11.1	0.14	46.9	0.12	n.d.	0.50	99.5	88.3
TAN-19I	40.5	0.01	11.1	0.19	46.7	0.12	0.04	0.52	99.2	88.3
TAN-19I	40.7	0.03	11.2	0.20	47.3	0.11	0.11	0.55	100.3	88.3
TAN-19I	40.6	0.03	11.1	0.15	46.8	0.10	0.05	0.48	99.3	88.3
TAN-19I	40.7	0.02	11.1	0.13	47.0	0.10	0.03	0.51	99.7	88.3
TAN-19I	40.7	0.02	11.2	0.16	47.0	0.11	0.05	0.48	99.8	88.2
TAN-19I	40.6	0.02	11.1	0.20	46.6	0.11	n.d.	0.42	99.0	88.2
TAN-19I	41.1	0.02	11.2	0.19	47.3	0.10	0.04	0.50	100.6	88.2
TAN-19I	40.7	0.01	11.1	0.17	46.8	0.10	0.04	0.50	99.5	88.2
TAN-19I	40.8	0.02	11.2	0.16	47.0	0.11	0.05	0.51	99.8	88.2
TAN-19I	40.8	0.02	11.2	n.d.	46.9	0.11	0.04	0.50	99.6	88.2
TAN-19I	40.9	0.02	11.2	0.17	47.1	0.10	n.d.	0.49	100.1	88.2
TAN-19I	41.1	0.02	11.2	0.17	46.9	0.13	n.d.	0.40	100.0	88.2
TAN-19I	41.0	0.02	11.2	0.11	46.7	0.11	0.05	0.50	99.7	88.2
TAN-19I	40.9	0.02	11.1	0.19	46.3	0.12	0.05	0.47	99.1	88.2
TAN-19I	40.7	0.01	11.3	0.22	47.1	0.10	0.05	0.53	100.0	88.1
TAN-19I	40.7	0.02	11.1	0.16	46.4	0.11	n.d.	0.50	99.1	88.1
TAN-19I	41.1	0.03	11.2	0.17	46.8	0.11	0.09	0.50	100.1	88.1
TAN-19I	40.5	0.02	11.3	0.12	46.8	0.10	n.d.	0.49	99.3	88.1
TAN-19I	40.6	0.02	11.2	0.16	46.8	0.11	0.11	0.48	99.4	88.1
TAN-19I	40.9	0.02	11.3	0.18	46.8	0.10	n.d.	0.50	99.7	88.1
TAN-19I	41.1	0.02	11.3	0.16	46.8	0.12	0.05	0.43	100.0	88.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	40.8	0.02	11.3	0.14	46.9	0.11	n.d.	0.48	99.7	88.1
TAN-19I	40.7	0.03	11.3	0.19	46.9	0.11	0.03	0.51	99.7	88.1
TAN-19I	40.6	0.01	11.3	0.12	46.9	0.12	0.03	0.49	99.6	88.1
TAN-19I	40.6	0.01	11.2	0.23	46.4	0.11	0.06	0.49	99.2	88.1
TAN-19I	40.5	0.03	11.3	0.19	46.8	0.12	0.04	0.43	99.5	88.0
TAN-19I	40.3	0.02	11.3	0.17	46.7	0.11	0.07	0.50	99.2	88.0
TAN-19I	40.7	0.02	11.3	0.16	46.5	0.12	0.07	0.49	99.3	88.0
TAN-19I	40.4	0.02	11.3	0.11	46.6	0.11	0.03	0.44	99.0	88.0
TAN-19I	40.5	0.03	11.4	0.21	46.7	0.12	0.07	0.51	99.5	88.0
TAN-19I	40.7	0.02	11.4	0.18	46.7	0.11	n.d.	0.48	99.6	88.0
TAN-19I	41.2	0.03	11.4	0.15	46.8	0.12	0.04	0.42	100.2	88.0
TAN-19I	40.7	0.02	11.4	0.16	46.6	0.11	n.d.	0.41	99.3	87.9
TAN-19I	40.9	0.01	11.5	0.14	46.9	0.11	0.08	0.51	100.1	87.9
TAN-19I	41.1	0.03	11.6	0.25	47.4	0.12	n.d.	0.37	100.9	87.9
TAN-19I	40.5	0.01	11.4	0.14	46.6	0.13	0.03	0.41	99.2	87.9
TAN-19I	40.6	0.02	11.5	0.12	46.9	0.10	0.03	0.49	99.8	87.9
TAN-19I	40.3	0.02	11.5	0.12	46.6	0.11	0.03	0.42	99.1	87.9
TAN-19I	40.2	0.06	11.8	0.14	48.1	0.14	n.d.	0.36	100.9	87.9
TAN-19I	40.5	0.02	11.5	0.14	46.7	0.12	0.04	0.46	99.4	87.8
TAN-19I	40.5	0.03	11.5	0.12	46.5	0.11	n.d.	0.46	99.2	87.8
TAN-19I	40.5	0.02	11.5	0.19	46.5	0.11	n.d.	0.50	99.3	87.8
TAN-19I	41.0	0.02	11.5	0.14	46.6	0.12	n.d.	0.47	100.0	87.8
TAN-19I	40.8	0.02	11.5	0.25	46.3	0.11	n.d.	0.51	99.4	87.8
TAN-19I	40.8	0.03	11.6	0.16	46.7	0.11	0.09	0.40	99.8	87.8
TAN-19I	40.7	n.d.	11.6	0.14	46.5	0.11	n.d.	0.46	99.6	87.8
TAN-19I	40.9	0.03	11.6	0.15	46.7	0.11	n.d.	0.45	100.1	87.7
TAN-19I	41.2	0.02	11.7	0.15	46.9	0.12	n.d.	0.41	100.5	87.7
TAN-19I	40.7	0.02	11.6	n.d.	46.6	0.10	n.d.	0.54	99.7	87.7
TAN-19I	40.5	0.01	11.6	0.19	46.5	0.11	0.05	0.42	99.4	87.7
TAN-19I	40.6	0.02	11.6	0.16	46.6	0.12	0.04	0.41	99.6	87.7
TAN-19I	41.3	0.01	11.7	0.18	46.4	0.11	n.d.	0.38	100.1	87.6
TAN-19I	40.5	0.02	11.7	0.10	46.3	0.11	0.04	0.45	99.2	87.6
TAN-19I	40.5	0.02	11.8	0.14	46.7	0.12	0.04	0.38	99.7	87.6
TAN-19I	40.5	0.03	11.7	0.16	46.3	0.12	n.d.	0.46	99.3	87.6
TAN-19I	40.4	0.03	11.7	0.18	46.3	0.12	n.d.	0.36	99.1	87.6
TAN-19I	40.3	0.01	11.7	0.12	46.3	0.12	0.04	0.45	99.1	87.6
TAN-19I	40.9	0.02	11.8	0.15	46.5	0.11	n.d.	0.38	100.0	87.6
TAN-19I	40.5	0.01	11.8	0.19	46.4	0.12	n.d.	0.38	99.4	87.5
TAN-19I	40.6	0.02	11.8	0.16	46.3	0.13	n.d.	0.48	99.5	87.5
TAN-19I	41.2	0.02	11.8	0.20	46.3	0.12	0.05	0.38	100.0	87.5
TAN-19I	41.1	0.02	11.9	0.14	46.5	0.11	n.d.	0.37	100.2	87.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	41.2	0.02	11.8	0.12	46.4	0.11	n.d.	0.36	100.0	87.5
TAN-19I	40.2	0.01	11.8	0.15	46.3	0.13	n.d.	0.39	99.1	87.5
TAN-19I	40.8	n.d.	11.9	0.20	46.4	0.12	n.d.	0.36	99.8	87.4
TAN-19I	41.3	0.02	11.9	0.18	46.5	0.12	0.03	0.39	100.4	87.4
TAN-19I	40.4	0.01	11.9	0.18	46.3	0.11	n.d.	0.45	99.4	87.4
TAN-19I	40.6	0.01	11.9	0.20	46.3	0.12	n.d.	0.34	99.5	87.4
TAN-19I	40.4	0.02	11.9	0.20	46.3	0.11	n.d.	0.41	99.4	87.4
TAN-19I	41.1	0.04	11.8	0.14	46.0	0.13	0.05	0.37	99.7	87.4
TAN-19I	40.9	0.02	11.9	0.23	46.3	0.10	n.d.	0.38	99.9	87.4
TAN-19I	40.7	0.01	12.0	0.18	46.4	0.11	0.04	0.38	99.8	87.4
TAN-19I	40.4	n.d.	11.9	0.20	46.0	0.10	0.03	0.36	99.0	87.4
TAN-19I	41.1	0.02	11.9	0.17	46.0	0.12	0.05	0.46	99.8	87.3
TAN-19I	41.2	n.d.	12.1	0.13	46.4	0.10	0.03	0.36	100.3	87.3
TAN-19I	40.2	0.03	12.0	0.16	46.1	0.13	n.d.	0.34	99.0	87.2
TAN-19I	41.3	0.04	12.0	0.16	46.0	0.10	0.03	0.42	100.0	87.2
TAN-19I	41.0	0.02	12.1	0.24	46.4	0.11	0.03	0.37	100.3	87.2
TAN-19I	40.9	0.02	12.0	0.13	46.0	0.11	n.d.	0.34	99.6	87.2
TAN-19I	40.3	0.01	12.0	0.16	46.0	0.11	0.04	0.38	99.0	87.2
TAN-19I	41.1	0.02	12.2	0.16	46.8	0.11	n.d.	0.40	100.9	87.2
TAN-19I	40.7	n.d.	12.1	0.15	46.3	0.11	0.04	0.36	99.8	87.2
TAN-19I	40.3	0.03	12.1	0.17	46.1	0.11	0.05	0.37	99.3	87.2
TAN-19I	40.8	0.02	12.2	0.11	46.5	0.11	0.05	0.39	100.3	87.2
TAN-19I	40.6	0.02	12.1	0.20	45.9	0.11	0.04	0.37	99.4	87.1
TAN-19I	40.5	0.02	12.1	0.17	45.9	0.12	n.d.	0.38	99.3	87.1
TAN-19I	40.6	0.16	12.2	0.15	46.4	0.11	n.d.	0.40	100.1	87.1
TAN-19I	40.4	0.01	12.2	0.16	46.1	0.11	0.05	0.39	99.3	87.1
TAN-19I	40.2	0.02	12.2	0.19	46.2	0.11	n.d.	0.38	99.3	87.1
TAN-19I	41.4	0.02	12.2	0.12	46.1	0.13	n.d.	0.34	100.3	87.1
TAN-19I	40.6	0.03	12.2	0.18	46.0	0.11	n.d.	0.32	99.5	87.1
TAN-19I	40.8	0.01	12.4	0.16	46.6	0.12	0.04	0.31	100.4	87.0
TAN-19I	40.3	0.02	12.3	0.17	46.0	0.12	n.d.	0.32	99.2	87.0
TAN-19I	40.4	0.02	12.3	0.14	46.1	0.12	n.d.	0.35	99.4	87.0
TAN-19I	40.1	0.01	12.3	0.22	45.9	0.14	0.03	0.32	99.0	87.0
TAN-19I	40.7	0.02	12.3	0.25	46.1	0.13	n.d.	0.32	99.9	87.0
TAN-19I	40.5	0.01	12.2	0.16	45.8	0.13	n.d.	0.30	99.1	87.0
TAN-19I	40.5	0.03	12.3	0.18	46.0	0.12	0.07	0.36	99.6	87.0
TAN-19I	40.5	n.d.	12.3	0.19	46.1	0.12	0.04	0.34	99.6	87.0
TAN-19I	40.4	0.02	12.3	0.13	45.9	0.12	n.d.	0.31	99.2	87.0
TAN-19I	40.5	n.d.	12.3	0.17	46.0	0.12	n.d.	0.31	99.4	87.0
TAN-19I	40.4	0.03	12.3	0.15	46.0	0.10	0.04	0.43	99.3	87.0
TAN-19I	40.3	0.03	12.3	0.14	45.8	0.11	n.d.	0.35	99.0	86.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	40.6	0.03	12.4	0.14	46.1	0.11	n.d.	0.37	99.8	86.9
TAN-19I	40.3	0.02	12.3	0.16	45.9	0.12	n.d.	0.33	99.2	86.9
TAN-19I	40.6	n.d.	12.4	0.12	46.0	0.11	0.03	0.47	99.7	86.9
TAN-19I	40.5	0.02	12.3	0.16	45.9	0.12	n.d.	0.37	99.4	86.9
TAN-19I	40.5	0.03	12.5	0.22	46.3	0.12	n.d.	0.32	99.9	86.9
TAN-19I	40.2	0.02	12.4	0.15	45.9	0.11	0.03	0.37	99.1	86.9
TAN-19I	40.5	0.03	12.4	0.16	46.0	0.11	0.13	0.33	99.7	86.9
TAN-19I	40.1	0.03	12.4	0.21	45.9	0.13	0.03	0.37	99.2	86.8
TAN-19I	40.3	0.02	12.4	0.20	45.7	0.13	0.04	0.26	99.0	86.8
TAN-19I	40.5	0.03	12.5	0.22	46.0	0.12	0.04	0.30	99.7	86.8
TAN-19I	40.5	0.04	12.5	0.17	46.0	0.12	0.04	0.34	99.6	86.8
TAN-19I	40.3	0.01	12.4	0.14	45.7	0.13	n.d.	0.34	99.0	86.8
TAN-19I	40.6	0.02	12.4	0.19	45.8	0.11	n.d.	0.34	99.5	86.8
TAN-19I	40.1	0.03	12.5	0.25	46.1	0.12	0.04	0.33	99.4	86.7
TAN-19I	40.2	0.01	12.5	0.23	45.9	0.12	n.d.	0.34	99.4	86.7
TAN-19I	40.8	0.02	12.6	0.19	46.1	0.12	n.d.	0.31	100.2	86.7
TAN-19I	40.6	0.03	12.6	0.22	46.4	0.13	0.04	0.38	100.4	86.7
TAN-19I	40.5	n.d.	12.5	0.20	45.9	0.13	n.d.	0.31	99.6	86.7
TAN-19I	40.4	0.02	12.6	0.13	45.9	0.12	0.04	0.28	99.5	86.7
TAN-19I	40.7	0.03	12.6	0.18	46.0	0.11	0.03	0.32	99.9	86.7
TAN-19I	40.4	0.01	12.5	0.20	45.5	0.12	n.d.	0.33	99.1	86.7
TAN-19I	40.3	0.02	12.5	0.17	45.6	0.12	0.03	0.31	99.0	86.7
TAN-19I	40.6	0.02	12.7	0.20	46.0	0.12	0.04	0.33	100.0	86.6
TAN-19I	40.4	0.01	12.5	0.14	45.5	0.12	n.d.	0.29	99.1	86.6
TAN-19I	40.3	0.02	12.6	0.19	45.8	0.11	n.d.	0.35	99.4	86.6
TAN-19I	40.7	0.02	12.6	0.19	45.8	0.14	0.03	0.30	99.8	86.6
TAN-19I	40.5	0.02	12.6	0.14	45.8	0.12	n.d.	0.32	99.4	86.6
TAN-19I	40.2	0.01	12.6	0.17	45.7	0.12	n.d.	0.27	99.1	86.6
TAN-19I	40.6	0.02	12.6	0.18	45.7	0.11	n.d.	0.33	99.6	86.6
TAN-19I	40.1	0.02	12.6	0.20	45.7	0.12	n.d.	0.34	99.2	86.6
TAN-19I	40.6	0.03	12.7	n.d.	45.9	0.13	0.04	0.32	99.8	86.6
TAN-19I	40.5	0.03	12.6	0.15	45.7	0.12	0.06	0.41	99.6	86.6
TAN-19I	40.2	0.03	12.6	0.16	45.6	0.13	0.05	0.30	99.1	86.6
TAN-19I	40.3	0.02	12.7	0.18	45.8	0.12	0.06	0.31	99.5	86.6
TAN-19I	40.4	0.02	12.7	0.22	45.7	0.13	0.04	0.31	99.5	86.5
TAN-19I	40.2	0.01	12.7	0.15	45.7	0.12	0.04	0.27	99.2	86.5
TAN-19I	40.3	0.03	12.6	0.21	45.5	0.12	0.05	0.29	99.2	86.5
TAN-19I	40.6	0.03	12.8	n.d.	45.9	0.12	0.03	0.31	99.8	86.5
TAN-19I	40.5	n.d.	12.6	0.21	45.4	0.13	0.05	0.33	99.3	86.5
TAN-19I	40.2	0.02	12.7	0.19	45.7	0.12	n.d.	0.22	99.3	86.5
TAN-19I	40.1	0.04	12.8	0.18	45.9	0.12	0.05	0.32	99.5	86.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	40.6	0.03	12.8	0.19	45.9	0.13	0.04	0.29	100.0	86.5
TAN-19I	40.0	0.03	12.8	0.18	45.8	0.12	0.05	0.35	99.3	86.5
TAN-19I	40.2	n.d.	12.7	0.12	45.6	0.12	0.04	0.33	99.2	86.4
TAN-19I	40.5	0.02	12.9	0.24	46.0	0.13	0.13	0.36	100.2	86.4
TAN-19I	40.7	n.d.	12.8	0.16	45.7	0.11	n.d.	0.34	99.8	86.4
TAN-19I	40.5	0.02	12.8	0.24	45.6	0.11	0.05	0.29	99.6	86.4
TAN-19I	40.2	0.02	12.8	0.23	45.7	0.14	n.d.	0.29	99.4	86.4
TAN-19I	40.6	0.02	12.8	0.20	45.5	0.12	n.d.	0.30	99.5	86.4
TAN-19I	40.6	0.02	12.8	0.23	45.6	0.12	n.d.	0.26	99.7	86.4
TAN-19I	40.4	0.02	12.8	0.24	45.6	0.12	n.d.	0.28	99.5	86.4
TAN-19I	40.7	0.02	12.9	0.21	45.8	0.12	0.04	0.34	100.1	86.4
TAN-19I	40.5	0.02	13.0	0.15	46.0	0.13	0.03	0.32	100.1	86.4
TAN-19I	40.1	n.d.	12.9	0.25	45.6	0.12	0.03	0.34	99.4	86.4
TAN-19I	40.5	0.02	12.9	0.15	45.6	0.13	0.03	0.27	99.6	86.4
TAN-19I	40.5	0.03	12.8	0.25	45.5	0.12	n.d.	0.30	99.6	86.4
TAN-19I	40.4	0.02	12.9	0.21	45.8	0.12	n.d.	0.31	99.7	86.4
TAN-19I	40.4	0.03	12.8	0.17	45.5	0.12	n.d.	0.27	99.4	86.3
TAN-19I	40.5	0.02	12.9	0.17	45.6	0.13	0.03	0.33	99.6	86.3
TAN-19I	40.1	0.02	12.9	0.28	45.6	0.11	n.d.	0.26	99.2	86.3
TAN-19I	40.4	0.01	12.9	0.20	45.6	0.13	n.d.	0.33	99.7	86.3
TAN-19I	40.5	0.02	12.9	0.21	45.6	0.12	n.d.	0.32	99.7	86.3
TAN-19I	40.2	0.02	12.9	0.15	45.6	0.12	0.03	0.28	99.2	86.3
TAN-19I	40.7	0.02	13.0	0.26	45.7	0.12	0.09	0.30	100.2	86.2
TAN-19I	41.9	0.26	12.6	0.18	44.0	0.15	0.03	0.28	99.4	86.2
TAN-19I	40.4	0.02	13.0	0.22	45.4	0.13	0.04	0.25	99.4	86.2
TAN-19I	40.2	0.02	13.0	0.25	45.5	0.13	n.d.	0.25	99.4	86.1
TAN-19I	40.3	0.02	13.0	0.19	45.2	0.12	n.d.	0.23	99.0	86.1
TAN-19I	40.4	0.02	13.0	0.17	45.4	0.12	n.d.	0.30	99.5	86.1
TAN-19I	40.4	0.01	13.1	0.19	45.7	0.13	n.d.	0.30	99.8	86.1
TAN-19I	40.1	n.d.	13.0	0.20	45.2	0.12	0.03	0.21	99.0	86.1
TAN-19I	40.2	0.01	13.0	0.14	45.2	0.14	n.d.	0.22	99.0	86.1
TAN-19I	40.1	0.02	13.0	0.20	45.4	0.13	0.04	0.27	99.2	86.1
TAN-19I	41.0	0.02	13.2	0.14	45.8	0.12	n.d.	0.32	100.5	86.1
TAN-19I	40.0	0.01	13.1	0.19	45.7	0.12	0.06	0.25	99.4	86.1
TAN-19I	40.7	0.01	13.2	0.23	45.6	0.12	n.d.	0.33	100.1	86.1
TAN-19I	40.2	0.02	13.1	0.22	45.3	0.13	n.d.	0.20	99.2	86.0
TAN-19I	40.4	0.02	13.1	0.19	45.3	0.13	n.d.	0.29	99.5	86.0
TAN-19I	40.6	n.d.	13.2	0.18	45.5	0.13	n.d.	0.30	99.9	86.0
TAN-19I	40.1	0.03	13.2	0.14	45.5	0.12	n.d.	0.28	99.5	86.0
TAN-19I	40.2	0.03	13.2	0.17	45.3	0.14	n.d.	0.30	99.2	86.0
TAN-19I	40.2	0.01	13.3	0.19	45.3	0.13	0.04	0.26	99.5	85.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	40.2	n.d.	13.3	0.26	45.2	0.13	n.d.	0.19	99.3	85.9
TAN-19I	40.1	0.01	13.3	0.21	45.4	0.12	n.d.	0.25	99.5	85.9
TAN-19I	40.4	0.03	13.3	0.21	45.4	0.14	0.03	0.26	99.8	85.9
TAN-19I	40.6	n.d.	13.4	0.21	45.4	0.14	0.05	0.25	100.1	85.8
TAN-19I	40.4	0.02	13.4	0.17	45.3	0.14	n.d.	0.24	99.6	85.8
TAN-19I	40.4	0.02	13.4	0.17	45.3	0.12	n.d.	0.26	99.6	85.8
TAN-19I	40.4	0.02	13.4	0.19	45.2	0.12	0.04	0.26	99.6	85.8
TAN-19I	40.1	0.01	13.3	0.15	45.1	0.13	n.d.	0.25	99.1	85.8
TAN-19I	40.5	n.d.	13.4	0.18	45.1	0.14	0.05	0.24	99.6	85.8
TAN-19I	40.1	0.01	13.5	0.19	45.5	0.13	n.d.	0.22	99.7	85.8
TAN-19I	40.2	0.01	13.3	0.18	45.0	0.12	0.04	0.24	99.2	85.7
TAN-19I	40.2	0.02	13.4	0.19	45.2	0.13	n.d.	0.24	99.4	85.7
TAN-19I	40.2	0.01	13.4	0.18	45.2	0.15	n.d.	0.25	99.5	85.7
TAN-19I	40.4	n.d.	13.4	0.20	45.3	0.13	n.d.	0.23	99.7	85.7
TAN-19I	40.2	0.03	13.4	0.22	45.1	0.14	n.d.	0.25	99.3	85.7
TAN-19I	40.3	n.d.	13.4	0.19	45.1	0.12	n.d.	0.25	99.4	85.7
TAN-19I	40.3	0.02	13.5	0.19	45.4	0.12	n.d.	0.25	99.8	85.7
TAN-19I	40.8	n.d.	13.5	0.21	45.2	0.12	n.d.	0.21	100.0	85.7
TAN-19I	40.6	n.d.	13.4	0.17	45.1	0.12	n.d.	0.26	99.7	85.7
TAN-19I	39.9	0.01	13.4	0.23	45.0	0.12	0.07	0.24	99.0	85.7
TAN-19I	40.3	0.01	13.4	0.24	45.0	0.14	n.d.	0.22	99.3	85.7
TAN-19I	40.3	0.02	13.3	0.24	44.8	0.12	n.d.	0.25	99.1	85.7
TAN-19I	40.3	n.d.	13.5	0.21	45.2	0.12	0.04	0.28	99.7	85.6
TAN-19I	40.6	n.d.	13.6	0.23	45.4	0.14	n.d.	0.21	100.2	85.6
TAN-19I	40.3	n.d.	13.6	0.20	45.4	0.14	n.d.	0.20	99.8	85.6
TAN-19I	40.0	n.d.	13.5	0.18	45.0	0.14	n.d.	0.24	99.1	85.6
TAN-19I	40.1	n.d.	13.5	0.19	44.9	0.14	0.03	0.22	99.1	85.6
TAN-19I	40.3	0.01	13.5	0.21	44.9	0.13	0.07	0.22	99.4	85.6
TAN-19I	40.3	n.d.	13.6	0.19	45.4	0.14	n.d.	0.18	99.8	85.6
TAN-19I	40.2	n.d.	13.6	0.17	45.2	0.13	n.d.	0.22	99.6	85.5
TAN-19I	40.2	0.02	13.6	0.20	45.2	0.13	0.03	0.22	99.6	85.5
TAN-19I	40.3	n.d.	13.7	0.18	45.2	0.12	0.03	0.22	99.8	85.5
TAN-19I	39.9	0.01	13.6	0.26	45.1	0.14	0.04	0.20	99.2	85.5
TAN-19I	40.2	0.02	13.7	0.20	45.2	0.14	n.d.	0.22	99.7	85.5
TAN-19I	39.9	0.01	13.6	0.21	44.9	0.13	0.04	0.18	99.0	85.5
TAN-19I	39.8	n.d.	13.7	0.18	45.2	0.14	n.d.	0.24	99.3	85.4
TAN-19I	40.1	0.02	13.6	0.16	44.7	0.10	0.06	0.39	99.1	85.4
TAN-19I	40.3	0.01	13.6	0.16	44.8	0.13	0.04	0.20	99.2	85.4
TAN-19I	40.3	0.01	13.7	0.25	45.2	0.12	n.d.	0.36	100.0	85.4
TAN-19I	40.4	0.01	13.7	0.22	45.1	0.13	n.d.	0.24	99.9	85.4
TAN-19I	40.3	0.02	13.8	0.21	45.3	0.15	n.d.	0.21	100.0	85.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	40.4	n.d.	13.8	0.20	45.2	0.12	n.d.	0.21	99.9	85.4
TAN-19I	40.0	0.01	13.7	0.20	45.0	0.13	n.d.	0.22	99.2	85.4
TAN-19I	40.3	0.01	13.7	0.24	45.0	0.13	n.d.	0.21	99.6	85.4
TAN-19I	40.1	n.d.	13.8	0.19	44.9	0.14	n.d.	0.25	99.4	85.3
TAN-19I	40.1	0.01	13.9	0.29	45.2	0.13	0.05	0.20	99.9	85.3
TAN-19I	40.3	0.02	13.9	0.19	45.3	0.14	0.03	0.20	100.1	85.3
TAN-19I	40.1	0.02	13.7	0.19	44.7	0.14	n.d.	0.20	99.1	85.3
TAN-19I	40.3	0.02	13.8	0.19	44.9	0.12	n.d.	0.19	99.5	85.3
TAN-19I	40.1	0.01	14.0	0.24	45.2	0.14	n.d.	0.17	99.9	85.2
TAN-19I	40.1	0.02	13.9	0.25	45.0	0.14	n.d.	0.19	99.6	85.2
TAN-19I	40.3	n.d.	13.8	0.21	44.7	0.13	n.d.	0.20	99.4	85.2
TAN-19I	40.3	0.02	13.8	0.22	44.7	0.13	0.04	0.15	99.4	85.2
TAN-19I	40.3	n.d.	14.0	0.23	45.1	0.14	0.05	0.25	100.1	85.2
TAN-19I	40.4	n.d.	14.0	0.22	45.3	0.13	n.d.	0.25	100.3	85.2
TAN-19I	40.2	n.d.	13.9	0.25	44.7	0.13	0.04	0.23	99.4	85.2
TAN-19I	40.6	0.01	14.0	0.24	45.0	0.14	n.d.	0.22	100.2	85.2
TAN-19I	40.0	0.02	13.8	0.25	44.5	0.12	0.04	0.35	99.1	85.2
TAN-19I	40.1	0.02	13.9	0.23	44.7	0.14	0.03	0.23	99.4	85.1
TAN-19I	40.1	0.03	13.9	0.18	44.6	0.14	n.d.	0.21	99.2	85.1
TAN-19I	40.4	n.d.	13.9	0.23	44.7	0.14	n.d.	0.21	99.6	85.1
TAN-19I	40.3	n.d.	14.0	0.17	45.1	0.12	n.d.	0.20	100.0	85.1
TAN-19I	40.2	0.01	14.0	0.21	44.9	0.13	n.d.	0.24	99.7	85.1
TAN-19I	40.3	0.01	14.0	0.20	44.8	0.13	0.03	0.21	99.7	85.1
TAN-19I	40.1	n.d.	14.0	0.22	44.8	0.12	n.d.	0.21	99.5	85.1
TAN-19I	40.2	0.01	14.0	0.25	44.7	0.13	n.d.	0.22	99.5	85.1
TAN-19I	39.9	n.d.	14.0	0.26	44.8	0.12	n.d.	0.20	99.4	85.1
TAN-19I	40.2	n.d.	14.0	0.18	44.7	0.14	n.d.	0.18	99.4	85.0
TAN-19I	40.3	0.02	14.1	0.21	44.9	0.14	n.d.	0.22	99.8	85.0
TAN-19I	40.3	0.03	13.9	0.20	44.4	0.14	0.05	0.17	99.3	85.0
TAN-19I	40.2	0.01	14.1	0.17	45.0	0.12	n.d.	0.21	99.8	85.0
TAN-19I	40.3	0.01	14.1	0.19	44.8	0.12	0.03	0.18	99.6	85.0
TAN-19I	40.3	0.02	14.2	0.21	44.9	0.13	0.03	0.18	99.9	85.0
TAN-19I	40.4	0.02	14.1	0.26	44.8	0.14	0.04	0.19	100.0	84.9
TAN-19I	40.4	0.02	14.1	0.28	44.6	0.14	0.04	0.15	99.7	84.9
TAN-19I	40.2	0.01	14.1	0.22	44.5	0.13	n.d.	0.19	99.3	84.9
TAN-19I	40.2	0.03	14.2	0.16	44.6	0.13	n.d.	0.16	99.5	84.8
TAN-19I	40.4	0.02	14.3	0.24	44.7	0.13	n.d.	0.20	99.9	84.8
TAN-19I	40.3	0.02	14.2	0.22	44.6	0.14	n.d.	0.19	99.7	84.8
TAN-19I	40.1	n.d.	14.3	0.18	44.6	0.13	0.05	0.22	99.6	84.8
TAN-19I	40.4	0.05	14.4	0.21	45.0	0.11	0.06	0.25	100.4	84.8
TAN-19I	40.1	n.d.	14.3	0.18	44.7	0.13	n.d.	0.21	99.6	84.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	40.3	0.03	14.2	0.15	44.5	0.14	n.d.	0.19	99.5	84.8
TAN-19I	40.1	0.02	14.3	0.22	44.4	0.13	n.d.	0.19	99.3	84.7
TAN-19I	40.7	0.02	14.4	0.17	44.7	0.13	n.d.	0.18	100.3	84.7
TAN-19I	40.1	0.02	14.3	0.18	44.5	0.14	n.d.	0.20	99.5	84.7
TAN-19I	40.1	0.01	14.4	0.28	44.8	0.14	0.06	0.22	100.1	84.7
TAN-19I	40.2	0.02	14.3	0.21	44.4	0.14	n.d.	0.17	99.4	84.7
TAN-19I	40.2	0.01	14.4	0.19	44.3	0.13	n.d.	0.15	99.4	84.6
TAN-19I	40.1	0.01	14.4	0.21	44.2	0.13	n.d.	0.24	99.2	84.6
TAN-19I	40.0	0.02	14.5	0.20	44.4	0.13	n.d.	0.15	99.4	84.6
TAN-19I	40.4	0.01	14.5	0.21	44.5	0.14	n.d.	0.20	99.9	84.5
TAN-19I	40.0	0.02	14.5	0.22	44.3	0.14	n.d.	0.18	99.4	84.5
TAN-19I	40.1	0.02	14.5	0.21	44.3	0.15	n.d.	0.17	99.4	84.5
TAN-19I	40.1	0.01	14.5	0.21	44.3	0.15	n.d.	0.21	99.5	84.5
TAN-19I	40.3	0.02	14.6	0.16	44.4	0.12	0.04	0.20	99.8	84.4
TAN-19I	40.3	0.02	14.6	0.21	44.5	0.12	0.07	0.17	100.0	84.4
TAN-19I	40.1	n.d.	14.4	0.16	44.0	0.14	0.03	0.18	99.0	84.4
TAN-19I	40.0	0.02	14.5	0.23	44.0	0.14	n.d.	0.15	99.0	84.4
TAN-19I	40.1	0.02	14.7	0.20	44.5	0.13	n.d.	0.17	99.8	84.4
TAN-19I	40.2	0.01	14.6	0.28	44.3	0.13	n.d.	0.17	99.7	84.4
TAN-19I	40.2	0.01	14.7	0.13	44.5	0.14	0.05	0.16	99.8	84.4
TAN-19I	40.3	0.02	14.5	0.25	44.1	0.15	0.03	0.15	99.5	84.4
TAN-19I	40.3	0.01	14.7	0.16	44.4	0.14	0.05	0.20	99.9	84.3
TAN-19I	40.3	0.01	14.7	0.23	44.4	0.13	n.d.	0.14	100.0	84.3
TAN-19I	40.1	n.d.	14.8	0.27	44.5	0.14	n.d.	0.17	100.0	84.3
TAN-19I	40.0	n.d.	14.7	0.21	44.2	0.15	n.d.	0.18	99.5	84.3
TAN-19I	40.1	n.d.	14.8	0.20	44.2	0.12	0.04	0.19	99.7	84.2
TAN-19I	40.1	0.02	14.8	0.22	44.3	0.14	n.d.	0.20	99.7	84.2
TAN-19I	39.8	0.01	15.0	0.24	44.3	0.14	n.d.	0.17	99.6	84.1
TAN-19I	40.1	0.02	15.0	0.19	44.2	0.12	0.04	0.16	99.8	84.0
TAN-19I	40.1	n.d.	14.9	0.20	43.9	0.14	n.d.	0.16	99.4	84.0
TAN-19I	40.2	0.01	15.0	0.17	44.1	0.12	n.d.	0.25	99.8	83.9
TAN-19I	40.2	0.01	15.0	0.23	44.0	0.14	n.d.	0.17	99.8	83.9
TAN-19I	40.2	0.01	14.9	0.20	43.6	0.13	0.04	0.19	99.4	83.9
TAN-19I	40.0	0.01	15.1	0.22	44.1	0.14	0.03	0.18	99.7	83.9
TAN-19I	40.0	n.d.	15.1	0.25	44.2	0.13	n.d.	0.25	100.0	83.9
TAN-19I	39.9	n.d.	15.1	0.27	43.8	0.14	n.d.	0.14	99.3	83.8
TAN-19I	40.2	0.01	15.4	0.19	43.9	0.15	n.d.	0.17	100.1	83.5
TAN-19I	40.2	n.d.	15.4	0.25	43.7	0.14	0.04	0.15	100.0	83.5
TAN-19I	39.5	0.03	15.4	0.25	43.4	0.14	n.d.	0.12	99.0	83.4
TAN-19I	40.0	n.d.	15.5	0.21	43.6	0.15	n.d.	0.13	99.6	83.4
TAN-19I	40.1	0.02	15.6	0.26	43.4	0.16	n.d.	0.15	99.7	83.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	39.8	0.02	15.7	0.20	43.6	0.14	n.d.	0.15	99.7	83.1
TAN-19I	40.2	0.01	15.7	0.22	43.1	0.14	n.d.	0.15	99.4	83.1
TAN-19I	39.7	0.02	15.9	0.21	43.2	0.13	0.05	0.16	99.3	82.9
TAN-19I	40.0	n.d.	15.8	0.25	43.0	0.15	n.d.	0.10	99.3	82.9
TAN-19I	40.2	0.02	15.9	0.23	43.0	0.13	n.d.	0.14	99.6	82.9
TAN-19I	39.7	n.d.	16.2	0.18	43.8	0.15	n.d.	0.11	100.3	82.8
TAN-19I	40.0	n.d.	16.0	0.28	43.1	0.15	n.d.	0.12	99.6	82.8
TAN-19I	39.7	n.d.	15.9	0.22	42.9	0.14	n.d.	0.12	99.0	82.8
TAN-19I	39.8	0.02	16.0	0.30	42.7	0.16	n.d.	0.10	99.1	82.6
TAN-19I	40.0	n.d.	16.0	0.25	42.8	0.14	n.d.	0.12	99.3	82.6
TAN-19I	39.9	0.02	16.1	0.20	42.8	0.15	n.d.	0.12	99.2	82.6
TAN-19I	39.9	0.02	16.2	0.25	43.0	0.13	n.d.	0.16	99.7	82.5
TAN-19I	39.9	n.d.	16.2	0.24	43.0	0.14	n.d.	0.10	99.7	82.5
TAN-19I	39.9	n.d.	16.4	0.25	43.3	0.13	n.d.	0.11	100.1	82.5
TAN-19I	39.7	0.01	16.3	0.31	43.0	0.14	n.d.	0.08	99.6	82.4
TAN-19I	39.7	0.02	16.3	0.18	42.8	0.16	0.03	0.12	99.3	82.4
TAN-19I	39.8	0.02	16.3	0.21	42.7	0.15	n.d.	0.11	99.2	82.4
TAN-19I	39.7	0.02	16.5	0.20	42.9	0.16	n.d.	0.11	99.6	82.3
TAN-19I	39.8	0.02	16.3	0.26	42.5	0.14	n.d.	0.09	99.1	82.3
TAN-19I	40.2	0.03	16.6	0.21	43.2	0.15	n.d.	0.13	100.5	82.3
TAN-19I	40.4	0.03	16.6	0.25	43.2	0.15	0.07	0.09	100.8	82.3
TAN-19I	40.1	0.02	16.4	0.21	42.7	0.17	n.d.	0.12	99.8	82.2
TAN-19I	39.6	n.d.	16.4	0.25	42.6	0.14	n.d.	0.14	99.2	82.2
TAN-19I	40.0	0.02	16.8	0.33	43.5	0.14	n.d.	0.10	100.9	82.2
TAN-19I	40.0	0.01	16.6	0.22	42.9	0.14	n.d.	0.08	100.0	82.1
TAN-19I	39.5	n.d.	16.8	0.20	43.0	0.12	n.d.	0.16	99.7	82.1
TAN-19I	39.9	0.02	16.7	0.23	42.9	0.17	n.d.	0.10	100.1	82.0
TAN-19I	40.0	n.d.	16.8	0.22	42.9	0.15	n.d.	0.11	100.2	82.0
TAN-19I	39.5	0.02	16.6	0.22	42.4	0.17	n.d.	0.08	99.1	82.0
TAN-19I	40.1	n.d.	16.8	0.25	42.5	0.14	n.d.	0.12	100.0	81.8
TAN-19I	39.9	0.02	16.8	0.28	42.5	0.17	n.d.	0.10	99.9	81.8
TAN-19I	39.7	0.01	16.8	0.13	42.2	0.16	n.d.	0.11	99.1	81.8
TAN-19I	39.7	0.01	16.9	0.21	42.6	0.16	n.d.	0.13	99.7	81.8
TAN-19I	40.1	n.d.	17.2	0.26	42.4	0.17	n.d.	0.11	100.3	81.5
TAN-19I	39.6	0.02	17.3	0.25	42.3	0.16	n.d.	0.16	99.7	81.4
TAN-19I	40.1	0.02	17.4	0.28	42.2	0.17	n.d.	0.12	100.3	81.2
TAN-19I	40.4	0.07	17.2	0.30	41.4	0.15	n.d.	0.08	99.6	81.1
TAN-19I	39.2	0.02	18.0	0.34	41.3	0.17	0.04	0.08	99.1	80.3
TAN-19I	39.5	n.d.	18.1	0.31	41.2	0.17	n.d.	0.07	99.4	80.2
TAN-19I	39.7	0.03	18.3	0.28	41.4	0.18	n.d.	0.05	100.0	80.1
TAN-19I	39.0	0.03	18.3	0.25	41.2	0.20	n.d.	0.06	99.0	80.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-19I	39.7	0.02	18.5	0.26	40.8	0.20	n.d.	0.05	99.6	79.7
TAN-19I	39.3	0.01	18.8	0.31	41.4	0.16	n.d.	0.07	100.1	79.7
TAN-19I	39.5	0.02	18.7	0.36	41.0	0.19	n.d.	0.08	99.8	79.6
TAN-19I	39.7	n.d.	18.6	0.24	40.7	0.16	n.d.	0.09	99.4	79.6
TAN-19I	39.4	n.d.	18.8	0.39	40.9	0.15	n.d.	0.09	99.7	79.5
TAN-19I	39.1	0.02	19.2	0.30	40.7	0.18	n.d.	0.07	99.6	79.1
TAN-19I	40.6	0.76	18.8	0.26	39.1	0.31	n.d.	0.11	99.9	78.8
TAN-19I	39.1	n.d.	20.1	0.34	40.1	0.17	n.d.	0.11	99.8	78.1
TAN-19I	39.2	0.02	20.5	0.38	39.1	0.19	n.d.	0.12	99.4	77.3
TAN-19I	38.7	0.01	21.5	0.38	38.6	0.20	n.d.	0.04	99.4	76.2
TAN-19I	38.9	0.02	21.6	0.29	38.7	0.17	n.d.	0.04	99.7	76.2
TAN-19I	38.8	0.01	22.7	0.47	37.5	0.20	n.d.	0.07	99.7	74.7
NI-27b-I	41.3	0.02	11.3	0.19	46.4	0.11	0.08	0.41	99.9	87.9
NI-27b-I	40.8	0.02	12.2	0.12	46.5	0.11	n.d.	0.37	100.6	87.9
NI-27b-I	40.4	0.02	11.7	0.14	46.4	0.11	0.04	0.44	99.0	87.9
NI-27b-I	41.0	0.02	11.6	0.14	46.6	0.11	0.03	0.46	99.4	87.8
NI-27b-I	40.4	0.02	11.9	0.17	46.6	0.12	0.07	0.41	99.9	87.8
NI-27b-I	40.4	0.02	11.5	0.16	46.7	0.10	0.04	0.46	99.4	87.8
NI-27b-I	41.3	0.02	11.6	0.15	46.5	0.12	n.d.	0.43	100.1	87.8
NI-27b-I	40.5	0.02	11.6	0.14	46.4	0.11	0.04	0.45	99.5	87.7
NI-27b-I	41.0	0.02	11.8	0.14	46.6	0.11	n.d.	0.45	99.6	87.7
NI-27b-I	40.2	0.01	11.8	0.15	46.4	0.12	0.04	0.43	99.3	87.7
NI-27b-I	41.3	0.02	11.7	n.d.	46.5	0.11	0.04	0.43	100.2	87.7
NI-27b-I	40.8	0.01	11.7	0.15	46.4	0.12	0.04	0.44	99.4	87.7
NI-27b-I	40.7	0.03	11.6	0.17	46.4	0.11	0.05	0.46	99.3	87.7
NI-27b-I	41.2	0.02	12.0	0.23	46.4	0.11	n.d.	0.40	99.8	87.7
NI-27b-I	41.2	0.02	12.1	0.17	46.7	0.12	0.18	0.43	99.6	87.7
NI-27b-I	41.1	0.02	12.4	0.21	46.6	0.12	n.d.	0.39	100.6	87.7
NI-27b-I	41.1	0.01	12.1	0.17	46.6	0.12	0.03	0.45	100.3	87.6
NI-27b-I	41.2	0.01	12.2	0.16	46.7	0.11	0.05	0.51	100.8	87.6
NI-27b-I	41.2	0.02	11.8	0.19	46.7	0.12	n.d.	0.42	100.4	87.6
NI-27b-I	40.7	0.03	12.0	0.16	45.9	0.13	n.d.	0.40	99.4	87.6
NI-27b-I	40.6	0.02	12.1	0.19	46.3	0.11	0.10	0.40	99.0	87.6
NI-27b-I	40.7	0.02	12.2	0.24	46.3	0.12	0.04	0.38	100.2	87.6
NI-27b-I	41.0	0.02	12.1	0.18	46.5	0.11	0.04	0.39	100.4	87.6
NI-27b-I	41.1	0.02	11.8	0.15	46.5	0.12	0.06	0.42	99.3	87.6
NI-27b-I	41.2	0.02	12.1	0.13	46.2	0.10	0.04	0.45	99.4	87.6
NI-27b-I	40.6	0.02	12.0	0.11	45.7	0.13	0.04	0.40	99.2	87.6
NI-27b-I	41.1	0.02	12.1	0.14	46.1	0.11	0.05	0.42	99.2	87.6
NI-27b-I	40.7	0.02	11.6	0.18	46.4	0.12	0.06	0.45	99.5	87.6
NI-27b-I	40.4	0.03	11.7	0.15	46.5	0.11	0.07	0.44	99.5	87.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	40.9	0.02	11.8	0.15	46.3	0.12	n.d.	0.43	100.3	87.6
NI-27b-I	41.1	0.01	12.3	0.19	46.4	0.12	n.d.	0.41	99.6	87.6
NI-27b-I	41.4	0.01	11.8	0.15	46.5	0.11	0.04	0.42	100.4	87.6
NI-27b-I	41.1	0.01	12.1	0.11	46.3	0.12	0.03	0.43	99.6	87.6
NI-27b-I	40.5	0.02	11.9	0.18	46.4	0.11	0.05	0.43	99.3	87.6
NI-27b-I	41.0	0.02	11.8	0.15	46.5	0.11	0.03	0.41	100.0	87.6
NI-27b-I	40.5	0.16	11.8	0.17	46.4	0.13	n.d.	0.43	100.6	87.6
NI-27b-I	40.8	0.03	11.9	0.12	46.6	0.12	n.d.	0.45	100.6	87.6
NI-27b-I	41.1	0.01	11.9	0.17	46.6	0.12	n.d.	0.41	100.7	87.6
NI-27b-I	41.1	0.03	11.8	0.20	46.7	0.11	0.03	0.46	100.5	87.6
NI-27b-I	40.1	0.01	11.8	0.16	46.5	0.13	0.06	0.42	99.4	87.6
NI-27b-I	41.2	0.02	12.1	0.19	46.6	0.11	n.d.	0.43	99.5	87.5
NI-27b-I	40.3	0.02	11.9	0.17	45.9	0.18	0.41	0.42	99.1	87.5
NI-27b-I	41.3	0.02	12.0	0.14	46.2	0.13	0.09	0.44	99.0	87.5
NI-27b-I	40.7	0.02	12.0	0.18	46.7	0.12	0.06	0.40	99.8	87.5
NI-27b-I	40.2	0.02	11.7	0.19	46.4	0.12	0.08	0.43	99.8	87.5
NI-27b-I	41.1	0.01	12.2	0.16	46.6	0.11	0.03	0.42	100.5	87.5
NI-27b-I	41.1	0.02	11.7	0.18	46.3	0.12	0.05	0.37	100.5	87.5
NI-27b-I	41.1	0.02	12.2	0.15	46.3	0.11	n.d.	0.40	100.0	87.5
NI-27b-I	41.1	0.02	12.6	0.13	46.5	0.12	0.05	0.39	99.6	87.5
NI-27b-I	40.2	0.02	11.7	0.20	46.5	0.11	0.03	0.45	99.7	87.5
NI-27b-I	41.3	0.02	12.2	0.16	46.6	0.13	0.06	0.41	100.7	87.5
NI-27b-I	40.5	0.02	11.6	0.17	46.7	0.12	0.04	0.45	100.9	87.5
NI-27b-I	40.3	0.03	11.8	0.14	46.3	0.10	0.06	0.43	99.4	87.5
NI-27b-I	40.5	0.01	11.9	0.14	46.5	0.13	0.04	0.41	100.6	87.5
NI-27b-I	41.2	0.01	12.1	0.13	46.5	0.12	0.03	0.40	100.5	87.5
NI-27b-I	40.9	0.03	11.8	0.24	46.5	0.13	0.16	0.45	100.2	87.5
NI-27b-I	41.2	0.02	12.2	0.16	46.4	0.12	n.d.	0.37	100.3	87.5
NI-27b-I	40.9	0.02	11.9	0.18	46.4	0.14	0.16	0.42	99.8	87.5
NI-27b-I	41.3	0.03	12.1	0.12	46.4	0.12	0.06	0.43	99.3	87.5
NI-27b-I	40.4	0.02	11.8	0.17	46.6	0.12	n.d.	0.43	99.8	87.5
NI-27b-I	40.4	0.02	11.4	0.20	46.5	0.12	0.04	0.48	100.5	87.5
NI-27b-I	41.5	0.02	12.2	0.12	46.5	0.11	0.05	0.42	100.6	87.5
NI-27b-I	41.2	0.02	12.3	0.14	46.6	0.12	0.03	0.44	99.5	87.5
NI-27b-I	41.4	0.02	12.2	0.12	46.6	0.11	n.d.	0.41	101.0	87.4
NI-27b-I	41.1	0.02	12.3	0.18	46.3	0.13	0.06	0.40	99.1	87.4
NI-27b-I	40.5	0.03	11.9	0.17	46.4	0.12	n.d.	0.42	99.5	87.4
NI-27b-I	41.3	0.03	11.9	0.16	46.6	0.11	0.03	0.43	100.6	87.4
NI-27b-I	40.6	0.02	11.6	0.22	46.2	0.11	0.03	0.44	99.9	87.4
NI-27b-I	41.2	0.02	11.9	0.26	46.7	0.13	0.05	0.44	100.7	87.4
NI-27b-I	41.4	0.03	12.0	0.16	46.2	0.10	0.11	0.43	99.0	87.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	41.3	0.02	12.2	0.16	46.6	0.12	n.d.	0.42	100.5	87.4
NI-27b-I	41.4	0.01	12.2	0.16	46.3	0.13	n.d.	0.40	100.3	87.4
NI-27b-I	41.1	0.03	12.3	0.15	46.4	0.12	0.06	0.41	99.4	87.4
NI-27b-I	41.2	0.02	11.7	0.11	46.6	0.12	0.05	0.45	99.7	87.4
NI-27b-I	40.2	0.02	12.4	0.19	46.3	0.13	0.04	0.36	100.3	87.4
NI-27b-I	41.2	0.01	12.5	0.17	46.3	0.11	0.04	0.40	99.9	87.4
NI-27b-I	40.6	0.02	11.8	0.16	46.3	0.12	n.d.	0.43	100.3	87.4
NI-27b-I	40.7	0.02	12.2	0.20	46.3	0.13	n.d.	0.38	99.8	87.4
NI-27b-I	41.1	0.02	12.0	0.16	46.3	0.13	0.12	0.41	100.5	87.4
NI-27b-I	41.2	0.03	12.0	0.13	46.7	0.11	0.05	0.46	100.7	87.4
NI-27b-I	41.1	0.02	11.9	0.18	46.3	0.13	0.05	0.37	100.5	87.4
NI-27b-I	41.4	0.02	12.1	0.18	46.3	0.12	0.05	0.40	100.7	87.4
NI-27b-I	40.2	0.03	12.1	0.17	46.4	0.12	n.d.	0.39	100.1	87.4
NI-27b-I	40.6	0.02	12.3	0.19	46.2	0.14	n.d.	0.36	99.4	87.4
NI-27b-I	41.2	0.02	12.0	0.17	46.5	0.11	n.d.	0.40	100.4	87.4
NI-27b-I	40.8	0.02	11.7	0.12	46.6	0.11	0.04	0.44	100.4	87.4
NI-27b-I	40.4	0.02	12.2	0.23	46.4	0.12	n.d.	0.39	100.5	87.4
NI-27b-I	40.9	0.01	12.3	0.25	46.2	0.12	n.d.	0.37	100.3	87.4
NI-27b-I	41.0	0.04	11.9	0.17	46.3	0.15	0.37	0.44	100.4	87.4
NI-27b-I	40.6	0.03	11.9	0.17	46.4	0.12	0.03	0.41	100.8	87.4
NI-27b-I	41.2	0.02	11.9	0.16	46.5	0.12	0.04	0.42	99.9	87.4
NI-27b-I	41.3	0.02	12.4	0.19	46.5	0.12	n.d.	0.41	100.4	87.4
NI-27b-I	40.2	0.01	11.7	0.15	46.3	0.10	n.d.	0.45	99.5	87.4
NI-27b-I	41.2	0.03	12.2	0.13	46.4	0.11	n.d.	0.39	100.1	87.4
NI-27b-I	41.3	0.02	12.3	0.13	46.5	0.11	n.d.	0.38	101.0	87.4
NI-27b-I	40.7	0.02	12.2	0.20	46.2	0.11	0.04	0.38	99.9	87.4
NI-27b-I	40.5	0.03	11.9	0.14	46.4	0.12	n.d.	0.40	100.5	87.4
NI-27b-I	41.3	0.03	12.0	0.18	46.6	0.12	0.05	0.42	100.7	87.4
NI-27b-I	40.9	0.02	12.2	0.11	46.5	0.12	0.03	0.39	100.7	87.4
NI-27b-I	41.0	0.04	12.0	0.19	46.5	0.14	0.21	0.47	100.6	87.4
NI-27b-I	41.3	n.d.	12.2	0.14	46.3	0.13	0.04	0.39	99.4	87.4
NI-27b-I	41.2	0.01	12.3	0.16	46.3	0.12	0.04	0.38	100.6	87.4
NI-27b-I	41.4	0.02	12.0	0.17	46.7	0.12	0.04	0.41	100.8	87.4
NI-27b-I	40.9	0.02	12.2	0.18	46.4	0.12	0.05	0.37	100.6	87.4
NI-27b-I	40.6	0.02	12.1	0.15	46.7	0.12	0.06	0.39	99.8	87.4
NI-27b-I	41.1	0.02	12.1	0.20	46.2	0.12	n.d.	0.37	100.2	87.4
NI-27b-I	41.3	0.02	12.4	0.19	46.3	0.11	n.d.	0.40	100.0	87.4
NI-27b-I	40.3	n.d.	12.7	0.19	46.2	0.12	0.04	0.34	100.1	87.4
NI-27b-I	41.1	0.02	12.1	0.21	46.4	0.11	0.03	0.41	99.8	87.4
NI-27b-I	41.3	0.02	11.9	0.20	46.4	0.11	0.04	0.45	100.6	87.4
NI-27b-I	41.1	0.02	12.2	0.18	46.5	0.13	n.d.	0.42	100.7	87.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	40.8	0.02	12.0	0.16	46.4	0.12	0.05	0.39	100.6	87.4
NI-27b-I	41.3	0.02	12.4	0.15	46.3	0.13	n.d.	0.37	100.3	87.4
NI-27b-I	40.9	0.02	12.2	0.19	46.1	0.13	0.05	0.39	99.3	87.4
NI-27b-I	41.2	0.03	12.3	0.11	46.2	0.13	n.d.	0.39	99.9	87.4
NI-27b-I	40.2	0.02	11.9	0.21	46.2	0.12	0.04	0.40	99.4	87.3
NI-27b-I	41.3	0.02	12.2	0.15	46.4	0.12	0.03	0.39	100.8	87.3
NI-27b-I	41.5	0.03	12.2	0.11	46.4	0.11	n.d.	0.39	100.3	87.3
NI-27b-I	41.0	0.02	12.1	0.14	46.2	0.13	0.04	0.39	100.4	87.3
NI-27b-I	41.0	0.44	12.1	0.24	46.2	0.12	0.05	0.37	99.2	87.3
NI-27b-I	41.4	0.02	12.0	n.d.	46.4	0.12	n.d.	0.42	99.7	87.3
NI-27b-I	40.9	0.02	12.0	0.15	46.3	0.12	0.04	0.40	99.4	87.3
NI-27b-I	41.3	0.02	12.0	0.17	46.2	0.13	0.04	0.40	100.1	87.3
NI-27b-I	41.2	0.01	12.3	0.18	46.2	0.11	0.04	0.38	99.1	87.3
NI-27b-I	41.1	0.02	11.9	0.20	46.3	0.12	0.04	0.40	100.4	87.3
NI-27b-I	41.0	0.02	12.9	0.19	46.1	0.13	0.06	0.31	99.3	87.3
NI-27b-I	41.0	0.02	12.2	0.17	46.3	0.12	0.04	0.38	100.3	87.3
NI-27b-I	41.1	0.02	12.3	0.13	46.6	0.11	0.03	0.37	101.0	87.3
NI-27b-I	41.4	0.03	11.9	0.12	46.6	0.12	0.04	0.42	101.0	87.3
NI-27b-I	41.2	0.02	12.4	0.17	46.4	0.11	n.d.	0.41	99.4	87.3
NI-27b-I	41.0	0.01	12.2	n.d.	46.3	0.11	0.03	0.37	99.5	87.3
NI-27b-I	41.1	0.02	12.5	0.19	46.3	0.13	0.03	0.35	100.2	87.3
NI-27b-I	40.9	0.03	12.5	0.20	46.5	0.12	0.03	0.40	100.2	87.3
NI-27b-I	40.5	0.02	11.7	0.24	46.3	0.12	n.d.	0.44	99.5	87.3
NI-27b-I	40.3	0.03	12.2	0.17	46.0	0.12	n.d.	0.38	99.1	87.3
NI-27b-I	41.2	0.02	12.1	0.20	46.5	0.13	0.03	0.39	100.6	87.3
NI-27b-I	41.0	0.02	11.9	0.14	46.4	0.11	0.04	0.41	100.5	87.3
NI-27b-I	41.1	0.03	12.3	0.17	46.2	0.12	n.d.	0.39	99.6	87.3
NI-27b-I	41.5	0.02	12.1	0.20	46.6	0.10	0.03	0.44	101.0	87.3
NI-27b-I	41.1	0.02	12.0	0.19	46.5	0.12	0.06	0.44	99.9	87.3
NI-27b-I	40.2	0.02	11.8	0.16	46.4	0.12	n.d.	0.42	100.1	87.3
NI-27b-I	40.2	0.03	11.9	0.19	46.5	0.12	0.05	0.42	99.7	87.3
NI-27b-I	41.0	0.01	12.3	0.15	46.4	0.12	0.04	0.38	100.6	87.3
NI-27b-I	40.4	0.01	12.0	0.20	46.3	0.11	n.d.	0.40	100.1	87.3
NI-27b-I	40.6	0.02	11.9	0.14	46.4	0.11	n.d.	0.42	100.3	87.3
NI-27b-I	41.3	0.02	12.0	0.20	46.4	0.13	0.05	0.40	100.7	87.3
NI-27b-I	41.0	0.02	12.9	0.17	46.4	0.12	0.05	0.36	100.7	87.3
NI-27b-I	40.5	0.02	12.2	0.19	46.2	0.13	0.05	0.39	100.3	87.3
NI-27b-I	40.6	0.03	11.6	0.20	46.2	0.12	0.06	0.46	100.4	87.3
NI-27b-I	41.2	0.03	12.3	0.20	46.3	0.12	n.d.	0.41	100.4	87.3
NI-27b-I	41.1	0.02	12.3	0.18	46.2	0.14	n.d.	0.36	100.5	87.3
NI-27b-I	41.3	0.02	12.1	n.d.	46.4	0.13	0.03	0.39	100.4	87.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	41.1	0.01	12.2	0.11	46.3	0.12	0.05	0.41	99.6	87.3
NI-27b-I	40.3	0.01	11.9	0.19	46.3	0.13	0.04	0.40	99.8	87.3
NI-27b-I	41.4	0.02	12.0	0.21	46.2	0.12	0.10	0.40	100.2	87.3
NI-27b-I	41.3	0.02	12.2	0.13	46.5	0.13	0.06	0.34	100.4	87.3
NI-27b-I	40.4	0.02	11.6	0.12	46.5	0.11	0.05	0.46	99.9	87.3
NI-27b-I	40.9	0.02	12.2	0.18	46.6	0.11	0.06	0.38	100.9	87.3
NI-27b-I	41.2	0.02	12.0	0.24	46.4	0.13	0.04	0.43	100.4	87.3
NI-27b-I	41.3	0.01	12.1	0.14	46.5	0.12	0.03	0.39	100.8	87.3
NI-27b-I	41.1	0.01	12.1	0.20	46.6	0.12	0.04	0.42	100.7	87.3
NI-27b-I	41.2	0.02	12.0	0.12	46.2	0.13	n.d.	0.40	99.7	87.2
NI-27b-I	41.3	0.02	11.9	0.24	46.5	0.12	0.04	0.40	100.9	87.2
NI-27b-I	41.1	0.02	12.6	0.19	46.1	0.12	0.03	0.37	100.0	87.2
NI-27b-I	40.8	0.02	12.0	0.13	46.6	0.13	n.d.	0.39	100.8	87.2
NI-27b-I	41.2	0.02	12.6	0.15	46.3	0.12	n.d.	0.37	99.5	87.2
NI-27b-I	40.6	0.01	11.8	0.22	46.2	0.12	0.14	0.43	99.4	87.2
NI-27b-I	41.0	0.02	12.0	n.d.	46.3	0.12	n.d.	0.41	100.4	87.2
NI-27b-I	40.5	0.01	12.0	0.17	46.2	0.14	n.d.	0.39	100.3	87.2
NI-27b-I	40.4	0.03	12.2	0.20	46.2	0.12	0.04	0.38	99.6	87.2
NI-27b-I	41.2	0.02	11.8	0.20	46.3	0.13	0.04	0.41	100.1	87.2
NI-27b-I	40.6	0.02	11.9	0.21	46.3	0.12	n.d.	0.40	100.0	87.2
NI-27b-I	41.1	0.03	12.3	0.16	46.3	0.12	0.04	0.39	99.6	87.2
NI-27b-I	41.1	0.02	11.9	0.19	46.5	0.12	0.03	0.43	100.6	87.2
NI-27b-I	41.2	0.02	12.0	0.21	46.4	0.11	n.d.	0.39	99.5	87.2
NI-27b-I	39.9	0.02	12.3	0.17	46.5	0.11	0.06	0.37	100.3	87.2
NI-27b-I	41.1	0.02	12.0	0.16	46.5	0.11	0.04	0.40	100.6	87.2
NI-27b-I	40.9	0.02	12.6	0.16	46.3	0.12	0.05	0.36	100.4	87.2
NI-27b-I	40.5	0.02	12.0	0.22	46.1	0.12	0.03	0.40	100.4	87.2
NI-27b-I	40.9	0.01	12.1	0.18	46.5	0.12	n.d.	0.39	100.4	87.2
NI-27b-I	41.1	0.02	12.2	0.17	46.5	0.12	n.d.	0.38	99.9	87.2
NI-27b-I	40.9	0.02	12.2	0.23	46.3	0.13	n.d.	0.36	100.2	87.2
NI-27b-I	40.4	0.02	11.9	0.19	46.4	0.13	n.d.	0.42	99.9	87.2
NI-27b-I	40.9	0.02	12.2	0.13	46.1	0.12	0.04	0.38	100.1	87.2
NI-27b-I	40.9	0.02	12.6	0.15	46.2	0.12	0.03	0.34	99.5	87.2
NI-27b-I	40.4	0.03	11.7	0.12	46.4	0.13	0.05	0.44	100.5	87.2
NI-27b-I	40.5	0.02	11.9	0.14	46.3	0.11	0.12	0.40	100.4	87.2
NI-27b-I	40.5	0.02	12.3	0.12	46.4	0.12	0.03	0.36	100.6	87.2
NI-27b-I	41.0	0.02	12.4	0.16	46.4	0.11	0.05	0.39	100.4	87.2
NI-27b-I	41.3	0.02	12.3	0.23	46.4	0.11	0.08	0.41	100.4	87.2
NI-27b-I	41.2	0.02	12.7	0.18	46.3	0.13	0.03	0.35	100.1	87.2
NI-27b-I	40.3	n.d.	12.1	0.19	46.5	0.12	n.d.	0.39	100.8	87.2
NI-27b-I	41.1	0.02	12.4	0.16	45.1	0.19	0.32	0.37	99.1	87.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	40.9	n.d.	13.0	0.18	46.2	0.12	0.03	0.34	100.3	87.2
NI-27b-I	40.6	0.03	12.1	0.14	46.4	0.12	n.d.	0.39	100.1	87.1
NI-27b-I	41.2	0.02	12.2	0.13	46.5	0.11	0.03	0.40	100.4	87.1
NI-27b-I	40.5	0.02	11.9	0.15	46.4	0.12	0.05	0.40	100.2	87.1
NI-27b-I	40.5	0.02	12.0	0.18	46.4	0.11	0.05	0.40	100.1	87.1
NI-27b-I	41.3	0.02	11.8	0.15	46.3	0.11	0.03	0.43	100.1	87.1
NI-27b-I	41.0	0.02	12.2	0.22	46.2	0.12	0.05	0.38	100.3	87.1
NI-27b-I	41.0	0.01	11.9	0.13	46.3	0.12	0.04	0.42	99.3	87.1
NI-27b-I	40.7	0.02	11.6	0.22	45.9	0.12	0.04	0.44	99.8	87.1
NI-27b-I	41.1	0.03	12.0	0.15	46.4	0.12	0.08	0.39	100.8	87.1
NI-27b-I	41.3	0.02	12.4	0.14	46.3	0.13	0.05	0.40	99.6	87.1
NI-27b-I	40.4	0.02	12.4	0.15	46.2	0.12	0.05	0.35	100.1	87.1
NI-27b-I	41.2	0.02	12.2	0.21	46.2	0.11	0.04	0.40	100.4	87.1
NI-27b-I	41.4	0.02	12.4	0.13	46.4	0.13	0.04	0.37	99.8	87.1
NI-27b-I	40.9	0.02	12.5	0.10	46.0	0.12	0.05	0.36	99.6	87.1
NI-27b-I	41.1	0.02	11.9	0.16	46.4	0.12	0.04	0.40	100.2	87.1
NI-27b-I	40.3	0.02	12.6	0.19	45.9	0.12	0.04	0.34	99.4	87.1
NI-27b-I	40.3	0.06	11.6	0.18	46.3	0.12	0.04	0.43	100.0	87.1
NI-27b-I	41.2	0.02	12.1	0.20	46.3	0.11	0.04	0.43	99.9	87.1
NI-27b-I	40.4	0.03	12.4	0.23	46.3	0.14	0.10	0.35	100.2	87.1
NI-27b-I	41.2	0.02	12.4	0.16	46.2	0.12	n.d.	0.36	100.0	87.1
NI-27b-I	40.9	0.02	12.2	0.14	46.2	0.12	0.05	0.37	100.3	87.1
NI-27b-I	41.0	0.02	12.3	0.23	46.1	0.12	n.d.	0.40	100.1	87.1
NI-27b-I	41.3	0.02	11.9	0.19	46.5	0.11	n.d.	0.41	101.0	87.1
NI-27b-I	40.8	0.03	12.2	0.14	46.4	0.12	n.d.	0.38	100.6	87.1
NI-27b-I	41.1	0.02	12.2	0.20	46.2	0.12	0.06	0.42	100.0	87.1
NI-27b-I	41.2	0.02	12.2	0.19	46.4	0.14	0.04	0.38	100.4	87.1
NI-27b-I	41.3	0.02	12.1	0.13	46.5	0.11	n.d.	0.40	100.6	87.1
NI-27b-I	40.3	0.02	12.0	0.16	46.3	0.12	n.d.	0.40	99.2	87.0
NI-27b-I	41.3	0.01	12.2	0.16	46.2	0.11	0.08	0.38	100.8	87.0
NI-27b-I	40.8	0.01	12.1	0.15	46.3	0.13	0.06	0.38	100.2	87.0
NI-27b-I	40.7	n.d.	12.2	n.d.	46.4	0.12	0.04	0.37	100.5	87.0
NI-27b-I	41.0	0.02	12.7	0.20	46.3	0.12	n.d.	0.34	99.2	87.0
NI-27b-I	41.2	0.02	12.5	0.20	45.9	0.12	0.04	0.37	99.5	87.0
NI-27b-I	40.8	0.28	12.1	0.16	46.4	0.11	0.06	0.38	100.7	87.0
NI-27b-I	41.0	0.03	12.4	0.15	46.2	0.11	n.d.	0.36	100.2	87.0
NI-27b-I	41.1	0.02	12.3	0.29	45.5	0.14	0.07	0.40	100.0	87.0
NI-27b-I	41.1	0.02	12.8	0.13	46.2	0.12	0.04	0.32	99.6	87.0
NI-27b-I	41.2	0.02	12.3	0.22	46.0	0.12	0.05	0.37	99.7	87.0
NI-27b-I	40.7	0.02	12.3	0.17	46.3	0.12	0.04	0.37	100.2	87.0
NI-27b-I	41.2	0.02	12.7	0.14	46.1	0.12	0.06	0.37	100.5	87.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	41.1	0.03	13.0	0.18	46.1	0.13	n.d.	0.35	99.7	87.0
NI-27b-I	40.9	0.02	12.3	0.15	46.0	0.11	0.05	0.38	99.8	87.0
NI-27b-I	40.4	0.02	12.3	0.18	46.2	0.13	0.04	0.37	100.7	87.0
NI-27b-I	41.0	0.02	12.5	0.18	46.2	0.13	n.d.	0.36	100.5	87.0
NI-27b-I	41.1	0.02	12.2	0.17	46.4	0.12	0.04	0.38	100.9	86.9
NI-27b-I	40.3	0.02	12.7	0.15	46.3	0.13	0.11	0.33	100.9	86.9
NI-27b-I	40.4	0.03	12.1	0.16	46.3	0.13	0.03	0.39	100.6	86.9
NI-27b-I	41.2	0.02	12.2	0.15	46.1	0.12	n.d.	0.35	99.6	86.9
NI-27b-I	40.5	0.01	12.1	0.16	46.4	0.11	0.04	0.39	100.6	86.9
NI-27b-I	41.1	0.03	12.4	0.21	46.0	0.13	0.03	0.35	99.7	86.9
NI-27b-I	41.0	0.02	12.9	n.d.	46.4	0.12	0.17	0.31	100.4	86.9
NI-27b-I	41.2	0.02	12.1	0.18	46.0	0.12	n.d.	0.37	100.4	86.9
NI-27b-I	39.9	0.03	12.3	0.18	46.3	0.12	n.d.	0.37	100.6	86.9
NI-27b-I	40.8	0.02	13.0	0.17	46.1	0.13	0.04	0.31	100.0	86.9
NI-27b-I	40.7	0.02	12.6	0.14	46.0	0.12	0.04	0.35	99.3	86.9
NI-27b-I	40.3	0.01	12.9	0.20	45.9	0.13	n.d.	0.32	100.1	86.9
NI-27b-I	41.1	0.02	12.1	0.17	46.3	0.11	n.d.	0.39	100.4	86.9
NI-27b-I	41.0	0.01	12.8	0.23	46.1	0.15	0.07	0.33	100.7	86.9
NI-27b-I	40.9	0.03	12.4	0.15	46.2	0.13	0.06	0.36	100.3	86.9
NI-27b-I	40.3	0.02	12.3	0.15	46.2	0.13	n.d.	0.35	100.2	86.9
NI-27b-I	40.5	0.01	12.1	0.15	46.3	0.12	0.03	0.39	100.9	86.9
NI-27b-I	40.9	0.11	11.9	0.21	46.1	0.12	0.05	0.38	100.4	86.8
NI-27b-I	41.2	0.02	12.5	n.d.	46.1	0.12	0.04	0.34	99.6	86.8
NI-27b-I	40.6	0.03	12.5	0.17	45.9	0.13	0.04	0.35	100.7	86.8
NI-27b-I	40.5	0.02	12.5	0.14	45.9	0.12	n.d.	0.35	99.4	86.8
NI-27b-I	41.2	0.03	11.8	0.17	46.2	0.13	0.04	0.40	99.9	86.8
NI-27b-I	40.8	0.02	12.4	0.17	45.6	0.12	0.04	0.35	99.0	86.8
NI-27b-I	40.2	0.01	13.0	0.17	46.0	0.12	n.d.	0.31	100.3	86.8
NI-27b-I	40.9	0.02	12.8	0.11	46.2	0.13	0.05	0.36	100.5	86.8
NI-27b-I	40.5	0.02	12.1	0.13	46.2	0.10	n.d.	0.40	100.6	86.8
NI-27b-I	41.1	0.02	12.4	0.14	46.2	0.11	0.04	0.34	100.3	86.8
NI-27b-I	40.6	n.d.	12.9	0.18	46.1	0.12	0.06	0.32	99.9	86.8
NI-27b-I	41.1	0.02	12.5	0.19	46.2	0.14	0.06	0.36	100.2	86.8
NI-27b-I	40.6	n.d.	11.8	0.15	45.9	0.13	n.d.	0.43	99.7	86.8
NI-27b-I	40.7	0.02	13.1	0.19	45.7	0.14	n.d.	0.30	99.5	86.7
NI-27b-I	41.3	0.02	12.6	0.15	46.2	0.12	0.05	0.31	100.4	86.7
NI-27b-I	41.2	0.01	12.5	0.18	46.1	0.12	0.04	0.35	100.3	86.7
NI-27b-I	40.2	0.02	12.9	0.19	45.8	0.13	0.06	0.31	100.5	86.7
NI-27b-I	41.1	0.01	12.2	0.12	46.2	0.12	n.d.	0.39	100.6	86.7
NI-27b-I	40.1	0.02	13.1	0.21	45.9	0.13	n.d.	0.30	99.8	86.7
NI-27b-I	41.4	0.02	12.7	0.16	45.9	0.13	n.d.	0.34	100.5	86.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	41.0	0.02	13.0	0.14	46.0	0.12	0.06	0.30	100.1	86.7
NI-27b-I	40.9	0.03	12.9	0.17	45.8	0.13	0.03	0.32	100.0	86.7
NI-27b-I	41.1	0.02	12.8	0.18	45.9	0.13	0.04	0.33	100.2	86.6
NI-27b-I	41.2	0.02	12.3	0.19	45.9	0.12	0.07	0.40	100.2	86.6
NI-27b-I	41.0	0.02	12.7	0.20	46.3	0.13	0.04	0.35	100.8	86.6
NI-27b-I	40.8	0.02	13.0	0.18	45.6	0.13	0.05	0.30	99.2	86.6
NI-27b-I	41.3	0.02	12.4	0.17	45.9	0.13	n.d.	0.37	99.5	86.6
NI-27b-I	40.4	0.02	13.0	0.25	46.1	0.12	n.d.	0.30	100.2	86.6
NI-27b-I	40.7	0.02	12.5	0.21	46.1	0.12	0.04	0.34	100.6	86.5
NI-27b-I	40.1	0.02	12.2	0.20	46.1	0.15	n.d.	0.38	100.7	86.5
NI-27b-I	41.1	0.02	12.6	0.14	46.1	0.13	0.03	0.34	100.7	86.5
NI-27b-I	41.0	0.02	12.6	0.15	46.0	0.12	0.03	0.34	99.9	86.5
NI-27b-I	40.5	0.02	12.8	0.19	45.8	0.13	0.04	0.33	99.5	86.5
NI-27b-I	41.0	0.02	13.2	0.18	45.9	0.13	0.04	0.29	99.5	86.5
NI-27b-I	40.7	n.d.	12.9	0.22	46.1	0.12	0.03	0.31	100.6	86.5
NI-27b-I	40.8	0.02	12.2	0.16	45.9	0.12	0.09	0.37	100.7	86.5
NI-27b-I	41.0	0.01	13.5	0.20	45.6	0.12	n.d.	0.28	99.4	86.4
NI-27b-I	41.0	0.01	13.3	0.21	46.1	0.13	0.04	0.32	100.1	86.4
NI-27b-I	40.7	0.01	13.3	0.27	45.9	0.12	n.d.	0.27	100.0	86.4
NI-27b-I	40.7	0.03	13.1	0.20	45.7	0.11	0.04	0.30	100.7	86.4
NI-27b-I	40.7	0.01	12.9	0.23	46.0	0.12	n.d.	0.31	100.4	86.4
NI-27b-I	41.0	0.02	12.2	0.18	45.8	0.13	n.d.	0.37	100.5	86.3
NI-27b-I	40.5	0.02	12.5	0.19	46.1	0.12	0.03	0.35	100.6	86.3
NI-27b-I	40.5	0.02	12.3	0.22	45.8	0.12	0.04	0.37	100.8	86.3
NI-27b-I	41.1	0.02	12.3	0.16	45.8	0.12	n.d.	0.41	99.7	86.3
NI-27b-I	40.3	0.01	12.0	0.19	45.7	0.13	n.d.	0.41	100.2	86.3
NI-27b-I	41.3	0.02	12.9	0.18	45.7	0.14	n.d.	0.31	100.8	86.3
NI-27b-I	40.9	0.02	13.3	0.19	45.6	0.12	n.d.	0.26	99.8	86.3
NI-27b-I	40.4	0.02	13.2	0.16	45.6	0.13	n.d.	0.27	100.2	86.3
NI-27b-I	41.5	0.06	12.9	0.17	45.4	0.13	n.d.	0.31	99.7	86.3
NI-27b-I	40.9	0.02	12.6	0.15	45.9	0.12	0.06	0.34	100.5	86.3
NI-27b-I	41.2	0.02	13.1	0.19	45.9	0.13	0.04	0.28	99.7	86.3
NI-27b-I	41.1	0.02	12.6	0.19	45.8	0.11	0.03	0.34	100.3	86.3
NI-27b-I	41.1	0.01	13.0	0.20	45.8	0.12	0.03	0.34	100.6	86.2
NI-27b-I	41.1	0.01	12.1	0.16	45.8	0.12	0.06	0.39	100.5	86.2
NI-27b-I	40.1	0.01	13.3	0.22	46.0	0.11	0.08	0.26	100.4	86.2
NI-27b-I	40.7	0.02	13.2	0.16	45.5	0.13	n.d.	0.27	99.6	86.2
NI-27b-I	40.1	0.02	13.1	0.19	45.8	0.13	0.04	0.28	100.4	86.2
NI-27b-I	40.5	0.02	13.2	0.17	45.8	0.12	0.04	0.27	100.7	86.2
NI-27b-I	42.0	0.37	12.8	0.18	45.5	0.13	0.03	0.30	99.9	86.2
NI-27b-I	41.0	0.01	13.4	0.20	45.3	0.12	0.04	0.25	99.8	86.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	41.2	0.02	13.1	0.20	44.7	0.14	0.03	0.28	100.5	86.2
NI-27b-I	40.5	0.01	13.4	0.16	45.8	0.13	n.d.	0.26	100.3	86.1
NI-27b-I	41.3	0.02	12.8	0.17	45.7	0.13	0.04	0.32	99.7	86.1
NI-27b-I	40.4	0.03	13.2	0.20	46.0	0.14	0.14	0.28	100.6	86.1
NI-27b-I	40.1	0.01	13.2	0.24	45.5	0.12	n.d.	0.26	100.2	86.1
NI-27b-I	40.8	n.d.	13.7	0.23	45.3	0.13	0.04	0.26	99.6	86.1
NI-27b-I	40.5	0.02	13.1	0.20	45.5	0.13	0.07	0.29	100.8	86.1
NI-27b-I	41.1	0.07	13.2	0.14	45.5	0.13	n.d.	0.28	99.8	86.1
NI-27b-I	41.0	0.02	12.8	0.23	45.5	0.12	0.18	0.33	100.4	86.1
NI-27b-I	40.5	0.02	13.3	0.16	45.9	0.14	0.04	0.28	100.9	86.1
NI-27b-I	40.8	0.01	13.3	0.20	45.5	0.13	0.04	0.25	100.5	86.1
NI-27b-I	40.5	0.01	13.2	0.16	45.8	0.13	n.d.	0.27	100.7	86.1
NI-27b-I	41.6	0.03	13.5	0.16	45.4	0.14	n.d.	0.24	100.3	86.1
NI-27b-I	40.9	0.02	13.0	0.16	45.6	0.13	n.d.	0.30	100.3	86.1
NI-27b-I	41.2	0.01	13.5	0.23	45.4	0.12	n.d.	0.24	99.2	86.1
NI-27b-I	39.9	n.d.	13.3	0.19	45.5	0.13	0.11	0.26	99.8	86.1
NI-27b-I	40.5	0.02	13.2	0.20	45.5	0.13	n.d.	0.27	99.7	86.1
NI-27b-I	41.0	0.01	13.3	0.13	45.5	0.13	0.11	0.30	100.7	86.0
NI-27b-I	41.4	0.03	11.8	0.23	45.8	0.12	0.03	0.43	100.1	86.0
NI-27b-I	40.9	0.02	13.1	0.21	45.5	0.12	n.d.	0.29	100.3	86.0
NI-27b-I	40.9	0.01	13.3	0.18	45.7	0.14	0.03	0.26	100.1	86.0
NI-27b-I	41.0	0.02	12.9	0.24	45.5	0.12	n.d.	0.30	99.8	86.0
NI-27b-I	40.9	n.d.	13.4	0.20	45.4	0.14	0.03	0.25	100.3	86.0
NI-27b-I	40.5	0.03	13.3	0.16	45.6	0.13	n.d.	0.26	99.7	86.0
NI-27b-I	40.4	0.01	13.6	0.22	45.6	0.13	0.04	0.24	99.9	86.0
NI-27b-I	41.1	0.02	13.5	0.20	45.4	0.13	0.08	0.25	100.0	86.0
NI-27b-I	40.5	0.03	13.6	0.20	45.4	0.14	0.03	0.24	99.8	86.0
NI-27b-I	40.4	0.02	13.5	0.18	45.5	0.13	n.d.	0.23	99.8	86.0
NI-27b-I	40.9	0.01	13.3	0.23	45.2	0.12	n.d.	0.26	99.4	86.0
NI-27b-I	40.6	0.02	13.2	0.18	45.3	0.13	0.05	0.27	99.6	86.0
NI-27b-I	40.6	0.02	13.4	0.25	45.4	0.14	n.d.	0.26	100.0	85.9
NI-27b-I	40.9	0.01	13.0	0.16	45.5	0.14	n.d.	0.30	99.8	85.9
NI-27b-I	40.6	0.02	13.6	0.22	45.4	0.14	0.04	0.24	100.5	85.9
NI-27b-I	41.4	0.01	13.1	0.22	45.4	0.13	0.03	0.29	99.9	85.9
NI-27b-I	41.0	0.01	13.2	0.24	45.6	0.13	n.d.	0.28	100.5	85.9
NI-27b-I	40.6	0.01	13.5	0.20	45.5	0.12	0.04	0.25	100.3	85.9
NI-27b-I	40.5	0.01	13.5	0.18	45.8	0.15	n.d.	0.24	100.2	85.9
NI-27b-I	40.6	0.02	13.0	0.23	45.5	0.13	n.d.	0.29	99.5	85.9
NI-27b-I	41.1	0.02	13.4	0.19	45.4	0.11	0.03	0.25	100.6	85.9
NI-27b-I	40.8	0.02	13.7	0.23	45.7	0.13	n.d.	0.23	99.7	85.9
NI-27b-I	40.5	0.02	13.2	0.21	45.5	0.12	0.03	0.27	100.1	85.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	40.2	0.01	13.2	0.17	45.5	0.13	0.09	0.27	99.4	85.9
NI-27b-I	41.0	0.02	13.2	0.17	45.5	0.12	0.05	0.27	100.3	85.9
NI-27b-I	41.0	0.01	13.7	0.16	45.8	0.13	n.d.	0.24	100.4	85.9
NI-27b-I	40.5	0.02	13.5	0.22	45.1	0.14	0.04	0.24	99.2	85.9
NI-27b-I	40.3	0.02	13.1	0.22	45.3	0.12	0.04	0.28	100.5	85.9
NI-27b-I	40.4	0.02	12.8	0.22	45.3	0.12	0.04	0.32	99.5	85.8
NI-27b-I	40.8	0.02	13.8	0.19	45.7	0.13	n.d.	0.23	100.8	85.8
NI-27b-I	40.1	0.01	13.3	0.14	45.5	0.13	n.d.	0.26	100.4	85.8
NI-27b-I	40.7	0.02	13.3	0.23	45.3	0.14	0.03	0.25	100.4	85.8
NI-27b-I	41.2	0.01	13.7	0.26	45.3	0.14	n.d.	0.23	100.2	85.8
NI-27b-I	40.3	0.02	13.4	0.20	45.3	0.14	n.d.	0.25	100.3	85.8
NI-27b-I	41.0	0.01	13.4	0.21	45.2	0.14	0.09	0.25	100.0	85.8
NI-27b-I	41.1	0.02	13.5	0.24	45.1	0.13	n.d.	0.25	99.9	85.8
NI-27b-I	41.0	0.01	13.2	0.16	45.4	0.13	n.d.	0.28	100.5	85.8
NI-27b-I	40.8	0.13	13.4	0.20	45.6	0.13	0.06	0.25	100.9	85.8
NI-27b-I	41.0	0.02	13.3	0.21	45.2	0.13	0.04	0.25	99.5	85.8
NI-27b-I	40.3	0.04	14.8	0.26	45.3	0.13	n.d.	0.19	100.2	85.7
NI-27b-I	40.9	n.d.	13.7	0.20	45.5	0.14	n.d.	0.26	100.8	85.7
NI-27b-I	40.5	0.01	14.1	0.20	45.3	0.13	n.d.	0.21	99.9	85.7
NI-27b-I	41.0	0.01	14.1	0.24	45.5	0.14	n.d.	0.24	100.9	85.7
NI-27b-I	41.2	0.02	13.9	0.19	45.1	0.13	0.04	0.22	99.0	85.7
NI-27b-I	40.3	0.02	13.3	0.19	45.3	0.14	n.d.	0.27	100.0	85.7
NI-27b-I	40.8	0.01	13.4	0.21	45.3	0.13	n.d.	0.25	101.0	85.6
NI-27b-I	40.4	0.02	13.5	0.20	45.2	0.14	0.03	0.24	100.3	85.6
NI-27b-I	40.6	0.02	13.5	0.19	45.2	0.14	0.03	0.24	99.9	85.6
NI-27b-I	41.1	0.02	13.5	0.20	45.0	0.13	n.d.	0.24	99.5	85.6
NI-27b-I	40.2	0.02	13.2	0.18	45.4	0.13	0.06	0.28	100.3	85.6
NI-27b-I	40.9	0.01	14.0	0.18	45.2	0.13	n.d.	0.22	100.9	85.6
NI-27b-I	41.0	0.01	13.6	0.18	45.3	0.13	n.d.	0.23	100.6	85.6
NI-27b-I	41.3	0.01	13.3	0.16	45.4	0.14	n.d.	0.27	100.7	85.6
NI-27b-I	40.4	0.02	13.8	0.20	45.2	0.14	n.d.	0.22	100.6	85.5
NI-27b-I	40.2	0.02	12.7	0.23	45.0	0.13	0.14	0.32	99.8	85.5
NI-27b-I	40.6	0.02	13.9	0.23	45.1	0.13	n.d.	0.22	99.4	85.5
NI-27b-I	40.0	0.01	13.4	0.20	45.0	0.14	n.d.	0.24	100.3	85.5
NI-27b-I	40.9	0.01	13.5	0.25	44.9	0.15	0.03	0.24	99.6	85.5
NI-27b-I	40.3	0.02	13.3	0.17	45.3	0.13	n.d.	0.25	100.8	85.5
NI-27b-I	40.9	0.02	14.0	0.24	44.8	0.13	0.03	0.21	99.3	85.5
NI-27b-I	40.6	0.33	13.7	0.16	45.3	0.16	n.d.	0.22	100.6	85.5
NI-27b-I	40.5	0.01	13.5	0.19	45.1	0.13	0.03	0.24	100.0	85.5
NI-27b-I	41.1	0.02	12.9	0.19	45.2	0.13	0.15	0.31	100.6	85.5
NI-27b-I	40.8	0.57	13.9	0.19	44.8	0.14	n.d.	0.22	99.3	85.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	40.3	0.02	14.2	0.19	45.2	0.13	0.04	0.21	100.8	85.5
NI-27b-I	40.6	0.02	11.9	0.22	44.9	0.11	n.d.	0.41	100.1	85.5
NI-27b-I	40.9	0.01	14.0	0.14	44.9	0.14	n.d.	0.24	100.2	85.4
NI-27b-I	40.3	0.15	14.4	0.24	45.1	0.14	n.d.	0.20	99.9	85.4
NI-27b-I	40.5	0.02	14.2	0.18	45.0	0.14	n.d.	0.20	99.0	85.4
NI-27b-I	40.4	0.02	14.1	0.18	45.1	0.14	n.d.	0.21	100.3	85.4
NI-27b-I	41.0	n.d.	12.9	0.20	44.7	0.14	0.04	0.29	99.9	85.3
NI-27b-I	40.6	0.01	14.3	0.19	44.8	0.15	n.d.	0.20	99.9	85.3
NI-27b-I	40.4	0.01	14.0	0.16	45.3	0.13	n.d.	0.22	100.6	85.3
NI-27b-I	41.0	0.02	13.9	0.22	45.2	0.14	n.d.	0.22	100.7	85.3
NI-27b-I	40.4	n.d.	14.0	0.19	44.9	0.13	0.04	0.21	99.7	85.3
NI-27b-I	40.3	0.02	14.7	0.19	45.0	0.13	n.d.	0.19	99.6	85.3
NI-27b-I	40.4	0.01	13.9	0.17	45.0	0.14	0.04	0.22	100.4	85.3
NI-27b-I	40.1	0.02	14.1	0.21	45.2	0.14	n.d.	0.21	100.9	85.3
NI-27b-I	40.9	0.02	14.4	0.22	45.1	0.14	n.d.	0.20	100.3	85.2
NI-27b-I	40.3	0.03	13.8	0.16	45.2	0.14	n.d.	0.22	100.6	85.2
NI-27b-I	40.9	0.01	13.9	0.25	45.2	0.12	n.d.	0.22	100.1	85.2
NI-27b-I	40.3	0.01	14.2	0.22	45.0	0.13	n.d.	0.21	99.8	85.2
NI-27b-I	40.9	0.02	14.4	0.19	44.8	0.14	n.d.	0.20	100.0	85.2
NI-27b-I	40.6	0.01	14.2	0.25	45.1	0.14	n.d.	0.21	100.1	85.1
NI-27b-I	39.8	0.01	13.7	0.20	45.1	0.13	0.03	0.23	100.2	85.1
NI-27b-I	40.5	n.d.	14.2	0.18	44.8	0.14	n.d.	0.21	99.8	85.0
NI-27b-I	40.8	0.02	13.7	0.21	44.5	0.14	0.03	0.23	100.1	85.0
NI-27b-I	41.1	0.02	13.6	0.21	45.1	0.14	n.d.	0.24	100.3	85.0
NI-27b-I	40.8	0.01	12.1	0.14	45.1	0.13	0.15	0.38	100.5	85.0
NI-27b-I	40.6	0.02	16.4	0.24	44.9	0.14	n.d.	0.16	99.9	84.9
NI-27b-2	40.3	0.02	14.3	0.22	44.6	0.13	0.03	0.20	100.0	84.9
NI-27b-I	40.3	0.01	16.2	0.20	44.7	0.15	n.d.	0.18	99.9	84.9
NI-27b-I	40.9	0.01	14.3	0.22	44.6	0.14	0.07	0.20	99.7	84.8
NI-27b-I	40.9	0.22	14.6	0.24	44.8	0.15	n.d.	0.19	100.2	84.8
NI-27b-I	40.7	0.02	13.9	0.19	44.7	0.12	n.d.	0.22	100.4	84.8
NI-27b-1	39.5	0.02	15.4	0.24	44.5	0.14	n.d.	0.18	99.7	84.8
NI-27b-I	40.4	0.02	14.2	0.16	44.7	0.14	n.d.	0.21	100.6	84.7
NI-27b-I	41.2	0.02	12.4	0.16	43.0	0.11	2.36	0.37	99.2	84.7
NI-27b-I	40.1	0.01	13.6	0.22	44.5	0.14	0.04	0.24	99.8	84.7
NI-27b-I	40.7	0.02	13.3	0.19	44.8	0.15	0.25	0.26	100.5	84.7
NI-27b-I	40.1	0.01	16.5	0.24	44.7	0.15	n.d.	0.16	100.6	84.7
NI-27b-I	40.7	0.01	15.5	0.20	44.8	0.15	n.d.	0.18	100.8	84.6
NI-27b-I	41.1	0.02	13.0	0.15	44.5	0.14	0.15	0.28	100.0	84.6
NI-27b-I	40.9	0.02	14.5	0.20	44.2	0.14	n.d.	0.20	99.7	84.3
NI-27b-I	40.2	0.03	14.4	0.29	43.8	0.16	n.d.	0.19	100.2	84.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-l	41.2	0.03	15.6	0.29	43.8	0.15	n.d.	0.18	99.2	84.1
NI-27b-l	41.1	0.02	13.6	0.21	44.1	0.13	n.d.	0.23	100.1	84.1
NI-27b-l	40.5	0.02	13.7	0.19	43.7	0.14	0.49	0.23	99.9	84.0
NI-27b-l	40.7	0.02	13.6	0.20	43.3	0.15	n.d.	0.23	99.3	83.7
NI-27b-l	39.6	0.02	17.5	0.24	42.0	0.21	0.04	0.15	100.9	83.7
NI-27b-l	39.8	0.03	19.3	0.29	43.7	0.14	0.04	0.14	99.1	83.5
NI-27b-l	40.9	0.01	16.1	0.28	43.9	0.14	n.d.	0.17	100.7	83.4
NI-27b-l	40.1	0.01	14.8	0.20	42.4	0.14	n.d.	0.19	99.9	82.9
NI-27b-l	40.6	0.02	16.3	0.28	43.3	0.16	n.d.	0.17	100.3	82.7
NI-27b-l	40.5	0.02	14.9	0.26	43.3	0.13	0.03	0.19	100.1	82.7
NI-27b-l	40.2	0.01	14.2	0.18	42.8	0.16	n.d.	0.20	100.5	82.6
NI-27b-'	39.2	0.01	17.8	0.21	42.9	0.16	0.05	0.15	100.3	82.5
NI-27b-l	41.1	0.02	13.6	0.23	42.9	0.14	0.04	0.24	100.6	82.4
NI-27b-l	39.7	0.02	16.3	0.24	42.6	0.16	n.d.	0.16	99.2	82.3
NI-27b-l	40.7	0.02	13.9	0.20	43.1	0.14	n.d.	0.21	100.4	82.3
NI-27b-l	40.4	0.01	15.1	0.22	42.9	0.16	0.06	0.18	100.5	81.8
NI-27b-l	39.7	0.01	17.1	0.29	42.0	0.15	0.03	0.16	99.7	81.1
NI-27b-l	39.0	0.01	19.7	0.36	42.0	0.12	n.d.	0.13	99.4	80.9
NI-27b-l	39.3	0.02	22.5	0.38	41.9	0.14	n.d.	0.09	99.3	80.7
NI-27b-l	39.8	0.01	22.0	0.33	41.5	0.15	n.d.	0.09	101.0	80.1
NI-27b-l	41.3	0.02	12.2	0.19	44.7	0.22	1.28	0.38	99.4	79.9
NI-27b-l	39.2	0.91	12.6	0.18	40.7	0.14	0.05	0.14	99.6	79.1
NI-27b-l	39.0	0.02	19.2	0.34	40.6	0.17	n.d.	0.14	100.3	79.0
NI-27b-l	39.7	0.01	20.7	0.34	40.4	0.17	n.d.	0.11	100.6	78.6
NI-27b-'	39.1	0.01	17.7	0.31	40.1	0.16	n.d.	0.15	100.1	78.4
NI-27b-l	38.5	0.02	20.1	0.32	39.8	0.17	0.04	0.12	99.1	78.3
NI-27b-l	39.0	0.04	23.2	0.35	40.2	0.16	n.d.	0.09	101.0	78.3
NI-27b-l	40.5	0.02	18.4	0.32	39.8	0.18	0.04	0.15	99.1	77.9
NI-27b-'	39.9	0.01	16.2	0.25	39.7	0.18	n.d.	0.17	99.6	77.5
NI-27b-l	38.7	0.04	25.0	0.31	39.2	0.18	n.d.	0.07	100.0	77.5
NI-27b-l	38.7	0.03	20.5	0.28	39.3	0.16	n.d.	0.11	100.3	77.2
NI-27b-l	38.4	0.03	23.7	0.34	38.8	0.16	n.d.	0.08	100.6	76.4
NI-27b-l	39.7	0.01	19.7	0.29	37.9	0.17	0.07	0.13	99.3	76.2
NI-27b-l	39.0	0.06	26.3	0.37	38.0	0.19	n.d.	0.06	100.4	75.5
NI-27b-l	39.3	0.02	22.1	0.32	38.2	0.20	n.d.	0.09	100.3	75.4
NI-27b-l	40.1	0.03	19.5	0.32	37.6	0.20	n.d.	0.13	100.2	74.8
NI-27b-l	39.8	0.01	21.4	0.34	37.6	0.21	n.d.	0.11	99.7	74.8
NI-27b-l	39.0	0.03	23.2	0.36	37.5	0.25	n.d.	0.09	100.5	74.2
NI-27b-l	38.8	0.05	24.7	0.33	36.9	0.22	n.d.	0.08	99.8	73.9
NI-27b-l	38.0	0.07	26.0	0.33	37.2	0.19	n.d.	0.05	100.9	73.8
NI-27b-l	39.9	0.02	20.3	0.29	36.7	0.22	0.04	0.11	99.6	73.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-27b-I	39.6	0.05	21.1	0.31	36.2	0.23	n.d.	0.10	100.1	72.7
NI-27b-I	39.5	0.02	23.5	0.33	36.1	0.21	0.04	0.08	99.6	72.7
NI-27b-I	40.3	0.02	19.9	0.32	36.1	0.23	n.d.	0.12	100.1	72.4
NI-27b-I	39.0	0.04	24.2	0.40	35.5	0.23	n.d.	0.08	99.8	71.9
NI-27b-I	38.8	0.02	22.6	0.35	35.4	0.24	0.04	0.09	99.9	71.6
NI-27b-I	38.7	0.03	24.5	0.39	34.5	0.25	n.d.	0.08	99.9	70.1
NI-27b-I	38.4	0.03	26.2	0.40	34.6	0.26	n.d.	0.07	100.7	70.1
NI-27b-I	38.5	0.02	24.2	0.47	34.3	0.30	n.d.	0.08	99.0	70.1
NI-5-NiC	40.3	n.d.	11.3	0.22	46.6	0.12	0.06	0.48	99.0	88.1
NI-5-NiC	40.7	0.02	11.5	0.15	46.7	0.13	0.04	0.39	99.6	87.9
NI-5-NiC	41.1	0.03	11.5	0.19	46.8	0.13	0.06	0.43	100.2	87.9
NI-5-NiC	40.3	0.02	11.5	0.22	46.6	0.13	n.d.	0.39	99.2	87.8
NI-5-NiC	40.6	0.01	11.6	0.18	46.9	0.12	0.04	0.45	99.9	87.8
NI-5-NiC	41.1	0.14	11.6	0.13	46.6	0.14	n.d.	0.43	100.1	87.8
NI-5-NiC	40.7	0.03	11.6	n.d.	46.7	0.13	0.04	0.40	99.7	87.8
NI-5-NiC	41.0	0.09	11.6	0.16	46.7	0.14	n.d.	0.36	100.2	87.7
NI-5-NiC	40.4	0.01	11.6	0.18	46.5	0.13	n.d.	0.39	99.2	87.7
NI-5-NiC	41.0	0.02	11.6	0.21	46.6	0.12	0.05	0.40	100.0	87.7
NI-5-NiC	40.8	0.04	11.6	0.22	46.3	0.13	0.05	0.42	99.6	87.7
NI-5-NiC	40.8	0.02	11.6	0.18	46.5	0.14	0.05	0.36	99.6	87.7
NI-5-NiC	40.9	0.02	11.7	0.12	46.8	0.12	0.05	0.44	100.1	87.7
NI-5-NiC	40.7	0.02	11.7	0.24	46.7	0.14	0.04	0.40	99.9	87.7
NI-5-NiC	40.9	0.01	11.6	0.19	46.3	0.14	0.04	0.38	99.6	87.7
NI-5-NiC	40.9	0.02	11.7	0.12	46.5	0.13	n.d.	0.40	99.8	87.7
NI-5-NiC	40.7	0.05	11.7	0.20	46.6	0.12	0.05	0.38	99.8	87.7
NI-5-NiC	40.4	0.02	11.7	0.20	46.6	0.13	0.11	0.42	99.5	87.7
NI-5-NiC	40.3	0.02	11.7	0.15	46.5	0.13	n.d.	0.42	99.2	87.7
NI-5-NiC	40.9	n.d.	11.8	0.13	46.9	0.13	0.05	0.42	100.3	87.6
NI-5-NiC	40.7	n.d.	11.8	0.11	46.8	0.12	0.04	0.44	99.9	87.6
NI-5-NiC	40.7	0.02	11.7	0.12	46.6	0.12	0.03	0.45	99.7	87.6
NI-5-NiC	40.2	n.d.	11.8	0.14	46.8	0.14	0.05	0.40	99.6	87.6
NI-5-NiC	41.0	0.02	11.7	0.13	46.6	0.13	0.04	0.42	100.1	87.6
NI-5-NiC	40.8	0.02	11.7	0.12	46.6	0.12	0.04	0.40	99.8	87.6
NI-5-NiC	40.6	0.02	11.7	0.16	46.4	0.12	0.04	0.35	99.4	87.6
NI-5-NiC	40.6	0.02	11.8	0.25	46.6	0.13	0.03	0.41	99.8	87.6
NI-5-NiC	40.6	0.01	11.8	0.16	46.5	0.13	0.05	0.40	99.6	87.6
NI-5-NiC	40.6	n.d.	11.8	0.17	46.6	0.12	0.05	0.45	99.9	87.6
NI-5-NiC	40.7	0.03	11.7	0.17	46.3	0.14	0.04	0.37	99.5	87.6
NI-5-NiC	40.8	0.03	11.8	0.12	46.6	0.13	0.04	0.42	100.0	87.6
NI-5-NiC	40.6	0.04	11.7	0.15	46.3	0.14	0.04	0.36	99.3	87.5
NI-5-NiC	40.6	0.02	11.8	0.20	46.6	0.14	0.06	0.36	99.8	87.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-5-Ni(	40.7	0.02	11.7	0.15	46.3	0.14	0.05	0.39	99.5	87.5
NI-5-Ni(	40.8	n.d.	11.8	0.14	46.6	0.14	0.07	0.37	100.0	87.5
NI-5-Ni(	40.7	0.02	11.8	0.23	46.4	0.14	0.05	0.39	99.8	87.5
NI-5-Ni(	40.8	0.02	12.0	0.13	47.4	0.14	n.d.	0.38	100.9	87.5
NI-5-Ni(	41.1	0.02	11.9	0.15	46.9	0.14	0.05	0.36	100.7	87.5
NI-5-Ni(	41.1	0.02	11.8	0.20	46.4	0.12	0.04	0.38	100.0	87.5
NI-5-Ni(	40.7	0.04	11.8	0.17	46.4	0.14	0.04	0.42	99.7	87.5
NI-5-Ni(	40.3	0.03	11.8	0.18	46.5	0.10	0.11	0.40	99.4	87.5
NI-5-Ni(	40.8	0.02	11.8	0.18	46.4	0.14	0.05	0.34	99.7	87.5
NI-5-Ni(	40.8	0.02	11.8	0.11	46.3	0.13	0.05	0.39	99.7	87.5
NI-5-Ni(	40.8	0.02	11.9	0.14	46.8	0.13	0.04	0.38	100.2	87.5
NI-5-Ni(	40.8	0.02	11.9	0.22	46.5	0.14	n.d.	0.39	100.0	87.5
NI-5-Ni(	40.8	0.02	11.9	0.17	46.8	0.11	0.03	0.44	100.3	87.5
NI-5-Ni(	40.3	0.02	11.8	0.18	46.2	0.12	0.05	0.40	99.1	87.5
NI-5-Ni(	40.6	0.02	11.9	n.d.	46.6	0.12	0.04	0.43	99.9	87.5
NI-5-Ni(	40.5	0.01	11.9	0.17	46.6	0.13	0.04	0.34	99.7	87.5
NI-5-Ni(	40.7	0.03	11.9	0.13	46.5	0.15	0.04	0.35	99.8	87.5
NI-5-Ni(	40.5	0.02	11.9	0.13	46.4	0.13	0.06	0.33	99.4	87.5
NI-5-Ni(	40.3	n.d.	11.9	0.17	46.4	0.14	0.04	0.34	99.3	87.5
NI-5-Ni(	40.4	n.d.	11.9	0.12	46.5	0.13	0.05	0.40	99.5	87.4
NI-5-Ni(	40.7	0.02	11.9	0.18	46.7	0.14	0.06	0.36	100.2	87.4
NI-5-Ni(	40.9	0.02	11.9	0.18	46.6	0.12	0.05	0.36	100.1	87.4
NI-5-Ni(	40.3	0.01	11.8	0.20	46.1	0.13	0.04	0.38	99.0	87.4
NI-5-Ni(	40.7	0.03	11.9	0.18	46.6	0.12	0.03	0.42	100.0	87.4
NI-5-Ni(	40.9	0.01	12.0	0.13	46.6	0.13	0.06	0.37	100.2	87.4
NI-5-Ni(	40.8	0.02	11.9	n.d.	46.5	0.15	0.05	0.37	99.9	87.4
NI-5-Ni(	40.7	0.02	12.0	0.17	46.5	0.12	0.05	0.45	100.0	87.4
NI-5-Ni(	40.8	0.03	11.9	0.19	46.4	0.13	n.d.	0.40	99.8	87.4
NI-5-Ni(	40.4	0.02	11.9	0.12	46.5	0.13	n.d.	0.41	99.5	87.4
NI-5-Ni(	40.8	0.01	12.0	0.13	46.7	0.12	0.04	0.41	100.2	87.4
NI-5-Ni(	41.0	0.03	11.9	0.10	46.5	0.15	0.03	0.43	100.2	87.4
NI-5-Ni(	40.2	0.02	11.9	0.20	46.3	0.13	0.04	0.34	99.2	87.4
NI-5-Ni(	40.5	0.03	12.0	0.23	46.4	0.13	0.04	0.40	99.7	87.4
NI-5-Ni(	40.7	0.02	12.0	0.12	46.5	0.13	0.06	0.34	99.9	87.4
NI-5-Ni(	40.8	0.02	11.9	0.20	46.2	0.13	0.04	0.35	99.7	87.4
NI-5-Ni(	40.7	n.d.	12.0	0.20	46.6	0.13	0.03	0.44	100.0	87.4
NI-5-Ni(	40.7	0.01	11.9	0.15	46.2	0.14	0.12	0.35	99.7	87.4
NI-5-Ni(	40.5	0.02	11.9	0.12	46.3	0.14	0.11	0.32	99.4	87.4
NI-5-Ni(	40.4	0.02	12.0	0.15	46.6	0.12	0.04	0.45	99.8	87.4
NI-5-Ni(	40.5	0.02	12.0	0.14	46.5	0.14	0.05	0.35	99.8	87.3
NI-5-Ni(	40.8	0.02	12.0	0.13	46.5	0.11	0.04	0.39	100.0	87.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-5-NiC	40.9	0.02	12.0	0.17	46.5	0.14	0.08	0.38	100.2	87.3
NI-5-NiC	40.3	0.01	12.0	0.19	46.2	0.12	0.04	0.37	99.2	87.3
NI-5-NiC	40.7	0.02	12.0	0.13	46.2	0.14	0.10	0.32	99.6	87.3
NI-5-NiC	40.6	0.03	12.0	0.14	46.3	0.13	0.05	0.36	99.6	87.3
NI-5-NiC	40.4	0.01	12.0	0.16	46.4	0.14	0.03	0.37	99.5	87.3
NI-5-NiC	40.4	0.02	12.0	0.14	46.3	0.14	0.06	0.34	99.4	87.3
NI-5-NiC	40.6	0.03	12.0	0.13	46.5	0.13	0.06	0.42	99.8	87.3
NI-5-NiC	40.6	n.d.	12.0	0.16	46.4	0.14	0.05	0.35	99.7	87.3
NI-5-NiC	40.9	0.02	12.1	0.17	46.6	0.14	0.07	0.39	100.4	87.3
NI-5-NiC	40.6	0.02	12.0	0.11	46.3	0.15	0.06	0.31	99.5	87.3
NI-5-NiC	40.9	n.d.	12.0	0.11	46.4	0.13	0.04	0.38	100.0	87.3
NI-5-NiC	40.0	n.d.	12.0	0.19	46.3	0.14	0.05	0.38	99.0	87.3
NI-5-NiC	40.7	0.03	12.0	0.18	46.4	0.14	0.09	0.39	100.0	87.3
NI-5-NiC	41.2	0.02	12.1	0.16	46.8	0.13	0.06	0.36	100.9	87.3
NI-5-NiC	40.3	0.01	12.0	0.18	46.2	0.13	0.04	0.36	99.3	87.3
NI-5-NiC	40.9	0.02	12.1	0.10	46.6	0.13	0.04	0.40	100.3	87.3
NI-5-NiC	41.0	0.02	11.9	0.15	45.8	0.13	0.03	0.43	99.5	87.3
NI-5-NiC	40.3	0.03	12.0	0.16	46.3	0.13	0.05	0.39	99.4	87.3
NI-5-NiC	40.5	0.02	12.1	0.24	46.5	0.14	0.05	0.35	99.9	87.3
NI-5-NiC	40.5	n.d.	12.0	0.17	46.0	0.14	n.d.	0.40	99.2	87.3
NI-5-NiC	40.7	0.01	12.1	0.18	46.3	0.13	0.05	0.35	99.8	87.3
NI-5-NiC	40.8	0.02	12.1	0.19	46.4	0.14	n.d.	0.38	100.0	87.3
NI-5-NiC	40.8	n.d.	12.2	0.21	46.7	0.12	0.05	0.40	100.5	87.2
NI-5-NiC	40.8	0.02	12.2	n.d.	46.8	0.13	n.d.	0.35	100.4	87.2
NI-5-NiC	40.7	n.d.	12.1	0.17	46.4	0.13	n.d.	0.37	99.9	87.2
NI-5-NiC	41.0	0.03	12.3	0.15	46.9	0.13	0.13	0.37	101.0	87.2
NI-5-NiC	40.7	0.02	12.1	0.14	46.4	0.14	0.06	0.37	100.0	87.2
NI-5-NiC	40.8	n.d.	12.1	0.21	46.4	0.13	n.d.	0.34	100.0	87.2
NI-5-NiC	40.5	0.02	12.2	0.13	46.4	0.14	0.06	0.36	99.8	87.2
NI-5-NiC	40.4	0.03	12.1	0.15	46.3	0.13	0.03	0.35	99.6	87.2
NI-5-NiC	40.2	0.03	12.1	0.16	46.2	0.13	0.04	0.35	99.2	87.2
NI-5-NiC	40.6	0.02	12.2	0.13	46.4	0.15	0.04	0.35	99.8	87.2
NI-5-NiC	40.3	0.02	12.1	0.19	46.2	0.12	0.03	0.36	99.4	87.2
NI-5-NiC	41.0	0.01	12.2	0.21	46.4	0.13	n.d.	0.36	100.2	87.2
NI-5-NiC	40.6	0.02	12.2	0.17	46.4	0.14	0.04	0.33	99.9	87.2
NI-5-NiC	40.3	0.02	12.1	0.14	46.2	0.14	0.09	0.38	99.4	87.2
NI-5-NiC	40.8	n.d.	12.1	0.15	46.3	0.13	0.07	0.35	99.9	87.2
NI-5-NiC	40.1	0.02	12.1	0.21	46.0	0.13	0.07	0.37	99.0	87.2
NI-5-NiC	40.6	0.02	12.1	0.13	46.3	0.13	n.d.	0.40	99.7	87.2
NI-5-NiC	40.7	n.d.	12.2	0.18	46.4	0.12	0.03	0.33	99.9	87.2
NI-5-NiC	40.6	0.02	12.2	0.23	46.4	0.11	0.05	0.34	99.9	87.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-5-Ni(	40.9	0.02	12.2	0.18	46.4	0.14	0.05	0.35	100.3	87.2
NI-5-Ni(	40.6	0.04	12.1	0.18	46.2	0.14	0.05	0.32	99.7	87.2
NI-5-Ni(	40.9	0.02	12.2	0.20	46.3	0.13	0.05	0.34	100.0	87.2
NI-5-Ni(	41.0	0.01	12.2	0.18	46.4	0.14	n.d.	0.34	100.3	87.2
NI-5-Ni(	40.4	0.03	12.2	0.19	46.4	0.12	n.d.	0.34	99.7	87.2
NI-5-Ni(	40.8	0.01	12.2	0.21	46.3	0.13	0.04	0.35	100.0	87.1
NI-5-Ni(	40.8	0.02	12.2	0.23	46.5	0.13	0.05	0.37	100.4	87.1
NI-5-Ni(	40.3	n.d.	12.1	0.16	46.1	0.13	n.d.	0.33	99.2	87.1
NI-5-Ni(	41.0	0.02	12.3	0.18	46.6	0.12	0.03	0.40	100.5	87.1
NI-5-Ni(	40.6	0.01	12.2	0.14	46.2	0.14	0.04	0.33	99.6	87.1
NI-5-Ni(	40.3	0.04	12.2	0.16	46.4	0.15	n.d.	0.35	99.6	87.1
NI-5-Ni(	40.4	0.01	12.1	0.15	46.1	0.14	n.d.	0.35	99.3	87.1
NI-5-Ni(	40.5	0.02	12.2	0.14	46.2	0.14	0.06	0.35	99.5	87.1
NI-5-Ni(	40.4	0.02	12.1	0.17	46.1	0.13	0.03	0.38	99.4	87.1
NI-5-Ni(	40.3	0.03	12.2	0.22	46.3	0.14	0.07	0.40	99.7	87.1
NI-5-Ni(	40.9	0.03	12.4	0.21	47.0	0.15	n.d.	0.29	101.0	87.1
NI-5-Ni(	40.9	0.02	12.3	n.d.	46.5	0.14	0.05	0.37	100.3	87.1
NI-5-Ni(	40.2	0.02	12.2	0.16	46.2	0.13	0.05	0.38	99.4	87.1
NI-5-Ni(	40.6	0.02	12.2	0.20	46.3	0.12	0.07	0.37	99.9	87.1
NI-5-Ni(	40.6	0.03	12.2	0.11	46.2	0.13	0.06	0.33	99.6	87.1
NI-5-Ni(	40.6	0.03	12.4	0.19	46.8	0.11	0.04	0.45	100.6	87.1
NI-5-Ni(	40.4	0.02	12.3	0.20	46.4	0.14	n.d.	0.35	99.7	87.1
NI-5-Ni(	40.7	0.02	12.2	0.13	46.2	0.12	0.04	0.33	99.7	87.1
NI-5-Ni(	40.8	0.03	12.3	0.13	46.4	0.13	0.04	0.37	100.2	87.1
NI-5-Ni(	40.5	n.d.	12.2	0.16	46.2	0.16	0.17	0.34	99.7	87.1
NI-5-Ni(	40.7	0.02	12.2	0.14	46.2	0.12	0.04	0.30	99.8	87.1
NI-5-Ni(	41.0	0.09	12.4	n.d.	46.7	0.15	0.04	0.30	100.7	87.1
NI-5-Ni(	40.4	0.02	12.2	0.15	46.2	0.14	0.04	0.31	99.4	87.1
NI-5-Ni(	40.7	0.02	12.2	0.17	46.2	0.14	0.05	0.32	99.9	87.1
NI-5-Ni(	40.6	0.02	12.4	0.17	46.8	0.14	n.d.	0.32	100.4	87.1
NI-5-Ni(	40.7	0.02	12.3	0.18	46.4	0.12	n.d.	0.37	100.1	87.1
NI-5-Ni(	40.3	0.02	12.2	0.22	46.1	0.12	0.04	0.31	99.4	87.1
NI-5-Ni(	40.2	0.02	12.2	0.21	46.1	0.14	n.d.	0.36	99.3	87.1
NI-5-Ni(	40.8	0.01	12.3	0.12	46.3	0.14	0.04	0.40	100.0	87.1
NI-5-Ni(	40.6	0.02	12.3	0.17	46.2	0.14	0.06	0.36	99.8	87.0
NI-5-Ni(	40.6	0.03	12.2	0.17	46.1	0.15	0.12	0.38	99.7	87.0
NI-5-Ni(	40.9	n.d.	12.3	0.17	46.4	0.13	n.d.	0.34	100.3	87.0
NI-5-Ni(	40.6	0.02	12.3	0.18	46.4	0.14	0.05	0.36	100.1	87.0
NI-5-Ni(	40.7	0.02	12.3	0.15	46.2	0.15	n.d.	0.28	99.8	87.0
NI-5-Ni(	40.6	0.01	12.3	0.16	46.3	0.13	n.d.	0.29	99.7	87.0
NI-5-Ni(	40.6	0.02	12.4	0.19	46.7	0.13	0.04	0.43	100.5	87.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-5-Ni(	40.8	0.02	12.3	0.13	46.3	0.12	0.03	0.33	100.1	87.0
NI-5-Ni(	40.6	n.d.	12.3	0.20	46.2	0.12	0.03	0.33	99.8	87.0
NI-5-Ni(	40.4	0.01	12.4	0.13	46.4	0.13	0.07	0.34	99.9	87.0
NI-5-Ni(	40.6	0.01	12.3	0.21	46.2	0.15	n.d.	0.28	99.8	87.0
NI-5-Ni(	40.0	0.02	12.3	0.14	46.2	0.12	0.04	0.39	99.2	87.0
NI-5-Ni(	40.9	n.d.	12.4	0.13	46.5	0.13	n.d.	0.28	100.4	87.0
NI-5-Ni(	40.7	0.02	12.4	0.20	46.4	0.14	0.04	0.37	100.2	87.0
NI-5-Ni(	40.7	0.01	12.4	0.15	46.3	0.13	n.d.	0.30	100.0	87.0
NI-5-Ni(	40.5	0.01	12.4	0.18	46.5	0.12	0.04	0.40	100.1	87.0
NI-5-Ni(	40.3	0.02	12.4	0.20	46.3	0.14	n.d.	0.29	99.6	87.0
NI-5-Ni(	40.4	0.02	12.3	0.14	46.2	0.13	0.04	0.37	99.6	87.0
NI-5-Ni(	40.5	0.02	12.3	0.18	46.0	0.14	0.03	0.28	99.5	87.0
NI-5-Ni(	40.4	0.02	12.4	0.10	46.2	0.14	0.04	0.32	99.6	86.9
NI-5-Ni(	40.3	0.02	12.4	0.11	46.2	0.14	0.03	0.31	99.4	86.9
NI-5-Ni(	40.7	0.02	12.4	0.16	46.3	0.14	n.d.	0.35	100.1	86.9
NI-5-Ni(	40.4	0.03	12.3	0.13	46.0	0.15	0.03	0.33	99.5	86.9
NI-5-Ni(	40.7	0.03	12.6	0.23	47.0	0.14	n.d.	0.34	101.0	86.9
NI-5-Ni(	40.7	0.02	12.4	0.17	46.2	0.13	0.04	0.37	100.0	86.9
NI-5-Ni(	40.7	0.02	12.5	0.12	46.4	0.13	n.d.	0.38	100.2	86.9
NI-5-Ni(	40.6	0.01	12.4	0.12	46.0	0.15	0.04	0.29	99.6	86.9
NI-5-Ni(	40.7	0.02	12.4	0.17	46.1	0.14	0.04	0.31	99.8	86.9
NI-5-Ni(	40.5	0.02	12.4	0.23	46.3	0.15	n.d.	0.25	99.9	86.9
NI-5-Ni(	40.3	0.02	12.4	0.20	46.1	0.13	n.d.	0.32	99.6	86.9
NI-5-Ni(	41.0	0.01	12.6	0.18	46.6	0.13	0.04	0.33	100.9	86.9
NI-5-Ni(	40.2	0.02	12.5	0.22	46.2	0.14	n.d.	0.29	99.6	86.9
NI-5-Ni(	40.4	n.d.	12.4	0.16	46.2	0.15	0.04	0.28	99.7	86.9
NI-5-Ni(	40.8	0.02	12.5	0.17	46.4	0.13	0.03	0.34	100.4	86.9
NI-5-Ni(	40.7	0.06	12.4	0.19	45.9	0.16	0.06	0.26	99.6	86.9
NI-5-Ni(	40.5	0.02	12.4	0.18	46.1	0.14	0.07	0.29	99.7	86.9
NI-5-Ni(	40.8	0.03	12.5	0.11	46.2	0.14	0.05	0.26	100.2	86.8
NI-5-Ni(	40.7	0.01	12.5	0.16	46.2	0.14	n.d.	0.28	100.0	86.8
NI-5-Ni(	40.8	n.d.	12.5	n.d.	46.1	0.15	0.04	0.25	99.8	86.8
NI-5-Ni(	40.8	0.01	12.4	0.20	45.8	0.14	0.03	0.30	99.7	86.8
NI-5-Ni(	40.7	0.02	12.5	0.12	46.0	0.14	n.d.	0.26	99.7	86.8
NI-5-Ni(	40.4	n.d.	12.4	0.16	45.6	0.15	n.d.	0.24	99.0	86.8
NI-5-Ni(	40.7	0.03	12.5	0.14	46.1	0.15	0.04	0.29	100.0	86.8
NI-5-Ni(	40.7	0.02	12.6	0.12	46.4	0.12	n.d.	0.35	100.3	86.8
NI-5-Ni(	40.1	0.03	12.4	0.12	45.9	0.15	n.d.	0.33	99.1	86.8
NI-5-Ni(	40.3	0.02	12.5	0.26	46.0	0.15	n.d.	0.29	99.5	86.8
NI-5-Ni(	40.5	0.02	12.5	0.14	46.0	0.14	n.d.	0.30	99.7	86.8
NI-5-Ni(	40.6	0.03	12.5	0.21	45.8	0.18	0.03	0.19	99.5	86.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-5-Ni(	40.2	0.01	12.5	0.12	46.1	0.13	0.04	0.32	99.4	86.8
NI-5-Ni(	40.3	0.03	12.4	0.24	45.7	0.15	n.d.	0.27	99.1	86.8
NI-5-Ni(	40.5	0.02	12.6	0.13	46.1	0.15	0.04	0.29	99.8	86.8
NI-5-Ni(	40.5	0.01	12.6	0.18	46.1	0.16	n.d.	0.22	99.8	86.8
NI-5-Ni(	40.8	0.02	12.5	0.18	46.1	0.14	0.05	0.28	100.0	86.7
NI-5-Ni(	40.3	0.02	12.6	0.18	46.2	0.15	0.05	0.35	99.8	86.7
NI-5-Ni(	40.7	0.03	12.5	0.11	46.0	0.15	n.d.	0.31	99.8	86.7
NI-5-Ni(	40.8	0.02	12.6	0.16	46.2	0.14	0.05	0.32	100.3	86.7
NI-5-Ni(	40.7	0.01	12.5	0.18	45.9	0.14	0.04	0.36	99.9	86.7
NI-5-Ni(	40.3	0.02	12.5	0.14	45.7	0.16	n.d.	0.29	99.1	86.7
NI-5-Ni(	40.9	0.02	12.6	0.13	46.2	0.16	n.d.	0.31	100.4	86.7
NI-5-Ni(	40.8	0.03	12.6	0.13	46.0	0.16	0.06	0.26	100.1	86.7
NI-5-Ni(	40.8	0.02	12.6	0.15	46.2	0.14	n.d.	0.30	100.3	86.7
NI-5-Ni(	40.5	0.02	12.6	0.13	46.2	0.14	0.05	0.32	99.9	86.7
NI-5-Ni(	40.6	0.03	12.6	0.18	45.9	0.14	0.10	0.35	99.9	86.7
NI-5-Ni(	40.3	0.02	12.6	0.20	45.9	0.17	0.04	0.28	99.4	86.7
NI-5-Ni(	40.2	0.01	12.5	0.18	45.7	0.16	0.05	0.24	99.0	86.7
NI-5-Ni(	40.7	n.d.	12.7	0.18	46.2	0.14	0.10	0.31	100.3	86.7
NI-5-Ni(	40.7	0.03	12.5	0.24	45.6	0.16	n.d.	0.29	99.6	86.7
NI-5-Ni(	40.3	0.02	12.7	0.22	46.1	0.14	n.d.	0.24	99.7	86.7
NI-5-Ni(	40.4	0.02	12.6	0.15	45.9	0.14	n.d.	0.30	99.5	86.7
NI-5-Ni(	40.0	0.01	12.6	0.20	45.9	0.13	0.03	0.30	99.2	86.6
NI-5-Ni(	40.3	0.01	12.6	0.20	45.9	0.16	n.d.	0.24	99.5	86.6
NI-5-Ni(	40.1	0.02	12.7	0.21	46.0	0.17	n.d.	0.20	99.4	86.6
NI-5-Ni(	40.6	0.02	12.7	0.19	46.1	0.17	0.06	0.23	100.0	86.6
NI-5-Ni(	40.8	0.01	12.7	0.23	46.2	0.15	0.05	0.25	100.4	86.6
NI-5-Ni(	40.6	0.02	12.7	0.19	46.0	0.14	0.03	0.30	100.0	86.6
NI-5-Ni(	40.1	0.02	12.7	0.22	45.8	0.17	0.04	0.22	99.3	86.6
NI-5-Ni(	40.7	n.d.	12.7	0.22	46.0	0.14	0.04	0.28	100.1	86.6
NI-5-Ni(	40.6	0.01	12.8	0.18	46.2	0.18	0.04	0.24	100.2	86.5
NI-5-Ni(	40.4	0.03	12.9	0.19	46.3	0.13	n.d.	0.30	100.2	86.5
NI-5-Ni(	40.3	n.d.	12.8	0.18	46.1	0.18	n.d.	0.22	99.7	86.5
NI-5-Ni(	40.8	0.02	12.8	0.17	46.3	0.16	0.03	0.22	100.5	86.5
NI-5-Ni(	40.7	0.01	12.8	0.15	46.0	0.17	0.04	0.22	100.0	86.5
NI-5-Ni(	40.6	0.01	12.8	0.18	46.0	0.14	n.d.	0.24	100.1	86.5
NI-5-Ni(	40.8	0.03	12.8	0.17	45.9	0.17	0.11	0.22	100.1	86.5
NI-5-Ni(	40.5	0.02	12.8	0.13	46.0	0.15	0.05	0.23	99.9	86.5
NI-5-Ni(	40.6	0.03	12.8	0.20	45.9	0.16	n.d.	0.24	100.0	86.5
NI-5-Ni(	40.3	0.01	12.8	0.19	46.0	0.17	0.04	0.28	99.8	86.5
NI-5-Ni(	40.3	0.01	12.9	0.23	46.1	0.17	0.11	0.24	100.1	86.5
NI-5-Ni(	40.4	0.01	12.8	0.22	45.9	0.16	0.07	0.31	99.8	86.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-5-Ni(	40.5	0.02	12.9	0.15	45.9	0.19	n.d.	0.23	99.9	86.4
NI-5-Ni(	40.8	0.03	12.9	0.22	46.1	0.14	n.d.	0.28	100.5	86.4
NI-5-Ni(	40.6	0.01	12.9	0.25	46.1	0.18	0.04	0.17	100.3	86.4
NI-5-Ni(	40.6	0.01	12.9	0.20	46.2	0.15	0.07	0.27	100.4	86.4
NI-5-Ni(	40.3	0.05	12.7	0.24	45.3	0.18	0.04	0.21	99.0	86.4
NI-5-Ni(	40.9	0.02	13.0	0.18	46.5	0.16	0.04	0.21	101.0	86.4
NI-5-Ni(	40.7	0.02	12.9	0.21	46.0	0.18	n.d.	0.21	100.3	86.4
NI-5-Ni(	40.8	n.d.	13.0	0.15	46.1	0.16	n.d.	0.27	100.5	86.4
NI-5-Ni(	40.2	0.02	12.9	n.d.	45.9	0.17	0.03	0.22	99.5	86.4
NI-5-Ni(	40.8	0.04	12.9	0.15	46.0	0.16	n.d.	0.22	100.3	86.4
NI-5-Ni(	40.4	0.01	12.9	0.15	45.8	0.17	0.05	0.20	99.7	86.4
NI-5-Ni(	40.9	0.01	13.0	0.18	46.1	0.17	n.d.	0.23	100.6	86.4
NI-5-Ni(	39.9	0.03	12.8	0.21	45.6	0.18	0.03	0.21	99.0	86.4
NI-5-Ni(	40.1	n.d.	12.9	0.23	45.7	0.19	n.d.	0.21	99.3	86.3
NI-5-Ni(	40.6	0.02	12.9	0.16	45.6	0.17	0.03	0.20	99.7	86.3
NI-5-Ni(	40.2	0.03	13.0	0.14	45.8	0.18	0.05	0.18	99.6	86.3
NI-5-Ni(	40.5	n.d.	13.0	0.23	45.7	0.16	n.d.	0.19	99.8	86.3
NI-5-Ni(	40.7	0.04	13.0	0.17	45.6	0.19	n.d.	0.20	99.9	86.3
NI-5-Ni(	40.3	0.01	12.9	0.20	45.4	0.17	0.03	0.23	99.2	86.2
NI-5-Ni(	40.5	0.02	12.9	0.17	45.4	0.19	n.d.	0.16	99.3	86.2
NI-5-Ni(	40.7	0.02	13.0	0.21	45.6	0.18	n.d.	0.21	99.9	86.2
NI-5-Ni(	40.2	0.02	13.0	0.21	45.5	0.19	n.d.	0.18	99.2	86.2
NI-5-Ni(	40.4	n.d.	13.1	0.17	45.9	0.16	n.d.	0.21	100.0	86.2
NI-5-Ni(	40.3	0.01	13.0	0.20	45.6	0.18	0.05	0.18	99.5	86.2
NI-5-Ni(	40.4	0.04	13.0	0.17	45.5	0.19	0.05	0.17	99.6	86.1
NI-5-Ni(	39.9	n.d.	13.1	0.23	45.5	0.19	0.04	0.17	99.1	86.1
NI-5-Ni(	40.8	0.01	13.2	0.24	45.9	0.18	0.03	0.13	100.5	86.1
NI-5-Ni(	40.6	0.02	13.2	0.20	45.6	0.18	n.d.	0.21	100.0	86.1
NI-5-Ni(	40.8	0.02	13.3	0.28	45.9	0.18	0.04	0.20	100.7	86.1
NI-5-Ni(	40.2	0.01	13.2	0.19	45.6	0.16	0.03	0.21	99.6	86.1
NI-5-Ni(	40.4	0.01	13.2	0.17	45.7	0.18	n.d.	0.18	99.9	86.1
NI-5-Ni(	40.8	0.02	13.1	0.18	45.5	0.13	0.04	0.33	100.1	86.1
NI-5-Ni(	40.3	0.03	13.2	0.20	45.8	0.20	n.d.	0.19	99.9	86.0
NI-5-Ni(	40.1	0.02	13.2	0.16	45.4	0.15	0.04	0.26	99.4	86.0
NI-5-Ni(	40.6	n.d.	13.2	0.19	45.5	0.19	0.03	0.16	99.8	86.0
NI-5-Ni(	40.3	n.d.	13.2	0.26	45.7	0.18	n.d.	0.15	99.8	86.0
NI-5-Ni(	40.1	n.d.	13.1	0.23	45.3	0.18	n.d.	0.18	99.2	86.0
NI-5-Ni(	40.2	n.d.	13.2	0.15	45.4	0.17	n.d.	0.15	99.3	86.0
NI-5-Ni(	40.6	0.03	13.3	0.15	45.6	0.17	n.d.	0.21	100.1	85.9
NI-5-Ni(	40.3	0.03	13.2	0.27	45.2	0.21	n.d.	0.25	99.5	85.9
NI-5-Ni(	40.1	0.03	13.3	0.20	45.4	0.17	0.04	0.19	99.5	85.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-5-Ni(	40.5	0.01	13.3	0.27	45.4	0.18	n.d.	0.19	99.8	85.9
NI-5-Ni(	40.3	0.03	13.3	0.21	45.3	0.22	0.06	0.12	99.5	85.9
NI-5-Ni(	40.4	0.04	13.2	0.21	45.1	0.18	n.d.	0.17	99.4	85.9
NI-5-Ni(	40.4	0.02	13.4	0.27	45.6	0.19	n.d.	0.18	100.1	85.8
NI-5-Ni(	40.4	0.01	13.4	0.13	45.3	0.18	n.d.	0.21	99.6	85.8
NI-5-Ni(	40.6	0.02	13.4	0.23	45.5	0.16	n.d.	0.25	100.2	85.8
NI-5-Ni(	40.2	0.02	13.5	0.21	45.5	0.21	n.d.	0.14	99.9	85.7
NI-5-Ni(	40.7	n.d.	13.5	0.24	45.6	0.19	n.d.	0.18	100.4	85.7
NI-5-Ni(	40.4	0.02	13.4	0.25	45.1	0.21	n.d.	0.17	99.6	85.7
NI-5-Ni(	40.3	0.02	13.7	0.27	46.0	0.20	0.04	0.12	100.7	85.7
NI-5-Ni(	40.9	0.11	13.5	0.21	45.2	0.18	0.04	0.22	100.3	85.7
NI-5-Ni(	40.4	0.02	13.6	0.18	45.3	0.14	n.d.	0.27	99.9	85.6
NI-5-Ni(	40.6	0.02	13.6	0.17	45.3	0.18	n.d.	0.16	100.1	85.6
NI-5-Ni(	40.1	0.02	13.6	0.22	45.3	0.21	0.04	0.14	99.6	85.6
NI-5-Ni(	40.6	0.01	13.7	0.19	45.4	0.18	n.d.	0.17	100.2	85.6
NI-5-Ni(	40.3	0.02	13.7	0.25	45.2	0.17	n.d.	0.19	99.9	85.4
NI-5-Ni(	40.6	n.d.	13.8	0.22	44.8	0.21	0.04	0.15	99.8	85.3
NI-5-Ni(	40.1	0.02	13.9	0.16	44.9	0.21	n.d.	0.13	99.4	85.2
NI-5-Ni(	40.4	0.02	14.0	0.30	45.0	0.21	n.d.	0.13	100.1	85.1
NI-5-Ni(	40.0	n.d.	14.0	0.27	44.7	0.21	n.d.	0.11	99.4	85.0
NI-5-Ni(	40.6	0.01	14.2	0.22	44.8	0.22	n.d.	0.10	100.1	84.9
NI-5-Ni(	40.3	0.03	14.3	0.25	44.8	0.16	n.d.	0.17	100.0	84.9
NI-5-Ni(	40.4	0.01	14.1	0.22	44.2	0.21	n.d.	0.11	99.3	84.8
NI-5-Ni(	40.4	0.02	14.9	0.12	44.2	0.21	n.d.	0.12	99.9	84.1
NI-5-Ni(	40.3	0.02	15.0	0.19	44.2	0.23	n.d.	0.11	100.1	84.0
NI-5-Ni(	39.7	0.03	15.0	0.24	44.0	0.18	0.04	0.13	99.4	83.9
NI-5-Ni(	39.7	0.03	15.0	0.24	43.8	0.24	n.d.	0.11	99.1	83.9
NI-5-Ni(	40.4	0.01	15.1	0.14	44.0	0.21	n.d.	0.15	99.9	83.9
NI-5-Ni(	40.1	n.d.	15.2	0.25	43.7	0.18	n.d.	0.18	99.6	83.7
NI-5-Ni(	39.4	0.04	17.1	0.37	42.0	0.20	n.d.	0.20	99.2	81.4
NI-5-Ni(	39.6	0.03	17.4	0.38	42.0	0.24	n.d.	0.08	99.7	81.1
NI-5-Ni(	39.5	0.04	18.2	0.32	41.1	0.24	0.08	0.12	99.7	80.1
NI-5-Ni(	39.7	0.02	18.3	0.35	41.1	0.20	n.d.	0.16	99.7	80.0
NI-5-Ni(	39.7	0.02	18.8	0.35	40.7	0.25	n.d.	0.05	99.8	79.4
APA-14ı	40.7	0.03	13.6	0.17	45.2	0.14	0.04	0.37	100.3	85.5
APA-14ı	40.8	0.03	13.6	0.20	45.0	0.13	0.03	0.33	100.2	85.5
APA-14ı	40.9	0.02	13.8	0.20	45.2	0.12	0.03	0.39	100.7	85.3
APA-14ı	40.9	0.02	13.8	0.17	45.1	0.14	0.03	0.40	100.6	85.3
APA-14ı	40.8	0.01	13.9	0.18	45.1	0.13	0.04	0.32	100.5	85.3
APA-14ı	40.7	0.02	13.9	0.19	45.2	0.14	0.04	0.38	100.6	85.2
APA-14ı	40.6	0.03	13.9	0.17	44.9	0.12	0.04	0.37	100.2	85.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	40.6	0.03	13.9	0.20	45.1	0.13	0.04	0.39	100.4	85.2
APA-14ı	40.5	0.03	13.9	0.17	44.9	0.14	n.d.	0.39	100.0	85.2
APA-14ı	40.4	0.02	13.9	0.18	44.8	0.13	0.03	0.36	99.8	85.2
APA-14ı	40.6	0.03	14.0	0.19	45.0	0.15	n.d.	0.36	100.4	85.2
APA-14ı	40.5	0.03	13.9	0.17	44.9	0.13	0.04	0.42	100.1	85.2
APA-14ı	40.5	0.03	14.0	0.17	45.0	0.14	0.03	0.40	100.3	85.1
APA-14ı	40.6	0.03	14.0	0.20	44.9	0.14	0.04	0.35	100.2	85.1
APA-14ı	40.5	0.03	14.0	0.16	44.9	0.13	0.03	0.37	100.1	85.1
APA-14ı	40.6	0.02	14.0	0.18	44.9	0.13	n.d.	0.40	100.2	85.1
APA-14ı	40.7	0.03	14.0	0.19	44.9	0.14	0.03	0.38	100.3	85.1
APA-14ı	40.5	0.04	14.0	0.18	44.9	0.13	0.04	0.37	100.2	85.1
APA-14ı	40.5	0.03	14.0	0.18	44.8	0.13	n.d.	0.37	100.1	85.1
APA-14ı	40.9	0.03	14.1	0.19	45.0	0.13	0.03	0.36	100.7	85.1
APA-14ı	40.5	0.02	14.0	0.20	44.9	0.11	n.d.	0.40	100.3	85.1
APA-14ı	40.7	0.03	14.1	0.18	44.9	0.13	n.d.	0.40	100.5	85.1
APA-14ı	40.5	0.01	14.0	0.19	44.8	0.12	n.d.	0.33	100.1	85.1
APA-14ı	40.9	0.02	14.1	0.15	44.9	0.12	0.04	0.34	100.5	85.0
APA-14ı	40.6	0.02	14.1	0.20	45.1	0.14	n.d.	0.39	100.6	85.0
APA-14ı	40.8	0.03	14.1	0.18	44.9	0.13	n.d.	0.35	100.5	85.0
APA-14ı	40.5	0.02	14.1	0.20	44.9	0.13	0.04	0.38	100.3	85.0
APA-14ı	40.5	0.03	14.1	0.18	44.9	0.12	0.04	0.35	100.3	85.0
APA-14ı	40.5	0.02	14.1	0.18	44.8	0.13	n.d.	0.39	100.2	85.0
APA-14ı	40.8	0.03	14.0	0.17	44.7	0.13	0.04	0.34	100.3	85.0
APA-14ı	40.4	0.02	14.1	0.18	44.8	0.14	0.04	0.36	100.1	85.0
APA-14ı	40.6	0.03	14.2	0.24	44.9	0.13	n.d.	0.35	100.5	85.0
APA-14ı	40.5	0.02	14.2	0.16	44.9	0.13	0.03	0.38	100.3	85.0
APA-14ı	40.8	0.03	14.2	0.19	44.9	0.15	n.d.	0.41	100.6	85.0
APA-14ı	40.9	0.03	14.2	0.19	44.9	0.12	n.d.	0.28	100.6	84.9
APA-14ı	40.7	0.02	14.2	0.20	44.9	0.14	n.d.	0.34	100.6	84.9
APA-14ı	40.5	0.01	14.2	0.21	44.9	0.14	0.03	0.33	100.3	84.9
APA-14ı	40.7	0.03	14.2	0.18	44.8	0.12	n.d.	0.30	100.4	84.9
APA-14ı	40.7	0.02	14.2	0.21	44.8	0.13	0.03	0.37	100.5	84.9
APA-14ı	40.6	0.02	14.3	0.18	45.0	0.15	n.d.	0.36	100.7	84.9
APA-14ı	40.8	0.03	14.3	0.21	45.0	0.13	0.03	0.35	100.8	84.9
APA-14ı	40.8	0.03	14.2	0.17	44.8	0.14	0.03	0.32	100.4	84.9
APA-14ı	40.8	0.03	14.3	0.18	45.0	0.16	0.08	0.35	100.8	84.9
APA-14ı	40.8	0.03	14.3	0.19	44.8	0.12	0.03	0.30	100.6	84.9
APA-14ı	40.3	0.03	14.3	0.22	44.9	0.15	0.03	0.32	100.2	84.8
APA-14ı	40.8	0.03	14.4	0.18	45.1	0.13	0.04	0.34	100.9	84.8
APA-14ı	40.7	0.02	14.4	0.19	45.0	0.15	0.04	0.31	100.8	84.8
APA-14ı	40.8	0.02	14.4	0.19	45.0	0.14	n.d.	0.27	101.0	84.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	40.7	0.01	14.4	0.19	44.8	0.13	n.d.	0.33	100.6	84.8
APA-14ı	40.6	0.03	14.4	0.17	44.9	0.12	0.04	0.35	100.6	84.8
APA-14ı	40.9	0.02	14.4	0.22	44.8	0.13	n.d.	0.30	100.7	84.8
APA-14ı	40.8	0.02	14.4	0.21	45.0	0.13	n.d.	0.37	101.0	84.8
APA-14ı	40.5	0.02	14.3	0.20	44.8	0.13	n.d.	0.36	100.4	84.8
APA-14ı	40.9	0.02	14.4	0.20	45.0	0.13	n.d.	0.32	101.0	84.8
APA-14ı	40.6	0.27	14.4	0.18	44.9	0.15	n.d.	0.33	100.9	84.7
APA-14ı	40.6	0.03	14.4	0.19	44.7	0.16	n.d.	0.37	100.5	84.7
APA-14ı	40.7	0.02	14.4	0.19	44.8	0.13	0.10	0.32	100.7	84.7
APA-14ı	40.7	0.02	14.4	0.20	44.8	0.13	n.d.	0.31	100.5	84.7
APA-14ı	40.5	0.03	14.4	0.20	44.8	0.14	0.07	0.32	100.4	84.7
APA-14ı	40.9	0.02	14.4	0.19	44.8	0.13	n.d.	0.37	100.8	84.7
APA-14ı	41.0	0.05	14.4	0.18	44.8	0.19	0.03	0.34	101.0	84.7
APA-14ı	40.6	0.02	14.5	0.19	44.9	0.14	n.d.	0.33	100.6	84.7
APA-14ı	40.7	0.03	14.4	0.19	44.7	0.12	n.d.	0.32	100.5	84.7
APA-14ı	40.8	0.05	14.5	0.22	44.9	0.14	0.03	0.35	100.9	84.7
APA-14ı	40.8	0.03	14.4	0.18	44.6	0.12	n.d.	0.33	100.5	84.7
APA-14ı	40.5	0.02	14.4	0.15	44.7	0.13	n.d.	0.32	100.2	84.7
APA-14ı	40.7	0.01	14.5	0.20	44.8	0.14	0.04	0.38	100.8	84.7
APA-14ı	40.5	0.03	14.4	0.18	44.7	0.14	0.04	0.35	100.5	84.7
APA-14ı	40.4	0.03	14.5	0.19	44.8	0.15	n.d.	0.34	100.4	84.7
APA-14ı	40.8	0.03	14.4	0.20	44.7	0.13	0.03	0.33	100.6	84.6
APA-14ı	41.0	0.02	14.5	0.20	44.8	0.13	n.d.	0.32	100.9	84.6
APA-14ı	40.9	0.03	14.5	0.17	44.8	0.13	0.03	0.37	101.0	84.6
APA-14ı	40.3	0.02	14.5	0.20	44.7	0.14	n.d.	0.26	100.2	84.6
APA-14ı	40.4	0.19	14.5	0.17	44.7	0.14	n.d.	0.32	100.4	84.6
APA-14ı	40.6	n.d.	14.5	0.19	44.6	0.13	n.d.	0.35	100.4	84.6
APA-14ı	40.6	0.02	14.5	0.22	44.8	0.13	n.d.	0.33	100.6	84.6
APA-14ı	40.5	0.04	14.5	0.22	44.8	0.13	0.03	0.34	100.6	84.6
APA-14ı	40.9	0.03	14.5	0.20	44.7	0.13	0.03	0.32	100.8	84.6
APA-14ı	40.8	0.02	14.5	0.14	44.7	0.13	0.04	0.29	100.6	84.6
APA-14ı	40.7	0.03	14.5	0.19	44.8	0.13	0.04	0.33	100.7	84.6
APA-14ı	40.6	0.03	14.5	0.18	44.7	0.14	0.05	0.30	100.5	84.6
APA-14ı	40.6	0.02	14.5	0.18	44.7	0.14	0.04	0.36	100.5	84.6
APA-14ı	40.6	0.02	14.5	0.19	44.7	0.17	n.d.	0.38	100.6	84.6
APA-14ı	40.8	0.03	14.5	0.19	44.8	0.14	n.d.	0.35	100.8	84.6
APA-14ı	40.7	0.02	14.5	0.17	44.7	0.12	n.d.	0.28	100.6	84.6
APA-14ı	40.8	0.02	14.5	0.18	44.7	0.13	n.d.	0.29	100.7	84.6
APA-14ı	40.8	0.03	14.4	0.20	44.3	0.13	n.d.	0.33	100.1	84.6
APA-14ı	40.5	0.02	14.5	0.22	44.6	0.14	n.d.	0.30	100.3	84.6
APA-14ı	40.4	0.02	14.5	0.19	44.8	0.12	n.d.	0.27	100.3	84.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	40.0	0.02	14.5	0.21	44.5	0.15	n.d.	0.33	99.7	84.6
APA-14ı	40.7	0.03	14.5	0.24	44.5	0.12	0.03	0.33	100.5	84.6
APA-14ı	40.5	0.02	14.6	0.18	44.8	0.13	n.d.	0.35	100.6	84.6
APA-14ı	40.6	0.03	14.4	0.19	44.3	0.18	0.05	0.29	100.1	84.5
APA-14ı	40.5	0.03	14.5	0.21	44.5	0.12	0.04	0.31	100.1	84.5
APA-14ı	40.5	0.04	14.6	0.20	44.7	0.14	0.03	0.37	100.5	84.5
APA-14ı	40.7	0.02	14.5	0.21	44.6	0.12	n.d.	0.36	100.6	84.5
APA-14ı	40.8	0.02	14.6	0.21	44.7	0.13	0.04	0.33	100.8	84.5
APA-14ı	40.3	0.20	14.6	0.19	44.6	0.15	0.03	0.31	100.4	84.5
APA-14ı	40.4	0.04	14.5	0.20	44.5	0.13	n.d.	0.29	100.1	84.5
APA-14ı	40.0	0.03	14.5	0.19	44.4	0.14	0.03	0.34	99.7	84.5
APA-14ı	40.8	0.02	14.6	0.20	44.5	0.13	n.d.	0.36	100.6	84.5
APA-14ı	40.4	0.02	14.4	0.18	44.2	0.13	n.d.	0.32	99.7	84.5
APA-14ı	40.1	0.02	14.5	0.17	44.4	0.14	n.d.	0.31	99.7	84.5
APA-14ı	40.7	0.02	14.6	0.21	44.6	0.13	n.d.	0.26	100.6	84.5
APA-14ı	40.4	0.02	14.6	0.20	44.4	0.13	n.d.	0.32	100.1	84.5
APA-14ı	40.1	0.02	14.5	0.20	44.4	0.13	n.d.	0.30	99.7	84.5
APA-14ı	40.6	0.02	14.7	0.19	44.8	0.13	0.03	0.28	100.7	84.5
APA-14ı	40.7	0.03	14.6	0.21	44.4	0.14	n.d.	0.30	100.4	84.5
APA-14ı	40.4	0.03	14.6	0.19	44.4	0.15	n.d.	0.31	100.1	84.5
APA-14ı	40.8	0.03	14.6	0.19	44.6	0.17	0.03	0.29	100.8	84.4
APA-14ı	40.9	0.02	14.7	0.21	44.6	0.17	n.d.	0.37	101.0	84.4
APA-14ı	40.0	0.02	14.6	0.18	44.4	0.13	n.d.	0.31	99.6	84.4
APA-14ı	40.7	0.03	14.7	0.19	44.8	0.15	n.d.	0.32	100.9	84.4
APA-14ı	39.9	0.02	14.6	0.22	44.3	0.13	n.d.	0.28	99.5	84.4
APA-14ı	39.9	0.03	14.5	0.17	44.1	0.13	n.d.	0.25	99.2	84.4
APA-14ı	40.7	0.02	14.7	0.18	44.6	0.14	n.d.	0.27	100.6	84.4
APA-14ı	40.4	0.02	14.7	0.17	44.5	0.13	n.d.	0.29	100.2	84.4
APA-14ı	40.2	0.02	14.7	0.23	44.4	0.13	0.04	0.35	100.0	84.4
APA-14ı	40.1	0.03	14.6	0.21	44.4	0.15	n.d.	0.29	99.8	84.4
APA-14ı	40.7	0.02	14.7	0.16	44.6	0.14	0.03	0.28	100.6	84.4
APA-14ı	40.4	0.02	14.7	0.21	44.5	0.14	n.d.	0.30	100.4	84.4
APA-14ı	40.7	0.01	14.7	0.17	44.5	0.14	n.d.	0.30	100.5	84.4
APA-14ı	40.4	0.03	14.5	0.17	43.9	0.15	n.d.	0.37	99.6	84.4
APA-14ı	40.6	0.02	14.8	0.14	44.7	0.15	0.10	0.31	100.7	84.3
APA-14ı	40.3	0.04	14.6	0.19	44.2	0.14	n.d.	0.30	99.9	84.3
APA-14ı	40.4	0.32	14.7	0.17	44.5	0.14	n.d.	0.30	100.5	84.3
APA-14ı	40.7	0.02	14.8	0.23	44.7	0.14	0.03	0.31	101.0	84.3
APA-14ı	40.5	0.02	14.7	0.22	44.5	0.14	n.d.	0.30	100.4	84.3
APA-14ı	40.6	0.02	14.8	0.21	44.5	0.15	0.05	0.26	100.6	84.3
APA-14ı	40.6	0.02	14.8	0.20	44.6	0.14	n.d.	0.27	100.7	84.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	40.5	0.02	14.8	0.20	44.7	0.15	n.d.	0.29	100.6	84.3
APA-14ı	40.5	0.03	14.8	0.20	44.8	0.14	n.d.	0.23	100.8	84.3
APA-14ı	40.7	0.03	14.8	0.18	44.7	0.14	n.d.	0.28	100.8	84.3
APA-14ı	40.6	0.02	14.8	0.19	44.7	0.14	0.03	0.28	100.7	84.3
APA-14ı	40.8	0.02	14.8	0.19	44.5	0.14	n.d.	0.29	100.7	84.3
APA-14ı	40.7	0.03	14.8	0.20	44.6	0.14	n.d.	0.24	100.7	84.3
APA-14ı	40.7	0.02	14.8	0.22	44.5	0.13	0.03	0.28	100.7	84.3
APA-14ı	40.5	0.02	14.8	0.21	44.6	0.14	n.d.	0.32	100.5	84.3
APA-14ı	40.7	0.02	14.8	0.20	44.5	0.14	n.d.	0.34	100.6	84.3
APA-14ı	40.1	0.02	14.8	0.19	44.5	0.14	n.d.	0.31	100.0	84.3
APA-14ı	40.5	0.45	14.8	0.21	44.6	0.14	n.d.	0.28	101.0	84.3
APA-14ı	40.5	0.03	14.9	0.18	44.6	0.14	n.d.	0.29	100.7	84.3
APA-14ı	40.6	0.03	14.8	0.21	44.5	0.14	0.05	0.26	100.6	84.3
APA-14ı	40.6	0.03	14.6	0.21	43.9	0.20	n.d.	0.28	99.8	84.3
APA-14ı	40.6	0.02	14.8	0.18	44.5	0.14	n.d.	0.28	100.5	84.3
APA-14ı	40.6	0.01	14.9	0.20	44.7	0.14	0.05	0.33	100.9	84.2
APA-14ı	40.5	0.02	14.9	0.19	44.6	0.14	n.d.	0.25	100.6	84.2
APA-14ı	40.1	0.02	14.7	0.16	44.1	0.20	0.05	0.31	99.7	84.2
APA-14ı	39.8	0.02	14.7	0.20	44.1	0.14	0.05	0.30	99.3	84.2
APA-14ı	40.6	0.02	14.8	0.22	44.3	0.14	n.d.	0.29	100.3	84.2
APA-14ı	40.7	0.03	14.9	0.22	44.5	0.14	n.d.	0.29	100.8	84.2
APA-14ı	40.6	0.03	14.9	0.19	44.5	0.16	0.03	0.32	100.8	84.2
APA-14ı	40.6	0.03	14.9	0.17	44.5	0.14	n.d.	0.30	100.6	84.2
APA-14ı	40.9	0.02	14.8	0.20	44.3	0.15	n.d.	0.25	100.6	84.2
APA-14ı	40.5	0.02	14.9	0.22	44.6	0.14	0.03	0.29	100.7	84.2
APA-14ı	40.5	0.01	14.9	0.20	44.6	0.13	0.04	0.25	100.6	84.2
APA-14ı	40.5	0.03	14.9	0.20	44.4	0.14	n.d.	0.29	100.4	84.2
APA-14ı	40.4	0.02	14.8	0.21	44.3	0.14	n.d.	0.28	100.1	84.2
APA-14ı	40.4	0.03	14.9	0.21	44.5	0.14	n.d.	0.27	100.5	84.2
APA-14ı	40.7	0.02	14.9	0.20	44.6	0.12	0.04	0.32	100.9	84.2
APA-14ı	40.8	0.02	14.9	0.21	44.5	0.13	n.d.	0.26	100.9	84.2
APA-14ı	40.4	0.02	14.9	0.20	44.3	0.14	n.d.	0.27	100.3	84.2
APA-14ı	40.5	0.02	15.0	0.18	44.6	0.14	n.d.	0.34	100.8	84.2
APA-14ı	40.8	0.02	15.0	0.22	44.5	0.14	n.d.	0.24	100.9	84.1
APA-14ı	40.5	0.02	15.0	0.19	44.7	0.13	n.d.	0.30	100.9	84.1
APA-14ı	40.3	0.03	14.9	0.21	44.3	0.15	0.17	0.30	100.4	84.1
APA-14ı	40.5	0.03	14.9	0.21	44.3	0.14	n.d.	0.28	100.4	84.1
APA-14ı	40.5	0.02	14.9	0.21	44.3	0.14	n.d.	0.31	100.3	84.1
APA-14ı	39.7	0.02	14.8	0.19	44.1	0.14	0.04	0.32	99.3	84.1
APA-14ı	40.6	0.01	15.0	0.20	44.4	0.15	n.d.	0.26	100.7	84.1
APA-14ı	40.4	0.02	14.9	0.18	44.2	0.13	0.04	0.25	100.2	84.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	40.3	0.02	14.9	0.22	44.3	0.15	n.d.	0.26	100.3	84.1
APA-14ı	40.8	0.03	15.0	0.20	44.4	0.23	n.d.	0.26	101.0	84.1
APA-14ı	40.7	0.02	14.9	0.20	44.3	0.13	0.04	0.34	100.6	84.1
APA-14ı	40.5	0.03	15.0	0.20	44.3	0.15	n.d.	0.33	100.5	84.1
APA-14ı	40.2	0.02	14.9	0.24	44.2	0.14	0.03	0.31	100.1	84.1
APA-14ı	40.5	0.02	15.0	0.19	44.5	0.15	n.d.	0.28	100.8	84.1
APA-14ı	40.7	0.02	15.1	0.17	44.5	0.13	n.d.	0.25	100.8	84.1
APA-14ı	40.5	0.03	15.0	0.18	44.4	0.14	n.d.	0.36	100.6	84.0
APA-14ı	40.6	0.02	14.9	0.20	44.0	0.18	0.11	0.26	100.3	84.0
APA-14ı	40.6	0.02	15.0	0.19	44.4	0.15	n.d.	0.26	100.6	84.0
APA-14ı	40.5	0.02	15.0	0.24	44.3	0.14	n.d.	0.31	100.5	84.0
APA-14ı	40.5	n.d.	15.1	0.23	44.5	0.16	n.d.	0.25	100.7	84.0
APA-14ı	40.5	0.02	15.1	0.18	44.3	0.15	n.d.	0.27	100.4	84.0
APA-14ı	40.7	0.02	15.2	0.18	44.5	0.13	n.d.	0.28	101.0	84.0
APA-14ı	40.5	0.02	15.0	0.19	44.1	0.14	n.d.	0.24	100.2	84.0
APA-14ı	40.6	0.02	15.0	0.20	44.1	0.14	n.d.	0.25	100.2	84.0
APA-14ı	40.4	0.02	15.1	0.21	44.4	0.15	n.d.	0.31	100.7	84.0
APA-14ı	40.2	0.02	15.1	0.17	44.2	0.14	n.d.	0.28	100.1	84.0
APA-14ı	40.1	0.02	15.0	0.18	44.1	0.14	n.d.	0.29	99.9	83.9
APA-14ı	40.8	0.03	15.2	0.21	44.4	0.14	0.03	0.26	101.0	83.9
APA-14ı	40.6	0.03	15.1	0.20	44.1	0.15	0.03	0.29	100.5	83.9
APA-14ı	40.6	0.02	15.2	0.18	44.4	0.14	0.06	0.26	100.8	83.9
APA-14ı	40.3	0.02	15.1	0.21	44.2	0.15	n.d.	0.24	100.2	83.9
APA-14ı	40.7	0.02	15.1	0.21	44.2	0.14	n.d.	0.27	100.7	83.9
APA-14ı	40.1	0.02	15.1	0.20	44.2	0.17	0.08	0.25	100.2	83.9
APA-14ı	40.7	0.02	15.2	0.19	44.3	0.14	n.d.	0.30	100.8	83.9
APA-14ı	40.7	0.51	15.0	0.20	43.9	0.32	0.04	0.26	101.0	83.9
APA-14ı	40.0	0.01	15.1	0.22	43.9	0.13	n.d.	0.31	99.6	83.9
APA-14ı	40.5	0.03	15.0	0.21	43.8	0.14	n.d.	0.31	100.0	83.9
APA-14ı	40.7	0.03	15.2	0.20	44.1	0.14	n.d.	0.26	100.7	83.8
APA-14ı	40.4	0.01	15.2	0.23	44.3	0.13	n.d.	0.27	100.6	83.8
APA-14ı	40.5	0.02	15.2	0.18	44.3	0.14	0.03	0.27	100.7	83.8
APA-14ı	40.6	0.03	15.1	0.19	44.0	0.15	n.d.	0.29	100.3	83.8
APA-14ı	40.8	0.02	15.2	0.21	44.2	0.14	n.d.	0.29	100.9	83.8
APA-14ı	40.6	0.03	15.2	0.21	44.3	0.13	0.05	0.25	100.9	83.8
APA-14ı	40.6	0.03	15.1	0.21	44.0	0.12	n.d.	0.29	100.4	83.8
APA-14ı	40.4	0.20	15.2	0.19	44.2	0.14	n.d.	0.26	100.6	83.8
APA-14ı	40.3	0.03	15.2	0.18	44.1	0.13	0.03	0.33	100.3	83.8
APA-14ı	40.7	0.01	15.2	0.17	44.2	0.15	0.03	0.32	100.9	83.8
APA-14ı	40.3	0.02	15.2	0.19	44.0	0.14	0.03	0.25	100.2	83.8
APA-14ı	40.4	0.01	15.2	0.26	44.0	0.13	n.d.	0.36	100.4	83.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	40.6	0.02	15.3	0.21	44.3	0.15	0.05	0.20	100.9	83.8
APA-14ı	40.7	0.02	15.3	0.16	44.2	0.13	n.d.	0.26	100.8	83.7
APA-14ı	39.9	0.02	15.2	0.22	43.8	0.14	0.04	0.29	99.7	83.7
APA-14ı	40.1	0.02	15.4	0.18	44.1	0.15	n.d.	0.26	100.3	83.6
APA-14ı	40.5	0.03	15.4	0.22	44.1	0.15	0.03	0.24	100.7	83.6
APA-14ı	40.5	n.d.	15.5	0.22	44.2	0.15	n.d.	0.22	100.9	83.6
APA-14ı	40.1	0.02	15.3	0.21	43.8	0.15	n.d.	0.28	99.9	83.6
APA-14ı	40.7	0.02	15.5	0.20	44.2	0.14	n.d.	0.29	101.0	83.6
APA-14ı	40.4	0.02	15.3	0.20	43.8	0.14	n.d.	0.25	100.1	83.6
APA-14ı	39.9	0.03	15.4	0.22	43.8	0.14	n.d.	0.22	99.7	83.5
APA-14ı	40.1	0.02	15.4	0.22	43.8	0.14	0.04	0.29	100.0	83.5
APA-14ı	40.3	0.01	15.4	0.22	43.7	0.14	n.d.	0.28	100.1	83.5
APA-14ı	40.5	0.03	15.6	0.22	44.1	0.14	n.d.	0.26	100.9	83.5
APA-14ı	39.7	0.14	15.4	0.22	43.5	0.21	0.04	0.29	99.5	83.4
APA-14ı	40.5	0.02	15.6	0.23	43.9	0.13	n.d.	0.33	100.8	83.4
APA-14ı	40.6	0.03	15.6	0.22	43.8	0.12	n.d.	0.29	100.7	83.4
APA-14ı	39.8	0.02	15.5	0.21	43.5	0.15	n.d.	0.27	99.5	83.4
APA-14ı	40.2	0.03	15.7	0.22	43.9	0.15	n.d.	0.26	100.5	83.3
APA-14ı	40.1	0.02	15.6	0.23	43.8	0.15	0.03	0.22	100.1	83.3
APA-14ı	40.3	0.02	15.6	0.23	43.7	0.15	0.03	0.33	100.4	83.3
APA-14ı	40.5	0.02	15.7	0.22	43.9	0.13	0.06	0.31	100.8	83.3
APA-14ı	40.7	0.02	15.7	0.21	43.7	0.15	n.d.	0.23	100.7	83.3
APA-14ı	40.5	0.02	15.7	0.22	43.9	0.14	0.04	0.23	100.8	83.3
APA-14ı	40.3	0.02	15.7	0.22	43.8	0.15	0.05	0.36	100.5	83.2
APA-14ı	40.1	0.02	15.7	0.20	43.6	0.15	n.d.	0.23	100.1	83.2
APA-14ı	40.3	0.02	15.7	0.23	43.6	0.13	0.04	0.25	100.3	83.2
APA-14ı	40.6	0.02	15.7	0.20	43.8	0.14	n.d.	0.24	100.7	83.2
APA-14ı	39.9	0.01	15.7	0.22	43.5	0.15	n.d.	0.26	99.8	83.2
APA-14ı	40.0	0.01	15.8	0.22	43.8	0.13	n.d.	0.32	100.4	83.2
APA-14ı	40.4	0.02	15.9	0.22	43.7	0.15	0.03	0.22	100.6	83.0
APA-14ı	40.3	0.06	15.9	0.21	43.6	0.13	n.d.	0.27	100.5	83.0
APA-14ı	40.3	0.02	16.0	0.22	43.8	0.14	n.d.	0.24	100.7	83.0
APA-14ı	40.6	0.02	16.0	0.24	43.7	0.13	0.04	0.25	100.9	83.0
APA-14ı	40.2	0.01	16.0	0.22	43.7	0.14	n.d.	0.24	100.6	83.0
APA-14ı	40.4	0.02	15.9	0.24	43.4	0.15	n.d.	0.26	100.4	82.9
APA-14ı	40.3	0.03	16.0	0.20	43.7	0.14	n.d.	0.20	100.6	82.9
APA-14ı	39.7	0.03	16.0	0.21	43.3	0.14	0.03	0.26	99.7	82.9
APA-14ı	40.0	0.01	16.0	0.19	43.4	0.14	n.d.	0.35	100.1	82.9
APA-14ı	40.4	0.02	16.1	0.25	43.6	0.15	n.d.	0.21	100.8	82.8
APA-14ı	40.0	0.02	16.2	0.21	43.3	0.16	n.d.	0.19	100.2	82.6
APA-14ı	40.3	0.02	16.3	0.25	43.3	0.15	n.d.	0.20	100.6	82.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	40.4	0.02	16.3	0.24	43.4	0.14	0.03	0.18	100.8	82.6
APA-14ı	39.9	0.02	16.3	0.23	43.4	0.15	n.d.	0.21	100.2	82.5
APA-14ı	40.2	0.03	16.3	0.20	43.3	0.13	n.d.	0.31	100.4	82.5
APA-14ı	40.4	0.01	16.4	0.21	43.5	0.15	n.d.	0.21	100.9	82.5
APA-14ı	40.3	0.03	16.3	0.24	43.2	0.15	n.d.	0.26	100.5	82.5
APA-14ı	39.7	0.02	16.3	0.22	43.0	0.16	n.d.	0.21	99.7	82.5
APA-14ı	40.3	0.02	16.5	0.22	43.5	0.17	n.d.	0.20	100.9	82.5
APA-14ı	40.3	0.02	16.5	0.24	43.4	0.14	n.d.	0.24	100.9	82.4
APA-14ı	39.7	0.02	16.5	0.25	43.1	0.15	n.d.	0.21	100.0	82.3
APA-14ı	40.0	0.02	16.6	0.25	43.1	0.15	n.d.	0.19	100.3	82.3
APA-14ı	40.1	0.14	16.6	0.26	43.0	0.14	n.d.	0.23	100.5	82.2
APA-14ı	40.1	n.d.	16.6	0.25	43.1	0.16	n.d.	0.23	100.4	82.2
APA-14ı	41.2	0.03	16.5	0.25	42.6	0.14	n.d.	0.26	101.0	82.2
APA-14ı	40.2	0.03	16.7	0.22	43.1	0.16	n.d.	0.22	100.7	82.2
APA-14ı	40.2	0.02	16.8	0.25	43.3	0.14	n.d.	0.19	100.9	82.1
APA-14ı	39.9	0.02	16.7	0.23	42.9	0.15	0.03	0.19	100.1	82.1
APA-14ı	40.2	0.02	16.7	0.23	42.9	0.14	n.d.	0.23	100.4	82.0
APA-14ı	39.6	0.02	16.7	0.26	42.7	0.14	n.d.	0.23	99.6	82.0
APA-14ı	39.7	0.02	16.7	0.25	42.6	0.15	0.03	0.27	99.6	82.0
APA-14ı	39.6	0.02	16.8	0.26	42.8	0.13	n.d.	0.24	99.9	82.0
APA-14ı	40.3	0.03	16.8	0.26	43.0	0.14	n.d.	0.25	100.9	82.0
APA-14ı	40.1	0.02	16.9	0.26	43.0	0.16	n.d.	0.24	100.8	82.0
APA-14ı	40.3	0.01	16.9	0.26	43.0	0.15	n.d.	0.27	100.9	82.0
APA-14ı	39.7	0.02	16.8	0.22	42.7	0.14	0.03	0.27	100.0	81.9
APA-14ı	40.2	0.02	16.9	0.21	42.7	0.15	n.d.	0.23	100.4	81.9
APA-14ı	40.2	0.02	16.9	0.24	42.7	0.16	n.d.	0.18	100.5	81.8
APA-14ı	40.2	0.02	16.9	0.21	42.7	0.13	n.d.	0.28	100.5	81.8
APA-14ı	40.4	0.02	16.9	0.23	42.7	0.13	n.d.	0.25	100.6	81.8
APA-14ı	40.1	0.08	17.0	0.24	42.7	0.14	n.d.	0.25	100.5	81.7
APA-14ı	40.0	0.02	17.0	0.22	42.5	0.22	n.d.	0.22	100.2	81.7
APA-14ı	40.1	0.02	17.1	0.25	42.8	0.16	n.d.	0.20	100.6	81.7
APA-14ı	40.0	0.01	17.1	0.24	42.7	0.16	n.d.	0.20	100.4	81.7
APA-14ı	40.0	0.02	17.2	0.23	42.9	0.14	n.d.	0.15	100.7	81.7
APA-14ı	40.4	0.02	17.1	0.27	42.5	0.15	n.d.	0.21	100.6	81.6
APA-14ı	40.3	0.02	17.2	0.26	42.7	0.13	0.03	0.23	100.8	81.6
APA-14ı	40.0	0.02	17.2	0.22	42.6	0.15	0.03	0.26	100.5	81.6
APA-14ı	40.1	0.02	17.2	0.27	42.5	0.15	n.d.	0.17	100.4	81.5
APA-14ı	40.5	0.02	17.2	0.25	42.4	0.17	n.d.	0.19	100.8	81.4
APA-14ı	40.0	0.01	17.3	0.23	42.5	0.14	n.d.	0.22	100.4	81.4
APA-14ı	40.3	0.02	17.4	0.24	42.6	0.16	n.d.	0.20	100.8	81.4
APA-14ı	40.1	0.01	17.4	0.25	42.3	0.16	0.03	0.16	100.5	81.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	40.1	0.02	17.5	0.21	42.5	0.15	n.d.	0.20	100.7	81.3
APA-14ı	40.0	0.02	17.4	0.20	42.4	0.17	n.d.	0.18	100.3	81.3
APA-14ı	40.3	0.02	17.5	0.23	42.5	0.13	n.d.	0.26	100.9	81.2
APA-14ı	39.6	0.03	17.5	0.23	42.2	0.15	0.04	0.23	100.0	81.2
APA-14ı	40.3	0.01	17.6	0.28	42.4	0.16	n.d.	0.22	101.0	81.1
APA-14ı	40.1	n.d.	17.8	0.24	42.2	0.15	n.d.	0.16	100.6	80.9
APA-14ı	40.0	0.02	17.8	0.25	42.2	0.14	n.d.	0.24	100.6	80.9
APA-14ı	39.8	0.03	17.8	0.23	42.0	0.14	n.d.	0.29	100.4	80.8
APA-14ı	39.8	0.02	17.9	0.22	41.9	0.15	n.d.	0.24	100.2	80.7
APA-14ı	39.9	0.01	18.0	0.26	42.1	0.15	n.d.	0.14	100.6	80.7
APA-14ı	39.6	0.10	17.8	0.26	41.2	0.19	0.10	0.20	99.5	80.5
APA-14ı	39.8	0.01	18.2	0.25	41.7	0.13	0.04	0.26	100.4	80.3
APA-14ı	39.7	0.02	18.3	0.22	41.9	0.14	n.d.	0.17	100.4	80.3
APA-14ı	40.1	0.02	18.3	0.26	41.9	0.15	n.d.	0.18	100.9	80.3
APA-14ı	39.9	0.02	18.2	0.23	41.7	0.13	n.d.	0.29	100.6	80.3
APA-14ı	40.0	0.02	18.5	0.27	41.9	0.15	n.d.	0.16	101.0	80.2
APA-14ı	39.7	0.02	18.7	0.30	41.7	0.14	n.d.	0.22	100.8	79.9
APA-14ı	39.7	0.03	18.9	0.24	41.7	0.15	n.d.	0.13	100.8	79.8
APA-14ı	39.8	0.02	18.8	0.27	41.3	0.15	0.05	0.17	100.5	79.7
APA-14ı	39.9	0.03	18.8	0.28	41.3	0.16	n.d.	0.22	100.8	79.6
APA-14ı	39.7	0.02	18.9	0.28	41.4	0.16	n.d.	0.13	100.6	79.6
APA-14ı	39.8	0.02	18.9	0.26	41.3	0.14	n.d.	0.24	100.7	79.5
APA-14ı	39.7	0.05	18.9	0.28	40.7	0.16	n.d.	0.13	100.1	79.3
APA-14ı	39.6	0.02	19.2	0.27	41.2	0.14	0.03	0.20	100.6	79.3
APA-14ı	40.0	0.06	19.2	0.29	41.0	0.16	n.d.	0.20	100.9	79.3
APA-14ı	39.3	0.02	19.1	0.29	40.9	0.16	n.d.	0.20	100.0	79.2
APA-14ı	39.1	0.01	19.1	0.27	40.8	0.15	n.d.	0.21	99.6	79.2
APA-14ı	40.0	n.d.	19.2	0.26	40.9	0.13	n.d.	0.21	100.8	79.2
APA-14ı	39.3	n.d.	19.2	0.25	40.9	0.13	n.d.	0.22	100.1	79.2
APA-14ı	39.9	0.02	19.3	0.28	41.1	0.16	n.d.	0.15	101.0	79.1
APA-14ı	39.6	0.03	19.5	0.25	41.1	0.14	n.d.	0.27	100.8	79.0
APA-14ı	39.8	0.02	19.4	0.28	40.9	0.14	0.11	0.27	100.8	79.0
APA-14ı	39.5	0.02	19.5	0.29	40.7	0.18	n.d.	0.15	100.3	78.9
APA-14ı	39.7	0.07	19.6	0.28	41.0	0.15	n.d.	0.18	101.0	78.8
APA-14ı	39.9	0.02	19.6	0.28	40.7	0.14	n.d.	0.16	100.8	78.7
APA-14ı	39.7	0.02	19.8	0.27	40.9	0.19	n.d.	0.14	101.0	78.7
APA-14ı	39.8	0.02	20.0	0.29	40.4	0.15	n.d.	0.20	100.8	78.3
APA-14ı	39.4	0.02	20.2	0.30	40.4	0.17	n.d.	0.11	100.6	78.1
APA-14ı	39.7	0.02	20.4	0.28	40.2	0.14	n.d.	0.18	101.0	77.9
APA-14ı	39.5	0.02	20.4	0.31	40.2	0.18	n.d.	0.10	100.7	77.9
APA-14ı	39.4	0.02	20.5	0.29	40.3	0.15	n.d.	0.20	100.8	77.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	39.6	0.02	20.5	0.32	40.0	0.16	n.d.	0.19	100.8	77.7
APA-14ı	39.7	0.01	20.5	0.29	40.0	0.18	n.d.	0.15	100.8	77.6
APA-14ı	39.6	0.02	20.7	0.30	39.6	0.13	n.d.	0.23	100.6	77.3
APA-14ı	39.2	0.01	20.9	0.27	39.7	0.15	n.d.	0.12	100.4	77.2
APA-14ı	39.3	0.02	20.9	0.33	39.7	0.15	n.d.	0.15	100.6	77.2
APA-14ı	38.7	n.d.	20.9	0.31	39.6	0.15	n.d.	0.17	99.9	77.1
APA-14ı	39.5	n.d.	21.2	0.30	39.5	0.17	n.d.	0.16	100.8	76.9
APA-14ı	39.0	0.02	21.2	0.29	39.4	0.15	n.d.	0.19	100.4	76.8
APA-14ı	39.1	0.02	21.2	0.34	39.2	0.17	n.d.	0.22	100.4	76.7
APA-14ı	39.4	0.01	21.3	0.33	39.3	0.16	n.d.	0.17	100.7	76.7
APA-14ı	39.1	0.02	21.2	0.32	39.1	0.13	n.d.	0.20	100.1	76.7
APA-14ı	39.1	0.02	21.7	0.30	39.1	0.15	n.d.	0.16	100.6	76.2
APA-14ı	39.5	0.02	21.6	0.35	38.9	0.15	n.d.	0.17	100.7	76.2
APA-14ı	39.2	0.02	21.7	0.31	38.9	0.15	n.d.	0.17	100.4	76.2
APA-14ı	39.4	0.23	21.3	0.30	38.1	0.24	n.d.	0.20	99.8	76.1
APA-14ı	39.2	0.02	22.1	0.32	38.7	0.15	n.d.	0.17	100.7	75.7
APA-14ı	39.1	0.02	22.2	0.34	38.5	0.15	0.03	0.21	100.5	75.5
APA-14ı	39.9	0.33	22.1	0.31	37.0	0.26	n.d.	0.14	100.0	74.9
APA-14ı	39.4	0.02	22.8	0.34	38.1	0.15	n.d.	0.20	101.0	74.9
APA-14ı	39.1	n.d.	23.0	0.32	37.9	0.15	n.d.	0.20	100.7	74.6
APA-14ı	39.1	0.01	23.1	0.35	37.7	0.18	n.d.	0.17	100.7	74.4
APA-14ı	38.9	n.d.	23.4	0.34	37.7	0.15	n.d.	0.18	100.7	74.2
APA-14ı	39.0	0.01	23.6	0.39	37.6	0.15	n.d.	0.17	100.9	74.0
APA-14ı	38.8	0.01	23.6	0.37	37.6	0.18	n.d.	0.17	100.9	74.0
APA-14ı	38.8	0.02	23.6	0.33	37.3	0.18	n.d.	0.17	100.5	73.9
APA-14ı	38.7	n.d.	23.7	0.38	37.5	0.14	n.d.	0.16	100.6	73.8
APA-14ı	39.1	0.02	23.9	0.34	37.3	0.16	n.d.	0.14	100.9	73.5
APA-14ı	38.7	0.02	24.3	0.39	37.0	0.20	0.03	0.13	100.8	73.1
APA-14ı	38.9	0.01	24.4	0.37	36.9	0.15	n.d.	0.14	100.9	72.9
APA-14ı	38.8	0.01	24.4	0.40	36.7	0.17	n.d.	0.13	100.6	72.8
APA-14ı	38.9	0.03	24.6	0.35	36.7	0.16	n.d.	0.19	100.8	72.7
APA-14ı	38.6	0.01	25.4	0.41	36.1	0.16	n.d.	0.11	100.8	71.7
APA-14ı	38.7	0.01	25.5	0.40	35.8	0.18	n.d.	0.15	100.7	71.4
APA-14ı	37.9	0.02	26.5	0.40	35.0	0.15	n.d.	0.14	100.1	70.1
APA-14ı	38.4	0.03	26.6	0.40	34.7	0.17	0.05	0.15	100.4	69.9
APA-14ı	38.2	0.02	26.9	0.39	34.9	0.21	n.d.	0.15	100.7	69.8
APA-14ı	38.0	0.03	27.0	0.43	34.8	0.23	n.d.	0.10	100.6	69.7
APA-14ı	38.0	0.02	27.8	0.43	34.0	0.19	n.d.	0.09	100.6	68.5
APA-14ı	38.1	0.15	27.5	0.43	33.1	0.23	n.d.	0.12	99.6	68.2
APA-14ı	37.3	0.02	29.1	0.47	33.3	0.18	n.d.	0.07	100.4	67.1
APA-14ı	37.9	0.02	29.1	0.45	33.1	0.27	n.d.	0.06	100.9	67.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-14ı	38.0	0.03	29.5	0.42	32.9	0.17	n.d.	0.07	101.0	66.6
TAN-48I	40.5	0.03	13.0	0.22	45.5	0.14	0.05	0.38	99.8	86.2
TAN-48I	40.7	0.02	13.1	0.23	45.4	0.14	0.03	0.34	99.9	86.1
TAN-48I	40.5	0.02	13.1	0.23	45.3	0.14	0.06	0.38	99.7	86.0
TAN-48I	40.7	0.03	13.2	0.17	45.5	0.15	0.08	0.37	100.2	86.0
TAN-48I	40.4	0.03	13.2	0.17	45.3	0.14	0.04	0.36	99.6	86.0
TAN-48I	40.3	0.02	13.2	0.21	45.4	0.14	0.04	0.36	99.7	86.0
TAN-48I	39.7	0.02	13.2	0.20	45.3	0.14	0.05	0.38	99.1	86.0
TAN-48I	40.7	0.02	13.1	0.19	45.1	0.14	0.04	0.37	99.7	86.0
TAN-48I	40.5	0.02	13.2	0.17	45.4	0.14	n.d.	0.35	99.8	86.0
TAN-48I	40.2	0.03	13.2	0.26	45.4	0.14	n.d.	0.40	99.8	86.0
TAN-48I	40.5	0.02	13.2	0.21	45.3	0.15	0.11	0.36	99.8	85.9
TAN-48I	40.5	0.03	13.2	0.22	45.3	0.14	0.04	0.36	99.8	85.9
TAN-48I	40.0	0.02	13.3	0.17	45.4	0.14	0.05	0.36	99.5	85.9
TAN-48I	40.6	0.02	13.2	0.18	45.2	0.15	n.d.	0.35	99.8	85.9
TAN-48I	40.6	0.02	13.2	0.19	45.3	0.16	0.05	0.38	99.9	85.9
TAN-48I	40.4	0.02	13.3	0.21	45.4	0.14	0.04	0.37	99.8	85.9
TAN-48I	39.8	0.02	13.3	0.20	45.4	0.14	0.05	0.38	99.3	85.9
TAN-48I	40.6	0.03	13.3	0.20	45.4	0.15	0.04	0.37	100.1	85.9
TAN-48I	40.6	0.02	13.3	0.21	45.5	0.14	n.d.	0.39	100.1	85.9
TAN-48I	40.5	0.02	13.4	0.17	45.5	0.14	0.04	0.36	100.1	85.9
TAN-48I	40.4	0.03	13.3	0.19	45.2	0.14	0.04	0.38	99.7	85.8
TAN-48I	40.6	0.02	13.3	0.14	45.4	0.14	0.05	0.37	100.0	85.8
TAN-48I	40.6	0.03	13.3	0.28	45.3	0.13	n.d.	0.39	100.1	85.8
TAN-48I	40.4	0.02	13.4	0.21	45.4	0.13	0.07	0.33	99.9	85.8
TAN-48I	40.0	0.02	13.4	0.21	45.6	0.16	0.11	0.40	99.8	85.8
TAN-48I	40.4	0.03	13.4	0.21	45.5	0.15	0.13	0.33	100.2	85.8
TAN-48I	40.7	0.03	13.4	0.21	45.5	0.15	0.05	0.39	100.4	85.8
TAN-48I	40.3	0.02	13.4	0.16	45.5	0.15	0.04	0.39	100.1	85.8
TAN-48I	40.3	0.02	13.3	0.19	45.2	0.16	0.05	0.33	99.5	85.8
TAN-48I	40.6	0.02	13.4	0.26	45.3	0.14	0.05	0.36	100.0	85.8
TAN-48I	40.6	0.02	13.4	0.12	45.5	0.14	0.04	0.42	100.2	85.8
TAN-48I	40.2	0.02	13.4	0.21	45.4	0.14	0.04	0.38	99.8	85.8
TAN-48I	40.5	0.02	13.4	0.21	45.4	0.14	n.d.	0.37	100.1	85.8
TAN-48I	40.7	0.02	13.4	0.20	45.4	0.15	0.04	0.34	100.3	85.8
TAN-48I	39.8	0.02	13.3	0.21	45.1	0.14	0.06	0.36	99.0	85.8
TAN-48I	40.4	0.03	13.4	0.14	45.4	0.14	0.04	0.36	99.9	85.8
TAN-48I	40.1	0.02	13.5	0.14	45.5	0.15	n.d.	0.38	99.8	85.8
TAN-48I	40.5	0.03	13.5	0.21	45.4	0.13	0.15	0.38	100.3	85.7
TAN-48I	40.6	0.03	13.5	0.27	45.6	0.13	0.04	0.34	100.5	85.7
TAN-48I	40.6	0.02	13.5	0.24	45.4	0.14	0.05	0.39	100.4	85.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-48I	40.6	0.01	13.5	0.17	45.6	0.15	n.d.	0.39	100.5	85.7
TAN-48I	40.6	0.02	13.5	0.17	45.3	0.16	0.05	0.35	100.2	85.7
TAN-48I	40.4	0.01	13.5	0.13	45.3	0.14	0.05	0.37	99.9	85.7
TAN-48I	40.4	0.02	13.5	0.13	45.5	0.14	n.d.	0.39	100.1	85.7
TAN-48I	40.7	0.02	13.6	0.20	45.8	0.15	0.12	0.38	100.9	85.7
TAN-48I	40.4	0.02	13.4	0.18	45.2	0.15	n.d.	0.36	99.7	85.7
TAN-48I	40.1	0.02	13.6	0.28	45.7	0.14	0.07	0.39	100.3	85.7
TAN-48I	40.5	0.02	13.5	0.28	45.4	0.15	0.04	0.36	100.2	85.7
TAN-48I	40.7	0.02	13.5	0.15	45.3	0.14	0.09	0.37	100.3	85.7
TAN-48I	41.3	0.03	13.4	0.17	45.0	0.15	0.08	0.35	100.4	85.7
TAN-48I	40.3	0.02	13.5	0.28	45.2	0.14	0.04	0.36	99.8	85.7
TAN-48I	40.7	0.02	13.6	0.16	45.4	0.15	0.03	0.35	100.4	85.6
TAN-48I	40.5	0.02	13.5	0.21	45.2	0.14	0.05	0.35	100.0	85.6
TAN-48I	40.5	0.02	13.5	0.17	45.2	0.15	0.05	0.38	100.0	85.6
TAN-48I	40.0	0.02	13.5	0.19	45.2	0.13	0.08	0.36	99.5	85.6
TAN-48I	40.8	0.02	13.6	0.20	45.4	0.15	n.d.	0.39	100.6	85.6
TAN-48I	40.4	0.03	13.4	0.17	44.9	0.14	0.12	0.36	99.6	85.6
TAN-48I	40.4	0.03	13.6	0.20	45.3	0.15	0.05	0.36	100.0	85.6
TAN-48I	41.2	0.03	13.5	0.22	45.0	0.13	n.d.	0.39	100.5	85.6
TAN-48I	40.7	0.02	13.6	0.23	45.5	0.15	0.05	0.37	100.6	85.6
TAN-48I	40.5	0.03	13.6	0.17	45.5	0.14	0.04	0.40	100.4	85.6
TAN-48I	40.3	0.02	13.6	0.22	45.3	0.15	0.09	0.35	100.0	85.6
TAN-48I	41.3	0.03	13.5	0.20	45.0	0.15	n.d.	0.37	100.5	85.6
TAN-48I	40.5	0.02	13.6	0.21	45.3	0.15	0.04	0.36	100.2	85.6
TAN-48I	41.5	0.03	13.5	0.19	44.9	0.13	0.03	0.36	100.6	85.6
TAN-48I	41.1	0.03	13.7	0.16	45.3	0.14	0.15	0.36	100.9	85.5
TAN-48I	40.5	0.03	13.7	0.18	45.4	0.15	0.04	0.36	100.3	85.5
TAN-48I	40.6	0.03	13.6	0.18	45.1	0.16	n.d.	0.39	100.2	85.5
TAN-48I	40.7	0.03	13.7	0.19	45.2	0.14	0.07	0.34	100.4	85.5
TAN-48I	39.9	0.04	13.6	0.20	45.1	0.16	0.03	0.36	99.4	85.5
TAN-48I	40.5	0.03	13.6	0.19	45.0	0.13	0.05	0.38	99.9	85.5
TAN-48I	39.8	0.02	13.7	0.19	45.2	0.15	0.05	0.37	99.4	85.5
TAN-48I	41.2	0.01	13.6	0.25	44.9	0.12	n.d.	0.38	100.6	85.5
TAN-48I	40.6	0.03	13.8	0.25	45.3	0.14	0.06	0.33	100.5	85.5
TAN-48I	40.6	0.02	13.7	0.19	45.2	0.14	0.04	0.35	100.3	85.5
TAN-48I	40.1	0.02	13.7	0.16	45.1	0.15	0.06	0.31	99.6	85.4
TAN-48I	40.8	0.03	13.7	0.17	45.3	0.15	0.09	0.32	100.6	85.4
TAN-48I	40.5	0.03	13.7	0.16	45.0	0.13	0.12	0.34	100.0	85.4
TAN-48I	40.4	0.03	13.7	0.19	45.1	0.14	0.05	0.34	100.0	85.4
TAN-48I	40.0	0.06	14.0	0.16	46.2	0.16	0.04	0.33	101.0	85.4
TAN-48I	39.9	0.02	13.7	0.21	45.1	0.16	0.04	0.35	99.5	85.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-48I	40.4	0.05	13.8	0.26	45.4	0.15	0.04	0.38	100.4	85.4
TAN-48I	41.4	0.03	13.7	0.12	45.0	0.14	0.04	0.37	100.8	85.4
TAN-48I	40.6	0.02	13.8	0.16	45.2	0.15	0.06	0.36	100.3	85.4
TAN-48I	40.5	0.02	13.8	0.21	45.3	0.13	n.d.	0.35	100.4	85.4
TAN-48I	40.5	n.d.	13.8	0.22	45.2	0.15	0.05	0.40	100.4	85.4
TAN-48I	40.5	0.02	13.7	0.16	45.0	0.14	n.d.	0.35	99.9	85.4
TAN-48I	41.1	0.03	13.6	0.18	44.6	0.13	0.04	0.35	100.0	85.4
TAN-48I	41.0	0.02	13.8	0.17	45.1	0.14	n.d.	0.33	100.5	85.4
TAN-48I	40.4	0.02	13.9	0.23	45.4	0.14	0.03	0.36	100.5	85.4
TAN-48I	40.5	0.03	13.8	0.16	45.1	0.13	0.03	0.34	100.1	85.4
TAN-48I	40.4	0.02	13.8	0.16	45.0	0.14	n.d.	0.33	99.8	85.3
TAN-48I	40.7	0.02	13.7	0.23	44.8	0.13	n.d.	0.37	99.9	85.3
TAN-48I	41.1	0.03	13.7	0.19	44.7	0.14	0.08	0.39	100.3	85.3
TAN-48I	40.0	0.02	13.7	0.15	44.9	0.14	n.d.	0.29	99.3	85.3
TAN-48I	40.9	0.02	13.8	0.15	45.1	0.13	0.05	0.36	100.6	85.3
TAN-48I	40.5	0.02	13.8	0.30	45.2	0.13	n.d.	0.34	100.4	85.3
TAN-48I	40.9	0.03	13.8	0.21	45.1	0.14	0.03	0.31	100.6	85.3
TAN-48I	41.2	0.02	13.8	0.21	44.9	0.13	0.05	0.38	100.6	85.3
TAN-48I	41.2	0.03	13.7	0.19	44.6	0.13	0.04	0.39	100.3	85.3
TAN-48I	40.5	0.02	13.8	0.25	44.8	0.15	n.d.	0.30	99.8	85.3
TAN-48I	40.6	0.02	14.0	0.19	45.3	0.15	0.06	0.34	100.7	85.3
TAN-48I	41.2	0.02	13.8	0.19	44.9	0.15	0.09	0.35	100.8	85.3
TAN-48I	40.3	0.02	13.8	0.19	44.9	0.15	0.09	0.35	99.9	85.3
TAN-48I	40.4	0.02	14.0	0.20	45.3	0.14	0.03	0.31	100.4	85.2
TAN-48I	40.2	0.03	13.9	0.24	44.8	0.14	0.04	0.30	99.6	85.2
TAN-48I	40.3	0.02	13.8	0.18	44.6	0.15	n.d.	0.31	99.4	85.2
TAN-48I	40.0	0.02	13.9	0.20	45.0	0.13	n.d.	0.33	99.7	85.2
TAN-48I	40.0	0.03	14.2	0.21	46.0	0.14	0.04	0.31	100.9	85.2
TAN-48I	41.3	0.02	13.8	0.22	44.5	0.15	n.d.	0.37	100.4	85.2
TAN-48I	41.2	0.03	13.8	0.18	44.5	0.13	n.d.	0.34	100.2	85.2
TAN-48I	40.5	0.02	13.9	0.24	45.0	0.15	n.d.	0.30	100.1	85.2
TAN-48I	39.8	0.02	13.9	0.21	45.0	0.14	0.05	0.34	99.5	85.2
TAN-48I	40.0	0.02	13.9	0.24	44.9	0.14	0.05	0.37	99.7	85.2
TAN-48I	39.7	0.02	13.9	0.19	44.7	0.16	n.d.	0.30	99.0	85.2
TAN-48I	40.6	0.02	14.0	0.26	45.0	0.15	0.04	0.28	100.3	85.2
TAN-48I	40.4	0.02	14.0	0.20	45.2	0.16	0.05	0.34	100.5	85.2
TAN-48I	40.5	0.02	13.9	0.27	44.9	0.15	0.04	0.33	100.1	85.2
TAN-48I	40.1	0.03	13.9	0.19	44.7	0.14	n.d.	0.28	99.3	85.1
TAN-48I	39.7	0.03	14.1	0.22	45.3	0.16	0.05	0.33	99.9	85.1
TAN-48I	41.1	0.03	13.8	0.17	44.4	0.16	0.25	0.37	100.2	85.1
TAN-48I	39.7	0.02	14.1	0.20	45.2	0.15	0.04	0.30	99.7	85.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-48I	40.0	0.02	14.0	0.25	44.8	0.14	n.d.	0.32	99.6	85.1
TAN-48I	40.4	0.02	14.1	0.25	45.2	0.15	n.d.	0.34	100.4	85.1
TAN-48I	41.5	0.03	14.0	0.19	44.8	0.12	0.04	0.34	101.0	85.1
TAN-48I	40.7	0.03	14.0	0.17	45.1	0.14	n.d.	0.34	100.5	85.1
TAN-48I	40.5	0.02	14.0	0.21	45.0	0.15	0.05	0.31	100.2	85.1
TAN-48I	40.1	0.02	13.9	0.24	44.6	0.15	0.09	0.35	99.6	85.1
TAN-48I	40.2	0.02	14.0	0.20	44.8	0.15	n.d.	0.30	99.7	85.1
TAN-48I	40.6	0.01	14.0	0.21	44.9	0.14	n.d.	0.29	100.2	85.1
TAN-48I	39.9	0.03	14.0	0.26	44.9	0.13	0.04	0.37	99.6	85.1
TAN-48I	40.0	0.02	14.0	0.13	44.8	0.14	n.d.	0.38	99.4	85.1
TAN-48I	41.3	0.02	14.0	0.17	44.8	0.15	0.04	0.38	100.8	85.1
TAN-48I	40.6	0.03	14.0	0.18	44.9	0.15	0.05	0.31	100.2	85.1
TAN-48I	39.7	0.03	14.0	0.15	44.9	0.15	0.03	0.30	99.2	85.1
TAN-48I	40.5	0.03	14.0	0.24	44.8	0.15	n.d.	0.29	100.1	85.1
TAN-48I	40.5	0.02	14.1	0.29	45.0	0.14	n.d.	0.30	100.4	85.1
TAN-48I	39.9	0.02	14.1	0.21	45.1	0.14	0.04	0.36	99.9	85.1
TAN-48I	39.7	0.03	14.1	0.27	45.0	0.16	0.08	0.31	99.6	85.1
TAN-48I	40.5	0.02	14.1	0.25	44.9	0.14	0.04	0.28	100.2	85.1
TAN-48I	40.6	0.02	14.0	0.26	44.8	0.16	n.d.	0.32	100.3	85.1
TAN-48I	39.7	0.03	14.0	0.21	44.8	0.15	0.04	0.31	99.3	85.1
TAN-48I	40.2	0.02	14.0	0.23	44.7	0.15	n.d.	0.33	99.6	85.0
TAN-48I	41.4	0.02	13.9	0.22	44.5	0.14	0.06	0.36	100.6	85.0
TAN-48I	40.6	0.03	14.0	0.22	44.7	0.17	0.03	0.35	100.1	85.0
TAN-48I	40.6	0.02	14.1	0.24	45.0	0.16	0.03	0.33	100.6	85.0
TAN-48I	40.7	0.02	14.1	0.18	44.9	0.16	n.d.	0.28	100.3	85.0
TAN-48I	40.1	0.02	14.1	0.25	44.8	0.13	n.d.	0.35	99.7	85.0
TAN-48I	40.1	0.02	14.2	0.20	45.1	0.13	n.d.	0.35	100.2	85.0
TAN-48I	41.2	0.02	14.0	0.24	44.6	0.15	n.d.	0.34	100.6	85.0
TAN-48I	40.7	0.02	14.2	0.24	45.2	0.13	0.03	0.31	100.8	85.0
TAN-48I	40.2	0.02	14.0	0.21	44.5	0.15	0.07	0.30	99.4	85.0
TAN-48I	40.6	0.02	14.1	0.22	44.8	0.14	n.d.	0.34	100.3	85.0
TAN-48I	40.0	0.02	14.1	0.14	44.5	0.14	0.05	0.29	99.2	85.0
TAN-48I	39.8	0.02	14.1	0.14	44.8	0.15	n.d.	0.32	99.3	84.9
TAN-48I	39.8	0.03	14.2	0.17	44.9	0.14	0.04	0.37	99.6	84.9
TAN-48I	39.8	0.03	14.2	0.20	44.7	0.14	0.04	0.40	99.6	84.9
TAN-48I	40.4	0.01	14.2	0.23	44.8	0.15	n.d.	0.30	100.1	84.9
TAN-48I	39.7	0.03	14.3	0.25	45.0	0.14	0.05	0.29	99.8	84.9
TAN-48I	40.7	0.01	14.2	0.17	44.8	0.16	0.06	0.30	100.5	84.9
TAN-48I	40.0	0.02	14.2	0.15	44.9	0.14	0.04	0.30	99.8	84.9
TAN-48I	39.9	0.02	14.2	0.21	44.6	0.15	n.d.	0.28	99.4	84.9
TAN-48I	40.1	0.02	14.4	0.15	45.3	0.15	0.09	0.28	100.4	84.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-48I	41.1	0.03	14.1	0.22	44.5	0.15	0.06	0.34	100.6	84.9
TAN-48I	39.9	0.02	14.2	0.28	44.8	0.15	0.04	0.32	99.6	84.9
TAN-48I	40.4	n.d.	14.2	0.19	44.8	0.15	n.d.	0.34	100.1	84.9
TAN-48I	40.9	0.03	14.1	0.19	44.2	0.14	0.06	0.35	99.9	84.9
TAN-48I	40.2	0.03	14.3	0.19	44.8	0.15	0.04	0.31	100.0	84.8
TAN-48I	40.0	0.01	14.3	0.21	44.7	0.16	0.03	0.28	99.7	84.8
TAN-48I	39.9	0.02	14.2	0.20	44.7	0.15	n.d.	0.32	99.5	84.8
TAN-48I	41.3	0.03	14.2	0.28	44.5	0.15	0.04	0.35	100.7	84.8
TAN-48I	39.9	0.02	14.2	0.24	44.4	0.14	n.d.	0.34	99.2	84.8
TAN-48I	40.1	0.02	14.3	0.11	44.7	0.16	0.15	0.29	99.7	84.8
TAN-48I	40.0	0.02	14.3	0.20	44.8	0.14	0.04	0.34	99.9	84.8
TAN-48I	40.5	0.02	14.3	0.28	44.9	0.15	n.d.	0.32	100.5	84.8
TAN-48I	41.3	0.02	14.2	0.21	44.6	0.14	0.04	0.34	100.8	84.8
TAN-48I	40.7	0.02	14.4	0.20	44.9	0.16	n.d.	0.31	100.6	84.8
TAN-48I	40.2	0.02	14.4	0.23	44.9	0.15	n.d.	0.31	100.2	84.8
TAN-48I	40.3	0.02	14.3	0.17	44.7	0.15	0.11	0.31	100.0	84.8
TAN-48I	40.1	0.02	14.4	0.20	44.9	0.14	0.03	0.30	100.0	84.7
TAN-48I	39.8	0.02	14.4	0.20	44.9	0.16	n.d.	0.36	99.8	84.7
TAN-48I	39.8	0.03	14.4	0.22	44.7	0.13	n.d.	0.33	99.6	84.7
TAN-48I	39.6	0.02	14.3	0.20	44.5	0.14	0.05	0.28	99.0	84.7
TAN-48I	39.8	0.02	14.4	0.25	44.7	0.15	n.d.	0.29	99.7	84.7
TAN-48I	40.0	0.02	14.4	0.19	44.6	0.14	n.d.	0.28	99.6	84.7
TAN-48I	39.7	0.01	14.4	0.25	44.6	0.15	0.04	0.27	99.4	84.7
TAN-48I	38.9	0.03	14.5	0.23	44.9	0.18	n.d.	0.29	99.0	84.7
TAN-48I	40.0	0.02	14.4	0.21	44.6	0.16	n.d.	0.35	99.8	84.7
TAN-48I	40.0	0.02	14.4	0.21	44.5	0.15	0.09	0.27	99.6	84.7
TAN-48I	41.2	0.02	14.3	0.23	44.3	0.14	n.d.	0.33	100.5	84.7
TAN-48I	40.3	0.02	14.5	0.19	44.8	0.15	0.09	0.30	100.4	84.7
TAN-48I	41.1	0.02	14.3	0.17	44.2	0.15	n.d.	0.33	100.3	84.7
TAN-48I	40.7	0.02	14.3	0.27	44.3	0.14	n.d.	0.29	100.0	84.6
TAN-48I	40.2	0.02	14.4	0.21	44.4	0.16	n.d.	0.30	99.7	84.6
TAN-48I	40.7	0.03	14.5	0.26	44.6	0.16	n.d.	0.26	100.5	84.6
TAN-48I	40.6	0.02	14.5	0.22	44.8	0.15	n.d.	0.31	100.6	84.6
TAN-48I	39.9	0.03	14.5	0.17	44.6	0.14	n.d.	0.26	99.6	84.6
TAN-48I	39.8	0.02	14.5	0.22	44.6	0.16	0.04	0.29	99.6	84.6
TAN-48I	40.0	0.02	14.5	0.22	44.6	0.15	0.07	0.28	99.9	84.6
TAN-48I	39.4	0.02	14.5	0.13	44.5	0.15	n.d.	0.31	99.0	84.6
TAN-48I	41.3	0.02	14.4	0.23	44.1	0.15	0.04	0.36	100.6	84.6
TAN-48I	40.1	0.04	14.4	0.23	44.3	0.17	n.d.	0.28	99.6	84.6
TAN-48I	39.7	0.02	14.5	0.21	44.5	0.15	0.10	0.28	99.4	84.5
TAN-48I	41.5	0.02	14.5	0.26	44.4	0.16	n.d.	0.29	101.0	84.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-48I	39.8	0.01	14.5	0.23	44.4	0.16	0.06	0.25	99.4	84.5
TAN-48I	39.6	0.02	14.5	0.22	44.5	0.15	0.03	0.25	99.3	84.5
TAN-48I	39.9	0.02	14.6	0.22	44.8	0.15	0.05	0.28	100.0	84.5
TAN-48I	40.2	0.02	14.5	0.21	44.2	0.15	0.21	0.27	99.8	84.5
TAN-48I	39.7	0.03	14.6	0.23	44.6	0.16	0.04	0.24	99.6	84.5
TAN-48I	39.8	0.02	14.6	0.21	44.5	0.15	0.05	0.25	99.6	84.4
TAN-48I	40.9	0.03	14.5	0.23	44.0	0.13	n.d.	0.32	100.2	84.4
TAN-48I	39.4	0.01	14.6	0.14	44.3	0.13	0.04	0.28	99.0	84.4
TAN-48I	40.1	0.02	14.6	0.26	44.4	0.16	0.04	0.28	100.0	84.4
TAN-48I	39.9	0.03	14.7	0.24	44.6	0.15	0.03	0.30	100.0	84.4
TAN-48I	41.0	0.03	14.4	0.28	43.8	0.15	n.d.	0.27	100.0	84.4
TAN-48I	39.8	0.02	14.7	0.16	44.6	0.15	0.03	0.28	99.7	84.4
TAN-48I	39.9	0.02	14.6	0.20	44.1	0.14	0.03	0.25	99.2	84.4
TAN-48I	39.9	0.02	14.6	0.22	44.3	0.14	0.04	0.31	99.6	84.3
TAN-48I	41.3	0.02	14.6	0.29	44.1	0.15	0.04	0.29	100.7	84.3
TAN-48I	39.6	0.01	14.7	0.26	44.4	0.13	n.d.	0.31	99.4	84.3
TAN-48I	40.1	0.03	14.8	0.19	44.5	0.15	0.04	0.27	100.0	84.3
TAN-48I	40.2	0.02	14.8	0.26	44.5	0.16	0.05	0.28	100.3	84.3
TAN-48I	40.3	0.02	14.6	0.19	44.0	0.15	0.04	0.28	99.6	84.3
TAN-48I	39.5	0.03	14.8	0.25	44.5	0.16	n.d.	0.26	99.6	84.3
TAN-48I	40.0	0.02	15.0	0.23	45.0	0.15	0.08	0.27	100.7	84.3
TAN-48I	40.1	0.02	14.6	0.17	44.0	0.16	0.04	0.27	99.4	84.3
TAN-48I	40.1	0.02	14.8	0.22	44.4	0.16	n.d.	0.24	100.0	84.3
TAN-48I	40.5	0.03	14.9	0.26	44.7	0.16	n.d.	0.24	100.8	84.3
TAN-48I	39.5	0.02	14.7	0.26	44.2	0.15	n.d.	0.32	99.1	84.2
TAN-48I	39.9	0.02	14.8	0.25	44.5	0.17	0.03	0.28	100.0	84.2
TAN-48I	39.4	0.02	14.9	0.22	44.8	0.16	n.d.	0.24	99.8	84.2
TAN-48I	39.9	0.02	14.8	0.24	44.2	0.15	0.03	0.32	99.6	84.2
TAN-48I	40.2	0.02	14.9	0.13	44.5	0.16	0.03	0.24	100.1	84.2
TAN-48I	39.5	0.37	14.7	0.21	43.7	0.19	0.46	0.25	99.3	84.1
TAN-48I	39.3	0.02	14.9	0.16	44.3	0.16	n.d.	0.25	99.2	84.1
TAN-48I	39.4	0.04	14.8	0.26	44.1	0.16	0.04	0.25	99.1	84.1
TAN-48I	39.7	0.02	14.8	0.23	43.8	0.14	0.04	0.34	99.0	84.1
TAN-48I	39.4	0.02	14.9	0.18	44.0	0.16	0.05	0.24	99.0	84.0
TAN-48I	39.7	0.03	14.9	0.20	43.9	0.15	n.d.	0.24	99.2	84.0
TAN-48I	40.0	0.02	15.1	0.28	44.3	0.15	0.19	0.25	100.3	84.0
TAN-48I	39.5	0.02	15.0	0.26	44.0	0.16	n.d.	0.25	99.2	83.9
TAN-48I	41.2	0.02	15.0	0.19	43.7	0.15	0.03	0.24	100.5	83.9
TAN-48I	39.8	0.02	15.1	0.24	44.0	0.16	n.d.	0.20	99.5	83.9
TAN-48I	40.2	0.03	15.2	0.25	44.3	0.17	0.04	0.23	100.5	83.9
TAN-48I	40.2	0.01	15.1	0.16	44.0	0.16	n.d.	0.28	100.0	83.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-48I	39.7	0.02	15.2	0.23	44.2	0.14	0.07	0.35	99.9	83.8
TAN-48I	39.5	0.03	15.2	0.15	44.2	0.16	0.08	0.25	99.5	83.8
TAN-48I	41.1	0.02	15.0	0.15	43.6	0.16	0.04	0.25	100.3	83.8
TAN-48I	39.5	0.02	15.3	0.19	44.2	0.16	n.d.	0.21	99.5	83.8
TAN-48I	39.8	0.02	15.2	0.21	44.0	0.16	n.d.	0.21	99.6	83.8
TAN-48I	39.6	0.01	15.3	0.20	44.1	0.16	n.d.	0.22	99.6	83.8
TAN-48I	40.1	0.02	15.2	0.23	43.8	0.15	n.d.	0.22	99.7	83.7
TAN-48I	39.8	0.02	15.2	0.22	43.9	0.16	n.d.	0.22	99.5	83.7
TAN-48I	39.6	0.02	15.2	0.22	43.9	0.16	n.d.	0.26	99.5	83.7
TAN-48I	39.7	0.02	15.2	0.24	43.8	0.15	n.d.	0.21	99.3	83.7
TAN-48I	39.4	0.02	15.2	0.18	43.9	0.15	n.d.	0.21	99.1	83.7
TAN-48I	39.7	0.02	15.2	0.21	43.7	0.17	n.d.	0.24	99.3	83.7
TAN-48I	39.8	0.02	15.4	0.20	44.1	0.16	n.d.	0.21	99.9	83.7
TAN-48I	39.9	0.02	15.3	0.28	43.8	0.16	n.d.	0.23	99.7	83.6
TAN-48I	40.0	0.03	15.3	0.26	43.7	0.16	0.03	0.22	99.7	83.6
TAN-48I	39.8	0.02	15.3	0.25	43.6	0.15	n.d.	0.23	99.3	83.6
TAN-48I	39.8	0.02	15.2	0.25	43.4	0.16	n.d.	0.20	99.0	83.6
TAN-48I	40.6	0.02	15.2	0.21	43.4	0.17	n.d.	0.21	99.9	83.6
TAN-48I	40.1	0.02	15.4	0.23	43.9	0.16	n.d.	0.26	100.0	83.5
TAN-48I	39.8	0.02	15.4	0.29	43.7	0.15	n.d.	0.19	99.5	83.5
TAN-48I	39.7	0.02	15.4	0.19	43.8	0.15	0.03	0.24	99.6	83.5
TAN-48I	40.2	0.03	15.6	0.24	44.2	0.17	n.d.	0.24	100.7	83.5
TAN-48I	39.7	0.02	15.5	0.22	44.0	0.16	0.08	0.27	99.9	83.5
TAN-48I	39.7	0.03	15.4	0.17	43.8	0.17	n.d.	0.17	99.5	83.5
TAN-48I	39.8	0.02	15.4	0.17	43.8	0.16	0.07	0.21	99.7	83.5
TAN-48I	39.9	0.02	15.5	0.31	43.8	0.16	n.d.	0.21	99.9	83.5
TAN-48I	39.3	0.02	15.5	0.30	43.6	0.16	0.04	0.26	99.2	83.4
TAN-48I	39.5	0.02	15.6	0.27	43.9	0.15	n.d.	0.20	99.7	83.4
TAN-48I	40.1	0.03	15.5	0.19	43.7	0.16	0.03	0.21	100.0	83.4
TAN-48I	39.5	0.02	15.6	0.27	43.8	0.16	0.04	0.21	99.6	83.4
TAN-48I	39.8	0.02	15.6	0.22	43.7	0.15	n.d.	0.18	99.7	83.4
TAN-48I	40.0	0.02	15.4	0.19	43.3	0.16	n.d.	0.28	99.3	83.3
TAN-48I	39.9	0.02	15.6	0.20	43.7	0.16	n.d.	0.18	99.7	83.3
TAN-48I	39.7	0.02	15.5	0.22	43.5	0.16	0.03	0.21	99.3	83.3
TAN-48I	39.8	0.02	15.6	0.24	43.7	0.16	0.04	0.20	99.8	83.3
TAN-48I	39.9	0.02	15.6	0.22	43.7	0.18	n.d.	0.23	99.8	83.3
TAN-48I	39.6	0.02	15.6	0.28	43.6	0.16	n.d.	0.22	99.6	83.3
TAN-48I	39.7	0.01	15.7	0.23	43.7	0.15	n.d.	0.20	99.7	83.3
TAN-48I	39.9	0.02	15.7	0.23	43.7	0.16	n.d.	0.21	99.8	83.2
TAN-48I	39.6	0.02	15.5	0.29	43.3	0.17	n.d.	0.20	99.1	83.2
TAN-48I	39.6	0.02	15.7	0.28	43.8	0.15	n.d.	0.19	99.8	83.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-48I	40.2	0.02	15.7	0.22	43.6	0.18	n.d.	0.16	100.2	83.2
TAN-48I	39.9	0.02	15.7	0.22	43.7	0.16	0.03	0.17	99.8	83.2
TAN-48I	39.9	0.02	15.7	0.24	43.6	0.16	n.d.	0.16	99.8	83.2
TAN-48I	40.1	0.02	15.7	0.24	43.5	0.16	n.d.	0.16	99.9	83.2
TAN-48I	40.0	0.02	15.6	0.28	43.3	0.18	n.d.	0.22	99.6	83.2
TAN-48I	39.7	0.02	15.8	0.23	43.8	0.16	n.d.	0.20	99.9	83.2
TAN-48I	39.4	0.03	15.7	0.27	43.4	0.14	n.d.	0.26	99.2	83.1
TAN-48I	39.5	0.02	15.8	0.22	43.6	0.16	n.d.	0.20	99.5	83.1
TAN-48I	40.0	0.02	15.8	0.33	43.5	0.16	n.d.	0.19	100.0	83.1
TAN-48I	40.2	0.01	15.7	0.24	43.3	0.15	n.d.	0.19	99.8	83.1
TAN-48I	39.4	0.13	15.7	0.25	43.2	0.17	0.19	0.21	99.2	83.1
TAN-48I	39.8	0.01	15.8	0.20	43.6	0.16	0.03	0.20	99.8	83.1
TAN-48I	40.1	0.02	15.8	0.26	43.6	0.16	n.d.	0.19	100.1	83.1
TAN-48I	40.0	0.03	16.1	0.24	44.2	0.14	0.03	0.21	101.0	83.0
TAN-48I	39.6	0.01	15.9	0.21	43.6	0.17	n.d.	0.19	99.7	83.0
TAN-48I	40.2	0.02	16.0	0.21	43.8	0.15	n.d.	0.19	100.6	83.0
TAN-48I	39.9	0.02	15.9	0.29	43.7	0.15	n.d.	0.20	100.3	83.0
TAN-48I	39.8	0.02	15.9	0.19	43.6	0.16	n.d.	0.20	99.9	83.0
TAN-48I	39.8	0.02	15.9	0.24	43.6	0.15	n.d.	0.18	99.9	83.0
TAN-48I	39.6	0.02	15.8	0.26	43.3	0.18	n.d.	0.15	99.4	83.0
TAN-48I	39.9	0.02	15.9	0.28	43.7	0.15	0.04	0.21	100.2	83.0
TAN-48I	39.3	0.02	15.9	0.31	43.6	0.17	n.d.	0.21	99.6	83.0
TAN-48I	39.4	0.02	15.9	0.28	43.4	0.18	n.d.	0.19	99.4	83.0
TAN-48I	39.6	0.02	16.0	0.19	43.6	0.16	n.d.	0.21	99.8	82.9
TAN-48I	39.8	0.02	15.9	0.29	43.3	0.17	n.d.	0.16	99.7	82.9
TAN-48I	39.7	0.02	16.0	0.22	43.4	0.16	0.03	0.17	99.7	82.9
TAN-48I	39.6	0.02	15.9	0.32	43.3	0.17	n.d.	0.17	99.5	82.9
TAN-48I	40.0	0.02	15.9	0.28	43.3	0.18	n.d.	0.18	99.8	82.9
TAN-48I	39.8	0.01	16.2	0.20	43.9	0.15	n.d.	0.17	100.4	82.9
TAN-48I	39.3	0.05	16.0	0.27	43.4	0.20	n.d.	0.17	99.4	82.8
TAN-48I	39.5	0.02	16.0	0.27	43.4	0.16	n.d.	0.18	99.5	82.8
TAN-48I	40.0	0.02	16.0	0.23	43.3	0.16	n.d.	0.17	99.9	82.8
TAN-48I	39.6	0.02	16.0	0.27	43.4	0.16	n.d.	0.15	99.7	82.8
TAN-48I	39.6	0.03	16.0	0.28	43.2	0.17	0.06	0.18	99.5	82.8
TAN-48I	39.5	0.03	16.1	0.31	43.3	0.17	n.d.	0.17	99.6	82.8
TAN-48I	39.9	0.02	16.2	0.24	43.6	0.16	n.d.	0.22	100.4	82.7
TAN-48I	39.6	0.02	16.1	0.24	43.3	0.16	n.d.	0.16	99.7	82.7
TAN-48I	39.7	0.02	16.1	0.22	43.2	0.16	0.04	0.18	99.6	82.7
TAN-48I	39.8	0.01	16.1	0.28	43.0	0.19	n.d.	0.14	99.5	82.6
TAN-48I	39.7	0.01	16.3	0.19	43.3	0.16	n.d.	0.18	99.8	82.6
TAN-48I	40.3	0.02	16.2	0.34	43.1	0.18	0.18	0.16	100.4	82.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-48I	40.0	0.01	16.2	0.26	43.1	0.17	n.d.	0.16	99.9	82.6
TAN-48I	39.7	0.02	16.3	0.28	43.2	0.17	n.d.	0.21	99.9	82.5
TAN-48I	39.8	0.02	16.4	0.22	43.3	0.19	n.d.	0.15	100.0	82.5
TAN-48I	39.8	0.02	16.4	0.24	43.3	0.18	n.d.	0.18	100.1	82.4
TAN-48I	39.9	0.02	16.4	0.32	43.0	0.16	n.d.	0.21	100.0	82.4
TAN-48I	39.7	0.02	16.4	0.31	43.2	0.18	n.d.	0.19	100.1	82.4
TAN-48I	39.6	0.02	16.4	0.23	42.9	0.19	0.04	0.12	99.5	82.4
TAN-48I	39.8	0.02	16.4	0.23	43.0	0.18	n.d.	0.17	99.9	82.4
TAN-48I	40.3	0.02	16.3	0.24	42.6	0.19	n.d.	0.15	99.8	82.4
TAN-48I	39.5	0.02	16.5	0.25	43.2	0.17	n.d.	0.14	99.8	82.4
TAN-48I	40.6	0.02	16.4	0.30	43.0	0.17	n.d.	0.17	100.7	82.3
TAN-48I	39.7	0.02	16.6	0.19	43.2	0.16	n.d.	0.15	100.0	82.3
TAN-48I	39.8	0.02	16.5	0.29	43.1	0.17	n.d.	0.19	100.1	82.3
TAN-48I	39.4	0.02	16.5	0.29	42.9	0.17	0.03	0.18	99.6	82.2
TAN-48I	39.7	0.01	16.7	0.23	43.0	0.17	n.d.	0.16	100.0	82.2
TAN-48I	40.0	0.02	16.7	0.23	42.9	0.18	n.d.	0.13	100.2	82.1
TAN-48I	39.9	0.02	16.7	0.28	43.0	0.17	n.d.	0.16	100.2	82.1
TAN-48I	39.3	0.02	16.7	0.20	42.9	0.19	0.04	0.14	99.6	82.1
TAN-48I	39.4	0.02	16.6	0.28	42.5	0.16	0.09	0.20	99.3	82.0
TAN-48I	40.3	0.02	16.8	0.26	42.9	0.16	0.04	0.24	100.7	82.0
TAN-48I	39.3	0.10	17.0	0.19	43.3	0.21	n.d.	0.10	100.3	82.0
TAN-48I	39.4	0.02	16.9	0.23	42.4	0.21	0.07	0.11	99.4	81.7
TAN-48I	39.8	0.02	17.0	0.29	42.6	0.20	n.d.	0.12	100.2	81.7
TAN-48I	40.1	0.02	17.1	0.27	42.7	0.19	n.d.	0.12	100.5	81.7
TAN-48I	39.6	0.02	17.1	0.26	42.4	0.19	n.d.	0.13	99.7	81.6
TAN-48I	39.2	0.02	17.2	0.23	42.3	0.19	n.d.	0.16	99.3	81.4
TAN-48I	39.8	0.02	17.3	0.28	42.3	0.17	0.04	0.17	100.0	81.4
TAN-48I	39.8	0.03	17.5	0.29	42.5	0.21	n.d.	0.11	100.4	81.2
TAN-48I	38.9	0.02	17.6	0.30	42.0	0.16	n.d.	0.16	99.1	81.0
TAN-48I	39.6	0.04	17.8	0.29	42.4	0.19	n.d.	0.11	100.5	80.9
TAN-48I	39.7	0.02	17.8	0.33	42.3	0.21	n.d.	0.13	100.6	80.9
TAN-48I	39.7	0.01	17.8	0.32	41.8	0.17	n.d.	0.13	99.9	80.8
TAN-48I	38.9	0.02	17.9	0.23	42.0	0.18	n.d.	0.16	99.4	80.7
TAN-48I	39.6	0.02	17.9	0.31	41.4	0.26	n.d.	0.10	99.6	80.5
TAN-48I	39.0	0.02	18.1	0.30	41.8	0.15	n.d.	0.18	99.6	80.5
TAN-48I	38.9	0.17	18.0	0.34	40.9	0.20	0.35	0.17	99.0	80.2
TAN-48I	39.1	0.03	18.3	0.31	41.7	0.22	0.09	0.14	99.9	80.2
TAN-48I	39.2	0.06	18.4	0.28	41.2	0.19	0.34	0.19	99.9	79.9
TAN-48I	39.2	0.05	18.5	0.26	41.2	0.21	0.26	0.17	99.9	79.9
TAN-48I	39.1	0.02	18.6	0.31	40.8	0.21	n.d.	0.14	99.2	79.6
TAN-48I	39.0	0.02	18.7	0.29	40.7	0.21	n.d.	0.11	99.1	79.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
TAN-48I	39.5	0.02	19.0	0.28	40.7	0.20	n.d.	0.23	100.0	79.2
TAN-48I	39.0	0.02	19.8	0.30	40.4	0.22	n.d.	0.19	100.0	78.4
TAN-48I	40.2	0.03	19.7	0.32	39.9	0.20	n.d.	0.10	100.5	78.3
TAN-48I	38.5	0.02	20.3	0.28	39.8	0.19	n.d.	0.09	99.3	77.7
TAN-48I	39.0	0.02	20.4	0.34	39.5	0.25	n.d.	0.12	99.6	77.5
TAN-48I	39.6	0.02	20.5	0.33	39.4	0.21	n.d.	0.10	100.2	77.4
TAN-48I	38.4	0.02	21.4	0.40	38.8	0.24	0.06	0.10	99.5	76.4
TAN-48I	38.8	0.02	21.4	0.38	38.8	0.24	n.d.	0.10	99.8	76.3
TAN-48I	40.4	0.09	22.0	0.48	37.4	0.26	n.d.	0.10	100.7	75.2
TAN-48I	38.5	0.02	22.3	0.37	37.9	0.25	0.20	0.09	99.6	75.2
TAN-48I	38.9	0.09	23.1	0.40	36.8	0.28	n.d.	0.09	99.6	74.0
TAN-48I	38.3	0.02	23.7	0.43	36.9	0.28	n.d.	0.05	99.7	73.5
TAN-48I	39.7	0.40	24.0	0.45	35.5	0.29	n.d.	0.06	100.5	72.5
TAN-48I	37.5	0.02	25.8	0.48	35.0	0.30	n.d.	0.06	99.2	70.7
TAN-48I	37.5	0.03	26.3	0.48	34.8	0.29	n.d.	0.06	99.5	70.2
TAN-48I	37.2	0.02	30.3	0.62	31.1	0.27	n.d.	0.05	99.6	64.6
TAN-48I	37.1	0.15	30.7	0.53	30.6	0.28	n.d.	n.d.	99.4	64.0
TAN-48I	37.1	0.03	32.0	0.56	30.1	0.26	n.d.	n.d.	100.1	62.7
UR-8B-I	40.4	0.03	13.5	0.15	44.5	0.13	n.d.	0.52	99.2	85.4
UR-8B-I	40.1	0.01	13.7	0.13	44.6	0.11	0.04	0.48	99.1	85.3
UR-8B-I	40.0	0.03	13.7	0.24	44.5	0.13	n.d.	0.48	99.1	85.3
UR-8B-I	40.1	0.02	13.7	0.14	44.6	0.12	n.d.	0.47	99.2	85.3
UR-8B-I	40.1	0.02	13.8	0.17	44.6	0.13	n.d.	0.50	99.3	85.2
UR-8B-I	40.0	0.02	13.8	0.19	44.7	0.11	n.d.	0.51	99.4	85.2
UR-8B-I	40.0	0.02	13.8	0.16	44.4	0.10	0.05	0.45	99.1	85.1
UR-8B-I	40.1	0.02	13.9	0.17	44.5	0.14	n.d.	0.49	99.3	85.1
UR-8B-I	40.0	n.d.	13.9	0.22	44.4	0.12	0.04	0.48	99.2	85.1
UR-8B-I	40.1	0.01	13.9	0.24	44.5	0.13	0.05	0.48	99.4	85.0
UR-8B-I	40.0	0.01	14.0	0.18	44.4	0.12	n.d.	0.49	99.2	85.0
UR-8B-I	40.3	0.02	14.0	0.18	44.7	0.12	0.05	0.46	99.8	85.0
UR-8B-I	40.3	0.03	13.9	0.17	44.3	0.11	0.04	0.48	99.4	85.0
UR-8B-I	40.2	0.02	14.0	0.21	44.6	0.14	n.d.	0.48	99.7	85.0
UR-8B-I	40.3	0.02	14.0	0.22	44.3	0.11	0.07	0.48	99.4	85.0
UR-8B-I	40.1	0.01	14.0	0.18	44.4	0.13	n.d.	0.47	99.4	85.0
UR-8B-I	40.2	0.03	13.9	0.15	44.1	0.10	0.05	0.48	99.1	85.0
UR-8B-I	40.1	0.02	14.0	0.19	44.4	0.11	n.d.	0.47	99.3	85.0
UR-8B-I	40.0	0.02	14.0	0.14	44.5	0.11	0.03	0.46	99.3	84.9
UR-8B-I	40.0	0.01	14.1	0.25	44.5	0.13	n.d.	0.43	99.4	84.9
UR-8B-I	40.1	0.03	14.0	0.23	44.4	0.13	0.04	0.50	99.5	84.9
UR-8B-I	40.1	0.03	14.1	0.20	44.5	0.13	0.04	0.45	99.5	84.9
UR-8B-I	40.2	0.02	14.1	0.14	44.5	0.14	0.15	0.37	99.7	84.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-8B-I	40.2	0.02	14.2	0.19	44.5	0.12	0.04	0.46	99.8	84.8
UR-8B-I	40.1	0.03	14.2	0.20	44.3	0.13	0.05	0.42	99.3	84.8
UR-8B-I	40.1	0.03	14.2	0.22	44.3	0.13	n.d.	0.43	99.4	84.8
UR-8B-I	40.2	n.d.	14.3	0.22	44.4	0.12	0.06	0.43	99.7	84.7
UR-8B-I	40.3	0.02	14.3	0.20	44.4	0.12	0.04	0.44	99.8	84.7
UR-8B-I	40.1	0.02	14.3	0.16	44.5	0.11	n.d.	0.43	99.7	84.7
UR-8B-I	40.0	0.01	14.3	0.17	44.3	0.12	0.04	0.45	99.4	84.7
UR-8B-I	40.2	n.d.	14.3	0.14	44.4	0.11	n.d.	0.43	99.6	84.7
UR-8B-I	39.9	0.03	14.3	0.21	44.3	0.13	n.d.	0.41	99.3	84.7
UR-8B-I	40.2	0.02	14.3	0.20	44.2	0.13	0.03	0.47	99.6	84.7
UR-8B-I	39.8	0.03	14.3	0.25	44.3	0.17	n.d.	0.46	99.3	84.7
UR-8B-I	40.1	0.03	14.2	0.20	43.9	0.12	n.d.	0.38	99.0	84.7
UR-8B-I	40.2	0.02	14.4	0.17	44.3	0.10	0.03	0.42	99.7	84.6
UR-8B-I	40.1	0.02	14.4	0.13	44.3	0.12	n.d.	0.43	99.5	84.6
UR-8B-I	39.9	0.01	14.4	0.17	44.3	0.10	n.d.	0.44	99.4	84.6
UR-8B-I	39.8	0.01	14.3	0.24	44.1	0.12	0.05	0.40	99.0	84.6
UR-8B-I	40.1	0.02	14.3	0.25	44.0	0.12	0.04	0.40	99.2	84.6
UR-8B-I	40.1	0.02	14.4	0.22	44.4	0.11	0.04	0.42	99.7	84.6
UR-8B-I	40.0	0.02	14.4	0.19	44.4	0.11	0.04	0.43	99.6	84.6
UR-8B-I	40.0	0.01	14.3	0.18	44.0	0.11	n.d.	0.48	99.1	84.6
UR-8B-I	40.1	0.03	14.4	0.22	44.2	0.13	n.d.	0.36	99.5	84.6
UR-8B-I	40.2	0.01	14.3	0.19	44.0	0.13	0.03	0.41	99.2	84.6
UR-8B-I	39.9	0.03	14.4	0.17	44.4	0.12	n.d.	0.42	99.5	84.6
UR-8B-I	39.8	0.01	14.4	0.25	44.2	0.12	n.d.	0.47	99.3	84.5
UR-8B-I	39.8	n.d.	14.4	0.24	44.3	0.12	n.d.	0.34	99.3	84.5
UR-8B-I	40.1	n.d.	14.5	0.17	44.3	0.11	0.07	0.43	99.7	84.5
UR-8B-I	40.0	n.d.	14.4	0.21	44.1	0.11	0.04	0.33	99.2	84.5
UR-8B-I	39.6	0.02	14.5	0.18	44.3	0.12	0.04	0.44	99.2	84.5
UR-8B-I	39.6	0.17	14.5	0.18	44.2	0.12	n.d.	0.48	99.2	84.5
UR-8B-I	40.1	0.02	14.4	0.15	44.1	0.10	0.06	0.44	99.4	84.5
UR-8B-I	39.9	0.02	14.5	0.24	44.2	0.13	n.d.	0.42	99.3	84.5
UR-8B-I	39.9	0.02	14.5	0.20	44.3	0.12	n.d.	0.39	99.5	84.4
UR-8B-I	40.1	0.02	14.6	0.16	44.3	0.12	0.03	0.44	99.7	84.4
UR-8B-I	40.2	0.04	14.6	0.15	44.4	0.11	0.04	0.42	100.0	84.4
UR-8B-I	39.9	0.03	14.6	0.27	44.3	0.12	0.05	0.45	99.6	84.4
UR-8B-I	40.1	0.02	14.6	0.20	44.3	0.12	0.04	0.37	99.7	84.4
UR-8B-I	40.3	0.02	14.5	0.19	44.0	0.11	0.05	0.38	99.5	84.4
UR-8B-I	39.6	0.02	14.6	0.22	44.2	0.10	n.d.	0.42	99.1	84.4
UR-8B-I	40.1	0.01	14.5	0.22	43.9	0.12	n.d.	0.47	99.4	84.4
UR-8B-I	39.7	n.d.	14.6	0.15	44.0	0.12	n.d.	0.37	99.0	84.4
UR-8B-I	40.1	0.01	14.5	0.17	43.8	0.12	n.d.	0.47	99.2	84.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-8B-I	40.0	n.d.	14.6	0.27	44.0	0.12	0.12	0.38	99.5	84.3
UR-8B-I	39.8	0.02	14.6	0.19	44.2	0.13	n.d.	0.33	99.3	84.3
UR-8B-I	40.0	0.02	14.6	0.22	44.1	0.12	n.d.	0.35	99.4	84.3
UR-8B-I	40.1	0.03	14.7	0.22	44.3	0.11	0.05	0.37	99.9	84.3
UR-8B-I	39.9	n.d.	14.6	0.22	44.0	0.13	0.05	0.39	99.3	84.3
UR-8B-I	39.8	0.01	14.6	0.27	44.0	0.12	n.d.	0.43	99.2	84.3
UR-8B-I	40.1	0.09	14.9	0.14	44.7	0.12	0.05	0.32	100.4	84.3
UR-8B-I	40.0	n.d.	14.6	0.16	44.0	0.12	n.d.	0.39	99.3	84.3
UR-8B-I	39.9	0.01	14.6	0.22	44.0	0.13	n.d.	0.31	99.2	84.3
UR-8B-I	40.2	0.02	14.7	0.17	44.0	0.13	0.03	0.36	99.7	84.2
UR-8B-I	40.0	0.02	14.7	0.17	44.0	0.12	0.03	0.35	99.4	84.2
UR-8B-I	39.8	0.03	14.7	0.23	44.0	0.14	n.d.	0.37	99.2	84.2
UR-8B-I	40.0	0.03	14.7	0.20	43.8	0.12	0.04	0.33	99.3	84.2
UR-8B-I	39.8	0.01	14.7	0.24	43.9	0.12	n.d.	0.35	99.1	84.2
UR-8B-I	39.8	0.02	14.7	0.28	43.9	0.13	n.d.	0.37	99.2	84.2
UR-8B-I	40.2	0.02	14.6	0.17	43.6	0.12	0.03	0.31	99.1	84.2
UR-8B-I	40.0	0.02	14.8	0.23	44.1	0.12	0.06	0.34	99.7	84.2
UR-8B-I	40.0	0.01	14.7	0.22	43.9	0.13	0.03	0.29	99.3	84.1
UR-8B-I	39.9	0.02	15.0	0.26	44.5	0.11	0.08	0.40	100.3	84.1
UR-8B-I	39.9	0.02	14.8	0.17	43.9	0.12	0.05	0.34	99.2	84.1
UR-8B-I	40.0	n.d.	14.8	0.18	44.0	0.13	n.d.	0.29	99.5	84.1
UR-8B-I	40.0	0.01	15.0	0.15	44.3	0.11	0.05	0.43	100.1	84.1
UR-8B-I	40.2	0.02	15.0	0.26	44.5	0.13	0.04	0.37	100.5	84.1
UR-8B-I	40.1	0.03	14.9	0.16	44.0	0.12	0.03	0.37	99.7	84.1
UR-8B-I	39.8	0.02	14.8	0.15	43.9	0.13	0.13	0.40	99.4	84.1
UR-8B-I	39.9	0.01	14.9	0.20	44.0	0.11	n.d.	0.43	99.7	84.0
UR-8B-I	39.6	0.03	14.8	0.19	43.6	0.16	0.39	0.34	99.1	84.0
UR-8B-I	39.7	0.02	14.9	0.13	43.9	0.14	n.d.	0.34	99.1	84.0
UR-8B-I	39.9	0.02	15.0	0.28	44.2	0.13	n.d.	0.38	99.9	84.0
UR-8B-I	39.8	0.02	15.0	0.20	44.0	0.13	n.d.	0.32	99.5	83.9
UR-8B-I	39.8	0.02	15.0	0.32	44.1	0.13	n.d.	0.28	99.6	83.9
UR-8B-I	40.0	0.01	14.9	0.20	43.7	0.12	n.d.	0.32	99.2	83.9
UR-8B-I	40.1	0.02	15.1	0.14	44.0	0.13	n.d.	0.35	99.8	83.9
UR-8B-I	40.3	0.01	15.1	0.24	44.1	0.11	0.06	0.35	100.3	83.9
UR-8B-I	40.4	0.02	15.0	0.19	43.8	0.12	0.05	0.36	99.9	83.9
UR-8B-I	39.7	0.02	15.0	0.22	43.8	0.13	n.d.	0.36	99.2	83.9
UR-8B-I	40.2	0.02	15.1	0.19	43.9	0.14	n.d.	0.36	100.0	83.8
UR-8B-I	40.0	0.03	15.1	0.20	44.0	0.12	0.11	0.27	99.8	83.8
UR-8B-I	39.9	0.02	15.0	0.21	43.7	0.12	0.03	0.37	99.4	83.8
UR-8B-I	39.6	0.02	15.0	0.25	43.7	0.12	0.04	0.34	99.1	83.8
UR-8B-I	39.9	0.01	15.1	0.22	43.8	0.14	0.05	0.35	99.6	83.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-8B-I	40.7	n.d.	15.1	0.24	44.0	0.15	0.20	0.31	100.7	83.8
UR-8B-I	40.1	0.02	15.1	0.26	43.8	0.12	0.05	0.46	99.8	83.8
UR-8B-I	40.2	0.02	15.1	0.27	43.9	0.12	n.d.	0.34	99.9	83.8
UR-8B-I	39.8	0.01	15.1	0.25	43.7	0.13	n.d.	0.29	99.3	83.8
UR-8B-I	39.8	0.01	15.1	0.17	43.7	0.14	0.03	0.27	99.3	83.8
UR-8B-I	40.0	n.d.	15.1	0.28	43.9	0.14	n.d.	0.33	99.8	83.8
UR-8B-I	39.7	0.02	15.1	0.21	43.8	0.14	0.04	0.25	99.3	83.8
UR-8B-I	39.4	0.02	15.1	0.24	43.8	0.12	0.05	0.30	99.0	83.8
UR-8B-I	39.9	0.02	15.0	0.18	43.5	0.14	0.04	0.34	99.2	83.8
UR-8B-I	40.4	0.02	15.2	0.22	44.0	0.13	0.08	0.29	100.3	83.8
UR-8B-I	39.7	0.01	15.1	0.26	43.7	0.12	n.d.	0.25	99.1	83.7
UR-8B-I	40.0	0.01	15.1	0.26	43.5	0.13	n.d.	0.34	99.4	83.7
UR-8B-I	39.7	0.02	15.2	0.17	43.9	0.14	n.d.	0.26	99.4	83.7
UR-8B-I	39.5	0.01	15.1	0.22	43.7	0.12	n.d.	0.31	99.0	83.7
UR-8B-I	39.9	0.01	15.2	0.29	43.6	0.13	0.07	0.38	99.6	83.7
UR-8B-I	40.4	0.02	15.2	0.23	43.9	0.12	n.d.	0.32	100.2	83.7
UR-8B-I	39.7	0.03	15.1	0.27	43.5	0.13	0.03	0.25	99.0	83.7
UR-8B-I	39.7	0.03	15.2	0.23	43.8	0.12	n.d.	0.33	99.4	83.7
UR-8B-I	39.9	0.03	15.1	0.26	43.3	0.12	0.04	0.30	99.0	83.7
UR-8B-I	40.0	0.02	15.2	0.24	43.6	0.14	n.d.	0.25	99.5	83.7
UR-8B-I	39.7	0.02	15.3	0.22	43.8	0.13	0.05	0.27	99.5	83.6
UR-8B-I	40.0	n.d.	15.3	0.24	43.8	0.13	n.d.	0.26	99.7	83.6
UR-8B-I	39.5	0.02	15.3	0.22	43.9	0.12	0.03	0.37	99.5	83.6
UR-8B-I	40.2	0.01	15.2	0.16	43.5	0.13	n.d.	0.35	99.5	83.6
UR-8B-I	39.9	0.02	15.3	0.25	43.5	0.13	0.04	0.25	99.3	83.6
UR-8B-I	40.0	0.01	15.3	0.22	43.4	0.12	n.d.	0.32	99.4	83.5
UR-8B-I	39.4	n.d.	15.4	0.25	43.7	0.14	0.03	0.25	99.1	83.5
UR-8B-I	39.4	0.02	15.4	0.21	43.7	0.12	n.d.	0.30	99.1	83.5
UR-8B-I	39.8	0.02	15.3	0.23	43.4	0.14	n.d.	0.27	99.2	83.5
UR-8B-I	39.8	0.01	15.4	0.23	43.6	0.13	0.04	0.26	99.5	83.5
UR-8B-I	39.6	n.d.	15.4	0.20	43.5	0.15	0.03	0.22	99.1	83.5
UR-8B-I	39.8	0.02	15.4	0.28	43.7	0.14	n.d.	0.24	99.6	83.4
UR-8B-I	39.6	0.02	15.5	0.21	43.9	0.15	n.d.	0.27	99.6	83.4
UR-8B-I	40.0	0.02	15.5	0.20	43.7	0.15	0.16	0.23	99.9	83.4
UR-8B-I	39.6	0.02	15.4	0.24	43.5	0.14	0.09	0.22	99.2	83.4
UR-8B-I	39.9	0.02	15.4	0.27	43.4	0.12	n.d.	0.27	99.3	83.4
UR-8B-I	39.8	0.04	15.5	0.21	43.6	0.12	n.d.	0.28	99.5	83.4
UR-8B-I	39.6	n.d.	15.4	0.19	43.6	0.12	n.d.	0.31	99.3	83.4
UR-8B-I	39.8	0.02	15.5	0.24	43.8	0.13	n.d.	0.28	99.8	83.4
UR-8B-I	39.6	0.01	15.5	0.22	43.6	0.13	n.d.	0.31	99.3	83.4
UR-8B-I	39.6	0.02	15.5	0.17	43.5	0.13	0.06	0.31	99.3	83.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-8B-I	39.5	0.07	15.5	0.18	43.5	0.16	0.05	0.22	99.2	83.4
UR-8B-I	39.9	n.d.	15.5	0.15	43.6	0.13	n.d.	0.26	99.6	83.4
UR-8B-I	40.1	0.02	15.6	0.17	43.8	0.13	n.d.	0.31	100.1	83.4
UR-8B-I	40.0	0.01	15.4	0.22	43.3	0.14	n.d.	0.27	99.3	83.4
UR-8B-I	40.1	0.01	15.5	0.21	43.6	0.13	0.06	0.37	100.0	83.4
UR-8B-I	39.8	0.02	15.4	0.25	43.3	0.14	n.d.	0.27	99.2	83.3
UR-8B-I	39.6	n.d.	15.5	0.25	43.4	0.11	n.d.	0.29	99.1	83.3
UR-8B-I	39.8	0.03	15.5	0.26	43.4	0.13	n.d.	0.27	99.5	83.3
UR-8B-I	39.7	0.02	15.7	0.21	43.8	0.14	n.d.	0.28	99.8	83.3
UR-8B-I	40.1	n.d.	15.6	0.25	43.5	0.13	n.d.	0.26	99.8	83.3
UR-8B-I	39.8	0.02	15.6	0.19	43.6	0.18	0.04	0.24	99.6	83.3
UR-8B-I	39.8	0.01	15.6	0.19	43.5	0.15	0.05	0.25	99.5	83.3
UR-8B-I	39.8	0.01	15.6	0.23	43.6	0.14	0.04	0.24	99.7	83.3
UR-8B-I	40.0	0.02	15.6	0.21	43.4	0.12	0.04	0.21	99.5	83.2
UR-8B-I	39.4	0.03	15.7	0.21	43.6	0.14	0.03	0.25	99.3	83.2
UR-8B-I	39.7	0.03	15.5	0.21	43.1	0.13	0.04	0.28	99.0	83.2
UR-8B-I	39.7	0.02	15.6	0.24	43.3	0.13	n.d.	0.24	99.3	83.2
UR-8B-I	39.9	0.02	15.6	0.33	43.5	0.13	0.17	0.21	99.9	83.2
UR-8B-I	39.4	0.03	15.6	0.25	43.3	0.15	n.d.	0.25	99.1	83.2
UR-8B-I	40.0	n.d.	15.6	0.24	43.4	0.15	n.d.	0.27	99.7	83.2
UR-8B-I	39.5	0.02	15.6	0.25	43.2	0.13	0.03	0.31	99.0	83.2
UR-8B-I	40.0	n.d.	15.6	0.27	43.2	0.12	0.04	0.34	99.6	83.2
UR-8B-I	40.0	0.02	15.7	0.21	43.5	0.12	n.d.	0.32	99.9	83.2
UR-8B-I	40.0	0.02	15.6	0.20	43.3	0.14	n.d.	0.29	99.5	83.1
UR-8B-I	39.8	0.02	15.7	0.24	43.5	0.15	n.d.	0.22	99.7	83.1
UR-8B-I	39.3	0.02	15.7	0.22	43.4	0.13	n.d.	0.27	99.0	83.1
UR-8B-I	39.7	0.02	15.8	0.24	43.6	0.14	0.11	0.23	99.9	83.1
UR-8B-I	39.9	0.02	15.7	0.27	43.4	0.13	0.04	0.23	99.7	83.1
UR-8B-I	39.9	0.02	15.7	0.19	43.3	0.13	0.04	0.24	99.6	83.1
UR-8B-I	39.9	0.01	15.8	0.22	43.3	0.13	n.d.	0.24	99.6	83.1
UR-8B-I	39.4	0.01	15.8	0.27	43.2	0.15	n.d.	0.20	99.1	83.0
UR-8B-I	39.5	0.02	15.8	0.27	43.3	0.13	n.d.	0.20	99.2	83.0
UR-8B-I	40.0	0.02	15.8	0.23	43.1	0.14	n.d.	0.21	99.4	83.0
UR-8B-I	39.7	n.d.	15.9	0.29	43.3	0.14	n.d.	0.20	99.6	82.9
UR-8B-I	39.9	0.01	15.8	0.28	43.0	0.15	n.d.	0.26	99.4	82.9
UR-8B-I	39.3	0.02	15.9	0.21	43.2	0.14	n.d.	0.20	99.1	82.9
UR-8B-I	39.8	0.02	15.9	0.19	43.0	0.13	n.d.	0.24	99.3	82.8
UR-8B-I	39.6	0.01	16.0	0.26	43.3	0.14	n.d.	0.19	99.5	82.8
UR-8B-I	40.0	0.03	16.0	0.24	43.1	0.15	n.d.	0.34	99.8	82.8
UR-8B-I	39.5	0.01	16.0	0.21	43.1	0.13	n.d.	0.29	99.3	82.8
UR-8B-I	39.6	0.03	16.0	0.25	43.0	0.14	n.d.	0.26	99.3	82.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-8B-I	39.7	0.02	16.0	0.19	43.2	0.15	n.d.	0.26	99.5	82.8
UR-8B-I	39.9	0.01	15.9	0.25	42.6	0.15	n.d.	0.18	99.0	82.7
UR-8B-I	40.0	0.02	16.1	0.21	43.2	0.15	n.d.	0.19	99.9	82.7
UR-8B-I	39.8	0.02	16.0	0.23	42.9	0.11	n.d.	0.40	99.4	82.7
UR-8B-I	39.7	n.d.	16.2	0.17	43.4	0.13	0.08	0.23	99.9	82.7
UR-8B-I	39.8	0.02	16.0	0.20	42.8	0.12	n.d.	0.33	99.3	82.7
UR-8B-I	39.8	0.04	16.2	0.22	43.3	0.14	0.10	0.22	100.0	82.6
UR-8B-I	39.8	0.02	16.0	0.27	42.9	0.13	0.03	0.29	99.5	82.6
UR-8B-I	39.6	n.d.	16.2	0.24	43.1	0.15	n.d.	0.19	99.6	82.6
UR-8B-I	40.0	0.02	16.2	0.24	43.1	0.12	n.d.	0.21	99.8	82.6
UR-8B-I	39.6	0.02	16.1	0.30	42.8	0.14	0.04	0.30	99.4	82.5
UR-8B-I	39.6	n.d.	16.2	0.19	43.0	0.12	n.d.	0.33	99.4	82.5
UR-8B-I	39.8	0.02	16.2	0.13	43.0	0.14	n.d.	0.19	99.5	82.5
UR-8B-I	40.1	0.02	16.3	0.25	43.0	0.15	n.d.	0.19	100.0	82.4
UR-8B-I	39.6	0.02	16.3	0.26	42.7	0.14	n.d.	0.23	99.3	82.4
UR-8B-I	40.0	n.d.	16.4	0.21	43.0	0.13	n.d.	0.21	99.9	82.4
UR-8B-I	39.4	0.02	16.3	0.29	42.8	0.14	n.d.	0.24	99.2	82.4
UR-8B-I	39.7	n.d.	16.3	0.24	42.7	0.15	n.d.	0.18	99.3	82.3
UR-8B-I	39.3	0.02	16.4	0.24	42.9	0.12	n.d.	0.32	99.3	82.3
UR-8B-I	39.6	0.01	16.4	0.27	43.0	0.15	0.04	0.16	99.7	82.3
UR-8B-I	39.5	0.02	16.4	0.29	42.9	0.15	n.d.	0.17	99.4	82.3
UR-8B-I	39.6	0.01	16.4	0.20	42.7	0.15	n.d.	0.15	99.2	82.3
UR-8B-I	39.7	n.d.	16.4	0.27	42.7	0.16	n.d.	0.17	99.4	82.3
UR-8B-I	39.8	0.01	16.6	0.25	43.1	0.13	n.d.	0.20	100.1	82.3
UR-8B-I	39.7	n.d.	16.5	0.19	42.8	0.15	0.03	0.15	99.5	82.2
UR-8B-I	39.7	0.02	16.5	0.32	42.6	0.13	n.d.	0.25	99.5	82.2
UR-8B-I	40.5	0.02	16.5	0.31	42.8	0.14	n.d.	0.19	100.6	82.2
UR-8B-I	40.0	0.01	16.6	0.25	42.9	0.16	n.d.	0.16	100.1	82.1
UR-8B-I	37.2	0.70	16.5	0.24	42.5	0.12	2.49	0.21	100.0	82.1
UR-8B-I	39.7	n.d.	16.6	0.28	42.6	0.16	n.d.	0.19	99.5	82.1
UR-8B-I	39.5	0.01	16.5	0.30	42.4	0.13	n.d.	0.25	99.0	82.1
UR-8B-I	39.7	n.d.	16.5	0.29	42.5	0.14	n.d.	0.21	99.4	82.1
UR-8B-I	39.7	n.d.	16.5	0.22	42.5	0.15	n.d.	0.21	99.4	82.1
UR-8B-I	39.9	n.d.	16.7	0.27	43.0	0.16	n.d.	0.18	100.2	82.1
UR-8B-I	39.6	0.02	16.6	0.28	42.5	0.15	n.d.	0.18	99.3	82.0
UR-8B-I	39.6	0.01	16.6	0.31	42.4	0.14	n.d.	0.14	99.1	82.0
UR-8B-I	39.7	0.02	16.7	0.20	42.5	0.15	n.d.	0.17	99.4	82.0
UR-8B-I	39.8	0.02	16.7	0.22	42.5	0.16	n.d.	0.16	99.5	82.0
UR-8B-I	39.9	0.01	16.8	0.22	42.6	0.15	n.d.	0.16	99.8	81.9
UR-8B-I	39.6	0.02	16.6	0.23	42.3	0.14	n.d.	0.15	99.1	81.9
UR-8B-I	39.5	n.d.	16.7	0.27	42.3	0.15	n.d.	0.14	99.0	81.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-8B-I	39.7	n.d.	16.7	0.28	42.4	0.15	0.04	0.24	99.6	81.9
UR-8B-I	39.5	0.02	16.6	0.26	42.2	0.15	n.d.	0.14	99.0	81.9
UR-8B-I	39.5	n.d.	16.8	0.38	42.5	0.14	n.d.	0.24	99.7	81.8
UR-8B-I	39.6	0.02	16.8	0.19	42.4	0.15	0.04	0.16	99.4	81.8
UR-8B-I	39.5	0.03	16.8	0.22	42.3	0.15	0.04	0.25	99.3	81.8
UR-8B-I	39.9	0.02	16.8	0.25	42.4	0.13	n.d.	0.28	99.7	81.8
UR-8B-I	39.2	n.d.	16.8	0.25	42.3	0.12	0.07	0.24	99.0	81.8
UR-8B-I	39.4	0.02	16.8	0.37	42.3	0.15	n.d.	0.16	99.3	81.8
UR-8B-I	39.5	0.02	16.9	0.31	42.6	0.17	n.d.	0.16	99.6	81.8
UR-8B-I	39.4	0.02	16.8	0.31	42.3	0.16	n.d.	0.18	99.2	81.8
UR-8B-I	39.4	n.d.	16.8	0.22	42.2	0.13	0.04	0.25	99.0	81.8
UR-8B-I	39.4	0.13	17.0	0.33	42.7	0.14	n.d.	0.16	99.9	81.7
UR-8B-I	39.7	0.01	16.9	0.27	42.2	0.13	n.d.	0.30	99.5	81.7
UR-8B-I	39.7	n.d.	17.0	0.26	42.4	0.17	n.d.	0.17	99.7	81.7
UR-8B-I	39.7	0.01	16.8	0.22	42.1	0.15	n.d.	0.16	99.2	81.7
UR-8B-I	39.5	0.01	16.9	0.28	42.2	0.15	0.04	0.19	99.2	81.7
UR-8B-I	39.8	0.02	17.1	0.27	42.5	0.15	n.d.	0.13	99.9	81.6
UR-8B-I	39.9	0.01	17.0	0.29	42.3	0.15	n.d.	0.16	99.8	81.6
UR-8B-I	39.7	0.02	17.0	0.28	42.2	0.15	n.d.	0.17	99.5	81.6
UR-8B-I	39.5	0.01	17.1	0.27	42.4	0.15	n.d.	0.15	99.7	81.5
UR-8B-I	39.4	0.02	17.0	0.27	42.1	0.17	n.d.	0.12	99.1	81.5
UR-8B-I	39.2	0.02	17.1	0.20	42.2	0.14	0.13	0.32	99.3	81.5
UR-8B-I	39.2	0.02	17.1	0.26	42.3	0.14	n.d.	0.15	99.2	81.5
UR-8B-I	39.5	n.d.	17.2	0.32	42.3	0.16	n.d.	0.18	99.7	81.4
UR-8B-I	39.5	n.d.	17.1	0.25	42.0	0.15	n.d.	0.09	99.2	81.4
UR-8B-I	39.5	0.01	17.1	0.30	42.1	0.15	n.d.	0.11	99.3	81.4
UR-8B-I	39.7	0.02	17.3	0.23	42.3	0.15	n.d.	0.16	99.8	81.4
UR-8B-I	39.6	0.01	17.2	0.28	41.9	0.11	n.d.	0.30	99.5	81.3
UR-8B-I	39.7	n.d.	17.3	0.26	42.2	0.15	n.d.	0.16	99.7	81.3
UR-8B-I	39.7	0.01	17.2	0.29	42.0	0.14	n.d.	0.24	99.5	81.3
UR-8B-I	39.7	0.01	17.3	0.32	42.3	0.14	0.04	0.25	100.1	81.3
UR-8B-I	39.7	0.02	17.3	0.27	42.0	0.16	n.d.	0.15	99.6	81.2
UR-8B-I	39.5	0.02	17.3	0.26	41.9	0.15	n.d.	0.17	99.4	81.2
UR-8B-I	39.7	0.02	17.5	0.34	41.9	0.15	n.d.	0.19	99.8	81.1
UR-8B-I	39.3	0.02	17.4	0.25	41.8	0.16	n.d.	0.18	99.2	81.0
UR-8B-I	39.2	0.01	17.6	0.30	41.7	0.16	n.d.	0.17	99.1	80.9
UR-8B-I	39.5	n.d.	17.6	0.32	41.6	0.15	n.d.	0.17	99.4	80.8
UR-8B-I	39.5	0.02	17.8	0.26	41.8	0.14	n.d.	0.21	99.7	80.7
UR-8B-I	39.2	0.01	17.9	0.32	41.7	0.14	0.04	0.22	99.5	80.6
UR-8B-I	40.3	0.03	18.0	0.26	41.8	0.15	n.d.	0.14	100.6	80.6
UR-8B-I	39.7	0.03	17.9	0.34	41.5	0.14	n.d.	0.20	99.7	80.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-8B-I	39.2	n.d.	17.9	0.27	41.6	0.12	n.d.	0.19	99.3	80.5
UR-8B-I	39.1	0.01	18.2	0.25	41.8	0.15	n.d.	0.14	99.6	80.3
UR-8B-I	39.5	0.01	18.2	0.31	41.6	0.12	n.d.	0.32	100.0	80.3
UR-8B-I	39.3	0.01	18.6	0.28	41.0	0.16	n.d.	0.12	99.5	79.7
UR-8B-I	39.6	0.01	18.7	0.26	41.1	0.15	n.d.	0.15	100.0	79.7
UR-8B-I	39.2	n.d.	18.6	0.27	40.7	0.15	n.d.	0.14	99.0	79.6
UR-8B-I	39.3	n.d.	18.8	0.36	40.9	0.18	0.03	0.13	99.7	79.4
UR-8B-I	39.0	0.02	18.9	0.34	41.0	0.15	n.d.	0.14	99.6	79.4
UR-8B-I	38.9	0.03	18.9	0.34	40.9	0.13	n.d.	0.21	99.5	79.4
UR-8B-I	39.3	n.d.	19.0	0.35	41.0	0.14	n.d.	0.21	99.9	79.4
UR-8B-I	39.6	n.d.	18.8	0.31	40.7	0.17	n.d.	0.16	99.7	79.4
UR-8B-I	39.2	0.03	19.0	0.31	40.9	0.15	n.d.	0.14	99.8	79.3
UR-8B-I	39.5	0.04	18.8	0.32	40.5	0.14	n.d.	0.24	99.5	79.3
UR-8B-I	39.2	0.02	18.9	0.34	40.5	0.16	n.d.	0.18	99.4	79.3
UR-8B-I	39.1	0.03	18.9	0.40	40.3	0.14	n.d.	0.24	99.1	79.2
UR-8B-I	38.9	0.02	19.1	0.37	40.5	0.17	n.d.	0.11	99.2	79.1
UR-8B-I	39.6	0.01	19.0	0.34	40.1	0.13	0.07	0.19	99.5	79.0
UR-8B-I	38.8	0.01	19.2	0.35	40.2	0.12	0.06	0.21	99.0	78.9
UR-8B-I	38.9	0.02	19.5	0.42	40.3	0.12	0.07	0.20	99.5	78.7
UR-8B-I	39.3	0.02	19.6	0.31	40.2	0.15	0.04	0.12	99.7	78.5
UR-8B-I	39.1	0.01	19.7	0.35	40.3	0.13	0.05	0.18	99.9	78.5
UR-8B-I	38.9	0.03	19.8	0.33	40.0	0.11	n.d.	0.21	99.3	78.3
UR-8B-I	39.4	0.02	19.9	0.28	40.2	0.15	n.d.	0.18	100.1	78.2
UR-8B-I	38.9	n.d.	19.8	0.42	39.6	0.16	n.d.	0.18	99.2	78.1
UR-8B-I	39.0	n.d.	19.9	0.32	39.8	0.14	n.d.	0.12	99.2	78.1
UR-8B-I	39.1	n.d.	20.4	0.40	39.9	0.18	n.d.	0.10	100.2	77.7
UR-8B-I	39.2	0.01	20.3	0.43	39.4	0.16	n.d.	0.11	99.6	77.6
UR-8B-I	38.8	0.01	20.5	0.45	39.6	0.16	0.11	0.16	99.8	77.4
UR-8B-I	38.6	0.02	20.4	0.48	39.2	0.12	n.d.	0.18	99.1	77.4
UR-8B-I	39.1	0.01	20.5	0.48	39.3	0.18	n.d.	0.10	99.6	77.4
UR-8B-I	38.9	0.02	20.4	0.47	38.9	0.15	n.d.	0.18	99.1	77.3
UR-8B-I	38.8	n.d.	20.6	0.46	39.3	0.13	0.06	0.16	99.5	77.2
UR-8B-I	38.5	0.04	20.6	0.61	38.9	0.17	n.d.	0.15	99.0	77.1
UR-8B-I	39.0	0.02	20.9	0.26	39.1	0.14	n.d.	0.17	99.6	76.9
UR-8B-I	38.8	0.01	21.3	0.36	39.1	0.16	n.d.	0.07	99.8	76.5
UR-8B-I	38.8	n.d.	21.2	0.52	38.7	0.16	n.d.	0.12	99.5	76.5
UR-8B-I	38.5	0.02	21.4	0.45	38.6	0.15	n.d.	0.13	99.2	76.3
UR-8B-I	38.8	0.01	21.2	0.47	38.3	0.17	n.d.	0.10	99.0	76.3
UR-8B-I	38.9	0.02	21.6	0.45	38.4	0.17	n.d.	0.08	99.6	76.0
UR-8B-I	38.6	0.02	21.6	0.48	38.3	0.17	n.d.	0.08	99.3	75.9
UR-8B-I	38.9	0.01	21.8	0.43	38.4	0.17	n.d.	0.13	99.8	75.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-8B-I	38.8	0.02	21.8	0.50	38.1	0.17	n.d.	0.09	99.5	75.7
UR-8B-I	38.5	0.09	21.9	0.52	38.1	0.20	n.d.	0.11	99.4	75.6
UR-8B-I	38.5	0.01	22.0	0.47	37.9	0.19	n.d.	0.10	99.2	75.4
UR-8B-I	39.1	0.02	22.0	0.35	37.9	0.19	n.d.	0.12	99.8	75.4
UR-8B-I	38.8	0.02	22.4	0.49	37.6	0.18	n.d.	0.11	99.6	74.9
UR-8B-I	38.9	n.d.	22.7	0.38	37.9	0.18	n.d.	0.08	100.2	74.9
UR-8B-I	38.4	n.d.	22.9	0.54	37.6	0.14	n.d.	0.06	99.7	74.6
UR-8B-I	38.6	0.03	22.8	0.52	37.4	0.19	n.d.	0.08	99.6	74.5
UR-8B-I	38.3	n.d.	23.1	0.41	37.5	0.17	n.d.	0.07	99.6	74.3
UR-8B-I	38.5	0.01	23.1	0.50	37.2	0.19	n.d.	0.07	99.5	74.2
UR-8B-I	38.4	0.01	23.5	0.57	36.9	0.18	n.d.	0.08	99.6	73.7
UR-8B-I	38.2	0.03	23.3	0.56	36.6	0.19	n.d.	0.07	99.0	73.7
UR-8B-I	38.0	0.02	24.5	0.47	36.0	0.20	n.d.	0.06	99.3	72.3
UR-8B-I	38.2	0.04	24.7	0.58	36.0	0.17	n.d.	0.06	99.7	72.2
APA-6b-	40.6	0.03	13.5	0.21	44.8	0.09	0.05	0.49	99.8	85.5
APA-6b-	40.2	0.03	13.7	0.15	45.0	0.11	n.d.	0.49	99.6	85.4
APA-6b-	40.6	0.01	13.6	0.19	44.8	0.10	0.04	0.47	99.8	85.4
APA-6b-	40.3	0.02	13.6	0.12	44.8	0.10	0.04	0.52	99.5	85.4
APA-6b-	40.4	0.03	13.6	0.18	44.6	0.13	0.61	0.45	100.1	85.3
APA-6b-	40.4	0.04	13.7	0.20	44.8	0.10	n.d.	0.47	99.8	85.3
APA-6b-	40.4	0.02	13.7	0.19	44.8	0.10	0.03	0.46	99.7	85.3
APA-6b-	40.6	0.07	13.7	0.18	44.6	0.12	0.04	0.45	99.8	85.3
APA-6b-	40.6	0.02	13.9	0.16	45.0	0.10	0.06	0.46	100.2	85.3
APA-6b-	40.6	0.06	13.7	0.14	44.5	0.12	0.34	0.45	100.0	85.3
APA-6b-	40.7	0.03	13.8	0.17	44.8	0.10	n.d.	0.49	100.2	85.2
APA-6b-	40.4	0.02	13.8	0.17	44.7	0.13	0.27	0.49	100.0	85.2
APA-6b-	40.5	0.03	13.8	0.20	44.7	0.10	0.03	0.47	99.8	85.2
APA-6b-	39.9	0.02	13.8	0.20	44.6	0.11	n.d.	0.44	99.1	85.2
APA-6b-	40.2	0.03	13.8	0.15	44.4	0.11	n.d.	0.46	99.2	85.2
APA-6b-	40.4	0.02	13.9	0.19	44.8	0.11	0.04	0.49	100.0	85.1
APA-6b-	39.9	0.02	13.9	0.18	44.6	0.11	n.d.	0.48	99.2	85.1
APA-6b-	39.9	0.04	13.9	0.21	44.5	0.11	n.d.	0.48	99.1	85.1
APA-6b-	40.7	0.01	13.9	0.13	44.5	0.11	n.d.	0.42	99.8	85.1
APA-6b-	39.6	0.03	13.9	0.17	44.6	0.11	0.06	0.48	99.0	85.1
APA-6b-	40.3	0.02	13.9	0.22	44.5	0.12	n.d.	0.43	99.5	85.1
APA-6b-	39.6	0.03	13.9	0.20	44.6	0.11	n.d.	0.47	99.0	85.1
APA-6b-	40.6	0.04	14.0	0.17	44.9	0.11	0.04	0.48	100.3	85.1
APA-6b-	40.6	0.02	14.0	0.22	44.8	0.10	0.06	0.48	100.2	85.1
APA-6b-	40.3	0.02	13.8	0.19	44.3	0.12	0.05	0.42	99.3	85.1
APA-6b-	40.3	0.02	14.0	0.18	44.7	0.10	n.d.	0.46	99.8	85.1
APA-6b-	39.9	0.02	14.0	0.19	44.5	0.11	0.04	0.45	99.2	85.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-6b-	40.4	0.01	14.0	0.23	44.6	0.11	0.06	0.45	99.8	85.0
APA-6b-	40.0	0.02	14.0	0.18	44.5	0.10	0.03	0.45	99.3	85.0
APA-6b-	40.6	0.02	14.0	0.17	44.5	0.11	0.19	0.46	100.0	85.0
APA-6b-	40.4	0.03	14.1	0.14	44.9	0.11	0.05	0.46	100.2	85.0
APA-6b-	40.7	0.01	14.1	0.19	44.7	0.10	0.05	0.50	100.3	85.0
APA-6b-	39.9	0.02	14.0	0.21	44.5	0.09	0.04	0.47	99.3	85.0
APA-6b-	40.6	n.d.	14.1	0.23	44.6	0.10	0.03	0.44	100.1	85.0
APA-6b-	40.3	0.02	14.0	0.15	44.4	0.13	0.04	0.47	99.5	85.0
APA-6b-	40.0	0.02	14.0	0.25	44.3	0.10	n.d.	0.46	99.2	84.9
APA-6b-	39.8	0.02	14.0	0.12	44.4	0.10	n.d.	0.42	99.0	84.9
APA-6b-	40.2	0.01	14.0	0.19	44.4	0.11	0.15	0.43	99.5	84.9
APA-6b-	40.5	0.03	14.0	0.22	44.3	0.12	0.04	0.42	99.7	84.9
APA-6b-	40.0	0.01	14.0	0.18	44.3	0.12	0.05	0.43	99.1	84.9
APA-6b-	40.0	0.02	14.1	0.21	44.4	0.11	n.d.	0.46	99.3	84.9
APA-6b-	40.0	0.02	14.1	0.19	44.4	0.12	0.04	0.41	99.2	84.9
APA-6b-	40.5	0.02	14.2	0.20	44.7	0.11	n.d.	0.47	100.2	84.9
APA-6b-	40.4	0.02	14.1	0.17	44.4	0.10	0.03	0.45	99.7	84.9
APA-6b-	40.3	0.02	14.1	0.13	44.4	0.11	0.04	0.46	99.6	84.9
APA-6b-	39.8	0.03	14.1	0.23	44.3	0.11	n.d.	0.43	99.0	84.9
APA-6b-	40.4	0.02	14.1	0.20	44.4	0.11	0.08	0.51	99.9	84.9
APA-6b-	39.8	0.02	14.1	0.21	44.4	0.11	n.d.	0.41	99.1	84.9
APA-6b-	40.2	0.04	14.1	0.19	44.4	0.12	0.07	0.46	99.6	84.9
APA-6b-	40.2	0.01	14.1	0.18	44.3	0.11	0.04	0.48	99.4	84.9
APA-6b-	40.2	0.03	14.3	0.22	44.9	0.11	n.d.	0.42	100.2	84.8
APA-6b-	40.6	0.03	14.2	0.20	44.7	0.09	0.05	0.45	100.3	84.8
APA-6b-	39.9	0.02	14.2	0.21	44.4	0.12	0.07	0.46	99.4	84.8
APA-6b-	39.8	0.03	14.2	0.21	44.4	0.12	n.d.	0.43	99.2	84.8
APA-6b-	40.1	0.03	14.1	0.18	44.2	0.10	0.04	0.40	99.2	84.8
APA-6b-	40.0	0.03	14.2	0.19	44.4	0.12	n.d.	0.47	99.3	84.8
APA-6b-	40.2	0.03	14.1	0.25	44.2	0.11	n.d.	0.43	99.4	84.8
APA-6b-	39.8	0.02	14.2	0.26	44.4	0.10	n.d.	0.41	99.2	84.8
APA-6b-	40.3	0.02	14.2	0.13	44.3	0.10	0.04	0.43	99.4	84.8
APA-6b-	40.2	0.06	14.1	0.10	44.0	0.11	0.05	0.43	99.0	84.8
APA-6b-	40.1	0.02	14.3	0.22	44.5	0.11	0.04	0.43	99.7	84.8
APA-6b-	40.1	0.02	14.2	0.23	44.4	0.11	n.d.	0.42	99.5	84.8
APA-6b-	40.4	0.02	14.2	0.22	44.2	0.11	n.d.	0.43	99.5	84.8
APA-6b-	39.7	0.02	14.4	0.20	44.6	0.11	n.d.	0.48	99.4	84.7
APA-6b-	40.0	0.03	14.3	0.22	44.3	0.11	0.04	0.42	99.4	84.7
APA-6b-	40.2	0.02	14.3	0.19	44.3	0.12	n.d.	0.47	99.6	84.7
APA-6b-	40.0	0.02	14.2	0.20	44.0	0.11	0.10	0.41	99.1	84.7
APA-6b-	40.6	0.02	14.3	0.14	44.2	0.10	n.d.	0.39	99.7	84.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-6b-	40.0	0.03	14.3	0.22	44.1	0.10	0.09	0.37	99.1	84.6
APA-6b-	40.2	0.02	14.3	0.24	44.3	0.11	n.d.	0.42	99.6	84.6
APA-6b-	40.3	0.03	14.4	0.22	44.4	0.11	n.d.	0.41	99.9	84.6
APA-6b-	40.3	0.02	14.3	0.19	44.2	0.11	0.04	0.41	99.5	84.6
APA-6b-	39.9	0.02	14.5	0.10	44.6	0.10	0.06	0.48	99.7	84.6
APA-6b-	40.2	0.07	14.2	0.18	43.9	0.11	0.03	0.45	99.1	84.6
APA-6b-	40.2	0.02	14.5	0.24	44.5	0.10	n.d.	0.39	99.9	84.6
APA-6b-	40.2	0.02	14.5	0.17	44.5	0.11	0.05	0.40	100.0	84.6
APA-6b-	39.7	0.03	14.3	0.20	44.1	0.10	0.04	0.42	99.0	84.6
APA-6b-	40.0	0.02	14.4	0.24	44.4	0.13	0.04	0.43	99.7	84.6
APA-6b-	39.7	0.02	14.4	0.18	44.3	0.10	n.d.	0.45	99.2	84.5
APA-6b-	39.5	0.03	14.4	0.31	44.2	0.11	0.04	0.43	99.0	84.5
APA-6b-	40.3	0.02	14.4	0.21	44.1	0.11	n.d.	0.36	99.5	84.5
APA-6b-	39.8	0.02	14.5	0.16	44.4	0.12	n.d.	0.41	99.5	84.5
APA-6b-	39.4	0.01	14.5	0.20	44.3	0.11	n.d.	0.37	99.0	84.4
APA-6b-	39.9	0.03	14.6	0.18	44.4	0.10	0.04	0.36	99.6	84.4
APA-6b-	39.8	0.02	14.5	0.14	44.2	0.12	n.d.	0.38	99.3	84.4
APA-6b-	39.9	0.03	14.6	0.18	44.4	0.10	n.d.	0.44	99.7	84.4
APA-6b-	39.8	0.02	14.6	0.20	44.3	0.10	n.d.	0.43	99.5	84.4
APA-6b-	40.1	0.01	14.6	0.19	44.2	0.12	n.d.	0.43	99.6	84.4
APA-6b-	40.1	n.d.	14.6	0.23	44.1	0.09	n.d.	0.34	99.4	84.4
APA-6b-	40.2	0.03	14.7	0.11	44.2	0.12	n.d.	0.40	99.7	84.3
APA-6b-	40.3	0.03	14.7	0.23	44.2	0.10	0.03	0.43	100.1	84.3
APA-6b-	39.8	0.03	14.7	0.22	44.2	0.10	0.18	0.40	99.7	84.3
APA-6b-	39.9	0.01	14.7	0.22	44.0	0.12	n.d.	0.30	99.2	84.3
APA-6b-	40.0	0.02	14.7	0.17	44.1	0.13	0.04	0.33	99.5	84.2
APA-6b-	39.8	0.03	14.7	0.18	44.1	0.11	0.03	0.32	99.3	84.2
APA-6b-	40.0	0.03	14.7	0.22	44.1	0.12	0.04	0.41	99.6	84.2
APA-6b-	40.1	0.03	14.8	0.17	44.2	0.10	n.d.	0.35	99.7	84.2
APA-6b-	40.0	0.03	14.7	0.20	43.9	0.12	0.18	0.34	99.5	84.2
APA-6b-	40.3	0.03	14.7	0.19	43.8	0.12	n.d.	0.32	99.4	84.2
APA-6b-	39.6	0.10	14.7	0.17	43.9	0.11	0.07	0.37	99.1	84.2
APA-6b-	40.2	0.02	14.8	0.22	44.2	0.12	n.d.	0.33	100.0	84.1
APA-6b-	40.0	0.01	14.8	0.24	44.0	0.11	n.d.	0.35	99.5	84.1
APA-6b-	40.1	0.02	14.7	0.15	43.7	0.12	0.03	0.34	99.2	84.1
APA-6b-	40.0	0.02	14.8	0.24	44.0	0.12	0.06	0.30	99.5	84.1
APA-6b-	39.7	0.02	14.8	0.21	43.9	0.12	n.d.	0.32	99.1	84.1
APA-6b-	39.8	n.d.	14.8	0.22	43.8	0.12	n.d.	0.31	99.1	84.0
APA-6b-	39.9	0.03	14.8	0.20	43.7	0.11	0.04	0.31	99.1	84.0
APA-6b-	39.8	0.02	14.8	0.22	43.8	0.13	n.d.	0.36	99.2	84.0
APA-6b-	39.8	0.03	14.9	0.16	43.9	0.11	0.12	0.41	99.4	84.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-6b-	40.0	0.02	14.9	0.18	43.8	0.12	0.03	0.35	99.4	84.0
APA-6b-	40.1	0.03	14.9	0.17	43.9	0.12	n.d.	0.30	99.6	84.0
APA-6b-	39.8	0.03	14.9	0.23	43.9	0.11	0.04	0.33	99.3	84.0
APA-6b-	40.2	0.02	15.0	0.24	44.1	0.12	n.d.	0.35	100.0	84.0
APA-6b-	40.1	0.03	15.0	0.20	44.0	0.13	n.d.	0.33	99.8	84.0
APA-6b-	39.8	0.03	14.9	0.23	43.9	0.13	n.d.	0.31	99.3	84.0
APA-6b-	39.8	0.01	15.0	0.21	44.2	0.11	n.d.	0.31	99.7	84.0
APA-6b-	39.8	0.02	15.0	0.17	44.0	0.12	0.26	0.31	99.7	84.0
APA-6b-	39.6	0.02	14.9	0.27	43.7	0.13	n.d.	0.33	99.0	84.0
APA-6b-	40.1	0.01	14.9	0.15	43.8	0.11	0.03	0.31	99.4	83.9
APA-6b-	40.0	0.02	15.0	0.21	43.9	0.12	n.d.	0.30	99.5	83.9
APA-6b-	39.8	0.33	14.9	0.21	43.6	0.13	0.05	0.34	99.4	83.9
APA-6b-	40.1	n.d.	15.0	0.25	43.8	0.12	0.04	0.31	99.6	83.9
APA-6b-	39.7	0.02	15.1	0.17	44.0	0.11	0.03	0.32	99.5	83.9
APA-6b-	39.9	n.d.	14.9	0.21	43.6	0.13	n.d.	0.35	99.1	83.9
APA-6b-	39.8	0.02	14.9	0.24	43.6	0.10	n.d.	0.37	99.1	83.9
APA-6b-	40.0	0.03	15.0	0.21	43.8	0.11	n.d.	0.30	99.4	83.9
APA-6b-	40.1	0.02	15.1	0.20	44.0	0.11	0.03	0.27	99.8	83.9
APA-6b-	39.7	0.01	15.2	0.25	44.1	0.11	n.d.	0.33	99.7	83.8
APA-6b-	39.8	0.09	15.1	0.18	43.8	0.11	0.34	0.31	99.7	83.8
APA-6b-	39.8	0.02	15.0	0.17	43.6	0.13	n.d.	0.27	99.0	83.8
APA-6b-	39.9	0.02	15.0	0.26	43.5	0.13	0.05	0.28	99.2	83.8
APA-6b-	39.8	0.02	15.1	0.21	43.8	0.13	n.d.	0.29	99.4	83.8
APA-6b-	39.7	0.03	15.1	0.15	43.7	0.10	n.d.	0.31	99.0	83.8
APA-6b-	39.9	0.02	15.1	0.21	43.7	0.11	n.d.	0.31	99.3	83.8
APA-6b-	39.5	0.01	15.2	0.22	43.8	0.12	n.d.	0.32	99.2	83.7
APA-6b-	40.3	0.33	14.9	0.11	43.0	0.14	n.d.	0.40	99.1	83.7
APA-6b-	40.0	0.03	15.1	0.20	43.6	0.12	n.d.	0.29	99.4	83.7
APA-6b-	40.3	0.02	15.1	0.23	43.6	0.13	n.d.	0.28	99.7	83.7
APA-6b-	39.8	0.03	15.1	0.21	43.6	0.11	n.d.	0.33	99.2	83.7
APA-6b-	39.6	0.02	15.1	0.18	43.6	0.12	n.d.	0.31	99.0	83.7
APA-6b-	39.7	0.03	15.2	0.22	43.6	0.12	n.d.	0.30	99.1	83.7
APA-6b-	39.9	0.03	15.2	0.15	43.6	0.11	0.03	0.31	99.4	83.7
APA-6b-	40.2	0.02	15.2	0.26	43.7	0.12	n.d.	0.34	99.9	83.7
APA-6b-	39.6	0.02	15.2	0.20	43.8	0.11	n.d.	0.34	99.3	83.7
APA-6b-	40.1	0.02	15.2	0.20	43.6	0.12	n.d.	0.28	99.6	83.6
APA-6b-	39.9	0.04	15.2	0.19	43.6	0.12	n.d.	0.36	99.5	83.6
APA-6b-	39.8	0.03	15.2	0.21	43.6	0.11	n.d.	0.29	99.2	83.6
APA-6b-	39.8	0.04	15.2	0.19	43.6	0.12	0.05	0.30	99.3	83.6
APA-6b-	39.7	0.01	15.2	0.16	43.4	0.12	0.08	0.33	99.0	83.6
APA-6b-	39.8	0.03	15.3	0.19	43.7	0.13	n.d.	0.28	99.4	83.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-6b-	40.0	0.02	15.2	0.21	43.5	0.10	n.d.	0.32	99.3	83.6
APA-6b-	39.7	0.02	15.2	0.17	43.6	0.13	n.d.	0.32	99.1	83.6
APA-6b-	39.7	0.02	15.2	0.21	43.5	0.13	n.d.	0.28	99.1	83.6
APA-6b-	40.1	0.02	15.3	0.18	43.6	0.12	0.05	0.32	99.6	83.5
APA-6b-	39.6	0.03	15.3	0.14	43.6	0.11	0.14	0.33	99.3	83.5
APA-6b-	39.7	0.02	15.3	0.14	43.5	0.11	n.d.	0.31	99.0	83.5
APA-6b-	40.1	0.03	15.3	0.25	43.4	0.12	n.d.	0.26	99.4	83.5
APA-6b-	39.6	0.01	15.3	0.17	43.4	0.11	n.d.	0.33	99.0	83.5
APA-6b-	39.8	0.02	15.3	0.20	43.3	0.12	0.06	0.26	99.1	83.5
APA-6b-	40.3	0.03	15.3	0.17	43.3	0.14	n.d.	0.26	99.5	83.5
APA-6b-	39.5	0.02	15.3	0.25	43.4	0.12	0.05	0.32	99.0	83.5
APA-6b-	39.7	0.01	15.4	0.26	43.4	0.12	n.d.	0.26	99.2	83.4
APA-6b-	40.0	0.01	15.4	0.21	43.5	0.11	0.03	0.38	99.7	83.4
APA-6b-	39.6	n.d.	15.4	0.26	43.4	0.12	n.d.	0.32	99.2	83.4
APA-6b-	39.9	0.03	15.5	0.25	43.6	0.12	n.d.	0.32	99.7	83.4
APA-6b-	39.9	0.02	15.4	0.14	43.5	0.13	n.d.	0.22	99.4	83.4
APA-6b-	39.9	0.03	15.4	0.28	43.3	0.13	0.04	0.27	99.4	83.4
APA-6b-	40.1	0.04	15.3	0.24	43.0	0.12	n.d.	0.33	99.2	83.3
APA-6b-	40.5	0.25	15.2	0.16	42.6	0.13	n.d.	0.30	99.2	83.3
APA-6b-	39.2	0.01	15.5	0.22	43.6	0.12	n.d.	0.31	99.0	83.3
APA-6b-	39.9	0.30	15.5	0.24	43.2	0.14	n.d.	0.33	99.7	83.3
APA-6b-	40.0	0.28	15.3	0.20	42.8	0.13	n.d.	0.33	99.0	83.3
APA-6b-	39.6	0.03	15.5	0.21	43.3	0.12	0.04	0.28	99.1	83.3
APA-6b-	39.8	0.02	15.6	0.24	43.5	0.13	0.15	0.26	99.7	83.3
APA-6b-	39.8	0.06	15.6	0.25	43.5	0.13	0.52	0.40	100.2	83.3
APA-6b-	39.7	0.02	15.6	0.20	43.5	0.12	0.03	0.26	99.5	83.2
APA-6b-	40.0	0.01	15.6	0.24	43.3	0.11	0.04	0.27	99.5	83.2
APA-6b-	39.8	0.03	15.6	0.15	43.4	0.12	n.d.	0.24	99.3	83.2
APA-6b-	39.8	0.04	15.6	0.21	43.2	0.10	n.d.	0.24	99.2	83.2
APA-6b-	39.4	0.02	15.7	0.19	43.4	0.13	n.d.	0.29	99.1	83.2
APA-6b-	39.9	0.09	16.0	0.20	44.4	0.12	n.d.	0.20	101.0	83.2
APA-6b-	40.1	0.02	15.7	0.25	43.5	0.12	n.d.	0.24	100.0	83.2
APA-6b-	40.0	0.01	15.6	0.16	43.3	0.12	n.d.	0.23	99.5	83.2
APA-6b-	39.6	0.01	15.6	0.19	43.2	0.13	n.d.	0.26	99.0	83.1
APA-6b-	39.6	0.02	15.6	0.19	43.2	0.12	0.03	0.28	99.0	83.1
APA-6b-	39.9	0.02	15.6	0.22	43.2	0.12	0.06	0.36	99.5	83.1
APA-6b-	40.0	n.d.	15.7	0.23	43.2	0.12	0.03	0.27	99.6	83.1
APA-6b-	39.4	0.01	15.7	0.19	43.2	0.11	0.04	0.41	99.1	83.1
APA-6b-	39.8	0.03	15.8	0.21	43.6	0.12	n.d.	0.27	99.9	83.1
APA-6b-	39.9	0.02	15.6	0.22	43.0	0.13	n.d.	0.28	99.2	83.1
APA-6b-	39.5	0.03	15.7	0.30	43.2	0.12	0.06	0.24	99.2	83.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-6b-	39.9	n.d.	15.7	0.23	43.2	0.12	0.03	0.28	99.5	83.1
APA-6b-	39.4	0.27	15.7	0.22	43.2	0.13	0.34	0.22	99.5	83.1
APA-6b-	39.5	0.01	15.8	0.21	43.1	0.12	n.d.	0.24	99.0	83.0
APA-6b-	39.8	0.03	15.8	0.19	43.2	0.13	0.04	0.23	99.4	83.0
APA-6b-	40.1	0.03	15.9	0.20	43.4	0.12	0.06	0.25	100.1	83.0
APA-6b-	39.7	0.29	15.7	0.19	43.1	0.13	0.04	0.23	99.5	83.0
APA-6b-	39.4	0.01	15.9	0.21	43.3	0.11	0.04	0.27	99.2	82.9
APA-6b-	39.5	0.02	15.9	0.17	43.2	0.12	n.d.	0.23	99.1	82.9
APA-6b-	39.8	0.03	15.8	0.21	42.9	0.12	n.d.	0.18	99.1	82.9
APA-6b-	39.6	0.02	16.0	0.21	43.2	0.13	0.03	0.21	99.3	82.8
APA-6b-	39.8	n.d.	16.0	0.23	43.1	0.11	n.d.	0.27	99.5	82.8
APA-6b-	39.9	0.02	16.0	0.27	43.1	0.13	n.d.	0.27	99.7	82.8
APA-6b-	39.8	0.02	16.0	0.28	42.9	0.12	n.d.	0.27	99.4	82.7
APA-6b-	40.2	0.02	16.0	0.21	43.0	0.12	n.d.	0.22	99.7	82.7
APA-6b-	40.0	0.03	16.2	0.21	43.0	0.13	n.d.	0.24	99.8	82.5
APA-6b-	39.7	n.d.	16.3	0.17	43.1	0.13	n.d.	0.24	99.7	82.5
APA-6b-	40.0	0.02	16.3	0.19	43.0	0.12	n.d.	0.25	99.9	82.5
APA-6b-	40.3	0.01	16.3	0.23	43.0	0.12	n.d.	0.29	100.2	82.5
APA-6b-	39.7	0.02	16.3	0.21	42.9	0.13	0.10	0.22	99.5	82.5
APA-6b-	39.8	0.03	16.2	0.25	42.8	0.12	n.d.	0.27	99.5	82.5
APA-6b-	40.1	n.d.	16.4	0.23	43.2	0.12	n.d.	0.25	100.4	82.4
APA-6b-	39.5	0.01	16.3	0.16	42.8	0.14	0.05	0.27	99.2	82.4
APA-6b-	39.7	0.02	16.3	0.22	42.7	0.11	n.d.	0.29	99.4	82.4
APA-6b-	39.3	0.02	16.4	0.21	42.8	0.14	n.d.	0.23	99.1	82.3
APA-6b-	40.0	0.02	16.5	0.21	42.8	0.13	n.d.	0.22	99.9	82.2
APA-6b-	39.5	0.02	16.4	0.23	42.6	0.13	n.d.	0.17	99.1	82.2
APA-6b-	39.8	0.01	16.4	0.21	42.5	0.14	0.04	0.22	99.3	82.2
APA-6b-	39.4	0.02	16.5	0.26	42.7	0.13	n.d.	0.23	99.2	82.1
APA-6b-	39.7	0.01	16.5	0.28	42.6	0.13	0.04	0.17	99.5	82.1
APA-6b-	39.5	0.02	16.6	0.14	42.5	0.11	n.d.	0.34	99.2	82.0
APA-6b-	39.6	0.01	16.8	0.29	42.3	0.14	n.d.	0.20	99.4	81.8
APA-6b-	39.7	n.d.	16.9	0.28	42.5	0.13	n.d.	0.23	99.8	81.7
APA-6b-	39.7	0.01	17.1	0.28	42.4	0.15	n.d.	0.17	99.8	81.6
APA-6b-	39.4	0.02	17.2	0.18	42.1	0.15	n.d.	0.18	99.2	81.4
APA-6b-	40.2	0.03	17.0	0.25	41.7	0.12	n.d.	0.16	99.5	81.4
APA-6b-	39.6	0.02	17.3	0.21	42.3	0.13	n.d.	0.16	99.8	81.3
APA-6b-	39.4	n.d.	17.2	0.30	41.9	0.12	n.d.	0.23	99.1	81.3
APA-6b-	39.5	0.03	17.2	0.18	41.7	0.14	n.d.	0.31	99.1	81.2
APA-6b-	39.1	0.01	17.3	0.30	42.0	0.14	n.d.	0.13	99.1	81.2
APA-6b-	39.6	0.02	17.3	0.29	41.7	0.14	0.13	0.19	99.4	81.1
APA-6b-	39.5	0.02	17.7	0.26	42.0	0.13	n.d.	0.26	99.9	80.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-6b-	39.5	0.01	17.9	0.23	42.0	0.12	0.03	0.24	100.0	80.7
APA-6b-	39.4	0.02	18.0	0.23	41.4	0.13	0.04	0.25	99.5	80.4
APA-6b-	39.3	0.02	18.1	0.23	41.3	0.15	n.d.	0.10	99.2	80.3
APA-6b-	39.3	0.01	18.3	0.19	41.1	0.13	n.d.	0.22	99.2	80.0
APA-6b-	40.5	0.08	18.5	0.24	41.0	0.15	n.d.	0.16	100.6	79.8
APA-6b-	38.8	0.01	18.9	0.32	40.7	0.16	n.d.	0.12	99.1	79.3
APA-6b-	39.5	0.01	19.4	0.32	40.2	0.12	n.d.	0.31	100.0	78.7
APA-6b-	38.7	0.04	19.5	0.36	40.3	0.16	n.d.	0.14	99.3	78.6
APA-6b-	38.6	0.03	20.8	0.31	39.2	0.14	n.d.	0.11	99.2	77.0
APA-6b-	38.3	0.01	21.1	0.25	39.3	0.15	n.d.	0.16	99.2	76.8
APA-6b-	38.6	0.08	21.5	0.36	38.1	0.19	n.d.	0.12	99.0	76.0
APA-6b-	38.6	0.02	22.0	0.32	38.5	0.15	n.d.	0.12	99.8	75.7
APA-6b-	38.7	0.05	22.4	0.35	37.8	0.19	n.d.	0.13	99.5	75.0
APA-6b-	38.7	0.01	22.5	0.31	37.6	0.17	n.d.	0.10	99.5	74.9
APA-6b-	38.5	0.01	22.6	0.28	37.4	0.19	n.d.	0.23	99.2	74.7
UR-2b-M	40.4	0.03	12.5	0.16	45.3	0.10	0.38	0.70	99.6	86.6
UR-2b-M	40.3	0.02	12.7	0.19	45.5	0.09	0.06	0.69	99.6	86.5
UR-2b-M	40.4	0.02	12.9	0.22	45.6	0.08	0.07	0.69	99.9	86.3
UR-2b-M	40.4	0.01	12.8	0.14	45.4	0.09	n.d.	0.67	99.6	86.3
UR-2b-M	40.5	0.02	12.8	0.20	45.4	0.09	0.03	0.66	99.6	86.3
UR-2b-M	40.4	0.02	12.8	0.14	45.5	0.09	0.12	0.65	99.7	86.3
UR-2b-M	40.5	0.03	12.9	0.15	45.5	0.08	n.d.	0.64	99.7	86.3
UR-2b-M	40.3	0.02	12.9	n.d.	45.4	0.09	n.d.	0.68	99.4	86.3
UR-2b-M	40.3	0.03	12.9	0.16	45.3	0.09	0.05	0.67	99.5	86.3
UR-2b-M	40.3	0.02	12.9	0.21	45.5	0.07	0.06	0.66	99.7	86.3
UR-2b-M	40.2	0.02	12.9	0.14	45.5	0.08	n.d.	0.67	99.5	86.3
UR-2b-M	40.3	0.02	13.0	0.18	45.5	0.09	n.d.	0.68	99.8	86.2
UR-2b-M	40.2	0.03	13.0	0.15	45.5	0.09	0.04	0.67	99.7	86.2
UR-2b-M	40.1	0.02	13.1	0.11	45.4	0.10	n.d.	0.64	99.5	86.1
UR-2b-M	40.2	0.02	13.1	0.12	45.3	0.09	0.03	0.62	99.5	86.1
UR-2b-M	40.5	0.02	13.1	0.16	45.3	0.09	0.04	0.66	99.8	86.0
UR-2b-M	40.3	0.03	13.1	0.16	45.3	0.09	0.04	0.58	99.6	86.0
UR-2b-M	40.1	0.01	13.2	0.16	45.3	0.09	0.04	0.59	99.5	86.0
UR-2b-M	40.6	0.01	13.1	n.d.	45.0	0.11	n.d.	0.61	99.5	86.0
UR-2b-M	40.7	n.d.	13.2	0.17	45.2	0.08	0.03	0.59	100.0	85.9
UR-2b-M	40.4	0.01	13.2	0.25	45.1	0.09	n.d.	0.62	99.6	85.9
UR-2b-M	40.6	n.d.	13.2	0.23	45.2	0.10	0.09	0.55	99.9	85.9
UR-2b-M	40.5	n.d.	13.2	0.20	45.0	0.10	0.10	0.61	99.8	85.9
UR-2b-M	40.3	0.01	13.3	0.13	45.2	0.08	0.03	0.63	99.7	85.8
UR-2b-M	40.2	0.02	13.3	0.22	45.2	0.09	0.04	0.60	99.7	85.8
UR-2b-M	40.3	0.02	13.2	0.20	45.0	0.10	0.06	0.59	99.4	85.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-2b-N	40.4	0.02	13.3	0.14	45.0	0.09	0.03	0.60	99.6	85.8
UR-2b-N	40.2	0.01	13.3	0.15	45.1	0.08	0.03	0.65	99.6	85.8
UR-2b-N	40.3	0.03	13.3	0.19	45.0	0.09	n.d.	0.60	99.5	85.8
UR-2b-N	40.3	0.02	13.2	0.24	44.7	0.09	n.d.	0.62	99.2	85.8
UR-2b-N	39.8	0.02	13.3	0.21	44.9	0.09	0.10	0.60	99.0	85.8
UR-2b-N	40.1	0.02	13.4	0.18	45.2	0.08	n.d.	0.55	99.5	85.8
UR-2b-N	40.1	0.56	13.2	0.12	44.7	0.10	0.03	0.60	99.4	85.8
UR-2b-N	41.0	0.02	13.4	n.d.	45.2	0.08	n.d.	0.55	100.4	85.8
UR-2b-N	40.2	n.d.	13.4	0.16	45.2	0.07	n.d.	0.58	99.7	85.8
UR-2b-N	40.2	0.03	13.3	0.20	45.0	0.09	0.04	0.56	99.4	85.8
UR-2b-N	40.0	0.02	13.4	0.16	45.3	0.09	n.d.	0.55	99.5	85.8
UR-2b-N	40.2	0.02	13.5	0.17	45.4	0.07	n.d.	0.59	100.0	85.8
UR-2b-N	40.0	n.d.	13.3	0.17	44.9	0.11	n.d.	0.59	99.1	85.8
UR-2b-N	40.2	0.03	13.4	0.18	45.1	0.07	n.d.	0.63	99.7	85.8
UR-2b-N	40.6	0.03	13.4	0.12	45.1	0.08	n.d.	0.61	100.0	85.7
UR-2b-N	40.2	0.02	13.4	0.16	45.2	0.09	0.04	0.53	99.6	85.7
UR-2b-N	40.7	0.01	13.4	0.15	45.2	0.07	n.d.	0.56	100.1	85.7
UR-2b-N	40.8	0.01	13.4	0.16	45.2	0.09	0.04	0.57	100.2	85.7
UR-2b-N	39.7	0.02	13.4	0.18	45.0	0.12	0.31	0.62	99.3	85.7
UR-2b-N	40.2	0.03	13.4	0.15	45.1	0.09	n.d.	0.61	99.6	85.7
UR-2b-N	40.3	n.d.	13.4	0.14	44.9	0.07	n.d.	0.60	99.3	85.7
UR-2b-N	40.4	0.08	13.5	0.21	45.1	0.07	n.d.	0.66	100.0	85.7
UR-2b-N	40.4	0.02	13.4	0.27	44.9	0.08	n.d.	0.57	99.7	85.7
UR-2b-N	40.5	0.09	13.4	0.22	45.0	0.09	0.04	0.61	99.9	85.7
UR-2b-N	40.8	0.02	13.5	0.13	45.1	0.09	0.08	0.59	100.3	85.6
UR-2b-N	40.2	0.01	13.4	0.18	45.0	0.09	0.04	0.64	99.6	85.6
UR-2b-N	40.2	0.02	13.4	0.15	44.9	0.09	n.d.	0.63	99.3	85.6
UR-2b-N	40.6	0.02	13.4	0.14	44.9	0.10	0.06	0.53	99.8	85.6
UR-2b-N	40.2	0.02	13.6	0.22	45.4	0.08	n.d.	0.59	100.1	85.6
UR-2b-N	40.7	0.01	13.5	0.18	45.0	0.09	0.08	0.59	100.1	85.6
UR-2b-N	40.3	0.10	13.4	0.21	44.8	0.09	n.d.	0.61	99.5	85.6
UR-2b-N	39.9	0.02	13.5	0.20	45.0	0.09	n.d.	0.53	99.3	85.6
UR-2b-N	40.2	0.05	13.8	0.24	46.1	0.09	n.d.	0.46	100.9	85.6
UR-2b-N	40.6	0.01	13.4	0.16	44.8	0.10	0.04	0.52	99.6	85.6
UR-2b-N	40.9	0.03	13.6	0.11	45.2	0.08	n.d.	0.59	100.5	85.6
UR-2b-N	40.2	0.01	13.4	0.14	44.8	0.09	0.04	0.55	99.2	85.6
UR-2b-N	40.2	0.02	13.6	0.19	45.1	0.08	n.d.	0.59	99.8	85.6
UR-2b-N	40.4	n.d.	13.6	0.18	45.0	0.10	n.d.	0.57	99.9	85.6
UR-2b-N	40.7	0.03	13.5	0.17	44.7	0.11	n.d.	0.50	99.7	85.5
UR-2b-N	40.6	0.02	13.6	0.17	45.1	0.09	0.03	0.60	100.2	85.5
UR-2b-N	40.4	0.02	13.6	0.17	45.1	0.09	n.d.	0.56	100.0	85.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-2b-l	40.2	0.02	13.6	0.20	45.0	0.09	n.d.	0.63	99.8	85.5
UR-2b-l	40.5	0.02	13.6	0.19	45.0	0.08	0.04	0.61	100.0	85.5
UR-2b-l	40.0	n.d.	13.6	0.24	45.1	0.11	0.05	0.53	99.7	85.5
UR-2b-l	40.4	0.02	13.6	0.16	45.2	0.09	n.d.	0.58	100.1	85.5
UR-2b-l	40.1	0.02	13.6	0.20	45.1	0.10	0.04	0.64	99.8	85.5
UR-2b-l	40.1	n.d.	13.6	0.22	44.9	0.09	0.04	0.48	99.4	85.5
UR-2b-l	39.8	0.01	13.6	0.13	45.0	0.09	n.d.	0.58	99.1	85.5
UR-2b-l	40.6	n.d.	13.7	0.21	45.3	0.10	n.d.	0.53	100.4	85.5
UR-2b-l	40.4	0.03	13.6	0.12	45.0	0.09	0.04	0.54	99.9	85.5
UR-2b-l	40.0	0.02	13.6	0.17	44.9	0.10	0.06	0.44	99.4	85.5
UR-2b-l	41.2	0.02	13.5	0.20	44.4	0.10	n.d.	0.52	99.9	85.5
UR-2b-l	40.4	0.01	13.7	0.18	45.1	0.08	0.05	0.56	100.1	85.4
UR-2b-l	40.1	0.03	13.7	0.15	44.8	0.09	0.04	0.45	99.4	85.4
UR-2b-l	40.1	0.02	13.7	0.20	45.0	0.08	n.d.	0.54	99.7	85.4
UR-2b-l	39.7	0.01	13.7	0.15	44.9	0.09	n.d.	0.60	99.2	85.4
UR-2b-l	40.4	0.03	13.8	0.22	45.1	0.09	n.d.	0.51	100.1	85.4
UR-2b-l	39.9	n.d.	13.7	0.25	44.9	0.11	0.05	0.59	99.6	85.4
UR-2b-l	40.0	0.03	13.8	0.22	45.2	0.09	n.d.	0.56	100.0	85.4
UR-2b-l	40.3	0.05	13.7	0.17	44.7	0.09	0.03	0.52	99.5	85.4
UR-2b-l	39.9	0.03	13.7	0.25	44.7	0.09	0.09	0.45	99.1	85.4
UR-2b-l	39.6	0.02	13.7	0.19	44.8	0.09	n.d.	0.56	99.0	85.3
UR-2b-l	40.7	n.d.	13.8	0.18	45.0	0.09	n.d.	0.52	100.3	85.3
UR-2b-l	40.3	0.01	13.8	0.19	44.8	0.10	n.d.	0.52	99.6	85.3
UR-2b-l	39.6	0.02	13.8	0.16	45.0	0.09	n.d.	0.52	99.2	85.3
UR-2b-l	39.7	n.d.	13.8	0.18	44.8	0.09	n.d.	0.50	99.0	85.3
UR-2b-l	40.3	0.01	13.8	0.20	44.9	0.10	n.d.	0.54	99.9	85.3
UR-2b-l	40.1	0.02	13.8	0.23	44.9	0.10	0.17	0.53	99.8	85.3
UR-2b-l	40.1	0.02	13.9	0.19	44.9	0.10	0.05	0.49	99.6	85.2
UR-2b-l	40.1	0.02	13.9	0.17	45.1	0.09	n.d.	0.52	100.0	85.2
UR-2b-l	40.0	0.03	13.9	0.15	45.1	0.09	n.d.	0.49	99.8	85.2
UR-2b-l	40.3	0.03	13.9	0.16	45.0	0.09	n.d.	0.59	100.1	85.2
UR-2b-l	39.8	0.01	13.8	0.21	44.6	0.10	n.d.	0.42	99.0	85.2
UR-2b-l	40.1	0.01	13.9	0.21	44.8	0.08	0.06	0.51	99.7	85.2
UR-2b-l	40.1	0.01	14.0	0.23	44.9	0.10	0.05	0.46	99.8	85.2
UR-2b-l	39.9	0.03	13.9	0.19	44.9	0.09	n.d.	0.42	99.5	85.2
UR-2b-l	40.3	0.02	14.0	0.21	45.1	0.10	0.05	0.52	100.3	85.2
UR-2b-l	40.0	0.02	13.9	0.15	44.7	0.09	n.d.	0.43	99.3	85.1
UR-2b-l	40.2	n.d.	13.9	0.25	44.7	0.09	n.d.	0.47	99.7	85.1
UR-2b-l	40.5	0.02	13.9	0.17	44.7	0.10	0.03	0.44	99.9	85.1
UR-2b-l	40.2	0.02	13.9	0.16	44.7	0.10	0.05	0.43	99.6	85.1
UR-2b-l	40.3	0.01	14.0	0.23	45.0	0.08	n.d.	0.51	100.2	85.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-2b-M	39.6	0.02	13.9	0.24	44.6	0.09	0.03	0.56	99.0	85.1
UR-2b-M	40.1	0.03	14.0	0.13	44.8	0.09	0.04	0.47	99.6	85.1
UR-2b-M	39.9	0.02	14.0	0.21	45.0	0.09	0.03	0.49	99.7	85.1
UR-2b-M	40.5	0.04	14.0	0.23	44.9	0.09	0.12	0.49	100.4	85.1
UR-2b-M	40.2	0.02	14.0	0.18	44.6	0.10	0.05	0.48	99.7	85.1
UR-2b-M	40.0	0.45	14.0	0.22	44.6	0.11	0.03	0.42	99.9	85.1
UR-2b-M	39.6	0.02	14.0	0.22	44.8	0.09	n.d.	0.44	99.2	85.0
UR-2b-M	40.0	0.02	14.1	0.15	45.1	0.09	n.d.	0.48	100.0	85.0
UR-2b-M	39.8	0.01	14.1	0.19	44.9	0.11	0.04	0.48	99.6	85.0
UR-2b-M	39.6	n.d.	14.1	0.19	45.0	0.09	0.03	0.51	99.6	85.0
UR-2b-M	40.3	0.01	14.1	0.13	44.9	0.09	0.07	0.49	100.0	85.0
UR-2b-M	39.9	0.01	14.1	0.18	44.9	0.09	n.d.	0.55	99.7	85.0
UR-2b-M	40.1	0.02	14.2	0.17	45.1	0.08	0.03	0.50	100.1	85.0
UR-2b-M	39.7	0.02	14.1	0.20	44.8	0.09	0.05	0.47	99.4	85.0
UR-2b-M	40.2	0.02	14.1	0.20	44.8	0.09	n.d.	0.51	99.9	85.0
UR-2b-M	40.5	0.01	14.1	0.13	44.9	0.09	0.04	0.52	100.4	85.0
UR-2b-M	39.6	0.01	14.1	0.19	44.9	0.09	n.d.	0.54	99.4	85.0
UR-2b-M	39.7	n.d.	14.0	0.10	44.7	0.09	0.03	0.45	99.1	85.0
UR-2b-M	40.1	0.02	14.2	0.19	45.0	0.10	0.04	0.55	100.1	85.0
UR-2b-M	40.7	0.03	14.0	0.16	44.5	0.08	n.d.	0.52	100.0	85.0
UR-2b-M	39.7	0.02	14.1	0.21	44.6	0.10	n.d.	0.42	99.1	85.0
UR-2b-M	40.4	0.02	14.1	0.22	44.8	0.09	n.d.	0.53	100.2	85.0
UR-2b-M	39.8	0.04	14.1	0.24	44.5	0.09	n.d.	0.42	99.2	84.9
UR-2b-M	39.7	0.02	14.1	0.18	44.7	0.10	n.d.	0.54	99.3	84.9
UR-2b-M	40.1	0.03	14.1	n.d.	44.7	0.09	n.d.	0.47	99.6	84.9
UR-2b-M	40.5	0.02	14.3	0.23	45.1	0.09	n.d.	0.44	100.6	84.9
UR-2b-M	40.4	0.02	14.2	0.22	44.8	0.09	0.17	0.46	100.3	84.9
UR-2b-M	40.9	0.02	14.1	0.27	44.4	0.10	n.d.	0.44	100.2	84.9
UR-2b-M	40.3	0.02	14.3	0.22	44.9	0.09	0.05	0.52	100.3	84.9
UR-2b-M	39.7	0.02	14.2	0.11	44.5	0.12	n.d.	0.42	99.0	84.9
UR-2b-M	40.5	0.02	14.2	0.16	44.6	0.09	n.d.	0.45	100.0	84.9
UR-2b-M	40.2	0.02	14.2	0.19	44.7	0.09	0.04	0.49	100.0	84.9
UR-2b-M	40.3	n.d.	14.2	0.17	44.5	0.09	n.d.	0.42	99.7	84.9
UR-2b-M	40.1	0.01	14.2	0.13	44.8	0.10	n.d.	0.42	99.8	84.9
UR-2b-M	40.2	n.d.	14.3	0.20	44.9	0.11	0.04	0.38	100.1	84.8
UR-2b-M	39.6	0.01	14.2	0.21	44.7	0.10	n.d.	0.41	99.3	84.8
UR-2b-M	39.8	0.03	14.3	0.23	44.8	0.09	n.d.	0.45	99.7	84.8
UR-2b-M	39.5	0.02	14.3	0.20	44.8	0.09	0.03	0.57	99.5	84.8
UR-2b-M	40.4	0.02	14.3	0.15	44.8	0.11	n.d.	0.47	100.3	84.8
UR-2b-M	39.9	n.d.	14.3	0.28	44.5	0.09	n.d.	0.43	99.5	84.7
UR-2b-M	40.1	0.01	14.3	0.26	44.4	0.10	n.d.	0.48	99.7	84.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-2b-N	39.9	0.02	14.3	0.16	44.4	0.09	n.d.	0.39	99.4	84.7
UR-2b-N	40.1	n.d.	14.3	0.25	44.3	0.10	0.04	0.34	99.5	84.6
UR-2b-N	40.3	0.02	14.3	0.19	44.1	0.09	0.04	0.38	99.4	84.6
UR-2b-N	39.7	0.03	14.5	0.21	44.6	0.12	n.d.	0.37	99.4	84.6
UR-2b-N	39.9	0.02	14.5	0.17	44.8	0.09	n.d.	0.46	99.9	84.6
UR-2b-N	39.8	0.02	14.6	0.21	44.8	0.09	0.03	0.46	100.1	84.6
UR-2b-N	40.6	0.02	14.4	0.23	44.3	0.10	n.d.	0.47	100.0	84.6
UR-2b-N	39.9	0.01	14.5	0.20	44.4	0.10	n.d.	0.44	99.6	84.6
UR-2b-N	40.4	0.01	14.5	0.30	44.4	0.10	0.06	0.39	100.1	84.5
UR-2b-N	40.3	n.d.	14.6	0.19	44.7	0.10	n.d.	0.41	100.3	84.5
UR-2b-N	40.0	0.03	14.5	0.26	44.4	0.10	n.d.	0.42	99.7	84.5
UR-2b-N	39.8	0.03	14.5	0.12	44.4	0.10	0.16	0.36	99.5	84.5
UR-2b-N	40.3	0.01	14.4	0.18	44.0	0.09	n.d.	0.46	99.5	84.5
UR-2b-N	39.8	n.d.	14.6	0.24	44.3	0.09	0.06	0.37	99.5	84.4
UR-2b-N	39.8	0.03	14.6	0.25	44.4	0.10	0.05	0.44	99.8	84.4
UR-2b-N	39.5	0.03	14.6	0.18	44.4	0.10	n.d.	0.43	99.3	84.4
UR-2b-N	40.1	0.02	14.7	0.28	44.5	0.10	n.d.	0.36	100.1	84.4
UR-2b-N	40.1	0.02	14.6	0.17	44.3	0.10	n.d.	0.32	99.7	84.4
UR-2b-N	40.3	0.02	14.7	0.17	44.4	0.09	n.d.	0.40	100.0	84.4
UR-2b-N	39.9	0.03	14.6	0.14	44.3	0.10	n.d.	0.38	99.5	84.4
UR-2b-N	40.3	0.02	14.7	0.19	44.5	0.09	n.d.	0.34	100.2	84.3
UR-2b-N	39.7	0.02	14.6	0.18	44.1	0.09	n.d.	0.41	99.1	84.3
UR-2b-N	40.0	0.03	14.6	0.20	44.2	0.10	0.05	0.36	99.5	84.3
UR-2b-N	40.5	0.01	14.9	0.20	44.8	0.09	n.d.	0.41	100.9	84.3
UR-2b-N	40.7	0.02	14.7	0.15	44.0	0.10	n.d.	0.34	100.0	84.3
UR-2b-N	40.0	0.01	14.7	0.22	44.1	0.09	n.d.	0.35	99.4	84.2
UR-2b-N	39.6	0.01	14.8	0.22	44.5	0.11	n.d.	0.39	99.7	84.2
UR-2b-N	39.6	0.02	14.8	0.20	44.2	0.09	0.05	0.32	99.3	84.2
UR-2b-N	40.3	0.04	14.9	0.20	44.4	0.11	n.d.	0.41	100.3	84.2
UR-2b-N	39.7	0.02	14.7	0.20	44.0	0.10	n.d.	0.38	99.1	84.2
UR-2b-N	40.7	0.03	14.7	0.22	44.0	0.09	n.d.	0.32	100.1	84.2
UR-2b-N	39.7	0.03	14.7	0.24	43.9	0.09	n.d.	0.39	99.2	84.2
UR-2b-N	40.1	n.d.	14.8	0.12	44.1	0.09	n.d.	0.36	99.6	84.1
UR-2b-N	40.3	0.02	14.9	0.23	44.4	0.10	n.d.	0.32	100.3	84.1
UR-2b-N	40.0	0.01	14.8	0.23	44.1	0.08	n.d.	0.35	99.6	84.1
UR-2b-N	39.5	0.01	15.0	0.15	44.5	0.09	0.05	0.36	99.7	84.1
UR-2b-N	40.1	0.03	14.9	0.19	44.1	0.10	0.05	0.34	99.7	84.1
UR-2b-N	40.3	0.02	15.0	0.21	44.6	0.09	n.d.	0.34	100.6	84.1
UR-2b-N	39.7	0.01	14.9	0.13	44.2	0.08	n.d.	0.43	99.5	84.1
UR-2b-N	40.3	0.02	15.0	0.16	44.4	0.10	n.d.	0.35	100.3	84.0
UR-2b-N	39.8	0.01	15.0	0.24	44.0	0.09	n.d.	0.29	99.4	84.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-2b-M	39.6	0.01	15.0	0.20	44.2	0.10	0.03	0.37	99.4	84.0
UR-2b-M	39.4	n.d.	15.1	0.19	44.2	0.10	0.04	0.35	99.4	83.9
UR-2b-M	39.6	0.03	15.0	0.20	43.8	0.10	0.03	0.50	99.3	83.9
UR-2b-M	39.9	0.06	15.1	0.12	44.1	0.09	n.d.	0.28	99.6	83.9
UR-2b-M	40.2	n.d.	15.2	0.18	44.4	0.09	n.d.	0.34	100.5	83.9
UR-2b-M	40.0	0.02	15.1	0.26	44.1	0.10	0.03	0.34	100.0	83.9
UR-2b-M	39.7	0.02	15.1	0.22	44.1	0.08	n.d.	0.37	99.5	83.9
UR-2b-M	40.2	0.04	15.1	0.22	44.1	0.15	n.d.	0.35	100.2	83.9
UR-2b-M	40.0	0.02	15.1	0.16	44.0	0.11	0.03	0.27	99.7	83.9
UR-2b-M	40.2	0.03	15.3	0.18	44.4	0.10	0.03	0.31	100.5	83.8
UR-2b-M	40.0	n.d.	15.2	0.21	44.3	0.10	n.d.	0.27	100.0	83.8
UR-2b-M	40.3	0.02	15.2	0.18	44.2	0.09	n.d.	0.30	100.3	83.8
UR-2b-M	39.7	0.02	15.2	0.20	44.3	0.10	n.d.	0.30	99.8	83.8
UR-2b-M	40.1	0.03	15.2	0.23	44.1	0.10	0.04	0.30	100.1	83.8
UR-2b-M	40.4	n.d.	15.3	0.19	44.3	0.09	n.d.	0.29	100.6	83.8
UR-2b-M	39.8	0.11	15.3	0.17	44.4	0.11	n.d.	0.35	100.3	83.8
UR-2b-M	40.2	0.02	15.2	0.25	44.1	0.10	n.d.	0.32	100.2	83.8
UR-2b-M	40.3	n.d.	15.3	0.21	44.4	0.11	n.d.	0.39	100.8	83.8
UR-2b-M	40.1	0.01	15.3	0.21	44.2	0.11	n.d.	0.34	100.4	83.7
UR-2b-M	40.0	0.02	15.3	0.26	44.1	0.09	n.d.	0.33	100.1	83.7
UR-2b-M	40.3	0.02	15.4	0.21	44.2	0.12	n.d.	0.35	100.6	83.7
UR-2b-M	40.1	n.d.	15.3	0.24	43.9	0.11	n.d.	0.26	99.9	83.7
UR-2b-M	40.0	n.d.	15.2	0.26	43.7	0.11	n.d.	0.26	99.5	83.7
UR-2b-M	40.0	0.03	15.3	0.24	44.0	0.12	0.07	0.29	100.1	83.7
UR-2b-M	39.9	0.02	15.3	0.21	43.8	0.10	n.d.	0.28	99.6	83.6
UR-2b-M	40.1	n.d.	15.4	0.21	44.1	0.11	n.d.	0.33	100.3	83.6
UR-2b-M	40.1	0.02	15.3	0.16	44.0	0.11	n.d.	0.28	100.0	83.6
UR-2b-M	39.8	0.02	15.2	0.17	43.7	0.11	n.d.	0.32	99.3	83.6
UR-2b-M	39.9	0.02	15.3	0.25	43.9	0.11	n.d.	0.27	99.8	83.6
UR-2b-M	39.4	0.01	15.2	0.17	43.6	0.10	0.03	0.40	99.0	83.6
UR-2b-M	40.0	0.02	15.3	0.23	43.8	0.10	n.d.	0.23	99.8	83.6
UR-2b-M	40.4	0.02	15.5	0.17	44.2	0.10	n.d.	0.30	100.6	83.6
UR-2b-M	40.2	0.02	15.3	0.17	43.7	0.10	n.d.	0.24	99.8	83.6
UR-2b-M	40.0	0.02	15.3	0.15	43.8	0.10	n.d.	0.24	99.6	83.6
UR-2b-M	40.2	0.01	15.3	0.18	43.8	0.10	n.d.	0.29	99.8	83.6
UR-2b-M	40.4	0.02	15.3	0.14	43.7	0.10	0.04	0.25	100.0	83.6
UR-2b-M	40.4	0.01	15.4	0.20	44.0	0.09	0.03	0.28	100.5	83.6
UR-2b-M	40.5	0.01	15.3	0.21	43.7	0.09	0.03	0.25	100.1	83.6
UR-2b-M	40.5	n.d.	15.4	0.17	44.0	0.11	n.d.	0.25	100.4	83.6
UR-2b-M	40.3	n.d.	15.6	0.24	44.2	0.11	0.03	0.32	100.8	83.5
UR-2b-M	39.5	n.d.	15.4	0.20	43.8	0.09	0.05	0.33	99.4	83.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-2b-	40.1	n.d.	15.4	0.19	43.6	0.09	n.d.	0.27	99.6	83.5
UR-2b-	40.0	0.02	15.4	0.21	43.6	0.09	n.d.	0.23	99.6	83.5
UR-2b-	39.8	0.03	15.5	0.24	43.9	0.10	n.d.	0.32	99.8	83.5
UR-2b-	39.9	n.d.	15.4	0.15	43.4	0.10	0.03	0.22	99.2	83.4
UR-2b-	40.3	0.02	15.5	0.19	43.8	0.12	n.d.	0.36	100.4	83.4
UR-2b-	39.4	0.02	15.6	0.21	43.9	0.09	n.d.	0.27	99.5	83.4
UR-2b-	39.6	0.01	15.4	0.30	43.5	0.10	n.d.	0.29	99.2	83.4
UR-2b-	39.7	0.02	15.6	0.21	43.9	0.09	0.05	0.27	99.9	83.4
UR-2b-	40.0	0.02	15.5	0.20	43.7	0.09	n.d.	0.33	99.9	83.4
UR-2b-	39.6	0.02	15.5	0.19	43.6	0.10	0.04	0.23	99.3	83.3
UR-2b-	40.0	0.03	15.5	0.22	43.5	0.11	0.04	0.23	99.7	83.3
UR-2b-	39.9	0.02	15.5	0.17	43.4	0.10	n.d.	0.23	99.4	83.3
UR-2b-	40.0	0.02	15.6	0.18	43.5	0.09	n.d.	0.24	99.6	83.3
UR-2b-	40.3	0.02	15.8	0.21	44.1	0.15	n.d.	0.33	100.9	83.3
UR-2b-	40.1	0.01	15.6	0.19	43.7	0.11	n.d.	0.20	99.9	83.3
UR-2b-	40.0	n.d.	15.6	0.23	43.6	0.10	0.04	0.24	99.8	83.3
UR-2b-	40.0	0.01	15.7	0.22	43.7	0.10	n.d.	0.23	100.0	83.2
UR-2b-	40.1	0.02	15.7	0.21	43.7	0.10	0.06	0.25	100.1	83.2
UR-2b-	40.3	n.d.	15.7	0.19	43.6	0.10	0.04	0.24	100.2	83.2
UR-2b-	39.7	n.d.	15.7	0.27	43.5	0.11	n.d.	0.27	99.7	83.2
UR-2b-	39.5	0.02	15.7	0.26	43.5	0.11	n.d.	0.25	99.3	83.2
UR-2b-	39.7	0.01	15.7	0.26	43.6	0.11	0.07	0.23	99.8	83.2
UR-2b-	40.1	0.27	15.6	0.17	43.3	0.11	n.d.	0.26	99.9	83.2
UR-2b-	39.6	n.d.	15.6	0.26	43.2	0.09	n.d.	0.50	99.4	83.1
UR-2b-	39.9	0.01	15.8	0.32	43.6	0.11	0.03	0.17	99.9	83.1
UR-2b-	40.1	0.02	15.8	0.25	43.7	0.10	n.d.	0.22	100.2	83.1
UR-2b-	39.8	0.28	15.7	0.18	43.3	0.11	0.65	0.21	100.2	83.1
UR-2b-	39.8	0.02	15.7	0.24	43.4	0.10	n.d.	0.26	99.6	83.1
UR-2b-	39.9	0.02	15.8	0.17	43.6	0.09	n.d.	0.31	100.0	83.1
UR-2b-	40.1	n.d.	15.8	0.24	43.4	0.10	0.04	0.36	100.0	83.1
UR-2b-	40.2	n.d.	15.8	0.21	43.5	0.10	0.05	0.22	100.1	83.1
UR-2b-	39.6	n.d.	15.8	0.15	43.3	0.11	0.04	0.23	99.2	83.1
UR-2b-	40.0	0.02	15.7	0.25	43.0	0.12	0.13	0.19	99.5	83.0
UR-2b-	39.7	0.02	15.9	0.20	43.5	0.10	n.d.	0.27	99.7	83.0
UR-2b-	39.9	0.02	16.0	0.22	43.6	0.09	n.d.	0.24	100.0	82.9
UR-2b-	40.1	0.01	16.0	0.14	43.7	0.10	n.d.	0.21	100.2	82.9
UR-2b-	39.8	0.09	15.8	0.26	43.1	0.11	n.d.	0.24	99.5	82.9
UR-2b-	40.1	0.02	15.9	0.22	43.3	0.11	0.05	0.20	100.0	82.9
UR-2b-	39.4	0.03	16.0	0.23	43.6	0.10	0.04	0.23	99.7	82.9
UR-2b-	40.1	0.02	16.0	0.17	43.4	0.10	0.05	0.21	100.0	82.9
UR-2b-	39.7	n.d.	16.1	0.23	43.3	0.10	n.d.	0.24	99.7	82.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-2b-M	40.1	0.01	16.2	0.26	43.4	0.11	0.04	0.20	100.3	82.7
UR-2b-M	39.9	n.d.	16.2	0.26	43.3	0.12	n.d.	0.18	100.0	82.7
UR-2b-M	40.1	0.01	16.2	0.31	43.4	0.11	n.d.	0.18	100.3	82.7
UR-2b-M	39.8	0.01	16.2	0.22	43.2	0.11	n.d.	0.27	99.8	82.7
UR-2b-M	39.9	0.01	16.2	0.19	43.2	0.10	n.d.	0.30	100.0	82.6
UR-2b-M	39.9	0.03	16.2	0.18	43.2	0.10	n.d.	0.18	99.9	82.6
UR-2b-M	40.0	0.02	16.2	0.19	43.3	0.11	0.03	0.21	100.0	82.6
UR-2b-M	39.5	0.02	16.3	0.28	43.4	0.09	0.03	0.36	100.0	82.6
UR-2b-M	39.6	0.02	16.2	0.23	43.2	0.11	n.d.	0.22	99.6	82.6
UR-2b-M	39.8	n.d.	16.2	0.24	43.0	0.12	n.d.	0.28	99.7	82.6
UR-2b-M	40.1	0.03	16.4	0.27	43.5	0.09	n.d.	0.24	100.7	82.5
UR-2b-M	40.1	0.01	16.3	0.12	42.9	0.11	n.d.	0.32	99.8	82.5
UR-2b-M	39.7	0.02	16.3	0.23	42.8	0.10	n.d.	0.16	99.3	82.4
UR-2b-M	40.2	0.02	16.5	0.22	43.2	0.09	0.03	0.20	100.4	82.4
UR-2b-M	39.7	0.03	16.5	0.25	42.6	0.12	n.d.	0.17	99.3	82.2
UR-2b-M	39.8	n.d.	16.5	0.32	42.7	0.12	0.06	0.17	99.7	82.2
UR-2b-M	39.8	0.02	16.7	0.22	42.9	0.10	0.04	0.16	99.9	82.1
UR-2b-M	40.0	0.02	16.8	0.27	43.1	0.10	n.d.	0.21	100.5	82.1
UR-2b-M	39.8	0.01	16.6	0.18	42.7	0.08	n.d.	0.34	99.7	82.1
UR-2b-M	39.6	0.01	16.7	0.23	42.7	0.10	n.d.	0.22	99.6	82.0
UR-2b-M	40.0	0.02	16.8	0.27	43.0	0.11	0.05	0.14	100.4	82.0
UR-2b-M	39.5	0.01	16.9	0.20	43.1	0.10	n.d.	0.17	100.1	81.9
UR-2b-M	40.2	0.02	16.9	0.27	42.8	0.11	n.d.	0.18	100.4	81.9
UR-2b-M	39.6	0.03	16.7	0.25	42.3	0.17	n.d.	0.20	99.3	81.9
UR-2b-M	39.7	0.03	16.8	0.23	42.6	0.10	n.d.	0.23	99.7	81.9
UR-2b-M	40.0	n.d.	17.0	0.28	43.0	0.10	n.d.	0.20	100.6	81.9
UR-2b-M	40.0	0.03	16.8	0.29	42.3	0.10	n.d.	0.25	99.7	81.8
UR-2b-M	39.2	n.d.	17.0	0.25	42.8	0.10	0.04	0.29	99.6	81.8
UR-2b-M	39.6	0.02	17.0	0.29	42.5	0.11	n.d.	0.28	99.8	81.7
UR-2b-M	39.5	0.03	16.9	0.22	42.3	0.11	n.d.	0.30	99.4	81.6
UR-2b-M	39.5	0.06	17.0	0.21	42.4	0.11	n.d.	0.18	99.5	81.6
UR-2b-M	39.4	n.d.	17.1	0.26	42.4	0.10	n.d.	0.21	99.4	81.5
UR-2b-M	40.0	0.02	17.0	0.18	42.0	0.12	n.d.	0.15	99.4	81.5
UR-2b-M	39.3	n.d.	17.2	0.24	42.2	0.10	0.05	0.21	99.3	81.4
UR-2b-M	39.8	0.04	17.2	0.26	42.0	0.12	n.d.	0.26	99.6	81.3
UR-2b-M	39.8	n.d.	17.4	0.29	42.4	0.12	n.d.	0.15	100.2	81.3
UR-2b-M	39.4	0.02	17.4	0.24	42.3	0.11	n.d.	0.13	99.7	81.2
UR-2b-M	39.6	n.d.	17.4	0.25	42.2	0.12	n.d.	0.22	99.8	81.2
UR-2b-M	39.6	n.d.	17.4	0.23	42.0	0.12	0.03	0.16	99.6	81.2
UR-2b-M	39.7	0.02	17.6	0.28	42.1	0.10	n.d.	0.24	100.0	81.0
UR-2b-M	39.3	n.d.	17.6	0.23	41.8	0.10	0.03	0.16	99.2	80.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-2b-N	39.9	0.02	17.9	0.30	42.4	0.13	n.d.	0.08	100.8	80.8
UR-2b-N	39.6	0.02	17.9	0.31	42.3	0.12	n.d.	0.19	100.5	80.8
UR-2b-N	39.7	0.01	18.0	0.31	42.4	0.11	n.d.	0.12	100.7	80.8
UR-2b-N	39.4	0.02	17.8	0.26	41.8	0.11	n.d.	0.20	99.6	80.8
UR-2b-N	39.5	0.02	17.8	0.25	41.8	0.11	n.d.	0.13	99.5	80.7
UR-2b-N	39.5	0.02	17.9	0.23	41.9	0.13	n.d.	0.09	99.7	80.7
UR-2b-N	39.3	0.02	17.9	0.23	41.5	0.13	n.d.	0.36	99.4	80.5
UR-2b-N	39.8	0.02	18.4	0.30	42.1	0.14	0.08	0.10	100.9	80.3
UR-2b-N	39.4	0.06	18.1	0.26	41.4	0.11	n.d.	0.12	99.5	80.3
UR-2b-N	39.7	0.02	18.3	0.27	41.4	0.12	n.d.	0.35	100.2	80.1
UR-2b-N	39.1	0.02	18.5	0.29	41.7	0.11	n.d.	0.15	99.9	80.1
UR-2b-N	39.6	n.d.	18.5	0.28	41.2	0.12	n.d.	0.19	100.0	79.8
UR-2b-N	39.5	0.02	18.6	0.29	41.2	0.12	n.d.	0.20	100.0	79.8
UR-2b-N	39.5	0.02	18.6	0.35	40.9	0.11	n.d.	0.33	99.8	79.7
UR-2b-N	39.6	0.02	18.8	0.33	41.2	0.12	n.d.	0.08	100.2	79.6
UR-2b-N	39.5	0.03	19.3	0.36	41.1	0.15	0.04	0.07	100.5	79.2
UR-2b-N	39.5	0.01	19.3	0.32	40.7	0.14	n.d.	0.18	100.1	79.0
UR-2b-N	39.1	n.d.	19.3	0.27	40.7	0.12	n.d.	0.19	99.7	79.0
UR-2b-N	39.2	0.01	19.3	0.36	40.4	0.14	n.d.	0.10	99.6	78.9
UR-2b-N	39.2	0.03	19.6	0.26	40.9	0.13	n.d.	0.11	100.3	78.8
UR-2b-N	38.6	0.02	19.5	0.32	40.2	0.12	n.d.	0.25	99.0	78.6
UR-2b-N	39.3	n.d.	19.7	0.31	40.3	0.13	0.06	0.13	99.9	78.5
UR-2b-N	38.7	0.01	19.6	0.28	40.1	0.13	0.03	0.19	99.0	78.4
UR-2b-N	39.2	0.03	19.8	0.32	40.1	0.13	0.03	0.09	99.7	78.3
UR-2b-N	39.3	0.02	19.8	0.30	40.0	0.13	n.d.	0.13	99.6	78.2
UR-2b-N	39.2	0.01	20.0	0.32	40.0	0.15	0.03	0.19	99.9	78.1
UR-2b-N	38.8	0.02	20.0	0.30	39.9	0.14	n.d.	0.27	99.4	78.0
UR-2b-N	39.0	n.d.	20.2	0.28	40.1	0.13	0.03	0.21	100.0	77.9
UR-2b-N	39.5	n.d.	20.1	0.31	39.5	0.13	n.d.	0.22	99.7	77.8
UR-2b-N	38.6	0.01	20.3	0.32	39.6	0.14	n.d.	0.13	99.1	77.7
UR-2b-N	39.1	0.01	20.6	0.36	39.6	0.15	n.d.	0.08	99.9	77.4
UR-2b-N	38.8	0.01	20.8	0.38	39.6	0.14	n.d.	0.06	99.8	77.3
UR-2b-N	38.7	0.04	20.9	0.31	39.6	0.13	0.03	0.09	99.8	77.2
UR-2b-N	39.1	0.02	20.6	0.30	39.1	0.17	n.d.	0.17	99.5	77.1
UR-2b-N	39.1	n.d.	20.9	0.32	39.1	0.17	0.03	0.23	99.9	77.0
UR-2b-N	39.2	n.d.	21.2	0.36	39.6	0.15	n.d.	0.08	100.5	76.9
UR-2b-N	38.8	0.02	21.0	0.32	39.2	0.15	n.d.	0.08	99.7	76.9
UR-2b-N	38.6	0.01	20.9	0.29	38.9	0.15	n.d.	0.10	99.0	76.8
UR-2b-N	38.8	0.01	21.2	0.37	38.7	0.15	n.d.	0.13	99.3	76.5
UR-2b-N	38.5	n.d.	21.4	0.35	39.0	0.17	n.d.	0.12	99.6	76.5
UR-2b-N	38.5	n.d.	21.9	0.34	38.1	0.17	n.d.	0.12	99.2	75.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-2b-N	38.9	0.01	22.5	0.41	38.1	0.16	n.d.	0.08	100.1	75.1
UR-2b-N	38.7	n.d.	22.6	0.38	38.2	0.15	n.d.	0.05	100.1	75.1
UR-2b-N	38.4	n.d.	23.2	0.37	37.3	0.18	n.d.	0.09	99.5	74.2
UR-2b-N	38.3	0.02	24.3	0.45	36.3	0.26	n.d.	0.07	99.6	72.7
NI-21b-I	40.4	0.02	13.7	0.18	44.8	0.11	0.04	0.52	99.7	85.4
NI-21b-I	40.8	0.02	13.7	0.25	44.8	0.11	0.06	0.51	100.3	85.3
NI-21b-I	40.1	0.02	13.7	0.15	44.7	0.11	n.d.	0.52	99.4	85.3
NI-21b-T	39.9	0.02	13.8	0.18	44.8	0.11	n.d.	0.53	99.4	85.2
NI-21b-T	40.2	0.03	13.8	0.14	44.7	0.09	0.04	0.56	99.5	85.2
NI-21b-I	40.7	0.03	13.9	0.29	44.6	0.10	0.05	0.53	100.2	85.1
NI-21b-I	40.2	0.02	13.9	0.15	44.7	0.12	n.d.	0.48	99.5	85.1
NI-21b-T	40.0	0.02	14.0	0.18	44.8	0.09	0.16	0.50	99.7	85.1
NI-21b-T	40.0	0.02	14.1	0.16	44.9	0.11	0.03	0.49	99.8	85.1
NI-21b-T	40.2	0.03	14.0	0.10	44.8	0.12	0.03	0.57	99.9	85.0
NI-21b-T	40.0	0.03	14.0	0.13	44.6	0.12	0.06	0.53	99.4	85.0
NI-21b-I	39.4	0.04	14.2	0.21	45.2	0.11	0.05	0.47	99.7	85.0
NI-21b-T	40.1	0.03	14.1	0.20	44.8	0.10	0.06	0.55	99.9	85.0
NI-21b-I	40.7	0.02	14.0	0.19	44.5	0.12	0.06	0.51	100.1	85.0
NI-21b-T	40.0	0.02	14.0	0.20	44.5	0.12	0.04	0.53	99.4	85.0
NI-21b-I	40.6	0.02	14.3	0.21	45.1	0.12	0.05	0.53	100.9	84.9
NI-21b-T	40.2	0.02	14.1	0.22	44.5	0.15	n.d.	0.41	99.7	84.9
NI-21b-T	40.1	0.03	14.2	0.16	44.6	0.11	n.d.	0.51	99.7	84.9
NI-21b-T	39.9	0.03	14.2	0.26	44.5	0.11	0.05	0.56	99.6	84.9
NI-21b-T	40.1	0.02	14.2	0.19	44.8	0.12	0.04	0.53	100.1	84.9
NI-21b-T	40.3	0.02	14.2	0.22	44.5	0.13	0.03	0.47	99.9	84.9
NI-21b-I	40.6	0.02	14.3	0.18	45.0	0.11	0.04	0.51	100.8	84.8
NI-21b-T	40.1	0.02	14.4	0.21	44.7	0.11	0.04	0.51	100.0	84.7
NI-21b-I	40.1	0.02	14.3	0.18	44.6	0.11	0.04	0.51	99.9	84.7
NI-21b-T	40.2	0.03	14.3	0.22	44.4	0.14	0.04	0.48	99.8	84.7
NI-21b-I	40.6	0.03	14.2	0.21	44.2	0.09	0.12	0.51	100.0	84.7
NI-21b-T	40.1	0.02	14.3	0.17	44.1	0.11	n.d.	0.50	99.4	84.6
NI-21b-T	40.1	0.03	14.4	0.18	44.3	0.11	0.08	0.52	99.6	84.6
NI-21b-T	40.1	0.02	14.4	0.23	44.2	0.10	n.d.	0.49	99.6	84.6
NI-21b-I	40.2	0.02	14.5	0.24	44.4	0.11	n.d.	0.44	99.9	84.5
NI-21b-I	40.1	0.02	14.5	0.21	44.3	0.11	n.d.	0.43	99.7	84.5
NI-21b-T	40.1	0.02	14.4	0.21	44.1	0.13	0.31	0.50	99.8	84.5
NI-21b-T	40.3	0.03	14.5	0.23	44.3	0.13	n.d.	0.48	100.0	84.5
NI-21b-T	40.0	0.03	14.5	0.23	44.4	0.12	0.06	0.52	99.9	84.5
NI-21b-I	40.2	0.03	14.5	0.24	44.3	0.13	n.d.	0.42	99.9	84.5
NI-21b-T	39.7	0.02	14.4	0.23	44.1	0.10	n.d.	0.50	99.1	84.5
NI-21b-T	40.1	0.02	14.5	0.21	44.2	0.10	0.04	0.48	99.6	84.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-I	40.7	0.02	14.5	0.19	44.3	0.11	0.07	0.54	100.5	84.5
NI-21b-I	40.9	0.02	14.6	0.18	44.5	0.12	0.10	0.51	100.9	84.4
NI-21b-I	40.5	0.03	14.6	0.21	44.3	0.11	0.04	0.51	100.3	84.4
NI-21b-I	40.0	0.02	14.6	0.17	44.3	0.11	n.d.	0.47	99.6	84.4
NI-21b-I	40.6	0.03	14.7	0.22	44.4	0.11	0.04	0.55	100.6	84.4
NI-21b-I	39.8	0.02	14.6	0.23	44.2	0.11	n.d.	0.45	99.5	84.4
NI-21b-I	40.7	0.02	14.7	0.24	44.3	0.10	0.03	0.50	100.6	84.4
NI-21b-I	39.8	0.02	14.7	0.23	44.3	0.11	n.d.	0.48	99.6	84.3
NI-21b-¯	39.9	0.02	14.7	0.16	44.3	0.13	0.47	0.38	100.1	84.3
NI-21b-¯	40.0	0.02	14.6	0.22	44.1	0.12	0.11	0.53	99.7	84.3
NI-21b-¯	40.0	0.02	14.7	0.27	44.3	0.13	0.13	0.50	100.0	84.3
NI-21b-¯	40.3	0.02	14.8	0.17	44.4	0.09	0.04	0.46	100.3	84.3
NI-21b-I	40.6	0.02	14.7	0.18	44.4	0.10	0.03	0.43	100.4	84.3
NI-21b-¯	40.0	0.01	14.7	0.26	44.3	0.12	0.05	0.47	99.9	84.3
NI-21b-I	39.8	0.02	14.7	0.23	44.2	0.10	n.d.	0.40	99.6	84.3
NI-21b-¯	40.3	0.02	14.7	0.22	44.2	0.13	n.d.	0.50	100.1	84.3
NI-21b-I	40.0	0.01	14.7	0.20	44.1	0.10	0.04	0.46	99.7	84.2
NI-21b-¯	39.9	0.02	14.7	0.22	44.2	0.11	0.03	0.52	99.8	84.2
NI-21b-¯	40.1	0.02	14.7	0.22	44.2	0.10	0.04	0.47	99.9	84.2
NI-21b-¯	40.2	0.02	14.7	0.18	44.2	0.10	0.04	0.48	99.9	84.2
NI-21b-I	39.9	0.02	14.8	0.24	44.1	0.11	n.d.	0.43	99.7	84.2
NI-21b-I	39.7	0.02	14.8	0.18	44.1	0.11	0.06	0.43	99.4	84.2
NI-21b-¯	39.9	0.02	14.8	0.23	44.2	0.13	0.15	0.50	99.9	84.2
NI-21b-¯	40.3	0.02	14.8	0.20	44.2	0.10	0.06	0.49	100.1	84.2
NI-21b-¯	40.2	0.03	14.8	0.22	44.3	0.14	0.05	0.46	100.1	84.2
NI-21b-¯	40.0	0.02	14.9	0.25	44.3	0.12	0.06	0.53	100.2	84.2
NI-21b-I	40.1	n.d.	14.8	0.25	44.2	0.14	0.06	0.48	100.0	84.2
NI-21b-¯	40.0	0.02	14.7	0.21	43.8	0.11	0.04	0.47	99.4	84.2
NI-21b-¯	40.4	0.03	14.8	0.18	44.1	0.10	0.03	0.53	100.1	84.2
NI-21b-¯	40.0	0.02	14.9	0.16	44.2	0.12	n.d.	0.46	99.9	84.1
NI-21b-¯	40.3	0.02	14.8	0.33	44.1	0.12	0.03	0.50	100.2	84.1
NI-21b-¯	40.2	0.02	14.9	0.17	44.3	0.11	0.13	0.44	100.2	84.1
NI-21b-¯	40.1	0.02	15.0	0.14	44.5	0.11	n.d.	0.50	100.3	84.1
NI-21b-¯	40.5	0.01	14.8	0.24	44.1	0.14	n.d.	0.50	100.3	84.1
NI-21b-¯	40.0	0.02	14.8	0.18	44.0	0.12	0.06	0.41	99.6	84.1
NI-21b-I	39.6	0.02	14.9	0.25	44.2	0.13	n.d.	0.42	99.6	84.1
NI-21b-I	40.6	0.02	14.9	0.19	44.1	0.11	n.d.	0.53	100.4	84.1
NI-21b-¯	40.1	0.02	14.8	0.26	43.8	0.11	0.03	0.43	99.6	84.1
NI-21b-¯	40.1	0.03	14.9	0.24	44.1	0.10	0.14	0.42	100.0	84.1
NI-21b-¯	40.0	0.03	14.9	0.21	44.1	0.11	n.d.	0.50	99.9	84.1
NI-21b-¯	39.8	0.02	14.8	0.25	44.0	0.10	0.05	0.46	99.6	84.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-	40.0	0.03	15.0	0.20	44.4	0.12	n.d.	0.49	100.3	84.1
NI-21b-	39.9	0.02	15.0	0.21	44.5	0.10	0.03	0.54	100.4	84.1
NI-21b-I	39.8	0.02	14.9	0.21	44.0	0.10	0.04	0.41	99.5	84.1
NI-21b-	39.9	0.02	14.8	0.15	43.7	0.10	0.17	0.44	99.2	84.1
NI-21b-	40.2	0.02	14.9	0.20	44.1	0.11	n.d.	0.47	100.0	84.1
NI-21b-	40.1	0.02	15.0	0.20	44.4	0.10	n.d.	0.49	100.3	84.1
NI-21b-	40.0	0.02	14.9	0.19	44.1	0.11	n.d.	0.43	99.7	84.1
NI-21b-	40.1	0.03	15.0	0.19	44.3	0.12	0.06	0.44	100.2	84.1
NI-21b-I	40.2	0.02	14.9	0.19	44.2	0.12	0.04	0.42	100.1	84.1
NI-21b-I	39.8	0.02	14.9	0.19	44.0	0.10	0.03	0.41	99.5	84.0
NI-21b-	39.8	0.02	14.9	0.22	44.2	0.10	n.d.	0.44	99.7	84.0
NI-21b-I	40.8	0.02	14.9	0.17	44.0	0.11	n.d.	0.50	100.5	84.0
NI-21b-	40.1	0.02	14.9	0.21	44.1	0.11	0.03	0.46	99.9	84.0
NI-21b-I	40.0	n.d.	15.0	0.15	44.2	0.10	0.05	0.41	99.9	84.0
NI-21b-	40.1	0.02	15.0	0.20	44.2	0.12	0.10	0.51	100.2	84.0
NI-21b-I	40.3	0.02	15.0	0.22	44.3	0.10	0.05	0.46	100.4	84.0
NI-21b-	40.0	0.03	15.0	0.24	44.3	0.11	0.17	0.49	100.4	84.0
NI-21b-	40.0	0.02	15.0	0.20	44.0	0.14	0.05	0.48	99.9	84.0
NI-21b-	40.2	0.02	15.0	0.23	44.0	0.11	n.d.	0.45	100.0	84.0
NI-21b-	40.3	0.01	15.0	0.18	44.1	0.11	n.d.	0.47	100.1	84.0
NI-21b-	39.8	0.02	14.9	0.15	43.7	0.12	n.d.	0.50	99.1	84.0
NI-21b-	40.1	0.02	14.9	0.21	43.8	0.10	n.d.	0.47	99.7	84.0
NI-21b-	39.7	0.01	15.0	0.16	43.9	0.10	n.d.	0.50	99.4	84.0
NI-21b-	40.1	0.02	15.0	0.21	44.1	0.11	n.d.	0.47	100.0	84.0
NI-21b-	40.1	0.02	15.0	0.19	43.9	0.10	n.d.	0.51	99.8	84.0
NI-21b-	39.9	0.03	15.1	0.24	44.3	0.12	0.09	0.50	100.3	84.0
NI-21b-	40.1	0.01	15.1	0.27	44.2	0.12	0.05	0.45	100.2	83.9
NI-21b-	39.9	0.01	15.0	0.25	43.9	0.14	0.04	0.49	99.7	83.9
NI-21b-	40.4	0.02	15.1	0.26	44.1	0.15	n.d.	0.52	100.6	83.9
NI-21b-I	40.1	0.01	15.1	0.22	44.3	0.11	0.04	0.44	100.3	83.9
NI-21b-	40.2	0.02	15.0	0.13	44.0	0.10	0.08	0.45	100.0	83.9
NI-21b-I	40.4	0.02	15.0	0.21	44.0	0.11	0.03	0.48	100.3	83.9
NI-21b-	40.0	0.02	15.1	0.15	44.1	0.11	0.04	0.42	99.9	83.9
NI-21b-	40.1	0.01	15.0	0.19	44.0	0.11	0.05	0.51	100.0	83.9
NI-21b-I	40.2	0.02	15.0	0.28	44.0	0.11	0.03	0.41	100.1	83.9
NI-21b-	40.5	0.02	15.0	0.25	43.8	0.10	n.d.	0.48	100.1	83.9
NI-21b-I	40.4	0.03	14.8	0.23	43.3	0.11	0.04	0.43	99.3	83.9
NI-21b-I	40.4	0.02	15.0	0.19	43.9	0.17	0.11	0.47	100.2	83.9
NI-21b-	40.1	0.02	15.1	0.15	44.1	0.10	0.04	0.45	100.1	83.9
NI-21b-I	40.6	0.03	15.1	0.22	44.1	0.19	n.d.	0.43	100.7	83.9
NI-21b-I	39.6	0.02	15.0	0.24	43.8	0.13	0.03	0.47	99.3	83.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-I	40.4	0.02	15.1	0.26	43.9	0.14	n.d.	0.46	100.3	83.9
NI-21b-I	40.9	0.02	15.0	0.23	43.9	0.12	0.03	0.48	100.7	83.9
NI-21b-	40.0	0.02	15.1	0.19	44.0	0.11	0.04	0.49	99.9	83.9
NI-21b-I	40.6	0.04	15.1	0.23	43.9	0.12	n.d.	0.49	100.4	83.9
NI-21b-	39.9	0.01	15.0	0.12	43.8	0.12	n.d.	0.49	99.5	83.9
NI-21b-	40.3	0.02	15.1	0.17	44.1	0.10	n.d.	0.50	100.4	83.9
NI-21b-	40.1	0.03	15.0	0.23	43.8	0.11	0.06	0.48	99.8	83.8
NI-21b-	40.0	0.02	15.1	0.28	43.9	0.13	0.04	0.43	99.8	83.8
NI-21b-	39.9	0.02	15.1	0.23	44.0	0.11	0.04	0.45	99.8	83.8
NI-21b-	40.5	0.02	15.1	0.18	44.0	0.11	n.d.	0.48	100.5	83.8
NI-21b-I	40.6	0.02	15.1	0.28	43.8	0.12	0.03	0.48	100.4	83.8
NI-21b-	39.6	0.02	15.1	0.20	43.9	0.14	0.04	0.49	99.6	83.8
NI-21b-	40.1	0.02	15.1	0.27	43.8	0.11	0.03	0.48	100.0	83.8
NI-21b-I	40.2	0.01	15.1	0.22	43.8	0.11	n.d.	0.43	99.9	83.8
NI-21b-	40.0	0.02	15.2	0.25	44.1	0.11	0.05	0.50	100.3	83.8
NI-21b-	39.6	0.02	15.2	0.22	43.9	0.11	0.06	0.51	99.5	83.8
NI-21b-	40.2	0.03	15.3	0.16	44.1	0.14	n.d.	0.44	100.4	83.8
NI-21b-	40.0	0.02	15.2	0.23	43.8	0.13	n.d.	0.45	99.8	83.7
NI-21b-I	40.3	0.02	15.2	0.21	44.0	0.10	0.04	0.50	100.4	83.7
NI-21b-I	40.5	0.02	15.2	0.18	43.8	0.11	n.d.	0.47	100.2	83.7
NI-21b-	40.0	0.02	15.3	0.22	44.0	0.10	n.d.	0.49	100.2	83.7
NI-21b-I	39.8	0.02	15.1	0.21	43.7	0.11	n.d.	0.43	99.4	83.7
NI-21b-	39.7	0.02	15.2	0.19	43.7	0.11	0.05	0.49	99.4	83.7
NI-21b-I	40.5	0.02	15.3	0.17	44.0	0.11	n.d.	0.47	100.6	83.7
NI-21b-	40.2	0.01	15.3	0.26	44.1	0.10	0.04	0.51	100.6	83.7
NI-21b-	40.2	0.03	15.3	0.27	44.0	0.11	0.03	0.43	100.4	83.7
NI-21b-	39.9	0.02	15.3	0.20	43.9	0.10	n.d.	0.48	100.0	83.7
NI-21b-	40.1	0.01	15.3	0.20	44.0	0.12	0.04	0.46	100.2	83.7
NI-21b-	40.0	0.03	15.3	0.17	43.8	0.11	n.d.	0.51	99.9	83.7
NI-21b-I	39.7	0.02	15.2	0.18	43.8	0.12	n.d.	0.44	99.5	83.7
NI-21b-	39.7	0.02	15.3	0.22	44.0	0.11	n.d.	0.50	99.9	83.6
NI-21b-	40.1	0.02	15.3	0.23	43.9	0.12	n.d.	0.49	100.2	83.6
NI-21b-I	40.4	0.03	15.3	0.21	43.9	0.11	n.d.	0.49	100.5	83.6
NI-21b-	39.9	0.02	15.3	0.24	43.9	0.12	0.06	0.46	100.0	83.6
NI-21b-I	39.4	0.03	15.3	0.23	43.7	0.15	0.04	0.42	99.2	83.6
NI-21b-	39.8	0.03	15.3	0.15	43.8	0.10	n.d.	0.43	99.6	83.6
NI-21b-I	40.5	0.02	15.2	0.18	43.6	0.11	0.05	0.46	100.1	83.6
NI-21b-I	39.9	0.03	15.4	0.19	43.9	0.17	n.d.	0.42	99.9	83.6
NI-21b-I	40.1	0.02	15.2	0.24	43.5	0.12	n.d.	0.40	99.7	83.6
NI-21b-I	39.6	0.02	15.3	0.24	43.6	0.11	n.d.	0.41	99.3	83.6
NI-21b-	40.0	n.d.	15.2	0.27	43.5	0.12	n.d.	0.38	99.4	83.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-N	39.4	0.02	15.3	0.19	43.6	0.12	n.d.	0.43	99.1	83.6
NI-21b-N	39.9	0.02	15.3	0.19	43.7	0.10	0.06	0.44	99.8	83.6
NI-21b-T	39.7	0.02	15.4	0.26	43.9	0.17	0.06	0.45	99.9	83.5
NI-21b-T	40.0	0.02	15.4	0.16	43.8	0.14	n.d.	0.47	100.0	83.5
NI-21b-T	40.0	0.01	15.5	0.22	44.0	0.11	0.03	0.47	100.3	83.5
NI-21b-T	39.7	0.04	15.3	0.19	43.5	0.17	n.d.	0.44	99.4	83.5
NI-21b-N	40.6	0.02	15.5	0.18	44.0	0.13	0.06	0.47	100.9	83.5
NI-21b-T	40.0	0.02	15.5	0.21	43.9	0.11	0.04	0.38	100.1	83.5
NI-21b-N	40.6	0.02	15.4	0.24	43.7	0.13	n.d.	0.44	100.6	83.5
NI-21b-T	39.9	0.02	15.4	0.25	43.6	0.16	0.04	0.48	99.8	83.5
NI-21b-T	39.8	0.02	15.4	0.19	43.6	0.11	n.d.	0.48	99.5	83.5
NI-21b-N	40.4	0.02	15.4	0.24	43.6	0.09	n.d.	0.49	100.3	83.5
NI-21b-T	39.9	0.01	15.5	0.21	43.9	0.15	n.d.	0.48	100.2	83.4
NI-21b-N	39.5	0.02	15.4	0.21	43.6	0.10	0.03	0.46	99.3	83.4
NI-21b-N	40.6	0.02	15.6	0.23	44.0	0.10	0.05	0.43	101.0	83.4
NI-21b-N	39.6	0.02	15.3	0.23	43.4	0.12	0.04	0.47	99.2	83.4
NI-21b-N	40.0	0.03	15.4	0.23	43.6	0.14	n.d.	0.46	100.0	83.4
NI-21b-T	39.5	0.02	15.4	0.23	43.5	0.12	0.03	0.48	99.3	83.4
NI-21b-N	40.3	0.02	15.4	0.22	43.5	0.11	n.d.	0.47	100.1	83.4
NI-21b-T	40.0	0.01	15.6	0.23	43.8	0.13	n.d.	0.49	100.3	83.4
NI-21b-N	40.1	0.02	15.4	0.28	43.4	0.11	n.d.	0.48	99.8	83.4
NI-21b-N	40.7	0.03	15.5	0.19	43.5	0.13	n.d.	0.40	100.4	83.4
NI-21b-T	40.0	0.02	15.6	0.23	43.8	0.11	n.d.	0.42	100.1	83.4
NI-21b-N	39.6	0.02	15.5	0.22	43.4	0.17	n.d.	0.39	99.2	83.3
NI-21b-T	40.3	0.02	15.7	0.22	44.0	0.11	0.11	0.48	100.9	83.3
NI-21b-T	40.3	0.02	15.5	0.20	43.5	0.09	n.d.	0.43	100.1	83.3
NI-21b-N	39.7	0.03	15.5	0.17	43.5	0.11	n.d.	0.50	99.5	83.3
NI-21b-N	39.9	0.02	15.4	0.27	43.1	0.12	0.04	0.38	99.2	83.3
NI-21b-T	39.7	0.02	15.5	0.20	43.4	0.13	0.05	0.44	99.5	83.3
NI-21b-N	40.8	0.02	15.6	0.26	43.6	0.11	0.04	0.44	100.9	83.3
NI-21b-T	39.8	0.02	15.6	0.22	43.6	0.10	n.d.	0.50	99.9	83.3
NI-21b-N	40.1	0.03	15.6	0.21	43.5	0.10	0.29	0.45	100.4	83.2
NI-21b-N	40.1	0.02	15.7	0.24	43.4	0.12	n.d.	0.46	100.1	83.2
NI-21b-T	40.0	n.d.	15.7	0.14	43.4	0.13	0.04	0.49	99.8	83.2
NI-21b-T	39.8	0.02	15.6	0.25	43.2	0.10	n.d.	0.47	99.4	83.2
NI-21b-N	40.1	0.02	15.6	0.25	43.3	0.11	n.d.	0.45	99.9	83.1
NI-21b-N	40.1	0.02	15.7	0.18	43.4	0.14	n.d.	0.39	100.0	83.1
NI-21b-N	40.6	0.02	15.8	0.27	43.5	0.13	0.05	0.46	100.8	83.1
NI-21b-N	40.3	0.02	15.7	0.22	43.4	0.15	n.d.	0.44	100.3	83.1
NI-21b-T	39.9	0.02	15.8	0.30	43.4	0.12	n.d.	0.42	100.0	83.0
NI-21b-N	39.8	0.01	15.8	0.29	43.2	0.12	n.d.	0.37	99.7	83.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-I	40.6	0.02	15.9	0.20	43.6	0.12	n.d.	0.42	100.8	83.0
NI-21b-	39.9	0.03	16.0	0.24	43.7	0.14	0.16	0.46	100.6	83.0
NI-21b-I	39.7	0.02	15.9	0.24	43.4	0.15	0.04	0.47	99.9	83.0
NI-21b-I	40.0	0.03	15.8	0.25	43.3	0.12	n.d.	0.41	99.9	83.0
NI-21b-	39.7	0.02	15.8	0.20	43.0	0.12	0.03	0.43	99.2	82.9
NI-21b-I	40.5	0.02	16.0	0.22	43.5	0.13	n.d.	0.48	100.9	82.9
NI-21b-I	40.4	0.03	15.8	0.23	43.0	0.10	n.d.	0.51	100.1	82.9
NI-21b-I	39.9	n.d.	15.9	0.25	43.3	0.12	n.d.	0.41	99.9	82.9
NI-21b-I	39.6	0.02	16.0	0.23	43.3	0.10	0.05	0.45	99.8	82.8
NI-21b-I	40.0	0.02	16.0	0.28	43.2	0.12	n.d.	0.43	99.9	82.8
NI-21b-I	40.0	0.02	16.0	0.28	43.1	0.11	n.d.	0.46	100.0	82.7
NI-21b-I	40.3	0.03	16.1	0.17	43.3	0.11	n.d.	0.35	100.3	82.7
NI-21b-	39.7	0.02	16.0	0.27	42.9	0.11	0.06	0.41	99.5	82.7
NI-21b-I	40.3	0.02	16.1	0.18	43.3	0.10	0.04	0.43	100.5	82.7
NI-21b-I	40.0	0.02	16.1	0.27	43.2	0.10	0.10	0.45	100.2	82.7
NI-21b-I	39.6	0.02	16.0	0.22	42.9	0.11	0.03	0.43	99.3	82.7
NI-21b-I	39.9	0.01	16.0	0.19	43.0	0.11	0.04	0.47	99.7	82.7
NI-21b-	39.7	0.02	16.1	0.19	43.0	0.13	0.03	0.47	99.7	82.7
NI-21b-I	40.2	0.02	16.3	0.27	43.5	0.11	0.03	0.39	100.8	82.7
NI-21b-I	40.3	0.04	16.2	0.19	43.3	0.19	0.09	0.36	100.7	82.7
NI-21b-I	40.0	0.02	16.1	0.22	43.1	0.10	n.d.	0.46	100.1	82.6
NI-21b-I	39.9	0.02	16.1	0.23	43.0	0.11	0.04	0.37	99.8	82.6
NI-21b-I	40.6	0.01	16.2	0.24	43.3	0.10	n.d.	0.42	101.0	82.6
NI-21b-	39.9	0.02	16.3	0.22	43.4	0.11	0.06	0.45	100.4	82.6
NI-21b-I	40.4	0.02	16.1	0.21	43.0	0.15	0.08	0.44	100.4	82.6
NI-21b-	39.7	0.03	16.0	0.26	42.7	0.11	n.d.	0.44	99.2	82.6
NI-21b-I	40.5	0.02	16.2	0.27	43.1	0.12	0.03	0.43	100.6	82.6
NI-21b-I	39.8	0.02	16.1	0.17	42.8	0.12	0.11	0.40	99.4	82.6
NI-21b-I	40.1	0.02	16.3	0.20	43.3	0.11	0.06	0.47	100.5	82.6
NI-21b-I	40.0	0.01	16.2	0.28	42.9	0.13	n.d.	0.39	99.9	82.5
NI-21b-I	39.9	0.02	16.1	0.21	42.6	0.11	0.05	0.43	99.4	82.5
NI-21b-I	40.2	0.02	16.3	0.25	43.0	0.11	0.04	0.46	100.3	82.5
NI-21b-I	40.5	0.03	16.3	0.20	43.0	0.11	n.d.	0.43	100.7	82.5
NI-21b-I	40.0	0.02	16.3	0.25	43.0	0.11	0.04	0.39	100.1	82.4
NI-21b-	40.1	0.02	16.3	0.28	42.8	0.12	0.04	0.45	100.1	82.4
NI-21b-	39.8	0.02	16.4	0.31	43.1	0.14	0.12	0.45	100.3	82.4
NI-21b-I	40.0	0.03	16.2	0.28	42.7	0.13	n.d.	0.38	99.7	82.4
NI-21b-I	40.2	0.02	16.3	0.19	43.0	0.11	n.d.	0.37	100.2	82.4
NI-21b-I	40.2	0.02	16.5	0.30	43.1	0.11	0.05	0.45	100.7	82.4
NI-21b-	39.8	0.02	16.5	0.25	43.1	0.12	0.05	0.37	100.2	82.3
NI-21b-I	39.8	0.02	16.3	0.23	42.6	0.11	n.d.	0.44	99.6	82.3

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-I	39.7	0.02	16.3	0.23	42.5	0.16	n.d.	0.43	99.4	82.3
NI-21b-I	39.9	0.02	16.6	0.22	43.0	0.13	0.06	0.42	100.3	82.2
NI-21b-I	39.8	0.02	16.4	0.28	42.6	0.12	n.d.	0.45	99.7	82.2
NI-21b-I	40.3	0.02	16.6	0.27	42.9	0.14	n.d.	0.40	100.6	82.2
NI-21b-I	40.3	0.01	16.5	0.25	42.7	0.14	n.d.	0.43	100.3	82.2
NI-21b-I	39.9	0.02	16.6	0.18	42.6	0.12	n.d.	0.46	100.0	82.1
NI-21b-I	40.1	0.02	16.8	0.19	42.9	0.11	n.d.	0.46	100.6	82.0
NI-21b-T	39.8	0.02	16.7	0.22	42.5	0.11	n.d.	0.43	99.8	82.0
NI-21b-I	39.6	0.01	16.8	0.30	42.5	0.12	n.d.	0.34	99.8	81.9
NI-21b-I	39.6	0.02	16.6	0.28	42.1	0.12	n.d.	0.41	99.1	81.9
NI-21b-I	40.3	0.04	16.9	0.21	42.7	0.12	n.d.	0.43	100.7	81.9
NI-21b-I	39.7	n.d.	16.8	0.25	42.6	0.13	n.d.	0.42	99.9	81.9
NI-21b-I	40.5	0.01	16.9	0.25	42.7	0.11	n.d.	0.36	100.8	81.8
NI-21b-I	39.7	0.02	16.8	0.25	42.4	0.13	n.d.	0.37	99.6	81.8
NI-21b-I	39.9	0.02	16.8	0.26	42.5	0.12	n.d.	0.32	99.9	81.8
NI-21b-I	39.3	0.02	16.7	0.27	42.3	0.12	0.05	0.34	99.1	81.8
NI-21b-I	39.6	0.03	16.8	0.26	42.1	0.12	n.d.	0.38	99.3	81.7
NI-21b-I	39.9	0.02	16.9	0.28	42.3	0.11	0.04	0.41	100.0	81.7
NI-21b-I	39.6	0.02	16.9	0.26	42.2	0.12	n.d.	0.39	99.6	81.6
NI-21b-I	40.2	0.02	16.9	0.22	42.0	0.12	n.d.	0.41	99.9	81.6
NI-21b-I	40.2	0.02	17.0	0.25	42.3	0.11	0.19	0.38	100.4	81.6
NI-21b-I	40.3	0.02	17.3	0.22	42.7	0.12	0.04	0.40	101.0	81.5
NI-21b-I	39.7	0.24	17.0	0.27	42.0	0.20	0.04	0.38	99.8	81.5
NI-21b-I	40.0	0.03	17.0	0.24	42.0	0.14	n.d.	0.39	99.9	81.5
NI-21b-I	40.0	0.01	17.1	0.27	42.1	0.13	n.d.	0.33	99.9	81.5
NI-21b-I	39.8	0.01	17.2	0.20	42.4	0.13	n.d.	0.43	100.2	81.4
NI-21b-I	39.8	0.06	17.1	0.24	42.1	0.11	0.04	0.38	99.9	81.4
NI-21b-I	39.8	0.04	17.2	0.28	42.1	0.12	0.03	0.40	100.0	81.3
NI-21b-I	40.0	0.01	17.3	0.23	42.1	0.12	n.d.	0.34	100.0	81.3
NI-21b-I	39.6	0.02	17.3	0.29	42.2	0.11	0.04	0.40	100.0	81.3
NI-21b-I	40.2	0.03	17.4	0.26	42.3	0.24	n.d.	0.45	101.0	81.2
NI-21b-I	40.4	0.03	17.4	0.29	42.1	0.11	n.d.	0.35	100.7	81.2
NI-21b-I	40.1	0.02	17.5	0.24	42.4	0.11	n.d.	0.44	100.8	81.2
NI-21b-T	39.5	0.02	17.4	0.25	42.2	0.11	n.d.	0.41	99.9	81.2
NI-21b-I	40.0	0.03	17.4	0.30	42.1	0.11	n.d.	0.37	100.3	81.2
NI-21b-I	39.5	0.02	17.5	0.21	42.2	0.11	0.04	0.43	100.0	81.2
NI-21b-T	39.4	0.02	17.4	0.25	42.0	0.11	n.d.	0.36	99.6	81.1
NI-21b-I	39.4	0.02	17.5	0.24	42.0	0.12	n.d.	0.34	99.6	81.1
NI-21b-I	40.2	0.02	17.6	0.33	42.3	0.11	n.d.	0.31	100.9	81.0
NI-21b-T	39.5	0.02	17.6	0.26	42.3	0.12	n.d.	0.40	100.2	81.0
NI-21b-I	39.0	0.02	17.5	0.21	41.9	0.11	n.d.	0.35	99.2	81.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-I	40.3	0.02	17.4	0.26	41.8	0.11	n.d.	0.40	100.2	81.0
NI-21b-I	39.8	0.02	17.4	0.23	41.6	0.12	n.d.	0.39	99.5	81.0
NI-21b-I	40.3	0.10	17.6	0.23	41.8	0.17	0.18	0.37	100.8	80.9
NI-21b-I	40.1	0.02	17.7	0.25	42.0	0.11	n.d.	0.39	100.6	80.9
NI-21b-I	39.5	0.02	17.6	0.22	41.8	0.13	0.05	0.36	99.7	80.9
NI-21b-I	40.3	0.02	17.6	0.24	41.7	0.12	0.03	0.39	100.4	80.8
NI-21b-I	39.6	0.03	17.7	0.24	42.0	0.12	0.04	0.43	100.2	80.8
NI-21b-I	40.0	0.02	17.6	0.27	41.6	0.16	0.15	0.36	100.2	80.8
NI-21b-I	39.0	0.02	17.6	0.28	41.6	0.10	n.d.	0.35	99.0	80.8
NI-21b-I	40.3	0.01	17.7	0.24	41.7	0.11	n.d.	0.46	100.6	80.8
NI-21b-I	40.2	0.02	17.9	0.30	42.0	0.11	n.d.	0.39	100.8	80.7
NI-21b-I	40.0	0.03	17.9	0.24	42.0	0.12	n.d.	0.33	100.6	80.7
NI-21b-I	39.5	n.d.	17.8	0.26	41.8	0.12	n.d.	0.37	99.9	80.7
NI-21b-I	40.0	0.02	17.8	0.28	41.8	0.12	n.d.	0.38	100.4	80.7
NI-21b-I	39.1	0.01	17.7	0.29	41.4	0.13	n.d.	0.38	99.0	80.7
NI-21b-I	39.9	0.02	17.8	0.28	41.7	0.14	n.d.	0.36	100.2	80.7
NI-21b-I	39.7	0.03	17.9	0.28	42.0	0.14	n.d.	0.35	100.4	80.7
NI-21b-I	40.2	0.02	17.9	0.31	41.8	0.12	n.d.	0.41	100.7	80.7
NI-21b-I	39.9	0.11	18.0	0.24	41.9	0.11	0.21	0.34	100.9	80.6
NI-21b-I	39.3	0.02	18.1	0.28	41.9	0.11	0.09	0.40	100.1	80.5
NI-21b-I	40.0	0.02	17.9	0.22	41.5	0.15	0.09	0.43	100.3	80.5
NI-21b-I	39.6	0.02	17.9	0.27	41.4	0.12	n.d.	0.34	99.7	80.5
NI-21b-I	39.4	0.02	18.0	0.25	41.4	0.11	0.04	0.37	99.5	80.4
NI-21b-I	39.5	0.02	17.8	0.27	41.1	0.11	0.04	0.36	99.2	80.4
NI-21b-I	39.7	0.02	18.0	0.31	41.4	0.12	n.d.	0.35	100.0	80.4
NI-21b-I	39.9	0.02	18.1	0.28	41.6	0.12	0.05	0.43	100.5	80.4
NI-21b-I	39.7	0.02	18.1	0.29	41.6	0.11	n.d.	0.38	100.2	80.4
NI-21b-I	39.5	0.03	18.1	0.19	41.4	0.11	0.04	0.43	99.8	80.3
NI-21b-I	40.0	0.02	18.1	0.29	41.4	0.11	n.d.	0.42	100.4	80.3
NI-21b-I	39.2	0.03	18.1	0.25	41.1	0.12	0.04	0.36	99.2	80.2
NI-21b-I	40.2	0.02	18.3	0.34	41.3	0.13	0.12	0.37	100.8	80.1
NI-21b-I	40.5	0.01	18.3	0.21	41.2	0.12	n.d.	0.42	100.8	80.0
NI-21b-I	40.2	n.d.	18.4	0.28	41.4	0.12	n.d.	0.43	100.9	80.0
NI-21b-I	40.2	0.02	18.3	0.33	41.2	0.12	n.d.	0.39	100.6	80.0
NI-21b-I	39.9	0.02	18.5	0.30	41.2	0.11	0.05	0.39	100.5	79.9
NI-21b-I	39.8	0.01	18.4	0.30	41.1	0.13	n.d.	0.34	100.1	79.9
NI-21b-I	39.6	0.02	18.3	0.34	40.8	0.12	n.d.	0.36	99.5	79.9
NI-21b-I	39.9	0.02	18.5	0.33	41.2	0.12	n.d.	0.31	100.4	79.8
NI-21b-I	40.1	0.04	18.7	0.22	41.4	0.11	n.d.	0.32	100.9	79.8
NI-21b-I	39.5	0.01	18.6	0.28	41.2	0.12	n.d.	0.36	100.1	79.8
NI-21b-I	40.4	0.06	18.6	0.24	41.1	0.18	n.d.	0.36	100.9	79.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-I	40.1	0.04	18.2	0.25	40.2	0.12	n.d.	0.39	99.3	79.8
NI-21b-I	39.9	0.02	18.8	0.29	41.2	0.11	n.d.	0.39	100.6	79.7
NI-21b-I	40.1	0.02	18.7	0.25	41.0	0.12	n.d.	0.30	100.5	79.6
NI-21b-I	39.9	0.02	18.6	0.25	40.7	0.12	n.d.	0.32	99.9	79.5
NI-21b-I	39.9	0.03	18.7	0.25	40.9	0.18	0.04	0.37	100.4	79.5
NI-21b-I	38.9	0.31	18.6	0.28	40.6	0.14	n.d.	0.29	99.1	79.5
NI-21b-I	40.3	0.02	18.8	0.24	40.9	0.12	0.04	0.40	100.8	79.5
NI-21b-I	39.4	n.d.	18.7	0.38	40.5	0.17	n.d.	0.31	99.4	79.4
NI-21b-I	39.4	0.02	18.8	0.23	40.7	0.12	n.d.	0.34	99.7	79.4
NI-21b-I	40.0	0.03	18.6	0.31	40.3	0.12	n.d.	0.34	99.8	79.4
NI-21b-I	39.8	0.02	18.9	0.29	40.9	0.13	n.d.	0.34	100.5	79.4
NI-21b-I	40.2	0.01	18.9	0.30	40.7	0.13	n.d.	0.34	100.5	79.3
NI-21b-I	39.6	0.02	18.9	0.29	40.7	0.11	n.d.	0.34	100.0	79.3
NI-21b-I	40.1	0.02	19.1	0.29	40.8	0.14	n.d.	0.38	100.8	79.2
NI-21b-I	39.8	0.02	19.1	0.25	40.9	0.13	n.d.	0.34	100.6	79.2
NI-21b-I	39.4	0.02	19.1	0.27	40.9	0.13	n.d.	0.42	100.2	79.2
NI-21b-I	39.9	0.02	19.2	0.25	40.8	0.12	0.21	0.39	100.8	79.1
NI-21b-I	39.7	0.01	19.3	0.32	40.8	0.11	n.d.	0.33	100.5	79.1
NI-21b-I	39.2	0.06	19.2	0.30	40.5	0.18	n.d.	0.33	99.7	79.0
NI-21b-I	40.0	0.02	19.2	0.36	40.3	0.14	0.04	0.38	100.5	78.9
NI-21b-I	39.2	0.02	19.3	0.30	40.5	0.12	0.05	0.35	99.9	78.9
NI-21b-	39.3	0.02	19.4	0.34	40.7	0.10	n.d.	0.34	100.3	78.9
NI-21b-I	38.8	0.01	19.4	0.38	40.3	0.15	n.d.	0.31	99.3	78.8
NI-21b-I	39.1	0.02	19.4	0.32	40.4	0.15	0.05	0.34	99.8	78.8
NI-21b-I	39.7	0.02	19.6	0.31	40.5	0.12	0.04	0.32	100.6	78.7
NI-21b-I	39.2	0.02	19.3	0.26	40.0	0.13	0.03	0.31	99.3	78.7
NI-21b-I	39.2	0.02	19.5	0.34	40.4	0.12	n.d.	0.34	100.0	78.6
NI-21b-I	39.9	0.05	19.7	0.25	40.1	0.17	0.17	0.31	100.6	78.4
NI-21b-I	39.5	0.02	19.8	0.33	40.1	0.13	n.d.	0.30	100.2	78.3
NI-21b-I	39.3	0.04	19.9	0.35	40.3	0.17	n.d.	0.29	100.3	78.3
NI-21b-I	39.1	0.02	19.9	0.33	40.1	0.13	0.03	0.27	100.0	78.2
NI-21b-I	39.0	0.02	19.9	0.27	40.0	0.12	n.d.	0.28	99.6	78.2
NI-21b-I	39.9	0.01	19.9	0.28	40.0	0.12	n.d.	0.34	100.6	78.1
NI-21b-I	39.6	0.02	19.9	0.28	40.0	0.15	n.d.	0.25	100.2	78.1
NI-21b-I	39.7	0.03	20.0	0.31	40.0	0.13	n.d.	0.30	100.4	78.1
NI-21b-I	39.2	0.03	19.9	0.29	39.8	0.17	n.d.	0.25	99.7	78.1
NI-21b-I	39.6	0.02	20.0	0.28	39.8	0.14	n.d.	0.26	100.1	78.0
NI-21b-I	39.0	0.02	20.0	0.33	39.8	0.12	n.d.	0.32	99.5	78.0
NI-21b-I	39.7	0.04	20.1	0.33	40.1	0.15	0.06	0.31	100.7	78.0
NI-21b-I	39.6	0.06	20.1	0.42	39.9	0.14	0.04	0.28	100.6	78.0
NI-21b-I	40.1	0.02	20.0	0.29	39.7	0.12	n.d.	0.33	100.7	77.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-I	39.3	0.02	20.1	0.30	39.7	0.21	n.d.	0.30	100.0	77.9
NI-21b-I	39.4	0.03	20.2	0.34	39.6	0.15	0.06	0.29	100.1	77.8
NI-21b-I	39.1	0.02	20.1	0.28	39.5	0.12	n.d.	0.38	99.5	77.8
NI-21b-I	39.2	0.02	20.1	0.28	39.4	0.11	n.d.	0.33	99.5	77.7
NI-21b-I	39.4	0.02	20.4	0.28	39.6	0.11	n.d.	0.34	100.2	77.6
NI-21b-I	39.1	0.01	20.3	0.34	39.4	0.16	n.d.	0.30	99.7	77.6
NI-21b-I	39.0	0.02	20.3	0.33	39.3	0.13	n.d.	0.30	99.4	77.5
NI-21b-I	39.7	0.02	20.4	0.22	39.3	0.12	n.d.	0.30	100.1	77.5
NI-21b-I	39.7	0.02	20.6	0.35	39.6	0.15	n.d.	0.29	100.7	77.4
NI-21b-I	39.4	0.02	20.6	0.33	39.5	0.13	0.03	0.33	100.3	77.4
NI-21b-I	39.2	0.03	20.3	0.33	38.9	0.15	n.d.	0.29	99.2	77.3
NI-21b-I	39.1	0.01	20.5	0.34	39.2	0.15	n.d.	0.27	99.6	77.3
NI-21b-I	39.9	0.02	20.7	0.32	39.5	0.14	0.03	0.28	100.9	77.3
NI-21b-I	39.5	0.02	20.7	0.35	39.4	0.14	0.04	0.30	100.5	77.2
NI-21b-I	39.6	0.05	20.5	0.29	39.0	0.17	n.d.	0.31	100.0	77.2
NI-21b-I	39.3	0.02	20.6	0.36	39.2	0.15	n.d.	0.29	100.0	77.2
NI-21b-I	39.5	0.02	20.8	0.36	39.6	0.12	n.d.	0.28	100.7	77.2
NI-21b-I	39.4	0.02	20.9	0.33	39.6	0.13	0.19	0.32	100.9	77.2
NI-21b-I	38.4	n.d.	20.8	0.30	39.4	0.18	n.d.	0.25	99.3	77.2
NI-21b-I	39.7	0.02	20.8	0.30	39.4	0.21	n.d.	0.28	100.7	77.1
NI-21b-I	39.7	0.02	20.7	0.34	39.2	0.15	0.04	0.30	100.4	77.1
NI-21b-I	38.8	0.01	20.8	0.39	39.2	0.15	n.d.	0.25	99.6	77.1
NI-21b-I	38.8	0.01	20.8	0.27	39.0	0.19	n.d.	0.24	99.2	77.0
NI-21b-I	39.1	0.04	20.8	0.33	39.0	0.14	0.03	0.25	99.8	77.0
NI-21b-I	40.0	0.02	20.9	0.28	39.3	0.13	n.d.	0.31	101.0	77.0
NI-21b-I	38.6	0.07	20.9	0.37	39.2	0.13	0.04	0.27	99.7	77.0
NI-21b-I	39.2	0.01	21.0	0.36	39.1	0.15	0.03	0.30	100.2	76.9
NI-21b-I	38.8	0.02	21.1	0.39	39.3	0.16	n.d.	0.27	100.1	76.9
NI-21b-I	39.0	0.02	20.9	0.35	38.9	0.21	n.d.	0.28	99.7	76.9
NI-21b-I	39.6	0.03	21.0	0.33	39.1	0.15	0.04	0.33	100.5	76.8
NI-21b-I	39.3	0.03	21.0	0.33	38.9	0.18	n.d.	0.30	100.1	76.7
NI-21b-I	38.8	n.d.	21.1	0.38	39.0	0.18	n.d.	0.26	99.7	76.7
NI-21b-I	39.7	0.02	21.1	0.36	39.0	0.19	0.04	0.26	100.7	76.7
NI-21b-I	39.4	0.02	21.3	0.39	39.2	0.20	n.d.	0.24	100.8	76.6
NI-21b-I	39.3	0.02	21.1	0.35	38.7	0.20	0.11	0.24	100.1	76.6
NI-21b-I	39.0	0.03	21.5	0.35	39.2	0.13	n.d.	0.28	100.5	76.5
NI-21b-I	39.3	0.02	21.2	0.35	38.1	0.20	n.d.	0.24	99.5	76.2
NI-21b-I	39.7	0.01	21.5	0.30	38.6	0.13	n.d.	0.24	100.4	76.2
NI-21b-I	39.6	0.01	21.4	0.40	38.3	0.22	0.03	0.25	100.2	76.1
NI-21b-I	39.0	0.02	21.5	0.39	38.5	0.21	n.d.	0.19	99.8	76.1
NI-21b-I	38.4	0.02	21.5	0.38	38.3	0.19	n.d.	0.17	99.0	76.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-I	39.2	0.02	21.8	0.40	38.5	0.21	n.d.	0.28	100.4	75.9
NI-21b-I	39.1	0.02	21.8	0.43	38.4	0.20	n.d.	0.25	100.2	75.9
NI-21b-I	38.6	0.02	21.7	0.35	38.3	0.11	n.d.	0.31	99.4	75.9
NI-21b-I	38.8	0.03	21.8	0.36	38.4	0.12	n.d.	0.32	99.9	75.8
NI-21b-I	38.7	0.02	21.8	0.35	38.1	0.20	n.d.	0.22	99.4	75.7
NI-21b-I	39.2	0.02	21.9	0.41	38.2	0.21	n.d.	0.20	100.1	75.7
NI-21b-I	39.0	0.02	22.1	0.38	38.6	0.21	n.d.	0.23	100.6	75.7
NI-21b-I	38.5	0.02	21.9	0.35	38.3	0.16	n.d.	0.27	99.5	75.7
NI-21b-I	39.3	0.02	22.1	0.32	38.5	0.15	n.d.	0.26	100.7	75.7
NI-21b-I	39.4	0.02	22.1	0.34	38.0	0.23	0.03	0.22	100.4	75.4
NI-21b-I	38.6	0.01	22.1	0.35	37.9	0.15	0.05	0.31	99.5	75.3
NI-21b-I	38.8	0.01	22.2	0.37	37.9	0.23	n.d.	0.21	99.7	75.3
NI-21b-I	39.4	0.02	22.4	0.43	38.2	0.22	n.d.	0.23	100.9	75.3
NI-21b-I	39.0	0.02	22.3	0.34	38.0	0.22	n.d.	0.25	100.2	75.3
NI-21b-I	38.4	0.02	22.2	0.37	37.8	0.21	0.04	0.18	99.2	75.3
NI-21b-I	38.9	0.02	22.4	0.37	38.2	0.21	n.d.	0.20	100.3	75.3
NI-21b-I	38.4	0.02	22.2	0.40	37.7	0.26	n.d.	0.15	99.2	75.2
NI-21b-I	38.4	0.02	22.2	0.41	37.8	0.23	n.d.	0.20	99.2	75.2
NI-21b-I	38.4	0.02	22.2	0.34	37.8	0.22	n.d.	0.20	99.3	75.2
NI-21b-I	39.1	0.02	22.5	0.34	38.0	0.21	n.d.	0.22	100.4	75.1
NI-21b-I	38.8	0.01	22.3	0.38	37.7	0.19	n.d.	0.24	99.7	75.1
NI-21b-I	38.6	n.d.	22.4	0.34	37.9	0.13	n.d.	0.27	99.6	75.1
NI-21b-I	39.7	0.01	22.4	0.42	37.9	0.16	n.d.	0.25	100.8	75.1
NI-21b-I	39.0	0.10	22.3	0.39	37.6	0.22	n.d.	0.20	99.8	75.1
NI-21b-I	38.9	0.03	22.3	0.37	37.6	0.22	n.d.	0.18	99.6	75.0
NI-21b-I	39.4	0.02	22.5	0.40	37.7	0.25	0.03	0.22	100.5	75.0
NI-21b-I	38.9	0.02	22.5	0.36	37.7	0.21	n.d.	0.14	99.9	75.0
NI-21b-I	38.9	0.02	22.2	0.29	37.3	0.20	n.d.	0.19	99.2	74.9
NI-21b-I	39.0	0.02	22.6	0.37	38.0	0.18	n.d.	0.28	100.5	74.9
NI-21b-I	39.1	0.02	22.4	0.44	37.5	0.23	n.d.	0.16	99.8	74.9
NI-21b-I	38.6	0.01	22.6	0.37	37.7	0.19	n.d.	0.24	99.7	74.9
NI-21b-I	39.6	0.03	22.5	0.34	37.5	0.27	n.d.	0.17	100.4	74.8
NI-21b-I	39.4	0.02	22.6	0.35	37.8	0.17	n.d.	0.26	100.6	74.8
NI-21b-I	38.6	0.02	22.5	0.37	37.6	0.21	0.22	0.26	99.7	74.8
NI-21b-I	38.7	0.01	22.8	0.39	38.1	0.19	n.d.	0.18	100.3	74.8
NI-21b-I	39.1	0.02	22.6	0.35	37.6	0.25	n.d.	0.17	100.2	74.8
NI-21b-I	38.6	0.03	22.6	0.36	37.5	0.20	n.d.	0.22	99.6	74.7
NI-21b-I	39.4	0.02	22.7	0.44	37.7	0.21	n.d.	0.23	100.7	74.7
NI-21b-I	38.8	0.02	22.6	0.39	37.3	0.22	n.d.	0.23	99.6	74.7
NI-21b-I	39.1	0.03	22.9	0.37	37.7	0.22	n.d.	0.24	100.5	74.6
NI-21b-I	38.9	0.02	22.6	0.35	37.2	0.24	n.d.	0.22	99.4	74.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
NI-21b-I	38.6	0.03	22.7	0.38	37.3	0.20	n.d.	0.21	99.4	74.5
NI-21b-I	38.9	0.02	22.9	0.33	37.6	0.21	n.d.	0.20	100.2	74.5
NI-21b-I	39.0	0.01	22.7	0.39	37.1	0.23	0.03	0.21	99.8	74.5
NI-21b-I	39.3	0.02	22.8	0.33	37.2	0.24	n.d.	0.22	100.2	74.4
NI-21b-I	38.6	0.02	22.9	0.32	37.1	0.25	n.d.	0.22	99.3	74.3
NI-21b-I	39.0	0.02	23.2	0.37	37.4	0.21	n.d.	0.16	100.5	74.2
NI-21b-I	38.9	0.02	23.1	0.39	37.2	0.23	n.d.	0.18	100.1	74.1
NI-21b-I	38.9	0.02	23.1	0.38	37.1	0.18	n.d.	0.25	99.9	74.1
NI-21b-I	38.8	0.02	23.3	0.40	37.1	0.26	n.d.	0.19	100.1	74.0
NI-21b-I	38.8	0.02	23.3	0.37	37.1	0.24	n.d.	0.20	100.1	73.9
NI-21b-I	38.4	n.d.	23.2	0.40	36.9	0.18	n.d.	0.25	99.4	73.9
NI-21b-I	38.6	0.02	23.3	0.35	37.0	0.27	n.d.	0.19	99.7	73.9
NI-21b-I	38.4	0.01	23.4	0.46	37.1	0.17	n.d.	0.25	99.9	73.9
NI-21b-I	38.4	0.02	23.3	0.40	36.7	0.25	0.05	0.18	99.2	73.8
NI-21b-I	39.5	0.06	22.8	0.37	36.0	0.57	n.d.	0.20	99.5	73.7
NI-21b-I	38.2	0.02	23.3	0.37	36.7	0.25	n.d.	0.16	99.0	73.7
NI-21b-I	38.9	0.02	23.5	0.33	37.0	0.26	0.04	0.19	100.3	73.7
NI-21b-I	39.3	0.02	23.6	0.36	36.9	0.25	n.d.	0.20	100.7	73.6
NI-21b-I	38.8	0.02	23.3	0.45	36.5	0.26	n.d.	0.18	99.6	73.6
NI-21b-I	38.5	0.03	23.5	0.44	36.4	0.25	n.d.	0.16	99.2	73.4
NI-21b-I	39.0	0.01	23.8	0.40	36.8	0.24	n.d.	0.22	100.5	73.4
NI-21b-I	38.7	0.02	23.9	0.36	36.7	0.27	0.03	0.14	100.1	73.3
NI-21b-I	37.8	0.01	24.1	0.41	36.7	0.22	n.d.	0.21	99.5	73.1
NI-21b-I	39.5	0.02	24.0	0.38	36.2	0.27	n.d.	0.19	100.6	72.9
APA-2n	40.7	0.02	14.2	0.22	44.3	0.13	0.04	0.34	100.0	84.8
APA-2n	40.5	0.03	14.2	0.18	44.1	0.13	0.04	0.35	99.4	84.7
APA-2n	40.4	0.02	14.3	0.21	44.3	0.13	n.d.	0.39	99.7	84.7
APA-2n	40.4	0.01	14.2	0.23	44.0	0.13	n.d.	0.38	99.4	84.7
APA-2n	40.3	0.02	14.3	0.16	44.2	0.14	0.03	0.35	99.6	84.6
APA-2n	40.1	0.01	14.3	0.17	44.0	0.14	0.03	0.38	99.1	84.6
APA-2n	40.6	0.01	14.4	0.21	44.2	0.13	n.d.	0.45	99.9	84.6
APA-2n	40.5	0.02	14.4	0.19	44.2	0.12	0.03	0.42	99.9	84.6
APA-2n	40.9	0.03	14.5	0.13	44.4	0.14	0.04	0.34	100.4	84.5
APA-2n	40.5	0.02	14.4	0.22	44.2	0.13	0.04	0.38	100.0	84.5
APA-2n	40.3	0.02	14.5	0.18	44.4	0.13	0.06	0.37	100.0	84.5
APA-2n	40.4	0.02	14.5	0.24	44.2	0.14	0.07	0.37	99.8	84.5
APA-2n	40.5	0.03	14.5	0.13	44.2	0.12	n.d.	0.37	99.9	84.5
APA-2n	40.2	0.03	14.5	0.23	44.0	0.14	0.07	0.35	99.5	84.5
APA-2n	40.7	0.02	14.5	0.24	44.1	0.13	n.d.	0.35	100.0	84.5
APA-2n	40.2	n.d.	14.5	0.25	44.1	0.14	0.03	0.36	99.6	84.4
APA-2n	40.3	0.02	14.5	0.23	44.0	0.13	n.d.	0.40	99.6	84.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-2n	40.6	0.03	14.4	0.19	43.8	0.14	0.05	0.42	99.7	84.4
APA-2n	40.7	0.03	14.5	0.18	43.9	0.14	n.d.	0.42	99.9	84.4
APA-2n	40.6	0.02	14.6	0.20	44.3	0.14	n.d.	0.35	100.3	84.4
APA-2n	40.4	0.04	14.5	0.20	43.9	0.13	0.03	0.41	99.7	84.3
APA-2n	40.3	0.03	14.7	0.24	44.2	0.13	0.04	0.34	99.9	84.3
APA-2n	40.7	0.03	14.7	0.20	44.2	0.13	n.d.	0.44	100.3	84.3
APA-2n	40.2	n.d.	14.6	0.18	44.0	0.14	0.05	0.37	99.5	84.3
APA-2n	40.8	0.01	14.6	0.22	44.0	0.12	0.03	0.45	100.2	84.3
APA-2n	40.6	0.03	14.7	0.25	44.2	0.13	n.d.	0.42	100.3	84.3
APA-2n	40.4	0.03	14.6	0.20	43.9	0.14	0.04	0.36	99.7	84.3
APA-2n	40.2	0.02	14.7	0.24	44.3	0.13	0.03	0.36	100.0	84.3
APA-2n	40.6	0.03	14.7	0.20	44.2	0.12	n.d.	0.46	100.3	84.3
APA-2n	40.4	0.01	14.7	0.25	44.2	0.13	0.05	0.40	100.2	84.3
APA-2n	40.6	0.02	14.7	0.25	44.1	0.13	n.d.	0.41	100.2	84.3
APA-2n	40.7	0.02	14.6	0.23	44.0	0.13	n.d.	0.45	100.1	84.3
APA-2n	40.4	0.03	14.7	0.18	44.0	0.12	0.03	0.41	99.9	84.2
APA-2n	40.6	0.02	14.7	0.21	43.9	0.12	0.04	0.37	100.0	84.2
APA-2n	40.5	0.02	14.7	0.15	44.1	0.13	0.06	0.40	100.1	84.2
APA-2n	40.4	0.03	14.7	0.24	44.0	0.12	n.d.	0.39	99.9	84.2
APA-2n	40.6	0.03	14.8	0.23	44.0	0.13	n.d.	0.42	100.2	84.2
APA-2n	40.7	0.02	14.7	0.21	43.9	0.13	0.05	0.40	100.2	84.2
APA-2n	40.5	0.01	14.9	0.16	44.1	0.12	0.05	0.47	100.3	84.1
APA-2n	40.7	0.01	14.9	0.20	44.2	0.12	0.04	0.47	100.6	84.1
APA-2n	40.5	0.02	14.8	0.24	43.8	0.13	n.d.	0.34	99.8	84.1
APA-2n	40.7	0.02	14.9	0.26	44.0	0.14	0.04	0.41	100.5	84.1
APA-2n	40.6	0.02	14.8	0.20	43.9	0.13	0.05	0.42	100.1	84.1
APA-2n	40.7	0.03	14.9	0.17	44.1	0.13	n.d.	0.43	100.4	84.1
APA-2n	40.6	0.03	14.8	0.19	43.8	0.14	0.08	0.38	99.9	84.1
APA-2n	40.5	0.02	14.8	0.21	43.9	0.12	n.d.	0.43	100.0	84.0
APA-2n	40.4	0.02	14.9	0.28	44.0	0.14	0.10	0.36	100.2	84.0
APA-2n	40.7	0.01	15.0	0.21	44.3	0.13	n.d.	0.44	100.7	84.0
APA-2n	40.2	0.01	14.9	0.19	43.9	0.14	0.04	0.34	99.7	84.0
APA-2n	40.6	0.03	14.9	0.21	44.0	0.12	0.03	0.42	100.2	84.0
APA-2n	40.6	0.01	14.8	0.19	43.8	0.14	n.d.	0.38	100.0	84.0
APA-2n	40.5	0.04	15.0	0.27	44.1	0.14	n.d.	0.41	100.5	84.0
APA-2n	40.6	0.03	14.8	0.20	43.7	0.13	n.d.	0.36	99.9	84.0
APA-2n	40.6	0.02	15.0	0.20	44.0	0.13	n.d.	0.43	100.4	84.0
APA-2n	40.5	0.02	14.9	0.16	43.8	0.14	0.04	0.35	99.8	84.0
APA-2n	40.4	0.02	14.9	0.21	43.9	0.12	0.03	0.42	100.1	84.0
APA-2n	40.6	0.01	15.0	0.23	43.9	0.13	0.04	0.39	100.3	83.9
APA-2n	40.1	0.02	14.9	0.24	43.7	0.20	0.12	0.33	99.6	83.9

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-2n	40.6	0.02	15.0	0.25	43.7	0.13	n.d.	0.39	100.0	83.9
APA-2n	40.7	0.01	15.1	0.20	44.0	0.12	n.d.	0.39	100.5	83.9
APA-2n	40.3	0.02	14.9	0.20	43.6	0.13	0.06	0.38	99.7	83.9
APA-2n	40.2	0.02	15.0	0.21	43.7	0.14	0.10	0.34	99.8	83.8
APA-2n	40.8	0.02	15.1	0.19	44.0	0.13	n.d.	0.41	100.7	83.8
APA-2n	40.6	0.02	15.2	0.16	44.1	0.14	0.05	0.40	100.6	83.8
APA-2n	40.5	0.03	15.2	0.27	44.2	0.13	0.06	0.34	100.7	83.8
APA-2n	40.1	0.03	15.1	0.32	43.6	0.15	n.d.	0.35	99.6	83.8
APA-2n	40.4	0.02	15.1	0.15	43.8	0.13	n.d.	0.36	100.1	83.8
APA-2n	40.4	0.02	15.1	0.24	43.7	0.13	0.03	0.36	100.0	83.7
APA-2n	40.4	n.d.	15.1	0.24	43.4	0.13	n.d.	0.36	99.7	83.7
APA-2n	40.4	0.01	15.2	0.21	43.7	0.12	n.d.	0.37	100.1	83.7
APA-2n	40.6	0.02	15.2	0.19	43.6	0.13	n.d.	0.34	100.1	83.7
APA-2n	40.7	0.02	15.3	0.20	43.7	0.13	0.07	0.38	100.5	83.6
APA-2n	40.6	0.02	15.3	0.25	43.7	0.14	0.04	0.37	100.3	83.6
APA-2n	40.5	0.03	15.2	0.21	43.5	0.14	n.d.	0.36	100.1	83.6
APA-2n	40.6	0.03	15.2	0.16	43.4	0.18	0.10	0.36	100.1	83.5
APA-2n	40.3	0.02	15.3	0.30	43.6	0.15	0.04	0.35	100.2	83.5
APA-2n	40.5	0.03	15.3	0.23	43.4	0.12	0.05	0.34	99.9	83.5
APA-2n	40.4	0.02	15.4	0.24	43.7	0.13	0.05	0.33	100.1	83.5
APA-2n	40.4	0.02	15.3	0.23	43.3	0.14	n.d.	0.37	99.8	83.5
APA-2n	40.7	0.02	15.3	0.24	43.3	0.13	n.d.	0.37	100.0	83.5
APA-2n	40.4	0.02	15.4	0.19	43.5	0.13	n.d.	0.38	100.0	83.4
APA-2n	40.5	n.d.	15.5	0.27	43.6	0.14	n.d.	0.33	100.4	83.4
APA-2n	40.5	0.02	15.4	0.16	43.3	0.12	n.d.	0.35	99.9	83.3
APA-2n	40.5	0.02	15.5	0.22	43.3	0.14	n.d.	0.38	100.1	83.3
APA-2n	40.5	0.02	15.5	0.26	43.4	0.13	0.03	0.36	100.3	83.3
APA-2n	40.4	0.02	15.6	0.23	43.6	0.13	0.03	0.33	100.4	83.3
APA-2n	40.2	0.01	15.5	0.25	43.1	0.13	n.d.	0.34	99.5	83.2
APA-2n	40.6	0.02	15.6	0.21	43.3	0.13	n.d.	0.31	100.2	83.2
APA-2n	40.4	0.02	15.6	0.26	43.4	0.12	0.04	0.34	100.2	83.2
APA-2n	40.4	0.02	15.7	0.19	43.5	0.13	n.d.	0.41	100.3	83.2
APA-2n	40.4	0.02	15.5	0.29	43.2	0.13	n.d.	0.38	100.0	83.2
APA-2n	40.6	0.02	15.7	0.23	43.5	0.12	0.03	0.32	100.5	83.2
APA-2n	40.5	0.01	15.6	0.19	43.3	0.14	0.03	0.31	100.1	83.2
APA-2n	40.7	0.02	15.7	0.25	43.4	0.12	0.04	0.31	100.5	83.1
APA-2n	40.6	0.01	15.8	0.22	43.6	0.12	n.d.	0.33	100.7	83.1
APA-2n	40.3	0.02	15.6	0.18	43.3	0.12	n.d.	0.33	99.9	83.1
APA-2n	40.5	0.02	15.7	0.20	43.4	0.13	0.07	0.33	100.4	83.1
APA-2n	40.6	0.02	15.8	0.20	43.5	0.14	0.04	0.33	100.6	83.1
APA-2n	40.5	n.d.	15.7	0.27	43.2	0.13	n.d.	0.34	100.1	83.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-2n	40.3	n.d.	15.7	0.25	43.3	0.14	n.d.	0.32	100.1	83.1
APA-2n	40.5	0.02	15.6	0.23	42.9	0.12	n.d.	0.30	99.7	83.1
APA-2n	40.4	0.02	15.7	0.24	43.2	0.12	0.04	0.34	100.1	83.0
APA-2n	40.5	0.02	15.9	0.20	43.5	0.13	n.d.	0.35	100.6	83.0
APA-2n	40.4	0.01	15.7	0.24	43.2	0.14	n.d.	0.33	100.1	83.0
APA-2n	40.6	0.02	15.8	0.26	43.4	0.12	n.d.	0.33	100.5	83.0
APA-2n	40.4	0.02	15.8	0.25	43.3	0.13	n.d.	0.35	100.3	83.0
APA-2n	40.6	0.02	15.8	0.15	43.3	0.14	0.04	0.34	100.4	83.0
APA-2n	40.3	0.01	15.9	0.22	43.6	0.13	n.d.	0.31	100.5	83.0
APA-2n	40.4	0.01	15.8	0.21	43.0	0.11	n.d.	0.31	99.8	82.9
APA-2n	40.4	0.02	15.8	0.21	43.1	0.14	n.d.	0.33	100.1	82.9
APA-2n	40.3	0.03	15.9	0.22	43.1	0.14	n.d.	0.33	100.0	82.9
APA-2n	40.4	0.02	16.0	0.23	43.3	0.13	n.d.	0.36	100.5	82.9
APA-2n	40.3	0.01	15.8	0.19	42.9	0.11	0.03	0.32	99.7	82.8
APA-2n	40.6	0.01	16.1	0.27	43.5	0.13	0.03	0.33	100.9	82.8
APA-2n	40.4	0.02	16.1	0.25	43.2	0.13	n.d.	0.33	100.4	82.8
APA-2n	40.4	0.02	16.0	0.22	43.0	0.13	0.04	0.32	100.1	82.8
APA-2n	40.3	0.03	16.0	0.24	43.0	0.13	0.03	0.30	100.0	82.7
APA-2n	40.3	n.d.	16.0	0.32	43.0	0.13	n.d.	0.29	100.1	82.7
APA-2n	40.3	0.02	16.0	0.16	42.9	0.13	n.d.	0.33	99.9	82.7
APA-2n	39.9	0.01	16.4	0.21	43.9	0.15	0.04	0.24	100.9	82.7
APA-2n	40.1	0.01	16.0	0.23	42.8	0.16	n.d.	0.31	99.7	82.6
APA-2n	39.9	0.02	16.1	0.22	42.9	0.12	n.d.	0.36	99.6	82.6
APA-2n	40.1	0.02	16.1	0.23	42.9	0.14	n.d.	0.27	99.8	82.6
APA-2n	40.0	0.02	15.9	0.26	42.5	0.13	n.d.	0.33	99.3	82.6
APA-2n	40.2	n.d.	16.1	0.26	42.9	0.14	0.04	0.27	100.0	82.6
APA-2n	40.5	0.02	16.2	0.20	43.2	0.13	0.05	0.32	100.6	82.6
APA-2n	40.5	0.02	16.2	0.24	43.0	0.15	n.d.	0.35	100.4	82.6
APA-2n	40.6	0.01	16.3	0.22	43.3	0.14	n.d.	0.30	100.8	82.5
APA-2n	40.3	0.01	16.2	0.27	42.9	0.12	n.d.	0.30	100.1	82.5
APA-2n	40.1	0.03	16.2	0.26	42.8	0.14	n.d.	0.26	99.8	82.5
APA-2n	40.3	0.01	16.2	0.19	42.8	0.13	n.d.	0.31	100.0	82.5
APA-2n	39.8	n.d.	16.1	0.25	42.5	0.14	0.08	0.32	99.2	82.5
APA-2n	40.4	0.02	16.3	0.32	43.0	0.12	n.d.	0.31	100.5	82.4
APA-2n	40.1	0.01	16.3	0.23	42.9	0.14	0.04	0.25	100.0	82.4
APA-2n	40.3	n.d.	16.3	0.28	42.9	0.13	0.03	0.30	100.3	82.4
APA-2n	40.5	0.01	16.4	0.24	42.9	0.13	0.04	0.28	100.5	82.4
APA-2n	40.0	n.d.	16.3	0.25	42.6	0.13	0.04	0.25	99.6	82.4
APA-2n	40.2	0.03	16.3	0.22	42.5	0.11	n.d.	0.32	99.7	82.3
APA-2n	40.4	0.02	16.4	0.24	42.7	0.14	n.d.	0.23	100.1	82.3
APA-2n	40.2	n.d.	16.5	0.29	42.9	0.12	n.d.	0.24	100.4	82.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-2n	40.0	0.01	16.2	0.25	42.1	0.13	n.d.	0.26	99.1	82.2
APA-2n	40.2	0.02	16.5	0.22	42.7	0.12	n.d.	0.29	100.1	82.2
APA-2n	40.2	0.02	16.5	0.25	42.7	0.15	n.d.	0.26	100.0	82.2
APA-2n	40.5	0.02	16.6	0.22	42.9	0.16	n.d.	0.27	100.7	82.2
APA-2n	40.3	0.02	16.5	0.24	42.7	0.12	n.d.	0.22	100.2	82.2
APA-2n	40.2	0.02	16.5	0.21	42.5	0.14	n.d.	0.29	99.9	82.1
APA-2n	40.1	0.02	16.5	0.24	42.5	0.12	n.d.	0.29	99.7	82.1
APA-2n	40.1	0.02	16.5	0.21	42.6	0.13	n.d.	0.37	100.0	82.1
APA-2n	40.3	0.02	16.6	0.25	42.8	0.13	n.d.	0.29	100.5	82.1
APA-2n	40.4	0.02	16.7	0.22	42.9	0.13	0.03	0.28	100.6	82.1
APA-2n	39.9	0.03	16.5	0.20	42.4	0.13	0.05	0.31	99.5	82.1
APA-2n	40.4	n.d.	16.7	0.22	42.8	0.13	0.04	0.31	100.6	82.1
APA-2n	40.4	0.02	16.7	0.24	42.8	0.15	n.d.	0.29	100.6	82.1
APA-2n	40.2	n.d.	16.7	0.22	42.9	0.13	0.03	0.33	100.6	82.0
APA-2n	40.4	0.03	16.7	0.21	42.8	0.13	n.d.	0.30	100.6	82.0
APA-2n	40.0	0.01	16.4	0.23	42.0	0.14	n.d.	0.26	99.1	82.0
APA-2n	40.4	0.03	16.7	0.18	42.6	0.13	n.d.	0.29	100.4	82.0
APA-2n	40.2	0.01	16.8	0.25	42.9	0.12	0.04	0.34	100.6	82.0
APA-2n	39.9	0.02	16.6	0.24	42.5	0.12	n.d.	0.30	99.8	82.0
APA-2n	40.6	n.d.	16.7	0.26	42.8	0.12	n.d.	0.28	100.8	82.0
APA-2n	40.7	0.02	16.6	0.29	42.3	0.13	n.d.	0.32	100.4	82.0
APA-2n	39.9	0.01	16.6	0.20	42.4	0.13	n.d.	0.32	99.6	82.0
APA-2n	40.4	n.d.	16.8	0.29	42.9	0.11	n.d.	0.25	100.7	82.0
APA-2n	40.0	0.02	16.7	0.27	42.4	0.13	n.d.	0.26	99.7	81.9
APA-2n	39.9	0.02	16.5	0.26	41.8	0.15	n.d.	0.33	99.1	81.9
APA-2n	40.3	0.02	16.8	0.30	42.6	0.13	0.03	0.29	100.5	81.9
APA-2n	40.3	0.02	16.8	0.19	42.6	0.11	n.d.	0.30	100.4	81.9
APA-2n	40.3	0.02	16.9	0.29	42.8	0.14	n.d.	0.29	100.9	81.8
APA-2n	40.2	0.01	16.7	0.25	42.2	0.14	0.04	0.33	99.9	81.8
APA-2n	40.4	0.02	17.0	0.28	42.8	0.13	n.d.	0.32	100.9	81.8
APA-2n	40.4	0.02	16.9	0.28	42.6	0.13	n.d.	0.23	100.5	81.8
APA-2n	39.9	0.01	16.7	0.22	42.1	0.13	n.d.	0.32	99.5	81.8
APA-2n	40.2	0.02	16.9	0.26	42.4	0.14	n.d.	0.31	100.3	81.8
APA-2n	40.2	0.02	16.8	0.24	42.1	0.13	0.04	0.28	99.8	81.7
APA-2n	40.3	0.02	16.9	0.22	42.4	0.15	n.d.	0.26	100.3	81.7
APA-2n	40.0	0.03	16.8	0.28	42.1	0.14	0.14	0.32	99.8	81.7
APA-2n	40.4	0.01	17.0	0.24	42.7	0.18	n.d.	0.36	100.9	81.7
APA-2n	40.5	0.02	17.1	0.23	42.8	0.15	n.d.	0.25	101.0	81.7
APA-2n	40.2	0.01	17.1	0.22	42.7	0.14	n.d.	0.25	100.6	81.7
APA-2n	40.4	0.03	17.0	0.25	42.6	0.13	0.03	0.32	100.8	81.7
APA-2n	40.1	0.03	17.0	0.29	42.3	0.13	n.d.	0.28	100.2	81.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-2n	40.4	0.02	17.1	0.24	42.7	0.16	n.d.	0.24	100.9	81.6
APA-2n	39.8	0.02	16.8	0.24	41.9	0.13	n.d.	0.31	99.3	81.6
APA-2n	40.4	0.02	17.0	0.21	42.4	0.13	n.d.	0.31	100.5	81.6
APA-2n	40.1	0.02	17.0	0.27	42.4	0.14	n.d.	0.23	100.2	81.6
APA-2n	39.9	0.02	17.0	0.31	42.2	0.14	n.d.	0.30	99.9	81.5
APA-2n	40.3	0.02	17.0	0.31	42.0	0.14	n.d.	0.25	100.1	81.5
APA-2n	40.3	0.02	17.1	0.27	42.3	0.13	n.d.	0.28	100.4	81.5
APA-2n	39.8	0.01	16.9	0.25	41.7	0.14	n.d.	0.20	99.0	81.5
APA-2n	40.0	0.02	17.0	0.20	42.0	0.13	n.d.	0.32	99.8	81.4
APA-2n	40.3	0.02	17.2	0.26	42.3	0.15	n.d.	0.24	100.5	81.4
APA-2n	39.9	0.01	17.2	0.31	42.2	0.14	0.03	0.23	100.2	81.4
APA-2n	40.3	n.d.	17.3	0.28	42.1	0.14	n.d.	0.25	100.3	81.3
APA-2n	40.2	0.02	17.4	0.24	42.3	0.17	0.04	0.26	100.6	81.3
APA-2n	40.0	0.02	17.2	0.17	41.9	0.15	n.d.	0.34	99.7	81.3
APA-2n	40.4	0.02	17.4	0.28	42.3	0.13	n.d.	0.27	100.8	81.3
APA-2n	40.2	0.01	17.3	0.29	42.0	0.14	n.d.	0.25	100.2	81.2
APA-2n	39.9	0.02	17.2	0.29	41.4	0.13	n.d.	0.25	99.2	81.1
APA-2n	39.9	0.01	17.5	0.28	42.1	0.12	0.03	0.28	100.2	81.1
APA-2n	40.2	0.02	17.5	0.30	42.0	0.15	n.d.	0.26	100.4	81.1
APA-2n	40.4	0.02	17.5	0.27	42.0	0.13	n.d.	0.30	100.6	81.0
APA-2n	40.3	0.02	17.6	0.22	42.1	0.14	n.d.	0.30	100.6	81.0
APA-2n	39.6	0.02	17.4	0.25	41.5	0.14	0.07	0.32	99.4	81.0
APA-2n	40.1	0.03	17.6	0.22	42.1	0.13	n.d.	0.29	100.6	81.0
APA-2n	40.0	0.01	17.4	0.32	41.6	0.14	n.d.	0.25	99.7	81.0
APA-2n	40.2	0.01	17.7	0.27	42.3	0.15	n.d.	0.25	100.9	81.0
APA-2n	40.4	0.01	17.6	0.27	41.9	0.14	n.d.	0.26	100.6	80.9
APA-2n	39.8	0.02	17.4	0.34	41.4	0.14	0.05	0.30	99.4	80.9
APA-2n	40.1	0.02	17.6	0.20	41.8	0.14	n.d.	0.24	100.0	80.9
APA-2n	40.0	0.01	17.7	0.29	42.0	0.15	n.d.	0.21	100.5	80.9
APA-2n	39.9	0.02	17.7	0.26	41.8	0.14	n.d.	0.26	100.1	80.9
APA-2n	39.9	n.d.	17.6	0.36	41.8	0.15	n.d.	0.23	100.1	80.8
APA-2n	40.2	0.01	17.8	0.29	42.1	0.14	n.d.	0.27	100.9	80.8
APA-2n	40.2	0.03	17.8	0.30	42.0	0.13	0.03	0.25	100.7	80.7
APA-2n	40.1	0.01	17.8	0.22	42.0	0.13	n.d.	0.27	100.5	80.7
APA-2n	40.7	0.05	17.4	0.31	40.9	0.17	n.d.	0.20	99.7	80.7
APA-2n	40.0	n.d.	17.8	0.33	41.9	0.18	n.d.	0.21	100.5	80.7
APA-2n	39.9	0.02	17.7	0.32	41.4	0.13	n.d.	0.29	99.7	80.7
APA-2n	40.4	0.02	17.8	0.33	41.6	0.14	n.d.	0.28	100.6	80.7
APA-2n	40.0	0.02	17.6	0.32	41.1	0.11	n.d.	0.26	99.5	80.6
APA-2n	39.8	0.01	17.7	0.32	41.4	0.13	n.d.	0.26	99.6	80.6
APA-2n	39.8	0.02	17.8	0.32	41.4	0.13	n.d.	0.30	99.7	80.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-2n	40.0	0.01	17.9	0.27	41.5	0.13	n.d.	0.31	100.1	80.6
APA-2n	40.1	n.d.	17.9	0.29	41.6	0.12	n.d.	0.23	100.3	80.5
APA-2n	40.0	0.02	17.9	0.24	41.6	0.15	n.d.	0.24	100.2	80.5
APA-2n	40.0	0.02	18.1	0.24	41.9	0.16	0.03	0.21	100.7	80.5
APA-2n	39.9	n.d.	18.0	0.31	41.5	0.13	0.03	0.31	100.2	80.5
APA-2n	40.4	0.03	18.2	0.27	41.8	0.13	n.d.	0.26	101.0	80.4
APA-2n	40.1	0.02	18.1	0.31	41.5	0.13	n.d.	0.22	100.4	80.4
APA-2n	39.7	0.02	18.2	0.23	41.7	0.16	n.d.	0.21	100.3	80.4
APA-2n	39.8	n.d.	18.0	0.32	41.4	0.12	0.06	0.33	100.0	80.4
APA-2n	39.6	n.d.	18.0	0.28	41.3	0.16	n.d.	0.23	99.5	80.3
APA-2n	40.0	0.02	18.0	0.18	41.1	0.13	n.d.	0.28	99.8	80.3
APA-2n	40.1	0.01	18.2	0.19	41.7	0.15	0.10	0.20	100.6	80.3
APA-2n	40.0	0.01	18.2	0.28	41.5	0.15	n.d.	0.19	100.3	80.3
APA-2n	40.3	0.16	18.1	0.24	41.2	0.17	n.d.	0.24	100.4	80.2
APA-2n	40.0	0.01	18.1	0.30	41.2	0.14	n.d.	0.22	99.9	80.2
APA-2n	38.6	0.05	18.8	0.27	42.6	0.15	n.d.	0.25	100.7	80.2
APA-2n	39.8	0.02	18.2	0.42	41.2	0.13	n.d.	0.27	100.1	80.2
APA-2n	40.3	0.04	18.2	0.30	41.2	0.13	n.d.	0.26	100.5	80.2
APA-2n	40.0	0.02	18.3	0.23	41.4	0.13	n.d.	0.24	100.4	80.1
APA-2n	40.4	0.02	18.4	0.31	41.4	0.14	n.d.	0.21	100.9	80.1
APA-2n	39.7	n.d.	18.2	0.24	41.1	0.14	0.04	0.28	99.8	80.1
APA-2n	39.9	0.02	18.5	0.24	41.6	0.14	n.d.	0.22	100.6	80.0
APA-2n	38.0	0.02	18.8	0.27	42.2	0.13	0.03	0.21	99.7	80.0
APA-2n	39.6	0.01	18.4	0.22	41.1	0.13	n.d.	0.28	99.7	80.0
APA-2n	40.0	0.01	18.7	0.33	41.6	0.13	n.d.	0.24	101.0	79.9
APA-2n	39.6	0.02	18.4	0.23	41.0	0.14	n.d.	0.30	99.8	79.9
APA-2n	40.1	0.03	18.6	0.33	41.2	0.15	n.d.	0.30	100.8	79.8
APA-2n	39.9	n.d.	18.4	0.34	40.8	0.14	n.d.	0.21	99.8	79.8
APA-2n	39.7	n.d.	18.5	0.30	41.0	0.13	n.d.	0.26	100.0	79.8
APA-2n	39.9	0.01	18.7	0.25	41.3	0.13	n.d.	0.23	100.6	79.8
APA-2n	39.9	0.02	18.7	0.39	41.1	0.13	n.d.	0.24	100.5	79.7
APA-2n	40.1	0.02	18.8	0.27	40.8	0.14	n.d.	0.26	100.4	79.5
APA-2n	39.4	0.02	18.7	0.29	40.6	0.15	n.d.	0.21	99.5	79.4
APA-2n	39.6	0.02	18.8	0.27	40.6	0.13	n.d.	0.29	99.7	79.4
APA-2n	39.7	0.01	18.9	0.25	40.6	0.15	n.d.	0.29	99.9	79.3
APA-2n	39.7	0.02	19.0	0.28	40.9	0.13	n.d.	0.31	100.4	79.3
APA-2n	39.4	0.01	18.9	0.28	40.5	0.12	0.05	0.26	99.5	79.3
APA-2n	39.9	n.d.	18.9	0.32	40.5	0.15	n.d.	0.28	100.0	79.3
APA-2n	40.0	0.02	19.1	0.27	40.8	0.14	n.d.	0.21	100.6	79.2
APA-2n	39.6	0.01	18.9	0.33	40.3	0.15	n.d.	0.21	99.6	79.2
APA-2n	39.7	0.02	19.0	0.21	40.5	0.14	n.d.	0.30	99.8	79.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-2n	39.9	0.02	19.0	0.23	40.4	0.15	0.06	0.19	100.0	79.1
APA-2n	39.8	0.02	19.2	0.31	40.5	0.13	0.08	0.24	100.3	79.0
APA-2n	40.1	0.02	19.4	0.26	40.8	0.14	n.d.	0.26	100.9	78.9
APA-2n	39.5	0.03	19.1	0.29	40.1	0.15	n.d.	0.23	99.4	78.9
APA-2n	39.8	0.01	19.3	0.27	40.4	0.14	n.d.	0.17	100.1	78.9
APA-2n	39.7	0.03	19.3	0.28	40.3	0.15	n.d.	0.21	100.0	78.8
APA-2n	39.8	0.02	19.4	0.23	40.5	0.14	n.d.	0.21	100.4	78.8
APA-2n	39.7	n.d.	19.4	0.22	40.4	0.12	n.d.	0.24	100.1	78.8
APA-2n	39.7	0.02	19.3	0.26	40.1	0.14	0.04	0.32	99.8	78.8
APA-2n	41.4	0.07	19.1	0.32	39.5	0.16	n.d.	0.28	100.8	78.7
APA-2n	39.2	0.02	19.6	0.30	40.6	0.16	n.d.	0.21	100.2	78.7
APA-2n	39.7	0.02	19.6	0.33	40.4	0.15	n.d.	0.21	100.5	78.6
APA-2n	39.4	0.02	19.5	0.22	40.1	0.13	n.d.	0.28	99.6	78.6
APA-2n	39.9	0.01	19.6	0.34	40.2	0.14	n.d.	0.21	100.4	78.5
APA-2n	39.7	0.01	19.7	0.34	40.2	0.14	n.d.	0.21	100.4	78.4
APA-2n	39.3	0.01	19.7	0.35	39.8	0.15	0.05	0.27	99.7	78.3
APA-2n	39.8	0.02	19.8	0.22	40.0	0.16	n.d.	0.23	100.2	78.3
APA-2n	39.5	0.02	19.7	0.27	39.7	0.16	n.d.	0.18	99.6	78.2
APA-2n	39.7	0.01	20.1	0.33	40.1	0.14	n.d.	0.20	100.6	78.1
APA-2n	39.8	0.02	20.1	0.29	39.9	0.14	n.d.	0.23	100.5	78.0
APA-2n	39.4	0.02	20.0	0.25	39.5	0.13	n.d.	0.21	99.5	77.9
APA-2n	39.6	0.01	20.3	0.29	39.6	0.14	n.d.	0.20	100.1	77.7
APA-2n	39.7	0.01	20.2	0.31	39.5	0.14	n.d.	0.21	100.1	77.7
APA-2n	39.4	0.02	20.3	0.30	39.3	0.14	n.d.	0.26	99.6	77.6
APA-2n	39.7	0.01	20.6	0.29	39.4	0.15	n.d.	0.19	100.4	77.4
APA-2n	39.7	0.02	20.8	0.36	39.7	0.17	n.d.	0.17	100.8	77.3
APA-2n	39.1	n.d.	20.5	0.33	39.0	0.15	0.04	0.17	99.4	77.2
APA-2n	39.2	0.03	20.7	0.34	39.1	0.14	n.d.	0.25	99.8	77.1
APA-2n	39.0	0.01	21.0	0.35	39.0	0.16	n.d.	0.18	99.7	76.8
APA-2n	39.2	0.02	21.0	0.35	38.9	0.15	n.d.	0.19	99.8	76.8
APA-2n	39.3	0.02	21.1	0.43	38.7	0.17	n.d.	0.18	99.9	76.6
APA-2n	39.7	0.01	21.4	0.34	39.1	0.18	n.d.	0.19	100.8	76.5
APA-2n	39.1	0.02	21.3	0.32	38.8	0.16	n.d.	0.15	99.9	76.5
APA-2n	39.4	0.01	21.4	0.32	38.9	0.16	n.d.	0.16	100.4	76.4
APA-2n	39.3	0.02	21.7	0.30	38.8	0.15	n.d.	0.23	100.5	76.1
APA-2n	39.1	0.01	21.7	0.39	38.7	0.16	n.d.	0.17	100.2	76.1
APA-2n	39.3	n.d.	21.5	0.24	38.3	0.20	n.d.	0.19	99.7	76.0
APA-2n	39.5	0.02	21.7	0.36	38.3	0.17	n.d.	0.18	100.3	75.9
APA-2n	39.2	0.01	21.7	0.33	38.2	0.21	n.d.	0.22	99.9	75.8
APA-2n	39.4	0.03	21.7	0.28	38.1	0.20	0.07	0.17	100.0	75.8
APA-2n	39.1	n.d.	21.8	0.36	38.1	0.18	n.d.	0.13	99.7	75.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
APA-2n	39.5	0.02	22.0	0.32	38.4	0.17	0.03	0.22	100.6	75.7
APA-2n	39.0	n.d.	21.8	0.30	38.0	0.17	n.d.	0.19	99.6	75.6
APA-2n	37.8	0.01	22.4	0.34	38.2	0.20	n.d.	0.16	99.1	75.3
APA-2n	39.5	0.02	22.3	0.39	37.9	0.18	n.d.	0.16	100.4	75.2
APA-2n	39.0	0.03	22.4	0.44	37.9	0.20	n.d.	0.14	100.1	75.1
APA-2n	39.2	0.02	22.4	0.38	37.9	0.25	n.d.	0.16	100.4	75.1
APA-2n	39.1	0.03	23.0	0.38	37.5	0.22	0.04	0.18	100.4	74.4
APA-2n	38.9	0.01	23.3	0.37	37.3	0.23	n.d.	0.14	100.3	74.0
APA-2n	38.9	n.d.	23.2	0.28	37.1	0.22	n.d.	0.17	99.9	74.0
APA-2n	38.9	0.03	23.5	0.36	37.0	0.18	n.d.	0.16	100.2	73.8
APA-2n	39.0	n.d.	23.4	0.48	36.7	0.23	n.d.	0.15	99.9	73.6
APA-2n	38.6	n.d.	23.9	0.43	36.6	0.22	n.d.	0.15	99.9	73.2
APA-2n	38.6	0.02	23.8	0.40	36.3	0.19	0.05	0.14	99.5	73.1
APA-2n	38.8	0.02	24.1	0.47	36.3	0.25	n.d.	0.18	100.1	72.8
APA-2n	39.0	0.02	24.3	0.34	36.2	0.23	n.d.	0.15	100.2	72.7
APA-2n	38.9	0.01	24.4	0.37	36.3	0.21	n.d.	0.20	100.3	72.6
APA-2n	38.7	0.01	25.1	0.40	35.6	0.26	n.d.	0.13	100.2	71.7
APA-2n	38.7	0.01	25.2	0.38	35.4	0.22	n.d.	0.17	100.1	71.5
APA-2n	38.7	0.01	25.5	0.39	35.6	0.21	n.d.	0.15	100.5	71.3
APA-2n	38.3	n.d.	25.8	0.38	35.1	0.22	n.d.	0.13	100.0	70.8
APA-2n	38.3	0.01	25.8	0.33	34.4	0.24	n.d.	0.16	99.3	70.4
APA-2n	37.9	0.14	27.8	0.48	32.4	0.30	n.d.	0.15	99.2	67.6
APA-2n	37.8	0.02	29.4	0.56	31.7	0.24	n.d.	0.14	99.8	65.7
APA-2n	37.4	n.d.	31.9	0.56	29.7	0.24	0.04	0.11	99.9	62.3
UR-61-M	40.1	0.02	15.2	0.22	43.5	0.12	n.d.	0.45	99.6	83.6
UR-61-M	40.4	0.02	15.3	0.18	43.9	0.12	0.04	0.46	100.3	83.6
UR-61-M	40.2	0.01	15.3	0.22	43.6	0.12	0.04	0.45	99.9	83.6
UR-61-M	40.2	0.02	15.2	0.28	43.5	0.10	0.08	0.45	99.9	83.6
UR-61-M	40.3	0.01	15.2	0.18	43.4	0.10	n.d.	0.45	99.6	83.6
UR-61-M	40.2	0.02	15.3	0.21	43.2	0.10	0.05	0.43	99.6	83.4
UR-61-M	40.4	0.01	15.4	0.29	43.3	0.10	0.06	0.42	100.1	83.4
UR-61-M	40.1	0.02	15.4	0.14	43.2	0.11	n.d.	0.41	99.4	83.3
UR-61-M	40.1	0.02	15.6	0.15	43.5	0.10	n.d.	0.43	99.9	83.3
UR-61-M	40.1	0.02	15.5	0.21	43.2	0.11	0.03	0.44	99.7	83.2
UR-61-M	39.9	0.02	15.5	0.22	43.1	0.11	n.d.	0.47	99.4	83.2
UR-61-M	40.4	0.01	15.6	0.22	43.0	0.11	n.d.	0.38	99.8	83.1
UR-61-M	40.2	0.02	15.8	0.27	42.9	0.12	n.d.	0.42	99.7	82.9
UR-61-M	40.0	0.01	15.8	0.15	42.9	0.12	0.04	0.38	99.4	82.9
UR-61-M	40.2	n.d.	15.9	0.17	43.0	0.10	0.04	0.41	99.8	82.8
UR-61-M	40.1	0.01	16.0	0.13	43.2	0.11	n.d.	0.38	99.9	82.8
UR-61-M	40.0	0.02	16.2	0.24	42.8	0.12	n.d.	0.38	99.9	82.5

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-61-I	40.1	0.01	16.2	0.27	42.7	0.11	n.d.	0.36	99.8	82.5
UR-61-I	39.7	0.02	16.5	0.21	42.1	0.13	n.d.	0.39	99.1	82.0
UR-61-I	40.1	0.02	16.8	0.19	42.0	0.12	n.d.	0.33	99.6	81.7
UR-61-I	40.2	0.02	17.2	0.29	42.6	0.12	n.d.	0.37	100.8	81.5
UR-61-I	40.1	0.02	17.1	0.23	42.0	0.10	0.04	0.32	99.9	81.4
UR-61-I	40.1	0.02	17.0	0.28	41.9	0.11	0.04	0.32	99.7	81.4
UR-61-I	40.0	0.02	17.1	0.25	42.1	0.12	n.d.	0.33	99.9	81.4
UR-61-I	40.2	0.02	17.1	0.24	42.0	0.10	n.d.	0.32	99.9	81.4
UR-61-I	40.0	0.02	17.0	0.20	41.8	0.14	n.d.	0.33	99.6	81.4
UR-61-I	40.0	0.02	17.2	0.19	42.1	0.11	n.d.	0.31	99.9	81.4
UR-61-I	40.1	0.01	17.1	0.19	41.9	0.12	n.d.	0.34	99.8	81.3
UR-61-I	39.9	0.02	17.2	0.30	42.1	0.11	n.d.	0.34	100.0	81.3
UR-61-I	39.7	0.03	17.2	0.20	41.9	0.10	n.d.	0.35	99.4	81.3
UR-61-I	40.0	0.02	17.1	0.20	41.8	0.10	n.d.	0.35	99.6	81.3
UR-61-I	39.9	0.02	17.1	0.24	41.7	0.10	n.d.	0.33	99.4	81.3
UR-61-I	40.1	n.d.	17.2	0.23	41.9	0.12	n.d.	0.33	99.9	81.3
UR-61-I	39.8	0.02	17.1	0.29	41.8	0.10	n.d.	0.34	99.6	81.3
UR-61-I	39.5	0.03	17.5	0.24	42.6	0.12	n.d.	0.33	100.4	81.3
UR-61-I	40.1	0.02	17.3	0.26	42.1	0.11	n.d.	0.37	100.2	81.3
UR-61-I	39.7	0.02	17.1	0.21	41.5	0.11	n.d.	0.30	99.0	81.3
UR-61-I	39.8	0.02	17.2	0.27	41.8	0.11	n.d.	0.28	99.5	81.3
UR-61-I	40.1	n.d.	17.2	0.25	41.9	0.11	n.d.	0.34	99.9	81.3
UR-61-I	39.8	0.02	17.3	0.25	42.0	0.10	n.d.	0.37	99.8	81.3
UR-61-I	39.7	0.02	17.3	0.21	42.0	0.10	n.d.	0.35	99.6	81.3
UR-61-I	40.0	0.02	17.2	0.30	41.7	0.11	n.d.	0.36	99.7	81.3
UR-61-I	39.6	0.03	17.4	0.25	42.2	0.11	n.d.	0.36	99.9	81.3
UR-61-I	39.9	0.02	17.2	0.27	41.8	0.10	n.d.	0.37	99.7	81.2
UR-61-I	39.8	0.01	17.3	0.26	41.9	0.12	0.04	0.35	99.7	81.2
UR-61-I	39.7	0.02	17.3	0.28	42.0	0.10	n.d.	0.33	99.7	81.2
UR-61-I	39.8	0.02	17.2	0.24	41.8	0.11	n.d.	0.33	99.5	81.2
UR-61-I	40.0	n.d.	17.3	0.26	41.9	0.10	n.d.	0.33	99.9	81.2
UR-61-I	39.7	0.02	17.5	0.25	42.4	0.13	n.d.	0.34	100.4	81.2
UR-61-I	40.0	0.02	17.2	0.20	41.8	0.11	n.d.	0.36	99.7	81.2
UR-61-I	39.8	0.01	17.2	0.22	41.7	0.11	n.d.	0.36	99.4	81.2
UR-61-I	40.0	0.01	17.4	0.31	42.0	0.11	n.d.	0.37	100.2	81.2
UR-61-I	39.7	0.02	17.3	0.25	41.9	0.10	n.d.	0.32	99.6	81.2
UR-61-I	40.2	0.01	17.3	0.24	41.8	0.11	n.d.	0.33	100.0	81.2
UR-61-I	40.0	0.02	17.3	0.18	41.7	0.11	n.d.	0.31	99.6	81.2
UR-61-I	40.3	0.02	17.3	0.18	41.8	0.11	n.d.	0.35	100.1	81.1
UR-61-I	39.9	0.02	17.3	0.22	41.7	0.10	n.d.	0.31	99.6	81.1
UR-61-I	39.7	0.02	17.4	0.18	42.0	0.11	n.d.	0.35	99.8	81.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-61-N	40.0	0.02	17.4	0.22	42.0	0.11	0.05	0.34	100.1	81.1
UR-61-N	40.1	0.01	17.4	0.24	41.8	0.11	n.d.	0.35	100.0	81.1
UR-61-N	40.2	0.02	17.4	0.17	41.9	0.11	n.d.	0.34	100.1	81.1
UR-61-N	39.7	0.01	17.4	0.24	41.8	0.11	n.d.	0.30	99.6	81.1
UR-61-N	39.9	n.d.	17.4	0.25	41.9	0.10	n.d.	0.34	100.0	81.1
UR-61-N	39.8	0.02	17.5	0.26	42.0	0.11	0.03	0.33	100.1	81.1
UR-61-N	39.9	n.d.	17.4	0.20	41.9	0.12	n.d.	0.34	99.9	81.1
UR-61-N	39.8	0.03	17.3	0.24	41.7	0.11	n.d.	0.34	99.6	81.1
UR-61-N	40.1	0.01	17.4	0.34	41.9	0.12	n.d.	0.34	100.2	81.1
UR-61-N	39.7	0.01	17.4	0.33	41.9	0.10	n.d.	0.34	99.8	81.1
UR-61-N	40.0	0.02	17.5	0.19	42.1	0.12	n.d.	0.34	100.3	81.1
UR-61-N	39.8	0.02	17.4	0.23	41.8	0.11	n.d.	0.35	99.7	81.1
UR-61-N	40.0	n.d.	17.5	0.27	42.0	0.12	n.d.	0.34	100.2	81.1
UR-61-N	39.9	0.02	17.4	0.25	41.7	0.11	n.d.	0.31	99.7	81.1
UR-61-N	39.8	0.02	17.6	0.23	42.2	0.11	n.d.	0.34	100.3	81.1
UR-61-N	40.3	0.02	17.4	0.24	41.7	0.12	0.05	0.29	100.1	81.1
UR-61-N	39.9	0.02	17.6	0.34	42.2	0.10	n.d.	0.36	100.4	81.1
UR-61-N	39.9	n.d.	17.6	0.26	42.2	0.10	n.d.	0.33	100.3	81.1
UR-61-N	40.1	0.02	17.4	0.20	41.7	0.10	n.d.	0.34	99.9	81.0
UR-61-N	40.1	0.01	17.5	0.25	41.9	0.11	n.d.	0.33	100.2	81.0
UR-61-N	39.9	0.02	17.5	0.24	42.0	0.10	n.d.	0.37	100.2	81.0
UR-61-N	39.7	0.02	17.3	0.27	41.6	0.11	n.d.	0.31	99.4	81.0
UR-61-N	40.1	0.02	17.5	0.18	41.9	0.10	n.d.	0.37	100.2	81.0
UR-61-N	39.8	0.02	17.5	0.23	41.9	0.12	n.d.	0.33	99.9	81.0
UR-61-N	40.0	0.02	17.5	0.27	41.9	0.12	n.d.	0.31	100.2	81.0
UR-61-N	40.0	0.04	17.2	0.24	41.1	0.11	n.d.	0.33	99.0	81.0
UR-61-N	40.1	0.02	17.5	0.28	42.0	0.11	n.d.	0.37	100.5	81.0
UR-61-N	39.9	0.01	17.4	0.24	41.6	0.11	0.03	0.37	99.8	81.0
UR-61-N	40.2	0.01	17.5	0.25	41.9	0.11	n.d.	0.35	100.3	81.0
UR-61-N	40.3	0.01	17.5	0.23	42.0	0.11	n.d.	0.34	100.5	81.0
UR-61-N	40.1	0.01	17.4	0.27	41.6	0.11	n.d.	0.31	99.8	81.0
UR-61-N	40.0	0.02	17.5	0.21	41.8	0.12	n.d.	0.33	100.0	81.0
UR-61-N	39.9	n.d.	17.5	0.28	41.9	0.11	n.d.	0.36	100.1	81.0
UR-61-N	40.0	0.02	17.4	0.22	41.6	0.11	n.d.	0.34	99.8	81.0
UR-61-N	39.9	0.02	17.5	0.26	41.8	0.11	n.d.	0.31	100.0	81.0
UR-61-N	40.0	0.02	17.5	0.22	41.7	0.11	n.d.	0.32	99.8	81.0
UR-61-N	39.9	0.01	17.6	0.27	42.1	0.11	n.d.	0.33	100.3	81.0
UR-61-N	40.1	n.d.	17.6	0.20	42.0	0.10	n.d.	0.36	100.3	81.0
UR-61-N	40.1	n.d.	17.5	0.27	41.7	0.12	0.04	0.37	100.1	81.0
UR-61-N	40.2	0.02	17.7	0.32	42.1	0.11	n.d.	0.35	100.8	81.0
UR-61-N	39.8	0.01	17.5	0.33	41.8	0.10	n.d.	0.31	99.9	81.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-61-N	39.8	0.35	17.6	0.23	42.0	0.17	n.d.	0.37	100.6	80.9
UR-61-N	40.0	0.02	17.5	0.29	41.7	0.10	n.d.	0.37	100.0	80.9
UR-61-N	39.6	0.02	17.6	0.23	41.8	0.11	n.d.	0.34	99.6	80.9
UR-61-N	40.0	0.02	17.6	0.24	41.9	0.09	n.d.	0.40	100.3	80.9
UR-61-N	40.2	0.03	17.6	0.24	41.9	0.11	n.d.	0.34	100.4	80.9
UR-61-N	39.9	n.d.	17.6	0.29	41.7	0.13	n.d.	0.30	100.0	80.9
UR-61-N	39.8	0.02	17.6	0.29	41.8	0.10	n.d.	0.30	100.0	80.9
UR-61-N	40.3	0.01	17.6	0.26	41.7	0.10	n.d.	0.36	100.4	80.9
UR-61-N	39.6	0.16	17.4	0.25	41.3	0.13	n.d.	0.35	99.2	80.9
UR-61-N	40.0	0.01	17.6	0.27	41.8	0.10	n.d.	0.32	100.1	80.9
UR-61-N	40.0	0.02	17.6	0.24	41.9	0.11	n.d.	0.35	100.3	80.9
UR-61-N	40.0	0.02	17.7	0.19	42.0	0.12	n.d.	0.38	100.3	80.9
UR-61-N	40.0	0.01	17.7	0.22	41.9	0.10	n.d.	0.31	100.2	80.9
UR-61-N	39.8	0.01	17.6	0.18	41.7	0.10	n.d.	0.34	99.8	80.9
UR-61-N	40.0	0.01	17.6	0.25	41.7	0.10	n.d.	0.38	100.1	80.9
UR-61-N	40.2	n.d.	17.7	0.17	41.9	0.11	n.d.	0.35	100.5	80.8
UR-61-N	40.1	0.01	17.7	0.28	41.8	0.10	0.03	0.34	100.4	80.8
UR-61-N	40.2	0.01	17.7	0.26	41.8	0.11	n.d.	0.37	100.4	80.8
UR-61-N	39.9	0.02	17.6	0.26	41.6	0.11	n.d.	0.40	99.8	80.8
UR-61-N	40.1	n.d.	17.7	0.17	42.0	0.10	n.d.	0.34	100.4	80.8
UR-61-N	40.0	0.02	17.7	0.29	42.0	0.10	n.d.	0.39	100.5	80.8
UR-61-N	40.1	0.01	17.8	0.31	42.1	0.11	n.d.	0.36	100.7	80.8
UR-61-N	40.0	0.01	17.7	0.29	41.9	0.11	n.d.	0.35	100.4	80.8
UR-61-N	40.1	0.02	17.6	0.25	41.7	0.11	n.d.	0.32	100.1	80.8
UR-61-N	39.9	0.01	17.6	0.21	41.6	0.09	n.d.	0.38	99.8	80.8
UR-61-N	39.9	0.02	17.6	0.23	41.6	0.10	n.d.	0.28	99.7	80.8
UR-61-N	39.9	0.02	17.7	0.21	42.0	0.12	n.d.	0.29	100.2	80.8
UR-61-N	39.9	0.01	17.6	0.23	41.7	0.12	n.d.	0.37	100.0	80.8
UR-61-N	40.0	0.01	17.7	0.19	41.9	0.11	n.d.	0.35	100.3	80.8
UR-61-N	39.9	0.01	17.6	0.20	41.6	0.11	n.d.	0.30	99.7	80.8
UR-61-N	39.9	0.02	17.6	0.26	41.6	0.11	n.d.	0.29	99.8	80.8
UR-61-N	40.1	0.02	17.6	0.20	41.6	0.11	n.d.	0.35	100.0	80.8
UR-61-N	39.7	0.01	17.6	0.23	41.4	0.12	n.d.	0.32	99.4	80.8
UR-61-N	40.1	0.01	17.8	0.27	41.9	0.11	n.d.	0.34	100.5	80.8
UR-61-N	40.9	0.97	17.3	0.23	40.8	0.15	n.d.	0.31	100.7	80.8
UR-61-N	40.2	0.01	17.7	0.16	41.8	0.11	n.d.	0.33	100.3	80.8
UR-61-N	39.8	0.02	17.8	0.22	41.8	0.12	n.d.	0.36	100.0	80.7
UR-61-N	39.7	n.d.	17.8	0.27	41.7	0.10	n.d.	0.35	99.9	80.7
UR-61-N	40.0	0.02	17.8	0.26	41.8	0.11	0.05	0.34	100.4	80.7
UR-61-N	39.9	0.02	17.8	0.30	41.8	0.11	n.d.	0.34	100.3	80.7
UR-61-N	39.9	n.d.	17.8	0.13	41.8	0.11	n.d.	0.33	100.1	80.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-61-N	39.9	0.01	17.8	0.25	41.7	0.12	n.d.	0.35	100.1	80.7
UR-61-N	39.9	0.02	17.8	0.29	41.8	0.12	n.d.	0.33	100.3	80.7
UR-61-N	39.7	0.01	17.8	0.24	41.8	0.10	n.d.	0.31	100.0	80.7
UR-61-N	39.9	0.02	17.7	0.26	41.5	0.11	0.04	0.30	99.9	80.7
UR-61-N	39.9	0.02	17.8	0.30	41.6	0.13	n.d.	0.32	100.1	80.7
UR-61-N	40.1	n.d.	17.8	0.30	41.6	0.11	0.05	0.32	100.3	80.7
UR-61-N	39.7	0.02	17.7	0.20	41.3	0.14	n.d.	0.37	99.5	80.6
UR-61-N	39.8	0.02	17.9	0.27	41.7	0.12	n.d.	0.36	100.2	80.6
UR-61-N	39.8	0.02	18.0	0.28	41.9	0.11	n.d.	0.38	100.5	80.6
UR-61-N	40.3	0.01	17.9	0.26	41.7	0.11	n.d.	0.34	100.7	80.6
UR-61-N	39.8	0.02	18.0	0.27	41.8	0.10	n.d.	0.37	100.4	80.6
UR-61-N	39.8	0.02	18.0	0.25	41.8	0.10	n.d.	0.35	100.3	80.6
UR-61-N	40.0	0.01	17.8	0.26	41.4	0.11	n.d.	0.33	99.9	80.6
UR-61-N	39.7	0.02	17.9	0.34	41.4	0.11	n.d.	0.33	99.8	80.5
UR-61-N	40.0	0.02	18.0	0.23	41.6	0.10	n.d.	0.29	100.2	80.5
UR-61-N	39.7	0.02	17.8	0.29	41.2	0.11	n.d.	0.33	99.4	80.5
UR-61-N	40.0	0.02	17.9	0.22	41.3	0.12	0.10	0.31	99.9	80.5
UR-61-N	39.7	0.02	18.0	0.26	41.5	0.11	0.04	0.28	99.9	80.5
UR-61-N	39.8	0.02	18.0	0.28	41.6	0.11	n.d.	0.31	100.1	80.4
UR-61-N	39.8	0.01	17.9	0.33	41.3	0.11	n.d.	0.28	99.8	80.4
UR-61-N	39.8	0.02	18.0	0.26	41.3	0.11	0.07	0.34	100.0	80.3
UR-61-N	39.9	0.01	18.3	0.28	41.7	0.10	n.d.	0.30	100.7	80.3
UR-61-N	40.3	0.02	18.1	0.24	41.1	0.12	n.d.	0.29	100.2	80.2
UR-61-N	39.8	0.01	18.3	0.20	41.6	0.11	n.d.	0.33	100.4	80.2
UR-61-N	39.8	0.01	18.2	0.22	41.1	0.11	n.d.	0.27	99.7	80.2
UR-61-N	39.9	0.02	18.2	0.22	41.2	0.11	n.d.	0.28	100.0	80.1
UR-61-N	39.7	0.01	18.2	0.22	41.2	0.10	n.d.	0.29	99.7	80.1
UR-61-N	39.9	0.02	18.3	0.24	41.2	0.09	0.03	0.28	100.0	80.1
UR-61-N	39.7	0.02	18.4	0.24	41.4	0.12	0.03	0.23	100.1	80.0
UR-61-N	39.8	0.02	18.3	0.24	40.9	0.11	n.d.	0.21	99.7	79.9
UR-61-N	39.8	0.02	18.6	0.34	41.4	0.13	0.03	0.29	100.6	79.9
UR-61-N	39.8	0.02	18.6	0.29	41.3	0.11	0.06	0.28	100.5	79.9
UR-61-N	39.7	0.01	18.5	0.26	41.1	0.11	n.d.	0.28	99.9	79.9
UR-61-N	39.8	0.01	18.5	0.30	40.9	0.13	n.d.	0.22	99.9	79.7
UR-61-N	39.8	0.02	18.6	0.21	41.0	0.12	n.d.	0.25	100.0	79.7
UR-61-N	39.1	0.68	18.7	0.24	41.0	0.21	n.d.	0.24	100.2	79.6
UR-61-N	39.8	0.01	18.7	0.34	40.9	0.13	n.d.	0.19	100.1	79.6
UR-61-N	39.5	0.02	18.7	0.34	40.9	0.13	n.d.	0.20	99.8	79.6
UR-61-N	39.5	0.01	18.7	0.30	40.8	0.11	n.d.	0.27	99.7	79.6
UR-61-N	39.6	0.01	18.8	0.31	41.0	0.11	n.d.	0.29	100.2	79.6
UR-61-N	39.7	n.d.	18.8	0.22	41.1	0.12	0.03	0.31	100.2	79.6

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-61-I	39.8	0.02	18.9	0.25	41.0	0.12	0.03	0.32	100.4	79.5
UR-61-I	39.6	0.02	18.8	0.28	40.9	0.11	0.04	0.26	100.0	79.5
UR-61-I	42.3	0.35	18.1	0.29	39.3	0.12	0.04	0.27	100.9	79.4
UR-61-I	39.6	0.02	19.0	0.21	41.0	0.13	n.d.	0.22	100.2	79.3
UR-61-I	39.7	0.01	18.9	0.25	40.7	0.13	n.d.	0.26	99.9	79.3
UR-61-I	39.8	0.02	19.2	0.25	40.7	0.12	0.09	0.28	100.4	79.1
UR-61-I	39.4	0.02	19.2	0.28	40.6	0.12	0.04	0.20	99.9	79.0
UR-61-I	39.8	0.01	19.2	0.30	40.3	0.14	n.d.	0.21	99.9	78.9
UR-61-I	39.8	0.02	19.3	0.26	40.3	0.12	n.d.	0.24	100.1	78.9
UR-61-I	39.7	0.02	19.2	0.28	40.2	0.13	n.d.	0.26	99.8	78.9
UR-61-I	39.3	0.03	19.3	0.28	40.4	0.11	n.d.	0.25	99.7	78.9
UR-61-I	39.5	0.02	19.4	0.25	40.3	0.13	n.d.	0.23	99.9	78.8
UR-61-I	39.6	0.01	19.5	0.32	40.5	0.13	n.d.	0.34	100.4	78.7
UR-61-I	39.7	0.02	19.4	0.29	39.8	0.13	0.04	0.33	99.8	78.5
UR-61-I	39.6	0.02	19.6	0.32	40.0	0.14	n.d.	0.17	99.8	78.5
UR-61-I	39.8	0.02	19.8	0.35	39.8	0.12	n.d.	0.26	100.2	78.2
UR-61-I	39.6	0.02	20.0	0.28	40.0	0.11	n.d.	0.27	100.4	78.1
UR-61-I	39.2	0.02	20.4	0.32	39.2	0.11	n.d.	0.26	99.6	77.4
UR-61-I	39.3	0.01	20.5	0.32	39.3	0.14	n.d.	0.21	99.7	77.4
UR-61-I	39.2	0.02	20.7	0.34	39.0	0.12	n.d.	0.25	99.7	77.1
UR-61-I	39.6	n.d.	21.5	0.37	38.7	0.13	n.d.	0.20	100.4	76.2
UR-61-I	39.4	0.02	21.5	0.31	38.6	0.15	n.d.	0.19	100.1	76.2
UR-61-I	39.0	0.01	22.2	0.32	38.4	0.14	n.d.	0.18	100.3	75.5
UR-61-I	39.0	0.02	22.2	0.37	38.0	0.17	n.d.	0.11	99.8	75.3
UR-61-I	39.0	0.02	22.8	0.41	37.4	0.15	n.d.	0.21	100.0	74.5
UR-61-I	38.9	0.01	23.0	0.29	37.2	0.14	n.d.	0.21	99.7	74.2
UR-61-I	39.1	0.02	24.3	0.29	36.2	0.20	n.d.	0.22	100.3	72.7
UR-61-I	38.6	0.02	24.4	0.47	36.4	0.20	n.d.	0.14	100.2	72.6
UR-61-I	38.1	0.01	25.0	0.37	35.2	0.17	n.d.	0.15	99.1	71.5
UR-61-I	38.5	0.02	25.6	0.53	35.0	0.18	n.d.	0.13	99.9	70.9
UR-60b-	40.0	n.d.	17.4	0.21	42.4	0.10	n.d.	0.40	100.5	81.3
UR-60b-	40.1	0.01	17.4	0.28	42.5	0.11	n.d.	0.37	100.7	81.3
UR-60b-	39.8	0.01	17.5	0.30	42.3	0.12	n.d.	0.31	100.4	81.2
UR-60b-	39.8	n.d.	17.5	0.32	42.3	0.10	n.d.	0.34	100.3	81.1
UR-60b-	40.1	0.01	17.5	0.28	42.1	0.11	n.d.	0.30	100.4	81.1
UR-60b-	39.7	n.d.	17.5	0.27	42.2	0.11	0.03	0.37	100.1	81.1
UR-60b-	39.8	n.d.	17.7	0.24	42.4	0.10	0.03	0.32	100.6	81.1
UR-60b-	39.9	0.02	17.6	0.26	42.2	0.10	0.04	0.36	100.4	81.1
UR-60b-	40.0	0.01	17.6	0.26	42.2	0.11	0.04	0.34	100.6	81.0
UR-60b-	39.8	0.02	17.6	0.24	42.1	0.10	n.d.	0.28	100.1	81.0
UR-60b-	39.7	0.02	17.6	0.24	42.1	0.11	0.03	0.34	100.1	81.0

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-60b·	39.9	n.d.	17.7	0.22	42.3	0.10	n.d.	0.34	100.6	81.0
UR-60b·	39.8	0.01	17.7	0.30	42.3	0.09	n.d.	0.34	100.5	81.0
UR-60b·	40.1	n.d.	17.7	0.22	42.3	0.10	n.d.	0.33	100.8	81.0
UR-60b·	39.9	0.01	17.7	0.32	42.3	0.10	0.03	0.34	100.7	81.0
UR-60b·	40.2	n.d.	17.6	0.16	42.1	0.09	n.d.	0.33	100.6	81.0
UR-60b·	40.0	n.d.	17.7	0.22	42.3	0.11	n.d.	0.34	100.7	81.0
UR-60b·	40.2	0.01	17.7	0.24	42.1	0.11	0.04	0.31	100.7	81.0
UR-60b·	40.1	0.01	17.8	0.23	42.5	0.10	n.d.	0.36	101.0	81.0
UR-60b·	39.9	0.01	17.8	0.25	42.3	0.10	n.d.	0.32	100.7	80.9
UR-60b·	40.2	n.d.	17.7	0.33	42.2	0.12	n.d.	0.34	100.9	80.9
UR-60b·	39.9	0.01	17.7	0.20	42.2	0.10	0.03	0.32	100.5	80.9
UR-60b·	39.7	0.01	17.8	0.20	42.3	0.11	n.d.	0.36	100.5	80.9
UR-60b·	39.3	n.d.	17.7	0.20	42.1	0.11	n.d.	0.37	99.8	80.9
UR-60b·	40.0	0.02	17.7	0.23	42.2	0.10	0.06	0.35	100.7	80.9
UR-60b·	39.7	0.01	17.7	0.29	42.1	0.10	n.d.	0.35	100.3	80.9
UR-60b·	39.9	0.01	17.8	0.26	42.3	0.11	n.d.	0.34	100.7	80.9
UR-60b·	39.9	0.02	17.7	0.24	42.2	0.10	n.d.	0.32	100.5	80.9
UR-60b·	40.2	0.01	17.7	0.22	42.1	0.10	n.d.	0.34	100.7	80.9
UR-60b·	40.1	n.d.	17.8	0.28	42.4	0.11	n.d.	0.31	101.0	80.9
UR-60b·	40.1	n.d.	17.8	0.28	42.2	0.11	0.03	0.33	100.8	80.9
UR-60b·	39.9	0.02	17.8	0.24	42.3	0.11	0.04	0.38	100.8	80.9
UR-60b·	40.0	n.d.	17.7	0.30	42.1	0.10	n.d.	0.33	100.6	80.9
UR-60b·	39.8	n.d.	17.9	0.25	42.4	0.11	n.d.	0.32	100.8	80.9
UR-60b·	40.0	n.d.	17.8	0.26	42.2	0.11	n.d.	0.34	100.7	80.9
UR-60b·	40.0	0.02	17.7	0.27	42.1	0.11	n.d.	0.31	100.6	80.9
UR-60b·	39.7	0.02	17.7	0.24	42.1	0.14	0.10	0.36	100.4	80.9
UR-60b·	39.9	0.01	17.8	0.21	42.1	0.10	n.d.	0.29	100.5	80.9
UR-60b·	39.9	0.02	17.8	0.23	42.1	0.10	0.23	0.37	100.7	80.9
UR-60b·	40.0	n.d.	17.8	0.24	42.2	0.10	n.d.	0.34	100.7	80.9
UR-60b·	39.8	0.01	17.8	0.25	42.2	0.11	0.04	0.32	100.5	80.9
UR-60b·	39.7	n.d.	17.8	0.32	42.2	0.10	n.d.	0.36	100.6	80.8
UR-60b·	40.2	0.01	17.9	0.21	42.3	0.11	n.d.	0.35	101.0	80.8
UR-60b·	40.1	0.01	17.8	0.20	42.1	0.10	n.d.	0.35	100.7	80.8
UR-60b·	39.7	0.02	17.9	0.25	42.3	0.11	n.d.	0.34	100.6	80.8
UR-60b·	39.9	0.01	17.9	0.19	42.3	0.10	n.d.	0.37	100.8	80.8
UR-60b·	39.9	0.02	17.8	0.28	42.1	0.10	n.d.	0.31	100.5	80.8
UR-60b·	39.9	0.02	17.9	0.28	42.2	0.09	0.04	0.35	100.7	80.8
UR-60b·	39.6	0.02	17.9	0.30	42.4	0.11	n.d.	0.32	100.7	80.8
UR-60b·	39.7	0.01	17.8	0.25	42.0	0.10	n.d.	0.33	100.2	80.8
UR-60b·	40.1	0.02	17.8	0.20	42.2	0.11	n.d.	0.37	100.8	80.8
UR-60b·	39.7	n.d.	17.7	0.31	41.9	0.10	n.d.	0.36	100.1	80.8

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-60b	39.9	0.02	17.8	0.26	42.1	0.11	n.d.	0.33	100.6	80.8
UR-60b	40.0	0.01	17.8	0.32	42.1	0.11	n.d.	0.33	100.7	80.8
UR-60b	39.9	n.d.	17.9	0.25	42.2	0.11	n.d.	0.34	100.8	80.8
UR-60b	39.7	n.d.	17.8	0.23	42.0	0.12	0.16	0.33	100.4	80.8
UR-60b	40.0	n.d.	17.9	0.26	42.2	0.11	n.d.	0.32	100.8	80.8
UR-60b	39.8	0.01	17.9	0.35	42.1	0.11	n.d.	0.34	100.6	80.8
UR-60b	39.8	0.02	18.0	0.31	42.4	0.11	n.d.	0.30	100.9	80.8
UR-60b	40.0	0.01	17.9	0.28	42.0	0.10	n.d.	0.31	100.6	80.8
UR-60b	40.1	0.01	17.9	0.26	42.2	0.12	n.d.	0.29	100.8	80.8
UR-60b	39.7	n.d.	18.0	0.29	42.2	0.08	n.d.	0.28	100.6	80.7
UR-60b	40.2	n.d.	17.9	0.21	42.2	0.10	0.04	0.31	101.0	80.7
UR-60b	39.8	n.d.	17.8	0.23	41.9	0.11	0.04	0.31	100.1	80.7
UR-60b	39.4	0.04	18.0	0.23	42.3	0.10	n.d.	0.36	100.4	80.7
UR-60b	39.9	n.d.	17.9	0.23	42.1	0.10	n.d.	0.31	100.5	80.7
UR-60b	40.0	n.d.	17.9	0.25	42.0	0.09	n.d.	0.33	100.6	80.7
UR-60b	40.0	n.d.	17.9	0.28	42.2	0.11	n.d.	0.33	100.9	80.7
UR-60b	39.9	0.02	18.0	0.27	42.3	0.10	n.d.	0.29	100.9	80.7
UR-60b	39.9	0.01	17.9	0.25	42.0	0.13	n.d.	0.33	100.5	80.7
UR-60b	39.9	0.01	18.0	0.25	42.3	0.09	n.d.	0.37	100.9	80.7
UR-60b	40.0	0.02	18.0	0.28	42.3	0.11	0.04	0.33	101.0	80.7
UR-60b	40.1	0.01	17.8	0.28	41.9	0.12	n.d.	0.38	100.6	80.7
UR-60b	40.0	0.01	17.9	0.16	42.1	0.11	n.d.	0.33	100.7	80.7
UR-60b	40.1	n.d.	17.9	0.23	42.1	0.09	n.d.	0.32	100.8	80.7
UR-60b	40.1	n.d.	18.0	0.29	42.2	0.11	n.d.	0.29	100.9	80.7
UR-60b	39.7	0.02	17.9	0.28	42.0	0.11	0.04	0.33	100.4	80.7
UR-60b	40.0	0.01	18.0	0.29	42.3	0.09	0.03	0.36	101.0	80.7
UR-60b	39.7	0.02	18.0	0.28	42.3	0.11	0.04	0.40	100.9	80.7
UR-60b	40.0	0.02	17.9	0.24	42.1	0.10	n.d.	0.37	100.8	80.7
UR-60b	39.9	0.02	18.0	0.25	42.2	0.11	n.d.	0.35	100.9	80.7
UR-60b	40.2	n.d.	17.9	0.25	42.0	0.11	n.d.	0.29	100.8	80.7
UR-60b	40.0	n.d.	18.0	0.26	42.3	0.10	n.d.	0.33	101.0	80.7
UR-60b	39.9	0.01	17.9	0.25	42.0	0.11	0.04	0.35	100.6	80.7
UR-60b	39.9	0.01	18.0	0.25	42.3	0.13	n.d.	0.36	101.0	80.7
UR-60b	39.6	0.02	17.9	0.31	41.9	0.10	n.d.	0.35	100.1	80.7
UR-60b	39.6	n.d.	17.9	0.32	42.0	0.10	n.d.	0.35	100.3	80.7
UR-60b	40.0	0.01	18.0	0.26	42.2	0.10	n.d.	0.34	101.0	80.7
UR-60b	40.1	0.02	18.0	0.23	42.2	0.09	n.d.	0.35	101.0	80.7
UR-60b	39.9	n.d.	18.0	0.26	42.2	0.10	n.d.	0.36	100.9	80.7
UR-60b	39.9	n.d.	18.0	0.26	42.1	0.12	n.d.	0.30	100.8	80.7
UR-60b	39.9	0.02	18.0	0.26	42.1	0.11	n.d.	0.35	100.7	80.7
UR-60b	40.1	n.d.	18.0	0.34	42.1	0.11	n.d.	0.31	101.0	80.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-60b·	39.7	0.01	18.0	0.26	42.0	0.12	0.04	0.36	100.4	80.6
UR-60b·	40.0	n.d.	18.0	0.30	42.0	0.11	n.d.	0.33	100.7	80.6
UR-60b·	40.0	0.02	17.9	0.23	41.9	0.12	n.d.	0.33	100.5	80.6
UR-60b·	39.7	0.01	18.0	0.28	42.1	0.11	n.d.	0.34	100.6	80.6
UR-60b·	40.0	0.02	18.0	0.31	42.0	0.10	0.04	0.30	100.8	80.6
UR-60b·	40.0	n.d.	18.0	0.29	42.0	0.11	n.d.	0.34	100.8	80.6
UR-60b·	39.9	0.02	18.0	0.32	42.0	0.10	n.d.	0.37	100.7	80.6
UR-60b·	39.8	0.01	18.0	0.28	42.1	0.11	n.d.	0.32	100.7	80.6
UR-60b·	39.6	0.02	17.9	0.29	41.7	0.12	n.d.	0.30	100.0	80.6
UR-60b·	39.9	n.d.	18.1	0.25	42.1	0.10	n.d.	0.33	100.8	80.6
UR-60b·	39.6	n.d.	18.1	0.24	42.2	0.11	0.04	0.33	100.6	80.6
UR-60b·	39.9	n.d.	18.1	0.21	42.1	0.09	n.d.	0.33	100.7	80.6
UR-60b·	40.1	0.01	18.1	0.20	42.1	0.11	0.06	0.33	100.9	80.6
UR-60b·	39.9	0.02	18.0	0.26	41.9	0.10	0.03	0.32	100.5	80.6
UR-60b·	39.8	0.01	18.0	0.19	42.0	0.10	n.d.	0.32	100.5	80.6
UR-60b·	39.8	0.01	18.0	0.25	41.8	0.11	0.10	0.34	100.5	80.6
UR-60b·	40.0	0.02	18.0	0.20	42.0	0.11	n.d.	0.32	100.7	80.6
UR-60b·	39.9	0.01	18.1	0.23	42.2	0.10	n.d.	0.33	101.0	80.6
UR-60b·	39.9	0.02	18.1	0.25	42.0	0.12	n.d.	0.32	100.7	80.6
UR-60b·	39.9	n.d.	18.0	0.27	41.9	0.10	n.d.	0.36	100.6	80.6
UR-60b·	39.9	0.02	18.1	0.28	42.1	0.12	n.d.	0.34	100.9	80.6
UR-60b·	39.8	0.01	18.0	0.20	41.9	0.12	n.d.	0.32	100.4	80.5
UR-60b·	39.8	0.01	18.0	0.21	41.9	0.09	n.d.	0.29	100.3	80.5
UR-60b·	40.0	n.d.	18.1	0.35	42.0	0.10	n.d.	0.32	101.0	80.5
UR-60b·	39.9	0.01	18.2	0.25	42.1	0.11	n.d.	0.31	100.9	80.5
UR-60b·	39.8	0.01	18.1	0.25	42.0	0.12	n.d.	0.33	100.7	80.5
UR-60b·	39.7	n.d.	18.1	0.24	42.1	0.11	n.d.	0.31	100.6	80.5
UR-60b·	39.7	0.02	18.2	0.24	42.3	0.11	n.d.	0.34	101.0	80.5
UR-60b·	39.8	0.01	18.2	0.26	42.2	0.12	n.d.	0.33	101.0	80.5
UR-60b·	39.7	0.02	18.1	0.22	41.9	0.11	n.d.	0.32	100.4	80.5
UR-60b·	39.9	0.01	18.2	0.30	42.1	0.11	0.05	0.33	101.0	80.5
UR-60b·	39.7	n.d.	18.1	0.27	42.0	0.11	0.11	0.35	100.6	80.5
UR-60b·	40.0	n.d.	18.1	0.27	41.9	0.12	n.d.	0.31	100.8	80.5
UR-60b·	40.0	0.02	18.2	0.21	42.0	0.12	0.06	0.34	100.9	80.5
UR-60b·	39.8	0.01	18.3	0.24	42.2	0.11	n.d.	0.32	101.0	80.5
UR-60b·	40.0	0.01	18.2	0.28	42.1	0.12	n.d.	0.32	101.0	80.5
UR-60b·	39.8	0.01	18.2	0.24	42.0	0.11	n.d.	0.33	100.7	80.5
UR-60b·	39.9	n.d.	18.0	0.18	41.6	0.11	n.d.	0.33	100.2	80.5
UR-60b·	40.0	0.01	18.2	0.22	42.0	0.11	n.d.	0.31	101.0	80.4
UR-60b·	39.7	0.01	18.1	0.23	41.8	0.11	n.d.	0.33	100.4	80.4
UR-60b·	39.8	n.d.	18.3	0.26	42.1	0.11	n.d.	0.33	100.9	80.4

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-60b-	40.0	0.01	18.2	0.24	41.9	0.12	n.d.	0.34	100.8	80.4
UR-60b-	39.7	0.02	18.1	0.22	41.7	0.11	0.04	0.33	100.2	80.4
UR-60b-	39.7	n.d.	18.1	0.17	41.6	0.11	n.d.	0.32	100.1	80.4
UR-60b-	39.7	0.01	18.2	0.25	41.8	0.11	n.d.	0.26	100.2	80.4
UR-60b-	40.0	n.d.	18.3	0.29	42.0	0.10	n.d.	0.33	101.0	80.4
UR-60b-	39.8	n.d.	18.3	0.26	42.1	0.10	n.d.	0.34	100.9	80.4
UR-60b-	39.7	n.d.	18.3	0.26	42.1	0.10	n.d.	0.33	100.8	80.4
UR-60b-	39.8	n.d.	18.3	0.28	42.0	0.11	n.d.	0.31	100.8	80.4
UR-60b-	39.7	n.d.	18.3	0.34	42.0	0.10	n.d.	0.31	100.9	80.4
UR-60b-	39.8	0.02	18.3	0.27	41.9	0.10	n.d.	0.30	100.7	80.3
UR-60b-	39.9	0.01	18.2	0.27	41.7	0.11	n.d.	0.30	100.5	80.3
UR-60b-	39.9	n.d.	18.3	0.24	42.0	0.11	n.d.	0.33	101.0	80.3
UR-60b-	39.8	0.01	18.4	0.25	42.1	0.10	n.d.	0.37	101.0	80.3
UR-60b-	39.8	0.02	18.3	0.24	42.0	0.11	0.04	0.33	100.8	80.3
UR-60b-	39.9	0.01	18.3	0.22	41.9	0.10	n.d.	0.31	100.8	80.3
UR-60b-	40.1	n.d.	18.3	0.20	41.9	0.11	n.d.	0.33	100.9	80.3
UR-60b-	39.5	0.02	18.3	0.26	41.9	0.11	n.d.	0.29	100.5	80.3
UR-60b-	39.9	0.02	18.3	0.21	41.9	0.09	n.d.	0.34	100.8	80.3
UR-60b-	39.7	0.01	18.3	0.34	41.8	0.11	n.d.	0.30	100.6	80.3
UR-60b-	39.8	0.02	18.3	0.20	41.8	0.11	n.d.	0.35	100.6	80.3
UR-60b-	39.8	0.01	18.3	0.18	41.7	0.11	n.d.	0.30	100.5	80.3
UR-60b-	39.9	n.d.	18.3	0.33	41.7	0.09	n.d.	0.33	100.6	80.3
UR-60b-	39.9	n.d.	18.3	0.33	41.7	0.11	n.d.	0.30	100.6	80.3
UR-60b-	39.9	n.d.	18.3	0.27	41.6	0.10	n.d.	0.30	100.5	80.2
UR-60b-	40.1	0.02	18.4	0.23	41.8	0.11	n.d.	0.32	101.0	80.2
UR-60b-	39.9	0.02	18.4	0.26	41.9	0.12	0.05	0.33	101.0	80.2
UR-60b-	39.5	0.01	18.3	0.32	41.6	0.11	n.d.	0.33	100.1	80.2
UR-60b-	39.7	0.02	18.4	0.28	41.9	0.11	n.d.	0.39	100.8	80.2
UR-60b-	39.8	0.01	18.4	0.25	41.8	0.11	n.d.	0.33	100.7	80.2
UR-60b-	39.8	0.01	18.4	0.25	41.8	0.11	n.d.	0.26	100.7	80.2
UR-60b-	39.8	n.d.	18.5	0.25	41.9	0.09	0.08	0.30	100.9	80.2
UR-60b-	40.0	n.d.	18.5	0.18	41.9	0.11	n.d.	0.33	101.0	80.2
UR-60b-	39.7	0.01	18.4	0.27	41.5	0.11	n.d.	0.28	100.2	80.1
UR-60b-	40.0	0.02	18.4	0.28	41.4	0.11	n.d.	0.28	100.5	80.1
UR-60b-	39.7	0.01	18.4	0.31	41.6	0.10	0.04	0.35	100.5	80.1
UR-60b-	39.7	0.01	18.5	0.28	41.6	0.12	0.06	0.29	100.6	80.1
UR-60b-	39.9	n.d.	18.6	0.22	41.9	0.09	n.d.	0.28	101.0	80.1
UR-60b-	39.7	0.02	18.4	0.24	41.5	0.10	n.d.	0.26	100.2	80.1
UR-60b-	39.9	n.d.	18.5	0.33	41.7	0.11	n.d.	0.28	100.9	80.0
UR-60b-	39.8	0.02	18.5	0.24	41.5	0.11	n.d.	0.31	100.5	80.0
UR-60b-	39.7	n.d.	18.7	0.19	41.9	0.11	n.d.	0.34	101.0	80.0

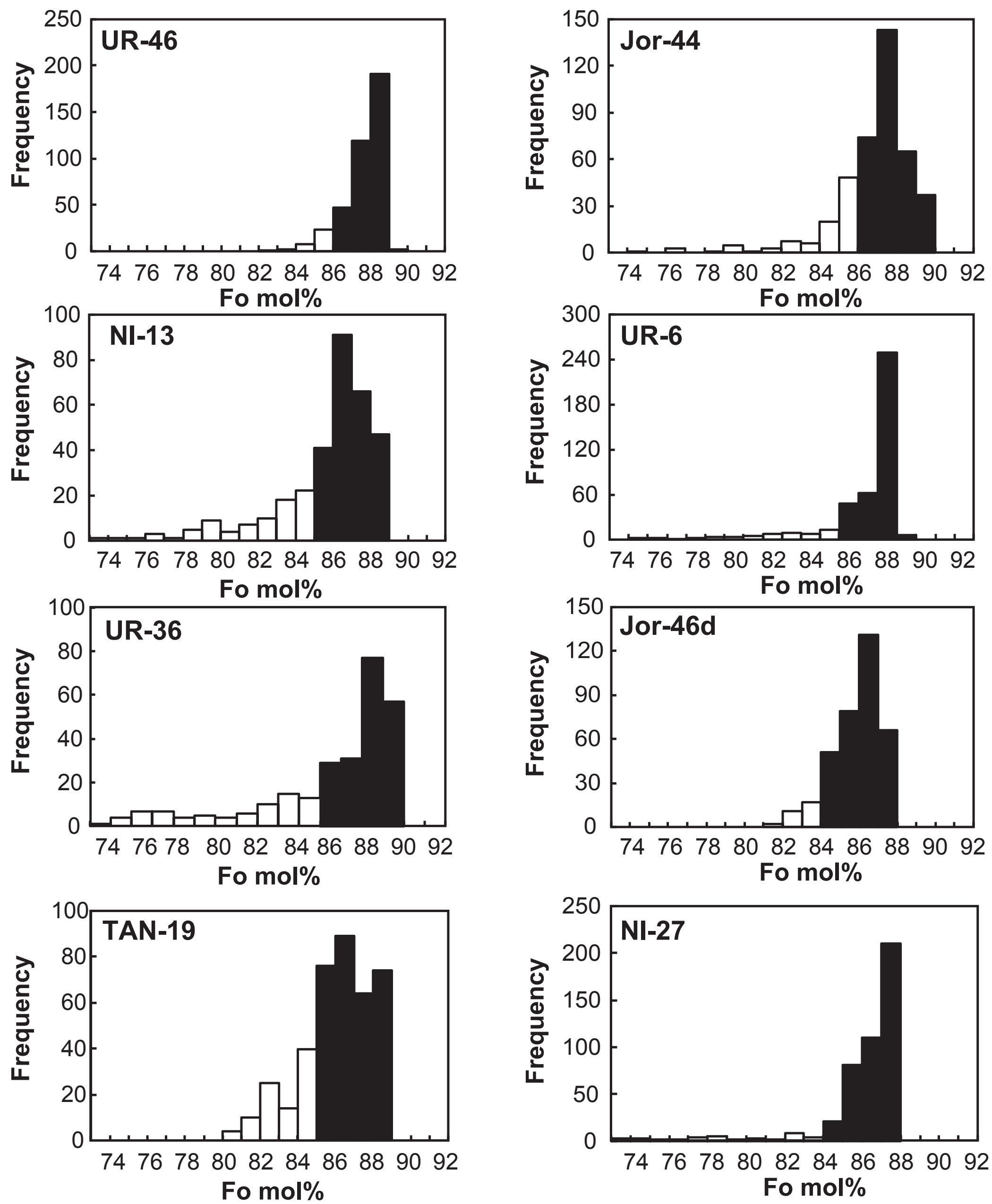
Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-60b·	39.7	n.d.	18.4	0.21	41.3	0.11	n.d.	0.33	100.1	80.0
UR-60b·	39.8	0.01	18.6	0.32	41.6	0.10	n.d.	0.30	100.7	80.0
UR-60b·	39.9	n.d.	18.6	0.28	41.5	0.14	n.d.	0.29	100.7	80.0
UR-60b·	39.8	0.01	18.7	0.29	41.8	0.12	n.d.	0.33	101.0	79.9
UR-60b·	39.8	0.01	18.7	0.22	41.6	0.11	0.03	0.29	100.8	79.9
UR-60b·	39.8	n.d.	18.7	0.20	41.6	0.11	n.d.	0.33	100.8	79.9
UR-60b·	39.7	0.01	18.7	0.31	41.6	0.11	n.d.	0.27	100.8	79.9
UR-60b·	39.5	n.d.	18.7	0.27	41.6	0.12	0.03	0.27	100.5	79.8
UR-60b·	39.8	n.d.	18.8	0.23	41.6	0.12	n.d.	0.32	100.9	79.8
UR-60b·	39.9	0.01	18.7	0.25	41.5	0.12	0.10	0.33	100.9	79.8
UR-60b·	39.6	0.01	18.7	0.29	41.3	0.11	0.06	0.34	100.4	79.7
UR-60b·	40.0	n.d.	18.9	0.30	41.5	0.11	n.d.	0.25	101.0	79.7
UR-60b·	39.8	n.d.	18.9	0.27	41.5	0.10	n.d.	0.29	100.8	79.7
UR-60b·	39.6	n.d.	18.9	0.36	41.3	0.13	n.d.	0.33	100.7	79.6
UR-60b·	39.6	0.01	18.9	0.35	41.3	0.12	n.d.	0.29	100.4	79.6
UR-60b·	39.5	0.01	18.9	0.31	41.5	0.11	n.d.	0.23	100.6	79.6
UR-60b·	39.7	0.02	18.9	0.28	41.3	0.12	n.d.	0.26	100.6	79.6
UR-60b·	39.8	0.01	18.9	0.31	41.3	0.10	0.04	0.27	100.7	79.5
UR-60b·	39.7	0.01	18.9	0.24	41.2	0.11	n.d.	0.25	100.5	79.5
UR-60b·	39.6	n.d.	18.9	0.26	41.1	0.11	0.03	0.27	100.3	79.5
UR-60b·	39.5	0.01	19.0	0.37	41.2	0.11	n.d.	0.21	100.4	79.5
UR-60b·	39.6	0.01	19.0	0.31	41.3	0.11	n.d.	0.31	100.6	79.5
UR-60b·	39.8	0.01	18.9	0.26	41.0	0.11	0.03	0.27	100.3	79.5
UR-60b·	39.7	0.01	19.0	0.28	41.3	0.12	n.d.	0.24	100.7	79.4
UR-60b·	39.6	0.01	19.1	0.32	41.3	0.13	n.d.	0.28	100.9	79.4
UR-60b·	39.8	0.01	19.0	0.22	41.0	0.13	n.d.	0.31	100.5	79.4
UR-60b·	39.9	0.01	19.1	0.29	41.2	0.10	n.d.	0.31	100.9	79.4
UR-60b·	39.8	0.01	19.2	0.23	41.3	0.10	n.d.	0.27	100.9	79.4
UR-60b·	39.6	0.02	19.1	0.26	41.1	0.09	n.d.	0.26	100.4	79.3
UR-60b·	39.4	n.d.	19.1	0.32	41.1	0.11	n.d.	0.27	100.3	79.3
UR-60b·	39.3	0.01	19.1	0.25	41.0	0.11	0.03	0.24	100.0	79.3
UR-60b·	39.8	0.02	19.2	0.28	41.2	0.10	0.08	0.32	101.0	79.3
UR-60b·	39.6	0.02	19.2	0.25	41.2	0.11	0.04	0.26	100.7	79.2
UR-60b·	39.4	0.02	19.2	0.24	41.0	0.12	n.d.	0.19	100.1	79.2
UR-60b·	39.7	0.01	19.2	0.23	41.0	0.13	n.d.	0.18	100.4	79.2
UR-60b·	39.4	0.01	19.3	0.33	41.1	0.12	n.d.	0.17	100.4	79.2
UR-60b·	39.7	0.01	19.2	0.20	41.0	0.11	n.d.	0.22	100.5	79.2
UR-60b·	39.6	n.d.	19.4	0.26	41.3	0.12	n.d.	0.26	100.9	79.2
UR-60b·	38.6	0.02	19.1	0.26	40.8	0.11	0.04	0.27	99.2	79.1
UR-60b·	39.6	0.01	19.3	0.33	41.1	0.12	n.d.	0.29	100.8	79.1
UR-60b·	39.3	0.02	19.3	0.35	40.9	0.11	n.d.	0.25	100.3	79.1

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-60b·	39.7	0.02	19.3	0.19	40.9	0.10	0.03	0.26	100.5	79.1
UR-60b·	39.8	0.01	19.2	0.24	40.8	0.10	n.d.	0.30	100.4	79.1
UR-60b·	39.8	0.01	19.3	0.39	40.9	0.11	n.d.	0.27	100.8	79.1
UR-60b·	39.8	n.d.	19.3	0.27	40.9	0.11	n.d.	0.24	100.7	79.1
UR-60b·	39.6	0.01	19.4	0.31	41.0	0.13	n.d.	0.33	100.8	79.1
UR-60b·	39.5	n.d.	19.4	0.24	41.0	0.12	0.03	0.23	100.5	79.1
UR-60b·	39.8	0.02	19.4	0.32	41.0	0.13	0.03	0.18	100.9	79.0
UR-60b·	39.6	0.01	19.3	0.29	40.8	0.14	n.d.	0.24	100.4	79.0
UR-60b·	39.7	0.02	19.4	0.32	40.9	0.12	n.d.	0.20	100.6	79.0
UR-60b·	39.2	n.d.	19.4	0.32	40.8	0.12	n.d.	0.17	100.0	79.0
UR-60b·	39.7	0.01	19.5	0.32	41.0	0.13	n.d.	0.34	101.0	79.0
UR-60b·	39.7	n.d.	19.5	0.28	41.0	0.11	n.d.	0.28	101.0	78.9
UR-60b·	39.4	0.01	19.5	0.30	40.9	0.11	0.12	0.31	100.6	78.9
UR-60b·	39.6	0.01	19.5	0.34	41.0	0.12	0.04	0.19	100.8	78.9
UR-60b·	39.4	0.02	19.6	0.26	41.1	0.12	n.d.	0.28	100.8	78.9
UR-60b·	39.6	n.d.	19.6	0.29	41.1	0.11	n.d.	0.29	101.0	78.9
UR-60b·	39.8	0.01	19.5	0.33	40.9	0.13	n.d.	0.15	100.8	78.9
UR-60b·	39.6	0.01	19.6	0.29	40.9	0.14	n.d.	0.28	100.9	78.8
UR-60b·	39.7	0.02	19.7	0.27	40.8	0.10	0.03	0.14	100.8	78.7
UR-60b·	39.6	n.d.	19.7	0.23	40.8	0.12	n.d.	0.20	100.6	78.7
UR-60b·	39.5	n.d.	19.8	0.32	41.1	0.12	n.d.	0.18	101.0	78.7
UR-60b·	39.5	0.01	19.7	0.23	40.7	0.12	n.d.	0.19	100.4	78.7
UR-60b·	39.4	n.d.	19.6	0.32	40.5	0.12	0.03	0.17	100.2	78.7
UR-60b·	39.4	0.01	19.7	0.29	40.7	0.14	n.d.	0.25	100.6	78.6
UR-60b·	39.5	0.01	19.8	0.31	40.8	0.11	n.d.	0.19	100.7	78.6
UR-60b·	39.5	0.01	19.9	0.22	40.9	0.12	0.04	0.22	100.9	78.6
UR-60b·	39.5	n.d.	19.8	0.27	40.7	0.13	n.d.	0.17	100.6	78.6
UR-60b·	39.6	0.01	19.7	0.31	40.6	0.14	n.d.	0.14	100.5	78.6
UR-60b·	39.6	0.01	19.9	0.26	40.8	0.12	n.d.	0.24	101.0	78.5
UR-60b·	39.5	0.01	19.9	0.25	40.8	0.13	n.d.	0.28	100.8	78.5
UR-60b·	39.4	0.01	20.0	0.19	41.1	0.11	n.d.	0.22	101.0	78.5
UR-60b·	39.8	0.01	19.8	0.34	40.6	0.13	n.d.	0.29	101.0	78.5
UR-60b·	39.6	n.d.	19.9	0.25	40.7	0.14	n.d.	0.17	100.8	78.5
UR-60b·	39.5	0.01	19.9	0.32	40.6	0.14	n.d.	0.17	100.6	78.4
UR-60b·	39.4	0.02	20.0	0.32	40.6	0.12	n.d.	0.21	100.7	78.3
UR-60b·	40.0	0.01	20.0	0.31	40.4	0.13	n.d.	0.19	101.0	78.3
UR-60b·	39.3	0.02	19.9	0.24	40.2	0.14	n.d.	0.17	100.0	78.3
UR-60b·	39.5	n.d.	20.1	0.35	40.5	0.12	n.d.	0.14	100.8	78.3
UR-60b·	39.4	n.d.	20.0	0.36	40.5	0.11	n.d.	0.25	100.6	78.3
UR-60b·	39.9	n.d.	19.9	0.32	40.1	0.15	n.d.	0.25	100.7	78.3
UR-60b·	39.5	n.d.	20.0	0.32	40.3	0.13	n.d.	0.16	100.4	78.2

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-60b·	39.5	0.01	20.1	0.32	40.5	0.13	n.d.	0.16	100.7	78.2
UR-60b·	39.8	0.01	20.1	0.27	40.4	0.10	n.d.	0.29	101.0	78.2
UR-60b·	39.2	0.01	20.1	0.32	40.2	0.11	n.d.	0.26	100.2	78.1
UR-60b·	39.5	0.01	20.2	0.35	40.5	0.13	n.d.	0.24	101.0	78.1
UR-60b·	39.2	0.01	20.2	0.24	40.4	0.13	n.d.	0.25	100.5	78.1
UR-60b·	39.6	n.d.	20.2	0.34	40.4	0.13	n.d.	0.20	100.9	78.1
UR-60b·	40.3	0.01	19.9	0.28	39.6	0.13	n.d.	0.16	100.4	78.1
UR-60b·	39.4	0.02	20.4	0.30	40.3	0.12	n.d.	0.22	100.7	77.9
UR-60b·	39.5	0.01	20.3	0.25	40.0	0.13	n.d.	0.27	100.5	77.9
UR-60b·	39.4	0.02	20.6	0.32	40.1	0.13	n.d.	0.18	100.7	77.7
UR-60b·	39.2	0.02	20.5	0.29	39.9	0.19	n.d.	0.18	100.3	77.6
UR-60b·	39.4	0.01	20.5	0.35	39.9	0.12	n.d.	0.19	100.5	77.6
UR-60b·	39.3	n.d.	20.6	0.31	39.8	0.13	n.d.	0.18	100.4	77.5
UR-60b·	39.0	0.01	20.7	0.25	40.1	0.10	n.d.	0.22	100.4	77.5
UR-60b·	39.5	0.01	20.9	0.27	40.1	0.12	n.d.	0.14	101.0	77.4
UR-60b·	39.2	0.02	20.9	0.35	40.1	0.13	0.04	0.15	100.9	77.4
UR-60b·	39.1	0.02	20.5	0.25	39.5	0.17	n.d.	0.18	99.7	77.4
UR-60b·	39.6	n.d.	20.8	0.34	39.7	0.13	0.06	0.33	100.9	77.3
UR-60b·	39.5	0.01	20.8	0.40	39.7	0.15	n.d.	0.26	100.9	77.3
UR-60b·	39.0	n.d.	20.8	0.29	39.6	0.12	n.d.	0.27	100.1	77.3
UR-60b·	39.5	n.d.	20.9	0.31	39.6	0.12	n.d.	0.19	100.6	77.2
UR-60b·	39.2	0.01	21.0	0.33	39.7	0.19	n.d.	0.20	100.6	77.1
UR-60b·	39.2	n.d.	21.0	0.27	39.8	0.10	0.04	0.30	100.7	77.1
UR-60b·	39.4	n.d.	21.0	0.29	39.7	0.12	n.d.	0.25	100.9	77.1
UR-60b·	39.5	n.d.	21.0	0.25	39.5	0.13	0.03	0.18	100.7	77.0
UR-60b·	39.4	n.d.	21.1	0.30	39.7	0.11	n.d.	0.29	100.9	77.0
UR-60b·	39.5	0.02	20.9	0.35	39.2	0.19	n.d.	0.17	100.4	77.0
UR-60b·	39.2	0.01	21.1	0.31	39.6	0.12	n.d.	0.25	100.6	77.0
UR-60b·	39.3	0.02	21.4	0.37	39.7	0.13	n.d.	0.15	101.0	76.8
UR-60b·	39.2	n.d.	21.4	0.30	39.5	0.13	n.d.	0.19	100.7	76.7
UR-60b·	39.1	0.02	21.4	0.40	39.3	0.16	n.d.	0.18	100.6	76.6
UR-60b·	39.2	n.d.	21.5	0.29	39.3	0.14	n.d.	0.18	100.7	76.6
UR-60b·	39.2	0.01	21.6	0.27	39.3	0.13	n.d.	0.13	100.6	76.5
UR-60b·	39.4	0.04	21.7	0.34	38.8	0.17	n.d.	0.21	100.7	76.1
UR-60b·	39.3	n.d.	21.8	0.29	38.9	0.13	n.d.	0.25	100.6	76.1
UR-60b·	38.8	0.01	21.8	0.36	38.8	0.14	n.d.	0.14	100.0	76.0
UR-60b·	39.0	n.d.	21.9	0.33	38.9	0.12	0.03	0.17	100.4	76.0
UR-60b·	39.4	0.02	22.0	0.35	38.6	0.15	n.d.	0.25	100.7	75.8
UR-60b·	39.0	n.d.	22.0	0.44	38.6	0.12	n.d.	0.15	100.3	75.8
UR-60b·	38.9	0.01	22.1	0.33	38.7	0.13	n.d.	0.15	100.4	75.7
UR-60b·	39.0	0.01	22.1	0.23	38.6	0.20	n.d.	0.16	100.3	75.7

Comme	SiO2	Al2O3	FeO	MnO	MgO	CaO	Cr2O3	NiO	Total	Fo#
UR-60b·	39.2	0.03	22.1	0.34	38.5	0.23	n.d.	0.19	100.6	75.6
UR-60b·	39.0	n.d.	22.3	0.25	38.8	0.12	n.d.	0.29	100.8	75.6
UR-60b·	39.3	0.01	22.5	0.28	38.6	0.14	n.d.	0.15	100.9	75.4
UR-60b·	39.0	0.01	23.0	0.31	38.2	0.14	n.d.	0.22	100.9	74.8
UR-60b·	38.8	0.02	23.0	0.33	38.0	0.24	n.d.	0.15	100.5	74.7
UR-60b·	38.9	0.01	23.2	0.33	38.3	0.16	n.d.	0.09	101.0	74.7
UR-60b·	39.1	0.02	23.1	0.38	38.0	0.18	0.05	0.18	100.9	74.6
UR-60b·	38.2	0.02	23.0	0.29	37.7	0.16	n.d.	0.16	99.5	74.5
UR-60b·	39.1	0.01	23.2	0.35	37.7	0.18	n.d.	0.20	100.7	74.3
UR-60b·	38.7	n.d.	23.1	0.36	37.5	0.14	0.05	0.11	100.0	74.3
UR-60b·	38.7	0.02	23.1	0.35	37.5	0.17	n.d.	0.19	100.0	74.3
UR-60b·	38.9	n.d.	23.3	0.41	37.6	0.17	n.d.	0.22	100.5	74.2
UR-60b·	38.6	0.01	23.7	0.32	37.3	0.18	n.d.	0.16	100.2	73.8
UR-60b·	38.6	n.d.	23.9	0.38	37.5	0.13	n.d.	0.23	100.8	73.7
UR-60b·	38.6	n.d.	24.0	0.37	37.7	0.13	n.d.	0.16	100.9	73.7
UR-60b·	38.7	0.02	23.7	0.37	37.1	0.19	n.d.	0.18	100.3	73.6
UR-60b·	38.8	0.02	23.8	0.27	37.2	0.20	n.d.	0.17	100.5	73.6
UR-60b·	38.7	0.01	23.9	0.36	37.3	0.18	n.d.	0.14	100.6	73.5
UR-60b·	38.9	n.d.	23.9	0.31	37.2	0.16	n.d.	0.18	100.6	73.5
UR-60b·	38.5	n.d.	24.1	0.34	37.5	0.15	n.d.	0.16	100.9	73.5
UR-60b·	51.4	0.70	17.4	0.32	27.0	2.27	0.15	0.10	99.3	73.4
UR-60b·	38.6	0.02	24.2	0.34	36.9	0.21	n.d.	0.13	100.4	73.1
UR-60b·	38.8	n.d.	24.4	0.40	37.0	0.15	n.d.	0.22	100.9	73.0
UR-60b·	38.9	0.01	24.4	0.35	36.7	0.19	0.05	0.15	100.7	72.8
UR-60b·	38.6	0.01	24.5	0.37	36.8	0.16	n.d.	0.17	100.6	72.8
UR-60b·	38.7	0.02	24.7	0.40	36.4	0.23	n.d.	0.12	100.6	72.4
UR-60b·	38.6	n.d.	24.9	0.39	36.6	0.17	n.d.	0.14	100.8	72.4
UR-60b·	38.8	0.02	24.9	0.39	36.4	0.20	n.d.	0.14	100.9	72.2
UR-60b·	38.5	0.02	24.9	0.42	36.3	0.21	n.d.	0.08	100.4	72.2
UR-60b·	38.8	n.d.	24.9	0.35	36.3	0.19	n.d.	0.14	100.8	72.2
UR-60b·	39.0	0.01	25.0	0.37	35.9	0.24	n.d.	0.13	100.7	71.9
UR-60b·	38.4	0.02	25.6	0.48	35.8	0.18	n.d.	0.13	100.6	71.4
UR-60b·	38.6	0.02	25.7	0.41	35.7	0.23	n.d.	0.10	100.8	71.3
UR-60b·	38.2	n.d.	26.0	0.47	35.5	0.18	n.d.	0.19	100.4	70.9
UR-60b·	45.8	0.51	22.7	0.40	29.6	1.69	n.d.	0.09	100.8	69.9
UR-60b·	39.6	0.07	26.4	0.51	33.8	0.39	n.d.	0.10	100.8	69.5
UR-60b·	38.4	0.03	27.2	0.49	34.3	0.21	n.d.	0.15	100.8	69.2
UR-60b·	37.9	0.01	27.3	0.42	33.8	0.25	n.d.	0.09	99.8	68.9
UR-60b·	37.8	0.01	28.1	0.44	33.6	0.23	n.d.	0.16	100.4	68.1
UR-60b·	37.7	0.03	28.0	0.51	32.9	0.22	n.d.	0.13	99.5	67.7

Figure A5 Histograms of forsterite content (Fo mol% = XMgO/(XMgO+XFeO) x100) of the analyzed olivine phenocrysts for the 18 subduction zone samples in Table II-6. All electron microprobe analyses are reported in Table A4. Histograms do not reflect the entire distribution of the olivine phenocryst composition: there was intentional sampling bias to analyze the most Mg-rich (and therefore Ni-rich) olivine crystals in each sample (see text). The black shading indicates the highest 3 mol% Fo of the analyzed olivine population in each sample, which was used to fit the linear relationship between wt% NiO vs. mol% Fo (see Fig. II-4).



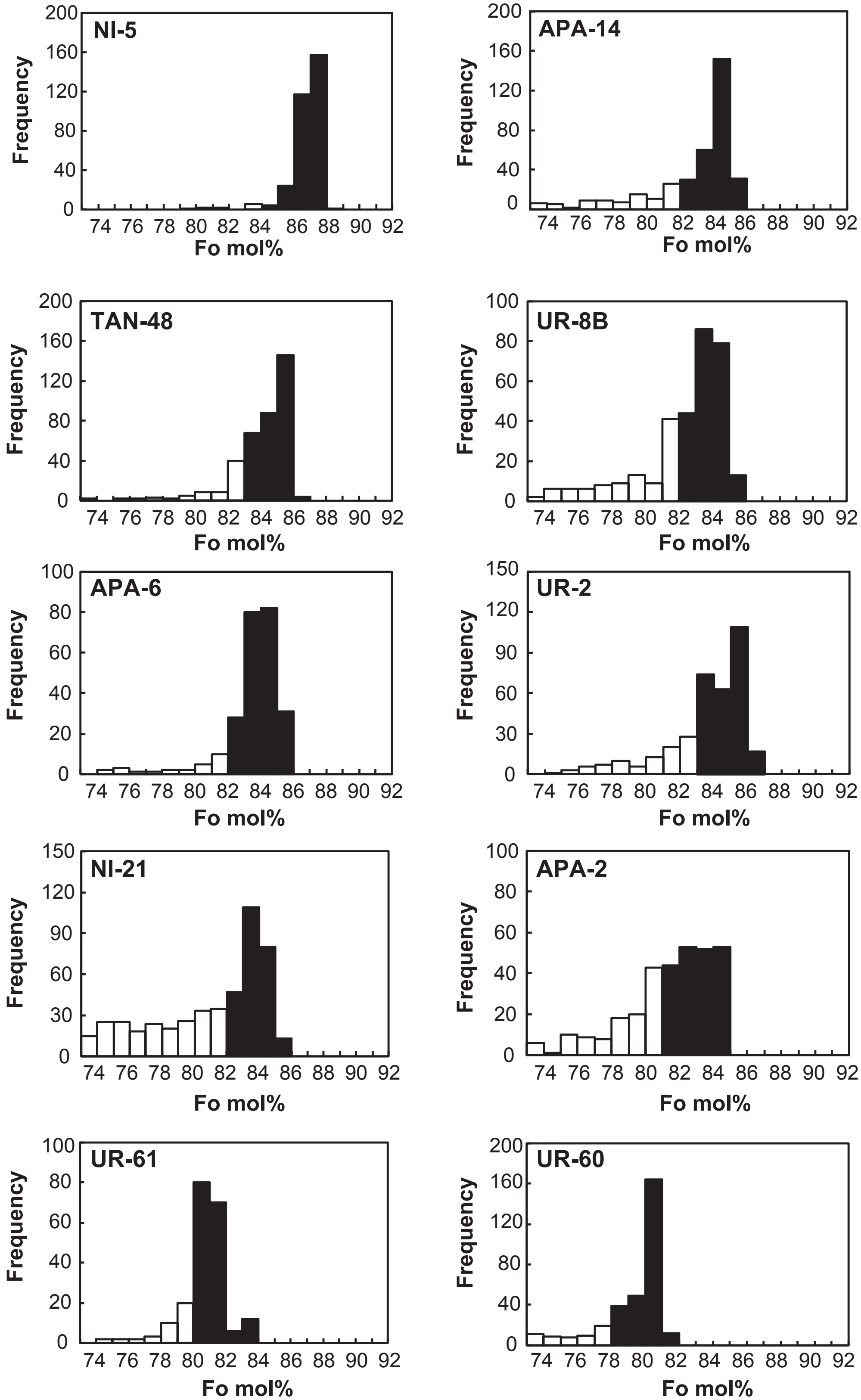

NI-5
APA-14
TAN-48
UR-8B
APA-6
UR-2
NI-21
APA-2
UR-61
UR-60
Frequency
Fo mol%
74 76 78 80 82 84 86 88 90 92
0 40 80 120 160 200
0 20 40 60 80 100
0 30 60 90 120 150

Figure A6 Histogram of $K_D^{oliv\text{-}liq}$ (=($XMgO^{oliv}$ /$XFeO^{oliv}$)/($XMgO^{liq}$/$XFeO^{liq}$)) for 108 hydrous olivine-melt equilibrium experiments from the literature where oxygen fugacity was buffered or known(Almeev et al., 2007; Médard and Grove, 2008; Moore and Carmichael, 1998; Parman et al., 2011; Righter and Carmichael, 1996; Sisson and Grove, 1993a; Sisson and Grove, 1993b; Wagner et al.,1995). The Fe^{3+} /Fe^{2+} ratio in each experimental melt was calculated from the model of Jayasuriya et al. (2004; their Eq. 12) based on reported temperature, oxygen fugacity, and melt composition. The average K_D value of these 108 experiments is 0.37 ± 0.04 (1σ), which is higher than the average value of 0.34 from anhydrous olivine-melt experiments (Matzen et al., 2011).

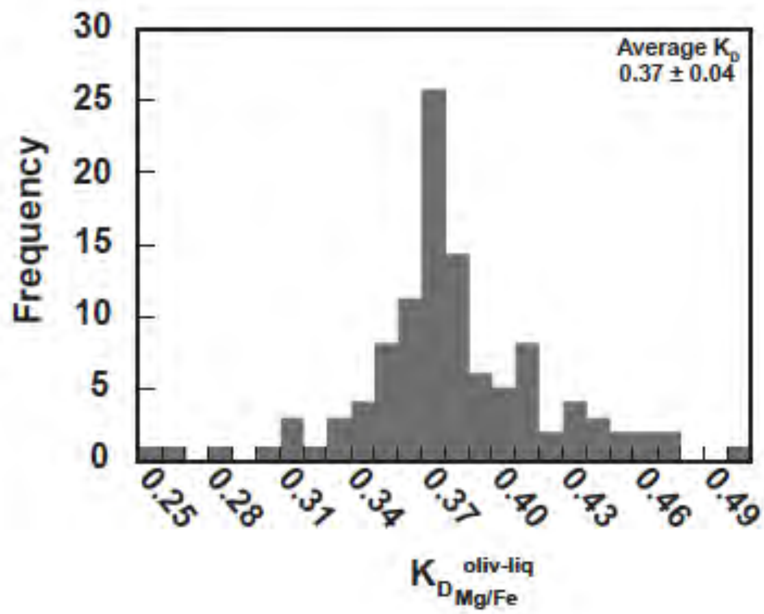


Table A5 Experimental conditions, melt compositions, Fe^{2+}/Fe^{3+} results, olivine Mg/Fe and K_D calculation of 108 hydrous experiments in Fig. A6

				melt composition (wt%)						
Study	Experiment	T(˚C)	∆NNO	SiO2	TiO2	Al2O3	FeO*	Fe2O3*	MnO	MgO
Almeev et al., 2007	#118	1210	-0.3	50.23	1.01	15.76	7.68	2.06	0.23	9.00
Almeev et al., 2007	#114	1210	-0.2	50.13	1.03	15.71	7.44	2.35	0.14	9.08
Almeev et al., 2007	#144	1175	0.1	50.33	1.08	15.96	5.89	4.16	0.14	8.64
Almeev et al., 2007	#115	1210	0.7	49.95	1.05	15.63	6.96	2.82	0.16	9.29
Almeev et al., 2007	#143	1175	0.6	50.28	1.07	15.91	5.35	4.66	0.16	8.95
Almeev et al., 2007	#146	1175	1.4	50.35	1.55	14.86	8.03	3.75	0.23	7.56
Almeev et al., 2007	#225	1210	1.0	49.84	1.11	15.37	7.68	2.15	0.11	9.23
Almeev et al., 2007	#140	1155	1.6	50.51	1.09	15.98	5.11	4.92	0.14	8.71
Almeev et al., 2007	#113	1190	1.6	50.06	1.07	15.92	6.55	3.19	0.16	8.68
Almeev et al., 2007	#155	1220	1.8	49.87	1.07	16.05	7.43	1.90	0.19	9.47
Almeev et al., 2007	#138	1155	0.8	50.34	1.07	15.87	4.78	5.18	0.14	9.21
Almeev et al., 2007	#112	1190	1.8	49.95	1.03	15.81	6.12	3.92	0.16	8.93
Almeev et al., 2007	#6	1200	2.3	50.35	1.08	15.73	6.75	2.67	0.18	8.89
Almeev et al., 2007	#87	1190	1.5	50.06	1.06	15.73	5.95	3.80	0.17	9.20
Almeev et al., 2007	#189	1130	1.9	50.73	1.08	15.71	4.07	5.54	0.15	8.87
Almeev et al., 2007	#193	1170	2.2	50.49	1.07	15.84	5.59	4.12	0.14	8.71
Almeev et al., 2007	#88	1190	2.2	50.01	1.05	15.57	5.79	4.00	0.17	9.38
Almeev et al., 2007	#194	1170	2.5	50.53	1.06	15.79	5.23	4.32	0.17	9.02
Almeev et al., 2007	#192	1170	2.8	50.40	1.08	15.81	5.26	4.40	0.20	8.91
Almeev et al., 2007	#31	1200	3.2	50.45	1.06	16.01	5.69	3.20	0.20	9.24
Almeev et al., 2007	#62	1170	3.5	50.61	1.19	15.82	6.13	3.81	0.18	8.01
Almeev et al., 2007	#188	1130	-0.2	50.72	1.05	15.70	3.85	5.80	0.17	9.11
Barclay and Carmichael, 2004	Jor46.2	1100	2.7	46.64	1.47	13.76	3.52	3.45	0.12	5.45
Berndt et al., 2005	62	1100	3.52	49.79	0.82	16.07	3.74	5.67	0.19	9.10
Berndt et al., 2005	129	1150	-1.55	50.60	0.84	16.70	6.91	1.03	0.14	8.71
Berndt et al., 2005	45	1100	3.52	50.15	0.82	16.29	3.63	5.62	0.17	8.97
Berndt et al., 2005	65	1150	2.87	49.88	0.77	16.29	4.52	5.04	0.10	9.21
Berndt et al., 2005	134	1100	-0.71	50.32	0.80	16.90	6.72	1.50	0.19	8.11
Moore and Carmichael, 1998	PEM22-17	1000	2.2	60.79	0.89	18.99	2.03	1.75	0.00	3.38
Moore and Carmichael, 1998	SAT-M22-2	1100	2.1	56.37	0.67	18.97	3.46	2.63	0.00	5.75
Moore and Carmichael, 1998	PEM22-12	1050	2.6	57.31	0.70	19.36	1.09	4.27	0.00	5.75
Moore and Carmichael, 1998	PEM22-6	1075	2	62.61	0.97	18.09	2.82	2.84	0.00	3.00
Moore and Carmichael, 1998	PEM22-1	1050	2.7	59.41	0.93	18.00	3.15	2.43	0.00	3.28
Moore and Carmichael, 1998	PEM22-9	1125	5.6	56.32	0.52	19.60	3.11	2.73	0.00	3.94
Moore and Carmichael, 1998	PEM22-8	1100	1.6	54.32	0.80	19.79	3.57	2.97	0.00	4.74
Moore and Carmichael, 1998	PEM22-7	1150	2	55.90	0.71	19.08	3.25	2.80	0.00	5.70
Moore and Carmichael, 1998	PEM22-20	1000	2	58.39	0.55	18.68	3.08	2.73	0.00	3.80
Moore and Carmichael, 1998	PEM22-18	1025	2	58.06	1.09	19.21	3.01	2.56	0.00	3.60
Moore and Carmichael, 1998	PEM22-19	1000	2	59.75	0.57	18.83	3.09	2.63	0.00	3.83
Moore and Carmichael, 1998	PEM22-2	1100	2	56.25	0.82	18.68	2.75	2.95	0.00	5.65
Médard and Grove, 2008	#7	1173	0	48.00	0.58	18.68	6.24	1.70	0.16	10.73
Médard and Grove, 2008	#126	1130	0	58.50	0.56	15.10	4.24	1.26	0.08	8.16
Médard and Grove, 2008	#8	1190	0	48.40	0.59	18.79	5.77	1.54	0.16	10.61
Médard and Grove, 2008	#127	1150	0	57.70	0.56	14.80	4.43	1.29	0.10	9.17
Médard and Grove, 2008	#1	1147	0	47.00	1.19	12.61	7.12	2.01	0.16	10.24
Médard and Grove, 2008	#23	1220	0	48.10	0.54	18.61	6.62	1.75	0.13	10.22
Médard and Grove, 2008	#11	1204	0	47.90	0.54	18.66	6.65	1.76	0.14	10.41
Médard and Grove, 2008	#13	1144	0	48.00	0.59	18.72	6.17	1.72	0.17	10.68
Médard and Grove, 2008	#5	1147	0	48.20	0.59	18.72	6.06	1.67	0.15	10.67
Parman et al., 2011	SAR11	1050	0	52.86	1.02	18.94	7.06	2.20	0.14	4.35
Parman et al., 2011	PAF19	1050	0	53.97	0.99	16.05	8.90	2.81	0.25	4.82
Parman et al., 2011	SAR5	1050	0	53.54	0.73	18.62	5.97	1.83	0.16	5.74
Parman et al., 2011	SAR7	1070	0	53.33	0.73	17.71	5.91	1.82	0.16	6.57
Parman et al., 2011	SAR3	1040	0	54.07	0.77	19.08	6.02	1.82	0.16	5.20
Parman et al., 2011	SAR4	1030	0	55.15	0.83	18.61	6.16	1.92	0.16	4.60
Parman et al., 2011	PAF5	1040	0	51.66	0.77	18.54	7.37	2.24	0.23	6.02
Parman et al., 2011	SAR17	1070	0	52.40	0.82	17.67	7.23	2.23	0.15	6.11
Parman et al., 2011	PAF22	1050	0	51.24	0.77	18.30	7.56	2.33	0.22	6.12
Parman et al., 2011	PAF15	1040	0	52.18	0.61	17.37	8.67	2.72	0.26	5.25
Parman et al., 2011	PAF24	1070	0	49.74	0.67	17.95	8.07	2.48	0.22	7.07
Parman et al., 2011	PAF11	1037	0	52.46	0.82	17.98	7.54	2.32	0.20	5.53
Parman et al., 2011	SAR15	1060	0	52.68	0.76	17.97	6.77	2.12	0.17	5.80
Parman et al., 2011	PAF16	1040	0	50.20	0.69	17.97	8.34	2.58	0.25	6.13
Parman et al., 2011	SAR9	1090	0	52.67	0.72	16.66	5.91	1.83	0.11	7.48
Parman et al., 2011	SAR16	1040	0	54.16	0.82	18.37	6.86	2.15	0.16	4.84
Parman et al., 2011	PAF17	1020	0	52.89	0.82	17.64	8.76	2.75	0.25	4.65
Parman et al., 2011	PAF8	1030	0	52.31	0.85	18.35	7.51	2.33	0.22	5.33
Parman et al., 2011	PAF20	1030	0	54.73	1.13	17.10	8.10	2.54	0.20	3.98
Parman et al., 2011	SAR2	1011	0	56.67	1.11	18.33	5.93	1.92	0.17	3.76
Parman et al., 2011	PAF7	1040	0	51.39	0.78	18.32	7.39	2.28	0.21	5.93
Parman et al., 2011	PAF6	1060	0	50.85	0.68	17.83	6.89	2.09	0.19	7.37

Experiment	CaO	Na2O	K2O	P2O5	Total	melt Mg/Fe	olivine XMgO/(XMgO+XFeO)*100	olivine Mg/Fe	KD
#118	12.07	2.10	0.06	0.00	100.21	2.09	86.0	6.1	0.341
#114	12.14	2.15	0.06	0.00	100.24	2.18	86.4	6.3	0.344
#144	11.86	2.28	0.06	0.00	100.42	2.61	88.4	7.6	0.344
#115	12.15	2.20	0.07	0.00	100.28	2.38	87.2	6.8	0.351
#143	11.78	2.23	0.07	0.00	100.47	2.98	89.3	8.4	0.357
#146	11.54	2.41	0.09	0.00	100.38	1.68	82.3	4.7	0.361
#225	12.45	2.14	0.13	0.00	100.22	2.14	85.4	5.8	0.367
#140	11.71	2.24	0.07	0.00	100.49	3.04	89.0	8.1	0.377
#113	12.46	2.15	0.07	0.00	100.32	2.36	86.1	6.2	0.382
#155	11.99	2.14	0.08	0.00	100.19	2.27	85.5	5.9	0.385
#138	11.62	2.23	0.08	0.00	100.52	3.44	89.8	8.8	0.390
#112	12.18	2.22	0.06	0.00	100.39	2.60	86.8	6.6	0.396
#6	12.41	2.15	0.06	0.00	100.27	2.35	85.5	5.9	0.397
#87	12.11	2.23	0.06	0.00	100.38	2.76	86.9	6.6	0.416
#189	12.19	2.13	0.07	0.00	100.55	3.88	90.2	9.2	0.420
#193	12.16	2.23	0.07	0.00	100.41	2.78	86.6	6.5	0.428
#88	12.15	2.21	0.06	0.00	100.40	2.89	87.1	6.7	0.429
#194	12.00	2.22	0.09	0.00	100.43	3.08	87.7	7.1	0.432
#192	12.08	2.25	0.06	0.00	100.44	3.02	87.1	6.7	0.448
#31	12.15	2.25	0.05	0.00	100.32	2.89	86.4	6.4	0.455
#62	12.25	2.31	0.07	0.00	100.38	2.33	83.6	5.1	0.457
#188	11.88	2.23	0.07	0.00	100.58	4.22	90.0	9.0	0.469
Jor46.2	7.58	4.25	2.82	1.19	90.27	2.76	89.2	8.3	0.334
62	12.79	2.11	0.12	0.17	100.55	4.3	94.9	18.6	0.233
129	12.84	2.22	0.05	0.05	100.09	2.2	88.2	7.5	0.300
45	12.47	2.26	0.11	0.08	100.55	4.4	93.2	13.6	0.323
65	12.41	2.20	0.03	0.04	100.47	3.6	91.4	10.7	0.339
134	13.23	2.15	0.09	0.13	100.13	2.2	85.7	6.0	0.358
PEM22-17	6.16	4.58	1.60	0.00	100.18	2.98	90.4	9.4	0.318
SAT-M22-2	7.59	3.41	1.41	0.00	100.26	2.97	89.2	8.3	0.359
PEM22-12	7.08	3.43	1.44	0.00	100.43	9.41	96.3	25.7	0.366
PEM22-6	5.73	2.35	1.86	0.00	100.28	1.89	83.7	5.1	0.368
PEM22-1	5.72	5.40	1.92	0.00	100.24	1.86	83.3	5.0	0.372
PEM22-9	7.55	5.19	1.32	0.00	100.27	2.26	85.7	6.0	0.376
PEM22-8	8.20	4.63	1.27	0.00	100.30	2.36	86.2	6.3	0.378
PEM22-7	6.68	4.87	1.29	0.00	100.28	3.13	88.6	7.8	0.403
PEM22-20	7.35	4.36	1.33	0.00	100.27	2.20	84.4	5.4	0.406
PEM22-18	7.12	4.26	1.35	0.00	100.26	2.13	82.9	4.9	0.438
PEM22-19	5.82	4.28	1.45	0.00	100.26	2.21	83.2	5.0	0.447
PEM22-2	7.31	4.62	1.27	0.00	100.30	3.66	88.7	7.8	0.467
#7	11.70	2.29	0.08	0.05	100.21	3.07	89.5	8.5	0.360
#126	8.36	3.07	0.68	0.12	100.13	3.43	90.4	9.4	0.365
#8	11.76	2.25	0.09	0.04	100.00	3.28	89.9	8.9	0.368
#127	8.23	3.06	0.66	0.14	100.14	3.69	90.9	10.0	0.369
#1	11.98	3.18	3.24	1.43	100.16	2.56	87.4	6.9	0.369
#23	11.83	2.22	0.08	0.08	100.19	2.75	88.1	7.4	0.371
#11	11.68	2.03	0.08	0.04	99.90	2.79	88.1	7.4	0.377
#13	11.64	2.32	0.08	0.03	100.12	3.09	89.1	8.2	0.378
#5	11.68	2.24	0.08	0.06	100.12	3.14	88.5	7.7	0.408
SAR11	10.62	2.44	0.46	0.13	100.22	1.10	80.1	4.0	0.273
PAF19	10.16	1.57	0.58	0.18	100.28	0.97	75.1	3.0	0.320
SAR5	10.76	2.28	0.47	0.07	100.18	1.72	83.5	5.1	0.338
SAR7	11.36	2.09	0.45	0.05	100.18	1.98	85.4	5.9	0.338
SAR3	10.36	2.13	0.50	0.08	100.18	1.54	81.8	4.5	0.342
SAR4	9.60	2.48	0.57	0.10	100.19	1.33	79.5	3.9	0.344
PAF5	11.55	1.38	0.41	0.05	100.22	1.46	80.9	4.2	0.344
SAR17	11.45	1.72	0.39	0.05	100.22	1.51	81.3	4.3	0.347
PAF22	11.73	1.48	0.43	0.05	100.23	1.44	80.4	4.1	0.352
PAF15	11.14	1.44	0.51	0.14	100.27	1.08	75.4	3.1	0.352
PAF24	12.30	1.31	0.41	0.04	100.25	1.56	81.3	4.3	0.360
PAF11	11.44	1.40	0.44	0.10	100.23	1.31	78.4	3.6	0.361
SAR15	11.29	2.09	0.48	0.08	100.21	1.53	80.8	4.2	0.362
PAF16	12.16	1.37	0.43	0.15	100.26	1.31	78.2	3.6	0.365
SAR9	12.33	1.95	0.43	0.10	100.18	2.26	86.1	6.2	0.365
SAR16	10.25	2.10	0.47	0.04	100.22	1.26	77.3	3.4	0.368
PAF17	10.41	1.46	0.53	0.13	100.28	0.95	71.8	2.5	0.373
PAF8	11.11	1.64	0.50	0.10	100.23	1.26	76.6	3.3	0.386
PAF20	10.03	1.63	0.64	0.17	100.25	0.88	69.0	2.2	0.393
SAR2	8.26	3.11	0.80	0.13	100.19	1.13	73.8	2.8	0.400
PAF7	11.96	1.44	0.44	0.08	100.23	1.43	77.7	3.5	0.411
PAF6	12.45	1.40	0.39	0.08	100.21	1.91	79.5	3.9	0.490

									melt composition (wt%)	
Study	Experiment	T(˚C)	∆NNO	SiO2	TiO2	Al2O3	FeO*	Fe2O3*	MnO	MgO
Righter and Carmichael, 1996	93A	1050	4.06	50.0	1.66	12.75	2.14	5.53	0	8.30
Righter and Carmichael, 1996	74A	1015	1.48	53.3	1.23	13.24	4.04	1.93	0	4.70
Sisson and Grove, 1993a	79-35g-#11	1035	0	49.00	0.72	19.70	6.72	2.19	0.16	6.37
Sisson and Grove, 1993a	79-35g-#6	1050	0	48.20	0.65	19.40	6.47	2.11	0.16	6.96
Sisson and Grove, 1993a	79-35g-#4	1050	0	49.40	0.72	19.20	6.41	2.07	0.15	6.58
Sisson and Grove, 1993a	79-35g-#10	1025	0	49.10	0.73	19.50	6.77	2.23	0.17	6.37
Sisson and Grove, 1993a	2-66+NAOH-#	985	0	54.80	0.62	20.10	4.99	1.76	0.16	3.32
Sisson and Grove, 1993a	5S52b+An80-#	965	0	53.70	0.93	20.00	5.24	1.78	0.16	3.75
Sisson and Grove, 1993a	87S35a-#3	970	0	52.10	1.27	19.30	6.39	2.18	0.15	4.14
Sisson and Grove, 1993a	82-66+Ab-#1	965	0	55.90	0.83	20.20	4.86	1.68	0.14	3.52
Sisson and Grove, 1993a	85S52b-#13	968	0	55.40	1.15	18.30	5.80	2.05	0.13	3.70
Sisson and Grove, 1993a	5S52b+An80-#	943	0	57.10	0.70	19.10	5.26	1.83	0.16	2.80
Sisson and Grove, 1993a	2-66+NAOH-#	965	0	55.40	0.60	19.90	5.19	1.79	0.17	3.64
Sisson and Grove, 1993a	82-62-#4	1000	0	51.80	1.28	19.40	6.60	2.24	0.17	4.56
Sisson and Grove, 1993a	85S52b-#11	1024	0	54.90	1.09	17.90	6.01	2.02	0.16	4.56
Sisson and Grove, 1993a	79-35g-#12	1000	0	52.50	0.98	19.20	6.15	2.10	0.20	4.99
Sisson and Grove, 1993a	85S52b-#14	940	0	56.30	1.09	18.60	5.47	1.98	0.13	3.09
Sisson and Grove, 1993a	82-62-#3	1012	0	51.50	1.19	19.20	6.67	2.25	0.19	4.98
Sisson and Grove, 1993a	82-66-#3	1012	0	52.90	1.08	19.10	6.07	2.03	0.17	4.80
Sisson and Grove, 1993a	82-66-#5	1000	0	52.70	1.06	19.30	5.96	1.99	0.14	4.83
Sisson and Grove, 1993a	5S52b+An80-#	960	0	56.50	1.04	18.80	5.22	1.77	0.17	3.27
Sisson and Grove, 1993a	87S35a-#11	965	0	53.20	1.10	19.20	5.90	1.92	0.16	3.66
Sisson and Grove, 1993a	85S52b-#12	998	0	55.00	1.13	18.00	5.81	2.10	0.18	4.42
Sisson and Grove, 1993a	82-66-#7	965	0	59.10	0.54	19.10	4.05	1.30	0.19	3.25
Sisson and Grove, 1993b	82-66-8	1020	0	55.80	1.49	17.40	6.28	2.18	0.18	3.45
Sisson and Grove, 1993b	79-35g-17	1100	0	48.70	0.63	19.00	6.47	1.93	0.14	7.87
Sisson and Grove, 1993b	82-66-10	1050	0	53.20	1.18	17.70	6.25	2.08	0.14	5.03
Sisson and Grove, 1993b	82-66-9	1035	0	54.80	1.38	17.50	6.19	2.12	0.17	4.14
Sisson and Grove, 1993b	79-35g-16	1082	0	51.10	0.93	17.50	6.86	2.28	0.18	6.09
Sisson and Grove, 1993b	1140MF-18	1050	0	57.20	0.94	17.50	5.26	1.72	0.11	4.26
Wagner et al., 1995	12	1050	0	52.30	1.12	18.10	7.36	2.05	0.14	5.31
Wagner et al., 1995	2	1015	0	54.60	1.58	17.20	7.39	2.23	0.19	3.70
Wagner et al., 1995	15	1075	0	51.80	1.08	17.80	7.26	2.04	0.18	5.80
Wagner et al., 1995	14	1045	0	53.50	1.19	17.90	6.78	1.91	0.18	4.86
Wagner et al., 1995	1	1000	0	56.00	1.58	17.10	7.00	2.12	0.15	3.30
Wagner et al., 1995	13	1035	0	53.90	1.21	17.60	6.80	2.00	0.08	4.63
Wagner et al., 1995	8	985	0	55.90	1.64	17.10	6.99	2.12	0.20	3.12

* FeO and Fe_2O_3 content of the melt were calculated from Jayasuriya et al. (2004) model, based on reported melt composition,T_{expt} and ∆NNO

Experiment	CaO	Na2O	K2O	P2O5	Total	melt Mg/Fe	olivine XMgO/(XMgO+XFeO)*100	olivine Mg/Fe	KD
93A	7.58	2.39	5.00	0.00	95.35	6.90	95.1	19.4	0.355
74A	7.90	3.04	5.52	2.05	96.95	2.07	88.9	8.0	0.259
79-35g-#11	12.10	3.08	0.11	0.09	100.24	1.69	84.9	5.6	0.300
79-35g-#6	13.20	2.89	0.12	0.09	100.25	1.92	86.4	6.4	0.301
79-35g-#4	12.60	2.77	0.12	0.06	100.09	1.83	84.7	5.6	0.329
79-35g-#10	12.20	2.99	0.11	0.09	100.25	1.68	83.6	5.1	0.330
32-66+NAOH-#:	7.63	5.56	0.94	0.28	100.17	1.19	77.7	3.5	0.341
5S52b+An80-#	8.77	3.98	1.60	0.33	100.24	1.28	78.5	3.6	0.350
87S35a-#3	8.77	4.49	1.00	0.42	100.21	1.16	76.2	3.2	0.361
82-66+Ab-#1	7.35	4.85	0.76	0.16	100.25	1.29	78.1	3.6	0.361
85S52b-#13	7.42	3.99	1.94	0.32	100.20	1.14	75.9	3.1	0.362
5S52b+An80-#	6.59	4.17	2.13	0.39	100.22	0.95	72.2	2.6	0.365
32-66+NAOH-#	7.67	4.64	1.02	0.25	100.27	1.25	77.2	3.4	0.368
82-62-#4	9.59	3.96	0.45	0.18	100.23	1.23	76.9	3.3	0.370
85S52b-#11	7.12	4.03	2.07	0.35	100.21	1.35	78.4	3.6	0.373
79-35g-#12	9.64	4.15	0.21	0.14	100.26	1.45	79.4	3.9	0.375
85S52b-#14	7.22	4.09	1.94	0.30	100.21	1.01	72.4	2.6	0.383
82-62-#3	10.00	3.72	0.42	0.14	100.27	1.33	77.6	3.5	0.384
82-66-#3	9.66	3.41	0.82	0.13	100.17	1.41	78.2	3.6	0.393
82-66-#5	9.80	3.44	0.80	0.16	100.18	1.44	78.3	3.6	0.401
5S52b+An80-#	7.42	3.68	2.04	0.36	100.28	1.12	73.5	2.8	0.403
87S35a-#11	8.58	4.54	1.23	0.64	100.13	1.11	73.2	2.7	0.404
85S52b-#12	7.06	4.04	2.18	0.18	100.10	1.36	76.3	3.2	0.421
82-66-#7	7.45	4.00	0.88	0.31	100.17	1.43	76.8	3.3	0.431
82-66-8	7.71	4.18	1.23	0.27	100.17	0.98	73.3	2.7	0.356
79-35g-17	12.60	2.62	0.10	0.15	100.20	2.17	85.6	6.0	0.364
82-66-10	10.00	3.53	0.87	0.23	100.21	1.43	79.5	3.9	0.370
82-66-9	8.51	4.01	1.09	0.24	100.15	1.19	76.3	3.2	0.371
79-35g-16	11.50	3.53	0.17	0.15	100.29	1.58	80.8	4.2	0.377
1140MF-18	7.86	3.80	1.30	0.22	100.17	1.44	78.0	3.5	0.407
12	9.40	0.48	3.70	0.24	100.19	1.29	79.1	3.8	0.340
2	7.90	0.72	4.40	0.29	100.20	0.89	71.5	2.5	0.356
15	9.70	0.51	3.80	0.23	100.20	1.42	79.7	3.9	0.362
14	9.20	0.54	3.80	0.24	100.10	1.28	77.9	3.5	0.363
1	7.30	0.80	4.60	0.28	100.22	0.84	69.8	2.3	0.363
13	9.00	0.60	4.10	0.22	100.14	1.21	76.4	3.2	0.374
8	7.00	0.87	4.90	0.32	100.16	0.80	67.3	2.1	0.387
								avg	**0.372**
								st. dev	**0.041**

Figure A7 Pressure-Temperature phase diagrams for MAS-22 and Jor-46 with all individual experiments plotted. MAS-22 experiments are from Moore and Carmichael (1998) and Jor-46 experiments are from Barclay and Carmichael (2004). Note that the 1-bar experiments for MAS-22 from Moore and Carmicheal (1998) at 1149˚C reported no presence of olivine. However, the marked difference of MgO content in the liquid of that experiments compared to the starting material (4.5wt% vs 6.68%) suggests the crystallization of olivine in the experiment.

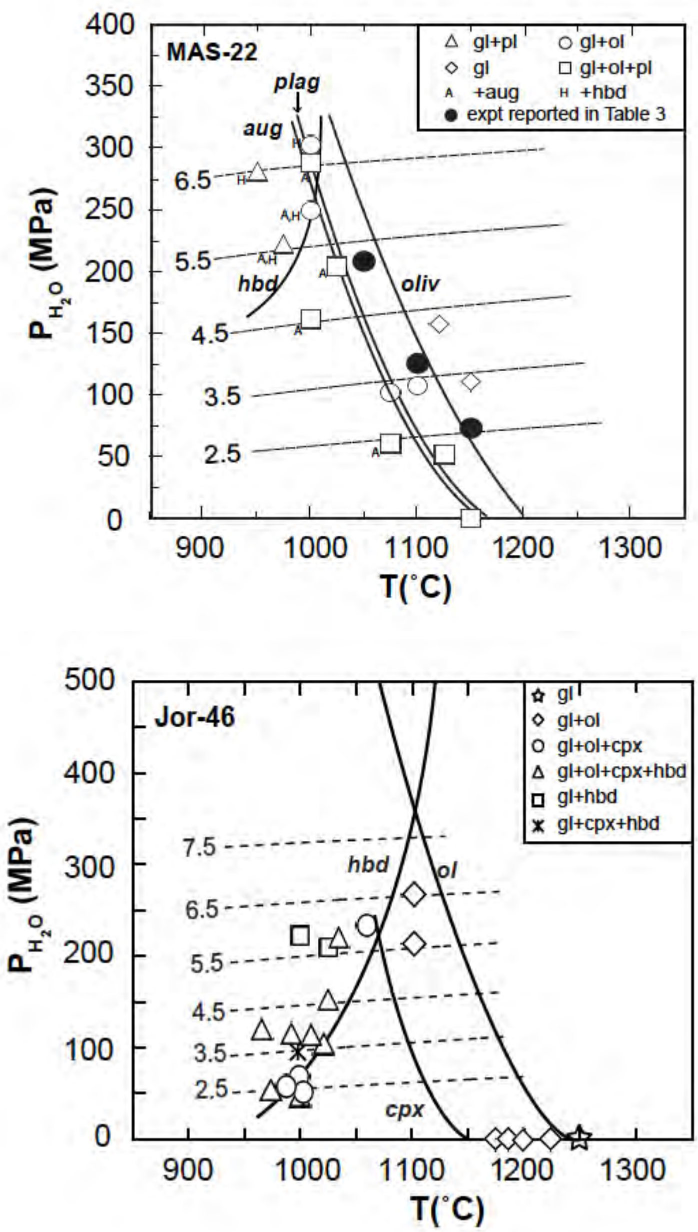


Table A6 Experiments used to calibrate the ΔT-H_2O relation

Study	Expt #	ol vol%	P(MPa)	T (˚C)	water-saturated?
Medard and Grove 2008	82-72f #23	1	10	1220	no
Medard and Grove 2008	82-72f #11	<0.5	25	1204	no
Medard and Grove 2008	82-72f #8	<0.5	50	1190	yes
Medard and Grove 2008	82-72f #7	1	100	1173	yes
Medard and Grove 2008	82-72f #13	1	200	1144	yes
Medard and Grove 2008	82-72f #5	1	200	1147	yes
Medard and Grove 2008	85-41c #127	<0.5	198	1150	yes
Medard and Grove 2008	85-41c #126	3	198	1139	yes
Medard and Grove 2008	Bb-107 #1	1	200	1147	yes
Almeev et al., 2007	155	0.5	203	1220	no
Almeev et al., 2007	115	0.5	204	1210	no
Almeev et al., 2007	6	1.9	204	1200	no
Almeev et al., 2007	31	1.4	203	1200	no
Almeev et al., 2007	88	0.4	203	1190	no
Almeev et al., 2007	143	1.4	205	1175	no
Almeev et al., 2007	193	2.2	205	1170	no
Almeev et al., 2007	194	1.4	205	1170	no
Almeev et al., 2007	192	1.7	205	1170	no
Almeev et al., 2007	138	0.8	204	1155	no
Almeev et al., 2007	188	1.1	203	1130	no
Sisson and Grove, 1993a	85S52b #11	1	200	1024	yes
Sisson and Grove, 1993a	85S52b #12	2	200	998	yes
Sisson and Grove, 1993b	1140-MF #18	1	100	1050	yes
Parman et al., 2010	PAF24	1.3	200	1070	yes
Parman et al., 2010	SAR9	1.2	200	1090	yes
Wagner et al., 1995	15	<0.5	100	1075	yes
Wagner et al., 1995	12	2	100	1050	yes
Moore and Carmichael, 1998	PEM 22-7	3	73	1150	yes
Moore and Carmichael, 1998	PEM 22-2	3	107	1100	yes
Moore and Carmichael, 1998	PEM 22-12	3	208	1050	yes
Berndt 2005	65	1.3	205	1150	no
Berndt 2005	45	1.8	202	1100	no
Berndt 2005	62	1.5	204	1100	yes
Berndt 2005	129	3.3	207	1150	no
Berndt 2005	134	4.4	203	1100	yes
Righter and Carmichael 1996	93A	4.2	75.1	1180	yes

Table A7 Plagioclase phenocryst compositions for UR-60 and UR-61

Comment	SiO2	Al2O3	FeO	CaO	Na2O	K2O	BaO	Total	An#
UR-60b-plagT23	46.68	33.14	0.53	16.82	1.91	0.02	n.d	99.14	82.8
UR-60b-plagT15	46.63	33.34	0.62	16.61	1.89	0.08	n.d	99.31	82.5
UR-60b-plagT3	47.78	33.19	0.50	16.52	2.01	0.06	n.d	100.16	81.7
UR-60b-plagT3	47.53	32.54	0.51	16.47	2.09	0.06	n.d	99.29	81.1
UR-60b-plagT4	47.24	32.55	0.50	16.44	2.14	0.01	n.d	98.95	80.9
UR-60b-plagT20	47.53	32.29	0.58	16.29	2.11	0.05	n.d	99.01	80.8
UR-60b-plagT2	47.47	32.35	0.60	16.39	2.15	0.03	n.d	99.06	80.7
UR-60b-plagT25	47.44	32.49	0.56	16.21	2.14	0.03	n.d	99.04	80.6
UR-60b-plagT4	47.48	32.72	0.61	16.10	2.16	0.02	n.d	99.12	80.4
UR-60b-plagT17	48.00	32.23	0.61	16.26	2.19	0.03	n.d	99.32	80.3
UR-60b-plagT1	48.01	32.59	0.59	16.14	2.15	0.08	0.07	99.69	80.2
UR-60b-plagT3	47.30	32.62	0.55	16.21	2.16	0.09	n.d	99.02	80.2
UR-60b-plagT17	48.09	32.54	0.55	16.25	2.19	0.07	n.d	99.87	80.1
UR-60b-plagT2	47.34	32.45	0.64	16.48	2.26	0.03	n.d	99.24	79.9
UR-60b-plagT13	47.19	32.26	0.60	16.47	2.26	0.04	n.d	98.95	79.9
UR-60b-plagT19	47.68	32.45	0.55	16.00	2.20	0.08	n.d	99.01	79.7
UR-60b-plagT2	47.73	32.12	0.84	16.06	2.21	0.12	n.d	99.29	79.5
UR-60b-plagT3	48.07	31.97	0.63	16.15	2.27	0.06	n.d	99.14	79.4
UR-60b-plagT1	47.57	32.60	0.57	16.20	2.27	0.09	0.05	99.48	79.3
UR-60b-plagT19	48.16	32.37	0.66	16.08	2.28	0.07	n.d	99.77	79.3
UR-60b-plagT21	47.90	32.39	0.53	16.03	2.29	0.05	n.d	99.26	79.2
UR-60b-plagT23	48.27	32.45	0.59	15.96	2.30	0.05	n.d	99.57	79.1
UR-60b-plagT10	48.05	32.74	0.46	15.93	2.25	0.12	n.d	99.64	79.0
UR-60b-plagT20	47.53	32.49	0.64	15.91	2.31	0.06	n.d	99.10	78.9
UR-60b-plagT17	47.44	32.47	0.65	16.28	2.36	0.07	n.d	99.37	78.9
UR-60b-plagT13	48.68	32.42	0.58	15.46	2.23	0.08	n.d	99.47	78.9
UR-60b-plagT13	47.22	32.63	0.70	15.97	2.35	0.03	n.d	99.12	78.8
UR-60b-plagT20	48.14	32.51	0.59	15.75	2.28	0.08	n.d	99.36	78.8
UR-60b-plagT6	48.67	31.85	0.61	15.54	2.28	0.06	n.d	99.11	78.7
UR-60b-plagT3	47.94	32.09	0.75	15.87	2.34	0.07	0.09	99.36	78.6
UR-60b-plagT17	47.79	32.21	0.61	15.95	2.35	0.09	0.06	99.18	78.5
UR-60b-plagT17	47.96	32.61	0.68	15.71	2.35	0.09	n.d	99.54	78.3
UR-60b-plagT23	48.00	32.13	0.53	15.97	2.41	0.07	n.d	99.22	78.2
UR-60b-plagT10	48.24	32.33	0.56	15.88	2.44	0.02	n.d	99.62	78.2
UR-60b-plagT2	48.47	31.87	0.60	15.83	2.41	0.07	n.d	99.27	78.1
UR-60b-plagT22	48.16	31.84	0.56	15.88	2.44	0.06	n.d	99.01	78.0
UR-60b-plagT17	48.07	32.05	0.67	15.69	2.44	0.06	n.d	99.04	77.8
UR-60b-plagT22	48.54	32.73	0.52	15.68	2.48	0.05	n.d	100.10	77.5
UR-60b-plagT1	48.70	32.65	0.57	15.53	2.48	0.04	n.d	100.14	77.4
UR-60b-plagT20	48.35	32.31	0.60	15.90	2.52	0.08	n.d	99.93	77.3
UR-60b-plagT10	48.80	32.34	0.47	15.48	2.48	0.07	n.d	99.70	77.2
UR-60b-plagT21	48.76	31.89	0.55	15.72	2.52	0.07	n.d	99.62	77.2
UR-60b-plagT4	48.44	32.40	0.62	15.90	2.54	0.09	n.d	100.13	77.2
UR-60b-plagT13	47.76	32.13	0.53	15.83	2.53	0.09	n.d	98.97	77.1
UR-60b-plagT10	47.86	32.52	0.50	15.47	2.48	0.08	n.d	99.03	77.1
UR-60b-plagT10	48.34	32.12	0.66	16.02	2.57	0.10	n.d	99.98	77.1
UR-60b-plagT4	48.36	31.95	0.57	15.53	2.49	0.11	n.d	99.14	77.0
UR-60b-plagT1	48.01	32.20	0.50	15.55	2.55	0.04	n.d	99.03	77.0
UR-60b-plagT9	48.68	31.84	0.63	15.40	2.55	0.08	n.d	99.30	76.6
UR-60b-plagT1	48.88	32.54	0.55	15.79	2.64	0.05	n.d	100.49	76.6
UR-60b-plagT20	48.55	32.33	0.55	15.74	2.63	0.09	n.d	99.98	76.4
UR-60b-plagT17	49.06	31.94	0.67	15.50	2.61	0.06	n.d	99.95	76.3
UR-60b-plagT23	48.24	31.81	0.54	15.62	2.67	0.04	n.d	99.04	76.2
UR-60b-plagT22	48.83	32.19	0.58	15.25	2.61	0.04	n.d	99.64	76.1
UR-60b-plagT1	48.52	31.82	0.56	15.53	2.68	0.04	0.09	99.31	76.0
UR-60b-plagT20	49.21	32.05	0.62	15.58	2.68	0.07	0.06	100.35	76.0
UR-60b-plagT4	48.31	31.99	0.51	15.58	2.74	0.03	n.d	99.30	75.7
UR-60b-plagT5	48.49	31.59	0.59	15.55	2.74	0.07	n.d	99.21	75.5
UR-60b-plagT19	48.88	31.66	0.55	15.50	2.74	0.07	n.d	99.54	75.5
UR-60b-plagT5	49.12	31.48	0.51	15.08	2.65	0.08	n.d	99.10	75.5
UR-60b-plagT17	49.16	32.03	0.61	15.56	2.77	0.05	n.d	100.33	75.4
UR-60b-plagT15	48.85	32.16	0.56	15.40	2.70	0.11	n.d	99.88	75.4
UR-60b-plagT2	49.15	31.19	0.60	15.48	2.75	0.08	n.d	99.28	75.3
UR-60b-plagT14	49.09	32.25	0.67	15.19	2.73	0.05	n.d	100.12	75.3
UR-60b-plagT7	49.09	31.81	0.53	15.31	2.73	0.07	n.d	99.51	75.3
UR-60b-plagT3	49.47	31.50	0.51	15.38	2.75	0.07	n.d	99.82	75.2
UR-60b-plagT13	48.73	31.60	0.54	15.20	2.72	0.11	n.d	99.01	75.1
UR-60b-plagT9	48.98	31.47	0.55	15.37	2.78	0.08	n.d	99.46	75.0
UR-60b-plagT22	49.32	31.85	0.49	15.45	2.81	0.06	n.d	100.09	74.9
UR-60b-plagT17	49.36	32.01	0.55	15.10	2.73	0.11	n.d	100.00	74.9
UR-60b-plagT10	48.83	31.76	0.53	15.33	2.84	0.06	0.06	99.58	74.6
UR-60b-plagT22	49.45	31.75	0.51	14.97	2.78	0.07	n.d	99.66	74.6
UR-60b-plagT1	49.54	31.15	0.52	15.12	2.82	0.06	n.d	99.33	74.5

Comment	SiO2	Al2O3	FeO	CaO	Na2O	K2O	BaO	Total	An#
UR-60b-plagT15	49.11	31.46	0.58	15.13	2.82	0.06	n.d	99.29	74.5
UR-60b-plagT7	48.85	31.74	0.49	15.36	2.86	0.07	n.d	99.57	74.5
UR-60b-plagT5	48.70	31.88	0.58	14.93	2.80	0.04	n.d	99.05	74.5
UR-60b-plagT1	48.96	31.42	0.54	15.26	2.87	0.03	n.d	99.18	74.5
UR-60b-plagT20	49.29	31.14	0.56	15.30	2.86	0.07	0.07	99.46	74.4
UR-60b-plagT4	49.01	31.42	0.77	15.39	2.86	0.09	n.d	99.61	74.4
UR-60b-plagT20	49.22	31.66	0.65	15.15	2.87	0.04	n.d	99.77	74.3
UR-60b-plagT12	48.67	31.71	0.57	15.39	2.93	0.04	n.d	99.36	74.2
UR-60b-plagT1	49.84	31.27	0.54	14.89	2.80	0.10	n.d	99.55	74.2
UR-60b-plagT4	49.13	31.53	0.55	14.92	2.84	0.09	n.d	99.13	74.0
UR-60b-plagT20	49.12	31.50	0.56	15.13	2.91	0.08	n.d	99.34	73.9
UR-60b-plagT1	49.40	31.44	0.52	14.92	2.88	0.08	n.d	99.23	73.8
UR-60b-plagT1	49.68	31.43	0.48	15.17	2.95	0.05	n.d	99.85	73.7
UR-60b-plagT17	49.46	31.23	0.53	14.75	2.87	0.08	n.d	99.12	73.6
UR-60b-plagT19	49.17	31.30	0.53	15.09	2.95	0.07	n.d	99.26	73.6
UR-60b-plagT22	49.09	31.28	0.60	15.19	3.01	0.07	n.d	99.30	73.3
UR-60b-plagT13	49.16	31.13	0.70	14.87	2.94	0.10	0.05	99.06	73.3
UR-60b-plagT18	48.98	31.92	0.60	14.83	2.95	0.07	n.d	99.47	73.3
UR-60b-plagT13	49.45	31.49	0.53	14.60	2.89	0.09	n.d	99.08	73.2
UR-60b-plagT20	49.86	31.37	0.56	15.05	3.02	0.05	n.d	99.99	73.1
UR-60b-plagT2	49.49	31.12	0.59	15.04	3.03	0.06	n.d	99.43	73.1
UR-60b-plagT20	49.77	31.06	0.48	14.78	2.99	0.07	n.d	99.35	72.9
UR-60b-plagT9	49.18	31.63	0.68	14.68	2.98	0.09	n.d	99.35	72.8
UR-60b-plagT13	49.32	31.22	0.57	14.91	3.03	0.09	n.d	99.25	72.7
UR-60b-plagT20	49.69	31.57	0.53	14.84	3.03	0.07	n.d	99.92	72.7
UR-60b-plagT8	49.59	30.92	0.56	14.80	3.01	0.09	n.d	99.02	72.7
UR-60b-plagT24	49.20	30.93	0.54	14.84	3.14	0.09	0.06	98.96	72.0
UR-60b-plagT9	49.53	31.22	0.51	14.86	3.13	0.12	n.d	99.56	71.9
UR-60b-plagT12	50.01	31.15	0.57	14.59	3.11	0.07	n.d	99.64	71.9
UR-60b-plagT15	49.88	31.10	0.62	14.64	3.10	0.12	n.d	99.63	71.8
UR-60b-plagT7	49.97	30.63	0.55	14.46	3.10	0.08	n.d	98.99	71.7
UR-60b-plagT11	50.45	30.93	0.62	14.67	3.15	0.10	n.d	100.12	71.6
UR-60b-plagT1	49.90	31.30	0.48	14.16	3.07	0.07	n.d	99.17	71.5
UR-60b-plagT18	49.81	30.87	0.58	14.73	3.17	0.11	n.d	99.52	71.5
UR-60b-plagT19	49.69	31.13	0.59	14.35	3.11	0.09	n.d	99.11	71.5
UR-60b-plagT2	49.74	31.01	0.55	14.80	3.21	0.08	n.d	99.47	71.4
UR-60b-plagT20	49.71	30.75	0.53	14.59	3.19	0.08	n.d	98.98	71.3
UR-60b-plagT5	49.95	30.92	0.55	14.39	3.13	0.12	n.d	99.20	71.3
UR-60b-plagT6	49.69	31.27	0.57	14.49	3.18	0.10	n.d	99.49	71.2
UR-60b-plagT12	49.61	30.95	0.58	14.55	3.21	0.09	n.d	99.09	71.1
UR-60b-plagT1	50.51	31.30	0.62	14.49	3.18	0.12	n.d	100.28	71.1
UR-60b-plagT12	50.89	30.80	0.55	14.59	3.22	0.09	n.d	100.15	71.1
UR-60b-plagT5	49.75	30.89	0.63	14.39	3.18	0.10	n.d	99.14	71.0
UR-60b-plagT20	50.04	30.95	0.66	14.36	3.18	0.10	n.d	99.47	71.0
UR-60b-plagT25	49.35	31.03	0.61	14.54	3.21	0.11	n.d	99.01	71.0
UR-60b-plagT12	50.17	30.40	0.55	14.42	3.19	0.10	n.d	99.02	71.0
UR-60b-plagT18	49.73	31.05	0.61	14.32	3.19	0.08	n.d	99.18	70.9
UR-60b-plagT1	49.93	30.90	0.50	14.59	3.26	0.07	0.08	99.45	70.9
UR-60b-plagT6	50.16	30.66	0.60	14.37	3.20	0.09	n.d	99.32	70.9
UR-60b-plagT1	50.05	30.81	0.63	14.20	3.13	0.14	n.d	99.14	70.9
UR-60b-plagT18	50.61	30.67	0.57	14.34	3.20	0.09	n.d	99.74	70.9
UR-60b-plagT23	49.72	31.06	0.57	14.39	3.22	0.09	n.d	99.25	70.8
UR-60b-plagT12	50.26	31.30	0.50	14.25	3.19	0.11	n.d	99.74	70.7
UR-60b-plagT1	50.09	30.80	0.56	14.26	3.21	0.08	n.d	99.13	70.7
UR-60b-plagT12	50.73	30.57	0.60	14.60	3.29	0.09	n.d	100.06	70.7
UR-60b-plagT11	49.94	30.74	0.59	14.66	3.29	0.11	n.d	99.41	70.6
UR-60b-plagT18	49.89	30.72	0.59	14.46	3.26	0.10	n.d	99.20	70.6
UR-60b-plagT15	49.66	30.92	0.52	14.52	3.29	0.08	n.d	99.10	70.6
UR-60b-plagT7	50.20	31.28	0.55	14.22	3.21	0.13	n.d	99.71	70.4
UR-60b-plagT20	50.16	30.87	0.56	14.25	3.29	0.03	n.d	99.17	70.4
UR-60b-plagT7	50.68	31.00	0.63	14.42	3.26	0.12	n.d	100.28	70.4
UR-60b-plagT13	50.31	30.73	0.59	14.41	3.30	0.08	n.d	99.57	70.4
UR-60b-plagT10	50.48	30.57	0.45	14.57	3.33	0.10	n.d	99.58	70.3
UR-60b-plagT1	50.12	31.38	0.54	14.34	3.29	0.09	0.06	99.95	70.3
UR-60b-plagT10	50.67	31.18	0.56	14.22	3.27	0.10	n.d	100.18	70.2
UR-60b-plagT4	50.19	30.82	0.62	14.39	3.32	0.09	n.d	99.60	70.2
UR-60b-plagT1	49.98	30.68	0.56	14.50	3.34	0.10	n.d	99.35	70.2
UR-60b-plagT15	50.13	30.61	0.60	14.18	3.27	0.10	n.d	99.02	70.1
UR-60b-plagT18	50.93	30.61	0.61	14.24	3.29	0.11	n.d	99.84	70.1
UR-60b-plagT1	49.65	30.99	0.57	14.40	3.35	0.09	n.d	99.20	70.0
UR-60b-plagT17	50.08	31.00	0.57	14.01	3.22	0.15	n.d	99.20	70.0
UR-60b-plagT2	50.24	30.75	0.53	14.32	3.34	0.08	n.d	99.41	70.0
UR-60b-plagT17	50.90	30.87	0.53	14.31	3.35	0.07	n.d	100.19	69.9
UR-60b-plagT21	50.00	30.82	0.49	14.20	3.32	0.09	0.08	99.16	69.9
UR-60b-plagT17	50.49	30.73	0.65	14.16	3.35	0.06	0.06	99.65	69.7

Comment	SiO2	Al2O3	FeO	CaO	Na2O	K2O	BaO	Total	An#
UR-60b-plagT1	50.34	30.69	0.46	14.09	3.34	0.07	n.d	99.17	69.7
UR-60b-plagT10	50.63	30.47	0.70	13.97	3.33	0.10	n.d	99.28	69.4
UR-60b-plagT2	50.16	31.09	0.51	13.90	3.33	0.08	n.d	99.22	69.4
UR-60b-plagT23	50.22	31.05	0.57	14.13	3.35	0.14	n.d	99.56	69.4
UR-60b-plagT21	50.54	30.34	0.65	14.35	3.44	0.10	n.d	99.54	69.3
UR-60b-plagT10	50.13	30.89	0.55	14.00	3.40	0.07	n.d	99.19	69.2
UR-60b-plagT12	51.32	30.76	0.58	14.33	3.48	0.08	n.d	100.66	69.1
UR-60b-plagT22	50.78	30.83	0.58	14.10	3.44	0.08	n.d	99.88	69.1
UR-60b-plagT17	50.15	31.03	0.47	14.24	3.44	0.14	n.d	99.66	69.0
UR-60b-plagT22	50.35	30.72	0.52	14.07	3.46	0.10	n.d	99.40	68.8
UR-60b-plagT3	50.64	30.33	0.54	13.94	3.47	0.07	n.d	99.11	68.7
UR-60b-plagT8	50.50	30.47	0.65	14.08	3.48	0.13	n.d	99.45	68.6
UR-60b-plagT7	50.49	31.02	0.54	13.99	3.49	0.08	n.d	99.73	68.6
UR-60b-plagT20	50.55	30.93	0.63	13.95	3.46	0.11	n.d	99.83	68.5
UR-60b-plagT3	50.51	30.58	0.57	14.06	3.51	0.10	n.d	99.54	68.5
UR-60b-plagT12	50.82	30.85	0.63	14.02	3.48	0.13	n.d	100.11	68.5
UR-60b-plagT5	50.69	30.84	0.61	13.87	3.46	0.11	n.d	99.73	68.5
UR-60b-plagT22	51.10	30.85	0.77	14.21	3.60	0.13	n.d	100.79	68.1
UR-60b-plagT23	50.86	30.55	0.65	13.98	3.57	0.08	n.d	99.88	68.0
UR-60b-plagT16	50.99	30.37	0.77	13.88	3.53	0.12	n.d	99.82	68.0
UR-60b-plagT3	50.32	30.20	0.85	13.67	3.49	0.14	0.12	98.97	67.8
UR-60b-plagT2	50.84	30.29	0.61	13.86	3.58	0.12	n.d	99.45	67.7
UR-60b-plagT15	51.32	30.17	0.57	13.84	3.58	0.18	n.d	99.80	67.4
UR-60b-plagT12	51.07	30.21	0.64	13.60	3.61	0.08	n.d	99.44	67.2
UR-60b-plagT5	50.96	30.39	0.69	13.49	3.64	0.11	n.d	99.40	66.8
UR-60b-plagT16	51.63	30.03	0.72	13.64	3.69	0.12	n.d	100.05	66.6
UR-60b-plagT15	52.28	30.39	0.75	13.11	3.59	0.11	n.d	100.33	66.4
UR-60b-plagT16	51.27	30.11	0.66	13.24	3.67	0.12	n.d	99.28	66.1
UR-60b-plagT16	51.59	29.89	0.83	13.53	3.79	0.13	n.d	99.93	65.9
UR-60b-plagT16	51.65	29.78	0.55	13.50	3.87	0.10	n.d	99.53	65.5
UR-60b-plagT16	51.93	30.24	0.71	13.46	3.88	0.09	n.d	100.51	65.4
UR-60b-plagT22	52.18	30.03	0.60	13.33	3.82	0.16	n.d	100.19	65.2
UR-60b-plagT14	51.69	29.88	0.61	13.34	3.89	0.11	0.05	99.76	65.0
UR-60b-plagT16	51.80	30.36	0.78	12.95	3.77	0.13	n.d	100.00	65.0
UR-60b-plagT6	51.23	29.86	0.78	13.19	3.91	0.13	n.d	99.24	64.6
UR-60b-plagT2	51.55	29.61	0.71	13.21	3.95	0.13	0.05	99.36	64.4
UR-60b-plagT16	51.69	29.80	0.71	13.23	3.98	0.09	n.d	99.65	64.4
UR-60b-plagT25	51.91	29.59	0.66	13.01	3.90	0.12	n.d	99.32	64.4
UR-60b-plagT14	51.98	29.77	0.68	12.87	3.86	0.17	n.d	99.48	64.2
UR-60b-plagT14	51.44	29.80	0.83	13.22	4.04	0.16	n.d	99.60	63.8
UR-60b-plagT25	51.54	29.70	0.75	12.95	4.00	0.15	n.d	99.22	63.5
UR-60b-plagT4	51.63	29.31	0.80	13.07	4.06	0.14	n.d	99.19	63.5
UR-60b-plagT18	51.99	29.48	0.85	12.90	4.00	0.15	n.d	99.61	63.5
UR-60b-plagT16	51.51	29.96	0.72	12.96	4.03	0.15	n.d	99.49	63.4
UR-60b-plagT20	52.53	29.17	0.85	12.70	4.08	0.15	n.d	99.71	62.7
UR-60b-plagT8	51.73	29.50	0.70	12.84	4.15	0.13	n.d	99.25	62.6
UR-60b-plagT15	52.03	29.43	0.75	12.72	4.12	0.16	0.06	99.41	62.4
UR-60b-plagT16	52.45	29.61	0.66	12.80	4.19	0.12	0.05	100.11	62.4
UR-60b-plagT7	52.49	29.39	0.84	12.42	4.03	0.19	n.d	99.45	62.3
UR-60b-plagT11	52.18	29.50	0.90	12.72	4.20	0.14	n.d	99.76	62.1
UR-60b-plagT15	52.51	29.03	0.92	12.57	4.15	0.18	n.d	99.48	61.9
UR-60b-plagT16	52.20	29.02	0.82	12.65	4.23	0.15	n.d	99.27	61.8
UR-60b-plagT8	52.10	28.89	0.83	12.64	4.27	0.18	n.d	99.14	61.4
UR-60b-plagT10	52.32	29.94	0.80	12.45	4.27	0.20	n.d	100.10	61.0
UR-60b-plagT16	52.80	29.35	0.88	12.27	4.23	0.18	n.d	99.90	60.9
UR-60b-plagT11	52.02	29.10	0.92	12.52	4.30	0.23	n.d	99.23	60.8
UR-60b-plagT3	51.85	28.93	0.96	12.55	4.37	0.17	n.d	98.95	60.8
UR-60b-plagT1	52.60	28.85	0.73	12.35	4.35	0.13	0.07	99.22	60.6
UR-60b-plagT5	53.02	29.14	0.78	12.26	4.36	0.18	n.d	99.85	60.2
UR-60b-plagT23	52.38	29.00	0.77	12.25	4.42	0.17	n.d	99.21	59.9
UR-60b-plagT20	53.55	29.00	0.82	12.15	4.39	0.23	n.d	100.26	59.7
UR-60b-plagT13	52.48	28.77	0.93	12.21	4.49	0.26	n.d	99.46	59.2
UR-60b-plagT8	52.23	28.80	1.08	12.04	4.44	0.25	n.d	99.13	59.1
UR-60b-plagT7	52.45	28.96	0.88	12.06	4.54	0.23	n.d	99.36	58.7
UR-60b-plagT20	53.52	28.68	0.99	12.00	4.63	0.26	0.06	100.26	58.0
UR-60b-plagT9	53.64	28.45	0.93	11.75	4.58	0.26	n.d	99.81	57.7
UR-60b-plagT1	53.58	28.19	0.98	11.74	4.63	0.21	n.d	99.52	57.6
UR-60b-plagT21	53.59	28.58	0.78	11.96	4.70	0.27	n.d	100.09	57.6
UR-60b-plagT9	53.28	28.12	0.86	11.82	4.69	0.21	n.d	99.16	57.5
UR-60b-plagT10	53.46	28.27	1.05	11.76	4.72	0.21	n.d	99.63	57.2
UR-60b-plagT22	53.91	28.34	0.98	11.90	4.84	0.25	n.d	100.45	56.8
UR-60b-plagT25	53.97	28.19	0.92	11.39	4.81	0.23	0.07	99.74	55.9
UR-60b-plagT12	54.26	27.99	0.88	11.39	4.81	0.30	n.d	99.74	55.7
UR-60b-plagT16	54.19	27.96	1.04	11.43	4.88	0.24	n.d	99.97	55.6
UR-60b-plagT1	53.85	28.36	0.96	11.40	4.95	0.20	0.07	100.02	55.4

Comment	SiO2	Al2O3	FeO	CaO	Na2O	K2O	BaO	Total	An#
UR-60b-plagT21	53.85	27.78	1.13	11.39	5.02	0.27	n.d	99.51	54.7
An50	55.24	27.64	0.39	9.95	5.41	0.52	n.d	99.26	48.9
UR-60b-plagT6	56.19	26.74	1.11	9.78	5.79	0.36	n.d	100.14	47.3
UR-60b-plagT20	57.81	25.32	1.10	8.91	5.51	0.75	0.15	99.89	45.1
UR-60b-plagT22	57.09	26.68	1.03	9.14	6.08	0.40	n.d	100.52	44.3
UR-60b-plagT11	58.83	23.44	1.29	8.53	5.38	0.99	0.16	99.03	43.9

plagioclase composition (wt%)

Comment	SiO2	Al2O3	FeO	CaO	Na2O	K2O	BaO	Total	An#
UR-61b-plag-T9	47.6	32.8	0.71	16.2	1.92	0.05	n.d.	99.5	82.1
UR-61b-plag-T8	47.9	32.8	0.58	16.4	2.11	0.03	n.d.	99.9	81.0
UR-61b-plag-T6	47.5	32.6	0.53	16.4	2.14	0.05	n.d.	99.4	80.7
UR-61b-plag-T26	47.7	32.9	0.61	16.0	2.13	0.06	n.d.	99.5	80.3
UR-61b-plag-T14	48.1	32.4	0.51	16.1	2.18	0.04	n.d.	99.5	80.1
UR-61b-plag-T18	47.8	32.3	0.57	16.0	2.15	0.07	n.d.	99.0	80.1
UR-61b-plag-T3-redo	47.8	32.7	0.46	16.2	2.19	0.05	n.d.	99.4	80.1
UR-61b-plag-T13	47.7	32.4	0.60	16.3	2.22	0.06	n.d.	99.5	80.0
UR-61b-plag-T19	47.6	32.8	0.55	16.1	2.19	0.05	n.d.	99.4	80.0
UR-61b-plag-T3	47.5	32.2	0.59	16.4	2.20	0.10	n.d.	99.2	80.0
UR-61b-plag-T21	47.9	32.6	0.62	16.0	2.18	0.05	n.d.	99.4	80.0
UR-61b-plag-T18	47.7	32.8	0.60	16.0	2.18	0.06	n.d.	99.4	79.9
UR-61b-plag-T27	47.8	32.3	0.58	16.4	2.25	0.08	n.d.	99.5	79.7
UR-61b-plag-T18	47.4	32.2	0.63	16.4	2.25	0.09	n.d.	99.0	79.6
UR-61b-plag-T10	48.1	32.7	0.58	16.0	2.24	0.07	n.d.	99.7	79.5
UR-61b-plag-T23	47.9	32.5	0.48	16.1	2.25	0.08	n.d.	99.4	79.4
UR-61b-plag-T18	47.7	32.2	0.52	16.0	2.27	0.05	n.d.	99.0	79.4
UR-61b-plag-T10	47.6	32.4	0.56	15.9	2.22	0.10	n.d.	99.0	79.4
UR-61b-plag-T19	47.6	32.8	0.62	16.2	2.28	0.07	n.d.	99.6	79.3
UR-61b-plag-T9	48.1	32.0	0.91	15.8	2.22	0.09	n.d.	99.3	79.3
UR-61b-plag-T9	48.1	30.9	2.31	15.5	2.19	0.09	n.d.	99.9	79.2
UR-61b-plag-T3-redo	47.6	32.5	0.57	16.0	2.28	0.07	n.d.	99.0	79.2
UR-61b-plag-T10	48.3	32.5	0.56	15.9	2.29	0.08	n.d.	99.7	78.9
UR-61b-plag-T9	47.7	32.4	0.56	15.9	2.32	0.06	n.d.	99.2	78.8
UR-61b-plag-T20	47.8	32.3	0.65	15.9	2.33	0.06	n.d.	99.2	78.8
UR-61b-plag-T20	47.8	32.3	0.56	16.2	2.37	0.07	n.d.	99.3	78.7
UR-61b-plag-T19	48.4	32.3	0.61	16.1	2.34	0.09	n.d.	100.0	78.7
UR-61b-plag-T17	48.0	32.0	0.65	16.0	2.36	0.09	n.d.	99.3	78.6
UR-61b-plag-T6	48.1	32.3	0.61	16.0	2.38	0.06	n.d.	99.7	78.5
UR-61b-plag-T14	48.1	32.5	0.57	15.7	2.38	0.03	n.d.	99.4	78.3
UR-61b-plag-T24	48.3	32.1	0.67	15.8	2.38	0.06	n.d.	99.4	78.2
UR-61b-plag-T9	48.6	31.7	0.58	15.8	2.39	0.07	n.d.	99.3	78.2
UR-61b-plag-T19	48.5	32.2	0.61	15.8	2.38	0.10	n.d.	99.7	78.2
UR-61b-plag-T24	48.8	32.4	0.56	16.0	2.40	0.10	n.d.	100.4	78.2
UR-61b-plag-T17	48.4	31.8	0.59	15.8	2.41	0.04	n.d.	99.0	78.1
UR-61b-plag-T27	48.1	32.0	0.58	16.0	2.43	0.06	n.d.	99.3	78.1
UR-61b-plag-T10	48.1	32.3	0.57	16.1	2.46	0.10	0.05	99.7	77.9
UR-61b-plag-T21	48.5	32.5	0.49	15.7	2.46	0.06	n.d.	99.8	77.6
UR-61b-plag-T21	48.5	32.2	0.52	15.5	2.45	0.04	n.d.	99.3	77.6
UR-61b-plag-T13	48.1	31.7	0.54	16.0	2.55	0.05	n.d.	99.0	77.4
UR-61b-plag-T17	48.6	31.7	0.54	15.7	2.52	0.08	n.d.	99.2	77.1
UR-61b-plag-T3-redo	48.7	31.7	0.55	15.4	2.51	0.04	n.d.	99.0	77.0
UR-61b-plag-T9	48.3	32.1	0.50	15.9	2.55	0.13	n.d.	99.6	76.9
UR-61b-plag-T27	48.7	31.7	0.68	15.8	2.61	0.03	0.08	99.6	76.8
UR-61b-plag-T23	48.3	32.0	0.55	15.5	2.60	-0.01	n.d.	99.0	76.8
UR-61b-plag-T19	48.2	31.9	0.55	15.7	2.58	0.07	0.05	99.2	76.8
UR-61b-plag-T23	48.3	31.7	0.60	15.7	2.59	0.06	n.d.	99.0	76.7
UR-61b-plag-T6	48.0	32.3	0.56	15.5	2.55	0.10	n.d.	99.2	76.6
UR-61b-plag-T26	48.1	32.1	0.54	15.6	2.56	0.10	n.d.	99.1	76.6
UR-61b-plag-T8	48.8	31.8	0.55	15.3	2.55	0.05	n.d.	99.2	76.6
UR-61b-plag-T5	49.0	32.1	0.55	15.5	2.57	0.08	n.d.	99.8	76.6
UR-61b-plag-T23	48.7	32.0	0.50	15.8	2.63	0.06	n.d.	99.8	76.6
UR-61b-plag-T19	48.6	32.0	0.54	15.5	2.60	0.04	n.d.	99.4	76.5
UR-61b-plag-T9	48.4	31.9	0.51	15.5	2.59	0.06	n.d.	99.1	76.5
UR-61b-plag-T22	49.0	31.9	0.57	15.2	2.59	0.07	n.d.	99.5	76.1
UR-61b-plag-T10	48.6	31.8	0.52	15.3	2.66	0.06	n.d.	99.1	75.8
UR-61b-plag-T18	48.5	31.7	0.60	15.3	2.66	0.05	n.d.	99.0	75.8
UR-61b-plag-T10	49.1	31.7	0.53	15.3	2.68	0.06	n.d.	99.6	75.7
UR-61b-plag-T23	49.7	31.8	0.61	15.0	2.63	0.05	n.d.	99.9	75.6
UR-61b-plag-T9	48.7	31.4	0.56	15.6	2.73	0.08	n.d.	99.1	75.6
UR-61b-plag-T22	48.9	31.9	0.61	14.9	2.64	0.07	n.d.	99.1	75.3
UR-61b-plag-T6	48.7	31.6	0.61	15.4	2.75	0.08	n.d.	99.2	75.2
UR-61b-plag-T14	48.6	32.6	0.50	15.2	2.76	0.02	n.d.	99.8	75.1
UR-61b-plag-T8	49.1	31.6	0.59	15.1	2.69	0.12	n.d.	99.3	75.1

Comment	SiO2	Al2O3	FeO	CaO	Na2O	K2O	BaO	Total	An#
UR-61b-plag-T7	48.9	31.7	0.54	15.1	2.71	0.09	n.d.	99.2	75.1
UR-61b-plag-T22	48.5	31.6	0.52	15.3	2.75	0.11	0.13	99.0	75.0
UR-61b-plag-T13	49.1	31.5	0.51	15.1	2.74	0.07	n.d.	99.1	75.0
UR-61b-plag-T23	49.8	31.2	0.60	15.2	2.79	0.05	n.d.	99.8	74.9
UR-61b-plag-T4	49.0	32.0	0.76	15.0	2.78	0.08	n.d.	99.7	74.5
UR-61b-plag-T5	48.9	31.7	0.48	15.0	2.80	0.07	n.d.	99.1	74.5
UR-61b-plag-T11	49.2	31.3	0.48	15.0	2.77	0.13	n.d.	99.0	74.4
UR-61b-plag-T27	48.8	31.6	0.60	15.4	2.86	0.10	n.d.	99.4	74.4
UR-61b-plag-T26	49.4	31.3	0.56	15.1	2.85	0.07	n.d.	99.3	74.2
UR-61b-plag-T3-redo	49.6	31.3	0.57	15.0	2.86	0.08	n.d.	99.6	74.1
UR-61b-plag-T20	49.5	31.2	0.61	14.9	2.83	0.12	n.d.	99.3	73.9
UR-61b-plag-T5	49.7	31.1	0.56	15.1	2.92	0.07	n.d.	99.6	73.8
UR-61b-plag-T17	49.2	31.4	0.60	15.0	2.92	0.07	n.d.	99.4	73.6
UR-61b-plag-T3	49.3	31.4	0.58	14.7	2.86	0.07	n.d.	99.1	73.6
UR-61b-plag-T15	49.2	31.4	0.70	15.1	2.95	0.06	n.d.	99.5	73.5
UR-61b-plag-T14	49.9	31.7	0.59	14.9	2.95	0.03	n.d.	100.3	73.5
UR-61b-plag-T27	49.4	31.4	0.56	14.9	2.92	0.08	n.d.	99.4	73.5
UR-61b-plag-T23	49.4	31.4	0.51	14.6	2.87	0.07	n.d.	99.0	73.5
UR-61b-plag-T3	49.8	31.5	0.60	14.9	2.95	0.05	n.d.	100.1	73.4
UR-61b-plag-T20	49.8	31.1	0.54	14.8	2.92	0.06	n.d.	99.4	73.4
UR-61b-plag-T10	49.2	31.8	0.55	15.0	2.93	0.12	0.05	99.8	73.4
UR-61b-plag-T14	49.4	31.3	0.53	15.0	2.92	0.13	n.d.	99.4	73.3
UR-61b-plag-T3-redo	49.1	31.5	0.55	15.1	3.00	0.07	n.d.	99.4	73.3
UR-61b-plag-T9	49.7	31.2	0.56	14.9	2.94	0.10	n.d.	99.5	73.3
UR-61b-plag-T7	49.5	31.0	0.68	15.0	3.01	0.09	n.d.	99.3	73.0
UR-61b-plag-T3-redo	49.3	31.6	0.57	14.6	2.93	0.07	n.d.	99.2	73.0
UR-61b-plag-T24	49.3	31.3	0.54	14.7	2.97	0.10	n.d.	99.1	72.8
UR-61b-plag-T9	49.5	30.6	1.19	14.6	2.93	0.13	n.d.	99.4	72.8
UR-61b-plag-T16	49.5	31.2	0.61	14.6	2.97	0.10	n.d.	99.1	72.7
UR-61b-plag-T17	49.8	31.0	0.57	14.7	2.99	0.10	n.d.	99.3	72.6
UR-61b-plag-T4	49.1	31.3	0.71	14.9	3.02	0.12	n.d.	99.3	72.6
UR-61b-plag-T23	49.7	31.0	0.58	14.8	3.02	0.09	n.d.	99.2	72.6
UR-61b-plag-T11	49.3	31.4	0.57	14.6	3.02	0.06	n.d.	99.1	72.5
UR-61b-plag-T19	49.8	31.5	0.53	14.5	2.99	0.10	n.d.	99.6	72.4
UR-61b-plag-T19	50.0	30.9	0.61	14.7	3.01	0.11	0.05	99.5	72.4
UR-61b-plag-T15	49.6	30.9	0.54	14.8	3.08	0.05	n.d.	99.1	72.4
UR-61b-plag-T13	49.6	31.3	0.62	14.5	3.04	0.08	0.05	99.3	72.2
UR-61b-plag-T17	49.9	31.0	0.64	14.6	3.07	0.07	0.06	99.6	72.2
UR-61b-plag-T21	49.7	31.3	0.67	14.4	3.01	0.10	n.d.	99.2	72.1
UR-61b-plag-T10	50.0	31.0	0.46	14.8	3.11	0.07	n.d.	99.5	72.1
UR-61b-plag-T10	49.6	31.5	0.61	14.4	3.04	0.08	n.d.	99.4	72.0
UR-61b-plag-T16	49.9	31.0	0.54	14.6	3.09	0.07	n.d.	99.4	72.0
UR-61b-plag-T26	49.7	31.1	0.53	14.6	3.06	0.10	n.d.	99.2	72.0
UR-61b-plag-T14	49.8	30.9	0.59	14.4	3.05	0.08	n.d.	99.0	72.0
UR-61b-plag-T13	49.5	30.9	0.59	14.6	3.09	0.10	n.d.	99.0	71.9
UR-61b-plag-T12	49.9	31.1	0.56	14.3	3.06	0.07	n.d.	99.0	71.8
UR-61b-plag-T26	50.0	30.9	0.60	14.4	3.07	0.08	0.06	99.3	71.8
UR-61b-plag-T27	49.6	31.3	0.45	14.5	3.13	0.04	n.d.	99.2	71.7
UR-61b-plag-T23	50.0	30.6	0.63	14.6	3.15	0.09	n.d.	99.1	71.6
UR-61b-plag-T9	49.1	31.1	0.62	14.7	3.18	0.07	n.d.	99.0	71.6
UR-61b-plag-T19	49.5	31.5	0.57	14.6	3.13	0.10	n.d.	99.6	71.6
UR-61b-plag-T15	50.3	30.5	0.55	14.4	3.12	0.07	n.d.	99.1	71.5
UR-61b-plag-T27	50.0	31.3	0.59	14.5	3.18	0.04	n.d.	99.8	71.5
UR-61b-plag-T22	51.2	28.7	1.44	13.8	2.78	0.41	n.d.	99.2	71.4
UR-61b-plag-T27	49.8	31.1	0.59	14.3	3.11	0.08	n.d.	99.1	71.3
UR-61b-plag-T24	50.1	30.8	0.53	14.4	3.17	0.06	n.d.	99.1	71.3
UR-61b-plag-T19	50.2	30.7	0.61	14.6	3.18	0.11	0.06	99.6	71.2
UR-61b-plag-T3	49.7	30.5	0.61	14.8	3.24	0.08	n.d.	99.0	71.2
UR-61b-plag-T16	49.9	30.8	0.62	14.6	3.18	0.15	n.d.	99.4	71.2
UR-61b-plag-T6	50.2	30.4	0.62	14.4	3.18	0.10	0.06	99.1	71.1
UR-61b-plag-T20	50.3	31.3	0.65	14.0	3.10	0.09	0.05	99.6	70.9
UR-61b-plag-T4	49.9	31.2	0.81	14.3	3.18	0.10	n.d.	99.6	70.9
UR-61b-plag-T20	50.4	30.7	0.60	14.6	3.27	0.10	n.d.	99.8	70.7
UR-61b-plag-T13	50.0	30.8	0.61	14.4	3.25	0.07	n.d.	99.1	70.7
UR-61b-plag-T5	49.7	30.6	0.62	14.6	3.30	0.10	0.06	99.2	70.5
UR-61b-plag-T15	50.0	30.7	0.62	14.2	3.23	0.08	n.d.	99.1	70.5
UR-61b-plag-T3	49.8	30.8	0.73	14.3	3.23	0.11	0.07	99.2	70.5
UR-61b-plag-T8	50.0	31.0	0.53	14.2	3.24	0.10	n.d.	99.2	70.4
UR-61b-plag-T5	50.0	30.7	0.58	14.4	3.28	0.11	n.d.	99.1	70.4
UR-61b-plag-T19	49.9	31.2	0.52	14.3	3.27	0.11	n.d.	99.4	70.4
UR-61b-plag-T18	50.5	31.0	0.63	14.5	3.31	0.09	n.d.	100.2	70.4
UR-61b-plag-T27	50.4	30.8	0.56	14.2	3.24	0.12	n.d.	99.6	70.3
UR-61b-plag-T6	50.3	30.8	0.57	14.5	3.31	0.12	0.07	99.9	70.3
UR-61b-plag-T3	50.4	30.7	0.58	14.3	3.27	0.11	n.d.	99.4	70.3
UR-61b-plag-T9	50.9	31.2	0.58	14.1	3.24	0.10	n.d.	100.2	70.2

Comment	SiO2	Al2O3	FeO	CaO	Na2O	K2O	BaO	Total	An#
UR-61b-plag-T8	49.9	30.7	0.55	14.6	3.36	0.11	n.d.	99.3	70.1
UR-61b-plag-T18	50.2	30.8	0.62	14.2	3.27	0.13	n.d.	99.4	70.1
UR-61b-plag-T18	49.9	30.6	0.54	14.3	3.28	0.13	n.d.	99.0	70.1
UR-61b-plag-T12	50.1	30.9	0.57	14.2	3.30	0.08	n.d.	99.2	70.0
UR-61b-plag-T15	50.0	30.5	0.63	14.4	3.32	0.12	n.d.	99.1	70.0
UR-61b-plag-T24	50.0	30.8	0.58	14.1	3.32	0.09	n.d.	99.1	69.9
UR-61b-plag-T14	50.5	31.1	0.56	14.0	3.30	0.07	n.d.	99.5	69.7
UR-61b-plag-T13	50.3	30.9	0.57	14.1	3.28	0.14	n.d.	99.4	69.7
UR-61b-plag-T24	50.7	30.2	0.58	14.2	3.34	0.09	n.d.	99.2	69.7
UR-61b-plag-T3-redc	51.0	30.9	0.57	14.0	3.31	0.11	n.d.	100.0	69.7
UR-61b-plag-T4	50.5	30.3	0.68	14.3	3.39	0.10	n.d.	99.5	69.6
UR-61b-plag-T3	50.6	31.1	0.61	14.1	3.34	0.10	n.d.	100.0	69.6
UR-61b-plag-T23	50.5	30.3	0.62	14.0	3.32	0.10	n.d.	99.0	69.5
UR-61b-plag-T7	50.4	30.4	0.46	14.2	3.37	0.15	n.d.	99.2	69.4
UR-61b-plag-T27	51.3	30.2	0.67	13.6	3.27	0.08	n.d.	99.2	69.4
UR-61b-plag-T8	50.3	30.7	0.63	14.2	3.39	0.13	n.d.	99.4	69.3
UR-61b-plag-T14	50.7	30.6	0.54	14.3	3.46	0.07	n.d.	99.8	69.3
UR-61b-plag-T21	50.5	30.5	0.55	14.0	3.34	0.13	n.d.	99.1	69.3
UR-61b-plag-T18	50.5	30.5	0.60	13.9	3.36	0.07	n.d.	99.0	69.2
UR-61b-plag-T23	50.5	30.2	0.42	14.3	3.44	0.12	n.d.	99.2	69.2
UR-61b-plag-T13	50.4	30.5	0.48	14.1	3.45	0.07	n.d.	99.3	69.1
UR-61b-plag-T12	50.8	30.5	0.61	13.6	3.35	0.07	0.05	99.2	68.9
UR-61b-plag-T5	50.3	30.6	0.44	14.1	3.44	0.12	n.d.	99.1	68.8
UR-61b-plag-T2	51.1	30.7	0.66	14.1	3.44	0.15	n.d.	100.4	68.8
UR-61b-plag-T12	50.8	30.6	0.60	13.9	3.41	0.10	n.d.	99.5	68.7
UR-61b-plag-T12	50.8	30.1	0.47	14.0	3.46	0.12	n.d.	99.1	68.6
UR-61b-plag-T18	50.4	29.9	0.58	14.4	3.58	0.09	n.d.	99.1	68.6
UR-61b-plag-T10	50.3	30.5	0.59	14.0	3.48	0.10	n.d.	99.1	68.6
UR-61b-plag-T7	50.8	29.9	0.49	14.1	3.53	0.09	n.d.	99.0	68.4
UR-61b-plag-T12	51.2	30.2	0.56	13.8	3.45	0.12	n.d.	99.6	68.4
UR-61b-plag-T15	50.8	30.3	0.64	13.8	3.47	0.07	n.d.	99.2	68.4
UR-61b-plag-T16	50.3	30.5	0.58	14.0	3.52	0.10	0.07	99.2	68.3
UR-61b-plag-T3-redc	50.6	30.7	0.69	13.7	3.44	0.11	n.d.	99.5	68.2
UR-61b-plag-T14	50.5	30.2	0.50	14.0	3.52	0.14	n.d.	99.0	68.2
UR-61b-plag-T8	50.6	30.4	0.67	13.7	3.57	0.12	0.06	99.3	67.5
UR-61b-plag-T15	51.2	30.0	0.59	13.5	3.54	0.07	n.d.	99.1	67.5
UR-61b-plag-T1	51.2	30.2	0.69	13.5	3.54	0.12	n.d.	99.5	67.4
UR-61b-plag-T18	50.7	30.6	0.65	13.8	3.62	0.09	n.d.	99.6	67.4
UR-61b-plag-T15	51.1	30.4	0.56	13.5	3.56	0.13	n.d.	99.4	67.2
UR-61b-plag-T8	51.2	30.1	0.83	13.6	3.61	0.11	n.d.	99.6	67.1
UR-61b-plag-T9	51.7	30.1	0.66	13.5	3.67	0.10	0.07	100.0	66.6
UR-61b-plag-T26	51.1	30.0	0.58	13.6	3.71	0.10	n.d.	99.3	66.6
UR-61b-plag-T21	51.2	30.4	0.55	13.2	3.60	0.13	n.d.	99.3	66.5
UR-61b-plag-T5	51.5	30.1	0.72	13.4	3.67	0.12	n.d.	99.7	66.3
UR-61b-plag-T25	51.4	30.0	0.76	13.3	3.68	0.10	n.d.	99.6	66.3
UR-61b-plag-T26	51.6	30.0	0.57	13.4	3.70	0.12	0.05	99.6	66.2
UR-61b-plag-T24	51.4	30.2	0.57	13.6	3.75	0.15	n.d.	99.9	66.2
UR-61b-plag-T7	51.2	29.5	0.71	13.6	3.76	0.11	n.d.	99.0	66.2
UR-61b-plag-T10	51.3	30.0	0.82	13.4	3.72	0.12	n.d.	99.4	66.1
UR-61b-plag-T23	51.2	30.0	0.66	13.5	3.77	0.10	n.d.	99.4	66.1
UR-61b-plag-T5	51.3	30.1	0.67	13.5	3.79	0.08	n.d.	99.5	66.0
UR-61b-plag-T15	51.1	30.2	0.78	13.4	3.71	0.18	n.d.	99.6	66.0
UR-61b-plag-T8	51.3	29.9	0.58	13.2	3.71	0.12	n.d.	99.1	65.9
UR-61b-plag-T2	51.6	30.1	0.69	13.3	3.81	0.07	n.d.	99.5	65.5
UR-61b-plag-T12	51.1	29.8	0.69	13.4	3.80	0.16	0.10	99.1	65.4
UR-61b-plag-T2	51.3	29.9	0.68	13.3	3.85	0.14	n.d.	99.3	65.1
UR-61b-plag-T25	51.7	29.1	0.69	13.4	3.89	0.17	n.d.	99.2	65.0
UR-61b-plag-T20	52.3	29.3	0.75	13.1	3.87	0.11	n.d.	99.7	64.7
UR-61b-plag-T23	51.6	29.8	0.76	13.2	3.87	0.14	0.06	99.6	64.7
UR-61b-plag-T8	51.9	29.9	0.63	13.2	3.90	0.13	n.d.	99.8	64.7
UR-61b-plag-T2	52.2	29.6	0.62	13.3	3.95	0.12	n.d.	99.9	64.6
UR-61b-plag-T16	52.1	29.2	0.64	13.0	3.89	0.11	n.d.	99.3	64.4
UR-61b-plag-T25	51.7	29.3	0.68	13.1	3.94	0.11	0.05	99.2	64.4
UR-61b-plag-T18	51.6	29.7	0.73	13.1	3.95	0.11	0.06	99.4	64.4
UR-61b-plag-T16	51.6	29.6	0.75	13.1	3.92	0.14	n.d.	99.4	64.3
UR-61b-plag-T25	51.6	29.6	0.86	13.0	3.90	0.12	0.05	99.2	64.3
UR-61b-plag-T26	51.9	29.9	0.73	13.1	3.92	0.17	n.d.	99.9	64.3
UR-61b-plag-T21	51.7	29.9	0.62	13.1	3.96	0.13	n.d.	99.6	64.2
UR-61b-plag-T5	52.2	29.6	0.70	13.1	3.93	0.14	n.d.	99.6	64.2
JR-61b-plag-T21-last	52.0	29.7	0.72	12.8	3.90	0.14	0.07	99.6	64.0
UR-61b-plag-T21	51.7	29.9	0.73	12.9	3.96	0.17	n.d.	99.5	63.7
UR-61b-plag-T2	51.7	29.6	0.64	13.2	4.05	0.15	n.d.	99.5	63.7
UR-61b-plag-T2	51.9	29.5	0.66	12.9	3.97	0.17	n.d.	99.3	63.6
UR-61b-plag-T11	51.4	29.8	0.70	13.0	4.01	0.16	n.d.	99.2	63.5
UR-61b-plag-T2	52.0	29.4	0.63	12.8	4.03	0.09	0.10	99.1	63.4

Comment	SiO2	Al2O3	FeO	CaO	Na2O	K2O	BaO	Total	An#
UR-61b-plag-T27	52.0	29.2	0.81	12.9	4.04	0.15	n.d.	99.3	63.3
UR-61b-plag-T22	52.3	29.5	0.71	12.9	4.00	0.20	0.05	99.8	63.2
UR-61b-plag-T2	52.2	29.4	0.60	12.7	4.00	0.12	n.d.	99.2	63.2
UR-61b-plag-T21	52.2	29.6	0.80	12.6	4.02	0.10	n.d.	99.4	63.0
UR-61b-plag-T1	52.2	29.2	0.83	12.8	4.01	0.22	n.d.	99.4	63.0
UR-61b-plag-T1	51.9	26.0	2.65	11.1	3.55	0.17	n.d.	100.1	62.7
UR-61b-plag-T2	52.5	29.0	0.62	13.0	4.16	0.16	n.d.	99.6	62.7
JR-61b-plag-T21-last	52.8	29.0	0.74	13.0	4.21	0.16	n.d.	100.1	62.6
UR-61b-plag-T1	53.0	29.5	0.80	12.6	4.18	0.16	0.08	100.6	61.9
UR-61b-plag-T1	52.7	28.9	0.82	12.5	4.14	0.17	0.05	99.4	61.9
UR-61b-plag-T24	52.8	28.7	0.68	12.7	4.27	0.13	n.d.	99.4	61.7
UR-61b-plag-T24	52.4	28.9	0.82	12.6	4.25	0.15	n.d.	99.3	61.6
UR-61b-plag-T8	53.1	28.7	0.86	12.3	4.27	0.21	n.d.	99.7	60.7
UR-61b-plag-T3-redo	52.4	28.7	0.90	12.4	4.36	0.15	n.d.	99.2	60.6
UR-61b-plag-T24	52.9	29.0	0.83	12.1	4.22	0.19	n.d.	99.5	60.6
UR-61b-plag-T1	53.6	29.5	0.87	12.3	4.28	0.20	n.d.	100.9	60.6
UR-61b-plag-T1	53.1	29.2	0.99	12.4	4.35	0.20	n.d.	100.6	60.5
UR-61b-plag-T12	53.1	28.9	0.89	12.1	4.27	0.23	n.d.	99.7	60.2
UR-61b-plag-T13	52.8	29.1	0.65	12.5	4.42	0.20	n.d.	99.8	60.2
UR-61b-plag-T20	52.7	28.7	0.87	12.1	4.35	0.16	n.d.	99.1	60.0
UR-61b-plag-T22	52.6	28.9	0.91	12.1	4.32	0.25	n.d.	99.3	59.9
UR-61b-plag-T14	52.6	28.5	0.89	12.2	4.45	0.17	n.d.	99.0	59.6
UR-61b-plag-T6	53.3	29.0	0.86	12.1	4.42	0.23	n.d.	100.0	59.5
UR-61b-plag-T23	52.9	28.7	0.83	11.9	4.38	0.21	n.d.	99.1	59.3
UR-61b-plag-T23	53.0	28.6	0.95	11.9	4.39	0.23	n.d.	99.2	59.2
UR-61b-plag-T1	52.8	28.6	1.05	12.0	4.43	0.28	0.12	99.7	58.9
UR-61b-plag-T2	52.7	28.6	0.76	12.1	4.50	0.28	n.d.	99.1	58.7
UR-61b-plag-T22	52.7	29.0	0.89	11.7	4.43	0.20	n.d.	99.1	58.7
UR-61b-plag-T7	53.0	28.1	0.97	12.0	4.51	0.23	n.d.	99.0	58.7
UR-61b-plag-T27	53.2	28.4	0.92	12.1	4.58	0.22	0.07	99.6	58.6
UR-61b-plag-T16	53.5	28.5	0.69	11.9	4.52	0.21	0.08	99.5	58.5
UR-61b-plag-T1	53.9	28.4	0.98	11.8	4.51	0.20	0.07	100.0	58.3
UR-61b-plag-T10	53.1	28.7	0.87	11.8	4.58	0.15	n.d.	99.4	58.3
UR-61b-plag-T25	52.9	28.5	0.93	12.1	4.66	0.20	n.d.	99.5	58.2
UR-61b-plag-T5	53.0	28.4	0.95	12.0	4.63	0.25	n.d.	99.3	57.9
UR-61b-plag-T12	54.0	28.4	0.85	11.9	4.68	0.18	0.05	100.3	57.9
UR-61b-plag-T25	53.9	28.6	0.78	11.8	4.66	0.13	n.d.	100.1	57.8
UR-61b-plag-T3-redo	53.9	27.7	0.80	11.7	4.51	0.38	0.07	99.3	57.7
UR-61b-plag-T24	53.4	28.2	0.93	11.8	4.66	0.23	n.d.	99.4	57.6
UR-61b-plag-T21	53.1	28.2	0.95	11.8	4.70	0.21	n.d.	99.1	57.5
UR-61b-plag-T6	53.2	28.5	0.86	11.5	4.60	0.19	n.d.	99.2	57.4
JR-61b-plag-T21-last	52.9	28.0	1.00	11.8	4.71	0.25	0.08	99.0	57.2
UR-61b-plag-T1	53.3	28.1	0.87	11.6	4.66	0.21	n.d.	99.0	57.1
UR-61b-plag-T14	55.0	27.3	0.92	11.1	4.59	0.32	n.d.	99.7	56.2
UR-61b-plag-T17	53.9	27.9	0.93	11.4	4.82	0.23	n.d.	99.5	55.9
UR-61b-plag-T17	53.6	28.0	1.01	11.4	4.78	0.31	n.d.	99.2	55.9
UR-61b-plag-T5	53.4	28.1	0.81	11.5	4.92	0.19	n.d.	99.1	55.8
UR-61b-plag-T19	54.0	28.0	1.02	11.2	4.87	0.20	0.08	99.5	55.3
UR-61b-plag-T15	53.8	28.2	1.03	11.0	4.93	0.26	0.05	99.4	54.4
UR-61b-plag-T1	54.3	27.8	1.08	10.6	4.74	0.32	n.d.	99.2	54.3
UR-61b-plag-T7	54.5	27.4	1.17	10.9	5.06	0.31	n.d.	99.7	53.4
UR-61b-plag-T9	56.1	26.3	1.13	10.8	4.98	0.48	n.d.	100.2	53.1
UR-61b-plag-T24	55.6	27.0	0.85	10.3	5.36	0.33	n.d.	99.7	50.5
UR-61b-plag-T2	55.9	27.3	1.03	10.3	5.75	0.33	n.d.	100.9	48.9

Figure A8 Histograms of the An# for plagioclase phenocryst in UR-60 and UR-61.

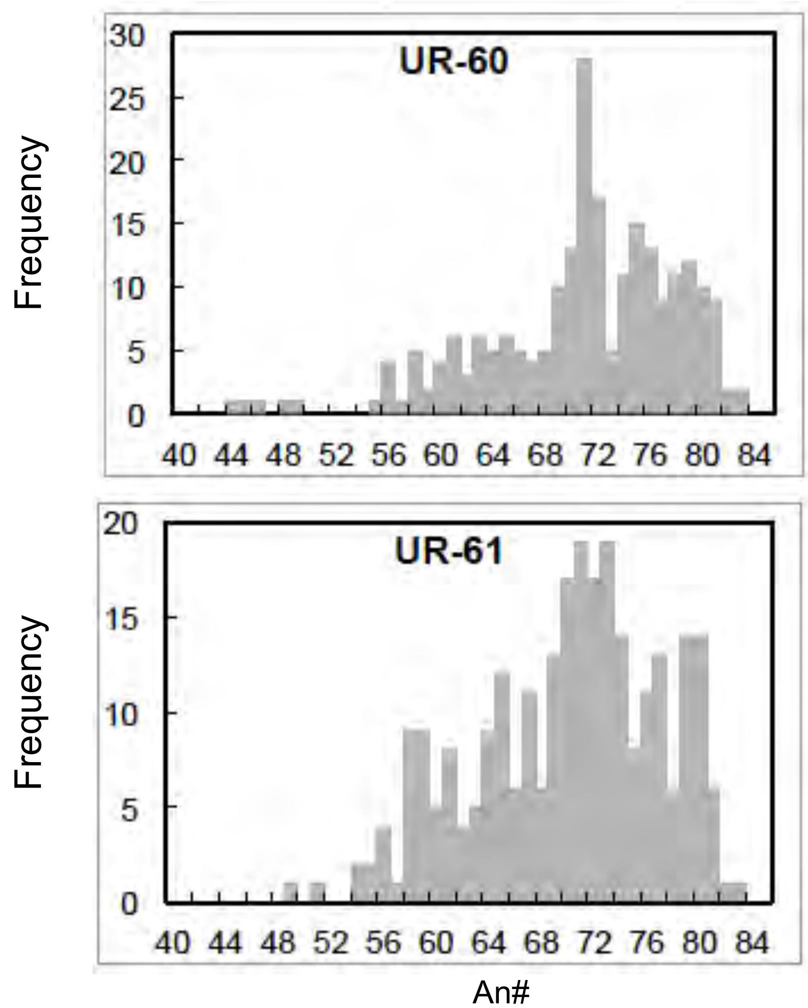


Figure A9 The MELTS software (Ghiroso and Sack, 1995; Asimow et al, 2001) was used to calculate the olivine liquidus temperature at 1 bar at two fO2 conditions (ΔQFM = +1 and +2, which is approximately equal to ΔNNO = +0.2 and + 1.2) for the whole-rock compositions in Table II-6. For the 14 samples that have olivine as their liquidus phase according to MELTS, the liquidus temperature calculated from MELTS matches the results from the Mg - thermometer in this study with an average deviation of 20 and 13 °C, respectively, for the ΔQFM = +1 and +2 runs. This close match in temperature is within the ± 1-sigma error of the Mg-thermometer calibration (±26˚C, Table II-3 in text). In addition, the composition of the most Mg-rich olivine analyzed in each sample (Table II-6) closely matches (within <1 % Fo content) the liquidus olivine composition predicted by MELTS.
These results support the following conclusions: (1) the whole-rock compositions in Table II-6 closely approximate liquid compositions, (2) these liquids had ΔNNO values between ~0 and +1.2 (as calculated from olivine KD and shown in Table II-6), and (3) the most Mg-rich olivine in each sample closely approximates the first olivine to crystalize from each liquid.

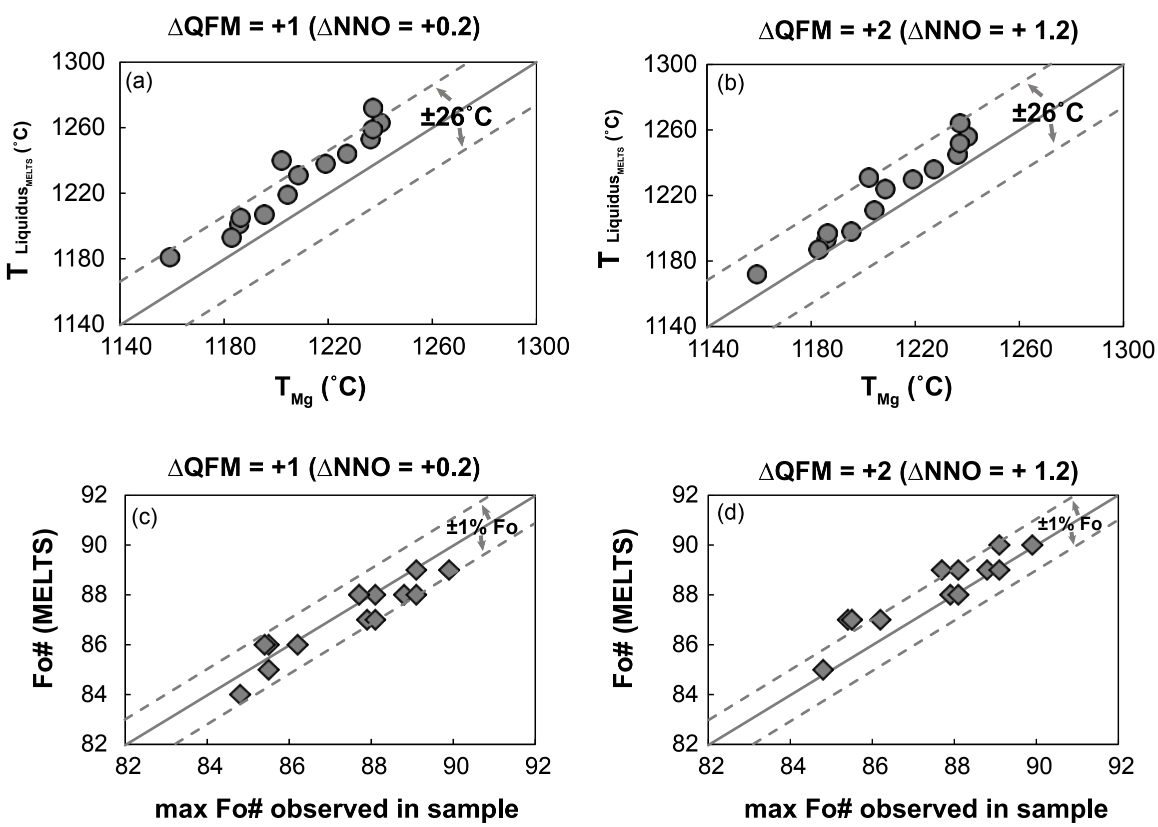


Figure caption: (a) Plot of the olivine liquidus temperature calculated by MELTS (at ∆QFM = +1) vs. the temperature calculated with the Mg-thermometer in this study (Table 3) for whole-rock samples from the Mexican volcanic arc (Table 6). Solid line is the 1:1 correspondence and dashed lines are ± 26°C (1-sigma error of Mg-thermometer). (b) Same as (a) but MELTS run at ∆QFM = +2. (c) Plot of the olivine liquidus composition (Fo#) calculated by MELTS (at ∆QFM = +1) vs. the most Mg-rich olivine analyzed in each sample (Table 6). Solid line is the 1:1 correspondence and dashed lines are ± 1 % Fo. (d) Same as (c) but MELTS run at ∆QFM = +2.
.

Appendix B

Table B1 Standards employed for electron microprobe analyses of glass

Element	Standard name	Mineral name of the standard
Fe	FESI	Bohlen Ferrosilite
Na, Al	JADE	JD-1 Jadeite
Mn	BHRH	Broken Hill Rhodonite
Si	VGBS	Smithsonian Indian Ocean basaltic glass
Ca	WOLL	Wollastonite
K	GKFS	St. Gothard Adularia
Na	ALBA	Amelia Albite
Mg, Ti	GEIK	Geikielite
P	BACL	Alforsite (Ba-Cl apatite)

Note: all mineral standards are from University of Michigan collection.

Table B2 Olivine crystal compositions for each experiments

Comment	MgO	Al2O3	SiO2	CaO	Cr2O3	MnO	FeO	NiO	Total	Fo#
UR-46-20-1-1-olivD1-1	47.11	0.06	40.45	0.21	0.06	0.22	11.13	0.47	99.7	88.3
UR-46-20-1-1-olivD1-2	47.14	0.07	40.56	0.20	0.06	0.18	11.10	0.48	99.8	88.3
UR-46-20-1-1-olivD1-3	46.80	0.07	40.23	0.21	0.06	0.14	11.03	0.50	99.0	88.3
UR-46-20-1-1-olivD1-4	46.52	0.07	40.43	0.20	0.06	0.14	11.06	0.50	99.0	88.2
UR-46-20-1-2-olivD1-1	46.99	0.14	40.70	0.24	0.06	0.16	10.94	0.40	99.6	88.4
UR-46-20-1-2-olivD1-2	46.85	0.10	40.36	0.27	0.07	0.15	11.04	0.41	99.2	88.3
UR-46-20-1-2-olivD1-3	46.91	0.15	40.53	0.25	0.07	0.19	10.84	0.38	99.3	88.5
average	46.90	0.09	40.47	0.23	0.06	0.17	11.02	0.45	99.39	88.36
stdandard deviation	0.21	0.04	0.15	0.03	0.00	0.03	0.10	0.05	0.32	0.10

Comment	MgO	Al2O3	SiO2	CaO	Cr2O3	MnO	FeO	NiO	Total	Fo#
UR-46-22-1-olivA1-1	46.82	0.11	41.27	0.24	0.07	0.13	11.09	0.49	100.2	88.3
UR-46-22-1-olivA1-2	47.06	0.09	40.96	0.25	0.06	0.17	11.04	0.48	100.1	88.4
UR-46-22-1-olivA2-1	46.51	0.06	41.30	0.20	0.05	0.16	11.09	0.58	100.0	88.2
UR-46-22-1-olivA2-2	46.16	0.10	41.01	0.20	0.07	0.18	11.15	0.55	99.4	88.1
UR-46-22-1-olivA2-3	47.17	0.07	41.47	0.20	0.06	0.20	10.60	0.65	100.4	88.8
UR-46-22-2-olivB1-1	46.49	0.08	41.48	0.25	0.07	0.15	10.89	0.39	99.8	88.4
average	46.70	0.09	41.25	0.22	0.06	0.17	10.98	0.52	99.99	88.35
stdandard deviation	0.38	0.02	0.22	0.03	0.01	0.03	0.20	0.09	0.34	0.25

Comment	MgO	Al2O3	SiO2	CaO	Cr2O3	MnO	FeO	NiO	Total	Fo#
UR-46-21-1-olivB1-1	47.12	0.11	40.76	0.21	0.08	0.18	11.23	0.40	100.1	88.2
UR-46-21-1-olivB2-3	47.37	0.11	41.21	0.20	0.07	0.20	11.12	0.42	100.7	88.4
UR-46-21-1-olivB2-4	47.04	0.08	40.85	0.23	0.06	0.18	11.29	0.41	100.1	88.1
UR-46-21-1-olivC1-1	46.33	0.09	40.66	0.21	0.05	0.16	11.53	0.48	99.5	87.7
UR-46-21-2-olivB1-1	46.39	0.06	40.34	0.26	0.03	0.15	11.41	0.51	99.1	87.9
UR-46-21-2-olivC1-2	46.75	0.06	41.61	0.21	0.05	0.20	11.53	0.56	101.0	87.8
UR-46-21-2-olivD1-1	46.49	0.09	40.95	0.21	0.05	0.18	11.50	0.54	100.0	87.8
UR-46-21-2-olivD1-3	46.55	0.06	40.66	0.21	0.04	0.14	11.67	0.54	99.9	87.7
UR-46-21-2-olivD1-4	46.11	0.09	40.73	0.23	0.06	0.13	11.53	0.43	99.3	87.7
UR-46-21-2-olivD1-5	46.91	0.09	40.55	0.23	0.05	0.16	11.91	0.46	100.4	87.5
average	46.71	0.08	40.83	0.22	0.05	0.17	11.47	0.47	100.01	87.89
stdandard deviation	0.40	0.02	0.36	0.02	0.02	0.02	0.23	0.06	0.58	0.26

Comment	MgO	Al2O3	SiO2	CaO	Cr2O3	MnO	FeO	NiO	Total	Fo#
UR-46-21-1-1-olivA2-1	46.31	0.06	40.48	0.21	0.07	0.14	11.86	0.41	99.5	87.4
UR-46-21-1-1-olivA2-2	46.41	0.10	40.34	0.22	0.07	0.16	11.94	0.43	99.7	87.4
UR-46-21-1-1-olivA2-4	46.58	0.08	40.52	0.21	0.06	0.16	11.78	0.44	99.8	87.6
UR-46-21-1-1-olivA2-5	45.88	0.11	40.50	0.21	0.07	0.19	11.77	0.39	99.1	87.4
UR-46-21-1-1-olivA2-6	46.54	0.07	40.59	0.22	0.07	0.13	12.03	0.42	100.1	87.3
UR-46-21-1-1-olivB1-1	45.68	0.08	40.48	0.21	0.07	0.25	11.99	0.39	99.2	87.2
UR-46-21-1-1-olivB1-2	46.26	0.07	40.62	0.21	0.06	0.17	11.92	0.41	99.7	87.4
UR-46-21-1-1-olivB1-3	45.91	0.06	40.69	0.22	0.05	0.16	11.86	0.37	99.3	87.3
UR-46-21-1-1-olivB1-4	46.78	0.09	41.09	0.22	0.06	0.20	11.64	0.43	100.5	87.7
UR-46-21-1-1-olivF1-1	46.67	0.05	40.88	0.20	0.06	0.17	11.91	0.40	100.3	87.5
UR-46-21-1-1-olivF1-2	47.15	0.07	41.04	0.20	0.06	0.18	11.76	0.43	100.9	87.7
UR-46-21-1-1-olivF1-3	46.61	0.10	40.87	0.21	0.07	0.23	11.93	0.41	100.4	87.4
UR-46-21-1-1-olivF1-4	46.80	0.10	41.06	0.20	0.08	0.15	11.60	0.43	100.4	87.8
UR-46-21-1-1-olivF1-5	47.08	0.10	41.06	0.20	0.08	0.18	11.60	0.51	100.8	87.9
UR-46-21-1-1-olivF2-1	46.76	0.06	41.19	0.21	0.05	0.21	12.06	0.43	101.0	87.4
UR-46-21-1-1-olivF2-2	46.58	0.04	40.73	0.19	0.06	0.15	11.73	0.46	99.9	87.6
UR-46-21-1-1-olivF2-3	46.72	0.10	40.79	0.21	0.09	0.19	11.85	0.47	100.4	87.5
UR-46-21-1-1-olivF2-4	46.94	0.06	40.62	0.20	0.06	0.20	11.99	0.41	100.5	87.5
UR-46-21-1-1-olivF2-5	46.65	0.07	40.44	0.21	0.06	0.19	11.92	0.38	99.9	87.5
UR-46-21-1-1-olivF2-6	46.55	0.07	41.02	0.20	0.06	0.18	12.12	0.39	100.6	87.3
UR-46-21-1-1-olivG1-1	45.99	0.07	41.26	0.22	0.06	0.13	12.09	0.39	100.2	87.1
UR-46-21-1-1-olivG1-2	46.02	0.08	41.12	0.21	0.07	0.17	11.94	0.40	100.0	87.3
UR-46-21-1-1-olivG1-3	46.42	0.12	41.24	0.20	0.07	0.20	11.56	0.49	100.3	87.7
UR-46-21-1-1-olivG1-4	46.13	0.07	40.83	0.21	0.05	0.20	12.03	0.42	99.9	87.2
UR-46-21-1-1-olivG1-5	45.66	0.09	41.13	0.22	0.05	0.15	12.03	0.43	99.8	87.1
UR-46-21-1-2-olivA1-1	45.85	0.07	40.62	0.21	0.05	0.14	12.14	0.44	99.5	87.1
UR-46-21-1-2-olivA1-2	46.04	0.05	40.40	0.21	0.05	0.25	12.14	0.41	99.6	87.1
UR-46-21-1-2-olivA1-3	46.34	0.06	40.66	0.22	0.05	0.19	12.11	0.45	100.1	87.2
UR-46-21-1-2-olivA1-4	46.43	0.05	40.85	0.23	0.04	0.18	12.17	0.42	100.4	87.2
UR-46-21-1-2-olivA1-5	46.49	0.05	41.18	0.22	0.04	0.24	12.18	0.41	100.8	87.2
UR-46-21-1-2-olivA1-6	46.28	0.09	41.04	0.18	0.06	0.15	11.82	0.53	100.1	87.5
UR-46-21-1-2-olivA1-7	46.39	0.07	40.82	0.21	0.06	0.14	12.01	0.45	100.1	87.3
UR-46-21-1-2-olivB1-1	46.69	0.07	40.77	0.21	0.06	0.17	11.84	0.46	100.3	87.5

UR-46-21-1-2-olivB1-2	46.34	0.13	40.80	0.22	0.11	0.17	11.91	0.56	100.2	87.4
UR-46-21-1-2-olivB1-3	46.09	0.08	40.87	0.22	0.05	0.14	12.03	0.49	100.0	87.2
UR-46-21-1-2-olivB1-4	46.28	0.09	41.00	0.22	0.06	0.22	11.88	0.50	100.2	87.4
UR-46-21-1-2-olivB1-5	45.52	0.05	40.31	0.22	0.05	0.23	12.15	0.47	99.0	87.0
UR-46-21-1-2-olivB1-6	46.44	0.09	40.00	0.22	0.07	0.14	12.06	0.42	99.4	87.3
UR-46-21-1-2-olivB1-7	45.84	0.08	40.25	0.21	0.06	0.17	12.03	0.46	99.1	87.2
UR-46-21-1-2-olivC1-1	46.73	0.04	41.10	0.19	0.04	0.15	11.44	0.38	100.1	87.9
UR-46-21-1-2-olivC1-2	46.56	0.04	40.98	0.21	0.03	0.20	11.81	0.37	100.2	87.5
UR-46-21-1-2-olivC1-3	46.29	0.34	40.92	0.21	0.05	0.15	11.87	0.37	100.2	87.4
UR-46-21-1-2-olivC1-4	46.22	0.04	41.21	0.23	0.04	0.16	11.99	0.35	100.2	87.3
UR-46-21-1-2-olivC1-5	46.50	0.06	41.14	0.20	0.05	0.23	11.76	0.39	100.3	87.6
average	46.37	0.08	40.81	0.21	0.06	0.18	11.91	0.43	100.05	87.40
stdandard deviation	0.37	0.05	0.31	0.01	0.01	0.03	0.18	0.04	0.49	0.22

Comment	MgO	Al2O3	SiO2	CaO	Cr2O3	MnO	FeO	NiO	Total	Fo#
UR-46-PC10-oliv3	49.92	0.05	41.69	0.17	0.02	0.20	7.33	0.66	100.1	92.4
UR-46-PC10-oliv4	50.03	0.05	41.06	0.17	0.03	0.18	7.92	0.48	99.9	91.8
UR-46-PC10-oliv5	49.37	0.05	41.72	0.19	0.01	0.17	7.77	0.49	99.8	91.9
UR-46-PC10-oliv6	49.29	0.03	41.80	0.19	0.01	0.18	7.63	0.53	99.7	92.0
UR-46-PC10-oliv7	49.81	0.04	42.19	0.17	0.02	0.17	7.74	0.55	100.7	92.0
UR-46-PC10-oliv8	49.39	0.06	41.40	0.16	0.03	0.19	7.73	0.54	99.5	91.9
UR-46-PC10-oliv9	48.94	0.05	41.35	0.18	0.02	0.13	7.82	0.51	99.0	91.8
UR-46-PC10-oliv10	49.60	0.08	41.80	0.20	0.02	0.19	7.82	0.55	100.3	91.9
UR-46-PC10-oliv11	49.62	0.05	42.72	0.19	0.01	0.15	7.70	0.52	101.0	92.0
UR-46-PC10-oliv12	48.98	0.06	41.67	0.20	0.02	0.18	7.79	0.57	99.5	91.8
UR-46-PC10-oliv13	48.33	0.48	40.97	0.19	0.40	0.10	9.06	0.55	100.1	90.5
UR-46-PC10-oliv14	49.36	0.06	41.52	0.18	0.00	0.14	7.74	0.55	99.6	91.9
UR-46-PC10-oliv15	49.65	0.05	41.92	0.18	0.01	0.13	7.75	0.50	100.2	91.9
UR-46-PC10-oliv16	49.81	0.05	42.56	0.17	0.01	0.26	7.67	0.52	101.1	92.0
average	49.44	0.08	41.74	0.18	0.04	0.17	7.82	0.54	100.01	91.85
stdandard deviation	0.46	0.11	0.50	0.01	0.10	0.04	0.38	0.05	0.59	0.42

Comment	MgO	Al2O3	SiO2	CaO	Cr2O3	MnO	FeO	NiO	Total	Fo#
UR-46-PC12-oliv11	47.96	0.24	41.72	0.22	0.07	0.15	9.16	0.63	100.1	90.3
UR-46-PC12-oliv6redo	48.20	0.04	41.51	0.18	0.02	0.16	8.73	0.65	99.5	90.8
UR-46-PC12-oliv8redo	48.13	0.06	41.33	0.19	0.02	0.18	8.88	0.66	99.4	90.6
UR-46-PC12-oliv12	48.15	0.05	40.82	0.20	0.01	0.18	8.73	0.63	98.8	90.8
UR-46-PC12-oliv13	48.45	0.05	41.20	0.18	0.01	0.17	8.74	0.63	99.4	90.8
average	48.18	0.09	41.32	0.19	0.03	0.17	8.85	0.64	99.46	90.66
stdandard deviation	0.18	0.08	0.34	0.02	0.02	0.01	0.19	0.02	0.49	0.20

Comment	MgO	Al2O3	SiO2	CaO	Cr2O3	MnO	FeO	NiO	Total	Fo#
UR-46-PC13-oliv1-1	46.45	0.03	41.66	0.17	0.02	0.17	11.34	0.37	100.2	88.0
UR-46-PC13-oliv1-2	46.27	0.04	41.09	0.16	0.02	0.19	11.27	0.37	99.4	88.0
UR-46-PC13-oliv1-3	46.58	0.04	40.98	0.16	0.03	0.22	11.25	0.40	99.7	88.1
UR-46-PC13-oliv1-4	46.53	0.05	40.87	0.16	0.03	0.17	11.30	0.35	99.5	88.0
UR-46-PC13-oliv1-5	46.29	0.06	41.11	0.16	0.03	0.21	11.27	0.35	99.5	88.0
UR-46-PC13-oliv2-1	46.27	0.04	40.94	0.17	0.02	0.16	11.32	0.34	99.3	87.9
UR-46-PC13-oliv2-2	46.34	0.05	41.21	0.17	0.03	0.23	11.12	0.39	99.5	88.1
UR-46-PC13-oliv2-3	46.79	0.03	41.47	0.17	0.01	0.21	11.25	0.38	100.3	88.1
UR-46-PC13-oliv2-4	46.67	0.04	41.36	0.17	0.02	0.19	11.21	0.37	100.0	88.1
UR-46-PC13-oliv2-5	46.39	0.06	41.41	0.17	0.03	0.21	11.33	0.35	99.9	88.0
UR-46-PC13-oliv3-1	46.76	0.04	41.26	0.16	0.05	0.14	11.08	0.38	99.9	88.3
UR-46-PC13-oliv3-2	46.50	0.05	41.47	0.17	0.02	0.18	11.12	0.38	99.9	88.2
UR-46-PC13-oliv3-3	46.26	0.04	41.23	0.17	0.02	0.23	11.42	0.35	99.7	87.8
UR-46-PC13-oliv3-4	46.25	0.04	41.26	0.17	0.03	0.14	11.35	0.34	99.6	87.9
UR-46-PC13-oliv3-5	46.62	0.04	41.42	0.15	0.03	0.16	11.25	0.38	100.1	88.1
UR-46-PC13-oliv4-1	46.48	0.04	41.52	0.16	0.02	0.13	11.34	0.34	100.0	88.0
UR-46-PC13-oliv4-2	46.56	0.05	41.33	0.15	0.03	0.17	11.09	0.40	99.8	88.2
UR-46-PC13-oliv4-3	46.76	0.12	41.36	0.17	0.01	0.18	11.26	0.34	100.2	88.1
UR-46-PC13-oliv4-4	44.88	3.33	40.49	0.23	0.02	0.14	10.82	0.36	100.3	88.1
UR-46-PC13-oliv4-5	46.23	0.02	41.22	0.17	0.01	0.15	11.36	0.36	99.5	87.9
UR-46-PC13-oliv6-1	46.61	0.05	41.31	0.16	0.03	0.16	10.72	0.40	99.4	88.6
UR-46-PC13-oliv6-2	46.92	0.04	41.39	0.18	0.02	0.17	10.74	0.41	99.9	88.6
UR-46-PC13-oliv6-3	46.59	0.04	41.61	0.16	0.02	0.19	10.72	0.39	99.7	88.6
UR-46-PC13-oliv6-4	46.67	0.06	41.30	0.16	0.04	0.15	10.77	0.42	99.6	88.5
UR-46-PC13-oliv6-5	46.74	0.04	41.18	0.19	0.02	0.19	10.76	0.39	99.5	88.6
UR-46-PC13-oliv7-1	46.56	0.05	40.87	0.17	0.02	0.18	10.68	0.39	98.9	88.6
UR-46-PC13-oliv7-2	46.85	0.04	41.23	0.15	0.03	0.17	10.75	0.42	99.6	88.6
UR-46-PC13-oliv7-3	46.90	0.05	41.24	0.18	0.03	0.18	10.71	0.42	99.7	88.6
UR-46-PC13-oliv7-4	46.84	0.04	41.45	0.15	0.03	0.12	10.68	0.39	99.7	88.7

UR-46-PC13-oliv7-5	46.79	0.04	41.46	0.15	0.03	0.19	10.74	0.39	99.8	88.6
UR-46-PC13-oliv7-6	46.54	0.04	41.24	0.17	0.02	0.18	10.76	0.38	99.3	88.5
UR-46-PC13-oliv7-7	46.72	0.05	41.44	0.20	0.02	0.20	10.69	0.38	99.7	88.6
UR-46-PC13-oliv7-8	46.91	0.04	41.48	0.16	0.03	0.13	10.75	0.40	99.9	88.6
UR-46-PC13-oliv7-9	46.75	0.03	41.55	0.16	0.02	0.17	10.64	0.40	99.7	88.7
average	46.54	0.14	41.28	0.17	0.02	0.18	11.03	0.38	99.73	88.27
stdandard deviation	0.36	0.56	0.24	0.02	0.01	0.03	0.28	0.02	0.30	0.30

Comment	MgO	Al2O3	SiO2	CaO	Cr2O3	MnO	FeO	NiO	Total	Fo#
UR-46-PC14-oliv1-1	47.19	0.05	41.18	0.15	0.08	0.16	10.50	0.66	100.0	88.9
UR-46-PC14-oliv1-2	47.43	0.06	40.58	0.16	0.08	0.18	10.27	0.70	99.5	89.2
UR-46-PC14-oliv1-3	47.47	0.05	40.72	0.15	0.05	0.16	10.35	0.67	99.6	89.1
UR-46-PC14-oliv1-4	47.11	0.04	40.93	0.15	0.04	0.15	10.77	0.57	99.8	88.6
UR-46-PC14-oliv2-1	47.00	0.06	41.17	0.16	0.05	0.11	10.69	0.54	99.8	88.7
UR-46-PC14-oliv2-2	47.30	0.04	40.82	0.16	0.04	0.24	10.92	0.53	100.0	88.5
UR-46-PC14-oliv2-3	46.81	0.04	41.30	0.14	0.05	0.13	10.52	0.58	99.6	88.8
UR-46-PC14-oliv2-4	47.44	0.06	40.83	0.16	0.08	0.20	10.41	0.57	99.7	89.0
UR-46-PC14-oliv3-1	47.29	0.04	41.16	0.18	0.02	0.14	11.00	0.50	100.3	88.5
UR-46-PC14-oliv3-2	47.21	0.04	41.04	0.17	0.03	0.22	10.93	0.53	100.2	88.5
UR-46-PC14-oliv4-1	47.05	0.05	41.44	0.17	0.03	0.23	10.53	0.54	100.0	88.8
UR-46-PC14-oliv4-2	48.01	0.07	41.69	0.14	0.06	0.19	10.05	0.64	100.8	89.5
UR-46-PC14-oliv4-3	48.25	0.05	41.80	0.16	0.03	0.14	10.23	0.58	101.2	89.4
UR-46-PC14-oliv4-4	47.51	0.04	41.37	0.15	0.02	0.15	10.62	0.57	100.4	88.9
UR-46-PC14-oliv5-1	46.82	0.04	40.50	0.16	0.02	0.17	11.02	0.51	99.2	88.3
UR-46-PC14-oliv5-2	46.61	0.06	40.42	0.15	0.03	0.17	10.75	0.53	98.7	88.5
UR-46-PC14-oliv6-1	47.58	0.04	41.18	0.16	0.05	0.16	10.17	0.62	100.0	89.3
UR-46-PC14-oliv6-2	48.25	0.04	40.44	0.16	0.03	0.19	10.43	0.58	100.1	89.2
UR-46-PC14-oliv7-1	48.15	0.04	41.90	0.15	0.03	0.17	10.61	0.62	101.7	89.0
UR-46-PC14-oliv7-2	47.69	0.04	41.09	0.17	0.02	0.19	10.93	0.56	100.7	88.6
UR-46-PC14-oliv7-3	49.01	0.04	41.32	0.15	0.05	0.19	10.18	0.69	101.6	89.6
UR-46-PC14-oliv7-4	47.61	0.05	40.27	0.13	0.04	0.17	10.24	0.68	99.2	89.2
UR-46-PC14-oliv8-1	47.90	0.03	41.06	0.17	0.06	0.17	10.73	0.53	100.7	88.8
UR-46-PC14-oliv8-2	47.57	0.06	41.05	0.15	0.07	0.18	10.58	0.59	100.2	88.9
UR-46-PC14-oliv8-3	47.70	0.06	41.07	0.16	0.03	0.19	10.49	0.62	100.3	89.0
UR-46-PC14-oliv8-4	48.08	0.04	41.04	0.15	0.04	0.17	10.46	0.60	100.6	89.1
UR-46-PC14-oliv8-5	47.41	0.06	40.87	0.17	0.03	0.14	10.82	0.58	100.1	88.7
UR-46-PC14-oliv8-6	47.57	0.04	41.34	0.20	0.02	0.17	10.97	0.52	100.8	88.5
average	47.54	0.05	41.06	0.16	0.04	0.17	10.58	0.59	100.18	88.90
stdandard deviation	0.52	0.01	0.40	0.01	0.02	0.03	0.28	0.06	0.69	0.33

Comment	MgO	Al2O3	SiO2	CaO	Cr2O3	MnO	FeO	NiO	Total	Fo#
UR-46-PC17-oliv1	48.72	0.05	42.62	0.19	0.03	0.17	8.37	0.69	100.8	91.2
UR-46-PC17-oliv2	48.31	0.05	42.62	0.15	0.06	0.18	8.16	0.76	100.3	91.3
UR-46-PC17-oliv3	48.20	0.05	43.10	0.15	0.05	0.15	8.03	0.80	100.5	91.4
UR-46-PC17-oliv4-1	48.04	0.04	42.26	0.14	0.04	0.21	8.17	0.75	99.6	91.3
UR-46-PC17-oliv4-2	48.10	0.03	42.66	0.14	0.05	0.18	8.13	0.77	100.1	91.3
UR-46-PC17-oliv4-3	47.94	0.04	42.09	0.16	0.04	0.17	8.32	0.71	99.5	91.1
UR-46-PC17-oliv5-1	48.00	0.05	42.26	0.16	0.03	0.17	8.27	0.76	99.7	91.2
UR-46-PC17-oliv5-2	47.73	0.05	42.58	0.16	0.05	0.17	8.11	0.76	99.6	91.3
UR-46-PC17-oliv6-2	47.71	0.04	41.87	0.14	0.02	0.16	8.57	0.72	99.2	90.8
UR-46-PC17-oliv7-1	48.25	0.02	41.82	0.13	0.04	0.13	8.45	0.67	99.5	91.1
UR-46-PC17-oliv7-2	47.72	0.05	41.86	0.14	0.04	0.18	8.58	0.68	99.3	90.8
UR-46-PC17-oliv7-3	47.94	0.08	41.38	0.13	0.12	0.14	8.47	0.76	99.0	91.0
UR-46-PC17-oliv7-4	48.09	0.05	41.85	0.13	0.03	0.18	8.69	0.68	99.7	90.8
UR-46-PC17-oliv8-1	48.07	0.05	41.96	0.19	0.01	0.13	8.69	0.63	99.7	90.8
UR-46-PC17-oliv8-2	47.90	0.04	41.95	0.19	0.03	0.22	8.68	0.67	99.7	90.8
UR-46-PC17-oliv9-2	48.68	0.05	42.44	0.13	0.10	0.16	8.35	0.72	100.6	91.2
UR-46-PC17-oliv10-1	48.48	0.05	42.17	0.15	0.02	0.15	8.55	0.68	100.3	91.0
UR-46-PC17-oliv10-2	47.84	0.04	41.93	0.14	0.04	0.15	8.51	0.69	99.3	90.9
UR-46-PC17-oliv10-3	47.77	0.03	42.64	0.13	0.02	0.16	8.56	0.68	100.0	90.9
UR-46-PC17-oliv11-1	47.88	0.08	42.04	0.15	0.09	0.14	8.53	0.70	99.6	90.9
UR-46-PC17-oliv11-2	48.14	0.06	42.40	0.13	0.03	0.12	8.45	0.66	100.0	91.0
UR-46-PC17-oliv12-1	48.29	0.05	42.25	0.17	0.08	0.09	8.45	0.69	100.1	91.1
UR-46-PC17-oliv12-2	47.91	0.07	42.03	0.13	0.13	0.18	8.22	0.77	99.4	91.2
UR-46-PC17-oliv13	48.20	0.05	41.86	0.16	0.10	0.13	8.48	0.68	99.7	91.0
UR-46-PC17-oliv14-1	48.25	0.05	42.19	0.14	0.03	0.14	8.51	0.65	100.0	91.0
UR-46-PC17-oliv14-2	48.31	0.04	41.96	0.16	0.03	0.15	8.50	0.64	99.8	91.0
UR-46-PC17-oliv15-1	48.22	0.07	42.24	0.14	0.09	0.12	8.57	0.71	100.2	90.9
UR-46-PC17-oliv15-2	48.74	0.04	42.43	0.13	0.04	0.16	8.49	0.68	100.7	91.1
UR-46-PC17-oliv15-3	48.07	0.04	41.62	0.17	0.03	0.18	8.54	0.65	99.3	90.9
UR-46-PC17-oliv15-5	48.26	0.06	42.18	0.14	0.08	0.22	8.46	0.70	100.1	91.1
UR-46-PC17-oliv16	48.36	0.02	41.88	0.14	0.01	0.18	8.65	0.64	99.9	90.9
UR-46-PC17-oliv17	48.71	0.05	42.22	0.14	0.05	0.16	8.32	0.75	100.4	91.3
UR-46-PC17-oliv18-1	48.36	0.04	42.43	0.15	0.02	0.17	8.55	0.65	100.4	91.0

UR-46-PC17-oliv19	48.29	0.04	42.61	0.14	0.02	0.20	8.32	0.70	100.3	91.2
UR-46-PC17-oliv20-1	48.20	0.04	42.52	0.13	0.04	0.18	8.03	0.76	99.9	91.5
UR-46-PC17-oliv20-2	48.09	0.04	42.53	0.16	0.03	0.17	8.20	0.79	100.0	91.3
average	48.16	0.05	42.21	0.15	0.05	0.16	8.41	0.71	99.90	91.07
stdandard deviation	0.28	0.01	0.35	0.02	0.03	0.03	0.19	0.05	0.45	0.19

Table B3 Glass compositions in each experiments

Comment	Na2O	MgO	Al2O3	SiO2	P2O5	K2O	CaO	TiO2	MnO	FeO	Total
UR46-20-1-1-glassA1	3.27	9.44	17.39	52.05	0.11	0.58	8.87	0.75	0.14	7.60	100.2
UR46-20-1-1-glassA2	3.38	9.41	17.09	51.93	0.12	0.62	8.73	0.75	0.12	7.59	99.7
UR46-20-1-1-glassB1	3.21	9.05	17.97	52.30	0.11	0.65	8.75	0.78	0.12	7.54	100.5
UR46-20-1-1-glassB2	3.33	9.22	17.35	52.34	0.10	0.55	8.81	0.76	0.11	7.55	100.1
UR46-20-1-1-glassC1	3.36	9.40	17.56	52.13	0.12	0.64	8.76	0.77	0.13	7.62	100.5
UR46-20-1-1-glassC2	3.26	9.36	17.55	52.30	0.15	0.60	8.83	0.75	0.14	7.58	100.5
UR46-20-1-1-glassC3	3.43	9.41	17.53	52.14	0.16	0.65	8.66	0.74	0.11	7.61	100.4
UR46-20-1-1-glassD1	3.27	9.39	17.56	51.87	0.10	0.68	8.86	0.73	0.13	7.65	100.2
UR46-20-1-1-glassD2	3.26	9.35	17.49	52.34	0.11	0.58	8.68	0.78	0.12	7.65	100.4
R46-20-1-1-glassD3 (near oli	3.28	9.09	17.42	51.76	0.19	0.70	8.73	0.75	0.13	7.63	99.7
R46-20-1-1-glassD4 (near oli	3.21	9.13	17.61	52.19	0.17	0.57	8.78	0.75	0.14	7.63	100.2
UR46-20-1-1-glassE1	3.18	9.18	17.41	52.19	0.17	0.64	8.88	0.77	0.14	7.53	100.1
UR46-20-1-1-glassE2	3.21	9.25	17.29	52.22	0.12	0.60	8.75	0.76	0.14	7.62	100.0
UR46-20-1-1-glassF1	3.47	9.29	17.49	52.57	0.11	0.63	8.81	0.74	0.17	7.56	100.8
UR46-20-1-1-glassF2	3.17	9.36	17.39	52.01	0.18	0.59	8.71	0.76	0.13	7.56	99.8
UR46-20-1-2-glassA1	3.39	9.33	17.58	52.37	0.14	0.63	8.76	0.77	0.10	7.58	100.6
UR46-20-1-2-glassA2	3.37	9.47	17.68	51.89	0.14	0.59	8.82	0.75	0.14	7.54	100.4
UR46-20-1-2-glassB1	3.36	9.36	17.62	52.43	0.08	0.62	8.87	0.77	0.15	7.54	100.8
UR46-20-1-2-glassB2	3.45	9.44	17.94	52.23	0.19	0.60	8.72	0.75	0.13	7.55	101.0
UR46-20-1-2-glassC1	3.29	9.36	17.78	52.20	0.15	0.65	8.75	0.78	0.14	7.58	100.7
UR46-20-1-2-glassC2	3.32	9.49	17.62	52.33	0.13	0.63	8.73	0.76	0.12	7.56	100.7
R46-20-1-2-glassD1 (near oli	3.39	9.08	17.65	52.25	0.13	0.61	8.76	0.76	0.14	7.55	100.3
UR46-20-1-2-glassD3	3.38	9.49	17.50	52.53	0.09	0.66	8.75	0.77	0.13	7.55	100.9
UR46-20-1-2-glassE2	3.30	9.32	17.59	52.42	0.10	0.63	8.84	0.78	0.16	7.55	100.7
average	3.31	9.32	17.54	52.21	0.13	0.62	8.77	0.76	0.13	7.58	100.38
standard deviation	0.09	0.13	0.19	0.21	0.03	0.04	0.06	0.01	0.02	0.04	0.36

Comment	Na2O	MgO	Al2O3	SiO2	P2O5	K2O	CaO	TiO2	MnO	FeO	Total
R-46-22-1-glassA1 (near oliv	3.35	9.19	17.73	52.61	0.10	0.65	8.82	0.79	0.12	7.44	100.8
R-46-22-1-glassA2 (near oliv	3.46	8.85	17.91	52.76	0.15	0.62	8.79	0.75	0.13	7.40	100.8
R-46-22-1-glassA3 (near oliv	3.41	8.81	17.70	52.57	0.13	0.63	8.83	0.76	0.14	7.46	100.4
R-46-22-1-glassB1 (near oliv	3.25	8.77	17.28	52.26	0.09	0.64	8.86	0.78	0.13	7.48	99.5
R-46-22-1-glassB2 (near oliv	3.34	8.61	17.61	52.74	0.20	0.66	8.75	0.76	0.15	7.61	100.4
R-46-22-1-glassB3 (inside oliv	3.45	8.06	17.76	52.55	0.05	0.70	8.66	0.73	0.14	7.37	99.5
UR-46-22-1-glassB4	3.22	9.03	17.37	52.19	0.14	0.60	8.74	0.78	0.12	7.58	99.8
UR-46-22-1-glassB5	3.27	9.44	17.61	52.38	0.16	0.64	8.79	0.76	0.12	7.65	100.8
UR-46-22-1-glassB6	3.28	9.16	17.60	52.81	0.19	0.66	8.67	0.76	0.11	7.52	100.8
UR-46-22-1-glassB7	3.40	9.05	17.48	52.35	0.15	0.63	8.83	0.76	0.13	7.45	100.2
UR-46-22-1-glassA4	3.40	8.90	17.68	52.77	0.07	0.66	8.74	0.76	0.14	7.37	100.5
UR-46-22-1-glassA5	3.29	9.10	17.65	52.47	0.06	0.60	8.83	0.76	0.12	7.55	100.4
UR-46-22-1-glassA6	3.37	9.23	17.40	52.40	0.15	0.64	8.76	0.75	0.14	7.47	100.3
UR-46-22-1-glassA7	3.38	8.90	17.73	52.86	0.15	0.62	8.78	0.76	0.12	7.48	100.8
UR-46-22-1-glassC1	3.43	9.08	17.69	52.57	0.16	0.63	8.75	0.77	0.13	7.64	100.9
UR-46-22-1-glassC2	3.48	9.18	17.66	52.89	0.04	0.66	8.60	0.76	0.13	7.49	100.9
UR-46-22-1-glassC3	3.26	9.06	17.66	52.76	0.12	0.63	8.66	0.76	0.12	7.59	100.6
UR-46-22-1-glassC4	3.24	9.17	17.40	52.06	0.08	0.64	8.78	0.77	0.14	7.56	99.8
UR-46-22-2-glassA1	3.38	9.30	17.59	52.18	0.10	0.61	8.75	0.77	0.12	7.65	100.5
UR-46-22-2-glassA2	3.47	9.23	17.38	52.60	0.12	0.67	8.83	0.76	0.16	7.62	100.8
UR-46-22-2-glassA3	3.40	9.32	17.69	52.51	0.23	0.65	8.70	0.77	0.13	7.51	100.9
UR-46-22-2-glassA4	3.44	9.32	17.48	52.74	0.20	0.60	8.69	0.76	0.12	7.60	101.0
UR-46-22-2-glassB1	3.24	9.21	17.43	52.32	0.16	0.64	8.78	0.77	0.13	7.42	100.1
UR-46-22-2-glassB2	3.38	9.19	17.74	52.58	0.12	0.67	8.76	0.79	0.13	7.50	100.8
UR-46-22-2-glassB3	3.37	8.94	17.75	52.58	0.15	0.58	8.81	0.75	0.13	7.49	100.5
R-46-22-2-glassB4 (near oliv	3.36	8.79	17.77	52.48	0.15	0.65	8.81	0.78	0.15	7.33	100.3
R-46-22-2-glassB5 (near oliv	3.40	8.94	17.91	52.39	0.13	0.58	8.80	0.75	0.12	7.42	100.4
UR-46-22-2-glassB6	3.41	9.33	17.72	53.26	0.12	0.63	8.80	0.77	0.13	7.58	101.7
average	3.36	9.04	17.62	52.56	0.13	0.64	8.76	0.76	0.13	7.51	100.51
standard deviation	0.08	0.28	0.16	0.26	0.05	0.03	0.06	0.01	0.01	0.09	0.48

Comment	Na2O	MgO	Al2O3	SiO2	P2O5	K2O	CaO	TiO2	MnO	FeO	Total
UR46-21-1-glassA1	3.47	9.23	17.50	52.31	0.14	0.63	8.77	0.76	0.11	7.57	100.5
UR46-21-1-glassA2	3.45	9.29	17.60	52.10	0.11	0.63	8.71	0.78	0.13	7.39	100.2
UR46-21-1-glassA3	3.45	9.26	17.29	51.89	0.09	0.66	8.84	0.77	0.16	7.61	100.0
JR46-21-1-glassA5 (near oliv	3.56	8.81	18.05	52.51	0.16	0.66	8.94	0.78	0.12	7.35	100.9
JR46-21-1-glassB1 (near oliv	3.67	8.83	17.84	52.23	0.21	0.67	8.81	0.77	0.12	7.27	100.4
JR46-21-1-glassB2 (near oliv	4.00	7.72	18.84	53.51	0.07	0.77	8.47	0.78	0.13	6.69	101.0
JR46-21-1-glassB3 (near oliv	3.54	8.63	18.08	52.57	0.11	0.70	8.70	0.81	0.15	7.16	100.4
UR46-21-1-glassB4	3.53	9.13	17.81	52.47	0.15	0.61	8.87	0.77	0.14	7.22	100.7
UR46-21-1-glassB5	3.44	8.94	17.46	52.45	0.12	0.63	8.84	0.80	0.15	7.29	100.1
JR46-21-1-glassC1 (near oliv	3.42	8.58	17.99	52.96	0.21	0.64	8.81	0.78	0.12	7.45	101.0
UR46-21-1-glassC2	3.40	8.73	17.84	52.17	0.13	0.64	8.76	0.79	0.12	7.30	99.9
UR46-21-1-glassC3	3.41	9.08	17.58	51.86	0.18	0.69	8.85	0.79	0.14	7.58	100.1
UR46-21-1-glassC4	3.34	9.06	17.38	51.93	0.11	0.64	8.86	0.76	0.13	7.47	99.7
UR46-21-2-glassA1	3.50	8.91	17.77	53.08	0.19	0.68	8.51	0.76	0.15	7.18	100.7
UR46-21-2-glassA2	3.50	9.19	17.41	52.03	0.18	0.67	8.61	0.75	0.14	7.28	99.8
UR46-21-2-glassA3	3.51	8.86	17.65	52.54	0.24	0.64	8.61	0.74	0.12	7.19	100.1
JR46-21-2-glassB1 (near oliv	3.55	8.70	17.85	51.98	0.16	0.65	8.73	0.75	0.14	7.40	99.9
UR46-21-2-glassB2	3.51	9.25	17.43	52.02	0.14	0.63	8.84	0.77	0.10	7.69	100.4
UR46-21-2-glassB3	3.30	9.19	17.24	51.58	0.13	0.61	8.86	0.75	0.14	7.69	99.5
UR46-21-2-glassC1	3.34	8.81	17.55	51.78	0.09	0.61	8.85	0.77	0.11	7.58	99.5
UR46-21-2-glassC2	3.59	8.96	17.46	52.05	0.15	0.64	8.73	0.77	0.11	7.57	100.0
JR46-21-2-glassC4 (near oliv	3.62	8.41	18.03	52.97	0.18	0.70	8.59	0.77	0.13	7.34	100.7
UR46-21-2-glassC6	3.32	9.01	17.18	51.32	0.18	0.61	8.88	0.77	0.11	7.71	99.1
JR46-21-2-glassD1 (near oliv	3.58	8.60	17.83	52.23	0.17	0.64	8.88	0.78	0.13	7.60	100.4
JR46-21-2-glassD2 (near oliv	3.52	8.54	17.83	51.99	0.20	0.65	8.86	0.77	0.15	7.39	99.9
UR46-21-2-glassD3	3.42	9.24	17.69	52.12	0.11	0.63	8.84	0.77	0.13	7.57	100.5
avg	3.50	8.88	17.70	52.26	0.15	0.65	8.77	0.77	0.13	7.41	100.21

standard deviation	0.14	0.35	0.35	0.49	0.04	0.04	0.12	0.02	0.02	0.22	0.49

Comment	Na2O	MgO	Al2O3	SiO2	P2O5	K2O	CaO	TiO2	MnO	FeO	Total
R46-21-1-1-glassA1 (near oli	3.47	7.75	18.52	53.34	0.13	0.69	9.02	0.78	0.13	7.24	101.1
R46-21-1-1-glassA2 (near oli	3.63	7.80	18.51	53.05	0.09	0.67	8.98	0.78	0.12	7.30	100.9
UR46-21-1-1-glassA3	3.58	8.04	18.24	52.39	0.25	0.63	8.93	0.79	0.12	7.29	100.2
UR46-21-1-1-glassA4	3.55	7.98	18.43	53.01	0.10	0.71	8.89	0.81	0.13	7.32	100.9
R46-21-1-1-glassB1 (near oli	3.43	8.00	18.17	53.10	0.16	0.65	8.96	0.78	0.12	7.45	100.8
UR46-21-1-1-glassB2	3.36	8.38	18.01	52.06	0.21	0.65	9.11	0.75	0.16	7.48	100.2
UR46-21-1-1-glassC1	3.44	8.36	18.02	52.91	0.11	0.67	8.99	0.79	0.13	7.51	100.9
UR46-21-1-1-glassC2	3.37	8.31	17.95	52.27	0.17	0.64	9.06	0.78	0.14	7.51	100.2
UR46-21-1-1-glassD1	3.51	8.24	17.93	52.55	0.15	0.59	9.07	0.79	0.12	7.41	100.3
UR46-21-1-1-glassE1	3.43	8.27	17.85	52.18	0.19	0.67	9.06	0.78	0.11	7.38	99.9
UR46-21-1-1-glassE2	3.50	8.14	18.01	52.11	0.17	0.64	9.02	0.77	0.15	7.57	100.1
R46-21-1-1-glassF1 (near oli	3.51	7.88	18.08	52.77	0.18	0.71	8.98	0.79	0.10	7.40	100.4
R46-21-1-1-glassF3 (near oli	3.55	7.85	18.56	52.76	0.18	0.70	8.87	0.76	0.12	7.31	100.7
UR46-21-1-1-glassF4	3.44	8.17	17.74	52.36	0.17	0.62	9.07	0.79	0.13	7.48	100.0
UR46-21-1-1-glassG1	3.44	8.35	18.15	52.57	0.13	0.67	9.04	0.77	0.15	7.57	100.8
R46-21-1-1-glassG2 (near oli	3.48	7.74	18.25	53.08	0.12	0.68	8.85	0.79	0.12	7.33	100.4
UR46-21-1-1-glassG3	3.48	8.06	18.19	52.57	0.12	0.66	9.03	0.78	0.13	7.30	100.3
R46-21-1-2-glassA1 (near oli	3.36	8.01	18.08	52.61	0.18	0.64	9.03	0.78	0.15	7.50	100.3
R46-21-1-2-glassA2 (near oli	3.43	7.64	18.63	53.42	0.11	0.69	8.90	0.80	0.15	7.17	100.9
R46-21-1-2-glassA3 (near oli	3.30	8.00	18.05	52.38	0.11	0.60	9.04	0.78	0.13	7.36	99.8
UR46-21-1-2-glassA4	3.43	8.25	17.97	52.86	0.16	0.65	8.86	0.81	0.13	7.38	100.5
UR46-21-1-2-glassA5	3.60	8.15	17.97	53.03	0.16	0.66	8.98	0.79	0.13	7.29	100.8
UR46-21-1-2-glassB1	3.53	8.12	18.32	52.87	0.06	0.60	8.89	0.78	0.13	7.44	100.7
UR46-21-1-2-glassB2	3.37	8.05	17.83	52.64	0.11	0.70	9.09	0.81	0.13	7.46	100.2
R46-21-1-2-glassB3 (inside ol	3.53	7.82	18.60	53.04	0.19	0.66	8.92	0.79	0.13	7.26	100.9
R46-21-1-2-glassB4 (near oli	3.65	7.83	18.07	52.63	0.08	0.66	8.87	0.79	0.13	7.36	100.1
R46-21-1-2-glassB5 (near oli	3.52	7.87	18.46	52.61	0.20	0.62	9.04	0.80	0.14	7.31	100.6
R46-21-1-2-glassC1 (near oli	3.56	8.09	18.09	53.19	0.12	0.66	8.96	0.78	0.13	7.42	101.0
UR46-21-1-2-glassC3	3.45	8.12	18.06	52.67	0.15	0.62	9.00	0.80	0.13	7.50	100.5
UR46-21-1-2-glassC4	3.48	8.16	18.00	52.77	0.15	0.61	8.87	0.80	0.14	7.44	100.4
UR46-21-1-2-glassD2	3.46	8.16	17.98	53.25	0.15	0.62	8.96	0.80	0.15	7.35	100.9
avg	3.48	8.05	18.15	52.74	0.15	0.65	8.98	0.79	0.13	7.39	100.51
standard deviation	0.08	0.20	0.24	0.36	0.04	0.03	0.08	0.01	0.01	0.10	0.36

Comment	Na2O	MgO	SiO2	Al2O3	P2O5	K2O	CaO	TiO2	MnO	FeO	NiO	Total
UR-46-PC10-glass1	3.37	7.62	49.57	17.12	0.35	0.62	8.71	0.74	0.19	7.09	0.02	95.4
UR-46-PC10-glass2	3.34	7.65	50.44	17.13	0.26	0.57	8.73	0.75	0.21	7.12	0.02	96.2
UR-46-PC10-glass3	3.31	7.50	50.40	17.40	0.30	0.62	8.79	0.74	0.14	6.99	0.03	96.2
UR-46-PC10-glass4	3.35	7.58	50.34	16.87	0.28	0.62	8.66	0.76	0.15	7.10	0.02	95.7
UR-46-PC10-glass5	3.31	7.69	50.67	17.00	0.35	0.65	8.66	0.75	0.13	6.99	0.02	96.2
UR-46-PC10-glass6	3.27	7.62	50.29	16.93	0.31	0.62	8.65	0.77	0.12	7.04	0.03	95.6
UR-46-PC10-glass7	3.28	7.68	50.27	17.14	0.26	0.59	8.62	0.75	0.12	7.00	0.02	95.7
UR-46-PC10-glass8	3.42	7.48	50.22	17.09	0.31	0.59	8.64	0.75	0.10	7.06	0.03	95.7
UR-46-PC10-glass9	3.18	7.40	47.69	17.08	0.28	0.59	8.81	0.73	0.16	7.05	0.01	93.0
UR-46-PC10-glass10	3.33	6.82	50.29	17.16	0.30	0.60	8.91	0.76	0.14	7.14	0.02	95.5
avg	3.32	7.50	50.02	17.09	0.30	0.61	8.72	0.75	0.15	7.06	0.02	95.53
standard deviation	0.07	0.26	0.86	0.15	0.03	0.02	0.09	0.01	0.03	0.05	0.00	0.95

Comment	Na2O	MgO	SiO2	Al2O3	P2O5	K2O	CaO	TiO2	MnO	FeO	NiO	Total
R-46-PC12-glass1 (near oliv 1	3.32	7.76	50.12	16.66	0.27	0.60	8.59	0.74	0.09	7.23	0.03	95.4
R-46-PC12-glass2 (near oliv 1	3.08	7.26	49.34	16.71	0.30	0.56	8.87	0.74	0.12	7.41	0.03	94.4
R-46-PC12-glass3 (near oliv 6	2.89	7.24	50.45	17.27	0.29	0.55	8.83	0.74	0.10	7.38	0.04	95.8
R-46-PC12-glass4 (near oliv 6	3.22	7.07	50.09	17.19	0.32	0.60	8.71	0.75	0.12	7.35	0.03	95.4
UR-46-PC12-glass5	3.21	5.35	50.58	17.09	0.27	0.55	9.22	0.80	0.11	7.34	0.01	94.5
UR-46-PC12-glass6	3.16	7.14	50.15	16.79	0.35	0.60	8.84	0.76	0.14	7.37	0.03	95.3
UR-46-PC12-glass7	3.06	7.49	49.95	16.66	0.28	0.59	8.61	0.74	0.16	7.27	0.03	94.9
UR-46-PC12-glass8	3.02	6.96	50.31	16.73	0.31	0.53	8.82	0.74	0.09	7.31	0.02	94.8
UR-46-PC12-glass9	3.06	7.10	50.25	17.14	0.28	0.56	8.71	0.75	0.14	7.23	0.03	95.2
R-46-PC12-glass10 (near oliv	3.10	7.62	49.74	16.88	0.33	0.56	8.65	0.74	0.13	7.36	0.02	95.1
UR-46-PC12-glass11	2.91	7.20	49.26	16.53	0.31	0.54	8.82	0.75	0.12	7.39	0.02	93.9
-46-PC12-glass12 (near caps	1.94	7.82	51.40	17.12	0.37	0.58	8.42	0.74	0.15	7.21	0.02	95.8
avg	3.00	7.17	50.14	16.90	0.31	0.57	8.76	0.75	0.12	7.32	0.02	95.05
standard deviation	0.35	0.64	0.57	0.25	0.03	0.02	0.20	0.02	0.02	0.07	0.01	0.58

Comment	Na2O	MgO	SiO2	Al2O3	P2O5	K2O	CaO	TiO2	MnO	FeO	NiO	Total
R-46-PC13-glass 1 (near oliv	3.66	7.37	51.69	17.71	0.38	0.62	8.58	0.76	0.15	7.45	0.01	98.4
R-46-PC13-glass 2 (near oliv	3.41	7.33	51.69	17.47	0.37	0.64	8.73	0.78	0.15	7.57	0.02	98.1
R-46-PC13-glass 3 (near oliv	3.35	7.21	51.63	17.44	0.32	0.62	8.60	0.75	0.19	7.33	0.02	97.5
R-46-PC13-glass 4 (near oliv	3.37	7.29	51.38	17.44	0.38	0.63	8.64	0.79	0.10	7.36	0.02	97.4
R-46-PC13-glass 5 (inside oli	3.23	9.06	51.30	17.31	0.35	0.59	8.44	0.74	0.10	7.56	0.02	98.7
R-46-PC13-glass 6 (near oliv	3.44	7.46	51.89	17.32	0.32	0.62	8.66	0.76	0.14	7.53	0.02	98.2
R-46-PC13-glass 7 (near oliv	3.36	7.51	52.23	17.35	0.36	0.63	8.67	0.76	0.18	7.62	0.02	98.7
R-46-PC13-glass 8 (near oliv3	3.56	7.29	51.89	17.40	0.33	0.66	8.58	0.74	0.15	7.40	0.02	98.0
R-46-PC13-glass 9 (near oliv	3.38	7.15	51.62	17.35	0.34	0.63	8.69	0.73	0.19	7.51	0.02	97.6
R-46-PC13-glass 10 (near oli	3.44	7.24	51.90	17.28	0.31	0.66	8.58	0.73	0.13	7.36	0.02	97.7
R-46-PC13-glass 11 (near oli	3.42	7.33	52.10	17.41	0.37	0.62	8.75	0.73	0.11	7.63	0.02	98.5
R-46-PC13-glass 12 (near op:	3.42	7.62	50.92	17.04	0.36	0.62	8.63	0.75	0.11	7.72	0.01	97.2
R-46-PC13-glass 13 (near op:	3.32	7.57	51.53	17.25	0.33	0.61	8.82	0.75	0.12	7.64	0.01	97.9
R-46-PC13-glass 14 (near op:	3.37	7.71	51.48	16.97	0.31	0.59	8.61	0.74	0.18	7.73	0.02	97.7
UR-46-PC13-glass 15	3.24	7.84	51.54	16.83	0.31	0.57	8.81	0.76	0.13	7.67	0.02	97.7
UR-46-PC13-glass 16	3.39	7.73	51.20	16.90	0.31	0.61	8.64	0.77	0.14	7.59	0.01	97.3
UR-46-PC13-glass 17	3.35	7.53	51.44	17.37	0.28	0.63	8.67	0.75	0.10	7.48	0.02	97.6
UR-46-PC13-glass 18	3.43	7.49	51.51	17.15	0.33	0.64	8.70	0.74	0.15	7.59	0.01	97.7

UR-46-PC13-glass 19	3.38	7.59	52.19	17.04	0.33	0.60	8.68	0.76	0.10	7.73	0.02	98.4
UR-46-PC13-glass 20	3.60	7.61	51.90	17.05	0.25	0.60	8.65	0.73	0.13	7.55	0.01	98.1
UR-46-PC13-glass 21	3.36	7.59	51.65	17.18	0.32	0.61	8.59	0.74	0.16	7.61	0.01	97.8
UR-46-PC13-glass 22	3.43	7.52	51.70	17.50	0.36	0.63	8.72	0.77	0.15	7.57	0.01	98.4
UR-46-PC13-glass 23	3.51	7.60	51.31	17.16	0.31	0.64	8.65	0.76	0.11	7.61	0.02	97.7
UR-46-PC13-glass 24	3.39	7.54	51.17	17.17	0.33	0.64	8.63	0.77	0.20	7.50	0.02	97.4
UR-46-PC13-glass 25	3.29	7.69	51.69	16.82	0.31	0.61	8.58	0.76	0.17	7.53	0.02	97.5
46-PC13-glass 26 (near caps	3.38	7.59	51.38	16.97	0.34	0.61	8.55	0.76	0.13	7.50	0.02	97.2
UR-46-PC13-glass 27	3.46	7.48	51.22	17.33	0.34	0.64	8.57	0.76	0.08	7.47	0.02	97.4
UR-46-PC13-glass 28	3.34	7.62	50.71	17.08	0.32	0.64	8.61	0.78	0.16	7.59	0.02	96.9
46-PC13-glass 29 (near caps	3.39	7.51	51.49	17.35	0.28	0.62	8.55	0.75	0.17	7.50	0.01	97.6
46-PC13-glass 30 (near caps	3.41	7.73	51.22	16.89	0.29	0.60	8.68	0.76	0.08	7.62	0.02	97.3
R-46-PC13-glass 31 (near oliv	3.34	7.54	51.38	17.27	0.32	0.63	8.57	0.74	0.14	7.59	0.02	97.5
-46-PC13-glass 32 (inside oli	3.40	7.16	51.49	17.65	0.36	0.59	8.90	0.74	0.11	7.74	0.02	98.2
R-46-PC13-glass 33 (near oliv	3.34	7.45	51.50	16.93	0.24	0.64	8.58	0.73	0.13	7.58	0.03	97.1
R-46-PC13-glass 34 (near oliv	3.43	7.37	51.87	17.30	0.29	0.62	8.64	0.74	0.18	7.61	0.01	98.0
-46-PC13-glass 35 (inside oli	3.35	6.82	51.96	17.40	0.28	0.60	8.91	0.72	0.13	7.64	0.02	97.8
-46-PC13-glass 36 (inside oli	3.13	6.58	51.48	17.10	0.30	0.59	9.03	0.77	0.11	7.82	0.02	96.9
R-46-PC13-glass 37 (near oliv	3.50	7.38	50.78	16.86	0.33	0.62	8.75	0.75	0.14	7.47	0.01	96.6
R-46-PC13-glass 38 (near oliv	3.36	7.34	51.06	17.13	0.37	0.63	8.65	0.76	0.13	7.57	0.02	97.0
46-PC13-glass 39 (near caps	3.40	7.59	52.09	17.16	0.30	0.64	8.61	0.74	0.14	7.54	0.01	98.2
UR-46-PC13-glass 40	3.40	7.49	51.63	16.99	0.33	0.60	8.65	0.73	0.15	7.53	0.02	97.5
avg	3.39	7.49	51.55	17.21	0.32	0.62	8.66	0.75	0.14	7.56	0.02	97.71
standard deviation	0.09	0.35	0.36	0.22	0.03	0.02	0.11	0.02	0.03	0.11	0.01	0.50

Comment	Na2O	MgO	Al2O3	SiO2	P2O5	K2O	CaO	TiO2	MnO	FeO	NiO	Total
JR46-PC14-glass1_near oliv	3.51	7.81	17.54	50.45	0.39	0.60	8.44	0.74	0.10	7.50	0.01	97.1
JR46-PC14-glass2_near oliv	3.49	7.87	17.27	50.43	0.28	0.64	8.46	0.76	0.15	7.50	0.03	96.9
JR46-PC14-glass3_near oliv	3.40	7.49	17.27	49.81	0.31	0.58	8.56	0.74	0.14	7.54	0.04	95.9
JR46-PC14-glass6_near oliv	3.57	7.30	17.19	50.07	0.31	0.62	8.62	0.74	0.11	7.80	0.03	96.4
JR46-PC14-glass7_near oliv	3.35	7.96	16.94	50.35	0.34	0.55	8.52	0.76	0.05	7.75	0.03	96.6
JR46-PC14-glass8_near oliv	3.46	8.01	16.91	49.97	0.32	0.58	8.52	0.74	0.11	7.62	0.03	96.3
JR46-PC14-glass9_near oliv	3.45	7.67	17.26	50.70	0.37	0.58	8.56	0.76	0.12	7.48	0.03	97.0
R46-PC14-glass10_near oliv	3.47	7.68	17.34	50.60	0.36	0.62	8.50	0.75	0.10	7.49	0.01	96.9
R46-PC14-glass11_near oliv	3.70	7.72	17.34	50.74	0.32	0.61	8.53	0.77	0.11	7.57	0.02	97.4
R46-PC14-glass12_near oliv	3.45	7.47	17.29	50.34	0.36	0.61	8.58	0.74	0.12	7.71	0.01	96.7
R46-PC14-glass14_inside oli	3.53	7.63	17.37	51.11	0.38	0.60	8.49	0.73	0.19	7.41	0.02	97.5
R46-PC14-glass15_inside oli	3.36	7.43	17.80	50.85	0.37	0.59	8.58	0.73	0.15	7.35	0.04	97.2
R46-PC14-glass16_near oliv	3.59	7.68	17.15	50.05	0.39	0.57	8.56	0.77	0.17	7.66	0.03	96.6
R46-PC14-glass17_near oliv	3.59	7.62	17.07	50.26	0.35	0.60	8.68	0.75	0.12	7.77	0.03	96.9
R46-PC14-glass18_near oliv	3.40	6.96	17.22	50.08	0.40	0.58	8.85	0.76	0.18	7.75	0.04	96.2
R46-PC14-glass19_near oliv	3.51	7.74	17.49	51.06	0.32	0.59	8.49	0.78	0.13	7.60	0.03	97.8
R46-PC14-glass20_near oliv	3.70	7.78	17.15	50.46	0.32	0.58	8.39	0.74	0.08	7.56	0.01	96.8
R46-PC14-glass21_near oliv	3.55	7.75	17.40	50.09	0.32	0.59	8.46	0.78	0.17	7.67	0.03	96.8
R46-PC14-glass22_near oliv	3.48	7.61	17.37	50.30	0.30	0.60	8.46	0.75	0.10	7.73	0.02	96.7
UR46-PC14-glass23	3.37	8.01	16.99	50.54	0.28	0.60	8.60	0.77	0.10	7.77	0.03	97.1
UR46-PC14-glass24	3.43	7.82	17.36	50.53	0.37	0.58	8.59	0.77	0.14	7.69	0.00	97.3
UR46-PC14-glass25	3.20	8.36	16.80	49.64	0.38	0.57	8.58	0.75	0.17	7.88	0.04	96.4
UR46-PC14-glass26	3.36	8.31	16.91	49.26	0.37	0.60	8.65	0.74	0.12	7.92	0.03	96.3
UR46-PC14-glass27	3.38	8.09	17.16	50.00	0.35	0.58	8.56	0.75	0.12	7.70	0.02	96.7
UR46-PC14-glass28	3.43	7.96	17.29	50.32	0.35	0.60	8.49	0.76	0.20	7.56	0.03	97.0
UR46-PC14-glass29	3.47	7.99	17.24	50.16	0.28	0.61	8.49	0.76	0.18	7.61	0.02	96.8
UR46-PC14-glass30	3.43	7.94	17.66	50.32	0.34	0.57	8.56	0.75	0.19	7.61	0.02	97.4
UR46-PC14-glass31	3.55	7.87	17.10	50.17	0.34	0.59	8.54	0.77	0.13	7.66	0.02	96.7
UR46-PC14-glass32	3.42	7.74	17.44	50.45	0.34	0.60	8.61	0.75	0.06	7.70	0.03	97.2
UR46-PC14-glass33	3.55	7.62	17.34	50.61	0.33	0.61	8.60	0.74	0.12	7.56	0.01	97.1
UR46-PC14-glass34	3.33	8.12	16.99	49.82	0.30	0.56	8.58	0.72	0.17	7.86	0.03	96.5
UR46-PC14-glass35	3.30	8.01	16.89	50.26	0.30	0.56	8.50	0.73	0.08	7.67	0.02	96.3
UR46-PC14-glass36	3.34	7.93	17.15	49.78	0.32	0.60	8.42	0.75	0.13	7.69	0.03	96.1
UR46-PC14-glass37	3.24	7.92	19.34	47.23	0.34	0.56	8.44	0.74	0.08	7.62	0.02	95.5
UR46-PC14-glass38	3.47	7.60	17.05	49.76	0.35	0.59	8.61	0.76	0.16	7.57	0.04	95.9
UR46-PC14-glass39	3.42	7.67	17.38	49.76	0.33	0.61	8.61	0.77	0.09	7.44	0.03	96.1
UR46-PC14-glass40	3.31	7.73	17.28	50.02	0.33	0.62	8.57	0.77	0.09	7.54	0.04	96.3
avg	3.45	7.78	17.29	50.17	0.34	0.59	8.55	0.75	0.13	7.64	0.03	96.71
standard deviation	0.11	0.27	0.41	0.63	0.03	0.02	0.08	0.02	0.04	0.13	0.01	0.50

Comment	Na2O	MgO	Al2O3	SiO2	P2O5	K2O	CaO	TiO2	MnO	FeO	NiO	Total
UR46-PC17-glass_near oliv1	3.10	7.15	17.17	50.77	0.35	0.57	8.51	0.73	0.14	7.36	0.03	95.9
UR46-PC17-glass_near oliv2	3.18	8.25	17.27	51.08	0.32	0.54	8.28	0.72	0.14	7.36	0.03	97.2
UR46-PC17-glass_near oliv3	3.18	8.12	16.99	50.77	0.31	0.58	8.38	0.73	0.16	7.40	0.03	96.7
UR46-PC17-glass_near oliv4	3.11	8.26	16.98	50.94	0.35	0.56	8.23	0.71	0.13	7.35	0.04	96.7
UR46-PC17-glass_near oliv5	3.07	8.18	17.15	51.17	0.35	0.60	8.25	0.73	0.13	7.37	0.03	97.0
UR46-PC17-glass_near oliv6	3.10	7.57	17.25	50.83	0.32	0.57	8.52	0.75	0.17	7.41	0.04	96.5
C17-glass_near oliv8 (amg qu	3.20	7.89	17.33	51.00	0.39	0.59	8.39	0.73	0.11	7.39	0.03	97.0
C17-glass_near oliv9 (amg qu	3.13	7.96	17.40	50.74	0.31	0.60	8.36	0.71	0.14	7.39	0.03	96.8
JR46-PC17-glass_near oliv10	3.11	7.70	17.31	50.81	0.35	0.60	8.58	0.75	0.10	7.51	0.05	96.9
R46-PC17-glass_near oliv11,	3.13	7.61	17.42	50.91	0.36	0.55	8.53	0.71	0.10	7.39	0.03	96.8
JR46-PC17-glass_near oliv14	3.20	8.06	17.30	50.60	0.35	0.55	8.38	0.74	0.10	7.33	0.04	96.6
R46-PC17-glass_inside oliv1	3.04	7.31	17.67	51.01	0.38	0.53	8.68	0.76	0.13	7.29	0.04	96.8
JR46-PC17-glass_near oliv15	3.15	7.70	17.41	50.75	0.34	0.58	8.42	0.74	0.13	7.31	0.03	96.6
JR46-PC17-glass_near oliv16	3.18	7.98	17.21	50.99	0.37	0.56	8.33	0.74	0.13	7.36	0.02	96.9
17-glass_near oliv18 (amg q	3.23	8.13	17.42	51.05	0.36	0.53	8.42	0.72	0.14	7.36	0.02	97.4
JR46-PC17-glass_near oliv19	3.28	8.27	17.33	51.12	0.32	0.55	8.29	0.71	0.12	7.23	0.04	97.2
17-glass_near oliv19 (amg q	2.98	8.10	17.02	51.03	0.31	0.57	8.24	0.74	0.14	7.34	0.04	96.5
JR46-PC17-glass_near oliv20	2.86	7.57	17.02	50.81	0.36	0.55	8.38	0.74	0.14	7.25	0.03	95.7
UR46-PC17-glass1	3.09	8.18	17.00	50.96	0.36	0.59	8.29	0.71	0.12	7.35	0.03	96.7
UR46-PC17-glass2	3.09	8.16	17.11	50.86	0.38	0.61	8.26	0.74	0.13	7.34	0.03	96.7
UR46-PC17-glass3	3.20	8.30	17.17	50.98	0.34	0.58	8.15	0.73	0.10	7.28	0.02	96.9
UR46-PC17-glass4	2.97	7.98	16.91	51.00	0.36	0.55	8.33	0.72	0.15	7.34	0.03	96.4
UR46-PC17-glass5	3.12	7.93	16.94	50.20	0.31	0.61	8.34	0.74	0.14	7.25	0.02	95.6
UR46-PC17-glass6	2.82	7.85	17.09	50.42	0.36	0.57	8.37	0.75	0.12	7.27	0.02	95.6

UR46-PC17-glass7	3.22	8.01	17.17	50.87	0.33	0.60	8.35	0.74	0.08	7.35	0.03	96.8
UR46-PC17-glass8	3.18	8.39	17.26	51.59	0.35	0.58	8.28	0.74	0.11	7.36	0.04	97.9
UR46-PC17-glass9_FTIR6	3.02	8.06	16.88	51.22	0.36	0.56	8.29	0.73	0.10	7.39	0.03	96.6
UR46-PC17-glass10_FTIR3	3.06	8.30	17.13	50.92	0.39	0.59	8.24	0.72	0.14	7.35	0.03	96.9
UR46-PC17-glass11_FTIR5	3.11	8.07	16.88	50.78	0.31	0.57	8.28	0.70	0.09	7.36	0.03	96.2
avg	3.11	7.97	17.18	50.90	0.35	0.57	8.36	0.73	0.13	7.35	0.03	96.67
standard deviation	0.10	0.30	0.19	0.25	0.02	0.02	0.12	0.01	0.02	0.06	0.01	0.50

Comment	Na2O	MgO	Al2O3	SiO2	P2O5	K2O	CaO	TiO2	MnO	FeO	Total
UR46PC33-glass1	4.02	7.51	16.95	50.16	0.16	0.69	9.09	0.91	0.15	8.64	98.3
R46PC33-glass2 (near capsu	3.90	7.77	17.13	50.98	0.18	0.64	8.91	0.79	0.13	8.79	99.2
UR46PC33-glass3	4.07	7.53	16.85	50.61	0.21	0.66	8.76	0.93	0.13	8.50	98.2
R46PC33-glass4 (near oliv7	3.95	7.36	17.15	50.37	0.17	0.71	9.05	0.93	0.16	8.59	98.4
R46PC33-glass5 (near oliv7	3.99	7.46	17.35	50.84	0.15	0.72	8.91	0.85	0.12	8.61	99.0
JR46PC33-glass6 (near plag	4.03	7.45	16.88	50.23	0.17	0.62	8.90	0.90	0.15	8.55	97.9
R46PC33-glass7 (in xtal mus	3.93	7.70	16.56	49.66	0.23	0.59	9.14	1.00	0.14	8.92	97.9
R46PC33-glass8 (near oliv4	4.04	7.51	17.12	50.46	0.15	0.71	9.04	0.91	0.14	8.60	98.7
JR46PC33-glass9 (near plag	4.05	7.51	17.12	50.45	0.16	0.73	8.75	0.86	0.12	8.68	98.4
R46PC33-glass10 (near oliv5	3.91	7.56	17.20	50.52	0.15	0.75	8.94	0.84	0.15	8.60	98.6
R46PC33-glass11 (near oliv4	4.10	7.56	16.87	50.63	0.16	0.72	8.90	0.85	0.13	8.57	98.5
R46PC33-glass12 (near plag	4.10	7.50	17.17	51.45	0.15	0.70	8.86	0.89	0.13	8.50	99.5
R46PC33-glass13 (near oliv6	4.15	7.54	17.21	50.43	0.17	0.67	8.93	0.89	0.13	8.67	98.8
46PC33-glass14 (near capsu	3.98	7.66	17.06	50.46	0.15	0.69	8.86	0.84	0.17	8.78	98.6
UR46PC33-glass15	4.08	7.60	17.36	50.50	0.14	0.70	8.84	0.78	0.13	8.66	98.8
UR46PC33-glass16	4.02	7.45	17.51	50.54	0.12	0.63	8.80	0.77	0.11	8.66	98.6
R46PC33-glass17 (in xtal mus	3.82	7.67	16.34	49.42	0.29	0.59	9.26	1.20	0.15	8.99	97.7
R46PC33-glass18 (near oliv7	4.04	7.52	17.29	50.60	0.16	0.68	8.75	0.87	0.14	8.65	98.7
UR46PC33-glass19	3.98	7.56	17.37	50.21	0.17	0.67	8.99	0.83	0.14	8.77	98.7
UR46PC33-glass20	3.87	7.49	17.20	50.28	0.16	0.72	9.01	0.84	0.15	8.65	98.4
avg	4.00	7.54	17.09	50.44	0.17	0.68	8.93	0.88	0.14	8.67	98.55
standard deviation	0.08	0.10	0.28	0.43	0.04	0.05	0.14	0.09	0.01	0.13	0.43

Appendix C

Table C1 Whole rock major element compositions measured by Carmichael et al. (2006) using XRF

	1001B	1003B	1005A	1006B	1007A	1007B	1008B	1013	1015	1016
	Whole Rock Major Element Composition wt%									
SiO_2	50.06	48.66	49.18	48.52	48.48	48.41	49.9	48.44	48.77	48.46
TiO_2	1.65	1.12	1.04	1.37	1.62	1.63	1.34	1.52	1.3	1.1
Al_2O_3	15.99	11.72	12.42	12.38	11.57	11.66	14.42	11.03	11.39	14.13
Fe_2O_3	2.87	5.25	5.29	4.3	4.07	4.63	3.54	5.21	4.47	5.08
FeO	7.11	2.73	2.79	3.92	3.41	2.91	4.96	2.94	3.56	3.82
FeO^T	9.69	7.45	7.55	7.79	7.07	7.08	8.15	7.63	7.58	8.39
MnO	0.15	0.12	0.13	0.13	0.12	0.12	0.14	0.12	0.13	0.15
MgO	6.15	13.09	13.43	11.54	11.67	11.74	9.08	12.73	13.42	10.57
CaO	9.15	9.01	9.02	8.52	8.01	8.07	9.04	8.37	9.35	10.22
Na_2O	3.35	2.93	2.56	3.06	3.52	3.76	2.55	2.34	2.28	2.43
K_2O	2.2	2.95	3.38	3.35	3.38	2.94	3.55	4.64	3.91	2.58
P_2O_5	0.52	1.01	0.83	1.13	1.32	1.31	0.86	1.18	0.95	0.7
Total	99.38	99.94	100.61	99.36	99.41	99.25	99.53	99.53	99.95	99.52

Table C2 Olivine phenocryst compositions for all Colima Cone samples

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	43.7	0.04	40.2	0.18	15.83	0.19	0.20	0.04	100.4	83.1
Col-1001B·	43.5	0.18	40.6	0.20	15.80	0.21	0.20	0.01	100.7	83.1
Col-1001B·	43.9	0.02	40.3	0.20	16.05	0.26	0.16	0.03	100.9	83.0
Col-1001B·	43.5	0.04	40.2	0.19	15.98	0.23	0.16	0.02	100.3	82.9
Col-1001B·	43.8	0.02	40.2	0.19	16.10	0.15	0.20	0.04	100.7	82.9
Col-1001B·	43.6	0.02	40.4	0.19	16.11	0.24	0.17	0.00	100.8	82.8
Col-1001B·	43.5	0.03	40.2	0.19	16.09	0.27	0.18	0.03	100.4	82.8
Col-1001B·	43.8	0.02	40.3	0.20	16.21	0.25	0.21	0.04	101.0	82.8
Col-1001B·	43.3	0.03	40.2	0.18	16.04	0.19	0.17	0.03	100.1	82.8
Col-1001B·	43.7	0.01	40.2	0.20	16.21	0.11	0.20	0.03	100.7	82.8
Col-1001B·	43.5	0.04	40.2	0.18	16.14	0.20	0.20	0.01	100.5	82.8
Col-1001B·	43.6	0.03	40.3	0.18	16.19	0.22	0.17	-0.01	100.6	82.8
Col-1001B·	43.3	0.02	40.1	0.19	16.19	0.15	0.16	0.03	100.2	82.7
Col-1001B·	43.7	0.03	40.0	0.19	16.35	0.19	0.19	0.03	100.7	82.7
Col-1001B·	43.3	0.03	40.1	0.18	16.19	0.27	0.17	0.05	100.3	82.7
Col-1001B·	43.3	0.03	40.1	0.18	16.19	0.23	0.19	0.04	100.2	82.7
Col-1001B·	43.4	0.02	40.1	0.19	16.23	0.26	0.20	0.04	100.4	82.7
Col-1001B·	43.2	0.03	39.9	0.19	16.16	0.29	0.19	0.02	99.9	82.6
Col-1001B·	43.4	0.03	39.9	0.21	16.30	0.23	0.17	0.03	100.2	82.6
Col-1001B·	43.1	0.02	39.9	0.19	16.22	0.21	0.19	0.04	99.9	82.6
Col-1001B·	43.1	0.02	39.7	0.18	16.35	0.19	0.19	0.04	99.7	82.4
Col-1001B·	43.5	0.05	40.0	0.18	16.51	0.22	0.16	0.02	100.6	82.4
Col-1001B·	43.4	0.03	40.0	0.18	16.54	0.19	0.19	0.03	100.6	82.4
Col-1001B·	42.8	0.02	39.9	0.18	16.32	0.21	0.18	0.02	99.7	82.4
Col-1001B·	43.1	0.03	40.3	0.19	16.47	0.22	0.19	0.04	100.5	82.4
Col-1001B·	42.9	0.03	39.6	0.18	16.45	0.22	0.19	0.03	99.7	82.3
Col-1001B·	42.7	0.03	39.7	0.19	16.38	0.18	0.18	0.03	99.4	82.3
Col-1001B·	42.6	0.04	39.8	0.20	16.39	0.18	0.19	0.03	99.5	82.3
Col-1001B·	43.1	0.04	40.0	0.19	16.56	0.27	0.18	0.04	100.3	82.3
Col-1001B·	43.1	0.03	39.9	0.18	16.58	0.23	0.22	0.02	100.3	82.2
Col-1001B·	43.0	0.02	40.0	0.19	16.57	0.20	0.18	0.02	100.2	82.2
Col-1001B·	42.5	0.02	39.6	0.19	16.39	0.20	0.16	0.05	99.1	82.2
Col-1001B·	43.2	0.03	40.1	0.20	16.73	0.16	0.18	0.04	100.7	82.2
Col-1001B·	42.9	0.01	40.0	0.19	16.59	0.19	0.17	0.01	100.0	82.2
Col-1001B·	42.9	0.05	40.1	0.17	16.61	0.15	0.15	0.04	100.2	82.2
Col-1001B·	42.5	0.02	39.8	0.19	16.46	0.23	0.18	0.03	99.4	82.1
Col-1001B·	43.1	0.03	40.0	0.17	16.71	0.19	0.21	0.03	100.4	82.1
Col-1001B·	43.0	0.05	39.9	0.19	16.68	0.19	0.16	0.04	100.2	82.1
Col-1001B·	42.6	0.03	39.7	0.19	16.54	0.34	0.17	0.03	99.6	82.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	42.9	0.03	40.0	0.19	16.64	0.22	0.19	0.04	100.2	82.1
Col-1001B·	43.0	0.04	39.8	0.20	16.69	0.28	0.15	0.00	100.1	82.1
Col-1001B·	42.6	0.03	39.7	0.20	16.56	0.19	0.19	0.02	99.6	82.1
Col-1001B·	43.0	0.08	39.9	0.19	16.72	0.16	0.16	0.02	100.3	82.1
Col-1001B·	43.0	0.02	39.7	0.19	16.70	0.21	0.16	0.03	100.0	82.1
Col-1001B·	41.8	2.12	38.4	0.21	16.27	0.22	0.15	0.03	99.2	82.1
Col-1001B·	43.2	0.03	40.0	0.19	16.82	0.18	0.21	0.02	100.6	82.1
Col-1001B·	42.5	0.03	39.7	0.20	16.60	0.28	0.14	0.02	99.5	82.0
Col-1001B·	42.8	0.03	39.8	0.21	16.73	0.18	0.16	0.03	100.0	82.0
Col-1001B·	42.3	0.03	39.6	0.22	16.60	0.25	0.15	0.02	99.2	82.0
Col-1001B·	42.5	0.03	39.3	0.20	16.71	0.17	0.15	0.03	99.1	81.9
Col-1001B·	43.3	0.04	39.9	0.18	17.01	0.17	0.18	0.04	100.8	81.9
Col-1001B·	42.6	0.03	39.7	0.21	16.76	0.20	0.14	0.04	99.6	81.9
Col-1001B·	42.6	0.03	39.5	0.19	16.77	0.22	0.18	0.02	99.5	81.9
Col-1001B·	43.0	0.03	39.9	0.20	16.95	0.26	0.14	0.05	100.5	81.9
Col-1001B·	42.6	0.04	39.8	0.19	16.81	0.24	0.19	0.01	99.9	81.9
Col-1001B·	42.5	0.08	39.6	0.19	16.76	0.27	0.17	0.03	99.5	81.9
Col-1001B·	42.5	0.04	39.2	0.19	16.79	0.22	0.18	0.03	99.2	81.9
Col-1001B·	42.5	0.04	39.7	0.19	16.81	0.20	0.16	0.01	99.6	81.9
Col-1001B·	42.4	0.02	39.3	0.20	16.76	0.26	0.17	0.03	99.1	81.9
Col-1001B·	42.4	0.02	39.7	0.18	16.78	0.18	0.15	0.02	99.5	81.9
Col-1001B·	42.2	0.03	39.7	0.19	16.70	0.23	0.14	0.01	99.3	81.8
Col-1001B·	42.4	0.05	39.7	0.20	16.77	0.17	0.15	0.03	99.5	81.8
Col-1001B·	42.6	0.04	39.8	0.20	16.87	0.16	0.17	0.01	99.9	81.8
Col-1001B·	42.8	0.01	39.9	0.19	16.98	0.20	0.15	0.03	100.3	81.8
Col-1001B·	42.5	0.03	39.6	0.20	16.85	0.22	0.18	0.05	99.5	81.8
Col-1001B·	42.6	0.03	40.1	0.20	16.92	0.26	0.15	0.02	100.2	81.8
Col-1001B·	42.3	0.04	39.3	0.21	16.82	0.24	0.17	0.04	99.1	81.8
Col-1001B·	42.4	0.03	39.7	0.19	16.85	0.19	0.16	0.01	99.5	81.8
Col-1001B·	42.7	0.02	39.8	0.20	16.98	0.26	0.15	0.04	100.1	81.8
Col-1001B·	42.4	0.03	39.8	0.19	16.86	0.27	0.17	0.04	99.7	81.7
Col-1001B·	42.4	0.02	39.6	0.19	16.87	0.17	0.19	0.04	99.4	81.7
Col-1001B·	42.4	0.04	39.3	0.18	16.96	0.17	0.19	0.04	99.3	81.7
Col-1001B·	42.4	0.04	39.6	0.19	16.94	0.21	0.16	0.00	99.5	81.7
Col-1001B·	42.5	0.03	39.7	0.17	17.02	0.28	0.15	0.03	99.9	81.7
Col-1001B·	42.2	0.03	39.3	0.18	16.88	0.20	0.20	0.11	99.1	81.7
Col-1001B·	42.3	0.04	39.4	0.20	16.95	0.20	0.17	0.08	99.4	81.6
Col-1001B·	42.4	0.08	39.5	0.20	17.03	0.21	0.15	0.03	99.6	81.6
Col-1001B·	42.7	0.03	40.0	0.20	17.15	0.25	0.16	0.04	100.5	81.6
Col-1001B·	42.6	0.03	40.1	0.19	17.14	0.20	0.16	0.04	100.5	81.6
Col-1001B·	42.1	0.02	39.6	0.17	16.94	0.27	0.15	0.03	99.3	81.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	42.2	0.03	39.7	0.18	16.98	0.23	0.15	0.02	99.4	81.6
Col-1001B·	42.3	0.03	39.6	0.21	17.05	0.18	0.15	0.03	99.6	81.6
Col-1001B·	42.3	0.04	39.5	0.19	17.05	0.20	0.19	0.03	99.4	81.6
Col-1001B·	42.4	0.03	39.4	0.19	17.12	0.29	0.19	0.03	99.7	81.5
Col-1001B·	42.6	0.03	39.1	0.18	17.17	0.20	0.18	0.02	99.4	81.5
Col-1001B·	42.3	0.03	39.5	0.19	17.07	0.15	0.14	0.04	99.4	81.5
Col-1001B·	42.5	0.02	39.1	0.19	17.14	0.19	0.15	0.03	99.2	81.5
Col-1001B·	42.4	0.04	39.3	0.18	17.11	0.22	0.16	0.05	99.4	81.5
Col-1001B·	42.4	0.02	39.4	0.19	17.14	0.16	0.20	0.01	99.6	81.5
Col-1001B·	42.3	0.03	39.3	0.19	17.13	0.21	0.17	0.04	99.4	81.5
Col-1001B·	42.4	0.04	39.6	0.18	17.15	0.21	0.18	0.03	99.7	81.5
Col-1001B·	42.6	0.03	39.7	0.18	17.26	0.22	0.19	0.03	100.2	81.5
Col-1001B·	42.7	0.01	39.9	0.20	17.30	0.18	0.13	0.04	100.4	81.5
Col-1001B·	42.5	0.03	39.6	0.18	17.23	0.23	0.14	0.01	99.9	81.5
Col-1001B·	42.2	0.03	39.8	0.20	17.13	0.29	0.15	0.06	99.9	81.5
Col-1001B·	42.5	0.04	39.5	0.19	17.25	0.20	0.17	0.02	99.9	81.4
Col-1001B·	42.4	0.02	39.4	0.19	17.22	0.22	0.17	0.04	99.6	81.4
Col-1001B·	42.5	0.02	40.0	0.20	17.30	0.17	0.16	0.01	100.3	81.4
Col-1001B·	42.4	0.03	39.3	0.20	17.26	0.29	0.13	0.03	99.6	81.4
Col-1001B·	42.1	0.02	39.5	0.20	17.16	0.25	0.16	0.02	99.4	81.4
Col-1001B·	42.3	0.03	39.4	0.19	17.24	0.25	0.15	0.01	99.6	81.4
Col-1001B·	42.0	0.04	39.8	0.21	17.14	0.23	0.16	0.02	99.6	81.4
Col-1001B·	42.8	0.21	39.6	0.20	17.47	0.26	0.18	0.02	100.7	81.4
Col-1001B·	42.5	0.02	39.5	0.18	17.37	0.23	0.16	0.02	100.0	81.4
Col-1001B·	42.1	0.03	39.5	0.18	17.22	0.22	0.18	0.03	99.5	81.3
Col-1001B·	42.1	0.03	39.2	0.20	17.21	0.22	0.16	0.02	99.1	81.3
Col-1001B·	42.4	0.04	39.1	0.21	17.39	0.19	0.16	0.03	99.6	81.3
Col-1001B·	41.8	0.03	39.3	0.20	17.14	0.27	0.15	0.05	99.0	81.3
Col-1001B·	42.2	0.03	39.0	0.20	17.29	0.18	0.16	0.01	99.1	81.3
Col-1001B·	42.4	0.03	39.8	0.21	17.39	0.17	0.13	0.02	100.2	81.3
Col-1001B·	42.4	0.01	39.6	0.20	17.41	0.20	0.16	0.05	100.0	81.3
Col-1001B·	42.0	0.02	39.4	0.19	17.25	0.13	0.15	0.03	99.2	81.3
Col-1001B·	42.3	0.04	39.8	0.20	17.38	0.24	0.16	0.04	100.2	81.3
Col-1001B·	42.2	0.03	39.8	0.19	17.33	0.20	0.15	0.04	99.9	81.3
Col-1001B·	42.4	0.02	39.7	0.19	17.42	0.19	0.14	0.05	100.1	81.3
Col-1001B·	42.1	0.03	39.4	0.21	17.32	0.22	0.15	0.01	99.4	81.2
Col-1001B·	42.4	0.02	39.6	0.19	17.44	0.28	0.17	0.01	100.1	81.2
Col-1001B·	42.3	0.03	39.3	0.19	17.44	0.17	0.18	0.02	99.6	81.2
Col-1001B·	42.0	0.04	39.1	0.18	17.34	0.27	0.16	0.03	99.1	81.2
Col-1001B·	42.2	0.03	38.9	0.21	17.41	0.23	0.16	0.03	99.1	81.2
Col-1001B·	42.0	0.03	39.3	0.19	17.36	0.32	0.16	0.01	99.4	81.2

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	42.2	0.02	39.5	0.20	17.43	0.31	0.15	0.03	99.8	81.2
Col-1001B·	42.1	0.02	39.7	0.18	17.43	0.24	0.11	0.03	99.9	81.2
Col-1001B·	42.0	0.02	39.0	0.19	17.39	0.23	0.13	0.01	99.0	81.2
Col-1001B·	42.4	0.04	39.0	0.20	17.55	0.20	0.17	0.03	99.6	81.1
Col-1001B·	42.1	0.03	39.5	0.18	17.43	0.26	0.15	0.05	99.7	81.1
Col-1001B·	42.0	0.03	39.3	0.19	17.41	0.23	0.14	0.04	99.4	81.1
Col-1001B·	42.0	0.02	39.1	0.18	17.41	0.23	0.18	0.02	99.1	81.1
Col-1001B·	42.1	0.03	39.7	0.19	17.47	0.25	0.16	0.03	99.9	81.1
Col-1001B·	42.2	0.02	39.7	0.21	17.52	0.29	0.16	0.06	100.1	81.1
Col-1001B·	41.8	0.03	39.6	0.21	17.34	0.22	0.15	0.02	99.3	81.1
Col-1001B·	42.3	0.03	39.2	0.19	17.54	0.26	0.16	0.04	99.6	81.1
Col-1001B·	42.3	0.01	39.3	0.18	17.55	0.17	0.16	0.00	99.7	81.1
Col-1001B·	42.3	0.04	39.4	0.20	17.56	0.33	0.16	0.02	100.0	81.1
Col-1001B·	42.1	0.04	39.7	0.20	17.56	0.26	0.19	0.01	100.1	81.1
Col-1001B·	41.8	0.03	39.5	0.18	17.44	0.28	0.16	0.02	99.5	81.0
Col-1001B·	41.9	0.04	39.6	0.19	17.47	0.29	0.18	0.01	99.6	81.0
Col-1001B·	42.2	0.04	39.5	0.21	17.62	0.18	0.13	0.03	99.9	81.0
Col-1001B·	42.1	0.03	39.7	0.19	17.60	0.26	0.15	0.03	100.1	81.0
Col-1001B·	42.1	0.01	39.6	0.19	17.57	0.27	0.13	0.02	99.9	81.0
Col-1001B·	41.9	0.02	39.4	0.21	17.54	0.27	0.13	0.03	99.5	81.0
Col-1001B·	42.1	0.02	38.9	0.19	17.65	0.26	0.14	0.02	99.3	81.0
Col-1001B·	42.2	0.03	39.2	0.19	17.68	0.27	0.13	0.03	99.7	81.0
Col-1001B·	41.8	0.03	39.0	0.18	17.54	0.27	0.16	0.01	99.1	81.0
Col-1001B·	41.8	0.02	39.3	0.20	17.56	0.31	0.16	0.08	99.5	80.9
Col-1001B·	41.8	0.03	39.1	0.24	17.56	0.23	0.19	0.31	99.5	80.9
Col-1001B·	41.9	0.02	39.3	0.18	17.62	0.28	0.16	0.02	99.5	80.9
Col-1001B·	41.8	0.03	39.2	0.20	17.56	0.27	0.13	0.02	99.3	80.9
Col-1001B·	41.8	0.02	39.1	0.19	17.57	0.31	0.15	0.04	99.2	80.9
Col-1001B·	42.0	0.03	39.4	0.19	17.64	0.24	0.13	0.03	99.6	80.9
Col-1001B·	41.7	0.03	39.5	0.20	17.53	0.25	0.13	0.01	99.3	80.9
Col-1001B·	42.0	0.04	39.7	0.19	17.68	0.29	0.17	0.01	100.1	80.9
Col-1001B·	41.9	0.02	39.0	0.18	17.65	0.18	0.15	-0.01	99.1	80.9
Col-1001B·	41.9	0.02	39.2	0.18	17.65	0.27	0.15	0.02	99.4	80.9
Col-1001B·	42.0	0.05	39.8	0.22	17.72	0.18	0.11	0.03	100.1	80.9
Col-1001B·	42.1	0.03	39.5	0.19	17.74	0.25	0.14	0.02	99.9	80.9
Col-1001B·	42.0	0.04	39.3	0.17	17.74	0.27	0.16	0.02	99.7	80.9
Col-1001B·	41.9	0.03	39.6	0.20	17.68	0.23	0.14	0.02	99.8	80.8
Col-1001B·	42.2	0.47	39.2	0.24	17.81	0.24	0.15	0.03	100.3	80.8
Col-1001B·	42.3	0.04	39.6	0.19	17.87	0.21	0.16	0.01	100.4	80.8
Col-1001B·	42.0	0.04	39.6	0.20	17.73	0.24	0.16	0.03	100.0	80.8
Col-1001B·	41.8	0.03	39.5	0.19	17.68	0.25	0.12	0.02	99.6	80.8

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	41.7	0.02	39.9	0.18	17.65	0.22	0.13	0.03	99.8	80.8
Col-1001B·	41.9	0.03	39.0	0.19	17.74	0.26	0.16	0.03	99.4	80.8
Col-1001B·	42.1	0.01	39.4	0.21	17.81	0.19	0.13	0.03	99.8	80.8
Col-1001B·	42.0	0.02	39.9	0.22	17.79	0.32	0.12	0.02	100.4	80.8
Col-1001B·	41.5	0.04	39.5	0.21	17.61	0.26	0.13	0.05	99.4	80.8
Col-1001B·	42.1	0.03	39.5	0.22	17.87	0.22	0.14	0.04	100.1	80.8
Col-1001B·	41.7	0.02	39.2	0.19	17.68	0.20	0.14	0.02	99.1	80.8
Col-1001B·	41.8	0.03	39.4	0.18	17.76	0.25	0.13	0.03	99.6	80.8
Col-1001B·	41.9	0.02	38.9	0.20	17.82	0.24	0.15	0.03	99.3	80.7
Col-1001B·	41.9	0.03	39.3	0.20	17.81	0.23	0.11	0.00	99.5	80.7
Col-1001B·	42.0	0.02	39.2	0.20	17.85	0.27	0.15	0.02	99.6	80.7
Col-1001B·	41.8	0.03	39.6	0.19	17.79	0.28	0.15	0.02	99.8	80.7
Col-1001B·	41.8	0.03	39.5	0.21	17.77	0.23	0.12	0.01	99.6	80.7
Col-1001B·	41.5	0.03	39.2	0.19	17.71	0.22	0.13	0.04	99.0	80.7
Col-1001B·	41.6	0.02	39.3	0.20	17.76	0.26	0.17	0.01	99.4	80.7
Col-1001B·	41.4	0.01	39.4	0.20	17.66	0.29	0.10	0.01	99.0	80.7
Col-1001B·	41.5	0.03	39.6	0.19	17.73	0.25	0.13	0.02	99.5	80.7
Col-1001B·	42.0	0.02	39.9	0.20	17.98	0.25	0.12	0.01	100.5	80.7
Col-1001B·	41.8	0.04	39.7	0.21	17.91	0.24	0.15	0.03	100.1	80.6
Col-1001B·	41.6	0.03	39.4	0.21	17.88	0.25	0.09	0.02	99.6	80.6
Col-1001B·	40.8	1.65	38.7	0.22	17.51	0.28	0.14	0.02	99.3	80.6
Col-1001B·	41.9	0.03	39.7	0.20	18.01	0.28	0.15	0.02	100.4	80.6
Col-1001B·	41.9	0.02	39.4	0.19	18.02	0.24	0.14	0.03	99.9	80.6
Col-1001B·	41.7	0.05	39.0	0.19	17.95	0.21	0.14	0.02	99.2	80.5
Col-1001B·	41.5	0.04	39.1	0.21	17.87	0.27	0.12	0.01	99.1	80.5
Col-1001B·	41.4	0.03	39.3	0.21	17.84	0.28	0.13	0.02	99.2	80.5
Col-1001B·	41.5	0.03	39.4	0.20	17.91	0.26	0.14	0.02	99.4	80.5
Col-1001B·	41.8	0.02	39.3	0.20	18.03	0.30	0.14	0.01	99.7	80.5
Col-1001B·	41.5	0.02	39.4	0.18	17.90	0.28	0.11	0.01	99.4	80.5
Col-1001B·	41.6	0.03	39.3	0.20	17.98	0.22	0.14	0.02	99.5	80.5
Col-1001B·	41.3	0.03	39.2	0.21	17.86	0.25	0.10	0.00	99.0	80.5
Col-1001B·	41.6	0.04	39.2	0.20	17.99	0.18	0.11	0.04	99.3	80.5
Col-1001B·	41.8	0.03	39.6	0.21	18.08	0.21	0.16	0.01	100.1	80.5
Col-1001B·	41.8	0.03	39.9	0.21	18.10	0.21	0.12	0.01	100.4	80.5
Col-1001B·	41.9	0.02	39.2	0.18	18.13	0.21	0.14	0.01	99.8	80.5
Col-1001B·	41.7	0.02	39.4	0.21	18.07	0.31	0.14	0.02	99.9	80.4
Col-1001B·	41.4	0.04	39.3	0.20	17.96	0.23	0.10	0.01	99.2	80.4
Col-1001B·	40.0	3.23	39.0	0.28	17.40	0.26	0.11	0.02	100.3	80.4
Col-1001B·	41.6	0.04	39.5	0.18	18.13	0.23	0.13	0.03	99.9	80.4
Col-1001B·	41.6	0.04	39.4	0.19	18.10	0.29	0.10	0.04	99.8	80.4
Col-1001B·	41.4	0.03	39.3	0.19	18.04	0.26	0.10	0.02	99.4	80.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	41.8	0.03	39.3	0.19	18.20	0.30	0.14	0.02	99.9	80.4
Col-1001B·	41.7	0.04	39.6	0.24	18.22	0.29	0.12	0.03	100.2	80.3
Col-1001B·	41.7	0.03	39.3	0.19	18.27	0.26	0.13	0.00	99.9	80.3
Col-1001B·	41.6	0.03	39.2	0.21	18.20	0.22	0.13	0.03	99.6	80.3
Col-1001B·	41.7	0.03	39.6	0.20	18.27	0.25	0.14	0.02	100.2	80.3
Col-1001B·	41.4	0.03	39.1	0.21	18.18	0.25	0.14	0.02	99.3	80.2
Col-1001B·	41.3	0.04	39.0	0.20	18.25	0.30	0.12	0.04	99.3	80.1
Col-1001B·	41.2	0.04	39.4	0.26	18.23	0.24	0.14	0.02	99.5	80.1
Col-1001B·	41.3	0.03	39.2	0.21	18.27	0.25	0.14	-0.01	99.4	80.1
Col-1001B·	41.3	0.05	39.3	0.20	18.29	0.28	0.14	0.02	99.6	80.1
Col-1001B·	41.3	0.03	39.6	0.19	18.26	0.27	0.13	0.04	99.7	80.1
Col-1001B·	41.3	0.02	38.7	0.19	18.31	0.26	0.16	0.03	99.0	80.1
Col-1001B·	41.8	0.02	39.3	0.20	18.55	0.28	0.14	0.00	100.3	80.1
Col-1001B·	41.6	0.01	39.2	0.20	18.44	0.29	0.09	0.02	99.9	80.1
Col-1001B·	41.3	0.05	39.1	0.20	18.34	0.24	0.09	0.02	99.3	80.1
Col-1001B·	41.4	0.01	38.9	0.20	18.38	0.26	0.13	0.01	99.2	80.0
Col-1001B·	41.6	0.03	39.9	0.20	18.47	0.24	0.18	0.04	100.6	80.0
Col-1001B·	41.3	0.02	38.8	0.18	18.34	0.21	0.14	0.02	99.0	80.0
Col-1001B·	41.5	0.01	39.4	0.20	18.44	0.25	0.16	0.01	99.9	80.0
Col-1001B·	41.3	0.02	39.2	0.21	18.36	0.22	0.12	0.02	99.4	80.0
Col-1001B·	41.3	0.03	38.9	0.19	18.40	0.28	0.14	0.03	99.3	80.0
Col-1001B·	41.3	0.03	38.9	0.18	18.49	0.25	0.10	0.02	99.3	79.9
Col-1001B·	41.4	0.02	39.4	0.20	18.52	0.30	0.10	0.00	99.9	79.9
Col-1001B·	41.5	0.04	39.5	0.19	18.58	0.25	0.13	0.01	100.2	79.9
Col-1001B·	41.4	0.02	39.4	0.20	18.54	0.30	0.09	0.02	100.0	79.9
Col-1001B·	41.6	0.02	39.6	0.19	18.63	0.16	0.13	0.01	100.3	79.9
Col-1001B·	41.0	0.03	39.1	0.20	18.40	0.24	0.12	0.01	99.1	79.9
Col-1001B·	41.3	0.02	39.3	0.19	18.58	0.32	0.13	0.01	99.9	79.8
Col-1001B·	41.3	0.02	39.1	0.20	18.62	0.27	0.10	0.02	99.5	79.8
Col-1001B·	41.1	0.03	39.1	0.20	18.55	0.23	0.11	0.03	99.3	79.8
Col-1001B·	41.1	0.03	38.7	0.22	18.60	0.31	0.14	0.03	99.1	79.7
Col-1001B·	40.9	0.03	39.4	0.21	18.51	0.30	0.12	0.00	99.4	79.7
Col-1001B·	41.1	0.04	38.7	0.19	18.65	0.26	0.14	0.01	99.1	79.7
Col-1001B·	41.3	0.04	39.4	0.21	18.78	0.27	0.09	0.00	100.0	79.7
Col-1001B·	41.2	0.04	39.1	0.20	18.79	0.22	0.12	0.02	99.7	79.6
Col-1001B·	40.9	0.03	39.2	0.19	18.64	0.28	0.10	0.01	99.3	79.6
Col-1001B·	41.1	0.04	39.1	0.19	18.73	0.24	0.13	0.03	99.5	79.6
Col-1001B·	41.2	0.03	39.1	0.19	18.82	0.25	0.12	0.02	99.8	79.6
Col-1001B·	41.1	0.02	39.0	0.20	18.82	0.26	0.11	0.01	99.5	79.5
Col-1001B·	41.0	0.04	39.6	0.21	18.80	0.25	0.12	0.00	100.1	79.5
Col-1001B·	40.8	0.01	39.2	0.20	18.76	0.20	0.10	0.00	99.2	79.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	41.1	0.01	39.7	0.19	18.94	0.28	0.10	0.00	100.4	79.5
Col-1001B·	41.4	0.03	39.4	0.21	19.05	0.23	0.12	0.04	100.4	79.5
Col-1001B·	41.0	0.03	38.8	0.17	18.87	0.21	0.13	0.03	99.2	79.5
Col-1001B·	40.7	0.04	39.2	0.19	18.82	0.31	0.09	0.01	99.4	79.4
Col-1001B·	41.2	0.04	39.3	0.20	19.07	0.34	0.09	-0.01	100.2	79.4
Col-1001B·	41.0	0.02	39.2	0.20	18.96	0.28	0.10	-0.01	99.7	79.4
Col-1001B·	40.8	0.02	39.1	0.19	18.91	0.30	0.11	0.01	99.4	79.4
Col-1001B·	40.7	0.02	39.3	0.21	18.89	0.32	0.10	0.01	99.5	79.4
Col-1001B·	40.9	0.02	38.6	0.19	18.99	0.21	0.14	0.01	99.1	79.3
Col-1001B·	40.9	0.03	39.3	0.20	19.02	0.30	0.09	0.00	99.8	79.3
Col-1001B·	40.9	0.03	38.7	0.20	19.00	0.29	0.11	0.02	99.2	79.3
Col-1001B·	40.8	0.03	39.2	0.21	19.00	0.27	0.08	0.02	99.7	79.3
Col-1001B·	40.9	0.03	39.5	0.21	19.11	0.23	0.09	0.01	100.1	79.2
Col-1001B·	40.7	0.03	39.0	0.20	19.03	0.23	0.09	0.00	99.2	79.2
Col-1001B·	41.2	0.02	38.8	0.21	19.29	0.25	0.12	0.00	99.9	79.2
Col-1001B·	40.9	0.02	39.4	0.19	19.20	0.24	0.11	0.03	100.1	79.1
Col-1001B·	40.9	0.03	39.0	0.20	19.23	0.23	0.10	0.01	99.7	79.1
Col-1001B·	40.5	0.03	39.3	0.24	19.07	0.26	0.10	0.01	99.5	79.1
Col-1001B·	40.9	0.02	38.8	0.19	19.24	0.25	0.14	0.04	99.5	79.1
Col-1001B·	40.4	0.03	39.0	0.20	19.09	0.34	0.12	0.02	99.2	79.1
Col-1001B·	40.8	0.01	39.0	0.19	19.26	0.23	0.11	0.00	99.6	79.1
Col-1001B·	40.6	0.03	38.6	0.18	19.24	0.26	0.10	0.03	99.1	79.0
Col-1001B·	40.5	0.03	38.8	0.20	19.23	0.31	0.10	0.00	99.2	79.0
Col-1001B·	40.6	0.02	39.2	0.21	19.28	0.23	0.12	-0.01	99.7	79.0
Col-1001B·	40.6	0.04	39.1	0.21	19.31	0.21	0.07	0.03	99.5	78.9
Col-1001B·	40.5	0.02	38.6	0.20	19.26	0.30	0.12	0.03	99.0	78.9
Col-1001B·	40.5	0.02	39.0	0.19	19.27	0.26	0.10	0.00	99.3	78.9
Col-1001B·	40.9	0.02	39.4	0.22	19.47	0.24	0.12	0.02	100.4	78.9
Col-1001B·	40.3	0.03	39.0	0.22	19.25	0.29	0.08	0.03	99.2	78.9
Col-1001B·	40.3	0.02	39.2	0.21	19.30	0.27	0.08	0.01	99.4	78.8
Col-1001B·	40.7	0.02	39.3	0.21	19.48	0.32	0.10	0.00	100.1	78.8
Col-1001B·	40.5	0.01	38.9	0.20	19.48	0.32	0.10	0.00	99.5	78.8
Col-1001B·	40.5	0.03	39.1	0.20	19.47	0.24	0.13	0.02	99.6	78.7
Col-1001B·	40.6	0.02	39.2	0.20	19.58	0.28	0.09	0.01	99.9	78.7
Col-1001B·	40.1	0.03	39.1	0.20	19.35	0.25	0.09	-0.01	99.1	78.7
Col-1001B·	40.5	0.04	39.5	0.22	19.65	0.34	0.09	0.02	100.4	78.6
Col-1001B·	40.4	0.02	38.4	0.21	19.65	0.23	0.09	0.03	99.1	78.6
Col-1001B·	40.3	0.01	39.1	0.20	19.62	0.32	0.10	0.03	99.7	78.6
Col-1001B·	40.2	0.02	39.1	0.20	19.63	0.29	0.11	0.01	99.5	78.5
Col-1001B·	40.1	0.03	38.9	0.21	19.63	0.29	0.10	0.00	99.2	78.5
Col-1001B·	40.3	0.03	39.2	0.20	19.81	0.22	0.09	0.02	99.9	78.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	40.2	0.03	38.6	0.22	19.78	0.25	0.05	0.01	99.1	78.4
Col-1001B·	40.3	0.02	39.2	0.20	19.85	0.25	0.08	-0.01	99.9	78.3
Col-1001B·	39.7	0.02	39.3	0.20	19.59	0.26	0.07	0.02	99.2	78.3
Col-1001B·	40.1	0.02	39.1	0.20	19.79	0.23	0.07	0.01	99.5	78.3
Col-1001B·	40.5	0.03	38.9	0.21	20.00	0.28	0.08	0.02	100.0	78.3
Col-1001B·	40.0	0.02	38.6	0.20	19.77	0.25	0.12	0.00	99.0	78.3
Col-1001B·	40.0	0.03	38.4	0.21	19.84	0.34	0.10	0.02	99.0	78.3
Col-1001B·	39.9	0.03	38.9	0.21	19.84	0.27	0.10	0.02	99.3	78.2
Col-1001B·	40.3	0.03	38.8	0.20	20.05	0.27	0.10	-0.01	99.7	78.2
Col-1001B·	40.2	0.02	39.0	0.20	20.18	0.29	0.09	-0.01	100.0	78.0
Col-1001B·	39.8	0.03	38.9	0.20	19.98	0.29	0.10	0.04	99.3	78.0
Col-1001B·	40.1	0.02	39.0	0.21	20.15	0.24	0.09	0.02	99.8	78.0
Col-1001B·	39.9	0.02	38.9	0.20	20.10	0.30	0.10	0.03	99.6	78.0
Col-1001B·	39.9	0.03	39.3	0.21	20.25	0.38	0.07	0.02	100.2	77.8
Col-1001B·	39.8	0.03	38.8	0.20	20.23	0.28	0.08	0.01	99.4	77.8
Col-1001B·	39.9	0.02	38.7	0.20	20.36	0.27	0.07	0.00	99.5	77.8
Col-1001B·	39.7	0.03	38.8	0.22	20.32	0.28	0.05	0.00	99.4	77.7
Col-1001B·	39.7	0.02	38.7	0.21	20.47	0.32	0.08	0.00	99.5	77.6
Col-1001B·	39.7	0.00	38.7	0.19	20.52	0.25	0.09	0.02	99.4	77.5
Col-1001B·	39.6	0.03	39.1	0.20	20.56	0.31	0.08	-0.01	100.0	77.5
Col-1001B·	39.4	0.03	38.9	0.21	20.48	0.31	0.08	0.02	99.4	77.4
Col-1001B·	39.5	0.01	38.8	0.22	20.68	0.31	0.08	0.00	99.6	77.3
Col-1001B·	39.5	0.07	38.8	0.20	20.72	0.35	0.09	-0.01	99.7	77.3
Col-1001B·	39.6	0.03	38.5	0.22	20.81	0.29	0.06	-0.02	99.5	77.2
Col-1001B·	39.2	0.03	38.7	0.21	20.68	0.29	0.07	0.00	99.2	77.2
Col-1001B·	39.5	0.01	38.9	0.21	20.88	0.28	0.09	0.02	99.9	77.1
Col-1001B·	39.5	0.02	38.6	0.20	20.98	0.36	0.06	0.00	99.7	77.0
Col-1001B·	39.3	0.04	38.6	0.21	20.97	0.30	0.08	0.01	99.5	77.0
Col-1001B·	39.4	0.02	39.0	0.20	21.03	0.30	0.10	0.00	100.0	77.0
Col-1001B·	39.3	0.03	38.4	0.21	21.01	0.27	0.07	0.02	99.3	76.9
Col-1001B·	39.2	0.02	38.6	0.21	20.98	0.35	0.10	0.00	99.4	76.9
Col-1001B·	39.3	0.03	39.0	0.19	21.05	0.31	0.06	0.00	99.9	76.9
Col-1001B·	38.9	0.04	38.9	0.22	20.89	0.29	0.10	0.01	99.3	76.8
Col-1001B·	39.0	0.03	38.6	0.21	21.10	0.28	0.10	0.02	99.4	76.7
Col-1001B·	38.9	0.02	38.4	0.20	21.15	0.35	0.07	0.01	99.0	76.6
Col-1001B·	39.2	0.01	38.8	0.21	21.36	0.33	0.10	0.01	100.0	76.6
Col-1001B·	39.5	0.03	38.9	0.21	21.52	0.25	0.09	0.00	100.5	76.6
Col-1001B·	38.8	0.03	38.8	0.21	21.22	0.26	0.08	0.00	99.5	76.5
Col-1001B·	39.0	0.02	38.7	0.20	21.31	0.30	0.08	0.00	99.6	76.5
Col-1001B·	38.7	0.03	38.6	0.18	21.37	0.29	0.08	0.02	99.3	76.4
Col-1001B·	38.8	0.02	38.7	0.20	21.46	0.30	0.07	0.00	99.6	76.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	38.7	0.02	38.7	0.23	21.48	0.25	0.07	0.00	99.5	76.3
Col-1001B·	39.0	0.02	38.7	0.20	21.70	0.29	0.09	0.01	100.0	76.2
Col-1001B·	38.8	0.01	38.4	0.19	21.63	0.22	0.07	-0.01	99.2	76.2
Col-1001B·	38.7	0.05	39.1	0.20	21.61	0.30	0.08	-0.02	100.0	76.2
Col-1001B·	38.7	0.03	38.8	0.21	21.60	0.23	0.05	0.03	99.6	76.1
Col-1001B·	38.7	0.03	38.6	0.21	21.85	0.36	0.08	0.04	99.9	76.0
Col-1001B·	38.6	0.03	38.8	0.22	21.83	0.29	0.08	0.01	99.8	75.9
Col-1001B·	38.3	0.03	38.5	0.21	21.72	0.31	0.04	0.01	99.1	75.9
Col-1001B·	38.7	0.02	38.4	0.21	22.03	0.30	0.07	0.01	99.7	75.8
Col-1001B·	38.5	0.04	38.5	0.20	21.98	0.31	0.08	0.01	99.6	75.7
Col-1001B·	38.4	0.03	38.3	0.22	21.93	0.32	0.05	0.00	99.2	75.7
Col-1001B·	38.4	0.02	38.5	0.20	22.06	0.33	0.10	0.01	99.7	75.6
Col-1001B·	38.2	0.02	38.3	0.20	22.09	0.26	0.07	0.02	99.2	75.5
Col-1001B·	38.4	0.02	38.8	0.20	22.26	0.32	0.06	0.01	100.1	75.5
Col-1001B·	38.1	0.02	38.8	0.19	22.36	0.41	0.06	0.00	99.9	75.2
Col-1001B·	38.1	0.01	38.4	0.23	22.43	0.34	0.10	0.00	99.6	75.2
Col-1001B·	38.2	0.02	38.3	0.18	22.65	0.33	0.08	0.01	99.8	75.0
Col-1001B·	38.1	0.02	38.0	0.19	22.69	0.28	0.09	0.00	99.4	75.0
Col-1001B·	37.8	0.01	38.5	0.24	22.68	0.30	0.08	0.02	99.7	74.8
Col-1001B·	37.6	0.01	38.0	0.23	22.83	0.34	0.07	0.01	99.1	74.6
Col-1001B·	37.1	0.02	38.4	0.27	22.72	0.37	0.09	-0.01	99.0	74.5
Col-1001B·	37.5	0.02	38.1	0.20	23.06	0.36	0.09	0.02	99.3	74.3
Col-1001B·	37.5	0.03	38.0	0.22	23.19	0.39	0.10	0.00	99.4	74.2
Col-1001B·	37.3	0.02	38.4	0.23	23.33	0.39	0.07	-0.02	99.6	74.0
Col-1001B·	37.1	0.03	38.3	0.21	23.23	0.39	0.06	0.02	99.3	74.0
Col-1001B·	37.3	0.02	38.6	0.22	23.42	0.35	0.04	-0.02	99.9	73.9
Col-1001B·	37.2	0.03	37.9	0.21	23.57	0.36	0.06	0.02	99.4	73.8
Col-1001B·	37.3	0.02	38.1	0.21	23.64	0.35	0.06	0.01	99.7	73.8
Col-1001B·	36.8	0.03	38.6	0.24	23.71	0.42	0.06	0.01	99.9	73.5
Col-1001B·	36.9	0.03	38.1	0.24	23.95	0.39	0.07	0.02	99.7	73.3
Col-1001B·	36.6	0.02	37.9	0.26	24.10	0.40	0.05	0.00	99.3	73.0
Col-1001B·	36.8	0.02	38.1	0.23	24.38	0.30	0.08	0.01	99.9	72.9
Col-1001B·	36.5	0.01	37.7	0.26	24.38	0.37	0.05	0.00	99.3	72.7
Col-1001B·	36.4	0.02	38.1	0.25	24.81	0.42	0.05	0.04	100.0	72.3
Col-1001B·	36.1	0.03	38.5	0.27	25.03	0.30	0.05	0.00	100.3	72.0
Col-1001B·	36.0	0.02	37.7	0.26	24.94	0.37	0.07	0.02	99.4	72.0
Col-1001B·	35.9	0.02	38.3	0.23	24.89	0.29	0.06	-0.01	99.6	72.0
Col-1001B·	35.7	0.01	37.8	0.27	25.39	0.41	0.07	0.02	99.7	71.5
Col-1001B·	35.5	0.02	37.6	0.26	25.28	0.42	0.05	0.03	99.2	71.4
Col-1001B·	34.9	0.02	37.7	0.29	26.13	0.35	0.04	-0.01	99.4	70.4
Col-1001B·	34.1	0.03	37.3	0.29	26.75	0.55	0.07	0.00	99.1	69.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1001B·	34.3	0.03	37.5	0.29	27.35	0.38	0.07	0.00	99.9	69.1
Col-1001B·	33.4	0.03	37.3	0.33	27.85	0.42	0.04	0.01	99.4	68.1
Col-1001B·	33.4	0.02	37.5	0.24	28.32	0.41	0.05	0.00	100.0	67.8
Col-1001B·	32.6	0.03	37.2	0.33	28.74	0.41	0.04	0.01	99.4	66.9
Col-1001B·	33.0	0.03	37.2	0.29	29.13	0.39	0.04	0.00	100.1	66.9
Col-1001B·	31.6	0.02	37.4	0.33	29.17	0.48	0.05	0.01	99.1	65.9
Col-1001B·	31.5	0.02	36.8	0.28	30.31	0.46	0.03	-0.01	99.4	65.0
Col-1001B·	31.4	0.02	36.7	0.34	30.33	0.43	0.07	0.02	99.3	64.8
Col-1001B·	29.8	0.02	36.7	0.34	32.53	0.55	0.03	0.02	100.0	62.0
Col-1001B·	29.3	0.01	36.5	0.31	32.91	0.60	0.04	0.01	99.7	61.4
Col-1001B·	27.3	0.01	35.9	0.36	35.38	0.64	0.04	0.00	99.7	57.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	50.4	0.02	42.0	0.14	6.90	0.09	0.64	0.05	100.2	92.9
Col-1003B·	50.3	0.01	41.5	0.15	6.92	0.09	0.58	0.09	99.6	92.8
Col-1003B·	50.3	0.01	42.0	0.13	6.94	0.11	0.66	0.08	100.2	92.8
Col-1003B·	50.1	0.02	41.8	0.14	6.94	0.15	0.65	0.09	99.9	92.8
Col-1003B·	50.5	0.03	42.0	0.16	7.01	0.05	0.59	0.15	100.5	92.8
Col-1003B·	50.4	0.02	41.8	0.14	7.00	0.12	0.59	0.11	100.2	92.8
Col-1003B·	50.4	0.02	42.0	0.14	7.03	0.06	0.62	0.09	100.4	92.7
Col-1003B·	50.3	0.01	42.1	0.15	7.03	0.11	0.62	0.06	100.4	92.7
Col-1003B·	50.3	0.02	42.0	0.14	7.05	0.12	0.61	0.05	100.3	92.7
Col-1003B·	50.5	0.01	42.1	0.16	7.09	0.04	0.60	0.13	100.6	92.7
Col-1003B·	50.5	0.02	41.9	0.13	7.10	0.13	0.62	0.06	100.5	92.7
Col-1003B·	50.4	0.01	42.0	0.14	7.09	0.10	0.60	0.06	100.4	92.7
Col-1003B·	50.3	0.03	42.1	0.14	7.12	0.08	0.64	0.13	100.5	92.6
Col-1003B·	50.3	0.01	41.8	0.14	7.14	0.16	0.60	0.06	100.3	92.6
Col-1003B·	50.4	0.01	41.8	0.14	7.17	0.09	0.65	0.07	100.4	92.6
Col-1003B·	50.1	0.02	42.0	0.14	7.13	0.13	0.55	0.06	100.1	92.6
Col-1003B·	50.2	0.03	41.6	0.14	7.21	0.12	0.56	0.11	99.9	92.5
Col-1003B·	50.2	0.02	41.6	0.15	7.23	0.14	0.57	0.08	99.9	92.5
Col-1003B·	50.2	0.02	41.6	0.14	7.24	0.08	0.58	0.04	99.9	92.5
Col-1003B·	50.1	0.03	41.7	0.13	7.24	0.13	0.64	0.06	100.1	92.5
Col-1003B·	49.2	0.02	41.9	0.13	7.12	0.14	0.64	0.10	99.3	92.5
Col-1003B·	50.0	0.01	41.6	0.14	7.25	0.12	0.58	0.05	99.8	92.5
Col-1003B·	50.0	0.02	41.6	0.13	7.26	0.18	0.57	0.08	99.8	92.5
Col-1003B·	50.0	0.02	41.4	0.15	7.29	0.08	0.61	0.05	99.6	92.4
Col-1003B·	49.8	0.02	41.7	0.16	7.27	0.07	0.59	0.07	99.6	92.4
Col-1003B·	50.0	0.01	41.9	0.14	7.29	0.12	0.62	0.07	100.1	92.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	49.6	0.03	41.7	0.13	7.26	0.13	0.59	0.06	99.6	92.4
Col-1003B·	50.0	0.03	41.2	0.15	7.32	0.14	0.62	0.08	99.6	92.4
Col-1003B·	49.8	0.01	41.7	0.15	7.28	0.13	0.59	0.06	99.7	92.4
Col-1003B·	49.9	0.02	41.7	0.15	7.31	0.11	0.60	0.09	99.9	92.4
Col-1003B·	50.5	0.01	42.0	0.14	7.41	0.07	0.62	0.09	100.8	92.4
Col-1003B·	50.3	0.03	42.1	0.16	7.41	0.13	0.60	0.08	100.8	92.4
Col-1003B·	49.9	0.02	41.3	0.12	7.34	0.11	0.57	0.09	99.4	92.4
Col-1003B·	50.0	0.00	41.7	0.14	7.38	0.10	0.61	0.07	100.1	92.4
Col-1003B·	50.2	0.02	42.0	0.14	7.41	0.04	0.59	0.08	100.5	92.4
Col-1003B·	49.9	0.02	41.4	0.14	7.36	0.13	0.64	0.10	99.7	92.4
Col-1003B·	49.9	0.01	41.4	0.15	7.37	0.10	0.60	0.16	99.8	92.3
Col-1003B·	50.1	0.01	41.9	0.16	7.41	0.08	0.56	0.09	100.4	92.3
Col-1003B·	50.1	0.03	41.6	0.14	7.40	0.12	0.56	0.05	100.0	92.3
Col-1003B·	49.9	0.01	42.0	0.14	7.39	0.09	0.60	0.06	100.2	92.3
Col-1003B·	50.3	0.03	41.8	0.14	7.46	0.11	0.59	0.07	100.5	92.3
Col-1003B·	50.0	0.01	41.7	0.15	7.41	0.07	0.55	0.04	99.9	92.3
Col-1003B·	49.7	0.02	41.9	0.15	7.40	0.13	0.62	0.06	100.0	92.3
Col-1003B·	49.8	0.04	41.4	0.14	7.43	0.15	0.59	0.07	99.6	92.3
Col-1003B·	49.6	0.02	41.6	0.14	7.42	0.08	0.56	0.08	99.5	92.3
Col-1003B·	49.9	0.02	41.5	0.14	7.48	0.13	0.59	0.07	99.9	92.2
Col-1003B·	50.2	0.02	42.0	0.14	7.52	0.09	0.60	0.08	100.6	92.2
Col-1003B·	49.8	0.03	41.5	0.14	7.48	0.11	0.59	0.05	99.8	92.2
Col-1003B·	49.5	0.02	41.6	0.13	7.43	0.13	0.60	0.05	99.5	92.2
Col-1003B·	50.0	0.02	42.0	0.14	7.51	0.10	0.61	0.05	100.5	92.2
Col-1003B·	49.7	0.02	41.6	0.13	7.48	0.11	0.59	0.09	99.7	92.2
Col-1003B·	50.0	0.02	41.7	0.13	7.53	0.12	0.57	0.08	100.2	92.2
Col-1003B·	50.0	0.03	41.7	0.14	7.53	0.09	0.63	0.06	100.2	92.2
Col-1003B·	49.7	0.02	41.5	0.14	7.49	0.13	0.56	0.06	99.5	92.2
Col-1003B·	49.7	0.02	41.2	0.13	7.49	0.08	0.60	0.09	99.3	92.2
Col-1003B·	49.8	0.00	41.8	0.14	7.51	0.08	0.57	0.07	99.9	92.2
Col-1003B·	49.8	0.02	41.7	0.14	7.53	0.12	0.59	0.05	100.0	92.2
Col-1003B·	49.8	0.02	41.6	0.14	7.53	0.13	0.59	0.06	99.9	92.2
Col-1003B·	49.7	0.02	41.6	0.15	7.54	0.12	0.60	0.08	99.8	92.2
Col-1003B·	50.0	0.03	41.9	0.14	7.59	0.11	0.58	0.07	100.4	92.2
Col-1003B·	49.9	0.02	41.3	0.15	7.58	0.10	0.52	0.08	99.7	92.1
Col-1003B·	49.8	0.02	41.4	0.14	7.57	0.09	0.60	0.08	99.6	92.1
Col-1003B·	50.0	0.04	41.9	0.14	7.60	0.12	0.64	0.07	100.5	92.1
Col-1003B·	49.3	0.02	41.4	0.15	7.52	0.09	0.58	0.05	99.1	92.1
Col-1003B·	49.3	0.01	41.3	0.14	7.52	0.09	0.59	0.07	99.0	92.1
Col-1003B·	49.7	0.01	41.2	0.14	7.59	0.12	0.58	0.07	99.4	92.1
Col-1003B·	50.0	0.02	41.8	0.14	7.63	0.08	0.61	0.07	100.4	92.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	50.1	0.01	41.6	0.15	7.65	0.08	0.58	0.08	100.2	92.1
Col-1003B·	49.8	0.03	41.5	0.13	7.62	0.14	0.59	0.07	99.9	92.1
Col-1003B·	50.0	0.02	41.6	0.15	7.65	0.07	0.59	0.07	100.1	92.1
Col-1003B·	49.9	0.01	41.7	0.16	7.65	0.05	0.55	0.06	100.1	92.1
Col-1003B·	49.8	0.02	41.4	0.13	7.63	0.11	0.54	0.06	99.7	92.1
Col-1003B·	49.7	0.01	41.7	0.14	7.63	0.09	0.60	0.07	100.0	92.1
Col-1003B·	50.0	0.01	41.9	0.14	7.68	0.08	0.56	0.04	100.4	92.1
Col-1003B·	49.9	0.01	41.5	0.13	7.67	0.12	0.57	0.05	100.0	92.1
Col-1003B·	49.8	0.03	41.6	0.14	7.65	0.12	0.63	0.10	100.1	92.1
Col-1003B·	50.3	0.04	41.5	0.15	7.74	0.11	0.55	0.07	100.4	92.1
Col-1003B·	50.0	0.03	41.6	0.14	7.71	0.08	0.58	0.08	100.2	92.0
Col-1003B·	49.8	0.00	41.6	0.16	7.67	0.14	0.59	0.05	100.0	92.0
Col-1003B·	49.8	0.02	41.7	0.15	7.68	0.11	0.61	0.07	100.2	92.0
Col-1003B·	49.5	0.00	41.8	0.15	7.64	0.10	0.54	0.06	99.8	92.0
Col-1003B·	49.8	0.02	41.7	0.14	7.69	0.10	0.48	0.09	100.1	92.0
Col-1003B·	49.8	0.01	42.2	0.14	7.72	0.11	0.55	0.07	100.6	92.0
Col-1003B·	49.9	0.01	41.4	0.15	7.75	0.14	0.55	0.06	100.0	92.0
Col-1003B·	49.7	0.01	41.4	0.14	7.71	0.08	0.63	0.08	99.7	92.0
Col-1003B·	49.7	0.02	41.7	0.14	7.71	0.06	0.57	0.09	100.0	92.0
Col-1003B·	49.6	0.01	41.5	0.15	7.70	0.07	0.63	0.05	99.7	92.0
Col-1003B·	49.6	0.01	41.2	0.13	7.71	0.10	0.56	0.09	99.5	92.0
Col-1003B·	49.5	0.00	41.4	0.13	7.71	0.13	0.62	0.08	99.6	92.0
Col-1003B·	49.4	0.01	41.8	0.16	7.68	0.15	0.51	0.05	99.7	92.0
Col-1003B·	50.0	-0.01	41.6	0.13	7.78	0.08	0.59	0.05	100.3	92.0
Col-1003B·	50.0	0.00	41.9	0.15	7.78	0.13	0.58	0.07	100.6	92.0
Col-1003B·	49.5	0.02	41.5	0.14	7.71	0.10	0.55	0.10	99.6	92.0
Col-1003B·	48.8	0.03	42.9	0.13	7.62	0.11	0.59	0.08	100.3	92.0
Col-1003B·	49.6	0.02	41.5	0.12	7.77	0.10	0.56	0.10	99.8	91.9
Col-1003B·	49.4	0.02	41.1	0.13	7.75	0.11	0.55	0.05	99.1	91.9
Col-1003B·	49.7	0.01	41.2	0.14	7.79	0.10	0.56	0.07	99.6	91.9
Col-1003B·	49.8	0.01	41.5	0.14	7.83	0.15	0.57	0.07	100.1	91.9
Col-1003B·	49.8	0.02	41.8	0.13	7.83	0.11	0.55	0.10	100.3	91.9
Col-1003B·	49.5	0.01	41.7	0.14	7.79	0.11	0.59	0.08	99.9	91.9
Col-1003B·	49.6	0.02	41.2	0.15	7.81	0.14	0.58	0.08	99.6	91.9
Col-1003B·	49.9	0.01	41.4	0.13	7.85	0.11	0.55	0.05	100.0	91.9
Col-1003B·	49.8	0.04	41.8	0.12	7.86	0.18	0.54	0.10	100.4	91.9
Col-1003B·	49.7	0.01	41.4	0.14	7.87	0.06	0.52	0.06	99.7	91.8
Col-1003B·	49.4	0.02	41.6	0.14	7.83	0.08	0.48	0.05	99.7	91.8
Col-1003B·	49.6	0.03	41.6	0.14	7.85	0.12	0.50	0.05	99.9	91.8
Col-1003B·	49.6	0.02	41.6	0.14	7.86	0.14	0.45	0.02	99.9	91.8
Col-1003B·	50.7	0.06	41.2	0.13	8.04	0.10	0.56	0.07	100.9	91.8

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	49.7	0.03	42.0	0.16	7.89	0.16	0.59	0.12	100.6	91.8
Col-1003B·	49.6	0.02	41.2	0.15	7.88	0.14	0.54	0.11	99.7	91.8
Col-1003B·	49.6	0.01	41.7	0.15	7.89	0.06	0.49	0.06	99.9	91.8
Col-1003B·	49.7	0.02	41.8	0.15	7.92	0.09	0.52	0.05	100.3	91.8
Col-1003B·	49.7	0.02	41.5	0.13	7.92	0.11	0.55	0.06	100.0	91.8
Col-1003B·	49.6	0.01	41.7	0.15	7.92	0.14	0.55	0.09	100.1	91.8
Col-1003B·	49.6	0.02	41.8	0.15	7.93	0.13	0.53	0.07	100.3	91.8
Col-1003B·	49.5	0.01	41.3	0.13	7.94	0.09	0.55	0.08	99.7	91.8
Col-1003B·	49.6	0.01	41.7	0.15	7.97	0.09	0.48	0.05	100.0	91.7
Col-1003B·	50.1	0.03	41.7	0.13	8.05	0.10	0.61	0.06	100.7	91.7
Col-1003B·	49.3	0.01	41.4	0.14	7.93	0.12	0.54	0.04	99.4	91.7
Col-1003B·	49.7	0.00	41.7	0.16	8.00	0.14	0.47	0.05	100.2	91.7
Col-1003B·	49.8	0.02	41.5	0.13	8.04	0.09	0.56	0.08	100.2	91.7
Col-1003B·	49.6	0.00	41.6	0.14	8.01	0.13	0.50	0.07	100.1	91.7
Col-1003B·	49.3	0.01	41.6	0.14	7.96	0.15	0.51	0.08	99.7	91.7
Col-1003B·	47.3	0.94	43.2	0.19	7.64	0.13	0.51	0.07	99.9	91.7
Col-1003B·	49.4	0.02	41.1	0.14	7.99	0.16	0.59	0.11	99.5	91.7
Col-1003B·	49.4	0.01	41.7	0.14	8.03	0.08	0.53	0.09	100.0	91.6
Col-1003B·	49.0	0.02	41.4	0.13	8.00	0.12	0.58	0.09	99.3	91.6
Col-1003B·	49.4	0.00	41.3	0.14	8.08	0.10	0.52	0.05	99.6	91.6
Col-1003B·	49.5	0.02	41.5	0.16	8.11	0.15	0.50	0.06	100.0	91.6
Col-1003B·	49.4	0.02	41.6	0.15	8.10	0.13	0.58	0.08	100.1	91.6
Col-1003B·	49.6	0.01	41.1	0.14	8.13	0.05	0.57	0.06	99.6	91.6
Col-1003B·	49.6	0.01	41.9	0.15	8.15	0.11	0.55	0.05	100.5	91.6
Col-1003B·	49.1	0.03	41.7	0.15	8.07	0.13	0.52	0.03	99.7	91.6
Col-1003B·	49.0	0.01	41.1	0.14	8.06	0.13	0.55	0.07	99.0	91.6
Col-1003B·	49.4	0.00	41.6	0.14	8.15	0.10	0.56	0.07	100.1	91.5
Col-1003B·	49.4	0.02	41.4	0.15	8.14	0.17	0.59	0.09	99.9	91.5
Col-1003B·	49.2	0.02	41.4	0.14	8.11	0.14	0.53	0.06	99.7	91.5
Col-1003B·	49.4	0.02	41.8	0.14	8.14	0.14	0.56	0.07	100.2	91.5
Col-1003B·	49.8	0.02	41.6	0.14	8.21	0.10	0.54	0.06	100.5	91.5
Col-1003B·	49.4	0.00	42.0	0.13	8.15	0.13	0.55	0.09	100.4	91.5
Col-1003B·	49.5	0.01	41.7	0.14	8.19	0.10	0.53	0.07	100.2	91.5
Col-1003B·	49.6	0.03	41.4	0.14	8.23	0.12	0.57	0.04	100.2	91.5
Col-1003B·	49.4	0.02	41.5	0.12	8.20	0.13	0.55	0.07	99.9	91.5
Col-1003B·	49.3	0.03	41.9	0.14	8.19	0.14	0.56	0.08	100.3	91.5
Col-1003B·	49.5	0.01	41.7	0.13	8.22	0.16	0.53	0.05	100.3	91.5
Col-1003B·	49.2	0.03	41.5	0.15	8.18	0.10	0.54	0.12	99.8	91.5
Col-1003B·	49.1	0.01	41.4	0.14	8.17	0.16	0.59	0.08	99.6	91.5
Col-1003B·	49.1	0.02	40.8	0.16	8.20	0.16	0.53	0.06	99.0	91.4
Col-1003B·	49.5	0.01	41.3	0.13	8.28	0.17	0.55	0.08	100.0	91.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	49.5	0.01	41.7	0.13	8.28	0.11	0.53	0.06	100.4	91.4
Col-1003B·	49.2	0.01	41.3	0.14	8.23	0.14	0.47	0.06	99.6	91.4
Col-1003B·	49.3	0.01	41.5	0.15	8.25	0.13	0.50	0.10	99.9	91.4
Col-1003B·	49.1	0.02	41.4	0.12	8.23	0.17	0.54	0.08	99.7	91.4
Col-1003B·	49.4	0.03	41.2	0.13	8.29	0.15	0.51	0.07	99.8	91.4
Col-1003B·	49.5	0.02	41.9	0.14	8.31	0.07	0.54	0.06	100.6	91.4
Col-1003B·	49.7	0.01	41.6	0.14	8.36	0.14	0.51	0.06	100.5	91.4
Col-1003B·	49.0	0.02	40.9	0.14	8.25	0.16	0.57	0.11	99.1	91.4
Col-1003B·	49.5	0.01	41.7	0.15	8.34	0.12	0.56	0.06	100.4	91.4
Col-1003B·	49.3	0.00	41.5	0.12	8.32	0.08	0.56	0.04	99.9	91.4
Col-1003B·	49.5	0.01	41.6	0.14	8.35	0.14	0.51	0.05	100.3	91.4
Col-1003B·	49.3	0.01	41.5	0.13	8.33	0.10	0.50	0.08	99.9	91.3
Col-1003B·	49.0	0.03	40.9	0.15	8.30	0.11	0.50	0.07	99.1	91.3
Col-1003B·	49.0	0.02	40.9	0.14	8.31	0.11	0.57	0.06	99.1	91.3
Col-1003B·	49.2	0.02	41.2	0.13	8.35	0.06	0.61	0.11	99.7	91.3
Col-1003B·	49.0	0.03	41.1	0.14	8.31	0.18	0.54	0.10	99.3	91.3
Col-1003B·	49.4	0.02	41.5	0.14	8.42	0.14	0.57	0.08	100.2	91.3
Col-1003B·	49.1	0.01	41.6	0.14	8.40	0.13	0.47	0.07	99.9	91.2
Col-1003B·	49.1	0.01	40.7	0.15	8.46	0.10	0.52	0.08	99.1	91.2
Col-1003B·	48.8	0.00	41.0	0.14	8.41	0.10	0.52	0.08	99.0	91.2
Col-1003B·	49.0	0.03	41.3	0.15	8.47	0.16	0.57	0.08	99.8	91.2
Col-1003B·	49.1	0.02	40.5	0.15	8.49	0.21	0.50	0.05	99.0	91.2
Col-1003B·	49.3	0.01	41.0	0.15	8.53	0.13	0.49	0.06	99.7	91.1
Col-1003B·	49.1	0.02	41.6	0.15	8.50	0.11	0.41	0.33	100.3	91.1
Col-1003B·	49.2	0.02	41.0	0.16	8.55	0.19	0.52	0.08	99.7	91.1
Col-1003B·	49.2	0.01	41.6	0.13	8.56	0.08	0.59	0.07	100.3	91.1
Col-1003B·	48.7	0.02	41.3	0.15	8.49	0.16	0.50	0.06	99.4	91.1
Col-1003B·	49.1	0.00	41.4	0.14	8.56	0.08	0.51	0.06	99.8	91.1
Col-1003B·	48.8	0.02	41.6	0.15	8.52	0.10	0.51	0.09	99.7	91.1
Col-1003B·	49.1	0.01	41.9	0.15	8.58	0.13	0.44	0.04	100.3	91.1
Col-1003B·	49.5	0.03	41.8	0.14	8.66	0.17	0.49	0.06	100.8	91.1
Col-1003B·	49.1	0.02	41.7	0.14	8.61	0.15	0.49	0.03	100.2	91.0
Col-1003B·	49.4	0.02	41.8	0.14	8.67	0.13	0.48	0.04	100.7	91.0
Col-1003B·	49.1	0.01	41.7	0.14	8.64	0.13	0.48	0.03	100.3	91.0
Col-1003B·	49.3	0.03	41.5	0.14	8.68	0.14	0.48	0.09	100.4	91.0
Col-1003B·	49.4	0.02	41.5	0.12	8.70	0.13	0.56	0.08	100.5	91.0
Col-1003B·	49.3	0.02	41.1	0.14	8.68	0.20	0.50	0.06	100.0	91.0
Col-1003B·	49.0	0.03	41.9	0.15	8.64	0.14	0.45	0.04	100.4	91.0
Col-1003B·	49.1	0.01	41.5	0.13	8.68	0.09	0.50	0.09	100.2	91.0
Col-1003B·	49.0	0.01	41.9	0.14	8.68	0.17	0.49	0.06	100.4	91.0
Col-1003B·	48.7	0.03	41.4	0.12	8.62	0.11	0.46	0.18	99.6	91.0

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	49.1	0.01	41.3	0.14	8.70	0.18	0.40	0.04	99.9	91.0
Col-1003B·	49.0	0.01	41.8	0.14	8.73	0.08	0.50	0.07	100.3	90.9
Col-1003B·	48.9	0.02	41.5	0.13	8.73	0.13	0.47	0.08	100.0	90.9
Col-1003B·	48.6	0.02	41.0	0.13	8.69	0.18	0.48	0.05	99.1	90.9
Col-1003B·	49.4	0.03	41.7	0.14	8.83	0.10	0.55	0.06	100.8	90.9
Col-1003B·	49.1	0.01	41.7	0.14	8.79	0.17	0.51	0.04	100.4	90.9
Col-1003B·	48.7	0.03	41.3	0.13	8.73	0.13	0.47	0.08	99.6	90.9
Col-1003B·	48.8	0.02	41.6	0.15	8.75	0.16	0.49	0.05	100.0	90.9
Col-1003B·	48.7	0.02	41.6	0.13	8.73	0.14	0.44	0.06	99.8	90.9
Col-1003B·	49.1	0.01	41.5	0.14	8.80	0.14	0.43	0.05	100.1	90.9
Col-1003B·	48.8	0.03	41.5	0.15	8.77	0.09	0.43	0.06	99.8	90.8
Col-1003B·	49.1	0.01	41.7	0.14	8.83	0.16	0.54	0.06	100.5	90.8
Col-1003B·	48.7	0.02	41.5	0.14	8.77	0.13	0.45	0.06	99.7	90.8
Col-1003B·	49.2	0.03	41.1	0.15	8.87	0.15	0.46	0.07	100.0	90.8
Col-1003B·	48.7	0.02	41.2	0.14	8.79	0.12	0.50	0.07	99.6	90.8
Col-1003B·	49.1	-0.01	41.2	0.16	8.88	0.17	0.37	0.04	99.9	90.8
Col-1003B·	48.6	0.03	41.0	0.14	8.80	0.16	0.47	0.04	99.3	90.8
Col-1003B·	49.1	0.02	41.5	0.13	8.92	0.12	0.54	0.09	100.4	90.8
Col-1003B·	49.6	0.03	41.3	0.14	9.03	0.16	0.39	0.16	100.9	90.7
Col-1003B·	48.6	0.01	41.5	0.16	8.85	0.15	0.42	0.03	99.7	90.7
Col-1003B·	48.7	0.01	41.5	0.16	8.87	0.13	0.44	0.05	99.9	90.7
Col-1003B·	48.4	0.01	41.1	0.13	8.82	0.14	0.48	0.05	99.2	90.7
Col-1003B·	48.8	0.01	41.1	0.15	8.90	0.09	0.52	0.07	99.6	90.7
Col-1003B·	49.1	0.01	41.5	0.19	8.96	0.18	0.33	0.03	100.3	90.7
Col-1003B·	48.7	0.01	41.4	0.16	8.88	0.09	0.42	0.05	99.7	90.7
Col-1003B·	48.5	0.03	41.3	0.15	8.87	0.11	0.46	0.03	99.4	90.7
Col-1003B·	48.9	0.02	41.1	0.16	8.96	0.15	0.44	0.07	99.8	90.7
Col-1003B·	48.8	0.02	40.8	0.15	8.93	0.12	0.53	0.06	99.3	90.7
Col-1003B·	48.5	0.02	40.9	0.15	8.89	0.16	0.46	0.05	99.1	90.7
Col-1003B·	49.1	0.01	41.7	0.13	9.00	0.11	0.48	0.03	100.6	90.7
Col-1003B·	48.5	0.03	41.1	0.14	8.90	0.14	0.43	0.03	99.2	90.7
Col-1003B·	48.8	0.03	41.4	0.15	8.96	0.14	0.45	0.09	100.0	90.7
Col-1003B·	48.6	0.04	40.5	0.13	8.94	0.12	0.51	0.11	99.0	90.7
Col-1003B·	48.8	0.00	41.7	0.14	8.98	0.13	0.48	0.05	100.3	90.7
Col-1003B·	48.6	0.01	41.1	0.13	8.95	0.17	0.44	0.03	99.5	90.6
Col-1003B·	48.5	0.03	41.1	0.12	8.94	0.14	0.46	0.06	99.3	90.6
Col-1003B·	48.8	0.03	41.4	0.13	9.02	0.07	0.45	0.06	100.0	90.6
Col-1003B·	48.6	0.01	40.9	0.14	8.99	0.12	0.44	0.07	99.3	90.6
Col-1003B·	48.7	0.02	41.5	0.15	9.02	0.12	0.44	0.05	100.0	90.6
Col-1003B·	48.9	0.01	41.4	0.14	9.06	0.14	0.44	0.07	100.2	90.6
Col-1003B·	48.5	0.01	41.1	0.16	8.99	0.15	0.42	0.03	99.4	90.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	48.9	0.01	41.4	0.13	9.07	0.13	0.42	0.04	100.1	90.6
Col-1003B·	48.9	0.01	41.3	0.14	9.07	0.11	0.48	0.09	100.1	90.6
Col-1003B·	48.7	0.01	41.2	0.14	9.05	0.14	0.42	0.04	99.7	90.6
Col-1003B·	48.7	0.03	41.2	0.15	9.07	0.12	0.38	0.10	99.7	90.5
Col-1003B·	48.8	0.02	41.7	0.13	9.09	0.15	0.45	0.06	100.4	90.5
Col-1003B·	48.7	0.01	41.4	0.14	9.07	0.14	0.41	0.04	99.9	90.5
Col-1003B·	48.5	0.02	41.0	0.13	9.03	0.03	0.47	0.04	99.2	90.5
Col-1003B·	48.4	0.04	40.9	0.14	9.03	0.13	0.45	0.06	99.2	90.5
Col-1003B·	48.8	0.01	41.1	0.15	9.11	0.15	0.46	0.08	99.9	90.5
Col-1003B·	48.4	0.03	41.1	0.15	9.03	0.11	0.47	0.08	99.4	90.5
Col-1003B·	48.7	0.02	41.6	0.13	9.10	0.05	0.46	0.06	100.1	90.5
Col-1003B·	48.8	0.01	41.3	0.12	9.12	0.11	0.49	0.06	100.1	90.5
Col-1003B·	49.1	0.13	41.3	0.15	9.19	0.14	0.39	0.07	100.5	90.5
Col-1003B·	48.9	0.01	41.5	0.14	9.16	0.12	0.45	0.06	100.3	90.5
Col-1003B·	48.8	0.02	41.6	0.14	9.15	0.12	0.48	0.06	100.4	90.5
Col-1003B·	48.4	0.00	41.1	0.14	9.07	0.18	0.43	0.02	99.3	90.5
Col-1003B·	48.4	0.04	41.2	0.14	9.07	0.15	0.42	0.04	99.4	90.5
Col-1003B·	48.6	0.01	41.1	0.14	9.12	0.13	0.43	0.06	99.6	90.5
Col-1003B·	48.7	0.01	41.3	0.12	9.17	0.12	0.44	0.05	99.9	90.4
Col-1003B·	48.5	0.01	41.2	0.14	9.13	0.13	0.39	0.05	99.6	90.4
Col-1003B·	48.9	0.03	41.6	0.14	9.21	0.08	0.42	0.03	100.4	90.4
Col-1003B·	48.4	0.01	41.2	0.15	9.16	0.17	0.50	0.05	99.7	90.4
Col-1003B·	48.5	0.02	41.5	0.14	9.18	0.11	0.42	0.09	100.0	90.4
Col-1003B·	49.3	0.01	41.4	0.14	9.32	0.15	0.44	0.04	100.8	90.4
Col-1003B·	48.8	0.02	41.2	0.14	9.24	0.12	0.43	0.06	100.0	90.4
Col-1003B·	48.7	0.00	41.3	0.15	9.25	0.15	0.45	0.07	100.0	90.4
Col-1003B·	48.6	0.02	41.5	0.14	9.24	0.14	0.42	0.07	100.1	90.4
Col-1003B·	48.5	0.02	40.8	0.15	9.22	0.14	0.42	0.04	99.3	90.4
Col-1003B·	48.8	0.02	41.4	0.17	9.28	0.17	0.38	0.11	100.3	90.4
Col-1003B·	48.7	0.02	41.1	0.14	9.27	0.10	0.43	0.14	99.9	90.4
Col-1003B·	48.6	0.00	41.4	0.14	9.27	0.14	0.41	0.05	100.0	90.3
Col-1003B·	48.5	0.01	41.3	0.15	9.25	0.16	0.34	0.02	99.8	90.3
Col-1003B·	48.2	0.02	41.1	0.15	9.18	0.12	0.43	0.03	99.2	90.3
Col-1003B·	48.5	0.01	41.0	0.14	9.25	0.15	0.39	0.07	99.5	90.3
Col-1003B·	48.6	0.01	41.4	0.14	9.29	0.15	0.41	0.06	100.1	90.3
Col-1003B·	48.6	0.02	41.2	0.14	9.30	0.13	0.45	0.06	99.9	90.3
Col-1003B·	48.9	0.03	41.4	0.16	9.36	0.18	0.42	0.04	100.5	90.3
Col-1003B·	48.3	0.01	41.4	0.15	9.26	0.16	0.42	0.06	99.8	90.3
Col-1003B·	48.8	0.02	41.4	0.15	9.37	0.15	0.52	0.06	100.4	90.3
Col-1003B·	48.3	0.02	41.0	0.16	9.29	0.14	0.40	0.03	99.4	90.3
Col-1003B·	48.3	0.02	41.1	0.16	9.29	0.19	0.38	0.07	99.5	90.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	48.7	0.01	41.2	0.15	9.37	0.18	0.47	0.04	100.1	90.3
Col-1003B·	48.5	0.03	41.1	0.14	9.35	0.15	0.41	0.03	99.8	90.2
Col-1003B·	48.3	0.01	40.7	0.15	9.30	0.14	0.40	0.06	99.1	90.2
Col-1003B·	48.2	0.01	42.2	0.15	9.30	0.13	0.44	0.06	100.5	90.2
Col-1003B·	48.4	0.02	41.2	0.15	9.32	0.08	0.37	0.08	99.6	90.2
Col-1003B·	48.7	0.01	41.4	0.14	9.39	0.11	0.43	0.07	100.3	90.2
Col-1003B·	48.4	0.01	41.0	0.15	9.35	0.14	0.42	0.06	99.6	90.2
Col-1003B·	49.2	0.02	41.2	0.14	9.49	0.14	0.46	0.08	100.7	90.2
Col-1003B·	48.9	0.01	41.5	0.14	9.43	0.18	0.42	0.07	100.6	90.2
Col-1003B·	48.3	0.00	41.2	0.15	9.34	0.12	0.38	0.05	99.6	90.2
Col-1003B·	48.2	0.02	41.1	0.16	9.33	0.18	0.44	0.04	99.4	90.2
Col-1003B·	48.5	0.02	40.7	0.15	9.40	0.11	0.42	0.06	99.4	90.2
Col-1003B·	48.4	0.01	41.3	0.16	9.38	0.12	0.37	0.04	99.8	90.2
Col-1003B·	48.6	0.01	41.2	0.14	9.44	0.16	0.42	0.05	100.1	90.2
Col-1003B·	48.5	0.02	41.4	0.14	9.43	0.16	0.43	0.04	100.1	90.2
Col-1003B·	48.8	0.01	41.3	0.14	9.52	0.07	0.41	0.06	100.4	90.1
Col-1003B·	48.6	0.03	41.2	0.15	9.49	0.14	0.38	0.07	100.1	90.1
Col-1003B·	48.4	0.03	41.2	0.15	9.45	0.14	0.40	0.05	99.8	90.1
Col-1003B·	48.3	0.03	41.2	0.14	9.43	0.19	0.43	0.07	99.8	90.1
Col-1003B·	48.1	0.00	40.9	0.14	9.40	0.12	0.38	0.09	99.1	90.1
Col-1003B·	48.3	0.02	41.0	0.14	9.46	0.14	0.43	0.04	99.5	90.1
Col-1003B·	48.6	0.01	40.8	0.14	9.53	0.06	0.43	0.06	99.7	90.1
Col-1003B·	48.6	0.01	41.4	0.15	9.53	0.15	0.36	0.05	100.2	90.1
Col-1003B·	48.3	0.00	41.2	0.15	9.48	0.14	0.36	0.04	99.6	90.1
Col-1003B·	48.4	0.02	40.8	0.21	9.53	0.21	0.24	0.02	99.5	90.1
Col-1003B·	48.2	0.02	41.3	0.15	9.48	0.08	0.44	0.04	99.7	90.1
Col-1003B·	48.2	0.02	40.9	0.15	9.50	0.09	0.35	0.05	99.3	90.0
Col-1003B·	48.5	0.03	41.2	0.14	9.56	0.16	0.48	0.07	100.2	90.0
Col-1003B·	47.9	0.01	41.2	0.14	9.47	0.14	0.40	0.03	99.3	90.0
Col-1003B·	48.2	0.02	41.2	0.16	9.52	0.11	0.34	0.07	99.7	90.0
Col-1003B·	47.9	0.02	41.1	0.15	9.47	0.10	0.31	0.11	99.2	90.0
Col-1003B·	48.2	0.01	41.3	0.15	9.53	0.17	0.44	0.04	99.8	90.0
Col-1003B·	48.4	0.02	41.2	0.15	9.58	0.17	0.42	0.12	100.1	90.0
Col-1003B·	48.3	0.01	40.9	0.15	9.57	0.22	0.39	0.05	99.6	90.0
Col-1003B·	48.1	0.02	41.0	0.15	9.54	0.13	0.41	0.03	99.4	90.0
Col-1003B·	48.1	0.01	41.3	0.15	9.54	0.17	0.31	0.08	99.7	90.0
Col-1003B·	48.5	0.01	41.2	0.15	9.62	0.13	0.36	0.05	100.0	90.0
Col-1003B·	48.0	0.02	40.9	0.16	9.54	0.20	0.32	0.05	99.2	90.0
Col-1003B·	48.3	0.01	41.0	0.15	9.62	0.12	0.38	0.05	99.6	90.0
Col-1003B·	48.1	0.03	41.1	0.14	9.59	0.12	0.42	0.06	99.6	89.9
Col-1003B·	47.9	0.01	41.2	0.15	9.55	0.19	0.37	0.06	99.5	89.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	48.6	0.01	41.7	0.14	9.70	0.15	0.35	0.05	100.8	89.9
Col-1003B·	48.5	0.08	41.4	0.16	9.74	0.15	0.36	0.06	100.5	89.9
Col-1003B·	48.8	0.01	41.6	0.15	9.82	0.13	0.38	0.03	100.9	89.9
Col-1003B·	48.4	0.01	41.5	0.15	9.76	0.10	0.35	0.03	100.3	89.8
Col-1003B·	48.0	0.03	41.2	0.14	9.69	0.13	0.38	0.03	99.6	89.8
Col-1003B·	48.1	0.01	40.8	0.16	9.73	0.18	0.34	0.03	99.4	89.8
Col-1003B·	48.0	0.01	41.4	0.17	9.72	0.12	0.31	0.08	99.8	89.8
Col-1003B·	48.0	0.01	41.1	0.17	9.71	0.19	0.30	0.04	99.5	89.8
Col-1003B·	48.1	0.01	41.4	0.18	9.74	0.15	0.33	0.04	99.9	89.8
Col-1003B·	48.5	0.00	41.5	0.16	9.83	0.16	0.34	0.03	100.5	89.8
Col-1003B·	48.4	0.30	41.1	0.18	9.81	0.15	0.32	0.11	100.3	89.8
Col-1003B·	48.2	0.02	41.2	0.14	9.79	0.15	0.42	0.03	100.0	89.8
Col-1003B·	48.2	0.03	41.0	0.16	9.80	0.15	0.37	0.05	99.8	89.8
Col-1003B·	47.8	0.01	40.9	0.14	9.72	0.18	0.45	0.07	99.3	89.8
Col-1003B·	48.5	0.02	41.6	0.17	9.88	0.14	0.37	0.05	100.7	89.8
Col-1003B·	47.9	0.00	41.1	0.15	9.77	0.19	0.32	0.04	99.5	89.7
Col-1003B·	48.3	0.01	41.2	0.16	9.85	0.14	0.43	0.08	100.1	89.7
Col-1003B·	48.3	0.06	42.0	0.19	9.87	0.15	0.39	0.04	101.0	89.7
Col-1003B·	48.4	0.01	41.3	0.14	9.91	0.22	0.39	0.03	100.4	89.7
Col-1003B·	47.9	0.01	41.1	0.15	9.79	0.19	0.41	0.03	99.6	89.7
Col-1003B·	47.8	0.02	40.8	0.15	9.83	0.07	0.33	0.03	99.1	89.7
Col-1003B·	48.4	0.02	41.4	0.16	9.97	0.12	0.31	0.04	100.3	89.6
Col-1003B·	48.0	0.01	41.0	0.17	9.91	0.11	0.30	0.05	99.6	89.6
Col-1003B·	48.0	0.01	41.1	0.15	9.94	0.15	0.34	0.02	99.7	89.6
Col-1003B·	47.9	0.03	40.9	0.17	9.94	0.12	0.28	0.05	99.4	89.6
Col-1003B·	48.1	0.01	41.3	0.21	9.98	0.17	0.17	0.04	100.0	89.6
Col-1003B·	47.9	0.02	41.3	0.16	9.94	0.26	0.32	0.04	100.0	89.6
Col-1003B·	48.1	0.02	41.1	0.17	10.00	0.17	0.30	0.04	100.0	89.6
Col-1003B·	48.0	0.04	41.0	0.16	9.97	0.14	0.40	0.06	99.7	89.6
Col-1003B·	48.2	0.02	40.9	0.15	10.02	0.23	0.31	0.05	99.9	89.5
Col-1003B·	48.3	0.02	41.3	0.16	10.08	0.11	0.30	0.04	100.4	89.5
Col-1003B·	48.2	0.02	41.4	0.19	10.06	0.19	0.25	0.08	100.4	89.5
Col-1003B·	48.0	0.01	41.4	0.17	10.05	0.10	0.27	0.03	100.0	89.5
Col-1003B·	48.1	0.01	41.4	0.15	10.08	0.18	0.30	0.04	100.2	89.5
Col-1003B·	47.9	0.02	40.9	0.15	10.05	0.17	0.45	0.05	99.7	89.5
Col-1003B·	47.9	0.01	40.9	0.13	10.06	0.18	0.38	0.04	99.6	89.5
Col-1003B·	47.9	0.02	41.5	0.14	10.05	0.14	0.38	0.06	100.2	89.5
Col-1003B·	47.8	0.01	41.1	0.17	10.04	0.17	0.28	0.06	99.6	89.5
Col-1003B·	47.7	0.01	40.6	0.16	10.02	0.15	0.33	0.08	99.0	89.4
Col-1003B·	47.7	0.02	41.5	0.17	10.09	0.19	0.30	0.01	99.9	89.4
Col-1003B·	47.9	0.03	41.0	0.16	10.16	0.18	0.29	0.04	99.8	89.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	47.7	0.00	40.5	0.19	10.11	0.20	0.23	0.05	99.0	89.4
Col-1003B·	48.0	0.01	41.8	0.17	10.23	0.14	0.30	0.03	100.7	89.3
Col-1003B·	48.0	0.01	41.4	0.17	10.23	0.17	0.31	0.06	100.3	89.3
Col-1003B·	48.0	0.01	41.4	0.18	10.24	0.12	0.27	0.02	100.3	89.3
Col-1003B·	47.8	0.02	41.1	0.17	10.23	0.18	0.36	0.04	99.9	89.3
Col-1003B·	48.1	0.01	41.6	0.17	10.29	0.18	0.35	0.03	100.8	89.3
Col-1003B·	48.0	0.02	41.1	0.17	10.30	0.14	0.32	0.07	100.1	89.3
Col-1003B·	47.8	0.02	41.4	0.20	10.27	0.12	0.22	0.09	100.2	89.2
Col-1003B·	48.3	0.00	41.6	0.18	10.43	0.16	0.24	0.03	100.9	89.2
Col-1003B·	47.8	0.01	41.8	0.16	10.35	0.20	0.33	0.04	100.7	89.2
Col-1003B·	47.9	0.02	41.0	0.16	10.37	0.14	0.25	0.03	99.8	89.2
Col-1003B·	47.4	0.00	40.8	0.17	10.36	0.22	0.21	0.06	99.2	89.1
Col-1003B·	47.9	0.00	41.6	0.16	10.58	0.16	0.23	0.06	100.7	89.0
Col-1003B·	48.1	0.00	41.3	0.17	10.62	0.19	0.27	0.03	100.6	89.0
Col-1003B·	47.8	0.00	41.4	0.17	10.59	0.16	0.27	0.04	100.5	88.9
Col-1003B·	47.9	0.01	40.6	0.16	10.61	0.12	0.30	0.03	99.7	88.9
Col-1003B·	47.6	0.02	40.8	0.20	10.58	0.16	0.22	0.03	99.7	88.9
Col-1003B·	47.7	0.01	41.1	0.17	10.66	0.15	0.24	0.02	100.0	88.9
Col-1003B·	47.3	0.02	41.0	0.18	10.57	0.15	0.27	0.05	99.5	88.9
Col-1003B·	47.5	0.00	40.8	0.19	10.62	0.18	0.25	0.05	99.6	88.9
Col-1003B·	47.8	0.00	41.3	0.17	10.69	0.18	0.25	0.05	100.4	88.9
Col-1003B·	47.5	0.01	40.8	0.18	10.65	0.13	0.26	0.07	99.6	88.8
Col-1003B·	47.8	0.02	41.4	0.19	10.72	0.17	0.26	0.04	100.6	88.8
Col-1003B·	47.4	0.02	40.9	0.18	10.66	0.22	0.23	0.05	99.6	88.8
Col-1003B·	47.3	0.02	41.2	0.18	10.64	0.16	0.22	0.04	99.7	88.8
Col-1003B·	47.4	0.02	40.5	0.18	10.76	0.14	0.20	0.03	99.2	88.7
Col-1003B·	47.2	0.01	40.6	0.19	10.75	0.15	0.21	0.02	99.2	88.7
Col-1003B·	47.1	0.01	40.8	0.15	10.71	0.15	0.23	0.03	99.2	88.7
Col-1003B·	47.6	0.02	41.2	0.18	10.86	0.22	0.21	0.04	100.4	88.7
Col-1003B·	47.3	0.02	40.8	0.20	10.81	0.16	0.20	0.02	99.5	88.6
Col-1003B·	47.6	0.02	41.3	0.17	10.90	0.14	0.24	0.03	100.5	88.6
Col-1003B·	47.1	0.02	40.6	0.18	10.80	0.22	0.28	0.04	99.2	88.6
Col-1003B·	47.7	0.02	41.7	0.18	10.96	0.15	0.23	0.01	100.9	88.6
Col-1003B·	47.7	0.02	41.3	0.18	10.98	0.15	0.19	0.05	100.5	88.6
Col-1003B·	47.5	0.01	41.2	0.20	10.96	0.23	0.21	0.03	100.3	88.5
Col-1003B·	47.7	0.01	40.7	0.21	11.03	0.13	0.20	0.01	99.9	88.5
Col-1003B·	47.1	0.02	40.6	0.16	10.89	0.18	0.22	0.04	99.2	88.5
Col-1003B·	46.9	0.01	40.5	0.17	10.91	0.20	0.19	0.05	99.0	88.5
Col-1003B·	47.7	0.00	41.4	0.17	11.11	0.22	0.24	0.04	100.9	88.5
Col-1003B·	47.4	0.00	40.9	0.20	11.06	0.22	0.21	0.05	100.0	88.4
Col-1003B·	46.9	0.01	40.7	0.14	10.95	0.13	0.17	0.03	99.1	88.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1003B·	47.3	0.00	41.4	0.21	11.07	0.14	0.23	0.03	100.4	88.4
Col-1003B·	47.6	0.01	41.3	0.16	11.14	0.18	0.22	0.02	100.6	88.4
Col-1003B·	47.5	0.00	41.3	0.18	11.15	0.19	0.22	0.04	100.6	88.4
Col-1003B·	47.2	0.01	40.7	0.22	11.07	0.17	0.14	0.12	99.6	88.4
Col-1003B·	46.7	0.01	40.9	0.16	11.01	0.15	0.19	0.03	99.2	88.3
Col-1003B·	46.9	0.01	40.5	0.17	11.07	0.23	0.20	0.03	99.1	88.3
Col-1003B·	46.8	0.00	40.8	0.15	11.09	0.22	0.22	0.03	99.3	88.3
Col-1003B·	47.0	0.01	40.8	0.16	11.16	0.16	0.20	0.02	99.5	88.2
Col-1003B·	46.7	0.01	40.9	0.16	11.11	0.22	0.22	0.03	99.4	88.2
Col-1003B·	47.3	0.01	41.2	0.17	11.26	0.15	0.20	0.03	100.3	88.2
Col-1003B·	47.1	0.01	41.1	0.17	11.25	0.17	0.23	0.05	100.1	88.2
Col-1003B·	47.4	0.00	40.8	0.22	11.35	0.16	0.16	0.04	100.1	88.2
Col-1003B·	46.8	0.01	40.8	0.18	11.22	0.17	0.23	0.04	99.5	88.2
Col-1003B·	47.0	0.01	40.4	0.15	11.26	0.18	0.19	0.02	99.2	88.2
Col-1003B·	46.9	0.01	40.6	0.18	11.26	0.18	0.23	0.02	99.3	88.1
Col-1003B·	46.8	0.02	40.5	0.17	11.24	0.20	0.20	0.03	99.1	88.1
Col-1003B·	47.0	0.01	40.9	0.20	11.31	0.15	0.16	0.04	99.7	88.1
Col-1003B·	47.1	0.01	41.1	0.20	11.35	0.18	0.20	0.01	100.1	88.1
Col-1003B·	47.1	0.00	40.5	0.21	11.36	0.23	0.16	0.02	99.6	88.1
Col-1003B·	47.0	0.01	40.9	0.16	11.36	0.14	0.21	0.01	99.8	88.1
Col-1003B·	47.0	0.01	40.5	0.20	11.40	0.22	0.20	0.02	99.5	88.0
Col-1003B·	46.9	0.01	40.7	0.16	11.39	0.21	0.21	0.01	99.6	88.0
Col-1003B·	47.0	0.01	40.8	0.21	11.49	0.23	0.21	0.03	100.0	87.9
Col-1003B·	47.0	0.02	41.0	0.16	11.50	0.17	0.18	0.02	100.0	87.9
Col-1003B·	46.7	0.02	40.5	0.22	11.49	0.19	0.15	0.04	99.3	87.9
Col-1003B·	47.2	0.03	40.9	0.20	11.60	0.15	0.19	0.01	100.3	87.9
Col-1003B·	46.8	0.02	40.6	0.17	11.60	0.22	0.24	0.05	99.7	87.8
Col-1003B·	46.4	0.00	40.8	0.41	12.16	0.22	0.15	0.05	100.1	87.2
Col-1003B·	44.9	0.11	39.6	0.29	13.69	0.24	0.19	0.06	99.0	85.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	50.6	0.05	41.9	0.12	7.50	0.18	0.54	0.03	100.9	92.3
Col-1005A·	50.0	0.01	41.8	0.12	7.49	0.12	0.53	0.08	100.2	92.2
Col-1005A·	49.4	0.03	41.4	0.11	7.45	0.17	0.55	0.06	99.18	92.2
Col-1005A·	49.9	0.01	41.8	0.13	7.52	0.16	0.56	0.07	100.1	92.2
Col-1005A·	50.0	0.01	41.9	0.14	7.58	0.09	0.42	0.06	100.2	92.2
Col-1005A·	50.2	0.02	41.9	0.13	7.65	0.09	0.60	0.08	100.7	92.1
Col-1005A·	49.9	0.01	41.0	0.14	7.62	0.09	0.42	0.05	99.28	92.1
Col-1005A·	50.0	0.01	41.8	0.14	7.66	0.08	0.43	0.07	100.1	92.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	49.8	0.04	41.7	0.14	7.68	0.17	0.57	0.08	100.2	92.0
Col-1005A·	50.1	0.02	41.7	0.11	7.72	0.11	0.45	0.12	100.3	92.0
Col-1005A·	49.6	0.01	41.6	0.14	7.67	0.12	0.47	0.07	99.72	92.0
Col-1005A·	50.3	0.03	41.8	0.14	7.77	0.17	0.48	0.21	100.8	92.0
Col-1005A·	50.3	0.01	42.2	0.14	7.80	0.14	0.42	0.05	101	92.0
Col-1005A·	49.9	0.01	41.8	0.15	7.74	0.11	0.41	0.05	100.2	92.0
Col-1005A·	49.9	0.01	41.6	0.13	7.76	0.07	0.52	0.06	100	92.0
Col-1005A·	49.6	0.04	41.7	0.12	7.72	0.11	0.53	0.03	99.83	92.0
Col-1005A·	49.7	0.02	41.7	0.12	7.77	0.15	0.60	0.11	100.2	91.9
Col-1005A·	50.1	0.01	41.8	0.14	7.84	0.14	0.51	0.05	100.6	91.9
Col-1005A·	49.7	0.02	41.7	0.13	7.79	0.11	0.43	0.04	99.94	91.9
Col-1005A·	50.2	0.00	42.0	0.10	7.86	0.08	0.47	0.03	100.7	91.9
Col-1005A·	50.0	0.03	41.8	0.13	7.84	0.11	0.48	0.07	100.5	91.9
Col-1005A·	49.4	0.02	41.4	0.12	7.77	0.14	0.54	0.12	99.57	91.9
Col-1005A·	50.2	0.02	41.9	0.14	7.88	0.18	0.42	0.07	100.7	91.9
Col-1005A·	49.9	0.03	41.7	0.17	7.85	0.12	0.42	0.17	100.4	91.9
Col-1005A·	49.9	0.02	41.7	0.11	7.87	0.15	0.61	0.12	100.5	91.9
Col-1005A·	50.0	0.01	41.7	0.13	7.93	0.06	0.53	0.09	100.5	91.8
Col-1005A·	49.5	0.03	41.3	0.13	7.84	0.14	0.50	0.05	99.47	91.8
Col-1005A·	49.8	0.01	41.9	0.14	7.93	0.15	0.42	0.08	100.4	91.8
Col-1005A·	49.9	0.01	41.4	0.13	7.96	0.13	0.55	0.07	100.1	91.8
Col-1005A·	49.6	0.03	41.5	0.13	7.98	0.05	0.52	0.08	99.9	91.7
Col-1005A·	49.8	0.04	41.8	0.10	8.01	0.09	0.65	0.12	100.6	91.7
Col-1005A·	49.3	0.03	41.2	0.12	7.94	0.10	0.48	0.10	99.3	91.7
Col-1005A·	49.8	0.04	41.3	0.13	8.01	0.12	0.44	0.09	99.91	91.7
Col-1005A·	50.0	0.02	41.6	0.13	8.04	0.16	0.46	0.04	100.5	91.7
Col-1005A·	49.4	0.00	41.4	0.11	7.96	0.12	0.52	0.08	99.53	91.7
Col-1005A·	49.0	0.01	41.7	0.19	7.90	0.23	0.33	0.03	99.34	91.7
Col-1005A·	49.6	0.01	41.4	0.12	8.02	0.12	0.56	0.09	99.91	91.7
Col-1005A·	49.9	0.01	42.0	0.09	8.06	0.13	0.36	0.02	100.6	91.7
Col-1005A·	49.9	0.02	41.5	0.12	8.06	0.11	0.49	0.10	100.3	91.7
Col-1005A·	49.6	0.02	41.5	0.13	8.02	0.09	0.59	0.05	99.95	91.7
Col-1005A·	49.7	0.02	41.7	0.11	8.05	0.11	0.54	0.05	100.3	91.7
Col-1005A·	49.8	0.03	41.6	0.16	8.08	0.19	0.38	0.04	100.2	91.7
Col-1005A·	49.6	0.02	41.6	0.23	8.05	0.06	0.53	0.04	100.1	91.7
Col-1005A·	49.9	0.02	42.0	0.13	8.13	0.10	0.47	0.08	100.8	91.6
Col-1005A·	49.6	0.01	41.7	0.14	8.08	0.13	0.45	0.03	100.1	91.6
Col-1005A·	49.6	0.02	41.5	0.12	8.11	0.13	0.49	0.07	100.1	91.6
Col-1005A·	49.4	0.02	41.3	0.13	8.07	0.12	0.53	0.06	99.65	91.6
Col-1005A·	49.8	0.02	41.8	0.13	8.14	0.14	0.49	0.06	100.5	91.6
Col-1005A·	50.0	0.01	41.6	0.13	8.17	0.11	0.48	0.06	100.5	91.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	49.8	0.02	41.6	0.10	8.15	0.11	0.43	0.21	100.4	91.6
Col-1005A·	49.8	0.03	41.9	0.12	8.15	0.16	0.49	0.07	100.8	91.6
Col-1005A·	49.7	0.02	41.4	0.11	8.13	0.13	0.46	0.09	100	91.6
Col-1005A·	49.9	0.02	41.8	0.13	8.18	0.17	0.55	0.04	100.7	91.6
Col-1005A·	49.6	0.03	41.5	0.12	8.14	0.17	0.53	0.04	100.2	91.6
Col-1005A·	49.8	0.02	42.0	0.13	8.17	0.11	0.51	0.02	100.7	91.6
Col-1005A·	49.3	0.01	41.3	0.12	8.10	0.11	0.55	0.10	99.6	91.6
Col-1005A·	49.6	0.02	41.6	0.12	8.14	0.13	0.49	0.08	100.2	91.6
Col-1005A·	50.1	0.03	41.8	0.14	8.23	0.10	0.35	0.04	100.7	91.6
Col-1005A·	49.5	0.02	41.5	0.13	8.14	0.12	0.49	0.07	99.98	91.6
Col-1005A·	49.9	0.02	41.7	0.13	8.21	0.05	0.53	0.13	100.7	91.5
Col-1005A·	49.7	0.01	41.5	0.11	8.19	0.13	0.54	0.05	100.2	91.5
Col-1005A·	49.5	0.02	41.5	0.12	8.16	0.16	0.50	0.05	100	91.5
Col-1005A·	49.5	0.01	41.5	0.13	8.19	0.14	0.53	0.08	100.2	91.5
Col-1005A·	50.0	0.01	41.7	0.13	8.29	0.06	0.50	0.05	100.8	91.5
Col-1005A·	49.6	0.01	41.6	0.13	8.22	0.09	0.51	0.05	100.3	91.5
Col-1005A·	49.8	0.02	41.8	0.12	8.25	0.13	0.52	0.10	100.7	91.5
Col-1005A·	49.8	0.04	42.0	0.12	8.28	0.16	0.49	0.07	100.9	91.5
Col-1005A·	48.9	0.01	41.6	0.14	8.13	0.15	0.38	0.24	99.5	91.5
Col-1005A·	49.2	0.01	41.3	0.09	8.21	0.16	0.32	0.11	99.38	91.4
Col-1005A·	49.5	0.01	41.7	0.12	8.27	0.10	0.59	0.09	100.4	91.4
Col-1005A·	49.9	0.03	41.6	0.12	8.33	0.20	0.37	0.03	100.5	91.4
Col-1005A·	49.1	0.02	41.3	0.13	8.21	0.11	0.49	0.10	99.45	91.4
Col-1005A·	49.3	0.04	41.1	0.13	8.25	0.11	0.51	0.20	99.63	91.4
Col-1005A·	48.9	0.01	41.3	0.13	8.21	0.11	0.34	0.03	99.06	91.4
Col-1005A·	49.0	0.01	41.4	0.13	8.23	0.11	0.56	0.04	99.42	91.4
Col-1005A·	49.8	0.02	41.9	0.12	8.38	0.15	0.50	0.06	100.9	91.4
Col-1005A·	49.5	0.01	41.5	0.12	8.33	0.15	0.47	0.02	100.1	91.4
Col-1005A·	49.3	0.01	41.7	0.13	8.29	0.11	0.42	0.06	99.98	91.4
Col-1005A·	49.9	0.01	41.8	0.12	8.40	0.15	0.55	0.06	100.9	91.4
Col-1005A·	49.3	0.01	41.3	0.11	8.32	0.12	0.45	0.04	99.59	91.3
Col-1005A·	49.6	0.02	41.8	0.13	8.38	0.07	0.49	0.04	100.6	91.3
Col-1005A·	49.6	0.03	41.7	0.14	8.38	0.12	0.39	0.08	100.4	91.3
Col-1005A·	49.7	0.02	41.7	0.18	8.41	0.26	0.37	0.04	100.7	91.3
Col-1005A·	49.4	0.01	41.1	0.13	8.37	0.08	0.53	0.05	99.69	91.3
Col-1005A·	49.5	0.00	41.7	0.14	8.39	0.10	0.46	0.05	100.3	91.3
Col-1005A·	49.6	0.01	41.9	0.13	8.40	0.10	0.48	0.05	100.6	91.3
Col-1005A·	49.4	0.01	41.4	0.12	8.38	0.06	0.46	0.04	99.87	91.3
Col-1005A·	49.5	0.01	41.7	0.12	8.41	0.01	0.55	0.07	100.5	91.3
Col-1005A·	49.8	0.02	41.6	0.11	8.46	0.08	0.48	0.07	100.6	91.3
Col-1005A·	49.6	0.00	41.5	0.13	8.42	0.15	0.51	0.06	100.3	91.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	49.3	0.03	41.4	0.12	8.38	0.12	0.48	0.07	99.89	91.3
Col-1005A·	49.6	0.04	41.8	0.11	8.44	0.13	0.51	0.04	100.7	91.3
Col-1005A·	49.7	0.03	41.7	0.13	8.46	0.14	0.49	0.06	100.7	91.3
Col-1005A·	49.2	0.00	41.2	0.13	8.37	0.10	0.51	0.06	99.6	91.3
Col-1005A·	49.7	0.03	41.4	0.12	8.48	0.19	0.48	0.05	100.4	91.3
Col-1005A·	49.6	0.04	41.6	0.14	8.46	0.15	0.46	0.08	100.5	91.3
Col-1005A·	49.5	0.04	41.9	0.14	8.45	0.07	0.49	0.16	100.8	91.3
Col-1005A·	49.5	0.02	41.7	0.14	8.46	0.17	0.53	0.09	100.7	91.3
Col-1005A·	49.1	0.01	41.2	0.13	8.39	0.17	0.51	0.08	99.59	91.3
Col-1005A·	49.7	0.03	41.8	0.11	8.50	0.16	0.40	0.07	100.7	91.3
Col-1005A·	49.3	0.01	41.3	0.12	8.43	0.17	0.41	0.05	99.79	91.2
Col-1005A·	49.3	0.01	41.3	0.12	8.43	0.15	0.47	0.10	99.85	91.2
Col-1005A·	49.3	0.01	41.3	0.12	8.43	0.19	0.46	0.08	99.85	91.2
Col-1005A·	49.4	0.00	41.6	0.12	8.47	0.15	0.48	0.08	100.4	91.2
Col-1005A·	49.6	0.01	42.0	0.12	8.49	0.16	0.50	0.06	101	91.2
Col-1005A·	49.1	0.02	41.5	0.14	8.41	0.11	0.44	0.07	99.75	91.2
Col-1005A·	49.6	0.02	41.8	0.13	8.51	0.12	0.48	0.07	100.7	91.2
Col-1005A·	49.2	0.04	41.6	0.15	8.46	0.10	0.38	0.07	100.1	91.2
Col-1005A·	49.7	0.01	41.7	0.13	8.54	0.12	0.49	0.04	100.7	91.2
Col-1005A·	49.4	0.02	41.3	0.13	8.50	0.14	0.49	0.11	100.1	91.2
Col-1005A·	49.5	0.02	41.7	0.16	8.53	0.16	0.39	0.05	100.5	91.2
Col-1005A·	49.5	0.06	41.5	0.16	8.53	0.13	0.50	0.08	100.5	91.2
Col-1005A·	49.4	0.02	41.7	0.12	8.51	0.13	0.47	0.07	100.4	91.2
Col-1005A·	49.8	0.04	41.8	0.12	8.58	0.11	0.46	0.08	101	91.2
Col-1005A·	49.0	0.03	41.6	0.15	8.45	0.20	0.38	0.02	99.87	91.2
Col-1005A·	49.3	0.03	41.4	0.13	8.50	0.16	0.44	0.09	100	91.2
Col-1005A·	49.2	0.01	41.6	0.12	8.49	0.21	0.54	0.13	100.3	91.2
Col-1005A·	49.5	0.02	41.9	0.14	8.55	0.20	0.38	0.02	100.7	91.2
Col-1005A·	49.5	0.03	41.9	0.13	8.56	0.05	0.47	0.04	100.7	91.2
Col-1005A·	49.2	0.01	41.4	0.12	8.50	0.16	0.48	0.03	99.83	91.2
Col-1005A·	49.4	0.00	41.3	0.13	8.54	0.20	0.46	0.06	100.1	91.2
Col-1005A·	49.4	0.01	41.8	0.13	8.54	0.12	0.40	0.07	100.5	91.2
Col-1005A·	49.3	0.02	41.4	0.12	8.55	0.14	0.46	0.07	100.1	91.1
Col-1005A·	49.4	0.02	41.7	0.12	8.57	0.13	0.50	0.04	100.5	91.1
Col-1005A·	49.6	0.03	41.7	0.13	8.61	0.13	0.40	0.08	100.8	91.1
Col-1005A·	49.7	0.01	41.8	0.13	8.62	0.06	0.47	0.05	100.8	91.1
Col-1005A·	49.5	0.01	41.7	0.12	8.59	0.12	0.49	0.08	100.6	91.1
Col-1005A·	49.4	-0.01	41.6	0.11	8.57	0.14	0.45	0.08	100.3	91.1
Col-1005A·	49.5	0.01	41.7	0.13	8.60	0.09	0.40	0.03	100.5	91.1
Col-1005A·	46.8	0.02	43.1	0.20	8.13	0.18	0.47	0.15	99.05	91.1
Col-1005A·	49.4	0.01	41.5	0.11	8.58	0.16	0.43	0.06	100.2	91.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	49.1	0.01	41.5	0.14	8.55	0.19	0.39	0.03	99.99	91.1
Col-1005A·	49.6	0.01	41.9	0.12	8.64	0.16	0.47	0.05	100.9	91.1
Col-1005A·	49.6	0.01	41.9	0.12	8.64	0.14	0.56	0.12	101	91.1
Col-1005A·	48.8	0.02	41.5	0.12	8.50	0.11	0.49	0.03	99.49	91.1
Col-1005A·	49.7	0.01	41.4	0.13	8.67	0.12	0.43	0.05	100.5	91.1
Col-1005A·	49.5	0.01	41.6	0.16	8.64	0.22	0.33	0.04	100.5	91.1
Col-1005A·	49.6	0.03	41.8	0.12	8.68	0.12	0.48	0.07	100.9	91.1
Col-1005A·	48.3	0.21	41.8	0.73	8.46	0.20	0.28	0.12	100.1	91.1
Col-1005A·	49.5	0.02	41.8	0.13	8.68	0.21	0.41	0.06	100.9	91.1
Col-1005A·	49.0	0.01	41.3	0.12	8.59	0.21	0.48	0.05	99.71	91.0
Col-1005A·	49.4	0.01	41.5	0.13	8.67	0.16	0.42	0.05	100.4	91.0
Col-1005A·	49.1	0.02	41.3	0.12	8.61	0.16	0.53	0.11	99.9	91.0
Col-1005A·	49.6	0.02	41.8	0.13	8.70	0.08	0.42	0.05	100.8	91.0
Col-1005A·	49.6	0.01	41.8	0.12	8.71	0.18	0.38	0.08	100.9	91.0
Col-1005A·	49.4	0.02	41.9	0.12	8.67	0.15	0.45	0.05	100.7	91.0
Col-1005A·	49.2	0.02	41.7	0.13	8.64	0.17	0.45	0.05	100.3	91.0
Col-1005A·	49.3	0.02	41.8	0.12	8.66	0.14	0.43	0.06	100.5	91.0
Col-1005A·	49.5	0.01	41.7	0.14	8.70	0.17	0.39	0.07	100.6	91.0
Col-1005A·	49.6	0.00	41.6	0.16	8.73	0.22	0.30	0.04	100.6	91.0
Col-1005A·	49.5	0.02	41.9	0.12	8.72	0.14	0.48	0.07	101	91.0
Col-1005A·	49.1	0.00	41.5	0.13	8.64	0.19	0.41	0.06	100	91.0
Col-1005A·	49.0	0.00	41.1	0.14	8.63	0.11	0.41	0.06	99.47	91.0
Col-1005A·	49.4	0.01	41.7	0.12	8.70	0.10	0.38	0.05	100.5	91.0
Col-1005A·	49.3	0.00	41.3	0.13	8.68	0.15	0.41	0.07	100.1	91.0
Col-1005A·	49.5	0.03	41.7	0.14	8.73	0.07	0.40	0.07	100.7	91.0
Col-1005A·	49.1	0.01	41.2	0.12	8.65	0.13	0.52	0.07	99.8	91.0
Col-1005A·	49.5	0.01	41.9	0.13	8.73	0.13	0.47	0.07	100.9	91.0
Col-1005A·	49.4	0.01	41.5	0.13	8.71	0.09	0.48	0.04	100.4	91.0
Col-1005A·	49.3	0.03	41.9	0.14	8.72	0.15	0.48	0.04	100.8	91.0
Col-1005A·	49.5	0.02	41.7	0.13	8.74	0.16	0.35	0.12	100.6	91.0
Col-1005A·	49.0	0.01	41.4	0.12	8.67	0.11	0.37	0.05	99.8	91.0
Col-1005A·	49.2	0.01	41.4	0.12	8.71	0.18	0.51	0.04	100.1	91.0
Col-1005A·	49.3	0.01	41.3	0.12	8.73	0.09	0.47	0.08	100	91.0
Col-1005A·	49.0	0.02	41.1	0.12	8.67	0.08	0.47	0.10	99.49	91.0
Col-1005A·	49.3	0.02	41.8	0.12	8.76	0.12	0.45	0.06	100.6	90.9
Col-1005A·	49.1	0.00	41.4	0.11	8.72	0.16	0.46	0.08	100	90.9
Col-1005A·	49.5	0.03	41.8	0.13	8.79	0.17	0.42	0.04	100.8	90.9
Col-1005A·	49.7	0.02	41.7	0.12	8.83	0.10	0.41	0.06	100.9	90.9
Col-1005A·	49.1	0.04	41.7	0.18	8.73	0.14	0.49	0.09	100.5	90.9
Col-1005A·	49.1	0.02	41.6	0.12	8.74	0.14	0.43	0.06	100.3	90.9
Col-1005A·	49.2	0.02	41.4	0.12	8.74	0.16	0.53	0.06	100.2	90.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	49.6	0.02	41.7	0.12	8.84	0.15	0.47	0.08	101	90.9
Col-1005A·	49.4	0.01	41.8	0.13	8.81	0.15	0.45	0.07	100.9	90.9
Col-1005A·	49.4	0.01	41.6	0.12	8.80	0.13	0.41	0.05	100.5	90.9
Col-1005A·	49.1	0.02	41.8	0.13	8.77	0.15	0.43	0.08	100.5	90.9
Col-1005A·	49.2	0.02	41.7	0.12	8.79	0.16	0.41	0.07	100.5	90.9
Col-1005A·	48.9	0.01	41.5	0.13	8.73	0.14	0.43	0.06	99.94	90.9
Col-1005A·	49.1	0.01	41.4	0.13	8.78	0.17	0.41	0.03	100.1	90.9
Col-1005A·	49.3	0.02	41.7	0.12	8.83	0.15	0.39	0.07	100.7	90.9
Col-1005A·	49.3	0.02	41.7	0.13	8.83	0.07	0.44	0.05	100.5	90.9
Col-1005A·	49.2	0.02	41.4	0.13	8.82	0.13	0.47	0.10	100.3	90.9
Col-1005A·	49.4	0.02	41.7	0.16	8.85	0.25	0.27	0.05	100.7	90.9
Col-1005A·	49.1	0.02	41.4	0.18	8.80	0.30	0.29	0.01	100.1	90.9
Col-1005A·	49.1	0.01	41.6	0.13	8.81	0.12	0.41	0.07	100.3	90.9
Col-1005A·	49.3	0.02	41.4	0.13	8.86	0.06	0.51	0.07	100.4	90.9
Col-1005A·	49.1	0.01	41.4	0.13	8.81	0.06	0.47	0.05	100	90.8
Col-1005A·	49.2	0.02	41.8	0.18	8.85	0.14	0.47	0.09	100.8	90.8
Col-1005A·	49.5	0.01	41.7	0.12	8.89	0.10	0.38	0.04	100.7	90.8
Col-1005A·	48.8	0.01	41.4	0.14	8.76	0.12	0.37	0.05	99.57	90.8
Col-1005A·	49.3	0.01	41.7	0.12	8.87	0.14	0.48	0.07	100.8	90.8
Col-1005A·	49.4	0.02	41.8	0.13	8.89	0.19	0.35	0.13	101	90.8
Col-1005A·	49.5	0.00	41.7	0.13	8.90	0.09	0.46	0.06	100.9	90.8
Col-1005A·	49.3	0.04	41.6	0.13	8.87	0.17	0.39	0.06	100.6	90.8
Col-1005A·	49.4	0.02	41.4	0.14	8.89	0.10	0.41	0.05	100.4	90.8
Col-1005A·	49.3	0.01	41.8	0.12	8.88	0.14	0.44	0.06	100.7	90.8
Col-1005A·	49.5	0.01	41.8	0.12	8.92	0.08	0.40	0.01	100.8	90.8
Col-1005A·	49.2	0.02	41.9	0.12	8.89	0.14	0.38	0.06	100.7	90.8
Col-1005A·	49.5	0.01	41.7	0.12	8.94	0.10	0.47	0.06	100.9	90.8
Col-1005A·	49.2	0.02	41.6	0.14	8.88	0.23	0.35	0.00	100.4	90.8
Col-1005A·	49.3	0.01	42.0	0.12	8.92	0.11	0.53	0.07	101	90.8
Col-1005A·	49.2	0.02	41.6	0.14	8.90	0.14	0.44	0.08	100.5	90.8
Col-1005A·	49.3	0.02	41.9	0.11	8.92	0.11	0.41	0.05	100.8	90.8
Col-1005A·	49.3	0.02	41.4	0.14	8.93	0.17	0.46	0.05	100.4	90.8
Col-1005A·	49.3	0.04	41.8	0.13	8.94	0.21	0.44	0.04	100.9	90.8
Col-1005A·	48.9	0.03	41.3	0.14	8.89	0.19	0.41	0.32	100.2	90.8
Col-1005A·	49.1	0.03	41.4	0.13	8.92	0.10	0.37	0.07	100.1	90.7
Col-1005A·	49.3	0.01	41.7	0.13	8.96	0.08	0.43	0.07	100.7	90.7
Col-1005A·	49.2	0.02	41.5	0.12	8.95	0.10	0.48	0.05	100.4	90.7
Col-1005A·	49.3	0.01	41.7	0.13	8.97	0.14	0.47	0.05	100.8	90.7
Col-1005A·	49.2	0.02	41.6	0.12	8.96	0.11	0.40	0.06	100.4	90.7
Col-1005A·	49.1	0.01	41.4	0.13	8.93	0.15	0.39	0.06	100.2	90.7
Col-1005A·	49.1	0.02	41.8	0.13	8.96	0.12	0.44	0.05	100.6	90.7

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	49.1	0.01	41.5	0.14	8.95	0.15	0.33	0.01	100.2	90.7
Col-1005A·	48.8	0.02	41.6	0.13	8.91	0.20	0.38	0.05	100.1	90.7
Col-1005A·	48.7	0.02	41.4	0.12	8.90	0.15	0.44	0.07	99.85	90.7
Col-1005A·	49.3	0.01	41.9	0.16	9.00	0.15	0.40	0.04	100.9	90.7
Col-1005A·	49.1	0.03	41.6	0.14	8.98	0.11	0.48	0.07	100.5	90.7
Col-1005A·	49.3	0.03	41.4	0.13	9.03	0.16	0.38	0.04	100.5	90.7
Col-1005A·	48.9	0.02	41.5	0.15	8.96	0.15	0.38	0.04	100.1	90.7
Col-1005A·	48.7	0.00	41.4	0.14	8.94	0.14	0.45	0.05	99.81	90.7
Col-1005A·	49.3	0.01	41.9	0.13	9.04	0.15	0.39	0.06	101	90.7
Col-1005A·	49.2	0.02	41.5	0.14	9.05	0.12	0.41	0.05	100.5	90.7
Col-1005A·	48.8	0.01	41.4	0.14	8.97	0.13	0.39	0.10	99.87	90.7
Col-1005A·	49.5	0.01	41.7	0.13	9.10	0.16	0.42	0.05	101	90.6
Col-1005A·	49.3	0.02	41.7	0.12	9.08	0.08	0.39	0.04	100.7	90.6
Col-1005A·	49.0	0.00	41.4	0.13	9.02	0.09	0.41	0.04	100	90.6
Col-1005A·	49.3	0.01	41.9	0.13	9.09	0.12	0.37	0.06	100.9	90.6
Col-1005A·	49.1	0.01	41.8	0.13	9.07	0.16	0.41	0.03	100.8	90.6
Col-1005A·	49.1	0.02	41.7	0.13	9.07	0.10	0.40	0.07	100.6	90.6
Col-1005A·	48.5	0.01	41.1	0.13	8.95	0.16	0.40	0.08	99.31	90.6
Col-1005A·	49.4	0.01	41.7	0.13	9.13	0.14	0.37	0.02	100.9	90.6
Col-1005A·	49.1	0.02	41.9	0.13	9.09	0.09	0.38	0.05	100.7	90.6
Col-1005A·	49.1	0.01	42.0	0.12	9.09	0.12	0.45	0.05	100.9	90.6
Col-1005A·	48.8	0.02	41.3	0.14	9.04	0.14	0.43	0.06	99.92	90.6
Col-1005A·	49.2	0.01	41.7	0.15	9.12	0.10	0.42	0.03	100.8	90.6
Col-1005A·	48.9	0.00	41.4	0.12	9.07	0.19	0.39	0.07	100.2	90.6
Col-1005A·	48.8	0.02	41.3	0.13	9.05	0.10	0.38	0.07	99.88	90.6
Col-1005A·	49.2	0.02	41.6	0.13	9.13	0.18	0.45	0.05	100.7	90.6
Col-1005A·	48.9	0.09	41.4	0.23	9.09	0.07	0.39	0.14	100.3	90.6
Col-1005A·	49.3	0.03	41.8	0.12	9.15	0.12	0.46	0.06	101	90.6
Col-1005A·	49.1	0.00	41.6	0.12	9.13	0.10	0.39	0.05	100.5	90.5
Col-1005A·	49.2	0.02	41.5	0.12	9.15	0.13	0.38	0.03	100.5	90.5
Col-1005A·	48.8	0.03	41.5	0.13	9.10	0.11	0.41	0.05	100.1	90.5
Col-1005A·	49.3	0.00	41.7	0.14	9.19	0.15	0.39	0.06	100.9	90.5
Col-1005A·	49.1	0.02	41.5	0.12	9.17	0.07	0.46	0.09	100.6	90.5
Col-1005A·	49.0	0.01	41.8	0.14	9.14	0.15	0.35	0.05	100.6	90.5
Col-1005A·	49.2	0.02	41.8	0.14	9.20	0.14	0.42	0.06	101	90.5
Col-1005A·	49.2	0.01	41.8	0.13	9.19	0.09	0.43	0.05	100.8	90.5
Col-1005A·	49.0	0.02	41.7	0.12	9.17	0.17	0.43	0.04	100.7	90.5
Col-1005A·	49.1	0.02	41.5	0.13	9.18	0.16	0.31	0.10	100.5	90.5
Col-1005A·	49.0	0.00	41.9	0.14	9.18	0.14	0.34	0.05	100.8	90.5
Col-1005A·	49.1	0.02	41.7	0.12	9.19	0.21	0.37	0.05	100.8	90.5
Col-1005A·	48.9	0.02	41.7	0.13	9.15	0.14	0.40	0.05	100.5	90.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	49.2	0.02	41.7	0.14	9.22	0.18	0.32	0.06	100.9	90.5
Col-1005A·	48.9	0.01	41.2	0.13	9.17	0.15	0.46	0.09	100.1	90.5
Col-1005A·	49.0	0.01	41.8	0.13	9.20	0.11	0.40	0.06	100.8	90.5
Col-1005A·	49.2	0.00	41.8	0.13	9.24	0.12	0.34	0.06	100.9	90.5
Col-1005A·	49.2	0.02	41.7	0.14	9.25	0.15	0.37	0.08	100.9	90.5
Col-1005A·	48.7	0.00	41.5	0.13	9.16	0.18	0.38	0.06	100.1	90.5
Col-1005A·	49.2	0.04	41.4	0.13	9.26	0.18	0.41	0.08	100.7	90.5
Col-1005A·	49.0	0.00	41.6	0.13	9.23	0.15	0.43	0.02	100.6	90.4
Col-1005A·	49.0	0.02	41.6	0.11	9.23	0.17	0.45	0.06	100.7	90.4
Col-1005A·	48.7	0.00	41.5	0.12	9.18	0.10	0.36	0.05	99.94	90.4
Col-1005A·	49.1	0.02	41.4	0.13	9.26	0.09	0.42	0.06	100.4	90.4
Col-1005A·	48.5	0.01	41.1	0.14	9.16	0.10	0.42	0.06	99.48	90.4
Col-1005A·	48.5	0.04	41.4	0.14	9.17	0.16	0.37	0.12	99.94	90.4
Col-1005A·	48.9	0.02	41.5	0.12	9.26	0.07	0.39	0.05	100.3	90.4
Col-1005A·	48.8	0.01	41.5	0.13	9.26	0.18	0.40	0.06	100.3	90.4
Col-1005A·	49.0	0.03	41.5	0.14	9.33	0.10	0.37	0.03	100.5	90.4
Col-1005A·	48.9	0.00	41.7	0.15	9.34	0.16	0.41	0.05	100.8	90.3
Col-1005A·	48.7	0.02	41.1	0.13	9.32	0.15	0.42	0.04	99.94	90.3
Col-1005A·	48.9	0.01	41.7	0.13	9.36	0.14	0.38	0.04	100.7	90.3
Col-1005A·	49.1	0.01	41.7	0.13	9.39	0.13	0.39	0.07	100.9	90.3
Col-1005A·	48.9	0.01	41.7	0.13	9.37	0.14	0.37	0.10	100.8	90.3
Col-1005A·	49.2	0.03	41.6	0.12	9.42	0.11	0.36	0.05	100.9	90.3
Col-1005A·	48.8	0.00	41.5	0.14	9.35	0.12	0.36	0.05	100.3	90.3
Col-1005A·	48.9	0.02	41.8	0.18	9.37	0.17	0.20	0.03	100.6	90.3
Col-1005A·	48.9	0.02	41.7	0.14	9.37	0.11	0.36	0.04	100.7	90.3
Col-1005A·	48.7	0.03	41.7	0.15	9.34	0.22	0.28	0.03	100.4	90.3
Col-1005A·	48.6	0.01	41.2	0.12	9.31	0.16	0.35	0.08	99.76	90.3
Col-1005A·	49.1	0.01	41.8	0.12	9.42	0.18	0.36	0.03	101	90.3
Col-1005A·	49.1	0.00	41.7	0.12	9.44	0.17	0.40	0.11	101	90.3
Col-1005A·	49.0	0.01	42.0	0.13	9.44	0.08	0.32	0.03	101	90.2
Col-1005A·	48.9	0.02	41.6	0.15	9.43	0.13	0.35	0.06	100.6	90.2
Col-1005A·	48.6	-0.01	41.6	0.16	9.37	0.23	0.31	0.04	100.3	90.2
Col-1005A·	49.0	0.02	41.3	0.12	9.46	0.13	0.30	0.02	100.3	90.2
Col-1005A·	49.2	0.03	41.4	0.14	9.52	0.18	0.36	0.05	100.9	90.2
Col-1005A·	48.7	0.00	41.5	0.12	9.44	0.15	0.32	0.04	100.2	90.2
Col-1005A·	48.8	0.03	41.5	0.16	9.46	0.24	0.19	0.03	100.4	90.2
Col-1005A·	48.8	0.01	41.5	0.13	9.48	0.11	0.38	0.05	100.5	90.2
Col-1005A·	48.7	0.00	41.6	0.17	9.45	0.24	0.23	0.03	100.3	90.2
Col-1005A·	48.6	0.01	41.2	0.14	9.44	0.13	0.35	0.06	99.9	90.2
Col-1005A·	48.8	0.02	41.8	0.18	9.49	0.28	0.17	0.04	100.8	90.2
Col-1005A·	48.5	0.00	41.6	0.14	9.44	0.16	0.46	0.03	100.4	90.2

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	48.7	0.02	41.6	0.19	9.47	0.17	0.19	0.02	100.3	90.2
Col-1005A·	48.3	0.04	41.1	0.15	9.43	0.14	0.36	0.06	99.64	90.1
Col-1005A·	48.9	0.01	41.5	0.14	9.53	0.21	0.39	0.07	100.7	90.1
Col-1005A·	48.8	0.02	41.7	0.12	9.54	0.15	0.35	0.01	100.7	90.1
Col-1005A·	48.7	0.01	41.7	0.12	9.52	0.10	0.30	0.02	100.5	90.1
Col-1005A·	48.8	-0.01	41.9	0.12	9.54	0.08	0.35	0.06	100.8	90.1
Col-1005A·	48.6	0.01	41.4	0.14	9.53	0.18	0.39	0.05	100.4	90.1
Col-1005A·	49.0	0.01	41.5	0.13	9.60	0.13	0.43	0.08	100.9	90.1
Col-1005A·	48.5	0.02	41.5	0.13	9.52	0.11	0.37	0.05	100.2	90.1
Col-1005A·	48.3	0.01	41.2	0.14	9.49	0.23	0.36	0.07	99.81	90.1
Col-1005A·	48.5	0.01	41.6	0.17	9.53	0.20	0.25	0.11	100.4	90.1
Col-1005A·	48.8	0.01	41.7	0.13	9.59	0.07	0.38	0.03	100.7	90.1
Col-1005A·	48.8	0.01	41.4	0.16	9.62	0.17	0.36	0.02	100.6	90.0
Col-1005A·	48.5	0.00	41.6	0.13	9.56	0.16	0.35	0.02	100.4	90.0
Col-1005A·	48.8	0.01	41.7	0.05	9.63	0.13	0.41	0.01	100.8	90.0
Col-1005A·	48.4	0.01	41.2	0.15	9.54	0.24	0.32	0.05	99.93	90.0
Col-1005A·	48.9	0.00	41.6	0.15	9.65	0.14	0.31	0.03	100.8	90.0
Col-1005A·	48.4	-0.01	41.5	0.14	9.56	0.14	0.30	0.05	100.1	90.0
Col-1005A·	48.6	0.03	41.2	0.13	9.60	0.21	0.38	0.05	100.3	90.0
Col-1005A·	48.7	0.01	41.5	0.16	9.62	0.22	0.31	0.05	100.6	90.0
Col-1005A·	48.6	0.01	41.2	0.12	9.64	0.18	0.39	0.04	100.1	90.0
Col-1005A·	48.5	0.00	41.7	0.14	9.63	0.13	0.29	0.02	100.4	90.0
Col-1005A·	48.9	0.00	41.1	0.14	9.72	0.20	0.38	0.08	100.6	90.0
Col-1005A·	48.7	0.02	41.8	0.13	9.70	0.10	0.34	0.02	100.8	90.0
Col-1005A·	48.6	0.02	41.7	0.13	9.70	0.16	0.40	0.08	100.8	89.9
Col-1005A·	48.4	0.02	41.4	0.14	9.66	0.14	0.38	0.04	100.2	89.9
Col-1005A·	48.6	0.02	41.5	0.16	9.71	0.18	0.34	0.06	100.6	89.9
Col-1005A·	48.4	0.02	41.3	0.12	9.67	0.10	0.38	0.08	100.1	89.9
Col-1005A·	48.8	0.02	41.8	0.14	9.76	0.10	0.30	0.03	100.9	89.9
Col-1005A·	48.6	0.02	41.4	0.14	9.73	0.12	0.30	0.11	100.5	89.9
Col-1005A·	48.9	0.02	41.2	0.17	9.81	0.21	0.33	0.07	100.8	89.9
Col-1005A·	48.7	0.02	41.7	0.14	9.77	0.17	0.28	0.06	100.8	89.9
Col-1005A·	48.1	0.01	41.3	0.12	9.67	0.11	0.37	0.05	99.77	89.9
Col-1005A·	48.6	0.01	41.6	0.14	9.77	0.15	0.35	0.03	100.7	89.9
Col-1005A·	48.5	0.03	41.5	0.15	9.76	0.13	0.32	0.04	100.5	89.9
Col-1005A·	48.3	0.00	41.4	0.15	9.72	0.16	0.27	0.03	100	89.9
Col-1005A·	48.5	0.00	41.4	0.15	9.77	0.23	0.34	0.07	100.5	89.9
Col-1005A·	48.4	0.00	41.4	0.12	9.75	0.09	0.36	0.05	100.2	89.8
Col-1005A·	49.0	0.00	41.4	0.12	9.92	0.18	0.29	0.05	101	89.8
Col-1005A·	48.3	0.02	41.2	0.14	9.78	0.20	0.24	0.03	99.88	89.8
Col-1005A·	48.3	0.01	41.5	0.13	9.80	0.14	0.33	0.02	100.3	89.8

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	48.7	0.01	41.7	0.12	9.88	0.19	0.34	0.05	101	89.8
Col-1005A·	48.7	0.01	41.4	0.17	9.90	0.22	0.17	0.04	100.6	89.8
Col-1005A·	48.5	0.00	41.5	0.16	9.87	0.20	0.32	0.04	100.7	89.8
Col-1005A·	48.0	-0.01	41.5	0.16	9.77	0.16	0.34	0.02	99.94	89.8
Col-1005A·	48.8	0.02	41.6	0.14	9.95	0.14	0.30	0.03	101	89.7
Col-1005A·	48.7	0.02	41.5	0.11	9.92	0.14	0.37	0.05	100.8	89.7
Col-1005A·	48.6	0.00	41.7	0.13	9.91	0.18	0.36	0.04	100.9	89.7
Col-1005A·	48.4	0.02	41.3	0.13	9.88	0.16	0.35	0.03	100.3	89.7
Col-1005A·	48.3	0.00	41.4	0.16	9.87	0.15	0.28	0.05	100.2	89.7
Col-1005A·	48.2	0.01	41.4	0.15	9.87	0.13	0.32	0.04	100.1	89.7
Col-1005A·	48.5	0.01	41.6	0.13	9.95	0.11	0.32	0.01	100.6	89.7
Col-1005A·	48.7	0.01	41.7	0.15	9.99	0.07	0.27	0.04	100.9	89.7
Col-1005A·	48.5	0.00	41.1	0.14	9.96	0.13	0.34	0.04	100.2	89.7
Col-1005A·	48.6	0.00	41.7	0.15	9.99	0.19	0.31	0.04	101	89.7
Col-1005A·	48.1	0.01	41.3	0.19	9.91	0.31	0.18	0.04	100.1	89.6
Col-1005A·	48.5	0.00	41.6	0.14	9.99	0.12	0.35	0.04	100.7	89.6
Col-1005A·	47.9	0.02	42.2	0.14	9.90	0.12	0.35	0.01	100.7	89.6
Col-1005A·	48.6	0.01	41.9	0.14	10.05	0.13	0.21	0.00	101	89.6
Col-1005A·	48.7	0.01	41.3	0.16	10.07	0.18	0.29	0.04	100.7	89.6
Col-1005A·	48.6	0.01	41.4	0.17	10.07	0.25	0.23	0.03	100.7	89.6
Col-1005A·	48.1	0.00	41.4	0.12	10.04	0.24	0.28	0.07	100.3	89.5
Col-1005A·	48.6	0.01	41.6	0.13	10.16	0.09	0.25	-0.01	100.9	89.5
Col-1005A·	48.3	0.01	41.4	0.22	10.11	0.27	0.11	0.01	100.5	89.5
Col-1005A·	48.3	0.01	41.4	0.18	10.13	0.26	0.20	0.02	100.5	89.5
Col-1005A·	48.1	0.03	41.0	0.14	10.12	0.24	0.30	0.04	99.97	89.4
Col-1005A·	48.4	0.01	41.4	0.15	10.19	0.19	0.25	0.02	100.6	89.4
Col-1005A·	48.3	0.02	41.8	0.14	10.18	0.16	0.27	0.03	100.9	89.4
Col-1005A·	48.2	0.01	41.7	0.06	10.18	0.14	0.37	0.01	100.7	89.4
Col-1005A·	48.1	0.05	41.5	0.17	10.20	0.18	0.37	0.11	100.7	89.4
Col-1005A·	48.5	0.01	41.6	0.20	10.29	0.25	0.10	0.02	100.9	89.4
Col-1005A·	47.5	0.02	41.6	0.12	10.10	0.13	0.29	0.03	99.74	89.3
Col-1005A·	48.5	0.03	41.5	0.15	10.34	0.12	0.27	0.07	101	89.3
Col-1005A·	48.0	-0.01	40.9	0.16	10.26	0.17	0.30	0.05	99.85	89.3
Col-1005A·	48.2	0.02	41.5	0.17	10.31	0.20	0.23	0.05	100.7	89.3
Col-1005A·	47.6	0.00	41.0	0.17	10.20	0.19	0.20	0.02	99.43	89.3
Col-1005A·	47.8	0.06	41.5	0.13	10.24	0.16	0.33	0.05	100.2	89.3
Col-1005A·	48.0	0.00	41.1	0.20	10.30	0.25	0.13	0.02	100	89.3
Col-1005A·	48.3	0.03	41.5	0.15	10.36	0.17	0.23	0.02	100.7	89.3
Col-1005A·	48.1	0.02	41.3	0.14	10.33	0.16	0.25	0.02	100.4	89.3
Col-1005A·	48.2	0.01	41.7	0.13	10.36	0.15	0.27	0.07	100.9	89.2
Col-1005A·	48.3	0.00	41.5	0.11	10.37	0.16	0.31	0.04	100.7	89.2

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1005A·	47.8	0.01	41.2	0.16	10.28	0.25	0.22	0.02	99.97	89.2
Col-1005A·	48.1	0.00	41.5	0.15	10.35	0.18	0.24	0.03	100.5	89.2
Col-1005A·	48.1	0.01	41.6	0.13	10.35	0.08	0.40	0.05	100.8	89.2
Col-1005A·	48.3	0.01	41.4	0.14	10.41	0.13	0.25	0.04	100.7	89.2
Col-1005A·	48.2	0.01	41.6	0.17	10.39	0.21	0.21	0.03	100.8	89.2
Col-1005A·	48.2	0.02	41.4	0.13	10.43	0.12	0.30	0.05	100.6	89.2
Col-1005A·	48.3	0.02	41.5	0.15	10.47	0.16	0.21	0.02	100.8	89.2
Col-1005A·	48.2	0.00	41.5	0.13	10.48	0.19	0.22	0.04	100.7	89.1
Col-1005A·	48.1	0.00	41.6	0.05	10.48	0.09	0.37	0.03	100.7	89.1
Col-1005A·	47.7	0.02	41.2	0.14	10.43	0.18	0.26	0.05	99.98	89.1
Col-1005A·	48.2	0.01	41.2	0.17	10.56	0.25	0.17	0.01	100.6	89.1
Col-1005A·	48.2	0.02	41.3	0.13	10.57	0.19	0.30	0.02	100.7	89.0
Col-1005A·	48.0	0.02	41.5	0.14	10.62	0.19	0.28	0.05	100.7	89.0
Col-1005A·	47.5	0.04	41.2	0.17	10.54	0.23	0.25	0.06	100.1	88.9
Col-1005A·	48.3	0.02	41.4	0.18	10.72	0.14	0.22	0.03	101	88.9
Col-1005A·	47.6	0.02	40.7	0.12	10.60	0.15	0.30	0.03	99.57	88.9
Col-1005A·	47.4	0.02	41.3	0.20	10.64	0.24	0.17	0.03	100	88.8
Col-1005A·	47.8	0.01	41.6	0.15	10.73	0.12	0.28	0.02	100.8	88.8
Col-1005A·	47.9	0.02	41.6	0.18	10.76	0.15	0.16	0.02	100.7	88.8
Col-1005A·	47.3	0.03	41.4	0.17	10.67	0.16	0.29	0.10	100.2	88.8
Col-1005A·	47.6	0.02	41.2	0.25	10.74	0.21	0.15	0.05	100.2	88.8
Col-1005A·	48.1	0.01	41.4	0.15	10.91	0.09	0.19	0.03	100.9	88.7
Col-1005A·	47.8	0.02	41.5	0.17	10.92	0.17	0.18	0.03	100.8	88.6
Col-1005A·	47.4	0.01	41.4	0.17	10.90	0.16	0.17	0.04	100.2	88.6
Col-1005A·	47.2	0.02	41.0	0.18	11.18	0.19	0.17	0.03	99.88	88.3
Col-1005A·	47.3	0.01	41.5	0.19	11.25	0.19	0.17	0.02	100.6	88.2
Col-1005A·	45.2	0.58	40.1	0.24	12.86	0.20	0.35	0.49	100	86.2
Col-1005A·	39.4	2.50	40.8	0.31	11.66	0.14	0.22	5.38	100.5	85.8
Col-1005A·	45.4	0.00	40.6	0.11	13.94	0.24	0.18	0.01	100.5	85.3
Col-1005A·	44.5	0.00	40.5	0.04	15.17	0.30	0.13	0.01	100.7	83.9
Col-1005A·	43.8	0.01	40.2	0.09	15.75	0.24	0.12	0.01	100.2	83.2
Col-1005A·	42.9	0.03	40.1	0.04	16.99	0.24	0.12	0.00	100.4	81.8
Col-1005A·	42.4	0.00	40.0	0.05	17.33	0.31	0.12	0.01	100.2	81.3
Col-1005A·	42.2	0.03	40.2	0.05	17.75	0.23	0.12	0.01	100.6	80.9
Col-1005A·	42.3	-0.02	39.7	0.04	17.96	0.26	0.12	0.01	100.4	80.8
Col-1005A·	42.2	0.00	39.9	0.06	18.32	0.24	0.11	0.00	100.9	80.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1006B·	49.5	0.02	41.3	0.13	7.52	0.01	0.56	0.06	99.14	92.2

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1006B·	50.2	0.02	41.9	0.12	7.61	0.11	0.58	0.05	100.5	92.2
Col-1006B·	50.0	0.03	41.6	0.13	7.48	0.05	0.58	0.08	99.9	92.2
Col-1006B·	50.1	0.01	41.8	0.12	7.80	0.11	0.58	0.07	100.6	92.0
Col-1006B·	49.6	0.02	41.6	0.12	7.73	0.06	0.60	0.05	99.8	92.0
Col-1006B·	50.0	0.03	41.7	0.12	7.71	0.09	0.60	0.07	100.3	92.0
Col-1006B·	49.8	0.03	41.4	0.12	7.74	0.13	0.61	0.04	99.89	92.0
Col-1006B·	50.2	0.01	41.7	0.13	7.50	0.08	0.61	0.06	100.3	92.3
Col-1006B·	49.9	0.04	41.3	0.12	7.77	0.10	0.61	0.05	99.9	92.0
Col-1006B·	49.9	0.03	41.6	0.12	7.76	0.14	0.63	0.05	100.2	92.0
Col-1006B·	50.0	0.01	41.6	0.12	7.77	0.11	0.63	0.06	100.3	92.0
Col-1006B·	49.9	0.03	41.8	0.11	7.43	0.10	0.63	0.06	100.1	92.3
Col-1006B·	50.0	0.02	41.6	0.12	7.59	0.10	0.64	0.05	100.1	92.1
Col-1006B·	49.8	0.04	41.6	0.12	7.68	0.10	0.64	0.06	99.98	92.0
Col-1006B·	50.0	0.02	41.7	0.11	7.55	0.09	0.64	0.04	100.2	92.2
Col-1006B·	50.0	0.03	41.8	0.12	7.67	0.13	0.65	0.07	100.5	92.1
Col-1006B·	50.0	0.03	41.9	0.12	7.37	0.16	0.65	0.05	100.3	92.4
Col-1006B·	49.9	0.11	41.6	0.12	7.49	0.15	0.67	0.08	100.2	92.2
Col-1006B·	50.2	0.01	41.7	0.12	7.31	0.11	0.67	0.06	100.3	92.5
Col-1006B·	50.0	0.02	41.7	0.11	7.20	0.10	0.68	0.09	99.95	92.5
Col-1006B·	50.3	0.04	41.7	0.10	7.36	0.13	0.68	0.10	100.4	92.4
Col-1006B·	50.1	0.02	41.6	0.11	7.54	0.10	0.68	0.06	100.2	92.2
Col-1006B·	50.2	0.01	41.8	0.11	7.22	0.04	0.70	0.08	100.2	92.5
Col-1006B·	49.6	0.04	41.4	0.11	7.77	0.15	0.61	0.04	99.72	91.9
Col-1006B·	49.8	0.02	41.4	0.11	7.83	0.07	0.63	0.08	99.88	91.9
Col-1006B·	49.9	0.00	41.8	0.11	7.88	0.13	0.61	0.08	100.6	91.9
Col-1006B·	49.6	0.02	41.6	0.11	7.92	0.06	0.60	0.06	99.95	91.8
Col-1006B·	49.7	0.03	41.4	0.11	7.94	0.05	0.59	0.12	99.93	91.8
Col-1006B·	49.7	0.03	41.5	0.12	7.96	0.10	0.59	0.07	100.1	91.8
Col-1006B·	49.8	0.01	41.5	0.12	8.07	0.10	0.59	0.07	100.3	91.7
Col-1006B·	49.6	0.01	41.4	0.11	8.05	0.13	0.59	0.07	99.97	91.7
Col-1006B·	49.5	0.02	41.4	0.12	8.03	0.11	0.61	0.07	99.9	91.7
Col-1006B·	49.6	0.02	41.8	0.12	8.07	0.12	0.65	0.10	100.5	91.6
Col-1006B·	49.5	0.02	41.2	0.12	8.05	0.08	0.57	0.04	99.55	91.6
Col-1006B·	49.5	0.02	40.8	0.12	8.07	0.12	0.57	0.06	99.25	91.6
Col-1006B·	49.1	0.02	40.9	0.12	8.07	0.09	0.62	0.08	99.01	91.6
Col-1006B·	49.5	0.03	41.5	0.12	8.13	0.10	0.57	0.08	99.96	91.6
Col-1006B·	49.5	0.01	41.2	0.12	8.16	0.12	0.56	0.05	99.69	91.5
Col-1006B·	48.9	0.04	41.1	0.12	8.07	0.16	0.56	0.05	99.01	91.5
Col-1006B·	49.4	0.02	41.3	0.12	8.16	0.11	0.48	0.07	99.69	91.5
Col-1006B·	49.2	0.02	41.3	0.13	8.14	0.14	0.58	0.09	99.6	91.5
Col-1006B·	49.2	0.02	41.0	0.12	8.13	0.09	0.58	0.04	99.15	91.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1006B·	49.3	0.03	41.1	0.13	8.15	0.16	0.53	0.03	99.44	91.5
Col-1006B·	49.3	0.02	41.4	0.12	8.21	0.12	0.54	0.07	99.78	91.5
Col-1006B·	49.4	0.03	41.5	0.13	8.24	0.10	0.48	0.07	99.98	91.4
Col-1006B·	49.0	0.09	40.9	0.13	8.18	0.07	0.56	0.05	98.98	91.4
Col-1006B·	49.5	0.02	41.3	0.13	8.28	0.12	0.58	0.05	100	91.4
Col-1006B·	49.1	0.03	41.1	0.13	8.21	0.07	0.56	0.09	99.33	91.4
Col-1006B·	49.1	0.00	41.1	0.13	8.21	0.10	0.60	0.08	99.31	91.4
Col-1006B·	49.3	0.02	41.3	0.12	8.27	0.16	0.49	0.06	99.73	91.4
Col-1006B·	49.5	0.02	41.4	0.11	8.30	0.17	0.56	0.07	100.2	91.4
Col-1006B·	49.2	0.02	41.0	0.12	8.26	0.11	0.55	0.03	99.38	91.4
Col-1006B·	49.3	0.02	41.3	0.14	8.28	0.06	0.52	0.07	99.74	91.4
Col-1006B·	49.4	0.04	41.1	0.11	8.30	0.13	0.57	0.04	99.68	91.4
Col-1006B·	49.5	0.03	41.4	0.11	8.32	0.09	0.54	0.08	100.1	91.4
Col-1006B·	49.1	0.02	41.1	0.13	8.29	0.10	0.57	0.11	99.39	91.3
Col-1006B·	49.5	0.03	41.3	0.13	8.36	0.10	0.56	0.05	100.1	91.3
Col-1006B·	49.1	0.02	41.1	0.11	8.30	0.16	0.59	0.05	99.36	91.3
Col-1006B·	49.5	0.03	41.4	0.12	8.40	0.14	0.55	0.04	100.2	91.3
Col-1006B·	49.3	0.03	41.4	0.12	8.38	0.10	0.47	0.11	99.84	91.3
Col-1006B·	48.9	0.01	40.9	0.13	8.36	0.10	0.55	0.07	98.99	91.2
Col-1006B·	48.9	0.02	40.9	0.12	8.38	0.15	0.58	0.07	99.12	91.2
Col-1006B·	49.2	0.03	41.6	0.12	8.44	0.07	0.50	0.05	99.96	91.2
Col-1006B·	49.2	0.02	41.6	0.11	8.46	0.13	0.52	0.09	100.2	91.2
Col-1006B·	49.5	0.02	41.5	0.12	8.51	0.17	0.47	0.05	100.3	91.2
Col-1006B·	49.2	0.03	41.1	0.13	8.48	0.06	0.52	0.06	99.58	91.2
Col-1006B·	49.2	0.02	41.7	0.13	8.50	0.13	0.45	0.05	100.2	91.2
Col-1006B·	49.1	0.01	41.3	0.20	8.47	0.11	0.46	0.03	99.67	91.2
Col-1006B·	49.1	0.01	41.3	0.12	8.49	0.18	0.53	0.07	99.81	91.2
Col-1006B·	49.2	0.04	41.3	0.13	8.50	0.11	0.47	0.04	99.78	91.2
Col-1006B·	49.3	0.02	41.4	0.11	8.53	0.11	0.45	0.06	99.95	91.1
Col-1006B·	49.2	0.02	41.6	0.13	8.52	0.14	0.54	0.04	100.1	91.1
Col-1006B·	49.2	0.03	41.3	0.12	8.52	0.15	0.48	0.05	99.79	91.1
Col-1006B·	49.3	0.02	41.4	0.12	8.54	0.10	0.45	0.03	99.91	91.1
Col-1006B·	49.4	0.02	41.7	0.12	8.57	0.12	0.52	0.05	100.5	91.1
Col-1006B·	49.3	0.00	41.6	0.13	8.56	0.08	0.50	0.08	100.3	91.1
Col-1006B·	49.2	0.02	41.6	0.13	8.55	0.11	0.46	0.04	100.2	91.1
Col-1006B·	49.1	0.02	41.3	0.12	8.53	0.12	0.49	0.06	99.65	91.1
Col-1006B·	49.0	0.02	41.3	0.13	8.51	0.09	0.50	0.07	99.59	91.1
Col-1006B·	49.2	0.02	41.1	0.13	8.56	0.09	0.52	0.08	99.73	91.1
Col-1006B·	49.1	0.04	41.3	0.13	8.54	0.20	0.50	0.04	99.82	91.1
Col-1006B·	49.1	0.01	41.3	0.12	8.56	0.12	0.52	0.06	99.77	91.1
Col-1006B·	49.1	0.01	41.4	0.13	8.56	0.15	0.45	0.05	99.81	91.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1006B·	49.0	0.01	41.4	0.14	8.55	0.15	0.46	0.04	99.77	91.1
Col-1006B·	49.0	0.02	41.2	0.12	8.57	0.14	0.51	0.05	99.62	91.1
Col-1006B·	49.4	0.01	41.4	0.11	8.64	0.17	0.49	0.07	100.2	91.1
Col-1006B·	49.3	0.01	41.4	0.12	8.63	0.19	0.49	0.07	100.2	91.1
Col-1006B·	49.3	0.02	41.3	0.12	8.64	0.15	0.47	0.06	100.1	91.0
Col-1006B·	48.9	0.22	41.2	0.13	8.58	0.14	0.55	0.06	99.81	91.0
Col-1006B·	49.2	0.04	41.5	0.13	8.64	0.11	0.48	0.06	100.2	91.0
Col-1006B·	49.0	0.02	41.4	0.12	8.61	0.12	0.49	0.04	99.81	91.0
Col-1006B·	49.2	0.00	41.3	0.11	8.65	0.13	0.49	0.04	99.95	91.0
Col-1006B·	48.9	0.04	41.0	0.13	8.59	0.16	0.52	0.04	99.43	91.0
Col-1006B·	49.2	0.04	41.5	0.13	8.66	0.14	0.46	0.05	100.2	91.0
Col-1006B·	49.1	0.01	41.3	0.12	8.64	0.13	0.45	0.05	99.82	91.0
Col-1006B·	49.3	0.02	41.3	0.12	8.69	0.18	0.50	0.09	100.2	91.0
Col-1006B·	48.8	0.11	40.8	0.11	8.62	0.14	0.55	0.03	99.23	91.0
Col-1006B·	49.2	0.02	41.3	0.11	8.69	0.09	0.53	0.04	100	91.0
Col-1006B·	49.4	0.03	41.6	0.13	8.74	0.10	0.52	0.06	100.6	91.0
Col-1006B·	49.3	0.03	41.4	0.13	8.72	0.13	0.51	0.09	100.3	91.0
Col-1006B·	49.2	0.02	41.2	0.12	8.70	0.10	0.48	0.05	99.8	91.0
Col-1006B·	49.0	0.03	41.3	0.12	8.68	0.10	0.48	0.06	99.72	91.0
Col-1006B·	49.4	0.02	41.4	0.13	8.76	0.13	0.51	0.08	100.5	91.0
Col-1006B·	49.3	0.02	41.3	0.12	8.75	0.10	0.46	0.04	100.1	90.9
Col-1006B·	49.2	0.03	41.3	0.12	8.75	0.08	0.51	0.04	100.1	90.9
Col-1006B·	49.2	0.02	41.4	0.12	8.74	0.13	0.43	0.05	100.1	90.9
Col-1006B·	49.0	0.03	41.3	0.23	8.72	0.14	0.44	0.02	99.89	90.9
Col-1006B·	49.3	0.02	41.4	0.13	8.78	0.15	0.47	0.05	100.3	90.9
Col-1006B·	48.9	0.03	41.7	0.13	8.74	0.17	0.47	0.07	100.2	90.9
Col-1006B·	48.6	0.01	41.0	0.12	8.71	0.12	0.48	0.05	99.18	90.9
Col-1006B·	49.0	0.00	41.2	0.13	8.79	0.14	0.40	0.07	99.79	90.9
Col-1006B·	48.8	0.01	41.3	0.11	8.76	0.12	0.49	0.06	99.69	90.9
Col-1006B·	49.1	0.02	41.5	0.12	8.80	0.10	0.45	0.03	100.1	90.9
Col-1006B·	49.1	0.01	41.5	0.21	8.82	0.17	0.47	0.01	100.3	90.8
Col-1006B·	49.3	0.02	41.5	0.13	8.87	0.10	0.40	0.07	100.4	90.8
Col-1006B·	49.4	0.03	41.3	0.13	8.89	0.16	0.50	0.05	100.4	90.8
Col-1006B·	49.1	0.02	41.5	0.11	8.88	0.08	0.47	0.07	100.3	90.8
Col-1006B·	49.1	0.01	41.3	0.13	8.92	0.16	0.48	0.05	100.2	90.8
Col-1006B·	48.9	0.03	41.4	0.13	8.96	0.09	0.44	0.07	100	90.7
Col-1006B·	48.8	0.03	41.3	0.13	8.96	0.15	0.44	0.05	99.78	90.7
Col-1006B·	48.9	0.03	41.5	0.13	9.03	0.17	0.45	0.05	100.3	90.6
Col-1006B·	48.6	0.05	41.2	0.14	8.98	0.18	0.45	0.03	99.65	90.6
Col-1006B·	48.8	0.03	41.4	0.14	9.07	0.14	0.42	0.06	100	90.6
Col-1006B·	48.3	0.02	41.4	0.11	8.97	0.11	0.43	0.04	99.35	90.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1006B·	48.9	0.03	41.2	0.13	9.09	0.14	0.43	0.05	99.93	90.5
Col-1006B·	48.7	0.03	41.3	0.11	9.07	0.15	0.43	0.04	99.86	90.5
Col-1006B·	48.8	0.03	41.2	0.13	9.10	0.18	0.39	0.23	100	90.5
Col-1006B·	48.8	0.04	41.3	0.11	9.14	0.04	0.41	0.07	99.93	90.5
Col-1006B·	48.6	0.02	40.7	0.14	9.12	0.10	0.46	0.07	99.29	90.5
Col-1006B·	49.0	0.03	41.4	0.12	9.25	0.12	0.45	0.05	100.4	90.4
Col-1006B·	48.8	0.01	41.5	0.13	9.26	0.18	0.42	0.06	100.4	90.4
Col-1006B·	48.4	0.01	41.2	0.13	9.18	0.13	0.37	0.05	99.44	90.4
Col-1006B·	48.6	0.01	41.1	0.12	9.25	0.12	0.42	0.05	99.67	90.4
Col-1006B·	48.6	0.02	41.1	0.15	9.27	0.08	0.47	0.05	99.75	90.3
Col-1006B·	48.8	0.03	41.5	0.12	9.32	0.13	0.45	0.06	100.4	90.3
Col-1006B·	48.8	0.03	41.4	0.14	9.34	0.09	0.41	0.05	100.3	90.3
Col-1006B·	48.2	0.03	40.9	0.12	9.22	0.11	0.43	0.05	98.98	90.3
Col-1006B·	48.9	0.03	41.4	0.12	9.36	0.11	0.41	0.04	100.4	90.3
Col-1006B·	48.5	0.03	41.4	0.13	9.33	0.16	0.44	0.04	100.1	90.3
Col-1006B·	48.4	0.02	40.7	0.14	9.30	0.11	0.44	0.05	99.08	90.3
Col-1006B·	48.6	0.04	41.1	0.13	9.36	0.14	0.46	0.06	99.92	90.2
Col-1006B·	48.2	0.01	41.1	0.11	9.28	0.16	0.42	0.03	99.29	90.2
Col-1006B·	48.7	0.02	41.1	0.13	9.43	0.15	0.45	0.05	100	90.2
Col-1006B·	48.1	0.02	41.0	0.13	9.32	0.13	0.41	0.04	99.09	90.2
Col-1006B·	48.6	0.03	40.9	0.13	9.45	0.08	0.47	0.04	99.71	90.2
Col-1006B·	48.3	0.02	41.1	0.11	9.40	0.14	0.39	0.04	99.51	90.1
Col-1006B·	48.7	0.02	41.5	0.13	9.57	0.06	0.40	0.05	100.4	90.1
Col-1006B·	48.6	0.02	41.4	0.12	9.55	0.15	0.39	0.05	100.2	90.1
Col-1006B·	48.0	0.02	41.1	0.13	9.45	0.13	0.42	0.04	99.33	90.1
Col-1006B·	48.2	0.02	41.0	0.11	9.51	0.16	0.39	0.06	99.52	90.0
Col-1006B·	48.6	0.04	41.2	0.12	9.61	0.16	0.41	0.05	100.2	90.0
Col-1006B·	48.6	0.03	41.5	0.13	9.62	0.13	0.34	0.06	100.4	90.0
Col-1006B·	48.7	0.03	41.5	0.12	9.65	0.10	0.42	0.04	100.5	90.0
Col-1006B·	48.7	0.00	41.4	0.12	9.66	0.13	0.37	0.05	100.4	90.0
Col-1006B·	48.6	0.02	41.4	0.14	9.68	0.16	0.41	0.09	100.5	89.9
Col-1006B·	47.9	0.03	40.9	0.13	9.59	0.17	0.40	0.03	99.24	89.9
Col-1006B·	48.3	0.01	41.6	0.13	9.67	0.16	0.36	0.03	100.3	89.9
Col-1006B·	48.6	0.01	41.2	0.12	9.74	0.10	0.42	0.04	100.2	89.9
Col-1006B·	48.1	0.01	41.0	0.14	9.66	0.12	0.37	0.04	99.44	89.9
Col-1006B·	48.3	0.02	41.0	0.14	9.69	0.15	0.41	0.05	99.72	89.9
Col-1006B·	48.9	0.01	41.5	0.14	9.82	0.12	0.43	0.06	101	89.9
Col-1006B·	48.2	0.01	40.7	0.14	9.69	0.08	0.42	0.05	99.28	89.9
Col-1006B·	48.5	0.01	41.4	0.14	9.78	0.17	0.40	0.06	100.4	89.8
Col-1006B·	48.5	0.01	41.6	0.14	9.77	0.18	0.34	0.05	100.6	89.8
Col-1006B·	48.0	0.03	40.8	0.11	9.71	0.15	0.39	0.05	99.33	89.8

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1006B·	48.4	0.00	41.6	0.13	9.89	0.16	0.33	0.03	100.5	89.7
Col-1006B·	47.8	0.01	41.1	0.14	9.81	0.17	0.34	0.02	99.4	89.7
Col-1006B·	48.3	0.01	41.2	0.13	9.93	0.19	0.36	0.04	100.2	89.7
Col-1006B·	48.4	0.03	41.4	0.14	9.96	0.09	0.39	0.07	100.4	89.6
Col-1006B·	48.3	0.06	41.3	0.13	9.96	0.18	0.38	0.30	100.6	89.6
Col-1006B·	48.4	0.02	41.5	0.13	9.98	0.11	0.35	0.03	100.6	89.6
Col-1006B·	48.1	0.03	41.3	0.13	9.92	0.14	0.37	0.03	99.96	89.6
Col-1006B·	47.9	0.03	41.2	0.12	9.92	0.15	0.44	0.04	99.81	89.6
Col-1006B·	48.0	0.03	40.7	0.13	9.98	0.15	0.33	0.04	99.32	89.6
Col-1006B·	47.9	0.01	40.9	0.14	9.99	0.16	0.30	0.06	99.44	89.5
Col-1006B·	48.0	0.03	40.9	0.14	10.05	0.13	0.32	0.05	99.69	89.5
Col-1006B·	47.7	0.00	40.8	0.13	9.99	0.12	0.34	0.02	99.01	89.5
Col-1006B·	47.1	0.05	42.6	0.13	9.90	0.14	0.36	0.03	100.3	89.5
Col-1006B·	48.1	0.01	41.4	0.13	10.11	0.12	0.37	0.09	100.4	89.5
Col-1006B·	48.4	0.02	41.3	0.13	10.19	0.08	0.37	0.05	100.6	89.4
Col-1006B·	47.9	0.02	40.7	0.13	10.07	0.09	0.37	0.01	99.26	89.4
Col-1006B·	48.0	0.01	41.3	0.14	10.11	0.14	0.30	0.03	99.98	89.4
Col-1006B·	48.0	0.02	40.9	0.14	10.11	0.17	0.30	0.06	99.64	89.4
Col-1006B·	48.4	0.03	41.4	0.13	10.21	0.13	0.39	0.08	100.8	89.4
Col-1006B·	47.9	0.01	40.9	0.14	10.13	0.18	0.31	0.03	99.63	89.4
Col-1006B·	48.3	0.00	41.0	0.15	10.23	0.13	0.32	0.04	100.2	89.4
Col-1006B·	47.7	0.03	40.9	0.13	10.11	0.19	0.34	0.04	99.49	89.4
Col-1006B·	47.9	0.02	41.0	0.13	10.16	0.06	0.37	0.07	99.75	89.4
Col-1006B·	47.7	0.01	41.0	0.12	10.15	0.14	0.36	0.04	99.49	89.3
Col-1006B·	47.7	0.04	41.1	0.13	10.14	0.10	0.28	0.05	99.51	89.3
Col-1006B·	48.1	0.02	40.9	0.12	10.25	0.11	0.39	0.02	99.93	89.3
Col-1006B·	48.2	0.05	40.9	0.15	10.27	0.20	0.32	0.03	100.1	89.3
Col-1006B·	48.2	0.02	41.2	0.14	10.28	0.14	0.35	0.05	100.4	89.3
Col-1006B·	47.8	0.01	40.7	0.14	10.24	0.22	0.31	0.04	99.42	89.3
Col-1006B·	47.9	0.01	40.7	0.13	10.28	0.16	0.36	0.03	99.6	89.3
Col-1006B·	47.9	0.01	40.8	0.14	10.27	0.13	0.31	0.05	99.58	89.3
Col-1006B·	47.9	0.01	41.0	0.14	10.30	0.16	0.27	0.04	99.82	89.2
Col-1006B·	48.0	0.03	41.3	0.12	10.31	0.15	0.32	0.05	100.3	89.2
Col-1006B·	47.7	0.03	40.9	0.14	10.25	0.17	0.33	0.03	99.49	89.2
Col-1006B·	47.8	0.33	40.9	0.17	10.29	0.16	0.31	0.05	100	89.2
Col-1006B·	48.0	0.04	41.2	0.13	10.35	0.14	0.31	0.04	100.3	89.2
Col-1006B·	47.4	0.01	40.7	0.14	10.22	0.18	0.38	0.05	99.08	89.2
Col-1006B·	47.6	0.01	40.7	0.13	10.27	0.09	0.24	0.04	99.09	89.2
Col-1006B·	47.9	0.04	40.9	0.14	10.38	0.19	0.33	0.06	99.91	89.2
Col-1006B·	47.4	0.03	40.6	0.13	10.31	0.15	0.31	0.05	99.04	89.1
Col-1006B·	47.5	0.00	40.7	0.12	10.37	0.20	0.31	0.08	99.25	89.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1006B·	47.8	0.03	41.2	0.14	10.46	0.18	0.30	0.03	100.1	89.1
Col-1006B·	47.4	0.05	40.8	0.14	10.38	0.09	0.32	0.04	99.21	89.1
Col-1006B·	47.6	0.02	40.8	0.14	10.43	0.12	0.31	0.03	99.43	89.1
Col-1006B·	47.5	0.01	40.7	0.13	10.41	0.13	0.33	0.03	99.19	89.0
Col-1006B·	48.0	0.03	41.4	0.13	10.53	0.16	0.33	0.06	100.6	89.0
Col-1006B·	47.4	0.03	41.0	0.14	10.40	0.13	0.28	0.03	99.37	89.0
Col-1006B·	47.8	0.01	40.8	0.14	10.53	0.13	0.33	0.03	99.72	89.0
Col-1006B·	47.4	0.02	40.7	0.13	10.47	0.11	0.30	0.06	99.2	89.0
Col-1006B·	47.5	0.02	40.6	0.12	10.49	0.16	0.31	0.06	99.27	89.0
Col-1006B·	47.3	0.01	40.6	0.14	10.45	0.20	0.32	0.06	99.03	89.0
Col-1006B·	47.6	0.01	41.0	0.13	10.51	0.11	0.30	0.04	99.62	89.0
Col-1006B·	47.3	0.03	40.7	0.13	10.46	0.13	0.29	0.04	99.03	89.0
Col-1006B·	47.6	0.03	41.0	0.14	10.61	0.18	0.30	0.02	99.84	88.9
Col-1006B·	47.7	0.02	40.8	0.14	10.64	0.10	0.29	0.09	99.76	88.9
Col-1006B·	48.2	0.00	41.2	0.13	10.75	0.19	0.32	0.03	100.8	88.9
Col-1006B·	47.3	0.03	40.9	0.13	10.61	0.17	0.27	0.03	99.45	88.8
Col-1006B·	47.2	0.02	40.6	0.12	10.60	0.13	0.33	0.06	99.11	88.8
Col-1006B·	47.3	0.03	40.6	0.15	10.65	0.16	0.27	0.03	99.22	88.8
Col-1006B·	47.9	0.01	41.3	0.13	10.80	0.17	0.31	0.07	100.7	88.8
Col-1006B·	47.5	0.02	40.7	0.13	10.72	0.16	0.31	0.02	99.5	88.8
Col-1006B·	47.4	0.01	40.5	0.14	10.71	0.18	0.31	0.06	99.25	88.7
Col-1006B·	47.5	0.00	40.9	0.15	10.75	0.16	0.30	0.02	99.8	88.7
Col-1006B·	47.5	0.11	41.3	0.14	10.77	0.15	0.25	0.05	100.3	88.7
Col-1006B·	47.5	0.03	40.5	0.14	10.80	0.18	0.28	0.04	99.41	88.7
Col-1006B·	47.2	0.01	40.5	0.14	10.74	0.11	0.30	0.04	99.07	88.7
Col-1006B·	47.4	0.02	40.8	0.12	10.81	0.15	0.28	0.03	99.59	88.7
Col-1006B·	47.2	0.02	40.7	0.13	10.78	0.18	0.28	0.04	99.39	88.6
Col-1006B·	47.8	0.02	41.4	0.13	10.93	0.20	0.31	0.06	100.9	88.6
Col-1006B·	47.5	0.03	40.8	0.16	10.87	0.15	0.22	0.06	99.77	88.6
Col-1006B·	47.8	0.00	41.3	0.14	10.99	0.18	0.28	0.08	100.7	88.6
Col-1006B·	47.9	0.03	41.1	0.14	11.02	0.17	0.27	0.05	100.7	88.6
Col-1006B·	47.3	0.03	40.8	0.15	10.89	0.18	0.26	0.03	99.68	88.6
Col-1006B·	47.7	0.03	41.3	0.13	11.00	0.11	0.27	0.05	100.6	88.5
Col-1006B·	47.6	0.02	41.4	0.14	10.99	0.13	0.27	0.03	100.5	88.5
Col-1006B·	47.6	0.02	41.5	0.14	11.02	0.15	0.28	0.05	100.8	88.5
Col-1006B·	47.4	0.02	40.9	0.12	10.99	0.14	0.40	0.07	100	88.5
Col-1006B·	47.5	0.01	41.2	0.13	11.03	0.15	0.29	0.03	100.4	88.5
Col-1006B·	47.4	0.01	40.8	0.15	11.01	0.17	0.27	0.02	99.77	88.5
Col-1006B·	47.9	0.02	41.3	0.14	11.17	0.17	0.29	0.05	101	88.4
Col-1006B·	47.1	0.03	40.7	0.14	11.07	0.18	0.34	0.05	99.62	88.3
Col-1006B·	47.8	0.04	41.3	0.13	11.25	0.15	0.28	0.04	101	88.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1006B·	47.0	0.03	40.7	0.14	11.07	0.19	0.24	0.03	99.42	88.3
Col-1006B·	47.1	0.02	40.5	0.14	11.12	0.13	0.26	0.33	99.63	88.3
Col-1006B·	47.5	0.03	41.2	0.15	11.20	0.19	0.24	0.05	100.6	88.3
Col-1006B·	47.4	0.00	41.0	0.15	11.26	0.23	0.23	0.01	100.3	88.2
Col-1006B·	46.9	0.01	40.8	0.15	11.16	0.25	0.25	0.04	99.63	88.2
Col-1006B·	47.4	0.01	41.2	0.15	11.41	0.18	0.28	0.04	100.7	88.1
Col-1006B·	46.7	0.01	40.6	0.15	11.25	0.18	0.23	0.03	99.09	88.1
Col-1006B·	46.9	0.02	40.6	0.14	11.32	0.17	0.26	0.04	99.46	88.1
Col-1006B·	46.8	0.02	40.5	0.16	11.30	0.15	0.18	0.05	99.19	88.1
Col-1006B·	46.9	0.01	40.8	0.15	11.35	0.18	0.22	0.03	99.65	88.1
Col-1006B·	47.0	0.02	40.9	0.14	11.41	0.18	0.22	0.03	99.87	88.0
Col-1006B·	46.6	0.02	40.5	0.15	11.31	0.16	0.20	0.04	99.01	88.0
Col-1006B·	47.0	0.01	40.9	0.15	11.41	0.16	0.21	0.03	99.87	88.0
Col-1006B·	47.2	0.03	40.9	0.15	11.46	0.13	0.24	0.03	100.2	88.0
Col-1006B·	47.4	0.02	41.3	0.15	11.54	0.24	0.21	0.04	100.8	88.0
Col-1006B·	46.9	0.02	40.9	0.16	11.43	0.18	0.22	0.02	99.88	88.0
Col-1006B·	46.8	0.04	40.7	0.13	11.45	0.22	0.32	0.03	99.72	87.9
Col-1006B·	46.6	0.03	40.7	0.14	11.40	0.18	0.25	0.03	99.35	87.9
Col-1006B·	46.6	0.02	40.7	0.17	11.41	0.23	0.22	0.04	99.4	87.9
Col-1006B·	46.8	0.03	40.9	0.15	11.49	0.17	0.23	0.06	99.89	87.9
Col-1006B·	46.8	0.02	40.7	0.15	11.55	0.12	0.21	0.04	99.57	87.8
Col-1006B·	46.6	0.02	40.8	0.16	11.51	0.22	0.18	0.04	99.53	87.8
Col-1006B·	47.1	0.01	40.8	0.16	11.65	0.17	0.18	0.03	100.1	87.8
Col-1006B·	47.2	0.02	41.3	0.15	11.67	0.21	0.25	0.03	100.7	87.8
Col-1006B·	47.2	0.03	41.1	0.17	11.68	0.21	0.21	0.04	100.6	87.8
Col-1006B·	46.7	0.02	40.3	0.15	11.60	0.19	0.21	0.04	99.22	87.8
Col-1006B·	46.8	0.02	40.4	0.16	11.68	0.20	0.20	0.04	99.58	87.7
Col-1006B·	46.8	0.02	40.8	0.15	11.77	0.21	0.22	0.03	99.92	87.6
Col-1006B·	46.3	0.02	40.4	0.14	11.67	0.21	0.18	0.02	99	87.6
Col-1006B·	46.4	0.02	40.7	0.19	11.81	0.17	0.20	0.16	99.64	87.5
Col-1006B·	46.6	0.02	40.5	0.15	11.85	0.21	0.22	0.03	99.56	87.5
Col-1006B·	46.3	0.02	40.7	0.15	11.92	0.21	0.19	0.04	99.48	87.4
Col-1006B·	46.8	0.01	40.8	0.14	12.08	0.18	0.19	0.01	100.2	87.3
Col-1006B·	46.9	0.02	41.3	0.15	12.18	0.19	0.17	0.02	101	87.3
Col-1006B·	46.5	0.02	41.0	0.16	12.08	0.23	0.16	0.03	100.2	87.3
Col-1006B·	46.1	0.02	40.8	0.18	12.02	0.23	0.14	0.03	99.51	87.2
Col-1006B·	46.9	0.02	41.0	0.16	12.23	0.11	0.19	0.03	100.7	87.2
Col-1006B·	46.7	0.02	40.7	0.17	12.39	0.12	0.16	0.01	100.2	87.0
Col-1006B·	46.3	0.02	40.3	0.17	12.34	0.19	0.17	0.03	99.51	87.0
Col-1006B·	46.1	0.02	40.6	0.18	12.36	0.13	0.15	0.04	99.57	86.9
Col-1006B·	45.9	0.02	40.3	0.18	12.36	0.22	0.16	0.01	99.07	86.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1006B·	46.2	0.02	40.8	0.19	12.46	0.25	0.12	0.03	100.1	86.9
Col-1006B·	45.8	0.02	40.5	0.15	12.44	0.31	0.17	0.01	99.46	86.8
Col-1006B·	46.0	0.02	41.1	0.19	12.78	0.26	0.12	0.03	100.5	86.5
Col-1006B·	45.8	0.03	40.7	0.20	13.12	0.18	0.09	0.02	100.1	86.2
Col-1006B·	45.8	0.01	40.9	0.23	13.26	0.21	0.10	0.02	100.5	86.0

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007A·	50.9	0.01	42.2	0.11	6.40	0.12	0.73	0.08	100.5	93.4
Col-1007A·	50.9	0.02	42.0	0.11	6.46	0.08	0.75	0.08	100.4	93.4
Col-1007A·	51.0	0.01	42.1	0.11	6.52	0.14	0.73	0.06	100.6	93.3
Col-1007A·	50.5	0.02	41.6	0.11	6.51	0.08	0.72	0.07	99.6	93.3
Col-1007A·	50.5	0.02	41.8	0.11	6.52	0.04	0.76	0.10	99.8	93.2
Col-1007A·	50.6	0.03	41.7	0.10	6.61	0.09	0.70	0.10	100.0	93.2
Col-1007A·	50.6	0.01	41.7	0.10	6.61	0.11	0.76	0.08	100.0	93.2
Col-1007A·	50.8	0.03	41.8	0.10	6.65	0.12	0.78	0.09	100.4	93.2
Col-1007A·	50.8	0.03	41.9	0.11	6.67	0.12	0.74	0.07	100.4	93.1
Col-1007A·	50.5	0.03	41.9	0.10	6.64	0.12	0.75	0.09	100.1	93.1
Col-1007A·	50.6	0.02	41.7	0.12	6.71	0.08	0.72	0.09	100.0	93.1
Col-1007A·	50.7	0.01	41.8	0.10	6.74	0.09	0.76	0.10	100.2	93.1
Col-1007A·	50.4	0.04	42.1	0.12	6.88	0.04	0.73	0.07	100.4	92.9
Col-1007A·	50.5	0.02	41.8	0.11	6.92	0.12	0.77	0.09	100.4	92.9
Col-1007A·	50.6	0.01	41.6	0.12	7.02	0.03	0.70	0.09	100.2	92.8
Col-1007A·	50.6	0.02	41.5	0.10	7.19	0.16	0.73	0.07	100.3	92.6
Col-1007A·	50.5	0.03	41.7	0.12	7.36	0.09	0.68	0.07	100.5	92.4
Col-1007A·	49.9	0.01	41.5	0.13	7.40	0.07	0.65	0.06	99.8	92.3
Col-1007A·	49.9	0.02	41.4	0.12	7.39	0.09	0.65	0.07	99.6	92.3
Col-1007A·	49.8	0.03	41.4	0.13	7.42	0.11	0.64	0.09	99.7	92.3
Col-1007A·	50.0	0.01	41.9	0.14	7.44	0.10	0.68	0.05	100.3	92.3
Col-1007A·	50.2	0.03	41.6	0.13	7.48	0.08	0.70	0.08	100.2	92.3
Col-1007A·	50.1	0.00	41.5	0.12	7.47	0.13	0.66	0.06	100.1	92.3
Col-1007A·	49.8	0.01	41.6	0.12	7.46	0.06	0.65	0.05	99.8	92.3
Col-1007A·	50.0	0.01	41.6	0.12	7.49	0.07	0.65	0.06	100.0	92.2
Col-1007A·	50.0	0.03	41.5	0.13	7.50	0.06	0.68	0.07	100.0	92.2
Col-1007A·	49.9	0.00	41.7	0.14	7.49	0.09	0.67	0.07	100.1	92.2
Col-1007A·	49.9	0.00	41.8	0.20	7.49	0.11	0.59	0.06	100.1	92.2
Col-1007A·	49.8	0.01	41.7	0.13	7.49	0.14	0.62	0.05	99.9	92.2
Col-1007A·	50.7	0.04	41.0	0.12	7.65	0.09	0.64	0.04	100.3	92.2
Col-1007A·	50.1	0.03	41.5	0.13	7.63	0.11	0.68	0.06	100.2	92.1
Col-1007A·	49.8	0.02	41.7	0.13	7.58	0.16	0.68	0.07	100.2	92.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007A·	49.9	0.03	41.7	0.13	7.61	0.13	0.63	0.06	100.1	92.1
Col-1007A·	49.8	0.02	41.6	0.17	7.59	0.12	0.59	0.05	99.9	92.1
Col-1007A·	49.9	0.00	41.6	0.12	7.63	0.06	0.67	0.07	100.1	92.1
Col-1007A·	49.7	0.03	41.7	0.21	7.60	0.06	0.60	0.30	100.2	92.1
Col-1007A·	49.9	0.01	41.6	0.13	7.67	0.11	0.64	0.07	100.2	92.1
Col-1007A·	49.7	0.03	41.6	0.12	7.64	0.14	0.67	0.06	100.0	92.1
Col-1007A·	49.7	0.02	41.4	0.15	7.67	0.13	0.64	0.07	99.8	92.0
Col-1007A·	49.8	0.00	41.8	0.14	7.70	0.15	0.67	0.07	100.3	92.0
Col-1007A·	49.8	0.03	41.7	0.13	7.71	0.09	0.63	0.05	100.2	92.0
Col-1007A·	49.6	0.00	41.6	0.13	7.69	0.04	0.64	0.07	99.8	92.0
Col-1007A·	49.9	0.02	41.7	0.12	7.73	0.09	0.62	0.07	100.2	92.0
Col-1007A·	50.0	0.02	42.0	0.13	7.75	0.11	0.60	0.08	100.6	92.0
Col-1007A·	49.9	0.02	41.6	0.13	7.74	0.05	0.66	0.08	100.1	92.0
Col-1007A·	50.0	0.01	41.4	0.13	7.78	0.11	0.65	0.07	100.1	92.0
Col-1007A·	49.8	0.01	41.5	0.14	7.75	0.10	0.63	0.06	100.0	92.0
Col-1007A·	48.5	0.03	42.4	0.14	7.56	0.11	0.62	0.04	99.5	92.0
Col-1007A·	50.1	0.01	41.7	0.15	7.81	0.13	0.62	0.06	100.5	91.9
Col-1007A·	49.8	0.03	41.7	0.14	7.79	0.12	0.59	0.07	100.3	91.9
Col-1007A·	49.7	0.02	41.7	0.13	7.77	0.07	0.64	0.05	100.2	91.9
Col-1007A·	50.0	0.03	41.7	0.13	7.82	0.10	0.67	0.08	100.6	91.9
Col-1007A·	49.8	0.01	41.8	0.14	7.79	0.09	0.65	0.04	100.3	91.9
Col-1007A·	49.9	0.01	41.7	0.12	7.81	0.10	0.68	0.06	100.3	91.9
Col-1007A·	50.1	0.02	41.8	0.22	7.85	0.17	0.64	0.04	100.9	91.9
Col-1007A·	49.8	0.01	41.8	0.14	7.80	0.12	0.57	0.06	100.3	91.9
Col-1007A·	49.8	0.02	41.8	0.13	7.80	0.13	0.57	0.06	100.3	91.9
Col-1007A·	49.8	0.01	41.8	0.17	7.80	0.15	0.56	0.06	100.3	91.9
Col-1007A·	50.0	0.01	41.5	0.14	7.84	0.10	0.60	0.07	100.2	91.9
Col-1007A·	49.9	0.01	41.8	0.12	7.85	0.09	0.66	0.05	100.5	91.9
Col-1007A·	49.9	0.03	41.8	0.12	7.84	0.15	0.57	0.04	100.4	91.9
Col-1007A·	49.5	0.01	41.5	0.12	7.77	0.15	0.61	0.06	99.7	91.9
Col-1007A·	50.1	0.01	41.5	0.14	7.90	0.11	0.58	0.06	100.4	91.9
Col-1007A·	50.0	0.02	41.5	0.14	7.95	0.13	0.65	0.07	100.4	91.8
Col-1007A·	49.9	0.02	42.0	0.10	7.96	0.11	0.56	0.06	100.7	91.8
Col-1007A·	49.9	0.03	41.7	0.14	7.96	0.08	0.61	0.04	100.5	91.8
Col-1007A·	52.6	0.11	38.1	0.19	8.40	0.14	0.52	0.08	100.2	91.8
Col-1007A·	49.7	0.02	41.9	0.14	7.95	0.08	0.60	0.04	100.4	91.8
Col-1007A·	49.7	0.02	41.5	0.13	7.98	0.15	0.65	0.06	100.2	91.7
Col-1007A·	49.4	0.02	41.7	0.13	7.95	0.09	0.58	0.06	99.9	91.7
Col-1007A·	49.6	0.00	41.7	0.14	8.00	0.08	0.60	0.07	100.2	91.7
Col-1007A·	49.6	0.01	41.7	0.13	8.01	0.14	0.59	0.04	100.3	91.7
Col-1007A·	49.6	0.01	41.6	0.13	8.00	0.06	0.61	0.07	100.1	91.7

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007A·	50.0	0.02	41.9	0.12	8.09	0.11	0.60	0.04	100.9	91.7
Col-1007A·	49.8	0.01	42.0	0.14	8.07	0.07	0.58	0.08	100.7	91.7
Col-1007A·	49.7	0.04	41.6	0.13	8.07	0.17	0.67	0.04	100.4	91.7
Col-1007A·	49.9	0.01	41.7	0.13	8.11	0.08	0.57	0.03	100.5	91.6
Col-1007A·	49.9	0.00	41.9	0.14	8.11	0.12	0.58	0.08	100.8	91.6
Col-1007A·	49.5	0.02	41.5	0.11	8.05	0.16	0.53	0.10	100.0	91.6
Col-1007A·	49.7	0.01	41.9	0.13	8.09	0.02	0.56	0.06	100.4	91.6
Col-1007A·	49.7	0.01	41.5	0.13	8.11	0.13	0.63	0.03	100.3	91.6
Col-1007A·	49.7	0.03	41.7	0.13	8.09	0.11	0.48	0.08	100.3	91.6
Col-1007A·	49.6	0.02	41.7	0.13	8.09	0.09	0.58	0.06	100.2	91.6
Col-1007A·	49.7	0.02	41.8	0.13	8.11	0.16	0.50	0.08	100.5	91.6
Col-1007A·	49.8	0.01	41.5	0.14	8.15	0.04	0.56	0.05	100.2	91.6
Col-1007A·	49.4	0.02	41.8	0.14	8.11	0.14	0.56	0.09	100.3	91.6
Col-1007A·	49.6	0.02	41.6	0.14	8.15	0.17	0.48	0.04	100.2	91.6
Col-1007A·	49.8	0.03	41.8	0.13	8.20	0.09	0.54	0.06	100.7	91.5
Col-1007A·	49.6	0.02	41.5	0.15	8.18	0.12	0.64	0.07	100.3	91.5
Col-1007A·	49.5	0.03	41.6	0.13	8.18	0.14	0.54	0.07	100.3	91.5
Col-1007A·	49.7	0.01	41.9	0.14	8.21	0.12	0.59	0.04	100.7	91.5
Col-1007A·	49.6	0.03	41.7	0.14	8.21	0.08	0.57	0.07	100.4	91.5
Col-1007A·	49.6	0.00	41.8	0.13	8.22	0.11	0.56	0.07	100.5	91.5
Col-1007A·	49.8	0.02	41.6	0.14	8.26	0.17	0.56	0.08	100.5	91.5
Col-1007A·	49.7	0.01	41.8	0.14	8.25	0.16	0.53	0.06	100.6	91.5
Col-1007A·	49.7	0.02	41.7	0.14	8.26	0.10	0.56	0.08	100.6	91.5
Col-1007A·	49.6	0.02	41.8	0.14	8.24	0.12	0.57	0.07	100.6	91.5
Col-1007A·	49.6	0.03	42.1	0.14	8.25	0.14	0.61	0.05	100.9	91.5
Col-1007A·	49.7	0.01	41.6	0.13	8.26	0.13	0.58	0.06	100.4	91.5
Col-1007A·	49.5	0.02	41.7	0.15	8.24	0.14	0.53	0.07	100.3	91.5
Col-1007A·	49.5	0.01	41.8	0.13	8.25	0.12	0.55	0.02	100.4	91.4
Col-1007A·	49.4	0.02	41.9	0.14	8.24	0.15	0.56	0.06	100.5	91.4
Col-1007A·	49.4	0.01	41.3	0.14	8.25	0.10	0.59	0.12	100.0	91.4
Col-1007A·	49.8	0.02	41.8	0.16	8.32	0.12	0.44	0.06	100.7	91.4
Col-1007A·	49.6	0.03	41.8	0.15	8.30	0.11	0.48	0.07	100.6	91.4
Col-1007A·	49.8	0.02	41.6	0.13	8.35	0.12	0.58	0.05	100.6	91.4
Col-1007A·	49.5	0.01	41.6	0.14	8.30	0.10	0.52	0.07	100.2	91.4
Col-1007A·	49.6	0.04	42.0	0.14	8.34	0.16	0.54	0.07	100.9	91.4
Col-1007A·	49.4	0.02	41.8	0.14	8.30	0.11	0.57	0.04	100.4	91.4
Col-1007A·	49.6	0.00	41.8	0.18	8.35	0.17	0.53	0.04	100.7	91.4
Col-1007A·	49.6	0.02	41.6	0.13	8.36	0.06	0.60	0.08	100.5	91.4
Col-1007A·	49.6	0.01	41.5	0.14	8.35	0.14	0.58	0.06	100.3	91.4
Col-1007A·	49.1	0.03	41.6	0.13	8.29	0.12	0.58	0.08	99.9	91.4
Col-1007A·	49.4	0.04	41.7	0.15	8.34	0.11	0.53	0.08	100.4	91.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007A·	49.6	0.03	41.6	0.15	8.38	0.14	0.53	0.05	100.5	91.3
Col-1007A·	49.6	0.01	41.8	0.13	8.38	0.13	0.56	0.05	100.7	91.3
Col-1007A·	49.1	0.01	41.4	0.14	8.29	0.07	0.58	0.05	99.6	91.3
Col-1007A·	49.7	0.00	41.8	0.14	8.41	0.09	0.55	0.07	100.8	91.3
Col-1007A·	49.1	0.02	41.2	0.15	8.31	0.17	0.55	0.07	99.5	91.3
Col-1007A·	49.3	0.02	41.4	0.13	8.34	0.12	0.55	0.04	99.9	91.3
Col-1007A·	49.3	0.02	41.8	0.13	8.34	0.09	0.57	0.07	100.3	91.3
Col-1007A·	49.2	0.04	41.1	1.04	8.35	0.09	0.50	0.08	100.5	91.3
Col-1007A·	49.2	0.00	41.4	0.14	8.35	0.08	0.53	0.15	99.9	91.3
Col-1007A·	49.4	0.02	41.8	0.14	8.39	0.13	0.52	0.07	100.5	91.3
Col-1007A·	49.6	0.04	41.8	0.17	8.44	0.13	0.46	0.08	100.6	91.3
Col-1007A·	49.4	0.04	42.2	0.16	8.41	0.13	0.50	0.21	101.0	91.3
Col-1007A·	49.8	0.01	41.5	0.13	8.48	0.05	0.56	0.07	100.6	91.3
Col-1007A·	49.4	0.02	41.3	0.14	8.43	0.13	0.58	0.03	100.0	91.3
Col-1007A·	49.4	0.02	41.9	0.16	8.42	0.13	0.57	0.04	100.6	91.3
Col-1007A·	49.8	0.03	41.6	0.15	8.50	0.11	0.47	0.05	100.7	91.3
Col-1007A·	49.4	0.01	41.5	0.13	8.44	0.13	0.54	0.06	100.2	91.3
Col-1007A·	49.5	0.00	41.9	0.15	8.46	0.10	0.52	0.06	100.7	91.2
Col-1007A·	49.5	0.02	41.5	0.15	8.47	0.20	0.54	0.06	100.4	91.2
Col-1007A·	49.6	0.01	41.6	0.13	8.50	0.13	0.53	0.07	100.6	91.2
Col-1007A·	49.5	0.01	41.4	0.15	8.48	0.12	0.53	0.04	100.2	91.2
Col-1007A·	49.4	0.00	41.4	0.13	8.46	0.13	0.55	0.03	100.1	91.2
Col-1007A·	49.3	0.02	41.8	0.18	8.45	0.12	0.59	0.04	100.5	91.2
Col-1007A·	48.9	0.03	41.9	0.14	8.39	0.10	0.51	0.05	100.1	91.2
Col-1007A·	49.2	0.03	41.5	0.16	8.45	0.13	0.58	0.07	100.1	91.2
Col-1007A·	49.4	0.02	41.6	0.14	8.49	0.15	0.52	0.04	100.4	91.2
Col-1007A·	49.4	0.03	41.8	0.14	8.49	0.08	0.55	0.05	100.5	91.2
Col-1007A·	49.5	0.02	41.5	0.14	8.52	0.12	0.61	0.05	100.4	91.2
Col-1007A·	49.2	0.01	41.5	0.13	8.48	0.20	0.49	0.06	100.0	91.2
Col-1007A·	49.6	0.01	41.8	0.12	8.57	0.05	0.56	0.05	100.7	91.2
Col-1007A·	49.3	0.01	41.6	0.14	8.53	0.11	0.54	0.04	100.3	91.2
Col-1007A·	49.4	0.02	41.7	0.14	8.54	0.10	0.53	0.06	100.5	91.2
Col-1007A·	49.5	0.00	41.8	0.14	8.57	0.13	0.53	0.16	100.9	91.1
Col-1007A·	49.2	0.01	41.6	0.13	8.54	0.14	0.55	0.05	100.2	91.1
Col-1007A·	49.6	0.02	41.7	0.14	8.61	0.16	0.57	0.05	100.9	91.1
Col-1007A·	49.3	0.02	41.5	0.15	8.56	0.08	0.51	0.03	100.2	91.1
Col-1007A·	49.2	0.02	41.7	0.16	8.54	0.08	0.47	0.05	100.2	91.1
Col-1007A·	49.6	0.00	41.7	0.14	8.61	0.06	0.54	0.05	100.7	91.1
Col-1007A·	49.3	0.02	41.5	0.14	8.58	0.05	0.53	0.06	100.2	91.1
Col-1007A·	49.3	0.02	41.6	0.13	8.59	0.10	0.52	0.08	100.4	91.1
Col-1007A·	49.0	0.02	41.5	0.14	8.55	0.13	0.48	0.04	99.9	91.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007A·	49.3	0.03	41.7	0.16	8.60	0.17	0.56	0.08	100.6	91.1
Col-1007A·	49.6	0.03	41.8	0.15	8.67	0.11	0.58	0.06	101.0	91.1
Col-1007A·	49.3	0.01	41.6	0.15	8.62	0.09	0.54	0.06	100.4	91.1
Col-1007A·	48.8	0.01	41.3	0.14	8.54	0.10	0.48	0.17	99.6	91.1
Col-1007A·	49.9	0.03	41.2	0.14	8.74	0.15	0.59	0.07	100.8	91.0
Col-1007A·	49.2	0.01	41.6	0.15	8.63	0.10	0.52	0.05	100.3	91.0
Col-1007A·	49.3	0.01	41.4	0.14	8.65	0.18	0.52	0.04	100.2	91.0
Col-1007A·	49.3	0.02	41.6	0.17	8.64	0.12	0.54	0.07	100.4	91.0
Col-1007A·	49.1	0.06	41.6	0.16	8.61	0.15	0.46	0.07	100.2	91.0
Col-1007A·	49.4	0.03	41.5	0.14	8.69	0.07	0.53	0.07	100.4	91.0
Col-1007A·	49.2	0.03	41.6	0.13	8.66	0.16	0.58	0.05	100.5	91.0
Col-1007A·	48.6	0.04	41.8	0.15	8.56	0.08	0.51	0.08	99.8	91.0
Col-1007A·	49.0	0.03	41.4	0.15	8.63	0.14	0.55	0.05	99.9	91.0
Col-1007A·	49.2	0.01	41.7	0.16	8.67	0.08	0.48	0.07	100.4	91.0
Col-1007A·	49.2	0.02	41.6	0.13	8.68	0.19	0.54	0.06	100.5	91.0
Col-1007A·	49.4	0.03	41.8	0.14	8.70	0.13	0.57	0.05	100.8	91.0
Col-1007A·	49.1	0.03	41.8	0.15	8.66	0.15	0.48	0.07	100.4	91.0
Col-1007A·	49.1	0.03	41.3	0.14	8.66	0.11	0.55	0.03	99.9	91.0
Col-1007A·	49.2	0.01	41.4	0.15	8.69	0.06	0.54	0.07	100.1	91.0
Col-1007A·	49.4	0.01	41.7	0.13	8.74	0.10	0.54	0.08	100.7	91.0
Col-1007A·	49.0	0.01	41.2	0.14	8.67	0.10	0.52	0.08	99.7	91.0
Col-1007A·	49.3	0.02	41.9	0.17	8.74	0.07	0.50	0.08	100.7	91.0
Col-1007A·	49.4	0.01	41.5	0.14	8.76	0.18	0.54	0.07	100.6	90.9
Col-1007A·	49.0	0.02	41.5	0.13	8.71	0.14	0.50	0.06	100.1	90.9
Col-1007A·	49.1	0.02	41.4	0.14	8.72	0.14	0.53	0.06	100.1	90.9
Col-1007A·	49.3	0.01	41.5	0.15	8.78	0.16	0.53	0.09	100.5	90.9
Col-1007A·	49.5	0.03	41.4	0.14	8.80	0.09	0.55	0.06	100.5	90.9
Col-1007A·	49.4	0.01	41.3	0.12	8.81	0.12	0.53	0.06	100.4	90.9
Col-1007A·	49.3	0.01	41.6	0.14	8.82	0.12	0.52	0.06	100.5	90.9
Col-1007A·	49.3	0.01	41.5	0.14	8.82	0.13	0.50	0.06	100.5	90.9
Col-1007A·	49.5	0.01	41.5	0.14	8.86	0.15	0.54	0.07	100.8	90.9
Col-1007A·	49.2	0.01	41.8	0.14	8.81	0.08	0.52	0.07	100.6	90.9
Col-1007A·	49.0	0.02	41.2	0.20	8.79	0.07	0.44	0.04	99.8	90.9
Col-1007A·	49.1	0.03	41.1	0.15	8.81	0.15	0.53	0.05	99.9	90.9
Col-1007A·	49.1	0.03	41.3	0.15	8.81	0.10	0.58	0.04	100.1	90.9
Col-1007A·	49.1	0.03	41.4	0.16	8.82	0.13	0.48	0.05	100.2	90.9
Col-1007A·	49.0	0.01	41.3	0.13	8.80	0.10	0.51	0.05	99.9	90.8
Col-1007A·	49.2	0.00	41.9	0.13	8.85	0.12	0.59	0.04	100.8	90.8
Col-1007A·	49.3	0.01	41.4	0.15	8.92	0.11	0.54	0.05	100.5	90.8
Col-1007A·	48.7	0.00	41.3	0.14	8.81	0.09	0.51	0.05	99.6	90.8
Col-1007A·	49.2	0.02	41.5	0.15	8.94	0.15	0.54	0.04	100.5	90.8

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007A·	49.2	0.01	41.7	0.18	8.94	0.09	0.51	0.05	100.6	90.7
Col-1007A·	48.7	0.00	41.2	0.15	8.89	0.14	0.54	0.07	99.8	90.7
Col-1007A·	49.1	0.01	41.9	0.14	8.96	0.17	0.49	0.05	100.8	90.7
Col-1007A·	49.0	0.01	41.9	0.15	8.95	0.11	0.50	0.06	100.6	90.7
Col-1007A·	49.3	0.01	41.7	0.13	9.02	0.06	0.51	0.04	100.7	90.7
Col-1007A·	49.0	0.03	41.6	0.15	8.97	0.13	0.58	0.06	100.5	90.7
Col-1007A·	49.2	0.02	41.3	0.18	9.03	0.10	0.46	0.05	100.3	90.7
Col-1007A·	48.8	0.01	41.5	0.13	8.99	0.15	0.44	0.03	100.0	90.6
Col-1007A·	49.1	0.01	41.6	0.15	9.06	0.14	0.46	0.07	100.6	90.6
Col-1007A·	49.0	0.02	41.4	0.13	9.05	0.10	0.49	0.09	100.3	90.6
Col-1007A·	49.2	0.01	41.6	0.14	9.08	0.14	0.50	0.04	100.7	90.6
Col-1007A·	48.8	0.06	41.5	0.14	9.01	0.09	0.52	0.14	100.2	90.6
Col-1007A·	49.1	0.00	41.8	0.16	9.07	0.11	0.50	0.06	100.7	90.6
Col-1007A·	48.0	0.05	41.3	0.15	8.86	0.19	0.52	0.14	99.2	90.6
Col-1007A·	48.7	0.00	41.5	0.14	9.00	0.10	0.45	0.09	99.9	90.6
Col-1007A·	49.1	0.01	41.5	0.13	9.08	0.16	0.48	0.05	100.5	90.6
Col-1007A·	49.0	0.00	41.5	0.14	9.07	0.14	0.52	0.04	100.4	90.6
Col-1007A·	49.0	0.03	41.7	0.15	9.10	0.16	0.48	0.03	100.6	90.6
Col-1007A·	49.2	0.03	41.5	0.14	9.15	0.18	0.49	0.06	100.8	90.6
Col-1007A·	48.9	0.01	41.3	0.15	9.10	0.10	0.51	0.06	100.1	90.5
Col-1007A·	49.1	0.02	41.7	0.16	9.14	0.15	0.48	0.04	100.8	90.5
Col-1007A·	49.0	0.00	41.3	0.14	9.13	0.10	0.49	0.05	100.2	90.5
Col-1007A·	48.8	0.02	41.3	0.14	9.11	0.17	0.47	0.06	100.0	90.5
Col-1007A·	48.6	0.01	41.4	0.15	9.08	0.06	0.43	0.06	99.8	90.5
Col-1007A·	48.7	0.01	41.2	0.18	9.12	0.09	0.45	0.07	99.7	90.5
Col-1007A·	48.9	0.02	41.5	0.14	9.17	0.13	0.45	0.06	100.4	90.5
Col-1007A·	48.8	0.03	41.4	0.13	9.16	0.08	0.53	0.07	100.2	90.5
Col-1007A·	48.9	0.03	41.2	0.16	9.17	0.19	0.50	0.08	100.2	90.5
Col-1007A·	48.8	0.02	41.6	0.15	9.21	0.09	0.49	0.09	100.5	90.4
Col-1007A·	48.8	0.01	41.4	0.14	9.24	0.12	0.45	0.04	100.2	90.4
Col-1007A·	48.9	0.01	41.8	0.14	9.25	0.14	0.48	0.06	100.8	90.4
Col-1007A·	48.4	0.03	41.1	0.15	9.17	0.19	0.53	0.05	99.6	90.4
Col-1007A·	48.8	0.01	41.5	0.14	9.27	0.14	0.45	0.07	100.4	90.4
Col-1007A·	48.9	0.00	41.4	0.14	9.28	0.12	0.45	0.07	100.3	90.4
Col-1007A·	49.0	0.00	41.6	0.15	9.31	0.10	0.53	0.04	100.8	90.4
Col-1007A·	48.6	0.02	41.4	0.16	9.27	0.12	0.47	0.06	100.1	90.3
Col-1007A·	48.8	0.01	41.2	0.15	9.29	0.12	0.51	0.06	100.1	90.3
Col-1007A·	48.7	0.02	41.3	0.13	9.28	0.16	0.48	0.05	100.1	90.3
Col-1007A·	48.8	0.02	41.6	0.13	9.34	0.14	0.45	0.05	100.5	90.3
Col-1007A·	48.4	0.03	41.5	0.15	9.27	0.08	0.45	0.11	100.0	90.3
Col-1007A·	48.8	0.02	41.5	0.14	9.35	0.13	0.57	0.08	100.6	90.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007A·	48.5	0.01	41.3	0.14	9.31	0.12	0.44	0.08	99.9	90.3
Col-1007A·	48.7	0.04	41.4	0.15	9.35	0.21	0.42	0.05	100.4	90.3
Col-1007A·	48.4	0.02	41.1	0.14	9.28	0.15	0.47	0.06	99.6	90.3
Col-1007A·	48.6	0.03	42.2	0.14	9.35	0.12	0.41	0.07	100.9	90.3
Col-1007A·	48.7	0.03	41.2	0.15	9.37	0.11	0.44	0.06	100.1	90.3
Col-1007A·	49.0	0.02	41.4	0.14	9.44	0.12	0.48	0.06	100.7	90.2
Col-1007A·	48.7	0.05	41.6	0.14	9.41	0.12	0.44	0.05	100.6	90.2
Col-1007A·	48.6	0.00	41.4	0.14	9.42	0.16	0.41	0.04	100.2	90.2
Col-1007A·	48.5	0.02	41.3	0.13	9.41	0.11	0.48	0.05	100.0	90.2
Col-1007A·	48.7	0.01	41.6	0.14	9.47	0.15	0.43	0.05	100.5	90.2
Col-1007A·	48.6	0.04	41.1	0.15	9.47	0.17	0.45	0.04	100.1	90.2
Col-1007A·	48.8	0.01	41.7	0.15	9.55	0.15	0.42	0.06	100.8	90.1
Col-1007A·	48.6	0.03	41.3	0.14	9.53	0.10	0.43	0.08	100.2	90.1
Col-1007A·	48.3	0.02	41.6	0.13	9.48	0.15	0.42	0.04	100.2	90.1
Col-1007A·	48.6	0.01	41.4	0.13	9.59	0.16	0.43	0.13	100.4	90.0
Col-1007A·	48.3	0.03	41.2	0.16	9.54	0.15	0.39	0.04	99.8	90.0
Col-1007A·	48.7	0.02	41.3	0.15	9.63	0.19	0.43	0.05	100.5	90.0
Col-1007A·	48.5	0.02	41.5	0.14	9.58	0.12	0.47	0.05	100.4	90.0
Col-1007A·	48.8	0.02	41.6	0.14	9.65	0.16	0.42	0.05	100.8	90.0
Col-1007A·	48.3	0.02	41.3	0.15	9.56	0.12	0.41	0.07	99.9	90.0
Col-1007A·	48.5	0.00	41.4	0.15	9.61	0.08	0.44	0.07	100.3	90.0
Col-1007A·	48.5	0.02	41.4	0.15	9.62	0.18	0.50	0.06	100.5	90.0
Col-1007A·	48.6	0.01	41.3	0.14	9.66	0.21	0.39	0.05	100.4	90.0
Col-1007A·	48.8	0.02	41.5	0.15	9.70	0.16	0.42	0.06	100.8	90.0
Col-1007A·	48.5	0.01	41.3	0.15	9.72	0.16	0.45	0.02	100.3	89.9
Col-1007A·	48.5	0.02	41.5	0.16	9.74	0.12	0.42	0.06	100.5	89.9
Col-1007A·	48.4	0.00	41.5	0.15	9.75	0.13	0.41	0.06	100.4	89.8
Col-1007A·	48.5	0.02	41.1	0.17	9.79	0.20	0.47	0.07	100.3	89.8
Col-1007A·	48.6	0.03	41.6	0.14	9.82	0.10	0.39	0.06	100.7	89.8
Col-1007A·	48.5	0.00	41.5	0.16	9.83	0.16	0.37	0.05	100.5	89.8
Col-1007A·	48.5	0.00	41.4	0.15	9.89	0.12	0.40	0.05	100.5	89.7
Col-1007A·	48.3	0.01	41.4	0.15	9.87	0.14	0.35	0.06	100.3	89.7
Col-1007A·	48.2	0.02	41.5	0.16	9.86	0.17	0.36	0.05	100.2	89.7
Col-1007A·	48.3	0.01	41.4	0.16	9.95	0.22	0.34	0.04	100.4	89.6
Col-1007A·	48.3	-0.01	41.4	0.17	9.95	0.14	0.36	0.07	100.4	89.6
Col-1007A·	48.3	0.02	41.2	0.17	9.94	0.13	0.35	0.28	100.4	89.6
Col-1007A·	48.2	0.01	41.2	0.15	9.94	0.12	0.37	0.05	100.0	89.6
Col-1007A·	48.5	0.01	41.4	0.16	10.04	0.15	0.38	0.13	100.8	89.6
Col-1007A·	48.0	0.03	41.4	0.15	9.94	0.13	0.37	0.10	100.1	89.6
Col-1007A·	48.1	0.02	41.5	0.16	9.97	0.18	0.34	0.06	100.3	89.6
Col-1007A·	48.5	0.03	41.4	0.15	10.05	0.13	0.37	0.09	100.7	89.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007A·	48.1	-0.01	41.5	0.18	9.99	0.16	0.31	0.02	100.2	89.6
Col-1007A·	48.8	0.03	41.3	0.14	10.14	0.13	0.38	0.05	101.0	89.6
Col-1007A·	48.5	0.01	41.1	0.21	10.11	0.18	0.30	0.04	100.4	89.5
Col-1007A·	48.1	0.01	41.1	0.15	10.05	0.16	0.39	0.07	100.1	89.5
Col-1007A·	48.0	0.02	41.4	0.14	10.06	0.13	0.39	0.05	100.2	89.5
Col-1007A·	48.5	0.02	41.6	0.14	10.16	0.11	0.38	0.07	101.0	89.5
Col-1007A·	48.1	0.02	41.5	0.14	10.12	0.19	0.36	0.03	100.5	89.4
Col-1007A·	48.0	0.01	41.4	0.17	10.12	0.18	0.30	0.05	100.3	89.4
Col-1007A·	48.1	-0.01	41.2	0.17	10.15	0.19	0.35	0.07	100.2	89.4
Col-1007A·	48.3	0.01	41.4	0.17	10.21	0.18	0.38	0.05	100.8	89.4
Col-1007A·	47.9	0.01	41.1	0.19	10.15	0.12	0.29	0.08	99.8	89.4
Col-1007A·	48.0	0.00	41.5	0.18	10.26	0.21	0.27	0.04	100.4	89.3
Col-1007A·	48.1	0.03	41.2	0.18	10.30	0.13	0.30	0.05	100.3	89.3
Col-1007A·	47.9	0.00	41.2	0.19	10.33	0.16	0.29	0.07	100.1	89.2
Col-1007A·	48.0	0.02	41.5	0.19	10.37	0.15	0.29	0.05	100.7	89.2
Col-1007A·	47.8	0.02	41.2	0.15	10.34	0.12	0.26	0.02	99.9	89.2
Col-1007A·	47.8	0.01	41.4	0.18	10.37	0.17	0.31	0.04	100.4	89.2
Col-1007A·	48.1	0.01	40.9	0.18	10.43	0.17	0.32	0.08	100.2	89.2
Col-1007A·	48.0	0.01	41.3	0.17	10.47	0.15	0.31	0.03	100.5	89.1
Col-1007A·	48.0	0.01	41.4	0.19	10.50	0.17	0.28	0.04	100.6	89.1
Col-1007A·	47.7	0.01	41.3	0.17	10.47	0.17	0.31	0.05	100.2	89.0
Col-1007A·	48.0	0.01	41.5	0.18	10.57	0.20	0.42	0.13	101.0	89.0
Col-1007A·	47.7	0.00	41.5	0.21	10.61	0.21	0.25	0.05	100.5	88.9
Col-1007A·	47.9	0.03	41.4	0.16	10.66	0.16	0.34	0.04	100.7	88.9
Col-1007A·	47.7	0.02	41.5	0.21	10.61	0.14	0.23	0.04	100.4	88.9
Col-1007A·	47.6	0.02	40.9	0.15	10.63	0.16	0.34	0.04	99.9	88.9
Col-1007A·	47.7	0.03	41.3	0.15	10.65	0.22	0.39	0.03	100.4	88.9
Col-1007A·	47.6	0.02	41.0	0.16	10.70	0.10	0.36	0.04	100.0	88.8
Col-1007A·	47.6	0.02	41.3	0.19	10.96	0.16	0.29	0.07	100.6	88.6
Col-1007A·	47.6	0.00	41.1	0.17	10.99	0.19	0.33	0.06	100.4	88.5
Col-1007A·	47.5	0.00	41.1	0.21	11.05	0.16	0.27	0.02	100.3	88.5
Col-1007A·	47.2	0.01	40.9	0.14	11.05	0.21	0.34	0.06	100.0	88.4
Col-1007A·	47.6	0.02	41.3	0.18	11.21	0.21	0.37	0.05	100.9	88.3
Col-1007A·	47.3	0.00	41.1	0.19	11.25	0.25	0.23	0.03	100.4	88.2
Col-1007A·	47.2	0.07	41.2	0.22	11.25	0.19	0.23	0.08	100.4	88.2
Col-1007A·	47.2	0.01	41.1	0.15	11.41	0.20	0.38	0.05	100.4	88.0
Col-1007A·	46.6	0.05	41.0	0.23	11.30	0.22	0.26	0.05	99.8	88.0
Col-1007A·	47.0	0.02	40.7	0.18	11.63	0.13	0.34	0.07	100.0	87.8
Col-1007A·	47.0	0.01	40.9	0.22	11.82	0.24	0.19	0.00	100.4	87.6
Col-1007A·	46.3	0.05	40.7	0.21	11.68	0.30	0.24	0.18	99.7	87.6
Col-1007A·	46.7	0.01	41.0	0.21	11.98	0.16	0.19	0.04	100.4	87.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007A·	46.8	0.01	41.2	0.18	12.07	0.25	0.28	0.04	100.9	87.4
Col-1007A·	46.8	0.01	40.7	0.22	12.19	0.23	0.18	0.01	100.4	87.3
Col-1007A·	46.7	0.01	40.9	0.24	12.19	0.23	0.17	0.01	100.4	87.2
Col-1007A·	46.4	0.00	41.2	0.21	12.32	0.26	0.19	0.03	100.6	87.0
Col-1007A·	46.0	0.02	41.0	0.26	12.46	0.25	0.15	0.02	100.2	86.8
Col-1007A·	46.4	0.02	40.8	0.24	12.82	0.27	0.16	0.01	100.7	86.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	49.7	0.02	41.4	0.08	7.15	0.11	0.78	0.10	99.36	92.5
Col-1007B·	49.7	0.04	41.5	0.07	7.30	0.06	0.72	0.13	99.51	92.4
Col-1007B·	49.7	0.05	41.5	0.09	7.32	0.16	0.77	0.12	99.7	92.4
Col-1007B·	49.5	0.01	41.5	0.08	7.30	0.09	0.82	0.10	99.41	92.4
Col-1007B·	49.7	0.02	41.6	0.10	7.35	0.10	0.77	0.11	99.71	92.3
Col-1007B·	49.7	0.03	41.6	0.08	7.41	0.09	0.76	0.10	99.73	92.3
Col-1007B·	49.3	0.02	41.5	0.08	7.37	0.13	0.74	0.06	99.22	92.3
Col-1007B·	49.7	0.04	41.5	0.08	7.46	0.11	0.74	0.13	99.85	92.2
Col-1007B·	49.3	0.00	41.4	0.10	7.42	0.14	0.74	0.09	99.21	92.2
Col-1007B·	51.6	0.27	40.1	0.17	7.80	0.10	0.56	0.07	100.6	92.2
Col-1007B·	49.6	0.03	41.6	0.09	7.51	0.13	0.75	0.07	99.84	92.2
Col-1007B·	49.3	0.03	41.5	0.08	7.47	0.08	0.74	0.11	99.25	92.2
Col-1007B·	49.3	0.02	41.4	0.10	7.51	0.09	0.68	0.08	99.24	92.1
Col-1007B·	49.6	0.04	41.4	0.10	7.57	0.06	0.68	0.09	99.58	92.1
Col-1007B·	49.5	0.03	41.7	0.09	7.61	0.14	0.74	0.09	99.93	92.1
Col-1007B·	49.3	0.03	41.6	0.11	7.59	0.15	0.67	0.08	99.59	92.1
Col-1007B·	49.4	0.01	41.4	0.10	7.63	0.08	0.68	0.06	99.28	92.0
Col-1007B·	49.3	0.02	41.7	0.12	7.63	0.13	0.67	0.07	99.64	92.0
Col-1007B·	49.8	0.02	41.5	0.09	7.80	0.04	0.75	0.12	100.1	91.9
Col-1007B·	49.3	0.03	41.3	0.11	7.81	0.14	0.64	0.07	99.35	91.8
Col-1007B·	49.3	0.01	41.6	0.14	7.81	0.16	0.60	0.09	99.66	91.8
Col-1007B·	49.4	0.04	41.3	0.11	7.87	0.10	0.64	0.08	99.58	91.8
Col-1007B·	49.5	0.03	41.5	0.10	7.94	0.12	0.72	0.08	100	91.7
Col-1007B·	48.9	0.02	41.5	0.14	7.92	0.04	0.61	0.07	99.14	91.7
Col-1007B·	49.3	0.01	41.7	0.14	8.01	0.13	0.60	0.06	99.97	91.7
Col-1007B·	49.1	0.04	41.4	0.14	7.97	0.12	0.56	0.04	99.32	91.6
Col-1007B·	49.6	0.03	41.5	0.09	8.06	0.18	0.67	0.07	100.2	91.6
Col-1007B·	49.1	0.01	41.5	0.14	7.98	0.09	0.59	0.06	99.51	91.6
Col-1007B·	49.4	0.02	41.8	0.13	8.04	0.13	0.60	0.10	100.2	91.6
Col-1007B·	49.5	0.03	41.6	0.14	8.08	0.12	0.59	0.07	100.2	91.6
Col-1007B·	49.0	0.02	41.5	0.14	8.01	0.07	0.55	0.08	99.38	91.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	49.1	0.02	41.5	0.13	8.03	0.10	0.59	0.07	99.58	91.6
Col-1007B·	49.6	0.02	42.0	0.14	8.12	0.11	0.58	0.09	100.6	91.6
Col-1007B·	49.2	0.02	41.9	0.13	8.07	0.19	0.61	0.04	100.2	91.6
Col-1007B·	49.4	0.01	42.0	0.15	8.09	0.13	0.54	0.06	100.4	91.6
Col-1007B·	49.4	0.01	41.8	0.15	8.10	0.16	0.60	0.06	100.4	91.6
Col-1007B·	49.2	0.01	41.9	0.14	8.08	0.10	0.60	0.09	100.1	91.6
Col-1007B·	49.3	0.03	41.9	0.14	8.09	0.08	0.52	0.06	100	91.6
Col-1007B·	49.4	0.02	41.7	0.13	8.12	0.17	0.58	0.06	100.3	91.6
Col-1007B·	49.4	0.01	41.3	0.13	8.11	0.06	0.68	0.06	99.72	91.6
Col-1007B·	49.4	0.02	41.9	0.11	8.12	0.10	0.61	0.07	100.3	91.6
Col-1007B·	49.0	0.02	41.7	0.14	8.06	0.16	0.55	0.05	99.72	91.6
Col-1007B·	49.4	0.02	41.9	0.14	8.12	0.14	0.62	0.06	100.4	91.6
Col-1007B·	49.1	0.03	41.6	0.14	8.07	0.13	0.56	0.07	99.71	91.6
Col-1007B·	49.4	0.02	41.7	0.15	8.14	0.12	0.53	0.06	100.1	91.5
Col-1007B·	49.1	0.03	41.7	0.14	8.08	0.13	0.60	0.04	99.78	91.5
Col-1007B·	49.6	0.02	41.7	0.15	8.17	0.19	0.56	0.08	100.5	91.5
Col-1007B·	49.5	0.01	41.6	0.13	8.16	0.08	0.55	0.04	100.1	91.5
Col-1007B·	49.5	0.01	41.7	0.13	8.18	0.12	0.59	0.05	100.3	91.5
Col-1007B·	49.1	0.02	41.6	0.12	8.11	0.10	0.53	0.06	99.57	91.5
Col-1007B·	49.6	0.00	41.8	0.14	8.21	0.16	0.56	0.08	100.5	91.5
Col-1007B·	48.8	0.03	41.3	0.13	8.08	0.13	0.58	0.05	99.05	91.5
Col-1007B·	49.3	0.02	41.5	0.13	8.16	0.12	0.61	0.07	99.89	91.5
Col-1007B·	49.5	0.01	41.6	0.12	8.21	0.17	0.56	0.04	100.2	91.5
Col-1007B·	49.1	0.04	41.5	0.12	8.15	0.05	0.63	0.06	99.68	91.5
Col-1007B·	49.2	0.02	41.7	0.14	8.16	0.10	0.57	0.09	99.91	91.5
Col-1007B·	49.2	0.00	41.5	0.13	8.17	0.12	0.56	0.08	99.75	91.5
Col-1007B·	49.3	0.01	41.8	0.14	8.19	0.17	0.54	0.06	100.2	91.5
Col-1007B·	49.4	0.02	41.5	0.12	8.20	0.04	0.60	0.07	100	91.5
Col-1007B·	49.2	0.00	41.7	0.13	8.17	0.14	0.54	0.08	99.98	91.5
Col-1007B·	49.4	0.02	41.7	0.15	8.21	0.06	0.58	0.07	100.2	91.5
Col-1007B·	49.2	0.03	41.8	0.12	8.18	0.12	0.57	0.11	100.1	91.5
Col-1007B·	49.4	0.01	41.8	0.13	8.22	0.15	0.53	0.05	100.3	91.5
Col-1007B·	49.4	0.01	41.7	0.14	8.23	0.18	0.63	0.06	100.3	91.4
Col-1007B·	49.1	0.04	41.6	0.14	8.18	0.12	0.57	0.04	99.76	91.4
Col-1007B·	49.3	0.03	41.7	0.13	8.23	0.11	0.52	0.05	100.1	91.4
Col-1007B·	49.1	0.01	41.6	0.14	8.20	0.12	0.53	0.07	99.84	91.4
Col-1007B·	49.2	0.01	41.6	0.13	8.21	0.17	0.61	0.06	99.97	91.4
Col-1007B·	49.0	0.01	41.6	0.15	8.19	0.02	0.50	0.03	99.57	91.4
Col-1007B·	49.4	0.01	41.7	0.14	8.24	0.09	0.56	0.03	100.1	91.4
Col-1007B·	48.6	0.02	41.4	0.14	8.12	0.10	0.53	0.07	98.98	91.4
Col-1007B·	49.3	0.04	41.7	0.14	8.24	0.10	0.56	0.04	100.1	91.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	49.6	0.02	41.7	0.12	8.30	0.15	0.62	0.07	100.6	91.4
Col-1007B·	49.2	0.02	41.7	0.13	8.24	0.13	0.56	0.10	100.1	91.4
Col-1007B·	49.1	0.02	41.4	0.13	8.22	0.13	0.56	0.06	99.6	91.4
Col-1007B·	49.3	0.02	41.7	0.15	8.27	0.09	0.59	0.08	100.2	91.4
Col-1007B·	49.5	0.02	41.9	0.14	8.29	0.15	0.62	0.06	100.7	91.4
Col-1007B·	49.3	0.02	41.8	0.13	8.27	0.05	0.53	0.06	100.2	91.4
Col-1007B·	48.9	0.01	41.4	0.14	8.19	0.15	0.60	0.07	99.38	91.4
Col-1007B·	49.2	0.00	41.7	0.14	8.26	0.09	0.57	0.12	100.1	91.4
Col-1007B·	49.4	0.01	41.7	0.14	8.30	0.20	0.51	0.05	100.4	91.4
Col-1007B·	49.4	0.01	41.7	0.14	8.30	0.11	0.60	0.07	100.4	91.4
Col-1007B·	49.3	0.00	41.6	0.14	8.29	0.10	0.57	0.11	100.1	91.4
Col-1007B·	49.5	0.01	41.8	0.14	8.31	0.13	0.56	0.09	100.5	91.4
Col-1007B·	49.1	0.02	41.7	0.13	8.26	0.09	0.57	0.06	99.99	91.4
Col-1007B·	49.2	0.02	41.9	0.13	8.28	0.16	0.56	0.06	100.3	91.4
Col-1007B·	48.9	0.02	41.7	0.13	8.23	0.11	0.55	0.06	99.64	91.4
Col-1007B·	49.2	0.03	41.7	0.14	8.28	0.15	0.56	0.07	100	91.4
Col-1007B·	49.1	0.03	41.3	0.13	8.26	0.09	0.61	0.09	99.54	91.4
Col-1007B·	48.9	0.03	41.4	0.14	8.24	0.12	0.57	0.07	99.53	91.4
Col-1007B·	49.3	0.03	41.6	0.14	8.32	0.14	0.57	0.07	100.2	91.4
Col-1007B·	49.2	0.02	41.5	0.13	8.29	0.18	0.56	0.10	100	91.4
Col-1007B·	49.1	0.01	41.5	0.16	8.28	0.12	0.56	0.16	99.85	91.4
Col-1007B·	49.5	0.03	41.8	0.14	8.35	0.15	0.60	0.10	100.6	91.4
Col-1007B·	49.5	0.00	41.7	0.14	8.35	0.05	0.51	0.04	100.2	91.4
Col-1007B·	49.1	0.03	41.7	0.13	8.29	0.13	0.58	0.05	99.95	91.3
Col-1007B·	49.1	0.02	41.7	0.15	8.29	0.06	0.57	0.10	99.9	91.3
Col-1007B·	49.1	0.02	41.5	0.12	8.30	0.11	0.58	0.06	99.82	91.3
Col-1007B·	49.0	0.02	41.5	0.13	8.29	0.10	0.51	0.04	99.62	91.3
Col-1007B·	49.3	0.02	41.9	0.15	8.33	0.13	0.53	0.05	100.3	91.3
Col-1007B·	49.4	0.03	41.7	0.13	8.36	0.15	0.55	0.07	100.4	91.3
Col-1007B·	49.4	0.02	41.7	0.13	8.35	0.11	0.57	0.09	100.3	91.3
Col-1007B·	48.9	0.03	41.3	0.14	8.27	0.15	0.57	0.04	99.42	91.3
Col-1007B·	49.5	0.01	41.7	0.14	8.39	0.12	0.52	0.06	100.5	91.3
Col-1007B·	49.2	0.02	41.5	0.13	8.34	0.17	0.57	0.05	99.97	91.3
Col-1007B·	49.6	0.01	42.0	0.12	8.41	0.10	0.57	0.06	100.9	91.3
Col-1007B·	49.6	0.07	41.6	0.17	8.43	0.11	0.52	0.21	100.7	91.3
Col-1007B·	49.1	0.02	41.8	0.15	8.33	0.15	0.54	0.06	100.1	91.3
Col-1007B·	49.3	0.01	41.4	0.13	8.38	0.15	0.58	0.04	100	91.3
Col-1007B·	49.4	0.03	41.8	0.14	8.39	0.15	0.52	0.07	100.4	91.3
Col-1007B·	49.4	0.02	41.6	0.14	8.39	0.05	0.59	0.06	100.2	91.3
Col-1007B·	49.3	0.01	41.9	0.15	8.38	0.15	0.58	0.11	100.5	91.3
Col-1007B·	49.1	0.02	41.8	0.15	8.35	0.13	0.51	0.04	100	91.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	49.0	0.01	41.5	0.13	8.34	0.07	0.51	0.08	99.66	91.3
Col-1007B·	48.7	0.03	41.1	0.14	8.28	0.12	0.55	0.09	99.03	91.3
Col-1007B·	49.2	0.01	41.9	0.13	8.38	0.12	0.53	0.05	100.4	91.3
Col-1007B·	49.1	0.04	41.7	0.14	8.35	0.10	0.55	0.06	100	91.3
Col-1007B·	49.1	0.02	41.1	0.14	8.37	0.12	0.57	0.13	99.52	91.3
Col-1007B·	49.0	0.02	41.7	0.14	8.35	0.18	0.55	0.04	99.98	91.3
Col-1007B·	49.3	0.01	41.7	0.16	8.40	0.14	0.51	0.04	100.3	91.3
Col-1007B·	49.3	0.02	41.6	0.13	8.41	0.10	0.57	0.06	100.2	91.3
Col-1007B·	49.4	0.03	41.7	0.14	8.43	0.12	0.53	0.06	100.4	91.3
Col-1007B·	49.4	0.01	41.7	0.14	8.42	0.11	0.54	0.05	100.3	91.3
Col-1007B·	49.2	0.02	41.7	0.15	8.40	0.10	0.55	0.08	100.2	91.3
Col-1007B·	49.7	0.02	41.7	0.13	8.49	0.12	0.57	0.11	100.9	91.3
Col-1007B·	48.9	0.03	41.4	0.14	8.35	0.11	0.56	0.06	99.49	91.3
Col-1007B·	49.3	0.02	41.6	0.13	8.44	0.12	0.53	0.06	100.2	91.2
Col-1007B·	49.1	0.02	41.8	0.13	8.40	0.11	0.52	0.10	100.2	91.2
Col-1007B·	49.1	0.02	41.8	0.14	8.41	0.12	0.54	0.08	100.3	91.2
Col-1007B·	48.9	0.00	41.7	0.14	8.37	0.12	0.54	0.07	99.84	91.2
Col-1007B·	49.4	0.02	41.7	0.13	8.47	0.17	0.59	0.06	100.6	91.2
Col-1007B·	48.9	0.01	41.6	0.14	8.38	0.09	0.53	0.06	99.71	91.2
Col-1007B·	49.5	0.02	41.5	0.14	8.48	0.05	0.57	0.06	100.2	91.2
Col-1007B·	49.2	0.01	41.5	0.15	8.43	0.11	0.54	0.08	100	91.2
Col-1007B·	49.1	0.00	41.7	0.15	8.42	0.12	0.53	0.07	100.1	91.2
Col-1007B·	49.2	0.02	41.5	0.15	8.44	0.08	0.54	0.04	100	91.2
Col-1007B·	49.1	0.01	41.5	0.14	8.42	0.16	0.53	0.09	99.95	91.2
Col-1007B·	49.0	0.02	41.6	0.15	8.42	0.08	0.55	0.05	99.87	91.2
Col-1007B·	49.3	0.01	41.5	0.14	8.47	0.08	0.59	0.09	100.2	91.2
Col-1007B·	49.4	0.01	41.5	0.14	8.49	0.09	0.58	0.06	100.3	91.2
Col-1007B·	49.0	0.03	41.6	0.15	8.42	0.05	0.55	0.05	99.9	91.2
Col-1007B·	49.0	0.02	41.4	0.13	8.44	0.11	0.55	0.05	99.75	91.2
Col-1007B·	48.9	0.03	41.5	0.16	8.42	0.13	0.60	0.09	99.86	91.2
Col-1007B·	49.1	0.02	41.5	0.13	8.46	0.17	0.56	0.07	100	91.2
Col-1007B·	49.0	0.02	41.9	0.14	8.45	0.15	0.55	0.06	100.3	91.2
Col-1007B·	49.3	0.03	41.6	0.15	8.49	0.07	0.55	0.07	100.2	91.2
Col-1007B·	49.0	0.02	41.4	0.13	8.45	0.09	0.54	0.08	99.71	91.2
Col-1007B·	49.0	0.02	41.4	0.14	8.45	0.10	0.50	0.06	99.69	91.2
Col-1007B·	48.9	0.00	41.2	0.15	8.43	0.12	0.54	0.06	99.42	91.2
Col-1007B·	49.2	0.02	41.5	0.13	8.50	0.15	0.52	0.05	100.1	91.2
Col-1007B·	49.2	0.02	41.8	0.12	8.49	0.12	0.54	0.09	100.3	91.2
Col-1007B·	49.2	0.01	41.5	0.13	8.50	0.12	0.55	0.08	100	91.2
Col-1007B·	49.1	0.02	41.5	0.13	8.48	0.12	0.57	0.04	99.92	91.2
Col-1007B·	49.0	0.02	41.7	0.14	8.48	0.10	0.49	0.08	100	91.2

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	49.1	0.02	41.9	0.13	8.50	0.19	0.51	0.07	100.4	91.1
Col-1007B·	49.4	0.01	41.8	0.15	8.55	0.06	0.55	0.06	100.5	91.1
Col-1007B·	48.9	0.01	41.5	0.13	8.47	0.13	0.55	0.08	99.75	91.1
Col-1007B·	49.0	0.01	41.9	0.14	8.49	0.13	0.53	0.13	100.3	91.1
Col-1007B·	49.2	0.04	41.3	0.13	8.53	0.11	0.55	0.05	99.96	91.1
Col-1007B·	49.2	0.01	41.8	0.14	8.53	0.09	0.53	0.06	100.3	91.1
Col-1007B·	49.1	0.03	41.7	0.12	8.53	0.14	0.53	0.05	100.2	91.1
Col-1007B·	49.0	0.02	41.5	0.14	8.51	0.11	0.52	0.05	99.87	91.1
Col-1007B·	49.2	0.01	41.4	0.13	8.55	0.11	0.60	0.07	100	91.1
Col-1007B·	48.8	0.01	41.7	0.14	8.49	0.08	0.54	0.03	99.86	91.1
Col-1007B·	49.2	0.03	41.7	0.14	8.56	0.18	0.52	0.05	100.4	91.1
Col-1007B·	48.9	0.03	41.7	0.14	8.51	0.12	0.57	0.06	99.97	91.1
Col-1007B·	48.5	0.01	41.3	0.14	8.46	0.13	0.55	0.06	99.15	91.1
Col-1007B·	49.1	0.02	41.6	0.15	8.57	0.12	0.53	0.06	100.2	91.1
Col-1007B·	48.9	0.02	41.7	0.14	8.54	0.13	0.53	0.08	100	91.1
Col-1007B·	49.1	0.02	41.6	0.13	8.57	0.18	0.53	0.03	100.2	91.1
Col-1007B·	49.1	0.02	41.6	0.14	8.57	0.10	0.52	0.05	100.1	91.1
Col-1007B·	49.0	0.02	41.5	0.14	8.57	0.11	0.53	0.07	100	91.1
Col-1007B·	49.1	0.03	41.5	0.14	8.59	0.16	0.56	0.07	100.2	91.1
Col-1007B·	49.1	0.01	41.7	0.15	8.58	0.15	0.52	0.07	100.3	91.1
Col-1007B·	49.2	0.02	41.6	0.14	8.61	0.14	0.54	0.07	100.3	91.1
Col-1007B·	48.8	0.02	41.2	0.14	8.54	0.16	0.55	0.06	99.45	91.1
Col-1007B·	49.1	0.04	41.6	0.15	8.59	0.08	0.52	0.04	100	91.1
Col-1007B·	48.7	0.06	41.6	0.16	8.53	0.15	0.50	0.04	99.71	91.1
Col-1007B·	48.6	0.05	41.4	0.18	8.51	0.15	0.51	0.08	99.43	91.1
Col-1007B·	49.3	0.00	41.0	0.14	8.63	0.08	0.54	0.08	99.78	91.0
Col-1007B·	49.2	0.01	41.3	0.15	8.63	0.11	0.57	0.05	99.99	91.0
Col-1007B·	49.0	0.00	41.5	0.13	8.58	0.15	0.56	0.04	99.91	91.0
Col-1007B·	49.1	0.02	41.5	0.14	8.61	0.13	0.54	0.06	100.1	91.0
Col-1007B·	49.0	0.01	41.8	0.14	8.59	0.12	0.56	0.05	100.2	91.0
Col-1007B·	49.1	0.02	41.8	0.13	8.62	0.18	0.53	0.06	100.5	91.0
Col-1007B·	49.2	0.00	41.7	0.14	8.64	0.13	0.51	0.05	100.3	91.0
Col-1007B·	48.9	0.02	41.6	0.15	8.59	0.10	0.54	0.06	99.9	91.0
Col-1007B·	48.7	0.04	41.4	0.15	8.57	0.05	0.57	0.06	99.61	91.0
Col-1007B·	49.0	0.01	41.6	0.15	8.61	0.10	0.54	0.07	100.1	91.0
Col-1007B·	49.3	0.02	41.7	0.13	8.67	0.14	0.57	0.06	100.5	91.0
Col-1007B·	48.6	0.01	41.5	0.15	8.56	0.13	0.52	0.09	99.61	91.0
Col-1007B·	48.9	0.01	41.7	0.14	8.61	0.10	0.53	0.06	100	91.0
Col-1007B·	49.0	0.03	41.4	0.16	8.63	0.18	0.55	0.08	100	91.0
Col-1007B·	48.9	0.02	41.6	0.13	8.60	0.11	0.57	0.08	100	91.0
Col-1007B·	49.0	0.01	41.7	0.15	8.64	0.18	0.57	0.09	100.4	91.0

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	49.0	0.01	41.7	0.14	8.64	0.10	0.49	0.10	100.2	91.0
Col-1007B·	49.1	0.01	41.7	0.14	8.65	0.09	0.56	0.04	100.3	91.0
Col-1007B·	49.4	0.02	41.7	0.14	8.71	0.13	0.60	0.07	100.8	91.0
Col-1007B·	49.0	0.03	41.3	0.13	8.64	0.15	0.58	0.04	99.89	91.0
Col-1007B·	48.8	0.02	41.8	0.16	8.61	0.10	0.58	0.06	100.1	91.0
Col-1007B·	49.0	0.03	41.5	0.14	8.65	0.10	0.53	0.06	100	91.0
Col-1007B·	48.9	0.03	41.8	0.15	8.64	0.15	0.47	0.04	100.2	91.0
Col-1007B·	49.1	0.02	41.7	0.17	8.68	0.12	0.51	0.04	100.4	91.0
Col-1007B·	48.9	0.02	41.5	0.14	8.65	0.17	0.53	0.07	100	91.0
Col-1007B·	48.9	0.03	41.5	0.14	8.66	0.13	0.56	0.07	100.1	91.0
Col-1007B·	48.9	0.02	41.5	0.13	8.67	0.14	0.53	0.05	99.94	91.0
Col-1007B·	49.2	0.03	41.7	0.14	8.71	0.15	0.55	0.06	100.5	91.0
Col-1007B·	49.1	0.02	41.9	0.14	8.70	0.11	0.52	0.05	100.5	91.0
Col-1007B·	49.2	0.02	41.6	0.16	8.72	0.13	0.50	0.02	100.4	91.0
Col-1007B·	48.9	0.02	41.6	0.14	8.68	0.14	0.56	0.06	100.2	91.0
Col-1007B·	48.9	0.02	41.6	0.13	8.69	0.08	0.55	0.10	100.1	90.9
Col-1007B·	49.0	0.02	41.6	0.13	8.71	0.08	0.57	0.07	100.2	90.9
Col-1007B·	48.8	0.01	41.5	0.14	8.68	0.18	0.54	0.05	99.87	90.9
Col-1007B·	49.0	0.02	41.7	0.15	8.71	0.13	0.59	0.06	100.4	90.9
Col-1007B·	48.9	0.01	41.2	0.13	8.71	0.16	0.55	0.08	99.68	90.9
Col-1007B·	48.9	0.02	41.8	0.15	8.71	0.14	0.52	0.16	100.4	90.9
Col-1007B·	48.6	0.01	41.4	0.14	8.66	0.13	0.48	0.06	99.48	90.9
Col-1007B·	49.1	0.02	41.8	0.14	8.76	0.10	0.53	0.05	100.5	90.9
Col-1007B·	48.6	0.02	41.7	0.15	8.67	0.15	0.54	0.12	99.91	90.9
Col-1007B·	48.7	0.02	41.4	0.14	8.69	0.12	0.50	0.06	99.62	90.9
Col-1007B·	48.5	0.01	41.2	0.13	8.66	0.11	0.54	0.08	99.2	90.9
Col-1007B·	49.1	-0.01	41.4	0.14	8.76	0.14	0.52	0.06	100.1	90.9
Col-1007B·	48.7	0.01	41.1	0.14	8.71	0.11	0.53	0.05	99.38	90.9
Col-1007B·	49.0	0.03	41.5	0.14	8.78	0.13	0.50	0.07	100.2	90.9
Col-1007B·	48.7	0.02	41.2	0.14	8.73	0.09	0.52	0.06	99.49	90.9
Col-1007B·	48.3	0.03	41.3	0.15	8.65	0.17	0.44	0.10	99.14	90.9
Col-1007B·	49.2	0.01	41.5	0.15	8.82	0.12	0.49	0.09	100.4	90.9
Col-1007B·	49.1	0.02	41.6	0.18	8.81	0.11	0.57	0.03	100.4	90.9
Col-1007B·	48.7	0.02	41.5	0.18	8.74	0.16	0.48	0.06	99.92	90.9
Col-1007B·	48.7	0.02	41.6	0.12	8.73	0.14	0.62	0.05	99.93	90.9
Col-1007B·	49.1	0.02	41.8	0.14	8.80	0.11	0.53	0.04	100.5	90.9
Col-1007B·	49.3	0.02	41.6	0.13	8.85	0.10	0.54	0.07	100.7	90.9
Col-1007B·	49.2	0.03	41.5	0.13	8.83	0.12	0.53	0.06	100.4	90.9
Col-1007B·	48.6	0.02	41.4	0.12	8.74	0.19	0.63	0.07	99.86	90.8
Col-1007B·	48.5	0.02	41.2	0.15	8.73	0.14	0.54	0.07	99.37	90.8
Col-1007B·	49.2	0.04	41.3	0.14	8.86	0.11	0.55	0.03	100.2	90.8

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	48.8	0.02	41.6	0.17	8.78	0.10	0.53	0.04	100	90.8
Col-1007B·	48.6	0.02	41.3	0.15	8.75	0.10	0.55	0.07	99.54	90.8
Col-1007B·	49.0	0.02	41.6	0.14	8.84	0.15	0.56	0.07	100.4	90.8
Col-1007B·	48.5	0.01	41.6	0.15	8.76	0.09	0.50	0.04	99.58	90.8
Col-1007B·	49.1	0.03	41.7	0.15	8.87	0.08	0.50	0.06	100.6	90.8
Col-1007B·	48.8	0.01	41.5	0.13	8.82	0.14	0.58	0.06	100.1	90.8
Col-1007B·	48.5	0.03	41.2	0.15	8.77	0.17	0.55	0.03	99.46	90.8
Col-1007B·	49.0	0.02	41.6	0.15	8.86	0.14	0.56	0.06	100.4	90.8
Col-1007B·	48.5	0.02	41.2	0.15	8.78	0.14	0.54	0.07	99.39	90.8
Col-1007B·	48.5	0.03	41.2	0.14	8.78	0.15	0.53	0.05	99.35	90.8
Col-1007B·	49.0	0.02	41.2	0.14	8.89	0.12	0.56	0.08	100	90.8
Col-1007B·	48.6	0.01	41.8	0.15	8.82	0.10	0.49	0.08	100.1	90.8
Col-1007B·	48.8	0.01	41.6	0.14	8.86	0.06	0.53	0.07	100.1	90.8
Col-1007B·	48.8	0.02	41.5	0.14	8.87	0.10	0.55	0.04	100	90.8
Col-1007B·	49.2	0.02	41.7	0.14	8.94	0.09	0.52	0.04	100.7	90.7
Col-1007B·	48.9	0.03	41.7	0.14	8.89	0.12	0.49	0.08	100.4	90.7
Col-1007B·	47.3	0.03	42.4	0.14	8.60	0.08	0.58	0.07	99.15	90.7
Col-1007B·	48.6	0.02	41.4	0.14	8.84	0.12	0.46	0.06	99.61	90.7
Col-1007B·	48.4	0.01	41.1	0.14	8.81	0.11	0.48	0.04	99.09	90.7
Col-1007B·	48.9	0.02	41.6	0.13	8.91	0.15	0.52	0.06	100.4	90.7
Col-1007B·	48.7	0.02	41.7	0.14	8.88	0.14	0.53	0.04	100.1	90.7
Col-1007B·	49.1	0.02	41.5	0.14	8.95	0.12	0.51	0.06	100.3	90.7
Col-1007B·	48.8	0.02	41.4	0.14	8.90	0.12	0.55	0.07	99.95	90.7
Col-1007B·	48.9	0.02	41.5	0.14	8.91	0.14	0.54	0.11	100.2	90.7
Col-1007B·	48.8	0.02	41.6	0.14	8.91	0.13	0.51	0.05	100.1	90.7
Col-1007B·	48.6	0.02	41.4	0.14	8.89	0.12	0.45	0.07	99.66	90.7
Col-1007B·	48.6	0.02	41.5	0.14	8.90	0.18	0.56	0.06	100	90.7
Col-1007B·	49.0	0.02	41.4	0.15	8.98	0.13	0.51	0.04	100.2	90.7
Col-1007B·	48.5	0.01	41.2	0.14	8.90	0.10	0.47	0.07	99.43	90.7
Col-1007B·	48.7	0.02	41.4	0.14	8.95	0.15	0.51	0.07	99.92	90.7
Col-1007B·	48.5	0.02	41.1	0.13	8.93	0.11	0.54	0.06	99.41	90.6
Col-1007B·	49.0	0.02	41.5	0.14	9.04	0.19	0.53	0.08	100.5	90.6
Col-1007B·	48.6	0.02	41.6	0.15	8.97	0.14	0.51	0.04	100	90.6
Col-1007B·	48.6	0.02	41.4	0.14	8.99	0.16	0.51	0.07	99.91	90.6
Col-1007B·	48.8	0.01	41.7	0.15	9.02	0.08	0.50	0.05	100.2	90.6
Col-1007B·	48.8	0.01	41.7	0.12	9.07	0.09	0.58	0.08	100.4	90.6
Col-1007B·	48.4	0.01	41.3	0.15	9.01	0.15	0.50	0.06	99.64	90.5
Col-1007B·	48.4	0.03	41.1	0.14	9.02	0.11	0.55	0.06	99.48	90.5
Col-1007B·	48.8	0.02	41.4	0.15	9.09	0.09	0.52	0.06	100.1	90.5
Col-1007B·	49.1	0.01	41.4	0.14	9.15	0.11	0.45	0.08	100.5	90.5
Col-1007B·	48.2	0.02	41.0	0.13	9.01	0.15	0.50	0.10	99.17	90.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	48.5	0.01	41.6	0.13	9.06	0.17	0.59	0.07	100.1	90.5
Col-1007B·	48.5	0.02	41.4	0.15	9.06	0.13	0.51	0.07	99.81	90.5
Col-1007B·	48.7	0.03	41.4	0.14	9.14	0.16	0.48	0.03	100	90.5
Col-1007B·	48.4	0.02	42.7	0.14	9.10	0.12	0.46	0.05	101	90.5
Col-1007B·	48.5	0.06	41.6	0.17	9.10	0.14	0.40	0.07	99.96	90.5
Col-1007B·	48.0	0.02	41.3	0.16	9.04	0.11	0.53	0.07	99.23	90.5
Col-1007B·	48.6	0.02	41.2	0.14	9.16	0.07	0.46	0.03	99.61	90.4
Col-1007B·	48.5	0.01	41.6	0.13	9.17	0.12	0.55	0.08	100.2	90.4
Col-1007B·	48.4	0.00	41.2	0.15	9.18	0.17	0.50	0.08	99.74	90.4
Col-1007B·	48.4	0.01	41.3	0.15	9.17	0.11	0.46	0.06	99.67	90.4
Col-1007B·	48.7	0.02	41.7	0.15	9.24	0.10	0.46	0.10	100.5	90.4
Col-1007B·	48.4	0.00	41.3	0.15	9.22	0.16	0.50	0.07	99.83	90.3
Col-1007B·	48.4	0.01	41.5	0.14	9.24	0.17	0.60	0.07	100.1	90.3
Col-1007B·	48.7	0.01	41.7	0.14	9.31	0.11	0.50	0.07	100.5	90.3
Col-1007B·	48.6	0.02	41.4	0.14	9.32	0.13	0.49	0.08	100.2	90.3
Col-1007B·	48.4	0.01	41.3	0.15	9.29	0.14	0.50	0.06	99.85	90.3
Col-1007B·	48.3	0.01	41.3	0.13	9.30	0.17	0.52	0.10	99.82	90.3
Col-1007B·	48.6	0.02	41.5	0.12	9.34	0.12	0.54	0.05	100.3	90.3
Col-1007B·	48.4	0.02	41.5	0.15	9.31	0.17	0.51	0.08	100.1	90.3
Col-1007B·	48.2	0.02	42.0	0.15	9.30	0.15	0.43	0.04	100.4	90.2
Col-1007B·	48.5	0.02	41.7	0.16	9.35	0.14	0.45	0.09	100.4	90.2
Col-1007B·	48.2	0.02	41.3	0.14	9.32	0.17	0.48	0.07	99.63	90.2
Col-1007B·	48.3	0.03	41.4	0.15	9.34	0.09	0.44	0.03	99.76	90.2
Col-1007B·	48.0	0.00	41.1	0.14	9.31	0.14	0.45	0.05	99.17	90.2
Col-1007B·	48.0	0.03	41.2	0.15	9.33	0.18	0.44	0.02	99.36	90.2
Col-1007B·	48.2	0.01	41.3	0.13	9.37	0.17	0.53	0.05	99.7	90.2
Col-1007B·	48.1	0.02	40.9	0.15	9.37	0.11	0.41	0.04	99.1	90.1
Col-1007B·	48.1	0.02	41.3	0.14	9.37	0.15	0.42	0.07	99.58	90.1
Col-1007B·	48.2	0.03	41.4	0.17	9.39	0.14	0.40	0.04	99.72	90.1
Col-1007B·	48.7	0.01	41.5	0.14	9.51	0.12	0.47	0.06	100.5	90.1
Col-1007B·	48.5	0.02	41.8	0.16	9.47	0.13	0.50	0.08	100.6	90.1
Col-1007B·	48.4	0.02	41.7	0.14	9.47	0.09	0.50	0.01	100.3	90.1
Col-1007B·	48.4	0.02	41.2	0.14	9.48	0.12	0.49	0.06	99.87	90.1
Col-1007B·	48.4	0.00	41.6	0.13	9.50	0.16	0.42	0.05	100.3	90.1
Col-1007B·	48.6	0.01	41.9	0.14	9.53	0.13	0.44	0.07	100.8	90.1
Col-1007B·	48.5	0.02	41.4	0.14	9.54	0.13	0.42	0.06	100.2	90.1
Col-1007B·	48.5	0.03	41.6	0.15	9.55	0.14	0.43	0.05	100.4	90.1
Col-1007B·	47.8	0.04	41.1	0.15	9.42	0.11	0.48	0.04	99.07	90.0
Col-1007B·	48.5	0.03	41.6	0.14	9.57	0.18	0.59	0.08	100.7	90.0
Col-1007B·	48.0	0.01	41.1	0.14	9.51	0.09	0.52	0.06	99.5	90.0
Col-1007B·	48.3	0.02	41.6	0.14	9.57	0.13	0.52	0.07	100.3	90.0

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	48.3	0.02	41.6	0.14	9.58	0.08	0.42	0.09	100.2	90.0
Col-1007B·	48.2	0.01	41.4	0.14	9.56	0.17	0.39	0.06	99.93	90.0
Col-1007B·	48.3	0.01	41.4	0.14	9.58	0.17	0.45	0.08	100	90.0
Col-1007B·	48.2	0.01	41.4	0.14	9.57	0.14	0.44	0.08	99.9	90.0
Col-1007B·	48.1	0.02	41.4	0.14	9.56	0.17	0.59	0.19	100.2	90.0
Col-1007B·	48.3	0.01	41.2	0.16	9.62	0.13	0.48	0.06	99.95	89.9
Col-1007B·	48.2	0.02	41.5	0.16	9.61	0.13	0.45	0.08	100.2	89.9
Col-1007B·	48.3	0.01	41.4	0.14	9.63	0.11	0.44	0.07	100.1	89.9
Col-1007B·	48.5	0.03	41.6	0.13	9.66	0.21	0.44	0.05	100.6	89.9
Col-1007B·	48.0	0.01	41.3	0.13	9.58	0.07	0.42	0.02	99.59	89.9
Col-1007B·	48.4	0.03	41.6	0.13	9.66	0.19	0.44	0.12	100.5	89.9
Col-1007B·	47.8	0.01	41.2	0.13	9.56	0.14	0.52	0.07	99.47	89.9
Col-1007B·	48.3	0.02	41.4	0.15	9.65	0.13	0.44	0.09	100.1	89.9
Col-1007B·	48.4	0.02	41.5	0.14	9.68	0.18	0.42	0.05	100.4	89.9
Col-1007B·	48.0	0.01	41.5	0.14	9.61	0.14	0.44	0.04	99.85	89.9
Col-1007B·	48.1	0.03	41.5	0.13	9.66	0.11	0.43	0.05	100.1	89.9
Col-1007B·	48.2	0.02	41.4	0.13	9.69	0.22	0.40	0.07	100.2	89.9
Col-1007B·	48.4	0.01	41.4	0.15	9.74	0.17	0.44	0.08	100.4	89.9
Col-1007B·	48.3	0.04	41.4	0.14	9.73	0.20	0.46	0.12	100.4	89.9
Col-1007B·	48.1	0.00	41.2	0.13	9.70	0.15	0.43	0.06	99.76	89.8
Col-1007B·	48.1	0.01	41.3	0.17	9.70	0.16	0.46	0.02	99.88	89.8
Col-1007B·	48.2	-0.01	41.6	0.15	9.73	0.17	0.54	0.05	100.4	89.8
Col-1007B·	48.3	0.02	41.4	0.15	9.77	0.09	0.45	0.05	100.2	89.8
Col-1007B·	48.0	0.02	41.1	0.14	9.72	0.14	0.42	0.05	99.56	89.8
Col-1007B·	47.8	0.01	41.1	0.14	9.69	0.15	0.49	0.04	99.5	89.8
Col-1007B·	48.2	0.02	41.3	0.14	9.78	0.15	0.49	0.06	100.1	89.8
Col-1007B·	48.4	0.02	41.5	0.15	9.84	0.22	0.41	0.05	100.6	89.8
Col-1007B·	48.0	0.02	41.4	0.14	9.79	0.10	0.43	0.04	99.9	89.7
Col-1007B·	47.8	0.02	41.2	0.14	9.76	0.16	0.48	0.07	99.71	89.7
Col-1007B·	47.9	0.02	40.9	0.13	9.78	0.13	0.43	0.04	99.29	89.7
Col-1007B·	48.3	0.02	41.2	0.15	9.88	0.13	0.45	0.06	100.2	89.7
Col-1007B·	48.1	0.02	41.2	0.15	9.84	0.12	0.40	0.05	99.93	89.7
Col-1007B·	47.8	0.03	41.1	0.14	9.80	0.16	0.42	0.08	99.55	89.7
Col-1007B·	47.5	0.02	41.2	0.15	9.76	0.14	0.45	0.06	99.36	89.7
Col-1007B·	47.8	0.01	41.4	0.15	9.82	0.15	0.36	0.06	99.74	89.7
Col-1007B·	48.0	0.02	41.2	0.14	9.88	0.16	0.45	0.05	99.89	89.6
Col-1007B·	47.9	0.00	41.4	0.15	9.90	0.20	0.35	0.07	99.91	89.6
Col-1007B·	47.7	0.02	41.2	0.16	9.87	0.16	0.38	0.04	99.51	89.6
Col-1007B·	47.9	0.01	41.3	0.15	9.94	0.11	0.41	0.02	99.81	89.6
Col-1007B·	48.3	0.02	41.4	0.15	10.05	0.10	0.40	0.05	100.4	89.5
Col-1007B·	48.1	0.01	41.5	0.14	10.04	0.19	0.44	0.04	100.5	89.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	47.7	0.01	41.4	0.19	9.98	0.24	0.29	0.01	99.81	89.5
Col-1007B·	47.9	0.02	41.3	0.16	10.05	0.11	0.35	0.08	99.96	89.5
Col-1007B·	48.1	0.03	41.3	0.14	10.10	0.13	0.41	0.07	100.2	89.5
Col-1007B·	47.8	0.02	41.3	0.14	10.03	0.16	0.44	0.07	99.96	89.5
Col-1007B·	48.1	0.02	41.3	0.16	10.10	0.14	0.36	0.07	100.2	89.5
Col-1007B·	48.3	0.02	41.4	0.15	10.15	0.12	0.38	0.06	100.5	89.5
Col-1007B·	47.8	0.01	41.2	0.17	10.04	0.19	0.33	0.03	99.76	89.5
Col-1007B·	47.6	0.00	41.5	0.16	10.03	0.18	0.34	0.04	99.83	89.4
Col-1007B·	48.1	0.01	41.1	0.16	10.17	0.18	0.35	0.04	100.1	89.4
Col-1007B·	47.9	0.03	41.6	0.14	10.12	0.15	0.45	0.08	100.4	89.4
Col-1007B·	48.1	0.01	41.4	0.14	10.18	0.14	0.41	0.06	100.5	89.4
Col-1007B·	47.9	0.02	41.0	0.17	10.14	0.15	0.30	0.06	99.67	89.4
Col-1007B·	47.8	0.02	41.2	0.18	10.12	0.16	0.34	0.04	99.83	89.4
Col-1007B·	47.4	0.03	41.2	0.14	10.05	0.07	0.40	0.04	99.36	89.4
Col-1007B·	47.5	0.01	41.3	0.18	10.07	0.16	0.29	0.06	99.56	89.4
Col-1007B·	48.1	0.00	41.6	0.14	10.20	0.14	0.38	0.05	100.6	89.4
Col-1007B·	47.6	0.01	41.2	0.14	10.11	0.15	0.43	0.02	99.66	89.4
Col-1007B·	48.2	0.02	41.7	0.15	10.22	0.13	0.36	0.16	100.9	89.4
Col-1007B·	47.5	0.02	40.9	0.15	10.10	0.10	0.39	0.04	99.25	89.4
Col-1007B·	47.9	0.01	41.5	0.16	10.17	0.16	0.32	0.05	100.3	89.4
Col-1007B·	48.1	0.03	41.5	0.14	10.23	0.15	0.40	0.09	100.7	89.3
Col-1007B·	47.5	0.02	41.4	0.17	10.10	0.14	0.31	0.02	99.7	89.3
Col-1007B·	48.0	0.00	41.3	0.18	10.22	0.12	0.29	0.05	100.2	89.3
Col-1007B·	47.7	0.02	41.4	0.17	10.19	0.16	0.40	0.07	100.1	89.3
Col-1007B·	47.7	0.01	41.5	0.16	10.25	0.12	0.41	0.03	100.3	89.3
Col-1007B·	47.9	0.02	41.3	0.15	10.29	0.21	0.46	0.07	100.4	89.2
Col-1007B·	48.0	0.01	41.2	0.15	10.31	0.21	0.32	0.03	100.2	89.2
Col-1007B·	47.6	0.01	41.5	0.20	10.24	0.16	0.31	0.07	100.1	89.2
Col-1007B·	47.8	-0.01	41.4	0.13	10.29	0.14	0.38	0.03	100.2	89.2
Col-1007B·	48.1	0.01	41.7	0.16	10.36	0.20	0.31	0.04	100.8	89.2
Col-1007B·	47.8	0.02	41.4	0.18	10.37	0.18	0.33	0.05	100.3	89.2
Col-1007B·	47.7	0.02	41.3	0.14	10.37	0.16	0.38	0.05	100.2	89.1
Col-1007B·	47.4	0.01	41.0	0.19	10.30	0.12	0.27	0.04	99.31	89.1
Col-1007B·	48.0	0.02	41.5	0.18	10.45	0.11	0.31	0.08	100.7	89.1
Col-1007B·	47.7	0.02	41.2	0.17	10.43	0.19	0.29	0.04	100.1	89.1
Col-1007B·	47.4	0.00	41.2	0.14	10.41	0.17	0.39	0.05	99.73	89.0
Col-1007B·	47.7	0.00	41.2	0.14	10.59	0.15	0.32	0.03	100.1	88.9
Col-1007B·	47.3	0.04	40.9	0.19	10.54	0.17	0.28	0.03	99.5	88.9
Col-1007B·	47.6	0.03	41.5	0.20	10.60	0.21	0.26	0.04	100.4	88.9
Col-1007B·	47.3	0.00	40.7	0.15	10.56	0.21	0.38	0.07	99.4	88.9
Col-1007B·	47.6	0.02	41.1	0.20	10.63	0.15	0.26	0.03	99.97	88.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1007B·	47.8	0.02	41.0	0.16	10.69	0.19	0.35	0.05	100.3	88.8
Col-1007B·	47.6	0.00	41.2	0.16	10.66	0.18	0.38	0.04	100.2	88.8
Col-1007B·	47.6	0.00	41.2	0.20	10.68	0.19	0.21	0.03	100.1	88.8
Col-1007B·	47.3	0.00	41.1	0.15	10.65	0.18	0.34	0.04	99.86	88.8
Col-1007B·	47.7	0.02	41.4	0.19	10.74	0.20	0.26	0.05	100.6	88.8
Col-1007B·	47.1	0.01	41.2	0.20	10.63	0.16	0.25	0.04	99.59	88.8
Col-1007B·	47.0	-0.01	41.2	0.15	10.66	0.17	0.37	0.04	99.6	88.7
Col-1007B·	47.3	0.01	41.2	0.14	10.72	0.08	0.37	0.06	99.79	88.7
Col-1007B·	47.4	-0.01	41.1	0.22	10.81	0.18	0.25	0.04	100	88.7
Col-1007B·	47.3	0.02	41.3	0.19	10.80	0.16	0.28	0.05	100.1	88.7
Col-1007B·	47.2	0.01	41.1	0.15	10.79	0.24	0.34	0.05	99.96	88.6
Col-1007B·	47.6	0.02	41.5	0.18	10.91	0.22	0.34	0.04	100.8	88.6
Col-1007B·	47.3	0.03	41.1	0.16	10.84	0.13	0.29	0.05	99.81	88.6
Col-1007B·	47.3	0.02	41.3	0.14	10.91	0.17	0.38	0.06	100.2	88.5
Col-1007B·	47.0	0.02	40.8	0.15	10.98	0.14	0.32	0.01	99.39	88.4
Col-1007B·	46.9	0.04	41.2	0.16	10.96	0.13	0.40	0.05	99.82	88.4
Col-1007B·	47.4	0.02	41.4	0.20	11.13	0.22	0.25	0.03	100.7	88.4
Col-1007B·	46.9	0.03	41.1	0.19	11.10	0.25	0.35	0.02	99.95	88.3
Col-1007B·	46.8	0.01	41.1	0.19	11.24	0.19	0.37	0.06	99.93	88.1
Col-1007B·	47.0	0.01	41.2	0.18	11.30	0.19	0.24	0.06	100.1	88.1
Col-1007B·	46.3	0.01	40.7	0.18	11.24	0.27	0.39	0.05	99.2	88.0
Col-1007B·	46.2	0.01	40.9	0.20	11.26	0.16	0.39	0.05	99.13	88.0
Col-1007B·	46.7	0.01	40.8	0.20	11.44	0.19	0.19	0.03	99.57	87.9
Col-1007B·	46.2	0.01	40.8	0.21	11.63	0.22	0.15	0.06	99.28	87.6
Col-1007B·	46.4	0.01	40.5	0.21	11.84	0.21	0.20	0.03	99.41	87.5
Col-1007B·	46.0	0.00	40.9	0.24	11.87	0.24	0.20	0.02	99.5	87.4
Col-1007B·	46.1	0.02	41.0	0.25	11.89	0.22	0.17	0.02	99.62	87.4
Col-1007B·	45.9	0.02	40.8	0.27	11.98	0.21	0.16	0.01	99.36	87.2
Col-1007B·	46.2	0.01	41.1	0.24	12.21	0.20	0.16	0.03	100.2	87.1
Col-1007B·	45.9	0.01	41.1	0.36	12.67	0.27	0.19	0.02	100.5	86.6
Col-1007B·	45.7	0.02	40.7	0.26	12.73	0.16	0.13	0.01	99.7	86.5
Col-1007B·	45.8	0.04	40.8	0.21	12.98	0.22	0.10	0.03	100.2	86.3
Col-1007B·	45.2	0.12	40.9	0.27	12.94	0.26	0.29	0.03	100	86.2
Col-1007B·	42.9	0.34	40.4	0.64	14.30	0.27	0.20	-0.01	99.04	84.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	48.9	0.03	41.4	0.12	9.25	0.11	0.50	0.07	100.4	90.4
Col-1008B·	48.8	0.02	41.6	0.13	9.23	0.12	0.45	0.06	100.4	90.4
Col-1008B·	48.8	0.01	41.6	0.12	9.33	0.10	0.44	0.06	100.5	90.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	48.6	0.03	41.5	0.14	9.31	0.13	0.47	0.07	100.2	90.3
Col-1008B·	48.8	0.02	41.5	0.13	9.37	0.15	0.49	0.06	100.5	90.3
Col-1008B·	48.7	0.01	41.5	0.13	9.37	0.08	0.44	0.06	100.3	90.3
Col-1008B·	48.7	0.02	41.6	0.13	9.39	0.15	0.46	0.06	100.5	90.2
Col-1008B·	48.7	0.04	41.4	0.12	9.43	0.12	0.47	0.07	100.3	90.2
Col-1008B·	48.6	0.03	41.6	0.12	9.42	0.14	0.46	0.07	100.4	90.2
Col-1008B·	48.8	0.03	41.8	0.13	9.46	0.17	0.46	0.07	101	90.2
Col-1008B·	48.8	0.03	41.2	0.12	9.47	0.10	0.47	0.04	100.3	90.2
Col-1008B·	48.6	0.02	41.6	0.11	9.44	0.15	0.43	0.04	100.4	90.2
Col-1008B·	48.9	0.03	41.7	0.13	9.52	0.11	0.49	0.05	100.9	90.2
Col-1008B·	48.7	0.05	41.4	0.12	9.48	0.17	0.48	0.05	100.4	90.1
Col-1008B·	49.1	0.03	41.4	0.12	9.56	0.14	0.46	0.07	100.9	90.1
Col-1008B·	48.7	0.01	41.5	0.12	9.49	0.15	0.47	0.05	100.5	90.1
Col-1008B·	48.7	0.03	41.4	0.13	9.52	0.08	0.46	0.05	100.4	90.1
Col-1008B·	48.8	0.04	41.4	0.14	9.55	0.16	0.50	0.03	100.7	90.1
Col-1008B·	48.9	0.04	41.6	0.12	9.56	0.13	0.45	0.02	100.8	90.1
Col-1008B·	48.8	0.01	41.6	0.12	9.56	0.08	0.47	0.07	100.7	90.1
Col-1008B·	48.5	0.00	41.2	0.11	9.50	0.15	0.43	0.06	99.9	90.1
Col-1008B·	48.7	0.03	41.5	0.13	9.55	0.17	0.43	0.05	100.5	90.1
Col-1008B·	48.0	0.02	40.8	0.12	9.43	0.13	0.51	0.05	99.09	90.1
Col-1008B·	48.7	0.03	41.5	0.13	9.59	0.10	0.49	0.07	100.7	90.1
Col-1008B·	48.6	0.03	41.3	0.13	9.56	0.15	0.48	0.03	100.2	90.1
Col-1008B·	48.2	0.02	41.5	0.11	9.49	0.17	0.44	0.05	99.99	90.1
Col-1008B·	48.6	0.05	41.7	0.12	9.57	0.08	0.45	0.06	100.7	90.1
Col-1008B·	48.5	0.03	41.5	0.12	9.56	0.14	0.45	0.05	100.3	90.0
Col-1008B·	48.7	0.02	41.5	0.12	9.61	0.12	0.48	0.04	100.5	90.0
Col-1008B·	48.7	0.02	41.7	0.12	9.62	0.14	0.46	0.07	100.9	90.0
Col-1008B·	48.7	0.00	41.5	0.12	9.62	0.12	0.43	0.04	100.6	90.0
Col-1008B·	48.8	0.03	41.4	0.12	9.64	0.26	0.45	0.06	100.7	90.0
Col-1008B·	48.8	0.03	41.7	0.13	9.65	0.16	0.45	0.02	101	90.0
Col-1008B·	48.7	0.02	41.3	0.13	9.64	0.18	0.45	0.06	100.5	90.0
Col-1008B·	48.6	0.02	41.3	0.13	9.63	0.15	0.48	0.07	100.4	90.0
Col-1008B·	48.4	0.02	41.5	0.13	9.60	0.06	0.40	0.07	100.2	90.0
Col-1008B·	48.4	0.03	41.5	0.13	9.61	0.16	0.44	0.04	100.3	90.0
Col-1008B·	48.8	0.02	41.8	0.13	9.70	0.05	0.40	0.05	100.9	90.0
Col-1008B·	48.9	0.02	41.3	0.13	9.74	0.11	0.46	0.04	100.7	89.9
Col-1008B·	48.6	0.02	41.5	0.13	9.68	0.16	0.43	0.04	100.5	89.9
Col-1008B·	48.8	0.01	41.5	0.13	9.74	0.16	0.42	0.05	100.8	89.9
Col-1008B·	48.6	0.02	41.8	0.13	9.71	0.10	0.49	0.05	100.9	89.9
Col-1008B·	48.4	0.02	41.5	0.13	9.68	0.19	0.41	0.05	100.4	89.9
Col-1008B·	48.9	0.01	41.5	0.13	9.79	0.18	0.46	0.06	101	89.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	48.8	0.03	41.4	0.13	9.78	0.09	0.46	0.17	100.8	89.9
Col-1008B·	48.8	0.02	41.7	0.12	9.78	0.14	0.49	0.06	101	89.9
Col-1008B·	48.6	0.02	41.6	0.13	9.77	0.15	0.50	0.05	100.8	89.9
Col-1008B·	48.5	0.04	41.3	0.14	9.74	0.07	0.44	0.07	100.3	89.9
Col-1008B·	48.2	0.04	41.2	0.12	9.69	0.07	0.44	0.07	99.81	89.9
Col-1008B·	48.9	0.04	41.4	0.11	9.84	0.12	0.46	0.05	100.9	89.9
Col-1008B·	48.7	0.03	41.6	0.12	9.81	0.17	0.46	0.05	101	89.9
Col-1008B·	48.6	0.02	41.3	0.14	9.79	0.17	0.47	0.05	100.5	89.8
Col-1008B·	48.3	0.03	41.1	0.13	9.76	0.17	0.46	0.04	100	89.8
Col-1008B·	48.5	0.03	41.4	0.14	9.79	0.14	0.43	0.04	100.4	89.8
Col-1008B·	48.8	0.01	41.4	0.13	9.85	0.13	0.47	0.07	100.9	89.8
Col-1008B·	48.8	0.03	41.4	0.13	9.86	0.11	0.46	0.05	100.8	89.8
Col-1008B·	48.5	0.04	41.2	0.13	9.80	0.15	0.42	0.07	100.3	89.8
Col-1008B·	48.5	0.03	41.3	0.13	9.81	0.14	0.47	0.09	100.5	89.8
Col-1008B·	48.6	0.00	41.5	0.12	9.84	0.16	0.45	0.05	100.8	89.8
Col-1008B·	48.7	0.02	41.6	0.13	9.87	0.12	0.42	0.05	100.9	89.8
Col-1008B·	48.5	0.03	41.4	0.12	9.86	0.11	0.45	0.05	100.5	89.8
Col-1008B·	48.5	0.02	41.2	0.13	9.88	0.19	0.44	0.05	100.5	89.7
Col-1008B·	48.8	0.01	41.4	0.14	9.95	0.14	0.41	0.03	100.9	89.7
Col-1008B·	48.7	0.01	41.1	0.13	9.96	0.14	0.42	0.05	100.5	89.7
Col-1008B·	48.5	0.03	41.3	0.13	10.04	0.15	0.42	0.04	100.7	89.6
Col-1008B·	48.5	0.04	41.3	0.14	10.03	0.18	0.41	0.07	100.7	89.6
Col-1008B·	48.4	0.03	41.2	0.13	10.09	0.11	0.42	0.05	100.4	89.5
Col-1008B·	48.3	0.02	41.4	0.13	10.10	0.13	0.43	0.04	100.5	89.5
Col-1008B·	48.4	0.02	41.4	0.14	10.12	0.17	0.42	0.06	100.7	89.5
Col-1008B·	48.3	0.02	41.3	0.13	10.13	0.14	0.44	0.04	100.4	89.5
Col-1008B·	48.1	0.03	41.2	0.15	10.12	0.22	0.38	0.04	100.2	89.4
Col-1008B·	48.3	0.04	41.2	0.12	10.21	0.16	0.39	0.05	100.5	89.4
Col-1008B·	48.2	0.03	41.6	0.14	10.26	0.11	0.40	0.07	100.8	89.3
Col-1008B·	48.2	0.03	41.2	0.13	10.34	0.13	0.37	0.03	100.4	89.3
Col-1008B·	48.2	0.01	41.2	0.13	10.37	0.07	0.39	0.05	100.5	89.2
Col-1008B·	48.4	0.02	41.2	0.14	10.49	0.15	0.36	0.07	100.9	89.2
Col-1008B·	47.9	0.02	41.4	0.14	10.43	0.19	0.36	0.07	100.5	89.1
Col-1008B·	47.5	0.02	41.1	0.14	10.46	0.15	0.36	0.06	99.8	89.0
Col-1008B·	48.2	0.03	41.2	0.12	10.65	0.11	0.47	0.04	100.8	89.0
Col-1008B·	47.7	0.02	41.4	0.15	10.69	0.12	0.35	0.05	100.5	88.8
Col-1008B·	47.9	0.02	41.4	0.15	10.75	0.12	0.34	0.06	100.7	88.8
Col-1008B·	48.1	0.03	41.3	0.14	10.89	0.17	0.30	0.04	101	88.7
Col-1008B·	48.1	0.03	41.3	0.15	10.90	0.16	0.38	0.05	101	88.7
Col-1008B·	47.5	0.01	41.3	0.12	10.84	0.08	0.36	0.03	100.2	88.7
Col-1008B·	47.7	0.02	41.2	0.14	10.91	0.18	0.40	0.04	100.6	88.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	47.4	0.03	41.1	0.15	10.85	0.16	0.34	0.05	100.1	88.6
Col-1008B·	47.9	0.02	41.3	0.13	10.98	0.15	0.34	0.04	100.8	88.6
Col-1008B·	47.5	0.02	40.9	0.13	10.94	0.15	0.36	0.05	100.1	88.6
Col-1008B·	47.6	0.01	41.3	0.17	11.19	0.21	0.38	0.05	100.9	88.4
Col-1008B·	47.5	0.02	41.4	0.14	11.17	0.12	0.30	0.04	100.7	88.3
Col-1008B·	47.2	0.03	41.1	0.14	11.17	0.18	0.39	0.07	100.2	88.3
Col-1008B·	47.6	0.02	41.3	0.13	11.32	0.14	0.30	0.04	100.9	88.2
Col-1008B·	47.2	0.01	41.0	0.14	11.23	0.19	0.35	0.05	100.2	88.2
Col-1008B·	47.3	0.01	41.1	0.14	11.28	0.20	0.31	0.02	100.4	88.2
Col-1008B·	47.5	0.02	40.9	0.13	11.40	0.15	0.32	0.05	100.5	88.1
Col-1008B·	47.2	0.03	41.1	0.15	11.33	0.19	0.32	0.07	100.3	88.1
Col-1008B·	47.4	0.02	41.1	0.14	11.40	0.20	0.30	0.04	100.6	88.1
Col-1008B·	46.8	0.02	40.8	0.13	11.35	0.21	0.35	0.05	99.76	88.0
Col-1008B·	47.1	0.01	40.8	0.15	11.43	0.17	0.32	0.08	100.1	88.0
Col-1008B·	47.3	0.03	40.9	0.15	11.56	0.15	0.27	0.02	100.4	87.9
Col-1008B·	48.0	0.02	40.6	0.15	11.75	0.12	0.31	0.03	101	87.9
Col-1008B·	46.8	0.03	40.9	0.15	11.49	0.17	0.29	0.06	99.89	87.9
Col-1008B·	47.1	0.15	40.9	0.14	11.56	0.19	0.33	0.34	100.7	87.9
Col-1008B·	47.4	0.01	41.0	0.14	11.67	0.16	0.29	0.06	100.8	87.9
Col-1008B·	47.1	0.03	41.0	0.13	11.59	0.19	0.27	0.07	100.4	87.9
Col-1008B·	46.5	0.11	41.0	0.20	11.45	0.17	0.33	0.07	99.77	87.9
Col-1008B·	47.3	0.02	41.0	0.15	11.67	0.20	0.28	0.07	100.7	87.8
Col-1008B·	47.0	0.04	41.1	0.14	11.60	0.18	0.29	0.04	100.4	87.8
Col-1008B·	47.3	0.01	41.1	0.15	11.69	0.26	0.27	0.04	100.8	87.8
Col-1008B·	46.6	0.02	40.9	0.15	11.54	0.19	0.25	0.03	99.65	87.8
Col-1008B·	46.7	0.03	41.0	0.14	11.58	0.22	0.28	0.03	99.99	87.8
Col-1008B·	47.2	0.04	41.0	0.15	11.70	0.14	0.28	0.04	100.5	87.8
Col-1008B·	47.0	0.01	41.0	0.15	11.66	0.21	0.25	0.04	100.3	87.8
Col-1008B·	47.0	0.01	40.8	0.16	11.67	0.18	0.28	0.03	100.2	87.8
Col-1008B·	46.6	0.05	41.2	0.17	11.59	0.20	0.28	0.52	100.6	87.8
Col-1008B·	46.8	0.14	41.0	0.14	11.63	0.14	0.27	0.04	100.1	87.8
Col-1008B·	46.9	0.02	40.9	0.15	11.73	0.15	0.26	0.04	100.2	87.7
Col-1008B·	46.9	0.02	41.1	0.14	11.74	0.16	0.27	0.03	100.3	87.7
Col-1008B·	47.1	0.01	41.0	0.14	11.79	0.19	0.25	0.12	100.6	87.7
Col-1008B·	47.2	0.02	41.1	0.14	11.84	0.09	0.25	0.09	100.8	87.7
Col-1008B·	46.8	0.01	40.9	0.15	11.76	0.19	0.23	0.04	100.1	87.6
Col-1008B·	47.0	0.03	41.1	0.15	11.83	0.20	0.27	0.04	100.6	87.6
Col-1008B·	47.1	0.01	40.9	0.14	11.85	0.16	0.29	0.01	100.4	87.6
Col-1008B·	47.0	0.01	41.1	0.15	11.85	0.15	0.27	0.05	100.7	87.6
Col-1008B·	48.2	0.02	39.7	0.16	12.15	0.15	0.22	0.04	100.6	87.6
Col-1008B·	47.2	0.02	41.0	0.13	11.91	0.19	0.26	0.03	100.7	87.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	46.1	0.03	40.8	0.16	11.68	0.18	0.25	0.05	99.31	87.6
Col-1008B·	46.7	0.02	41.0	0.14	11.88	0.16	0.31	0.04	100.3	87.5
Col-1008B·	46.5	0.01	41.0	0.15	11.88	0.15	0.25	0.04	100	87.5
Col-1008B·	46.9	0.01	40.6	0.13	12.00	0.18	0.31	0.08	100.2	87.4
Col-1008B·	47.0	0.01	41.0	0.15	12.04	0.19	0.26	0.05	100.8	87.4
Col-1008B·	46.6	0.03	40.8	0.15	11.95	0.22	0.23	0.04	100	87.4
Col-1008B·	46.6	0.02	40.6	0.14	12.01	0.21	0.28	0.04	99.9	87.4
Col-1008B·	46.6	0.02	40.8	0.15	12.04	0.13	0.26	0.05	100	87.3
Col-1008B·	46.8	0.02	41.3	0.14	12.14	0.16	0.25	0.07	100.9	87.3
Col-1008B·	47.2	0.02	40.9	0.14	12.26	0.17	0.26	0.05	101	87.3
Col-1008B·	46.8	0.01	41.0	0.16	12.17	0.18	0.23	0.08	100.6	87.3
Col-1008B·	46.9	0.02	41.1	0.15	12.21	0.15	0.28	0.05	100.9	87.3
Col-1008B·	46.7	0.04	41.0	0.15	12.16	0.17	0.22	0.03	100.4	87.3
Col-1008B·	46.5	0.02	40.8	0.15	12.12	0.16	0.23	0.03	100	87.3
Col-1008B·	46.6	0.02	40.8	0.16	12.16	0.20	0.21	0.03	100.2	87.2
Col-1008B·	46.6	0.00	40.8	0.14	12.17	0.19	0.26	0.02	100.2	87.2
Col-1008B·	46.9	0.03	41.0	0.13	12.26	0.13	0.28	0.07	100.8	87.2
Col-1008B·	46.9	0.01	40.9	0.14	12.26	0.15	0.26	0.05	100.7	87.2
Col-1008B·	46.6	0.01	40.9	0.14	12.21	0.22	0.22	0.03	100.3	87.2
Col-1008B·	46.9	0.01	41.0	0.16	12.29	0.16	0.19	0.02	100.8	87.2
Col-1008B·	46.8	0.02	40.7	0.15	12.25	0.19	0.21	0.03	100.3	87.2
Col-1008B·	46.6	0.00	41.0	0.15	12.24	0.20	0.21	0.05	100.5	87.2
Col-1008B·	46.6	0.02	40.9	0.15	12.24	0.24	0.22	0.04	100.4	87.2
Col-1008B·	46.3	0.02	40.7	0.14	12.20	0.18	0.23	0.04	99.79	87.1
Col-1008B·	46.2	0.02	40.7	0.16	12.17	0.25	0.22	0.03	99.7	87.1
Col-1008B·	46.8	0.03	41.0	0.14	12.36	0.22	0.26	0.04	100.8	87.1
Col-1008B·	46.3	0.02	40.9	0.15	12.23	0.19	0.24	0.02	100.1	87.1
Col-1008B·	46.3	0.03	40.8	0.16	12.23	0.21	0.23	0.01	99.96	87.1
Col-1008B·	46.6	0.01	41.0	0.15	12.34	0.21	0.21	0.03	100.6	87.1
Col-1008B·	46.3	0.02	40.8	0.15	12.26	0.20	0.22	0.02	100	87.1
Col-1008B·	46.4	0.01	40.9	0.16	12.29	0.19	0.20	0.05	100.2	87.1
Col-1008B·	46.6	0.02	41.3	0.15	12.34	0.15	0.22	0.04	100.8	87.1
Col-1008B·	46.5	0.01	40.8	0.16	12.31	0.20	0.22	0.04	100.2	87.1
Col-1008B·	46.7	0.01	41.2	0.15	12.36	0.21	0.21	0.03	100.8	87.1
Col-1008B·	46.7	0.01	41.0	0.15	12.37	0.20	0.21	0.03	100.6	87.1
Col-1008B·	46.5	0.00	40.8	0.15	12.34	0.18	0.20	0.04	100.3	87.0
Col-1008B·	46.1	0.02	40.7	0.15	12.25	0.16	0.23	0.04	99.68	87.0
Col-1008B·	46.6	0.02	40.9	0.14	12.38	0.11	0.23	0.04	100.3	87.0
Col-1008B·	46.5	0.01	41.0	0.13	12.36	0.19	0.24	0.07	100.6	87.0
Col-1008B·	46.6	0.02	41.0	0.14	12.39	0.17	0.21	0.04	100.5	87.0
Col-1008B·	46.5	0.01	40.9	0.15	12.37	0.18	0.25	0.03	100.4	87.0

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	46.6	0.00	41.0	0.14	12.40	0.24	0.21	0.04	100.6	87.0
Col-1008B·	46.5	0.05	41.0	0.15	12.39	0.21	0.23	0.06	100.6	87.0
Col-1008B·	46.7	0.03	41.2	0.14	12.45	0.23	0.21	0.05	101	87.0
Col-1008B·	46.5	0.01	41.0	0.14	12.39	0.12	0.23	0.03	100.3	87.0
Col-1008B·	46.4	0.02	41.1	0.13	12.38	0.20	0.25	0.06	100.6	87.0
Col-1008B·	46.3	0.03	40.9	0.16	12.40	0.19	0.21	0.04	100.2	86.9
Col-1008B·	46.5	0.03	40.9	0.15	12.44	0.19	0.23	0.05	100.4	86.9
Col-1008B·	46.3	0.01	41.0	0.15	12.41	0.17	0.21	0.03	100.3	86.9
Col-1008B·	46.8	0.02	40.9	0.16	12.55	0.19	0.22	0.06	100.9	86.9
Col-1008B·	46.4	0.03	40.8	0.14	12.45	0.14	0.20	0.04	100.2	86.9
Col-1008B·	46.5	0.03	40.9	0.14	12.50	0.15	0.18	0.04	100.5	86.9
Col-1008B·	46.6	0.00	40.8	0.14	12.55	0.19	0.22	0.04	100.5	86.9
Col-1008B·	46.7	0.01	40.7	0.14	12.58	0.25	0.22	0.04	100.6	86.9
Col-1008B·	46.6	0.02	41.1	0.16	12.55	0.19	0.23	0.04	100.9	86.9
Col-1008B·	46.4	0.01	40.9	0.15	12.53	0.12	0.20	0.05	100.4	86.9
Col-1008B·	46.3	0.01	40.9	0.15	12.51	0.18	0.23	0.03	100.3	86.8
Col-1008B·	46.7	0.03	40.9	0.16	12.62	0.21	0.22	0.15	101	86.8
Col-1008B·	46.4	0.02	40.8	0.13	12.55	0.14	0.24	0.07	100.4	86.8
Col-1008B·	46.6	0.00	40.9	0.14	12.62	0.20	0.24	0.04	100.8	86.8
Col-1008B·	46.2	0.03	40.6	0.14	12.51	0.21	0.19	0.03	99.9	86.8
Col-1008B·	46.5	0.00	40.7	0.14	12.58	0.15	0.23	0.03	100.4	86.8
Col-1008B·	46.5	0.02	41.0	0.14	12.63	0.20	0.21	0.02	100.7	86.8
Col-1008B·	46.5	0.01	40.8	0.15	12.67	0.14	0.27	0.06	100.6	86.7
Col-1008B·	46.1	0.02	40.7	0.14	12.59	0.19	0.18	0.04	99.96	86.7
Col-1008B·	46.4	0.03	40.7	0.15	12.69	0.21	0.23	0.05	100.5	86.7
Col-1008B·	46.4	0.01	40.8	0.14	12.68	0.20	0.19	0.02	100.4	86.7
Col-1008B·	46.2	0.02	40.8	0.14	12.64	0.27	0.22	0.03	100.2	86.7
Col-1008B·	46.4	0.01	40.8	0.16	12.74	0.20	0.19	0.03	100.5	86.7
Col-1008B·	46.3	0.02	40.8	0.14	12.72	0.23	0.25	0.06	100.5	86.7
Col-1008B·	46.1	0.01	40.7	0.15	12.68	0.16	0.23	0.05	100.1	86.6
Col-1008B·	46.1	0.00	40.8	0.16	12.71	0.16	0.21	0.04	100.2	86.6
Col-1008B·	46.2	0.01	40.8	0.14	12.75	0.15	0.18	0.05	100.3	86.6
Col-1008B·	46.5	0.03	41.1	0.14	12.84	0.22	0.21	0.05	101	86.6
Col-1008B·	46.4	0.01	41.0	0.16	12.84	0.22	0.24	0.03	100.9	86.6
Col-1008B·	46.2	0.02	40.7	0.16	12.81	0.15	0.21	0.08	100.4	86.5
Col-1008B·	46.4	0.00	41.0	0.16	12.88	0.22	0.19	0.05	101	86.5
Col-1008B·	46.0	0.02	40.7	0.15	12.79	0.16	0.21	0.03	100.1	86.5
Col-1008B·	46.3	0.02	40.9	0.15	12.86	0.23	0.19	0.03	100.7	86.5
Col-1008B·	46.2	0.01	40.7	0.15	12.85	0.25	0.18	0.04	100.4	86.5
Col-1008B·	46.0	0.03	40.8	0.14	12.82	0.24	0.20	0.05	100.2	86.5
Col-1008B·	46.0	0.01	40.9	0.14	12.83	0.25	0.18	0.05	100.4	86.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	46.1	0.02	40.7	0.14	12.87	0.23	0.17	0.03	100.2	86.5
Col-1008B·	46.1	0.01	40.8	0.14	12.89	0.24	0.21	0.04	100.4	86.4
Col-1008B·	46.1	0.18	40.8	0.21	12.91	0.16	0.16	0.24	100.8	86.4
Col-1008B·	46.5	0.03	40.8	0.15	13.07	0.19	0.17	0.03	100.9	86.4
Col-1008B·	45.9	0.03	40.9	0.15	12.94	0.17	0.18	0.03	100.4	86.4
Col-1008B·	46.0	0.02	40.7	0.15	12.96	0.23	0.20	0.03	100.3	86.3
Col-1008B·	45.6	0.02	40.7	0.16	12.88	0.21	0.20	0.04	99.8	86.3
Col-1008B·	46.0	0.02	40.9	0.15	13.02	0.16	0.18	0.02	100.4	86.3
Col-1008B·	45.9	0.00	40.6	0.15	13.03	0.17	0.17	0.02	100	86.3
Col-1008B·	46.0	0.02	40.9	0.15	13.11	0.07	0.18	0.04	100.5	86.2
Col-1008B·	45.7	0.02	40.3	0.15	13.00	0.21	0.17	0.05	99.63	86.2
Col-1008B·	46.1	0.02	40.9	0.15	13.14	0.16	0.17	0.04	100.7	86.2
Col-1008B·	45.7	0.02	40.7	0.15	13.04	0.32	0.16	0.03	100.1	86.2
Col-1008B·	46.0	0.02	40.9	0.15	13.11	0.19	0.17	0.02	100.6	86.2
Col-1008B·	45.8	0.01	40.6	0.15	13.09	0.25	0.18	0.07	100.1	86.2
Col-1008B·	46.0	0.02	40.9	0.14	13.16	0.16	0.21	0.04	100.7	86.2
Col-1008B·	45.9	0.02	40.8	0.15	13.12	0.17	0.20	0.03	100.3	86.2
Col-1008B·	46.1	0.02	40.8	0.15	13.21	0.20	0.19	0.05	100.7	86.2
Col-1008B·	46.1	0.01	41.1	0.16	13.24	0.21	0.14	0.01	101	86.1
Col-1008B·	46.0	0.03	40.8	0.15	13.21	0.12	0.16	0.04	100.5	86.1
Col-1008B·	45.9	0.00	40.8	0.15	13.20	0.18	0.17	0.07	100.4	86.1
Col-1008B·	46.1	0.02	41.0	0.14	13.26	0.22	0.14	0.08	101	86.1
Col-1008B·	45.9	0.01	40.9	0.15	13.22	0.28	0.17	0.08	100.7	86.1
Col-1008B·	46.0	0.02	41.0	0.14	13.24	0.23	0.19	0.03	100.8	86.1
Col-1008B·	45.8	0.02	40.9	0.14	13.20	0.25	0.16	0.03	100.5	86.1
Col-1008B·	46.0	0.01	40.9	0.16	13.28	0.23	0.19	0.03	100.8	86.1
Col-1008B·	45.9	0.01	40.8	0.15	13.31	0.17	0.16	0.02	100.6	86.0
Col-1008B·	45.8	0.02	41.1	0.15	13.34	0.21	0.18	0.02	100.8	86.0
Col-1008B·	45.7	0.02	40.5	0.15	13.32	0.20	0.16	0.03	100.1	86.0
Col-1008B·	45.9	0.01	40.6	0.16	13.37	0.18	0.18	0.05	100.5	86.0
Col-1008B·	45.7	0.02	41.0	0.14	13.34	0.15	0.17	0.02	100.6	85.9
Col-1008B·	45.8	0.02	40.8	0.15	13.38	0.18	0.16	0.05	100.5	85.9
Col-1008B·	46.1	0.03	40.7	0.15	13.51	0.25	0.17	0.02	101	85.9
Col-1008B·	45.3	0.00	40.6	0.14	13.29	0.19	0.18	0.03	99.79	85.9
Col-1008B·	45.8	0.02	40.9	0.15	13.44	0.22	0.16	0.04	100.8	85.9
Col-1008B·	45.6	0.02	40.5	0.15	13.41	0.20	0.20	0.04	100.1	85.9
Col-1008B·	45.9	0.01	40.9	0.16	13.49	0.27	0.15	0.02	100.9	85.8
Col-1008B·	45.6	0.01	40.8	0.14	13.43	0.22	0.17	0.05	100.4	85.8
Col-1008B·	45.6	0.02	40.7	0.15	13.44	0.18	0.17	0.02	100.3	85.8
Col-1008B·	45.8	0.01	41.1	0.16	13.51	0.22	0.16	0.04	100.9	85.8
Col-1008B·	45.7	0.00	40.7	0.15	13.55	0.17	0.17	0.06	100.6	85.7

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	45.7	0.00	40.6	0.16	13.55	0.23	0.15	0.04	100.5	85.7
Col-1008B·	45.5	0.02	40.9	0.15	13.48	0.25	0.15	0.02	100.4	85.7
Col-1008B·	45.4	0.02	40.5	0.15	13.49	0.18	0.17	0.03	100	85.7
Col-1008B·	45.7	0.00	40.7	0.15	13.57	0.19	0.17	0.04	100.5	85.7
Col-1008B·	45.9	0.01	40.7	0.16	13.63	0.24	0.15	0.05	100.8	85.7
Col-1008B·	45.6	0.02	40.6	0.15	13.58	0.25	0.14	0.04	100.4	85.7
Col-1008B·	46.0	0.01	40.1	0.16	13.69	0.25	0.16	0.04	100.4	85.7
Col-1008B·	45.4	0.01	40.7	0.16	13.52	0.20	0.13	0.03	100.1	85.7
Col-1008B·	45.4	0.03	40.6	0.17	13.56	0.20	0.17	0.02	100.2	85.7
Col-1008B·	45.7	0.02	40.9	0.15	13.62	0.21	0.14	0.05	100.7	85.7
Col-1008B·	45.3	0.03	40.9	0.16	13.53	0.20	0.17	0.02	100.2	85.7
Col-1008B·	45.5	0.01	40.7	0.15	13.60	0.21	0.15	0.04	100.4	85.6
Col-1008B·	45.5	0.01	40.7	0.15	13.60	0.19	0.17	0.01	100.3	85.6
Col-1008B·	45.7	0.01	40.8	0.15	13.69	0.22	0.17	0.04	100.8	85.6
Col-1008B·	45.8	0.01	40.7	0.15	13.70	0.16	0.16	0.05	100.6	85.6
Col-1008B·	45.6	0.02	40.8	0.14	13.68	0.18	0.12	0.03	100.6	85.6
Col-1008B·	45.5	0.02	41.0	0.16	13.67	0.19	0.14	0.04	100.8	85.6
Col-1008B·	45.8	0.02	40.8	0.14	13.76	0.21	0.16	0.03	100.9	85.6
Col-1008B·	45.7	0.02	40.9	0.15	13.73	0.13	0.16	0.02	100.8	85.6
Col-1008B·	45.4	0.02	40.6	0.16	13.65	0.23	0.12	0.05	100.3	85.6
Col-1008B·	45.0	0.01	40.4	0.15	13.51	0.24	0.17	0.05	99.49	85.6
Col-1008B·	45.4	0.03	41.0	0.16	13.67	0.19	0.16	0.03	100.7	85.6
Col-1008B·	45.5	0.01	40.8	0.16	13.71	0.23	0.17	0.07	100.7	85.5
Col-1008B·	45.6	0.01	40.7	0.16	13.78	0.25	0.16	0.04	100.7	85.5
Col-1008B·	45.4	-0.02	40.5	0.16	13.73	0.22	0.16	0.03	100.2	85.5
Col-1008B·	45.6	0.01	40.6	0.15	13.80	0.22	0.17	0.03	100.6	85.5
Col-1008B·	45.1	0.01	40.5	0.15	13.69	0.18	0.17	0.02	99.86	85.5
Col-1008B·	45.5	0.01	40.8	0.16	13.83	0.16	0.13	0.03	100.6	85.4
Col-1008B·	45.7	0.01	40.8	0.15	13.90	0.23	0.13	0.03	101	85.4
Col-1008B·	45.3	0.03	40.6	0.16	13.80	0.20	0.13	0.04	100.3	85.4
Col-1008B·	45.3	0.02	40.6	0.15	13.83	0.19	0.15	0.03	100.3	85.4
Col-1008B·	45.6	0.03	40.9	0.16	13.91	0.17	0.16	0.01	101	85.4
Col-1008B·	45.4	0.01	40.8	0.16	13.86	0.24	0.13	0.03	100.6	85.4
Col-1008B·	45.3	0.01	40.7	0.17	13.82	0.22	0.15	0.03	100.3	85.4
Col-1008B·	45.5	0.01	40.9	0.16	13.89	0.26	0.14	0.04	100.9	85.4
Col-1008B·	45.1	0.00	40.4	0.16	13.80	0.17	0.14	0.03	99.85	85.4
Col-1008B·	45.6	0.02	40.8	0.15	13.94	0.22	0.11	0.03	100.8	85.4
Col-1008B·	45.5	0.01	40.5	0.15	13.93	0.16	0.16	0.04	100.4	85.4
Col-1008B·	45.4	0.01	41.0	0.16	13.89	0.18	0.11	0.04	100.8	85.4
Col-1008B·	45.0	0.00	40.2	0.16	13.77	0.18	0.16	0.03	99.5	85.3
Col-1008B·	45.2	0.00	40.7	0.16	13.90	0.23	0.12	0.01	100.4	85.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	45.5	0.02	40.8	0.17	13.99	0.19	0.13	0.04	100.8	85.3
Col-1008B·	45.4	0.02	41.0	0.17	13.98	0.17	0.12	0.01	100.9	85.3
Col-1008B·	45.2	0.01	40.5	0.17	13.90	0.16	0.17	0.07	100.1	85.3
Col-1008B·	45.4	0.03	40.6	0.15	13.97	0.23	0.16	0.04	100.5	85.3
Col-1008B·	45.3	0.00	40.4	0.17	13.93	0.15	0.13	0.01	100.1	85.3
Col-1008B·	45.2	0.01	40.9	0.18	13.94	0.23	0.14	0.05	100.6	85.3
Col-1008B·	45.4	0.01	40.6	0.16	14.01	0.25	0.15	0.05	100.6	85.2
Col-1008B·	45.3	0.02	40.8	0.15	13.98	0.27	0.14	0.02	100.7	85.2
Col-1008B·	45.3	0.01	40.7	0.16	14.00	0.23	0.14	0.02	100.6	85.2
Col-1008B·	45.0	0.21	40.5	0.19	13.90	0.18	0.15	0.27	100.4	85.2
Col-1008B·	45.5	0.01	40.9	0.16	14.05	0.20	0.13	0.02	101	85.2
Col-1008B·	45.1	0.00	40.8	0.17	13.95	0.27	0.13	0.04	100.5	85.2
Col-1008B·	45.5	0.02	40.7	0.16	14.05	0.20	0.15	0.03	100.7	85.2
Col-1008B·	45.5	0.02	40.6	0.15	14.07	0.16	0.13	0.02	100.6	85.2
Col-1008B·	45.0	-0.01	40.7	0.16	13.96	0.24	0.13	0.03	100.2	85.2
Col-1008B·	45.1	0.02	41.1	0.15	14.04	0.21	0.15	0.03	100.9	85.1
Col-1008B·	44.9	0.03	41.1	0.16	13.97	0.12	0.09	0.00	100.4	85.1
Col-1008B·	45.1	0.01	40.5	0.16	14.05	0.15	0.14	0.03	100.2	85.1
Col-1008B·	45.3	0.02	40.8	0.16	14.12	0.22	0.11	0.03	100.7	85.1
Col-1008B·	45.5	0.01	40.8	0.16	14.18	0.22	0.14	0.05	101	85.1
Col-1008B·	45.2	0.02	40.7	0.15	14.09	0.23	0.12	0.02	100.5	85.1
Col-1008B·	45.1	0.01	40.6	0.17	14.10	0.28	0.14	0.01	100.4	85.1
Col-1008B·	45.2	0.01	40.7	0.20	14.15	0.18	0.10	0.03	100.5	85.1
Col-1008B·	45.2	0.00	40.5	0.19	14.19	0.20	0.12	0.05	100.5	85.0
Col-1008B·	45.4	0.01	40.6	0.18	14.26	0.28	0.09	0.01	100.9	85.0
Col-1008B·	45.1	0.01	40.9	0.14	14.17	0.23	0.14	0.03	100.7	85.0
Col-1008B·	45.4	0.01	40.8	0.15	14.24	0.15	0.15	0.02	100.9	85.0
Col-1008B·	45.0	0.01	40.5	0.16	14.12	0.23	0.12	0.02	100.2	85.0
Col-1008B·	45.3	0.01	40.6	0.18	14.24	0.23	0.08	0.03	100.7	85.0
Col-1008B·	45.1	0.00	40.7	0.15	14.26	0.22	0.13	0.00	100.6	84.9
Col-1008B·	44.9	-0.01	40.4	0.16	14.21	0.23	0.12	0.04	100	84.9
Col-1008B·	44.9	0.01	40.7	0.19	14.24	0.22	0.11	0.00	100.4	84.9
Col-1008B·	45.2	0.00	40.8	0.15	14.34	0.30	0.11	0.01	101	84.9
Col-1008B·	44.9	0.00	40.1	0.18	14.23	0.25	0.14	0.01	99.77	84.9
Col-1008B·	44.9	-0.01	40.6	0.17	14.24	0.20	0.13	0.01	100.2	84.9
Col-1008B·	45.0	0.00	41.1	0.16	14.29	0.22	0.09	0.03	100.9	84.9
Col-1008B·	44.9	0.01	40.4	0.16	14.26	0.26	0.11	0.04	100.2	84.9
Col-1008B·	45.2	0.02	40.6	0.18	14.35	0.27	0.08	0.00	100.7	84.9
Col-1008B·	44.9	0.00	40.5	0.16	14.28	0.24	0.09	0.02	100.2	84.9
Col-1008B·	44.7	0.02	40.4	0.16	14.23	0.20	0.12	0.02	99.87	84.9
Col-1008B·	44.8	0.01	40.6	0.18	14.34	0.24	0.10	0.05	100.3	84.8

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B·	45.0	0.01	40.8	0.17	14.47	0.21	0.10	0.03	100.8	84.7
Col-1008B·	45.1	0.03	40.5	0.17	14.53	0.26	0.11	0.01	100.7	84.7
Col-1008B·	44.9	0.01	40.7	0.18	14.46	0.23	0.10	0.06	100.6	84.7
Col-1008B·	45.2	0.01	40.7	0.18	14.57	0.16	0.10	0.02	101	84.7
Col-1008B·	45.0	0.02	40.8	0.15	14.50	0.22	0.13	0.03	100.8	84.7
Col-1008B·	45.0	0.01	40.6	0.17	14.55	0.24	0.13	0.03	100.7	84.7
Col-1008B·	44.6	0.02	40.8	0.17	14.44	0.19	0.09	0.03	100.3	84.6
Col-1008B·	44.9	0.01	40.9	0.19	14.55	0.25	0.07	0.03	100.9	84.6
Col-1008B·	44.9	0.01	40.7	0.20	14.56	0.22	0.11	0.04	100.8	84.6
Col-1008B·	44.6	0.01	40.5	0.18	14.48	0.12	0.10	0.01	100	84.6
Col-1008B·	44.6	0.01	40.5	0.19	14.51	0.23	0.09	0.03	100.1	84.6
Col-1008B·	45.0	0.03	40.7	0.17	14.65	0.18	0.10	0.04	100.9	84.6
Col-1008B·	44.8	0.01	40.5	0.18	14.61	0.21	0.13	-0.01	100.4	84.5
Col-1008B·	44.7	0.02	40.7	0.19	14.59	0.34	0.09	-0.01	100.6	84.5
Col-1008B·	45.1	0.01	40.5	0.20	14.73	0.17	0.12	0.01	100.8	84.5
Col-1008B·	44.6	0.00	40.4	0.19	14.62	0.23	0.09	0.00	100.1	84.5
Col-1008B·	44.6	0.02	40.3	0.18	14.65	0.17	0.10	0.04	100.1	84.4
Col-1008B·	44.8	0.01	40.4	0.20	14.74	0.25	0.08	0.03	100.6	84.4
Col-1008B·	44.5	0.01	40.3	0.20	14.64	0.20	0.07	0.03	99.94	84.4
Col-1008B·	44.7	0.02	40.4	0.18	14.71	0.22	0.09	0.02	100.3	84.4
Col-1008B·	44.7	0.00	40.6	0.19	14.73	0.23	0.09	0.01	100.5	84.4
Col-1008B·	44.6	0.02	40.6	0.19	14.72	0.22	0.06	0.01	100.5	84.4
Col-1008B·	44.7	0.01	40.7	0.18	14.77	0.24	0.10	-0.01	100.7	84.4
Col-1008B·	44.7	-0.01	40.8	0.18	14.83	0.27	0.10	0.03	100.9	84.3
Col-1008B·	44.7	0.02	40.7	0.20	14.85	0.21	0.12	0.04	100.9	84.3
Col-1008B·	44.5	0.02	40.5	0.19	14.83	0.31	0.11	0.02	100.5	84.2
Col-1008B·	44.6	0.01	40.5	0.20	14.89	0.32	0.07	0.01	100.6	84.2
Col-1008B·	44.6	0.00	40.6	0.20	14.92	0.28	0.09	0.03	100.7	84.2
Col-1008B·	44.8	0.03	40.5	0.20	14.98	0.29	0.09	0.02	100.9	84.2
Col-1008B·	44.5	0.03	40.4	0.19	14.92	0.25	0.10	0.02	100.4	84.2
Col-1008B·	44.6	0.01	40.5	0.17	15.12	0.24	0.06	0.04	100.8	84.0
Col-1008B·	44.5	0.01	40.5	0.21	15.09	0.22	0.07	0.04	100.7	84.0
Col-1008B·	44.3	0.00	40.6	0.21	15.02	0.27	0.07	0.02	100.5	84.0
Col-1008B·	44.3	0.02	40.5	0.21	15.06	0.20	0.08	0.01	100.4	84.0
Col-1008B·	44.4	0.01	40.5	0.21	15.14	0.24	0.09	0.02	100.6	83.9
Col-1008B·	44.3	0.01	40.4	0.22	15.22	0.22	0.06	0.02	100.5	83.8
Col-1008B·	44.3	0.00	40.6	0.20	15.35	0.18	0.06	0.02	100.6	83.7
Col-1008B·	44.1	0.02	40.4	0.21	15.30	0.19	0.07	-0.01	100.3	83.7
Col-1008B·	43.9	0.01	40.3	0.21	15.44	0.23	0.09	0.01	100.1	83.5
Col-1008B·	43.8	0.02	40.3	0.21	16.00	0.20	0.07	0.01	100.6	83.0
Col-1008B·	43.5	0.01	40.6	0.20	16.12	0.28	0.13	0.05	100.9	82.8

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1008B-	43.2	0.00	40.1	0.23	16.05	0.23	0.07	0.02	100	82.8
Col-1008B-	43.7	0.01	40.3	0.18	16.21	0.29	0.11	0.01	100.7	82.8
Col-1008B-	43.4	0.01	40.5	0.15	16.21	0.22	0.10	0.04	100.7	82.7
Col-1008B-	43.0	0.03	40.2	0.21	16.70	0.34	0.06	0.02	100.5	82.1
Col-1008B-	42.5	0.16	40.3	0.24	16.55	0.30	0.08	0.01	100.1	82.1
Col-1008B-	43.1	0.01	40.4	0.16	16.83	0.30	0.10	0.03	100.9	82.0
Col-1008B-	42.8	0.00	40.2	0.19	16.99	0.27	0.08	0.03	100.5	81.8
Col-1008B-	42.8	0.00	40.3	0.17	17.04	0.36	0.09	0.01	100.8	81.8
Col-1008B-	42.9	0.02	40.1	0.14	17.13	0.26	0.06	0.01	100.7	81.7
Col-1008B-	42.6	0.01	40.1	0.24	17.05	0.26	0.06	0.02	100.4	81.7
Col-1008B-	42.4	0.02	40.3	0.23	17.23	0.32	0.04	0.00	100.5	81.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	50.7	0.03	42.0	0.15	6.49	0.16	0.55	0.09	100.2	93.3
Col-1013-a	50.7	0.02	41.9	0.15	6.63	0.12	0.59	0.07	100.3	93.2
Col-1013-a	50.7	0.02	41.8	0.15	6.71	0.07	0.57	0.10	100.2	93.1
Col-1013-a	50.7	0.02	42.0	0.15	6.74	0.12	0.58	0.10	100.4	93.1
Col-1013-a	50.5	0.01	41.5	0.13	6.72	0.08	0.63	0.09	99.6	93.1
Col-1013-a	50.6	0.02	42.0	0.16	6.74	0.09	0.57	0.08	100.3	93.0
Col-1013-a	50.3	0.02	41.7	0.15	6.78	0.09	0.59	0.06	99.7	93.0
Col-1013-a	50.6	0.02	41.8	0.15	6.84	0.05	0.58	0.09	100.2	93.0
Col-1013-a	50.6	0.02	42.1	0.15	6.86	0.05	0.56	0.10	100.5	92.9
Col-1013-a	50.6	0.01	41.9	0.15	6.87	0.09	0.59	0.06	100.4	92.9
Col-1013-a	50.8	0.01	41.8	0.15	6.91	0.13	0.51	0.25	100.6	92.9
Col-1013-a	50.2	0.02	41.8	0.16	6.85	0.10	0.58	0.08	99.8	92.9
Col-1013-a	50.6	0.01	42.0	0.15	6.90	0.09	0.63	0.08	100.4	92.9
Col-1013-a	50.5	0.04	41.9	0.13	6.91	0.03	0.63	0.06	100.2	92.9
Col-1013-a	50.5	0.02	42.0	0.16	6.94	0.10	0.58	0.06	100.4	92.8
Col-1013-a	50.4	0.00	42.0	0.15	6.93	0.13	0.61	0.08	100.3	92.8
Col-1013-a	50.6	0.03	41.8	0.14	6.97	0.10	0.60	0.07	100.3	92.8
Col-1013-a	50.3	0.03	41.8	0.14	6.93	0.10	0.66	0.08	100.1	92.8
Col-1013-a	50.6	0.02	42.0	0.15	6.98	0.12	0.65	0.05	100.5	92.8
Col-1013-a	50.5	0.02	41.7	0.14	6.99	0.09	0.62	0.07	100.2	92.8
Col-1013-a	50.2	0.03	41.7	0.16	6.96	0.14	0.57	0.07	99.8	92.8
Col-1013-a	50.2	0.03	41.7	0.17	6.98	0.07	0.57	0.09	99.8	92.8
Col-1013-a	50.4	0.02	41.9	0.15	7.05	0.10	0.55	0.07	100.2	92.7
Col-1013-a	50.5	0.01	41.8	0.14	7.07	0.08	0.67	0.08	100.3	92.7
Col-1013-a	50.2	0.00	41.8	0.17	7.05	0.16	0.54	0.05	100.0	92.7
Col-1013-a	50.3	0.02	41.8	0.15	7.08	0.12	0.59	0.10	100.2	92.7

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	50.8	0.03	42.0	0.12	7.18	0.06	0.64	0.07	100.9	92.7
Col-1013-a	50.1	0.02	41.9	0.17	7.10	0.07	0.54	0.06	100.0	92.6
Col-1013-a	50.1	0.02	41.6	0.16	7.14	0.08	0.55	0.06	99.6	92.6
Col-1013-a	50.4	0.03	41.8	0.16	7.19	0.06	0.56	0.06	100.3	92.6
Col-1013-a	50.5	0.02	41.8	0.15	7.21	0.11	0.61	0.06	100.4	92.6
Col-1013-a	50.5	0.02	41.8	0.12	7.21	0.12	0.68	0.09	100.5	92.6
Col-1013-a	50.0	0.03	41.4	0.14	7.15	0.09	0.57	0.07	99.4	92.6
Col-1013-a	50.6	0.02	42.0	0.16	7.24	0.10	0.54	0.09	100.7	92.6
Col-1013-a	50.6	0.01	42.0	0.13	7.24	0.14	0.64	0.05	100.8	92.6
Col-1013-a	50.0	0.02	42.1	0.16	7.18	0.13	0.55	0.08	100.2	92.5
Col-1013-a	50.1	0.02	41.6	0.15	7.21	0.12	0.59	0.09	99.8	92.5
Col-1013-a	50.1	0.01	41.7	0.15	7.21	0.12	0.60	0.07	99.9	92.5
Col-1013-a	50.3	0.01	41.6	0.13	7.24	0.08	0.66	0.05	100.1	92.5
Col-1013-a	50.4	0.03	41.8	0.16	7.27	0.10	0.55	0.08	100.4	92.5
Col-1013-a	50.4	0.02	41.8	0.13	7.30	0.14	0.63	0.08	100.5	92.5
Col-1013-a	50.0	0.00	41.6	0.16	7.25	0.06	0.54	0.08	99.6	92.5
Col-1013-a	50.1	0.01	41.6	0.12	7.28	0.06	0.66	0.06	99.9	92.5
Col-1013-a	50.3	0.01	41.5	0.14	7.33	0.13	0.59	0.10	100.1	92.4
Col-1013-a	50.0	0.02	41.4	0.14	7.29	0.07	0.56	0.13	99.6	92.4
Col-1013-a	50.5	0.04	42.0	0.15	7.38	0.08	0.65	0.05	100.9	92.4
Col-1013-a	50.2	0.01	41.6	0.14	7.33	0.13	0.57	0.07	100.0	92.4
Col-1013-a	50.0	0.01	41.5	0.13	7.31	0.15	0.63	0.06	99.9	92.4
Col-1013-a	50.0	0.02	41.5	0.15	7.32	0.12	0.59	0.09	99.8	92.4
Col-1013-a	50.1	0.04	41.6	0.14	7.33	0.10	0.60	0.08	100.0	92.4
Col-1013-a	50.1	0.01	41.8	0.13	7.36	0.09	0.63	0.10	100.2	92.4
Col-1013-a	50.3	0.01	41.6	0.13	7.39	0.09	0.58	0.08	100.2	92.4
Col-1013-a	50.1	0.02	41.6	0.13	7.38	0.13	0.59	0.08	100.1	92.4
Col-1013-a	50.1	0.00	41.5	0.13	7.38	0.11	0.58	0.09	99.9	92.4
Col-1013-a	50.1	0.01	41.5	0.14	7.41	0.13	0.58	0.06	99.9	92.3
Col-1013-a	50.1	-0.01	41.4	0.13	7.42	0.10	0.57	0.08	99.8	92.3
Col-1013-a	50.2	0.02	41.6	0.14	7.45	0.06	0.60	0.13	100.2	92.3
Col-1013-a	50.2	0.01	41.4	0.13	7.46	0.09	0.55	0.05	99.9	92.3
Col-1013-a	50.0	0.02	41.7	0.15	7.44	0.08	0.53	0.05	99.9	92.3
Col-1013-a	50.1	0.02	41.4	0.14	7.47	0.11	0.58	0.07	99.8	92.3
Col-1013-a	50.1	0.01	41.9	0.13	7.49	0.15	0.57	0.06	100.4	92.3
Col-1013-a	50.0	0.02	41.9	0.15	7.48	0.08	0.64	0.14	100.4	92.3
Col-1013-a	50.3	0.02	41.6	0.13	7.53	0.14	0.61	0.08	100.3	92.3
Col-1013-a	50.0	0.03	42.0	0.18	7.49	0.09	0.55	0.17	100.5	92.2
Col-1013-a	50.4	0.02	41.9	0.12	7.56	0.15	0.65	0.09	100.9	92.2
Col-1013-a	50.0	0.01	41.4	0.14	7.50	0.09	0.60	0.08	99.8	92.2
Col-1013-a	50.4	0.01	42.0	0.17	7.57	0.13	0.53	0.19	101.0	92.2

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	50.1	0.02	41.2	0.13	7.53	0.07	0.60	0.07	99.7	92.2
Col-1013-a	50.1	0.03	41.8	0.11	7.54	0.11	0.65	0.09	100.4	92.2
Col-1013-a	50.1	0.02	41.6	0.13	7.67	0.08	0.62	0.07	100.2	92.1
Col-1013-a	50.0	0.01	41.7	0.12	7.70	0.13	0.56	0.20	100.4	92.0
Col-1013-a	50.0	0.02	41.9	0.14	7.75	0.08	0.50	0.08	100.5	92.0
Col-1013-a	50.1	0.00	41.8	0.13	7.77	0.09	0.67	0.06	100.5	92.0
Col-1013-a	49.7	0.01	41.6	0.15	7.73	0.13	0.63	0.08	100.0	92.0
Col-1013-a	49.9	0.02	41.3	0.14	7.76	0.07	0.62	0.04	99.9	92.0
Col-1013-a	50.0	0.00	41.4	0.12	7.79	0.07	0.63	0.07	100.1	92.0
Col-1013-a	49.9	0.01	41.8	0.12	7.78	0.09	0.64	0.08	100.5	92.0
Col-1013-a	49.8	0.01	41.8	0.16	7.78	0.09	0.56	0.06	100.3	91.9
Col-1013-a	49.7	0.02	41.6	0.13	7.79	0.08	0.61	0.05	100.0	91.9
Col-1013-a	49.8	0.01	41.7	0.12	7.86	0.13	0.59	0.06	100.3	91.9
Col-1013-a	50.0	0.01	41.5	0.12	7.89	0.04	0.55	0.09	100.2	91.9
Col-1013-a	49.6	0.02	41.8	0.14	7.84	0.14	0.61	0.07	100.3	91.9
Col-1013-a	49.8	0.02	41.8	0.12	7.88	0.14	0.67	0.05	100.5	91.8
Col-1013-a	50.0	0.03	41.8	0.13	7.92	0.12	0.55	0.07	100.7	91.8
Col-1013-a	49.9	-0.01	41.9	0.12	7.93	0.11	0.62	0.04	100.6	91.8
Col-1013-a	49.7	0.01	42.0	0.14	7.91	0.11	0.55	0.07	100.6	91.8
Col-1013-a	49.6	0.01	41.7	0.16	7.91	0.14	0.50	0.06	100.0	91.8
Col-1013-a	49.5	0.01	41.6	0.11	7.90	0.09	0.63	0.08	99.9	91.8
Col-1013-a	50.1	0.02	41.9	0.15	8.04	0.13	0.50	0.09	100.9	91.7
Col-1013-a	50.0	0.01	41.8	0.16	8.04	0.14	0.51	0.07	100.7	91.7
Col-1013-a	49.7	0.02	41.5	0.13	8.02	0.14	0.57	0.08	100.2	91.7
Col-1013-a	49.9	0.03	41.9	0.15	8.06	0.09	0.53	0.06	100.7	91.7
Col-1013-a	49.7	0.00	41.6	0.15	8.03	0.13	0.47	0.07	100.1	91.7
Col-1013-a	49.9	0.01	42.0	0.15	8.07	0.12	0.49	0.13	100.8	91.7
Col-1013-a	49.8	0.02	41.5	0.14	8.07	0.13	0.56	0.05	100.3	91.7
Col-1013-a	50.0	0.03	41.8	0.14	8.11	0.11	0.53	0.08	100.8	91.7
Col-1013-a	49.4	0.01	41.5	0.13	8.01	0.10	0.57	0.09	99.8	91.7
Col-1013-a	49.5	-0.01	41.7	0.14	8.04	0.09	0.59	0.05	100.1	91.7
Col-1013-a	49.8	0.01	41.8	0.14	8.10	0.10	0.54	0.07	100.5	91.6
Col-1013-a	49.9	0.02	41.8	0.13	8.17	0.15	0.56	0.08	100.8	91.6
Col-1013-a	48.8	0.01	41.3	0.14	8.01	0.09	0.58	0.17	99.1	91.6
Col-1013-a	49.9	0.01	42.0	0.13	8.18	0.02	0.57	0.04	100.8	91.6
Col-1013-a	49.5	0.02	41.5	0.13	8.14	0.16	0.62	0.04	100.1	91.6
Col-1013-a	49.6	0.00	41.8	0.13	8.17	0.17	0.61	0.08	100.5	91.5
Col-1013-a	49.5	0.01	41.6	0.14	8.18	0.08	0.61	0.09	100.3	91.5
Col-1013-a	49.8	0.01	41.7	0.13	8.23	0.14	0.57	0.07	100.7	91.5
Col-1013-a	49.8	0.01	42.1	0.15	8.25	0.10	0.49	0.06	100.9	91.5
Col-1013-a	49.7	0.01	41.4	0.13	8.24	0.13	0.54	0.06	100.2	91.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	49.7	0.03	41.9	0.13	8.31	0.11	0.54	0.05	100.7	91.4
Col-1013-a	49.3	0.00	41.9	0.15	8.26	0.10	0.45	0.07	100.2	91.4
Col-1013-a	49.4	0.01	41.8	0.13	8.28	0.08	0.54	0.06	100.3	91.4
Col-1013-a	49.6	0.01	41.8	0.14	8.34	0.10	0.50	0.07	100.6	91.4
Col-1013-a	48.8	0.01	41.3	0.12	8.22	0.08	0.63	0.08	99.2	91.4
Col-1013-a	49.6	0.03	41.7	0.12	8.36	0.15	0.59	0.04	100.6	91.4
Col-1013-a	49.7	0.01	41.7	0.14	8.40	0.16	0.57	0.07	100.8	91.3
Col-1013-a	48.9	0.02	41.2	0.14	8.28	0.08	0.57	0.11	99.2	91.3
Col-1013-a	49.4	0.03	41.5	0.13	8.38	0.11	0.60	0.04	100.1	91.3
Col-1013-a	49.7	0.02	42.1	0.15	8.44	0.12	0.45	0.06	101.0	91.3
Col-1013-a	49.6	0.01	41.6	0.14	8.42	0.09	0.59	0.09	100.5	91.3
Col-1013-a	48.7	0.02	41.4	0.14	8.28	0.12	0.59	0.07	99.4	91.3
Col-1013-a	48.8	0.01	41.5	0.13	8.30	0.08	0.58	0.06	99.4	91.3
Col-1013-a	49.6	0.01	41.4	0.13	8.44	0.15	0.57	0.05	100.4	91.3
Col-1013-a	48.7	0.03	41.1	0.13	8.33	0.10	0.56	0.06	99.0	91.2
Col-1013-a	49.8	0.00	41.8	0.13	8.52	0.15	0.55	0.04	100.9	91.2
Col-1013-a	49.5	0.01	41.6	0.14	8.48	0.15	0.55	0.07	100.5	91.2
Col-1013-a	49.7	0.01	41.6	0.14	8.53	0.15	0.54	0.03	100.7	91.2
Col-1013-a	49.6	0.02	41.8	0.14	8.51	0.13	0.47	0.03	100.7	91.2
Col-1013-a	49.4	0.01	41.6	0.13	8.49	0.06	0.56	0.06	100.2	91.2
Col-1013-a	49.5	0.02	41.8	0.14	8.52	0.13	0.53	0.12	100.8	91.2
Col-1013-a	49.3	0.02	41.7	0.13	8.49	0.11	0.55	0.07	100.4	91.2
Col-1013-a	49.0	0.01	41.6	0.12	8.44	0.15	0.53	0.06	99.9	91.2
Col-1013-a	48.7	0.01	41.4	0.13	8.40	0.14	0.58	0.10	99.5	91.2
Col-1013-a	49.4	0.01	41.5	0.13	8.51	0.08	0.56	0.05	100.2	91.2
Col-1013-a	48.9	0.02	41.2	0.13	8.43	0.10	0.56	0.07	99.4	91.2
Col-1013-a	49.6	0.01	41.9	0.15	8.57	0.10	0.46	0.06	100.9	91.2
Col-1013-a	49.3	0.03	41.6	0.14	8.54	0.12	0.54	0.08	100.4	91.2
Col-1013-a	49.2	0.01	41.7	0.13	8.52	0.15	0.55	0.10	100.4	91.2
Col-1013-a	49.5	0.01	41.8	0.13	8.58	0.15	0.53	0.06	100.8	91.1
Col-1013-a	49.2	0.02	41.5	0.13	8.53	0.12	0.52	0.04	100.1	91.1
Col-1013-a	49.1	0.00	41.6	0.14	8.53	0.15	0.54	0.05	100.2	91.1
Col-1013-a	49.3	0.01	41.6	0.13	8.57	0.14	0.53	0.04	100.4	91.1
Col-1013-a	49.5	0.02	41.7	0.16	8.60	0.18	0.47	0.03	100.7	91.1
Col-1013-a	48.8	0.00	41.5	0.13	8.48	0.09	0.52	0.03	99.5	91.1
Col-1013-a	49.4	0.01	41.6	0.13	8.59	0.11	0.52	0.07	100.4	91.1
Col-1013-a	49.6	0.01	41.8	0.13	8.64	0.09	0.49	0.05	100.8	91.1
Col-1013-a	49.1	0.02	41.6	0.12	8.56	0.12	0.53	0.07	100.1	91.1
Col-1013-a	49.0	0.02	41.3	0.13	8.55	0.15	0.51	0.07	99.8	91.1
Col-1013-a	49.0	0.01	41.5	0.13	8.54	0.11	0.59	0.07	99.9	91.1
Col-1013-a	49.0	0.00	41.5	0.14	8.56	0.14	0.51	0.07	100.0	91.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	49.4	0.00	41.5	0.12	8.62	0.13	0.54	0.04	100.4	91.1
Col-1013-a	49.1	0.01	41.5	0.13	8.57	0.10	0.53	0.06	99.9	91.1
Col-1013-a	49.6	0.00	41.8	0.14	8.68	0.13	0.49	0.06	100.9	91.1
Col-1013-a	49.2	0.02	41.8	0.13	8.62	0.10	0.52	0.08	100.5	91.1
Col-1013-a	49.0	0.02	41.4	0.13	8.59	0.16	0.55	0.03	99.8	91.0
Col-1013-a	49.3	0.00	41.5	0.14	8.65	0.18	0.46	0.06	100.3	91.0
Col-1013-a	49.5	0.00	41.8	0.13	8.69	0.07	0.50	0.04	100.7	91.0
Col-1013-a	49.2	0.02	41.4	0.15	8.63	0.11	0.52	0.07	100.1	91.0
Col-1013-a	49.4	0.02	41.6	0.14	8.68	0.10	0.51	0.04	100.5	91.0
Col-1013-a	49.5	0.02	41.7	0.14	8.70	0.14	0.47	0.04	100.7	91.0
Col-1013-a	49.4	0.01	41.7	0.13	8.69	0.13	0.53	0.06	100.6	91.0
Col-1013-a	49.4	0.03	41.9	0.16	8.70	0.15	0.51	0.10	101.0	91.0
Col-1013-a	49.3	0.01	41.5	0.14	8.68	0.08	0.53	0.04	100.3	91.0
Col-1013-a	49.1	0.02	41.6	0.12	8.66	0.12	0.54	0.05	100.3	91.0
Col-1013-a	49.2	0.02	41.5	0.13	8.68	0.09	0.51	0.07	100.2	91.0
Col-1013-a	49.3	0.03	41.6	0.13	8.69	0.14	0.53	0.05	100.4	91.0
Col-1013-a	49.2	0.02	41.4	0.14	8.72	0.11	0.53	0.09	100.2	91.0
Col-1013-a	49.3	0.00	41.8	0.14	8.76	0.09	0.47	0.09	100.7	90.9
Col-1013-a	49.1	0.02	41.8	0.13	8.73	0.13	0.47	0.06	100.4	90.9
Col-1013-a	48.8	0.01	41.5	0.12	8.68	0.16	0.50	0.04	99.8	90.9
Col-1013-a	49.3	0.01	41.5	0.13	8.78	0.12	0.51	0.04	100.5	90.9
Col-1013-a	49.3	0.01	41.6	0.14	8.78	0.13	0.53	0.04	100.6	90.9
Col-1013-a	49.3	0.00	41.8	0.13	8.80	0.11	0.55	0.08	100.8	90.9
Col-1013-a	49.3	0.01	41.5	0.13	8.81	0.16	0.49	0.06	100.5	90.9
Col-1013-a	49.2	0.02	41.5	0.13	8.80	0.11	0.54	0.05	100.3	90.9
Col-1013-a	49.1	0.00	41.7	0.13	8.79	0.14	0.54	0.04	100.4	90.9
Col-1013-a	49.0	0.03	41.4	0.14	8.78	0.12	0.52	0.07	100.1	90.9
Col-1013-a	48.9	0.03	41.4	0.14	8.77	0.15	0.46	0.07	99.9	90.9
Col-1013-a	49.4	0.02	41.8	0.18	8.88	0.09	0.44	0.01	100.8	90.8
Col-1013-a	49.0	0.01	41.9	0.14	8.80	0.13	0.50	0.07	100.6	90.8
Col-1013-a	49.1	0.03	41.5	0.14	8.83	0.12	0.52	0.05	100.3	90.8
Col-1013-a	49.1	0.01	41.6	0.13	8.84	0.11	0.50	0.05	100.4	90.8
Col-1013-a	49.0	0.01	41.6	0.15	8.82	0.14	0.53	0.04	100.3	90.8
Col-1013-a	48.6	0.02	41.6	0.14	8.75	0.18	0.50	0.05	99.8	90.8
Col-1013-a	49.2	0.01	41.4	0.13	8.87	0.16	0.51	0.05	100.4	90.8
Col-1013-a	49.0	0.03	41.8	0.13	8.86	0.15	0.52	0.07	100.6	90.8
Col-1013-a	48.8	0.01	41.3	0.14	8.82	0.14	0.50	0.08	99.8	90.8
Col-1013-a	48.8	0.02	41.4	0.12	8.84	0.09	0.54	0.08	100.0	90.8
Col-1013-a	48.9	0.01	41.7	0.14	8.86	0.11	0.52	0.03	100.3	90.8
Col-1013-a	48.8	0.01	41.4	0.13	8.84	0.07	0.50	0.06	99.8	90.8
Col-1013-a	49.5	0.03	41.6	0.13	8.97	0.07	0.51	0.05	100.9	90.8

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	49.0	0.01	41.3	0.13	8.90	0.15	0.48	0.08	100.0	90.8
Col-1013-a	49.2	0.00	41.6	0.14	8.95	0.06	0.46	0.06	100.5	90.7
Col-1013-a	48.5	0.01	41.5	0.16	8.82	0.08	0.50	0.10	99.7	90.7
Col-1013-a	49.1	0.03	41.7	0.13	8.95	0.08	0.49	0.05	100.6	90.7
Col-1013-a	49.3	0.01	41.7	0.14	8.98	0.09	0.48	0.05	100.7	90.7
Col-1013-a	49.1	0.01	41.4	0.14	8.95	0.14	0.51	0.04	100.3	90.7
Col-1013-a	45.7	1.30	43.1	0.25	8.34	0.11	0.42	0.12	99.3	90.7
Col-1013-a	48.9	0.02	41.7	0.12	8.94	0.16	0.46	0.06	100.3	90.7
Col-1013-a	49.1	0.02	41.6	0.13	8.98	0.15	0.53	0.05	100.6	90.7
Col-1013-a	49.1	0.02	41.6	0.13	9.00	0.04	0.50	0.07	100.5	90.7
Col-1013-a	49.1	0.02	41.8	0.15	9.01	0.11	0.49	0.06	100.8	90.7
Col-1013-a	48.4	0.01	41.5	0.14	8.88	0.17	0.44	0.04	99.6	90.7
Col-1013-a	49.2	0.02	41.9	0.15	9.05	0.12	0.45	0.07	100.9	90.6
Col-1013-a	49.0	0.03	41.3	0.14	9.02	0.17	0.46	0.09	100.2	90.6
Col-1013-a	49.0	0.02	41.6	0.13	9.02	0.10	0.49	0.06	100.4	90.6
Col-1013-a	48.9	0.01	41.2	0.13	9.02	0.13	0.49	0.05	99.9	90.6
Col-1013-a	49.3	0.00	41.6	0.13	9.12	0.10	0.53	0.04	100.8	90.6
Col-1013-a	49.0	0.02	41.5	0.13	9.05	0.16	0.55	0.07	100.4	90.6
Col-1013-a	48.9	-0.01	41.5	0.13	9.03	0.12	0.47	0.03	100.1	90.6
Col-1013-a	48.8	0.02	41.4	0.12	9.03	0.13	0.53	0.09	100.1	90.6
Col-1013-a	48.1	0.04	41.3	0.13	8.89	0.09	0.57	0.04	99.2	90.6
Col-1013-a	48.8	0.01	41.5	0.13	9.02	0.11	0.51	0.02	100.0	90.6
Col-1013-a	48.9	0.00	41.4	0.13	9.05	0.15	0.46	0.08	100.2	90.6
Col-1013-a	48.3	0.09	41.0	0.15	8.95	0.10	0.43	0.32	99.4	90.6
Col-1013-a	49.0	0.02	41.7	0.13	9.08	0.16	0.52	0.06	100.7	90.6
Col-1013-a	49.1	0.01	41.3	0.12	9.11	0.09	0.49	0.09	100.4	90.6
Col-1013-a	49.2	0.02	41.5	0.15	9.12	0.09	0.45	0.03	100.6	90.6
Col-1013-a	48.9	0.02	41.4	0.15	9.07	0.13	0.46	0.03	100.1	90.6
Col-1013-a	48.9	0.00	41.4	0.13	9.07	0.06	0.51	0.07	100.1	90.6
Col-1013-a	49.0	0.01	41.3	0.14	9.09	0.11	0.48	0.09	100.2	90.6
Col-1013-a	48.8	0.00	41.4	0.12	9.07	0.03	0.51	0.08	100.0	90.6
Col-1013-a	48.8	0.02	41.5	0.14	9.07	0.15	0.45	0.06	100.2	90.5
Col-1013-a	49.1	0.03	41.8	0.14	9.14	0.11	0.54	0.05	101.0	90.5
Col-1013-a	48.8	0.01	41.6	0.14	9.08	0.09	0.44	0.05	100.2	90.5
Col-1013-a	48.9	0.02	41.4	0.13	9.12	0.08	0.47	0.07	100.2	90.5
Col-1013-a	49.2	0.01	41.8	0.11	9.17	0.13	0.48	0.06	100.9	90.5
Col-1013-a	48.7	0.01	41.7	0.13	9.09	0.10	0.56	0.06	100.3	90.5
Col-1013-a	48.9	0.02	41.4	0.14	9.12	0.17	0.44	0.10	100.2	90.5
Col-1013-a	48.9	0.01	41.8	0.14	9.15	0.05	0.49	0.04	100.6	90.5
Col-1013-a	48.9	0.01	41.6	0.13	9.16	0.08	0.47	0.06	100.4	90.5
Col-1013-a	49.0	0.01	41.9	0.13	9.18	0.16	0.44	0.05	100.9	90.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	47.7	0.25	42.0	0.18	8.96	0.17	0.27	0.74	100.3	90.5
Col-1013-a	48.8	0.02	41.7	0.14	9.18	0.19	0.42	0.03	100.5	90.5
Col-1013-a	48.8	0.00	41.3	0.14	9.18	0.13	0.44	0.05	100.0	90.5
Col-1013-a	48.9	0.02	41.8	0.14	9.21	0.21	0.42	0.07	100.8	90.4
Col-1013-a	49.0	0.02	41.6	0.16	9.24	0.14	0.41	0.04	100.6	90.4
Col-1013-a	49.0	0.01	41.4	0.14	9.23	0.10	0.51	0.05	100.5	90.4
Col-1013-a	49.0	0.01	41.8	0.15	9.25	0.19	0.43	0.06	100.9	90.4
Col-1013-a	48.8	0.02	41.3	0.13	9.22	0.16	0.43	0.08	100.2	90.4
Col-1013-a	49.1	0.01	41.9	0.14	9.26	0.14	0.44	0.05	101.0	90.4
Col-1013-a	49.1	-0.01	41.8	0.20	9.27	0.31	0.23	0.03	100.9	90.4
Col-1013-a	48.8	-0.01	41.4	0.13	9.23	0.12	0.48	0.08	100.3	90.4
Col-1013-a	49.1	0.01	41.5	0.14	9.28	0.07	0.44	0.07	100.6	90.4
Col-1013-a	48.8	0.02	41.2	0.14	9.22	0.15	0.50	0.13	100.1	90.4
Col-1013-a	49.1	0.02	41.6	0.15	9.28	0.11	0.39	0.06	100.7	90.4
Col-1013-a	48.5	0.02	41.7	0.13	9.19	0.08	0.43	0.04	100.1	90.4
Col-1013-a	49.0	0.01	41.6	0.13	9.31	0.12	0.40	0.03	100.7	90.4
Col-1013-a	48.9	0.01	41.3	0.13	9.29	0.09	0.54	0.09	100.4	90.4
Col-1013-a	48.8	0.02	41.7	0.15	9.30	0.18	0.46	0.04	100.6	90.4
Col-1013-a	48.9	0.02	41.5	0.14	9.33	0.13	0.46	0.06	100.6	90.3
Col-1013-a	48.6	0.02	41.7	0.15	9.28	0.13	0.40	0.04	100.3	90.3
Col-1013-a	48.5	0.01	41.3	0.14	9.26	0.19	0.35	0.06	99.8	90.3
Col-1013-a	49.1	0.01	41.7	0.14	9.39	0.15	0.49	0.03	101.0	90.3
Col-1013-a	48.7	0.01	41.4	0.14	9.34	0.18	0.46	0.04	100.3	90.3
Col-1013-a	48.9	0.00	41.7	0.14	9.42	0.12	0.45	0.04	100.7	90.2
Col-1013-a	48.8	0.02	41.3	0.16	9.44	0.15	0.39	0.05	100.4	90.2
Col-1013-a	48.6	0.00	41.5	0.15	9.40	0.14	0.38	0.01	100.2	90.2
Col-1013-a	48.6	0.01	41.2	0.14	9.41	0.12	0.45	0.05	100.0	90.2
Col-1013-a	48.6	0.02	41.6	0.16	9.40	0.14	0.34	0.04	100.2	90.2
Col-1013-a	48.3	0.01	41.5	0.14	9.35	0.16	0.45	0.04	99.9	90.2
Col-1013-a	49.0	0.02	41.5	0.16	9.49	0.12	0.36	0.05	100.7	90.2
Col-1013-a	48.7	0.03	41.5	0.17	9.49	0.09	0.21	0.10	100.4	90.2
Col-1013-a	48.6	0.02	41.4	0.14	9.48	0.13	0.46	0.04	100.2	90.1
Col-1013-a	48.3	0.00	41.5	0.16	9.44	0.12	0.34	0.04	99.9	90.1
Col-1013-a	48.3	0.03	41.5	0.16	9.43	0.11	0.39	0.02	99.9	90.1
Col-1013-a	48.9	0.02	41.5	0.14	9.54	0.15	0.40	0.09	100.7	90.1
Col-1013-a	48.8	0.09	41.5	0.17	9.54	0.04	0.41	0.11	100.6	90.1
Col-1013-a	48.8	0.01	41.7	0.14	9.55	0.18	0.38	0.05	100.8	90.1
Col-1013-a	48.6	0.00	41.4	0.13	9.51	0.16	0.45	0.03	100.3	90.1
Col-1013-a	49.0	0.02	41.6	0.15	9.59	0.14	0.41	0.01	101.0	90.1
Col-1013-a	48.9	0.02	41.0	0.16	9.58	0.11	0.42	0.04	100.3	90.1
Col-1013-a	48.6	0.02	41.5	0.14	9.53	0.12	0.42	0.03	100.4	90.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	48.8	0.04	41.7	0.14	9.57	0.17	0.35	0.05	100.8	90.1
Col-1013-a	48.9	0.01	41.7	0.14	9.60	0.10	0.49	0.05	101.0	90.1
Col-1013-a	48.5	-0.01	41.4	0.14	9.50	0.14	0.41	0.03	100.1	90.1
Col-1013-a	48.5	0.02	41.6	0.14	9.54	0.06	0.41	0.05	100.4	90.1
Col-1013-a	48.6	0.00	41.5	0.15	9.57	0.23	0.39	0.04	100.5	90.1
Col-1013-a	48.2	0.02	41.2	0.15	9.50	0.15	0.40	0.07	99.7	90.0
Col-1013-a	48.4	0.02	41.5	0.15	9.53	0.16	0.42	0.06	100.2	90.0
Col-1013-a	48.6	0.01	41.6	0.14	9.59	0.16	0.41	0.05	100.6	90.0
Col-1013-a	48.8	0.01	41.6	0.15	9.61	0.10	0.37	0.04	100.6	90.0
Col-1013-a	48.3	0.00	41.4	0.15	9.53	0.12	0.40	0.04	99.9	90.0
Col-1013-a	48.4	0.02	41.4	0.16	9.56	0.14	0.37	0.03	100.0	90.0
Col-1013-a	48.6	0.02	41.5	0.20	9.60	0.09	0.25	0.13	100.4	90.0
Col-1013-a	48.6	0.01	41.9	0.16	9.61	0.14	0.36	0.02	100.8	90.0
Col-1013-a	48.5	0.02	41.3	0.14	9.60	0.17	0.40	0.02	100.1	90.0
Col-1013-a	48.6	0.01	41.9	0.18	9.63	0.09	0.35	0.06	100.8	90.0
Col-1013-a	48.1	0.02	41.5	0.15	9.53	0.20	0.39	0.07	99.9	90.0
Col-1013-a	48.4	0.00	41.7	0.15	9.63	0.17	0.36	0.06	100.5	90.0
Col-1013-a	49.0	0.02	41.4	0.16	9.75	0.18	0.35	0.05	100.9	89.9
Col-1013-a	48.6	0.03	41.6	0.17	9.70	0.14	0.37	0.02	100.6	89.9
Col-1013-a	48.3	0.01	41.5	0.20	9.63	0.23	0.22	0.03	100.1	89.9
Col-1013-a	48.2	0.02	41.2	0.16	9.62	0.13	0.34	0.08	99.7	89.9
Col-1013-a	48.8	0.02	41.3	0.13	9.77	0.22	0.38	0.04	100.6	89.9
Col-1013-a	48.4	0.02	41.6	0.16	9.68	0.10	0.37	0.06	100.3	89.9
Col-1013-a	48.4	0.00	41.4	0.14	9.72	0.16	0.40	0.01	100.3	89.9
Col-1013-a	48.6	0.02	41.4	0.19	9.77	0.26	0.21	-0.02	100.4	89.9
Col-1013-a	48.4	0.00	41.3	0.18	9.73	0.13	0.33	0.07	100.1	89.9
Col-1013-a	48.3	0.01	41.4	0.16	9.73	0.10	0.36	0.05	100.1	89.9
Col-1013-a	48.5	0.02	41.8	0.14	9.76	0.12	0.40	0.03	100.8	89.9
Col-1013-a	48.0	0.03	41.4	0.14	9.66	0.18	0.43	0.02	99.9	89.9
Col-1013-a	48.4	0.01	41.2	0.16	9.76	0.15	0.38	0.06	100.1	89.8
Col-1013-a	48.6	0.03	41.6	0.15	9.80	0.19	0.38	0.05	100.8	89.8
Col-1013-a	48.1	0.02	41.5	0.18	9.72	0.20	0.35	0.05	100.1	89.8
Col-1013-a	48.4	0.02	41.4	0.16	9.82	0.17	0.32	0.03	100.3	89.8
Col-1013-a	48.3	0.01	41.4	0.16	9.81	0.15	0.39	0.02	100.1	89.8
Col-1013-a	48.2	0.03	41.2	0.15	9.80	0.16	0.34	0.08	100.0	89.8
Col-1013-a	48.5	0.01	41.3	0.16	9.87	0.15	0.31	0.07	100.4	89.8
Col-1013-a	48.3	0.00	41.5	0.17	9.84	0.19	0.34	0.06	100.4	89.7
Col-1013-a	48.3	0.03	41.4	0.17	9.85	0.12	0.31	0.03	100.3	89.7
Col-1013-a	48.2	0.00	41.5	0.17	9.84	0.16	0.34	0.06	100.2	89.7
Col-1013-a	48.1	0.02	41.3	0.15	9.84	0.12	0.39	0.07	99.9	89.7
Col-1013-a	48.4	0.03	41.3	0.15	9.90	0.15	0.32	0.06	100.3	89.7

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	48.3	-0.01	41.4	0.17	9.89	0.17	0.35	0.06	100.4	89.7
Col-1013-a	48.4	0.02	41.5	0.16	9.93	0.11	0.35	0.05	100.5	89.7
Col-1013-a	48.4	0.05	41.6	0.15	9.96	0.19	0.30	0.00	100.7	89.7
Col-1013-a	48.5	0.02	41.6	0.18	9.99	0.17	0.31	0.05	100.8	89.6
Col-1013-a	48.2	0.02	41.2	0.16	9.94	0.20	0.32	0.02	100.0	89.6
Col-1013-a	48.4	0.01	41.4	0.15	9.99	0.11	0.32	0.04	100.5	89.6
Col-1013-a	48.7	0.01	41.3	0.15	10.05	0.14	0.32	0.09	100.8	89.6
Col-1013-a	48.3	0.01	41.2	0.18	10.03	0.14	0.34	0.05	100.2	89.6
Col-1013-a	47.8	0.00	41.0	0.16	9.94	0.12	0.33	0.03	99.4	89.6
Col-1013-a	48.1	0.01	41.5	0.18	10.04	0.19	0.34	0.06	100.4	89.5
Col-1013-a	48.1	0.01	41.5	0.17	10.06	0.10	0.36	0.03	100.4	89.5
Col-1013-a	48.3	0.01	41.2	0.16	10.09	0.16	0.30	0.02	100.2	89.5
Col-1013-a	48.0	0.02	41.4	0.17	10.03	0.15	0.29	0.06	100.1	89.5
Col-1013-a	48.4	0.01	41.4	0.16	10.13	0.18	0.30	0.05	100.7	89.5
Col-1013-a	48.0	0.00	41.3	0.18	10.05	0.22	0.31	0.04	100.2	89.5
Col-1013-a	48.5	0.02	41.5	0.16	10.16	0.16	0.34	0.07	101.0	89.5
Col-1013-a	48.3	0.00	41.3	0.17	10.15	0.12	0.26	0.05	100.4	89.5
Col-1013-a	47.8	0.00	41.3	0.17	10.06	0.10	0.28	0.03	99.8	89.5
Col-1013-a	47.7	0.01	41.2	0.17	10.04	0.14	0.26	0.04	99.6	89.4
Col-1013-a	48.2	0.01	41.3	0.18	10.15	0.22	0.31	0.06	100.4	89.4
Col-1013-a	48.0	0.00	41.2	0.16	10.13	0.13	0.25	0.05	99.9	89.4
Col-1013-a	48.1	0.02	41.2	0.17	10.21	0.14	0.31	0.05	100.3	89.4
Col-1013-a	48.0	0.02	41.5	0.18	10.19	0.26	0.25	0.06	100.4	89.4
Col-1013-a	48.2	0.01	41.4	0.16	10.26	0.16	0.30	0.04	100.6	89.3
Col-1013-a	47.9	0.00	41.1	0.16	10.21	0.14	0.29	0.04	99.8	89.3
Col-1013-a	48.0	0.00	41.3	0.15	10.24	0.13	0.35	0.01	100.3	89.3
Col-1013-a	47.8	0.00	41.6	0.17	10.21	0.17	0.28	0.03	100.3	89.3
Col-1013-a	48.2	0.00	41.5	0.18	10.29	0.14	0.29	0.05	100.6	89.3
Col-1013-a	48.1	0.01	41.3	0.17	10.31	0.14	0.30	0.05	100.3	89.3
Col-1013-a	48.1	-0.01	41.6	0.18	10.31	0.13	0.30	0.03	100.7	89.3
Col-1013-a	48.0	0.01	41.3	0.17	10.31	0.18	0.32	0.05	100.4	89.2
Col-1013-a	48.1	0.01	41.4	0.16	10.33	0.16	0.28	0.04	100.4	89.2
Col-1013-a	48.3	0.00	41.4	0.17	10.39	0.14	0.27	0.04	100.6	89.2
Col-1013-a	47.9	0.00	41.2	0.18	10.31	0.16	0.31	0.04	100.1	89.2
Col-1013-a	47.9	0.02	41.4	0.19	10.34	0.16	0.35	0.07	100.4	89.2
Col-1013-a	48.1	0.00	41.5	0.17	10.39	0.13	0.28	0.05	100.7	89.2
Col-1013-a	48.0	0.01	41.4	0.17	10.35	0.20	0.26	0.03	100.3	89.2
Col-1013-a	48.1	0.01	41.2	0.17	10.40	0.16	0.28	0.05	100.4	89.2
Col-1013-a	48.0	0.01	41.3	0.18	10.38	0.13	0.37	0.03	100.4	89.2
Col-1013-a	48.1	0.01	41.5	0.17	10.44	0.18	0.24	0.03	100.6	89.1
Col-1013-a	48.0	0.00	41.3	0.19	10.45	0.20	0.24	0.03	100.4	89.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1013-a	48.0	0.02	41.3	0.17	10.46	0.16	0.26	0.03	100.4	89.1
Col-1013-a	47.7	0.01	41.1	0.17	10.41	0.13	0.25	0.05	99.9	89.1
Col-1013-a	47.8	0.03	41.3	0.17	10.45	0.19	0.23	0.08	100.2	89.1
Col-1013-a	48.1	0.01	41.3	0.19	10.61	0.16	0.23	0.04	100.6	89.0
Col-1013-a	48.1	0.01	41.4	0.18	10.70	0.16	0.27	0.05	100.8	88.9
Col-1013-a	47.8	0.01	41.3	0.18	10.65	0.13	0.28	0.02	100.4	88.9
Col-1013-a	47.5	0.00	41.3	0.20	10.61	0.23	0.20	0.05	100.1	88.9
Col-1013-a	47.9	0.03	41.3	0.18	10.77	0.12	0.25	0.05	100.5	88.8
Col-1013-a	47.7	0.02	41.3	0.17	10.82	0.14	0.23	0.07	100.5	88.7
Col-1013-a	47.7	0.01	41.4	0.19	10.84	0.17	0.23	0.01	100.5	88.7
Col-1013-a	47.7	0.02	41.2	0.23	10.84	0.28	0.13	0.00	100.4	88.7
Col-1013-a	47.5	0.02	41.0	0.21	10.89	0.19	0.20	0.03	100.1	88.6
Col-1013-a	47.8	0.02	41.2	0.18	11.00	0.10	0.22	0.04	100.5	88.6
Col-1013-a	47.6	0.01	41.1	0.19	11.00	0.15	0.23	0.01	100.4	88.5
Col-1013-a	47.6	0.01	41.1	0.28	11.09	0.27	0.11	0.03	100.5	88.4
Col-1013-a	47.2	0.00	41.2	0.19	11.02	0.13	0.22	0.03	100.1	88.4
Col-1013-a	47.4	0.01	41.2	0.19	11.08	0.22	0.23	0.01	100.4	88.4
Col-1013-a	47.3	0.01	41.1	0.18	11.05	0.16	0.18	0.02	100.0	88.4
Col-1013-a	47.3	0.01	41.0	0.20	11.06	0.23	0.21	0.03	100.0	88.4
Col-1013-a	47.5	0.00	41.1	0.21	11.13	0.17	0.19	0.03	100.4	88.4
Col-1013-a	47.5	0.00	41.3	0.20	11.18	0.21	0.22	0.06	100.7	88.3
Col-1013-a	47.3	0.01	41.5	0.22	11.14	0.25	0.15	0.04	100.6	88.3
Col-1013-a	47.0	0.00	40.9	0.22	11.56	0.25	0.15	0.02	100.2	87.9
Col-1013-a	46.7	0.00	41.1	0.20	11.53	0.25	0.15	0.02	100.0	87.8
Col-1013-a	46.9	0.01	41.1	0.23	11.57	0.20	0.17	0.05	100.2	87.8
Col-1013-a	46.7	0.01	41.0	0.21	11.69	0.14	0.16	0.02	100.0	87.7
Col-1013-a	46.9	0.00	41.0	0.22	11.84	0.27	0.17	0.02	100.4	87.6
Col-1013-a	46.7	0.01	41.2	0.21	12.07	0.11	0.17	0.02	100.5	87.3
Col-1013-a	46.6	0.01	41.1	0.19	12.25	0.21	0.16	0.01	100.4	87.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	50.7	0.02	41.8	0.16	7.06	0.11	0.52	0.07	100.50	92.8
Col-1015-N	50.8	0.03	41.8	0.13	7.11	0.09	0.60	0.07	100.59	92.7
Col-1015-N	50.4	0.01	41.8	0.16	7.05	0.06	0.53	0.09	100.02	92.7
Col-1015-N	50.1	0.01	41.6	0.15	7.07	0.07	0.55	0.07	99.56	92.7
Col-1015-N	50.0	0.04	41.5	0.14	7.08	0.08	0.55	0.08	99.45	92.6
Col-1015-N	50.8	0.02	42.0	0.15	7.20	0.14	0.57	0.10	100.99	92.6
Col-1015-N	50.6	0.03	41.8	0.16	7.17	0.08	0.53	0.07	100.45	92.6
Col-1015-N	50.7	0.02	42.1	0.15	7.24	0.09	0.55	0.09	100.98	92.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	50.2	0.03	41.6	0.15	7.19	0.17	0.58	0.07	100.03	92.6
Col-1015-N	49.8	0.03	41.2	0.15	7.15	0.13	0.58	0.08	99.20	92.5
Col-1015-N	50.6	0.02	41.7	0.15	7.28	0.13	0.58	0.09	100.55	92.5
Col-1015-N	50.2	0.05	41.5	0.16	7.23	0.11	0.57	0.05	99.82	92.5
Col-1015-N	50.6	0.02	41.9	0.15	7.30	0.11	0.53	0.08	100.78	92.5
Col-1015-N	50.3	0.04	42.2	0.16	7.25	0.08	0.54	0.07	100.64	92.5
Col-1015-N	50.4	0.02	42.0	0.16	7.30	0.13	0.52	0.07	100.61	92.5
Col-1015-N	50.3	0.02	41.5	0.16	7.28	0.07	0.57	0.10	100.01	92.5
Col-1015-N	50.6	0.01	42.0	0.16	7.36	0.14	0.56	0.07	100.95	92.5
Col-1015-N	50.4	0.02	41.7	0.17	7.33	0.09	0.54	0.06	100.32	92.5
Col-1015-N	50.5	0.03	42.0	0.15	7.35	0.14	0.52	0.07	100.82	92.5
Col-1015-N	50.6	0.01	42.0	0.15	7.36	0.09	0.55	0.09	100.90	92.5
Col-1015-N	50.6	0.02	42.0	0.14	7.37	0.11	0.54	0.07	100.86	92.4
Col-1015-N	50.5	0.03	42.1	0.15	7.38	0.01	0.55	0.04	100.73	92.4
Col-1015-N	50.0	0.01	41.6	0.15	7.30	0.17	0.57	0.11	99.86	92.4
Col-1015-N	50.6	0.02	41.7	0.15	7.39	0.11	0.52	0.08	100.55	92.4
Col-1015-N	50.6	0.03	41.9	0.14	7.40	0.15	0.54	0.07	100.87	92.4
Col-1015-N	50.6	0.02	41.8	0.17	7.39	0.11	0.53	0.14	100.69	92.4
Col-1015-N	50.7	0.03	42.0	0.15	7.41	0.07	0.56	0.05	100.93	92.4
Col-1015-N	50.6	0.02	42.0	0.14	7.41	0.13	0.53	0.11	100.90	92.4
Col-1015-N	50.5	0.02	41.9	0.15	7.41	0.12	0.50	0.07	100.64	92.4
Col-1015-N	50.5	0.01	42.2	0.15	7.41	0.06	0.55	0.06	100.88	92.4
Col-1015-N	50.1	0.02	41.4	0.15	7.35	0.15	0.49	0.08	99.75	92.4
Col-1015-N	50.4	0.03	41.5	0.15	7.40	0.09	0.54	0.07	100.17	92.4
Col-1015-N	50.5	0.02	42.0	0.16	7.43	0.08	0.57	0.09	100.83	92.4
Col-1015-N	50.3	0.03	41.9	0.15	7.42	0.15	0.55	0.05	100.52	92.4
Col-1015-N	50.3	0.03	42.0	0.15	7.44	0.10	0.51	0.05	100.59	92.3
Col-1015-N	50.5	0.03	42.0	0.14	7.47	0.14	0.54	0.05	100.86	92.3
Col-1015-N	50.6	0.01	42.0	0.15	7.49	0.05	0.54	0.07	100.90	92.3
Col-1015-N	50.3	0.03	42.1	0.16	7.45	0.05	0.54	0.08	100.71	92.3
Col-1015-N	50.4	0.03	42.0	0.16	7.48	0.12	0.50	0.06	100.79	92.3
Col-1015-N	50.1	0.01	41.5	0.13	7.45	0.04	0.55	0.04	99.86	92.3
Col-1015-N	50.5	0.02	42.1	0.15	7.52	0.11	0.52	0.05	100.96	92.3
Col-1015-N	49.9	0.07	41.5	0.15	7.43	0.07	0.54	0.07	99.66	92.3
Col-1015-N	50.6	0.02	42.1	0.15	7.54	0.14	0.50	0.07	101.05	92.3
Col-1015-N	49.5	0.03	41.6	0.16	7.41	0.08	0.51	0.08	99.36	92.3
Col-1015-N	50.1	0.02	41.7	0.16	7.52	0.12	0.54	0.09	100.23	92.2
Col-1015-N	49.3	0.02	41.5	0.14	7.45	0.16	0.56	0.05	99.17	92.2
Col-1015-N	50.3	0.02	41.4	0.15	7.60	0.12	0.53	0.10	100.20	92.2
Col-1015-N	49.8	0.25	42.2	0.18	7.55	0.09	0.54	0.07	100.72	92.2
Col-1015-N	50.3	0.03	41.9	0.17	7.62	0.10	0.50	0.09	100.69	92.2

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	49.5	0.02	41.9	0.15	7.51	0.15	0.49	0.08	99.81	92.2
Col-1015-N	49.4	0.03	41.6	0.15	7.53	0.11	0.54	0.07	99.44	92.1
Col-1015-N	49.3	0.02	41.6	0.15	7.52	0.06	0.53	0.06	99.26	92.1
Col-1015-N	50.3	0.02	41.9	0.15	7.67	0.10	0.48	0.07	100.64	92.1
Col-1015-N	49.6	0.02	41.8	0.16	7.56	0.11	0.52	0.09	99.79	92.1
Col-1015-N	49.4	0.02	41.3	0.15	7.54	0.16	0.50	0.07	99.20	92.1
Col-1015-N	50.1	0.02	41.5	0.14	7.68	0.11	0.58	0.05	100.22	92.1
Col-1015-N	49.2	0.03	41.9	0.15	7.54	0.12	0.51	0.06	99.60	92.1
Col-1015-N	50.9	0.03	41.3	0.17	7.81	0.15	0.45	0.08	100.89	92.1
Col-1015-N	50.3	0.02	42.1	0.16	7.73	0.08	0.48	0.09	101.02	92.1
Col-1015-N	49.5	0.02	41.6	0.16	7.60	0.10	0.48	0.08	99.48	92.1
Col-1015-N	49.6	0.03	41.5	0.17	7.62	0.19	0.50	0.07	99.66	92.1
Col-1015-N	49.9	0.03	41.8	0.15	7.68	0.15	0.53	0.06	100.27	92.1
Col-1015-N	50.1	0.02	41.5	0.14	7.72	0.14	0.52	0.10	100.25	92.0
Col-1015-N	50.4	0.02	41.9	0.15	7.77	0.08	0.50	0.10	100.92	92.0
Col-1015-N	50.2	0.02	41.7	0.14	7.75	0.13	0.55	0.09	100.57	92.0
Col-1015-N	49.4	0.03	42.0	0.18	7.63	0.11	0.46	0.10	99.90	92.0
Col-1015-N	49.5	0.06	41.5	0.17	7.65	0.15	0.51	0.08	99.56	92.0
Col-1015-N	49.3	0.02	42.0	0.16	7.63	0.13	0.53	0.06	99.87	92.0
Col-1015-N	49.3	0.02	41.7	0.17	7.63	0.14	0.47	0.08	99.53	92.0
Col-1015-N	50.1	0.01	41.5	0.16	7.76	0.16	0.50	0.10	100.31	92.0
Col-1015-N	50.2	0.02	41.6	0.14	7.78	0.06	0.54	0.11	100.41	92.0
Col-1015-N	50.2	0.00	41.7	0.14	7.79	0.11	0.54	0.17	100.64	92.0
Col-1015-N	50.1	0.02	41.7	0.16	7.77	0.14	0.49	0.09	100.40	92.0
Col-1015-N	52.5	0.12	37.6	0.18	8.15	0.14	0.43	0.07	99.21	92.0
Col-1015-N	49.1	0.04	41.6	0.17	7.63	0.11	0.44	0.08	99.15	92.0
Col-1015-N	49.0	0.02	41.5	0.17	7.63	0.09	0.47	0.07	98.96	92.0
Col-1015-N	49.3	0.03	41.7	0.15	7.68	0.12	0.51	0.05	99.48	92.0
Col-1015-N	50.1	0.01	41.7	0.17	7.81	0.18	0.50	0.07	100.50	92.0
Col-1015-N	49.3	0.01	41.7	0.15	7.70	0.09	0.60	0.10	99.72	91.9
Col-1015-N	49.4	0.08	42.1	0.19	7.71	0.12	0.51	0.08	100.15	91.9
Col-1015-N	49.7	0.03	41.6	0.16	7.77	0.13	0.44	0.06	99.91	91.9
Col-1015-N	50.0	0.01	41.5	0.14	7.82	0.15	0.57	0.08	100.32	91.9
Col-1015-N	50.1	0.02	41.6	0.15	7.85	0.08	0.52	0.10	100.35	91.9
Col-1015-N	50.1	0.01	41.5	0.17	7.85	0.17	0.50	0.08	100.39	91.9
Col-1015-N	50.0	0.04	41.5	0.18	7.83	0.24	0.48	0.10	100.30	91.9
Col-1015-N	49.3	0.29	41.3	0.16	7.74	0.13	0.48	0.09	99.49	91.9
Col-1015-N	49.3	0.02	41.8	0.15	7.74	0.13	0.50	0.08	99.80	91.9
Col-1015-N	50.2	0.02	41.8	0.14	7.89	0.12	0.51	0.08	100.82	91.9
Col-1015-N	50.0	0.02	41.6	0.13	7.85	0.09	0.60	0.07	100.34	91.9
Col-1015-N	49.2	0.01	41.6	0.16	7.75	0.14	0.47	0.10	99.44	91.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	49.2	0.02	41.6	0.17	7.75	0.11	0.50	0.11	99.41	91.9
Col-1015-N	50.2	0.02	41.7	0.16	7.91	0.13	0.51	0.07	100.67	91.9
Col-1015-N	49.1	0.05	41.5	0.18	7.75	0.12	0.47	0.08	99.22	91.9
Col-1015-N	49.2	0.02	41.2	0.17	7.76	0.06	0.50	0.09	98.97	91.9
Col-1015-N	48.9	0.03	41.5	0.16	7.75	0.09	0.50	0.10	98.99	91.8
Col-1015-N	49.3	0.02	41.5	0.15	7.81	0.10	0.52	0.07	99.43	91.8
Col-1015-N	50.1	0.02	41.8	0.16	7.94	0.11	0.51	0.07	100.65	91.8
Col-1015-N	49.1	0.03	41.5	0.16	7.80	0.13	0.49	0.05	99.26	91.8
Col-1015-N	49.5	0.03	41.5	0.16	7.86	0.08	0.43	0.08	99.58	91.8
Col-1015-N	50.0	0.02	41.4	0.17	7.94	0.09	0.52	0.08	100.21	91.8
Col-1015-N	49.8	0.13	41.6	0.18	7.92	0.15	0.46	0.16	100.46	91.8
Col-1015-N	50.0	0.02	41.4	0.17	7.94	0.16	0.50	0.11	100.30	91.8
Col-1015-N	49.4	0.02	41.4	0.14	7.86	0.10	0.46	0.05	99.43	91.8
Col-1015-N	49.4	0.03	41.5	0.16	7.87	0.12	0.50	0.07	99.62	91.8
Col-1015-N	50.0	0.02	41.6	0.14	7.97	0.14	0.49	0.08	100.41	91.8
Col-1015-N	50.1	0.04	41.5	0.17	7.99	0.12	0.49	0.06	100.47	91.8
Col-1015-N	48.8	0.60	41.0	0.18	7.80	0.14	0.47	0.12	99.09	91.8
Col-1015-N	49.3	0.03	41.4	0.16	7.88	0.06	0.47	0.07	99.38	91.8
Col-1015-N	49.2	0.03	41.2	0.17	7.87	0.11	0.46	0.09	99.14	91.8
Col-1015-N	49.4	0.02	41.4	0.14	7.90	0.13	0.48	0.06	99.55	91.8
Col-1015-N	49.3	0.03	41.3	0.18	7.89	0.13	0.44	0.09	99.34	91.8
Col-1015-N	49.9	0.08	41.4	0.18	7.99	0.08	0.48	0.08	100.15	91.7
Col-1015-N	49.8	0.03	41.8	0.18	8.00	0.07	0.48	0.07	100.47	91.7
Col-1015-N	49.6	0.00	41.9	0.16	7.96	0.12	0.50	0.07	100.33	91.7
Col-1015-N	49.2	0.03	41.5	0.15	7.90	0.20	0.50	0.09	99.56	91.7
Col-1015-N	49.2	0.03	41.5	0.17	7.93	0.14	0.51	0.10	99.54	91.7
Col-1015-N	49.2	0.02	41.3	0.17	7.92	0.11	0.46	0.08	99.18	91.7
Col-1015-N	49.2	0.03	42.2	0.16	7.94	0.12	0.43	0.09	100.10	91.7
Col-1015-N	48.9	0.02	41.5	0.16	7.90	0.13	0.47	0.06	99.09	91.7
Col-1015-N	49.8	0.02	41.5	0.13	8.05	0.12	0.57	0.09	100.28	91.7
Col-1015-N	49.5	0.03	42.3	0.18	8.01	0.12	0.43	0.05	100.64	91.7
Col-1015-N	49.1	0.02	41.3	0.16	7.95	0.10	0.45	0.08	99.19	91.7
Col-1015-N	50.1	0.01	41.6	0.14	8.11	0.05	0.54	0.07	100.62	91.7
Col-1015-N	49.9	0.04	41.1	0.17	8.09	0.11	0.47	0.19	100.12	91.7
Col-1015-N	49.3	0.03	41.5	0.16	8.00	0.10	0.49	0.07	99.71	91.7
Col-1015-N	49.9	0.02	42.1	0.15	8.10	0.10	0.48	0.09	100.90	91.7
Col-1015-N	49.0	0.08	41.6	0.18	7.95	0.10	0.46	0.09	99.39	91.7
Col-1015-N	49.9	0.00	41.7	0.18	8.11	0.12	0.45	0.08	100.56	91.6
Col-1015-N	49.1	0.02	41.8	0.15	7.98	0.09	0.47	0.08	99.66	91.6
Col-1015-N	49.3	0.02	41.7	0.16	8.02	0.10	0.47	0.11	99.84	91.6
Col-1015-N	50.1	0.02	41.8	0.15	8.14	0.10	0.52	0.04	100.82	91.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	49.9	0.02	41.7	0.16	8.14	0.10	0.46	0.11	100.58	91.6
Col-1015-N	49.1	0.02	41.5	0.17	8.02	0.12	0.45	0.10	99.57	91.6
Col-1015-N	49.1	0.08	41.0	0.17	8.01	0.12	0.44	0.07	98.95	91.6
Col-1015-N	49.0	0.02	41.3	0.16	8.01	0.11	0.45	0.07	99.11	91.6
Col-1015-N	49.0	0.03	41.9	0.16	8.01	0.17	0.43	0.04	99.71	91.6
Col-1015-N	50.1	0.04	41.9	0.16	8.21	0.10	0.43	0.07	101.01	91.6
Col-1015-N	49.9	0.01	42.0	0.17	8.18	0.15	0.40	0.07	100.91	91.6
Col-1015-N	49.1	0.02	41.4	0.15	8.05	0.11	0.53	0.07	99.51	91.6
Col-1015-N	49.3	0.03	40.9	0.16	8.08	0.10	0.46	0.07	99.08	91.6
Col-1015-N	49.3	0.03	41.6	0.16	8.09	0.14	0.45	0.09	99.90	91.6
Col-1015-N	50.0	0.02	41.7	0.17	8.23	0.12	0.44	0.06	100.72	91.5
Col-1015-N	48.3	0.13	41.8	0.21	7.96	0.10	0.35	0.23	99.04	91.5
Col-1015-N	50.2	0.01	39.9	0.16	8.29	0.14	0.41	0.04	99.22	91.5
Col-1015-N	49.5	0.03	41.6	0.18	8.17	0.19	0.48	0.07	100.23	91.5
Col-1015-N	50.0	0.03	41.7	0.15	8.25	0.15	0.48	0.10	100.82	91.5
Col-1015-N	50.0	0.02	41.4	0.18	8.26	0.15	0.48	0.06	100.51	91.5
Col-1015-N	48.9	0.03	41.5	0.16	8.09	0.08	0.46	0.09	99.22	91.5
Col-1015-N	49.8	0.01	41.5	0.16	8.25	0.12	0.43	0.06	100.36	91.5
Col-1015-N	49.0	0.03	41.6	0.16	8.12	0.11	0.46	0.07	99.55	91.5
Col-1015-N	48.9	0.02	41.3	0.17	8.10	0.15	0.46	0.06	99.19	91.5
Col-1015-N	48.7	0.02	41.4	0.16	8.08	0.12	0.43	0.07	99.02	91.5
Col-1015-N	49.6	0.64	41.7	0.18	8.23	0.16	0.42	0.05	100.99	91.5
Col-1015-N	49.9	0.02	41.6	0.15	8.29	0.07	0.51	0.08	100.64	91.5
Col-1015-N	49.0	0.02	41.7	0.17	8.14	0.03	0.48	0.08	99.65	91.5
Col-1015-N	49.3	0.03	41.4	0.17	8.20	0.11	0.47	0.07	99.73	91.5
Col-1015-N	49.9	0.01	41.7	0.15	8.30	0.12	0.47	0.08	100.69	91.5
Col-1015-N	48.8	0.02	41.3	0.15	8.13	0.14	0.44	0.06	99.10	91.5
Col-1015-N	49.0	0.02	41.5	0.15	8.17	0.16	0.48	0.08	99.56	91.5
Col-1015-N	49.3	0.02	41.5	0.16	8.22	0.15	0.46	0.05	99.85	91.4
Col-1015-N	49.6	0.00	41.5	0.16	8.29	0.09	0.49	0.09	100.27	91.4
Col-1015-N	49.7	0.05	41.2	0.16	8.30	0.09	0.45	0.52	100.44	91.4
Col-1015-N	49.8	0.01	42.0	0.17	8.34	0.15	0.45	0.06	101.00	91.4
Col-1015-N	49.7	0.02	42.0	0.18	8.32	0.13	0.41	0.06	100.85	91.4
Col-1015-N	49.5	0.03	41.4	0.17	8.30	0.11	0.43	0.07	99.99	91.4
Col-1015-N	49.8	0.02	42.1	0.17	8.35	0.10	0.42	0.16	101.04	91.4
Col-1015-N	49.8	0.03	41.5	0.17	8.36	0.12	0.43	0.07	100.53	91.4
Col-1015-N	48.9	0.02	42.0	0.17	8.20	0.09	0.43	0.06	99.85	91.4
Col-1015-N	49.2	0.01	41.8	0.14	8.26	0.14	0.48	0.05	100.04	91.4
Col-1015-N	49.8	0.02	41.8	0.18	8.37	0.09	0.42	0.05	100.67	91.4
Col-1015-N	49.8	0.02	41.9	0.15	8.38	0.17	0.45	0.09	100.92	91.4
Col-1015-N	49.5	0.02	41.3	0.17	8.33	0.13	0.44	0.07	100.00	91.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	49.1	0.02	41.4	0.17	8.27	0.06	0.42	0.06	99.48	91.4
Col-1015-N	49.9	0.02	41.7	0.17	8.42	0.12	0.39	0.04	100.81	91.4
Col-1015-N	48.9	0.03	41.9	0.16	8.26	0.15	0.44	0.09	99.95	91.3
Col-1015-N	48.4	0.09	41.4	0.17	8.18	0.13	0.48	0.06	98.97	91.3
Col-1015-N	49.7	0.01	41.7	0.17	8.41	0.13	0.39	0.05	100.57	91.3
Col-1015-N	49.1	0.04	41.2	0.16	8.31	0.08	0.40	0.07	99.33	91.3
Col-1015-N	49.7	0.02	41.5	0.18	8.42	0.12	0.40	0.05	100.39	91.3
Col-1015-N	49.1	0.03	41.8	0.18	8.33	0.14	0.41	0.05	100.10	91.3
Col-1015-N	48.6	0.15	41.2	0.16	8.26	0.12	0.45	0.07	99.06	91.3
Col-1015-N	49.2	0.31	41.5	0.18	8.35	0.05	0.41	0.06	100.06	91.3
Col-1015-N	49.6	0.01	41.6	0.18	8.43	0.09	0.39	0.11	100.41	91.3
Col-1015-N	49.8	0.02	41.7	0.16	8.47	0.11	0.45	0.06	100.78	91.3
Col-1015-N	49.7	0.01	41.8	0.16	8.45	0.11	0.44	0.11	100.77	91.3
Col-1015-N	48.9	0.00	41.5	0.15	8.32	0.12	0.40	0.07	99.46	91.3
Col-1015-N	49.4	0.02	41.9	0.14	8.40	0.11	0.53	0.07	100.57	91.3
Col-1015-N	49.0	0.03	42.0	0.17	8.35	0.15	0.40	0.05	100.13	91.3
Col-1015-N	48.7	0.02	41.5	0.17	8.30	0.09	0.44	0.09	99.30	91.3
Col-1015-N	49.1	0.02	41.6	0.18	8.37	0.14	0.41	0.31	100.10	91.3
Col-1015-N	48.8	0.03	41.3	0.17	8.33	0.10	0.44	0.11	99.30	91.3
Col-1015-N	48.8	0.02	41.7	0.17	8.32	0.12	0.42	0.08	99.63	91.3
Col-1015-N	49.0	0.02	41.6	0.16	8.36	0.11	0.42	0.06	99.71	91.3
Col-1015-N	49.6	0.01	41.9	0.16	8.49	0.15	0.39	0.02	100.79	91.2
Col-1015-N	49.4	0.00	41.8	0.16	8.46	0.19	0.40	0.08	100.46	91.2
Col-1015-N	49.5	0.00	41.5	0.15	8.48	0.11	0.45	0.06	100.31	91.2
Col-1015-N	49.5	0.02	41.4	0.22	8.49	0.14	0.40	0.08	100.21	91.2
Col-1015-N	48.9	0.04	41.0	0.17	8.38	0.13	0.44	0.07	99.13	91.2
Col-1015-N	48.3	0.09	43.4	0.14	8.28	0.10	0.53	0.06	100.82	91.2
Col-1015-N	48.8	0.03	41.4	0.16	8.38	0.13	0.45	0.08	99.43	91.2
Col-1015-N	49.7	0.03	41.5	0.19	8.54	0.13	0.44	0.07	100.61	91.2
Col-1015-N	49.7	0.01	41.8	0.17	8.56	0.10	0.43	0.15	100.93	91.2
Col-1015-N	49.8	0.02	41.6	0.16	8.59	0.14	0.47	0.06	100.90	91.2
Col-1015-N	48.9	0.02	41.8	0.17	8.44	0.10	0.41	0.08	99.90	91.2
Col-1015-N	49.4	0.02	41.5	0.18	8.53	0.12	0.44	0.05	100.30	91.2
Col-1015-N	49.0	0.03	41.4	0.17	8.46	0.18	0.45	0.09	99.70	91.2
Col-1015-N	48.9	0.03	41.4	0.17	8.45	0.12	0.41	0.08	99.58	91.2
Col-1015-N	49.5	0.01	41.4	0.17	8.56	0.11	0.40	0.08	100.19	91.2
Col-1015-N	48.4	0.02	41.6	0.16	8.38	0.10	0.43	0.07	99.14	91.2
Col-1015-N	48.9	0.02	41.4	0.17	8.46	0.11	0.41	0.12	99.54	91.2
Col-1015-N	49.5	0.00	41.4	0.18	8.57	0.12	0.43	0.08	100.24	91.1
Col-1015-N	47.7	0.93	42.7	0.17	8.27	0.10	0.42	0.05	100.36	91.1
Col-1015-N	49.4	0.03	41.6	0.17	8.58	0.13	0.48	0.11	100.51	91.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	48.7	0.03	41.0	0.17	8.47	0.13	0.43	0.06	98.97	91.1
Col-1015-N	49.0	0.01	41.7	0.13	8.52	0.09	0.54	0.09	100.02	91.1
Col-1015-N	49.6	0.03	41.6	0.17	8.64	0.12	0.37	0.05	100.53	91.1
Col-1015-N	48.8	0.03	41.9	0.18	8.50	0.11	0.36	0.06	99.91	91.1
Col-1015-N	49.6	0.02	41.7	0.18	8.65	0.11	0.36	0.06	100.69	91.1
Col-1015-N	48.8	0.02	41.7	0.17	8.51	0.12	0.40	0.08	99.83	91.1
Col-1015-N	49.1	0.05	41.5	0.18	8.57	0.15	0.40	0.06	99.95	91.1
Col-1015-N	49.7	0.02	41.8	0.16	8.68	0.14	0.41	0.09	100.94	91.1
Col-1015-N	49.5	0.02	41.6	0.17	8.66	0.10	0.43	0.07	100.51	91.1
Col-1015-N	48.8	0.01	41.3	0.19	8.53	0.11	0.38	0.02	99.33	91.1
Col-1015-N	48.9	0.02	42.0	0.14	8.55	0.19	0.48	0.09	100.31	91.1
Col-1015-N	49.2	0.01	41.4	0.14	8.62	0.15	0.54	0.06	100.10	91.1
Col-1015-N	49.0	0.02	41.4	0.19	8.58	0.11	0.39	0.07	99.77	91.1
Col-1015-N	48.5	0.02	41.7	0.16	8.51	0.18	0.44	0.08	99.57	91.0
Col-1015-N	48.7	0.03	41.3	0.16	8.55	0.17	0.39	0.07	99.39	91.0
Col-1015-N	49.6	0.02	41.5	0.15	8.71	0.14	0.42	0.03	100.61	91.0
Col-1015-N	48.6	0.03	41.5	0.15	8.54	0.14	0.53	0.05	99.63	91.0
Col-1015-N	49.5	0.02	41.4	0.16	8.70	0.10	0.39	0.05	100.35	91.0
Col-1015-N	49.2	0.03	41.6	0.18	8.65	0.19	0.42	0.04	100.28	91.0
Col-1015-N	49.0	0.01	41.8	0.15	8.64	0.19	0.54	0.08	100.39	91.0
Col-1015-N	48.6	0.03	41.3	0.17	8.57	0.14	0.39	0.15	99.43	91.0
Col-1015-N	49.3	0.02	41.8	0.16	8.69	0.19	0.38	0.18	100.75	91.0
Col-1015-N	48.9	0.01	41.7	0.17	8.63	0.14	0.39	0.06	100.03	91.0
Col-1015-N	49.5	0.01	41.6	0.18	8.75	0.11	0.36	0.05	100.54	91.0
Col-1015-N	48.9	0.02	41.8	0.14	8.65	0.09	0.42	0.03	100.05	91.0
Col-1015-N	49.4	0.02	41.3	0.16	8.75	0.18	0.39	0.04	100.26	91.0
Col-1015-N	49.5	0.01	42.0	0.17	8.78	0.16	0.38	0.07	101.05	91.0
Col-1015-N	49.3	0.02	41.8	0.17	8.74	0.15	0.38	0.05	100.68	91.0
Col-1015-N	49.6	0.00	41.8	0.17	8.79	0.11	0.33	0.05	100.85	91.0
Col-1015-N	48.6	0.02	41.3	0.17	8.61	0.14	0.36	0.05	99.20	91.0
Col-1015-N	49.4	0.02	41.4	0.13	8.76	0.13	0.52	0.07	100.37	90.9
Col-1015-N	48.6	0.01	41.6	0.17	8.65	0.13	0.41	0.09	99.62	90.9
Col-1015-N	49.5	0.01	41.9	0.18	8.82	0.09	0.35	0.07	100.92	90.9
Col-1015-N	49.0	0.02	41.2	0.18	8.73	0.17	0.41	0.05	99.83	90.9
Col-1015-N	49.5	0.01	41.7	0.18	8.82	0.11	0.37	0.23	100.92	90.9
Col-1015-N	49.3	0.00	41.8	0.17	8.80	0.13	0.41	0.07	100.66	90.9
Col-1015-N	48.9	0.02	41.6	0.16	8.73	0.14	0.39	0.06	99.99	90.9
Col-1015-N	48.8	0.01	41.9	0.15	8.71	0.12	0.44	0.05	100.12	90.9
Col-1015-N	49.3	0.01	41.1	0.17	8.80	0.18	0.40	0.09	100.06	90.9
Col-1015-N	49.5	0.02	41.6	0.17	8.85	0.13	0.36	0.07	100.78	90.9
Col-1015-N	49.6	0.03	41.6	0.17	8.87	0.10	0.42	0.06	100.91	90.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	49.6	0.00	41.7	0.17	8.87	0.15	0.37	0.09	101.00	90.9
Col-1015-N	48.6	0.02	41.5	0.18	8.70	0.24	0.43	0.10	99.84	90.9
Col-1015-N	48.6	0.00	41.7	0.19	8.70	0.15	0.38	0.05	99.79	90.9
Col-1015-N	48.6	0.02	41.8	0.17	8.71	0.11	0.35	0.09	99.90	90.9
Col-1015-N	49.4	0.03	41.6	0.18	8.85	0.18	0.38	0.03	100.60	90.9
Col-1015-N	49.4	0.01	41.4	0.13	8.86	0.13	0.50	0.06	100.50	90.9
Col-1015-N	49.3	0.03	41.7	0.17	8.84	0.19	0.42	0.07	100.71	90.9
Col-1015-N	49.5	0.03	41.6	0.18	8.87	0.07	0.42	0.06	100.76	90.9
Col-1015-N	49.1	0.01	41.8	0.18	8.80	0.17	0.39	0.05	100.46	90.9
Col-1015-N	48.4	0.04	41.6	0.18	8.69	0.10	0.38	0.13	99.51	90.9
Col-1015-N	49.0	0.02	41.5	0.16	8.80	0.10	0.44	0.06	100.04	90.8
Col-1015-N	48.8	0.02	41.4	0.18	8.76	0.09	0.38	0.05	99.68	90.8
Col-1015-N	48.3	0.02	41.2	0.17	8.68	0.17	0.37	0.09	99.05	90.8
Col-1015-N	49.3	0.00	41.3	0.14	8.86	0.15	0.42	0.06	100.28	90.8
Col-1015-N	49.0	0.02	41.5	0.18	8.82	0.08	0.36	0.05	100.05	90.8
Col-1015-N	48.7	0.02	41.1	0.18	8.77	0.14	0.34	0.07	99.35	90.8
Col-1015-N	49.5	0.02	41.8	0.17	8.91	0.13	0.36	0.07	100.99	90.8
Col-1015-N	49.0	0.01	41.7	0.18	8.83	0.12	0.40	0.05	100.34	90.8
Col-1015-N	48.8	0.02	42.0	0.19	8.80	0.11	0.39	0.05	100.41	90.8
Col-1015-N	49.4	0.02	41.4	0.19	8.90	0.22	0.38	0.06	100.54	90.8
Col-1015-N	48.8	0.01	41.9	0.19	8.79	0.14	0.41	0.07	100.24	90.8
Col-1015-N	49.3	0.00	41.5	0.15	8.89	0.08	0.41	0.04	100.39	90.8
Col-1015-N	49.3	0.02	41.5	0.17	8.91	0.15	0.41	0.05	100.48	90.8
Col-1015-N	49.2	0.02	41.3	0.19	8.89	0.17	0.40	0.07	100.18	90.8
Col-1015-N	49.4	0.02	41.5	0.14	8.93	0.11	0.53	0.07	100.72	90.8
Col-1015-N	49.6	0.02	41.7	0.18	8.99	0.15	0.38	0.06	101.02	90.8
Col-1015-N	49.3	0.03	41.4	0.17	8.95	0.13	0.37	0.07	100.42	90.8
Col-1015-N	48.9	0.01	41.4	0.16	8.87	0.15	0.36	0.07	99.91	90.8
Col-1015-N	49.4	0.02	41.6	0.14	8.97	0.12	0.42	0.07	100.70	90.8
Col-1015-N	49.0	0.09	41.6	0.18	8.90	0.17	0.33	0.03	100.36	90.8
Col-1015-N	48.5	0.02	41.4	0.16	8.80	0.11	0.38	0.06	99.36	90.8
Col-1015-N	49.4	0.01	41.4	0.15	8.98	0.13	0.46	0.08	100.65	90.7
Col-1015-N	49.3	0.01	42.0	0.19	8.96	0.17	0.33	0.04	100.96	90.7
Col-1015-N	48.3	0.03	41.1	0.18	8.82	0.15	0.35	0.05	99.04	90.7
Col-1015-N	49.3	0.02	41.3	0.14	8.99	0.11	0.49	0.08	100.40	90.7
Col-1015-N	48.8	0.01	41.7	0.17	8.91	0.12	0.41	0.07	100.18	90.7
Col-1015-N	48.2	0.06	41.2	0.18	8.80	0.14	0.43	0.06	98.99	90.7
Col-1015-N	48.6	0.02	41.0	0.19	8.89	0.10	0.37	0.07	99.28	90.7
Col-1015-N	49.1	0.03	41.8	0.17	8.97	0.17	0.33	0.03	100.57	90.7
Col-1015-N	49.2	0.00	41.5	0.18	9.01	0.14	0.36	0.04	100.47	90.7
Col-1015-N	49.5	0.01	41.5	0.16	9.06	0.11	0.36	0.05	100.72	90.7

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	49.0	0.00	41.4	0.15	8.98	0.17	0.42	0.03	100.18	90.7
Col-1015-N	48.6	0.02	41.5	0.18	8.91	0.08	0.39	0.07	99.78	90.7
Col-1015-N	48.7	0.01	41.9	0.18	8.93	0.15	0.29	0.08	100.29	90.7
Col-1015-N	49.2	0.01	41.6	0.15	9.03	0.13	0.45	0.06	100.68	90.7
Col-1015-N	49.3	0.01	41.8	0.16	9.04	0.12	0.36	0.09	100.89	90.7
Col-1015-N	48.2	0.20	41.9	0.20	8.84	0.11	0.35	0.06	99.89	90.7
Col-1015-N	49.2	0.02	41.4	0.14	9.03	0.14	0.43	0.07	100.44	90.7
Col-1015-N	48.4	0.01	41.2	0.17	8.89	0.18	0.38	0.06	99.28	90.7
Col-1015-N	49.0	0.01	41.4	0.13	9.00	0.11	0.53	0.07	100.30	90.7
Col-1015-N	48.3	0.04	42.0	0.17	8.87	0.16	0.37	0.08	99.95	90.7
Col-1015-N	49.1	0.00	41.4	0.16	9.02	0.14	0.35	0.06	100.21	90.7
Col-1015-N	48.5	0.01	41.5	0.17	8.93	0.18	0.37	0.06	99.72	90.6
Col-1015-N	49.2	0.01	41.4	0.14	9.05	0.14	0.55	0.14	100.68	90.6
Col-1015-N	47.9	0.84	42.5	0.18	8.81	0.14	0.36	0.10	100.84	90.6
Col-1015-N	47.8	1.77	40.3	0.22	8.80	0.11	0.36	0.04	99.40	90.6
Col-1015-N	48.8	0.02	41.6	0.20	8.99	0.18	0.31	0.07	100.15	90.6
Col-1015-N	48.8	0.01	41.5	0.17	8.98	0.12	0.34	0.06	99.97	90.6
Col-1015-N	49.2	0.02	41.2	0.15	9.06	0.13	0.52	0.03	100.29	90.6
Col-1015-N	48.7	0.03	41.6	0.15	8.98	0.15	0.43	0.06	100.15	90.6
Col-1015-N	49.1	0.02	41.4	0.19	9.05	0.20	0.40	0.05	100.37	90.6
Col-1015-N	49.4	0.00	41.4	0.17	9.12	0.17	0.38	0.07	100.69	90.6
Col-1015-N	49.5	-0.01	41.6	0.17	9.14	0.16	0.35	0.06	101.00	90.6
Col-1015-N	49.3	0.02	41.7	0.18	9.10	0.14	0.34	0.06	100.85	90.6
Col-1015-N	49.2	0.01	41.2	0.18	9.08	0.16	0.37	0.09	100.25	90.6
Col-1015-N	48.4	0.02	41.2	0.20	8.93	0.16	0.37	0.05	99.31	90.6
Col-1015-N	48.2	0.02	41.3	0.17	8.89	0.17	0.37	0.05	99.09	90.6
Col-1015-N	48.8	0.01	41.3	0.19	9.01	0.10	0.38	0.05	99.84	90.6
Col-1015-N	49.0	0.00	41.5	0.18	9.06	0.06	0.36	0.05	100.21	90.6
Col-1015-N	48.9	0.02	41.4	0.17	9.06	0.18	0.33	0.04	100.16	90.6
Col-1015-N	49.3	0.01	41.6	0.19	9.12	0.12	0.33	0.04	100.67	90.6
Col-1015-N	48.2	0.01	41.5	0.17	8.92	0.19	0.36	0.05	99.44	90.6
Col-1015-N	49.1	0.02	41.3	0.18	9.10	0.17	0.40	0.11	100.43	90.6
Col-1015-N	49.4	0.01	41.3	0.14	9.15	0.15	0.43	0.03	100.65	90.6
Col-1015-N	48.4	0.02	41.4	0.19	8.97	0.18	0.32	0.09	99.57	90.6
Col-1015-N	49.2	0.03	41.8	0.20	9.12	0.14	0.28	0.07	100.85	90.6
Col-1015-N	48.5	0.00	41.0	0.20	8.99	0.14	0.37	0.22	99.35	90.6
Col-1015-N	48.5	0.02	41.5	0.19	9.00	0.13	0.34	0.07	99.73	90.6
Col-1015-N	48.5	0.02	41.2	0.17	9.01	0.14	0.40	0.10	99.54	90.6
Col-1015-N	49.1	0.00	41.2	0.17	9.13	0.19	0.37	0.04	100.26	90.6
Col-1015-N	48.6	0.03	41.1	0.18	9.04	0.17	0.36	0.09	99.57	90.5
Col-1015-N	49.3	0.01	41.8	0.19	9.17	0.14	0.32	0.06	100.97	90.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	48.3	0.03	41.0	0.17	8.99	0.13	0.36	0.21	99.19	90.5
Col-1015-N	48.5	0.04	41.1	0.17	9.03	0.14	0.38	0.15	99.41	90.5
Col-1015-N	48.2	0.01	41.1	0.18	8.99	0.16	0.33	0.06	99.05	90.5
Col-1015-N	48.6	0.02	41.7	0.15	9.07	0.11	0.38	0.02	100.07	90.5
Col-1015-N	49.3	0.01	41.5	0.17	9.19	0.07	0.43	0.07	100.76	90.5
Col-1015-N	49.2	0.01	41.3	0.15	9.18	0.08	0.41	0.04	100.32	90.5
Col-1015-N	48.1	0.07	42.2	0.17	8.98	0.13	0.35	0.06	100.10	90.5
Col-1015-N	49.1	0.00	41.3	0.19	9.17	0.17	0.34	0.11	100.41	90.5
Col-1015-N	48.9	0.01	41.3	0.18	9.14	0.15	0.36	0.05	100.10	90.5
Col-1015-N	48.9	0.02	41.2	0.16	9.13	0.13	0.35	0.06	99.97	90.5
Col-1015-N	49.2	0.01	41.6	0.19	9.19	0.20	0.31	0.08	100.77	90.5
Col-1015-N	49.3	0.00	41.6	0.16	9.23	0.16	0.41	0.04	100.95	90.5
Col-1015-N	49.0	0.00	41.0	0.19	9.17	0.14	0.34	0.08	99.90	90.5
Col-1015-N	49.2	0.02	41.3	0.17	9.22	0.14	0.34	0.04	100.43	90.5
Col-1015-N	48.5	0.02	41.3	0.18	9.09	0.12	0.35	0.04	99.59	90.5
Col-1015-N	48.9	0.01	41.1	0.18	9.18	0.15	0.30	0.14	99.99	90.5
Col-1015-N	48.4	0.03	41.6	0.13	9.10	0.15	0.46	0.08	99.96	90.5
Col-1015-N	48.5	0.02	41.7	0.18	9.13	0.08	0.34	0.05	99.99	90.5
Col-1015-N	48.9	0.01	41.4	0.19	9.19	0.17	0.31	0.05	100.14	90.5
Col-1015-N	49.0	0.01	41.4	0.18	9.22	0.12	0.32	0.07	100.37	90.5
Col-1015-N	48.4	0.01	41.6	0.20	9.11	0.15	0.32	0.04	99.81	90.4
Col-1015-N	48.1	0.12	41.2	0.18	9.07	0.17	0.34	0.03	99.17	90.4
Col-1015-N	48.9	0.02	41.2	0.19	9.23	0.14	0.29	0.08	100.07	90.4
Col-1015-N	48.9	0.04	41.2	0.18	9.22	0.16	0.28	0.06	100.01	90.4
Col-1015-N	49.1	0.02	41.7	0.20	9.26	0.15	0.31	0.05	100.82	90.4
Col-1015-N	49.2	0.00	41.3	0.17	9.30	0.14	0.36	0.06	100.57	90.4
Col-1015-N	49.1	0.02	41.4	0.13	9.30	0.15	0.43	0.08	100.66	90.4
Col-1015-N	48.4	0.02	41.3	0.18	9.16	0.11	0.33	0.04	99.51	90.4
Col-1015-N	49.2	0.01	41.6	0.18	9.31	0.20	0.35	0.06	100.93	90.4
Col-1015-N	48.5	0.02	41.6	0.18	9.20	0.13	0.34	0.06	100.02	90.4
Col-1015-N	49.2	0.03	41.3	0.14	9.32	0.25	0.36	0.08	100.68	90.4
Col-1015-N	49.2	0.01	41.6	0.18	9.33	0.08	0.33	0.05	100.75	90.4
Col-1015-N	48.7	0.03	41.3	0.16	9.25	0.13	0.31	0.06	100.01	90.4
Col-1015-N	48.2	0.03	41.6	0.20	9.15	0.14	0.30	0.06	99.70	90.4
Col-1015-N	49.0	0.01	41.3	0.15	9.30	0.15	0.43	0.06	100.41	90.4
Col-1015-N	49.0	0.02	41.5	0.19	9.31	0.20	0.33	0.06	100.56	90.4
Col-1015-N	49.0	0.01	41.7	0.18	9.32	0.12	0.33	0.09	100.80	90.4
Col-1015-N	48.5	0.02	41.2	0.19	9.22	0.11	0.37	0.07	99.69	90.4
Col-1015-N	48.8	0.03	41.6	0.15	9.27	0.13	0.37	0.06	100.34	90.4
Col-1015-N	49.4	0.01	41.6	0.17	9.39	0.05	0.34	0.05	100.99	90.4
Col-1015-N	48.4	0.02	41.2	0.19	9.20	0.14	0.31	0.06	99.51	90.4

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	49.0	0.04	41.4	0.18	9.33	0.18	0.46	0.08	100.69	90.4
Col-1015-N	48.2	0.01	40.9	0.19	9.18	0.10	0.32	0.09	99.06	90.4
Col-1015-N	48.0	0.02	41.7	0.19	9.15	0.14	0.34	0.04	99.59	90.4
Col-1015-N	49.0	0.00	41.5	0.19	9.34	0.13	0.32	0.06	100.61	90.4
Col-1015-N	48.9	0.01	42.1	0.18	9.31	0.10	0.33	0.04	100.93	90.3
Col-1015-N	48.9	0.02	41.3	0.17	9.31	0.12	0.37	0.07	100.26	90.3
Col-1015-N	48.4	0.01	41.6	0.18	9.22	0.15	0.35	0.10	100.00	90.3
Col-1015-N	48.9	0.02	41.7	0.18	9.33	0.14	0.30	0.06	100.69	90.3
Col-1015-N	48.7	0.02	41.4	0.19	9.29	0.15	0.29	0.05	100.12	90.3
Col-1015-N	48.8	0.03	41.6	0.19	9.31	0.10	0.33	0.06	100.41	90.3
Col-1015-N	48.1	0.03	41.1	0.20	9.18	0.14	0.36	0.14	99.22	90.3
Col-1015-N	48.7	-0.01	41.1	0.18	9.29	0.19	0.32	0.05	99.87	90.3
Col-1015-N	48.9	0.02	41.3	0.17	9.34	0.12	0.33	0.05	100.26	90.3
Col-1015-N	48.9	0.02	41.5	0.19	9.33	0.16	0.35	0.07	100.53	90.3
Col-1015-N	49.2	0.00	41.7	0.19	9.40	0.12	0.33	0.06	101.02	90.3
Col-1015-N	49.1	0.01	41.6	0.13	9.39	0.14	0.42	0.04	100.90	90.3
Col-1015-N	48.1	0.02	41.0	0.17	9.19	0.11	0.36	0.06	99.03	90.3
Col-1015-N	47.9	0.02	41.4	0.17	9.16	0.15	0.32	0.05	99.25	90.3
Col-1015-N	48.1	0.02	41.0	0.17	9.19	0.11	0.33	0.06	98.98	90.3
Col-1015-N	48.8	0.00	41.4	0.17	9.34	0.18	0.33	0.05	100.27	90.3
Col-1015-N	48.6	0.02	41.2	0.21	9.31	0.11	0.28	0.05	99.86	90.3
Col-1015-N	48.1	0.02	41.6	0.20	9.21	0.07	0.28	0.06	99.57	90.3
Col-1015-N	48.9	0.01	41.5	0.18	9.38	0.11	0.33	0.09	100.47	90.3
Col-1015-N	48.9	0.02	41.5	0.19	9.38	0.17	0.33	0.06	100.50	90.3
Col-1015-N	48.9	0.01	41.3	0.18	9.39	0.17	0.33	0.04	100.27	90.3
Col-1015-N	47.1	0.03	42.9	0.17	9.05	0.13	0.40	0.16	99.90	90.3
Col-1015-N	48.2	0.01	40.9	0.17	9.28	0.13	0.30	0.06	99.03	90.2
Col-1015-N	49.0	0.02	41.4	0.20	9.43	0.11	0.30	0.06	100.52	90.2
Col-1015-N	48.4	0.01	41.5	0.21	9.32	0.19	0.27	0.04	99.99	90.2
Col-1015-N	48.1	0.01	41.4	0.21	9.28	0.12	0.28	0.06	99.46	90.2
Col-1015-N	48.8	0.02	41.3	0.19	9.43	0.15	0.32	0.04	100.25	90.2
Col-1015-N	48.8	0.02	41.4	0.17	9.42	0.14	0.34	0.08	100.36	90.2
Col-1015-N	48.1	0.01	41.1	0.20	9.28	0.10	0.29	0.03	99.03	90.2
Col-1015-N	48.9	0.07	40.9	0.20	9.45	0.14	0.30	0.05	100.07	90.2
Col-1015-N	48.8	0.00	41.1	0.19	9.44	0.13	0.33	0.17	100.18	90.2
Col-1015-N	48.2	0.02	41.0	0.17	9.31	0.15	0.34	0.04	99.14	90.2
Col-1015-N	48.1	0.01	41.0	0.18	9.31	0.14	0.31	0.06	99.18	90.2
Col-1015-N	48.2	0.02	41.1	0.16	9.34	0.12	0.27	0.03	99.22	90.2
Col-1015-N	48.4	0.01	41.2	0.18	9.36	0.17	0.28	0.05	99.65	90.2
Col-1015-N	48.3	0.00	40.8	0.18	9.35	0.19	0.33	0.02	99.17	90.2
Col-1015-N	48.7	0.01	41.3	0.17	9.44	0.14	0.30	0.05	100.16	90.2

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	48.3	0.01	41.2	0.19	9.37	0.13	0.30	0.04	99.56	90.2
Col-1015-N	49.0	0.02	41.6	0.17	9.51	0.12	0.40	0.08	100.89	90.2
Col-1015-N	48.9	0.03	41.2	0.18	9.49	0.14	0.31	0.10	100.38	90.2
Col-1015-N	48.7	0.01	41.3	0.17	9.45	0.14	0.33	0.05	100.22	90.2
Col-1015-N	48.9	0.01	41.7	0.20	9.49	0.12	0.31	0.04	100.80	90.2
Col-1015-N	48.6	0.02	41.3	0.19	9.43	0.11	0.30	0.07	100.01	90.2
Col-1015-N	48.0	0.04	41.0	0.20	9.34	0.15	0.30	0.02	99.05	90.2
Col-1015-N	48.3	0.02	41.4	0.16	9.40	0.12	0.40	0.11	99.98	90.2
Col-1015-N	48.6	0.02	41.2	0.18	9.45	0.13	0.32	0.04	99.87	90.2
Col-1015-N	48.1	0.02	40.9	0.16	9.35	0.12	0.33	0.05	98.98	90.2
Col-1015-N	48.2	0.01	41.5	0.20	9.39	0.08	0.27	0.05	99.63	90.1
Col-1015-N	48.3	0.03	41.0	0.18	9.41	0.15	0.34	0.08	99.49	90.1
Col-1015-N	48.8	0.02	41.8	0.19	9.52	0.12	0.30	0.09	100.86	90.1
Col-1015-N	48.9	0.02	41.6	0.19	9.54	0.14	0.32	0.05	100.74	90.1
Col-1015-N	48.0	0.02	41.5	0.19	9.37	0.21	0.27	0.01	99.57	90.1
Col-1015-N	48.8	0.01	41.3	0.18	9.53	0.07	0.30	0.06	100.30	90.1
Col-1015-N	48.0	0.01	41.2	0.21	9.38	0.18	0.28	0.04	99.37	90.1
Col-1015-N	48.6	0.01	41.2	0.21	9.50	0.13	0.28	0.04	100.04	90.1
Col-1015-N	48.9	0.01	41.3	0.16	9.55	0.14	0.36	0.05	100.46	90.1
Col-1015-N	48.9	0.02	41.9	0.20	9.56	0.13	0.30	0.05	101.03	90.1
Col-1015-N	48.8	0.01	41.4	0.18	9.55	0.16	0.30	0.06	100.47	90.1
Col-1015-N	48.6	0.01	41.4	0.19	9.52	0.21	0.33	0.05	100.36	90.1
Col-1015-N	48.7	0.02	41.4	0.20	9.54	0.09	0.30	0.05	100.34	90.1
Col-1015-N	48.2	0.01	40.9	0.19	9.45	0.16	0.30	0.05	99.23	90.1
Col-1015-N	48.6	0.07	41.5	0.19	9.53	0.22	0.27	0.11	100.51	90.1
Col-1015-N	48.9	0.01	41.6	0.18	9.59	0.16	0.29	0.05	100.77	90.1
Col-1015-N	47.8	0.02	41.2	0.23	9.39	0.13	0.26	0.02	99.08	90.1
Col-1015-N	48.2	0.02	41.4	0.20	9.46	0.19	0.31	0.05	99.79	90.1
Col-1015-N	47.8	0.02	41.2	0.21	9.39	0.14	0.28	0.05	99.12	90.1
Col-1015-N	48.8	0.01	41.3	0.21	9.58	0.20	0.26	0.07	100.40	90.1
Col-1015-N	48.9	0.02	41.7	0.21	9.61	0.16	0.28	0.04	100.93	90.1
Col-1015-N	48.7	0.00	41.3	0.18	9.58	0.19	0.30	0.04	100.26	90.1
Col-1015-N	49.0	-0.01	41.6	0.17	9.65	0.23	0.30	0.05	101.03	90.1
Col-1015-N	49.0	0.02	41.5	0.20	9.64	0.17	0.28	0.05	100.82	90.1
Col-1015-N	48.4	0.04	41.4	0.19	9.53	0.15	0.26	0.08	100.13	90.1
Col-1015-N	47.8	0.03	41.4	0.20	9.41	0.19	0.29	0.05	99.38	90.1
Col-1015-N	48.7	0.01	41.3	0.19	9.59	0.12	0.30	0.07	100.33	90.1
Col-1015-N	48.8	0.00	41.4	0.14	9.62	0.15	0.38	0.06	100.52	90.0
Col-1015-N	47.8	0.01	41.3	0.13	9.43	0.15	0.49	0.03	99.37	90.0
Col-1015-N	48.4	0.03	41.8	0.20	9.54	0.12	0.31	0.04	100.43	90.0
Col-1015-N	48.0	0.02	40.8	0.19	9.47	0.12	0.30	0.06	98.96	90.0

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	48.8	0.01	41.1	0.18	9.63	0.15	0.29	0.05	100.14	90.0
Col-1015-N	48.2	0.02	41.8	0.19	9.52	0.20	0.30	0.07	100.37	90.0
Col-1015-N	48.2	0.02	41.0	0.20	9.53	0.14	0.28	0.07	99.41	90.0
Col-1015-N	48.8	0.02	41.7	0.20	9.67	0.18	0.29	0.04	100.88	90.0
Col-1015-N	49.0	0.01	41.5	0.18	9.71	0.16	0.32	0.05	100.96	90.0
Col-1015-N	48.9	-0.01	41.4	0.20	9.70	0.15	0.28	0.07	100.72	90.0
Col-1015-N	48.8	0.01	41.0	0.21	9.68	0.10	0.29	0.06	100.13	90.0
Col-1015-N	47.9	0.00	41.5	0.20	9.52	0.14	0.27	0.04	99.58	90.0
Col-1015-N	48.7	0.02	41.4	0.20	9.68	0.12	0.29	0.02	100.40	90.0
Col-1015-N	48.2	0.01	41.0	0.17	9.57	0.17	0.28	0.03	99.42	90.0
Col-1015-N	48.0	0.02	41.7	0.20	9.54	0.15	0.28	0.05	99.98	90.0
Col-1015-N	48.9	0.01	41.0	0.20	9.72	0.20	0.30	0.10	100.37	90.0
Col-1015-N	48.6	0.00	41.3	0.20	9.68	0.17	0.28	0.07	100.35	90.0
Col-1015-N	48.8	0.01	41.6	0.20	9.73	0.16	0.28	0.07	100.89	89.9
Col-1015-N	48.9	0.00	41.3	0.19	9.75	0.17	0.30	0.05	100.63	89.9
Col-1015-N	48.1	0.02	41.7	0.19	9.60	0.20	0.30	0.04	100.17	89.9
Col-1015-N	49.0	0.00	41.6	0.19	9.78	0.12	0.25	0.02	100.98	89.9
Col-1015-N	48.1	0.03	41.2	0.20	9.62	0.15	0.32	0.04	99.73	89.9
Col-1015-N	48.2	0.02	41.2	0.19	9.64	0.18	0.31	0.03	99.82	89.9
Col-1015-N	48.0	0.01	41.4	0.21	9.59	0.13	0.26	0.04	99.58	89.9
Col-1015-N	48.4	0.04	42.2	0.21	9.68	0.16	0.27	0.05	101.04	89.9
Col-1015-N	47.8	0.04	41.4	0.21	9.58	0.19	0.28	0.05	99.59	89.9
Col-1015-N	48.7	0.03	41.8	0.21	9.75	0.19	0.21	0.04	100.93	89.9
Col-1015-N	48.5	0.00	41.4	0.20	9.72	0.16	0.27	0.03	100.28	89.9
Col-1015-N	48.5	0.01	41.6	0.21	9.73	0.15	0.24	0.03	100.53	89.9
Col-1015-N	48.9	0.02	41.4	0.20	9.80	0.15	0.27	0.07	100.72	89.9
Col-1015-N	48.1	0.01	41.2	0.21	9.67	0.19	0.28	0.05	99.69	89.9
Col-1015-N	47.8	0.02	41.5	0.20	9.62	0.15	0.28	0.05	99.66	89.9
Col-1015-N	47.9	0.02	41.2	0.23	9.66	0.14	0.27	0.03	99.45	89.8
Col-1015-N	47.8	0.02	41.1	0.20	9.64	0.17	0.30	0.03	99.20	89.8
Col-1015-N	48.0	0.02	41.6	0.20	9.69	0.16	0.26	0.07	99.94	89.8
Col-1015-N	47.3	0.01	41.5	0.20	9.58	0.17	0.29	0.03	99.06	89.8
Col-1015-N	47.1	0.02	42.2	0.19	9.54	0.19	0.32	0.05	99.54	89.8
Col-1015-N	47.9	0.01	41.1	0.19	9.71	0.11	0.31	0.06	99.40	89.8
Col-1015-N	48.3	0.01	41.6	0.22	9.80	0.11	0.26	0.06	100.38	89.8
Col-1015-N	47.7	0.01	41.2	0.18	9.68	0.11	0.28	0.05	99.25	89.8
Col-1015-N	48.6	0.03	41.5	0.19	9.88	0.21	0.28	0.05	100.71	89.8
Col-1015-N	48.5	0.01	41.7	0.17	9.87	0.10	0.30	0.04	100.68	89.8
Col-1015-N	48.0	0.02	41.5	0.22	9.77	0.16	0.25	0.05	99.99	89.7
Col-1015-N	48.8	0.01	41.5	0.20	9.94	0.16	0.29	0.04	100.98	89.7
Col-1015-N	48.1	0.03	41.7	0.22	9.80	0.20	0.26	0.04	100.30	89.7

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	48.7	0.01	41.6	0.18	9.92	0.14	0.27	0.04	100.84	89.7
Col-1015-N	48.6	0.00	41.1	0.20	9.92	0.17	0.28	0.06	100.36	89.7
Col-1015-N	46.3	0.06	44.0	0.20	9.44	0.17	0.30	0.04	100.56	89.7
Col-1015-N	47.8	0.03	41.4	0.22	9.82	0.23	0.26	0.03	99.77	89.7
Col-1015-N	48.4	0.01	41.6	0.17	9.93	0.14	0.25	0.07	100.58	89.7
Col-1015-N	48.6	0.02	41.5	0.22	9.98	0.17	0.21	0.01	100.65	89.7
Col-1015-N	47.9	0.01	41.3	0.21	9.84	0.17	0.26	0.02	99.71	89.7
Col-1015-N	47.7	0.01	41.1	0.22	9.80	0.21	0.29	0.03	99.33	89.7
Col-1015-N	48.7	0.01	41.6	0.21	10.04	0.13	0.24	0.06	101.04	89.6
Col-1015-N	48.8	0.00	41.5	0.19	10.06	0.18	0.26	0.04	100.99	89.6
Col-1015-N	47.5	0.05	41.2	0.22	9.83	0.15	0.24	0.03	99.31	89.6
Col-1015-N	48.1	0.00	41.1	0.22	9.95	0.21	0.25	0.03	99.79	89.6
Col-1015-N	47.8	0.02	41.3	0.20	9.89	0.16	0.26	0.05	99.70	89.6
Col-1015-N	47.7	0.03	41.2	0.22	9.89	0.17	0.22	0.04	99.49	89.6
Col-1015-N	47.6	0.02	41.4	0.22	9.88	0.19	0.23	0.04	99.62	89.6
Col-1015-N	48.7	0.02	41.4	0.20	10.12	0.10	0.25	0.05	100.85	89.6
Col-1015-N	48.4	0.00	41.0	0.20	10.07	0.18	0.26	0.05	100.16	89.5
Col-1015-N	47.8	0.01	41.2	0.19	9.97	0.14	0.23	0.02	99.57	89.5
Col-1015-N	48.5	0.00	41.4	0.19	10.12	0.17	0.25	0.03	100.67	89.5
Col-1015-N	47.9	0.02	40.9	0.20	10.05	0.14	0.19	0.08	99.57	89.5
Col-1015-N	48.5	0.01	41.4	0.22	10.16	0.16	0.25	0.05	100.71	89.5
Col-1015-N	47.6	0.01	40.8	0.19	10.04	0.16	0.31	0.05	99.21	89.4
Col-1015-N	48.1	0.01	41.5	0.22	10.16	0.16	0.24	0.03	100.43	89.4
Col-1015-N	48.7	0.00	41.2	0.18	10.29	0.16	0.25	0.04	100.83	89.4
Col-1015-N	47.5	0.01	40.9	0.19	10.07	0.16	0.25	0.05	99.14	89.4
Col-1015-N	48.4	0.01	41.7	0.24	10.27	0.21	0.20	0.02	101.00	89.4
Col-1015-N	47.3	0.02	41.6	0.20	10.09	0.13	0.28	0.08	99.69	89.3
Col-1015-N	48.2	0.03	41.5	0.22	10.29	0.17	0.27	0.05	100.75	89.3
Col-1015-N	48.1	0.00	41.1	0.21	10.30	0.18	0.26	0.04	100.11	89.3
Col-1015-N	48.3	0.01	41.1	0.21	10.35	0.15	0.24	0.04	100.39	89.3
Col-1015-N	47.0	0.05	41.6	0.20	10.08	0.13	0.27	0.05	99.36	89.3
Col-1015-N	48.0	0.02	41.0	0.20	10.31	0.15	0.23	0.04	99.96	89.2
Col-1015-N	47.5	0.02	41.5	0.18	10.20	0.14	0.30	0.06	99.92	89.2
Col-1015-N	47.6	0.02	41.8	0.18	10.22	0.16	0.23	0.05	100.20	89.2
Col-1015-N	48.1	0.03	41.8	0.19	10.35	0.11	0.27	0.07	100.84	89.2
Col-1015-N	48.3	0.01	41.3	0.24	10.44	0.21	0.22	0.03	100.72	89.2
Col-1015-N	48.1	0.01	41.2	0.24	10.42	0.28	0.20	0.03	100.42	89.2
Col-1015-N	48.0	0.01	41.2	0.22	10.41	0.19	0.21	0.04	100.25	89.2
Col-1015-N	47.7	0.02	42.0	0.20	10.34	0.15	0.27	0.02	100.63	89.1
Col-1015-N	48.2	0.07	41.3	0.30	10.47	0.27	0.13	0.01	100.75	89.1
Col-1015-N	48.2	0.01	41.6	0.20	10.46	0.14	0.24	0.06	100.89	89.1

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1015-N	48.0	0.03	41.5	0.25	10.42	0.20	0.18	0.04	100.60	89.1
Col-1015-N	48.4	0.02	41.3	0.20	10.57	0.20	0.27	0.03	101.01	89.1
Col-1015-N	47.5	0.02	40.9	0.21	10.44	0.19	0.23	0.05	99.50	89.0
Col-1015-N	47.3	0.00	40.9	0.25	10.51	0.17	0.18	0.05	99.43	88.9
Col-1015-N	47.3	0.01	41.1	0.26	10.51	0.17	0.18	0.03	99.56	88.9
Col-1015-N	48.0	0.01	41.3	0.21	10.69	0.24	0.23	0.05	100.79	88.9
Col-1015-N	47.3	0.00	41.3	0.24	10.51	0.18	0.20	0.02	99.72	88.9
Col-1015-N	48.0	0.00	40.7	0.24	10.69	0.15	0.20	0.03	100.03	88.9
Col-1015-N	47.6	0.00	41.0	0.22	10.60	0.18	0.18	0.03	99.85	88.9
Col-1015-N	47.2	0.02	41.2	0.19	10.51	0.14	0.27	0.10	99.60	88.9
Col-1015-N	47.9	0.02	41.0	0.22	10.69	0.17	0.24	0.02	100.28	88.9
Col-1015-N	47.0	0.01	41.1	0.26	10.55	0.21	0.19	0.02	99.34	88.8
Col-1015-N	47.8	0.00	41.0	0.26	10.73	0.20	0.15	0.06	100.20	88.8
Col-1015-N	47.1	0.01	41.1	0.19	10.60	0.15	0.25	0.06	99.50	88.8
Col-1015-N	47.4	0.02	41.3	0.19	10.66	0.14	0.23	0.08	99.99	88.8
Col-1015-N	47.8	0.02	40.7	0.25	10.77	0.22	0.15	0.04	99.94	88.8
Col-1015-N	46.9	0.02	41.2	0.20	10.59	0.11	0.26	0.03	99.28	88.8
Col-1015-N	47.7	0.02	41.3	0.24	10.79	0.22	0.18	0.03	100.53	88.7
Col-1015-N	47.4	0.02	41.6	0.23	10.73	0.15	0.23	0.03	100.34	88.7
Col-1015-N	47.2	0.02	41.5	0.20	10.70	0.12	0.24	0.06	100.06	88.7
Col-1015-N	47.6	0.01	41.2	0.21	10.79	0.14	0.17	0.04	100.17	88.7
Col-1015-N	47.2	0.01	41.3	0.20	10.75	0.19	0.25	0.06	99.94	88.7
Col-1015-N	47.2	0.03	41.3	0.25	10.77	0.17	0.22	0.01	99.97	88.6
Col-1015-N	47.2	0.01	41.6	0.18	10.78	0.19	0.31	0.04	100.34	88.6
Col-1015-N	47.7	0.02	41.2	0.28	10.93	0.21	0.20	0.12	100.66	88.6
Col-1015-N	48.0	0.02	41.3	0.24	11.03	0.14	0.19	0.01	100.90	88.6
Col-1015-N	46.9	0.01	41.4	0.26	10.77	0.21	0.18	0.03	99.73	88.6
Col-1015-N	47.7	0.02	41.5	0.22	11.00	0.23	0.20	0.02	100.91	88.6
Col-1015-N	48.0	0.01	41.3	0.26	11.06	0.19	0.18	0.02	101.05	88.6
Col-1015-N	47.8	0.02	41.3	0.22	11.06	0.14	0.21	0.02	100.74	88.5
Col-1015-N	47.2	0.02	41.4	0.26	10.93	0.22	0.16	0.02	100.23	88.5
Col-1015-N	46.8	0.01	41.3	0.25	10.94	0.13	0.15	0.03	99.56	88.4
Col-1015-N	47.6	0.00	41.1	0.24	11.16	0.13	0.19	0.03	100.47	88.4
Col-1015-N	47.8	0.00	41.1	0.21	11.29	0.19	0.18	0.00	100.80	88.3
Col-1015-N	46.8	0.02	41.0	0.24	11.11	0.15	0.16	0.02	99.48	88.2
Col-1015-N	47.3	0.00	41.3	0.22	11.37	0.16	0.20	0.05	100.67	88.1
Col-1015-N	46.9	0.01	41.2	0.23	11.34	0.22	0.17	0.04	100.16	88.1
Col-1015-N	47.2	0.03	41.4	0.23	11.70	0.23	0.17	0.03	100.97	87.8
Col-1015-N	46.8	0.02	41.2	0.21	11.70	0.21	0.18	0.05	100.34	87.7
Col-1015-N	46.8	0.02	41.3	0.20	11.72	0.17	0.25	0.03	100.46	87.7
Col-1015-N	46.3	0.02	41.0	0.23	11.80	0.17	0.17	0.03	99.67	87.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	
Col-1016-a	48.5	0.04	41.3	0.18	9.44	0.21	0.37	0.07	100.1	90.1
Col-1016-a	48.7	0.05	41.5	0.16	9.52	0.16	0.36	0.07	100.5	90.1
Col-1016-a	48.5	0.04	41.1	0.16	9.53	0.14	0.45	0.05	99.96	90.1
Col-1016-a	48.5	0.03	41.4	0.15	9.56	0.15	0.33	0.05	100.2	90.0
Col-1016-a	48.4	0.03	41.5	0.15	9.68	0.18	0.31	0.05	100.3	89.9
Col-1016-a	48.2	0.08	41.1	0.17	9.69	0.18	0.42	0.07	99.97	89.9
Col-1016-a	48.9	0.02	41.1	0.15	9.83	0.21	0.44	0.06	100.8	89.9
Col-1016-a	48.7	0.03	41.4	0.15	9.81	0.11	0.46	0.08	100.8	89.8
Col-1016-a	48.4	0.03	41.5	0.15	9.76	0.09	0.32	0.05	100.3	89.8
Col-1016-a	48.7	0.02	41.4	0.15	9.82	0.17	0.35	0.08	100.6	89.8
Col-1016-a	48.4	0.03	41.4	0.16	9.76	0.14	0.35	0.09	100.3	89.8
Col-1016-a	48.5	0.03	41.8	0.16	9.82	0.11	0.35	0.04	100.8	89.8
Col-1016-a	48.5	0.05	41.7	0.16	9.89	0.18	0.35	0.07	100.9	89.7
Col-1016-a	48.5	0.04	41.3	0.15	9.90	0.09	0.39	0.06	100.5	89.7
Col-1016-a	48.1	0.02	41.1	0.16	9.84	0.19	0.42	0.04	99.85	89.7
Col-1016-a	48.2	0.02	41.5	0.16	9.89	0.15	0.41	0.03	100.4	89.7
Col-1016-a	48.4	0.02	41.5	0.17	9.94	0.22	0.34	0.04	100.6	89.7
Col-1016-a	48.7	0.05	41.3	0.19	10.02	0.15	0.42	0.07	100.9	89.6
Col-1016-a	48.6	0.02	41.5	0.16	10.02	0.14	0.36	0.06	100.9	89.6
Col-1016-a	48.1	0.01	41.3	0.17	9.97	0.18	0.40	0.07	100.2	89.6
Col-1016-a	48.4	0.03	41.7	0.16	10.06	0.14	0.34	0.04	100.9	89.6
Col-1016-a	48.6	0.03	41.4	0.17	10.15	0.13	0.34	0.05	100.9	89.5
Col-1016-a	48.3	0.03	41.5	0.16	10.10	0.19	0.34	0.06	100.7	89.5
Col-1016-a	48.3	0.03	41.6	0.15	10.12	0.14	0.35	0.05	100.8	89.5
Col-1016-a	48.2	0.03	41.5	0.16	10.11	0.12	0.32	0.04	100.5	89.5
Col-1016-a	48.3	0.03	41.2	0.18	10.13	0.14	0.35	0.06	100.4	89.5
Col-1016-a	48.3	0.02	41.5	0.15	10.17	0.17	0.43	0.03	100.7	89.4
Col-1016-a	48.2	0.01	41.4	0.15	10.19	0.17	0.40	0.04	100.5	89.4
Col-1016-a	47.9	0.03	40.9	0.16	10.13	0.10	0.39	0.08	99.69	89.4
Col-1016-a	48.0	0.02	41.8	0.16	10.17	0.16	0.36	0.03	100.8	89.4
Col-1016-a	48.4	0.02	41.4	0.15	10.32	0.11	0.32	0.05	100.8	89.3
Col-1016-a	47.9	0.02	41.0	0.16	10.23	0.20	0.33	0.04	99.91	89.3
Col-1016-a	47.9	0.02	41.4	0.16	10.23	0.17	0.33	0.08	100.3	89.3
Col-1016-a	48.1	0.03	41.5	0.16	10.28	0.23	0.41	0.04	100.7	89.3
Col-1016-a	48.3	0.03	41.5	0.15	10.35	0.16	0.34	0.05	100.9	89.3
Col-1016-a	47.8	0.03	41.9	0.17	10.26	0.13	0.34	0.05	100.7	89.3
Col-1016-a	48.3	0.01	41.6	0.16	10.38	0.09	0.34	0.05	101	89.2

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1016-a	47.9	0.01	41.1	0.16	10.30	0.16	0.36	0.18	100.2	89.2
Col-1016-a	48.3	0.02	41.4	0.16	10.37	0.10	0.35	0.05	100.7	89.2
Col-1016-a	48.0	0.03	41.2	0.16	10.34	0.15	0.34	0.05	100.3	89.2
Col-1016-a	48.0	0.03	41.5	0.16	10.35	0.16	0.37	0.07	100.6	89.2
Col-1016-a	48.1	0.03	41.5	0.18	10.37	0.15	0.37	0.06	100.7	89.2
Col-1016-a	48.3	0.02	41.5	0.16	10.42	0.14	0.30	0.06	100.9	89.2
Col-1016-a	48.0	0.04	41.6	0.16	10.37	0.20	0.31	0.06	100.7	89.2
Col-1016-a	48.2	0.02	41.4	0.16	10.41	0.22	0.40	0.04	100.8	89.2
Col-1016-a	48.0	0.02	41.0	0.16	10.38	0.17	0.40	0.03	100.2	89.2
Col-1016-a	48.0	0.03	41.4	0.16	10.39	0.18	0.37	0.08	100.6	89.2
Col-1016-a	48.1	0.02	41.4	0.16	10.44	0.17	0.36	0.05	100.6	89.1
Col-1016-a	47.9	0.02	41.3	0.17	10.41	0.22	0.36	0.08	100.5	89.1
Col-1016-a	47.9	0.04	41.3	0.18	10.41	0.15	0.34	0.10	100.5	89.1
Col-1016-a	48.0	0.02	41.4	0.16	10.44	0.23	0.36	0.06	100.7	89.1
Col-1016-a	48.0	0.02	41.3	0.16	10.45	0.21	0.34	0.04	100.5	89.1
Col-1016-a	47.9	0.02	41.5	0.17	10.43	0.14	0.36	0.03	100.5	89.1
Col-1016-a	48.2	0.02	41.5	0.16	10.54	0.16	0.35	0.03	100.9	89.1
Col-1016-a	47.9	0.02	41.4	0.18	10.50	0.18	0.31	0.07	100.7	89.1
Col-1016-a	48.0	0.02	41.3	0.15	10.51	0.14	0.37	0.07	100.5	89.0
Col-1016-a	48.0	0.03	41.7	0.17	10.53	0.18	0.36	0.06	101	89.0
Col-1016-a	48.0	0.03	41.6	0.16	10.53	0.17	0.33	0.04	100.9	89.0
Col-1016-a	47.8	0.01	41.5	0.17	10.50	0.15	0.33	0.06	100.6	89.0
Col-1016-a	48.0	0.02	41.7	0.16	10.55	0.11	0.36	0.06	101	89.0
Col-1016-a	47.8	0.02	41.5	0.17	10.50	0.17	0.35	0.04	100.6	89.0
Col-1016-a	48.2	0.03	41.4	0.17	10.58	0.16	0.34	0.04	100.9	89.0
Col-1016-a	47.6	0.01	41.4	0.16	10.47	0.16	0.34	0.08	100.3	89.0
Col-1016-a	47.7	0.02	41.1	0.17	10.49	0.22	0.35	0.05	100.1	89.0
Col-1016-a	47.5	0.02	41.3	0.17	10.46	0.19	0.38	0.05	100.1	89.0
Col-1016-a	47.9	0.03	41.7	0.18	10.55	0.06	0.37	0.04	100.8	89.0
Col-1016-a	48.1	0.02	41.6	0.17	10.59	0.21	0.33	0.03	101	89.0
Col-1016-a	47.9	0.00	41.5	0.15	10.57	0.14	0.33	0.04	100.6	89.0
Col-1016-a	48.0	0.04	41.1	0.16	10.61	0.24	0.36	0.06	100.6	89.0
Col-1016-a	47.1	0.04	41.9	0.16	10.42	0.21	0.32	0.05	100.3	89.0
Col-1016-a	47.6	0.02	41.1	0.17	10.54	0.17	0.39	0.05	100	89.0
Col-1016-a	48.0	0.03	41.7	0.17	10.61	0.19	0.35	0.05	101	89.0
Col-1016-a	48.1	0.02	41.4	0.17	10.66	0.18	0.34	0.06	100.9	88.9
Col-1016-a	47.8	0.03	41.2	0.16	10.59	0.23	0.40	0.03	100.3	88.9
Col-1016-a	47.9	0.03	41.6	0.16	10.64	0.21	0.38	0.02	101	88.9
Col-1016-a	47.7	0.02	41.6	0.17	10.60	0.19	0.38	0.10	100.8	88.9
Col-1016-a	47.2	0.12	41.1	0.21	10.50	0.21	0.35	0.06	99.65	88.9
Col-1016-a	47.7	0.03	41.4	0.17	10.64	0.18	0.39	0.04	100.6	88.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1016-a	47.9	0.03	41.5	0.15	10.68	0.18	0.33	0.03	100.8	88.9
Col-1016-a	47.8	0.02	41.0	0.16	10.66	0.13	0.36	0.03	100.2	88.9
Col-1016-a	47.9	0.02	41.5	0.16	10.72	0.20	0.35	0.04	100.8	88.8
Col-1016-a	47.8	0.03	40.9	0.18	10.71	0.15	0.35	0.05	100.2	88.8
Col-1016-a	47.9	0.03	41.5	0.16	10.73	0.17	0.30	0.06	100.9	88.8
Col-1016-a	48.0	0.04	41.5	0.16	10.76	0.17	0.36	0.04	101	88.8
Col-1016-a	48.0	0.00	41.4	0.17	10.77	0.16	0.38	0.06	100.9	88.8
Col-1016-a	47.8	0.01	41.4	0.16	10.74	0.17	0.33	0.06	100.6	88.8
Col-1016-a	47.9	0.02	41.4	0.17	10.77	0.18	0.34	0.04	100.8	88.8
Col-1016-a	47.5	0.03	41.2	0.17	10.69	0.25	0.33	0.03	100.2	88.8
Col-1016-a	47.8	0.03	41.3	0.17	10.79	0.20	0.31	0.04	100.6	88.8
Col-1016-a	47.7	0.02	41.3	0.17	10.77	0.20	0.33	0.03	100.6	88.8
Col-1016-a	47.8	0.02	41.5	0.17	10.80	0.18	0.35	0.04	100.8	88.7
Col-1016-a	47.7	0.01	41.3	0.16	10.78	0.17	0.40	0.07	100.6	88.7
Col-1016-a	47.9	0.03	41.2	0.16	10.84	0.21	0.31	0.05	100.6	88.7
Col-1016-a	47.8	0.03	41.5	0.16	10.86	0.16	0.37	0.02	100.9	88.7
Col-1016-a	47.7	0.03	41.0	0.16	10.86	0.19	0.36	0.04	100.4	88.7
Col-1016-a	47.7	0.02	41.1	0.17	10.86	0.24	0.37	0.02	100.5	88.7
Col-1016-a	47.7	0.03	41.2	0.15	10.85	0.19	0.30	0.07	100.5	88.7
Col-1016-a	47.7	0.01	41.4	0.17	10.87	0.18	0.32	0.03	100.6	88.7
Col-1016-a	47.8	0.02	41.3	0.16	10.90	0.17	0.28	0.04	100.7	88.7
Col-1016-a	47.7	0.03	41.4	0.17	10.91	0.17	0.38	0.07	100.8	88.6
Col-1016-a	47.7	0.02	41.3	0.17	10.91	0.14	0.32	0.05	100.6	88.6
Col-1016-a	47.8	0.03	41.3	0.17	10.94	0.19	0.30	0.03	100.7	88.6
Col-1016-a	47.4	0.03	41.5	0.16	10.85	0.12	0.35	0.04	100.4	88.6
Col-1016-a	47.9	0.02	41.4	0.16	10.97	0.10	0.32	0.05	100.9	88.6
Col-1016-a	47.0	0.12	40.8	0.20	10.76	0.19	0.38	0.11	99.48	88.6
Col-1016-a	47.7	0.03	41.3	0.16	10.94	0.10	0.29	0.04	100.6	88.6
Col-1016-a	47.7	0.04	41.4	0.17	10.93	0.15	0.29	0.03	100.6	88.6
Col-1016-a	47.2	0.02	41.3	0.16	10.83	0.21	0.29	0.05	100	88.6
Col-1016-a	47.7	0.02	41.0	0.18	10.96	0.18	0.35	0.02	100.4	88.6
Col-1016-a	47.4	0.01	41.0	0.19	10.91	0.17	0.25	0.13	100.1	88.6
Col-1016-a	47.7	0.02	41.3	0.16	10.99	0.15	0.35	0.04	100.6	88.5
Col-1016-a	47.5	0.02	40.8	0.17	10.97	0.19	0.35	0.05	100.1	88.5
Col-1016-a	47.3	0.01	41.5	0.16	10.94	0.19	0.29	0.04	100.4	88.5
Col-1016-a	47.6	0.03	41.2	0.16	11.03	0.18	0.32	0.04	100.6	88.5
Col-1016-a	47.8	0.02	41.4	0.18	11.06	0.13	0.32	0.06	100.9	88.5
Col-1016-a	47.3	0.02	41.2	0.16	11.00	0.18	0.28	0.03	100.2	88.5
Col-1016-a	47.4	0.02	41.8	0.17	11.01	0.18	0.31	0.04	100.9	88.5
Col-1016-a	47.6	0.03	41.3	0.16	11.07	0.18	0.31	0.06	100.7	88.5
Col-1016-a	47.6	0.03	41.2	0.17	11.08	0.15	0.29	0.04	100.5	88.5

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1016-a	47.6	0.04	41.4	0.16	11.08	0.12	0.32	0.05	100.8	88.5
Col-1016-a	47.4	0.03	41.4	0.16	11.04	0.19	0.32	0.05	100.6	88.4
Col-1016-a	47.5	0.02	41.1	0.16	11.08	0.19	0.32	0.12	100.5	88.4
Col-1016-a	47.4	0.02	41.1	0.16	11.05	0.16	0.32	0.06	100.2	88.4
Col-1016-a	47.4	0.03	41.7	0.18	11.12	0.14	0.34	0.03	100.9	88.4
Col-1016-a	47.6	0.03	41.1	0.18	11.18	0.17	0.31	0.02	100.6	88.4
Col-1016-a	47.4	0.02	41.5	0.16	11.14	0.22	0.33	0.04	100.8	88.4
Col-1016-a	47.6	0.02	41.5	0.19	11.21	0.17	0.30	0.03	101	88.3
Col-1016-a	47.5	0.03	41.3	0.16	11.19	0.14	0.33	0.05	100.7	88.3
Col-1016-a	47.7	0.02	41.4	0.16	11.25	0.19	0.28	0.06	101	88.3
Col-1016-a	47.7	0.01	41.2	0.17	11.25	0.24	0.35	0.04	100.9	88.3
Col-1016-a	47.7	0.03	41.2	0.16	11.26	0.13	0.32	0.03	100.8	88.3
Col-1016-a	47.6	0.02	40.9	0.15	11.24	0.17	0.36	0.05	100.4	88.3
Col-1016-a	47.5	0.03	41.1	0.18	11.22	0.24	0.33	0.04	100.7	88.3
Col-1016-a	47.3	0.02	41.3	0.15	11.18	0.22	0.34	0.12	100.6	88.3
Col-1016-a	47.3	0.03	41.3	0.16	11.18	0.20	0.30	0.05	100.5	88.3
Col-1016-a	47.7	0.02	41.2	0.16	11.33	0.19	0.27	0.04	100.9	88.2
Col-1016-a	47.3	0.02	40.8	0.19	11.23	0.19	0.34	0.04	100.1	88.2
Col-1016-a	47.4	0.03	41.2	0.17	11.27	0.15	0.34	0.06	100.6	88.2
Col-1016-a	47.1	0.01	41.3	0.18	11.22	0.20	0.33	0.03	100.4	88.2
Col-1016-a	46.6	0.15	41.6	0.21	11.12	0.22	0.34	0.06	100.3	88.2
Col-1016-a	47.4	0.01	41.3	0.17	11.33	0.16	0.26	0.05	100.7	88.2
Col-1016-a	47.3	0.01	41.4	0.17	11.33	0.23	0.27	0.03	100.8	88.2
Col-1016-a	47.3	0.01	41.5	0.18	11.32	0.20	0.31	0.05	100.8	88.2
Col-1016-a	47.3	0.02	41.5	0.18	11.35	0.23	0.33	0.03	101	88.1
Col-1016-a	47.4	0.02	41.4	0.17	11.39	0.18	0.28	0.04	100.9	88.1
Col-1016-a	47.2	0.01	41.7	0.16	11.34	0.18	0.29	0.04	100.9	88.1
Col-1016-a	47.3	0.02	41.5	0.17	11.38	0.19	0.36	0.05	101	88.1
Col-1016-a	47.3	0.01	41.4	0.17	11.38	0.16	0.30	0.02	100.7	88.1
Col-1016-a	47.3	0.02	40.9	0.18	11.38	0.14	0.31	0.06	100.3	88.1
Col-1016-a	47.1	0.02	41.2	0.16	11.38	0.23	0.33	0.02	100.4	88.1
Col-1016-a	47.1	0.02	41.5	0.17	11.41	0.18	0.30	0.04	100.7	88.0
Col-1016-a	44.9	0.82	42.7	0.32	10.88	0.10	0.27	0.07	100.1	88.0
Col-1016-a	46.8	0.04	41.1	0.16	11.35	0.19	0.29	0.08	99.99	88.0
Col-1016-a	47.1	0.03	40.7	0.17	11.44	0.17	0.29	0.03	99.95	88.0
Col-1016-a	47.4	0.02	41.2	0.17	11.55	0.21	0.24	0.07	100.9	88.0
Col-1016-a	47.3	0.02	41.2	0.17	11.52	0.23	0.26	0.03	100.7	88.0
Col-1016-a	47.0	0.01	41.3	0.17	11.45	0.21	0.27	0.04	100.4	88.0
Col-1016-a	47.1	0.03	41.0	0.16	11.50	0.12	0.29	0.05	100.3	88.0
Col-1016-a	47.0	0.01	41.2	0.16	11.51	0.22	0.23	0.04	100.4	87.9
Col-1016-a	47.1	0.02	40.9	0.19	11.54	0.14	0.25	0.04	100.2	87.9

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1016-a	47.3	0.03	41.4	0.17	11.61	0.21	0.24	0.03	101	87.9
Col-1016-a	47.1	0.03	40.9	0.15	11.60	0.17	0.36	0.05	100.3	87.9
Col-1016-a	47.5	0.03	41.0	0.17	11.73	0.24	0.25	0.02	101	87.8
Col-1016-a	47.1	0.02	41.3	0.16	11.62	0.16	0.26	0.06	100.7	87.8
Col-1016-a	47.3	0.03	41.2	0.16	11.67	0.20	0.28	0.05	100.9	87.8
Col-1016-a	47.0	0.01	41.0	0.18	11.62	0.19	0.26	0.05	100.4	87.8
Col-1016-a	47.2	0.02	41.1	0.17	11.69	0.20	0.26	0.04	100.7	87.8
Col-1016-a	47.0	0.03	40.7	0.17	11.64	0.21	0.24	0.04	100	87.8
Col-1016-a	47.0	0.03	41.4	0.16	11.68	0.21	0.27	0.04	100.8	87.8
Col-1016-a	46.8	0.01	40.9	0.17	11.62	0.17	0.33	0.01	99.96	87.8
Col-1016-a	46.9	0.02	41.0	0.17	11.68	0.24	0.22	0.05	100.3	87.8
Col-1016-a	47.1	0.03	41.1	0.18	11.72	0.21	0.32	0.08	100.8	87.8
Col-1016-a	47.0	0.03	41.6	0.16	11.69	0.16	0.26	0.02	100.9	87.7
Col-1016-a	46.0	0.14	40.9	0.18	11.50	0.16	0.26	0.06	99.27	87.7
Col-1016-a	46.8	0.00	41.1	0.19	11.70	0.19	0.25	0.01	100.2	87.7
Col-1016-a	47.1	0.03	41.0	0.17	11.84	0.23	0.24	0.05	100.6	87.6
Col-1016-a	47.1	0.02	41.0	0.17	11.85	0.15	0.26	0.06	100.6	87.6
Col-1016-a	47.0	0.03	41.0	0.20	11.83	0.27	0.25	0.02	100.5	87.6
Col-1016-a	46.9	0.05	41.4	0.17	11.81	0.16	0.25	0.05	100.8	87.6
Col-1016-a	46.7	0.02	41.1	0.18	11.76	0.22	0.23	0.07	100.3	87.6
Col-1016-a	46.9	0.01	41.4	0.17	11.85	0.17	0.26	0.02	100.8	87.6
Col-1016-a	47.0	0.02	41.0	0.18	11.87	0.20	0.28	0.04	100.6	87.6
Col-1016-a	46.8	0.04	39.7	0.19	11.85	0.17	0.25	0.05	99.1	87.6
Col-1016-a	47.2	0.03	41.1	0.17	11.97	0.24	0.23	0.04	101	87.5
Col-1016-a	46.7	0.01	40.9	0.19	11.86	0.17	0.27	0.02	100.1	87.5
Col-1016-a	47.0	0.03	41.1	0.18	11.93	0.16	0.28	0.06	100.7	87.5
Col-1016-a	46.8	0.02	40.8	0.19	11.92	0.17	0.25	0.08	100.3	87.5
Col-1016-a	46.6	0.03	40.6	0.18	11.85	0.21	0.27	0.05	99.77	87.5
Col-1016-a	46.8	0.03	41.3	0.17	11.92	0.14	0.29	0.03	100.8	87.5
Col-1016-a	46.9	0.01	41.2	0.16	11.95	0.22	0.27	0.05	100.8	87.5
Col-1016-a	46.8	0.01	41.0	0.17	11.99	0.19	0.27	0.07	100.5	87.4
Col-1016-a	46.8	0.00	41.1	0.17	12.00	0.20	0.21	0.04	100.5	87.4
Col-1016-a	46.6	0.02	41.0	0.17	11.96	0.21	0.24	0.03	100.3	87.4
Col-1016-a	46.8	0.02	41.6	0.17	12.00	0.20	0.25	0.02	101	87.4
Col-1016-a	46.8	0.03	41.3	0.17	12.08	0.18	0.23	0.01	100.8	87.4
Col-1016-a	46.5	0.02	41.4	0.18	12.01	0.18	0.22	0.02	100.5	87.3
Col-1016-a	46.6	0.00	41.0	0.18	12.04	0.16	0.24	0.04	100.2	87.3
Col-1016-a	46.6	0.02	41.0	0.17	12.05	0.21	0.24	0.04	100.4	87.3
Col-1016-a	46.8	0.02	40.9	0.17	12.12	0.24	0.22	0.06	100.5	87.3
Col-1016-a	46.9	0.02	40.9	0.18	12.15	0.20	0.22	0.02	100.6	87.3
Col-1016-a	46.8	0.03	40.9	0.16	12.13	0.14	0.22	0.04	100.4	87.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1016-a	46.5	0.01	41.2	0.18	12.10	0.24	0.25	0.01	100.5	87.3
Col-1016-a	46.7	0.02	41.4	0.16	12.18	0.14	0.27	0.03	101	87.2
Col-1016-a	46.7	0.02	41.3	0.18	12.18	0.21	0.25	0.05	100.9	87.2
Col-1016-a	46.3	0.02	41.2	0.17	12.15	0.24	0.20	0.05	100.3	87.2
Col-1016-a	46.6	0.01	41.2	0.18	12.26	0.19	0.24	0.06	100.8	87.1
Col-1016-a	46.4	0.02	41.3	0.18	12.28	0.20	0.21	0.03	100.6	87.1
Col-1016-a	46.7	0.02	41.0	0.16	12.35	0.18	0.22	0.03	100.6	87.1
Col-1016-a	46.6	0.02	41.0	0.20	12.37	0.21	0.23	0.05	100.7	87.0
Col-1016-a	46.5	0.12	40.8	0.20	12.34	0.17	0.26	0.14	100.5	87.0
Col-1016-a	46.6	0.02	41.3	0.18	12.38	0.17	0.27	0.03	100.9	87.0
Col-1016-a	46.8	0.02	41.0	0.18	12.44	0.24	0.21	0.04	100.9	87.0
Col-1016-a	46.7	0.04	40.8	0.18	12.44	0.17	0.23	0.19	100.7	87.0
Col-1016-a	46.5	0.01	40.9	0.17	12.39	0.21	0.21	0.02	100.4	87.0
Col-1016-a	46.3	0.00	40.7	0.18	12.34	0.32	0.25	0.05	100.1	87.0
Col-1016-a	46.7	0.01	40.8	0.18	12.44	0.20	0.28	0.07	100.7	87.0
Col-1016-a	46.5	0.03	41.0	0.19	12.41	0.21	0.22	0.03	100.6	87.0
Col-1016-a	46.5	0.03	40.8	0.18	12.43	0.15	0.29	0.02	100.4	87.0
Col-1016-a	46.4	0.03	41.0	0.17	12.40	0.16	0.24	0.02	100.4	87.0
Col-1016-a	46.5	0.02	41.0	0.18	12.43	0.24	0.27	0.01	100.6	87.0
Col-1016-a	46.5	0.02	40.6	0.18	12.44	0.27	0.25	0.04	100.3	86.9
Col-1016-a	46.6	0.03	41.0	0.17	12.54	0.27	0.21	0.03	100.9	86.9
Col-1016-a	46.6	0.03	41.2	0.19	12.54	0.21	0.21	0.02	101	86.9
Col-1016-a	46.3	0.03	41.0	0.18	12.49	0.24	0.20	0.13	100.5	86.9
Col-1016-a	46.2	0.01	40.9	0.18	12.49	0.26	0.20	0.02	100.3	86.8
Col-1016-a	46.5	0.02	40.8	0.17	12.61	0.21	0.21	0.07	100.6	86.8
Col-1016-a	46.4	0.02	40.8	0.18	12.58	0.24	0.22	0.05	100.5	86.8
Col-1016-a	46.1	0.00	41.1	0.16	12.50	0.22	0.24	0.07	100.4	86.8
Col-1016-a	46.3	0.01	40.9	0.18	12.56	0.16	0.20	0.03	100.4	86.8
Col-1016-a	46.3	0.02	40.8	0.17	12.57	0.21	0.21	0.05	100.3	86.8
Col-1016-a	46.1	0.00	41.2	0.17	12.53	0.17	0.21	0.01	100.4	86.8
Col-1016-a	46.4	0.03	41.0	0.18	12.64	0.19	0.18	0.01	100.6	86.7
Col-1016-a	46.6	0.04	41.0	0.17	12.72	0.17	0.22	0.05	101	86.7
Col-1016-a	46.3	0.02	41.0	0.18	12.69	0.20	0.23	0.04	100.6	86.7
Col-1016-a	46.1	0.01	40.8	0.19	12.67	0.18	0.22	0.03	100.3	86.7
Col-1016-a	45.9	0.03	40.9	0.17	12.61	0.14	0.22	0.12	100.1	86.6
Col-1016-a	46.1	0.00	41.0	0.18	12.67	0.26	0.23	0.02	100.4	86.6
Col-1016-a	46.1	0.03	41.3	0.17	12.67	0.26	0.18	0.01	100.7	86.6
Col-1016-a	46.3	0.02	41.1	0.17	12.77	0.19	0.19	0.03	100.7	86.6
Col-1016-a	46.1	0.02	41.4	0.18	12.71	0.22	0.25	0.06	100.9	86.6
Col-1016-a	46.3	0.03	41.2	0.17	12.78	0.15	0.21	0.07	100.9	86.6
Col-1016-a	46.3	0.01	40.9	0.18	12.78	0.20	0.20	-0.01	100.6	86.6

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1016-a	46.4	0.01	41.0	0.18	12.85	0.12	0.21	0.02	100.9	86.6
Col-1016-a	46.5	0.00	41.0	0.18	12.87	0.20	0.20	0.05	101	86.6
Col-1016-a	46.0	0.02	41.4	0.17	12.75	0.20	0.20	0.08	100.8	86.5
Col-1016-a	46.1	0.00	41.4	0.17	12.89	0.16	0.21	0.06	101	86.4
Col-1016-a	46.1	0.03	41.0	0.19	12.91	0.23	0.17	0.02	100.6	86.4
Col-1016-a	46.1	0.02	41.0	0.18	12.94	0.19	0.19	0.02	100.7	86.4
Col-1016-a	45.7	0.01	41.1	0.18	12.82	0.23	0.17	0.04	100.2	86.4
Col-1016-a	45.8	0.02	40.6	0.17	12.85	0.24	0.18	0.02	99.91	86.4
Col-1016-a	46.2	0.01	41.1	0.20	13.00	0.23	0.17	0.01	100.9	86.4
Col-1016-a	45.6	0.02	40.6	0.19	12.85	0.19	0.19	0.05	99.69	86.4
Col-1016-a	45.9	0.02	40.8	0.19	12.93	0.20	0.21	0.11	100.4	86.4
Col-1016-a	46.2	0.04	40.9	0.17	13.03	0.20	0.21	0.02	100.8	86.3
Col-1016-a	45.8	0.01	40.5	0.19	12.96	0.24	0.21	0.02	99.98	86.3
Col-1016-a	46.1	0.02	40.9	0.19	13.04	0.19	0.20	0.08	100.7	86.3
Col-1016-a	46.0	0.01	41.0	0.18	13.04	0.29	0.18	0.02	100.8	86.3
Col-1016-a	45.9	0.04	41.0	0.17	13.04	0.23	0.18	0.03	100.6	86.3
Col-1016-a	45.9	0.02	40.9	0.19	13.05	0.20	0.18	0.03	100.5	86.2
Col-1016-a	45.9	0.01	40.9	0.18	13.08	0.21	0.17	0.04	100.5	86.2
Col-1016-a	46.0	0.01	40.8	0.19	13.11	0.23	0.17	0.02	100.4	86.2
Col-1016-a	45.7	0.01	40.7	0.19	13.18	0.22	0.17	0.06	100.3	86.1
Col-1016-a	45.8	0.03	40.7	0.18	13.22	0.28	0.22	0.02	100.4	86.1
Col-1016-a	46.0	0.02	40.7	0.19	13.36	0.26	0.16	0.02	100.7	86.0
Col-1016-a	45.9	0.01	40.7	0.20	13.34	0.22	0.16	0.03	100.6	86.0
Col-1016-a	45.6	0.02	40.6	0.20	13.27	0.28	0.17	0.03	100.2	86.0
Col-1016-a	45.6	0.01	40.6	0.20	13.27	0.20	0.14	0.03	100.1	86.0
Col-1016-a	46.1	0.02	40.8	0.18	13.41	0.21	0.16	0.03	100.9	86.0
Col-1016-a	45.6	0.01	41.3	0.20	13.36	0.29	0.15	0.01	100.9	85.9
Col-1016-a	45.7	0.01	40.7	0.20	13.39	0.17	0.12	0.00	100.3	85.9
Col-1016-a	45.8	0.02	40.9	0.19	13.44	0.21	0.18	0.04	100.8	85.9
Col-1016-a	45.5	0.02	40.7	0.19	13.35	0.25	0.16	0.03	100.2	85.9
Col-1016-a	45.8	0.02	41.1	0.19	13.44	0.23	0.17	0.03	100.9	85.9
Col-1016-a	45.0	0.10	40.8	0.22	13.22	0.24	0.19	0.02	99.78	85.8
Col-1016-a	45.6	0.01	40.9	0.21	13.48	0.24	0.13	0.03	100.6	85.8
Col-1016-a	45.7	0.01	40.6	0.20	13.55	0.30	0.15	0.03	100.5	85.7
Col-1016-a	45.4	0.00	40.6	0.20	13.69	0.25	0.13	0.04	100.3	85.5
Col-1016-a	45.6	0.03	40.8	0.22	13.80	0.24	0.12	0.04	100.9	85.5
Col-1016-a	45.5	0.01	40.8	0.20	13.85	0.27	0.18	0.04	100.8	85.4
Col-1016-a	45.2	0.02	40.2	0.20	13.84	0.26	0.14	0.02	99.91	85.3
Col-1016-a	45.5	0.03	40.9	0.21	13.96	0.31	0.12	0.00	101	85.3
Col-1016-a	45.3	0.00	40.9	0.19	13.89	0.23	0.15	0.01	100.6	85.3
Col-1016-a	45.3	0.00	41.1	0.21	13.93	0.26	0.13	0.00	101	85.3

Comment	MgO	Al2O3	SiO2	CaO	FeO	MnO	NiO	Cr2O3	Total	Mg#
Col-1016-a	45.4	-0.01	40.7	0.24	14.07	0.36	0.07	0.01	100.8	85.2
Col-1016-a	45.2	0.03	40.7	0.21	14.39	0.25	0.14	0.02	100.9	84.8
Col-1016-a	44.7	0.01	40.6	0.22	14.33	0.42	0.09	0.04	100.4	84.8
Col-1016-a	45.0	0.02	40.1	0.23	14.68	0.27	0.08	-0.01	100.4	84.5
Col-1016-a	44.1	0.02	40.3	0.20	14.47	0.25	0.10	0.01	99.47	84.5
Col-1016-a	43.8	0.13	40.2	0.26	14.37	0.31	0.13	0.00	99.18	84.5
Col-1016-a	44.3	0.02	40.5	0.23	14.98	0.39	0.09	0.00	100.6	84.1
Col-1016-a	44.3	0.07	40.6	0.26	15.08	0.33	0.15	0.01	100.8	84.0
Col-1016-a	44.2	0.01	40.5	0.22	15.31	0.19	0.08	0.03	100.5	83.7
Col-1016-a	42.6	0.01	40.3	0.21	15.41	0.44	0.10	-0.01	99.09	83.1