Table S4: Results of $^{40}Ar/^{39}Ar$ analyses

Step	$^{40}Ar/^{39}Ar$[1]	± 1 s.d.	$^{38}Ar/^{39}Ar$[1]	± 1 s.d.	$^{37}Ar/^{39}Ar$[1]	± 1 s.d.	$^{36}Ar/^{39}Ar$[1]	± 1 s.d.	^{39}Ar (mol)[2]	^{39}Ar (%)	$^{40}Ar^{*}$[3] (%)	$^{40}Ar^{*}/^{39}Ar$[3]	± 1 s.d.	Age (Ma)	± 1 s.d.
SVANETI															
N6 (C16019) Muscovite															
1	185.73	2.41E+00	4.59E-01	1.77E-02	4.95E-03	4.95E-05	6.12E-01	1.85E-02	1.48E-17	0.09	1.5	2.98	6.02	9.72	19.55
2	188.16	2.41E+00	5.34E-01	1.62E-02	4.95E-03	4.95E-05	5.88E-01	1.53E-02	2.06E-17	0.16	6.4	12.54	5.18	40.52	16.54
3	43.489	3.53E-02	8.44E-02	2.32E-04	4.95E-03	4.95E-05	3.40E-02	1.26E-04	4.35E-15	15.4	76.5	33.32	0.05	105.68	0.16
4	45.570	3.53E-02	5.11E-02	1.65E-04	4.95E-03	4.95E-05	5.56E-03	5.62E-05	5.65E-15	35.2	96.3	43.90	0.04	138.01	0.12
5	46.641	4.75E-02	5.14E-02	2.57E-04	4.95E-03	4.95E-05	6.30E-03	1.02E-04	2.82E-15	45.1	95.9	44.75	0.06	140.58	0.17
6	45.878	3.79E-02	5.46E-02	1.57E-04	4.95E-03	4.95E-05	1.03E-02	7.90E-05	4.03E-15	59.2	93.2	42.79	0.04	134.64	0.14
7	45.700	4.62E-02	5.28E-02	1.58E-04	4.95E-03	4.95E-05	7.72E-03	6.16E-05	5.18E-15	77.4	94.9	43.39	0.05	136.44	0.15
8	45.902	4.80E-02	5.12E-02	2.73E-04	4.95E-03	4.95E-05	5.21E-03	9.83E-05	2.37E-15	85.7	96.5	44.34	0.06	139.33	0.17
9	47.477	5.30E-02	5.04E-02	2.26E-04	4.95E-03	4.95E-05	5.42E-03	9.55E-05	2.03E-15	92.9	96.4	45.85	0.06	143.89	0.18
10	49.382	6.76E-02	5.19E-02	2.50E-04	4.95E-03	4.95E-05	6.09E-03	9.53E-05	2.04E-15	100.0	96.2	47.56	0.07	149.03	0.22
KAZBEGI															
K1 (V16046D) Biotite															
1	13.023	4.95E-02	2.22E-02	6.53E-04	4.95E-03	4.95E-05	1.53E-02	9.88E-04	3.09E-16	1.2	62.3	8.44	0.30	27.32	0.96
2	17.233	3.77E-02	1.67E-02	3.64E-04	4.95E-03	4.95E-05	4.27E-03	4.75E-04	5.91E-16	3.4	91.1	15.95	0.15	51.29	0.47
3	16.164	3.35E-02	1.38E-02	2.29E-04	4.95E-03	4.95E-05	1.71E-03	2.00E-04	9.97E-16	7.2	95.8	15.65	0.07	50.33	0.22
4	17.662	3.34E-02	1.30E-02	1.79E-04	4.95E-03	4.95E-05	7.89E-04	2.04E-04	9.75E-16	10.8	97.7	17.42	0.07	55.94	0.22
5	19.127	3.35E-02	1.31E-02	1.09E-04	4.95E-03	4.95E-05	4.23E-04	1.10E-04	1.75E-15	17.4	98.8	18.99	0.05	60.91	0.15
6	21.409	2.86E-02	1.27E-02	1.37E-04	4.95E-03	4.95E-05	4.62E-04	1.02E-04	1.98E-15	24.9	98.9	21.26	0.04	68.06	0.13
7	24.361	3.31E-02	1.27E-02	1.15E-04	4.95E-03	4.95E-05	4.18E-04	7.69E-05	2.48E-15	34.3	99.2	24.23	0.04	77.34	0.13
8	28.616	3.13E-02	1.30E-02	8.50E-05	4.95E-03	4.95E-05	3.89E-04	5.28E-05	3.55E-15	47.6	99.4	28.49	0.04	90.62	0.11
9	33.840	3.21E-02	1.30E-02	8.10E-05	4.95E-03	4.95E-05	4.89E-04	3.01E-05	6.28E-15	71.3	99.5	33.69	0.03	106.66	0.10
10	40.105	3.19E-02	1.32E-02	7.32E-05	4.95E-03	4.95E-05	5.87E-04	2.95E-05	6.93E-15	97.4	99.5	39.92	0.03	125.73	0.10
11	44.053	8.61E-02	1.42E-02	2.57E-04	4.95E-03	4.95E-05	2.11E-03	2.94E-04	6.78E-16	100.0	98.0	43.42	0.12	136.32	0.37
K2 (V16052A) Muscovite															
1	42.636	4.30E-01	4.75E-02	3.75E-03	4.95E-03	4.95E-05	4.99E-02	6.00E-03	4.15E-17	0.5	60.4	27.74	1.84	88.57	5.74
2	44.555	2.24E-01	2.01E-02	1.24E-03	4.95E-03	4.95E-05	1.49E-02	3.21E-03	8.34E-17	1.4	86.9	40.11	0.98	126.70	3.00
3	49.892	2.87E-01	1.31E-02	1.45E-03	4.95E-03	4.95E-05	1.41E-02	1.79E-03	1.60E-16	3.3	90.0	45.67	0.61	143.60	1.83
4	52.938	2.40E-01	1.37E-02	5.72E-04	4.95E-03	4.95E-05	9.12E-03	1.02E-03	2.24E-16	5.9	93.8	50.21	0.39	157.26	1.17
5	56.872	2.07E-01	1.34E-02	5.11E-04	4.95E-03	4.95E-05	4.96E-03	7.95E-04	2.83E-16	9.1	96.6	55.38	0.31	172.71	0.94
6	62.278	1.83E-01	1.29E-02	3.12E-04	4.95E-03	4.95E-05	5.92E-03	5.97E-04	3.76E-16	13.5	96.6	60.51	0.26	187.88	0.75
7	74.045	1.11E-01	1.36E-02	1.44E-04	4.95E-03	4.95E-05	4.27E-03	1.45E-04	1.67E-15	32.8	98.2	72.76	0.12	223.67	0.34
8	68.062	1.14E-01	1.29E-02	1.32E-04	4.95E-03	4.95E-05	2.18E-03	1.18E-04	1.83E-15	53.9	98.9	67.40	0.12	208.11	0.35
9	63.881	1.64E-01	1.27E-02	2.42E-04	4.95E-03	4.95E-05	2.93E-03	3.73E-04	6.10E-16	61.0	98.3	63.00	0.20	195.22	0.58
10	65.683	1.40E-01	1.36E-02	2.54E-04	4.95E-03	4.95E-05	4.18E-03	3.25E-04	7.22E-16	69.3	97.8	64.43	0.17	199.41	0.50
11	68.922	1.28E-01	1.34E-02	1.50E-04	4.95E-03	4.95E-05	3.19E-03	1.77E-04	1.32E-15	84.6	98.5	67.96	0.14	209.74	0.40
12	74.222	7.61E-02	1.32E-02	1.68E-04	4.95E-03	4.95E-05	2.69E-03	1.69E-04	1.33E-15	100.0	98.8	73.41	0.09	225.55	0.26

Procedural Blank (mol)[2]

^{40}Ar	^{39}Ar	^{38}Ar	^{37}Ar	^{36}Ar
8.71E-17	5.39E-19	5.52E-19	2.69E-18	1.99E-18

Procedural Blank (mol)[2]

^{40}Ar	^{39}Ar	^{38}Ar	^{37}Ar	^{36}Ar
1.20E-16	1.08E-18	5.19E-19	2.48E-18	2.28E-18

Procedural Blank (mol)[2]

^{40}Ar	^{39}Ar	^{38}Ar	^{37}Ar	^{36}Ar
1.00E-16	8.17E-19	7.38E-19	2.79E-18	2.30E-18

Atmospheric Argon, Radioactive Decay, & Flux Monitor Constants

$^{40}Ar/^{36}Ar$	^{40}K (Ma^{-1})	Monitor	Age (Ma)	Irradiation	Days
298.57	0.000555	FCS	28.02	4.29E+04	331

Irradiation Constants

J-Factor	± 1 s.d.	$^{40}Ar/^{39}Ar_K$	$^{38}Ar/^{39}Ar_K$	$^{36}Ar/^{37}Ar_{Ca}$	$^{39}Ar/^{37}Ar_{Ca}$
1.81E-03	1.55E-05	6.88E-03	1.27E-02	2.95E-04	6.81E-04

[1]Raw data corrected for MS baselines; IC deadtime; mass discrimination; procedural blank; & radioactive decay
[2]Normalized to 100% gas delivery to the Mass Spectrometer
[3]Corrected for nuclear interferences & atmospheric Ar; only measurement errors (±1 s.d.) are included.