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Supporting Information for

The Effect of Mars-relevant Soil Analogs on the Water Uptake of Magnesium Perchlorate and Implications for the Near-Surface of Mars

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Introduction

The following 2 Figures and 1 Table are supplementary information that has been mentioned in the main manuscript text.

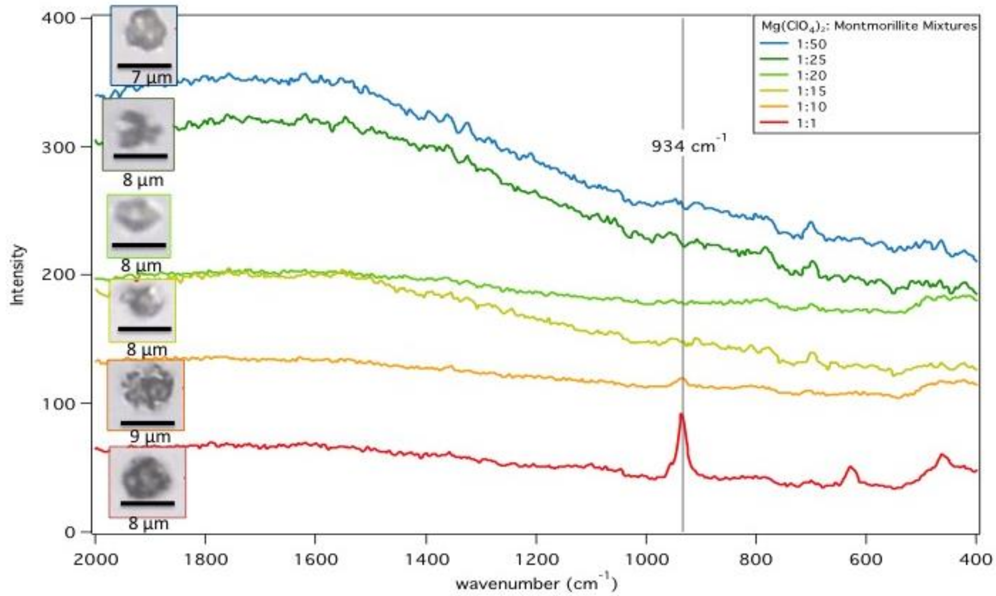

Figure S1. Raman spectra of the perchlorate region (934 cm^{-1}) of magnesium perchlorate and montmorillonite mixtures. The range is from 1:1 to 1:50 magnesium perchlorate: montmorillonite. The spectra show that the perchlorate peak is the strongest in the 1:1 mixture and completely disappears at 1:10, thus the reason for choosing a 1:1 mixture of salt to mineral.

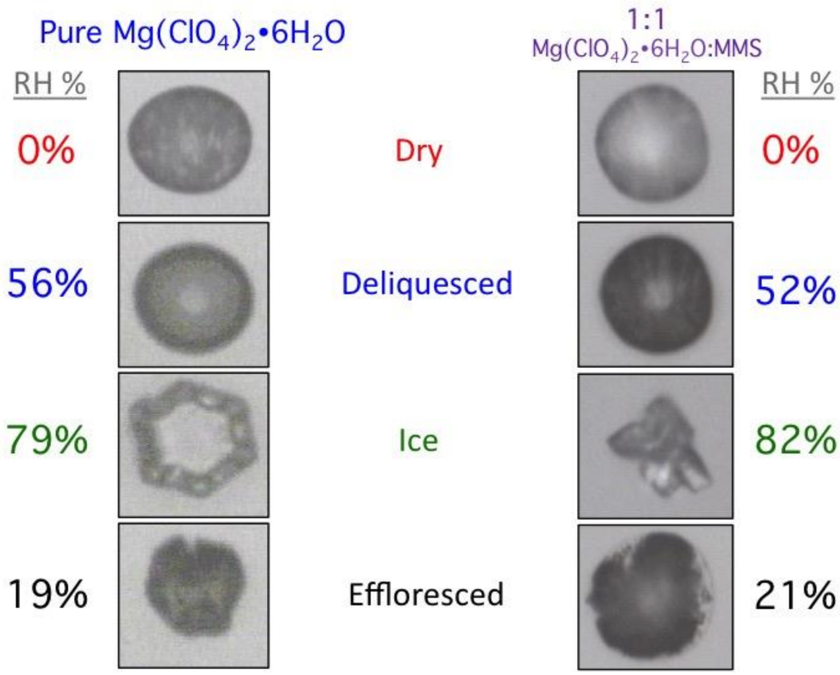

Figure S2. Optical images of pure $Mg(ClO_4)_2$•$6H_2O$ undergoing phase transitions (left) compared to images of the same phase transitions for the mixture of 1:1 $Mg(ClO_4)_2$•$6H_2O$: MMS (right). Although Raman spectra was unable to be obtained due to laser absorption of MMS, the following images show the visual changes while the mixture particle took up and released water. These images were taken where 25°C ≥ T ≥ -53°C.

Table S1. Complete data set of DRH, ERH, and ice formation RH of pure $Mg(ClO_4)_2•6H_2O$, 1:1 $Mg(ClO_4)_2•6H_2O$: montmorillonite, and 1:1 $Mg(ClO_4)_2•6H_2O$:MMS.

1:1 Mg(ClO4)2:Mont.			
	T(K)	% RH of Ice formation	S_{ice}
	255.6 ± 0.1	101.4 ± 0.5	1.20 ± 0.01
	246.5 ± 1.7	99.9 ± 1.1	1.30 ± 0.01
	233.4 ± 1.7	89.7 ± 4.5	1.32 ± 0.05
	224.9 ± 0.6	81.2 ± 2.9	1.28 ± 0.03
	214.1 ± 1.5	89.3 ± 1.2	1.53 ± 0.01
	T(K)	DRH	
	265.0 ± 0.5	46.7 ± 0.5	
	252.3 ± 0.6	49.4 ± 0.6	
	245.0 ± 0.4	49.9 ± 0.9	
	232.1 ± 0.3	55.8 ± 1.1	
	222.4 ± 1.0	61.5 ± 5.1	
	T(K)	ERH	
	273.7 ± 0.8	24.4 ± 0.7	
	262.5 ± 0.6	21.0 ± 1.0	
	254.3 ± 1.5	22.9 ± 1.8	
	243.2 ± 1.0	21.0 ± 0.6	
1:1 Mg(ClO4)2:MMS			
	T(K)	% RH of Ice formation	S_{ice}
	256.6 ± 1.4	96.1 ± 3.3	1.13 ± 0.03
	241.2 ± 1.6	95.3 ± 1.6	1.30 ± 0.02
	223.8 ± 2.2	82.4 ± 1.9	1.31 ± 0.02
	T(K)	DRH	
	266.8 ± 0.7	42.0 ± 0.4	
	249.1 ± 2.0	46.2 ± 0.8	
	227.0 ± 2.8	54.4 ± 2.5	
	T(K)	ERH	
	277.0 ± 0.2	20.0 ± 1.1	
	258.8 ± 2.5	21.4 ± 1.6	
	237.2 ± 2.2	22.2 ± 0.7	