

Supplement of Solid Earth, 12, 389–404, 2021
<https://doi.org/10.5194/se-12-389-2021-supplement>
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Supplement of

Quartz dissolution associated with magnesium silicate hydrate cement precipitation

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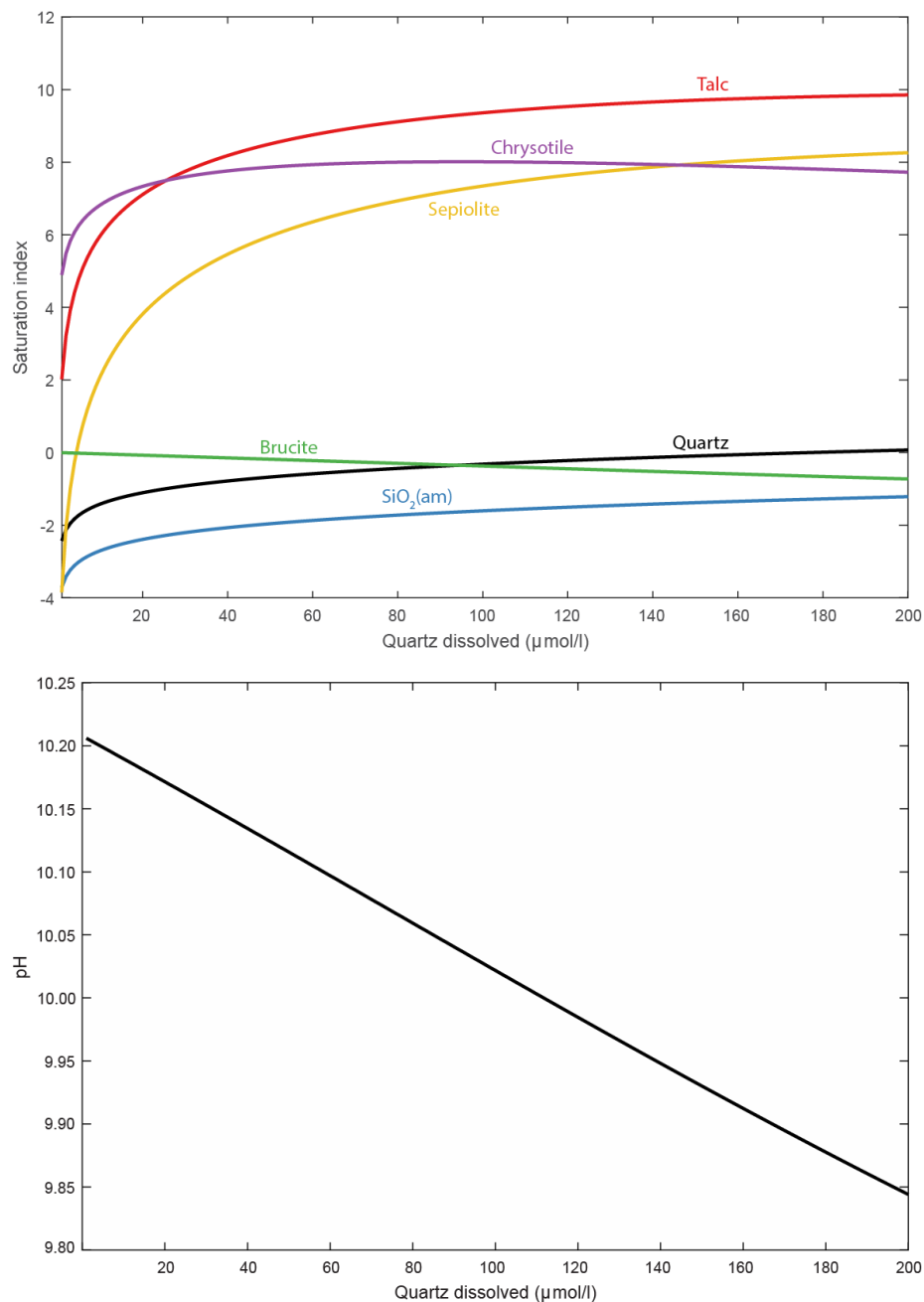


Figure S1. PHREEQC calculations showing the development of a solution in which quartz dissolves until equilibrium. The initial solution is in equilibrium with brucite. The results show that the saturation index of sepiolite ($\text{Mg}_4\text{Si}_6\text{O}_{15}(\text{OH})_2 \cdot 6\text{H}_2\text{O}$), talc ($\text{Mg}_3\text{Si}_4\text{O}_{10}(\text{OH})_2$) and chrysotile ($\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_4$) is above 0 after very little quartz has been dissolved, and that the solution is thus supersaturated with respect to these phases. The saturation index of brucite ($\text{Mg}(\text{OH})_2$) and amorphous silica stays below 0. The pH of the solution decreases gradually during quartz dissolution.

Table S1. Composition of till from frost-boil at the Feragen Ultramafic Body (FER18/15 and 19/15) and nearby M-S-H cemented rock (FER21/15). Data is obtained by whole rock geochemical analysis.

	FER18/15	FER19/15	FER21/15
SiO ₂	87.72	89.58	72.81
Al ₂ O ₃	4.48	4.23	4.25
Fe ₂ O ₃ (T)	1.54	1.42	1.01
MnO	0.02	0.02	0.01
MgO	0.79	0.63	9.98
CaO	0.26	0.30	0.24
Na ₂ O	0.69	0.70	0.56
K ₂ O	2.11	1.99	1.90
TiO ₂	0.20	0.21	0.16
P ₂ O ₅	0.04	0.03	0.03
LOI	0.70	0.52	9.40
Total	98.55	99.61	100.4