

Electronic Supplementary Information

Impact of citrate ions on the nucleation and growth of anhydrous CaCO_3

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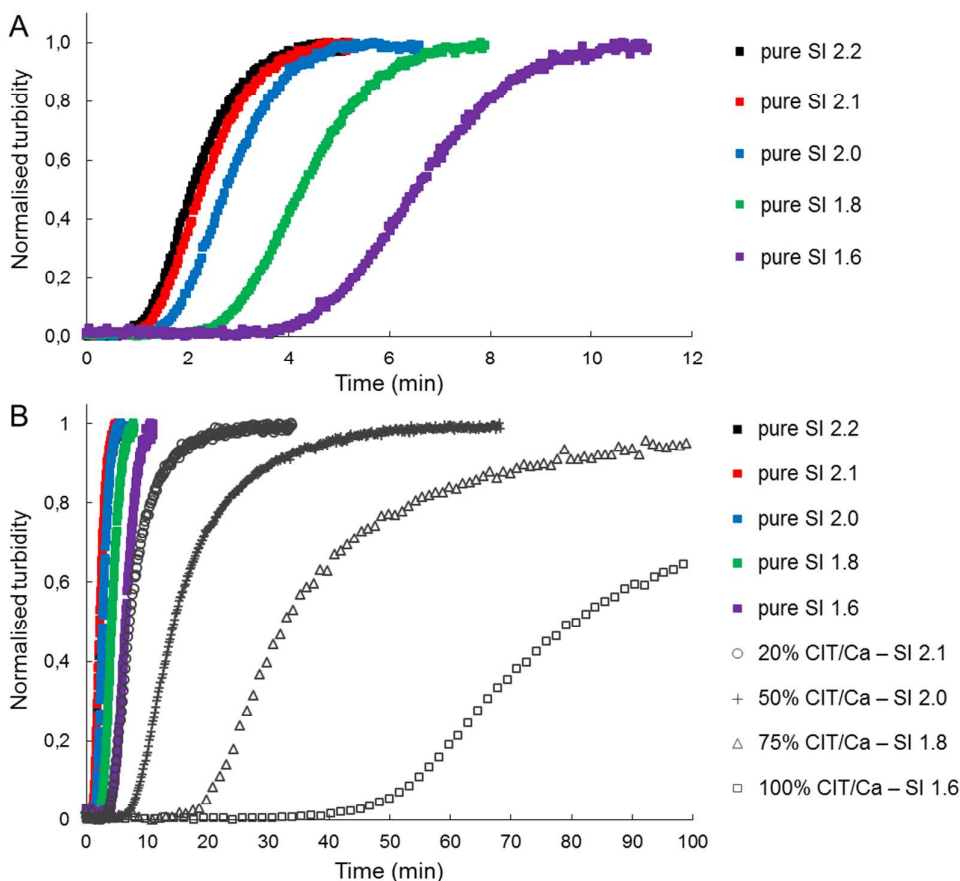


Figure S1: CaCO_3 crystallization experiments monitored with UV-vis spectrophotometry. A) Normalized turbidity is plotted as a function of time and saturation index (SI) in pure CaCO_3 experiments, where SI was lowered by reducing initial $[\text{Ca}^{2+}]$ from 2 to 0.375 mM, while keeping $[\text{CO}_3^{2-}]$ constant at 2 mM. B) Comparison of turbidity profiles from pure and CIT containing CaCO_3 crystallisation experiments with identical SI values.

Table S2: Comparison of JMAK parameters between pure and CIT containing CaCO_3 crystallisation experiments with identical SI values.

Experiment	[Ca] (mM) ¹	CIT/Ca (%)	SI	JMAK model fit	
				t_{ind} (min) ²	k (s ⁻¹) ³
Pure SI 2.2	2	0	2.2	0.5	1.06
Pure SI 2.1	1.6	0	2.1	0.9	0.97
Pure SI 2.0	1.1	0	2.0	1.0	0.9
Pure SI 1.8	0.63	0	1.8	1.6	0.7
Pure SI 1.6	0.38	0	1.6	3.1	0.53
20% CIT/Ca	2	20	2.1	2.2	0.23
50% CIT/Ca	2	50	2.0	3.9	0.11
75% CIT/Ca	2	75	1.8	10	0.05
100% CIT/Ca	2	100	1.6	27	0.02

¹Initial $[\text{CO}_3] = 2$ mM in all experiments.

²Extracted from JMAK n=4 model fit.

³Extracted from JMAK n=1 model fit.

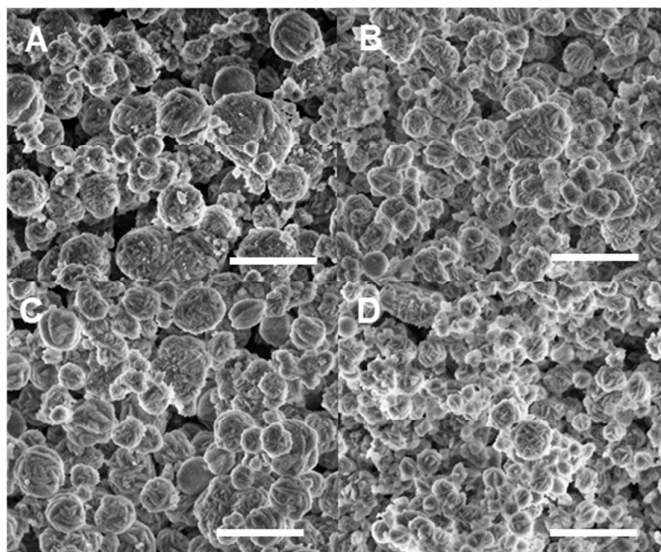


Figure S3: SEM images of CaCO_3 formed in the various turbidity experiments, when turbidity reached a plateau, with SI being A) 2.2, B) 2.0, C) 1.8, and D) 1.6 (in the absence of any citrate). Scale bar is 4 μm.