Barium sulfate crystallization in non-aqueous solvent - Supporting Information

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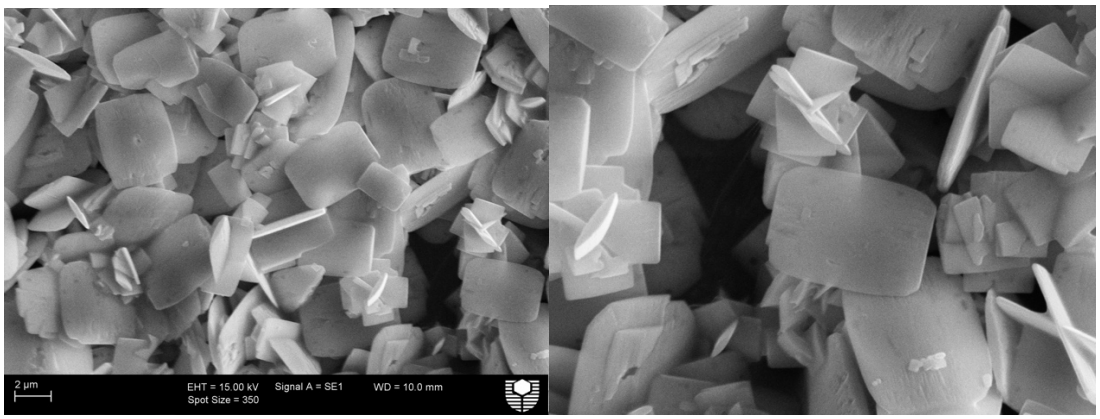
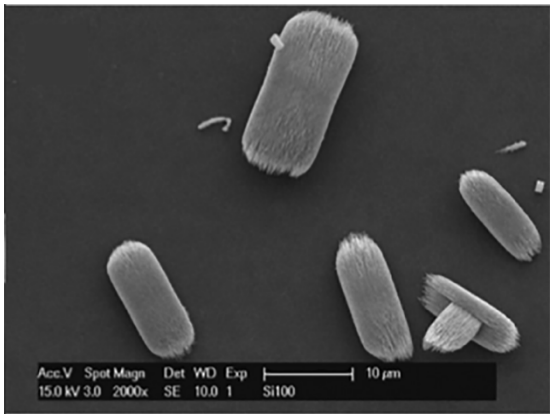
SFig 1. SEM images of barium sulfate particles formed in the presence of sulfuric acid in water

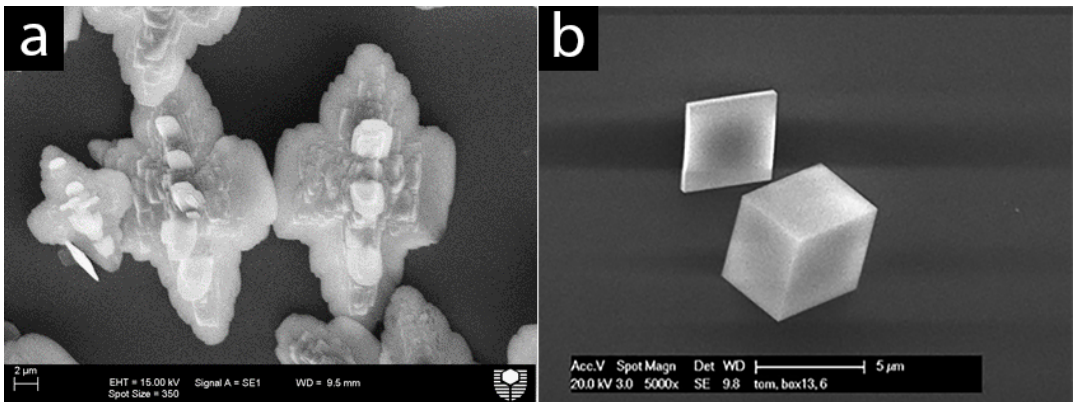


SFig 2. SEM image of barium sulfate particles formed in the presence of silicate at pH 10. (with permission from Jones *et al.* 2012*)*



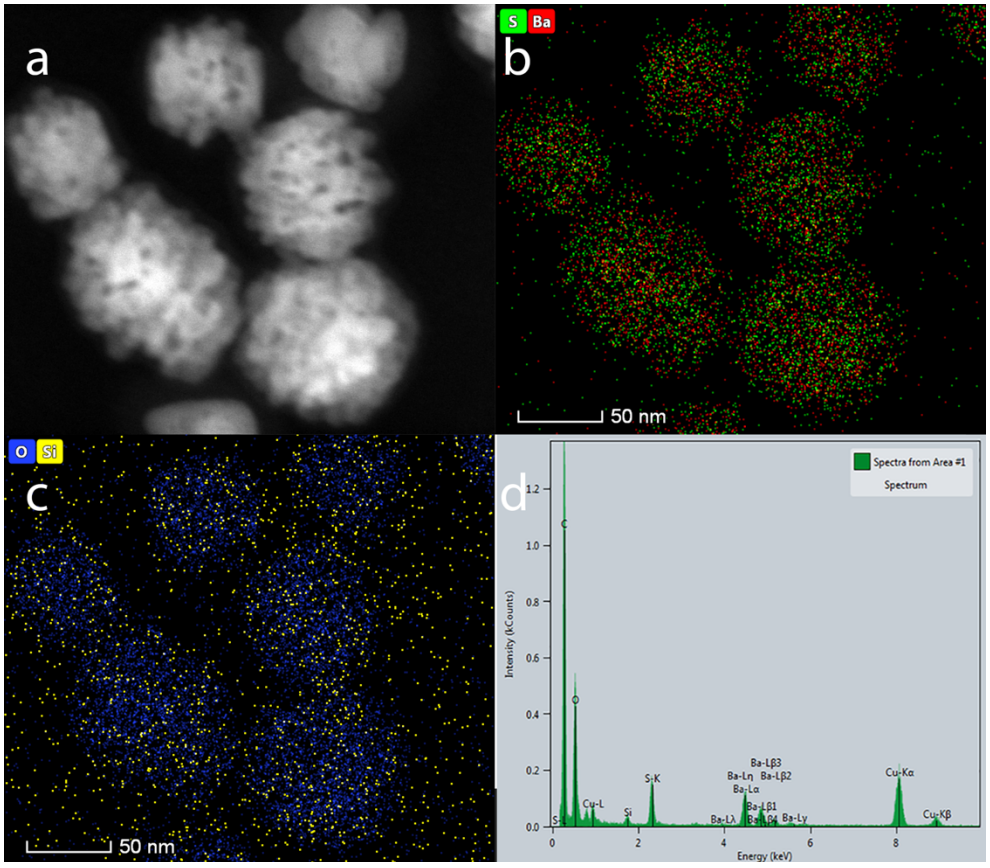
Jones, F.; Radomirovic, T.; Ogden, M. I. Effect of Solution Silicate on the Precipitation of Barium Sulfate. *Cryst. Growth Des.* **2012**, *12* (6), 3057–3065. https://doi.org/10.1021/cg300263f.

SFig 3. SEM image of barium sulfate morphology of (a) dendritic form[#] and (b) diamond-shape morphology

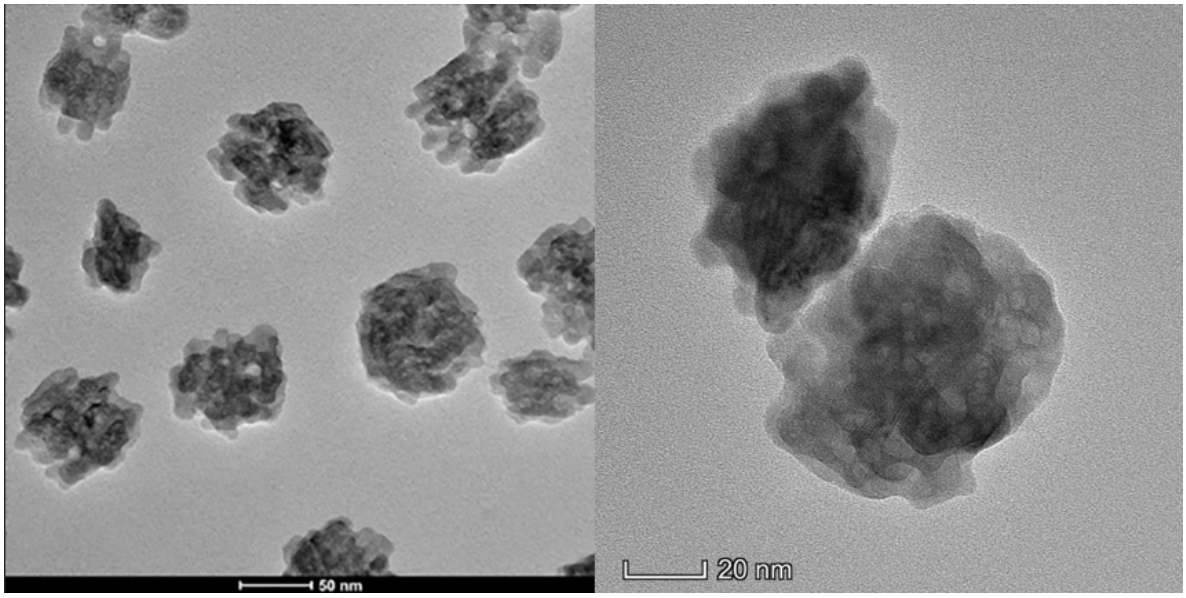


reproduced with permission from Matthew Boon and Franca Jones "Barium Sulfate Crystallization from Synthetic Seawater", *Cryst. Growth Des.* 2016, **16**, 4646−4657. DOI: 10.1021/acs.cgd.6b00729

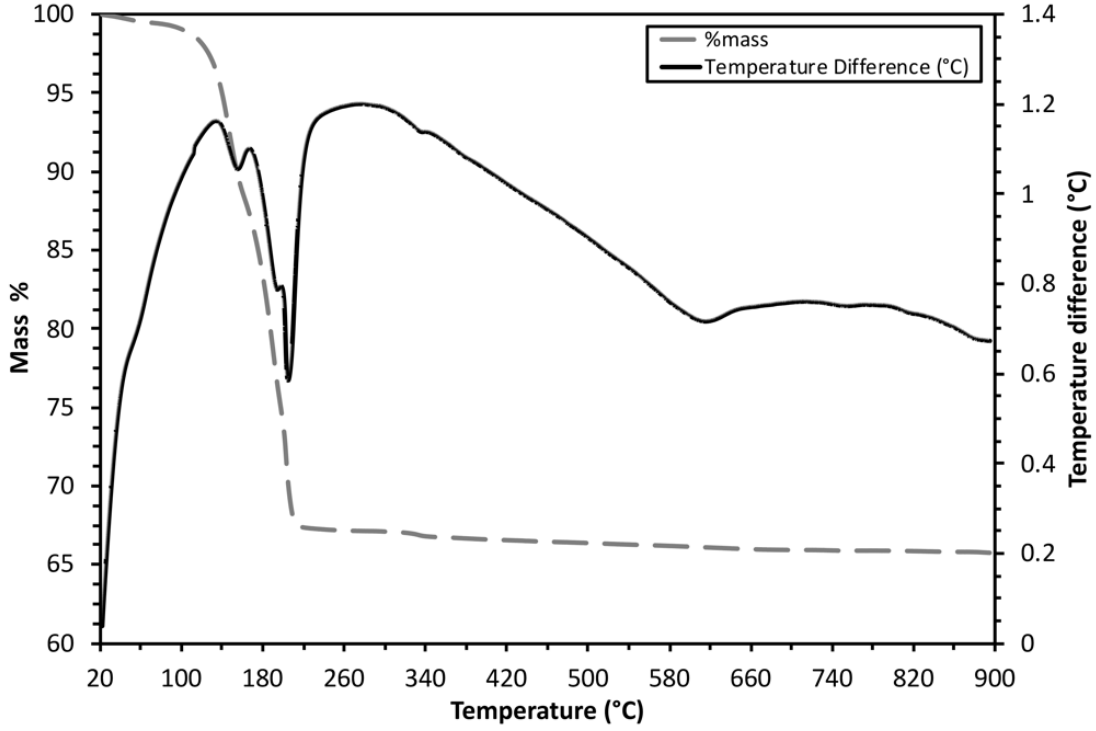
SFig. 4 EDX mapping of particles formed in low silica DMSO (The residual silica observed is believed to be a contaminant of the TEM grid.)



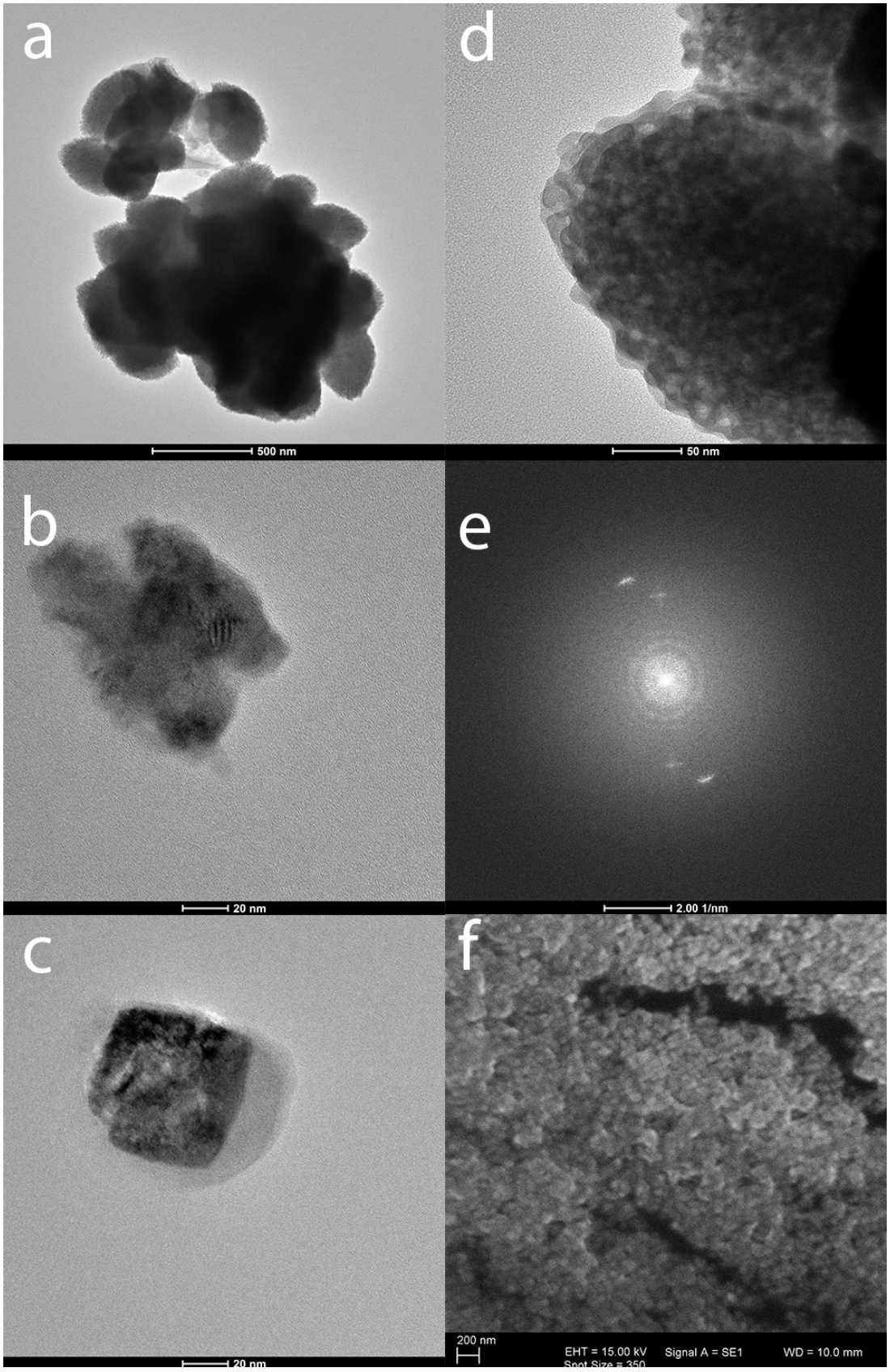
SFig. 5 TEM images of $BaSO_4$ morphology found in the absence of silica



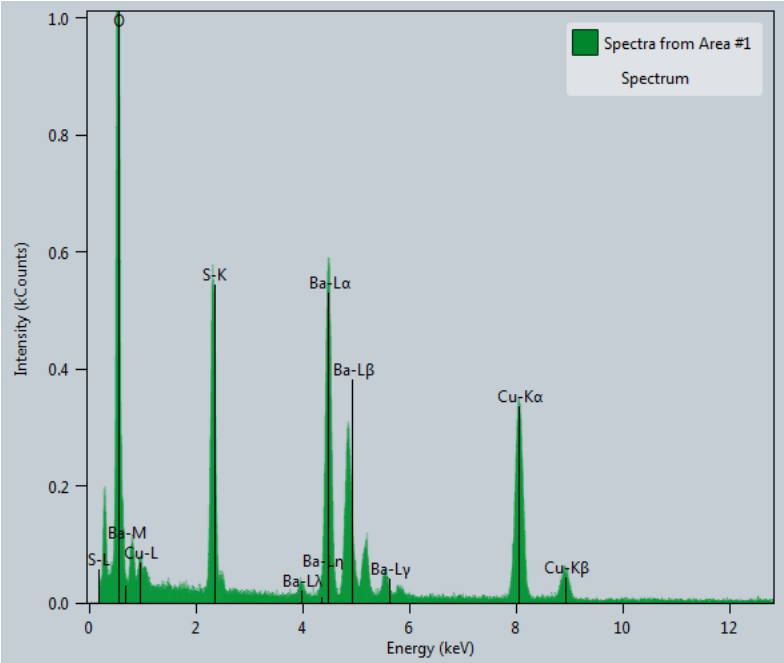
SFig. 6 TGA of particles formed in DMSO



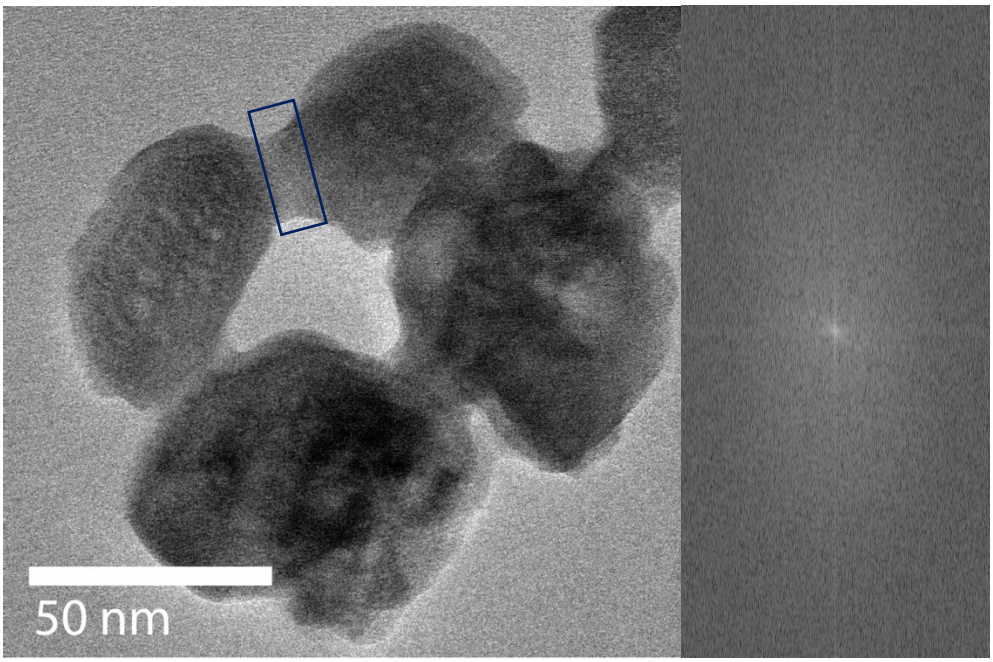
SFig. 7 TEM images of $BaSO_4$ formed in DMSO (a, d, e 1 mM initial [Ba^{2+}]). FFT is of area shown in d. Individual particles found (b, c). f) SEM image of $BaSO_4$ formed at 30mM initial [Ba^{2+}]



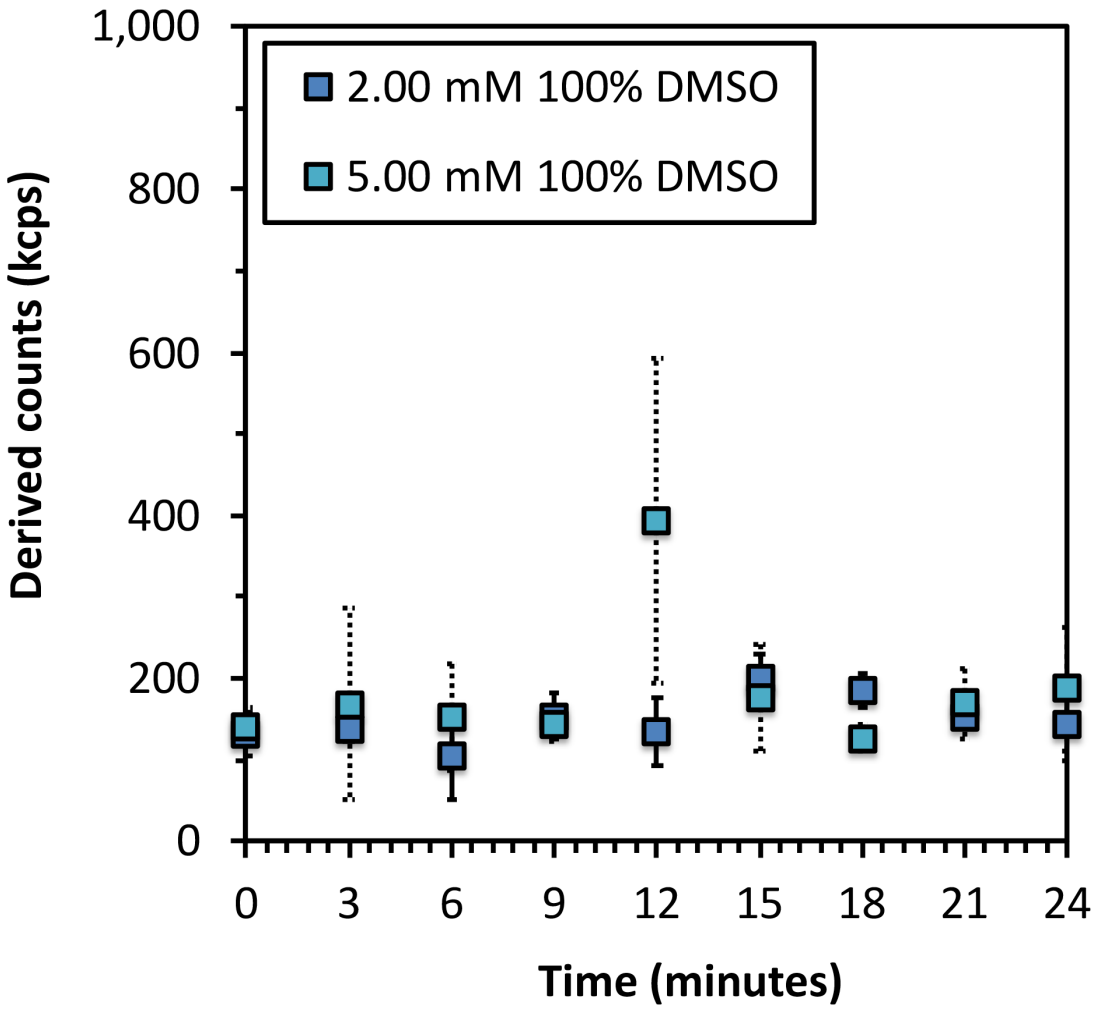
SFig 8. EDX spectrum of solids formed in DMSO (1 mM initial [Ba^{2+}])



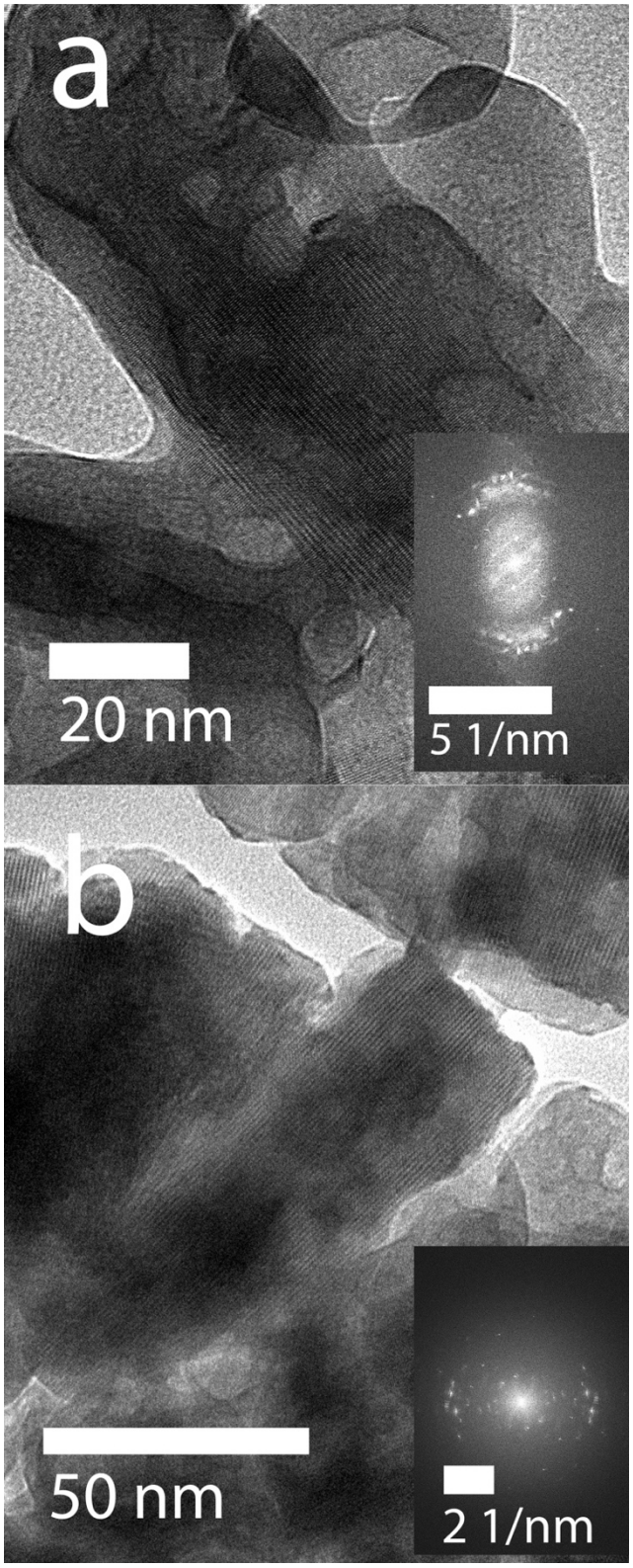
SFig. 9 Amorphous material in neck of agglomerated particle on addition of water (FFT of area shown by blue box)



SFig. 10 DLS graph showing nucleation behavior of BaSO4 formation at 2 and 5 mM but with Ba nitrate in DMSO not water



SFig. 11 Close up of particles formed in the presence of (a) 60% (FFT of area shown) and (b) 80% water (FFT of whole particle shown in Figure 10).



SFig 12. TEM of particles formed in 100±1% DMSO