

Incorporation of organic molecules into calcite crystals: a kinetic or thermodynamic driven process?

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Organic molecules regulate the process of biomineralization and enable to tune various physical properties of biominerals to a specific function. This process is the source of inspiration to the study we will present on the incorporation of single amino acids into calcite. It has previously been observed that amino acids can get incorporated into single crystals of calcite¹. It was also shown that the higher the amino acids occlusion concentration, the harder do the calcite host crystals get².

Here we take this study one step forward and try to answer the question if the incorporation of amino acids is kinetically driven or also thermodynamically. We utilize synchrotron high-resolution powder diffraction and amino acid analysis among other state-of-the-art techniques to answer this question.

[1] Borukhin et al. (2012) *Adv Funct* **22**, 4216-4224

[2] Kim et al. (2016) *Nature Mater.* **15**, 903-912