Morphology changes caused by seawater ions in templated calcite crystals.\(^1\) BENJAMIN STRIPE, AHMET UYSAL, PULAK DUTTA, Northwestern University — It has been shown that the presence of Mg in ratios approximately equal to those found in seawater, during the organic-monolayer-templated nucleation of CaCO\(_3\), significantly changes the morphology of the nucleating crystals. Crystals nucleated from supersaturated subphases of CaCO\(_3\) under floating arachidic sulfate monolayers grow as (001) oriented tetragonal pyramids [1]. We have found that crystals nucleating under arachidic sulfate from supersaturated solutions of CaCO\(_3\) containing approximately 5:1 Mg:CaCO\(_3\) grow as (001) hexagonal prisms, which express (100) or (110) faces. The crystal-water surface energy of these faces is almost twice that of the (104) face expressed on the tetragonal pyramids [2]. The growth of two morphologies displaying different surfaces but the same (001) orientation suggests that epitaxy, when present, plays a larger role than surface energetics alone. Our studies of Mg-concentration-dependent changes in morphology will also be presented.


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