

Various CaCO_3 crystal morphologies by dropping aspartic acid and sodium carbonate into calcium chloride solution

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Dropping solution methods, in which aspartic acid (Asp) and sodium carbonate solution are mixed with calcium chloride solution, were used to study the biomineralization of calcium carbonate. Morphology and growth of crystals were varied by changing dropping velocity of Asp or Na_2CO_3 solution into CaCl_2 solution. The ratio of calcite and vaterite crystals was observed in accordance with the reaction time.

CaCO_3 crystals were analyzed by X-ray Diffraction (XRD), Field Emission Scanning Electron Microscope (FE-SEM) and Fourier Transform Infrared Spectrometry (FT-IR). XRD was used to select the intensities and crystal structure of specific calcium carbonate. SEM was employed for the analysis of the morphology of the precipitation and particle size. Two kinds of crystals were identified by FT-IR spectrum. Vaterite morphologies were affected by the Asp in the crystallization solution. Excess amount of Asp induced vaterite morphologies. Various morphologies of CaCO_3 were made by changing dropping velocity of Asp and Na_2CO_3 solutions.