Supporting Information Available.

Additives-dependent morphogenesis of oriented calcite crystals on mica

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Experimental

Firstly, a vial containing a 10 mM $CaCl_2$ (Sigma, anhydrous, > 96%) solution was placed in a desiccator along with a dish containing 5 g ammonium carbonate powder and the desiccator was closed. 20 min later, a new cleavage mica facing down was placed on top of the $CaCl_2$ solution. Calcium carbonate crystals were deposited onto the mica by slow diffusion of the CO_2 produced by decomposition of the ammonium carbonate at room temperature. The deposition time was 2 h. After deposition, the substrate was rinsed with water and dried using nitrogen gas. The time when mica was introduced and the deposition time was different from the experiment published in Langmuir[1] for preparing amorphous calcium carbonate hemispheres on mica. When sodium poly (vinyl sulfonate) (PVS, Aldrich, 25 wt. % solution in water) and poly (acrylic acid) (PAA, Aldrich, M_w 2000) were used as additives, the additives with various concentration were mixed with 10 mM $CaCl_2$ solution before experiment. The other steps for the use of the additives were the same as described above. The resulting crystals were observed using optical microscope (Zeiss) and field emission scanning electron microscope (Hitachi S-4200). X-ray diffraction experiment was performed on MAC science M18XHF.

1 Xu, X.R.; Han, J.T.; Cho, K. *Langmuir*, **2005**, *21*, 4801.