

Morphological Control of Calcium Oxalate by Hydrophilic Block Copolymers

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Biom mineralization processes have attracted considerable attention due to their importance in life sciences, especially with respect to pathological effects[1]. On the aspect of biom mineralization, it is of interest to study the crystallization of calcium oxalate monohydrate (COM), because COM crystals have been known as a possible source of urinary and kidney stones[2]. Previous works have shown that the significant influence of urinary macromolecules on calcium oxalate crystallization[3]. Both inhibition and promotion of crystal growth and crystal aggregation by these biopolymers has been reported [4]. An understanding of biological solid-state interactions would be of immense value in many areas.

In this study, we prepared a range of acrylic polymers with different architectures to explore their relative effectiveness in inhibiting crystal growth of calcium oxalate. We investigated the effect of polymers on the particle size, morphology and precipitation of crystals. The presence of copolymers inhibited the crystal growth of calcium oxalate possibly through adsorption onto the active growth sites for crystal growth due to the charge and hydrophilic effects.

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