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### Special Patterns of Calcium Oxalate Monohydrate Crystals Induced by Defective Langmuir-Blodgett Film

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中文摘要:

英文摘要:

A special pattern of calcium oxalate monohydrate (COM) crystals was induced by DPPC Langmuir-Blodgett films with defects. The pattern was that a large hexagonal COM crystal located in the middle of a ring-shaped pattern of needle-like crystals. The number of such special patterns with a diameter between 10  $\mu\text{m}$  and 40  $\mu\text{m}$  accounted for about 5% of the whole crystal patterns. It is due to the "islands" composed of aggregated film-forming molecules in the middle of the liquid-condensed domains. The effects of the concentration of potassium oxalate and the growth time on the crystal patterns were studied. When the concentration of potassium oxalate ( $\text{C}_{\text{K}_2\text{C}_2\text{O}_4}$ ) was 0.6  $\text{mmol} \cdot \text{L}^{-1}$ , the needle-like COM crystals on the rings grew towards inside part of the patterns as the induced-time increased from 1 h to 4 h. After 2 h, the solid circle patterns were formed. On the other hand, the size of the hexagonal COM crystal in the middle of the pattern increased. The size of the COM crystals on the rings were about 3  $\mu\text{m} \times 2 \mu\text{m}$ , and that of three-dimensional COM crystals in the middle of the patterns were about 16  $\mu\text{m} \times 7 \mu\text{m} \times 6 \mu\text{m}$  after 4 h. However, when  $\text{C}_{\text{K}_2\text{C}_2\text{O}_4}$  was increased to 5.0  $\text{mmol} \cdot \text{L}^{-1}$ , there was only a large COM crystal grown in the middle of the circular COM crystallites no matter 1 h or 4 h of crystal growth, and the ratio of these special COM patterns increased. It can be explained that the interaction between oxalate and DPPC molecules is enhanced as the increase of  $\text{C}_{\text{K}_2\text{C}_2\text{O}_4}$ , so more and more DPPC molecules fled away from the substrate surface, resulting in decrease of the nucleating sites in the circle.

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