

From Unraveling Crystal Growth Strategies in Nature to Their Implementation in Synthetic Systems

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Crystals produced by organisms, in contrast to synthetic materials, must be formed under ambient conditions and from a limited selection of elements. Although these crystals serve specific functions, usually in an extraordinarily apposite manner, the specific materials used are not the ones that engineers would select. Nevertheless, living organisms demonstrate elegant strategies for creating various crystals with specific functions.

In this talk I will present several of these identified fascinating strategies. Two examples will include the incorporation of biological molecules into the inorganic crystal lattices [1-2] and the toughening of ceramic crystals by compressive stresses caused by inhomogeneous distribution of various inorganic impurities within single crystals [3-4].

In addition, I will show how we are emulating these specific strategies biomimetically to synthetically grow crystals exhibiting new properties and characteristics such as optical [5-7] and magnetic [8].

References

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