

Abstract Submitted
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**Interface-Limited Spherulitic
Growth of Hydroxyapatite/Chondroitin Sulfate Composite Enamel-like
Films¹**

GUOBIN MA, YIFEI XU, XIYAN WANG, MU WANG, National Laboratory of Solid State Microstructures, and Department of Physics, Nanjing University, Nanjing 210093, China — Understanding and mimicking the growth of hard tissues such as tooth enamel may lead to innovative approaches toward engineering novel functional materials and providing new therapeutics. Up to now, in vitro growth of enamel-like materials is still a great challenge, and the microscopic formation mechanisms are far from well understood. Here we report synthesis of large-scale hydroxyapatite (HAP) and chondroitin sulfate (ChS) composite films by an efficient solution-air interface growth method. The products have the characteristic hierarchical prism structures of enamel and the mechanical properties comparable to dentin. We demonstrate that the films are assembled by spherulites nucleated at the solution surface. The growth of the spherulites is limited by the interfaces between them as well as between the solution and air, leading to the ordered prism structure. The results are beneficial for a clearer understanding of the fundamentals of tooth enamel formation.

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