Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supporting Information

Morphological Control of Calcium Phosphates Nanostructures Using Lyotropic Liquid Crystals

*Wenxiao He, Yu Fu, and Martin Andersson**

Department of Chemical and Biological Engineering, Chalmers University of Technology,

Göteborg SE-41296, Sweden.

Materials and Methods

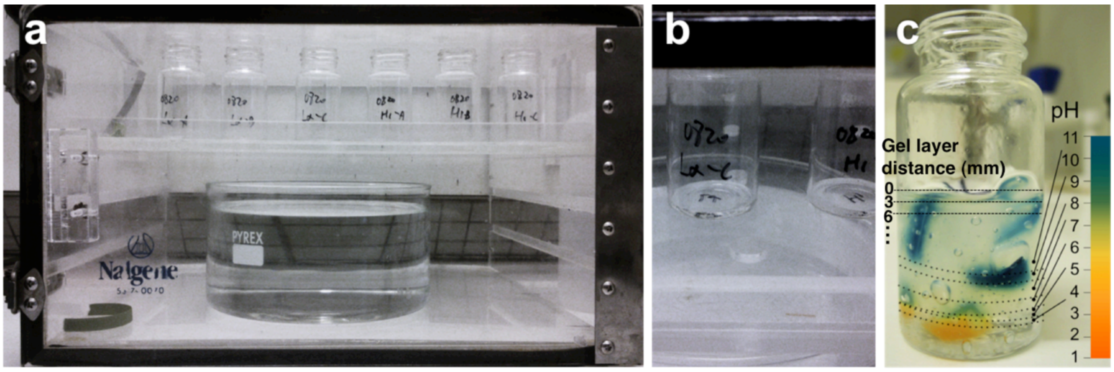


Figure S1. Pictures of the experimental setup. (a) The desiccator cabinet being used to create an enclosed environment, where samples were placed in the upper compartment, and a beaker containing ammonia solution used as a pH regulator was placed in the lower part. (b) A closer view of the upper compartment showing that the evaporated ammonia gas could diffuse through the holes in the board and penetrate into thin gel layers in the glass vials. (c) An example of pH indicator (made of LC gel containing small pieces of pH paper), which was used to follow the pH increase during the synthesis.

Results Section

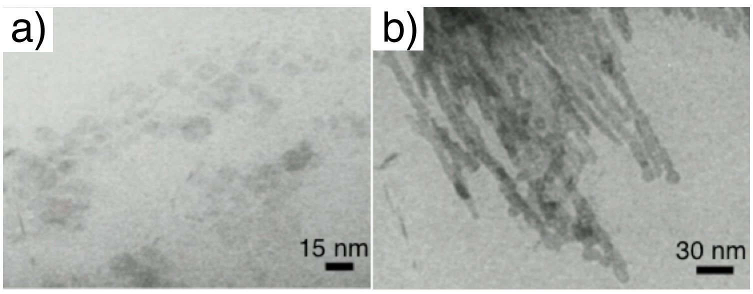


Figure S2. TEM images of CaP particles obtained from H_2 LC gel when collected from 3–6 mm gel layer from upper surface a) after 24 h and b) after 48 h. Gel recipe: L-1 in Table 1. Gel thickness: 3.5–4 cm. Ammonia dose: 300 mL 35 wt% NH_3OH solution.

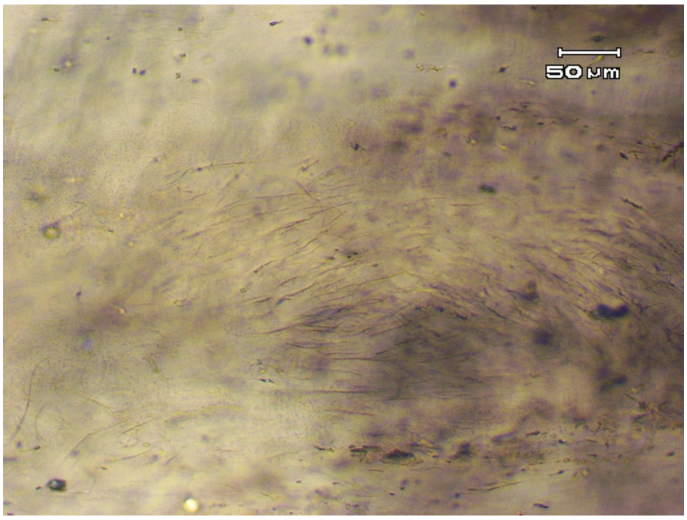


Figure S3. Optical microscopy image of the H_2 LC gel harvested from 3–6 mm layer from upper gel surface after 72 h of reaction (Gel recipe: Table 1 L-1. Gel thickness: 3.5–4 cm. Ammonia dose: 300 mL 35 wt% NH_3OH solution). Note each hair-like feature represents each array of CaP nanowires embedded in the background H_2 LC gel.

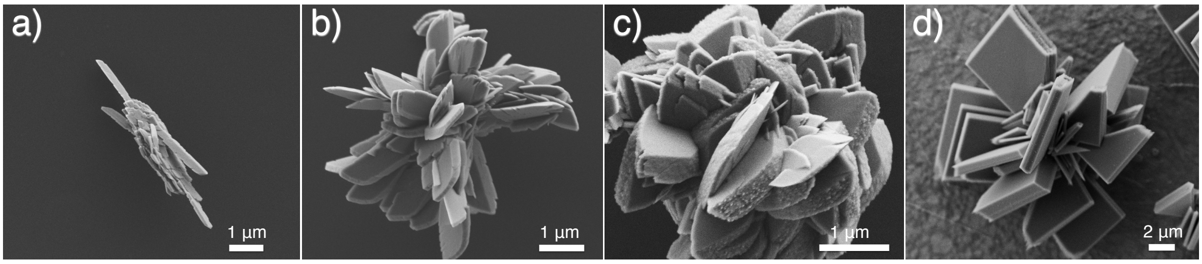
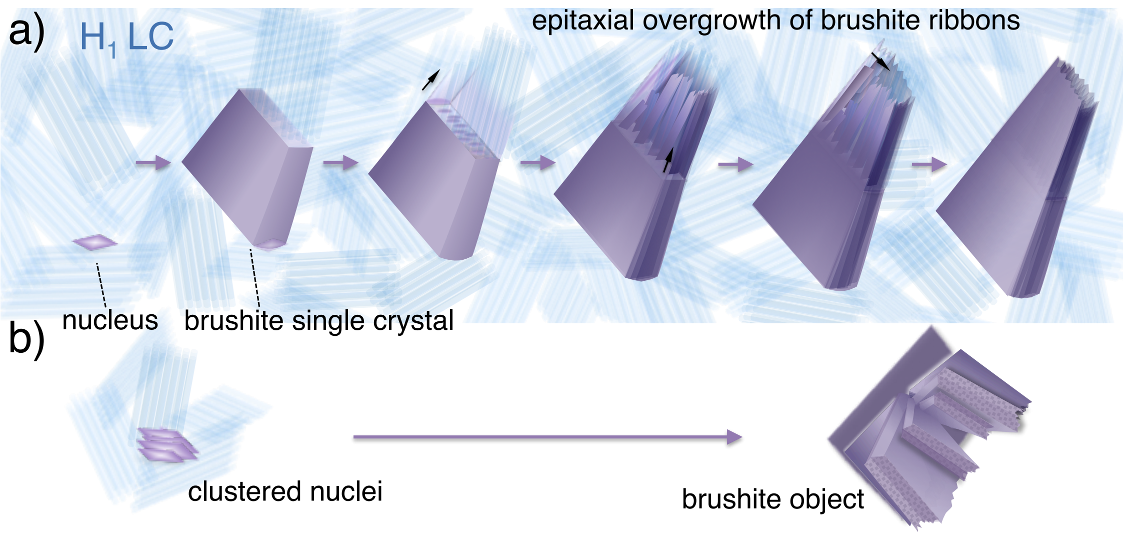


Figure S4. Scanning electron microscopy (SEM) images of the CaP nuclei formed in F127-based H_1 LC after being subjected to sonication bath for a) 10 min, b) 30 min and c) 60 min. d) The CaP nuclei evolved into CaP object with superstructure after 48 h's reaction (Gel recipe: Table 1 F-1. Ammonia dose: 80 mL 35 wt% NH_3OH solution. Collected layer: 12–15 mm gel layer from upper surface).



Scheme S1. Illustration of the proposed epitaxial overgrowth of brushite subunits on brushite single crystal in the presence of H_1 LC. a) brushite brick developed from a nucleus via: firstly growth of brushite single crystal, followed by multiple nucleation on specific facet possibly due to the combination of spatial confinement of the template, decreased supersaturation and increased pH, then followed by overgrowth of brushite subunit; b) brushite superstructure evolved from a cluster of nuclei. The sizes of CaPs and templates etc. are exaggerated for a better illustration.