

# Hollow Calcite Crystals with Complex Morphologies Formed from Amorphous Precursors and Regulated by Surfactant Micellar Structures

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## Electronic Supplementary Information

**Figure SI-1.** (A) SEM image of a sample obtained after 9 h of reaction in the presence of 10 mM CTAB; (B) SEM image of broken rod shaped crystals obtained after 9 h of reaction in the presence of 277 mM CTAB; (C) XRD pattern of a sample collected after 9 h of reaction in the presence of 100 mM CTAB, in accord with the standard pattern of calcite (JCPDS: 47-1743); (D) SEM image of a sample obtained after 9 h of reaction in the absence of CTAB.

**Figure SI-2.** (A) Photograph showing a laser beam path through the mother solution obtained after 4.5 h of reaction in  $\text{NH}_4\text{HCO}_3$  atmosphere (h: height of the solution in a quartz cell); (B) EDX spectrum of the particles formed after 4.5 h of reaction in the atmosphere of  $\text{NH}_4\text{HCO}_3$ .

**Figure SI-3.** The pH drift assay vs. the reaction time at various CTAB concentrations.

**Figure SI-4.** High magnification SEM images: (A, B) Aggregated spherical particles and radiating cluster shaped branches in the presence of 1 mM CTAB after 2 h of reaction, corresponding to Figure 4B. (C) Radiating cluster shaped branches formed in the presence of 5 mM CTAB after 2 h of reaction, corresponding to Figure 4F. (D) Radiating cluster shaped branches formed in the presence of 10 mM CTAB after 2 h of reaction, corresponding to Figure 4J. (E, F) Spherical particles as the core and the radiating spiciform shaped branches obtained in the presence of 100 mM CTAB after 2 h of reaction, corresponding to Figure 4N.

**Figure SI-5.** SEM image of a sample formed after 9 h of reaction in the presence of 10 mM CTAB (A: larger single crystals; B: smaller nanocrystals).

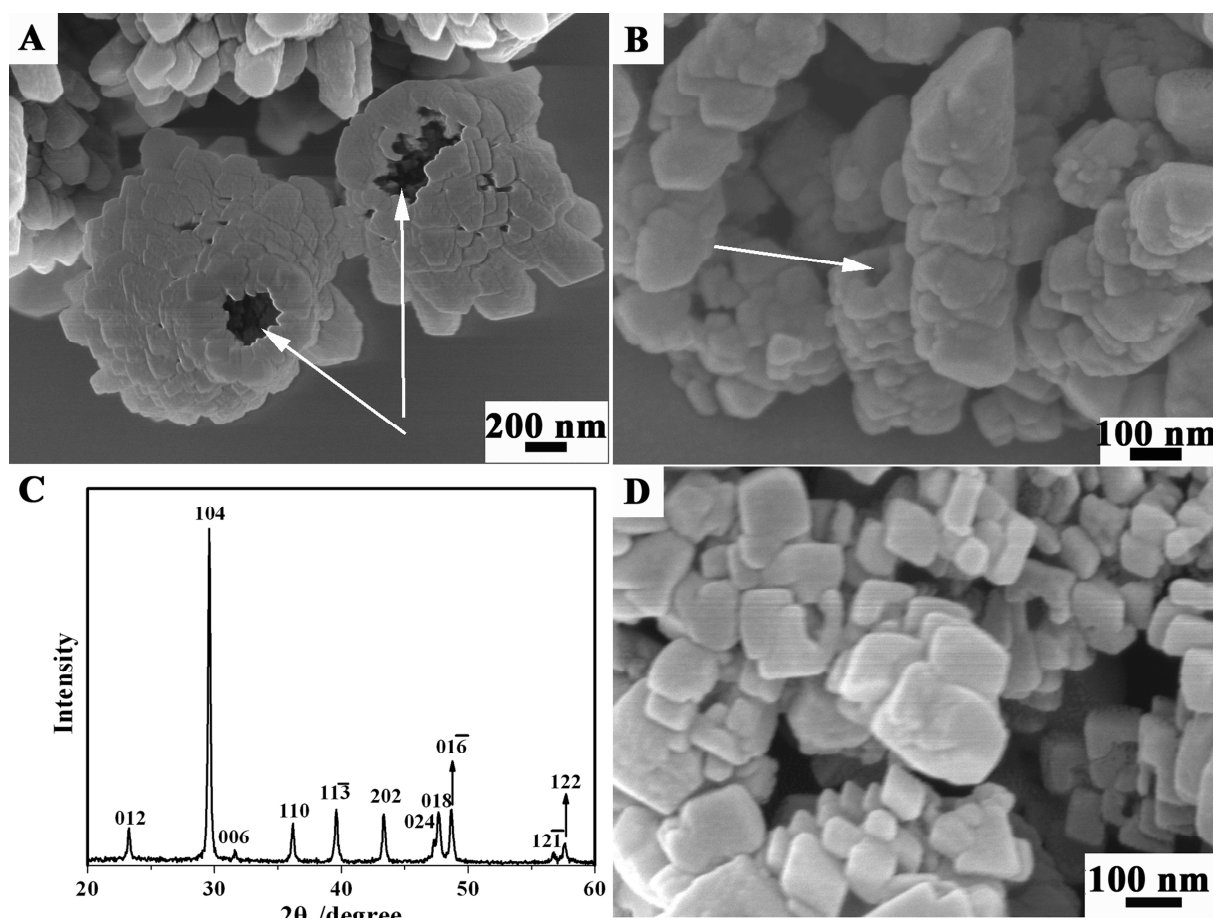
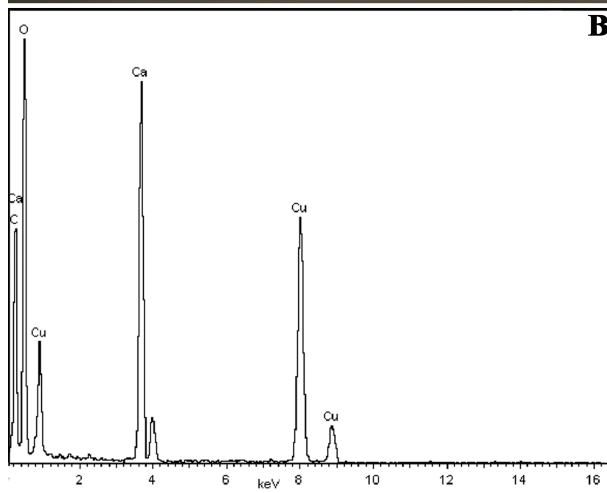
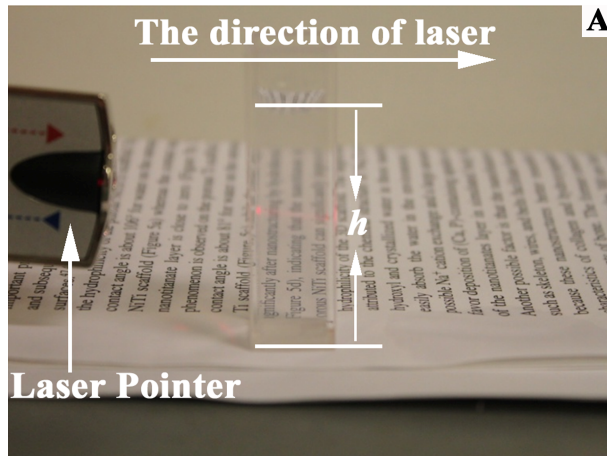
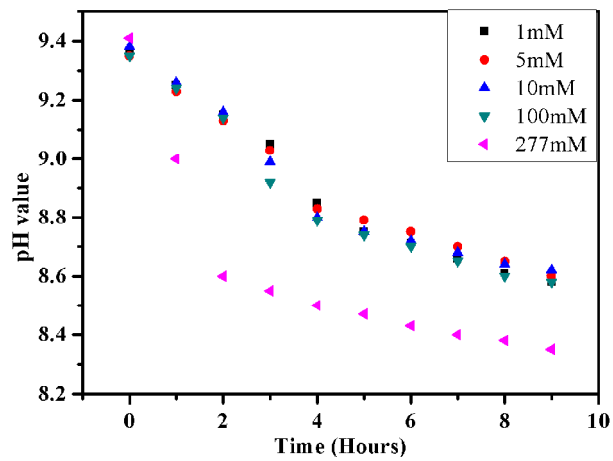


Figure SI-1

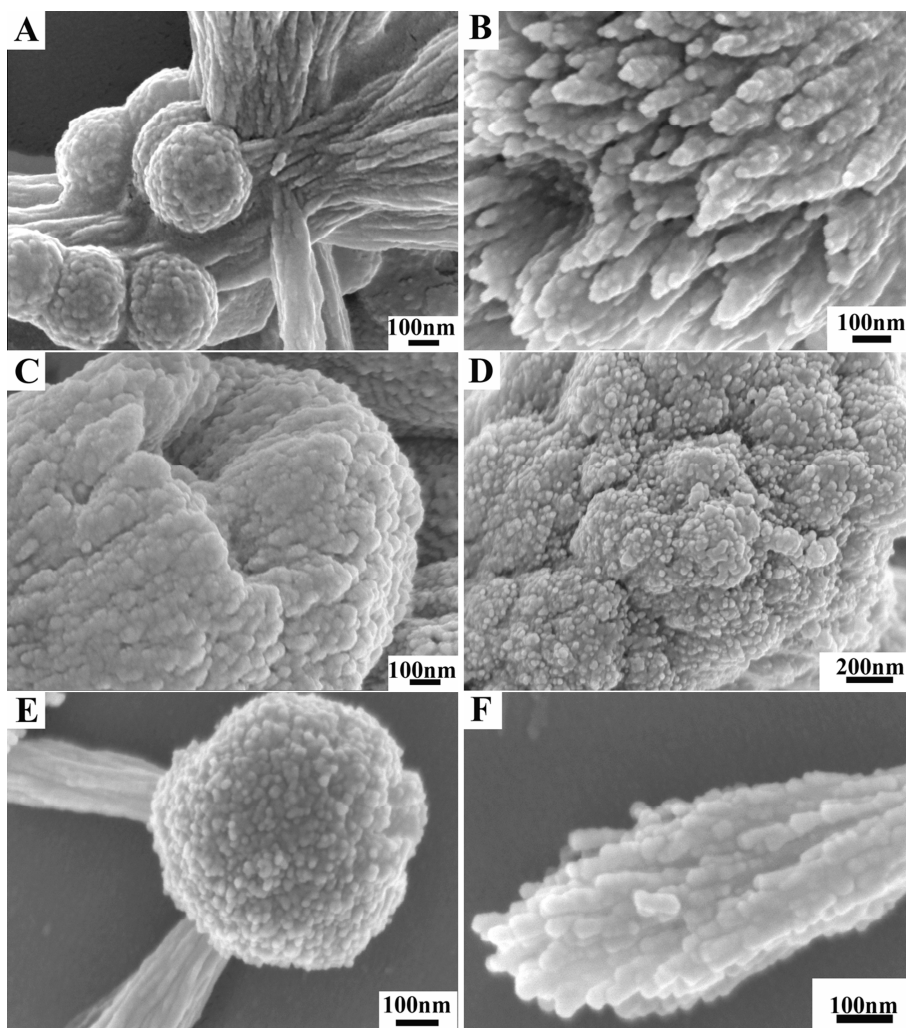


**Figure SI-2**

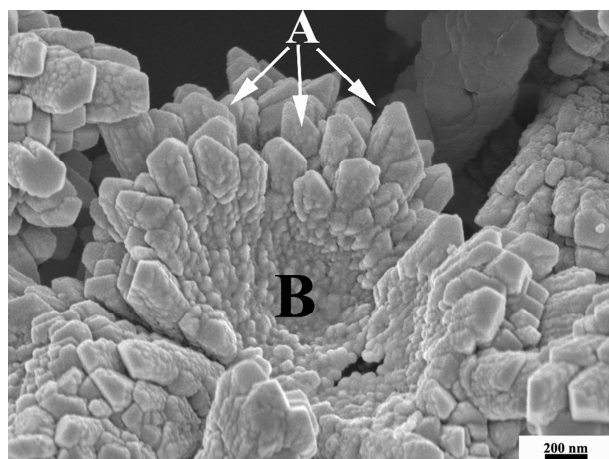


**Figure SI-3**





**Figure SI-4**



**Figure SI-5**