

Supporting Information

Nanoporous Anatase TiO₂ Mesocrystals: Additive-Free Synthesis, Remarkable Crystalline Phase Stability, and Improved Lithium Insertion Behavior

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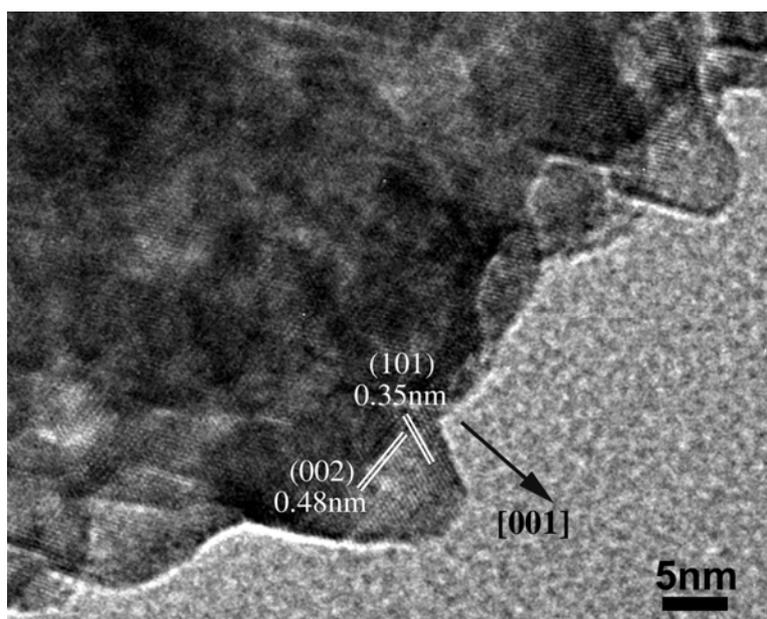


Figure S1. HRTEM image of a nanoporous anatase TiO₂ mesocrystal showing the protruding subunits.

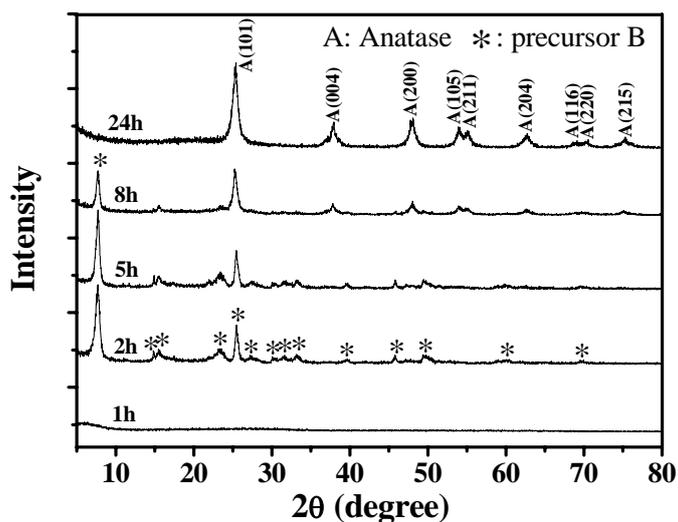


Figure S2. XRD patterns of the precipitates obtained at different reaction times. “*” denotes diffraction peaks attributed to the crystalline precursor B with an unknown phase.

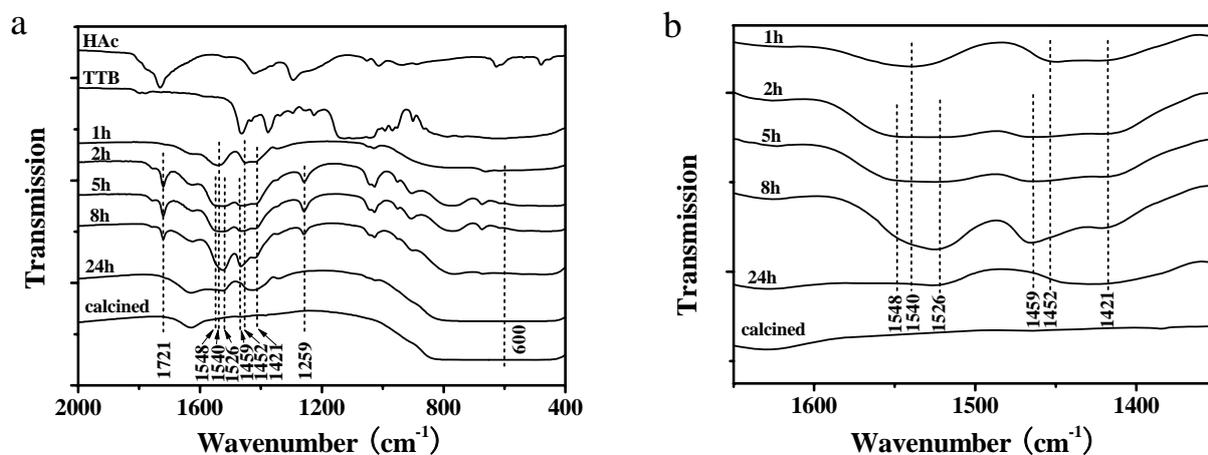


Figure S3. FTIR patterns of HAc, TTb, the precipitates obtained at different reaction times, as well as the precipitate obtained after 24 h of reaction and 30 min of calcination at 400 °C. Chart (b) is a zoom of chart (a) in the range 1350-1650 cm^{-1} .

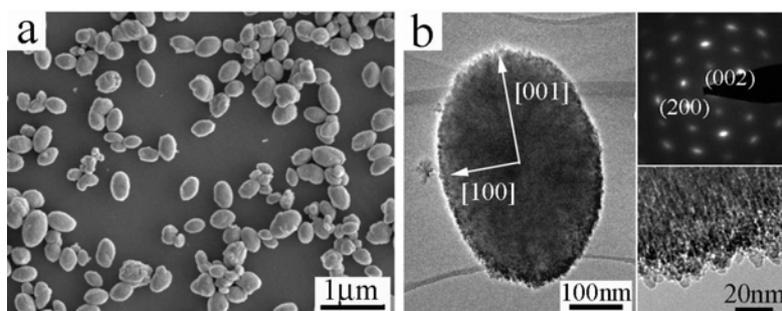


Figure S4. SEM (a) and TEM (b) images of the as-precipitated anatase TiO₂ mesocrystals obtained after a reaction time of 24 h. The inset in the upper right corner in (b) shows the related SAED pattern, while the inset in the lower right corner is an enlarged TEM image.

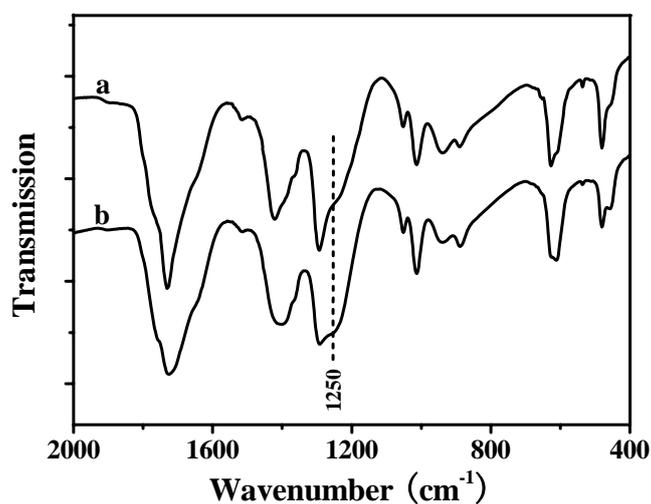


Figure S5. FTIR spectra of a) HAC and b) the supernatant solution after removing the precipitate by centrifugation at 4000 rpm.

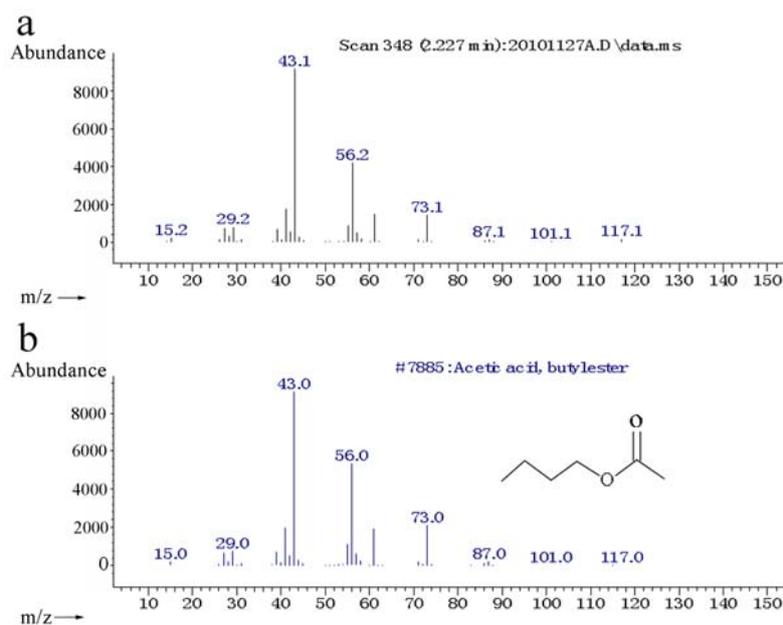


Figure S6. Comparison of a) MS data of the extract of the final reaction solution and b) standard MS data of butyl acetate, revealing the existence of butyl acetate in the final reaction solution.

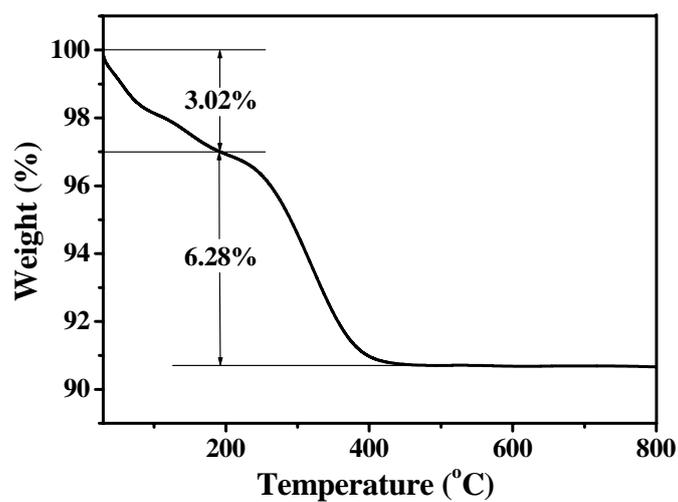


Figure S7. TGA curve of the as-precipitated anatase TiO_2 mesocrystals obtained after a reaction time of 24 h.

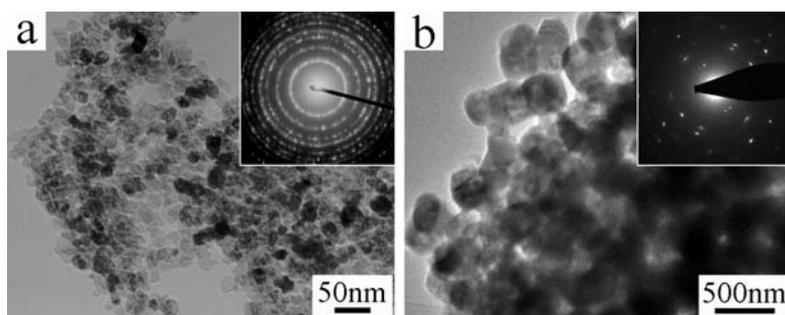


Figure S8. TEM images of the anatase nanocrystals obtained by reaction with 1mL water added and subsequent calcination with different conditions: a) 400 °C for 30 min and b) 400 °C for 30 min and then 900 °C for 3 h. Insets show the related SAED patterns.

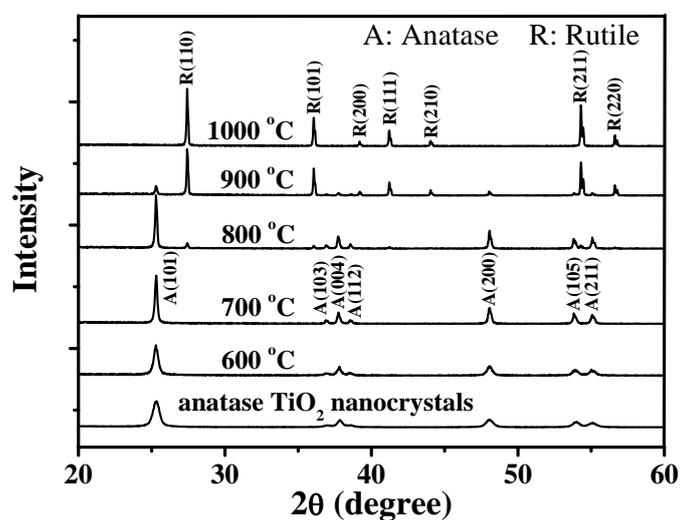


Figure S9. XRD patterns of the anatase nanocrystals obtained by reaction with 1mL water added and subsequent calcination at 400 °C for 30 min, followed by calcination at different temperatures for 3 h.

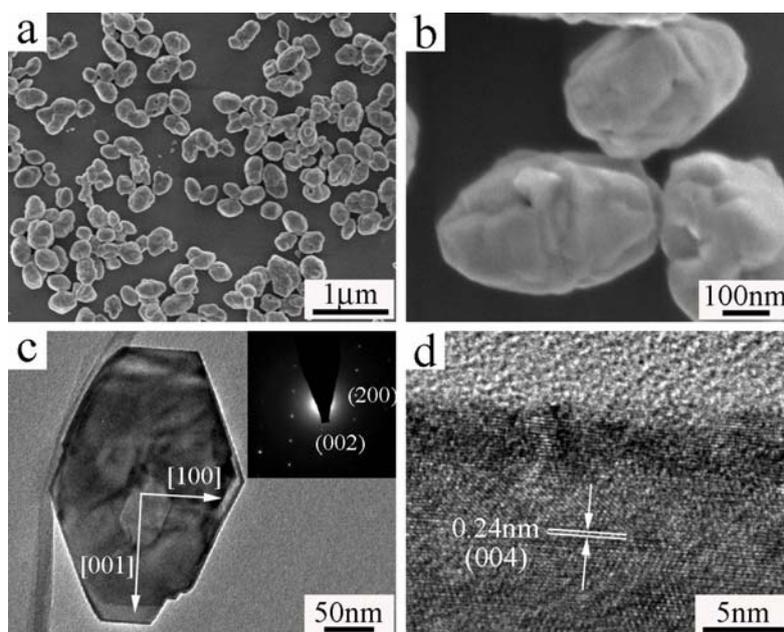


Figure S10. SEM (a,b), TEM (c), and HRTEM (d) images of the anatase crystals obtained after annealing anatase TiO₂ mesocrystals at 900 °C for 3 h. Inset shows the related SAED pattern.