Supporting Information

Synthesis of TiO2 nanosheets via an exfoliation route assisted by surfactant

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Experimental section:

Synthesis of TiO_2 nanosheets: All chemicals were of analytical grade and purchased from Sigma-Aldrich and all chemicals were used as recieved. Ultra pure water with resistivity larger than 18.0 MΩ was produced from a Ultrapure Water System (Purifier). In a detailed process, 0.1g anatase TiO_2 powder and 8 g TBAOH were added in the 10 ml, 10 M NaOH aqueous solution under stirring. After 30 min, the mixture was transfered into a 100 ml Teflon container, then sealed in a stainless autoclave and treated in an air-flow electric oven at 130 ^oC for 24 hours. After cooling down naturally, the precipitate was collected using a centrifuge and was washed with water and ethanol. Then drying in an 80 ^oC oven.

Characterization:

The morphologies of samples were examined by scanning electron microscopy (SEM) (Zeiss Supra 40 FE), and transmissionelectron microscopy (TEM) (JEOL 100CX instrument 300 kV). The crystal phases of the samples were characterized by X-ray diffraction analysis (XRD) recorded on a powder diffractometer (Bruker D8 Advanced Diffractometer System) with Cu-Ka(1.5418 Å) source. The Raman spectra was measured on a Renishaw inVia Raman microscope using a 514 nm laser under ambient conditions.

Electrochemical measurement:

The electrochemical tests for all samples were performed using CR2106 coin-type cells. Slurry was prepared by mixing 70% active materials, 15% carbon black (super P), and 15% Polyvinylidene Fluoride (PVDF) in n-methyl-2-pyrrolidone (NMP) solution. The working electrodes were fabricated by pasting the prepared slurry on a Cu foil, then drying in an oven overnight. The typical loading density of as-prepared electrodes was 1~2 mg cm^{-2}. All cells were assembled using working electrode, pure Li foil, separator (Celgard 2500), and electrolyte (1 M LiPF6 in EC : DEC : DMC = 1 : 1 : 1 organic solutions) in an argon-filled glovebox. A voltage window of 1.0 – 3.0 V vs. $Li^0/Li+$ was applied for all tests.

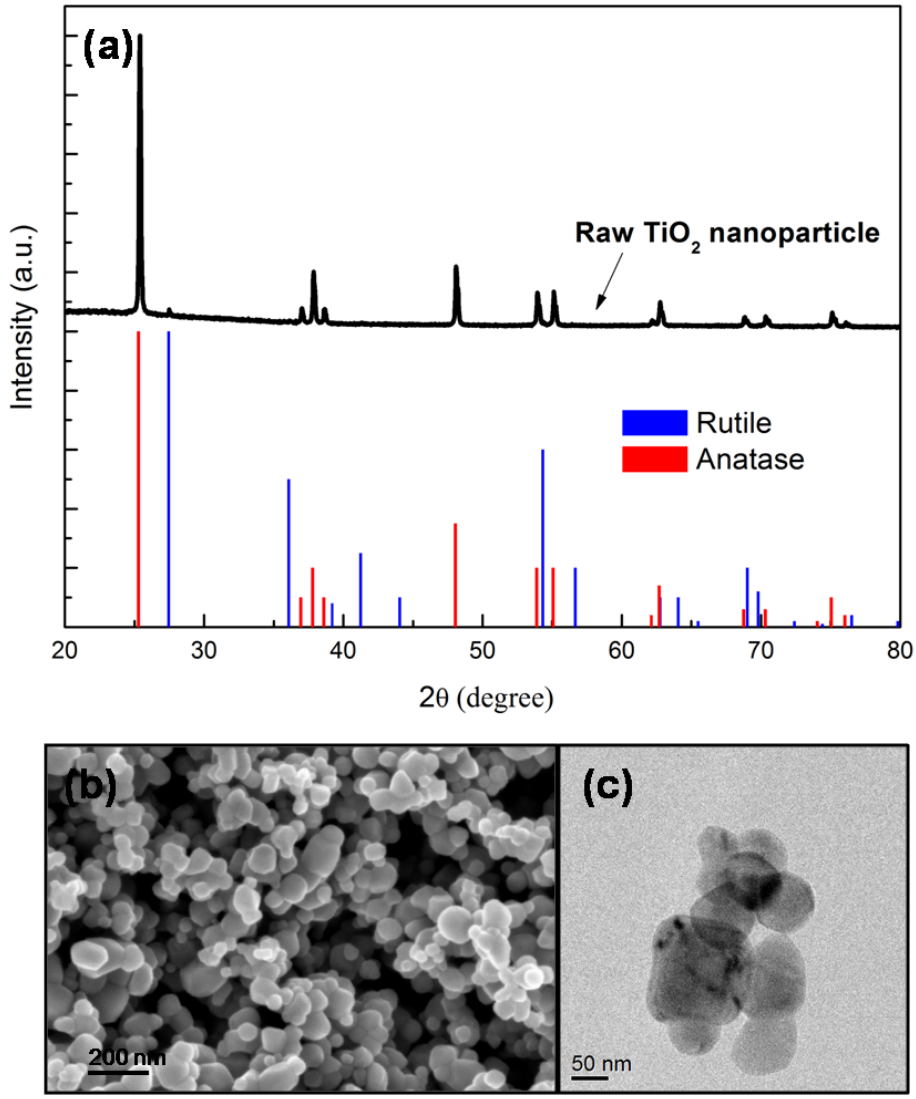

Figure S1. XRD (a), SEM (b) and TEM (c) of raw TiO_2 nanoparticles.

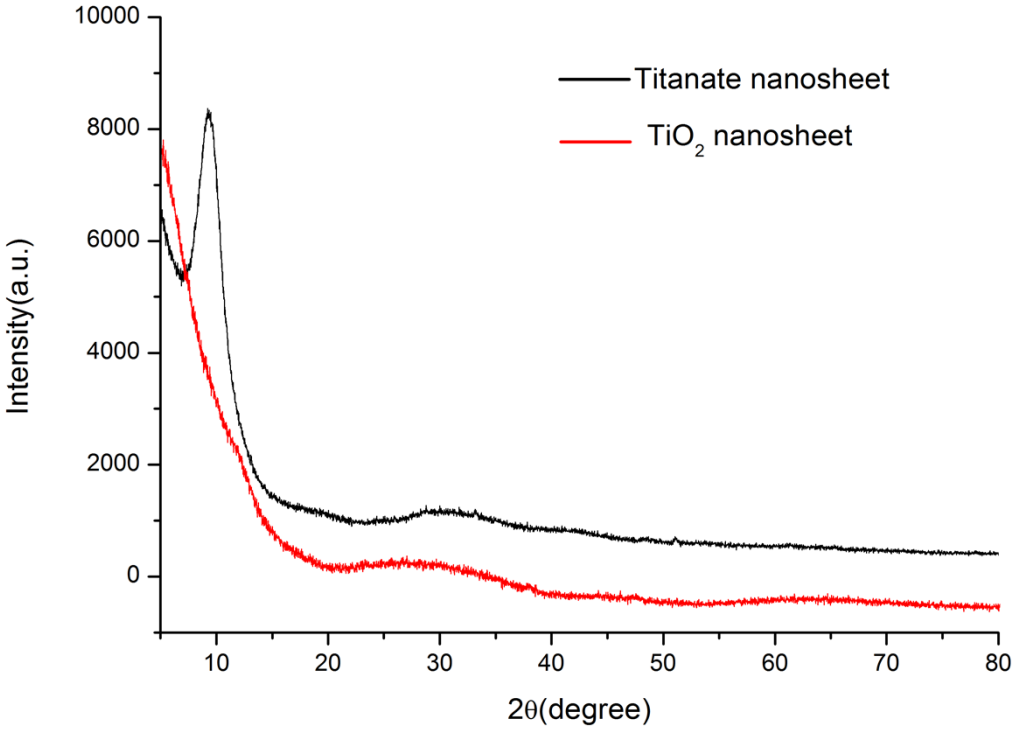

Figure S2. XRD patterns of intermediate titanates (black line) and as-prepared TiO2 nanosheets (red line).

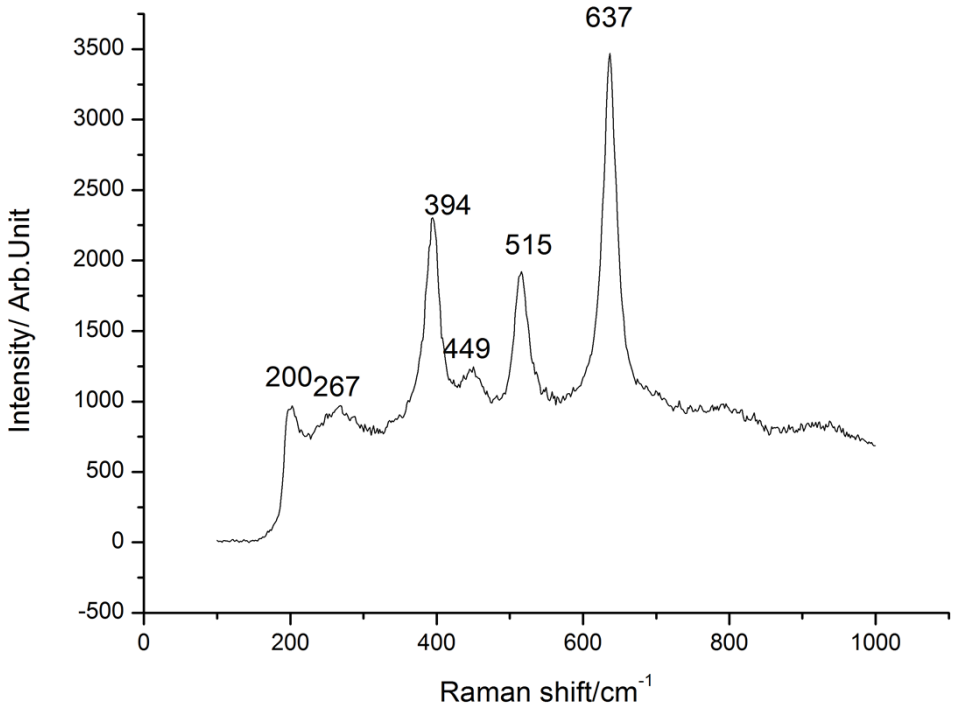

Figure S3. Raman spectrum of the as-prepared TiO2 nanosheets .

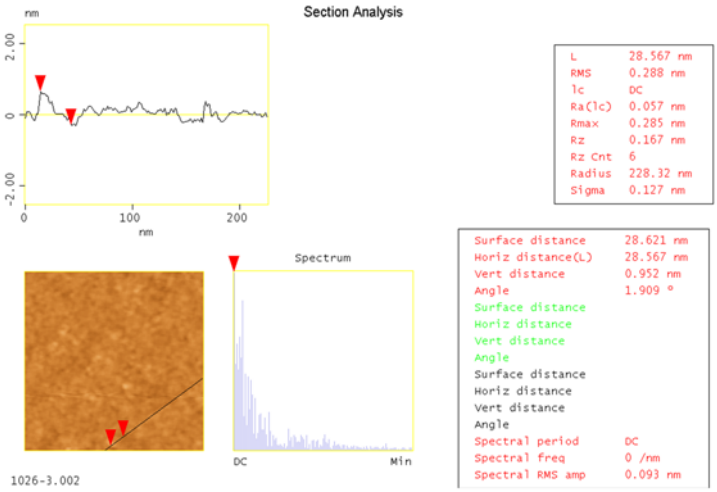

Figure S4: AFM image of the as-synthesized TiO_2 nanosheets.

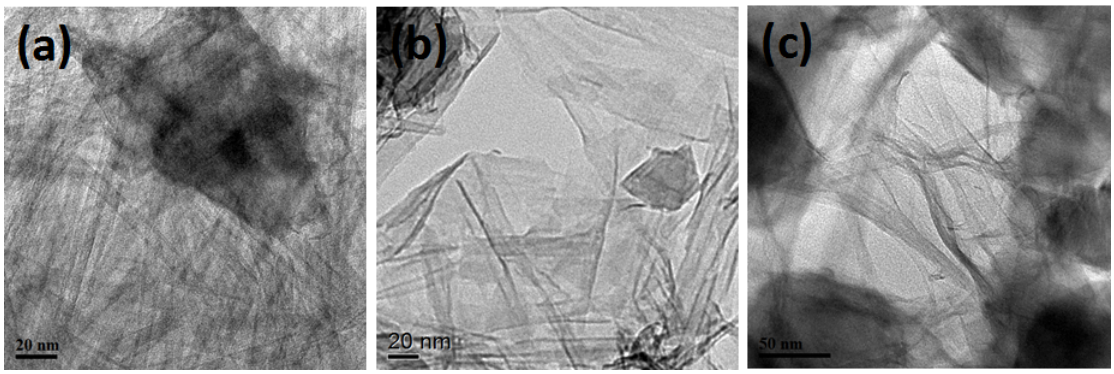

Figure S5. TEM images of the products with addition of different amount of TBAOH at the typical condition for 6 h. (a) 0 g, (b) 4 g, (c) 8 g.

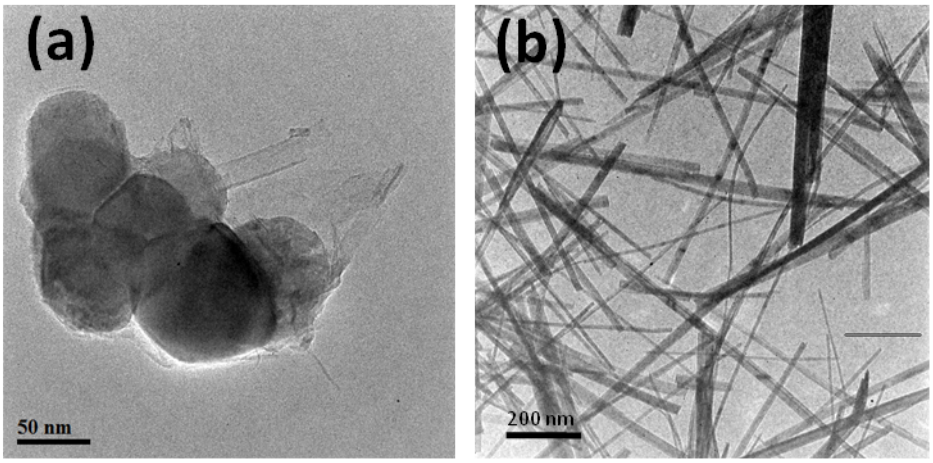

Figure S6. TEM images of products at different temperatures for 24 h while other parameters kept unchanged. (a) 80 °C, (b) 180 °C.