

Successful Growth of TiO₂ nanosheets with {001} facets for Dye-Sensitized Solar Cells

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Abstract

The growth of nanocrystals with exposed high energy facets has a particular significance due to the high reactivity of these facets. In this work, we report a fast hydrothermal synthesis of high-quality single crystals TiO₂ nanosheets with the highly reactive {001} facets as the top and bottom dominating facets. X-Ray Diffraction (XRD) showed that the grown nanosheets have the typical anatase structure. Scanning Electron Microscopy and Transmission Electron Microscopy showed that the grown nanosheets have average area of about 50-60 nm. Selected area electron diffraction (SAED) patterns of the nanosheets confirmed that the {001} are the exposed facets. Dye-sensitized solar cells (DSSCs) fabricated using the grown nanosheets will be discussed in this work, and a comparison with the commercial Degussa P25 TiO₂ nanoparticles will be presented.