

Synthesis, Property Control and Catalysis of Nanostructured Hollow TiO₂ particles

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Because they have advantageous properties including high surface area, reduced diffusion resistance and improved accessibility during chemical reactions, hollow nanostructures have received much attention in fundamental research as well as in practical engineering. Recently, we developed novel synthetic methods for synthesizing TiO₂ hollow nanostructures. By changing the synthetic parameters and conditions, we precisely controlled chemical, physical characteristics and surface properties of TiO₂ shell nanostructures. We also introduced precious metal particles (Au or Pt) into hollow TiO₂ nanostructures and prepared Core-shell/Yolk-shell nanostructures. When they are used as photocatalysts for hydrogen productions and degradation of Rhodamine B under UV irradiation, TiO₂ shell-based nanostructures showed significantly improved catalytic activity. In this presentation, we will discuss further our synthetic methodology, property control and catalytic activity of TiO₂ shell-based nanostructures.