

Synthesis of hollow SiO₂ @TiO₂ hollow particles

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In this work, we proposed an effective way to construct uniform TiO₂ shells onto the surface of SiO₂ hollow particles via sol-gel reaction. The thickness of TiO₂ shell on SiO₂ hollow particles could reach to 150nm from the STEM characterization. The TiO₂ shells have showed good adhesion strength to the hollow SiO₂ cores. The SiO₂/TiO₂ structure could be maintained even after calcinating at 500°C for 5hrs as the temperature which amorphous TiO₂ transferred to Anatase TiO₂.

The photo-responsive property of HS/TiO₂ is much closer to that of TiO₂ rather than that of SiO₂ hollow particles and no significant difference of the reflectivity can be observed between TiO₂ particles and hollow SiO₂/TiO₂ particles. The on-set absorbance wavelength of and hollow SiO₂/TiO₂ particles was higher than that of TiO₂ particles. The band gap of hollow SiO₂/TiO₂ particles and TiO₂ particles have been calculated as 3.24 and 3.30 eV, respectively.

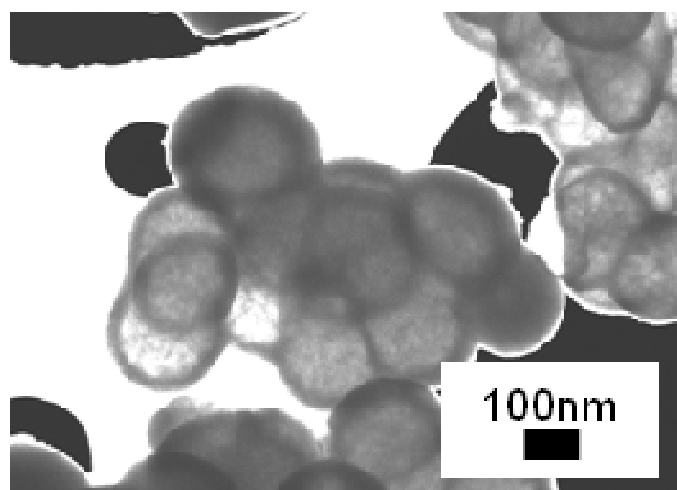


Fig.1 STEM imagines of the hollow SiO₂/TiO₂ particles; accelerate voltage: 25 kV.