

A facile synthesis of rutile-rich titanium oxide nanoparticles using reverse micelle method and their photocatalytic applications

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Flower-like shaped rutile-rich TiO₂ nanoparticles were synthesized by the reaction of HCl with titanium diisopropoxide bis(acetylacetonate) immobilized in reverse micelles composed of oleic acid, water, and xylene. Brunauer-Emmett-Teller (BET) analysis showed large surface area of the synthesized TiO₂ nanoparticles of 177.8 m²/g. We investigated the effect of the concentration of Ti precursor and role of oleic acid in the formation of TiO₂ nanoparticles. Rutile-rich TiO₂ nanoparticles with large surface area showed better photocatalytic activity in decomposing methyl orange under visible-light irradiation than anatase and rutile mixed phase TiO₂ particles.