

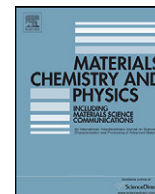


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Sonochemical preparation of TiO₂ nanoparticles in the ionic liquid 1-(3-hydroxypropyl)-3-methylimidazolium-bis(trifluoromethylsulfonyl)amide

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ARTICLE INFO

Article history:

Received 25 June 2009

Received in revised form

19 September 2009

Accepted 25 October 2009

Keywords:

Ionic liquids
Nanomaterials
Photocatalyst
Synthesis

ABSTRACT

Spherical shaped anatase nanoparticles (\varnothing 5 nm) have been synthesized in the ionic liquid 1-(3-hydroxypropyl)-3-methylimidazolium-bis(trifluoromethanesulfonyl)amide from titanium tetraisopropoxide by ultrasound assisted synthesis under ambient conditions. XRD, EDX, TEM, XPS, Raman, UV–vis, PL and BET measurements have been employed for characterization of the nanostructure of as-prepared TiO₂. XRD and Raman measurements both show that the obtained material is crystalline with anatase structure. The morphology of TiO₂ nanoparticles was characterized by transmission electron microscopy (TEM). The bandgap of the TiO₂ nanocrystals estimated from XRD and UV–vis measurements is about 3.3 eV. The surface area of a typical sample is 177 m² g⁻¹. The synthesized anatase nanocrystals show good photocatalytic activity in the degradation of methylorange.

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