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GREEN ROUTE SYNTHESIS OF NANO TITANIA USING GHEE AND HONEY AS SURFACE DIRECTING AGENTS FOR PHOTOCATALYTIC APPLICATION

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Abstract

Synthesis of nano titania with large surface area and good adsorptivity can be achieved by mediating the synthesis with templates. Using biomaterials as templates proves to be an ecofriendly as well as economically beneficial method for the synthesis of nanoparticles. The influence of ghee and honey as templates in synthesizing titania with improved surface area by sol-gel method accompanied by crystallite, surface characteristic, morphological characteristic studies and the shift in the absorption edge towards visible region facilitating the photocatalytic activity in the degradation of methyl orange has been reported in the present study. XRD results indicated the possession of anatase structure for Ghee Templated Titania (GTT) and Honey Templated Titania (HTT). The crystallite sizes of the newly synthesised GTT and HTT were found to be 25.3 nm and 21.8 nm, respectively, which are lower than those of titania that is non templated (29.5 nm). It was observed that titania with templates had a larger surface area than titania without templates. Being a biotemplate, ghee and honey provide a potential support for the controlled growth of nanotitania using the sol-gel method and also exhibits the ability of being a visibly active photocatalyst.

Key words: eco-friendly templates, ghee, honey, photocatalysis, sol-gel, titania

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