



Synthesis, Characterization and Visible Light Photocatalytic Degradation Study of Thiourea modified Nano Titania Composites

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ABSTRACT

In the present work, visible light induced photocatalytic degradation of Congo red dye in aqueous medium was investigated by employing Thiourea modified nanotitania (NT) particles. The composites were synthesized by organic solvent free controlled hydrolysis of titanium tetrachloride followed by dispersing thiourea and the samples were designated as x mole % thiourea titania nanocomposites (where $x = 5, 10, 20$ mole %). These composites have been characterized by X-Ray Diffraction (XRD), Field Emission Scanning Electron Microscopy (FE-SEM), and UV-Visible Diffuse Reflectance Spectroscopy (UV-Vis DRS). Efficiency of the composites towards the photocatalytic degradation of Congo red dye was assessed by analyzing the effect of nanotitania particles with increase in the content of Thiourea and effect of pH of the dye solution. Photocatalytic degradation of Congo red dye was enhanced by contriving the composites into visible light absorption on dispersing Thiourea on the surface of nanotitania particles. With an optimum increase in the Thiourea content, the photocatalytic activity of the composites was improved and a superior photocatalytic activity was observed with 10% Thiourea -nanotitania composite material.

Graphical Abstract



Visible light Photocatalyticdegradation mechanism of synthesized x mole % thiourea- nanotitania composites on Congo red dye

Keywords: Visible Light Photocatalytic degradation, Thiourea modified Nano Titania, Congo red.