



Effect of Graphene Oxide on Nano Titania Particles in Visible Light Induced Photocatalytic Degradation of Congo red

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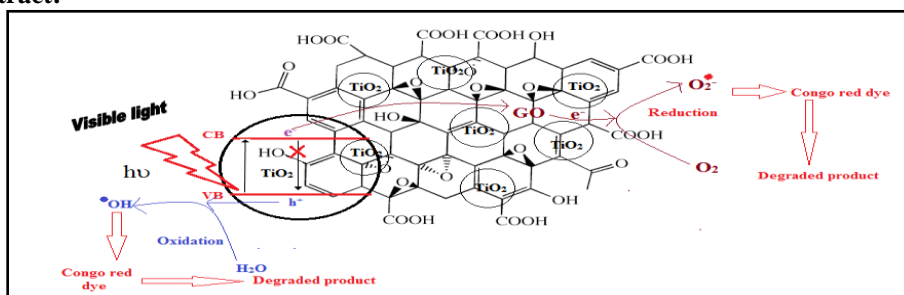
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ABSTRACT

In the present work, visible light induced photocatalytic degradation of Congo red dye in aqueous medium was investigated by employing modified nano titania (NT) particles exfoliated with graphene oxide (GO) particles. The composites were synthesized by organic solvent free controlled hydrolysis of titanium tetrachloride followed by dispersing an aqueous solution of graphene oxide. These composites have been characterized by X-Ray Diffraction (XRD), Fourier Transform Infra-Red Spectroscopy (FT-IR), 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 nano titania particles with increase in the content of GO 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 grafting GO on the surface of nano titania particles. With an optimum increase in the GO content, the photocatalytic activity of the composites was improved and a superior photocatalytic activity was observed with 10% GO-nano titania composite material.

Graphical Abstract:



Photocatalytic degradation mechanism of synthesized GO-nanotitania composites on Congo red dye under visible light irradiation

Keywords: Photocatalytic degradation, Nano titania, Graphene oxide, Congo red.