

Use of azomethine-bridged phenolic metallophthalocyanines for sensitization of TiO₂

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ABSTRACT

A group of novel azomethine-bridged phenolic metallophthalocyanines (substituted at nonperipheral position, MPc) were synthesized, characterized and used as sensitizer. Phthalocyanine derivatives (containing TiO(II), Fe(II), Co(II), Ni(II) and Zn(II) ions in the center of phthalocyanine) were immobilized on TiO₂ photocatalyst using a wet deposition method. MPc/TiO₂ nanocomposites have been tested for their photocatalytic reduction ability of Cr(VI) ions in aqueous solution under near visible light irradiation. The results demonstrated that the presence of the sensitizer is certainly beneficial for the photocatalytic activity of TiO₂, confirming the significant role of substitution and metal co-ordination in the center of the phthalocyanine ring. Photoreduction results show that the all composite materials exposed significantly higher Cr(VI) removal performance than bare TiO₂. Consequently, MPc sensitized TiO₂ nanocomposites may be good alternatives for efficient photocatalysis that can be used for wastewater treatment processes.

Keywords: Dye sensitization; Metallophthalocyanines; Photocatalysis

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