



Photodecomposition of dimethyl phthalate in an aqueous solution with UV radiation using novel catalysts

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ABSTRACT

This study investigates the photolytic and photocatalytic degradation of dimethyl phthalate (DMP) with novel catalysts including the titanium dioxide-coated magnetic poly(methyl methacrylate) (TiO₂/mPMMA) and platinum-doped TiO₂/mPMMA microspheres. The experiments under the illumination of ultraviolet (UV) radiation at 185 and 254 nm are conducted to examine the effects of the initial DMP concentration, photocatalyst, and Pt doping on the degradation of DMP and its mineralization efficiency. The photocatalyst and initial DMP concentration are important factors for the degradation of DMP, while the Pt doping has a minor effect. On the other hand, the mineralization efficiency would be significantly accelerated by the presence of photocatalysts and the Pt doping. In addition, it demonstrates the remarkable contribution of UV radiation at 185 nm to the elimination of DMP and intermediates via both direct photolysis and photocatalysis. This study provides useful information about the direct photolytic and photocatalytic degradation of DMP using the novel photocatalysts with the presence of UV radiation at 185 nm.

Keywords: Dimethyl phthalate; Photolysis; Photocatalytic degradation; UV radiation; Titanium dioxide; Pt doping

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