



Photocatalytic decolorization of Red Dye in aqueous doped-TiO₂ suspensions

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Abstract

The photocatalytic decolorization of aqueous solutions of Direct Red 27 in the presence of various types of additives with TiO₂ suspensions has been investigated in a batch reactor with the use of artificial light sources. Transition metals with TiO₂ have been found the most active photocatalysts; the effect of metallic ions on decreasing band gap and restricting e⁻/h⁺ recombination improved its efficiency. The catalyst loading and type on the reaction rate was optimized for maximum degradation. The V-doped TiO₂ have the maximum decolonization, because of effectively decreased band gap, and adsorbed UV-Vis light. In addition, the effects of additives contents were examined in this photocatalytic process. Mo doped TiO₂ composition 1:100 indicated slightly higher efficiency. The results showed that the decolorization efficiency increases with increase in metal content, and decrease in band gap. The efficiency is related to mechanism of recombination electron/hole, broad energy adsorption of light.

Keywords: Photocatalysis; Decolorization; doping; TiO₂.

References

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