

Visible-Light Induced Photocatalytic Degradation of Dye Molecules over ZnWO₄-Bi₂WO₆ Composite

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Abstract : The photocatalytic degradation of Methylene blue (MB) and Rhodamine B (RhB) in the presence of ZnWO₄-Bi₂WO₆ composite under visible light irradiation ($\lambda \geq 400$ nm) were studied in this research. The structural and photophysical properties of ZnWO₄-Bi₂WO₆ composite on the photocatalytic degradation process were investigated. The as-prepared ZnWO₄-Bi₂WO₆ composite photocatalyst exhibits wide absorption in the visible-light region and display superior visible-light-driven photocatalytic activities in degradation of MB and RhB. The enhanced photocatalytic activity was attributed to electron-hole separation with the appropriate band potential and the physicochemical properties of ZnWO₄ and Bi₂WO₆. The main active species for the degradation of organic dyes were investigated to explain the enhancement of photocatalytic performance of ZnWO₄-Bi₂WO₆ composite. The possible photocatalytic degradation pathway of aqueous MB and RhB dyes and charge transfer of ZnWO₄-Bi₂WO₆ composite was proposed.

Keywords : composite, dyes, photocatalytic activity, ZnWO₄-Bi₂WO₆

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