

Photocatalytic Degradation of Acid Dye Over Ag, Loaded ZnO Under UV/Solar Light

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Abstract : The feasibility of using solar irradiation instead of UV light in photocatalysis is a promising approach for water treatment. In this study, photocatalytic degradation of a widely used textile dye, Acid Blue 25 (AB25), with noble metal loaded ZnO photocatalyst (Ag/ZnO), was investigated in aqueous suspension under solar light. The results showed that the deposition of Ag as a noble metal onto the ZnO surface, improved the photodegradation of AB25. . The effect of different parameters such as catalyst dose, initial dye concentration, and contact time was optimized and the optimal degradation of AB25 (97%) was achieved for initial AB25 concentration of 24 mg L⁻¹ an catalyst dose of 1 g L⁻¹ at natural pH (5.42) after 180 min. The kinetic studies were achieved and revealed that the photocatalytic degradation process obeyed to Langmuir-Hinshelwood model and followed a pseudo-first order rate expression. This work envisages the great potential that sunlight photocatalysis has in the degradation of dyes from wastewater

Keywords : acid dye, photocatalytic degradation, sunlight, zinc oxide, noble metal, Langmuir-Hinshelwood model

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