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Removal of textile dye Reactive Blue 59 by using Nb_2O_5 as a photocatalyst

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ABSTRACT

In this work, photocatalytic degradation of textile dye Reactive Blue 59 in aqueous suspension was examined using Nb_2O_5 as a photocatalyst in the presence of UV light in photocatalytic reactor. The Nb_2O_5 photocatalyst was characterized by X-ray diffraction, scanning electron microscopy, and energy dispersive X-ray spectrometry techniques. The photocatalytic experiments were carried out to optimize the various parameters like effect of amount of catalyst, initial dye concentration, irradiation time, and pH. The effect of UV light and Nb_2O_5 photocatalyst on the rate of removal of dye was studied. In addition to this, the changes in the chemical oxygen demand of the dye solution after photocatalytic irradiation in the presence of Nb_2O_5 were studied. The maximum photocatalytic removal of reactive blue achieved using Nb_2O_5 was 88.97% with 15 mg/L optimum dye concentration.

Keywords: Nb_2O_5; Reactive Blue 59; Photocatalytic degradation; SEM

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