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Degradation of Rose Bengal by UV in the Presence of NiFe2O4 Nanoparticles

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Abstract : Photocatalysis has made a revolution in wastewater treatment and the elimination of persistent organic pollutants. This process is based on the use of semiconductors as photocatalysts. In this study, nickel ferrite spinel (NiFe2O4) nanoparticles were successfully synthesized by the sol-gel route. The structural, morphological, elemental composition, chemical state, particle size, optical and electrochemical characterizations using powder X-ray diffraction (P-XRD), Fourier transform infrared spectroscopy (FTIR), scanning electron microscopy(SEM), energy-dispersive X-ray spectroscopy (EDAX). We tested the prepared NiFe2O4(NPS)by monitoring the degradation of Rose Bengal (RB) dye in an aqueous solution under direct sunlight irradiation. The effects of catalyst dosage and dye concentration were also considered for the effective degradation of RB dye. The optimum catalyst dosage and concentration of dye were found to be 1 g/L and 10 µM, respectively. A maximum of 80% photocatalytic degradation efficiency (DE%) was achieved at 120 min of direct sunlight irradiation.

Keywords : Rose Bengal, Nickelate, photocatalysis, irradiation
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