



Fenton oxidation of Diamine Blue 3B using heterogeneous catalyst based on hydroxyapatite nanoparticles

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ABSTRACT

In this study, degradation of Diamine Blue 3B (DB) azo dye by Fenton oxidation process ($\text{Fe}^{2+}/\text{H}_2\text{O}_2$) was investigated. Hydroxyapatite (HAP) was used as heterogeneous catalyst for oxidation of DB. HAP was synthesized and characterized by Fourier transform infrared spectroscopy, scanning electron microscopy, transmission electron microscopy and X-ray diffraction methods. The optimal conditions for the degradation of DB were determined at pH = 6.0, HAP = 500 mg L⁻¹, Fe^{2+} = 9.8×10^{-3} mg L⁻¹ and H_2O_2 = 100 mg L⁻¹. The results of experiments showed that degradation of DB dye could be described with a pseudo-second-order kinetic model. The results of thermodynamic implied that the oxidation process was feasible, spontaneous and endothermic. The HAP was conveniently regenerated after four cycles.

Keywords: Fenton's reagent; Hydroxyapatite; Heterogeneous catalysis; Diamine Blue 3B; Oxidation

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