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A Homogeneous Catalytic System for Decolorization of a Mixture of Orange G Acid and Naphthol Blue-Black Dye Based on Hydrogen Peroxide and a Recyclable DAWSON Type Heteropolyanion

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Abstract : The color removal from industrial effluents is a major concern in wastewater treatment. The main objective of this work was to study the decolorization of a mixture of Orange G acid (OG) and naphthol blue black dye (NBB) in aqueous solution by hydrogen peroxide using [H1,5Fe1,5P2W12Mo6O61,23H2O] as catalyst. [H1,5Fe1,5P2 W12Mo6O61,23H2O] is a recyclable DAWSON type heteropolyanion. Effects of various experimental parameters of the oxidation reaction of the dye were investigated. The studied parameters were: the initial pH, H2O2 concentration, the catalyst mass and the temperature. The optimum conditions had been determined, and it was found that efficiency of degradation obtained after 15 minutes of reaction was about 100%. The optimal parameters were: initial pH = 3; [H2O2]0 = 0.08 mM; catalyst mass = 0.05g; for a concentration of dyes = 30mg/L.

Keywords : Dawson type heteropolyanion, naphthol blue-black, dye degradation, orange G acid, oxidation, hydrogen peroxide
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