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Removal of Tartrazine Dye Form Aqueous Solutions by Adsorption on the Surface of Polyaniline/Iron Oxide Composite

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Abstract : In this work, a polyaniline/Iron oxide (PANI/Fe2O3) composite was chemically prepared by oxidative polymerization of aniline in acid medium, in presence of ammonium persulphate as an oxidant and amount of Fe2O3. The composite was characterized by a scanning electron microscopy (SEM). The prepared composite has been used as adsorbent to remove Tartrazine dye form aqueous solutions. The effects of initial dye concentration and temperature on the adsorption capacity of PANI/Fe2O3 for Tartrazine dye have been studied in this paper. The Langmuir and Freundlich adsorption models have been used for the mathematical description of adsorption equilibrium data. The best fit is obtained using the Freundlich isotherm with an R2 value of 0.998. The change of Gibbs energy, enthalpy, and entropy of adsorption has been also evaluated for the adsorption of Tartrazine onto PANI/ Fe2O3. It has been proved according the results that the adsorption process is endothermic in nature.

Keywords : adsorption, composite, dye, polyaniline, tartrazine
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