

THE ADSORPTION OF REACTIVE BLUE FROM AQUEOUS SOLUTION BY USING FERRITE NANOPARTICLES

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ABSTRACT

Releasing the industrial dye-bearing wastewaters without removing colour is becoming one of the major environmental problems since most dyes are stable to light and oxidizing agents. Since the wastewaters including dyes reduce the light penetration and photosynthesis, destroy the biological cycle and some are toxic and even carcinogenic for human health, it is important to remove these dyes from wastewater. In this study we have synthesized $MnFe_2O_4$ and $NiFe_2O_4$ nanoporous materials by using auto-combustion method and used them to remove REACTIVE BLUE 5 (RB5) from aqueous solutions. XRD studies indicated that the nanoparticles have single phase spinel structure. SEM pictures revealed that the samples have porous nanostructures which are advantageous for RB5 removal. From VSM measurements it is observed that the samples have superparamagnetic behavior at room temperature. The saturation magnetization of the samples are found to be 28 emu/g for $MnFe_2O_4$ and 34 emu/g for $NiFe_2O_4$ which are sufficient for magnetic separation via applying strong external magnetic field. Removal efficiency of the materials are found to be %79.84-82.22 RB5 removal by using 2 g/L nanoparticles ($NiFe_2O_4$ and $MnFe_2O_4$) and 24.00-24.70 mg/g adsorption capacity were determined.