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Soy meal hull activated carbon: preparation, characterization and dye adsorption properties

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ABSTRACT

In this paper, the preparation, characterization and dye adsorption properties of soy meal hull activated carbon (SMH-AC) were investigated. Physical characteristics of SMH-AC were studied using Fourier transform infrared (FTIR) and scanning electron microscopy (SEM). Two textile dyes, Acid Red 14 (AR14) and Acid Red 18 (AR18), were used as model compounds. The effects of operational parameter such as SMH-AC dosage, initial dye concentration, pH and salt on dye removal were evaluated. The isotherm of dye adsorption was studied. The data were evaluated for compliance with the Langmuir and Freundlich isotherm models. It was found that AR14 and AR18 followed with Langmuir isotherm. Based on the data of present investigation, one could conclude that the SMH-AC being an eco-friendly and low-cost adsorbent might be a suitable alternative to remove dyes from colored aqueous solutions.

Keywords: Soy meal hull; Activated carbon; Preparation; Characterization; Dye removal; Textile; Wastewater

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