Application of Wheat Husk in Color Removal of Textile Wastewater

Abstract - Adsorption is the most efficient technique used to remove organic pollutants from wastewater. Dyes represent one of the pollutants that may remove by adsorption. The textile industry used dyes for colorization of fibers and always generates a considerable amount of colored wastewater. In present work, the removal of Malachite green (MG) dye pollutant from synthetic wastewater onto mesoporous Wheat husk (WH) was studied in batch adsorption systems. The characterization for the prepared wheat husk was studied by, scanning electron microscopy (SEM), Fourier transforms infrared (FTIR) spectroscopy. The batch experiments were carried out to measure the removal efficiency of MG as a function of contact time, initial concentration (25-135mg/L), pH (2-13) and adsorbent dose (1-7 g/L). The equilibrium was achieved within 8 hours. The equilibrium adsorption data of MG dye on wheat husk adsorbent were analyzed using isotherm models and the adsorption kinetic data were analyzed using pseudo-first and second order. The adsorption isotherm results indicated a better fitting obtained by the Langmuir ($R^2=0.995$) than Freundlich ($R^2= 0.883$) and the adsorption formation of the monolayer could be described. Adsorption Kinetic results were fitted better by Pseudo-second order($0.9886$) than Pseudo first order ($0.984$). The properties obtained make WH an ideal adsorbent for treatment of MG dye from wastewater, besides, to develop some environment-friendly and low-priced material is also the crucial work.

Keywords - Adsorption, Dyes, Wheat Husk

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