

Melon husk-based activated carbon for treatment of industrial wastewater.

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Abstract

The adsorption of organic contaminants from industrial effluent using melon husk activated carbon has been investigated. Melon husk was carbonized at 450°C for 20 minutes and activated with sulphuric acid to produce granular activated carbon (AC). The fixed carbon increased with increase in concentration of activating agent. The effect of concentration of activating agent, adsorbent dose and contact time on adsorption of organic contaminants from Coca Cola wastewater was examined at room temperature. The AC prepared with 1.0 M activating agent proved to be the most effective in contaminants removal when dosage and contact time were varied individually. The optimum COD removal of 98.76% was achieved while 88.48% COD removal was attained in 5 hours. The concentration of contaminants, measured as COD reduced to a value within the allowable discharge limit after treatment. The experimental batch equilibrium data was correlated by Langmuir and Freundlich adsorption isotherms. The adsorption data fitted better into the Freundlich isotherm. The adsorption kinetic data follows pseudo-second order kinetics and the rate constants obtained with pseudo-second order kinetics are in close agreement with the experimental values.

Keywords: Melon husk activated carbon; Wastewater; COD; Adsorption isotherms, Kinetic studies.

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