

Removal of Dark Blue-GI From Wastewater Using Water Hyacinth: A Study Of Equilibrium Adsorption Isotherm

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ABSTRACT

The present investigation demonstrates that water hyacinth root is a potential adsorbent for the removal of dark blue-GL dye from wastewater by batch process. Various operating parameters such as the adsorption capacity, initial dye concentration, contact time, effect of pH, and adsorbent dosage were examined at different experimental conditions. The effect of pH and dye concentration found to be crucial, have been optimized, and the maximum recovery (~90%) was detected at pH 3 and concentration 150 ppm. The separation of dark blue-GL is proportionally related to the adsorbent dosage, and up to 77% dye was recovered for the dose 1.5 g/L. Langmuir adsorption isotherm model of the adsorption process was carried out at the equilibrium concentration of dark blue-GL uptake, and the corresponding data were analyzed by the least square methods. Kinetic parameters calculated from the tentative data could be fitted well to a pseudo-second-order kinetic model. These results point out aptness of the adsorbent in the niche area due to high adsorption capacity (~24 g/kg) and can be applied in the execution of dark blue-GL-enriched wastewater.

KEYWORDS: Water hyacinth, Adsorption, Dark blue-GL, Kinetics, Wastewater

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