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Equilibrium studies for Basic blue 3 adsorption onto durian peel (*Durio zibethinus* Murray)

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ABSTRACT

A waste material with practically no cost, durian peel (DP) was studied for its ability to remove Basic blue 3 (BB3) from aqueous solutions. Batch kinetic studies were carried out to study the adsorption characteristics under various experimental conditions. The optimum pH for the dye removal occurred in the pH range of 3–10. Adsorption was found to be concentration dependent. The kinetics of dye adsorption fitted a pseudo-second order rate expression. Both Langmuir and Freundlich models appeared to provide reasonable fittings for the adsorption data of BB3 on DP. Application of Langmuir isotherm indicated that under the experimental condition of room temperature (25 ± 2°C) with natural pH of the dye solution and shaken at 150 rpm, the maximum adsorption capacity of DP for BB3 was 49.50 mg g^{-1}. The percentage uptake of BB3 increased with the increase in temperature. Adsorption of BB3 was found to be endothermic and various thermodynamic parameters were evaluated using van't Hoff plot.

Keywords: Durian peel; Low cost sorbent; Batch study; Adsorption; Basic blue 3; Kinetics

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