Removal of Acid Blue 113 dyes from aqueous solution by activated carbon of Varagu millet husk: Equilibrium, Kinetics and Thermodynamic Studies.

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Abstract: Activated carbon was prepared from Varagu millet husk (ACVMH). The Characterizations of prepared activated carbon (ACVMH) was determined using SEM, XRD, BET and FTIR analysis. The surface area was found to be $397.33 m^2/g$. Experiments were carried out to evaluate the batch adsorption isotherms and kinetics of Acid blue (AB113) on ACVMH at different temperatures. Experimental equilibrium data were analyzed by the Langmuir, Freundlich and Dubinin–Radushkevich (D–R) isotherm models. The results show that the best fit was achieved with the Langmuir isotherm equation with a maximum adsorption capacity of 231.92mg/g. Pseudo-first order and pseudo-second order models were used to analyze the kinetic data. The adsorption kinetic data were well described by the pseudo-second order model. The calculated thermodynamic parameters, namely ΔG^0, ΔH^0, and ΔS^0 showed that adsorption of AB113 onto activated carbon of Black gram husk was spontaneous and endothermic under examined conditions.
Keywords: Activated carbon; Adsorption; Isotherm; Kinetics; Thermodynamics.

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