

Study of Equilibrium, Kinetic and Thermodynamic Parameters about Victoria blue R Dye Adsorbed onto Activated Carbon

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In this study, adsorption equilibrium, dynamics and thermodynamic properties of direct Victoria Blue R using activated carbon were studied. The adsorption parameters were determined by temperature, contact time, initial concentration of VBR solution, and concentration of activated carbon. The experimental results revealed that activated carbon exhibit high efficiencies to remove Victoria blue R dyes from the aqueous solution. The equilibrium process can be well described by Freundlich isotherm in the temperature range from 298K to 318K. From adsorption kinetic experiments, the adsorption process followed a pseudo second order kinetic model, and the adsorption rate constant() decreased with increasing the initial concentration of Victoria Blue R. Calculation of changes in adsorption free energy(G) enthalpy(H) and entropy(S) showed that the standard free energy change amount was +18.9~-1.80 kJ/mol, which decreased spontaneity as the temperature increased. The positive value for H 27.13kJ/mol, indicates that the adsorption of Victoria blue R dyes on activated carbon is an endothermic process.