International Academy of Science, Engineering and Technology

IASET Connecting Researchers; Nurturing Innovations

EQUILIBRIUM AND KINETICS STUDIES FOR THE ADSORPTION OF CRYSTAL VIOLET DYE BY *SPIRULINA PLATENSIS*

UZMA NADEEM, ARUN KANT & PANMEI GAIJON

Department of Chemistry, University of Delhi, Delhi, India

ABSTRACT

Equilibrium and kinetics of the sorption of the Crystal Violet dye on *Spirulina platensis* was studied. The pH stability of the dye was also studied. The equilibrium sorption data were fitted into Langmuir, Freundlich and Temkin isotherms. Freundlich adsorption isotherm fitted well as the R^2 value of Freundlich isotherm model was the highest. The maximum monolayer coverage (q_{max}) from Langmuir isotherm model was determined to be 126.28 mg g^{-1}. For the Freundlich isotherm model, the sorption intensity (n) is 1.33, which indicates favourable sorption. The heat of sorption process was calculated from Temkin Isotherm model is 50.27 J mol^{-1}, which proved that the adsorption experiment followed a physical process. Adsorption kinetic data were applied on the best fitted model was pseudo second order kinetics with highest R^2 and K_2 values for pseudo-second-order are 0.99 and 15.8479 mg/g respectively, indicating maximum equilibrium adsorption capacity for pseudo-second-order kinetics. The intra-particle diffusion model was also applied.

KEYWORDS: Biosorption, Crystal Violet Dye, Isotherm, Kinetics, *Spirulina platensis*