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## **Biosorption of Crystal violet dye by Downy wood mint seeds in aqueous solution**

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**Abstract:**In this study, equilibrium, kinetics and thermodynamics of Crystal Violet (CV) adsorption onto Downy wood mint seeds (DWMS) was investigated. Parameters that influence the adsorption process such as pH, adsorbent dose, initial dye concentration, contact time and temperature were studied by batch adsorption process using UV-Visible spectrophotometric. The optimum conditions for removal of CV were found to be pH 7.0, equilibrium time 90 min, biosorbent dosage 1.4 g, initial dye concentration 4 mg L<sup>-1</sup>. The CV biosorption potential of DWMS increased with increasing temperature. Biosorption data were modeled by Langmuir, Freundlich, Temkin and Dubinin–Radushkevich (D–R) isotherms, it seems to fit Freundlich isotherm model with high coefficients of correlation at different temperatures. Kinetics of the adsorption process was tested by pseudo-first-order and pseudo-second-order kinetics, and intraparticle diffusion mechanism. Pseudo-second-order kinetic model provided a better discretion. Thermodynamic parameters suggest that the biosorption process is spontaneous and exothermic in nature.

**Keywords:** Adsorption; Crystal violet; Downy wood mint seeds; Kinetics; Isotherm; Thermodynamics.