

Adsorption of Cd²⁺ from Aqueous Solutions Using Chitosan Obtained from a Mixture of *Littorina littorea* and *Achatinoidea* Shells

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Abstract : Adsorption of Cd²⁺ ions from aqueous solution by Chitosan, a natural polymer, obtained from a mixture of the exoskeletons of *Littorina littorea* (Periwinkle) and *Achatinoidea* (Snail) was studied at varying adsorbent dose, contact time, metal ion concentrations, temperature and pH using batch adsorption method. The equilibrium adsorption isotherms were determined between 298 K and 345 K. The adsorption data were adjusted to Langmuir, Freundlich and the pseudo second order kinetic models. It was found that the Langmuir isotherm model most fitted the experimental data, with a maximum monolayer adsorption of 35.1 mgkg⁻¹ at 308 K. The entropy and enthalpy of adsorption were -0.1121 kJmol⁻¹K⁻¹ and -11.43 kJmol⁻¹ respectively. The Freundlich adsorption model, gave K_f and n values consistent with good adsorption. The pseudo-second order reaction model gave a straight line plot with rate constant of 1.291x 10⁻³ kgmg⁻¹ min⁻¹. The q_e value was 21.98 mgkg⁻¹, indicating that the adsorption of Cadmium ion by the chitosan composite followed the pseudo-second order kinetic model.

Keywords : adsorption, chitosan, littorina littorea, achatinoidea, natural polymer

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