

Cadmium Removal from Aqueous Solution Using Chitosan Beads Prepared from Shrimp Shell Extracted Chitosan

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Abstract : In this study, chitosan was derived from *Parapenaeus longirostris* shrimp shells sourced from a local market in Annaba, eastern Algeria. The extraction process entailed four chemical stages: demineralization, deproteinization, decolorization, and deacetylation. The degree of deacetylation was calculated to be 80.86 %. The extracted chitosan was physically altered to synthesize chitosan beads and characterized via FTIR and XRD analysis. These beads were employed to eliminate cadmium ions from synthetic water. The batch adsorption process was optimized by analyzing the impact of contact time, pH, adsorbent dose, and temperature. The adsorption capacity of and Cd+2 on chitosan beads was found to be 6.83 mg/g and 7.94 mg/g, respectively. The kinetic adsorption of Cd+2 conformed to the pseudo-first-order model, while the isotherm study indicated that the Langmuir Isotherm model well described the adsorption of cadmium . A thermodynamic analysis demonstrated that the adsorption of Cd+2 on chitosan beads is spontaneous and exothermic.

Keywords : Cd, chitosan, chitosanbeds, bioadsorbent

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