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Adsorption of Chromium from aqueous solutions using Crosslinked Chitosan - Diethylenetriaminepentaacetic acid

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Abstract

Chitosan (CH) and its derivatives have been the focus of attention for researchers as potential adsorbents for heavy metal removal. The adsorption potential of chitosan cross-linked with Diethylenetriaminepentaacetic acid (CD) for Cr⁶⁺ was investigated. CD was characterized by FTIR, XRD, TGA, XPS and ESR techniques. Batch experiments were conducted to optimize the parameters affecting the adsorption of chromium. The optimum pH was found to be 3 and the adsorption process was found to be exothermic. Adsorption isotherms were determined and the maximum adsorption capacity of CD for chromium was found to be 192.3mg/g which was higher than the adsorption capacity of the adsorbents reported in literature. The thermodynamic parameters, such as Gibbs free energy, changes in enthalpy and changes in entropy change were also evaluated. XPS and ESR studies revealed that Cr⁶⁺

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