REMOVAL OF Cr(VI) BY POLYAMINE-POLYUREA POLYMER

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Chromium was found primarily as trivalent chromium (Cr III) and hexavalent chromium (Cr VI) in the environment. Chromium exposure may be from natural or industrial sources.

Chromium(VI) is more toxic than chromium(III). The respiratory tract is also the major target organ for chromium III) toxicity, similar to chromium(VI). As chromium(III) is an essential element for human body, it can be detoxified as in some amount of chromium(VI) to chromium(III). Contamination of chromium(VI) to waste water may be from automotive, leather, metal plating etc industries.

In this study, polyamine-polyurea polymer was synthesized and employed for adsorption of Cr(VI) from aqueous solution. The characterizations of the polymer was performed with elemental analysis and FTIR spectroscopic techniques.

Adsorption studies were carried out to examine effects of parameters such as pH, contact time, amount of adsorbent, initial concentration of Cr(VI) and the temperature. To reach equilibrium, 240 minutes of contact time in pH: 2,5 with adsorbent dose 0,05 g/50 mL was necessary.

Adsorption results are applied to Langmuir and Freundlich isotherm equations and Pseudo-first-order and Pseudo-second-order kinetic models. As results of isotherm and kinetic investigations, the adsorption by our polyamine-polyurea polymer was fitted well to Langmuir isotherm adsorption and Pseudo second order kinetic model which describes chemisorptions. Maximum adsorption capacities of polymer from Langmuir isotherms is 135,1 mg/g.

Thermodynamic parameters that calculated with the results of temperature studies showed the adsorption processes have exothermic, reversible and spontaneous nature.

KEYWORDS: Cr(VI), adsorption, polymer, isotherm, kinetic, thermodynamic

REFERENCES: