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Uklanjanje šestovalentnog hroma iz vode primenom biosorpcije na hitozanu

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U ovom radu ispitivana je mogućnost primene biopolimera hitozana kao adsorbensa za uklanjanje šetvovalentnog hroma iz vode. Adsorpcija je rađena u šaržnom sistemu i ispitivan je uticaj različitih parametara (pH, vreme kontakta, početna koncentracija Cr(VI)) na efikasnost uklanjanja Cr(VI). Rezultati su pokazali da se ravnoteža uspostavlja nakon 60 min, a da je efikasnost uklanjanja najveća u intervalu pH vrednosti od 2.0 do 3.5. Analiza kinetičkih parametara adsorpcije Cr(VI) pokazala je da model pseudo-drugog reda reakcije najbolje opisuje kinetiku adsorpcije za dati sistem. Dobijeni podaci su fitovani pomoću dva ravnotežna adsorpciona modela - Langmirovom i Frojndlihovom izotermom. Bolje slaganje je postignuto primenom Langmirove izoterme i nađeno je da je adsorpcioni kapacitet hitozana 86.1 mg/g. Na osnovu dobijenih rezultata može se zaključiti da hitozan ima dobar potencijal za primenu u prečišćavanju otpadnih voda zagađenih toksičnim metalom hromom.

Removal of hexavalent chromium from aqueous solutions by adsorption on biopolymer chitosan

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Biopolymer chitosan was used as an adsorbent for the removal of hexavalent chromium from aqueous solutions. Batch adsorption experiments were conducted to evaluate the effects of different parameters, such as pH, contact time and initial Cr(VI) concentration, on Cr(VI) removal. The obtained results showed that the adsorption equilibrium was established within 60 min, and the maximum adsorption occurred in the pH range of 2.0 to 3.5. Analysis of kinetic parameters of Cr(VI) adsorption showed that pseudo second-order model described the kinetics fot the investigated system. The data were fitted using two equilibrium adsorption models – Langmuir and Freundlich isotherm. The adsorption equilibrium data fit the Langmuir equation and the maximum adsorption capacity was found to be 86.1 mg/g. According to the presented results, it can be concluded that biopolymer chitosan has a great potential for application in the treatment of chromium contaminated wastewaters.