

ADSORPTION OF HEAVY METALS BY CHITOSAN CROSSLINKED WITH GLUTARALDEHYDE

Adsorbent based on chitosan beads has been prepared by crosslinking of biopolymer with glutaraldehyde. Crosslinking of chitosan was confirmed by IR spectroscopy. Adsorption of microquantities of Zn(II), Cu(II), Cd(II), Pb(II), Fe(III) cations and V(V), Mo(VI), Cr(VI) oxoanions from aqueous solutions has been studied by obtained adsorbent taking into account the most suitable pH of the medium. The highest sorption capacities were observed with respect to molybdenum(VI) oxoanions (4.04 mmol/g at pH 2,5 and 1.01 mmol/g at pH 7), vanadium(V) oxoanions (3.58 mmol/g at pH 2.5 and 0.98 mmol/g at pH 7), and copper(II) cations (1.45 mmol/g at pH 8). Chromium(VI) oxoanions extracted by crosslinked chitosan with the adsorption capacity more than 0.63 mmol/g at pH 2.5 and 0.89 mmol/g from the neutral medium. One gram of synthesized composite adsorbs more than 0.23 mmol Cd(II) cations in the neutral medium and 0.33 mmol in the slightly alkaline medium (pH 8); Pb(II) and Fe(III) – about 0.04 mmol at pH 8 and 7, respectively. The synthesized composites were found to show the lowest adsorption capacity with respect to zinc(II) ions.

Keywords: chitosan, toxic heavy metals, adsorption, water treatment.