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MULTIFUNCTIONAL RESIN DIPHONIX IN ADSORPTION OF HEAVY METAL COMPLEXES WITH METHYLGLYCINEDIACETIC ACID

Justyna Jachula*, Dorota Kolodyńska, Zbigniew Hubicki

*Department of Inorganic Chemistry, Faculty of Chemistry, Maria Curie-Skłodowska University,
Maria Curie-Skłodowska Sq.2., 20-031 Lublin, Poland*

Abstract

The aim of this research is to investigate adsorption characteristics of Co(II), Ni(II), Cu(II), Zn(II), Cd(II) and Pb(II) complexes with MGDA (methylglycinediacetic acid) from aqueous solutions by using the multifunctional chelating ion exchanger Diphonix. MGDA, belonging to a group of new generation complexones which readily undergo biodegradation, is patented by BASF and marketed under the brand name Trilon M. Optimum adsorption conditions were determined as a function of phase contact time, initial ions concentration, pH and temperature. The Langmuir, Freundlich, Temkin and Dubinin–Radushkevich (D–R) models were applied to describe the adsorption isotherm. The variations of thermodynamic parameters (ΔG° , free energy change; ΔS° , entropy change; and ΔH° , enthalpy change) for adsorption of Co(II), Ni(II), Cu(II), Zn(II), Cd(II) and Pb(II) complexes with MGDA were evaluated. Experimental data were also tested in terms of adsorption kinetics using the Lagergren and Ho and McKay kinetic equations. The adsorption of studied metal ions in the presence of MGDA on Diphonix followed the pseudo second order kinetics. Thermodynamic calculations showed that in the majority cases the adsorption process was favourable and endothermic.

Key words: adsorption, Diphonix, environment, methylglycinediacetic acid, polymers

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* Author to whom all correspondence should be addressed: e-mail: justyna.drabko@wp.pl; Phone: +48 (81) 5375511; Fax: +48 (81) 533348