KINETIC STUDY ON HEAVY METALS ADSORPTION BY IMINODIACETATE CHELATING RESINS

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Abstract

Two chelating resins (CRs) bearing iminodiacetate (IDA) groups derived from acrylonitrile – divinylbenzene (AN-DVB) copolymers having 10 and 15 wt.% nominal cross-linking degrees were used as sorbents for removal of heavy metal ions like: Cu2+, Ni2+ and Co2+ from aqueous solutions by batch technique. The experimental data were analyzed by pseudo-first order, pseudo-second order, and intra-particle diffusion equations. The adsorption kinetics was well described by the pseudo-second order equation, supporting the chemisorption would be the rate-determining step. CRs showed good retention ability for the metal ions in the following order: Cu2+ > Ni2+ > Co2+, the retention capacity increasing with the decrease of the hydrated cation radius. Desorption of Cu2+ from the CRs was achieved in about 60 min using 1 M H2SO4, and in about 40 min for Ni2+ and Co2+ with 1 M HCl.

Key words: adsorption, chelating resin, heavy metals, iminodiacetate groups, kinetics

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