

Subject area: Physico-chemical and sorption properties of modified "sol-gel" materials. Part 1.

Kinetic study in removing platinum(IV) ions from aqueous solutions by polysiloxanes

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Abstract

Organic-Inorganic hybrid sorbents based on a polysiloxane modified with amino and thiourea groups and non-modified polysiloxane have been synthesized for the first time by a sol-gel process. Kinetic dependences of sorption of platinum(IV) has been investigated. Experimental curves has been processed by the equations of known diffusive and kinetic models. Influence of the nature of a sorbent, initial concentration of metal, aggregate size of a sorbent, speed of agitating of a solution and temperature of the sorption environment on kinetics of process has been studied. Diffusivities at various stages of sorption has been calculated; the results demonstrate that the model of the pseudo-second order adequately describes sorption process in all time interval. Kinetic character of sorption of platinum by polysiloxanes is proved. The essential contribution of intraparticle diffusion at the initial stage of process has been revealed. It is shown, that at transferring from S,N- to N-polysiloxane and further to not modified the role of diffusion in kinetics of sorption increases, that agrees with theoretical assumptions of the mechanism of process.