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KINETIC STUDY OF COBALT(II) ADSORPTION ON PEAT ACTIVATED BY SIMPLE CHEMICAL TREATMENTS

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Abstract

In this study the adsorption of cobalt(II) from aqueous solutions on peat (from Poiana Stampei, Romania) activated by simple chemical treatments, was investigated from kinetic point of view. The chemical treatments suppose the mixing of peat with aqueous solutions of common chemical reagents (H_2SO_4, NaCl and NaOH), without the addition of supplementary additives. An increase of adsorption capacity of peat was obtained in case of treatments with NaCl and NaOH respectively, and this is mainly attributed to the increase of functional groups availability from adsorbent surface. In order to estimate the performances of activated peat in adsorption process of cobalt(II) from aqueous solutions, the influence of initial metal ion concentration and contact time was studied in batch system, in comparison with untreated peat. The experimental data were analyzed using three kinetics models: pseudo-first order, pseudo-second order and intra-particle diffusion models. On the basis of these models the kinetics parameters (rate constants and equilibrium adsorption capacities) were calculated.

Key words: adsorption, cobalt(II), chemical treatment, kinetics, peat

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