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STUDY OF CADMIUM SORPTION ON SOME ROMANIAN SOILS

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Abstract

Cadmium is a heavy metal that occurs naturally in soils. The concentrations of total dissolved cadmium and the behavior of its free ions in soil solution are influenced by soil pH, organic matter (OM) content, cation exchange capacity (CEC), and clay mineralogy. In this paper, the cadmium (II) sorption to the natural soils samples was investigated by batch tests. Soil samples were previously analyzed and characterized. The influence of physico-chemical key parameters such as pH, initial concentration of cadmium in solution, soil dose, and contact time has been considered in batch tests. The adsorption data were fitted by Langmuir and Freundlich isotherm models. Langmuir model described better the retention of cadmium ions on soil particles with q_m = 17.20 for IS 30/2 and q_m = 17.20 for IS 35/2. An evaluation of thermodynamic parameters of Cd (II) adsorption onto soils showed that sorption process of Cd(II) on studied soils is almost spontaneous and favorable even at high metal ion concentrations according to negative values of Gibbs free energy (ΔG).

Keywords: cadmium, heavy metals, soil, sorption

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