



Thermodynamic study of cd (II) sorption on soil

Raluca-Maria HLIHOR, Petronela COZMA, Cristina GHINEA, Vasile Lucian PAVEL, Brindusa Mihaela ROBU, Maria GAVRILESCU - "Gheorghe Asachi" Technical University of Iași

Sorption is a major process responsible for the fate of heavy metals in soils, since the mobility of heavy metals is directly related to their partitioning between the soil solid phase and soil solution. Among the heavy metals cadmium is one of the most toxic with adverse health effects. The objective of this study is to analyze the sorption of Cd(II) from aqueous solution on soil from the industrial area of the city of Iasi (Romania) as a function of temperature at natural pH of the solution using a batch technique. A maximum uptake of about 9.7 mg of cadmium per g of soil and aprox. 95 % removal of metal was observed at 20 g/L soil amount, 200 mg/L cadmium solution and 41 °C, with an equilibrium time of 24 hours. Sorption isotherm of Cd(II) on soil were represented by Freundlich and Dubinin-Radushkevich models and the parameters indicated that the sorption of Cd(II) increased with increasing temperature of the system. Enthalpy (ΔH^0), entropy (ΔS^0) and Gibbs free energy (ΔG^0) were calculated from the temperature dependent sorption data, and the results indicated that the sorption of Cd(II) on soil is a spontaneous, feasible and endothermic process.