



## Sorption kinetics and thermodynamics for the removal of lead (II) ions from aqueous solutions on thermal power plant ash

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The kinetics and thermodynamics of lead ions sorption on an energy pit coal fly ash, a massive waste of a thermal power station in Iași (Romania) have been studied. A comparison of kinetic models applied to the sorption of lead (II) ions on fly ash has evaluated for the pseudo-first order and pseudo second order models. Results show that the pseudo-second order model was able to describe the experimental data well. The lead (II) sorption process follows the Langmuir isotherm. The thermodynamic parameters, free energy change ( $\Delta G$ ) enthalpy change ( $\Delta H$ ) and entropy change ( $\Delta S$ ) have been calculated on the basis of Langmuir constants. The negative values of  $\Delta G$  validate the feasibility and the spontaneity of the lead (II) sorption process by the fly ash. The positive value of  $\Delta H$  shows the endothermic nature of the sorption process. The positive value of  $\Delta S$  suggests the increase in randomness at the solid solution interface during the sorption of Lead (II) on tested fly ash. The obtained results are very promising for fly ash applications in lead(II) ions effluent management.