Kinetic and thermodynamic profile of pb(II) sorption by untreated hemp fibers

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The use of low cost sorbents for removing heavy metals from wastewaters has emerged as a potential alternative method to conventional techniques (chemical precipitation, reverse osmosis, electrolysis, ion exchange). However, the success of this approach depends on economic feasibility, which can be obtained by the optimization of the environmental conditions. The results showed that sorption kinetics of Pb(II) on untreated hemp fibers could be described by pseudo –first order and pseudo – second order models. In order to evaluate the thermodynamic feasibility of the Pb (II) sorption process on hemp, the thermodynamic parameters, free energy change (ΔG), enthalpy change (ΔH) and entropy change (ΔS) have been calculated At all working temperatures, the ΔG values are negative, showing the spontaneous nature a of Pb (II) sorption on hemp fibers. The positive values of ΔH indicate that the Pb (II) sorption on hemp is an endothermic process, favored by temperature increasing. For ΔS a positive value has been obtained, suggesting an increased randomness at the interface of hemp – solution and affinity of the natural hemp for Pb(II) ions.