عنوان مقاله:

Application of Green Novel NiO/ZSM-5 for Removal of Lead and Mercury ions from Aqueous Solution: Investigation of Adsorption Parameters

محل انتشار:

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خلاصه مقاله:

Consistent with the US Environmental Protection Agency, heavy metals are classified as carcinogenicto humans. Their numerous agricultural, industrial, domestic, medical, and technical requirementshave resulted in their widespread dissemination in the environment. This article examines a new greenadsorbent for the removal of two hazardous heavy metals, lead, and mercury. The impact of contact time,pH, initial concentration, and temperature on the adsorption capacity of Pb2+ and Hg2+ were evaluated.Experimental data were analyzed by adsorption models. The equilibrium data were well adapted to theLangmuir adsorption model. The results show that the adsorption is homogeneous and localized in amonolayer. In addition, the maximum adsorption capacity was 277.78 mg/g for Pb2+ and 64.52 mg/g forHg2+ from Langmuir isotherm. Thermodynamic data, including free energy (ΔG°), enthalpy (ΔH°), andentropy (ΔS°) variations were also considered. The important point is that the negative value of ΔG°signifies the spontaneity of the adsorption process of the heavy metals–NiO/ZSM-5 system.

کلمات کلیدی:

Adsorption Capacity, Lead, Mercury, NiO/ZSM-5, Thermodynamic