

عنوان مقاله:

Thermodynamic study of (pb²⁺) removal by adsorption onto modified magnetic Graphene Oxide with Chitosan and Cysteine

محل انتشار:

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خلاصه مقاله:

A new modified magnetic Graphene Oxide with Chitosan and Cysteine was synthesized for removing Pb²⁺ ions from aqueous solution. The properties of this adsorbent were characterized by Field Emission Scanning Electron Microscopy (FESEM), Vibrating Sample Magnetometer (VSM) and Energy Dispersive Analysis System of X-ray (EDAX). Physicochemical parameters such as effect of pH, contact time, adsorbent dosage and initial concentration of Pb²⁺ was also studied. The results showed that the maximum capacity of adsorbent in Lead ions adsorption (at Equilibrium concentration of ۱۲۰ ppm) occurred at pH Optimum = ۵.۷۵, t Optimum = ۳۰ min and adsorbent ۸۵.۴ mg/g dosage = ۰.۱ gr. Maximum empirical adsorption capacity (q_{max}) was calculated ۸۵.۴ mg/g. The thermodynamic parameters (ΔH° , ΔG° and ΔS°) showed that the adsorption process of Pb²⁺ on modified magnetic Graphene Oxide with Chitosan and Cysteine was endothermic and spontaneous. Removal percentage was reduced to ۱۵% after five stages of Sorption/desorption studies. So, modified magnetic Graphene Oxide with Chitosan and Cysteine can be used as a complementary process for removal of Pb²⁺ ions from water and wastewater.

کلمات کلیدی:

Magnetic Graphene Oxide, Surface modification, Nanoparticles, Removal of lead, Adsorption thermodynamics

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