

A novel polymer derived from chitosan and 1-hydroxy-2-pyridinethione-4-carboxylic acid as pendant group was prepared and characterized by different spectroscopic methods and by elemental analysis. The chelation properties of the new polymer towards the divalent metal ions (Pb²⁺, Cd²⁺, Cu²⁺, Ni²⁺, and Zn²⁺) in aqueous solutions was studied by a batch equilibration technique as a function of contact time, pH, mass of resin, concentration of metal ions, and particle size. The amount of metal-ion uptake of the polymer was determined by using atomic absorption spectrometry(AAS). Results of the investigation revealed that there is exhibited higher capacities and a more pronounced adsorption toward Pb²⁺ and that the metal-ion uptake follows the order: Pb²⁺ > Cu²⁺ > Zn²⁺ > Ni²⁺ > Cd²⁺. The isothermal behavior and the kinetics of adsorption of Pb(II) ions on the resin were also investigated; the experimental data of the adsorption equilibrium from Pb(II) solution correlates well with the Langmuir isotherm equation.