

Equilibrium and kinetic behavior on cadmium and lead removal by using synthetic polymer

ABSTRACT

It is known that synthetic polymer plays a big role in various applications. One of its potentials is to remove heavy metal ions through single batch adsorption. Adsorption behavior and mechanism of synthetic polymer are the two main focuses in this research. The synthetic polymer of Poly(AN-co-AA) has been successfully polymerized, modified with hydroxylamine hydrochloride and removed Cd^{2+} and Pb^{2+} . The poly(AN-co-AA) and amidoxime (AO) modified poly(AN-co-AA) were characterized by Fourier Transform Infrared Analysis (FTIR), microanalysis, Scanning Electron Microscopy (SEM) and Thermogravimetry (TGA). At pH 9, the percentage removal for Cd^{2+} (90%) and Pb^{2+} (98%) were the highest with adsorbent dosage at 4 g L^{-1} and 8 g L^{-1} , respectively. The experimental data for Cd^{2+} (20 mg g^{-1}) and Pb^{2+} (125 mg g^{-1}) were fitted well by Sips and Freundlich isotherms model, respectively. The adsorption rate for both Cd^{2+} and Pb^{2+} were stated by using Lagergren pseudo-first order.

Keyword: Amidoxime; Polymer synthesis; Heavy metal; Kinetic; Equilibrium