An Investigation Of Removal Of Some Heavy Metals By Adsorption On Natural Bentonite

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In this study, the removal of Cu(II), Cd(II), Co(II) and Pb(II) ions from aqueous solutions using the adsorption process on natural bentonite has been investigated as a function of initial metal concentration, pH, stirring time and adsorbent amount. Equilibrium modeling of the adsorption showed that adsorption of metals were well fitted to Langmuir and Freundlich isotherms. The percentage adsorption and distribution coefficients (K_D) were determined for the adsorption system as a function adsorbate concentration. It is shown that the bentonite is sensitive to pH changes, so that the amounts heavy metal cations adsorbed increase as pH increase in adsorbent-adsorbate system. Optimum conditions were found as pH: 5, concentration: 10 mg/L, adsorbent amount: 0.2 g and stirring time: 30 min. The rate of attaining equilibrium of adsorption of metal ions follows the order Cd(II) > Co(II) > Cu(II) > Pb(II). These results show that bentonite hold great potential to remove the relevant heavy metal cations from aqueous solutions.

References