Beneficial reuse of chicken feathers in removal of heavy metals from wastewater

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Abstract

Natural and chemically treated chicken feathers (CF) were tested for their ability, as adsorbents, to remove copper and zinc from wastewater. Alkaline solutions of 0.2 N NaOH were found to be the best for the sorption process and a 0.6 wt% solution of dodecyl sulfate, as anionic surfactant, also gave best adsorption results. Treatment of CF with alkaline solutions adsorb more metal ions than those treated with the anionic surfactant followed by the untreated CF. Generally, the kinetics of the removal process by all tested sorbents was fast. The Freundlich isotherm model was found to represent the equilibrium results, of all adsorbents toward copper and zinc, reasonably well.

Keywords: Chicken feathers; Alkaline treatment; Anionic surfactant; Adsorption; Freundlich isotherm