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Potential use of novel modified fishbone for anchoring hazardous metal ions from their solutions

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Abstract

Bones obtained from Mullet fish in the Red Sea were grafted with acrylic acid by radiation-induced polymerization and were used as natural sorbents in the removal of lead and cadmium ions which are considered as major pollutants in the wastewater. The removal efficiency of the adsorbent was investigated as a function of pH, contact time, initial metal ion concentration, and adsorbent dose. The maximum adsorption capacities of lead and cadmium ions were 855 mg/g and 785 mg/g, respectively at optimum conditions. The kinetic studies of adsorption for lead and cadmium ions were found to obey a pseudo-second-order model and the adsorption of both ions was found to fit the Langmuir isotherm. The grafted fishbone was effectively used as a sorbent for the removal of Pb²⁺ and Cd²⁺ ions from aqueous solution. (C) 2013 Elsevier B.V. All rights reserved.

Keywords

Author Keywords: Fishbone; Grafted fishbone; Removal of hazardous metal ions; Radiation induced grafting polymerization

KeyWords Plus: HEAVY-METALS; ANIMAL BONES; REMOVAL; WASTE; WATER; HYDROXYAPATITE; BIOSORPTION; ADSORPTION; KINETICS; CR(VI)

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