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Hydroxyapatite based nanostructures for efficient treatment of lead containing waste water

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The present work deals with the development of hydroxyapatite (n-HA) and hydroxyapatite-chitosan composite (n-HACs) nanostructres for removal of lead ions from aqueous lead containing solutions. The synthesis of n-HA was carried out using sol-gel route while the n-HACs was prepared by a co-precipitation method. The nanostructures were characterised using transmission electron microscopy, X-ray diffraction, fourier transform infrared spectrophotometry and thermogravimetric analysis to reveal the morphology, crystal structure, functionality and stability respectively. In order to evaluate the lead removal characteristics of n-HA and n-HACs, adsorption tests were conducted and the results showed better performance of n-HACs than n-HA. The equilibrium Pb^{+2} ions concentration was identified by atomic absorption spectroscopy. The influence of initial Pb^{+2} ion concetration, and sorbent dosage on sorption capacity was studied. The kinetics of the sorption process was also investigated. Two models of adsorption isotherms (Freundlich and langmuir) were employed to corelate the results and to understand the adsorption mechanism. Adsorption kinetics and isotherm tests revealed that Pb^{+2} adsorption to the n-HACs follows pseudo-seond order kinetic and Langmuir-type adsorption respectively.

Biography

Uma Batra is Professor and Head of Department of Materials & Metallurgical Engineering and Dean of Faculty Affairs at PEC University of Technology, Chandigarh, India, a premier institute with a history of more than 100 years. Significantly PEC is the alma mater of the late Indo-American astronaut and Aeronautical Engineering student Kalpana Chawla. Her research areas include nano hydroxyapatite for bioimplants, bioactive coatings on metallic implants. She has authored more than 100 research papers in national and international journals. She has delivered more than 50 invited talks in the area of Metallurgy and Materials. She was nominated officially in 2007 as the first Indian Woman Engineer representative to the U.S Society of Women Engineers (SWE) US by a delegation from the American Society of Engineering Education.

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