

Studies on the removal of Pb (II) from wastewater by activated carbon developed from Apricot stone activated with sulphuric acid

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Description

Studies on the utilization of low cost adsorbents for removal of heavy metals from wastewaters are gaining attention. Activated carbons were developed from Apricot stone, by chemically treating with sulfuric acid. Batch adsorption experiments were performed to find out the effective lead removal at different metal ion concentrations, adsorbent size and dosage. Operational parameters such as pH, agitation time and adsorbent concentration, initial ion concentration and particle size were also studied. Adsorption data fitted well with the Langmuir and Freundlich models. However, Freundlich isotherm displayed a better fitting model than Langmuir isotherm because of the higher correlation coefficient that the former exhibited. Apricot Adsorption kinetics data were modeled using the pseudo-first and pseudo-second-order models. The results indicate that the second-order model best describes adsorption kinetic data. The estimated maximum capacities of lead ions adsorbed by Apricot stone activated with sulphuric acid were 21.38 mg g⁻¹. In addition, the thermodynamic parameters, standard free energy (ΔG^0), standard enthalpy (ΔH^0), standard entropy (ΔS^0) of the adsorption process were calculated