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Removal of Copper(II) and Lead(II) from Aqueous Phase by Plum Stone Activated Carbon

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Abstract : In this study, plum stone shell activated carbon (PS-AC) was prepared to adsorb Cu(II) and Pb(II) ions in aqueous solutions. Some important parameters that influence the adsorption of metal ions such as pH, contact time and metal concentration have been systematically investigated in batch type reactors. The characterization of adsorbent is carried out by means of FTIR and SEM. It was found that the adsorption capacities of PS-AC were pH-dependent, and the optimal pH values were 4.5 and 5.0 for Cu(II) and Pb(II), respectively. The adsorption was rapid and the equilibrium was reached within 60 minutes to remove of Cu(II) and Pb(II) ions. The adsorption stability was studied in various doses of adsorbent. Langmuir, Freundlich and D-R adsorption models were used to describe adsorption equilibrium studies of PS-AC. Adsorption data showed that the adsorption of Cu(II) and Pb(II) is compatible with Langmuir isotherm model. The result showed that adsorption capacities calculated from the Langmuir isotherm were 33.22 mg/g and 57.80 mg/g for Cu(II) and Pb(II), respectively.

Keywords : plum-stone, activated carbon, copper and lead, isotherms
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