



Lead(II) adsorption by peach palm waste

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ABSTRACT

The aim of the present study was to investigate the efficiency of chemical treatments for peach palm sheaths, targeting the treatment of Pb(II) contaminated aqueous effluents. The modification was done with sodium hydroxide and citric acid to introduce carboxyl groups. Pb(II) adsorption was evaluated in function of pH, contact time, metal concentration, desorption ability and thermodynamic factors. An infrared adsorption peak was observed at 1740 cm⁻¹ due to the presence of carboxyl groups. The required time for the system to reach equilibrium was about 150 min, and the Pb(II) adsorption followed a pseudo-second-order kinetic model. The Langmuir model showed the best fit for the adsorption data. The maximum adsorption capacity and minimum desorption rate values of 65.32 mg g⁻¹ and 74.72%, respectively were obtained for the NaOH-modified peach palm sheath. After using the chemical treatment, the adsorbent properties improved and the system became more spontaneous, as confirmed by low Gibbs energy values.

Keywords: *Bactris gasipaes*; Adsorption; Biomaterials; Biosorption; Metals; Waste

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