

Sustainable natural adsorbents for heavy metal removal from wastewater: lead sorption on pine bark (*Pinus radiata* D. Don)

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Resumen

Aqueous Pb(II) adsorption on pine bark (*Pinus Radiata* D. Don), an inexpensive and sustainable natural sorbent material, has been evaluated and the mechanism of metal retention characterized by scanning electron microscopy (SEM), diffuse reflectance infrared Fourier transform spectroscopy (DRIFTS) and X-ray photoelectron spectroscopy (XPS). Bark pulp densities > 1.5 g l⁻¹ achieve near 100% Pb(II) removal from aqueous solutions containing 100 mg l⁻¹ Pb(II). Adsorption rates increased with pulp density, although adsorption capacity diminished at high densities because of blockage of adsorption sites. The effects of washing and sulfuric acid activation were assessed and found to be less important than in previous metal sorption studies. Pb(II) sorption takes place mainly at the lignocellulosic C-O groups, with adsorption at phenolic sites appearing to be most significant. Copyright (C) 2015 John Wiley & Sons, Ltd.

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