

REMOVAL OF LEAD (II) FROM AQUEOUS SOLUTIONS BY PEELS OF BANANA VARIETY AVAILABLE IN SRI LANKA

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Lead (II) is a water pollutant released from industrial and agricultural activities to the environment. It is non-biodegradable and tends to bio-accumulate, which causes environmental contamination. This study investigated the removal of Pb (II) ions using peels of the Puwalu banana (*Musa acuminata* Colla), a banana variety available in Sri Lanka. Banana peels (BP) are waste material that could be used as an environmentally friendly adsorbent. The dried ground Puwalu BP were characterised by a Scanning Electron Microscope, which illustrated the surface morphology of the BP, and pattern of the Powder X-ray diffraction of the BP showed the amorphous nature of the adsorbent. Fourier Transform Infrared spectroscopy analysis was conducted for the BP before and after Pb (II) adsorption to determine the functional groups involved in removing Pb (II) ions. Parameters such as particle size, adsorbent dosage, contact time, and pH were optimised, and the concentrations of Pb (II) ion in solutions were determined using a Flame Atomic Absorption Spectrometer. Under optimal conditions, the maximum Pb (II) removal percentage was 87.19%. Langmuir and Freundlich isotherm models were applied to determine the adsorption behaviour between the metal ion and the adsorbent. Both isotherm models showed a correlation coefficient where R^2 values were close to one ($R^2 \approx 0.99$), and the maximum adsorption capacity for Pb (II) was 11.42 mg g^{-1} . The present study suggests that ground Puwalu BP can be used as a cost effective adsorbent for removing Pb (II) ions from aqueous media.

Keywords: Adsorption, Banana peels, Isotherms, Pb (II), Puwalu