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EQUILIBRIUM STUDIES ON THE BIOSORPTION OF LEAD (Pb²⁺) CONTAMINATED WASTEWATER USING CATTAILS LEAVES (*Typha angustifolia*)

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Abstract

Dried *Typha angustifolia* (TA) leaves or commonly known as the common cattail were evaluated as an adsorbent for the adsorption of lead in synthetic aqueous solutions. Equilibrium studies were conducted in a batch mode and the selected sorption isotherms were then applied. Equilibrium was achieved after 8 hours. The selected sorption isotherms were the Langmuir, Freundlich, D-R and Temkin model. Data fitting was done based on linear regression analysis. The adsorption system fitted the Langmuir model best as compared to the Freundlich, Temkin and D-R model. The maximum monolayer adsorption capacity calculated from the Langmuir model was 51.02 mg/g with a removal rate of 89%. This proves that adsorption occurred via monolayer coverage of the adsorbate at the outer layer of the adsorbent. The infrared spectra of the dried leaves before and after adsorption confirmed that there was interaction between the lead ions and the organic functional groups of the leaves. Thus, cattail leaves were successful in adsorbing lead in aqueous solution.

Key words: adsorption isotherms, cattails, lead

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