

Batch Experiment of Removal of Heavy Metal (Pb) (II) by use of Inexpensive Bio Absorbent Leaf of *Abutilon pannosum* (APL)

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Abstract

The contamination of heavy metals to the environment, i.e., soil, water, plant and air is of great concern due to their potential impact on human and animal health. Lead causes pollution and affects all the systems of the human body. The present study highlights experimental data on low cost adsorbent like leaf powder of plant *Abutilon pannosum* (APL) for removal of heavy metal (Pb²⁺) ions. The adsorbent material opted was found to be an efficient material for removal of Lead (II). The present study aimed to identify efficient medium for the removal of heavy metal with various parameters like adsorbent dosages, concentration, agitation time, temperature and pH. This report also identified the adsorption capacity of APL leaf powder. The experiments were done using Atomic absorption spectrometer. Different isotherm models like Freundlich isotherm, Langmuir Isotherm, Temkin isotherm, Dubinin-Radushkevich isotherm, Redlich-Peterson isotherm, Sips or Langmuir-Freundlich isotherm, Halsey adsorption Isotherm, Khan isotherm for understanding the mechanism of the process. Thermodynamic parameters were studied at different temperatures 295 to 312 K to evaluate the nature of adsorption of Pb²⁺ by APL powder. The two parameter isotherm coefficients ($R^2 > 0.99$) for kinetics of the process were studied using Pseudo first order, Pseudo second order, Elovich equation, Intra- particle diffusion and Bangham equations. This study has demonstrated that the plant materials of *Abutilon pannosum* can be used as an effective bio absorbent for removal of lead from aqueous solutions.