

CHAPTER: 8
ACTIVATED CARBON DERIVED FROM BALAM KHIRA (*KIGELIA AFRICANA*)
USED FOR REMOVAL OF Pb (II) ION FROM ITS AQUEOUS SOLUTION

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ABSTRACT

A low cost activated carbon derived from the fruit of *Kigelia Africana* (KA), was characterized for effective removal of Pb (II) from its aqueous solution. The derived carbon from *Kigelia Africana* (CKA) had micro porous and meso porous pore size distribution with high surface area ($799 \text{ m}^2 \text{ g}^{-1}$) and high carbon content (79.42 %). The batch experiments are carried out to investigate the effect of process parameters such as solution concentration, pH, temperature, contact time, CKA amount on adsorption. The maximum adsorption was found at pH 5.0 (on 97 % for 2.5 g/l CKA in 50 mg/l Pb (II) initial concentration). The Langmuir, Freundlich and Temkin models were modeled to evaluate the equilibrium adsorption data. The adsorption isotherm data was best fitted by Langmuir model with adsorption capacity 79.87 mg/g ($R^2 = 0.99$) at 30°C . Thermodynamic study demonstrates spontaneous and endothermic nature of the adsorption. Kinetic studies were examined using different kinetic models (Lagergren first order and pseudo second order) and found pseudo second order kinetic data are well fitted for adsorption process.

Keyword: Low cost activated carbon (CKA), Pb (II), isotherm models, Lagergren first order, Pseudo second order