



## **Kinetic and Thermodynamic Studies on the Adsorption Behaviour of Rhodamine-B Dye onto Carbonized Powder of Polyalthia Longifolia Seeds (Ashoka)**

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**Abstract** : Removal of Rhodamine-B from aqueous media was achieved onto carbonized powder of polyalthia longifolia seeds as a new low cost adsorbent. The adsorption of basic Rhodamine-B occurred by studying the effect of adsorbent amount, dye concentration, contact time, pH and temperature. Adsorption Study of removal of Rhodamine-B from aqueous solution at 610 nm wavelength has been investigated through a batch study. Solutions of dye having concentrations 10, 20, 30 & 40 mg/lit were used. Maximum removal of dye was found to be 93% for 10 mg/lit solution, in 120 min with 6.5 pH, 250 mg/50 ml as dose and 60°C temperature. The adsorption followed pseudo-2<sup>nd</sup> order kinetics. Both intra-particle and film diffusion governed the adsorption process. Thermodynamic parameters, such as standard Gibbs free energy ( $\Delta G^0$ ), standard enthalpy ( $\Delta H^0$ ) and standard entropy ( $\Delta S^0$ ) were calculated. All results found concluded that carbonized powder of polyalthia longifolia seeds could be effectively employed as effective new low cost adsorbent for the removal textile dyes from aqueous solutions.

**Keywords** : Rhodamine-B, Polyalthia Longifolia, Lagergren 1<sup>st</sup> order, Pseudo 2<sup>nd</sup> order, Kinetic and Thermodynamic, Clean & Cheap, Biosorbent.

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