



## Activated Red Mud as an Adsorbent in the Removal of Anionic Dye, Brilliant Yellow Dye, From Polluted Waters

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**Abstract:**The sorption nature of acid activated red mud towards anionic dye, Brilliant yellow dye, has been investigated with respect to various physicochemical parameters like pH, sorbent concentration, agitation time, temperature and initial concentration of the dye using simulated waters and the conditions have been optimized for the maximum removal of the dye. The interference of co-ions on the adsorption of the dye has been investigated. The adsorption data is analyzed using Langmuir, Freundlich, Temkin and Dubinin-Radushkevich isotherms. Correlation coefficient ( $R^2$ ) and dimensionless separation factor ( $R_L$ ) values have confirmed that adsorption obeys Langmuir adsorption ( $R^2$ : 0.9914;  $R_L$ : 0.0290) indicating monolayer formation while Temkin isotherm and Dubinin-Radushkevich isotherms indicate that the adsorption is 'physisorption' in nature. Pseudo-first-order, pseudo-second-order, Bangham's pore diffusion and Elovich equations have been applied to identify the kinetics of adsorption process and found that adsorption follows pseudo-second-order kinetics. The thermodynamic study revealed that adsorption of the dye is an endothermic process and the adsorption increases with increase in temperature. The procedures developed in this investigation have been applied to the samples collected from the effluents of textile industries and found to be successful.

**Key Words:** Anionic Dye, Brilliant yellow dye, Pollution and Control, Activated Red mud, adsorption, applications.

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