



A Comparative Adsorption Study with Different Activated Carbons as Adsorbents for the Removal of Cationic Dye from Aqueous Solution

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ABSTRACT

A carbonaceous adsorbent prepared from plant material like Emblica Officinalis Bark Carbon (EOBC) was found to show good porosity, appreciable surface area and consequently adsorbs dyes to an appreciable extent. Effect of various experimental parameters have been investigated using batch adsorption technique at room temperature ($30\pm 1^\circ\text{C}$) and the adsorption of Rhodamine B (RB) on carbonaceous adsorbent confirms to Langmuir equation, is a first-order process and pore diffusion controlled. The efficiency of carbonaceous adsorbent was evaluated by comparing the results with those obtained on a Commercial Activated Carbon (CAC). It was found that prepared carbonaceous adsorbent exhibits dye removal efficiency that is about 86–96% of that observed with CAC. FT-IR spectra of the adsorbents were recorded to explore the number and position of functional groups available for the binding of dye onto adsorbents. SEMs of the native and exhausted (CAC and EOBC) were recorded to explore the morphology of the adsorbent.

Keywords: Rhodamine B , , Emblica Officinalis Bark Carbon , Freundlich and Langmuir isotherms, Kinetics of adsorption.
