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Sodium chloride-activated rubber seed shell carbon for methylene blue removal

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Abstract. Rubber seed shell was converted into adsorbents via sodium chloride activation at mass ratios (NaCl-to-rubber seed shell) of 0.5, 1.0, and 2.0 for methylene blue adsorption. The char (without NaCl activation) was also prepared for comparison. The adsorbents were characterized for specific area, functional groups, and morphology, while the dye adsorption was studied at different concentrations, contact times, and solution temperatures for equilibrium, kinetics, and thermodynamics, respectively. The surface morphology of activated carbon becomes more porous when NaCl concentration for activation increases. The textural analysis shows a greater specific area of 330 m^2/g for activated carbon by NaCl activation at a mass ratio of 0.5, while char exhibits the magnitude of only 68.8 m^2/g. However, the latter exhibits the best adsorptive performance for methylene blue. The char displays a greater pore size of 4.7 nm, while all activated carbons are relatively microporous, thus inhibiting the smooth diffusion of dye molecules.

***Keywords*:** activated carbon; adsorption; rubber seed shell; NaCl activation; methylene blue.

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