



## **Liquid Phase Adsorption of Phenol by Activated Carbon Derived From Hazelnut Bagasse<sup>#</sup>**

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**Abstract:** Wastewater containing phenolic compounds presents a serious discharge problem due to their poor biodegradability, high toxicity and ecological aspects. In this study, the adsorption of phenol from aqueous solution on activated carbon obtained from hazelnut bagasse activated with ZnCl<sub>2</sub> was investigated. Batch adsorption experiments were carried out at constant pH value under varying experimental conditions of contact time, phenol concentration, temperature and adsorbent dose. Adsorption equilibrium was reached within 300 min. Studies showed that the removal efficiency of phenol increased with increase in adsorbent dose and phenol concentration. Temperature was not affected significantly phenol removal. Freundlich and Langmuir adsorption isotherms were applied to the experimental data. Both the Freundlich and Langmuir isotherm models adequately fit to the adsorption data for all temperatures. The adsorption capacities calculated from Langmuir equation were found to be 97.36, 91.32 and 99.27 mg/g for 25, 35 and 45 °C, respectively. The adsorption kinetics were examined at three different phenol concentrations (300, 400 and 600 mg/L). The kinetic models such as pseudo first order and pseudo second order model were fitted to identify the mechanism of adsorption process; the adsorption of phenol obeyed pseudo second order rate equation for all concentration range. The present study shows that the activated carbon derived from hazelnut bagasse can be used as low-cost adsorbent for adsorption of phenol.

**Keywords:** *Adsorption; Phenol; Activated Carbon; Hazelnut Bagasse.*

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