# ADSORPTIVE REMOVAL OF PHENOL AND *P*-CHLOROPHENOL BY ACTIVATED CARBONS

## ABSTRACT

In this study, two kinds of commercial activated carbons (Calgon Filtrasorb 400 Activated Carbons & Coconut Shell-Based Activated Carbons) were used for adsorption of phenols from contaminated water. Phenol and *p*-chlorophenol were chosen as adsorbates for the sorption test. In this work, adsorption of phenol and *p*-chlorophenol has been studied by using batch studies. Adsorption studies for phenol and *p*-chlorophenol removal were carried out under varying experimental conditions of initial concentration of solutions, temperature and pH. The highest adsorption capacity between the adsorbates; phenol & *p*-chlorophenol and the adsorbents; Calgon F400 & Coconut Shell-Based Activated Carbons has been determined. The experimental data were analyzed using Langmuir and Freundlich isotherm equations. Almost all data were described well by the Langmuir isotherm equation. The highest adsorption capacity of phenol and *p*-chlorophenol were at 25 mg/L initial concentration and at 30°C. The optimum pH for the highest adsorption of phenol and *p*-chlorophenol are in range 6-8 for a phenolics concentration of 200 mg/L. Kinetics of adsorption obeyed a second order rate equation while for the reversible kinetics, it's fitted to first order equation. A comparative study between two kinds activated carbons showed that Calgon Filtrasorb 400 were more efficient compared to Coconut Shell-Based Activated Carbons. On the other hand, a comparative between the adsorbates showed that *p*-chlorophenol was better than phenol.