

## KINETICS OF CHLOROPHENOL ADSORPTION ONTO COMMERCIAL AND FLUTED PUMPKIN ACTIVATED CARBON IN AQUEOUS SYSTEMS

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### ABSTRACT

*Experiments were carried out in a batch process for the removal of chlorophenol from fluted pumpkin stem waste and a commercial activated carbon. The results of equilibrium studies showed that equilibrium was reached within one hour of exposure time. Five kinetic models were applied to fit the experimental data namely pseudo first order, pseudo second – order, Elovich, intra-particle and liquid –film diffusion models. The interpretation of the released results have shown that, pseudo second order model is the most suitable dynamic theory describing the adsorption of chlorophenol onto both activated carbons predicting therefore a chemisorptions process. Chlorophenol thermodynamic data on FPAC and CAC indicates the feasibility and spontaneous nature of the process with  $\Delta G^\circ$ ,  $\Delta H^\circ$ ,  $\Delta S^\circ$  being negative. Fluted pumpkin stem an abundant waste in Nigeria, if used for the wastewater treatment process would serve as an economically viable option to the increasing toxic threat to the environment.*

**Keyword:** Chlorophenol, adsorption, fluted pumpkin, temperature, kinetic modelling