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**Removal of benzene from aqueous solution using carbon nanotube  
synthesized from fuel oil waste**

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**Abstract: This investigation is dealing with adsorption of benzene compound from aqueous solution using a new carbon nanotube (CNT) synthesized from a fuel oil waste of power plants which identify by FE-SEM and TEM. It was found that a CNT has a very significant adsorption for benzene compared to that of non-activated carbon. The equilibrium adsorption data were analyzed using adsorption models of Langmuir, Freundlich and Temkin. The results showed that the model isotherms are fitting very well with the experimental data. Kinetic study was conducted and the results pointed out that a pseudo-first order model was represented the data. Values of the activation thermodynamic functions were calculated through equilibrium constants at different temperature. All values of Gibbs functions were negative with values of -1.6 and -13.0 kJmol<sup>-1</sup> for non-active and CNT respectively, while values of enthalpy and entropy were about -33kJmol<sup>-1</sup> and -65JK<sup>-1</sup> mol<sup>1</sup> for CNT respectively. These results indicated that the adsorption process was feasible, spontaneous and exothermic.**

**Keywords: CNT; Benzene; Fuel oil; Adsorption**