**Preparation of waste tea activated carbon using potassium acetate as an activating agent for adsorption of Acid Blue 25 dye**

**Abstract**

Waste tea activated carbon (WTAC) was prepared through chemical activation with a novel activating agent, potassium acetate and used for the sorption of Acid Blue 25 (AB25) dye. Batch adsorption studies were carried out with the consideration of factors such as initial dye concentration (50–350 mg/L), temperature (30, 40, 50 ◦C), contact time and initial pH (2–12). This was done to enable the determination of kinetics and isotherms behaviour. Langmuir, Freundlich, Temkin and Dubinin–Radushkevich (D–R) isotherm models were tested and the adsorption of AB25 dye on WTAC was best fitted to Langmuir and the maximum monolayer of WTAC was 203.34 mg/g. Pseudo-second order kinetic model was found to adequately describe the adsorption process. The adsorbent, WTAC gave 97.88% adsorption of AB25 dye.