

# Adsorption of Binary Dye Solution Using Activated Carbon Prepared from Waste Sludge and the Evaluation of the Subsequent

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## ABSTRACT

Among various methods of wastewater treatment, adsorption is one of the effective processes. The objectives of the research is to compare the adsorption efficiencies of the commercial GAC and the adsorbents prepared from waste sludge, in terms of the removal of dyestuff solutions. Both single (RR141、AR27 and MG) and binary mixed dyestuff solutions (MG+AR27 and MG+RR141) were studied, and effects of adsorption temperature (30、40、45) and initial concentration (20~100ppm) were also discussed. Besides, TiO<sub>2</sub> and adsorbents were combined to evaluate the possibility of adsorption and photocatalytic degradation. The results showed that the adsorption of binary mixed dye solutions using GAC and prepared adsorbents could be well described by the rate equation of pseudo-second-order reaction. The equilibrium adsorption capacity of GAC is slightly greater than that of prepared adsorbents. As for the adsorption isotherms, The Redlich-Peterson equation could successfully describe most conditions, except the adsorption of RR141 by GAC. There was no obvious difference among various photocatalytic reactions using different photocatalysts combined with adsorbents.

Keywords : Equilibrium adsorption capacity, Adsorption kinetic equation, waste sludge, Dyestuff, Photocatalysts

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