

## **Decolourisation of Reactive Orange 16 by activated carbon and copper oxide catalysts supported on activated carbon**

### **ABSTRACT**

Decolourisation of Reactive Orange 16 (RO16) dye by HNO<sub>3</sub>-modified activated carbons (ACs) and a copper oxide catalyst supported by modified AC (Cu-Ac) were investigated. The percentage of colour removal for AC modified with 12 M HNO<sub>3</sub> acid (19%) was found to be lower than that of AC modified using 4 M and 8 M HNO<sub>3</sub>, which are 23% and 22%, respectively. The Cu-AC, prepared by impregnating the 4 M HNO<sub>3</sub>-modified AC with copper nitrate solution for a 5 wt% of Cu followed by calcination at 500°C in an N<sub>2</sub> atmosphere, shows the highest percentage of removal (63%) compared to the modified and the heat-treated modified AC. Decolourisation of RO16 by the Cu catalyst increases in the presence of H<sub>2</sub>O<sub>2</sub> and UV-light. The decolourisation efficiency of the catalyst under four different conditions was observed to have the following order: Cu-AC/H<sub>2</sub>O<sub>2</sub>/UV > Cu-AC/H<sub>2</sub>O<sub>2</sub> > Cu-ACN/UV > Cu-AC.

**Keyword:** Modified activated carbon; Copper catalyst; Decolorization; Reactive Orange 16