

Thesis Title	Removal of Reactive Dyes from Synthetic Dye Solution by Adsorption on Spent Silica-Alumina
Thesis Credits	12
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Abstract

The spent silica-alumina, a waste product from hydrogenperoxide industry, was used as an adsorbent for three reactive dyes such as Reactive Red 2 (RR2), Reactive Red 120 (RR120) and Reactive Red 141 (RR141) which have different molecular weight. Effect of equilibrium time, particle size of adsorbent, temperature, pH of system, molecular weight of dyes and the addition of electrolyte were investigated. It was noted that a decrease in the pH of system, an increase in the temperature and molecular weight resulted in an increase in the dye adsorbed by the adsorbent. Whereas increasing in the particle size of the adsorbent and concentration of electrolyte in the dye solution resulted in a decrease in the dye adsorbed by the adsorbent. Desorption studies showed that an increase in system pH resulted in an increase of desorption of reactive dye adsorbed onto spent silica-alumina. The experimental data of dye adsorption by spent silica-alumina can be fitted well to the Langmuir isotherm model more than the Freundlich isotherm model. The adsorption capacity of RR2, RR120 and RR141 was 58.8 mg, 65.4 mg and 105.3 mg per g of the adsorbent, respectively at system pH of 4.40 and temperature 30°C. The evaluation of the thermodynamic data of reactive dye adsorption by spent silica-alumina showed that the adsorption process is endothermic.