

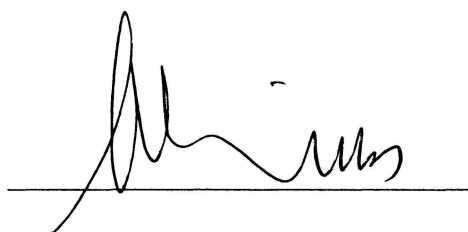
REMOVAL OF REACTIVE RED 2 DYE FROM AQUEOUS SOLUTION  
BY  $Zn-Al-CO_3$  HYDROTALCITES

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**This Final Year Report entitled “Removal of Reactive Red 2 Dye from Aqueous Solution by ZnAlCO<sub>3</sub> Hydrotalcite” was submitted by Nor Farina Binti Sulaiman, in partial fulfillment of the requirements for the Degree of Bachelor Science (Hons) Applied Chemistry, in the Faculty of Applied Science, and was approved by**



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## ABSTRACT

### REMOVAL OF REACTIVE RED 2 DYE FROM AQUEOUS SOLUTION BY Zn-Al-CO<sub>3</sub> HYDROTALCITES

Hydrotalcites (HTs) were found to have high anionic exchange capacity as removal Reactive Red 2 dye contaminants from aqueous solution. In this study, ZnAlCO<sub>3</sub>-HT was synthesized by using co-precipitation method. Different parameters that affect the adsorption processes were studied which includes effect of contact time at different initial concentration, adsorbent dosage, pH and temperature. The results of contact time at different initial concentration indicate that the maximum percentage uptake of Reactive Red 2 dye by HT is 98.19 % at 6 hours was achieved in 50 ppm. The results of adsorbent dosage indicate that the maximum percentage uptake of Reactive Red 2 dye is 94.36 % was achieved in 0.25 g and for effect of initial pH is 92.97% was achieved at its natural pH, 4.5. Meanwhile for effect of temperature the maximum uptake percentage uptake is 92.97% at 25<sup>0</sup>C. With increase of contact times, adsorbent dosage, temperature and pH but for pH decreased after achieved its maximum uptake will gave results of increased on adsorption by ZnAlCO<sub>3</sub>-HT until at point the equilibrium reached. For the effects of initial concentration of dye, the dye adsorption by ZnAlCO<sub>3</sub>-HT decreased as increased at this effects. The results on the adsorption dye fit better into Langmuir isotherm than Freundlich isotherm. The maximum capacity adsorbent of Langmuir is 18.69 mg/g, higher than Freundlich isotherm. The characteristic of these HTs was carried out using FTIR which showed the broad band at 3640 cm<sup>-1</sup> due to hydrogen bond, and confirm that the water is present in this HT sample. Other characteristic in these studies also carried out by XRD and FESEM confirmed that the HTs used are true HTs.