

**ADSORPTION OF DIRECT RED 80 DYE ONTO $ZnAlNO_3$ –
(HYDROTALCITE-LIKE) COMPOUND**

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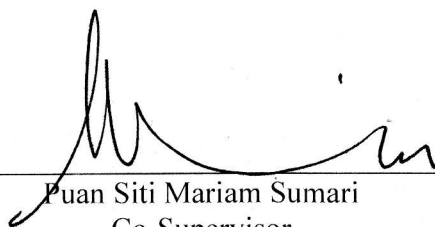
**BACHELOR OF SCIENCE (Hons.) CHEMISTRY
FACULTY OF APPLIED SCIENCES
UNIVERSITI TEKNOLOGI MARA**

APRIL 2009

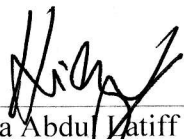
This Final Year Project Report entitled “**Adsorption of Direct Red 80 dye onto ZnAlNO₃ – (Hydrotalcite-like) Compound**” was submitted by Nur Syazana, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry, in the Faculty of Applied Sciences, and was approved by



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17 MAY 2009

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	viii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1 INTRODUCTION	
1.1 Background Study	1
1.1.1 Problem statement	3
1.2 Significance of study	4
1.3 Objectives of study	4
1.4 Scope and Limitation	5
CHAPTER 2 LITERATURE REVIEW	
2.1 Historical background of layered double hydroxides, LDH	6
2.1.1 Structure of layered double hydroxides	7
2.1.2 Adsorption process	9
2.1.3 Adsorbent	10
2.1.4 Adsorption of dye using layered double hydroxides	10
2.2 Introduction to dyes	11
2.2.1 Direct dyes	12
2.2.2 Direct Red 80	13
CHAPTER 3 METHODOLOGY	
3.1 Chemicals	15
3.2 Equipments and Instruments	15
3.3 Preparation of layered double hydroxides, ZnAlNO ₃ -type compound	16
3.4 Characterization of the Layered Double Hydroxides	16
3.4.1 Powder X-Ray Diffractometer (XRD)	16
3.4.2 Fourier Transform Spectrometer (FTIR)	17
3.4.3 Scanning Electron Microscope (SEM)	17
3.5 Analysis of adsorption capacity	18
3.5.1 UV-Visible Spectrophotometer (UV-VIS)	19
3.6 Optimization of studies	19
3.6.1 Effect of contact time	19
3.6.2 Effect of adsorbent dosage	20
3.6.3 Effect of particle size	20

3.6.4	Effect of pH	20
3.6.5	Effect of temperature	21
CHAPTER 4 RESULTS AND DISCUSSIONS		
4.1	Characterization of Zn-Al-NO ₃	22
4.1.1	Power X-Ray Diffractometer (XRD)	22
4.1.2	Fourier Transform Infrared (FTIR)	24
4.1.3	Scanning Electron Microscope (SEM)	25
4.2	Optimization of studies	27
4.2.1	Effect of contact time	27
4.2.2	Effect of adsorbent dosage	28
4.2.3	Effect of particle size	29
4.2.4	Effect of pH	30
4.2.4	Effect of temperature	32
4.3	Adsorption isotherms model	33
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS		
5.1	Conclusion	39
5.2	Recommendations	40
CITED REFERENCES		42
APPENDICES		44
CURRICULUM VITAE		48

ABSTRACT

ADSORPTION OF DIRECT RED 80 DYE ONTO ZnAlNO₃- (HYDROTALCITE-LIKE) COMPOUND

Removal of Direct Red 80 from aqueous solutions by adsorption onto hydrotalcite particles was investigated using batch rate experiments. Layered double hydroxides of aluminium and zinc (Zn/Al-LDH) with the molar ratio of 4:1 were prepared by synthesized using a co-precipitation method as reported. Measurements are performed at various initial concentrations, pH values, temperature, particles size and adsorbent dosage. Characterization of LDH using X-Ray Diffractogram showed the presence of sharp and intense peaks with the d-spacing 7.6 Å which signifying high crystallinity. Fourier Transform Infrared Spectroscopy FTIR, confirmed the impurity inorganic charge balancing anions, Nitro group presence at 1384.27 cm⁻¹. From Scanning Electron Microscope (SEM) after adsorption, LDH particles were packed with DR 80 compared before. DR 80 can adsorbed on the surface or enter the interlayer region of LDH by anion exchange. In the adsorption of DR 80 on the LDH, maximum uptake or removal was achieved at 99% at 50 mg/L concentration of dye at an equilibrium time of 1 hour, with 0.2 g of LDH, 425 µm particles size of LDH and at 30°C. Isotherms for DR 80 dye sorption LDH were described using the Langmuir and Freundlich isotherm. The best fit equilibrium model was Langmuir isotherms followed by Freundlich isotherm. From Langmuir, adsorption capacity was found to be 36.364 mg/g. From Freundlich isotherm, n was 22.831 which indicate that it was not fitted well to explain the adsorption of DR 80 onto LDH. As conclusion, adsorption experiments confirmed that LDH was effective in remove of DR 80 from aqueous solution.