ADSORPTION OF METHYLENE BLUE ONTO CHEMICALLY MODIFIED COCONUT PALM FROND (*cocos nucifera*) POWDER

MOHAMAD SHAHRIZAD BIN ZAINAL ABIDIN

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

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TABLE OF CONTENTS

		Page
ACKNOWLEDGEMENTS		iii
TABLE OF CONTENTS		iv
LIST OF TABLES		vi
LIST OF FIGURES		vii
LIST OF ABBREVIATIONS		viii
ABSTRACT		xi
ABSTRAK		xii
CHAPTER 1 INTRODUCTION		1
1.1	Dye in the environment	1
1.2	Problem statement	4
1.3	Significance of study	5
1.4	Objectives of study	5
1.5	Scope of works	6
CHAPTER 2 LITERATURE REVIEW		7
2.1	Dye Removal Techniques	7
2.2	Activated Carbon	10
2.3	Adsorption by using activated carbon (biomass and waste material based)	10
2.4	Adsorption by using agricultural waste material	11
2.5	Factors Affecting Biosorption	15
2.6	Modification method for plant wastes	17
CHAPTER 3 METHODOLOGY		21
3.1	Materials	21
	3.1.1 Raw materials	21
	3.1.2 Chemicals and reagents	21
	3.1.3 Equipments and analytical instruments	21
3.2	Preparation of absorbent	22

3.2.1 Collection of raw material and chemical treatment 22
3.2.1.1 Sample collection 22
3.2.1.2 Chemical treatment of CF 22
3.2.1.3 Preparation of stock solutions of MB 23
3.3 Characterization of chemically treated coconut frond powder 23
3.3.1 Determination of pH of aqueous slurry (pH_{slurry}) 23
3.3.2 Determination of pH of zero point charge (pH_{zpc}) 23
3.3.3 FTIR spectroscopy 24
3.3.4 SEM-EDX 24
3.4 Batch adsorption studies 24
3.4.1 Effects of pH on adsorption of MB solution 25
3.4.2 Effect of adsorbent dosage 25
3.4.3 Effect of concentration and contact time 26
3.4.4 Isotherm study 26
3.5 Expression of result 27

CHAPTER 4 RESULT AND DISCUSSION 30
4.1 Characterization of adsorbent 30
4.1.1 Physiochemical properties of adsorbent 30
4.1.1.1 pHzpc and pHslurry 30
4.1.1.2 FTIR spectroscopy 31
4.1.1.3 SEM and EDX 34
4.2 Effect of pH 36
4.3 Effect of adsorbent dosage 38
4.4 Effect of MB concentration and contact time 40
4.5 Adsorption kinetic modeling 41
4.5.1 Pseudo-first-order kinetic model 42
4.5.2 Pseudo-second-order kinetic model 43
4.6 Adsorption isotherm 46
4.6.1 Langmuir isotherm 47
4.6.2 Freundlich isotherm 48

CHAPTER 5 CONCLUSION AND RECOMMENDATIONS 51

CITED REFERENCES 53

APPENDIXES 61

CURRICULUM VITAE 73

LIST OF TABLES

Table	Caption	Page
2.1	Some conventional treatment of dyes removal techniques	9
2.2	Summary of the various adsorbents with the maximum adsorption capacity (q_{max}) MB	14
4.1	Percentage removal of MB (%) and adsorbed (mg g^{-1})	39
4.2	The pseudo-first-order and pseudo-second-order parameters at different MB concentrations	46
4.3	Langmuir, Freundlich isotherm constant and correlation coefficients	50

ABSTRACT

ADSORPTION OF METHYLENE BLUE ONTO CHEMICALLY TREATED COCONUT FROND (*Cocos nucifera*) POWDER

In this study coconut frond treated with sulfuric acid has been used as the low-cost adsorbent in adsorption of methylene blue (MB) from aqueous solution. Adsorption technique gives more advantage compared to other techniques for the removal of methylene blue (MB) from wastewater. The used of low cost adsorbent is more preferable compare to common adsorbent which is activated carbon which is expensive. Parameter of the analyses such as solution pH (2-10), SACF dose (0.01 – 0.05 g), contact time, initial concentration (20, 30, 40 mg L^{-1}). The equilibrium data were analysed using the Langmuir and the Freundlich isotherm. The kinetic process regarding to the adsorption of methylene blue (MB) onto SACF were described by applying the pseudo-first-order and pseudo-second-order kinetic model. FTIR analysis showed that a large number of carbonyl and hydroxyl group presence on the surface of SACF. The pH_{zpc} of SACF was determined to be 7.19 in which the adsorption of methylene blue (MB^+) that considered as cationic dye was favourable. The Langmuir and Freundlich isotherms models were employed in order to investigate the adsorption behavior of SACF and the best fit to the data was obtained with the Langmuir isotherm model with maximum adsorption capacity (q_{max}) was found to be 62.5 mg g^{-1} at pH 6, shaking speed of 120 strokes per minutes and at temperature at 303 K. So, it shows that adsorption process was monolayer with the coverage of the MB molecule only takes place at the outer surface of SACF.