

**EFFECT OF POST-TREATMENTS ON CELLULOSE
NANOCRYSTAL ISOLATED FROM OIL PALM EMPTY
FRUIT BUNCH (OPEFB)**

SITI MAISARAH BINTI RAHIM

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This Final Year Project Report entitled “**Effect of post-treatments on cellulose nanocrystal isolated from oil palm empty fruit bunch (OPEFB)**” was submitted by Siti Maisarah Rahim, 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

Ahmad Husaini Mohamed
Supervisor
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

Nur Nadia Dzulkifli
Co-supervisor
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

Dr. Sheikh Ahmad Izaddin
Sheikh Mohd Ghazali
Project Coordinator
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

Mazni Musa
Head of Programme
B. Sc. (Hons.) Chemistry
Faculty of Applied Sciences
Universiti Teknologi MARA
72000 Kuala Pilah
Negeri Sembilan

Date: _____

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	vii
LIST OF ABBREVIATIONS	ix
ABSTRACT	xi
ABSTRAK	xii
CHAPTER 1 INTRODUCTION	
1.1 Background and problem statement	1
1.1.1 Nanocellulose	1
1.1.2 Oil palm empty fruit bunch (OPEFB)	5
1.1.3 Isolation method of cellulose nanocrystal	8
1.1.4 Problem statement	9
1.2 Significance of study	11
1.3 Objective of study	12
CHAPTER 2 LITERATURE REVIEW	
2.1 Nanocellulose	13
2.2 Oil palm empty fruit bunch (OPEFB)	17
2.3 Isolation method of cellulose nanocrystal	21
CHAPTER 3 METHODOLOGY	
3.1 Materials	25
3.1.1 Raw material	25
3.1.2 Chemicals	25
3.1.3 Apparatus	26
3.2 Methods	27
3.2.1 Sample preparation	27
3.2.2 Pretreatment procedure	27
3.2.3 Isolation CNC using acid hydrolysis	28
3.3 Characterizations	29
3.3.1 Spectroscopic study by Fourier transform infrared (FTIR)	29
3.3.2 Optical transparency	29
3.3.3 Color	29
3.3.4 Scanning Electron Microscopy (SEM)	30

CHAPTER 4 RESULT AND DISCUSSION	
4.1 Isolation of cellulose nanocrystal	31
4.2 Fourier transform infrared (FTIR) spectra	35
4.3 Optical transparency	38
4.4 Color	40
4.5 Scanning Electron Microscopy (SEM)	43
CHAPTER 5 CONCLUSION AND RECOMMENDATION	
5.1 Conclusion	46
5.2 Recommendation	48
CITED REFERENCES	49
APPENDICES	53
<i>CURRICULUM VITAE</i>	61

ABSTRACT

EFFECT OF POST-TREATMENTS ON CELLULOSE NANOCRYSTAL ISOLATED FROM OIL PALM EMPTY FRUIT BUNCH (OPEFB)

Cellulose nanocrystal (CNC) was isolated from oil palm empty fruit bunch (OPEFB) using sulfuric acid (H_2SO_4) hydrolysis with three different post-treatments which were suspension without post-treatment (CNC1), dialyze against water (CNC2) and neutralized with 0.1 M sodium hydroxide (NaOH) solution (CNC3). The percentage yield of CNC1, CNC2 and CNC3 were 71%, 82% and 83% respectively. The characterization of raw OPEFB fiber, bleaching OPEFB fiber and all CNC were carried out by Fourier transform infrared spectroscopy (ATR-FTIR), UV-Vis spectrophotometer (UV-Vis), chroma meter and scanning electron microscopy (SEM). The FTIR result showed that hemicellulose and lignin from raw OPEFB fiber were removed effectively when treated with bleaching pretreatment. The CNC3 has highest percentage transmittance more than 95 % at wavelength 700 nm due to the no residual sulfate content on surface of CNC compared to CNC1 and CNC2. CNC3 has more transparency and more saturated due to the highest lightness (L) and chroma value (C^*) that produced smaller particle of diameter size compared to others CNC. The SEM result showed that the CNC3 had shorter size of rod-like shape compared to CNC2. CNC has been well dispersed and more homogeneous isolated when neutralize with NaOH solution since it is simple and efficient method to form CNC.