

**OXIDATION OF CELLULOSE AND EFFECT OF
ACID/BASE ON THE FORMATION
OF COPPER COMPLEX**

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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	x
ABSTRAK	xi
CHAPTER 1 INTRODUCTION	1
1.1 Cellulose	1
1.1.1 Background	1
1.1.2 Cellulose Surface Modification	2
1.2 Oxidation Reaction	3
1.2.1 TEMPO Oxidation	4
1.2.2 Oxidation using KMnO ₄	5
1.3 Complexation of Cu(II) Metal	5
1.4 Problem Statement	7
1.5 Significant Study	8
1.6 Objectives	10
CHAPTER 2 LITERATURE REVIEW	11
2.1 Surface Modification of Cellulose	11
2.2 Complexation of Modified Cellulose	17
CHAPTER 3 METHODOLOGY	21
3.1 Materials	21
3.1.1 Chemicals	21
3.2 Oxidation of MCC using KMnO ₄	21
3.3 Oxidation of MCC using TEMPO	22
3.4 Complexation of oxidized cellulose (OMCC)	22
3.5 Characterization methods	23
3.5.1 Fourier transform infrared spectroscopy (FTIR)	23
3.5.1.1 Attenuated total reflection - IR	23
3.5.1.2 Potassium bromide - IR	23
3.5.2 Thermogravimetric analysis (TGA)	23

CHAPTER 4 RESULTS AND DISCUSSION	24
4.1 Oxidation of MCC	24
4.1.1 By KMnO ₄	24
4.1.2 By TEMPO	28
4.2 Complexation of OMCC using CuCl ₂	30
4.3 Thermal analysis of Cu-OMCC	35
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	40
5.1 Conclusions	40
5.2 Recommendations	41
CITED REFERENCES	42
APPENDICES	50
<i>CURRICULUM VITAE</i>	57

ABSTRACT

OXIDATION OF CELLULOSE AND EFFECT OF ACID/BASE ON THE FORMATION OF COPPER COMPLEX

There has been an increasing interest in recent years from researchers to modify cellulose. However, reaction conducted mostly are not environmental friendly. In this study, the oxidation reaction of microcrystalline cellulose (MCC) using potassium permanganate (KMnO_4) has the ability to be recycled, therefore the process is environmental friendly. This reaction involved the primary hydroxyl groups of the pyranose ring resulting in oxidized MCC (OMCC). The reaction was proceeded by the complexation of OMCC and resulting product is copper-cellulose complex (Cu-OMCC). The optimization of concentration based on mass ratio of KMnO_4 to MCC was investigated to get the ideal condition for the oxidation reaction. The reaction conditions for complexation also revealed that higher alkaline solution would be needed to promote complexing ability of OMCC. The result revealed that oxidation of MCC was successful as indicated by the characteristic peaks in the Fourier Transform Infrared (FTIR) spectra through the appearance of COO^- peaks at the range from 1635 to 1640 cm^{-1} and the complexation of OMCC was proved by the appearance of Cu-O peaks at the range from 589 to 617 cm^{-1} . While thermogravimetric (TGA) analysis stated that Cu-OMCC- NH_3 has higher thermal stability with 53.87% weight loss compared to Cu-OMCC-HCl of 72.40% weight loss.