

## CONTENTS

TITLE PAGE	i
APPROVAL PAGE	ii
STATEMENT OF PLAGIARISM-FREE	iii
ACKNOWLEDGEMENT	iv
DEDICATION PAGE	v
CONTENTS	vi
LIST OF FIGURES	viii
LIST OF TABLES	x
LIST OF APPENDICES	xi
ABSTRACT	xii
INTISARI	xiii
<b>CHAPTER I INTRODUCTION</b>	<b>1</b>
I.1 Background	1
I.2 Research Objectives	3
I.3 Research Benefits	3
<b>CHAPTER II LITERATURE REVIEW AND HYPOTHESIS FORMULATION</b>	<b>4</b>
II.1 Literature Review	5
II.1.1. Bifunctional catalyst (Co, Mo, $\gamma$ -Al <sub>2</sub> O <sub>3</sub> )	5
II.1.2. Wet and dry impregnation	7
II.1.3. Vegetable oil as feedstock	8
II.1.4. Hydrocracking and hydrodeoxygenation	11
II.2 Hypothesis Formulation and Research Design	13
II.2.1. Hypothesis Formulation 1	13
II.2.2. Hypothesis Formulation 2	13
II.2.3. Hypothesis Formulation 3	14
II.2.4. Research Design	15
<b>CHAPTER III RESEARCH METHODOLOGY</b>	<b>16</b>
III.1 Material	16
III.2 Equipment and Instrumentation	16
III.3 Procedure	17
<b>CHAPTER IV RESULTS AND DISCUSSION</b>	<b>19</b>
IV.1 Catalysts Characterization	19
IV.1.1 Metal content analysis (XRF and EDX)	19
IV.1.2 Catalyst structure characterization (XRD, XPS, XANES)	20
IV.1.3 Catalyst acidity (NH <sub>3</sub> -TPD)	25
IV.1.4 Catalyst surface and porosity (SAA, SEM, Element mapping)	27

	IV.2	Activity and Selectivity Test of Catalysts	33
	IV.2.1	Catalyst activity	33
	IV.2.2	Catalyst selectivity	35
	IV.2.3	Reusability of catalyst	38
	IV.3	Optimization of Reaction Condition	41
	IV.3.1	Study of temperature reaction	41
	IV.3.2	Study of ratio catalyst/feed	43
<b>CHAPTER V</b>	<b>CONCLUSION</b>		45
<b>REFERENCE</b>			46
<b>APPENDIX</b>			51