

## TABLE OF CONTENTS

<b>COVER PAGE</b>	<b>i</b>
<b>RATIFICATION PAGE</b>	<b>ii</b>
<b>STATEMENT PAGE</b>	<b>iii</b>
<b>DEDICATION PAGE</b>	<b>iv</b>
<b>FOREWORD</b>	<b>v</b>
<b>TABLE OF CONTENTS</b>	<b>vi</b>
<b>LIST OF FIGURES</b>	<b>viii</b>
<b>LIST OF TABLES</b>	<b>ix</b>
<b>LIST OF APPENDIX</b>	<b>x</b>
<b>ABSTRACT</b>	<b>xi</b>
<b>INTISARI</b>	<b>xii</b>
<b>CHAPTER I INTRODUCTION</b>	<b>1</b>
I.1 Background	1
I.2 Research Purposes	4
I.3 Research Benefits	4
<b>CHAPTER II LITERATURE REVIEW AND HYPOTHESIS FORMULATION</b>	<b>6</b>
II.1 Literature Review	6
II.1.1 The use of coconut oil	6
II.1.2 Conversion of used oil into biofuel	8
II.1.3 Catalytic hydrotreatment for the conversion of used oil into biofuel	12
II.1.4 Synthesis of mesoporous silica nanoparticles	16
II.1.5 Extraction of silica from Lapindo mud	17
II.1.6 Amine grafted mesoporous silica	18
II.2 Hypothesis Formulation and Research Plan	19
II.2.1 Hypothesis formulation I	19
II.2.2 Hypothesis formulation II	20
II.2.3 Research planning	20
<b>CHAPTER III RESEARCH METHOD</b>	<b>22</b>
III.1 Materials	22
III.2 Equipments	22
III.3 Procedures	23
III.3.1 Silica extraction from Lapindo mud	23
III.3.2 Preparation of mesoporous silica nanoparticles	24
III.3.3 Impregnation of metal into mesoporous silica nanoparticles (MSN)	24
III.3.4 Synthesis of amine functionalized metal/MSN	25
III.3.5 Catalytic activity test	25
<b>CHAPTER IV RESULT AND DISCUSSION</b>	<b>27</b>
IV.1 Silica Extraction from Lapindo Mud	27

	IV.2 Preparation of Mesoporous Silica Nanoparticles (MSN) Catalyst	29
	IV.3 Grafting of Mesoporous Silica Catalysts	40
	IV.4 Catalytic Activity Test	41
<b>CHAPTER V</b>	<b>CONCLUSION AND SUGGESTION</b>	<b>55</b>
	V.1 Conclusion	55
	V.2 Suggestion	55
<b>REFERENCES</b>		<b>56</b>
<b>APPENDICES</b>		<b>62</b>