

**SYNTHESIS OF USED FRYING-OIL BASED POLYOL FOR RIGID
POLYURETHANE FOAM**

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TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	i
TABLE OF CONTENTS	ii
LIST OF TABLES	iv
LIST OF FIGURES	v
LIST OF ABBREVIATIONS	vii
ABSTRACT	ix
ABSTRAK	x
CHAPTER 1 INTRODUCTION	
1.1 Background study	1
1.2 Problem Statement	4
1.3 Significance of study	4
1.4 Objectives of study	5
CHAPTER 2 LITERATURE REVIEW	
2.1 Polyurethane (PU)	6
2.2 Petroleum-based Polyurethane	8
2.3 Plant-based Polyurethane	9
2.3.1 Palm oil-based polyurethane	10
2.3.2 Soy bean oil-based polyurethane	12
2.3.3 Cottonseed and Karanja oil-based polyurethane	13
2.3.4 Jatropha oil-based polyurethane	15
2.3.5 Rapeseed oil-based polyurethane	16
2.4 Used-frying Oil Based Polyurethane	17
CHAPTER 3 METHODOLOGY	
3.1 Materials	21
3.1.1 Raw Materials	21
3.1.2 Chemicals	22
3.1.3 Apparatus	22
3.2 Methods	22
3.2.1 Treatment process of UFO	24
3.2.2 Preparations of UFO-based polyol	24
3.2.3 Preparations of UFO-based Polyurethane	26
3.3 Characterization	28
3.3.1 FTIR Spectroscopy Analysis	28
3.3.2 Morphological Analysis	28
3.3.3 Properties Analysis	29
3.3.3.1 Free Fatty Acid (FFA) Analysis	29
3.3.3.2 Viscosity Analysis	31

CHAPTER 4 RESULTS AND DISCUSSION	
4.1 Fourier Transform Infrared (FTIR) Spectroscopy Analysis	33
4.2 Morphological Analysis	38
4.3 Free Fatty Acid (FFA) and Viscosity Analysis	40
CHAPTER 5 CONCLUSION AND RECOMMENDATIONS	43
CITED REFERENCES	45
APPENDICES	48
PUBLICATION	54
AWARD	55
<i>CURRICULUM VITAE</i>	56

ABSTRACT

SYNTHESIS OF USED FRYING-OIL BASED POLYOL FOR RIGID POLYURETHANE FOAM

The Used Frying-Oil (UFO) that usually thrown out and become waste have potential to be used as the starting material of synthesizing polyurethane. This study was carried out to determine the potential of UFO in preparation of rigid polyurethane (PU) foam. The raw UFO was first treated by filtration using food strainer and cheesecloth to remove the suspended particles and heated under the temperature of 105 – 110 °C for 1 hour. Next, the filtered UFO was mixed with polyhydric compound to synthesize polyol via transesterification reaction. The UFO-based polyol was then combined with other chemicals at various ratios to form PU rigid foam. The UFO-based polyol showed the decreased in free fatty acid percentage (% FFA) from 1.187 % to 0.70 % and increase in viscosity, from 60.5 mPas to 150.5 mPas when compared to the unfiltered UFO. No alteration of functional group observed after filtration as proven by Fourier Transform Infrared (FTIR) Spectroscopy. The FTIR spectra of UFO-based polyol showed the formation of hydroxyl (OH) absorption peak at 3400 cm^{-1} . The formation of urethane linkage (NHCOO) backbone in PU foam was confirmed using FTIR. The morphological structure of the surface was analyzed at magnification 20x and 50x. The properties of PU foam are highly dependent on the chemical composition. This study showed that UFO exhibit promising potential as raw material for PU formation.