

**SYNTHESIS AND CHARACTERIZATION OF
GRAPHENE USING LIQUID PHASE
EXFOLIATION**

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SYNTHESIS AND CHARACTERIZATION OF
GRAPHENE USING LIQUID PHASE EXFOLIATION

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for the award of the degree of
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SUPERVISORS' DECLARATION

I hereby declare that I have checked the thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor of Applied Science (Honor) Material Technology.

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STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree.

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DEDICATION

I dedicate this thesis to my beloved family for their unconditional love, support and encouragement.

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TABLE OF CONTENTS

	Page
SUPERVISORS' DECLARATION	iii
STUDENT'S DECLARATION	iv
DEDICATION	v
ACKNOWLEDGEMENTS	vi
ABSTRACT	vii
ABSTRAK	viii
TABLE OF CONTENTS	ix
LIST OF TABLES	xi
LIST OF FIGURES	xii
LIST OF SYMBOLS	xiv
LIST OF ABBREVIATIONS	xv
CHAPTER 1 INTRODUCTION	1
1.1 INTRODUCTION	1
1.2 PROBLEM STATEMENT	3
1.3 OBJECTIVES OF RESEARCH	3
1.4 STATEMENT OF CONTRIBUTION	4
CHAPTER 2 LITERATURE REVIEW	5
2.1 INTRODUCTION	5
2.2 PROPERTIES OF GRAPHENE	5
2.2.1 Structural and Electronic Properties of Graphene	5
2.2.2 Optical Properties of Graphene	8
2.2.3 Mechanical Properties of Graphene	9
2.2.4 Transport Properties of Graphene	10
2.3 REVIEW OF EXPERIMENTAL WORK ON GRAPHENE	10
2.4 REVIEW OF FUNCTIONALIZED GRAPHENE	14
CHAPTER 3 MATERIALS AND METHODS	16
3.1 INTRODUCTION	16
3.2 RESEARCH FLOW CHART	16
3.3 SYNTHESIS OF GRAPHENE	17
3.4 CHARACTERIZATION OF GRAPHENE	17

3.4.1	UV-Vis Spectrometer	17
3.4.2	Field Emission Scanning Electron Microscopy (FESEM)	18
3.4.3	Fourier Transform Infrared (FTIR) and Attenuated Total Reflectance (ATR)	18
CHAPTER 4 RESULT AND DISCUSSION		19
4.1	SYNTHESIS AND CHARACTERIZATION OF GRAPHENE	19
4.1.1	ATR-FTIR Analysis	19
4.1.2	UV-Vis Analysis	20
4.1.3	FESEM Analysis	24
CHAPTER 5 CONCLUSION AND RECOMMENDATION		27
5.1	CONCLUSION	27
5.2	RECOMMENDATIONS	27
REFERENCE		29

LIST OF TABLES

Table	Title	Page
Table 2.1	Different technique employed to synthesis graphene	11
Table 2.2	LPE methods used to employed synthesis graphene from various precursor	14

LIST OF FIGURES

Figure	Title	Page
Figure 2.1	Honeycomb lattice of graphene (left) and Brillouin zone	6
Figure 2.2	The example low-energy electron diffraction (LEED) images of (a) Gr/Ni(111) and (b) the Gr/Al/Ni(111) system collected at primary electron energy of 75 eV and 78 eV respectively. (c) Top and side view of ball model of Gr/Al/Ni(111) obtained	7
Figure 2.3	The behavior of (a) laser beam passing through and (b) optical transparency of aqueous dispersion of graphene	8
Figure 2.4	Graphene on polyethylene terephthalate (PET), assembled in a touch panel which shows outstanding exhibity	9
Figure 3.1	Figure 3.1: Flow chart of synthesized and characterization of graphene	16
Figure 4.1	FTIR spectra of exfoliated	20

	graphene, commercial graphene and AC	
Figure 4.2	Plot of absorbance at 660nm versus graphene concentration (mg/ml). The straight line is linear regression line	22
Figure 4.3	Plot of graph surface tension versus mass of glycine	23
Figure 4.4	Plot of graph absorbance at 660 versus variety ratio of AC and glycine	24
Figure 4.5	FESEM images of graphene different magnification: (a) 30000x and (b) 50000x	25
Figure 4.6	FESEM image of (A) graphene oxide and (B) bacterially reduced graphene oxide	26

LIST OF SYMBOLS

mg mL^{-1}	-	milligrams per millilitre
mmol	-	millimoles
mN/m^2	-	millinewton per square meter
$\text{Wm}^{-1}\text{k}^{-1}$	-	watt per metre kelvin
eV	-	electron volt
$\text{cm}^2\text{V}^{-1}\text{s}^{-1}$	-	centimeter square per volt second
cm^{-2}	-	per centimeter square
cm^{-1}	-	per centimeter
rpm	-	revolutions per minute
nm	-	nanometer
>	-	more than
<	-	less than
~	-	approximately
%	-	percent
$^{\circ}\text{C}$	-	degree celcius
g	-	grams
h	-	hour
t	-	time

LIST OF ABBREVIATIONS

2D	-	two-dimensional
CVD	-	chemical vapor deposition
CMOS	-	complementary metal-oxide-semiconductor
LPE	-	liquid phase exfoliation
NMP	-	N-methyl-2-pyrrolidone
DMF	-	N,N-dimethylformamide
EG	-	expanded graphite
AC	-	activated carbon
SiC	-	silicon carbide
HMIH	-	1-hexyl-3-methyl-imidazolium hexafluorophosphate
FTIR	-	Fourier Transform Infrared Spectroscopy
ATR	-	Attenuated Total Reflectance
UV-Vis	-	Ultraviolet-visible spectroscopy
FESEM	-	Field Emission Scanning Electron Microscopy
LEED	-	low-energy electron diffraction
PET	-	polyethylene terephthalate
TEM	-	transmission electron microscopy
GO	-	graphite oxide
GCE	-	glassy carbon electrode
SCE	-	saturated calomel electrode
GIC	-	graphite intercalation compound
GBL	-	<i>gamma</i> -Butyrolactone