

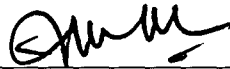
**CHARACTERISTICS OF IONIC CONDUCTIVITY IN LITHIUM SALT
ONTO MG30 POLYMER ELECTROLYTE**

NOR FAZILA BINTI MAHAMAD YUSOFF

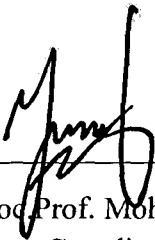
**Final Year Project Report Submitted In
Partial Fulfillments Of The Requirements For The
Degree Of Bachelor Science (Hons.)Physics
In The Faculty Of Applied Sciences
Universiti Teknologi MARA**

JULY 2012

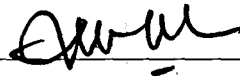
This Final Year Project Report entitled “**Characteristics Of Ionic Conductivity In Lithium Salt Onto MG30 Polymer Electrolyte**” was submitted by Nor Fazila Binti Mahamad Yusoff, in partial fulfillment of the requirements for the Degree Of Bachelor Science (Hons.) Physics , in the Faculty Of Applied Sciences and was approved by :



Prof.Madya Dr Ab.Malik Marwan Ali
Supervisor
Faculty of Applied Sciences
University Teknologi MARA
40450 Shah Alam
Selangor



Assoc.Prof. Mohd Yusof Theeran
Project Coordinator
Faculty of Applied Sciences
Universiti Teknologi MARA
40450 Shah Alam
Selangor



Prof.Madya Dr Ab.Malik Marwan Ali
Head Of Programme
B.Sc. (Hons.) Physics
Faculty of Applied Sciences
Universiti Teknologi MARA
40450 Shah Alam
Selangor

Date : 20 JUL 2012

ACKNOWLEDGEMENT

ALHAMDULILLAH, I am highly grateful and praises to ALLAH S.W.T , the almighty god as permission given, finally my Final Year Project entitled “**Characteristics Of Ionic Conductivity In Lithium Salt Onto MG30 Polymer Electrolyte**” has been successfully done during entire given time.

Firstly, I would like to express my special thanks to my supervisor, Prof.Madya Dr. Ab. Malik Marwan Ali for his guidance and advices during preparation of this Final Year Project. I would also thanks to my friends for their cooperation and supported me and everyone who has lends a hand to help me out in completed this Final Year Project from the beginning.

Lastly, my special appreciation is dedicated to my parents and family whom give continuous support, attention and encouragement doing this thesis for Final Year Project.

Thank You.

Nor Fazila Binti Mahamad Yusoff

Universiti Teknologi MARA

JULY 2012

ABSTRACT

CHARACTERISTICS OF IONIC CONDUCTIVITY IN LITHIUM SALT ONTO MG30 POLYMER ELECTROLYTE

A 30% PMMA-grafted natural rubber (MG30), lithium trifluoromethanesulfonate (LiCF_3SO_3 or LiTf) and dimethyl carbonate (DMC) as a plasticizer were dissolved in tetrahydroforan (THF) as a solvent in the preparation of the solid polymer and gel polymers electrolytes (SPEs and GPEs). The ionic conductivity was characterized by using Impedance Spectroscopy (IS) at room temperature. The highest of conductivity value of SPE with composition of MG30 - 35 wt% LiCF_3SO_3 is $39.05 \times 10^{-5} \text{ S cm}^{-1}$ at room temperature. SPE with highest conductivity was added with different weight percent of DMC plasticizer to form a GPE. The GPE with highest conductivity is $21.24 \times 10^{-5} \text{ S cm}^{-1}$ at composition of 30 wt% of DMC plasticizer at room temperature. The polymer salt complexes were investigated using Fourier – Transform Infrared (FTIR) at room temperature within the frequency range of $4000\text{--}500 \text{ cm}^{-1}$.

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENT	iv
LIST OF ABBREVIATIONS	v
LIST OF TABLES	vi
LIST OF FIGURE	vii
ABSTRACT	x
ABSTRAK	xi
CHAPTER 1 : INTRODUCTION	
1.1 Introduction	1
1.2 Problem Statement	3
1.3 Objective Of Research	4
1.4 Scope Of Work	4
1.5 Significant Of Study	4
CHAPTER 2 : LITERATURE REVIEW	
2.1 Introduction	5
2.2 Properties of Polymer Electrolyte	7
2.3 Classification of Polymer Electrolyte	7
2.3.1 Solid Polymer Electrolyte	8
2.3.2 Gel Polymer Electrolyte	9
2.3.3 Composite Polymer Electrolyte	10
2.4 Plasticizer	10
2.5 Lithium Salt	10
2.6 Methyl Grafted Natural Rubber (MG30)	11
CHAPTER 3 : METHODOLOGY	
3.1 Materials	13
3.2 Equipments	13
3.3 Methods	14