

**IONIC CONDUCTIVITY STUDIES ON EPOXY NATURAL RUBBER-BASED
POLYMER ELECTROLYTES FOR ELECTROCHEMICAL SYSTEM**

ANNIE MARIA MAHAT

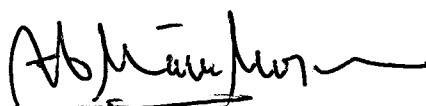
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This Final Year Project Report entitled “**Ionic Conductivity Studies on Epoxy Natural Rubber-Based Polymer Electrolytes for Electrochemical System**” was submitted by Annie Maria Mahat, in partial fulfillment of the requirements for the Degree of Bachelor of Science (Hons.) Physics, in the Faculty of Applied Sciences, and was approved by



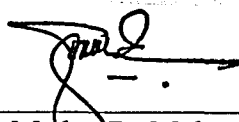
Dr. Muhd. Zu Azhan Yahya
Supervisor
Faculty of Applied Sciences
Universiti Teknologi MARA



En. Abdul Malik Marwan Ali
Co-Supervisor
Faculty of Applied Sciences
Universiti Teknologi MARA



Dr. Muhd. Zu Azhan Yahya
Head of Programme
B.Sc. (Hons.) Physics
Universiti Teknologi MARA



Prof. Madya Dr Mohamad Kamal Harun
Dean
Faculty of Applied Sciences
Universiti Teknologi MARA

Date: 16 JUN 2006

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ABSTRACT

IONIC CONDUCTIVITY STUDIES ON EPOXY NATURAL RUBBER-BASED POLYMER ELECTROLYTE FOR ELECTROCHEMICAL SYSTEM

Epoxy natural rubber-based-50 (ENR-50) acted as a polymer host, lithium perchlorate (LiClO_4) as the doping salt, tetra hydrofuran (THF) as the solvent, poly carbonate (PC) as the plasticizer were used in this research project. The ENR-50 salt complexes and PC were prepared by solution cast technique. The electrical conductivities of all samples were measured by using the electrochemical impedance spectroscopy (EIS) at ambient and elevated temperature (303 K-373 K). From the EIS, true bulk resistance of each samples obtained from the complex impedance plot in the frequency range of 100 Hz-1 MHz were used to calculate the samples' conductivities. The highest conductivity was $8.55 \times 10^{-5} \text{ Scm}^{-1}$ at 30 wt% salt for non-plasticized samples, while $2.2 \times 10^{-4} \text{ Scm}^{-1}$ at 30 wt% PC for plasticized samples. The temperature dependence studies show that the samples obey the Arrhenius rule which indicate the conductivities were thermally assisted.

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