

**EFFECT OF PLASTICIZER ON PMMA
GRAFTED NATURAL RUBBER POLYMER
ELECTROLYTE**

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ABSTRACT

EFFECT OF PLASTICIZER ON PMMA GRAFTED NATURAL RUBBER POLYMER ELECTROLYTE

In this research, poly(methyl methacrylate) (PMMA), 30% PMMA grafted natural rubber (MG30), Ammonium Triflate $\text{NH}_4\text{CF}_3\text{SO}_3$ and propylene carbonate (PC) were used in the preparation of solid polymer electrolyte (SPE) and gel polymer electrolyte (GPE). Gel polymer electrolytes containing MG30- $\text{NH}_4\text{CF}_3\text{SO}_3$ + PC will be prepared by solution cast technique. The composition between polymer and salt will be investigated using Fourier-transformed infrared spectroscopy. The ionic conductivity of the electrolytes will be determined by the ac impedance spectroscopy studies. The other admittance behaviour will be analyzed based on the impedance spectroscopy data obtained.

CHAPTER 1

INTRODUCTION

1.1 Background

Polymer is a class of material that is made up of large number of molecule which is formed from the repetition of small and simple chemical units called monomer linked together by covalent bond. The physical and chemical properties of the polymer depends on the overall size of the polymer chain and on the inter and intra molecular forces that hold the polymer together. According to *Wright et al* (1973), the polymers become ionically conducting when inorganic salt are being added to them. These type of polymers commonly known as a polymer electrolytes.

Generally, polymer electrolyte may defined as a membrane that possesses transport properties comparable with that of common liquid ionic solution. The development of polymer electrolytes has drawn the attention of many researchers in the three last decades as they find a suitable applications in various electrochemical devices such as in lithium polymer batteries, supercapacitors, electrochromic windows, and electrochemical sensors . These electrolytes have several advantages over their liquid counter part such as no internal shorting, leak free and non-combustible reaction at the electrode-electrolytes interface. The polymer acts as a host, while the