

**RECHARGEABLE ZINB BATTERY USING ION CONDUCTING  
ELECTROLYTÈS**

**FARAH ENINE FAIZUN**

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## ABSTRACT

Gel –polymer electrolytes with PMMA as host polymer, Zinc Triflate as doping salt and PC acts as plasticizers was studied. Impedance spectroscopy was used to determine the ionic conductivity at room temperature. The addition of plasticizers assist in enhancing the ionic conductivity of polymer. The optimum electrical conductivity in  $Zn_2(CF_3SO_3)_2$ -PC system was at 0.4 M with conductivity of  $2.912 \times 10^{-2} \text{ S cm}^{-1}$  and 3 wt%  $Zn_2(CF_3SO_3)_2$ -PC-PMMA system with conductivity of  $1.780 \times 10^{-2} \text{ S cm}^{-1}$

# CHAPTER 1

## INTRODUCTION

### 1.1 Introduction

A polymer can be defined as a compound consisting of a large number of repeating units, called monomers. These monomers are joined together by covalent bonds to form a polymer. 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. They do not possess any segmental motions at low temperature (below glass transition temperature,  $T_g$ ) and are normally insulators. According to Wright et al., (1973), the polymer become ionically conducting when inorganic salts are being added in them. The polymer, act as host, while an inorganic salt dissociate to provide mobile species. Polymer salts complexes that exhibit good electrical conducting is useful for the development of electrochemical devices. Generally, the electrical conductivity in polymer salt complexes is due to the mobility of the conducting species contributed by the inorganic salts which dissociates into ions. The ability of polymer to allow ions to move in heir matrix is what is known as polymer electrolytes. Good polymer electrolytes should possess high ionic conductivity and poor electronic conductivity.