PREFACE

Solid electrolytes materials are solid state ionic conductors in which the conductivity is due to the motion of ions. Solid electrolytes play a key role in various technological applications, such as electrochemical devices and fuel cells. The solid electrolytes can be classified into various categories; e.g., Framework crystalline electrolytes, glassy electrolytes, composite electrolytes and polymer electrolytes etc. Among the solid electrolytes, the polymer electrolytes have several important advantages over the other electrolytes. To illustrate the scope of present work, we have divided this thesis into six chapters and brief content of each of the chapters is as below.

Chapter-1 presents a general background of solid polymer electrolytes. Different types of solid electrolytes, effect of polymer blending, incorporation of plasticizers, addition of nano-fillers and the effect of irradiation are discussed in this chapter. **Chapter-2,** describes various theoretical models which have been employed to explain the conduction mechanism in solid polymer electrolytes. **Chapter-3** presents the method of preparation of blend electrolyte samples and theoretical details of the experimental techniques used for characterizing the samples. In **Chapter-4** we preset results and discussion of the characterization studies of prepared samples. In **Chapter-5** we discuss the polymer electrolyte response of electrochemical impedance spectroscopy in detail. Conduction mechanism followed by the electrolyte system is discussed in the frequency and temperature regime. The results of conduction and relaxation processes, the dielectric properties ε^* and modulus formalism M^*, calculated from the frequency dependent impedance data have also been discussed. Effect of polymer blending and incorporation of the salt, plasticizers and nano-filler n the ionic conductivity and dielectric properties are explained in detail. **Chapter-6** comprises of summary of our findings on the investigated blend electrolyte system and the scope of future work. A list of emanated from the present work is included at the end of the chapter 6.

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