

**CHARACTERIZATION OF PLASTICISED AND NON PLASTICISED EPOXIDISED NATURAL RUBBER BASED POLYMER ELECTROLYTE SYSTEMS**

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**ABSTRACT**

Lithium polymer electrolyte film consists of epoxidized natural rubber (ENR50) and lithium imide,  $\text{LiN}(\text{SO}_2\text{CF}_3)_2$  salt was prepared by solvent casting technique. Lithium imide was employed for interaction with ether oxygen of epoxidized rubber to improve ionic conductivity value at ambient temperature. The electrolyte compositions consist of various salt concentrations express in molar ratios calculated based on oxygen to lithium denoted as O/Li; ~ 64:1, 23:1, 13:1, 9:1 and 3:1 respectively were studied. Polymer electrolytes made from ENR rubber formed free-standing films with thickness range 100-200  $\mu\text{m}$  were obtained. Plasticizer-added sample containing salt has shown optimal ionic conductivity  $10^{-3} \text{ S cm}^{-1}$  with compositional molar ratio O/Li ~ 9:1 at room temperature. The trend of thermal behavior indicates that single transition glass temperature ( $T_g$ ) for all systems.  $T_g$  values has increased for ENR50- $\text{LiN}(\text{SO}_2\text{CF}_3)_2$  system whereas addition of EC/PC has reduced their values dramatically.

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