

ABSTRACT NO.: 547

Preparation of a report

TITLE: 1-Propyl-3-methylimidazolium Tetrafluoroborate Lithium Ionic
Liquid Based Ternary Electrolytes for Lithium Batteries

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Lithium batteries are alternative sources of energy which differentiates itself from other battery systems by the type of electrolytes being used. Polymer electrolytes are materials which are widely used in the lithium batteries as they exhibit adequate conductivity, good mechanical properties and good electrochemical and thermal stability. Ionic liquid based polymer electrolytes shows these properties and hence are developed in this project. The addition of ionic liquid to these electrolytes significantly increases the ionic conductivity. Ternary electrolyte systems based on polymer-ionic liquid-fumed silica has also been synthesized using poly(ethylene oxide) (PEO) as a polymer, 1-propyl-3-methylimidazolium tetrafluoroborate (PMImBF₄) as an ionic liquid and fumed silica as an inorganic phase. Conductivity of the order of 10^{-4} S/cm has been observed for these electrolytes using Impedance Spectroscopy measurements. SEM and XRD studies have also been carried out in order to understand the role of the polymer, ionic liquid and fumed silica within the polymer electrolytes and are compared with the binary polymer electrolytes.