EFFECT OF LITFSI COMPOSITION ON IONIC CONDUCTIVITY OF CARBOXYMETHYL CELLULOSE BASED SOLID POLYMER ELECTROLYTE

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ABSTRACT

EFFECT OF LiTFSI COMPOSITION ON IONIC CONDUCTIVITY OF CARBOXYMETHYL CELLULOSE BASED SOLID POLYMER ELECTROLYTE

This study was carried out to measure the effect of CMC- LiTFSI on ionic conductivity of CMC-based SPE. The SPEs sample was successfully prepared via solution casting and has been characterized by using Electrical Impedance Spectroscopy (EIS), Fourier Transform Infra-Red spectroscopy (FTIR), X-ray Diffraction (XRD) and Thermo Gravimetric Analysis (TGA) technique. An increase in amorphous nature of SPE observed as more LiTFSI added which correlate well with EIS result. The sample contain 30% LiTFSI exhibited the highest conductivity of 2.9100 X 10^{-7} S/cm at 303 K. The IR-spectra showed the occurrence of complexation between CMC and LiTFSI. An increase in the amorphous nature of the polymer electrolytes was confirmed by XRD analysis. The TGA studies reveal that incorporation of LiTFSI to enhance the thermal stability of the films. Amount of salt LiTFSI is added effectively to enhance the ionic conductivity and mechanical properties.