**ABSTRACT**

Besides commercially available synthetic polymers, the present work has been undertaken to explore the significance of poly(glycerol suberate) (PGS) polyester synthesised under lab scale in energy storage device. In this regard, a blend polymer electrolytecomprisingofpolyvinylalcohol(PVA),poly(glycerolsuberate)(PGS)polyesteralongwiththevariousproportionsof ammonium thiocyanate (NH4SCN) was prepared adopting solution casting technique. The synthesised polyester PGS was characterised by Fourier transform infrared (FT-IR) spectroscopy, 1H and13C nuclear magnetic resonance (NMR) spectroscopy. The prepared electrolyte film was subjected to FT-IR analysis to study the complexation that has occurred within the blend. Its amorphous naturewas revealedfromX-raydiffraction(XRD) studies.InfluenceofNH4SCNontheglasstransitiontemperature. (Tg)wasdrawnfromdifferentialscanningcalorimetry(DSC)technique.Thedispersionofdopantwithinthepolymermatrixwas supported by scanning electron microscopy (SEM) followed by its elemental composition from energy dispersive spectroscopy (EDS). From the AC impedance technique, maximum conductivity of 3.01×10−4 S cm−1 was elicited for the optimised electrolyte (1 g PVA+0.75 g PGS+0.6 g NH4SCN). Frequency-dependent dielectric and modulus spectra were analysed to study the mechanism of transportation. Transport parameters evaluated by Wagner’s polarisation method proved that the conductivity was predominantly due to cations. Proton conducting battery was configured with the highest conducting electrolytic film and its cell parameters are presented.