**ABSTRACT**

An attempt has been made to synthesise a new proton conducting polymer electrolyte using the biopolymer dextrin doped with ammonium thiocyanate salts using solution casting technique. The complexation has been studied using X-ray diffraction (XRD) and Fourier transform infrared spectroscopy (FT-IR). The differential scanning calorimetry (DSC) thermograms of dextrin with NH4SCN showed that Tg value increases with respect to the increase of NH4SCN concentration. The electrical conductivity was measured using AC impedance analyser which showed that ionic conductivity increases with increase in salt concentration up to 40%. Transference number measurement was carried out to investigate the nature of the charge transport species in the polymer electrolyte. Surface morphology of the electrolytes was determined using scanning electron microscope (SEM) studies, and the chemical composition of the elements present was determined using EDAX. The proton battery was constructed with the highest conducting polymer electrolyte Dex-40%NH4SCN and its open circuit voltage with load were carried out.