

18th ASIAN CONFERENCE ON SOLID STATE IONICS ACSSI - 2024

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MEENAKSHI COLLEGE FOR WOMEN
(Autonomous)

Kodambakkam, Chennai - 600024, India

BOOK OF ABSTRACTS

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For

Asian Society for Solid State Ionics

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Fabrication of Primary Proton-conducting battery using Cassia Auriculata as biomaterial-based electrolyte

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Abstract

In this study, synthesis of biomaterial-based electrolyte is prepared for fabricating the primary battery. Electrolyte is prepared by solution casting technique using Cassia Auriculata as a biomaterial based host with different Molecular weight percentage (M.wt%) of NH_4SCN salt and distilled water is used as a solvent. The prepared biomaterial membrane is characterized by different techniques such as X-ray diffraction (XRD) analysis, AC impedance spectroscopy and transference number measurement (TNM). XRD confirms the crystalline/amorphous nature of the biomaterial membrane. The membrane with the concentration of 1g of Cassia Auriculata with 0.6M.wt% of NH_4SCN yields high ionic conductivity of $1.0402 \times 10^{-2} \text{ S/cm}$ which has been found using Ac impedance analysis. Transference number measurement (TNM) is carried out to confirm that the majority of charge carriers are ions. By making use of highest proton conducting membrane as an electrolyte, the primary proton battery is fabricated which results with an open circuit voltage of 1.54V. Then by applying a load of 100 K Ω , 16 μA of current is drawn from the cell.

Keywords: Cassia Auriculata, Primary proton battery, XRD, AC Impedance spectroscopy.