

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 Magnesium Ion Conducting Battery using Cassia Auriculata Biomaterial – Based Membrane as an Electrolyte

S. Priyadharshini^{a,b,*}, Sr. J. Arul Mary^a, R. Meera Naachiyar^{b,c}, S. Aafrin Hazaana^{b,c}, N. Muniraj@Vignesh^{b,d}, S. Selvasekarapandian^{b,e}

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Abstract

In this study, biomaterial based membrane is prepared using solution casting method in which Cassia Auriculata [1] (Avaram Poo) flower powder is used as a source material with an additive Magnesium Chloride (MgCl₂) of different concentration. The prepared bio-membranes are characterized using various techniques such as X-Ray Diffraction method (XRD) and AC Impedance analysis. In order to examine the crystalline/amorphous nature of the membrane, XRD method is performed. AC Impedance method is used to measure the ionic conductivity of the prepared membranes and the membrane with the composition of 1g Cassia Auriculata and 0.8 M.wt% of MgCl₂ shows highest ionic conductivity of 5.12×10^{-4} S/cm. Transference number measurement is studied to confirm that the majority of charge carriers are ions. By utilizing the highest ion conducting membrane as an electrolyte, a primary magnesium ion battery [2] has been fabricated and exhibits an open circuit voltage of 2.0 V. 19 μ A of current is drawn by connecting a load of 100K Ω to the constructed setup.

Keywords: Cassia Auriculata, MgCl₂, XRD, AC Impedance, Primary Mg-ion battery

Reference

[1] Maneemegalai, S., and T. Naveen. "Evaluation of antibacterial activity of flower extracts of Cassia auriculata." *Ethnobotanical Leaflets* 2010.1 (2010): 3.v