

18th ASIAN CONFERENCE ON SOLID STATE IONICS ACSSI - 2024

19th - 22nd FEBRUARY, 2024

MEENAKSHI COLLEGE FOR WOMEN
(Autonomous)

Kodambakkam, Chennai - 600024, India

BOOK OF ABSTRACTS

Sponsored by



Materials Research Society
SINGAPORE



Solid State Ionics
Society of Japan



Subramanian - Thangathai
Educational Trust



Council of Science
&
Industrial
Research



Defence Research
&
Development
Organisation



MTN College



Royal Eastern

Organized by

MATERIALS RESEARCH CENTER

Run by Subramanian - Thangathai Educational Trust
Coimbatore - 641045, India

&

**MEENAKSHI COLLEGE FOR WOMEN
(Autonomous)**

Kodambakkam, Chennai - 600024, India

For

Asian Society for Solid State Ionics

Editors

Dr. S. Selvasekarapandian
Dr. K. S. Lakshmi
Dr. V. Meenakshi Sundaram
Dr. A. R. Kulkarni
Dr. C. Sanjeeviraja
Dr. K. Hariharan



First Edition: February 2024

Published by

Subramanian – Thangathai Educational Trust
(Register. No: 60/BK-IV/2013)

200 – A, Thiruvalluvar Nagar,
Ramanathapuram, Coimbatore – 641045, India

**18th Asian Conference on Solid State Ionics
(ACSSI – 2024) – BOOK OF ABSTRACTS**

Copyright © 2024 by Subramanian – Thangathai
Educational Trust

*All rights reserved. This book, or parts thereof,
may not be reproduced in any form or by any
means, electronic or mechanical, including
photocopying, recording or any information
storage and retrieval system now known or to be
invented, without written permission from the
Publisher*

ISBN Number: 978-93-340-1267-5

	<i>Kamatchi Devi S^{1,2,*}, Shanmugapriya C¹, Selvasekarapandian S^{2,3}, Aafrin Hazaana S^{2,4}, Meera Naachiyar R^{2,4}, Muniraj @ Vignesh N^{2,5}, Vanathi S²</i>	
C1-OP17	Study of Primary Zinc ion battery constructed using biopolymer electrolyte based on Pectin and Zinc Nitrate <i>Eswaragomathy S^{1,2}, Selvanayagam S¹, Kamatchi Devi S^{2,3}, Selvasekarapandian S^{2,4,*}, Muniraj @ Vignesh N^{2,5}, Aafrin Hazaana S^{2,6}, Meera Naachiyar R^{2,6}</i>	112
C1-OP18	Construction and Study of Primary Sodium Ion Battery Using Balloon Vine Spinach and Sodium thiocyanate <i>Vanathi. S^a, Kamatchi Devi. S^{a,b}, Muniraj @ Vignesh N^{a,c}, Aafrin Hazaana S^{a,d}, Meera Naachiyar R^{a,e}, Selvasekarapandian. S^{a,e}</i>	113
C1-OP19	Study of Li⁺ conduction properties of NASICON material Li_{1.3}Al_{0.29}Ga_{0.005}Sc_{0.005}Ti_{1.7}(PO₄)₃ <i>Dharmesh H. Kothari^{a,*}, D. K Kanchan^b, Ketan Chaudhari^a</i>	114
C1-OP20	Primary Lithium ion-conducting battery fabrication using Cassia Auriculata as biomaterial-based electrolyte <i>A. Delicia^{a,b,*}, A. Rajeswari^a, S. Aafrin Hazaana^{b,c}, R. Meera Naachiyar^{b,c}, N. Muniraj @ Vignesh^{b,d}, S. Selvasekarapandian^{b,e}</i>	115
C1-OP21	Sulfonated Electrospun PVDF Sheet as Proton Exchange Membrane for PEMFC <i>Rahul Patel^a and Yogesh Sharma^{*b}</i>	116
C1-OP22	Blend polymer electrolyte based on PVA and Nelumbo nucifera (Lotus Leaf) with NH₄SCN for Primary sodium ion conducting battery <i>Leena Chandra M V^{m,*}, Josiba Arockia Pavithra^b, Aafrin Hazaana S^{a,b}, Meera Naachiyar R^{a,b}, Muniraj @ Vignesh N^{b,c}, Selvasekarapandian S^{b,d}</i>	117
C2-OP01	All-Solid-State Proton-Based Tandem Structure Achieving Ultrafast Switching Electrochromic Windows <i>Aibin Huang^{1,2}, Xun Cao^{*1,2}</i>	118
C2-OP02	Withania somnifera – as proton conducting solid electrolyte for Proton cell and EDLC: A comparative study <i>Meera Naachiyar Ramadhasan^{*a,b}, Ragam M^a, Roshini J^b, Marshalin Reena C^b, Leena Chandra M V^a, Alphonsa Fernando R^a, Selvasekarapandian S^{b,c}</i>	119

Primary Lithium ion-conducting battery fabrication using Cassia Auriculata as biomaterial-based electrolyte

A. Delicia^{a,b,*}, A. Rajeswari^a, S. Aafrin Hazaana^{b,c}, R. Meera Naachiyar^{b,c}, N. Muniraj @ Vignesh^{b,d}, S. Selvasekarapandian^{b,e}

^aDepartment of Chemistry, Fatima College (Affiliated to Madurai Kamaraj University), Madurai- 625018, Tamil Nadu, India

^bMaterial Research Center, Coimbatore- 641045, Tamil Nadu, India.

^cResearch Centre of Physics, Fatima College (Affiliated to Madurai Kamaraj University), Madurai – 625018, Tamil Nadu, India

^dDepartment of Physics, Mannar Thirumalai Naicker College (Affiliated to Madurai Kamaraj University), Madurai - 625004, India.

^eDepartment of Physics, Bharathiar University, Coimbatore-641046, India.

*E-mail: delalourdhanai@gmail.com

Abstract

In the emerging world, there is a high demand for biomaterial based electrochemical devices [1]. In this study, development of Lithium ion conducting membrane using Cassia Auriculata and LiClO₄ has been made by Solution Casting method. The prepared biomaterial based membrane has been characterized by X-ray diffraction analysis (XRD) to study the crystalline/ amorphous nature of the biomaterial membrane. AC impedance technique has been utilized to study the conductivity of the samples. 1g Cassia Auriculata and 0.4 M.Wt.% of LiClO₄ membrane exhibits enhanced ionic conductivity of $3.81 \times 10^{-4} \text{ Scm}^{-1}$. Transference number measurement is carried out to confirm that the majority of charge carriers are ions. By employing the highest ion-conducting biomaterial based membrane as an electrolyte, primary Lithium ion conducting battery has been fabricated and result with an open circuit voltage of 1.65V [2]. By applying load of 100K Ω , 16 μ A of current is drawn from the cell.

References

- [1] Xuwei Fu, Wei-Hong Zhong, *Biomaterials for High-Energy Lithium-Based Batteries: Strategies, Challenges and Perspectives*. (2019)