

**Souvenir**

# **International Conference on Recent Trends in Materials Science**

**RTMS-2024**

**(Under UGC Autonomous Grant)**

**01<sup>st</sup> March, 2024**



*Organized by*

**PG & Research Department of Physics**  
**Arul Anandar College (Autonomous)**

*Reaccredited by NAAC at A Grade*

*DST-FIST Sponsored College*

**Karumathur – 625 514**  
**Madurai District, Tamilnadu.**

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57	<b>Performance Study of Sodium Alginate (SA) with Lithium Chloride (LiCl) based Solid-State Membrane as an Electrolyte in Electrochemical Device Application</b> <i>Aafrin Hazaana S, Ancemma Joseph &amp; Selvasekarapandian S</i>

## **Efficacy of $\text{TiO}_2$ Nanoparticles in Gellan gum Biopolymer Electrolyte towards Storage and Conversion Application**

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### **Abstract**

Gellan gum (GG), an anionic heteropolysaccharide has been chosen as the host polymer in the field of Solid state Ionics due to the presence of considerable amount of polar groups in it. The present work comprises, development of free-standing membranes using solution casting technique towards the focus on solid electrolytes using host biopolymer GG incorporated with various compositions of Ammonium Iodide ( $\text{NH}_4\text{I}$ ) salt. The role of  $\text{n-TiO}_2$  is prominent to improve the ionic conductivity in the solid electrolytes by removing the clusters. Various characterization studies such as XRD, FTIR, DSC TGA, Ac Impedance spectroscopy, LSV etc., exhibits the nature of prepared free standing membranes and highlighted the best (solid electrolyte) towards the storage and conversion applications.

**Keywords:** *Gellan Gum;  $\text{NH}_4\text{I}$ ;  $\text{TiO}_2$*



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EQUALITY of status and of opportunity; and to promote among them all  
FRATERNITY assuring the dignity of the individual and the unity and  
integrity of the Nation."



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