

Electrical Properties of A Novel Solid Biopolymer Electrolyte based on Algi-nate Incorporated with Citric Acid

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ABSTRACT

In the present study, a novel solid biopolymer electrolytes (SBE) system has been introduced by doping citric acid into alginate polymer. The sample of alginate-citric acid SBE system was prepared via solution casting technique. By using Electrical Impedance Spectroscopy (EIS), the electrolytes of alginate-citric acid has been analyzed from 5 Hz to 1 MHz achieved highest conductivity value at 20 wt.% of $5.49 \times 10^{-7} \text{ S cm}^{-1}$. The temperature dependence of various composition citric acid was found to obey the Arrhenius rules with $R^2 \sim 1$ where all SBE system is thermally activated when increasing temperature. The dielectric studies of the alginate-citric acid SBE system showed a non-debye behavior based on data measured using complex permittivity (ϵ^*) and complex electrical modulus (M^*) at selected temperature where there are no single relation was found in new biopolymer electrolytes system.

Keywords: biopolymer; ionic conductivity; Arrhenius; dielectric studies

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