

Study of Electrical Properties of Alg-PVA-NH₄NO₃ Complexed Polymer Electrolyte Films

*N.M.Ghazali and A.S.Samsudin**

Ionic Materials Team, Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia

**Corresponding author: ahmadsalihin@ump.edu.my*

Abstract

In this work, the studies on electrical properties of bio-polymer blend electrolytes (BBEs)-based alginate-poly (vinyl alcohol) (Alg-PVA) blend complexed with various NH₄NO₃ salt weight percent was carried out and successfully prepared via solution casting method. Electrical impedance spectroscopy (EIS) was used to analyze the film's conducting behavior, and it was found that both salt content and temperature improved the ionic conductivity of the BBEs system with the highest ionic conductivity reach at 5.20×10^{-4} S cm⁻¹ for a sample containing with 35 wt.% of NH₄NO₃. The BBEs were found to follow the Arrhenius relation as a function of temperature. From the impedance analysis, the electrical properties of the BBEs system were examined using complex permittivity, ϵ^* and complex electrical modulus, M^* to further study the relation between the Alg-PVA bio-polymer blend with NH₄NO₃.

Keywords: Alginate; Polymer blend films; Impedance spectroscopy; Dielectric; Electrical modulus