Short Communication

Formation of biopolymer electrolyte by interaction between carboxymethyl cellulose and NaCH₃COO and its Na⁺ ion transport properties

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doi: 10.20964/2020.12.57

Received: 6 July 2020 / *Accepted:* 12 October 2020 / *Published:* 31 October 2020

The present work deals with a new biodegradable biopolymer electrolyte-based carboxymethyl cellulose, CMC which was isolated from palm oil empty fruit bunch. Biopolymer electrolytes were developed with different ratios of sodium acetate (NaCH₃COO) via a solution casting technique, and their structural, electrical and electrochemical behaviours were investigated. The incorporation of 30 wt% sodium acetate yielded an optimized ionic conductivity of $1.83 \times 10^{-3} \text{ S cm}^{-1}$ at room temperature. Fourier transform infrared results suggested that interactions between components occurred in the biopolymer. The CMC-NaCH₃COO film with the highest conductivity had an electrochemical stability of 2.8 V, and transference number measurements confirmed that ions predominate in the conduction of electrolytes.

Keywords: Biopolymer electrolytes; sodium acetate; electrical studies; electrochemical stability

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