

**WASTE COOKING OIL – BASED POLYURETHANE COMPOSITE
POLYMER ELECTROLYTES: THE EFFECT OF CARBOXYMETHYL
CELLULOSE AS BIO FILLER**

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ABSTRACT

WASTE COOKING OIL – BASED POLYURETHANE COMPOSITE POLYMER ELECTROLYTES: THE EFFECT OF CARBOXYMETHYL CELLULOSE AS BIO FILLER

Waste cooking oil based polyurethane composite polymer electrolytes was synthesized by using solvent-free method and the effect of carboxymethyl cellulose as bio-filler was investigated. The study focusing on the ionic conductivity and mechanical properties. The films were characterized by fourier transform infrared spectroscopy (FTIR), electrochemical impedance spectroscopy (EIS), X-Ray diffraction (XRD), differential scanning calorimetry (DSC) and tensile strength. The conductivity increased when carboxymethyl cellulose was added. The highest conductivity value was obtained is PU-LiCF₃SO₃-15%CMC at 1.19×10^{-5} S/cm. The lowest tensile strength at PU is 20.13 MPa and the highest at the PU-LiCF₃SO₃-10%CMC is 34.17 MPa. It is concluded that the addition of carboxymethyl cellulose produce good ionic conductivity and mechanical properties. The film is suitable for future application as solid polymer electrolyte.

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