

Synthesis and properties of solid polymer electrolytes based on Poly(vinyl acetate-co-acetyl ethylene oxide methacrylate)

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Poly(vinyl acetate-co-acetyl ethylene oxide methacrylate) (P(VAc-AEOMA)) was synthesized and used as a host for lithium salt to prepare an all solid polymer electrolyte in lithium rechargeable batteries. Introduction of carbonyl groups into the copolymer increased ionic conductivity. The relationship between the lithium salt concentration and ionic conductivity was investigated by Fourier transform infrared (FTIR) spectroscopy. The interaction between the lithium salt and carbonyl groups in the polymer matrix accelerated the dissociation of the lithium salt and thus resulted in a maximum ionic conductivity at a salt concentration higher than pure PAEGMA-salts system. The stability of the interface between electrode and electrolyte was evaluated by measuring the alternating current (AC) impedance.