

Structural, Thermal and Electrical Properties of PVDF-HFP/LiBOB Salt and TiO₂ as Composite Polymer Electrolyte in Lithium Ion Batteries.

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Composite polymer electrolyte membrane used in Lithium ion batteries consisting of Poly (vinylidene fluoride-co-hexafluoropropylene) (PVDF-HFP) with Lithium Bis oxalato borate (LiBOB) salt and various concentrations of TiO₂ as filler have been prepared by solution casting technique. The structural of polymer electrolyte membrane are studied by XRD and SEM, while thermal properties was studied by DSC. The electrical properties was studied by Cyclic Voltametry and Impedance spectroscopy. The result analysis of XRD reveals the amorphous nature of PVDF-HFP/ LiBOB and TiO₂ composite matrix. SEM photographs of polymer electrolyte membran indicate good compatibility between polymer, salt, and other contents as well as the amorphous phase formation in the fabricate of polymer electrolyte membran.[1]. Polymer electrolyte membrane without additional ceramic filler with composition of 70 % polymer, 30 % LiBOB and 0 % TiO₂ has the greatest conductivity for forming amorphous phase and the most stable electrochemical interface. The XRD and DSC studies indicate that the conductivity increase is due to the increase of the amorphous content which enhances the segmental flexibility of polymeric chains and the disordered structure of the electrolyte. [2]

References:

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