

Master's Thesis
Multifunctional Epoxy Based Solid Electrolytes for Structural Sodium Batteries

Project Description

Multifunctional structures are innovative concepts to increase efficiency at system level. The structural batteries are one such multifunctional structure that have the capability to store electrical energy and carry load (provides structural integrity). The structural electrolyte is one of the most important constituents of a structural battery which should possess good ionic conductivity and mechanical strength. Various approaches have been researched in the past by many researchers. One of the successful approaches is to make a bi-continuous phase matrix which has a solid phase for providing mechanical strength and a liquid phase containing ionic liquid and salt for high ionic conductivity as shown in Fig.1. This master's thesis topic deals with the preparation and characterization of a structural battery electrolyte for a sodium ion battery.

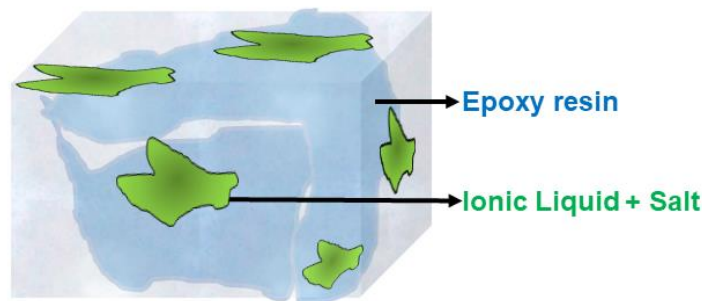


Figure 1: Bi-continuous phase type electrolyte

Requirements:

The student is expected to perform the following tasks during the study

- Preparation of solid battery electrolyte
- Solid electrolyte microstructure study
 - FTIR (Fourier Transform Infrared Spectroscopy)
 - Scanning electron microscopy (SEM)
- Mechanical and electrochemical characterization
 - Dynamic Mechanical Analysis (DMA)
 - Electrochemical Impedance Spectroscopy (EIS)

Contact information

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