

Nanocomposites and nanomaterials

Electrochemical properties of interface: Li electrode - solid polymer electrolyte

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High energy batteries with Li anode and solid polymer electrolyte based on high-boiling aprotic solvent are very promising. Some benefits include the following: 1) prevention short contact between anode and cathode during battery cycling and therefore allow use Li anode for secondary batteries; 2) allow to using the Li batteries under high temperature, up to 120 C.

Electrochemical properties of the interface between Li based anode and solid polymer electrolyte plays the critical role [1, 2]. We developed:

- Materials and technologies for fabrication the solid polymer electrolytes based on the ionic liquid, Li-salts and high-boiling aprotic solvent;
- Method of formation contact Li and solid polymer electrolyte that provides low interface resistance and high efficiency of cycling ability Li anode.

During presentation will be presented the following data:

- Influence the composition and technology preparing the solid polymer electrolyte on the conductivity in wide operating rang of temperature; electrochemical and chemical stability; thermo physical properties of solid polymer electrolyte;
- Impedance characteristics of the interface the Li anode and optimized solid polymer electrolyte; parameters of efficiency during Li anode cycling.

Results of investigation and optimization these parameters are background for development a new generation high energy Li batteries with solid polymer electrolytes.

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1. *O. Kolomojets, I.Maksyuta, O.Chervakov, E. Shembel* Lithium Rechargeable Work in the Systems With Polymer Electrolytes Based On C-PVC And PVdF/ Electrochemical Energetic 2008 –Vol.8.- № 1- p. 51-57.

2. *Y. Lu, S.K. Das, S.S. Moganty, L.A. Archer* Ionic liquid-nanoparticle hybrid electrolytes and their application in secondary lithium-metal batteries / Advanced Materials – 2012. – Vol. 24. – p. 4430-4435.