

# High energy Li batteries with solid polymer electrolyte and cathode based on the spinel $\text{LiMn}_2\text{O}_4$

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The purpose of this work is the development of a highly energy batteries with an anode based on lithium, a cathode based on spinel  $\text{LiMn}_2\text{O}_4$ , and a solid polymer electrolyte. Such type of batteries are characterized by high energy, increased safety during operation and low self-discharge. At the same time, in order to achieve the set goals, it is necessary to solve the problems connected with the synthesis of innovative polymer materials and with the technology of manufacturing a batteries with solid polymer electrolyte

In our investigations and development solid polymer electrolytes are based on composites of the quaternary ammonium salts, lithium salts and high-boiling aprotic solvents. The composition and structure of the solid polymer electrolyte affects its electrochemical properties, and also on the mechanism of the cathodic process in the lithium batteries

For the cathode active material we developed method of modification of lithium manganese spinel [1]. Spinel that synthesized on the basis on Ukrainian manganese ores, was used.

During presentation the results of investigation the cathode process and the results of testing the Li- batteries with a solid polymer electrolyte will be presented. Developed electrochemical system Li –  $\text{LiMn}_2\text{O}_4$  with solid polymer electrolyte is highly promising for Li batteries, has high level of the safety, wide operating range of the temperature and would be widely applied.

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1. *I. M. Maksuta, A. V. Markevych, L. I. Neduzko, N. D. Zaderey, E. M. Shembel* Method obtaining the modified active cathode material for lithium-ion batteries. Ukrainian Patent 113443, January 25, 2017