

ABSTRACT

Explanatory note: 92 p., 26 figures, 18 tables, 44 references.

The object of study - nanodisperse lithium manganova spinel with a radial concentration gradient of Nickel atoms that are partially substituted by atoms of manganese to increase the mobility of lithium ions in intercalation processes.

Subject of research - physico-chemical characteristics of gradient lithium manganova spinel as the basis of the cathodes of lithium-ion batteries and the optimum mode of its manufacture.

The objective was to determine the optimal mode of manufacturing gradient lithium manganova spinel to increase the mobility of lithium ions in an electrochemical system with a non-aqueous lithium salt solutions provided play an electric capacitance of the layout of the cathode of lithium-ion battery is more stable compared to unmodified electrodes of lithium-manganova spinel.

The obtained gradient material based on lithium-manganova spinel with the change in the radial direction the concentration of Nickel atoms partially replacing atoms of manganese. Determined the electrical capacity of modified spinel, which amounted to 94.5 mA·h/g with the internal resistance element 144 Ohms and coulomb efficiency established on the basis of this spinel cathode 99%. It is shown that the optimum temperature for the fabrication of spinel is 750

The results of research used in the scientific reports of the Department of Interagency Department of Electrochemical Power engineering of NAS of Ukraine. Suggestions for direction of future research is the determination of the optimal size of the concentration gradient of Nickel in the spinel Itimamente providing the greater capacity is produced on the basis of the cathode at its high stability in progress of charge-discharge cycles.

Keywords: lithium-manganova spinel modification, the concentration gradient of Nickel, the cathode of lithium-ion battery, capacity.