Full Paper _____ *Thematic Section:* Physicochemical Research.
Reference Object Identifier – ROI: jbc-02/15-44-12-132 *Subsection:* Electrochemistry.
Publication is available for discussion in the framework of the on-line Internet conference "*Butlerov readings*".
http://butlerov.com/readings/ *(English Preprint)*
Contributed: November 27, 2015.

Interrelation of transport properties and dynamics of fluctuation of atoms of a crystal lattice of the $Li_{8-x}Zr_{1-x}V_xO_6$ solid solutions

© **Maria S. Shchelkanova**,[1]*+ **Marina I. Pantyukhina**,[1]
Emma G. Vovkotrub,[2] and **Sergey V. Plaksin**[2]

[1] *Laboratory of Chemical Power Source. Institute of High Temperature Electrochemistry, Ural Branch of the Russian Academy of Sciences. Akademicheskaya St., 20. Yekaterinburg, 620990. Russia. Phone: +7 (343) 362-34-79. E-mail: werty0@e1.ru*

[2] *Laboratory of Physical and Chemical Methods of Research of Structure of Substance. Institute of High Temperature Electrochemistry, Ural Branch of the Russian Academy of Sciences. Akademicheskaya St., 20. Yekaterinburg, 620990. Russia. Phone: +7 (343) 362-33-48. E-mail: E.Vovkotrub@ihte.uran.ru*

*Supervising author; +Corresponding author

Keywords: lithium-ionic conductors, solid electrolytes, activation energy of conductivity, mechanism for the Li^+ ions motion.

Abstract

The region of existence of solid solutions in the $Li_{8-x}Zr_{1-x}V_xO_6$ system, where $0 \le x \le 0.015$, was specified. The $Li_{7.985}Zr_{0.985}V_{0.015}O_6$ solution has the highest value of conductivity ($4.4 \cdot 10^{-1}$ S/cm) at 873 K. The fraction of electronic conductivity in the $Li_{7.985}Zr_{0.985}V_{0.015}O_6$ sample does not exceed 0.1% of the total conductivity value at 873-673 K. The NMR spectra for $Li_{7.985}Zr_{0.985}V_{0.15}O_6$ were recorded and deciphered. Activation energy for the "short-range" motion of Li^+ ions for $Li_{7.985}Zr_{0.985}V_{0.15}O_6$ is 0.45 eV.