X Conference “Fundamental Problems of Solid State Ionics”

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The present and the following two issues of the Journal “Elektrokhimiya” contain papers based on the lectures delivered at the X International Conference “Fundamental Problems of Solid State Ionics” which was held at the Institute of Problems of Chemical Physics of the Russian Academy of Sciences (Chernogolovka, Moscow Region) on June 14–16, 2010.

The conference was dedicated to the memory of Professor Evgenii Aleksandrovich Ukshe, the initiator of seminars “Solid State Ionics” which were successfully held in the 80s of the past century, united the scientists specialized in solid state physics, inorganic chemistry, crystal chemistry, and electrochemistry, and favored the extension of research to numerous interdisciplinary fields including applied electrochemistry.

Later, due to the rapid development of this science direction, namely, solid state ionics, these seminars were transformed into the International Conferences “Fundamental Problems of Solid State Ionics”, which involved the problems of solid-state chemistry, electrochemistry, and material science. Solid materials with high ionic conductivity proved to be promising ionic membranes (solid electrolytes) and electrodes (materials with mixed ionic-electronic conduction) in the elaboration of various electrochemical devices such as fuel cells, chemical power sources, ionizers, gas sensors, etc. In the past years, the studies aimed at the synthesis of new materials for the most part conducted by well-directed doping and also at the prediction of their properties by computer simulations have gained wide acceptance.

The discussion of lectures included into the X Conference Program has shown that in the field of fundamental studies of solid state ionics, the Russian scientists occupied the leading position largely because they had an opportunity to actively exchange their ideas

and research results at such topical meetings and conferences.

The main subjects discussed in the X Conference were as follows:

- mechanisms of the fast ion transfer in solids;
- methods for studying ion-conducting systems;
- electrochemical processes on solid interfaces such as ionic conductor/electronic conductor including the interfaces with participation of active gases;
- solid electrolytes with superionic conduction (including proton-conducting membranes): synthesis, structure, properties;
- materials with mixed electronic-ionic conduction;
- composite and nanostructural materials with ionic conduction;
- application fields of superionic conductors.

The X Conference united nearly 300 young scientists and leading specialists from institutes of the Russian Academy of Sciences and universities of Russia and the countries of the former Soviet Union (Azerbaijan, Belarus, Moldova) and also from other foreign countries (Czechia, France, Germany, Greece, Portugal, Slovakia, Spain).

The Organizing Committee of the X Conference “Fundamental Problems of Solid State Ionics” is grateful to the Russian Foundation of Basic Research for the financial support and the directorate of the Institute of the Problems of Chemical Physics of RAS for their help in carrying out the conference and also to everyone who took part in the preparation of these topical issues of Journal “Elektrokhimiya”.

*On behalf of the Organizing Committee,
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