SCHEDULE of the FPSSI-2022

16th International Meeting "Fundamental Problems of Solid State Ionics"

June 27, 2022

SECTION 1. IONIC CONDUCTORS: SYNTHESIS, STRUCTURE, PROPERTIES AND TRANSFER MECHANISMS

Section Chairman Dobrovolsky Yu.A. / Astafev E.A.

9^{00} Conference opening

Opening speech Prof. Yury Dobrovolsky and Prof. Boris Grafov

9^{15}-9^{45} I-1. *Philippe Colomban* Mobile proton and protonic species. A historical view of their identification and outstanding questions *Laboratory "from molecule to nano*-objects *"(MONARIS), Paris, France*

9^{50}-10^{20} I-2 *Alexey K. Ivanov-Schitz* Solid state ionics - trends (2010-2021) and outlook *MGIMO University, FSRC «Crystallography and Photonics» RAS, Moscow, Russia*

10^{25}-10^{55} I-3. *Andrey B. Yaroslavtsev* Development of new membranes for hydrogen energy *Kurnakov Institute of General and Inorganic Chemistry RAS, Moscow, Russia*

11^{00}-11^{20} O-1 *Irina Makarova*, E. Selezneva, A. Tolstikhina, R. Gainutdinov, A. Vasiliyev, V. Komornikov, V. Grebenev, I. Malyshkina Proton conductivity and its changes as a manifestation of the features of the atomic and real structure of superprotonic crystals *Shubnikov Institute of Crystallography of Federal Scientific Research Centre "Crystallography and Photonics" RAS, Moscow, Russia*

11^{25}-11^{35} COFFEE BREAK

11^{35}-11^{55} O-2 *Ekaterina Yu. Safronova*, D.Yu. Voropaeva, A.V. Parshina, A.B. Yaroslavtsev Materials based on perfluorosulfonic acid polymers: correlation between dispertion composition and properties of recast membranes *Kurnakov Institute of General and Inorganic Chemistry RAS, Moscow, Russia*

12^{00}-12^{15} O-3 *Olga S. Lezova*, O.A. Zagrebelny, S.I. Selivanov, O.A. Shilova, A.G. Ivanova Ion-conducting hybrid membranes based on polyvinyl alcohol: composition, properties, Felton test *Institute of Silicate Chemistry RAS, St. Petersburg, Russia*

12^{15}-12^{30} O-*Ulyana M. Zavorotnaya*, I.I. Ponomarev, Yu.A. Volkova, A.D. Modestov, V.N. Andreev, A.F. Privalov, M. Vogel, V.V. Synitsyn Investigation of proton conductivity and diffusion of fluorine-free proton exchange membranes and the development of hydrogen-air fuel cells based on them *Prokhorov Institute of General Physics RAS, Inenergy LLC, Moscow, Russia*

12^{30}-12^{45} O-5 *Semyon D. Chernyuk*, O.V. Bushkova, A.P. Safronov Supromolecular structure and swelling kinetics of Nafion membrane in water and aprotic solvents *Institute of Solid-State*

Chemistry, UB RAS, Yekaterinburg; Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia

12^{45}-13^{05} O-6 *Lyubov Shmygleva*, R.R. Kayumov, V.M. Freyman, L.S. Leonova Influence of composition and preparation method on proton conducting properties of composite electrolytes based on ammonium salts of phosphotungstic acid and calixarene *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

13^{10}-14^{30} DINNER

Section Chairman Animitsa U.E. / Ukshe A.E.

14^{30}-14^{45} O-7 *Vladimir M. Freiman*, A.A. Knyazeva, A.V. Vinyukov Proton conductivity of bis-calix[4]arene sulfonic acids *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

14^{45}-15^{00} O-8 *Alina A. Knyazeva*, V.M. Freiman, A.V. Vinyukov, Yu.A. Dobrovolsky Ion conductivity study of lithium salts of calixarene[n]sulfonic acid solvated with aprotic solvent *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

15^{00}-15^{30} I-4 *Valentina G. Ponomareva* Electrotransport and morphological features of nanocomposite CsH_2PO_4-nanodiamond systems *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

15^{35}-15^{50} O-9 *Dmitry V. Alekseev*, Yu.G. Mateyshina, N.F. Uvarov Study of the transport properties of solid composite electrolytes based on cesium nitrite dopaged with nanodiamond particles *Novosibirsk State University, Institute of Solid State Chemistry and Mechanochemistry of SB RAS, Novosibirsk, Russia*

15^{50}-16^{05} O-10 *Magomed A. Akhmedov*, M.M. Gafurov, K.Sh. Rabadanov, Z.Yu. Kubataev, A.M. Amirov, N.S. Shabanov, M.B. Ataev, M.G. Kakagasanov The effect of mechanoactivation on the structure and electrical conductivity in the system KNO_3-AL_2O_3 *Analytical Center for Collective Use of the DFRC RAS, Makhachkala, Russia*

16^{05}-16^{15} COFFEE BREAK

16^{15}-16^{30} O-11 *Zaur Yu. Kubataev*, M.M. Gafurov, K.Sh. Rabadanov, M.A. Akhmedov, M.G. Kakagasanov The effect on the structure and conductivity of the nano-Al_2O_3 $(1–x)(LiClO_4 – NaClO_4) + xAl_2O_3$ system *Analytical Center for Collective Use, Dagestan Federal Research Center RAS, Makhachkala, Russia*

16^{30}-16^{45} O-12 *Alexander A. Glukhov*, A.E. Ukshe, O.G. Reznitskikh, T.V. Yaroslavtseva, O.V. Bushkova Transport properties of $CsAg_4Br_{3-x}I_{2+x}$ solid electrolytes *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

16^{45}-17^{00} O-13 *Ji Qianlong*, N.A. Melnikova, O.V. Glumov and I.V. Murin Mechanochemical synthesis and electrolytic properties of solid solutions in PbF_2-SrF_2-KF system *Institute of Chemistry of Saint Petersburg State University, Saint-Petersburg, Russia*

V Scientific School of Young Scientists «Hydrogen and electrochemical energy»

17^{10} *Boris P. Tarasov* Problems of storage and transportation of hydrogen *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

18^{30} Welcome Party

June 28, 2022

SECTION 1. IONIC CONDUCTORS: SYNTHESIS, STRUCTURE, PROPERTIES AND TRANSFER MECHANISMS

Section Chairman Animitsa I.E. / Lyskov N.V.

9^{00}-9^{30} I-5 *Irina E. Animitsa* Oxygen-ion and proton transport in phases based on $BaLaInO_4$ and $La_2BaIn_2O_7$ with Ruddlesden-Popper Structure *Ural Federal University, Institute of Natural Sciences and Mathematics, Ekaterinburg, Russia*

9^{35}-9^{55} O-14 *Vladislav A. Sadykov*, E.M. Sadovskaya, N.F. Eremeev, T.Yu. Maksimchuk, E.Yu. Pikalova Oxygen mobility in $La_{1.7}Ca_{0.3}Ni_{1-y}Cu_yO_{4+\delta}$ materials *Federal Research Center Boreskov Institute of Catalysis SB RAS, Novosibirsk, Russia*

10^{00}-10^{15} O-15 *Irina A. Anokhina*, V.N. Frolova, A.F. Buzina, V.I. Voronin, I.E. Animitsa Structure and transport properties of Mg-dopted $Gd_2Zr_2O_7$ *Institute of High Temperature Electrochemistry of the Ural branch of the RAS, Ural Federal University, Yekaterinburg*

10^{15}-10^{30} O-16 *Anzhelika O. Galisheva*, N.A. Tarasova, I.E. Animitsa Oxygen-ionic and protonic transport in Nd-doped complex oxide based on $BaLaInO_4$ *Institute of High Temperature Electrochemistry UB RAS, Ural Federal University, Ekaterinburg, Russia*

10^{30}-11^{00} I-6. *Artem M. Abakumov* Order and disorder in cathode materials for metal-ion batteries *Skolkovo Institute of Science and Technology, Moscow, Russia*

11^{05}-11^{15} COFFEE BREAK

11^{15}-11^{35} O-17 *Anna V. Shlyakhtina*, N.V.Lyskov, I.V. Kolbanev, G.A. Vorobieva, A.V. Kasyanova, D.A. Medvedev Proton and oxygen-ion conductivityof "stuffed" and pure RE hafnates pyrochlores *Semenov Federal Research Center for Chemical Physics RAS, Kurnakov Institute of General and Inorganic Chemistry RAS, Moscow, Russia*

11^{40}-11^{55} O-18 *Inna Zvonareva*, A. Mineev, D. Medvedev Ionic and electronic transport in $BaSn_{1-x}Sc_xO_{3-\delta}$ perovskite oxides *Institute of High Temperature Electrochemistry, Ural Federal University, Yekaterinburg, Russia*

11^{55}-12^{15} O-19 *Oleg V. Merkulov*, R.R. Samigullin, A.A. Markov, M.V. Patrakeev Impact of a-site cation deficiency on charge transport in $La_{0.5-x}Sr_{0.5}FeO_{3-\delta}$ *Institute of Solid State Chemistry, UB*

RAS, Ekaterinburg; Institute of Solid State Chemistry and Mechanochemistry, SB RAS, Novosibirsk, Russia

12^{20}-12^{40} O-20 *Vladimir G. Goffman*, A.V. Gorokhovskii, A.D. Makarova, E.V.Tret'yachenko, N.V. Gorshkov, M.A. Vikulova, E.V. Kolokolova, A.M. Baynyashev, T.S. Teliukova **Impedance spectroscopy of modified potassium titanate *Gagarin State Technical University of Saratov, Saratov, Russia***

12^{45}-13^{15} I-7 *Nikolai F. Uvarov* Composite solid electrolytes for solid-state electrochemical devices *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

13^{20}-14^{30} DINNER

Section Chairman Dobrovolsky Yu.A.

14^{30}-17^{00} Round table "Hydrogen technologies. Hydrogen Energy»

"Hydrogen cluster in the Sakhalin region"

16^{00}-16^{10} COFFEE BREAK

V Scientific School of Young Scientists «Hydrogen and electrochemical energy»

17^{00}-18^{00} *Artem M. Abakumov* *Skolkovo Institute of Science and Technology, Moscow, Russia*

18^{00} POSTER SESSION Reports P.1.1-P.1.44

Round table Discussion of poster presentations, 3-5 min. reports

June 29, 2022

SECTION 2. ELECTRODE PROCESSES AND ELECTROCATALYSIS AT INTERPHASE BOUNDARIES

Section Chairman Astafev E.A. / Lyskov N.V.

9^{00}-9^{30} I-8 *Ilan Riess* Analysis of experimental results of defect concentrations in the surface layer of acceptor doped ceria *Physics Department, Technion IIT, Haifa, Israel*

9^{35}-10^{05} I-9 *Alexander P. Nemudry*, S.A. Chizhik, M.P. Popov, I.V. Kovalev Comparison of oxygen exchange processes in perovskites using various methods *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

10^{10}-10^{30} O-21 *Igor I. Gainutdinov* Features of the electronic structure of oxygen-deficient perovskites $SrFe_{1-x}Mo_xO_{3-y}$ *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

10^{35}-10^{55} O-22 *Ivan L. Ivanov*, P.O. Zakiryanov, V.V. Sereda, M.O. Mazurin, D.A. Malyshkin, D.S. Tsvetkov, A.Yu. Zuev Oxygen chemical diffusion and surface exchange in double perovskites

$ReBaCo_{2-x}Fe_xO_{6-d}$ *Laboratory of Hydrogen Energy, Ural Federal University, Institute of Natural Sciences and Mathematics, Ural Federal University, Yekaterinburg, Russia*

11^{00}-11^{10} COFFEE BREAK

11^{10}-11^{30} O-23 *Nikolay V. Lyskov*, M.Z. Galin, L.S. Leonova, G.N. Mazo Influence of additives of praseodymium, cobalt and manganese oxides on the electrochemical properties of cathode materials based on praseodymium cuprate *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

11^{35}-11^{55} O-24 *Anton Kuzmin*, M. Plekhanov, A. Stroeva, Z. Ichetovkin Electronic-ionic conductivity materials based on lanthanum scandate and transition metals *Vyatka State University, Kirov, Russia*

12^{00}-12^{15} O-25 *Dmitriy A. Vatlin*, N.A. Popov, O.G. Reznitskikh, O.V. Bushkova Synthesis and investigation of the physico-chemical properties of zinc pyrophosphate $Zn_2P_2O_7$ *Institute of Solid State Chemistry, UB RAS, Ekaterinburg, Russia*

12^{15}-12^{30} O-26 *Alexander V. Antonyuk*, N.A. Kabanova, Ye.A. Morkhova Prospective oxygen-ion conductors of $Ln_aX_bO_z$ composition: geometric and energetic calculations *Samara Center for Theoretical Materials Science, Samara State Technical University, Samara, Russia Samara University, Samara, Russia*

12^{30}-12^{45} O-27 *Anastasia A. Koshkina*, T.V. Yaroslavtseva, A.E. Ukshe, O.V. Bushkova Degradation of lithium-manganese spinel $LiMn_2O_4$ in contact with a standard electrolyte solution by impedance spectroscopy *Institute of Solid State Chemistry UB RAS, Yekaterinburg, Russia*

12^{45}-13^{00} O-28 *Vladislav Chernyavsky*, A. Kim, Yu. Koshtyal, A. Rumyantsev, A. Popovich, M.Yu. Maximov Structural features of complete and partial activation of Li-rich cathodes studied by in-situ XRD *Peter the Great Saint-Petersburg Polytechnic University, Saint Petersburg, Russia*

13^{00}-13^{15} O-29 *Efim D. Lyalin*, E.A. Il'ina, L.S. Pershina, T.A. Kuznetsova Influence of the L_3BO_3 addition on the cathode | solid electrolyte interface *Ural Federal University named after the First President of Russia B. N. Yeltsin, Institute of High Temperature Electrochemistry of the Ural Branch of the RAS, Yekaterinburg, Russia*

13^{15}-14^{30} DINNER

Section Chairman Uvarov N.F. / Levchenko A.V.

14^{30}-15^{00} I-10 *Tamara A. Kravchenko*, Polyansky L.N., Krysanov V.A., Vakhnin D.D. Nanoscale effects of metal-ion-exchange composites in chemical and electrochemical oxygen reduction and water deoxygenation: theory and technology *Voronezh State University, Voronezh, Russia*

15^{05}-15^{25} O-30 .V. Smirnova, *Alexandra B. Kuriganova* Application of non-stationary electrolysis in the technology of electro- and catalytically active materials *Platov South-Russian State Polytechnic University (NPI), Novocherkassk, Russia*

15^{30}-15^{50} O-31 *Кашин Алексей Михайлович* Электрохимические технологии для электротранспорта в перспективной энергетике *InEnergy, г. Москва, Россия*

15^{55}-16^{10} O-32 *Inna E. Vernigor*, V.A. Bogdanovskaya, M.V. Radina, V.N. Andreev effect of the platinum content and the nature of the support on the path of oxygen reduction reaction in an alkaline electrolyte *A.N. Frumkin Institute of Physical Chemistry and Electrochemistry, Russian Academy of Sciences, Moscow, Russia*

16^{10}-16^{30} O-33 . *Roman A. Manzhos*, N.S. Komarova, A.S. Kotkin, V.K. Kochergin, A.G. Krivenko Plasma electrochemical synthesis of graphene-phosphorene composites and their catalytic activity towards hydrogen evolution reaction *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

16^{30}-16^{40} COFFEE BREAK

16^{40}-17^{10} I-11 *Raoul R. Nigmatullin*, V.S. Alexandrov, A.V. Sidelnikov, H.C. Budnikov, E.I. Maksyutova Quantitative description of voltammetric time series of unclosed electric circuits for detection of differences between different potentiostats/galvanostats *Kazan National Research Technical University named after A.N. Tupolev, Kazan, Russia*

17^{15}-17^{45} I-12 *Galina A. Tsirlina* Birnessite as the broad assignment electrode material *Lomonosov Moscow State University, Moscow, Russia*

17^{50}-18^{10} O-34 Wei Liu, Meigeng Gao, Xiaomei Zhang, *Elena Yu. Konysheva* Reactivity of chromium containing vapour with components in solid oxide fuel cells: impact of porosity and temperature *Institute of Metallurgy, Ural Branch of the Russian Academy of Sciences, Yekaterinburg, Russia*

V Scientific School of Young Scientists «Hydrogen and electrochemical energy»

18^{10}-19^{10} *Nikolay Lyskov* Solid oxide fuel cells: functional materials, design features and developers *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

June 30, 2022

SECTION 2. ELECTRODE PROCESSES AND ELECTROCATALYSIS AT INTERPHASE BOUNDARIES

Section Chairman Ukshe A.E. / Vasiliev A.A.

9^{00}-9^{30} I-13 *Vladimir E. Guterman* Catalysts for electrolyzers and PEM fuel cells. Problems, solutions and russian production *Faculty of Chemistry, Southern Federal University, Prometheus R&D Ltd. (participant of the Skolkovo project), Rostov-on-Don, Russia*

9^{35}-9^{50} O-35 *Alina K. Nevelskaya*, S.V. Belenov Effect of heat treatment on the activity and stability of PtCo/C electrocatalysts *Southern Federal University, Rostov-on-Don, Russia*

9^{50}-10^{10} O-36 *Anastasia A. Alekseenko*, A.S. Pavlets, K.O. Paperzh, E.A. Moguchikh, Yu.A.Bayan, E.L. Kozhokar, D.V. Aleksenko, S.V. Belenov Control of the platinum-containing electrocatalysts structural characteristics for low temperature fuel cells *Southern Federal University, Rostov-on-Don, Russia*

10^{15}-10^{45} I-14 *Mikhail A. Vorotyntsev*, A.E. Antipov Specific features of autocatalytic halate reduction process inside porous flow-through cathode *Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow; Institute for Problems of Chemical Physics RAS, Chernogolovka; Mendeleev University of Chemical Technology of Russia, Moscow, Russia*

10^{50}-11^{00} COFFEE BREAK

SECTION 3. EXPERIMENTAL AND THEORETICAL METHODS FOR STUDYING PROCESSES IN SOLID-STATE IONIC AND MIXED CONDUCTORS

11^{00}-11^{30} I-15 *Boris M. Grafov*, A.L. Klyuev, A.D. Davydov Fluctuation-dissipation analysis of electrochemical noise resistance *Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow, Russia*

11^{35}-11^{55} O-37 *Mikhail A. Abaturov*, Yu.V. Sirotinskiy Achieving the minimum noise level of the amplifier when measuring the noise of chemical current sources *Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow, Russia*

12^{00}-12^{20} O-38 *Evgeny A. Astafev* A new powerful potentiostat for the study of chemical power sources *Institute of problems of chemical physics RAS. Chernogolovka, Russia*

12^{25}-12^{45} O-39 *Victor V. Nikonenko*, A.E. Kozmai, N.D. Pismenskaya The effect of an anion-exchange membrane modification with a perfluorosulfonated ionomer on its selectivity *Membrane Institute, Kuban State University, Krasnodar, Russia*

12^{50}-13^{10} O-40 *Svetlana I. Kulakovskaya*, A.V. Kulikov, T.S. Zyubina, A.S. Zyubin, L.N. Sviridova, E.V. Stenina, A.G. Ryabenko, E.V. Zolotukhina, Yu.A. Dobrovolskiy Electrochemical and quantum chemical studies of electrocatalytic system 2,5-di-Me-pyrazine-di-N-oxide - methanol - single-walled and multi-walled carbon nanotube paper electrodes *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

13^{15}-14^{30} DINNER

Section Chairman Dobrovolsky Yu.A.

14^{30} ROUND TABLE "ELECTRIC TRANSPORT"

16^{50}-17^{00} COFFEE BREAK

V Scientific School of Young Scientists «Hydrogen and electrochemical energy»

17^{00}-18^{00} ***Alexey M. Kashin*** Electrochemical technologies for electric transport in the promising energy sector *InEnergy, Moscow, Russia*

18^{30} BANQUET

July 01, 2022

SECTION 3. EXPERIMENTAL AND THEORETICAL METHODS FOR STUDYING PROCESSES IN SOLID-STATE IONIC AND MIXED CONDUCTORS

Section Chairman Uvarov N.F. / Astafev E.A.

9^{00}-9^{30} I-16 *Vitaly I. Volkov*, A.V. Chernyak Ionic and molecular transport in solid electrolytes studied by NMR *Institute of Problems of Chemical Physics RAS, Scientific Center in Chernogolovka RAS, Chernogolovka, Russia*

9^{35}-9^{55} O-41 *Nikita A. Slesarenko*, A.V. Chernyak, V.I. Volkov Features of the mobility of alkali metal cations in sulfonic cation-exchange membranes to NMR relaxation data *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

10^{00}-10^{20} O-42 *Daniil I. Kolokolov*, A. Khudozhitkov Can we monitor the limiting step of the charge transfer in solid proton conductors by solid state 2H NMR?*Boreskov Institute of Catalysis SB RAS, Novosibirsk State University, Novosibirsk, Russia*

10^{25}-10^{55} I-17 *Pawel J. Kulesza* Development and characterization of low-platinum content catalysts for oxygen electroreduction in acid medium *Faculty of Chemistry, University of Warsaw, Poland*

11^{00}-11^{10} COFFEE BREAK

11^{10}-11^{30} O-43 T.R. Fazledinov, *Vladimir V. Tomaev*, E.V. Smirnov, Yu.S. Tverjanovich Features of the effect of silver chalcogenides on the softening temperature of chalcogenide glasses with ionic conductivity *St.-Petersburg Institute of Technology (Technical University), Saint-Petersburg Mining University, St.-Petersburg, Russia*

11^{35}-11^{55} O-44 *Tatiana S. Zyubina*, A.S. Zyubin, A.V. Korchun, E.Yu. Evshchik, V.G. Kolmakov, D.A. Kislov, Yu.A. Dobrovolsky Quantum-chemical simulation of litiation of a silicon oxide cluster adsorbed on graphene oxide *Institute for Problems of Chemical Physics RAS, Chernogolovka, Russia*

12^{00}-12^{20} O-45 *Sophia S. Borisevich*, E.M. Khamitov, O.V. Bushkova, Yu.A. Dobrovolsky Theoretical evaluation of the lithium-conducting nafion membrane plasticized by a mixture of

solvents ethylene carbonate-sulfolane *Ufa institute of chemistry UFRC RAS, Ufa, Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

12^{25}-12^{45} O-46 V.S. Pervov, *Natalia V. Kireeva*, A.Yu. Tsivadze Modeling of electrochemical characteristics of li-rich layered oxides: assessing impact of lattice constant and surface chemistry *Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow, Russia*

12^{50}-13^{05} O-47 *Yelizaveta A. Morkhova*, M.S. Koroleva, A.A. Kabanov, A.V. Egorova, V.A. Blatov Superionic conductivity in pure and Li/Cu-doped $MgNb_2O_6$: theoretical analysis and experimental testing *Samara National Research University, Samara State Technical University, Samara, Russia*

13^{05}-13^{20} O-48 *Ilya Sidorov* Synthesis and physico-chemical investigation of sodium-iron gexacianoferrate *Belarusian State Technological University, Minsk, Belarus*

13^{20}-14^{30} DINNER

Section Chairman Vasiliev A.A/ Zyubina T.S.

14^{30}-14^{50} O-49 *Guzaliya R. Baymuratova*, K.G. Khatmullina, I.K. Yakushenko, G.Z. Tulibaeva, O.V. Yarmolenko gelled tetraglyme-based electrolyte for organic anode materials *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

14^{55}-15^{15} O-50 *Viktor A. Markov*, A.A. Alexandrova, A.Z. Smedlyaeva, M.Y. Maximov The influence of tellurium on the properties of a solid LAGP electrolyte *Peter the Great St.Petersburg Polytechnic University, Russia*

15^{20}-15^{35} O-51 *Akhmed S. Datsiev*, M.M. Gafurov, M.A. Akhmedov, A.M. Amirov, K.Sh. Rabadanov, N.S. Shabanov, S.I. Suleimanov, Z.Yu. Kubutaev, M.B. Ataev The phase transitions and ionic conductivity in the polyvinyl alcohol– lithium perchlorate system *Analytical Center for Collective Use of the DFRC RAS, Makhachkala, Russia*

15^{35}-15^{50} O-52 *Akhmed M. Amirov*, M.M. Gafurov, M.A. Akhmedov, K.Sh. Rabadanov Study of the effect of Li_2SO_4 on the properties of glass K_2SO_4–Na_2SO_4–$ZnSO_4$ *Dagestan Federal Research Center RAS, Makhachkala, Russia*

15^{50}-16^{05} O-53 *Natalia V. Kartashova*, A.A. Pustovalova, D.A. Roschupkina, D.V. Konev, A.E. Antipov, M.A. Vorotyntsev Manufacturing and assessing the lifetime RuO_2/TiO_2/Ti electrode for hydrogen-bromate battery *Mendeleev University of Chemical Technology of Russia, Lomonosov Moscow State University, Moscow, Russia*

16^{05}-16^{15} COFFEE BREAK

16^{15}-16^{35} O-54 *Andrey A. Belmesov*, D.V. Koryakin, E.V. Gerasimova, A.V. Levchenko Anode electrocatalysts on oxide supports for hydrogen-air and alcohol fuel cells *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

16^{35}-16^{55} O-55 *Alexander E. Ukshe*, E.A. Astafev Investigation of the relaxation of the intercalated lithium layer as a result of the discharge of primary lithium-manganese elements by the method of analysis of magnetoresistance *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

16^{55}-17^{10} O-56 *Dmitry Kuznetsov* Influence of heat treatment conditions on magnetic properties of FeCoNi/C nanocomposites *NUST MISIS, Moscow, Russia*

V Scientific School of Young Scientists «Hydrogen and electrochemical energy»

17^{15} *Sophia Borisevich* Molecular modeling of electrochemical systems: from molecular dynamics to quantum chemistry *Ufa institute of chemistry UFRC RAS, Ufa, Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

18^{15} POSTER SESSION Reports P.2.1-P.2.22, P.3.1-P.3.16

Round table Discussion of poster presentations, 3-5 min. reports

July 02, 2022

SECTION 4. THE PRACTICAL USE OF SOLID-STATE ELECTROCHEMICAL DEVICES: FUEL CELLS, LI-ION BATTERIES, IONISTORS, SENSORS, ETC.

Section Chairman Pukha V.E. / Gurevich S.A.

9^{00}-9^{30} I-18 *Sang-Cheol Nam*, Oh-Min Kwon and Ji-Woong Moon Development of air stable Argyrodite solid electrolyte *Research Institute of Industrial Science and Technology (RIST) POSCO Global R&D Center, Incheon, South Korea*

9^{35}-10^{05} I-19 *Vladimir Linkov*, Mykhaylo Lototskyy, Michael Browne, Gerhard Human, S Pasupathi Development of hydrogen fuel cell powered light duty vehicles at HySA Systems Competence Centre *HySA Systems Competence Centre, South African Institute for Advanced Materials Chemistry (SAIAMC), University of the Western Cape, Bellville, Cape Town, South Africa*

10^{10}-10^{40} I-20 *Sergey A. Gurevich* Sub-nano-carbon: structure, properties and applications in Li-ion technology *Ioffe Institute, Saint-Petersburg, Russia*

10^{45}-11^{05} O-57 *Yury Volfkovich* Self-discharge of supercapacitors *Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow, Russia*

11^{10}-11^{20} COFFEE BREAK

11^{20}-11^{50} I-21 *Alexander M. Skundin* Nanomaterials based n germanium as applied to lithium-ion and sodium-ion batteries *Frumkin Institute of Physical Chemistry and Electrochemistry, Russia*

11^{55}-12^{15} O-58 *Maxim Yu. Maximov* Atomic layer deposition of metals oxides for thin-film batteries *Peter the Great St. Petersburg Polytechnic University, St. Petersburg, Russia*

12^{20}-12^{35} O-59 *Ilya S. Ezhov*, D.V. Nazarov, Yu.M. Koshtyal, A.M. Rumyantsev, A.A. Popovich, M.Yu. Maximov Atomic layer deposition of Li-Ta-Al-O coatings for all solid-state batteries *Peter the Great St. Petersburg Polytechnic University, Saint-Petersburg, Russia*

12^{35}-13^{05} I-22 *Olga V. Bushkova* Lithium-conducting electrolytes based on membranes of the Nafion family and prospects for their use in lithium electrochemical systems *Institute of Solid-State Chemistry, UB RAS, Yekaterinburg, Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

13^{10}-14^{30} DINNER

Section Chairman Bushkova O.V. / Levchenko A.V.

14^{30}-14^{45} O-60 *Denis A. Olkhovsky*, Yu.M. Koshtyal, A.M. Roumyantsev, M.Yu. Maximov Coatings for cathode materials of lithium-ion batteries produced by the method of molecular layering: applications and advantages *St. Petersburg Polytechnic University of Peter the Great, Saint-Petersburg, Russia*

14^{45}-15^{05} O-61 *Anna A. Slesarenko*, G.R. Baymuratova, I.K. Yakuschenko, G.Z. Tulibaeva, P.A. Troshin, A.F. Shestakov, O.V. Yarmolenko New organic electrode materials for lithium batteries produced by condensation of cyclohexanehexone with *p*-phenylenediamine *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

15^{10}-15^{30} O-62 *Alexey Vasiliev*, J.V. Kul, A.S. Nikitin Thick film technology of ceramic MEMS for high temperature gas sensors *NRC Kurchatov institute, Moscow, LLC C-Component, Moscow, Russia*

15^{35}-15^{55} O-63 *Olga Yu. Sinelshchikova*, N.V. Bezprozvannykh, N.A. Morozov, D.S. Ershov, S.K. Kuchaeva Ceramics based on $Cs_{1.65}Al_{1.17}Ti_{6.71}O_{16}$ hollandite as a promising material for hydrogen sensors *Grebenshchikov Institute of Silicate Chemistry RAS, St. Petersburg, Russia*

16^{00}-16^{15} O-64 *Aleksey V. Alekseyev*, D.G. Gromov, R.M. Ryazanov, A.A. Dudin Electrophoretic deposition as a tool for the formation of composite electrode materials for electrochemical energy storage *National Research University of Electronic Technology, Moscow, Russia*

16^{15}-16^{25} COFFEE BREAK

16^{25}-16^{45} O-65 *Viktor A. Markov*, T.V. Farziev, A.B. Tolstoguzov Ion emission from the surface of a solid electrolyte of the GeS_2-Sb_2S_3-AgI system *Peter the Great St.Petersburg Polytechnic University, Russia*

V Scientific School of Young Scientists «Hydrogen and electrochemical energy»

17^{00} *Alexander Skundin* What will happen after lithium-ion batteries? *Frumkin Institute of Physical Chemistry and Electrochemistry, Russia*

18^{00} Poster session P.4.1-P.4.32

Round table Discussion of poster presentations, 3-5 min. reports

July 03, 2022

SECTION 4. THE PRACTICAL USE OF SOLID-STATE ELECTROCHEMICAL DEVICES: FUEL CELLS, LI-ION BATTERIES, IONISTORS, SENSORS, ETC.

Section Chairman Levchenko A.V. / Ukshe A.E.

9^{00}-9^{30} I-23 *Igor Lubomirsky* Non-classical electrostriction in ionic conductors: microscopic origin and prospects of practical applications *Department of Molecular Chemistry and Materials Science, Weizmann Institute of Science, Rehovot, Israel*

9^{35}-9^{55} O-66 *Yury A. Kirillov*, B.V. Akhremenkov Hydrogen logistics in preparation for a trans-carbon tax *NFC Logistics*

10^{00}-10^{30} I-24 *Boris P. Tarasov* Methods of hydrogen storage and transportation and hydrogen safety issues *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

10^{35}-10^{55} O-67 *Pavel V. Fursikov*, O.P. Charkin, V.N. Fokin, E.E. Fokina, A.A. Arbuzov, S.A. Mozhzhuhin, B.P. Tarasov experimental and theoretical studies of hydrogen sorption behaviours of magnesium based nanostructured composites and nanosized clasters *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

11^{00}-11^{20} O-68 *Alexey A. Volodin*, I.O. Yakushin, B.P. Tarasov Cathode materials for metal hydride power sources *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

11^{20}-11^{30} COFFEE BREAK

11^{30}-11^{50} O-69 *Sergey Somov* Methane pyrolysis at electrochemical reactor with solid proton-conducting electrolyte *InEnergy LLC, Moscow, Russia*

11^{55}-12^{15} O-70 *Alexander Zyubin*, T.S. Zyubina, O.V. Kravchenko, M.V. Solov'ev, V.P. Vasiliev, A.A. Zaitsev, A.V. Shihovtsev, Yu.A. Dobrovol'sky Extraction of molecular hydrogen from magnesium triammoniate borohydride: quantum chemical modeling *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

12^{20}-12^{40} O-71 *Daria V. Chernysheva*, V.A. Klushin, E.A. Sidash, M.S. Konstantinov, N.V. Smirnova Carbon electrode materials from wastes of plant biomass chemical processing into furan derivatives *Platov South-Russian State Polytechnic University (NPI), Novocherkassk, Russia*

12^{45}-13^{00} O-72 *Maria V. Dmitrieva*, V.A. Pavlov, P.S. Afanas'yeva, E.V. Zolotukhina Development of a technology for obtaining a new bioelectrocatalyst based on *Saccharomyces Cerevisiae*: effect of the nature of a buffer solution at the stage of resuspending on the dehydrogenase activity of "crude" extracts *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

13^{00}-13^{20} O-73 *Vladimir E. Pukha*, Kabachkov E.N., Khodos I.I. Chemical bonds and new structures arising when surface irradiation with accelerated C60 ions *Institute of Problems of Chemical Physics, Chernogolovka, Russia*

13^{30} Closing of the conference and the School

Nadezhda Bukun, Alexander Ukshe

POSTER REPORTS

SECTION 1. IONIC CONDUCTORS: SYNTHESIS, STRUCTURE, PROPERTIES AND TRANSFER MECHANISMS

P-1-1. *Guzel R. Akmanova*, N.N. Bikkulova, R.A. Yakshibaev, E.V. Tikhonov, A.R. Kurbangulov, D.I. Safargaliev Phase diagram simulation Cu-Se *Bashkir State University, Ufa, Russia*

P-1-2. *Roman D. Andreev*, I.A. Anokhina, I.E. Animitsa Transport properties of the materials based on hexagonal perovskite-like complex oxide $Ba_5In_2Al_2ZrO_{13}$ *Ural Federal University, Institute of High-Temperature Electrochemistry UB RAS, Yekaterinburg, Russia*

P-1-3. *Magomed A. Akhmedov*, Khidirov Sh.Sh., Kapparova A.A. Voltammetric study of the polyvinyl alcohol–zinc methanesulfonate system *Analytical Center for Collective Use of the DFRC RAS, Makhachkala, Russia*

P-1-4. *Irina N. Bagryantseva*, V.G. Ponomareva, D.O. Dormidonova, Yu.E. Kungurtsev Polymer composite electrolytes based on CsH_2PO_4 and fluoropolymers *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-1-5. *Irina N. Bagryantseva*, V.G. Ponomareva, N.F. Uvarov Tetraethylammonium hydrosulphate: proton conductivity, thermodynamic, structural properties and its-based composites *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-1-6. *Irina N. Bagryantseva*, V.G. Ponomareva, N.F. Uvarov Proton conductivity and thermodynamic properties of tetrabutylammonium hydrosulphate *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-1-7. *Egor D. Baldin*, T.A. Sorokin, N.V. Gorshkov, E.I. Orlova, E.P. Kharitonova, N.V. Lyskov, V.G. Goffman, V.I. Voronkova Fluorite-like rare earth oxyfluorides $NaLn_4Mo_3O_{15}F$ (Ln = La, Pr, Nd): synthesis and physical properties *Lomonosov Moscow State University, Moscow, Russia*

P-1-8. *Alexander A. Baranov*, A.A. Belmesov, L.S. Leonova, L.V. Shmygleva, D.I. Domashnev, Y.A. Dobrovolsky, A.V. Levchenko Effect of synthesis conditions on the morphology and properties of cesium salts of phosphorotungstic acid *Institute of Problems of Chemical Physics RAS, Chernogolovka, Sakhalin State University, Yuzhno-Sakhalinsk, Russia*

P-1-9. *Valeria A. Beliatova*, A.F. Guseva, N.N. Pestereva Oxygen-ion composites MWO_4-SiO_2 (M – Sr, Ba) *Institute of Natural Sciences and Mathematics, Ural Federal University, Yekaterinburg, Russia*

P-1-10. *Nuria N. Bikkulova*, P.E. Panfilov, G.R. Akmanova, R.A. Yakshibaev, A.R. Kurbangulov, D.I. Safargaliev Mechanical properties of the superion monocrystal $Cu_{1.8}Se$ *Sterlitamak branch of Bashkir State University, Sterlitamak, Russian Federation*

P-1-11. *Anastasia Bocharova*, I. Stenina Influence of the synthesis method on the ionic conductivity of $Li_{1+y}Ti_{2-x-y}Zr_xAl_y(PO_4)_3$ solid electrolyte *Kurnakov Institute of General and Inorganic Chemistry, RAS, Moscow, Russia*

P-1-12. *Anna A. Boyarshinova*, V.A. Gardt, A.F. Guseva, N.N. Pestereva Electric transport properties of composites MWO_4-Al_2O_3 (M – Ca, Sr) *Institute of Natural Sciences and Mathematics, Ural Federal University, Yekaterinburg, Russia*

P-1-13. *Elena G. Bulycheva*, Belomoina N.M., Nikiforova G.G., Vasil'ev V.G., Buzin M.I. Ionomers based on polynaphtoylenebenzimidazoles. Synthesis and properties *Nesmeyanov Institute of Organoelement Compound, RAS, Moscow, Russia*

P-1-14. *Violetta V. Gil*, *M.V. Porozhnyy, M.S. Oshchepkov, I.A. Moroz* Applying fluorescent antiscalants for visualization of electroconvective flows in systems with ion-exchange materials *Kuban State University, Krasnodar, Russia*

P-1-15. *Violetta V. Gil*, V.D. Titorova, Sharafan M.V. specific adsorption of calcium ions on the surface of heterogeneous sulfocationite membranes *Kuban State University, Krasnodar, Russia*

P-1-16. I.V. Alyabysheva, *Svetlana A. Kanakina*, E.S. Matveev, N.A. Kochetova Synthesis, thermal properties and total electrical conductivity of B-substituted barium indate *Ural Federal University, Yekaterinburg, Russia*

P-1-17. *Ivan V. Kovalev*, R. D. Guskov, V. P. Sivcev, M. P. Popov, N.V. Bulina, A. P. Nemudry Effect of niobium doping on the thermodynamic properties of the cathode composition of (LaSr) ferrite *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-1-18. *Olesya V. Kostenko*, I.I. Ponomarev, Yu.A. Volkova, A.D. Modestov, V.N. Andreev, Iv.I. Ponomarev, V.V. Sinitsyn Proton-exchange composite membrane based on sulfated polynaphtoyleneimide and nanofiber polybenzimedazole polymers *National Research University Higher School of Economics, Faculty of Physics, Inenergy LLC, Moscow, Russia*

P-1-19. *Alexey A. Krylov*, Yu.V. Emelyanova, M.V. Morozova, S.A. Petrova, E.S. Buyanova Functional characteristics of BIFEVOX-based complex oxides *Ural federal university, Ekaterinburg, Russia*

P-1-20. *Galina B. Kunshina*, O.O. Shichalin, A.A. Belov, I.V. Bocharova Properties of lithium-conducting $Li_{1.3}Al_{0.3}Ti_{1.7}(PO_4)_3$ ceramics obtained by spark plasma sintering *Tananaev Institute of Chemistry - Subdivision of the Federal Research Centre «Kola Science Centre of the Russian Academy of Sciences», Apatity, Russia*

P-1-21. *Natalia A. Kutenko*, N.V. Loza Influence of MF-4SK layer on electrotranspot properties of MK-40 membrane *Kuban State University, Krasnodar, Russia*

P-1-22. M.A. Brovkina, *Natalia A. Kutenko* Electrochemical behavior of heterogeneous cation-exchange membranes modified with polyaniline *Kuban State University, Krasnodar, Russia*

P-1-23. *Maria A. Lebedeva*, D.A. Dyuskina, M.V. Kalinina, O.A. Shilova Comparative investigation of physico-chemical properties of nanopowders and ceramics in CeO_2–Sm_2O_3, CeO_2–Nd_2O_3 systems as electrolyte materials of medium-temperature fuel cells *St. Petersburg Polytechnic University of Peter the Great, Saint-Petersburg, Russia*

P-1-24. *Larisa P. Lyashenko*, A.V. Levchenko, R.D. Svetogorov, Ya.V. Zubavichus electrical condactivity nanostructured fluorite-like $Sc_4Ti_3O_{12}$ *Institute of Problems Chemical Phisics RAS, Chernogolovka, Russia*

P-1-25. *Yulia G. Mateyshina*, D.V. Alekseev, Uvarov N.F. Transport properties of solid electrolytes based on substituted ammonium salts and nanodiamonds *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk State University, Novosibirsk State Technical University, Novosibirsk, Russia*

P-1-26. *Natalia A. Melnikova*, Q. Ji, O.V. Glumov, I.V. Murin Mechanochemical synthesis a of solid electrolytes in PbF_2-MF_2 (M=Ca, Sr, Ba) systems *Institute of Chemistry of Saint Petersburg State University, Saint-Petersburg, Russia*

P-1-27. *Kseniya V. Mishchenko*, O.A. Podgornova, D.O. Semykina, A.A. Shindrov, N.V. Kosova The influence of the d^0 nature on the stability of the anionic redox couple in oxyfluorides with disordered rock salt structure *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-1-28. *Elena N. Nosova*, N.A. Romanyuk, S.S. Melnikov, V.I. Zabolotskiy Investigation of electromembrane systems with delayed chemical reactions *Kuban State University, Krasnodar, Russia*

P-1-29. A.V. Pisareva, G.V. Shilov, *Rostislav V. Pisarev*, A.I. Karelin, Yu.A. Dobrovolsky Salts of m-cresolsulfonic acid: synthesis and study of the structure *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-1-30. *Anna V. Pisareva*, R.V. Pisarev, N.M. Bekomoina, E.G. Bulycheva, Yu.A. Dobrovolsky Sulfonated polyphenylquinoxalines: a brief overview of the state of the field and our results *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-1-31. *Olga A. Podgornova*, K.V. Mishchenko, D.O. Semykina, A.A. Shindrov, M.A. Kirsanova, N.V. Kosova Optimization of the local structure and electrochemical properties of cathode materials based on $Li_{1.2+y}Nb_{3y}Ti_{0.4-4y}Mn_{0.4}O_2$ by varying the Nb/Ti ratio *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-1-32. *Daria O. Semykina*, A.A. Shindrov, O.A. Podgorova, K.V. Mishchenko, N.V. Kosova $Na_{1-x}Li_xV_2(PO_4)_3$: synthesis and study of migration paths of alkali ions *Institute of Solid-State Chemistry Physics RAS, Novosibirsk, Russia*

P-1-33. *Nikita A. Slesarenko*, A.V. Chernyak, A.A. Slesarenko, G.R. Baymuratova, G.Z. Tulibaeva, O.V. Yarmolenko Effect of a solvate environment on ionic mobility in solutions of electrolytes based on $LiBF_4$ and $LiN(CF_3SO_2)_2$ *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-1-34. *Ivan A. Stebnitsky*, Yu.G. Mateyshina, N.F. Uvarov Transport properties of solid electrolytes (1-x) $(n\text{-}C_4H_9)_4BF_4$ – x $(n\text{-}C_4H_9)_3(CH_3)NBF_4$ *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk National Research State University, Novosibirsk, Russia*

P-1-35. *Anna Yu. Stroeva*, A.V. Ivanov, Z.N. Ichetovkin, V.A. Vorotnikov, O.S. Bervitskaja, A.V. Kuzmin Formation of a specified microstructure of materials based on lanthanum zirconate when synthesis techniques varying *Vyatka State University, Kirov, Russia*

P-1-36. *Ivan S. Timakov*, V.V. Grebenev, V.A. Komornikov Composite materials of electrolytes based on superprotons *Federal Scientific Research Centre "Crystallography and Photonics" RAS, Shubnikov Institute of Crystallography RAS, Moscow, Russia*

P-1-37. *Ivan S. Timakov*, V.V. Grebenev, V.A. Komornikov Effect of cationic substitution on realization of superprotonic phase transitions in a continuous series of solid solutions $(Rb_{1-x}K_x)_3H(SO_4)_2$ *Federal Scientific Research Centre "Crystallography and Photonics" RAS, Shubnikov Institute of Crystallography RAS, Moscow, Russia*

P-1-38. *Artem S. Ulihin*, N.F. Uvarov, A.V. Ukhina, K.S. Rabadanov, M.M. Gafurov effect of the lithium salt doping on the structural and transport properties of tetrabutylammonium

tetrafluoroborate *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-1-39. *Artem S. Ulihin*, N.F. Uvarov, A.V. Ukhina, K.S. Rabadanov, M.M. Gafurov Influence of the lithium salt addition on ionic conductivity and structural properties of $(C_4H_9)_4NBF_4$-Al_2O_3 composites *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-1-40. *Natalia V. Urusova*, T.V. Yaroslavtseva, O.G. Reznitskikh, O.V. Bushkova Crystal structure of solid electolite $CsAg_4Br_{3-x}I_{2+x}$ ($0 \leq X \leq 1$) *Institute of Solid State Chemistry, Ekaterinburg, Russia*

P-1-41. *Inga M. Kharlamova*, A.E. Usenka, L.V. Makhnach, V.V. Pankov, E.V. Korobko Formation of 2P/RS Ruddlesden-Popper phase in Sr–(Al, Ga)–Ni–O system *Luikov Heat and Mass Transfer Institute National Academy of Sciences of Belarus, Minsk, Belarus*

P-1-42. *Alexander A. Shindrov*, D.O. Semykina, K.V. Mishchenko, O.A. Podgornova, N.V. Kosova Solid electrolytes $(Li,Na)_{1+x}Al_xTi_{2-x}(PO_4)_3$ with a Nasicon-type structure *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-1-43. *Anna V. Shlyakhtina*, N.V. Lyskov, N.V. Gorshkov, I.V. Kolbanev, G.A. Vorobieva, A.N. Shchegolikhin, V.I.Voronkova Properties of $La_2W_{1+x}O_{6+3x}$ (x~ 0.11 - 0.22) fluorite−like hexagonal tungstates *Semenov Federal Research Center for Chemical Physics RAS, Moscow, Russia*

P-1-44. *Anna V. Shlyakhtina*, N.V.Lyskov, I.V. Kolbanev, G.A. Vorobieva, A.V. Kasyanova, D.A. Medvedev Proton and oxygen-ion conductivityof "stuffed" and pure RE hafnates pyrochlores *Semenov Federal Research Center for Chemical Physics RAS, Kurnakov Institute of General and Inorganic Chemistry RAS, Moscow, Russia*

SECTION 2. ELECTRODE PROCESSES AND ELECTROCATALYSIS AT INTERPHASE BOUNDARIES

P-2-1. *Yury M. Baikov*, V.M. Egorov Germanium electrode in an electrochemically active heterostructure with hydroxide proton conductor at room temperature *Independent Researcher, St.-Petersburg, Russia*

P-2-2. *Igor N. Buzmakov*, N.V. Lyskov, M.Z. Galin, V.V. Sinitsyn, E.A. Levchenko, A.V. Sivak Reduction of the polarization resistance of microtubular SOFC by Pr_6O_{11} infiltration of the LSCF cathode *Institute of Problems of Chemical Physics RAS, Chernogolovka, National Research University "Higher School of Economics", Moscow, Russia*

P-2-3. *Alexey L. Dmitriev* Spark discharge mechanism on ceramic insulator surface *Russian State Hydrometeorological University, Saint Petersburg, Russia*

P-2-4. ***Maria V. Dmitrieva*****, V.A. Pavlov, P.S. Afanas'yeva, E.V. Zolotukhina** Development of a technology for obtaining a new bioelectrocatalyst based on *Saccharomyces Cerevisiae*: effect of the nature of a buffer solution at the stage of resuspending on the dehydrogenase activity of "crude" extracts *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-2-5. ***Sofia A. Kleinikova*****, E.V. Zolotukhina, E.V. Gerasimova, M.G. Levchenko** Some features of alcohols and aldehydes electrooxidation *Institute of Problems of Chemical Physics RAS, Chernogolovka; Sakhalin State University, Yuzhno-Sakhalinsk, Russia*

P-2-6. ***Artjom O. Konakov*****, M.V. Dmitrieva, E.V. Zolotukhina** Synthesis and catalytic properties of hybrid material CuO/Cu_2O/CuI-PPy in glutaraldehyde oxidation *Institute of Problems of Chemical Physics RAS, Chernogolovka; Lomonosov Moscow State University, Moscow, Russia*

P-2-7. ***Valeriy K. Kochergin*****, R.A. Manzhos, A.G. Krivenko** One-step plasma electrochemical synthesis of nanocomposites of few-layer graphene structures with manganese oxides *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-2-8. ***Valeriy K. Kochergin*****, R.A. Manzhos, A.G. Krivenko, A.V. Karabulin, V.I. Matyushenko** Oxygen reduction reaction on Pt-nanowires synthesized in a superfluid helium *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-2-9. ***Vladimir A. Kurmaz*****, D.V. Konev, S.V. Kurmaz, N.S. Emel'yanova** Electrochemistry of isonicotinamide complexes of Pt(IV) in solutions: comparative study of their free forms and encapsulated into amphiphilic copolymers *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-2-10. ***Roman A. Manzhos*****, N.S. Komarova, A.S. Kotkin, V.K. Kochergin, A.G. Krivenko** Plasma electrochemical synthesis of graphene-phosphorene composites and their catalytic activity towards hydrogen evolution reaction *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-2-11. ***Leyla F. Mashadiyeva*****, D.M. Babanly, Yu.A. Yusibov, M.B. Babanly** thermodynamic investigation of copper and arsenic selenides by the EMF method with the $Cu_4RbCl_3I_2$ solid electrolyte *Institute of Catalysis and Inorganic Chemistry of ANAS, Baku, Azerbaijan*

P-2-12. ***Leyla F. Mashadiyeva*****, K.N. Babanly, U.R. Bayramova, G.M. Shukyurova, Yu.A. Yusibov** Solid-phase equilibrium in Ag-Ge(Si)-S systems and thermodynamic properties of intermediate phases *Institute of Catalysis and Inorganic Chemistry of ANAS, Baku, Azerbaijan*

P-2-13. ***Vladislav S. Menshikov*****, S.V. Belenov** Platinum electrocatalysts in the methanol oxidation reaction *Southern Federal University, Rostov-on-Don, Russia*

P-2-14. ***Denis A. Osinkin*****, E.P. Antonova, N.M. Porotnikova, N.M. Bogdanovich** Features of the electrochemical reaction of hydrogen oxidation on the composite $SrFeO_3$ – based anode for a

protonic ceramic fuel cell *Institute of High–Temperature Electrochemistry, Ural Federal University, Ekaterinburg, Russia*

P-2-15. *Kirill O. Paperzh*, V.S. Menshchikov, S.V. Belenov Synthesis, composition, structure, and electrochemical behavior of platinum-ruthenium catalysts *Southern Federal University, Rostov-on-Don, Russia*

P-2-16. *Elena Yu. Pisarevskaya*, A.L. Klyuev, O.N. Efimov, V.N. Andreev Isoniazid electrochemical planar sensor based on RGO-PPD-SIW composite *Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow, Russia*

P-2-17. *Natalia M. Porotnikova*, M.V. Ananyev, D.A. Osinkin, A.V. Khodimchuk, A.V. Fetisov, A.S. Farlenkov, E.Kh. Kurumchin, A.I. Popov Increase in the density of $Sr_2Fe_{1.5}Mo_{0.5}O_{6-\delta}$ membranes through an excess of iron oxide: the effect of iron oxide on transport and kinetic parameters *Institute of High-Temperature Electrochemistry UB RAS, Yekaterinburg, Russia*

P-2-18. *Andrey Starkov*, L.S. Leonova, L.V. Shmygleva Influence of platinum content in material of working electrode on properties of potentiometric CO sensors *Moscow State University, Moscow, Russia*

P-2-19. *Irina A. Stenina*, P.V. Minakova, T.L. Kulova, A.V. Desyatov Effect of the method of introducing carbon nanomaterials on electrochemical properties of $LiFePO_4$/C composites *Kurnakov Institute of General and Inorganic Chemistry RAS, Moscow, Russia*

P-2-20. *Maria A. Choba*, V.A. Safonov Specific features of the interface between a mechanically renewable graphite electrode and solutions based on propylene carbonate *Lomonosov Moscow State University, Moscow, Russia*

P-2-21. I. Chikina, *Valery Shikin* DLVO colloids near the interface between two media *Institute of solid state physis RAS, Chernogolovka, Russia*

P-2-22. *Tatyana V. Yaroslavtseva*, A.S. Istomina, O.G. Reznitskikh, L.V. Shmygleva, O.V. Bushkova Study of the degradation of a metallic lithium electrode in contact with a lithiated Nafion membrane *Institute of Solid-State Chemistry of the Ural Branch RAS, Ekaterinburg, Russia*

SECTION 3. EXPERIMENTAL AND THEORETICAL METHODS FOR STUDYING PROCESSES IN SOLID-STATE IONIC AND MIXED CONDUCTORS

P-3-1. *Bulat M. Akhmetgaliev*, R.A. Alina, M.Kh. Balapanov, R.Kh. Ishembetov, K.A. Kuterbekov, R.Kh. Kubenova, R.A. Yakshibaev Electron transport in cesium-doped copper sulfide *Bashkir State University, Ufa, Russia*

P-3-2. ***Rostislav D.Guskov*****, M.P. Popov, I.V. Kovalev, A.P. Nemudry** Study of kinetic parameters of $SrCo_{0.9}Ta_{0.1}O_{3-\delta}$ oxide with perovskite structure using oxygen partial pressure relaxation technique *Institute of Solid State Chemistry and Mechanochemistry SB RAS, Novosibirsk, Russia*

P-3-3. ***Yuriy O. Dobrovolskiy*****, G.N. Mazo, N.V. Lyskov** Influence of Pr_6O_{11} additive on the electrochemical characteristics of sofc with a cathode based on Pr_2CuO_4 *Department of Chemistry, Moscow State University, Moscow, Russia*

P-3-4. ***Elizaveta Yu. Evshchik*****, S.S. Borisevich, V.G. Kolmakov, O.V. Bushkova, Yu.A. Dobrovolsky** Electrochemical stability of electrolyte for lithium-ion batteries based on $LiBF_4$ in ethylene carbonate/dimethyl carbonate mixture *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-3-5. ***Anastasia V. Egorova*****, K.G. Belova, S.P. Pachina, I.E. Animitsa** Partial conductivities of the perovskites $La_2Me^{+3}ZnO_{5.5}$ (Me^{+3}=Al, Sc, In) *Institute of High Electrochemistry, UB RAS, Ural Federal University, Yekaterinburg, Russia*

P-3-6. ***Anastasia V. Egorova*****, K.G. Belova, S.P. Pachina, I.E. Animitsa** Transport properties of calcium-doped $La_2ZnNdO_{5.5}$ *Institute of High Electrochemistry, UB RAS, Ural Federal University, Yekaterinburg, Russia*

P-3-7. ***Alexander I. Karelin*****, E.A. Sanginov** Vibrational spectra and structure of the electrolytic dissociation products of anhydrous perchloric acid in dimethyl sulfoxide *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-3-8. ***Natalia V. Kartashova*****, D.V. Konev, P.A. Loktionov, D.A. Roschupkina, A.E. Antipov, M.A. Vorotyntsev** Operando spectroscopic study of processes at positive electrode of hydrogen-bromate battery *Mendeleev University of Chemical Technology of Russia, Lomonosov Moscow State University, Moscow, Russia*

P-3-9. ***Dmitry A. Malyshkin*****, V. Sereda, I. Ivanov, D. Tsvetkov, A.Yu. Zuev** Defect structure and thermodynamics of $SrTi_{1-x}Fe_xO_{3-\delta}$ *Ural Federal University, Yekaterinburg, Russia*

P-3-10. ***Victor V. Nikonenko*****, A.E. Kozmai, N.D. Pismenskaya** The effect of an anion-exchange membrane modification with a perfluorosulfonated ionomer on its selectivity *Membrane Institute, Kuban State University, Krasnodar, Russia*

P-3-11. ***Peter M. Osherov*****, E.Yu. Evshchik, S.S. Borisevich, Yu.A. Dobrovolsky** Theoretical evaluation of lithium-conducting Nafion membrane plasticized by 1M LiDFOB in propylene carbonate *Moscow Institute of Physics and Technology, Moscow, Russia*

P-3-12. ***Mikhail V. Porozhnyy*****, A.A. Mareev, A.E. Kozmai, V.V. Gil** Neutralization dialysis of the mixed solution of sodium chloride and phenylalanine. Model and experiment *Kuban State University, Krasnodar, Russia*

P-3-13. ***Olesya A. Rybalkina*, K.A.Tsygurina, E.L.Pasechnaya, N.D. Pismenskaya** Adaptation of electrodialysis method for processing of winemaking liquid waste *Kuban state university, Krasnodar, Russia*

P-3-14. *Olesya A. Rybalkina*, N.D. Pismenskaya, I.A. Moroz Development of electroconvection during electrodialysis desalination of sodium chloride and dihydrophosphate solutions under direct and pulsed electric field *Kuban State University, Krasnodar, Russia*

P-3-15. *Sagim I. Suleymanov*, L.A. Kazieva, A.M. Amirov Concept of high-voltage pulsed discharge in ionic melts *Analytical Center for Collective Use of the Dagestan Federal Research Center of the Russian Academy of Sciences, Dagestan State University, Makhachkala, Russia*

P-3-16. Petrov A. V., *Ji Qianlong*, Murin I. V. Computer simulation of the mobility of fluorine ions in $Pb_{0.8}Sr_{0.2}F_2$ nanoparticles *St. Petersburg State University, St. Petersburg, Russia*

SECTION 4. THE PRACTICAL USE OF SOLID-STATE ELECTROCHEMICAL DEVICES: FUEL CELLS, LI-ION BATTERIES, IONISTORS, SENSORS, ETC.

P-4-1. T.A. Savinykh, Z.M. Dzhabieva, *Lidia V. Avdeeva*, T.S. Dzhabiev Formation of H_2 and O_2 during decomposition of water on titanium oxide semiconductors and cadmium sulfide *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-4-2. *Lidia V. Avdeeva*, Z.M. Dzhabieva, T.A. Savinykh, T.S. Dzhabiev Redox reactions during photolysis of water on suspensions of TiO_2 and $SrTiO_3$ semiconductors *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-4-3. *Danil V. Alekseenko*, S.V. Belenov, K.O. Paperj, I.A. Gerasimova Production of commercial electrocatalysts for low temperature fuel cells *Southern Federal University, PROMETHEUS R&D Ltd., Rostov-on-Don, Russia*

P-4-4. *Andrey A. Belmesov*, V.A. Kopotkov, E.V. Gerasimova, V.D. Kislitsyn, A.V. Levchenko Production of protective niobium coatings for bipolar plates of electrolysers by the method of magnetron sputtering *Institute of Problems of Chemical Physics RAS, Chernogolovka, Sakhalin State University, Yuzhno-Sakhalinsk, Russia*

P-4-5. *Dmitrii Yu. Butylskii*, N.D. Pismenskaya, V.V. Nikonenko Selective extraction of lithium from natural brines by the electro-baromembrane method *Membrane Institute, Kuban State University, Krasnodar, Russia*

P-4-6. *Dmitrii Yu. Butylskii*, V.A. Troizkij, A.S. Skudarnova Scaling reduction during electrodialysis concentration of imitates of mine waters *Membrane Institute, Kuban State University, Krasnodar, Russia*

P-4-7. ***Vladimir P. Vasiliev*****, O.V. Kravchenko, A.S. Zyubin, T.S. Zyubina, A.A. Zaytsev, A.V. Shikhovtsev, M.V. Soloviev, Yu.A. Dobrovolsky** Synthesis, properties and thermal decomposition particularities of $Mg(BH_4)_2(NH_3)_n$ (n = 1, 2, 3) *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-4-8. ***Mikhail K. Vlasov*****, M. Z. Galin, V.E. Pukha, N.V. Lyskov** Formation of porous model coatings based on zirconium dioxide by the aerosol deposition method *Lomonosov Moscow State University, Moscow, Russia*

P-4-9. ***Yury Volfkovich*****, M.M. Kardash, A.A. Mikhalin** The use of cation-anion-exchange mosaic membranes for obtaining pure water by capacitive deionization of water - a variant of supercapacitor *Frumkin Institute of Physical Chemistry and Electrochemistry, Moscow, Russia*

P-4-10. ***Polina E. Dergacheva*****, S.V. Fedorov, V.V. Belousov** Bismuth rutenate based composite electrode for electrochemical oxygen generator with partially molten Bi_2O_3-B_2O_3 electrolyte *Baikov Institute of Metallurgy and Materials Science (IMET RAS), Moscow, Russia*

P-4-11. ***Timur V. Kildiyarov*****, A.A. Glukhov, V.E. Pukha, G.V. Nechaev, N.V. Lyskov** Formation of coatings based on ScYSZ by aerosol deposition *Lomonosov Moscow state university, Moscow, Russia*

P-4-12. ***Dmitriy A. Kislov*****, A.V. Korchun, E.U. Evshchik, B.V. Ahremenkov, S.A. Baskakov, Y.A. Dobrovolsky** Investigation of graphene oxide as the active material of a negative electrode for a lithium-ion battery *Institute of Problems of Chemical Physics RAS, Chernogolovka; Moscow Institute of Physics and Technology (National Research University), Dolgoprudny, Russia*

P-4-13. ***Andrey V. Korchun*****, Kislov D.A., Evshchik E.Yu., Dobrovolsky Yu.A.** Power characteristics of negative electrode material for lithium-ion batteries based on silicon – reduced graphene oxide composite *Institute for Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-4-14. ***Grigory V. Nechaev*****, N.V. Lyskov, V.I. Berestenko, V.D. Makhaev, V.E. Pukha** Synthesis of low-aggregated stabilised zirconia powders for the fabrication of solid electrolyte films by vacuum aerosol deposition *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-4-15. ***Alyona Ovsyannikova*****, L.S. Leonova, L.V. Shmygleva** Solid state potentiometric sensors on H_2 and CO based on disubstituted ammonium salt of phosphotungstic acid and calixarene *Moscow State University, Moscow, Russia*

P-4-16. ***Aleksandr S. Pankin*****, Gerasimova E.V., Levchenko A.V.** Simulation of the geometry of anode channels of an electrolyzer with a proton-exchange membrane *Institute of Problems of Chemical Physics RAS, Chernogolovka; MIPT, Dolgoprudny, Russia*

P-4-17. ***Elena M. Petrenko*****, V.A. Semenova, E.A. Kiseleva** Diagnostics of chemical current sources based on complexing various physical and chemical methods *Joint Institute for High Temperatures RAS, Moscow, Russia*

P-4-18. ***Roman D. Pichugov*****, A.A. Pustovalova, A.T. Glazkov, A.E. Antipov, D.V. Konev** Flow system for recovering the capacity of vanadium redox flow battery *Mendeleev University of Chemical Technology of Russia, Moscow, Russia*

P-4-19. ***Roman D. Pichugov*****, P.A. Loktionov, N.V. Kartashova, D.V. Chikin, M.A. Elkhimov, D.V. Konev** The influence of vanadium purity on the performance of vanadium redox flow battery *Mendeleev University of Chemical Technology of Russia, Moscow, Russia*

P-4-20. ***Lyudmila A. Puntusova*****, D.Yu. Kornilov** Innovative sorbent based on graphene oxide for deep drying of lithium-ion rechargeable battery electrolytes *"Grafenika" LLC, Moscow, Russia*

P-4-21. ***Pavel V. Pyrkov*****, E.V. Gerasimova, Y.A. Dobrovolsky** Investigation PEMFC performance depending on fed gases and external conditions by multiphysics simulation method *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-4-22. ***Daria A. Roschupkina*****, N.V. Kartashova, E.A. Ruban, A.A. Shaporenkov, D.V. Konev, V.V. Dushik, A.E. Antipov** Tungsten-deposited carbon paper for rechargeable hydrogen-bromate battery *Mendeleev University of Chemical Technology of Russia, Moscow, Russia*

P-4-23. ***Evgeny A. Ruban*****, L.Z. Abunaeva, M.A. Myachina, P.A. Loktionov, D.E. Verakso, A.A. Pustovalova, M.M. Petrov, D.V. Konev** The mixture of phospho-vanado-molybdate heteropolyacids as a cathode redox-mediator for hybrid hydrogen fuel cell *Institute of Problems of Chemical Physics RAS, Chernogolovka; Frumkin Institute of Physical Chemistry and Electrochemistry RAS, Moscow, Russia*

P-4-24. P.E. L'vov, M.Yu. Tikhonchev, ***Renat T. Sibatov*****,** Phase-field model of lithium-ion battery *Moscow Institute of Physics and Technology, Dolgoprudny, Russia*

P-4-25. ***Ekaterina Titskaya*****, Natalia Loza, Irina Falina, Sergey Timofeev, Ludmila Bobrova** Effect of thickness and inert modifier in perfluorinated membrane on their conductive and diffusion properties *Kuban State University, Krasnodar, Russia*

P-4-26. ***Ekaterina Titskaya*****, I. Falina, A. Alekseenko** Investigation of electrochemical characteristics of a hydrogen-air fuel cell with $PtCu_X$ catalysts with various composition and structure *Kuban State University, Krasnodar, Russia*

P-4-27. ***Alexander Tolstoguzov*****, W. Zuo, T. Abudouwufu, S.I. Gusev, D.-J. Fu** Solid-state emissionnanoionics: state-of-artand development prospects *Utkin Ryazan State Radio Engineering University, Ryazan, Russia; School of Physics and Technology, Wuhan University, Wuhan, China; Centre of Physics and Technological Research, Universidade Nova de Lisboa, Portugal*

P-4-28. **A.Y. Tryaszyn, O.A. Remizova, *Vladimir V. Tomaev*, S.V. Mjakin, E.V. Nikolaeva** Development of a portable impedance meter for the characterization of electrochemical sensors *Saint-Petersburg State Institute of Technology (Technical University), Saint-Petersburg Mining University, Saint-Petersburg, Russia*

P-4-29. ***Alisa S. Freiman*, E.V. Zolotukhina** Usage of methyl orange as a mediator for *Escherichia Coli* in biofuel cell *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-4-30. ***Maxim V. Tsvetkov*, D.N. Podlesniy, A.Yu. Zaichenko, E.A. Salgansky, Yu.Yu. Tsvetkova, I.V. Sedov, S.N. Kadubovsky, V.A. Lekh** Thermodynamic evaluation of hydrogen production regimes by partial oxidation of methane *Institute of Problems of Chemical Physics RAS, Chernogolovka, Sakhalin State University, Yuzhno-Sakhalinsk, Russia*

P-4-31. ***Alena V. Yudina*, G.R. Baymuratova, A.A. Nizamov, O.V. Yarmolenko, I.M. Davletbaeva** Polymer gel electrolytes for lithium current sources based on polyurethane ionomers *Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia*

P-4-32. ***Gleb B. Lashnev*, V.E. Pukha, A.A. Belmesov** Formation of coatings and surface sputtering upon irradiation of Ti and Si substrates with accelerated C60 ions *Lomonosov Moscow state university, Moscow, Russia*