

Table of Contents

Preface

Electrical, Optical and Mechanical Properties of Zirconia-Yttria-Chromic Oxide System with Fluorite Structure

M. Hartmanová, K. Putyera, D. Tonega, A.A. Urusovskaya, G.G. Knab, K. Kosová and T.V. Oreshnikova

1

Ion Transport in Glasses - The Effect of Ion Density and Network

C. Kaps and A. Häger

5

Ion Conductivity in Crystalline and Glass-Like Fluoride Materials

N.I. Sorokin, A.K. Ivanov-Shitz, P.P. Fedorov, E.A. Krivandina, L.K. Vistin' and B.P. Sobolev

9

Phase Relations, Microstructure and Physical Properties of Superionic Fluoride Composites

V. Trnovcová, C. Bárta, P.P. Fedorov and I. Zibrov

13

Physical Properties of YSZ Solid Solutions Doped with Tungsten

M. Hartmanová, I. Travenec, K. Putyera, D. Tonega, A.A. Urusovskaya, I.I. Korobkov and T.V. Oreshnikova

19

Technological Conditions as a Determining Factor for Properties of ThO₂ - YO_{1.5} Ceramics

H. Hanic, K. Kosová, M. Hartmanová and H. Ullmann

25

Structure and Electrical Conductivity of Partially-Stabilized ZrO₂ - MgO Ceramics

M. Hartmanová, F. Hanic, K. Kosová, W. Richter, H. Zitzmann and H. Ullmann

29

Relationship between the Texture of Precursor Powders, Microstructure and Transport Properties in La³⁺-Stabilized Beta-Alumina Ceramics

M. Zaharescu, C. Pârlog, V. Stancovschi, A. Brăileanu, D. Crisan, N. Dragan and T. Surdeanu

33

The Study of the "Ageing" Effect of some Solid Electrolytes Ceramic Masses

S. Tanasescu, M. Keul, V. Leahu and D.I. Marchidan

37

Atomic Structure, Phase Transitions and Ionic Conductivity of Li₃Cr₂(PO₄)₃ Single Crystals in the Range 293-650 K

E.A. Genkina, B.A. Maximov and S.E. Sigaryov

41

Non-Nernstian Response of Solid-State Cells with Protonic Electrolyte in Hydrogen-Air Environment

E.A. Ukshe and L. Leonova

45

Electrical and Ultrasonic Investigation of Phase Transitions and Relaxation Phenomena in Solid Ionic Conductors

A. Kežionis, A.F. Orliukas and V. Samulionis

49

Structural Phase Transitions in Na_{4.5}FeP₂O_{8.5}F_{0.5} and Na₄TiP₂O₉ Superionic Conductors

N.E. Klokočová, B.A. Maximov, R.A. Tamazyan and V.I. Simonov

53

Structural Properties of the Molten Fast Ion Conductors with Silver Cations by the Integral Equation's Methods

A.D. Trokhymchuk and O.A. Pizio

57

Chemical Intercalation of Divalent Cations

P.G. Bruce, F. Krok, J. Nowinski, V.C. Gibson and K. Tavakkoli

61

Electrochemical Properties of the Solid Solutions on the Bi₂O₃ Basis

E.N. Naumovich, P. Shuk and A.A. Vecher

65

Ionic Disorder and Transport Properties of the Solid Solutions Based on AMO₂-Type Compounds (A=Li...Cs)

E.I. Burmakin

69

Ionic Conductivity in Binary Conducting Solid Electrolytes - The Mixed Mobile Ion Effect

H. Kahnt and J.M. Réau

73

On Some Properties of Zr-Deficient Nasicon Compounds

F. Krok, W. Bogusz and W. Jakubowski

77

Characteristics of a PEO-Copolymer/LiI Solid Electrolyte

A. Reiche, P. Lobitz, H. Füllbier and J.C. Illner

81

Protonic Conductivity and Thermal Stability of the Amorphous Hydrogen Periodate

J.E. Garbaraczyk

87

On the Substitution of Zr⁴⁺ by Fe³⁺ Ions in Silica-Rich Nasicon

F. Krok, M. Morawiecki, W. Bogusz and W. Jakubowski

91

Composition Dependence of Electrical Properties of Sodium Borophosphate Glasses	95
M. Wasiucionek, W. Jakubowski, P. Kurek, W. Bogusz, F. Krok and M. Morawiecki	
Solid Oxygen-Conducting Electrolytes on the Base of Complex Fluoride-Oxides	99
L.S. Karenina, E.I. Burmakin and A.S. Vinogradova-Zabrova	
Investigation of Solid Electrolyte RbSn₂F₅	103
A. Pecheliunaite and A.F. Orliukas	
Ionic Conductivity of Li₆Ge₂O₇ and its Solid Solutions	107
E.I. Burmakin, G.S. Shehtman and V.N. Alikin	
Oxygen Permeation through Thin Dense EVD YSZ Membranes	111
G.J.E. Polhaar, Y.S. Lin, L.G.J. de Haart, K.J. de Vries and A.J. Burggraaf	
Microstructure - Property Relations of Thoria-Yttria Solid Electrolytes I. Reversibility of Cell Potential and Crystallinity	115
H.J. Lang, U. Ullmann, K. Teske, A. Blayer, H. Kahnt, F. Schirrmeister and A. Feltz	
Microstructure - Property Relations of Thoria-Yttria Solid Electrolytes II. Oxygen Exchange Capacity and Microstructure	119
H.J. Lang, K. Teske and H. Ullmann	
A Quaternary Oxide Ion-Conducting Solid Electrolyte with Favourable Sintering Properties	123
R. Hartung, S. Jakobs, S. Kockert, H. Sandow, U. Lawrenz and H.-. Möbius	
MgPSZ - An Ionic Conductor with Excellent Mechanical and Thermal Qualities	127
W. Richter, H. Zitzmann and H.J. Lang	
The Influence of Additions on the Microstructure and the Electrical Conductivity of Calcia Stabilized Zirconia	131
K. Künstler, U. Guth and J. Edelmann	
Composites Based on Oxoanionic Solid Electrolytes	137
U. Guth, S. Brosda, B. Löscher, A. Simmich, P. Schmidt and H.-. Möbius	
Catalytic and Electrocatalytic Reactions in Solid Electrolyte Cells: The Nemca Effect	141
C.G. Vayenas, S. Bebelis, I.V. Yentekakis, P. Tsiakaras, H. Karasali and C. Karavasilis	
Necessary Properties of Electrode Materials with Mixed Conductivity for SOFC and MCFC	149
B. Rohland	
Mixed Conductors on the Lanthanid Cobaltites Basis	161
P. Shuk, V. Charton and V. Samochval	
Oxygen Semi-Permeability of Erbia-Stabilized Bismuth Oxide	165
H.J.M. Bouwmeester, H. Kruidhof, A.J. Burggraaf and P.J. Gellings	
Non-Faradaic Electrochemical Modification of Catalytic Activity in Stabilized Zirconia Cells: The Oxidation of CO on Pt	171
H. Karasali and C.G. Vayenas	
Non-Faradaic Electrochemical Modification of Catalytic Activity in Stabilized Zirconia Cells: The Oxidation of CO on Polycrystalline Ag	175
C. Karavasilis, S. Bebelis and C.G. Vayenas	
Non-Faradaic Electrochemical Modification of the Catalytic Activity of Pt for the Oxidation of Methane in a Solid Oxide Fuel Cell Reactor	179
P. Tsiakaras and C.G. Vayenas	
AC Behaviour of Ag/Na₃Zr₂Si₂PO₁₂ Interface	183
N.G. Bukun	
Electrochemical Properties of the Modified Lanthanum Manganite on the Oxygen Ion Solid Electrolyte Surface	187
P. Shuk, L. Tichonova, A. Tonoyan and A.A. Vecher	
Manifestation of the Conduction Properties of Solid Electrolyte Information of the Electrode Polarization	191
M.V. Glumov and M.I. Brainin	
Diagnostics of Unequilibrium Dissociated Gas	195
A.A. Vecher	
How to Study Fast Ion Transport in Solids by Nuclear Magnetic Resonance (NMR)	205
D. Brinkmann	
Intergranular Impedance in Solid Electrolyte	213
E.A. Ukshe, A.J. Ukshe and N.G. Bukun	

Work Function Measurements in Solid Electrolyte Cells: Dependence of Electrode Work Function on Electrode Potential and Polarization	221
S. Bebelis and C.G. Vayenas	
Molecular Dynamics Simulation of Superionic State in BaF₂	225
A.K. Ivanov-Shitz	
Methods for Determination of Electrical and Acoustic Properties of Superionics and Mixed Ionic-Electronic Conductors	229
A. Kežionis, A.F. Orliukas, K. Paulavicius and V. Samulionis	
Constant Phase Angle Relaxation at Metal-Superionic Interface	233
A.J. Ukshe	
Baro-EMF in Systems with Fast Ion Transport	237
A.J. Ukshe and E.L. Maklakova	
A Study of Properties of Superionic Conductors in Electrical Systems Using the Estance Technique	241
A.Y. Tarasov and A.T. Filyayev	
New Applications of Solid Electrolytes	245
M.W. Breiter	
Carbon Dioxide Gas Sensor Based on Na⁺-Beta/Beta"-Alumina Solid Electrolytes and Its Cross-Sensitivity with other Gases	253
J. Liu and W. Weppner	
Development of an Amtec, a Converter of Thermal to Electrical Energy	261
V. Heinzel, F. Huber, W. Peppler and H. Will	
Interface Analysis for Solid State Electrochemistry	265
H.D. Wiemhöfer, U. Vohrer and W. Göpel	
Investigation of Oxygen Exchange of Oxides in a Wide Range of Temperature and Homogeneity	269
K. Teske	
Oxygen Activity in Glass Melts and the Relation to Optical Properties of the Glasses	273
S. Grimm, E. Katzschmann and W. Burckhardt	
Application of Calcium- and Manganese Beta" - Aluminas to the Direct Determination of the Thermodynamic Functions of Mixing for Ca_xMn_{1-x}O Solid Solutions	277
G. Róg, A. Kozłowska-Róg, W. Pycior and K. Zakula	
Coulombmeter on the Base of Solid Electrolyte	283
L.D. Yushina and V.V. Terekhov	
Fuel Cell with solid Oxide Proton Conducting Electrolyte	287
F.G.K. Baucke, S. Dorner, V. Heinzel and G. Röth	
Thermodynamic Investigation of Uranium-Mixed Oxide by a Solid-Electrolyte Based Technique	289
C. Nebelung	
Coulometric Determination of Water Traces Using Zirconia Cells	293
D. Rettig	
Subject Index	299