



Strasbourg (France)

E-MRS Spring Meeting 2004  
May 24-28, 2004

## SYMPOSIUM K

Solid state ionics: high temperature vs. low  
temperature defect chemistry

### Symposium Organizers:

Werner Sitte, University of Leoben, Austria

Jürgen Fleig, Max-Planck-Institut, Stuttgart, Germany

Janez Jamnik, National Institute of Chemistry, Ljubljana, Slovenia

Hans-Dieter Wiemhöfer, University of Münster, Germany

Papers will be published in Solid State Ionics

# E-MRS 2004 SPRING MEETING

## SYMPOSIUM K

Tuesday, May 25, 2004

Morning

Session I: Modelling and mechanisms

Session chair: Werner Sitte

- K-I.1** 9:00 -Invited- HIGH TEMPERATURE DEFECT CHEMISTRY VS. LOW TEMPERATURE DEFECT CHEMISTRY  
**Joachim Maier**, Max-Planck-Institut für Festkörperforschung, Heisenbergstr.1, 70569 Stuttgart, Germany
- K-I.2** 9:30 -Invited- FROM PEROVSKITES TO APATITES: THE ATOMISTIC MODELLING OF DEFECTS, PROTONS AND ION TRANSPORT IN OXIDE MATERIALS  
**M. Saiful Islam**, Chemistry Division, University of Surrey, Guildford, U.K.
- K-I.3** 10:00 DEFECT CHEMISTRY OF  $(\text{La,Sr})_{1-x}\text{Mn}_{1-y}\text{O}_{3-z}$  PEROVSKITES MODELLED USING THE CALPHAD APPROACH  
**A.N. Grundy**, L.J. Gauckler, Nonmetallic Materials, ETH Zurich, Switzerland, B. Hallstedt, RWTH Aachen, Germany
- K-I.4** 10:20 HYDROGEN EFFECTS IN ZIRCONIA AND HAFNIA  
**Jacob Gavartin** and Alexander Shluger, Department of Physics and Astronomy, University College London, Gower Street, WC1E 6BT London, U.K.
- 10:40 **BREAK**

Session II: Modelling and mechanisms

Session chair: M. Saiful Islam

- K-II.1** 11:10 -Invited- FORMATION AND MOBILITY OF PROTONIC DEFECTS IN LOW- AND HIGH TEMPERATURE SEPARATOR MATERIALS FOR FUEL CELL APPLICATION  
**Klaus-Dieter Kreuer**, Max-Planck-Institut für Festkörperforschung, Heisenbergstr. 1, 70569 Stuttgart, Germany
- K-II.2** 11:40 PROTONIC DEFECT IN TRIFLUOROMETHANESULFONIC ACID MONOHYDRATE DETERMINED BY AB INITIO MOLECULAR DYNAMICS  
**Stephen J. Paddison**, Lawrence R. Pratt, Theoretical Chemistry and Molecular Physics Group, Los Alamos National Laboratory, P.O. Box 1663, Los Alamos, NM 87545, USA
- K-II.3** 12:00 STOCHASTIC MODELING OF ION DYNAMICS IN GLASSES  
T. Höhr(a), **W. Dieterich**(a) and P. Maass(b), (a)Fachbereich Physik, Universität Konstanz, 78457 Konstanz, Germany, (b)Institut für Physik, Technische Universität Ilmenau, 98648 Ilmenau, Germany
- K-II.4** 12:20 NEARLY CONSTANT LOSS BEHAVIOUR IN Na- $\beta$ -ALUMINA  
**Radha D. Banhatti** and K. Funke, University of Muenster, Institute for Physical Chemistry and Sonderforschungsbereich 458, Correnstrasse 30, 48149 Muenster, Germany
- K-II.5** 12:40 IONIC TRANSPORT IN SODIUM-RUBIDIUM BORATE MIXED- AND SINGLE-ALKALI GLASSES  
**Á.W. Imre**, S. Voss, F. Berkemeier and H. Mehrer, Institut für Materialphysik, Universität Münster, Wilhelm-Klemm-Str. 10, 48149 Münster, Germany
- 13:00 **LUNCH**

Tuesday, May 25, 2004

Afternoon

Session III: Transport in nanostructured materials

Session chair: Joachim Maier

- K-III.1** 14:30 -Invited- DEFECT CHEMISTRY IN NANOCRYSTALLINE ANATASE (TiO<sub>2</sub>)  
A. Weibel, R. Bouchet, **Philippe Knauth**, MADIREL, Université de Provence-CNRS, Centre St Jérôme, 13397 Marseille Cedex 20, France
- K-III.2** 15:00 ION TRANSPORT AT INTERFACES: AN AC CONDUCTIVITY STUDY ON GLASS CERAMICS CONTAINING NANOCRYSTALLITES  
Bernhard Roling, Sevi Murugavel, Institute of Physical Chemistry and Collaborative Research Center 458, University of Muenster, Corrensstr. 30, 48149 Muenster, Germany
- K-III.3** 15:20 CONDUCTIVITY OF FREESTANDING THIN FILMS OF NANOCRYSTALLINE Gd-DOPED CERIA  
Mark Greenberg and Igor Lubomirsky, Weizmann Institute of Science, Rehovot, 76100, Israel, Juergen Fleig, Sangtae Kim and Joachim Maier, Max Planck Institut für Festkörperforschung, Heisenbergstrasse 1, 70569 Stuttgart, Germany
- K-III.4** 15:40 CONDUCTIVITY OF NANOCRYSTALLINE AND MICROCRYSTALLINE SrTiO<sub>3</sub>  
P. Balaya, J. Fleig and J. Maier, Max-Planck-Institut für Festkörperforschung, 70569 Stuttgart, Germany
- K-III.5** 16:00 HYDROGEN AS A SOURCE OF PROTONIC AND ELECTRONIC CONDUCTION IN A NANOPOROUS COMPLEX OXIDE  
P.V. Sushko, A.L. Shluger, Department of Physics and Astronomy, University College London, Gower St., London WC1E 6BT, U.K. and K. Hayashi, M. Hirano, H. Hosono, Transparent Electro-Active Materials Project, ERATO, JST, KSP C-1232, 3-2-1 Sakado, Takatsu-ku, Kawasaki 213-0012, Japan
- 16:20 **BREAK**

Session IV: Ionic and mixed ionic-electronic conductors I

Session chair: Ilan Riess

- K-IV.1** 16:50 -Invited- DEFECT CHEMISTRY OF MIXED-CONDUCTING PEROVSKITE OXIDE MEMBRANES  
**Henny J.M. Bouwmeester**, University of Twente, Department of Science and Technology, Inorganic Materials Science Group, MESA+ Institute for Nanotechnology, P.O. Box 217, 7500 AE Enschede, The Netherlands
- K-IV.2** 17:20 -Invited- SOFTWARE FOR DEFECT CHEMISTRY ANALYSIS  
**João.C.C. Abrantes**(a), J.R. Frade(b), (a)ESTG, Instituto Politécnico de Viana do Castelo, 4900 Viana do Castelo, Portugal, (b)Ceramics and Glass Engineering Dep. (CICECO), University of Aveiro, 3810 Aveiro, Portugal
- K-IV.3** 17:50 KINETICS OF OXYGEN STOICHIOMETRY CHANGES: MECHANISTIC INTERPRETATION AND k\*-D\* CORRELATION  
Rotraut Merkle and Joachim Maier, Max-Planck-Institute for Solid State Research, Heisenbergstr. 1, 70563 Stuttgart, Germany
- K-IV.4** 18:10 DEFECTS IN HYDROGEN CONTAINING OXIDES UNDER REDUCING CONDITIONS  
Marius Widerøe, Truls Norby, Centre for Materials Science, University of Oslo, Gaustadalleen 21, 0349 Oslo, Norway

Wednesday, May 26, 2004

Afternoon

Session V: Defects and transport in grain boundaries

Session chair: Philippe Knauth

- K-V.1** 14:00 -Invited- STRUCTURES AND PROPERTIES OF GRAIN BOUNDARIES IN SEMICONDUCTING ELECTROCERAMICS  
**Robert Freer**, Materials Science Centre, University of Manchester/UMIST, Manchester M1 7HS, U.K.
- K-V.2** 14:30 TRANSPORT ACROSS INTERNAL AND EXTERNAL INTERFACES IN Fe-DOPED SrTiO<sub>3</sub>  
R.A. De Souza, Institut für Physikalische Chemie I, RWTH Aachen, 52056 Aachen. Germany, J. Maier, Max-Planck-Institut für Festkörperforschung, 70509 Stuttgart. Germany
- K-V.3** 14:50 BULK AND GRAIN BOUNDARY RESISTIVITIES OF DONOR DOPED BARIUM TITANATE CERAMICS  
W. Preis, A. Bürgermeister, W. Sitte, Department für Allgemeine, Analytische und Physikalische Chemie, Montanuniversität Leoben, Franz-Josef-Strasse 18, 8700 Leoben, Austria, P. Supancic, Institut für Struktur- und Funktionskeramik, Montanuniversität Leoben, Peter-Tunner-Strasse 5, 8700 Leoben, Austria
- K-V.4** 15:10 THE GRAIN BOUNDARY EFFECT IN HEAVILY DOPED CERIUM OXIDE  
A. Tschöpe, S. Kilassonia, R. Birringer, Universität des Saarlandes, Technische Physik, Gebäude 43, Postfach 15 11 50, 66041 Saarbrücken, Germany
- K-V.5** 15:30 NONLINEAR ELECTRICAL PROPERTIES OF GRAIN BOUNDARIES IN OXYGEN ION CONDUCTORS: CASE OF ACCEPTOR DOPED CERIA  
Xin Guo and Rainer Waser, Institut für Festkörperforschung, Forschungszentrum Jülich, 52425 Jülich, Germany
- 15:50 **BREAK**

Session VI: Ionic and mixed ionic-electronic conductors II

Session chair: Henny J.M. Bouwmeester

- K-VI.1** 16:20 -Invited- SIMULATION OF DIFFUSION PROCESSES AND CHARGE TRANSPORT IN MIXED IONIC/ELECTRONIC CONDUCTORS  
**Rene Meyer**, Xin Guo, Rainer Waser, Institut fuer Festkoerperforschung Forschungszentrum Juelich, 52425 Juelich, Germany
- K-VI.2** 16:50 -Invited- HYDROGEN DEFECTS IN OXIDIC SOLIDS  
**Truls Norby**, University of Oslo, Centre for Materials Science, Gaustadalleen 21, 0349 Oslo, Norway
- K-VI.3** 17:20 IONIC AND ELECTRONIC CONDUCTIVITY IN LEAD-ZIRCONATE-TITANATE STUDIED BY IMPEDANCE SPECTROSCOPY  
Bernard A. Boukamp, Mai T.N. Pham, Dave H.A. Blank and Henny J.M. Bouwmeester, Inorganic Materials Science, Fac. Science and Technology and MESA+ Institute for Nanotechnology, Twente University P.O.Box 217, 7500 AE Enschede, The Netherlands
- K-VI.4** 17:40 DEFECT CHEMICAL ANALYSIS OF THE ELECTRONIC CONDUCTIVITY OF STRONTIUM-DOPED LANTHANUM FERRITE  
E. Bucher, W. Sitte, Department of General, Analytical and Physical Chemistry, University of Leoben, 8700 Leoben, Austria

Thursday, May 27, 2004

Morning

Session VII: Methods and characterization

Session chair: Bernard A. Boukamp

- K-VII.1** 8:30 -Invited- TRAPPING EFFECTS DURING CHARGE AND MASS TRANSPORT IN OXIDES  
**Manfred Martin**, Institute of Physical Chemistry, RWTH Aachen University, Templergraben 59, 52056 Aachen, Germany
- K-VII.2** 9:00 -Invited- OXYGEN IN HIGH TEMPERATURE SUPERCONDUCTORS: OXYGEN DIFFUSION AND OXYGEN MICROSTRUCTURE PROBED BY TRANSPORT AND MAGNETIC MEASUREMENTS  
**Andreas Erb**, Walther-Meissner-Institut, Bayerische Akademie der Wissenschaften, Walther-Meissner-Str. 8, 85748 Garching, Germany
- K-VII.3** 9:30 CATION DIFFUSION IN SOLID SOLUTIONS OF SODIUM ORTHOPHOSPHATE AND SODIUM SODIUM SULFATE - A DETAILED STUDY BY QUASIELASTIC NEUTRON SCATTERING AND CONDUCTIVITY SPECTROSCOPY  
D. Wilmer, H.W. Meyer, Institute of Physical Chemistry, Corrensstr. 30, 48149 Münster, Germany and J. Combet, Institut Laue-Langevin, 6 rue Jules Horowitz, 38042 Grenoble Cedex 9, France.
- K-VII.4** 9:50 RADIOTRACER DIFFUSION AND ION CONDUCTION IN THE POLYMER ELECTROLYTE PEO30NaI  
Sh. Obeidi, B. Zazoum and N.A. Stolwijk, Institute of Materials Physics, University of Münster, Wilhelm-Klemm-Str. 10, 48149 Münster, Germany
- K-VII.5** 10:10 BOND VALENCE ANALYSIS OF AMORPHOUS AND CRYSTALLINE SOLID ELECTROLYTES  
S. Adams, GZG, Kristallographie, Universitaet Goettingen, Germany and J. Swenson, Condensed Matter Physics, Chalmers University of Technology, Goeteborg, Sweden
- 10:30 **BREAK**

Session VIII: Ionic and mixed ionic-electronic conductors III

Session chair: Truls Norby

- K-VIII.1** 11:00 -Invited- PO<sub>2</sub> DEPENDENCE OF VALENCE NUMVER OF Co IN LaGaO<sub>3</sub> AND ITS INFLUENCE ON PARTIAL ELECTRONIC AND OXIDE IONIC CONDUCTIVITY  
**Tatsumi Ishihara**(b), S. Ishikawa(a), H. Nishiguchi(a) and Y. Takita(a), (a)Department of Applied Chemistry, Faculty of Engineering, Oita University, Dannoharu 700, Oita 870-1192, Japan, (b)Department of Applied Chemistry, Faculty of Engineering, Kyushu University, Hakozaki 6-10-1, Higashi-Ku, Fukuoka, 812-8581, Japan
- K-VIII.2** 11:30 -Invited- COMPARISON BETWEEN LIQUID STATE AND SOLID STATE ELECTROCHEMISTRY  
**Ilan Riess**, Physics Department, Technion-Israel Institute of Technology, Haifa 32000, Israel
- K-VIII.3** 12:00 OXYGEN PERMEATION AND SURFACE PROPERTIES OF Pr-Fe-BASED PEROVSKITE-TYPE MIXED CONDUCTORS  
H. Itoigawa, H. Takamura, A. Kamegawa and M. Okada, CREST, Japan Science and Technology Agency, Department of Materials Science, Graduate School of Engineering, Tohoku University, Aoba-yama 02, Sendai 980-8579, Japan
- K-VIII.4** 12:20 HIGH-TEMPERATURE CONDUCTIVITY IN STRAINED EPITAXIAL Sr<sub>4</sub>Fe<sub>6</sub>O<sub>13</sub> THIN FILMS  
J.A. Pardo, J. Santiso, C. Solis, G. Garcia and A. Figueras Crystal Growth Laboratory. Institut de Ciència de Materials de Barcelona, ICMAB-CSIC. Campus UAB, 08193 Bellaterra. Spain
- 12:40 **LUNCH**

Thursday, May 27, 2004

Afternoon

14:00

POSTER SESSION

- K/P01** EFFECT OF Mo DOPING ON STRUCTURE AND PROPERTIES OF NANOSIZED INVERSE SPINEL  $\text{LiCrVO}_4$   
W. Chen, L.Q. Mai, Q. Xu, Q.Y. Zhu, Institute of Materials Science and Engineering, Wuhan University of Technology, Wuhan 430070, China
- K/P02** SOLID STATES DETECTORS FOR MEASUREMENTS LOW AND HIGH RADIATION DOSES  
I.Kh. Abdukadirova, Institute of Nuclear Physics, Solid State Physics, p.Ulugbek, 702132 Tashkent, Uzbekistan
- K/P03** HIGH TEMPERATURE ELECTRICAL CONDUCTIVITY IN  $\text{ZnS:Al}$  AND IN  $\text{CdSe:Al}$   
K. Lott, T. Nirk, S. Shinkarenko Tallinn Technical University, Ehitajate tee 5, 19086 Tallinn, Estonia
- K/P04** ZINC NON-STOICHIOMETRY IN ZnO  
K. Lott, S. Shinkarenko Tallinn Technical University, Ehitajate tee 5, 19086 Tallinn, Estonia, E. Gorohova, S.I. Vavilov State Optical Institute, St.Petersburg, Russia, A. Grebennik, Y. Silkov, A. Vishnjakov, D.I. Mendelejev University of Chemical Technology of Russia, Miusskaya sq.9, 125190 Moscow, Russia
- K/P05** DEFECT ASSOCIATION IN Fe-DOPED  $\text{SrTiO}_3$ : A QUANTITATIVE IN-SITU EPR STUDY  
Rotraut Merkle and Joachim Maier, Max-Planck-Institute for Solid State Research, Heisenbergstr. 1, 70563 Stuttgart, Germany
- K/P06** INVESTIGATION OF THE PHASE DIAGRAM AND THE DEFECT STRUCTURE OF NONSTOICHIOMETRIC Li-Mn-O SPINEL  
Ch.H. Luo, M. Martin, Institute of Physical Chemistry, RWTH Aachen (Aachen University of Technology), Germany
- K/P07** CONDUCTIVITY STUDIES ON PMMA BASED PROTON CONDUCTING GEL ELECTROLYTES  
S.L. Agrawal and Shilpa Pandey, Department of Physics, A.P.S.University, Rewa(M.P) 4860003, India
- K/P08** ELECTRONIC CONDUCTIVITIES OF  $\text{La}_{0.6}\text{Sr}_{0.4}\text{CoO}_{(3-\delta)}$  WITH CONSTANT OXYGEN NON-STOICHIOMETRIES BETWEEN 15 AND 1200 K  
A. Benisek and W. Sitte, Institut für Physikalische Chemie, Montanuniversität Leoben, Franz-Josef-Strasse 18, 8700 Leoben, Austria
- K/P09** GETTERING BY HEAT THERMAL PROCESSING-APPLICATION IN CRYSTALLINE SILICON SOLAR CELLS  
N. Khehdher, A. Ben Jaballah, M. Hassen, M. Hajji, M.F. Boujmil, B. Bessaïs, H. Ezzaouia, R. Bennaceur, INRS, Hammam-Lif, Tunisia
- K/P10** ON OPTIMUM THERMODYNAMIC CONDITIONS FOR PREPARATION OF HIGH QUALITY GSO:Ce scintillators  
V. Bondar, V. Krivoshein, L. Lisetski, V. Martynov, L. Nagornaya, V. Ryzhikov, V. Spasov, N. Starzhinskiy, Concern "Institute for Single Crystals", NASU, Kharkov, Ukraine
- K/P11** PROPERTIES OF SOFC UNIT CELL USING SYNTHESIZED  $(\text{La}_{1-x}\text{Sr}_x)\text{Mn}_{1-y}\text{O}_3$ -CATHODE BY GLYCINE NITRATE PROCESS AND DIFFERENT ELECTROLYTE  
Mi Jai Lee, Sang Sun Park, Young Hun Lee, Ji Woong Moon, Jong Hoo Paik, Byung Hyun Choi Electronic Materials Lab, Electronic Components & Materials Group, KICET, Seoul 153-801, Korea, Young Seung Yoo, Alternative Energy & Fuel Cell Advanced Technology Center, KEPRI, Kaejeon 305-380, Korea
- K/P12** POLY (2-VINYL PYRIDINIUM FLUOROBORATE) AS IONICS AND ADHESIVE  
J.R. Chetia(a), A. Dutta(a) and N.N. Dass (b), (a)Department of Chemistry, Dibrugarh University, Dibrugarh-786004, India, (b)Institute of Advanced Study In Science And Technology, Jawahar Nagar, Khanapara, Guwahati-781022, India
- K/P13** Sn-Mn BASED INTERMETALLIC COMPOUND AS ANODE FOR LITHIUM ION BATTERIES  
S. Buniran and S.M. Hasanaly, Sirim Berhad, Advanced Materials Centre, Lot 34, Jalan Hi-Tech 2/3, Kulim Hi-Tech Park, 09000 Kulim, Kedah, Malaysia
- K/P14** CONDUCTIVE PROPERTIES OF SILICON NITRIDE THIN FILMS WITH EMBEDDED NANOPARTICLES  
A.Pinyol and E. Bertran, I. Porqueras, C. Person, A. Canillas, FEMAN, Dept. de Física Aplicada i Òptica - Universitat de Barcelona, Av. Diagonal 647, 08028 Barcelona, Spain
- K/P15** THERMODYNAMIC STUDIES ON TRANSITION METAL OXIDE BRONZES  
J. Gabel, W. Vonau, U. Guth, Kurt-Schwabe-Institut für Mess- und Sensortechnik e.V. Meinsberg, Fabrikstrasse 69, 04720 Ziegra-Knobelsdorf, Germany
- K/P16** ELECTRONIC SURFACE PROPERTIES OF RF MAGNETRON SPUTTERED  $\text{In}_2\text{O}_3$  AND  $\text{In}_2\text{O}_3:\text{Sn}$   
Y. Gassenbauer, R. Schafrank, A. Klein, Darmstadt University of Technology, Surface Science Division, Petersenstrasse 23, 64287 Darmstadt, Germany
- K/P17** THE ELECTRONIC STRUCTURE OF PEROVSKITE MANGANATES  
D. Fuks, Mater. Eng. Dept., BGU, P.O.B. 653, 84105 Beer Sheva, Israel, S. Dorfman, Dept. Physics, Technion, 32000 Haifa, Israel, L. Bakaleinikov, A. Gordon, Dept. Math. & Phys, Haifa Univ, 36006 Tivon, Israel, E.A. Kotomin, MPI, Heisenbergstr.1, 70569 Stuttgart, Germany and Inst. Solid State Physics, Kengaraga str. 8, Riga 1063, Latvia

- K/P18** NEW CURRENT COLLECTOR DESIGN AND MATERIALS FOR SOLID-OXIDE FUEL CELLS  
L. Riess and I. Feldman, Physics Department, Technion-IIT, Haifa 32000, Israel
- K/P19** PREMELTING EFFECT IN AgBr: MD SIMULATION  
A.K. Ivanov-Schitz, G.N. Mazo, S.N. Savvin, V.V. Demin, Institute of Crystallography, Leninsky pr. 59, 117333 Moscow, Russia  
Chemistry Department of Moscow State University, 119899, Moscow, Russia
- K/P20** COMPLETE REVERSIBILITY OF HETEROGENEOUS Li-STORAGE IN RuO<sub>2</sub> ELECTRODE  
P. Balaya, H. Li, L. Kienle and J. Maier, Max-Planck-Institut für Festkörperforschung, 70569 Stuttgart, Germany
- K/P21** OXYGEN PERMEATION AND MECHANICAL PROPERTIES OF Ba-La-In-BASED PEROVSKITE-TYPE OXIDES  
Y. Aizumi, H. Takamura, A. Kamegawa and M. Okada, CREST, Japan Science and Technology Agency, Department of Materials Science, Graduate School of Engineering, Tohoku University, Aoba-yama 02, Sendai 980-8579, Japan
- K/P22** HIGH MIXED ELECTRONIC-PROTONIC CONDUCTIVITY IN NANOPOROUS CRYSTAL, 12CaO-7Al<sub>2</sub>O<sub>3</sub>  
K. Hayashi, M. Hirano, H. Hosono, Japan Science and Technology Agency, KSP C-1232, Kawasaki 213-0012 Japan, P.V. Sushko, A.L. Shluger, Department of Physics and Astronomy, University College London, London WC1E 6BT, U.K.
- K/P23** OXYGEN INCORPORATION INTO SrTiO<sub>3</sub>: INFLUENCE OF SrO SURFACE COATINGS  
S.F. Wagner, W. Menesklou, L. Merkle, Th. Schneider, E. Ivers-Tiffée, Institut für Werkstoffe der Elektrotechnik, Universität Karlsruhe (TH), Germany
- K/P24** INCREASING OF DEFECTS CONCENTRATION IN GeO<sub>2</sub>-ZrO<sub>2</sub> SYSTEM  
E. Frolova, M. Ivanovskaya, Research Institute for Physical Chemical Problems, BSU, Leningradskaya str. 14, 220080 Minsk, Belarus, V. Petranovskii, S. Fuentes, CCMC, UNAM, Ensenada, B.C. 22800, Mexico
- K/P25** EFFECTS OF B AND HEAT TREATMENT IN CARBON AEROGELS FOR ELECTRIC DOUBLE-LAYER CAPACITORS  
Young-jae Lee, R&D center, Samsung Fine Chemicals, Co., Ltd., 103-1 Moonji-dong, Yoosung-gu, Daejeon 305-380 Korea  
Hiroaki Hatori, Noriko Yoshizawa, Yasushi Soneda, Energy Storage Materials Group, AIST Tsukuba West, 16-1 Onogawa, AIST, Tsukuba, Ibaraki 305-8569 Japan
- K/P26** MICROSTRUCTURE EVOLUTION AND CONDUCTIVITY OF Bi<sub>2</sub>CuO<sub>4</sub>-Bi<sub>2</sub>O<sub>3</sub> COMPOSITES NEARBY THE EUTECTIC POINT  
N.V. Lyskov(a), Yu.G. Metlin(b), V.V. Belousov(a), Yu.D. Tretyakov(a,b), (a)Materials Science Department, Moscow State University, (b)Chemistry Department, Moscow State University, Russia
- K/P27** ELECTRON TRANSPORT AND REDOX STATES IN Gd DOPED CERIA-ZIRCONIA  
V. Ruehrup, H.D. Wiemhöfer, Institute for Inorganic and Analytical Chemistry, University of Münster, 48149 Münster, Germany
- K/P28** ELECTRON TRANSPORT AND ELECTRONIC STATE DENSITIES IN OXYGEN ION CONDUCTING LANTHANUM GALLATES  
M. Dogan, H.-D. Wiemhöfer, Institute for Inorganic and Analytical Chemistry, University of Münster, 48149 Münster, Germany and Th. Koslowski, Institute for Physical Chemistry, University of Freiburg, 79104 Freiburg, Germany
- K/P29** STABILITY OF NANOCRYSTALLINE TUNGSTEN OXIDE FILMS AT HIGH TEMPERATURES  
Ahalapitiya H. Jayatissa, MIME department, College of Engineering, The University of Toledo, Ohio, USA
- K/P30** IONIC CONDUCTIVITY IN POLY(AMINOPHOSPHAZENE)-SiO<sub>2</sub> COMPOSITE POLYMER ELECTROLYTES  
N. Kaskhedikar(a), J. Paulsdorf(b), M. Burjanadze(b), H.-D. Wiemhöfer(b), University of Münster, (a)International NRW Graduate School of Chemistry (GSC-MS), (b)Institute for Inorganic and Analytical Chemistry and SFB 458, 48149 Münster, Germany
- K/P31** IONIC CONDUCTIVITIES OF POLYPHOSPHAZENE SOLID ELECTROLYTES MIXED WITH DIFFERENT SALTS  
J. Paulsdorf(a), N. Kaskhedikar(b), M. Burjanadze(a), H.-D. Wiemhöfer(a), S. Obeidi(c), N. Stolwijk(c), University of Münster, (a)Institute for Inorganic and Analytical Chemistry and SFB 458, (b)International NRW Graduate School of Chemistry (GSC-MS), (c)Institute for Material Physics, 48149 Münster, Germany
- K/P32** CORRELATION BETWEEN IONIC RADIUS AND DIFFUSION IN STABILISED ZIRCONIA  
M.A. Taylor, Ch. Argiris, M. Kilo, G. Borchardt, TU Clausthal, Institut f. Metallurgie, Robert-Koch-Str. 42, 38678 Clausthal-Zellerfeld, Germany
- K/P33** THE EFFECT OF THE DOPANTS AND OXYGEN NONSTOICHIOMETRY ON THE THERMODYNAMIC PROPERTIES OF MICRO AND NANOSTRUCTURED LANTHANUM MANGANITES  
Speranta Tanasescu, Cornelia Marinescu, Florentina Maxim, Institute of Physical Chemistry "I.G.Murgulescu" of the Romanian Academy
- K/P34** DEFECT CHEMISTRY AND TRANSPORT PROPERTIES OF LANTHANUM NICKEL OXIDE  
Mirela-Anca Dragan and Michael Schroeder, Institute of Physical Chemistry, RWTH-Aachen, Germany
- K/P35** CHARACTERISATION OF YSZ/CeO<sub>2</sub> SUPERLATTICES PREPARED BY PULSED INJECTION MOCVD  
G. Garcia, J. Santiso, J.A. Pardo and A. Figueras\*, Laboratory of Crystal Growth, ICMAB/CSIC, Campus UAB, 08193 Bellaterra, Spain, \*second ardes Instituto de Fisica, Campus UNAM, Juriquilla- CP 76230, Queretaro, Mexico

- K/P36** DYNAMICS IN FRAGILE IONIC MELTS FROM BROADBAND CONDUCTIVITY SPECTROSCOPY  
Prabhakar Singh, Radha D. Banhatti and K. Funke, University of Muenster, Institute for Physical Chemistry and Sonderforschungsbereich 458, Corrensstrasse 30, 48149 Muenster, Germany
- K/P37** DEFECT ORDERING IN OXYGEN-DEFICIENT (La,Sr)(Co,Fe)O<sub>3</sub>  
E. Bucher, W. Sitte, Department of General, Analytical and Physical Chemistry, University of Leoben, 8700 Leoben, Austria, Ch. Gspan, W. Grogger, F. Hofer, Research Institute for Electron Microscopy and Fine Structure Research, Graz University of Technology, 8010 Graz, Austria
- K/P38** ELECTROCHEMICAL DEVICE FOR THE PRECISE ADJUSTMENT OF OXYGEN PARTIAL PRESSURES IN A GAS STREAM  
A. Bürgermeister, A. Benisek, W. Sitte, Department of General, Analytical and Physical Chemistry, University of Leoben, 8700 Leoben, Austria
- K/P39** OXYGEN EXCHANGE MEASUREMENTS ON STRONTIUM-SUBSTITUTED LANTHANUM COBALTITES AND FERRITES  
W. Preis, E. Bucher, W. Sitte, Department Allgemeine, Analytische und Physikalische Chemie, Montanuniversität Leoben, Franz-Josef-Strasse 18, 8700 Leoben, Austria
- K/P40** THERMODYNAMIC AND KINETIC INVESTIGATIONS OF NANOSIZED SILVER STRUCTURES  
Alexandra Schroeder, Juergen Fleig, Joachim Maier, Max-Planck-Institute for Solid State Research, Heisenbergstr. 1, 70563 Stuttgart, Germany, and Werner Sitte, Montanuniversität Leoben, Franz-Josef-Str. 18, 8700 Leoben, Austria
- K/P41** ELECTRICALLY PROBED NITROGEN PROFILES IN NITROGEN-STABILIZED ZIRCONIA  
J.-S. Lee, J. Fleig, J. Maier, Max-Planck-Institut für Festkörperforschung, 70569 Stuttgart, Germany, T.-J. Chung, School of Materials Science and Engineering, Andong National University, Kyungbuk 760-749 Korea and D.-Y. Kim, School of Materials Science and Engineering, Seoul National University, Seoul 151-744, Korea
- K/P42** RECENT PROGRESS IN IONICALLY CONDUCTING CaF<sub>2</sub>-BaF<sub>2</sub> HETEROLAYERS  
X.X. Guo, I. Matei, J.-S. Lee, N. Sata, J. Maier, Max-Planck-Institut für Festkörperforschung, 70569 Stuttgart, Germany
- K/P43** REASONABLE k AND D FACTORS FOR MIXED CONDUCTING POROUS SOFC CATHODES  
J. Fleig, Max-Planck-Institute for Solid State Research, Heisenbergstr. 1, 70569 Stuttgart, Germany
- K/P44** TRANSPORT PROCESSES AND ELECTRODE PROPERTIES OF SOME AN MIXED CONDUCTING COBALTITES AND CHROMITES WITH PEROVSKITE STRUCTURE  
Hans-Dieter Wiemhöfer, Hans-Gerhard Bremes, Ulrich Nigge, Institut für Anorganische und Analytische Chemie, Universität Münster, Corrensstr. 30, 48149 Münster, Germany
- K/P45** INFLUENCE OF GRAIN SIZE ON THE OXIDATION KINETICS OF NANOCRYSTALLINE CERIA  
Anna Eden Kossoy, Yishay Feldman and Igor Lubomirsky, Weizmann Institute of Science, Department of Materials & Interfaces, Rehovot 76100, Israel

16:00

**BREAK**

## Session IX: Anion conductors

Session chair: Harry L. Tuller

- K-IX.1** 16:30 -Invited- NEW OXIDE ION CONDUCTORS BASED ON La<sub>2</sub>Mo<sub>2</sub>O<sub>9</sub>  
Philippe Lacorre, S. Georges, F. Goutenoire, O. Bohnke, Y. Laligant, G. Corbel Laboratoire des Oxydes et Fluorures, UMR CNRS 6010, Université du Maine, Avenue Olivier Messiaen, 72085 Le Mans cedex 9, France, M.C. Steil Laboratoire de Cristallochimie et de Physicochimie du Solide, UMR CNRS 8012, ENSCL, Université de Science et Technologie de Lille, B.P. 108, 59652 Villeneuve d'Ascq Cedex, France, S.J. Skinner, Centre for Ion Conducting Membranes, Department of Materials, Imperial College London, Prince Consort Road, London SW7 2BP, U.K., H.-D. Wiemhöfer Institute of Inorganic and Analytical Chemistry and SFB 458, University of Münster, Wilhelm-Klemm-Str. 8, 48149 Münster, Germany
- K-IX.2** 17:00 OXIDE-ION TRANSPORT IN GADOLINIUM ZIRCONATES UNDER HIGH PRESSURE  
H. Takamura, H. Kakuta, A. Kamegawa, M. Okada, CREST, Japan Science and Technology Agency, Department of Materials Science, Graduate School of Engineering, Tohoku University, Aoba-yama 02, Sendai 980-8579, Japan, and H. L. Tuller, Department of Materials Science and Engineering, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139, USA
- K-IX.3** 17:20 HIGH CONCENTRATION OF OXYGEN RADICALS IN 12CaO-Al<sub>2</sub>O<sub>3</sub>: EFFECTS OF STABILITY AND DIFFUSIVITY OF EXTRA-FRAMEWORK OXYGEN SPECIES  
K. Hayashi, M. Hirano and H. Hosono, Japan Science and Technology Agency, KSP C-1232, Kawasaki 213-0012 Japan
- K-IX.4** 17:40 OXYGEN MOBILITY AND ELECTRICAL CONDUCTIVITY OF PEROVSKITE-LIKE CUPRATES La<sub>2-x</sub>Sr<sub>x</sub>CuO<sub>4-d</sub> AND La<sub>1-x</sub>Sr<sub>x</sub>CuO<sub>3-d</sub>  
S.N. Savvin, E.V. Mychka, G.N. Mazo, Chemistry Department of Moscow State University, 119899 Moscow, Russia, L.S. Leonova, Yu.A. Dobrovolsky, Institute of Problems of Chemical Physics RAS, Chernogolovka, Russia

Friday, May 28, 2004

Morning

Session X: Applications

Session chair: Tatsumi Ishihara

- K-X.1** 8:30 -Invited- LOW TEMPERATURE PREPARATION OF PHOSPHATES FOR Li BATTERY APPLICATIONS  
**Christian Masquelier**, C. Delacourt, C. Wurm, L. Laffont, P. Poizot, M. Morcrette, J.M. Tarascon LRCS, Université Picardie Jules Verne, Amiens, France
- K-X.2** 9:00 DEFECT STRUCTURE OF LITHIUM MANGANESE SPINELS (Li:Mn=1:2) CHARACTERISED BY XRD, DSC, TGA AND RAMAN SPECTROSCOPY  
M. Molenda, R. Dziembaj\*, L.M. Proniewicz, E. Podstawka, Faculty of Chemistry, Jagiellonian University, \*Regional Laboratory of Physicochemical Analyses and Structure Researches, ul. Ingardena 3, 30-060 Cracow, Poland
- K-X.3** 9:20 WITHDRAW
- K-X.4** 9:40 STRESS EFFECTS IN LITHIUM INTERCALATION INTO AMORPHOUS WO<sub>3</sub> THIN FILMS  
J. Bisquert, G. Garcia-Belmonte, J. Garcia-Cañadas, Universitat Jaume I, 12080 Castelló, Spain, V.S. Vikhrenko, Belarussian State Technological University, 220 050 Minsk, Belarus
- 10:00 **BREAK**

Session XI: Applications

Session chair: Christian Masquelier

- K-XI.1** 10:30 -Invited- THE ROLE OF DEFECT CHEMISTRY IN PREDICTING FEASIBILITY OF HIGH TEMPERATURE RESONANT SENSORS BASED ON La<sub>3</sub>Ga<sub>5</sub>SiO<sub>14</sub>  
**Harry L. Tuller** and H. Seh, Department of Materials Science and Engineering, MIT, Cambridge MA 02139, USA, H. Fritze and M. Schulz, Institut für Metallurgie, TU Clausthal, 38678 Clausthal-Zellerfeld, Germany
- K-XI.2** 11:00 PARTIAL REDUCTION AND RE-OXIDATION OF IRON- AND COBALT-CONTAINING PEROVSKITES USING CATALYST CHARACTERISATION MEASUREMENTS  
A. Mai, F. Tietz, D. Stoever; Forschungszentrum Juelich GmbH, 52425 Juelich, Germany
- K-XI.3** 11:20 AGING OF NANOSTRUCTURED TETRAGONAL ZIRCONIA ELECTROLYTES FOR INTERMEDIATE TEMPERATURE SOFCs  
Elisabeth Djurado, Laurent Dessemond, Florence Boulc'h, Laboratoire d'Electrochimie et de Physico-chimie des Matériaux et des Interfaces, CNRS 1130, BP 75, 38402 Saint-Martin d'Hères Cedex, France
- K-XI.4** 11:40 ALUMINA SINGLE CRYSTAL GROWTH BY USING THE Al<sup>3+</sup> CONDUCTING SOLID ELECTROLYTE  
S. Tamura, Y.-W. Kim, T. Masui and N. Imanaka, Department of Applied Chemistry, Faculty of Engineering, Osaka University, Japan
- K-XI.5** 12:00 ELECTROSTATIC SPRAY ASSISTED VAPOUR DEPOSITION OF TiO<sub>2</sub>-BASED FILMS FOR GAS SENSING  
Jing Du and Kwang-Leong Choy, School of Mechanical, Materials, Manufacturing Engineering and Management, University of Nottingham, University Park NG7 2RD, U.K.
- K-XI.6** 12:20 INVESTIGATION OF SURFACE CHEMISTRY OF Sb-DOPED SnO<sub>2</sub> GAS SENSORS BY SYNCHROTRON RADIATION INDUCED XPS AND UPS AND THE EFFECT ON GAS-SENSING CHARACTERISTICS  
A. Panupat, National Metal and Materials Technology Center, Thailand Science Park, Pathumthani 12120, Thailand and U. Korkerd, Department of Material Science, Chulalongkorn University, Bangkok 10400, Thailand