Program

Nonstoichiometric Compounds

March 8-13, 2009
Jeju Island, Korea

Conference Chairs

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Seoul National University, Korea

Professor Shu Yamaguchi
The University of Tokyo, Japan

Professor Juergen Janek
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Our thanks to

SAMSUNG ELECTRO-MECHANICS

for their generous support

of this conference.

Thank you also to

한국세라믹학회 The Korean Ceramic Society

for their technical endorsement.

Sunday, March 8, 2009

16:00 - 18:00	Registration
18:00 – 20:00	Welcome Party/Dinner

Monday, March 9, 2009

07:30 – 08:20	Breakfast
08:20 – 08:30	**Opening Remarks**
	Session I: Basics/Defects/ Defect driven phenomena Session Chairs: S. Yamaguchi & X. Guo
08:30 - 09:00	DEFECT INTERACTIONS IN $SrTiO_3$ IN THE TEMPERATURE RANGE OF 25 TO 250 ^{O}C Xin Guo, Institute of Solid State Research, Germany
09:00 - 09:20	THE OXYGEN RELEASE BEHAVIOR OF CAF_2-TYPE $(PR_{0.75}ZR_{0.25})O_{2-Y}$ PHASE WITH WIDE OXYGEN NONSTOICHIOMETRY Shinya Otsuka-Yao-Matsuo, Osaka University, Japan
09:20 - 09:40	MICROSTRUCTURAL EVOLUTION IN PEROVSKITES BY OXYGEN PARTIAL PRESSURE CHANGE AND DONOR DOPING Suk-Joong L. Kang, KAIST, Korea
09:40 - 10:00	DISORDER, LATTICE DYNAMICS AND IONIC CONDUCTION IN SUPERIONIC COPPER CHALCOGENIDES S.A. Danilkin, ANSTO, Australia
10:00 - 10:30	Coffee break
10:30 - 11:00	ON THE ORIGIN OF ANOMALOUS V_{TH} SHIFT IN HIGH-K MOSFETS Akira Toriumi, The University of Tokyo, Japan
11:00 - 11:20	DIRECT OBSERVATION OF REVERSIBLE OXIDATION AND REDUCTION AT BURIED OXIDE/METAL INTERFACES Andreas Klein, Technische Universität Darmstadt, Germany
11:20 - 11:40	STRUCTURAL FEATURES OF BATIO3 NANO-POWDERS AND NANO-GRAINED CERAMICS N.-H. Cho, Inha University, Korea
11:40 - 12:00	DEFECT COMPLEX AND DIELECTRIC PROPERTIES OF ACCEPTOR AND MNO-DOPED BATIO3 Young Ho Han, Sungkyunkwan University, Korea

12:00 - 14:00	Lunch
	Session II: Ferroelectrics Session Chairs: H-I. Yoo & P. McIntyre
14:00 - 14:30	Effect of Acceptor (Mg) Concentration on the Resistance Degradation Behavior in $BaTiO_3$ Model Deielectrics: Impedance Spectroscopy and TSDC (Thermally Stimulated Depolarization Current) Analysis Seok-Hyun Yoon, Samsung Electro-Mechanics Co., Korea
14:30 - 14:50	DIFFUSION PROCESSES IN MULTI-LAYER CERAMIC CAPACITORS Markus Kessel, Institute of Physical Chemistry, RWTH Aachen University, Germany
14:50 - 15:10	ROLE OF ELECTRON EMISSION FROM THE RARE-EARTH METAL OXIDES IN DISPLAY DEVICE Ki-Woong Whang, Seoul National University, Korea
15:10 – 15:40	Coffee break
15:40 – 16:10	BULK AND INTERFACIAL OXYGEN DEFECTS IN HAFNIA DIELECTRIC STACKS: A CRITICAL ASSESSMENT Paul C. McIntyre, Stanford University, USA
16:10 – 16:30	ATOMIC-RESOLUTION STRUCTURAL ANALYSIS OF $LA_{2/3-X}LI_{3X}TIO_3$ BY HIGH RESOLUTION ELECTRON MICROSCOPY Takao Tsurui, Tohoku University, Japan
16:30 - 16:50	TRANSMISSION ELECTRON MICROSCOPY STUDY OF AN ELECTRON-BEAM-INDUCED ORDER TO DISORDER TRANSFORMATION OF NONSTOICHIMETRIC NIOBIUM NITRIDE Jonghan Won, Los Alamos National Laboratory, USA
16:50 – 17:40	**Short Presentation for Poster Session I (Odd number)**
18:00 – 19:30	Dinner
19:30 – 20:30	**Poster Session I** and Social Hour

Tuesday, March 10, 2009

07:30 – 08:30	Breakfast
	Session III: Thermoelectric, Energy conv/storage Session Chairs: K. Koumoto & M. Schroeder
08:30 - 09:00	NANOSTRUCTURED STRONTIUM TITANATE-BASED OXIDES FOR THERMOELECTRICS Kunihito Koumoto, Nagoya University, Japan
09:00 - 09:20	THERMOELECTRIC PROPERTIES OF NONSTOICHIOMETRIC CHALCOGENIDE COMPOUNDS: THEORETICAL AND EXPERIMENTAL STUDIES Min Wook Oh, Korea Electrotechnology Research Institute, Korea
09:20 - 09:40	COPPER INDIUM DISELENIDE AND DISULFIDE SEMICONDUCTOR NANOCRYSTALS; SYNTHESES AND THEIR DEFECT RELATED OPTICAL PROPERTIES Takahisa Omata, Osaka University, Japan
09:40- 10:00	AVERAGE AND LOCAL STRUCTURE INVESTIGATION OF ION CONDUCTORS BY MEANS OF TOTAL NEUTRON SCATTERING Lorenzo Malavasi, University of Pavia, Italy
10:00 - 10:20	WORK FUNCTIONS OF TRANSPARENT CONDUCTING OXIDES Andreas Klein, Technical University of Darmstadt, Germany
10:20 - 10:50	Coffee break
10:50 - 11:20	KEY PROPERTIES OF INORGANIC MEMBRANES FOR PARTIAL OXIDATION AND ENERGY CONVERSION PROCESSES Michael Schroeder, RWTH Aachen University, Germany
11:20 - 11:40	DISORDER AND DIFFUSION IN VARIOUSLY DOPED MAYENITES Hans Boysen, LMU, Germany
11:40 - 12:00	DEFECT MODEL OF LIQUID APPLIED TO IONIC CONDUCTIVITY OF GLASS Junichi Kawamura, IMRAM, Tohoku University, Japan
12:00 - 12:20	DEFECT STRUCTURE AND TRANSPORT PROPERTIES OF MG-Y-BASED HYDRIDES PREPARED UNDER HIGH PRESSURE Hitoshi Takamura, Tohoku University, Japan
12:20 - 14:00	Lunch

Session IV: Wuensch Symposium
Session Chairs: Sossina Haile & Tom Mason

14:00 - 14:30	A CHEMICALLY DRIVEN INSULATOR-METAL TRANSITION IN AMORPHOUS AND NON-STOICHIOMETRIC GALLIUM OXIDE Manfred Martin, RWTH Aachen University, Germany
14:30 - 15:00	DISCOVERY AND PROGRESS OF IRON-BASED SUPERCONDUCTORS Hideo Hosono, Tokyo Institute of Technology, Japan
15:00 - 15:30	LOW-TEMPERATURE PROTONIC CONDUCTION IN NANOCRYSTALLINE FLUORITE-STRUCTURED OXIDES: CONDUCTION MECHANISM Sangtae Kim, University of California, Davis, USA
15:30 - 16:00	Coffee break
16:00 - 16:30	THE NANO-GRAIN COMPOSITE MODEL (N-GCM): AN ALTERNATIVE TO THE BRICK LAYER MODEL FOR ANALYZING NANOCERAMICS Thomas O. Mason, Northwestern University, USA
16:30 - 17:10	CRYSTAL CHEMISTRY AND STRUCTURE FOR ANION-DEFICIENT FLUORITE PHASES Bernhardt J. Wuensch, Massachusetts Institute of Technology, USA
17:10 - 18:00	**Short Presentation for Poster Session II (Even numbers)**
18:00 - 19:30	Dinner
19:30 - 20:30	**Poster Session II** and Social Hour

Wednesday, March 11, 2009

07:30 - 08:30	Breakfast
	Session V: Magnetic Materials Session Chairs: Manfred Martin & Klaus Becker
08:30 - 09:00	THE DEVELOPMENT OF A-SITE ORDERED MANGANITES UTILIZING OXYGEN NONSTOICHIOMETRY Yutaka Ueda, University of Tokyo, Japan
09:00 - 09:20	NONSTOICHIOMETRY AND PHYSICAL PROPERTIES OF ?-PHASE $Ag_XV_2O_5$ ($0.65 < X < 0.90$) Masahiko Isobe, University of Tokyo, Japan
09:20 - 09:40	STRUCTURE ANALYSIS OF COBALT OXIDE SUPERCONDUCTORS BASED ON COMPOSITE CRYSTAL MODELS Kazunori Takada, National Institute for Materials Science, Japan
09:40 - 10:00	DEFECT-CHEMICAL PROPERTIES AND ELECTRONIC STRUCTURE OF DOPED $BAPRO_3$ Shogo Miyoshi, The University of Tokyo, Japan
10:00 - 10:30	Coffee break
10:30 - 11:00	A HIGH-TEMPERATURE MöSSBAUER STUDY INTO THE STRUCTURE, DISORDER, AND FORMATION KINETICS OF IRON NITRIDES K.-D. Becker, Technical University of Braunschweig, Germany
11:00 - 11:20	SURFACE MODIFICATION OF $(La,Sr)CoO_3$ FOR HIGH PERFORMANCE SOFC CATHODE Koji Amezawa, Tohoku University, Japan
11:20 - 11:40	CHEMICAL ROUTE FROM A SOLID ELECTROLYTE TO AN ELECTRIDE - DEFECT CHEMISTRY OF MAYENITE ($C_{12}A_7$) Juergen Janek, Justus-Liebig-University Giessen, Germany
12:00 - 13:00	Lunch
13:00	Optional excursions
	Dinner on your own

Thursday, March 12, 2009

07:30 – 08:30	Breakfast
	Session VI: Mixed Conductors Session Chairs: H. Tuller & J. Mizusaki
08:30 - 09:00	INVESTIGATION OF CATHODE BEHAVIOR OF MODEL THIN FILM $SrTiI_{1-X}Fe_XO_{3-D}$ MIXED IONIC-ELECTRONIC CONDUCTING ELECTRODES AND CORRELATION WITH DEFECT PROPERTIES Harry Tuller, Massachusetts Institute of Technology, USA
09:00 - 09:20	OXIDATION STATES OF THE TRANSITION METAL CATIONS IN THE HIGHLY NONSTOICHIOMETRIC PEROVSKITE-TYPE OXIDE $BA_{0.1}SR_{0.9}CO_{0.8}FE_{0.2}O_{3-DELTA}$ David N. Mueller, RWTH Aachen, Germany
09:20 - 09:40	OXYGEN NONSTOICHIOMETRY IN MIXED CONDUCTORS FROM ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY IN A THIN FILM GEOMETRY Sossina M. Haile, California Institute of Technology, USA
09:40 - 10:00	ANALYSIS OF STRUCTURAL PHASE TRANSITION OF $BaCe_{1-X}Y_XO_{3-ƒÂ}$ BY THERMAL ANALYSES AND X-RAY DIFFRACTION AT HIGH TEMPERATURES Takuya Hashimoto, Nihon University, Japan
10:00 - 10:30	Coffee break
10:30 - 11:00	B-SITE CATION MIXING EFFECTS ON CHEMICAL STABILITY AND DEFECT EQUILIBRIUM OF $LaCrO_3$ BASED PEROVSKITE-TYPE OXIDE ELECTRONIC CONDUCTORS Junichiro Mizusaki, Tohoku University, Japan
11:00 - 11:20	PHASE STABILITY AND PROTON CONDUCTIVITY OF BARIUM CERATES DOPED BY TRIVALENT CATIONS HAVING DIFFERENT IONIC RADII Byung-Kook Kim, Korea Institute of Science and Technology, Korea
11:20 - 11:40	OXYGEN TRANSPORT KINETICS IN PBCF DOUBLE PEROVSKITE MEMBRANE Ji Haeng Yu, Korea Institute of Energy Research, Korea
11:40 - 12:00	MONITORING OF CHEMICAL POTENTIAL OF OXYGEN ON THE SURFACE OF GROWING OXIDE SCALES IN HIGH TENPERATURE OXIDATION OF METALS AND ALLOYS Toshio MARUYAMA, Tokyo Institute of Technology, Japan
12:00 - 14:00	Lunch

Session VII: Interface/composite/nanosize effects
Session Chairs: S-T. Kim & R. A. De Souza

14:00 - 14:30	STRUCTURE–PROPERTY RELATIONSHIPS FOR TILT GRAIN BOUNDARIES IN STRONTIUM TITANATE Roger A. De Souza, RWTH Aachen University, Germany
14:30 - 14:50	ELASTIC STRAIN IN INTERFACES AND ITS INFLUENCE ON THE INTERFACIAL IONIC TRANSPORT – EXPERIMENTAL STUDIES AND FORMAL CONSIDERATIONS N. Schichtel, Justus-Liebig-University Giessen, Germany
14:50 - 15:10	NANOSCALE CONTROL OF ELECTRODE MATERIALS FOR LI-ION BATTERY AND FUEL CELL Byungwoo Park, Seoul National University, Korea
15:10 - 15:30	OXYGEN PERMEATION PROPERTIES OF $GdBaCO_2O_5$+d-$Ce_{0.8}Gd_{0.2}O_2$ COMPOSITE MEMBRANE Sun-Ju Song, Chonnam National University, Korea
15:30 – 16:00	Coffee break
16:00 – 16:30	STOICHIOMETRY AND PROPERTIES OF COMPLEX OXIDE THIN FILMS Jun Woo Son, University of California, Santa Barbara, USA
16:30 – 16:50	RELATIONSHIP BETWEEN STRUCTURAL AND ELECTRICAL PROPERTIES ON PROTON CONDUCTING $BaZrO_3$ THIN FILM Hiroo Yugami, Tohoku University, Japan
16:50 - 17:10	A COMPREHENSIVE ELECTRICAL CHARACTERIZATION OF ACCEPTOR DOPED $BaTiO_3$ IN QUENCHED STATE Jong-Sook Lee, Chonnam National University, Korea
17:10 – 17:50	**Poster Discussion**
18:30 – 20:30	Conference Banquet with entertainment

Friday, March 13, 2009

07:30 – 08:30	Breakfast
	Session VIII: Solid State Devices Session Chairs: T. Hasegawa & J. Janek
08:30 - 09:00	THREE-TERMINAL ATOMIC SWITCH USING Ta_2O_5 Tsuyoshi Hasegawa, National Institute for Materials Science, Japan
09:00 - 09:20	NONSTOICHIOMETRIC OXIDES AND THEIR APPLICATION TO RESISTIVE SWITCHING MEMORY DEVICES Jinha Hwang, Hongik University, Korea
09:20 - 09:40	CONTROL OF LOCAL ION TRANSPORT TO DEVELOP UNIQUE FUNCTIONAL NANOIONICS DEVICES Kazuya Terabe, National Institute for Materials Science, Japan
09:40- 10:00	MIXED CONDUCTING SILVER(I) POLYCHALCOGENIDE HALIDES, COMPOUNDS WITH UNEXPECTED SWITCHING PROPERTIES Tom Nilges, University of Muenster, Germany
10:00 - 10:20	AB INITIO STUDY ON THE ELECTRONIC CONDUCTION PATHS IN SOLID ELECTROLYTE ATOMIC SWITCHES Satoshi Watanabe, The University of Tokyo, Japan
10:20 - 10:50	Coffee break
10:50 - 11:20	DEFECT CHEMISTRY AND TRANSPORT PROPERTIES OF NITROGEN-DOPED YSZ Juergen Janek, Justus-Liebig-University Giessen, Germany
11:20 – 11:40	FABRICATION AND CHARACTERIZATION OF THE NANO-STRUCTURED THIN FILM ELECTROLYTE Jong-Ho Lee, Korea Institute of Science and Technology, Korea
11:40 - 12:00	THERMAL ATOMIC OXYGEN EMISSION FROM ZIRCONIA Katsuro Hayashi, Tokyo Institute of Technology, Japan
12:00 – 12:10	**Closing Remarks**
12:10	Lunch and Departures

List of Posters

Poster Session 1 (Monday)

<01> REDOX REACTION AND ELECTROCHEMICAL CHARACTERISTIC OF PT-(CE,GD)O2 MIXEDSYSTEM
Kenji Yoshimura, Department of Materials Engineering, University of Tokyo, Japan

<03> IONIC/ELECTRONIC TRANSPORT PROPERTIES AND DEFECT/ELECTRONIC STRUCTURE OF $Ba(ZRr,Pr)O_3$
Mao Tamaru, Department of Materials Engineering, University of Tokyo, Japan

<05> CONCENTRATION-DEPENDENT DIFFUSION OF DONORS IN ZINC OXIDE
Tsubasa Nakagawa, National Institute for Materials Science, Japan

<07> ELECTROCHEMICAL PROPERTIES OF ELECTRODE-SUPPORTED $LA_{0.75}SR_{0.25}GA_{0.8}MG_{0.16}FE_{0.04}O_{3-D}$ SOLID OXIDE FUEL CELLS
Ji Haeng Yu, Korea Institute of Energy Research, Korea

<09> QUANTITATIVE ESTIMATION OF VOLUME FRACTION OF VOID AT METAL/SCALE INTERFACE AND AT THE INTERFACE OF DUPLEX SCALE FORMED DURING HIGH TEMPERATURE OXIDATION OF METALS AND ALLOY
Mitsutoshi Ueda, Tokyo Institute of Technology, Japan

<11> TRANSPORT PROPERTIES OF $La_{0.1}Sr_{0.9}Co_{0.8}Fe_{0.2}O_{3-\hat{i}}$ MEMBRANE
Moon-Bong Choi, Alternative Energy Materials Research Laboratory, School of Materials Science and Engineering, Chonnam National University, Korea

<13> ELECTRICAL PROPERTY OF $BaCe_{0.85}$-XZrXY$_{0.15}O_3$-¥ä (0¡ÂX¡Â$_{0.85}$) PROTON-CONDUCTORS
Cheol-Jae Park, Alternative Energy Materials Research Laboratory, School of Materials Science and Engineering, Chonnam National University, Korea

<15> FIRST PRINCIPLES SIMULATION OF STOICHIOMETRY AND INTERFACE/SURFACE EFFECTS ON IONIC CONDUCTIVITY OF YTTRIA-STABILIZED ZIRCONIA
Shusuke Kasamatsu, Department of Materials Engineering, University of Tokyo, Japan

<17> PREPARATION AND CHARACTERIZATION OF COMPLEX OXIDES FOR WATER PHOTOLYSIS
Eui-Chol Shin, Chonnam National University, Korea

<19> SYNTHESIS AND STRUCTURE OF NONSTOICHIOMETRIC COMPOUND V4O9 AS A MISSING LINK OF WASLEY PHASES
Satoshi Yamazaki, Institute for Solid State Physics, University of Tokyo, Japan

Poster Session 2 (Tuesday)

<02> EFFECT OF OXYGEN NON-STOICHIOMETRY ON THE MAGNETIC PROPERTIES OF TiO_2 THIN FILMS
Lorenzo Malavasi, University of Pavia, Italy

<04> THE MAGNETORESISTANCE OF METAL-RICH $AG_{2+X}SE$ - A PROTOTYPE NANOSCALE METAL/SEMICONDUCTOR DISPERSION
Juergen Janek, Justus-Liebig-University Giessen, Institute of Physical Chemistry, Germany

<06> MOCVD GROWTH OF DOPED CERIA THIN FILMS
Tae-Sik Oh, California Institute of Technology, USA

<08> SYNTHESIS AND PHYSICAL CHARACTERIZATION OF NANO-GRAINED BATIO3 CERAMICS
S.-M. Moon, Inha University, Korea

<10> STRUCTURE OF TI_4O_7 PREPARED BY MECHANOCHEMICAL SYNTHESIS
Kosuke O. Hara, Graduate School of Energy Science, Kyoto University, Japan

<12> EFFECT OF SM AND W CO-DOPING ON PROPERTIES OF FAST OXYGEN ION
Moon-Bong Choi, Alternative Energy Materials Research Laboratory, School of Materials Science and Engineering, Chonnam National University, Korea

<14> FIRST PRINCIPLES STUDY ON THE ELECTRONIC STRUCTURE AND REACTIVITY OF Ni/H/ZrO_2 TRIPLE PHASE BOUNDARY IN SOLID OXIDE FUEL CELL
Tomofumi Tada, Department of Materials Engineering, University of Tokyo, Japan

<16> ROLES OF OXYGEN VACANCY AND INTERSTITIAL CU IN ATOMIC SWITCH OF Ta_2O_5: AN AB INITIO STUDY
Tingkun Gu, Department of Materials Engineering, University of Tokyo, Japan

<18> ACCEPTOR CENTERS IN GA2O3
Detlev M. Hofmann, Physics Institute, University of Giessen, Germany