

Symposium 6: Advances in Electro Ceramics

Main Organizers

- Satoshi Wada, University of Yamanashi, Japan
- Clive A. Randall, The Pennsylvania State University, USA

Co-Organizers

- Takashi Iijima, AIST, Japan
- Yoshihiko Imanaka, Fujitsu, Japan
- Naoki Ohashi, NIMS, Japan
- Toshio Kamiya, Tokyo Institute of Tech., Japan
- Toshimasa Suzuki, Taiyo-yuden, Japan
- Wataru Sakamoto, Nagoya Univ., Japan
- Hajime Nagata, Tokyo University of Science
- Rintaro Aoyagi, Nagoya Institute of Technology, Japan
- Susan Trolier-McKinstry, The Pennsylvania State University, USA
- Ian Reaney, University of Sheffield, England
- Dragan Damjanovic, EPFL, Switzerland
- Long-Qing Chen, The Pennsylvania State University, USA
- Guorong Li, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China
- Derek Sinclair, University of Sheffield, UK
- Suk-Joong L. Kang, KAIST, Korea
- Shashank Priya, Virginia Tech., USA

Oral Session

Monday, November 15

Room: 1004

14:15 - 16:00: High Frequency Application and New Dielectric Materials I

Chair: Ian M Reaney (University of Sheffield, UK)

14:15-14:45

S6-001 Ceramic-based Dielectric Film on Polymer Film for Embedded Passive and Stretchable Electronics (Invited)

Y. Imanaka, F. Kumasaka, H. Amada; Fujitsu Laboratories Ltd., Japan

14:45-15:15

S6-002 Low Temperature Sintering Dielectric Ceramics for Passive Integration in RF to Microwave Range (Invited)

H. Wang; Xi'an Jiaotong University, China

15:15-15:45

S6-003 Intrinsic Dielectric Properties of Al₂O₃ Single Crystal at Millimeter Wave Frequency (Invited)

I. Ueda¹, T. Shimada¹, J. Krupka²; ¹Hitachi Metals LTD., Japan, ²Warsaw University of Technology, Poland

15:45-16:00

S6-004 Development of LTCC Materials with High Mechanical Strength

S. Kawai, S. Nishiura, Y. Terashi, T. Furuse; Kyocera corporation, Japan

16:00 - 16:15 Break

Symposium 6

16:15 - 17:45: High Frequency Application and New Dielectric Materials II

Chair: Wataru Sakamoto (Nagoya University, Japan)

16:15-16:45

S6-005 **Circularly Polarized Dielectrically-Loaded Antennas: Current Technology and Future Challenges (Invited)**

L. M. Reaney¹, B. Zalinska¹, M. Mirsaneh², O. Leisten³; ¹University of Sheffield, UK, ²University of Southampton, UK, ³Sarantel Ltd, UK

16:45-17:15

S6-006 **Experimental Characterization and Theoretical Analysis of Highly Tunable Paraelectric Perovskite Thin Films (Invited)**

I. P. Koutsaroff, S. Higai, A. Ando, H. Takagi, H. Ieki; Murata Manufacturing Co., Ltd., Japan

17:15-17:30

S6-007 **Z-, Y- and M-Type Hexagonal Ferrites for High-Frequency Multilayer Inductors**

J. Töpfer¹, S. Kracunovska¹, S. Barth², B. Pawlowski², F. Bechtold³, J. Müller⁴; ¹Univ. Appl. Sciences Jena, Germany, ²Fraunhofer IKTS Hersdorf, Germany, ³Via Electronic GmbH Hermsdorf, Germany, ⁴Tech. Univ. Ilmenau, Germany

17:30-17:45

S6-008 **The Ultra-Low Temperature Firing Microwave Dielectric Ceramics with Low-k, Medium-k and High-k for Multilayer Co-Firing Applications**

D. Zhou¹, H. Wang¹, C. Randall², X. Yao¹; ¹Key Laboratory of the Ministry of Education, Xi'an Jiaotong University, China, ²The Pennsylvania State University, USA

Tuesday, November 16

Room: 1004

9:00 - 10:30: High Frequency Application and New Dielectric Materials III

Chair: Takaaki Tsurumi (Tokyo Institute of Technology, Japan)

9:00-9:45

S6-009 **Progress in Flexure Mode Designed Flexoelectric Piezoelectric Composites (Invited)**

B. Chu, W. Zhu, N. Li, L. E. Cross; Pennsylvania State University, USA

9:45-10:15

S6-010 **AlN Thin Films: New Developments in Growth, Property Modification, and Applications (Invited)**

A. Artieda, R. Matloub, E. Milyutin, P. Muralt; EPFL, Switzerland

10:15-10:30

S6-011 **Microwave Dielectric Properties and Crystal Structures on Ni-doped Cordierite and Indialite System**

H. Ohsato^{1,2}, A.-Y. Kim¹, C.-I. Cheon¹, K.-W. Chae¹, J.-S. Kim¹, I. Kagomiya³; ¹Hoseo University, Korea, ²Nagoya Industrial Science Research Institute, Japan., ³Nagoya Institute of Technology, Japan

10:30 - 10:45 **Break**

10:45 - 11:45: High Frequency Application and New Dielectric Materials IV

Chair: L.Eric Cross (Penn State University, USA)

10:45-11:00

S6-012 **Effect of Particle Shape on Absorption Characteristics of Composite Electromagnetic Wave Absorber Made of Sendust Particles Dispersed in Polystyren Resin**

K. Sakai^{1,2}, Y. Guan¹, Y. Sato¹, S. Yoshikado¹; ¹Doshisha University, Japan, ²Japan Society for the Promotion of Science, Japan

11:00-11:15

S6-013 Colossal Dielectric Constants in Transition-Metal Oxides
S. Krohns, P. Lunkenheimer, A. Loidl; University of Augsburg, Germany

11:15-11:45

S6-014 High-*k* Dielectrics Assembled from Oxide Nanosheets (Invited)
M. Osada^{1,2}, T. Sasaki^{1,2}; ¹National Institute for Materials Science, Japan, ²Japan Science and Technology Agency, Japan

14:15 - 16:00: Capacitor and Local Structure Characterization I

Chair: Clive Alan Randall (The Pennsylvania State University, USA)

14:15-15:00

S6-015 Evolution of Multi-layer Ceramic Capacitor Technology and Challenge to the Margin (Invited)
H. Chazono; Taiyo Yuden Co., Ltd., Japan

15:00-15:30

S6-016 Effect of Variable-Valence Acceptors on the Resistance Degradation Behavior of BaTiO₃ Ceramics and MLCC (Invited)
S.-H. Yoon¹, S.-H. Kang¹, J.-Y. Park¹, S.-H. Kwon¹, K.-H. Hur¹, C. A. Randall²; ¹Samsung Electro-Mechanics Co. Ltd., Korea, ²The Pennsylvania State University, USA

15:30-16:00

S6-017 For Understanding Reliability Issue of MLCC (Invited)
T. Tsurumi, T. Hoshina, H. Takeda; Tokyo Institute of Technology, Japan

16:00 - 16:15 Break

16:15 - 18:00: Capacitor and Local Structure Characterization II

Chair: Satoshi Wada (University of Yamanashi, Japan)

16:15-16:45

S6-018 Improvement of Reliability of Dielectrics for MLCC (Invited)
 N. Kubodera, T. Yao, T. Nakamura, N. Wada, H. Takagi; Murata Manufacturing Co., Ltd., Japan

16:45-17:00

S6-019 Unravelling the Electrical Properties of ACu₃Ti₄O₁₂ Perovskites
D. C. Sinclair; University of Sheffield, UK

17:00-17:15

S6-020 Ca Substitution Effect in BaTi₂O₅ Glass-Ceramics
A. Masuno¹, C. Moriyoshi², T. Mizoguchi¹, H. Inoue¹, F. Yoshida², Y. Kuroiwa², Y. Arai³, J. Yu³; ¹the University of Tokyo, Japan, ²Hiroshima University, Japan, ³Japan Aerospace Exploration Agency, Japan

17:15-17:30

S6-021 Phase-Field Model of Resistance Degradation of Dielectric Capacitors
 Y. Cao, S. Bhattacharya, C. A. Randall, L. Q. Chen; Penn State University, USA

17:30-18:00

S6-022 Direct Analysis of Atomic Site Occupancy in Rare-earth Doped BaTiO₃ Ceramics by Cs-corrected STEM-EDX (Invited)
S. Ueda, Y. Fujikawa; TDK Corporation, Japan

Symposium 6

Wednesday, November 17

Room: 1004

9:00 - 10:15: Capacitor and Local Structure Characterization III

Chair: Derek Sinclair (University of Sheffield, UK)

9:00-9:30

S6-023 Defects in Perovskite-based Materials (President - Designated)

C. A. Randall¹, R. Maier¹, S. I. Lee¹, R. Levi², S. H. Yoon³; ¹The Pennsylvania State University, USA, ²Intel, USA, ³Samsung Electro-Mechanics, Korea

9:30-10:00

S6-024 Grain Growth in Perovskites with Respect to Interface Structure and Defects (Invited)

S.-J. L. Kang; Korea Advanced Institute of Science and Technology, Korea

10:00-10:15

S6-025 Anneal Effect for Dielectric Properties of Barium Titanate Films Deposited by Aerosol Deposition Method

M. Suzuki, J. Akedo; National Institute of Advanced Industrial Science and Technology, Japan

10:15 - 10:45 Break

10:45 - 12:00: Modeling of Functional Electroceramics and Local Structure Characterization I

Chair: Suk-Joong L. Kang (KAIST, Korea)

10:45-11:15

S6-026 Numerical Simulations of Ferroelectric Ceramic Materials with Defects (Invited)

A. K. Soh; The University of Hong Kong, China

11:15-11:30

S6-027 The Defect Chemistry of Rare Earth-doped Barium Titanate

D. C. Sinclair, L. Ben, J. Dawson, C. L. Freeman, J. Harding; University of Sheffield, UK

11:30-12:00

S6-028 *Ab-initio* Point Defect Energetics in Rutile Titanium Dioxide (Invited)

E. C. Dickey, X. Li, J. Britson; Pennsylvania State University, USA

13:15 - 15:00: Modeling of Functional Electroceramics and Local Structure Characterization II

Chair: Long-Qing Chen (Penn State University, USA)

13:15-14:00

S6-029 New Directions in Modeling Electroceramics (Invited)

A. M. Rappe; University of Pennsylvania, USA

14:00-14:30

S6-030 Ferroelectric Nanopowders and Nanostructures by Solid-state Reaction. Microstructure Control through Nanoscale Engineering (Invited)

V. Buscaglia¹, M. T. Buscaglia¹, A. Bassano¹, V. Kalyani², P. Nanni^{1,2}; ¹IENI-CNR, Italy, ²University of Genoa, Italy

14:30-14:45

S6-031 Ferroelectric Domain Structures in Multiferroic BiFeO₃ Thin Films

P. P. Wu¹, B. Winchester¹, D. G. Schlom², Y. H. Chu³, R. Ramesh⁴, S. V. Kalinin⁵, X. Q. Pan⁶, C. B. Eom⁷, L. Q. Chen¹; ¹Pennsylvania State University, USA, ²Cornell University, USA, ³National Chiao Tung University, Taiwan, ⁴University of California, Berkeley, USA, ⁵Oak Ridge National Laboratory, USA, ⁶University of Michigan, USA, ⁷University of Wisconsin, USA

14:45-15:00

- S6-032 Cation Off-stoichiometry at/near Surfaces in SrTiO₃**
T. Yamamoto¹, N. Shibata¹, T. Mizoguchi¹, Y. Ikuhara^{1,2}; ¹The University of Tokyo, Japan, ²Tohoku University, Japan

15:00 - 15:15 Break

15:15 - 17:15: Modeling of Functional Electroceramics and Local Structure Characterization III

Chair: Vincenzo Buscaglia (National Research Council - CNR, Italy)

15:15-15:45

- S6-033 Measurements of Local Structure in Electroceramics (Invited)**
I. Levin; National Institute of Standards and Technology, USA

15:45-16:00

- S6-034 Domain Structures with Multiple Inhomogeneities in the Monoclinic Phase of 0.68Pb(Mg_{1/3}Nb_{2/3})O₃-0.32PbTiO₃**
S. Mori¹, K. Kurushima²; ¹Osaka Prefecture University, Japan, ²Toray Research Center, Japan

16:00-16:15

- S6-035 Rapid and High Sensitive Structure Evaluation of Ferroelectric Films Using Micro-Raman Spectroscopy**
M. Nishide¹, T. Tai², T. Katoda², S. Yokoyama³, H. Funakubo³, K. Nishida¹, T. Yamamoto¹; ¹National Defense Academy, Japan, ²Kochi University of Technology, Japan, ³Tokyo Institute of Technology, Japan

16:15-16:45

- S6-036 *In Situ* Crystal Structure Investigation of BaTiO₃-Based Ceramics under Electric Fields by High Energy Synchrotron Radiation Diffraction (Invited)**
Y. Kuroiwa; Hiroshima University, Japan

16:45-17:15

- S6-037 Contributions to the Converse Piezoelectric Coefficients in Ferroelectric Ceramics Revealed Using *In Situ* X-ray Diffraction (Invited)**
J. L. Jones¹, A. Pramanick^{1,2}, J. C. Nino¹, J. E. Daniels^{3,4}, D. Damjanovic⁵; ¹University of Florida, FL, USA, ²Oak Ridge National Laboratory, USA, ³European Synchrotron Radiation Facility, France, ⁴University of New South Wales, Australia, ⁵Swiss Federal Institute of Technology in Lausanne - EPFL, Switzerland

Thursday, November 18

Room: 1004

9:00 - 10:30: Low Temperature Processing I

Chair: Guorong Li (Shanghai Institute of Ceramics, Chinese Academy of Sciences, China)

9:00-9:45

- S6-038 Soft Processing of Electro-Ceramics: Feature and Future (Invited)**
M. Yoshimura^{1,2}; ¹Tokyo Institute of Technology, Japan, ²National Cheng Kung University, Taiwan

9:45-10:15

- S6-039 Direct-Write, Chemically-Prepared Temperature Insensitive Dielectrics (Invited)**
J. F. Carroll III, B. A. Tuttle, B. A. Hernandez-Sanchez, P. Mahoney, D. L. Moore, P. Lu; Sandia National Laboratories, USA

10:15-10:30

- S6-040 Preparation and Characterization of LiNbO₃ Nanocrystals and Nanocomposite Thin Films (Invited)**
A. M. Harun, F. Bygrave, T. P. Comyn, A. J. Bell; University of Leeds, UK

Symposium 6

10:45 - 12:00: Low Temperature Processing II

Chair: Masahiro Yoshimura (Tokyo Institute of Technology, Japan and National Cheng Kung University, Taiwan)

10:45-11:15

S6-041 Optical and Electric Properties of PMN-PT Transparent Ceramics (Invited)

G. Li¹, W. Ruan¹, J. Zeng¹, L. Zheng¹, H. Zeng¹, A. Ding¹, L. S. Kamzina²; ¹Chinese Academy of Sciences, China, ²Russian Academy of Science, Russia

11:15-11:30

S6-042 Textured Microstructure and A-site Occupancy in Niobate Ceramics with Tungsten Bronze Structure: an Analytical TEM Study

H. Gu, X. Wang; Chinese Academy of Sciences, China

11:30-12:00

S6-043 Microscopic Properties and Electronic Structure of the O-deficient Amorphous Semiconducting Oxides (Invited)

I.-J. Kang, C. H. Park; Pusan National University, Korea

13:15 - 15:00: Low Temperature Processing III

Chair: Andrew J. Bell (University of Leeds, UK)

13:15-13:45

S6-044 Room Temperature Impact Consolidation (RTIC) of Fine Ceramic Powder by Aerosol Deposition Method and Its Mechanism (Invited)

J. Akedo; National Institute of Advanced Industrial Science and Technology, Japan

13:45-14:15

S6-045 Low Temperature Synthesis of Epitaxial KNbO₃ Thick Films Grown by Hydrothermal Method (Invited)

M. Ishikawa¹, H. Einishi¹, T. Hasegawa¹, T. Morita², M. Kurosawa¹, H. Funakubo¹; ¹Tokyo Institute of Technology, Japan, ²The University of Tokyo, Japan

14:15-14:30

S6-046 New Ferroelectric Aurivillius Oxides: Incorporation of Sc³⁺ in Stoichiometric Compositions

T. Sivakumar, M. Itoh; Tokyo Institute of Technology, Japan

14:30-14:45

S6-047 Doped and Non-doped Barium Titanate Prepared from a New Water-based Precursor-solution

Y. Matsushima, K. Iwase, S. Kasuga, T. Kawai; Yamagata University, Japan

14:45-15:00

S6-048 Direct Synthesis of Platelet KNbO₃ Particles from KNb₃O₈ Precursor Using New Topochemical Conversion Method

K. Kakimoto, K. Sugiyama, I. Kagomiya; Nagoya Institute of Technology, Japan

15:00 - 15:15 Break

15:15 - 16:30: Low Temperature Processing IV

Chair: Satoshi Wada (University of Yamanashi, Japan)

15:15-15:45

S6-049 Microwave Processing for Sintering at Low Temperature (Invited)

T. S. Suzuki¹, M. Sekimoto^{2,1}, H. Tanaka¹, T. Nishimura¹, Y. Sakka^{1,2}; ¹National Institute for Materials Science, Japan, ²University of Tsukuba, Japan

15:45-16:00

S6-050 T-x-y Diagrams Computer Models for Lead-Free Soldering Systems

V. Lutsyk, V. Vorobjeva; RAS, Russia

16:00-16:30

S6-051 Fractal Geometry and Contact Surface Area Modelling of Electroceramics (Invited)

V. Mitic^{1,2}, V. B. Pavlovic³, V. Paunovic¹, L. Kocic¹, L. Zivkovic¹; ¹University of Nis, Serbia, ²Serban Academy of Science and Arts Serbia, ³University of Belgrade, Serbia

Monday, November 15

Room: 1005

14:15 - 16:00: Transparent Electrodes & Semiconductor Ceramics I

Chair: Naoki Ohashi (National Institute for Materials Science, Japan)

14:15-14:45

S6-053 Density Functional Approach to Point Defects in Oxide Semiconductors (Invited)

F. Oba; Kyoto University, Japan

14:45-15:15

S6-054 Preparation of Ga-doped ZnO Tablets and Application to Thin Films Deposited by Ion-plating Method (Invited)

A. Senjuh¹, N. Kuroiwa¹, T. Yamamoto¹, Y. Sato², H. Makino², N. Yamamoto², T. Yamamoto²; ¹Hakusui Tech Co., Ltd., Japan, ²Kochi University of Technology, Japan

15:15-15:30

S6-055 Properties of Al Doped Zinc Oxide Films Prepared by Electron Beam-PVD

N. Yamaguchi, T. Kuroyama, Y. Okuhara, H. Matsubara; Japan Fine Ceramics Center, Japan

15:30-15:45

S6-056 First Attempt to Evaluate Nitrogen Diffusivity in AlN

T. Ohgaki¹, H. Haneda^{1,2}, I. Sakaguchi¹, K. Watanabe¹, S. Hishita¹, Y. Adachi¹, N. Ohashi^{1,2}; ¹National Institute for Materials Science, Japan, ²Kyushu University, Japan

15:45-16:00

S6-057 ZnO Thin Films Grown by Electrochemical Deposition Method with Pulsed Electrolytic Current and Its Electrical Conductivity

A. Ashida, T. Okuma, T. Nagata, N. Fujimura; Osaka Prefecture University, Japan

16:00 - 16:15 Break

16:15 - 18:00: Transparent Electrodes & Semiconductor Ceramics II

Chair: Fumiyasu Oba (Kyoto University, Japan)

16:15-16:45

S6-058 Structural Variation in ZnO-LiGaO₂ Pseudo-Binary System and Appearance of Novel Compound Semiconductor; Zn₂LiGaO₄ (Invited)

T. Omata¹, M. Kita², K. Tachibana¹, S. Otsuka-Yao-Matsuo¹; ¹Osaka University, Japan, ²Toyama National College of Technology, Japan

16:45-17:15

S6-059 Fabrication of MgO(111) Polar Films by Pulsed Laser Deposition (Invited)

T. Susaki^{1,2}, S. Kumada¹, H. Ishida¹, K. Matsuzaki¹, H. Hosono^{1,2}; ¹Tokyo Institute of Technology, Japan, ²Japan Science and Technology Agency, Japan

17:15-17:30

S6-060 Tailoring the Microstructure and Current-Voltage Characteristics of ZnO-Based Varistor Ceramics Using an IBs-Induced Grain-Growth Mechanism

S. Bernik^{1,2}, M. Podlogar¹, N. Daneu^{1,2}, A. Rečnik^{1,2}; ¹Jozef Stefan Institute, Slovenia, ²Center of Excellence NAMASTE, Slovenia

Symposium 6

17:30-17:45

S6-061 Near-Infrared Reflection from Al-doped ZnO films Prepared by Multi-Target Reactive Sputtering
Y. Okuhara¹, H. Matsubara¹, M. Takata²; ¹Japan Fine Ceramics Center, Japan, ²Nagaoka University of Technology, Japan

17:45-18:00

S6-062 Observation of Potential Distribution at Interface by Hard-x-ray Photoelectron Spectroscopy
N. Ohashi, J. Li, S. Ueda, Y. Yamashita, H. Yoshikawa, K. Kobayashi, I. Sakaguchi, Y. Adachi, H. Okushi, H. Haneda; National Institute for Materials Science, Japan

Tuesday, November 16

Room: 1005

9:00 - 10:30: Multiferroelectrics I

Chair: Shuxiang Dong (Peking University, China)

9:00-9:45

S6-063 Domain Wall Nanoelectronics (Invited)
R. Ramesh; University of California, Berkeley, USA

9:45-10:15

S6-064 Structural Studies of BiMO₃ Perovskites: Bi₂Mn_{2/3}M_{2/3}Ni_{2/3}O₆, Bi₂Ti_{3/4}Fe_{1/2}M_{3/4}O₆ and Bi₂M'M''O₆ (Invited)
J. B. Claridge; University of Liverpool, UK

10:15-10:30

S6-065 Influence of Magneto-electric Coefficient for Magnetic and Electric Charge Injection Properties on Magneto-electric MIS Capacitor
T. Yokota, Y. Tsuboi, R. Imura, S. Kito, M. Gomi; Nagoya Institute of Technology, Japan

10:30 - 10:45 Break

10:45 - 11:45: Multiferroelectrics II

Chair: Toshio Kamiya (Tokyo Institute of Technology, Japan)

10:45-11:00

S6-066 YSZ Thin Films by Ultrasonic Aerosol Assisted Chemical Vapor Deposition (UAA-CVD)
M. V. F. Schlupp, J. L. M. Rupp, A. Bieberle-Hütter, L. J. Gauckler; ETH Zürich, Switzerland

11:00-11:15

S6-067 Densification Behavior of Gadolinium-doped Ceria upon Sintering on an Atomic Scale
T. Kosaka, K. Sato; Tokyo Gakugei University, Japan

11:15-11:30

S6-068 Effect of Distance between Wire and Glass Substrate on Particle Size of Tungsten Oxide Prepared by Electric Current Heating Method Using Tungsten Wire
T. Hagizawa, T. Honma, Y. Kuroki, T. Okamoto, M. Takata; Nagaoka University of Technology, Japan

11:30-11:45

S6-069 PTCR Properties of (Gd,Yb)-Mn Co-doped (Ba,Sr)TiO₃ Fired in Ar
N. Takeuchi, E. Nakamura, H. Kobayashi; Kyoto Institute of Technology, Japan

14:15 - 16:00: Multiferroelectrics III

Chair: Muralt Paul (EPFL, Switzerland)

14:15-14:45

S6-070 A Resonance Bending Bode Magnetolectric Coupling Equivalent Circuit (Invited)
M. Guo, S. Dong; Peking University, China

14:45-15:15

S6-071 Magnetolectric Composites Thick Films by Aerosol-Deposition (Invited)

J. Ryu¹, G. Han¹, N.-K. Oh¹, C.-W. Baek², D.-Y. Jeong², J.-W. Kim¹, W.-H. Yoon¹, D.-S. Park¹, C.-S. Park³, S. Priya³; ¹Korea Institute of Materials Science, Korea, ²Myong-Ji University, Korea, ³Virginia Tech, USA

15:15-15:45

S6-072 Phenomenological Model on Electric-Field-Induced Magnetic Easy Axis Reorientation in Multiferroic Layered Heterostructures (Invited)

J. M. Hu, C. W. Nan; Tsinghua University, China

15:45-16:00

S6-073 Cofiring of Integrated Ferrite+Dielectric Laminates

Y.-L. Tung¹, R.-T. Hsu¹, J.-H. Jean¹, S.-C. Lin²; ¹National Tsing Hua University, Taiwan, ²ACX Corp., Taiwan

16:00 - 16:15 Break

16:15 - 18:00: Energy Ferroelectrics I

Chair: Susan Trolier-McKinstry (Penn State University, USA)

16:15-17:00

S6-074 Energy Harvesting with Piezoelectric Thin Film Micro Structures: Status and Promises (Invited)

P. Muralt; EPFL, Switzerland

17:00-17:30

S6-075 Potential Thermoelectric Materials: Ferroelectric Oxides (Invited)

S. Lee, C. A. Randall; The Pennsylvania State University, USA

17:30-18:00

S6-076 Bismuth-based Compounds for Lead-free Piezoelectric Materials (Invited)

K. Datta, S. Gorfman, P. Thomas; University of Warwick, South Africa

Wednesday, November 17

Room: 1005

9:00 - 10:30: Energy Ferroelectrics II

Chair: Kenji Uchino (The Penn State University, USA)

9:00-9:30

S6-077 Processing of Piezoelectric Films for MEMS Applications (Invited)

S. Trolier-McKinstry; Penn State University,

9:30-10:00

S6-078 Nonlinear Energy Harvesting (Invited)

M. Lallart, D. Guyomar; Université de Lyon, France

10:00-10:15

S6-079 PLZT-Based Photovoltaic Piezoelectric Transformer with Light Feedback

L. Kozielski¹, M. Adamczyk¹, J. Erhart²; ¹University of Silesia, Poland, ²International Center for Piezoelectric Research, Czech Republic

10:15-10:30

S6-080 Characterization of Direct Piezoelectric Effect for Vibration Energy Harvesting

T. Toshimura¹, H. Miyabuchi¹, S. Murakami², A. Ashida¹, N. Fujimura¹; ¹Osaka Prefecture University, Japan, ²Technology Research Institute of Osaka Prefecture, Japan

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10:45 - 11:45: Energy Ferroelectrics III

Chair: Hajime Nagata (Tokyo University of Science, Japan)

10:45-11:15

S6-081 Preparation and Characteristics of Piezoelectric Thick Films (Invited)

D.-S. Parik, J. Ryu, J.-J. Choi, B.-D. Hahn, W.-H. Yoon, J.-W. Kim; Korea Institute of Materials Science, Korea

11:15-11:30

S6-082 Universal Loss Characterization Methodology in Smart Materials

K. Uchino; The Penn State University, USA

11:30-11:45

S6-083 Porosity Dependence of Piezoelectric Properties for Porous Potassium Niobate System Ceramics

S. Wada, K. Maeda, Y. Mase, S. Shimizu, I. Fujii, K. Nakashima, N. Miyajima; University of Yamanashi, Japan

13:15 - 15:00: Piezoelectric Materials I

Chair: Takashi Iijima (National Institute of Advanced Industrial Science and Technology, Japan)

13:15-14:00

S6-084 Current Developments and Future Prospective of Perovskite-type Lead-free Piezoelectric Ceramics (Invited)

T. Takenaka, Y. Hiruma, H. Nagata; Tokyo University of Science, Japan

14:00-14:30

S6-085 Electric-Field Effects in Bi-based Perovskites (Invited)

J. Rödel, W. Jo; TU Darmstadt, Germany

14:30-14:45

S6-086 Abnormally Enhanced Electric-Field-Induced Strain of $\text{Bi}_{0.5}(\text{Na}_{0.82}\text{K}_{0.18})_{0.5}\text{TiO}_3$ Lead-Free Piezoelectric Ceramics by Sn Doping

K.-N. Pham¹, H.-S. Han¹, V. D. N. Tran¹, I. W. Kim¹, S.-J. Jeong², J.-S. Lee¹; ¹University of Ulsan, Korea, ²Korea Electrotechnology Research Institute, Korea

14:45-15:00

S6-087 Piezoelectric Properties and Field-induced Strain of Textured $(\text{Bi}_{1/2}\text{K}_{1/2})\text{TiO}_3$ -Based Ceramics

H. Nagata, M. Saitoh, F. Kawata, Y. Hiruma, T. Takenaka; Tokyo University of Science, Japan

15:15 - 17:15: Piezoelectric Materials II

Chair: Tadashi Takenaka (Tokyo University of Science, Japan)

15:15-15:45

S6-088 Bi-Based Ferroelectric Single Crystals Grown by High-Oxygen-Pressure Top-Seeded Solution Growth Method (Invited)

Y. Noguchi, Y. Kitanaka, H. Onozuka, A. Morishita, M. Miyayama; The University of Tokyo, Japan

15:45-16:00

S6-089 Electric Field-Induced Strain in $(\text{Na KLi})(\text{NbTa})\text{O}_3$ Ceramics

S.-J. Jeong¹, D.-S. Lee¹, M.-S. Kim¹, J.-S. Lee²; ¹Korea Electrotechnology Research Institute, Korea, ²Ulsan University, Korea

16:00-16:15

S6-090 Polarization Behavior in the $\text{Na}_{0.5}\text{Bi}_{0.5}\text{TiO}_3\text{-Li}_{3x}\text{La}_{(2/3-x)\dagger(1/3-2x)}\text{TiO}_3$ System

D. Suvorov, M. Spreitzer; Jozef Stefan Institute, Slovenia

16:15-16:30

S6-091 Growth Control of BiFeO_3 Thin Films by Oxide Buffer Layers and Heterolayered Multiferroic Structures

J. Wang, J. Wu, H. J. Liu; National University of Singapore, Singapore

16:30-16:45

S6-092 A New Approach to Enhance Piezoelectric Response of Li-modified (K, Na)NbO₃ Lead-free Piezoelectric Ceramics

J.-F. Li, K. Wang; Tsinghua University, China

16:45-17:15

S6-093 Domain-wall Contribution to Dielectric and Piezoelectric Properties of Fine-grained BaTiO₃ Ceramics (Invited)

T. Hoshina, Y. Kigoshi, T. Yamazaki, S. Hatta, T. Teranishi, H. Takeda, T. Tsurumi; Tokyo Institute of Technology, Japan

Thursday, November 18

Room: 1005

9:00 - 10:30: Piezoelectric Materials III

Chair: Rintaro Aoyagi (Nagoya Institute of Technology, Japan)

9:00-9:30

S6-094 High Temperature ReCOB Piezocrystals: Recent Developments (Invited)

S. Zhang¹, F. Yu^{1,2}, Y. Fei³, E. Frantz¹, X. Zhao², D. Yuan², B. H. T. Chai³, D. Snyder¹, T. R. Shrout¹;
¹Pennsylvania State University, USA, ²Shandong University, China, ³Crystal Photonics Inc., USA,

9:30-9:45

S6-095 Growth, Structure and Electrical Properties of Aluminum Substituted Langasite Family Crystals

H. Takeda¹, J. Yamaura², T. Hoshina¹, T. Tsurumi¹; ¹Tokyo Institute of Technology, Japan, ²The University of Tokyo, Japan

9:45-10:00

S6-096 Microstructure and Textue Development in Lead-Free Piezoelectric Ceramics Made by a Templated Grain Growth Process

T. Kimura; Keio University, Japan

10:00-10:15

S6-097 Tetragonal-Rhombohedral Morphotropic Phase Boundary In Perovskite Niobate-Based Solid Solutions

R. Wang¹, H. Bando¹, M. Itoh²; ¹National Institute of Advanced Industrial Science and Technology, Japan, ²Tokyo Institute of Technology, Japan

10:15-10:30

S6-098 Anomalous Discharge Characteristics and Piezoelectric Property of Alkali Niobate Piezoceramics

H. Matsudo, K. Kakimoto, I. Kagomiya; Nagoya Institute of Technology, Japan

10:30 - 10:45 **Break**

10:45 - 12:00: Piezoelectric Materials IV

Chair: Shujun Zhang (Pennsylvania State University, USA)

10:45-11:15

S6-099 Enhanced Properties of Electro-Ceramics by Low Temperature Microwave Sintering (Invited)

J. Kim¹, S.-H. Choi¹, H.-W. Lee¹, J. Moon²; ¹Korea Institue of Sci & Tech., Korea, ²Yonsei University, Korea

11:15-11:30

S6-100 Rhombohedral-Tetragonal Transition and Enhanced Piezoelectric Property of (1-x)BiFeO₃-xBiCoO₃ Solid Solution Thin Films

Y. Nakamura, M. Kawai, M. Azuma, Y. Shimakawa; Kyoto University, Japan

Symposium 6

11:30-11:45

S6-101 Synthesis and Characterization of Lead-Free Piezoelectric NaNbO₃-BaTiO₃ Thin Films by Chemical Solution Deposition

W. Sakamoto¹, Y. Hamazaki¹, H. Maiwa², B.-Y. Lee³, T. Iijima³, M. Moriya¹, T. Yogo¹; ¹Nagoya University, Japan, ²Shonan Institute of Technology, Japan, ³National Institute of Advanced Industrial Science and Technology, Japan

11:45-12:00

S6-102 Structural, Dielectric, and Piezoelectric Properties of BaTiO₃-Bi(Mg_{1/2}Ti_{1/2})O₃ Ceramics

I. Fujii, R. Mitsui, K. Yamato, K. Nakashima, N. Kumada, S. Wada; University of Yamanashi, Japan

13:15 - 15:00: Piezoelectric Materials V

Chair: Ho-Yong Lee (Sunmoon University, Korea)

13:15-13:45

S6-103 Stress Induced Behavior of PMN-PT and KNN Thick Films (Invited)

M. Kosec, H. Uršič, J. Pavlič, T. Rojac, J. Holc; Jozef Stefan Institute, Slovenia

13:45-14:00

S6-104 Influence of BZT Content on Crystallographic and Ferroelectric Properties in PZT-BZT Materials

C. Mohamed-Tahar¹, Y. Sugiyama², Y. Tasaki³, H. Ishiwara¹, H. Funakubo¹; ¹Tokyo Institute of Technology, Japan, ²Fujitsu Laboratories, Ltd., Japan, ³Toshiba Manufacturing Co., Ltd., Japan

14:00-14:15

S6-105 High-Pressure Synthesis and Characterization of Novel LiNbO₃-type Oxides

Y. Inaguma¹, A. Aimi¹, K. Tanaka¹, D. Mori¹, T. Tsuchiya¹, M. Yoshida¹, T. Katsumata², T. Ohba³, K. Hiraki¹, T. Takahashi¹, M. Nakayama⁴, J. Yeon⁵, P. S. Halasyamani⁵; ¹Gakushuin Univ., Japan, ²Tokai Univ., Japan, ³Chiba Univ., Japan, ⁴Nagoya Inst. of Tech., Japan, ⁵Univ. of Houston, USA

14:15-14:30

S6-106 Triple-point-driven Nanodomains in Lead-free BZT-BCT Ceramics—the Origin of Strong Piezoelectricity Competing with PZT

J. Gao^{1,2}, D. Xue^{1,2}, X. Ren^{1,2}; ¹Xi'an Jiaotong University, China, ²National Institute for Materials Science, Japan

14:30-15:00

S6-107 Phase Transitions in Relaxed Epitaxial Pb(Zr_{1-x}Ti_x)O₃ Films (Invited)

D. S. Tinberg¹, R. L. Johnson-Wilke¹, D. D. Fong², T. T. Fister², S. K. Streiffer³, Y. Han⁴, I. M. Reaney⁴, S. Trolier-McKinstry¹; ¹The Pennsylvania State University, USA, ²Argonne National Laboratory, USA, ³Argonne National Laboratory, USA, ⁴University of Sheffield, UK

15:15 - 16:15: Piezoelectric Materials VI

Chair: Wataru Sakamoto (Nagoya University, Japan)

15:15-15:45

S6-108 High T_C/T_{RT}/E_C PMN-PZT Single Crystals Fabricated by Solid-State Crystal Growth (SSCG) Technique (Invited)

S.-M. Lee¹, D.-H. Kim¹, H.-Y. Lee^{1,2}; ¹Ceracomp Co., Ltd., Korea, ²Sunmoon University, Korea

15:45-16:15

S6-109 Field Induced Effect Near MPB in Pb(Zn_{1/3}Nb_{2/3})O₃-PbTiO₃ (Invited)

M. Iwata¹, S. Kato¹, R. Aoyagi¹, M. Maeda¹, Y. Ishibashi²; ¹Nagoya Institute of Technology, Japan, ²Kyushu University, Japan

Poster Session

Monday, November 15

Room: Event Hall

12:00 - 14:00

- S6-P001 Ba₄XTa₁₀O₃₀, X = Co, Mg, Zn, and Ni: Novel Quantum Pseudoferroelectric Compounds**
L. Wang, T. Kolodiazny, Y. Sakka; National Institute for Materials Science, Japan
- S6-P002 Effects of Alkaline-earth Oxide Additives to (Ba,Sr)TiO₃ Ceramics Fired under Reduced Atmosphere**
Y. Sakai¹, T. Futakuchi¹, M. Adachi²; ¹Toyama Industrial Technology Center, Japan, ²Toyama Prefectural University, Japan
- S6-P003 Microstructure and Dielectric Properties of BaTi_{1-x}Zr_xO₃ Ceramics Obtained by Spark Plasma Sintering Method**
A. Ianculescu¹, D. Berger¹, L. Curecheriu², C. Ciomaga², F. Tudorache², L. Mitoşeriu², G. Bonnefont³, G. Fantozzi³; ¹Polytechnics University of Bucharest, Romania, ²Al. I. Cuza University, Romania, ³University of Lyon, France
- S6-P004 Dielectric Properties of Dense Nanograin Barium Titanate Free-Standing Films**
H. Shimooka¹, S. Kohiki¹, M. Kuwabara²; ¹Kyushu Institute of Technology, Japan, ²The University of Tokyo, Japan
- S6-P005 Charge Compensation, Electrical and Dielectric Behavior in Donor Doped CaCu₃Ti₄O₁₂**
A. K. Dubey¹, O. Parkash², D. Kumar², P. Singh², S. Singh²; ¹Indian Institute of Technology, India, ²Institute of Technology, India
- S6-P006 High-pressure Synthesis, Structure and Dielectric Properties for SrCu₃Ti₄O₁₂**
D. Mori, M. Shimoi, Y. Kato, T. Katsumata, K. Hiraki, Y. Inaguma; Gakushuin University, Japan
- S6-P007 Preparation of Strontium Titanate Nanocubes Using Titanium Alkoxide and their Accumulations by Capillary Force**
S. Iwatsuki, M. Kera, K. Nakashima, I. Fujii, T. Takei, N. Kumada, S. Wada; University of Yamanashi, Japan
- S6-P008 Preparation of Barium Titanate / Strontium Titanate Multilayer Complex Nanoparticles Using Nanocube Substrate**
T. Goto¹, S. Iwatsuki¹, K. Nakashima¹, I. Fujii¹, Y. Kuroiwa², Y. Makita³, S. Wada¹; ¹University of Yamanashi, Japan, ²Hiroshima University, Japan, ³National Institute of Advanced Industrial Science and Technology, Japan
- S6-P009 Preparation and Characterization of Grain-Oriented Barium Titanate Ceramics Using Electrophoresis Deposition Method under A High Magnetic Field**
T. Kita¹, S. Kondo¹, T. Takei¹, N. Kumada¹, K. Nakashima¹, I. Fujii¹, T. S. Suzuki², T. Uchikoshi², Y. Sakka², Y. Miwa³, S. Kawada³, M. Kimura³, S. Wada¹; ¹University of Yamanashi, Japan, ²National Institute for Materials Science, Japan, ³Murata Manufacturing, Japan
- S6-P010 Control of Interfacial Structure of Potassium Niobate-Barium Titanate Ceramics and their Dielectric Properties**
K. Yamashita¹, S. Shimizu¹, I. Fujii¹, K. Nakashima¹, N. Kumada¹, T. Tsukada², T. S. Suzuki³, T. Uchikoshi³, Y. Sakka³, S. Wada¹; ¹University of Yamanashi, Japan, ²TDK Corporation, Japan, ³National Institute for Materials Science, Japan
- S6-P011 Fabrication of SnO₂ Crystal Layers by Flux Coating Method**
S. Suzuki, K. Teshima, S. H. Lee, S. Oishi; Shinshu University, Japan
- S6-P012 Sol-Gel Deposition of Transparent Conducting ZnO Films**
I. Winer, G. E. Shter, G. S. Grader; Israel Institute of Technology, Israel



Symposium 6

- S6-P013 Preparation and Characterization of Cu²⁺-substituted Calcium Aluminate Electride**
Y. Komaya, M. Nagao, S. Watauchi, I. Tanaka; University of Yamanashi, Japan
- S6-P014 Low-Temperature Fabrication of Highly Crystalline ZnO Layers by an Atmospheric Pressure Plasma-Assisted Flux Coating (APP-FC)**
M. Oishi¹, S. Suzuki¹, K. Teshima¹, S. H. Lee¹, S. Tajima², S. Tsuchiya², T. Ichiki², S. Oishi¹; ¹Shinshu University, Japan, ²The University of Tokyo, Japan
- S6-P015 Conductive Perovskite-type Metal Oxide Thin Films Prepared by Chemical Solution Deposition Technique**
K. Sasajima, H. Uchida; Sophia University, Japan
- S6-P016 Electric Property of ZnO Based Transparent Conductor Films in GHz Range**
T. Ogino^{1,2,3}, S. Sato^{3,4}, N. Ohashi^{1,3,4}, S. Hishita³, I. Sakaguchi³, Y. Adachi³, K. Nakajima², T. Takenaka⁴, H. Haneda^{1,3}; ¹Kyushu Univ., Japan, ²Taiyo Yuden Co.,Ltd.,Japan, ³National Institute for Materials Science, Japan, ⁴Tokyo University of Science, Japan
- S6-P017 Coloration and Depth Distribution of Cations Electrochemically-inserted into Electrochromic WO₃ Thin Films**
M. Kawai, S. Sakida, Y. Benino, T. Nanba; Okayama University, Japan
- S6-P018 Oxygen Diffusion in Al-implanted ZnO Ceramics**
I. Sakaguchi¹, K. Watanabe¹, T. Ogino^{2,3}, Y. Adachi¹, T. Ohgaki¹, S. Hishita¹, N. Ohashi^{1,2}, H. Haneda^{1,2}; ¹National Institute for Materials Science, Japan, ²Kyushu Univ., Japan, ³Taiyo Yuden Ltd.,Japan
- S6-P019 Characterization of Pt/SrTiO₃:Nb Junctions by Electron Beam Induced Current**
J. Li, J. Chen, N. Ohashi, H. Okushi, I. Sakaguchi, T. Sekiguchi, H. Haneda; National Institute for Materials Science, Japan
- S6-P020 Non-polar ZnO and (Mg,Zn)O Films Grown by Pulsed Laser Deposition**
Y. Adachi, I. Sakaguchi, N. Ohashi, H. Haneda; National Institute for Materials Science, Japan
- S6-P021 ZnO Crystal Growth on Micro Electrode by Electrochemical Deposition Method**
Y. Kondo, A. Atsushi, N. Nouzu, N. Fujimura; Osaka Prefecture University, Japan
- S6-P022 Electrical Properties of PTC Ceramics Prepared from Nd-Doped BaTiO₃ by Hydrothermal Synthesis**
E. Sato, S. Umeki, T. Hashishin, J. Tamaki, K. Kojima; Ritsumeikan University, Japan
- S6-P023 Degenerate p-type Semiconductivity in Mg-doped Silicon**
Y. Uenaka, T. Uchino; Kobe University, Japan
- S6-P024 Control of Varistor Voltage by Grain-size Control of Bi-added ZnO Varistors**
A. Fukumori, M. Takada, Y. Sato, S. Yoshikado; Doshisha University, Japan
- S6-P025 High Frequency Magnetic Properties of Bi and Si Oxides-doped NiCuZn Ferrite**
J. Kato, K. Ono, Y. Matsuo; FDK Corporation, Japan
- S6-P026 Enhanced Magnetic and Electrical Properties in Cobalt Ferrite Ceramics by Doping Trace Amount of Alumina**
R. Guo, C-A. Wang, Y. Huang; Tsinghua University, China
- S6-P027 Anomalous Electric Field-Induced Switching of Local Magnetization Vector in a Simple FeBSiC-on-Pb(Zr,Ti)O₃ Multiferroic Bilayer**
J. Ma, C. W. Nan; Tsinghua University, China
- S6-P028 Dielectric Properties and Related Microstructures in Mu-Substituted YbFe₂O₄**
K. Matsumoto¹, T. Hoshiyama¹, S. Mori¹, K. Yoshii², T. Kambe³, N. Ikeda³; ¹Osaka Prefecture University, Japan, ²Japan Atomic Energy Agency, Japan, ³Okayama University, Japan
- S6-P029 AC Impedance Studies on Ferroelectromagnetic Ceramics**
D. Czekaj, A. Lisinska-Czekaj; University of Silesia, Poland

- S6-P030 From Fe_2O_3 @ BaTiO_3 Core-Shell Particles to Multifunctional Composites Containing Different Magnetic Phases: Synthesis and Properties**
M. T. Buscaglia¹, V. Buscaglia¹, L. Curecheriu², P. Postolache², L. Mitoseriu², A. C. Ianculescu³, B. S. Vasile³, Z. Zhao⁴, P. Nanni^{1,5}; ¹IENI-CNR, Italy, ²Al. I. Cuza University, Romania, ³Polytechnics University of Bucharest, Romania, ⁴University of Stockholm, Sweden, ⁵University of Genoa, Italy
- S6-P031 Magnetolectric Properties of $0.1\text{Bi}_{0.95}\text{Dy}_{0.05}\text{FeO}_3$ - $0.9\text{Pb}(\text{Fe}_{2/3}\text{W}_{1/3})\text{O}_3$ Multiferroic**
A. Stoch¹, P. Stoch^{2,3}, J. Kulawik¹, P. Zieliński⁴, J. Maurin^{2,5}; ¹Institute of Electron Technology Krakow Division, Poland, ²Institute of Atomic Energy – POLATOM, Poland, ³AGH-University of Science and Technology, Poland, ⁴Institute of Nuclear Physics PAN, ul. Poland, ⁵National Medicines Institute, Poland
- S6-P032 Structural and Mössbauer Effect Studies of $0.1\text{Bi}_{0.95}\text{Dy}_{0.05}\text{FeO}_3$ - $0.9\text{Pb}(\text{Fe}_{2/3}\text{W}_{1/3})\text{O}_3$ Multiferroic**
P. Stoch^{1,2}, A. Stoch³, J. Kulawik³, J. Maurin^{1,4}, P. Zachariasz¹; ¹Institute of Atomic Energy – POLATOM, Poland, ²AGH-University of Science and Technology, Poland, ³Institute of Electron Technology Krakow Division, Poland, ⁴National Medicines Institute, Poland
- S6-P033 Low-Temperature Sintering of NiZnCu Ferrite - (Ba, Sr)TiO₃ Composites**
T. Kawasaki¹, K. Abe¹, N. Kitahara², J. Takahashi¹; ¹Hokkaido University, Japan, ²Tokyo Polytechtic University, Japan
- S6-P034 Magnetic Ion Substitution for Ti-sites in Ferroelectric $\text{Bi}_4\text{Ti}_3\text{O}_{12}$ and $\text{BaBi}_4\text{Ti}_4\text{O}_{15}$**
R. Suzuki¹, T. Shigyo², H. Kiyono¹, N. Adachi³, T. Ota³, J. Takahashi¹; ¹Hokkaido University, Japan, ²Hokkaido Research Organization, Japan, ³Nagoya Institute of Technology, Japan
- S6-P035 Preferential Crystal Growth of (100)-oriented BiFeO₃ Films on Si Substrate**
M. Hayashi¹, S. Yasui², H. Funakubo², H. Uchida¹; ¹Sophia University, Japan, ²Tokyo Institute of Technology, Japan
- S6-P036 Effect of Lattice Misfit Strain on Crystal System and Ferroelectric Property of BiFeO₃ Epitaxial Thin Films**
K. Ujimoto¹, H. Izumi², T. Yoshimura¹, A. Ashida¹, N. Fujimura¹; ¹Osaka Prefecture University, Japan, ²Hyogo Prefectural Institute of Technology, Japan
- S6-P037 Influence of Electron Exchange on Dielectric Properties of (1-x)CoFe₂O₄-(x)BaTiO₃ Composites**
A. Khamkongkaeo¹, T. Yamwong², S. Maensiri¹; ¹Khon Kaen University, Thailand, ²National Metals and Materials Technology Center, Thailand
- S6-P038 Preparation and Electromagnetic Properties of Y-type Ferrite Composites**
M. Nakanishi¹, C. Yamaguchi¹, T. Fujii¹, J. Takada¹, T. Kikuchi²; ¹Okayama University, Japan, ²University of Hyogo, Japan
- S6-P039 Structure and Magnetic Properties of CuFe_{1-x}Mn_xO₂ Solid Solution**
R. Fukatsu, T. Nozaki, K. Hayashi, Y. Miyazaki, T. Kajitani; Tohoku University, Japan
- S6-P040 Mn Doping Effect on Microstructure and Dielectric Properties of BiFeO₃-BaTiO₃ Ceramics Prepared by Solid State Reaction**
R. Kato, M. Moriya, W. Sakamoto, T. Yogo; Nagoya University, Japan
- S6-P041 Room Temperature Magneto-electric Effects of Cr₂O₃/Cr₂O_{3±x}/LiNbO₃/Cr₂O_{3±x}/Cr₂O₃ Hetero Structure**
Y. Tsuboi, T. Yokota, S. Kito, R. Imura, M. Gomi; Nagoya Institute of Technology, Japan
- S6-P042 Synthesis and Phase Stability and Compression Behavior of Transition Metal Phosphide in High Pressure and Temperature**
H. Kubota¹, K. Niwa¹, M. Hasegawa¹, K. Kusaba¹, T. Yagi²; ¹Nagoya University, Japan, ²University of Tokyo, Japan
- S6-P043 Optical Constants of (001), (110), and (111)-oriented Epitaxial BiFeO₃ Thin Films**
H. Shima¹, K. Sone¹, K. Tsutsumi², M. Suzuki², T. Tadokoro³, H. Naganuma⁴, T. Iijima⁵, T. Nakajima¹, S. Okamura¹; ¹Tokyo University of Science, Japan, ²J. A. Woollam Japan, Japan, ³Techno-Synergy, Inc., Japan, ⁴Tohoku University, Japan, ⁵National Institute of Advanced Industrial Science and Technology, Japan



Symposium 6

- S6-P044 Magnetic and Electric Field Induced Resistance Changes in SrFeO Thin Film**
S. Kito, T. Yokota, Y. Tsuboi, R. Imura, M. Gomi; Nagoya Institute of Technology, Japan
- S6-P045 An Optimization of Firing Temperature and Chromium Amount on Magnetic Properties of Strontium Hexaferrite**
A. A. Nourbakhsh¹, M. Nourbakhsh², M. Shaygan¹, M. Mozaffari³, C. Gharibian¹; ¹Islamic Azad University, Iran, ²Taban Magnetic Materials Development Co, Iran, ³Naghshejahan Higher Education Institute, Iran
- S6-P046 Magnetic Nanoscale Chessboard-type Domain Structures in the Mn-doped CoFe₂O₄**
M. Ohno, Y. Togawa¹, Y. Horibe², S. Mori¹; ¹Osaka Prefecture University, Japan, ²Rutgers University, USA
- S6-P047 Dielectric and Magnetic Properties of Y-Fe-O Films Prepared by MOCVD**
H. Masumoto, S. Taura, K. Tanaka; Tohoku University, Japan
- S6-P048 Synthesis and Characterization of Grain-Oriented Multiferroic Aurivillius Ceramics**
M. Palizdar, T. P. Comyn, A. J. Bell; University of Leeds, UK
- S6-P049 Synthesis and Properties of Bi_{5-x}Sr_xTi_{3+3x}Fe_{1-x-y}V_yO₁₅ Ceramics by Solid State Reaction**
K. Kawada, T. Moriyama, A. Kan, H. Ogawa; Meijo University, Japan
- S6-P050 Ferroelectric Properties and Crystal Structure of Bi₇Fe₃Ti₃O₂₁ Ceramic in Bi₄Ti₃O₁₂-BiFeO₃ System**
H. Ogawa, T. Moriyama, A. Kan; Meijo University, Japan

Tuesday, November 16

Room: Event Hall

12:00 - 14:00

- S6-P051 Physical and Electrical Properties of Lead-Free (Na_{0.5}K_{0.5})NbO₃-(Bi_{0.5}Na_{0.5})TiO₃ Ceramics**
C.-H. Wang; Nan-Jeon Institute of Technology, Taiwan
- S6-P052 Physical and Electrical Properties of Lead-Free (Bi_{0.5}Na_{0.5})TiO₃-Ba(Sn,Ti)O₃ Ceramics**
C.-H. Wang; Nan-Jeon Institute of Technology, Taiwan
- S6-P053 Effect of Mn Doping on Piezoelectric Property of Lead-free (Na, K)NbO₃ Ceramics**
J. Kohara, K. Kakimoto, I. Kagomiya; Nagoya Institute of Technology, Japan
- S6-P054 Ferroelectric Property of (Ba_{1-2x}Bi_{2x})(Ti_{1-x}M_x)O₃ Ceramics**
K. Shiroki, N. Kumada, H. Ogiso, Y. Yonesaki, T. Takei, N. Kinomura, S. Wada; University of Yamanashi, Japan
- S6-P055 Mechanism of Grain Orientation in Bismuth Layered-Structure Ferroelectrics made by Templated Grain Growth**
K. Onodera, T. Kimura; Keio University, Japan
- S6-P056 The Mechanism of the Formation of Single-Crystalline Films by a Solid State Process**
D. Furuta, T. Kimura; Keio University, Japan
- S6-P057 Dielectric, Ferroelectric and Mechanical Properties of the Microwave Sintered Bi based High Temperature Piezoelectric Ceramics**
A. Rambabu, K. C. J. Raju; University of Hyderabad, India
- S6-P058 Piezoelectric Properties and Moisture-Resistance of Glass Added K_{0.5}Na_{0.5}NbO₃**
Y. Oba, R. Kobayashi, Y. Matsuo; FDK Corporation, Japan
- S6-P059 Processing and Study of Dielectric and Ferroelectric Nature of BiFeO₃ - Modified Bi₄Ti₃O₁₂**
A. Lisinska-Czekaj, D. Czekaj; University of Silesia, Poland
- S6-P060 Grain Size Dependence on Crystal Structure of Lead-free (Na,K)NbO₃ Ceramics**
Y. Shinkai, K. Kakimoto, I. Kagomiya; Nagoya Institute of Technology, Japan

- S6-P061 Preparation and Piezoelectric Properties of Lead-free BaTiO₃-Based Ceramics**
N. Matsumoto, H. Maiwa, T. Hayashi; Shonan Institute of Technology, Japan
- S6-P062 Fabrication and Evaluation of Mn-Substituted Ba(Cu_{1/3}Nb_{2/3})O₃ Ceramics**
Y. Kamimura¹, K. Yazawa², B.-Y. Lee³, H. Funakubo², T. Iijima³, H. Uchida¹; ¹Sophia University, Japan, ²Tokyo Institute of Technology, Japan, ³National Institute of Advanced Industrial Science and Technology, Japan
- S6-P063 Phase Formation and Characterization of (1-x)PZT-xBNbT Ceramics**
N. Thongmee, A. Watcharapasorn, S. Jiansirisomboon; Chiang Mai University, Thailand
- S6-P064 A Role of Sintering Time on Microstructure and Electrical Properties of Bi_{3.25}La_{0.75}(Ti_{1-x}W_x)₃O₁₂ Ceramic**
P. Siprapa, A. Watcharapasorn, S. Jiansirisomboon; Chiang Mai University, Thailand
- S6-P065 Effect of Lead Zirconate Titanate Addition on Microstructure, Mechanical and Electrical Properties of Bismuth Sodium Lanthanum Titanate Ceramics**
P. Jaita, A. Watcharapasorn, S. Jiansirisomboon; Chiang Mai University, Thailand
- S6-P066 Fabrication of PZT Thick Films for 100 MHz Ultrasonic Transducer**
N. Kochi^{1,2}, T. Iijima², T. Nakajima¹, S. Okamura¹; ¹Tokyo University of Science, Japan, ²National Institute of Advanced Industrial Science and Technology, Japan
- S6-P067 Synthesis and Characterization of Ba(Cu_{1/2}Ta_{2/3})O₃-BaTiO₃ Ceramics**
B.-Y. Lee¹, H. Funakubo², H. Uchida³, S. Okamura⁴, T. Iijima¹; ¹National Institute of Advanced Industrial Science and Technology, Japan, ²Tokyo Institute of Technology, Japan, ³Sophia University, Japan, ⁴Tokyo University of Science, Japan
- S6-P068 Sintering and Piezoelectric Properties of Lead-free (K_{0.38}Na_{0.58}Li_{0.04})(Nb_{0.86}Ta_{0.10}Sb_{0.04})O₃ Ceramics with Fe₂O₃ Doping**
Y.-P. Ok¹, H.-N. Ji¹, K.-S. Kim¹, W.-P. Tai¹, J.-H. Seol², I.-K. Hong², J.-S. Lee²; ¹Ulsan Fine chemical Industry Center, Korea, ²University of Ulsan, Korea
- S6-P069 Domain Memory and Polarization Memory in an Acceptor-doped Ferroelectric**
D. Xue^{1,2}, J. Gao^{1,2}, X. Ren^{1,2}; ¹Xi'an Jiaotong University, China, ²National Institute for Materials Science, Japan
- S6-P070 Poling Field Dependence of Piezoelectric and Dielectric Properties in (Li,Na)NbO₃ Lead-Free Piezoelectric Ceramics**
R. Aoyagi¹, T. Ohashi¹, M. Maeda¹, M. Iwata¹, T. Shiosaki²; ¹Nagoya Institute of Technology, Japan, ²Shibaura Institute of Technology, Japan
- S6-P071 Thermal Expansion and Polarization Behavior in Lead Titanate/Zinc Oxide Nanocomposite Ceramics**
R. Wongmaneerung¹, R. Yimnirun², S. Ananta³; ¹Maejo University, Thailand, ²Suranaree University of Technology, Thailand, ³Chiang Mai University, Thailand
- S6-P072 Cancelled**
- S6-P073 Direct Measurement of Piezoelectric Transverse Displacement for PZT Thick Film**
Y. Kashiwagi^{1,2}, T. Iijima², T. Aiso³, T. Yamamoto⁴, H. Funakubo⁵, T. Nakajima¹, S. Okamura¹; ¹Tokyo University of Science, Japan, ²National Institute of Advanced Industrial Science and Technology, Japan, ³Toyo Corporation, Japan, ⁴National Defense Academy, Japan, ⁵Tokyo Institute of Technology, Japan
- S6-P074 Preparation of Single Phase Bismuth Niobium Based Perovskite-type Oxides**
A. Shimamura¹, N. Kumada¹, I. Fujii¹, K. Nakashima¹, M. Azuma², Y. Kuroiwa³, S. Wada¹; ¹University of Yamanashi, Japan, ²Kyoto University, Japan, ³Hiroshima University, Japan
- S6-P075 Microstructure Control of Barium Titanate Grain-Oriented Ceramics by Hydrothermal Treatment of Green Body and their Piezoelectric Properties**
R. Mori¹, K. Nakashima¹, I. Fujii¹, H. Hayashi², Y. Nagamori², Y. Yamamoto², S. Wada¹; ¹University of Yamanashi, Japan, ²Hayashi Chemical Industry Co., Ltd., Japan, ³Konoshima Chemical Co., Ltd., Japan



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- S6-P076 Preparation of Barium Titanate – Potassium Niobate Solid Solution System Ceramics Using Spark Plasma Sintering and Their Piezoelectric Properties**
S. Shimizu¹, N. Kumada¹, K. Nakashima¹, I. Fujii¹, D. Tanaka², M. Furukawa², Y. Kuroiwa³, T. S. Suzuki⁴, T. Uchikoshi⁴, Y. Sakka⁴, S. Wada¹; ¹University of Yamanashi, Japan, ²TDK Co., Ltd., Japan, ³Hiroshima University, Japan, ⁴National Institute for Materials Science, Japan
- S6-P077 Microstructure and Piezoelectric Properties of Ca-Substituted Ba(Ti_{0.9}Zr_{0.1})O₃ Ceramics**
S. Ye, J. Fuh, L. Lu; National University of Singapore, Singapore
- S6-P078 Ferroelectric Properties of Bi_{4.5}Na_{1-x}Ag_xNb₂WO₁₅ Solid Solutions**
T. Moriyama, A. Kan, K. Kawada, H. Ogawa; Meijo University, Japan
- S6-P079** Cancelled
- S6-P080 Microwave Dielectric Properties of (Mg_{1/2}Co_{1/2})Al₂O₄ Ceramics**
C.-H. Hsu, H.-H. Tung, C.-K. Hsu; National United University, Taiwan
- S6-P081 Microwave Dielectric Properties of Mg(Zr_{0.05}Ti_{0.95})O₃ Ceramics Doped with B₂O₃**
C.-F. Tseng, W.-Y. Hsu; National United University, Taiwan
- S6-P082 Fabrication and Characterization of Tunable Devices Using (Ba,Sr)TiO₃ Thin Films on α-Al₂O₃**
T. Nishida¹, H. Kimura², R. Onodera¹, M. Horita¹, M. Uenuma¹, Y. Ishikawa¹, Y. Uraoka^{1,3}; ¹Nara Institute of Science Technology, Japan, ²National Institute for Materials Science, Japan, ³CREST, Japan
- S6-P083 Hf, Mn and Y Doped Ba(Zn_{1/3}Nb_{2/3})O₃ Ceramics**
M. Ayhan, K. Esin; Marmara University Göztepe Campus, Turkey
- S6-P084 Influence of Nonstoichiometry on Extrinsic Electrical Conduction and Microwave Dielectric Loss of BaCo_{1/3}Nb_{2/3}O₃ Ceramics**
M. Li¹, A. Feteira¹, M. Mirsaneh¹, S. Lee², M. T. Lanagan², C. A. Randall², D. C. Sinclair¹; ¹The University of Sheffield, UK, ²The Pennsylvania State University, USA
- S6-P085 Two Approaches of the Obtaining of Doped Ba(Mg_{1/3}Ta_{2/3})O₃ Microwave Ceramics**
S. Jinga¹, E. Andronescu¹, C. Jinga¹, D. Berger¹, C. Matei¹, C. Jinga¹, A. Ioachim²; ¹University "Politehnica" of Bucharest, Romania, ²National Institute of Materials Physics, Romania
- S6-P086 Low-temperature Synthesis of Needle-like NaNbO₃ by a Molten NaOH Method**
S. Yamazoe, T. Kawawaki, T. Imai, T. Wada; Ryukoku University, Japan
- S6-P087 Modification of Microstructure and Mechanical Properties of Electroporcelain by Correction of Firing Curve**
P. Janusz; AGH University of Science and Technology, Poland
- S6-P088 Sintering and Nonlinear Dielectric Properties of Ba_{0.6}Sr_{0.4}TiO₃/MgO Composite Ceramics Prepared from Superfine Powders**
X.-F. Zhang¹, Q. Xu¹, D.-P. Huang¹, W. Chen¹, B.-H. Kim²; ¹Wuhan University of Technology, China, ²Chonbuk National University, Korea
- S6-P089 Preparation of Oriented Ba_{1-x}Ca_xTiO₃ Material by Soft Chemical Process**
K. Kurokawa, X. Kong, Y. Ishikawa, Q. Feng; Kagawa University, Japan
- S6-P090 Synthesis of La-Co Substituted M-type Calcium Hexaferrite by Polymerizable Complex Method**
T. Kikuchi¹, T. Nakamura¹, T. Yamasaki¹, M. Nakanishi², T. Fujii², J. Takada², Y. Ikeda²; ¹University of Hyogo, Japan, ²Okayama University, Japan, ³Research Institute of Production Development, Japan
- S6-P091 Effect of Mechanical Milling Treatment on the Pressureless Sintering of KSr₂Nb₅O₁₅ Ceramics**
Y. Iwai; Nagaoka National College of Technology, Japan
- S6-P092 Investigations of a Morphology Control of Perovskite Oxide Using Solvothermal Reaction**
K. Nakashima, T. Goto, S. Iwatsuki, M. Kera, I. Fujii, S. Wada; University of Yamanashi, Japan

- S6-P093 Electroceramics Microstructure Fractal Characterization**
V. V. Mitic^{1,2}, V. B. Pavlovic³, V. Paunovic¹, J. Purenovic¹, J. Nedin¹, M. Miljkovic¹; ¹University of Nis, Serbia, ²Serbian Academy of Sciences and Arts, Serbia, ³University of Belgrade, Serbia
- S6-P094 Characterization of Mechanical and Electric Properties of BaTiO₃ Thin Films Grown by Aerosol Deposition**
H. K. Kim, H. J. Kim, S. M. Nam; Kwangwoon University, Korea
- S6-P095 Effect of Hardness of Starting Powder on Growth of Ceramic Thick Films by Aerosol Deposition**
C. W. Kim, H. J. Kim, S. M. Nam; Kwangwoon University, Korea
- S6-P096 Fabrication of Al₂O₃ Films Using Aerosol Deposition Method and Their Characterization**
Y. Uemichi, K. Nishikawa, Y. Sato, S. Yoshikado; Doshisha University, Japan
- S6-P097 Effect of Dopant, Crystal Orientation, and Space Charge Layer on Oxygen Diffusion in Bi₄Ti₃O₁₂ Ceramics**
I. Sakaguchi¹, K. Matsumoto¹, H. Nagata², Y. Hiruma², H. Haneda¹, T. Takenaka²; ¹National Institute for Materials Science, Japan, ²Tokyo University of Science, Japan
- S6-P098 Photoelectron Diffraction Study on Polar ZnO Surface**
J. Williams, N. Ohashi, K. Kobayashi, I. Pis, M. Kobata; National Institute for Materials Science, Japan
- S6-P099 High-Pressure Raman Study of Al¹⁴N and Al¹⁵N Epitaxial Thin Films on Sapphire Substrates**
H. Yusa, T. Ohgaki, N. Ohashi, I. Sakaguchi, H. Haneda; National Institute for Materilas Science, Japan
- S6-P100 Atomic-Resolution Imaging of Domain Polarity and Domain Wall Structure of PbTiO₃ Thin Film**
T. Kiguchi¹, K. Aoyagi¹, T. J. Konno¹, S. Utsugi², T. Yamada², H. Funakubo²; ¹Tohoku University, Japan, ²Tokyo Institute of Technology, Japan
- S6-P101 Dielectric Properties and Related Microstructures in (1-x)BiFeO₃-xRTiO₃ (R=Pb and Sr)**
R. Fujii¹, T. Ozaki¹, M. Soda², S. Mori¹; ¹Osak Prefecture University, Japan, ²Osaka University, Japan
- S6-P102 Phonon Dynamics and Phase Transition in Ba_{1-x}Ca_xTiO₃ Studied by Raman Scattering**
T. Shimizu¹, D. Fu², H. Taniguchi¹, T. Taniyama¹, M. Itoh¹; ¹Tokyo Institute of Technology, Japan, ²Shizuoka University, Japan
- S6-P103 Observation of Fracture Surface of PMN-PT Single Crystal by Scanning Probe Microscope**
A. Matsunaga, J. Tatami, T. Wakihara, K. Komeya, T. Meguro; Yokohama National University, Japan
- S6-P104 Electric Field Thermopower Modulation in an Anatase TiO₂ Based Thin Film Transistor**
Y. Nagao¹, A. Yoshikawa¹, K. Koumoto¹, T. Kato², Y. Ikuhara^{2,3}, H. Ohta^{1,4}; ¹Nagoya University, Japan, ²Mutsuno, Japan, ³The University of Tokyo, Japan, ⁴Japan Science and Technology Agency, Japan
- S6-P105 Development of the Electromagnetic Induction Type Micro Air Turbine Generator Using MEMS and Multilayer Ceramic Technology**
A. Iiduka, K. Ishigaki, Y. Takikawa, T. Ohse, K. Saito, F. Uchikoba; Nihon University, Japan
- S6-P106 Heat Generation Ability in AC Magnetic Field for Y₃Fe₅O₁₂-based Garnet Ferrite**
H. Hirazawa¹, H. Aono², K. Moritani², T. Naohara², T. Maehara², Y. Watanabe²; ¹Niihama National College of Technology, Japan, ²Ehime University, Japan
- S6-P107 Preparation of Barium Titanate Porous Ceramics and their Application to Piezoelectric Energy Harvesting**
Y. Shimura, P. Pulpan, I. Fujii, K. Nakashima, S. Wada; University of Yamanashi, Japan
- S6-P108 Continuous Radiation of X-ray by Thermal Excitation Using Multiple LiTaO₃ Single Crystals**
H. Honda¹, S. Fukao¹, Y. Guan¹, Y. Nakanishi¹, Y. Sato¹, Y. Ito², S. Yoshikado¹; ¹Doshisha University, Japan, ²Kyoto University, Japan
- S6-P109 Synthesis and Opto-Electrical Properties of ABO₂ (A=Li, Na; B=Y, Yb)**
Y. Zhao, Y. Natsume, N. Sawaguchi, M. Sasaki; Muroran Institue of Technology, Japan

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- S6-P110 TaN Thin Film Fabricated Using a Low Vacuum Magnetron Sputtering System**
T. Hashizume, A. Saiki, K. Terayama; University of Toyama, Japan
- S6-P111 Synthesis of Sn₃N₄ by Direct Nitriding Reaction in High Pressure and Temperature**
K. Okuno¹, K. Niwa¹, K. Kusaba¹, M. Hasegawa¹, T. Yagi²; ¹Nagoya Univ., Japan, ²The Univ. of Tokyo, Japan
- S6-P112 Effect of Ir, Zr and In Substitution on Structure and Dielectric Properties of Bi_{1.5}Zn_{0.92}Nb_{1.5}O_{6.92} Pyrochlore Ceramics**
M. Ayhan, O. Oguz; Marmara University, Turkey
- S6-P113 Sintering of the Pure K_{0.48}Na_{0.52}NbO₃ Lead-free Piezoceramics With KNbO₃ as Sintering Aid and Its Piezoelectric Properties**
Y.-J. Dai, T. Sun, Y.-L. Li, X.-W. Zhang; Tianjin University, China
- S6-P114 Ferroelastic Domain Switching in Lead Titanate Zirconate Ceramics: Temperature Dependence and Fracture Toughness Variations**
Y. W. Li¹, X. L. Zhou¹, F. X. Li^{1,2}; ¹Peking University, China, ²Chinese Academy of Sciences, China