Tuesday, October 9

09:00h......... Technical Exhibit
09:00h......... Professional Development Series: Career Fair
09:30h......... Technical Session Coffee Break
12:00h......... Student Poster Award Presentation
14:00h......... Professional Development Series: Resume Workshop
18:00h......... General Poster Session & Technical Exhibit
18:00h......... Professional Development Series: Career Fair

A2 Nanotechnology General Session
All Divisions / New Technology Subcommittee
313C, Level 3, Hawaii Convention Center

Applications of Nanomaterials – 08:00 – 12:00
Co-Chairs: Oana Leonte and N. Kobayashi

08:00 249 Graphene Nanocomposites for Electrochemical Applications – L. Niu (Chinese Academy of Sciences)
08:20 250 Three Dimensional PtRh Alloy Porous Nanostructures: Tuning the Atomic Composition and Controlling the Morphology for the Application of Direct Methanol Fuel Cell – Y. Zhang (Shanghai University), C. Liu (National Central University), M. Janyasupab (Case Western Reserve University), J. Xu (Shanghai University), and C. Liu (Case Western Reserve University)
08:40 251 Cesium Transfer from Granule Conglomerate Using Water Containing Nano-Sized Air Bubbles – Y. Ueda, Y. Tokuda (Kyoto University), S. Fujimura (Fukushima Agricultural Technology Centre), and T. Oka (Sunstar Engineering Inc.)
09:00 252 Scalable Non-Volatile Memory and Switch Device for High-Density Bipolar ReRAM Applications – D. Lee, M. Lee, and U. Chung (Samsung Advanced Institute of Technology)
09:20 253 Storage Properties of Surfaces and Interfaces: Enhanced Nonstoichiometry of Thin Silver Sulfide and Gold/Silver Sulfide Films – A. Rein, B. Luerßen (Justus Liebig University), and J. Janek (Justus Liebig University Gießen)
09:40 254 Intermission (20 Minutes)
10:00 254 Fabrication of Hollow Spheres with Ordered Porous Structures by Anodization of Small Metal Particles – T. Yamagishi, S. Ueno, K. Nishio, and H. Masuda (Tokyo Metropolitan University)
10:20 255 Building 3D Nanostructured Supports for Pt Nanoparticles Used in Electrocatalytic Applications – C. Hu (Chongqing University)
10:40 256 Molecular Electronic Devices Based on Self-Assembled Multilayer Films Bearing Redox-Active Ru Complexes – M. Haga, T. Nakabayashi, H. Ozawa, T. Suzuki (Chuo University), T. Joke, and K. Nakazato (Nagoya University)

11:00 257 Micropatterned MnO2/CNT MEA Ultracapacitors – S. Raina, S. Hsu, W. Kang, and J. Huang (Vanderbilt University)
11:20 258 Formation of a Vertically Oriented Anodic TiO2 Nanotube Film on a Transparent Conductive Oxide Layer and Its Application to a Dye-Sensitized Solar Cell – R. Kojima, T. Ma, Y. Kimura, and M. Niwano (Tohoku University)
11:40 259 Synthesis of ZnO Nano-Sheets and Their Application in UV-Detector – S. Sahoo, S. Barik, A. Gaur, R. Katiyar, and R. Katiyar (University of Puerto Rico)

Synthesis of Nanomaterials – 14:00 – 17:20
Co-Chairs: Oana Leonte and Guoliang Xiao

14:00 260 Colloidal Synthesis of Semiconducting Ag2ZnSnS4 Nanoparticle and Their Visible-Light-Driven Photoresponse – T. Sasamura, T. Osaki, T. Kameyama, K. Okazaki (Nagoya University), A. Kudo (Tokyo University of Science), S. Kuwabata (Osaka University), and T. Torimoto (Nagoya University)
14:20 261 A Novel Surface Nano-Structure Design for SiGe/Si Type-II Hetero-Junction Solar Cell with Superior Performance – M. Liao, C. Chen, L. Chang, C. Yang (National Taiwan University), C. Hsieh (Industrial Technology Research Institute), and M. Lee (National Taiwan Normal University)
14:40 262 Evolution of Germanium Quantum Dots Migration in Si Bearing Layer Mediated by Thermal Oxidation – K. Chen, I. Chen, C. Chien, C. Wang (National Central University), T. George (Zyomed Corporation), and P. Li (National Central University)
15:00 263 Fe-Co Alloy Nanoparticles and Nanowires Prepared by Electroless Deposition – M. Kawamori (Kyoto University), S. Yagi (Osaka Prefecture University), and E. Matsubara (Kyoto University)
15:40 264 Intermission (20 Minutes)
16:00 265 Preparation and Characteristics of Proton Conducting Oxide Nano-Particles Using Planetary Bead-Mill – T. Sakai, Y. Okuyama, T. Ishihara, and H. Matsumoto (Kyushu University)
Co-Chairs: A. Manivannan and P. Kumta

Emerging Battery Technologies – 08:00 – 12:20

08:00 353 Electrochemical Behavior of Nanocrystalline MgMnO$_3$, Cubic Defect Spinel Cathode for Rechargeable Magnesium Battery – P. Saha, M. Datta (University of Pittsburgh), A. Manivannan (U.S. Department of Energy), and P. N. Kumta (University of Pittsburgh)

08:20 354 A Novel Boron-Based Electrolyte System for Rechargeable Mg Batteries – Y. Guo, J. Yang, F. Zhang, and F. Wang (Shanghai Jiao Tong University)

08:40 355 Electrochemical Stability of Metal Electrodes for Reversible Magnesium Deposition/Dissolution in Tetrahydrofuran – S. Yagi, A. Tanaka (Osaka Prefecture University), T. Ichitsubu, and E. Matsubara (Kyoto University)

09:00 356 Electrochemical Performances of Tetrathiafulvalene Polymer (TTF) as a Cathode Material for Nonaqueous Secondary Batteries – N. Hojo, T. Tsukagoshi, Y. Inatomi, and H. Yoshizawa (Panasonic Corporation)

09:20 357 A Review of Secondary Magnesium Battery R&D at The Dow Chemical Company – T. D. Gregory (The Dow Chemical Company)

09:40 Intermission (20 Minutes)

10:00 358 Magnesium Electrolyte Based on EMImBF$_4$ and δ-[MgCl$_2$]$_n$ for Secondary Magnesium Batteries – V. Di Noto, F. Bertasi, E. Negro, and S. Lavina (Università di Padova)

10:20 359 Beta-Battery Based on δ$^+$Ni/Macroporous Silicon – A. Dolgyi, S. Redko, H. Bandarenka, A. Shapel, and V. Bondarenko (Belarussian State University of Informatics and Radioelectronics)

10:40 360 Developing Novel Electrolytes for Rechargeable Mg Batteries – J. Muldoon and C. B. Bucur (Toyota Research Institute of North America)

11:00 361 Improvement of Sulfone-Based Electrolyte for Aluminum Rechargeable Battery – Y. Nakayama, Y. Senda (Sony Corporation), H. Kawasaki (KRI, Inc.), S. Chung (The University of Tokyo), N. Koshitani, S. Hosoii, Y. Kudo, and H. Morioka (Sony Corporation)

11:20 362 A Conjugated Sulfidepolymer Battery with Variable Capacitance Controlled by Redox Reaction – J. Sakata (Toyota Central R&D Labs., Inc.)

11:40 363 Building a Robust Liquid Metal Battery – P. J. Burke, B. H. Chung, A. D. LaDelpha, and D. R. Sadoway (Massachusetts Institute of Technology)

12:00 364 Electrode Kinetics of Low Cost, High-Rate Tolerant, Engineering-Scale Liquid Metal Batteries – B. H. Chung, A. D. LaDelpha, and D. R. Sadoway (Massachusetts Institute of Technology)

Meeting Program PRIME 2012 October 7-12, 2012 Honolulu, Hawaii
November 7-12, 2012
PRIME 2012
Hilton Hawaiian Village

Co-Chairs: A. Manivannan and Christina M. Johnston

10:00 377 Measurements of Effective Electronic and Ionic Conductivities in Porous Li-Ion Electrodes – S. Harris, N. Zacharias, C. Skelton, K. Knackstedt, D. Stephenson, Y. Wen, and D. R. Wheeler (Brigham Young University)


10:40 379 Structure and Electrochemistry of Olivine-Inorganic Composites for Lithium Batteries – I. Belharouak, G. Koenig (Argonne National Laboratory), and R. R. Shahbazian-Yassar (Michigan Technological University)

11:00 380 Graphene as a Conductive Additive to Improve the Performance of Layered Li[Ni0.66Co0.17Mn0.17]O2 Cathode for Lithium-Ion Batteries – C. Venkateswara Rao, J. Shojian, and R. Katiyar (University of Puerto Rico)

11:20 381 Olivine type Li[Mn1/3Co1/3Ni1/3]PO4 Cathode for Secondary Battery Applications – M. Minakshi and P. Singh (Murdoch University)

11:40 382 Effects of LLTO Coating on High Temperature Cycle Life Performance of LiMn2O4 Cathode Material – M. Reddy, M. Prabu (National University of Singapore), S. Selvasekaranpandian (Material Research Centre), G. Subba Rao, and B. Chowdari (National University of Singapore)

12:00 383 Damage Evaluation of Solid Cells by Intelligent Information Processing on Acoustic Emission Events – D. Inaba, K. Fukui (Osaka University), K. Sato, J. Mizusaki, N. Kuwata, J. Kawamura (Tohoku University), and M. Numao (Osaka University)

Co-Chairs: Adam Weber and Trung Nyugen

14:00 392 Performance Improvement of a Hydrogen-Bromine Flow Battery – K. Cho, A. Weber, Q. He, P. Ridgway, V. Battaglia, and V. Srinivasan (Lawrence Berkeley National Laboratory)


14:40 394 New Discharge/Charge Performance Data for a H2-Br2 Flow Battery – V. Yarlagadda and T. V. Nguyen (The University of Kansas)

15:00 395 Halogen Flow Batteries for Grid-Scale Electricity Storage – B. Huskinson, S. Mondal, J. Rugolo, and M. J. Aziz (Harvard School of Engineering and Applied Sciences)


15:40 Intermission (20 Minutes)

16:00 397 Aqueous Semi-Solid Flow Cell – Z. Li, P. Limthongkul, W. Carter, and Y. Chiang (Massachusetts Institute of Technology)

16:20 398 Hydrogen Bromine Redox Flow Battery Cell Performance Study – Y. Bai (The University of Tennessee Knoxville), A. B. Papandrew, and T. A. Zawodzinski Jr. (The University of Tennessee)
Co-Chairs: Y. Gogotsi and K. Lian

Carbon II – 10:00 – 12:00
Co-Chairs: Y. Gogotsi and K. Lian

10:00 505 Performance Limits of 2 V C/C Supercapacitors in Alkali Sulfate Aqueous Media – F. Béguin, K. Fic, P. Ratajczak, K. Jurewicz, Q. Abbas, G. Lotto (Poznan University of Technology), G. Gao, L. Demarconnay, E. Raymundo (CRM University), and E. Frackowiak (Poznan University of Technology)

10:20 506 Diameter Dependent Doping of Single-Walled Carbon Nanotube Used as Electrical Double Layer Capacitor Electrode – A. Al-zubaidi, Y. Ishii, T. Matsuishi, and S. Kawasaki (Nagoya Institute of Technology)

10:40 507 Three Dimensional Graphene-MWNTs Foam Architectures for Electrochemical Capacitors – W. Wang, S. Guo, M. Ozkan, and C. Ozkan (University of California, Riverside)

11:00 508 Effect of Additives on the Hydrothermal Synthesis of Carbon Nano- and Micro-Spheres and Their Performance in Double-Layer Capacitors – I. Kunadian, R. Chen, S. M. Lipka, C. R. Swartz, and F. Rogers (University of Kentucky)


11:40 510 Temperature effects in Activated Carbon Super capacitors – D. W. Kirk (University of Toronto)

Electrolytes – 14:00 – 15:40
Co-Chairs: M. Morita and P. Kulesza

14:00 511 Redox Active Electrolytes for Electrochemical Capacitors – E. Frackowiak, K. Fic, M. Meller, and G. Lotto (Poznan University of Technology)

14:40 512 Mixed Ionic Liquid Electrolytes and Electrochemical Double Layer Capacitors – E. T. Fox, J. S. Dickmann, J. E. Weaver, J. L. Allen, and W. A. Henderson (North Carolina State University)

15:00 513 Electrochemical Capacitor Using a Highly Conductive Ionic Plastic Crystal – R. Taniki, K. Matsumoto, T. Nohira, and R. Hagiwara (Kyoto University)

10:00  637  Nanoscale Single Crystal Electrochemistry as a Diagnostic Tool for Li-Ion Batteries – J. S. Syzdek (Lawrence Berkeley National Laboratory), I. T. Lucas, J. Elangbam, A. Bagnato, and R. M. Kostecki (Lawrence Berkeley National Laboratory)

10:20  638  In Situ TEM-EELS Studies of Degradation and Thermal Stability of High-Energy Cathodes for Li-Ion Batteries – F. Wang (Brookhaven National Laboratory), S. Bo (Stony Brook University), L. Zhang, C. Ma (Brookhaven National Laboratory), G. Clare, P. Khalifah (Stony Brook University), Y. Zhu, and J. Graetz (Brookhaven National Laboratory)


11:00  640  In Situ Small-Angle Neutron Scattering Studies of Electrodes for Lithium-Ion Batteries – C. A. Bridges, X. Sun, J. Zhao, M. Paranthaman, and S. Dai (Oak Ridge National Laboratory)


12:00  643  Use of In Situ XAS to Elucidate Surface Structural Changes and Capacity Loss during Electrical Cycling of nanoscale LiCoO2 – C. J. Patridge (NRC/NRL Cooperative Research Associate), C. T. Love (U.S. Naval Research Laboratory), and D. E. Ramaker (The George Washington University)

Cathode II – 14:00 – 17:20
Co-Chairs: Yong Yang and Atsuo Yamada

14:00  644  Toward Safe and Long-Cycle Life Li-Ion Batteries: New Polyanion-Cathode and Their Reaction Mechanism – Y. Yang (Xiamen University)

14:40  645  Bimetallic Sulfates AₓMₓ(SO₄)ₓ·xH₂O (A = Li, Na and M = 3d Metal): New Electrode Materials for Li- and Na-Ion Batteries – M. Reynaud, M. Ati (Université de Picardie Jules Verne CNRS UMR7314), M. Sougrati (Institut Charles Gerhardt, CNRS UMR5253), B. Melot (Université de Picardie Jules Verne CNRS UMR7314), G. Rousse (Institut de Minéralogie et de Physique des Milieux Condensées, Université Pierre et Marie Curie CNRS UMR7590), J. Chotard, and J. Tarascon (Université de Picardie Jules Verne CNRS UMR7314)

15:00  646  Revisiting the Lithium Metal Borate (LiMBO₃; M= Fe, Mn, Co) Cathode Systems: Synthesis and Electrochemical Findings – Y. Yamashita, P. Barpanda, S. Chung, Y. Yamada, S. Nishimura, and A. Yamada (The University of Tokyo)

15:20  Intermission (20 Minutes)

15:40  647  Reaction Mechanism of Pyrophosphate Cathode Material Liₓ(MₓFe₁₋ₓ)₂P₂O₇ – S. Nishimura, N. Furuta, D. Shimizu, P. Barpanda, Y. Yamada, and A. Yamada (The University of Tokyo)

16:00  648  A Cooperative Mechanism for the Diffusion of Li⁺ Ions in LiMgSO₄F – D. Marrocchelli (Trinity College Dublin), M. Salanne (Universite Pierre et Marie Curie), and G. W. Watson (Trinity College Dublin)

16:20  649  Novel Electrode Materials for Li-Ion Batteries – M. Reddy and B. Chowdari (National University of Singapore)

16:40  650  Tracking Disorder in LiFePO₄ with Electrochemical Lithium Insertion/Extraction – C. T. Love (U.S. Naval Research Laboratory), A. Korovina, D. E. Ramaker (The George Washington University), and K. Swider-Lyons (U.S. Naval Research Laboratory)

17:00  651  Distinct Configuration of Antisite Defects in Olivine Phosphates: Comparison between LiFePO₄ and LiMnP₄O₆ – S. Chung (Korea Advanced Institute of Science & Technology) and S. Choi (Korea Institute of Materials Science)

Interfaces and Interphases in Battery Systems

Tuesday, October 9

B5

Interpretations and Interfaces in Battery Systems

B5

Battery / Energy Technology
Honolulu 1, Tapa Conference Center, Hilton Hawaiian Village

Interfaces and Interphases in Battery Systems III – 08:00 – 12:00
Co-Chairs: Takeshi Abe and Takeyuki Doi

08:00  732  Ionic and Electronic Transport in Metal Fluoride Conversion Electrodes – J. Graetz, F. Wang, Y. Zhu (Brookhaven National Laboratory), H. Yu, A. Van Der Ven, K. Thornton (University of Michigan), N. Pereira, and G. G. Amatucci (Rutgers – The State University of New Jersey)


09:00  734  Electrode Architectures for Conversion-Based Cathodes: Case of Iron Fluorides and Oxyfluorides – S. K. Martha, J. Nanda, J. Iдроbo, S. Pannala, S. Dai, N. J. Dudney (Oak Ridge National Laboratory), J. Wang, and P. V. Braun (University of Illinois)


09:40  Intermission (20 Minutes)

10:00  736  In Situ ECAFM and Raman Study on Interfacial Reactions between Graphite and PC-Based Solutions in Lithium Secondary Batteries – S. Jeon, H. Song (Seoul National University), T. Abe (Kyoto University), M. Inaba (Doshisha University), and Z. Ogumi (Kyoto University)
10:40 737 Polyimide Gel Polymer Electrolyte-Directed Nanoscale Wrapping of High-Voltage LiNi0.5Co0.2Mn0.3O2 Cathode Active Materials for Lithium-Ion Batteries – J. Park, J. Cho, and S. Lee (Kangwon National University)

11:00 738 In Situ Raman Imaging Applied to the Observation of Li Transport in a LiCoO2 Cathode – T. Nishi, H. Nakai, and A. Kita (Sony Energy Devices Corporation)

11:20 739 In Situ Electrochemical X-ray Absorption Spectroscopy of Mg Deposition – T. S. Arthur (Toyota Research Institute of North America), P. Glans-Suzuki (Lawrence Berkeley National Laboratory), M. Matsui, R. Zhang (Toyota Research Institute of North America), J. Guo (Lawrence Berkeley National Laboratory), and F. Mizuno (Toyota Research Institute of North America)

11:40 740 In Situ Observation of Sn Thin-Film Anode / Electrolyte Interface by X-ray Reflectivity – K. Shimada, T. Kawaguchi, T. Ichisubo, E. Matsubara, K. Fukuda, Y. Uchimoto, and Z. Ogumi (Kyoto University)

Interfaces and Interphases in Battery Systems IV – 14:00 – 17:00

Co-Chairs: Soon Ki-Jeong and Yue Qi

14:00 741 Spectroscopic and Spectrometric Studies of the SEI and Its Interaction with Anode Electrode Surfaces – A. A. Gewirth, H. Tavassoli, B. R. Long, J. W. Bathker, and L. Huff (University of Illinois)

14:40 742 Porous Silicon Impregnated Carbon Nanospheres for S-Block Metal Ion Battery Negative Electrodes – S. Polisski and T. Abe (Kyoto University)

15:00 743 Study on Solid Electrolyte Interphase Layer on Si Anode by Surface Modification – C. Jung, W. Jeon, H. Han (Samsung Advanced Institute of Technology), H. Choi, and S. Jeong (Soochunhyang University)

15:20 744 Inelastic Shape Changes in Contacting Silicon Particles and Binder Failure in Composite Lithium-ion-battery Electrodes – H. Wang, V. A. Sethuraman, P. R. Guduru, and V. B. Shenoy (Brown University)

15:40 745 Intermersion (20 Minutes)

16:00 746 Studies of Interfacial Reactions on Silicon-Based Film Electrode in Ionic Liquid Battery Electrolyte – C. Nguyen (Chungnam National University), S. Woo (LG Chem Ltd.), and S. Song (Chungnam National University)

16:20 747 Mechanism of SEI Layer Formation on the Si Electrodes Studied by XPS and ToF-SIMS – C. Pereira-Nabais, J. Swiatowska (CNRS Chimie ParisTech), A. Chagnes (Chimie ParisTech (ENSCP)), P. Tran-Van (Renault Research Department), M. Cassir (Chimie ParisTech (ENSCP)), and P. Marcus (CNRS Chimie ParisTech)

16:40 748 In Situ Stress Measurements in Composite Lithium-Ion-Battery Electrodes during Charge/Discharge Processes – V. A. Sethuraman, A. Nguyen, S. P. Nadimpalli (Brown University), D. P. Abraham (Argonne National Laboratory), A. F. Bower, V. B. Shenoy, and P. R. Guduru (Brown University)

Interfaces and Interphases in Battery Systems Poster Session – 18:00 – 20:00

- 748 Interface Modification for Advanced 5V-Class All-Solid-State Lithium Batteries – A. Omori (Shizuoka University), C. Yada, H. Yamasaki (Toyota Motor Corporation), F. Sagane, and Y. Iriyama (Shizuoka University)

- 749 Reduction of the Interfacial Resistance at the LiLa2Zr2O7/LiCoO2 by Interface Modification – T. Kato (Shizuoka University), T. Hamanaka (Japan Fine Ceramics Center), F. Sagane (Shizuoka University), K. Yamamoto, T. Hirayama (Japan Fine Ceramics Center), and Y. Iriyama (Shizuoka University)


- 751 Silicon and Porous Silicon/Carbon Nanocomposites for Rechargeable Li- and Mg-Ion Batteries – S. Polisski and T. Abe (Kyoto University)

- 752 Effects of Initial Charging Temperature on Electrochemical Properties of Solid Electrolyte Interphase Formed upon Graphite Anodes – J. Choi, T. Lee, S. Kim, J. Ko, and Y. Lee (Hanbat National University)

- 753 Interfacial Reaction on Li3PO4/Li2RuO3 Thin-Film Electrode – S. Taminato, K. Suzuki, K. Kim (Tokyo Institute of Technology), J. Son (Japan Synchrotron Radiation Research Institute), K. Tamura, J. Mizuki (Japan Atomic Energy Agency), M. Hirayama, and R. Kanno (Tokyo Institute of Technology)

- 754 Fundamental Investigations of Mechanical and Chemical Degradation Mechanisms in Lithium-Ion Battery Materials – V. A. Sethuraman, V. B. Shenoy, A. F. Bower (Brown University), L. Wang, B. L. Lucht, A. B. Amani, and T. Abe (Lawrence Berkeley National Laboratory), and P. R. Guduru (Brown University)


- 756 Depth-Resolved X-ray Absorption Spectroscopic Study on Nanoscale Observation of the Electrode-Electrolyte Interface for All Solid State Lithium-Ion Batteries – T. Ina (Kyoto University), H. Wang, T. Nakatsutsumi, Y. Ikada, H. Arai (Kyoto University), Y. Iriyama (Shizuoka University), T. Uruga (Japan Synchrotron Radiation Research Institute), H. Tanida, Z. Ogumi, and Y. Uchimoto (Kyoto University)
Lithium-Ion Batteries: Cathodes II (Lithium NMC-Based Systems) – 08:00 – 09:40
Co-Chairs: Daniel Abraham and Ilias Belharouak

08:00 804 Synthesis of 0.5Li2MnO3•0.5LiMO2 (M = Mn, Ni, Co) Layered-Layered Integrated Cathode Electrode Materials with Mechanochemical Process – S. Kim, K. Chung, and B. Cho (Korea Institute of Science and Technology)

08:20 805 Composition Optimization of xLi2MnO3(1-x) LiMO3 Electrodes (M= Mn, Ni, Co) Prepared via Spray Pyrolysis Process – M. Lengyel (Washington University in St. Louis), X. Zhang (Argonne National Laboratory), G. Atlas (Washington University in St. Louis), D. Elhassid (X-tend Energy LLC), I. Belharouak (Argonne National Laboratory), and R. Axelbaum (Washington University in St. Louis)

08:40 806 Structure Evolution and Its Relation to the Voltage Fade Behavior in Li-Rich Layered Li1.23Ni0.1Mn0.67O2 Cathode Material during Cycling: X-ray Diffraction and Absorption Spectroscopy Study – X. Yu, K. Nam, E. Hu (Brookhaven National Laboratory), D. P. Abraham (Argonne National Laboratory), and X. Yang (Brookhaven National Laboratory)

09:00 807 Effect of Precursor Synthesis Atmosphere on Morphology and Electrochemical Performance of Li1.20Ni0.15Mn0.55O2 Cathode Material with Ionic Liquids Electrolyte for Lithium-Ion Batteries Using Quasi-Solidified Glyme – Li-Salt Complexes as Electrolytes – A. Unemoto, T. Matsuo, Y. Gambe, and I. Honma (Tohoku University)

09:20 808 Synthesis and Morphological Analysis of Carbonate Based Precursors for Lithium-Ion Battery Cathode Materials – R. Shunmugasundaram, T. Byrne, and J. Dahn (Dalhousie University)

Coral 4, Mid-Pacific Conference Center, Hilton Hawaiian Village

Lithium-Ion Batteries: Electrolytes I – 08:00 – 09:40
Co-Chairs: Brett Lucht and Marshall Smart

08:00 809 Development of All-Solid-State Lithium-Ion Rechargeable Battery Using Quasi-Solidified Glyme – Li-Salt Complexes as Electrolytes – A. Unemoto, T. Matsuo, Y. Gambe, and I. Honma (Tohoku University)


08:40 811 Development of Li-Ion Technology Based on Aqueous Electrolytes – S. Martinet, L. Crepel-Marchal (CEA-LITEN), F. Alloin, and J. Lepretre (LEPMI, Grenoble-INP)

09:00 812 Topological Analysis of Lithium Migration Paths: Application to Solid Electrolytes – L. Miara, M. Aryanpour (Samsung Electronics), S. Ong, Y. Mo, G. Ceder (Massachusetts Institute of Technology), and H. Lee (Samsung Electronics)

09:20 813 The Effect of Microstructure on the Lithium Ion Conduction of the LiBH4-LiI Solid Solution – D. Sveinbjörnsson, D. Blanchard, M. Mogensen, P. Norby, and T. Vegge (Technical University of Denmark)

Coral 3, Mid-Pacific Conference Center, Hilton Hawaiian Village

Lithium-Ion Batteries: Cathodes II (Lithium NMC-Based Systems) – 10:00 – 12:20
Co-Chairs: Ilias Belharouak and Daniel Abraham

10:00 814 The Effect of LaMeO3 as Stabilizer Phase in 0.5[Li0.33Mn0.67]O2•0.5Li[Ni0.33Co0.33Mn0.33]O2 Cathode Material – M. Kim, K. Park, J. Yoon, M. Park, J. Park (Samsung Electronics), W. Yoon (Sungkyunkwan University), and S. Doo (Samsung Electronics)

10:20 815 Effect of Carbon Coating on Li[Li1/3Mn2/3] O2-LiMO3 Cathode Materials for Lithium Ion Batteries – Y. Wu (General Motors), X. Wang (Optimal, Inc.), and Z. Liu (General Motors)

10:40 816 Transition Metal Dissolution on Mixed LiNi1/3Co1/3Mn1/3O2-LiMn2O4 Cathodes for Li-ion Batteries – L. Liu, A. Drews, and R. Kudla (Ford Motor Company)

11:00 817 Optimizing LiNi1/3Mn1/3Co1/2O2 Capacity by Controlling Cathode Porosity through Calendering – J. Li, J. Kiggans, C. Daniel, and D. L. Wood (Oak Ridge National Laboratory)

11:20 818 Root Cause for Rapid Growth of Cell Impedance in Li-Ion High Energy Cells Having Overlithiated Cathodes and Graphite Negatives – C. Ma, R. Staniewicz, B. Deveney, S. Hafner (SAFT America Inc), R. Bugga (California Institute of Technology), W. C. West, M. C. Smart, and J. Soler (California Institute of Technology)


12:00 820 Improvement of Elevated Temperature Performance of Li-Rich Cathode Material with Ionic Liquids Electrolyte for Lithium-Ion Batteries – J. Li, S. Jeong (University of Muenster), R. Klöpsch, M. Winter, and S. Passerini (University of Münster)

Tuesday, October 9
10:20 822 Investigation of Temperature Dependent Stability of Ethylene Carbonate and Propylene Carbonate in multicomponent Electrolytes for Lithium Ion batteries – C. L. Foss (Norwegian University of Science and Technology), A. Svensson, E. Sheridan (SINTEF Materials and Chemistry), S. Sunde, and F. Vullum-Brüer (Norwegian University of Science and Technology)

10:40 823 Advanced Electrolytes for Lithium Ion Batteries in High Voltage Systems – J. Li and M. Payne (Novolyte Technologies)

11:00 824 Examination of Applying Fluorinated Phosphate Ester to Electrolyte Solvent of the Batteries with LiNi0.4Mn1.6O4 TiO2 Cathode – T. Noguchi, M. Uehara, Y. Katoh, H. Sasaki, and K. Utugi (NEC corporation)

11:20 825 Effect of Electrolyte Solvents on Low-Temperature Performance of Li-Ion Batteries – J. Eom, L. Cao, and C. Wang (The Pennsylvania State University)

11:40 826 Influences of Molecular Interactions on Battery Electrolyte Properties and Processes – K. L. Gering (Idaho National Laboratory)

12:00 827 Novel IL Based Electrolytes for Secondary Lithium Ion Batteries – H. Srour (Laboratoire de Chimie Organométallique de Surface), H. Rouault (CEA), and C. Santini (CNRS)

Coral 3, Mid-Pacific Conference Center, Hilton Hawaiian Village

Lithium-Ion Batteries: Electrolytes I – 14:00 – 15:40
Co-Chairs: Wesley Henderson and Matthew Foley

14:00 832 Conformal Electrodeposition of Copolymer Electrolyte into Self-Organized Titania Nanotubes for Lithium Ion Microbatteries – T. Djenizian (University of Aix-Marseille)

14:20 833 Gelled Polymer Electrolyte Thin Films with Mechanical Integrity and Persistent Structure for Lithium Ion Batteries – S. Wang, C. Huang, P. Kuo, and H. Teng (National Cheng Kung University)


15:00 835 Structure, Disorder, and Crystalization; Lessons Learned from Analysis of Lithium Trifluoromethanesulfonate – M. P. Foley (U.S. Naval Academy), C. Worsos, L. Haverhals, K. Sweely (U. S. Naval Academy), W. A. Henderson (North Carolina State University), H. De Long (AFRL/AFOSR), and P. Trulove (US Naval Academy)


Coral 3, Mid-Pacific Conference Center, Hilton Hawaiian Village

Lithium-Ion Batteries: Cathodes III (Metal Oxide Systems) – 16:00 – 17:40
Co-Chairs: Ratnakumar Bugga and Ayyakkannu Manivannan

16:00 837 Flux Growth of High-Quality LiCoO2 Crystals for All-Crystal-State Lithium-Ion Rechargeable Batteries – Y. Mizuno, H. Wagata (Shinshu University), T. Ishizaki (Shibaura Institute of Technology), T. Sakaguchi, K. Kohama (Toyota Motor Corporation), K. Yubuta, T. Shishido (Tohoku University), S. Oishi, and K. Teshima (Shinshu University)

16:20 838 The effects of Carbon Additive on Electrochemical Performance of High Voltage Spinel LiNi0.4Mn1.6O4 – J. Zheng, J. Xiao, W. Xu, X. Li, and J. Zhang (Pacific Northwest National Laboratory)

16:40 839 First Principles Calculation of Electronic Structures and Thermal Stability of Spinel LiNi0.4Mn1.6O4 – A. Kuwabara, C. Fisher, Y. Ikuhara, H. Moriwake (Japan Fine Ceramics Center), H. Oki (Toyota Motor Corporation), and Y. Ikuhara (The University of Tokyo)

17:00 840 Investigations of the Phase Diagram of the Lithium-Manganese-Nickel Oxide System obtained at 800°C – E. McCalla and J. Dahn (Dalhousie University)

17:20 841 Production of Manganese Oxide Nanowire Powders and Their Characterization for Li Ion Batteries and Capacitors – V. Vendra, A. Thapa, S. Sunkara (University of Louisville), T. Nguyen (University of Louisville), and M. K. Sunkara (University of Louisville)
Lithium-Ion Batteries: Cell Design Aspects – 16:00 – 18:00
Co-Chairs: Daniel Abraham and Fikile Brushett

16:00 842 Designing Long-Life, High Energy Lithium-Ion Cells – D. P. Abraham (Argonne National Laboratory), Y. Li (University of Rochester), M. Betige, and Y. Zhu (Argonne National Laboratory)


17:00 845 Evaluation of Effective Electrical Conductivity of Carbon Electrode with Porous Metal Collector – G. Inoue (Kyoto University), S. Abe, Y. Fan, Y. Matsukuma, and M. Minemoto (Kyushu University)

17:20 846 VGCF Cloth for Thin, Flexible Electrodes for Advanced Conformal Batteries – D. J. Burton (Applied Sciences, Inc.), N. J. Dudney (Oak Ridge National Laboratory), G. Nazri (Wayne State University), S. K. Martha (Oak Ridge National Laboratory), G. Nazri (Wayne State University), and J. Howe (Oak Ridge National Laboratory)

17:40 847 Effects of Volume Expansion and Fluid-Solid Stress Interaction within Lithium-Ion Batteries – C. Zhang (The Ohio State University), A. Conlisk, G. Rizzoni (Ohio State University), and J. Marcicki (The Ohio State University & Ford Motor Company)

Metal-Air Batteries
Battery / Energy Technology / Fullerenes, Nanotubes, and Carbon Nanostructures
Nautilus 1, Mid-Pacific Conference Center, Hilton Hawaiian Village

Electrolyte – 08:00 – 12:00
Co-Chairs: Yangchuan Xing and Jie Xiao

08:00 1113 (Invited) Dual-Electrolyte Lithium-Air Batteries with Buffer Catholytes – A. Manthiram (The University of Texas at Austin), L. Li, and Y. Fu (University of Texas at Austin)

08:40 1114 Investigations of Li-O2 Batteries Using Polyethylene Oxide in Structured Three-Phase Electrodes – J. R. Harding, Y. Lu, P. T. Hammond, and Y. Shao-Horn (Massachusetts Institute of Technology)

09:00 1115 Recent Developments in Solid Li-Ion Electrolytes – V. Thangadurai (University of Calgary)


09:40 Intermission (20 Minutes)


10:40 1118 A Long Life, High Capacity, High Rate Lithium-Air Battery Using a Stable Glyme Electrolyte – H. Jung, J. Park, H. Kim (Hanyang University), J. Hassoun (University of Rome Sapienza), C. Yoon, B. Scrosati, and Y. Sun (Hanyang University)

11:00 1119 Stability of Li-Salts during the Discharge Reaction in a Li-O2 Cell – G. M. Veith, J. Nanda, and N. J. Dudney (Oak Ridge National Laboratory)

11:20 1120 Stability of Pyr14TFSI Ionic Liquid in Li-O2 Cells and Its effect on the Cycling Behavior – M. Piana, N. Tsiovvaras, S. Meini, I. Buchberger, J. Wandt, H. A. Gasteiger (Technische Universität München), and A. Garsuch (BASF SE)

11:40 1121 Electrochemical Performance of All-Solid-State Lithium-Air Batteries – H. Kitaura and H. Zhou (National Institute of Advanced Industrial Science and Technology)

Catalyst – 13:20 – 17:00
Co-Chairs: V. Thangadurai and Zheng Li


14:00 1123 Metal Nitrides as Alternative Catalyst for Air Cathodes – C. Pozo-Gonzalo, A. A. Torrero, P. Howlett, M. Forsyth (Deakin University), A. M. Glushenkov, O. Kartachova, and Y. Chen (Geelong Technology Precinct)

14:20 1124 Role of Manganese Oxides in the Oxygen Electrode for Li-Air Batteries – I. Bae (Duracell Technology Center) and K. Nam (Brookhaven National Laboratory)


15:00 Battery division student research award address- held jointly with B4 (20 Minutes)


16:00 1128  Graphene/Metal Oxide Catalyst Based High Capacity Cathode for Li-O₂ Batteries – R. S. Kalubarme, C. Ahn, and C. Park (Chonnam National University)

16:20 1129  Activated and Nitrogen Doped Carbon Nanofibers as Oxygen Reduction Electrode Materials for Zinc-Air Batteries – D. C. Higgins, Y. Liu, Z. Chen, and Z. Chen (University of Waterloo)

16:40 1130  Nickel Cobalt Oxide Nanostructures on Graphene as an Active Bifunctional Electrocatalyst – D. Lee, A. Yu, H. Park, and Z. Chen (University of Waterloo)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

**B7 – Poster Session – 18:00 – 20:00**

**Co-Chairs: Nobuyuki Imanishi and V. Thangadual**

- 1131  Cyclic Voltammetry of Zn/Zn(II) Couple in Dicyanamide Anion and Bis-(trifluoromethylsulfonyl)Imide Anion Based Ionic Liquids – M. Xu, D. Ivey (University of Alberta), Y. Bing, Z. Xie, and W. Qu (National Research Council Canada)
- 1133  Microwave-Assistanted Synthesis of Ag-MnO₂/ SWNT Electrocatalyst for Metal-Air Cells – G. Zhang and Y. Jiang (Yangtze Normal University)
- 1134  Carbon Sphere Dotted with Co₃O₄ and RuO₂ Nano Particles for Rechargeable Li/Air Batteries – C. Park and Y. Park (Kyonggi University)
- 1136  Air Electrode with Oxygen Catalyst for Aqueous Lithium-Air Rechargeable Batteries – S. Sunahiro, H. Ohkuma, I. Uechi, N. Imanishi, Y. Takeda, and O. Yamamoto (Mie University)
- 1137  Lithium Nitride Formation on Lithium Metal – N. Futamura, T. Ichikawa, N. Imanishi, Y. Takeda, and O. Yamamoto (Mie University)
- 1138  Role of Metal Decoration in the Catalytic Activity of Urchín-Like MnO₂ for Oxygen Reaction in Aqueous Lithium-Oxygen Batteries – K. Jung, J. Lee, A. Riaz, S. Lee, T. Lim, S. Park, R. Song, and K. Shin (Korea Institute of Energy Research)
- 1139  Tape-Cast Lithium Conducting Solid Electrolyte Li₄₋ₓTlₓ/Alₓ(PO₄)₂ for Aqueous Lithium-Air Batteries – K. Takahashi, N. Imanishi, Y. Takeda, and O. Yamamoto (Mie University)
- 1140  Rechargeable, All-Solid Li-Air Battery – W. Chang (Industrial Technology Research Institute), D. Hallinan (Lawrence Berkeley National Laboratory), Y. Lee (Industrial Technology Research Institute), T. Yen (CPC), and C. Yang (Industrial Technology Research Institute)
- 1141  Mesoporous Nitrogen Doped Carbon as Cathode Materials for High Capacity Lithium-Air Batteries – A. Zahoor, M. Christy, Y. Huang, J. Choi, and K. Nahm (Chonbuk National University)
- 1142  An Effort to Understand the Basic Characteristics of Hybrid Li-air Cell Performance – D. S. Kim (SK Innovation), M. Park (SK Innovation, Battery R&D), S. Kim, and H. Sun (SK Innovation)
- 1143  Electrodeposited Manganese Oxide Catalysts for Oxygen Reduction Aqueous Alkaline Media – S. H. Pulukadang and S. W. Donne (University of Newcastle)
- 1144  Electrochemical Properties of Graphene Based Catalyst for Rechargeable Li/O₂ Batteries – C. Ahn, R. S. Kalubarme, and C. Park (Chonnam National University)
- 1145  Effects of Nb₂O₅ Addition on the Electrochemical Properties of Li₁ₓAlₓGe₁₋ₓP₃O₁₂ Glass Ceramic for Li-Air Batteries – T. Kim, R. S. Kalubarme, and C. Park (Chonnam National University)
- 1146  Rechargeable Li/O₂ Cell Based on a LiTFSI-DMMF/PSA-Li Composite Electrolyte – H. Wang (Shanghai Jiao Tong University), X. Liao (Shanghai Jiaotong University), L. Li, and Z. Ma (Shanghai Jiao Tong University)
- 1147  MnO₂-Based Nanostructures as Catalysts for Oxygen Oxidation-Reduction Reaction in Rechargeable Lithium-Oxygen Battery – B. Huang (Shanghai Jiao Tong University), X. Liao (Shanghai Jiaotong University), and Z. Ma (Shanghai Jiao Tong University)
- 1149  Modeling of Bifunctional Electrode in Metal Air Battery – D. Chan (LeeMing Institute of Technology), K. Hsueh (National United University), C. Wu, and W. Chang (Industrial Technology Research Institute)
- 1150  Inhibiting Ability of Chelating Agent on Aluminum Corrosion in Alkaline Solution and Testing of Aluminum-Air Single Cell – C. Wu, X. C. Chang (Industrial Technology Research Institute), K. Hsueh (National United University), and W. Chang (Industrial Technology Research Institute)
- 1151  The Kinetic Reaction of Aluminum-Air Battery in Different Aqueous Solution – C. Wang, K. Hsueh (National United University), and C. Hsueh (Institute of Nuclear Energy Research)
- 1152  Manganese Oxide Nanosheets: Applications in High Energy Density Zn-Air Batteries – Y. Korenlblit (Ulsan National Institute of Science & Technology), G. Yushin (Georgia Institute of Technology), and J. Cho (Ulsan National Institute of Science & Technology)
Meeting Program • PRIME 2012 • October 7-12, 2012 • Honolulu, Hawaii

B8 Non-Aqueous Electrolytes for Lithium Batteries
Battery / Energy Technology / Physical and Analytical Electrochemistry
South Pacific 3, Mid-Pacific Conference Center, Hilton Hawaiian Village

Solid Electrolytes, Polymer – 08:00 – 09:40
Co-Chairs: Dr. Henderson and Dr. Ue

08:00 1201 Nanostructured Solid Electrolytes for Lithium Batteries – N. P. Balsara (Lawrence Berkeley National Laboratory)
08:40 1202 Block Copolymer-Ceramic Nanocomposites as Solid Electrolytes for Lithium Batteries – I. Gurevitch, J. Cabana, and N. P. Balsara (Lawrence Berkeley National Laboratory)
09:00 1203 Conductivity of Electronic and Ionic Conducting Block Copolymer Electrolytes through Electrochemical Doping in the Solid-State – S. N. Patel, A. E. Javier (University of California – Berkeley), and N. P. Balsara (Lawrence Berkeley National Laboratory)
09:20 1204 High Temperature Cycling of Solid Polymer Lithium Batteries – Q. Hu, A. Caputo, and D. R. Sadoway (Massachusetts Institute of Technology)

Liquid Electrolytes, Gel and Composite – 10:00 – 12:00
Co-Chairs: Dr. Jow and Dr. Winter

10:00 1205 Preparation, Performance in Various Cell Configurations and Limitations of Novel Electrolyte Components for Liquid and Gel Polymer Electrolytes – R. Schmitz, E. Krämer, R. Müller, R. W. Schmitz, J. Kasnatscheew, R. Wagner, M. Amereller, P. Janßen (Westfälische Wilhelms-University Münster), P. Bicker, T. Placke, O. Fromm, H. Meyer (University of Münster), P. Isken, A. Lex-Baldacci, I. Profatilova, T. Langer, A. Schmitz, C. Stock, U. Vogl, T. Schedlbauer, H. Gores (Westfälische Wilhelms-University Münster), S. Passerini (University of Münster), and M. Winter (Westfälische Wilhelms-University Münster)
10:40 1206 Organoboron Ion-Gel Electrolytes as Lithium-Ions Transport Media – N. Matsumi (Japan Advanced Institute of Science and Technology)
11:00 1207 Design of Borosilicate Type Organic-Inorganic Hybrid Ion-Gel Electrolytes – K. S. Smaran and N. Matsumi (Japan Advanced Institute of Science and Technology)
11:20 1208 3D Hybrid Clay-CNT Nanofillers for Polymer Electrolytes in Lithium-Ion Batteries – H. Ardebeli (University of Houston), C. Tang (Sichuan University), K. Hackenberg (Rice University), Q. Fu (Sichuan University), and P. Ajayan (Rice University)
11:40 1209 Electrochemical Characterization of Ionic Liquid Based Composite Electrolytes for Lithium-Ion Batteries – N. Krawczyk, K. Sann (Justus Liebig University Gießen), S. Kraas, A. Schlifke, J. Vogel (University of Hamburg), B. Luerßen (Justus Liebig University), M. Fröba (University of Hamburg), and J. Janek (Justus Liebig University Gießen)

Liquid Electrolytes, Ionic Liquid 1 – 14:00 – 15:40
Co-Chairs: Dr. Winter and Dr. Ishikawa

14:00 1210 FSI-Based Ionic Liquid Electrolyte and Its Specific Effects with Other Component Materials on Li Battery Performance – M. Ishikawa and M. Yamagata (Kansai University)
14:40 1211 Lithiated Block Copolymer Electrolytes with Ionic Liquids for Batteries – A. S. Fisher, M. B. Khalid, and P. Kofinas (University of Maryland)
15:00 1212 Improving the Cathode/Electrolyte Interface Using Ionic Liquids – A. Caputo, Q. Hu, and D. R. Sadoway (Massachusetts Institute of Technology)

Liquid Electrolytes, Ionic Liquid 2 – 16:00 – 17:40
Co-Chairs: Dr. Ishikawa and Dr. Trulove

16:00 1214 Application of Electroactive Ionic Liquids to Improve the Safety of Lithium-Ion Batteries – J. C. Forgrie, D. Rochefort, S. El Khakani, and D. MacNeil (Université de Montréal)
16:20 1215 Transport Properties for Ionic Liquids and Implications for Li-Ion Battery Design – V. L. George and T. F. Fuller (Georgia Institute of Technology)
16:40 1216 Exploring Solvents toward Stable Electrolyte for Li-Air Battery – K. Takechi, T. Shiga, S. Higashi (Toyota Central Research & Develop Labs. Inc.), H. Nakamoto (Toyota Motor Corporation), F. Mizuno (Toyota Research Institute of North America), H. Nishikiori, H. Iba (Toyota Motor Corporation), and T. Asaoka (Toyota Central R&D Labs., Inc.)
17:00 1217 Li+ Cation Diffusion in Ionic Liquid Electrolyte and Rate Capability of Lithium Secondary Battery – K. Yoshida, N. Tachikawa, K. Ueno, K. Dokko, and M. Watanabe (Yokohama National University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

B8 – Poster Session – Electrolytes – 18:00 – 20:00
Co-Chairs: Dr. Ue, Dr. Ishikawa, and Dr. Henderson

• 1219 First-Principles Study on Li Diffusion in Solid Electrolyte Lithium Lanthanum Titanates(LLTO) – Y. Tanaka and T. Ohno (National Institute for Materials Science)
A-1.1 Modeling 1 – 08:00 – 12:00

Co-Chairs: Partha Mukerjee, David Harvey, and Scott Calabrese Barton

08:00 1282 Modeling and Diagnostics in Biological Fuel Cells – H. Wen, D. Chakraborty, P. Kar, and S. Calabrese Barton (Michigan State University)

08:40 1283 Modelling of Water Droplet Dynamics in PEM Fuel Cell Flow Channels – T. Wu and N. Djlilal (University of Victoria)

09:20 1284 Modeling Oxygen Concentration Oscillation in the Gas Channel of Polymer Electrolyte Fuel Cells: A Comparison between Numerical and Analytical Approaches – P. Guillemet (University of Nantes), G. Maranzana, J. Mainka (Nancy University), O. Lottin (Lorraine University-CNRS), J. Dillet, and A. Lamibrac (Nancy University)

09:40 Intermission (20 Minutes)

10:00 1285 A Two-Phase Pressure Drop Model Incorporating Local Water Balance in PEM Fuel Cell Gas Channels – E. J. See and S. Kandlikar (Rochester Institute of Technology)


10:40 1287 A Map to Start PEFC under Freezing Temperature -Theoretical Analysis of Super-cooled State in Cell – Y. Ishikawa (NIPPON SOKEN, INC), K. Ito (Kyushu University), M. Shiozawa (Nippon Soken, Inc.), and M. Kondo (Toyota Motor Corporation)

11:00 1288 Numerical Modeling of a Non-Flooding Hybrid Polymer Electrolyte Fuel Cell – B. McNealy and J. L. Hertz (University of Delaware)

11:20 1289 Statistical Simulation of the Performance and Degradation of a PEMFC Membrane Electrode Assembly – D. B. Harvey (Queen’s University), A. Bellemare-Davis (Ballard Power Systems), K. Karan, B. Jayansankar (Queen’s University), J. Pharoah (Queen’s-RMC Fuel Cell Research Centre), V. Colbow, A. Young, and S. Wessel (Ballard Power Systems)

11:40 1290 Multi-Scale First-Principles Modeling of Three-Phase System of Polymer Electrolyte Membrane Fuel Cell – G. Brunello, J. Choi, S. Jang (Georgia Institute of Technology), and D. B. Harvey (Queen’s University)

B-1.1 Contamination Effects – 08:00 – 12:00

Co-Chairs: Balsu Lakshmanan and Doug Hansen

08:00 1291 Missions and Progressions of Impurities WG under NEDO’s PEFC Residential CHP System Project – K. Kobayashi (Fuel Cell Research Center, Daido University), Y. Oono, and M. Hori (Daido University)


08:40 1293 Understanding the Effects of Contaminants from Assembly Aids Materials used as Balance of Plant Materials on PEMFCs -In Situ Studies – M. S. Opu, M. Ohashi, H. Cho (University of South Carolina), C. S. Macomber, H. N. Dinh (National Renewable Energy Laboratory), and J. Van Zee (University of South Carolina)

09:00 1294 The Impact of Operating Conditions on the Performance effect of Selected Airborne PEMFC Contaminants – Y. Zhai, M. Angelo, and J. St-Pierre (University of Hawaii)

09:20 1295 The Contamination Behavior of Organic Compounds on PEMFC – H. Cho, M. S. Opu, M. Ohashi, and J. Van Zee (University of South Carolina)

09:40 Intermission (20 Minutes)

10:00 1296 Liquid Water Scavenging of PEMFC Contaminants – B. Wetton (University of British Columbia) and J. St-Pierre (University of Hawaii)

10:20 1297 The Poisoning and Recovery of Pt/VC Electro catalysts Contaminated with Glycol-Based Coolant Formulations – Y. Garsany (EXCET/NRL), S. Dutta (Dynalene), and K. Swider-Lyons (Naval Research Laboratory)

10:40 1298 Evaluation of PEMFC System Contaminants on the Performance of Pt Catalyst via Cyclic Voltammetry – H. Wang, C. S. Macomber, J. Christ, G. Bender, B. S. Pivovar, H. N. Dinh (National Renewable Energy Laboratory), R. Reid, B. Lakshmanan, K. O’Leary (General Motors Corporation), M. Das, M. Ohashi, and J. Van Zee (University of South Carolina)

11:00 1299 The Influence of NaCl Aerosol on the Performance of a PEM Fuel Cell Cathode – O. A. Batunina (Naval Research Laboratory), P. Northrup (Stony Brook University), and K. Swider-Lyons (Naval Research Laboratory)

Honolulu 2, Tapa Conference Center, Hilton Hawaiian Village

### C-1.1 Perfluorosulfonic Acid Membranes
**8:00 – 12:00**

**Co-Chairs: Mark Edmundson and Deborah Jones**

### C-1.1 Perfluorosulfonic Acid Membranes
- **8:00**
  - Advances in Proton Exchange Membrane Technology – S. Banerjee, D. Prugh, and S. Frisk (DuPont Company)
- **8:40**
  - Nanofiber Composite Membranes Using Low EW PFSA – J. Ballenengee and P. Pintauro (Vanderbilt University)
- **9:00**
  - Novel System for Characterizing Electro-Osmotic Drag Coefficient of Proton Exchange Membranes – H. Xu, J. Ma, and C. Mittelsteadt (Giner Inc.)
- **9:20**
  - Mechanism of Perfluorosulfonic Acid Membrane Chemical Degradation Under Low RH Conditions – F. D. Coms (General Motors Company), H. Xu, T. McCallum, and C. Mittelsteadt (Giner Inc.)
- **9:40**
  - Intermission (20 Minutes)
- **10:00**
  - Challenges to High-Volume Production of Fuel Cell Materials: Quality Control – M. Ulsh (National Renewable Energy Laboratory), B. Sopori, N. Aiesta (NREL), and G. Bender (National Renewable Energy Laboratory)
- **10:40**
  - Polymer Electrolyte Membrane Durability - Local degradation at pinholes – S. Kreitmeier (Paul Scherrer Institut), A. Wokaun (Paul Scherrer Institute), and F. Büchi (Paul Scherrer Institut)
- **11:00**
- **11:20**
  - Modeling of Side Chain Degradation in PEMFC Membranes – K. Wong, P. Melchy, M. Eikerling (Simon Fraser University), M. Lauritzen (Ballard Power Systems), and E. Kjeang (Simon Fraser University)
- **11:40**

Tapa 2, Tapa Conference Center, Hilton Hawaiian Village

### D-1.1 Durability of Pt-Based Cathodes
**8:00 – 12:00**

**Co-Chairs: David A. Muller and Yu Morimoto**

### D-1.1 Durability of Pt-Based Cathodes
- **8:00**
  - Imaging Catalyst Degradation at the Atomic Scale – D. A. Muller, Y. Yu, H. Xin, D. Wang, and H. D. Abrauña (Cornell University)
- **8:40**
- **9:00**
- **9:20**
  - Quantifying Catalyst Losses in Polymer Electrolyte Membrane Fuel Cells – D. A. Cullen and K. L. More (Oak Ridge National Laboratory)
- **9:40**
  - Intermission (20 Minutes)
- **10:00**
  - Catalyst Degradation: Nanoparticle Population Dynamics and Kinetic Processes – S. G. Rinaldo (Simon Fraser University), W. Lee (Automotive Fuel Cell Cooperation Corporation), J. Stumper (Automotive Fuel Cell Cooperation Corp.), and M. Eikerling (Simon Fraser University, 8888 University Drive, Burnaby, B.C. Canada V5A 1S6)
- **10:20**
  - Study of the Cathode Catalyst Layer Degradation Mechanisms in PEM Fuel Cell – P. Urchaga, S. Goli (Tennessee Technological University), and C. A. Rice (Tennessee Tech University)
- **10:40**
- **11:00**
  - Cathode Catalysts Degradation Mechanism from Liquid Electrolyte to Polymer Electrolyte Membrane Fuel Cells – A. A. Marcu and G. Toth (Daimler AG)
- **11:20**
  - Rotating Disk Electrode Techniques Designed to Simulate Fuel Cell Startup/Shut-Down Transient Conditions – D. A. Stevens, J. Harlow, R. J. Sanderson, T. C. Crowt, J. Dahn (Dalhousie University), G. D. Vernstrom, L. L. Atanasoska, G. M. Haugen, and R. T. Atanasoski (3M Company)
- **11:40**
  - The Influence of Experimental Conditions on the Catalyst Degradation in the Accelerated Durability Test using a Rotating Disk Electrode – T. Nagai, H. Murata (TOYOTA CENTRAL R&D LABS., INC.), and Y. Morimoto (Toyota Central R&D Labs, Inc.)
08:40  1322  Reaction Mechanism of Ethanol Oxidation over Gold Catalyst under Alkaline Environment – M. Koyama, Y. Amano, S. Liu, and T. Ishimoto (Kyushu University)

09:00  1323  Rh Porphyrin-Based Electrocatalysts for the Oxidation of Alcohols – S. Yamazaki, M. Yao, N. Fujiiwara, Z. Siroma, M. Asahi, and T. Ioroi (National Institute of Advanced Industrial Science and Technology)

09:20  1324  Ethanol Electro-Oxidation on Pt/C and Pd/C Catalysts in Alkaline Media – L. Ma (IUPUI), H. He, A. Hsu (Wright State University), D. Chu (U.S. Army Research Laboratory), and R. Chen (IUPUI)

09:40  1325  Enhanced O2 Reduction Kinetics by Tuning Electrochemical Interface of Carbon or Ag/C Electrodes with Metallophthalocyanine Molecules in Alkaline Media – R. Chen, J. Guo, H. He, J. Zhou (iupui), and D. Chu (U.S. Army Research Laboratory)

10:00  1326  Catalysts for Alkaline Direct Ethanol and Direct Formate Fuel Cells – A. M. Bartrom, G. Ognibene, J. Ta, J. Tran, and J. L. Haan (California State University, Fullerton)

11:00  1327  Development of Electrocatalyst for Anion-type Polymer Electrolyte Fuel Cell using KOH-doped Polybenzimidazole – T. Fujigaya and N. Nakashima (Kyushu University)

11:20  1328  Pt-Free Catalysts for Alkaline Direct Ethanol Membrane Electrode Assemblies – A. Stadthofer, M. Bodner, H. Schrottner, and V. Hacker (Graz University of Technology)


14:00  1330  Network Formation and Ion Conduction in Ionomer Membranes – K. Promislow, A. Christlieb, J. Jones (Michigan State University), Z. Xu (Michigan Technological University), and N. Gavish (Michigan State University)

14:40  1331  On Water Transport in Polymer Electrolyte Membranes during the Passage of Current – T. Berning (Aalborg University)

15:00  1332  Molecular Simulation of Proton and Water Transport in Hydrated Nafion Membrane – T. Mabuchi and T. Tokumasu (Tohoku University)

15:20  1333  Understanding Water Management as a Function of Catalyst-Layer Thickness – P. K. Das and W. Adam (Lawrence Berkeley National Laboratory)


16:00  1335  Molecular Dynamics Study of Water Transport Property in Micro Hydrophobic Pore – A. Fukushima (Tohoku University), T. Mima, I. Kinefuchi (University of Tokyo), and T. Tokumasu (Tohoku University)

16:40  1336  3D Modeling of One and Two Component Gas Flow in Fibrous Microstructures in Fuel Cells by Using the Lattice-Boltzmann Method – J. Brinkmann, D. Froning, U. Reimer (Forschungszentrum Jülich GmbH), V. Schmidt (Ulm University), W. Lehnter, and D. Stolten (Forschungszentrum Jülich GmbH)

17:00  1337  Lattice Boltzmann Modeling of the Effective Thermal Conductivity of an Anisotropic PEMFC GDL with Residual Water – J. Yablecki and A. Bazylak (University of Toronto)

17:20  1338  Numerical Determination of Transport Properties of Gas Diffusion Layers in Wet Conditions – Z. TAYARANI YOOSEFABADI (Simon Fraser University), D. B. Harvey (Queen's University), and E. Kjeang (Simon Fraser University)


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Tapa 3, Tapa Conference Center, Hilton Hawaiian Village

B-1.2 MEA Degradation – 14:00 – 17:00
Co-Chairs: Tom Fuller and Kazuhiko Shinohara

14:00  1340  Effect of N-doping on Performance and Durability of Supported PtRu Direct Methanol Fuel Cell Catalyst – S. Pylypenko, A. Corpuz (Colorado School of Mines), T. Olson, A. Dameron (National Renewable Energy Laboratory), K. Wood, P. Joghee (Colorado School of Mines), K. Hurst, S. Christensen, D. Ginley, B. S. Pivovar (National Renewable Energy Laboratory), R. M. Richards (Colorado School of Mines), H. N. Dinh, T. Gennett (National Renewable Energy Laboratory), and R. O’Hayre (Colorado School of Mines)

14:20  1341  Performance and Durability of HT-PEFCs with Customized Flow Field Plates – F. Liu (Forschungszentrum Jülich GmbH), M. Kvesić (Forschungszentrum Juelich), W. Wimmermann, U. Reimer, and W. Lehnter (Forschungszentrum Jülich GmbH)

15:00  1343  Internal Currents, CO₂ Emissions and Decrease of the Pt Electrochemical Surface Area during Fuel Cell Start-Up and Shut-Down – A. Lamibrac (Lorraine University-CNRS), J. Durst (Grenoble INP-CNRS), D. Spernjak (Los Alamos National Laboratory), G. Maranzana, J. Dillet, S. Didierjean, O. Lottin (Lorraine University-CNRS), F. Maillard, L. Dubau, M. Chatenet (Grenoble INP-CNRS), R. Mukundan, and R. L. Borup (Los Alamos National Laboratory)


15:40  1345  Relation between Local Loss of Performances in a Segmented PEMFC and Local Degradaions of the Pt/C Cathode Catalyst – J. Durst (Grenoble INP-CNRS), A. Lamibrac (Lorraine University-CNRS), L. Dubau, F. Maillard, M. Chatenet (Grenoble INP-CNRS), J. Dillet, G. Maranzana, and O. Lottin (Lorraine University-CNRS)

16:00  Intermission (20 Minutes)

16:20  1346  Study on Protocols for Evaluating Mechanical and Chemical Durability of PEFC Electrolyte Membranes – Y. Oono, Y. Yamaguchi (Daido Institute), K. Kobayashi (Fuel Cell Research Center, DAIDO University), A. Daimaru, and M. Hori (Daido University)

16:40  1347  Membrane Durability Testing for Heavy Duty Bus Fuel Cells – N. MACAULEY (SFU), M. Watson (Ballard Power Systems), M. Cruickshank, C. Lim, A. Tavassoli, G. Wang, X. Feng (SFU), M. Lauritzen, J. Kolodziej, S. Knights (Ballard Power Systems), and E. Kjeang (Simon Fraser University)

Tuesday, October 9

Honolulu 2, Tapa Conference Center, Hilton Hawaiian Village

C-1.2 Sulfonated Polyaromatic Polymers and Membranes – 14:00 – 18:00
Co-Chairs: Paul Kohl and Shoibal Banerjee

14:00  1348  Cross-linked Aromatic Polymers for High Durability PEM Membranes: Materials and Methods – M. Di Vona (University of Roma Tor Vergata)

14:40  1349  Cross-linked poly(arylene Ether Ketone) Membranes Sulfonated on both Backbone and Pendant Position for High Proton Conducting and Low Water Uptake – H. Dang and D. Kim (Sungkyunkwan University)

15:00  1350  Poly(Arylene Ether Sulfone) Ionomers with Different Acidity Strengths and Fuel Cell Membrane Properties – Y. Chang (University of Nevada Las Vegas), G. Brunello (Georgia Institute of Technology), M. Disabb-Miller (The Pennsylvania State University), M. Hawley, Y. Kim (Los Alamos National Laboratory), M. Hickner (The Pennsylvania State University), S. Jang (Georgia Institute of Technology), and C. Bae (University of Nevada Las Vegas)

15:20  1351  Synthesis and Characterization of Sulfonated Poly(Arylene Ether-1,3,4-Oxadiazole) Derivatives – I. Hajdok and J. A. Kerres (University of Stuttgart)

15:40  1352  Effect of Humidity and Temperature on Durability of Sulfonated Poly(arylene ether sulfone ketone) Multiblock Copolymer Membranes in PEFC Operation – Y. Sakiyama (Toray Research Center, Inc), H. Uchida, M. Kondo, K. Miyatake, M. Uchida, M. Watanabe (University of Yamanashi), and Y. Nakagawa (Toray Research Center, Inc.)

16:00  Intermission (20 Minutes)

16:20  1353  Proton Mobility in Hydrated Acidic Polymers: Consequences for Optimization of Proton Conductivity – P. Knauth (Aix-Marseille University) and M. Di Vona (University of Roma Tor Vergata)

16:40  1354  PFG-NMR and SANS Studies in Cation Exchange Membranes based on Sulfonated Polyphenylene Multiblock Copolymers – M. Yoshida (Sophia University), Y. Zhao (Japan Atomic Energy Agency), M. Yoshizawa-Fujita (Sophia University), A. Ohira (AIST), Y. Takeoka (Sophia University), S. Koizumi (Ibaraki University), and M. Rikukawa (Sophia University)

17:00  1355  Proton Conductive Paths on Polymer Electrolyte Membranes Detected by AFM under Controlled Hydrogen Atmosphere – J. Inukai, M. Hara (University of Yamanashi), D. Hattori (UYamanashi), B. Bae (U. Yamanashi), K. Miyatake, and M. Watanabe (University of Yamanashi)


Tapa 2, Tapa Conference Center, Hilton Hawaiian Village

D-1.2 Durability of Pt-Based Cathodes 2 – 14:00 – 17:40
Co-Chairs: Christophe Coutanceau and Katsuyoshi Kakinuma

14:00  1358  Studies on the Platinum Dissolution Reaction in PEMFC Electrocatalysts – The Effect of Temperature on catalyst degradation – P. Sivashubramanian and R. Mohtadi (Toyota Research Institute of North America)

14:20  1359  Degradation of Platinum Cathode Electrocatalysts in Sulphuric Acid Solution under Thermal Stress Induced by Linear Sweep Cyclic Thermammetry – G. T. Burstein and G. Smith (University of Cambridge)

14:40  1360  A Study of Electrochemical Ostwald Ripening in Pt and Ag Catalysts Supported on Carbon – P. Parthasarathy and A. V. Virkar (The University of Utah)
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**15:00 1361** Particle Size Effect on Electrocatalyst Stability – C. Wang, N. M. Markovic, and V. R. Stamenkovic (Argonne National Laboratory)

**15:20 1362** Performance, Degradation and Structural Changes Associated with Pt Cathode Catalyst Layer Design – V. Colbow, M. Dutta, A. Young, Z. Ahmad, E. Rogers (Ballard Power Systems), D. B. Harvey (Queen's University), and S. Wessel (Ballard Power Systems)

**15:40 1363** Mitigation of Catalyst Layer Degradation under Automotive Fuel Cell Operations – J. Li, K. Wang, Y. Yang, Y. Zou, and R. Vohra (Automotive Fuel Cell Cooperation)

**16:00** Intermission (20 Minutes)


**16:40 1365** Durable, OER-Active Compositions of Pt, Ir, and Ru for PEM Fuel Cell Start-Stop Protection – J. Harlow, D. A. Stevens, R. Sanderson, T. C. Crowt, J. Dahn (Dalhousie University), G. M. Haugen, L. L. Atanasoska, G. D. Vernstrom, and R. T. Atanasoska (3M Company)

**17:00 1366** Effect of Nanosheet Size on Activity and Durability of RuO$_2$ Nanosheet Pt/C Catalyst – C. Chauvin, T. Saída, K. Lokesh, and W. Sugimoto (Shinshu University)


**Honolulu 3, Tapa Conference Center, Hilton Hawaiian Village**

**E-1.2 Alkaline Membranes I – 14:00 – 18:00**

**Co-Chairs: Dario Dekel and Young-Woo Choi**

**14:00 1368** Alkaline Membrane Fuel Cell (AMFC) materials and system improvement – State-of-the-Art – D. R. Dekel (CellEra)

**14:40 1369** A Raman Spectroscopy Investigation into the Alkaline Stabilities of Hydrated Anion-Exchange Head-Groups Relevant to Alkaline Membrane Fuel Cells – J. R. Varcoe, H. Herman, and D. K. Whellung (University of Surrey)

**15:00 1370** Engineering the van der Waals Interaction in Cross-Linking-Free Hydroxide Exchange Membranes for Low-Swelling and High-Conductivity – S. Gu (University of Delaware), J. Skogvard (University of California, Riverside), and Y. Yan (University of Delaware)

**15:20 1371** Catalytic Advances and Electrolyte Stability for Carbonate Exchange Membrane Fuel Cells – W. E. Mustain (University of Connecticut)

**15:40 1372** Molecular Dynamics Simulations of Hydroxide Solvation and Transport in Anionic Exchange Membranes – G. E. Lindberg, C. Knight, and G. A. Voth (The University of Chicago)

**16:00** Intermission (20 Minutes)


**17:00 1374** Evaluating the Contribution of Direct vs. Indirect Carbonate Production in Anion Exchange Membrane Fuel Cells – M. Ignatowich, G. Crettol, M. Chhiv, and W. E. Mustain (University of Connecticut)

**17:20 1375** Fundamental Studies of Alkaline Exchange Membranes Towards Optimization in a Fuel Cell Environment – A. Herring (Colorado School of Mines), E. Coughlin (University of Massachusetts, Amherst), D. Knauss (Colorado School of Mines), G. A. Voth (The University of Chicago), T. Witten (University of Chicago), M. Liberatore (Colorado School of Mines), and Y. Yan (University of Delaware)


**Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center**

**B9 – Poster Session – 18:00 – 20:00**

**Co-Chairs: Jim Fenton, Pezhman Shirvanian, and Thomas Schmidt**


**• 1378** Effect and Development of Cathode Catalyst on PEFC Cell Performance under Low and High Relative Humidity – H. Nakajima and K. Matsutani (Tanaka Kikinzoku Kogyo K.K.)

**• 1379** Subzero Degradation Analysis of Membrane Electrode Assemblies Fabricated Using Two Common Techniques – A. Pistono (Tennessee Technological University), C. A. Rice (Tennessee Tech University), J. Lewis, and V. Ramani (Illinois Institute of Technology)

**• 1380** Application of Electrospinning Technique in the Fabrication of a Composite Electrode for PEMFC – J. J. Sightler, E. McPherson (USC), W. A. Rigdon (University of South Carolina), and X. Huang (USC)

**• 1381** Verification of Durability Test Methods of an MEA for Automotive Application – Y. Hashimasa, T. Shimizu, Y. Matsuda, D. Imamura, and M. Akai (Japan Automobile Research Institute)

**• 1382** Structural Change of the Pt/C Electrocatalyst in Humidified Air Observed by In Situ TEM – T. Shimizu, D. Imamura (Japan Automobile Research Institute), T. Yaguchi, T. Kanemura, and T. Kamino (Hitachi High-Technologies Corporation)

**• 1383** Effects of Pt Loading in Anode Electrode on the Degradation of MEA for PEMFCs during Startup/Shutdown Cycling – E. Cho, K. Eom, T. Lim, J. Jang, and H. Kim (Korea Institute of Science and Technology)
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• 1384 Evaluation of Pt/C Catalysts and MEA’s Fabricated by Carbon Materials with Different Nanostructures for Polymer Electrolyte Fuel Cells – X. Zhao, Z. Noda, A. Hayashi, and K. Sasaki (Kyushu University)


• 1386 Investigation of Role of Cathode Microporous Layers in PEMFC – E. Nishiyama (Fukui University of Technology), M. Hara (Fukui University of Technology), and T. Murahashi (Fukui University of Technology)

• 1387 Multi-Analytical Study of Gas Diffusion Layers PTFE Content Variation – K. Artysykhova, P. Atanassov (The University of New Mexico), T. V. Reshetenko (University of Hawaii at Manoa), and J. St-Pierre (University of Hawaii)

• 1388 Using Plasmas to Modify Gas Diffusion Layers to Enhance the Long Term Stability of PEMFCs – C. Walter, V. Brüser, A. Quade, and K. Weltmann (INP Greifswald)

• 1389 Dynamic SIMS Analysis of PEMFC Catalyst Layer/Solid Electrolyte Membrane Interface – T. Ebihara, M. Nojima, T. Kondo, and M. Yuasa (Tokyo University of Science)

• 1390 Numerical Investigation of effect of Oxygen and Water Distribution on PEM Fuel Cell Performance – M. Yoneda and H. Motegi (Mizuho Information and Research Institute, Inc.)

• 1391 Reactive Molecular Dynamics Simulations of Proton Exchange Membranes – J. Savage and G. A. Voth (The University of Chicago)

• 1392 Thermo-Fluid Dynamics Simulation of Passive Type PEFC by COMSOL Multiphysics – Y. Nakajima (Chiba Institute of Technology Graduate school), J. Otsuka, and E. Ejiri (Chiba Institute of Technology)

• 1393 The Mechanism of the Improvement in Catalytic Activity of Ir Modified by V Compared to Pure Ir/C – B. Li, D. Yang, R. Lin, Z. Yu, and J. Ma (Tongji University)

• 1394 Analysis of Non-Steady State Electrochemical Gas Permeability Measurements for PEM Fuel Cells and Electrolysers – D. Bessarabov (Northwest University), I. Beckman, and I. Buntseva (Lomonosov Moscow State University)

• 1395 Interfacial Contact Resistance of Tantalum Coated Construction Materials for High Temperature Steam Electrolysers and Fuel Cells – A. H. Jensen, E. Christensen, and J. Von Barner (Technical University of Denmark)

• 1396 Hydrogen Generation from Aluminum Corrosion in Aqueous Solutions – Y. Chiu, C. Chen, K. Hsueh, and J. Hung (National United University)

• 1397 Fabrication of Mg-Ni Alloys for the Purpose of Fast Hydrogen Generation from the Hydrolysis in Neutral Aqueous NaCl solution – S. Oh (Korea Advanced Institute of Science and Technology), K. Eom (Korea Institute of Science and Technology), J. Kyung, D. Kim (Yonsei University), and H. Kwon (Korea Advanced Institute of Science and Technology)

• 1398 Computer Modeling of a kW Combined Heat and Power Fuel Cell Unit – P. Ho, W. Wang, C. Dai (National United University), Y. Chang, W. Chang (Industrial Technology Research Institute), K. Hsueh, and J. Hung (National United University)

• 1399 Maximum Efficiency Point Tracking Type Power Control System for a Fuel Cell Power Generation System – K. Itako and H. Takahashi (Kanagawa Institute of Technology)


• 1401 A Study of Electrochemical Recycle for Noble Metals in PEFCs – H. Shiroishi, H. Matsumot (Tokyo National College of Technology), M. Yonekawa (Tokyo Institute of Technology), R. Shoji, I. Kato (Tokyo National College of Technology), and M. Kunimatsu (Kanagawa Industrial Technology Center)

• 1402 Effects of Atmospheric Trace Species on Polymer Electrolyte Fuel Cell Performance: Analysis of Performance Deterioration Mechanism by Current Distribution Measurement – D. Imamura and K. Ohno (Japan Automobile Research Institute)

• 1403 Development of Methods to Estimate the Effects of Impurities on PEFC Performance II. Impact of Acrylonitrile Poisoning on Oxygen Reduction Reaction at Pt/C Catalysts – M. El-Deab, F. Kitamura, and T. Ohsaka (Tokyo Institute of Technology)

• 1404 Ammonium Polysulfophosphate Composite Based Electrolytes for Intermediate Temperature Fuel Cells – N. Kluy (TU München), B. Reeb (TUM CREATE Centre for Electromobility Singapore), O. Paschos (Technische Universität München), F. Maglia (University of Pavia), O. Schneider, U. Stimming (Technische Universität München), S. Angioni, and P. Righetti (University of Pavia)


• 1406 A New Design of PEMFC Bipolar Plate for Corrosion Study – Y. Hitoshi, T. Ichikawa, S. Chu (Iwate University), M. Kumagai (Taiyo Stainless Spring Co., Ltd.), and S. Myung (Sejong University)

• 1407 DMFC Performance of Cross-Linked Sulfoethylcellulose/Poly(Vinyl Alcohol) Blend Electrolyte Membranes – Y. Kasai, T. Okayama (Aomori Prefectural Industrial Technology Research Center), G. Guan, and A. Abudula (Hirosaki University)

• 1408 Investigation of Power Efficiency from the Microbial Biofuel Cell System with the Photosynthetic Bacteria, Rhodopseudomonas Sphaeroides – M. Syu and Y. Chang (National Cheng Kung University)
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• 1409 Immobilization of Enzymes onto the Carbon Paper Electrode by the Conducting Polymer/Carbon Nanotubes Composite for the Investigation of the Biofuel Cell System – M. Syu and C. Lin (National Cheng Kung University)

• 1410 Designing a Highly Ordered Nanowire with High Proton Conductivity for Polymer Membrane and Catalyst Layer of PEFC – T. Kim (KIER), Y. Choi (Korea Institute of Energy Research), and S. Yim (KIER)

• 1411 Electrochemical and Raman Spectroscopic Evaluation of Pt/GCB Durability for the Start/Stop Operating Condition – M. Harai (University of Yamanashi), M. Lee (Northeastern University), Y. Yamashita, M. Uchida, H. Uchida, and M. Watanabe (University of Yamanashi)

• 1412 Investigation of Carbon Corrosion Resistance of CNT Containing Electrode – D. Larrabee, W. A. Rigdon (University of South Carolina), E. McPherson, J. J. Sightler, and X. Huang (USC)


• 1414 Durability of Arc Plasma Synthesized Pt/C Nano-Catalyst – H. Joo (Yonsei University), J. Park (Sejong University), and H. Choi (Korea Institute of Industrial Technology)


• 1416 Oxygen Reduction Reaction Activity and Durability of Electrocataysts Supported on SnO₂ – T. Tsukatsune, Y. Takabatake, Z. Noda (Kyushu University), S. Taniguchi (International Research Center for Hydrogen Energy), Y. Shiratori, A. Hayashi, and K. Sasaki (Kyushu University)

• 1417 Effects of Tin Dioxide Loading on ORR Activity and Durability of Pt/C Catalyst – N. Eguchi, T. Kinumoto, T. Tsumura, and M. Toyoda (Oita University)

• 1418 Durability Enhancement of Pt/C Catalysts via Support Functionalization with Silicotungstic Acid – K. S. Mason (Colorado School of Mines), K. Neyerlin (National Renewable Energy Laboratory), M. Kuo, K. Horning (Colorado School of Mines), S. S. Kocha, J. A. Turner (National Renewable Energy Laboratory), and A. Herrington (Colorado School of Mines)

• 1419 Performance Evaluation of Pt-Deposited SiO₂ Composite Catalyst under Low Humidity Conditions – J. Yoo (University of Incheon), I. Choi (Seoul National University), S. Ahn (Korea Institute of Science and Technology), J. Kim (Seoul National University), and O. Kwon (University of Incheon)

• 1420 Durability of Au Core/Pt Shell Structured Catalyst – E. Maki, Y. Ikehata, T. Nishikawa, Y. Kirihata (Doshisha University), N. Aoki (ishihuku metal industry), H. Inoue (Ishihuku Metal Industry Co., Ltd), H. YAMADA (Nara National College of Technology), H. Daimon, and M. Inaba (Doshisha University)

• 1421 Electrochemical Stability of Pt ML on Au/ QC Electrode – H. Yamada, A. Kawamura, T. Kobayashi, K. Katakura (Nara National College of Technology), and M. Inaba (Doshisha University)


• 1423 Platinum Dissolution in Nitrogen Oxides-Containing HClO₄ Solution Studied by Electrochemical Quartz Crystal Microbalance – Y. Uchiyama, T. Abe, T. Morita, and S. Imabayashi (Shibaura Institute of Technology)

• 1424 Poly(Benzimidazole)-Functionalized Graphene Supported Pt Electrocatalyst and Its Application in High Temperature PEM Fuel Cells – A. A. Permyakova, J. Jensen, Q. Li, and N. Bjerrum (Technical University of Denmark)

• 1425 Evaluation of the Pt/C Catalyst for Fuel Cells Prepared by a Nano Particle Formation Technique Using a Pulsed Arc Plasma Source – Y. Agawa (ULVAC RIKO, Inc.), S. Endo, M. Matsuura, and Y. Ishii (ULVAC-RIKO, Inc.)

• 1426 Controlled Pt Coverage for Extended Thin Film Catalyst ORR Studies via Templated Gas Phase Synthesis – J. Bult, K. Neyerlin, S. Christensen, A. Dameron, B. S. Pivovar, and H. Hurst (National Renewable Energy Laboratory)

• 1427 Synthesis and Characterization of Au-Decorated Pt Surface for Oxygen Reduction Reaction – J. Ahn, H. Lee, H. Kim (Korea Institute of Industrial Technology), Y. Shul, and H. Kim (Yonsei University)

• 1428 Synthesis of Alkanetiol Stabilized Au/C and Durability of Au Core/Pt Shell Structured Catalyst – N. Aoki (ishihuku metal industry), H. Inoue (ishihuku metal industry), T. Kirihata, E. Maki, H. Daimon, and M. Inaba (Doshisha University)

• 1429 Various Types of Tubular Carbon Nanofibers as a Support Material of Catalysts for Fuel Cell – J. Kim (University of Science & Technology), S. Lim (Korea Institute of Energy Research), M. Seo, B. Kim, S. Yoon (Kyushu University), and D. Jung (Korea Institute of Energy Research)

• 1430 High-Performance Pt catalysts Supported on High-Surface-Area Graphene Composites for PEFCs – L. Sun (1Department of Mechanical Engineering, Purdue School of Engineering and Technology, Indiana University-Purdue University Indianapolis (IUPUI)), H. Zhang, L. Stanciu (Weldon School of Biomedical Engineering and School of Materials Engineering), J. Ilavsky (Argonne National Laboratory), and J. Xie (Indiana University Purdue University Indianapolis)

• 1431 Platinum Yttrium Alloy Nanocrystals as Oxygen Reduction Reaction Electrocatalysts – Z. Zhuang (University of Delaware), Y. Zhang (University of Delaware), and Y. Yan (University of Delaware)

• 1432 Oxygen Reduction on Pt-Rd Electrode for PEFC Cathode – A. Hyono, Y. Sugawara, M. Ueda, and T. Ohtsuka (Hokkaido University)
• 1433 Improvement in Activity of Highly Durable Silica-Coated Pt/CNT Cathode Catalysts for PEFC by Addition of Cu – S. Takenaka, H. Miyata, T. Tsukamoto, H. Matsune, and M. Kishida (Kyushu University)

• 1434 Preparation of Highly Active Zr Oxide-Based Oxygen Reduction Electrocatalysts as PEFC Cathode – S. Yin, A. Ishihara (Yokohama National University), M. Matsumoto, M. Arawo, H. Imai (NISSAN ARC Ltd.), K. Matsuzawa, S. Mitsushima, and K. Ota (Yokohama National University)

• 1435 Highly Active Titanium Oxide-Based Electrocatalyst for Oxygen Reduction Reaction for PEFC – K. Suito (Green Hydrogen Research Center), A. Ishihara (Yokohama National University), M. Matsumoto, M. Arawo, H. Imai (Nissan Arc Ltd.), K. Matsuzawa, S. Mitsushima, and K. Ota (Yokohama National University)

• 1436 Surface Reaction Analysis of Tantalum-Oxide Oxygen-Reduction Catalysts by Using X-ray Photoelectron Spectroscopy – M. Matsumoto, H. Imai (NISSAN ARC Ltd.), T. Miyazaki, S. Fujieda (NEC Corporation), A. Ishihara, and K. Ota (Yokohama National University)

• 1437 Development of Tantalum Boride Thin Film Catalysts for Oxygen Reduction Reaction Using an RF Magnetron Sputtering Deposition – K. Kushibe, K. Iyutani, Y. Horiuchi, and M. Matsuoka (Osaka Prefecture University)

• 1438 Preparation and Electrochemical Performance of Nitrogen-doped Graphene by Intermittent Microwave-assisted Heating for Fuel Cells – J. Liu, Y. Xin, Y. Zhou, and Z. Zou (Nanjing University)

• 1439 Characteristics of Oxygen Adsorption on Nitrogen Doped HOPG Revealed by X-ray Absorption Spectroscopy – H. Kiuchi (The University of Tokyo), T. Kondo, M. Sakurai (University of Tsukuba), H. Nawa, M. Kobayashi, Y. Harada (The University of Tokyo), T. Ikeda (Japan Atomic Energy Agency), K. Terakura (Tokyo Institute of Technology), J. Nakamura (University of Tsukuba), and M. Oshima (The University of Tokyo)

• 1440 Nitrogen-doped Graphene for Oxygen Reduction Reaction in Air Electrodes – D. Lee, A. Yu, and Z. Chen (University of Waterloo)

• 1441 NH3-Pyrolyzed Fe-Impregnated Polyaniline for the use as a Cathode Catalyst for Polymer Electrolyte Fuel Cells – K. Nahm, S. Kim, and P. Kim (Chonbuk National University)

• 1442 Characterization of High-Performance Non-precious Metal Catalysts for Oxygen Reduction Reaction (ORR) – N. Ranjar Sahraie, D. Wilhelm (Technical University of Berlin), and P. Strasser (Technische Universität Berlin)

• 1443 Highly Active Tetracyanoethylene Derived Non-precious Metal Catalyst for Oxygen Reduction Reaction in PEM Fuel Cell – J. Choi and Z. Chen (University of Waterloo)

• 1444 Carbon Supported Copper Phthalocyanine (CuPc/C) as Novel Cathode Catalyst for Polymer Electrolyte Membrane Fuel Cells ---Effect of Nafion Ionomer as for Alkaline Electrolyte – L. Ding, L. Xu (Donghua University), B. Tian (Pearl Hydrogen Technology Co., Ltd.), S. Ibrahim, Y. Liu (Tohoku University), and J. Qiao (Donghua University)

• 1445 RRDE Studies of Oxygen Reduction Reaction at Various Catalysts in Alkaline Solution – J. Choi (Kyungil University) and H. Jung (Kangwon National University)

• 1446 Analysis of Mechanism of Oxygen Reduction Reaction on Non-Noble Metals in Alkaline Solution by Scanning Electrochemical Microscopy – R. Teranishi, E. Higuchi, M. Chikui, and H. Inoue (Osaka Prefecture University)

• 1447 FePc/C and CoPc/C Catalysts for the Oxygen Reduction Reaction as Cathode Catalysts for Alkaline Direct Methanol Fuel Cell – J. Jang (University of Science and Technology), S. Kim, S. Lim, D. Peck, and D. Jung (Korea Institute of Energy Research)


• 1449 Enhanced Electrocatalytic Performance for Methanol Oxidation via Insertion of Ruthenium Oxide Particles into Pt and Polyaniline-Poly(Acrylic Acid-co-Maleic Acid) Composite Electrode – C. Kuo (National Kaohsiung University of Applied Sciences), Z. Kuo (Department of Chemical and Materials Engineering, National Kaohsiung University of Applied Sciences, Kaohsiung 80778, Taiwan, ROC), T. Wu (National Yunlin University of Science and Technology), J. Chen, and W. Li (Department of Chemical and Materials Engineering, National Kaohsiung University of Applied Sciences, Kaohsiung 80778, Taiwan, ROC)

• 1450 Methanol Oxidation Performance of Electrocatalysts Prepared by the Polygonal Barrel-Sputtering Method – M. Inoue, C. Hiromi, K. Hirakawa, and T. Abe (University of Toyama)

• 1451 Quantitative Analysis of CO2 Generation during Ethanol Electrooxidation on Pt-Sn/C and Pt-SnOx/C – S. Kaneda, K. Matsuzawa, and S. Mitsushima (Yokohama National University)

• 1452 The Distribution of Products of Ethanol Electrooxidation on Carbon-Supported Noble Metals Catalysts in Direct Ethanol Fuel Cell – J. Seweryn and A. Lewera (University of Warsaw)
• 1453 The Graphene-Supported Palladium and Palladium-yttrium Nanoparticles for the Ethanol Oxidation Reactions: Experimental and Theoretical Modeling – M. Seo (Daegu Gyeongbuk Institute of Science and Technology (DGIST)), S. Choi (Gwangju Institute of Science and Technology (GIST)), J. Seo, S. Noh (Daegu Gyeongbuk Institute of Science and Technology (DGIST)), W. Kim (Gwangju Institute of Science and Technology (GIST)), and B. Han (Daegu Gyeongbuk Institute of Science and Technology (DGIST))

• 1454 Studies of the Catalytic Activity of Unsupported Pt-Based Anodes Modified with CeO₂ for the Electro-Oxidation of Ethylene Glycol in Acid Electrolyte – A. Chávez Villanueva, A. Ramírez (Universidad de la Ciencia de Michoacán de Ocampo), G. Vargas Gutiérrez, and F. Rodríguez Varela (Cinvestav Unidad Saltillo)

• 1455 Investigation of Electrocatatytic Activity of the Nanostructured Au-Cu Catalyst Deposited on the Titanium Surface towards Borohydride Oxidation – L. Tamašauskaite-Tamašūnaitė, A. Balčiūnaitė, A. Vaiciukevičienė, J. Stankevičienė, A. Selskis, and E. Norkus (Institute of Chemistry, Center for Physical Sciences and Technology)

• 1456 Catalytic Activity of Pt/MWCNT for the Electro-Oxidation of Ethylene Glycol in Alkaline Media – Y. Verde-Gómez, B. Escobar (Instituto Tecnologico de Cancun), A. Chávez Villanueva (Universidad de la Ciencia de Michoacán de Ocampo), and F. Rodríguez Varela (Cinvestav Unidad Saltillo)

• 1457 Chemisorption Studies of Dissolved Pt Species on RuO₂ nanosheet – L. K. Sangnawoda, C. Chauvin, and W. Sugimoto (Shinsu University)


• 1460 Fabrication and Electrochemical Properties of Electro-Spun RuO₂-Carbon Nanofibers Supported Pt Nanoparticles – G. An and H. Ahn (Seoul National University of Science and Technology)


• 1462 Alkaline Membrane Fuel Cells with Several Alternative Fuels – K. Fukuta, T. Negishi, Y. Kikkawa, K. Oda, S. Watanabe, and H. Yanagi (Tokuyama Corp.)


• 1466 Preparation and Characterization of Anionic Binder Based Electrodes for Anion-Exchangeable Membrane Fuel Cells – M. Shin, Y. Byun, J. Park, M. Kang (Sungmyung University), and Y. Kim (Chungbuk National University)

• 1467 13C PGSTE NMR Diffusion and Conductivity Measurements on Tetraalkyl Ammonium Cations – H. N. Sarode and A. Herring (Colorado School of Mines)

• 1468 Chemical Degradation Mechanism of Membranes for Alkaline Membrane Fuel Cells – Y. Choe (National Institute of Advanced Industrial Science & Technology), N. J. Henson, and Y. Kim (Los Alamos National Laboratory)

• 1469 Novel Nanostructured High-Performance Anion Exchange Ionomers for Anion Exchange Membrane Fuel Cells – J. Zhou, L. Sun, J. Guo (IUPUI), D. Chu (U.S. Army Research Laboratory), and R. Chen (IUPUI)

• 1470 Radio-Chemically Pore-Filled Anion Exchange Membranes for Solid Alkaline Fuel Cells (SAFC) – T. Sherazi (COMSATS Institute of Information Technology), D. Hwang (Hanyang University), J. Sohn (Korea Atomic Energy Research Institute), M. Guiver (National Research Council Canada), and Y. Lee (Hanyang University)

• 1471 Ionic Conductivity of [dena][TfO]/Solid Acid-Base Composite Membrane – A. Fujisawa, K. Matsuzawa, and S. Mitsuhashi (Yokohama National University)

• 1472 A Proton Conduction Silicate-Nanoencapsulated Polyimide Nonwoven as a Novel Porous Substrate for a Reinforced Sulfonated Poly(Arylene Ether Sulfone) Composite Membrane – J. Seol, J. Won (Kangwon National University), M. Lee (Kolon Central Research Park), Y. Hong (Korea Research Institute of Chemical Technology), and S. Lee (Kangwon National University)

• 1473 Relationship Between Morphology and Proton Conductivity of Aromatic Diblock Copolymer Electrolytes – T. Oshima, K. Umezawa, M. Yoshizawa-Fujita (Sophia University), A. Ohira (AIST), Y. Takeoka, and M. Rikukawa (Sophia University)

• 1474 Synthesis of Hydrocarbon Ionomer Materials and Evaluations of MEA – S. Miura, T. Oshima, K. Umezawa, M. Yoshizawa-Fujita (Sophia University), A. Ohira (AIST), Y. Takeoka, and M. Rikukawa (Sophia University)

• 1475 Nano-Composite Ion-Condutting Polymer Electrolytes (ICPEs) for Fuel Cell Application – H. Zarrin, M. Fowler, A. Yu, and Z. Chen (University of Waterloo)

• 1476 Polyvinyl Alcohol Based Nanocomposite Membranes Containing Aluminum Hydroxide Gel – O. I. Radionova, I. Y. Prokhorov, and G. Y. Akimov (DonPTI NAS Ukraine)
09:10 1732 Photo_reduction of CO₂ over Morphology Controlled TiO₂ or Nanocomposite System of g-C₃N₄ and WO₃ – T. Ohno and N. Murakami (Kyushu Institute of Technology)

09:30 1733 Photoelectrochemical Enzyme Biofuel Cell with the Function of CO₂ Conversion to Formic Acid – Y. Amao (Oita University Dannoharu), Y. Sakai (Oita University), and N. Shuto (Oita University)

New Materials for Solar Energy and Fuels – 10:00 – 12:20
Co-Chairs: Gregory Jackson and Ravi Subramanian

10:00 1734 Upconversion Nanocrystals: A New Class of Energy Materials – X. Liu (National University of Singapore)


11:00 1736 Graphite Oxide Modified by Ammonia as Photocatalyst for Water Oxidation under Visible Light Illumination – T. Yeh and H. Teng (National Cheng Kung University)


11:40 1738 Electrospun Ceria-Based Fibers for Renewable Fuel Production from Concentrated Sunlight – W. T. Gibbons and G. S. Jackson (University of Maryland)

12:00 1739 Role of Electro catalysts in Photoelectrochemical Water Oxidation of Oxide Semiconductor Electrod es – S. Choi, T. Jeon, U. Kang, H. Jeong, and H. Park (Kyungpook National University)

Photoelectrochemical Cells – 14:00 – 15:40
Co-Chairs: Helli Wang and Teruhsa Ohno

14:00 1740 Fabrication of Efficient Nanostructured Photoelectrodes for Photoelectrochemical Hydrogen Production from Water – J. Lee (Pohang University of Science & Technology)

14:30 1741 Performance and Limits of 2.2 eV Copper Tungstate (CuWO₄) Mineral for Photoelectrochemical Hydrogen Production – N. M. Gaillard (University of Hawaii at Manoa)

15:00 1742 Performance Limiting Factors in Co-Pi Catalyzed, Spray-Deposited BiVO₄ Photoanodes – F. F. Abdi, N. Firet, and R. Van de Krol (Delft University of Technology)

15:20 1743 Photoelectrolysis on p-GaInP₂: Extended Durability by Nitrogen Ion Implantation – T. G. Deutsch, A. Welch (National Renewable Energy Laboratory), M. Bär, L. Weinhardt, M. G. Weir, K. E. George, C. Heske (University of Nevada), and J. A. Turner (National Renewable Energy Laboratory)
Ion Conducting Thin Film Electrolytes 2 – 08:00 – 10:00  
**Co-Chairs:** Jennifer Rupp and Joshua Hertz

**08:00**  
1890  Enhanced Oxygen Surface Exchange Kinetics in Surface Modified Yttria Stabilized Zirconia by Atomic Layer Deposition – J. Park (Lawrence Berkeley National Laboratory), C. Chao, X. Tian (Stanford University), J. Shim (Korea University), and F. Prinz (Stanford University)

**08:20**  
1891  Thin Film Electrolyte Membranes of Yttria-Stabilized Zirconia Prepared by Aerosol Assisted Chemical Vapor Deposition – M. V. Schlupp (ETH Zurich), J. Courbat, D. Briend, N. De Rooij (EPFL Lausanne), M. Prestat, and L. Gauckler (ETH Zurich)

**08:40**  
1892  Ion Conduction in Nanoscale Yttria-Stabilized Zirconia Thin Films Fabricated by Atomic Layer Deposition – K. Son, M. Bae, K. Bae, J. Ha, and J. Shim (Korea University)

**09:00**  
1893  Atomic Resolution Imaging of Oxygen Columns in Oxide Ion Conductor Using HRTEM – J. An, A. Koh (Stanford University), J. Park (Department of Mechanical Engineering, 440 Escondido Mall Bldg 530-226, Stanford, CA94305, USA), H. Jung, T. M. Güür, and F. B. Prinz (Stanford University)

**09:20**  
1894  Detecting Li-Ion Currents on the Nanoscale through a Thin Film Battery – N. Balke, S. Jesse, A. Tselev, N. J. Dudney, and S. Kalinin (Oak Ridge National Laboratory)

**09:40**  
Intermission (20 Minutes)

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**10:00**  
1895  Lateral Oxygen Tracer Diffusion in a Multilayered SDC/PNCG Film Displaying Enhanced Electrical Conductivity – S. N. Cook (Imperial College London), J. Druce (International Institute for Carbon Neutral Research), T. Ishihara (Kyushu University), and J. A. Kilner (Imperial College London)

**10:20**  
1896  Analysis of Lateral Diffusion of Oxide Ions along YSZ-MgO(100) Interface – K. Bae (Korea University), J. Park (Department of Mechanical Engineering, 440 Escondido Mall Bldg 530-226, Stanford, CA94305, USA), F. B. Prinz (Stanford University), J. Son, and J. Shim (Korea University)

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**10:40**  

**11:00**  

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**11:40**  
1900  Cation Interdiffusion Model for Enhanced Oxygen Kinetics at Oxide Heterostructure Interfaces – M. Gadre (University of Wisconsin-Madison), Y. Lee (Massachusetts Institute of Technology), and D. Morgan (University of Wisconsin-Madison)

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**14:00**  
1901  Nanostructured La$_{0.6}$Sr$_{0.4}$CoO$_{3-δ}$ Cathodes Prepared by Spray Pyrolysis for Thin Film SOFC – M. Prestat, Z. Žang, O. Pecho (ETH Zurich), L. Holzer (Zurich University of Applied Sciences), J. Martynczuk, A. Evans, L. Gauckler (ETH Zurich), T. Hocker (Zurich University of Applied Sciences), J. Hwang (Korea Institute of Science and Technology), and J. Son (Korea University)

**14:20**  
1902  Cation Segregation and Electrochemical Activity of Ruddlesden Popper Phase Cobalt Oxides in Oxygen Reduction and Oxygen Evolution – Z. Cai, Y. Chen, and B. Yildiz (Massachusetts Institute of Technology)
Meeting Program • PRIME 2012 • October 7-12, 2012 • Honolulu, Hawaii

**Modeling and Devices – 16:40 – 18:20**

**Co-Chairs: Dane Morgan and Keith Duncan**

- **16:40 1903** In Situ Ambient Pressure X-ray Photoelectron Spectroscopy of Epitaxial Strontium Substituted Lanthanum Cobalt Oxides Near Operating Conditions Under Applied Potentials – E. J. Crumlin, E. Mutoro (Massachusetts Institute of Technology), Z. Liu (Lawrence Berkeley National Laboratory), M. D. Biegalski (Oak Ridge National Laboratory), W. T. Hong (Massachusetts Institute of Technology), H. M. Christen (Oak Ridge National Laboratory), H. Bluhm (Lawrence Berkeley National Laboratory), and Y. Shao-Horn (Massachusetts Institute of Technology)

- **15:00 1904** Hard X-ray Surface Composition and Electronic Structure Measurements of Heteroepitaxial Solid Oxide Fuel Cell Cathode Material – J. N. Davis (Boston University), L. Saraf, T. Kaspar (PNPL), S. Gopalan, U. B. Pal (Boston University), J. Woicik (National Institute of Standards and Technology), S. Basu, and K. F. Ludwig (Boston University)

- **15:20 1905** Spray Pyrolysis Deposition and Electrochemistry of La0.4Sr0.6MnO3 Thin Film Anodes for Solid Oxide Fuel Cells – Z. Yang, S. Bisig, M. Prestat, and L. Gauckler (ETH Zurich)

- **15:40 1906** Synthesis and Characterization of Ruthenium – Gadolinia-doped Ceria Composite Thin Film Anode for Direct Methane SOFCs – Y. Takagi (SONY Corporation) and S. Ramanathan (Harvard University)

- **16:00 1907** Nanostructured Vanadium Oxide Anodes for Thin Film Solid-Oxide Fuel Cells – Q. Van Overmeere and S. Ramanathan (Harvard University)

- **16:20** Intermission (20 Minutes)

**Tuesday, October 9**

- **08:00 2011** Recent R&D on Disposable Electrochemical Biosensors – H. Nam, G. Cha (Kwangwoon University), M. Kim, M. Lee, and S. Chung (i-sens, inc.)

- **08:40 2012** Floated Electrochemical Cell for On-Line Electrospray Mass Spectrometry for Detection of Biological Radical Reactions – D. Looi, I. Iftikhar (University of Florida), G. Garbellini (São Paulo State University), and A. Brajter-Toth (University of Florida)

- **09:00 2013** High Efficient Glucose Oxidation by Ordered Molecular Assembly inside Carbon Nanotube Forests – S. Yoshino, T. Miyake, H. Kaji (Tohoku University), T. Yamada, K. Hata (National Institute of Advanced Industrial Science and Technology), and M. Nishizawa (Tohoku University)

- **09:20 2014** Evaluation of Electrochemical Disinfection of Feline Calicivirus in Aqueous Conditions – N. Shinonori, T. Tanaka (Tokyo University of Agriculture and Technology), T. Sato, Y. Fujimori, T. Nagao, T. Nakayama (NBC Meshtec inc.), and T. Matsunaga (Tokyo University of Agriculture and Technology)

- **09:40** Intermission (20 Minutes)

- **10:00 2015** Electrochemistry-Based and Signal-Amplified Sensing Strategies for DNA-Based Point-of-Care Biosensors – I. Hsing (The Hong Kong University of Science and Technology)

- **10:40 2016** Electrochemical and Physical Assessment on Electrode Coating Materials for Neuromodulation Application – A. Shi, B. Li, P. Cong, and D. Seeley (Medtronic Neuromodulation)

- **11:00 2017** Mechanical Force-Based Probing of Cytoskeletal Proteins in Living Cells Using Antibody-Immobilized Nanoneedles – C. Nakamura (Tokyo University of Agriculture and Technology), Y. R. Silberberg, R. Kawamura (National Institute of Advanced Industrial Science and Technology), S. Mieda (Tokyo University of Agriculture and Technology), Y. Amemiya (National Institute of Advanced Industrial Science and Technology), K. Nakatani (Tokyo University), and K. Amemiya (National Institute of Advanced Industrial Science and Technology), and K. Miyake (Osaka University)

- **11:20 2018** A Spatio and Temporal Gaseous Ethanol Visualization System for Real-Time Analysis from Human Breath and Body – T. Arakawa, X. Wang (Tokyo Medical and Dental University), T. Kajiro (Tokyo University of Technology), K. Miyajima, H. Kudo (Tokyo Medical and Dental University), K. Yano (Tokyo University of Technology), and K. Mitsubishi (Tokyo Medical and Dental University)

Co-Chairs: K. Sode, M. Meyerhoff, K. Kerman, I. Hsing, I. Kubo, and E. Tamiya

14:00 2020 Electrochemical Impedance Spectroscopy on Nanomaterial-Modified Surfaces – A. J. Veloso, X. Chen, V. Hung, N. Li, and K. Kerman (University of Toronto)

14:40 2021 Second Generation Continuous Glucose Sensing System Employing Direct Electron Transfer Principle – W. Tsugawa (Tokyo University of Agriculture and Technology), K. Kojima (Ultrizyme International Ltd.), and K. Sode (Tokyo University of Agriculture and Technology)

15:00 2022 Engineering Fungi Derived FAD Glucose Dehydrogenase and Its Application for Glucose Sensor Strip Employing Screen Printed Carbon Electrode – Y. Onishi, M. Nakajima, W. Tsugawa (Tokyo University of Agriculture and Technology), K. Mori, K. Kojima (Ultrizyme International Ltd.), and K. Sode (Tokyo University of Agriculture and Technology)

15:20 2023 Profile of IgE and IgG4 Binding Epitopes in Cow’s Milk Allergens Using Peptide Array – M. Okochi (Nagoya University), Y. Yoshida, and H. Honda (Nagoya University)

15:40 2024 Fiber-Optic Fluoroimmunoassay System for On-Site Determination of the Indoor Allergen – K. Miyajima (Tokyo Medical and Dental University), K. Tamari, E. Kiyomiya (Bunkyo Gakuin University), M. Hanata, T. Arakawa, H. Kudo (Tokyo Medical and Dental University), K. Shiba (Bunkyo Gakuin University), and K. Mitsubayashi (Tokyo Medical and Dental University)

16:00 2025 Self-Assembled Synthetic Protein Scaffolds: Biosynthesis and Applications – W. W. Su and Z. Han (University of Hawaii, Manoa)

17:00 2026 Use of High Surface Area Electrodes for Safe Delivery of Direct Current for Nerve Conduction Block – T. Vrabec, J. Wainwright, N. Bhadra, N. Bhadra, and K. Kilgore (Case Western Reserve University)

17:20 2027 Electrochemical Approach to Fabricate Stacked Thick Cell Sheets – N. Mochiuuki, H. Suzuki, and J. Fukuda (University of Tsukuba)

17:40 2028 Electrical Bioassay System Using a Hydrogel-Supported Skeletal Muscle Cells – K. Nagamine, H. Kaji, M. Kanzaki, and M. Nishizawa (Tohoku University)

C2 – Poster Session – 18:00 – 20:00

Co-Chairs: K. Sode, M. Meyerhoff, K. Kerman, I. Hsing, I. Kubo, and E. Tamiya


- 2030 Higher Catalytic Activity by Fluctuation effect of Captured Enzyme Molecules in Designed Self-Organized Membrane on an Electrode Surface – Y. Takatsuji, R. Yamasaki, A. Iwanaga (Kyushu Institute of Technology), M. Lienemann, M. Linder (VTT Biotechnology), and T. Haruyama (Kyushu Institute of Technology)

- 2031 Nano-Structured Protein Layer on an Electrode Surface Taking Advantage of Self-Organized HFBI and Its Electrochemical Property – R. Yamasaki, Y. Takatsuji, A. Iwanaga (Kyushu Institute of Technology), M. Lienemann, M. Linder (VTT Biotechnology), and T. Haruyama (Kyushu Institute of Technology)

- 2032 Analysis of Cell Exfoliation Specifically Observed during the Formation of Spermine-Induced Multilayer Muscle Fiber Sheet – A. Ishida, N. Abe, H. Matsuoka, and M. Saito (Tokyo University of Agriculture and Technology)

- 2033 Quantitative Analysis of Cell Death Observed during the Formation of Spermine-Induced Multilayer Muscle Fiber Sheet – N. Abe, A. Ishida, H. Matsuoka, and M. Saito (Tokyo University of Agriculture and Technology)

- 2034 In Vivo Delivery of RNAi Reagents into a Mouse – M. Kaburagi, Y. Kakutani, H. Matsuoka, and M. Saito (Tokyo University of Agriculture and Technology)

- 2035 Surface Modification of Titanium Dioxide Nanoparticles with Gold Nanoparticles for Bio Fuel Cell Application – H. Park (Korea Institute of Science and Technology), S. Pyo, D. Lee, S. Kim, and H. Park (Chung-Ang University)


- 2037 Evaluation of Activity of RNAi Against Diabetes Related Genes in MIN6 Cells – Y. Kakutani (Tokyo University A&T), M. Kaburagi, H. Matsuoka, and M. Saito (Tokyo University of Agriculture and Technology)

- 2038 Electrochemical Detection of Cell Membrane Proteins using Scanning Electrochemical Microscopy – Y. Matsumae, Y. Takakashi, K. Ino, H. Shiku, and T. Matsue (Tohoku University)

- 2039 Electrochemical Monitoring of Loop-Mediated Isothermal Amplification for Influenza Virus Detection – K. Yamanaka, M. Saito (Osaka University), N. Nagatani (Okayama University of Science), K. Ikuta, and E. Tamiya (Osaka University)

- 2040 Cell-Based Assay Using Cells Adjusted at a Specific Stage during Differentiation to β-Cells – N. Hanata, H. Matsuoka, and M. Saito (Tokyo University of Agriculture and Technology)
• 2041 Development of High-Throughput Toxicity Assay System Integrated with a Chemical Gradient Generator – Y. Sugamura (Tokyo University of Agriculture and Technology), M. Hosokawa, A. Arakaki, T. Tanaka, and T. Matsunaga (Tokyo University of Agriculture and Technology)

• 2042 Detection of E. coli Using Electrochemical and Immunoassay Assay for Amplified Gene by PCR – Y. Ogido (Okayama University of Science), H. Usuijima (Biodevice and Technology Ltd.), K. Yamamaka, M. Saito, E. Tamiya (Osaka University), S. Katayama, T. Miyahara, and N. Nagatani (Okayama University of Science)

• 2043 Suppression of an Oct3/4 Transcription Activity in ES Cells by Decoy DNA Injection – S. Oura (Tokyo University of Agriculture and Technology), H. Funabashi (Hiroshima University), M. Saito, and H. Matsuoka (Tokyo University of Agriculture and Technology)

• 2044 Production of a Differentiation Regulating Protein to Be Feroinjected into ES Single-Cells – T. Tanaka (Tokyo University of Agriculture and Technology), H. Funabashi (Hiroshima University), M. Saito, and H. Matsuoka (Tokyo University of Agriculture and Technology)

• 2045 PEDOT Microelectrodes Anchored to Hydrogel for Efficient Cellular Electrical Stimulation – D. Takahashi, M. Sasaki, R. Suzuki, K. Nagamine, T. Miyake, H. Kaji, and M. Nishizawa (Toboku University)

• 2046 Development of a Patch-Type Gel Sheet Sensor for Detection of Extracellular Metabolites – S. Otani, S. Ito, K. Nagamine, H. Kaji, and M. Nishizawa (Toboku University)

• 2047 Dynamic Properties of Fluorescent Reporter Proteins Feroinjected into ES Single-Cells – S. Hisatomi (Tokyo University of Agriculture and Technology), H. Funabashi (Hiroshima University), M. Saito, and H. Matsuoka (Tokyo University of Agriculture and Technology)

• 2048 Development of Cell Analysis Method by Using CMOS Sensor for High-Throughput Blood Cell Profiling – T. Saeki, M. Hosokawa (Tokyo University of Agriculture and Technology), T. Lim, K. Tomita, M. Harada (Malcom Co., Ltd.), T. Yoshino, T. Tanaka, and T. Matsunaga (Tokyo University of Agriculture and Technology)

• 2049 Flexible Biofuel Cell Using Enzyme-Modified Nanoeengineered Carbon Fabric – T. Yamada, S. Yoshino, T. Oji, T. Miyake, H. Kaji, and M. Nishizawa (Toboku University)

• 2050 Evaluating the Insertion Efficiencies of Silicon Nanonneedles into Living Single Cells – S. Ryu (Tokyo University of Agriculture and Technology), R. Kawamura (National Institute of Advanced Industrial Science and Technology), T. Kitagawa, N. Nakamura, and C. Nakamura (Tokyo University of Agriculture and Technology)

• 2051 Development of a Method to Modify Nanoneedle Arrays with Molecular Probes for the Analysis of Living Cells – M. Shimooko (Tokyo University of Agriculture and Technology), S. Ramachandra Rao, R. Kawamura (National Institute of Advanced Industrial Science and Technology), K. Ishihara, K. Fukazawa (The University of Tokyo), and C. Nakamura (Tokyo University of Agriculture and Technology)

• 2052 Feasibility Study of Dual-FRET Molecular Beacon for the Dynamic Analysis of Oct3/4 mRNA in ES Cells – H. Koike (Tokyo University of Agriculture and Technology), H. Funabashi (Hiroshima University), M. Saito, and H. Matsuoka (Tokyo University of Agriculture and Technology)

• 2053 Effect of Particle Size on the Electrochemical Responses of Cytochrome c and Pyrroloquinoline Quinone Immobilised on Gold Nanoparticle-Modified Electrodes – M. Suzuki, K. Murata, N. Nakamura, and H. Ohno (Tokyo University of Agriculture and Technology)

• 2054 Hydrophilicity and Osteoconductivity of Ti Anodized in Various Aqueous Solutions – D. Yamamoto, K. Kuroda, R. Ichino, and M. Okido (Nagoya University)

• 2055 Effect of a Carbohydrate-Binding Domain on the Transfer between Proteins and Carbon Electrodes – H. Shimofusa, M. Inukai, M. Yoshida (Tokyo University of Agriculture and Technology), K. Igarashi, K. Samejima (The University of Tokyo), N. Nakamura, and H. Ohno (Tokyo University of Agriculture and Technology)


• 2057 Turning Glucose Oxidase into Essentially Dehydrogenase – Y. Horaguchi, S. Saito, S. Ferri (Tokyo University of Agriculture and Technology), K. Mori, K. Kojima (Ultrazyme International Ltd.), W. Tsugawa, and K. Sode (Tokyo University of Agriculture and Technology)


• 2059 Correlation between Spectroscope Absorbance and Biofilm to Anode Microbial Fuel Cell – R. J. Marassi, J. M. Santos, C. E. Teodor, F. S. Santos, and G. C. Silva (Universidade Federal Fluminense)


• 2062 Development of a POCT Diagnostic System for Periodontal Disease Using a Printed Electrode – T. Uenojaya (Department of Applied Physics, Graduate school of engineering, Osaka University), K. Yamamaka, M. Saitou, Y. Yamaguchi, M. Wada, and E. Tamaiya (Osaka University)
**Meeting Program**

**C4 – Poster Session – 18:00 – 20:00**

**Co-Chair: A. J. Fry**

- **2094** The Electrochemical Oxidation of Pyrogallol: Formation of Long-Lived Oxygen Radicals and Application to Assess the Radical Scavenging Abilities of Antioxidants – S. Mu (Yangzhou University)

**D2 – Poster Session – 18:00 – 20:00**

**Co-Chair: N. Missert**

- **2144** First-Principles Molecular Dynamics Simulation of the Chemical Degradation of Polymer Electrolyte Membranes – A. Kobayashi, T. Ishikawa, Y. Higuchi, N. Ozawa, T. Shimazaki, and M. Kubo (Tohoku University)
- **2145** Molecular Dynamics Study for Sintering Characteristics of Solid Oxide Fuel Cell Anode – K. Nakao, T. Ishimoto, and M. Koyama (Kyushu University)
Models – 08:00 – 09:45
Co-Chairs: Takumi Haruna and Dave Williams

08:00 2199 Predicting the Steady State Thickness of Passive Films with the Point Defect Model in Fretting Corrosion Experiments – J. Geringer (ENSMSE), M. L. Taylor, and D. D. Macdonald (The Pennsylvania State University)


08:30 2201 Neural Network as a Data Mining Tool for Prediction of Corrosion Behavior – M. Kamrunnahar and M. Urquidi-Macdonald (The Pennsylvania State University)

08:45 2202 Vacancy Formation and Electronic Structure on FeS$_2$ Surfaces – Model System for Iron Sulfide Corrosion Films – F. W. Herbert, A. Krishnamoorthy, K. J. Van Vliet, and B. Yildiz (Massachusetts Institute of Technology)

09:00 2203 Deterministic Prediction of Localized Corrosion Damage in Oil and Gas Pipelines – G. R. Engelhardt (OLI Systems, Inc.), R. Wollam (BP), and D. D. Macdonald (The Pennsylvania State University)

09:15 2204 Application of the Kramers-Kronig Relations to Impedance Spectroscopy – M. E. Orazem (University of Florida)

09:30 2205 Microstructure-Influenced Numerical Modeling of Pitting Corrosion in 316 Stainless Steel – N. Kota (Science Applications International Corporation), S. Qudwai, and V. DeGiorgi (U.S. Naval Research Laboratory)

Models – 10:00 – 12:00
Co-Chairs: Jordi Abellà and Mike McKubre

10:00 2206 The Role of MnS Inclusions and Passive Films in the Initiation of Pitting Corrosion of Stainless Steels – N. Hara, Y. Sugawara, and I. Muto (Tohoku University)

10:30 2207 CPE Behavior of Oxide Layer Impedance – B. Tribollet, I. Frateau (CNRS), M. Musiani (IENI CNR), M. E. Orazem (University of Florida), and V. Vivier (CNRS)

10:45 2208 A Spectroscopic and Electrochemical Investigation of the Structure of Ni(OH)$_2$ Materials – D. S. Hall (University of Ottawa), C. Bock, B. MacDougall (National Research Council Canada), D. J. Lockwood (National Research Council), and S. Poirier (National Research Council Canada)

11:00 2209 Electrochemical and Surface Study of the Oxide Growth and Conversion on 316L Stainless Steel – Q. W. Knapp, J. J. Noël, and J. Wren (Western University)

11:15 2210 Constant Phase Elements and Impedance of Rough Surfaces: A Numerical Study – M. Venkatraman, I. S. Cole (CSIRO Materials Science and Engineering), D. Sherwood (Central Electrochemical Research Institute), I. G. Bosco (CSIRO Materials Science and Engineering), and B. Emmanuelle (Central Electrochemical Research Institute)

11:30 2211 Mathematical Models for Under-Deposit Corrosion – Y. Chang and M. E. Orazem (University of Florida)

11:45 2212 Weight Loss Model for Atmospheric Corrosion of Steel in Mexico Using Artificial Neural Networks – E. Bolanos Rodriguez (Universidad Autonoma del Estado de Hidalgo, Mexico) and J. González Islas (Universidad Tecnológica de Tulancingo, México)

Impedance – 13:45 – 15:30
Co-Chairs: Ignacio Gonzalez and Patrick Schmuki

13:45 2213 Electrochemical Correlation Study of On-Line Corrosion Monitoring Probes – D. Bai (Harbin Institute of Technology, Shenzhen Graduate School), J. Wu (Harbin Institute of Technology Shenzhen Graduate School), and F. Chen (Shenzhen Grusen Technology Co., Ltd)

14:00 2214 (Corrosion Division H. H. Uhlig Award Presentation) Understanding of Passivity Due to the Application of Surface Methods, a Review – H. Strebblow (Heinrich-Heine-University Dusseldorf)

14:30 2215 (Corrosion Division Morris Cohen Award Presentation) Evaluation of Thiosulfate as a Substitute of Hydrogen Sulfide in Sour Corrosion Fatigue Studies – M. Kappes (University of Akron), G. Frankel (The Ohio State University), R. Thodla (DNV), N. Sridhar (Det Norske Veritas (USA) Inc.), and R. Carranza (Comisión Nacional de Energía Atómica)

15:00 2216 Marine Biofilms Mimic Metal/Air Battery Current Enhancement Strategies: A Study of Peroxide Degradation via Manganese Dioxide Catalysis in Seawater – M. J. Strom (U.S. Naval Research Laboratory), G. W. Luther, and S. C. Dexter (University of Delaware)

15:15 2217 Dissolution Behavior of Novel Lead Anodes for Copper Electrowinning – M. Clancy, C. Bettles, N. Birbils (Monash University), and A. Stuart (Origma Pty Ltd.)
Meeting Program – PRIME 2012 – October 7-12, 2012 – Honolulu, Hawaii

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

D3 – Poster Session – 18:00 – 20:00

- **2229** Density Functional Theory Calculations of Defects Formation Energies in Cr₂O₃ – B. Malki, B. Baroux, O. Le Bacq, and A. Pasturel (Grenoble INP)
- **2230** Electrical Microdischarge Characterization during Spark Anodization of Zirconium – J. S. Santos (Universidade Federal de Sao Carlos), S. G. Lemos (Universidade Federal da Paraiba), W. N. Gonçalves, O. M. Bruno (Universidade de Sao Paulo), and E. C. Pereira (Universidade Federal de Sao Carlos)

- **2231** Preparation of Pt-Ru/CNT/Carbon Cloth Catalysts by Electrodeposition Method for Use in Fuel Cell – Y. Lin, T. Yeh, and M. Tsai (National Tsing Hua University)
- **2232** Effect of passivation potential on amount of bound water in passive film on titanium – T. Haruna and S. Ito (Kansai University)
- **2233** Prediction of stress corrosion cracking of Type 304 stainless steel weld components exposed to chloride environments – G. Nakayama and Y. Sakakibara (IHI Corporation)
- **2234** Electrochemical studies of the alloy Ti6Al4V after being subjected to UV-C irradiation treatment – M. Pachá-Olvíenza (CIBER-BBN), A. Gallardo-Moreno, V. Vadillo-Rodriguez, M. González-Martín, C. Pérez Giraldo (University of Extremadura), and J. C. Galván (Centro Nacional de Investigaciones Metalúrgicas)
- **2235** Effects of Cu on the localized corrosion and repassivation kinetics of ferritic stainless steels – S. Ahn, K. Oh (KAIST), and H. Kwon (Korea Advanced Institute of Science and Technology)

High Temperature Corrosion Materials Chemistry 10
High Temperature Materials / Corrosion
318A, Level 3, Hawaii Convention Center

Oxidation and Corrosion of Metallic Systems 1 – 08:00 – 12:00
Co-Chairs: P. Gannon and T. Maruyama

- **2306** Fabrication of Vertically Aligned Nano-Oxide Arrays via Internal Oxidation of Dilute Alloys – M. Nanko and D. T. Do (Nagaoka University of Technology)
- **2307** High-Temperature Oxidation Kinetics for Recovery of Mechanical Strength on Nano-Ni Dispersed Al₂O₃ Hybrid Materials – D. Maruoka and M. Nanko (Nagaoka University of Technology)
- **2308** Early Oxidation Stages of Alumina Formers and the effect of the Additions: A Brief Survey – J. Jedliński (AGH University of Science and Technology)
- **2309** The Influence of KCl(s) on the Oxidation of a FeCrAl Alloy at 600 °C in Dry and Wet Environment – N. Israelsen, L. Johansson, and J. Svensson (Chalmers University of Technology)
- **2310** Intermission (20 Minutes)
- **2311** High-Temperature Corrosion Behavior of Sputtered Ni-Based Nanocrystalline Coating with Yttrium Addition in Chloride at 900°C – P. Yu (Shenyang University of Chemical Technology), W. Wang, F. Wang, and S. Zhu (Chinese Academy of Sciences)
- **2312** Accelerated Corrosion of Low Alloy and Stainless Steel by PbCl₂-Containing Salt Mixtures – D. P. Bankiewicz, P. Yrjas, and M. Hupa (Abo Akademi University)
11:00  2313  An Electrochemical Impedance Spectroscopy Study on the effect of Condensate on Oxides Formed on a 25Cr/20Ni Cast Stainless Steel in Exhaust Environments – M. Ekström (Royal Institute of Technology), B. Zhu (Materials Technology, Scania CV AB), P. Szakalos, and S. Jonsson (Royal Institute of Technology)

11:20  2314  The effect of Water Vapor on the Distribution of Oxide Precipitates during Internal Oxidation of Ni-5Cr Alloy at 1073 K – M. Ueda (Tokyo Institute of Technology), Y. Kurata (NGK Insulators Ltd.), K. Kawamura, and T. Maruyama (Tokyo Institute of Technology)

11:40  2315  Oxidation Behaviour of Sanicro 25 in CO_2 and H_2O-Rich Environments – L. Intiso (Centro sviluppo Materiali), L. Johansson, and M. Halvarsson (Chalmers University of Technology)

**Oxidation and Corrosion of Metallic Systems 2 – 14:00 – 15:20**

Co-Chairs: P. Masset and G. Meier

14:00  2316  Behaviors of SOFC Interconnect Steels and Coatings with Contacting Electrodes and Seals in Single and Dual Atmosphere Exposures – R. Amendola, A. Weinstein, S. Sofie, and P. Gannon (Montana State University)


14:40  2318  Kinetics and Mechanisms of Copper Catastrophic Oxidation in the Presence of Low-Melting Oxides – V. V. Belousov (Russian Academy of Sciences)

15:00  Intermission (20 Minutes)

**High Temperature Electrochemistry – 15:20 – 16:40**

Co-Chairs: G. Meier and P. Masset


15:40  2320  High Temperature Electrolysis for Liquid Iron Production – G. Haarberg, E. Kvalheim (Norwegian University of Science and Technology), A. Martinez (SINTEF), S. Rolseth (SINTEF Materials and Chemistry), and H. Gudbrandsen (SINTEF)

16:00  2321  Corrosion Behavior of Construction Materials for Intermediate Temperature Steam Electrolysers – A. V. Nikiforov (Technical University of Denmark), I. M. Petrushina (Technical University of Denmark), J. Jensen, and N. Bjerrum (Technical University of Denmark)

16:20  2322  Evaluation of Electrode Materials for Electrolytic Reduction of Nuclear Fuels – A. Merwin and D. Chidamaram (University of Nevada Reno)

**Corrosion / Luminescence and Display Materials**

323B, Level 3, Hawaii Convention Center

10:00  2383  Optical Characterization of Self-Assembled Systems: Nanoparticles and Monolayers – N. Rowell (National Research Council Canada)

10:30  2384  XPS Analysis of Porous Silicon – D. Aureau (CNRS-UVSQ), J. Chazalviet, F. Ozanam (CNRS-Ecole polytechnique), and A. Etcheberry (CNRS-UVSQ)

10:50  2385  Transient Surface Photovoltage Studies of Nano-Porous Silicon with Embedded Metal Nanoparticles – P. R. Chapagain, E. Davis, A. Nemashkalo, Y. Strzhemechny (Texas Christian University), P. Granitzer, K. Rumpf (Karl-Franzens-University Graz), and E. Nguyen (Paschal High School)
Applications of Silicon and Metal Oxide Nanostructures – 15:20 – 18:10
Co-Chairs: F. Ozanam and B. Gelloz


15:30 2390 Deposition of Ternary Alloys of Cadmium Selenium-Sulfide Thin Films on Nanoporous TiO2 for Solar Cells Applications – A. Sephehrifard, A. Aushana, and S. Morin (York University)

16:10 2391 Fabrication of Highly Ordered Porous Si and Its Application to Anodes in Lithium-Ion Battery – H. Masuda, S. Tagawa, and K. Nishio (Tokyo Metropolitan University)

16:30 2392 Silicon and Porous Silicon/Carbon Nanocomposites for Rechargeable Li- and Mg-Ion Batteries – S. Polisski and T. Abe (Kyoto University)

16:50 2393 Silicon Nanowires for Innovative Energy Applications – V. Sivakov, M. Kulmas (Institute of Photonic Technology), B. Hoffmann (Max Planck Institute for the Science of Light), F. Talkenberg (Institute of Photonic Technology), R. Kirchgeorg, C. Lee (Friedrich Alexander Universität), P. Schmuki (University of Erlangen-Nuremberg), and S. Christiansen (Max Planck Institute for the Science of Light)

17:10 2394 Transition Metal Oxide Particles Deposited onto Titania Nanotubes as High Performance Electrodes for Li-Ion Microbatteries – N. Kyeremateng and T. Djenizian (University of Aix-Marseille)

17:30 2395 Designing Structure and Composition of Nanoporous Anodic Alumina for Optical Applications – D. Routkevitch (InRedox LLC)

17:50 2396 Deposition of LaF3 to Passivate the Pore-Walls of Porous Silicon Using a Simple Single-Source Chemical Bath Technique – A. Ismail (Rajshahi University), M. Rahman (Pabna Science & Technology University), M. Hossain, M. Nain, and S. Mou (Rajshahi University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

D7 – Poster Session – 18:10 – 20:00
Co-Chairs: P. Schmuki, H. Masuda, and P. Granitzer

- 2397 Preparation and Characteristics of Anodic Aluminum Oxide Membranes with Mesoporous Structure – T. N. Nguyen, M. Kim, J. Ahn (Korea Electrotechnology Research Institute), J. Kaeuwak (Korean Electrotechnology Research Institute), J. Kim, and D. Jeong (Korea Electrotechnology Research Institute)

- 2398 Fabrication of Flexible Alumina Microlens Array by Laser Irradiation and Aluminum Anodizing – T. Kikuchi, Y. Wachi, T. Takahashi, M. Sakairi (Hokkaido University), and R. O. Suzuki (Eco-Processing)

- 2399 Formation of Self-Organized Nanoporous Anodic Films on Carbon Steels – S. Yang, Y. Konno, E. Taji, Y. Aoki (Hokkaido University), H. Shoji (Nippon Steel Corporation), P. Skeldon, G. E. Thompson (The University of Manchester), and H. Habazaki (Hokkaido University)

- 2400 Metal Assisted Etching of Silicon in a V2O5 Plus HF Solution – W. B. Barclay and K. W. Kolansinski (West Chester University)

- 2401 Anodic Porous Etching of n-InP: A Chemical-Assisted Dissolution Process – L. Santinacci (CNRS – Aix-Marseille University), M. Boutemy, and A. Etcheberry (University of Versailles -CNRS)

- 2402 Mathematical Model for <111>A Pore Propagation and Relation to Current for InP in Aqueous KOH Electrolytes – R. Lynch, N. Quill, C. O’Dwyer (University of Limerick), and D. Buckley (Materials & Surface Science Institute, University of Limerick)

- 2403 Differential Photoacoustic Electrochemical Cell to Study In Situ the Wetting Process in Different Materials – D. G. Espinosa-Arbelaez and M. Rodriguez-Garcia (Universidad Nacional Autónoma de México)

- 2404 Study of the Microstructural and Optical Properties of Porous Silicon Bragg Reflectors Obtained by Differential Photoacoustic Electrochemical Cell – M. Rodriguez-Garcia and D. G. Espinosa-Arbelaez (Universidad Nacional Autónoma de México)

Atomic Layer Deposition Applications 8
Dielectric Science and Technology / Electronics and Photonics
304B, Level 3, Hawaii Convention Center

Energy – 08:20 – 10:00

08:20 2467 Growth Characteristics and Properties of Yttrium Oxide Thin Films by Atomic Layer Deposition from Novel Y(iPrCp)3 Precursor and O3 – R. Xu, S. Selvaraj, N. Azimi, and C. G. Takoudis (University of Illinois at Chicago)

Meeting Program – PRIME 2012 – October 7-12, 2012 – Honolulu, Hawaii
Meeting Program  PRIME 2012  October 7-12, 2012  Honolulu, Hawaii

Tuesday, October 9

08:40  2468 Electrocatalytic Activity of Platinum Grown by Atomic Layer Deposition on Carbon Nanotubes for Si-Based DMFC Applications – A. Johansson, R. Yang (Danish Technological Institute), B. Dalslet, J. V. Larsen, K. Haune (Technical University of Denmark), L. H. Christensen (Danish Technological Institute), and E. V. Thomsen (Technical University of Denmark)

09:00  2469 Atomic Layer Deposition of Copper (I) Sulfide Using Commercially Produced Precursors – S. Christensen, A. Dameron, T. Gennett, and I. Repins (National Renewable Energy Laboratory)

09:20  2470 High Performance Core-Shell Nanowire Array Devices Prepared by Atomic Layer Deposition – H. Kim (Yonsei University)

09:40  Intermission (20 Minutes)

Novel Applications – 10:00 – 12:00

10:00  2471 Metal Oxide ALD Films for Low Power Sensor Applications – S. H. Brongersma (Holst Centre / imec)

10:40  2472 Enabling High Performance Detectors and Optics for Astronomy and Planetary Exploration with ALD – F. Greer (Jet Propulsion Laboratory)

11:20  2473 Nanomechanical Properties of Ultra Thin Films Synthesized by Atomic Layer Deposition – H. Baumgart (Old Dominion University)

Metals – 14:00 – 15:50

14:00  2474 Study on Growth Characteristics of ALD RuO2 Thin Films with Deposition Conditions – W. Kim (Samsung Electronics Co. Ltd.), B. Kim, J. Chang (Samsung Electronics Co., Ltd.), Y. Tak (Samsung Electronics Co. Ltd.), H. Yang, S. Moon, O. Kwon, K. Cho, C. Yoo, and H. Kang (Samsung Electronics Co., Ltd.)

14:20  2475 Atomic Layer Deposition of TiN/Al2O3/TiN Nanolaminates for Capacitor Applications – L. Assaud, M. Hambucken, and L. Santinacci (CNRS – Aix-Marseille University)


15:00  2477 Atomic Layer Deposition of Ruthenium in Various Precursor and Oxygen Doses – J. Kim, K. Son, B. Kim, W. Kim, and J. Shim (Korea University)

15:20  Intermission (30 Minutes)

Reaction Mechanisms II – 15:50 – 17:40


16:30  2479 Substrate Reactivity effects in the ALD of Al2O3 Revealed by In Situ ALD – M. Tallarida, M. Michling, C. Das, and D. Schmeisser (Brandenburg University of Technology)

16:50  2480 New Reaction Chemistries for Late Transition Metal Atomic Layer Deposition – B. Vidjayacoumar, V. Ramalingam, R. Kleinberger, D. J. Emslie (McMaster University), J. Blackwell, and S. Clendenning (Intel Corporation)

17:30  Concluding Remarks (10 Minutes)

E4  Gallium Nitride and Silicon Carbide Power Technologies 2

Electronics and Photonics / Dielectric Science and Technology
316C, Level 3, Hawaii Convention Center

GaN Power Switching Transistors – 08:00 – 10:00
Co-Chairs: Mike Spencer and Joachim Wurfl

08:00  2528 Physics of GaN-based Power Field Effect Transistors – M. Shur (RPI)

08:20  2529 Recent Advances in III-N High-Power Electronics – R. Dupuis, Y. Lee, Z. Lochner, H. Kim, Y. Zhang, J. Ryou, and S. Shen (Georgia Institute of Technology)


09:00  2531 Demonstration of Low ON-Resistance CAVETS with Ammonia MBE Grown Active p-GaN Layer as the Current Blocking Layer for High Power Applications – R. Yeluri, C. Hurni, S. Chowdhury, J. S. Speck, and U. Mishra (University of California Santa Barbara)

09:20  2532 AlGaN/GaN Heterojunction FETs for High-Breakdown and Low-Leakage Operation – M. Kuzuhara and H. Tokuda (University of Fukui)

09:40  Intermission (20 Minutes)
Tuesday, October 9

10:00 2533 III-Nitride High Voltage Power Electronics – M. Spencer and W. Schaff (Cornell University)
10:40 2535 Electrochemical Solution Growth of Gallium Nitride – T. C. Monson, K. Waldrip (Sandia National Laboratories), V. Krishnamoorthy (Wish Consulting), A. Mollo, and L. E. Johnson (Sandia National Laboratories)

11:00 2536 Comparison of Si, Sapphire, SiC, and GaN Substrates for HEMT Epitaxy – M. Leszczynski, P. Prystawko (Institute of High Pressure Physics), J. Plesiewicz (TopGaN Ltd.), L. Dmowski, E. Litwin-Staszewska, S. Grzanka, E. Grzanka (Institute of High Pressure Physics), and F. Roccaforte (CNR-IMM)

11:20 2537 GaN-on-Si for Power Technology – D. Visalli, J. Derluny, S. Degroote, and M. Germain (EpiGaN)
11:40 2538 Scalable GaN-On-Silicon Using Rare Earth Oxide Buffer Layers – M. Lebby (Translucent Inc.), F. Arkun (Translucent Inc.), R. Dargis, R. Roucka, R. S. Smith, and A. Clark (Translucent Inc.)

14:00 2539 Recent Advances in Wide Bandgap Power Devices – K. Sheng (Zhejiang University)
14:20 2540 Advanced Driver and Control ICs for GaN and SiC Power Devices – S. P. Pendharkar and C. Chey (Texas Instruments Inc.)
14:40 2541 GaN-Based Wide-Bandgap Power Switching Devices: From Atoms to the Grid – S. Atcitty, L. Biedermann (Sandia National Laboratories), M. Sun, T. Palacios (Massachusetts Institute of Technology), and M. Smith (Sandia National Labs)
15:20 2543 Degradation Study of Single and Double-Heterojunction InAlN/GaN HEMTs by Two-Dimensional Simulation – V. Palankovski and J. Kuzmik (TU Wien)

16:00 2545 Introduction of Panelists (15 Minutes)
16:15 Mietek Bakowski (10 Minutes)
16:25 Joachim Würfl (10 Minutes)
16:35 Krishna Shenai (10 Minutes)
16:45 Aivars Lelis (10 Minutes)
16:55 Robert Kaplar (10 Minutes)
17:05 Bobby Brar (10 Minutes)
17:15 Q&A (45 Minutes)

Dielectric Materials and Metals for Nanoelectronics and Photonics 10
Dielectric Science and Technology / Electronics and Photonics
313A, Level 3, Hawaii Convention Center

Ge Channel – 09:00 – 09:40
Co-Chair: Koji Kita
09:00 2584 Conducton Band-offset in GeO$_2$/Ge Stack Determined by Internal Photoemission Spectroscopy – W. Zhang, T. Nishimura, K. Nagashio, K. Kita, and A. Toriumi (The University of Tokyo)
09:20 2585 Hydrogen Interaction with HfO$_2$ Films Deposited on Ge(100) and Si(100) – G. V. Soares (UFRGS), T. Feijó (IF-UFRGS), I. Baumvol (IF-UFRGS and UCS), C. Aguzzoli (UCS), C. Krug (IF-UFRGS and CEITEC S.A), and C. Radtke (IQ-UFRGS)

InGaAs and GaAs Passivation – 10:00 – 12:30
Co-Chairs: Susanne Stemmer and Heiji Watanabe
10:00 Award Ceremony (10 Minutes)
10:10 2586 MOS Interface Control of High Mobility Channel Materials for Realizing Ultrathin EOT Gate Stacks – S. Takagi, R. Zhang, R. Suzuki, N. Taoka, M. Yokoyama, and M. Takenaka (The University of Tokyo)
10:40 2587 III-V/Oxide Interfaces Investigated with Synchrotron Radiation Photoemission Spectroscopy – M. Tallarida (Brandenburg University of Technology)
11:10 2588 Unit Cell by Unit Cell Cleaning and Nucleation for ALD Gate Oxide Deposition – W. Melitz, T. Kent, E. Chagarov (UCSD), M. Edmonds, T. Kaufman-Osborn (University of California, San Diego), J. Sung Lee (UCSD), K. Kianatj, and A. Kummel (University of California, San Diego)
11:40 2589 Scaling and Interface Control of High-k/III-V Interfaces – S. Stemmer, V. Chobpattana, Y. Hwang (University of California Santa Barbara), and R. Engel-Herbert (The Pennsylvania State University)
12:10 2590 Effect of In$_{0.45}$Ga$_{0.55}$As surface Nitridation on Electrical Characteristics of High-k/ Capacitors – Y. Suzuki, D. Zadeh, K. Kakushima, P. Ahmet, Y. Kataoka, A. Nishiyama, N. Sugii, K. Tsutsui, K. Natori, T. Hattori, and H. Iwai (Tokyo Institute of Technology)
Meeting Program – PRIME 2012 – October 7-12, 2012 – Honolulu, Hawaii

Tuesday, October 9

Co-Chairs: Akira Toriumi and Atif Noori

14:00 2591 Interface Dipole Cancellation in SiO2/High-k/ SiO2/Si Gate Stacks – S. Hibino, T. Nishimura, K. Nagashio, K. Kita, and A. Toriumi (The University of Tokyo)

14:20 2592 Phenomena of Dielectric Capping Layer Insertion into High-κ Metal Gate Stacks in Gate-First/Gate-Last Integration – H. Jagganathan, P. Jamison, and V. Paruchuri (IBM Research)


15:10 2594 Investigation of Mg Diffusion in Ta(N) based Electrodes on HfO2 for sub-32nm CMOS Gate-Last Transistors – R. Gassilloud, C. Maunoury, C. Leroux (CEA France), P. Chevalier (STMicroelectronics), C. Dressler, F. Aussenc, F. Martin (CEA France), D. Bansahel (STMicroelectronics), and S. Maitrejean (CEA France)

FinFET and 3-D Transistors – 15:40 – 17:40

Co-Chairs: Kaushik Roy and Durga Misra

15:40 2595 Device-Circuit Co-design of FinFETs in Scaled Technologies – S. Gupta and K. Roy (Purdue University)

16:10 2596 Independent-Double-Gate FinFET SRAM Technology – K. Endo, S. O’uchi, Y. Liu, T. Matsukawa, and M. Masahara (AIST)


17:10 2598 Current Status of High-k and Metal Gates in CMOS – G. Wilk, M. Verghese, P. Chen (ASM America), and J. Maes (ASM Belgium)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

E5 – Poster Session – 18:00 – 20:00

Co-Chairs: Durga Misra and Samares Kar

• 2599 Roles of Target Composition on the Dielectric Property of RF Sputtered Bi2O3-ZnO-Nb2O5 Pyrochlore Thin Film – K. Ko, M. Lim, B. Lee, H. Lee, and J. Choi (Ajou University)

• 2600 Effect of Erbium Silicide Crystallinity for Low Barrier Contact Between Erbium Silicide and n-type Silicon – H. Tanaka, A. Teramoto, S. Sugawa, and T. Ohmi (Tohoku University)

• 2601 Measurement and Identification of Three Contributing Charge Terms in Negative bias Temperature Instability – C. Mayberry (AFRL), D. Nguyen, C. Kouhestani (AFRL/RVSE), K. Kambour (SAIC), H. Hjalmarson (Sandia National Laboratories), and R. Devine (AFRL/RVSE)

E6 High Purity Silicon 12

Electronics and Photonics

320, Level 3, Hawaii Convention Center

Advanced Substrates and Characterization – 08:10 – 09:40

Co-Chair: J. A. Martino

08:10 2634 Manufacturing of Ultra Thin SOI – O. Bonnin, W. Schwarzenbach, V. Barec, N. Daval, X. Cauchy, B. Nguyen, and C. Maleville (Soitec)

08:40 2635 Hybrid-Formation of Ge-on-Insulator Structures on Si Platform by SiGe-Mixing-Triggered Rapid-Melting Growth --- A Road to Artificial Crystal --- – M. Miyao, M. Kurosawa, K. Toko, and T. Sadoh (Kyushu University)

09:10 2636 The Pseudo-MOSFET: Principles and Recent Trends – S. Cristoloveanu, I. Ionica, A. Diab, and F. Liu (IMEP)

09:40 Intermission (20 Minutes)
Radiation Effects and Characterization – 10:00 – 12:00
Co-Chair: S. Cristoloveanu

10:00  2637  Interface and Border Traps in Ge pMOSFETs – D. M. Fleetwood (Vanderbilt University), E. Simoen (imec), S. Francis (Air Force Institute of Technology), X. Zhang (Vanderbilt University), R. Arora (Georgia Tech), E. Zhang, R. Schrimpf, K. Galloway (Vanderbilt University), J. Mitard, and C. Claeys (imec)

10:30  2638  Radiation Influence on Biaxial+uniaxial Strained Silicon MuGFETs – C. Bordallo (Centro Universitário da FEI), P. G. Agopian, J. A. Martino (University of Sao Paulo), E. Simoen, and C. Claey (imec)

10:50  2639  Wafer Level Statistical Evaluation of the Proton Radiation Hardness of a High-k Dielectric/Metal Gate 45 nm Bulk CMOS Technology – C. Claey, S. Iacovo (imec), D. Kobayashi (ISAS/JAXA), A. Mercha, A. Griffoni, P. Roussel (imec), F. Crupi (DEIS, University of Calabria), and E. Simoen (imec)

11:10  2640  Transistor-Based Extraction of Carrier Lifetime and Interface Traps in Silicon-on-Insulator Materials – J. A. Martino (University of Sao Paulo), V. Sonnenberg (FATEC/SP), M. Galetti (University of Sao Paulo), M. Aoulaiche, E. Simoen, and C. Claey (imec)

11:40  2641  Physical Mechanisms of Charge Pumping and DCIV Currents in Floating-Body SOI MOSFETs – E. Zhang, D. M. Fleetwood, R. Schrimpf (Vanderbilt University), E. Simoen, and D. Linten (imec)

12:00  Lunch Break (120 Minutes)

Oxygen-, Hydrogen-Related Defects and Their Characterization – 14:00 – 15:20
Co-Chairs: R. Job and J. Murphy

14:00  2642  Lifetime-Degrading Boron-Oxygen Centres in p-types and n-type Silicon – V. V. Voronkov, R. J. Falster (MEMC Electronic Materials), B. Lim, and J. Schmidt (ISFH)

14:30  2643  Impact of Oxide Precipitates on Minority Carrier Lifetime in Silicon – J. D. Murphy (University of Oxford), K. Bothe, R. Kranz (Institut für Solarenergieforschung Hameln/Emmerthal), M. Olmo, V. V. Voronkov, and R. J. Falster (MEMC Electronic Materials)

15:00  2644  Comparison of the Impact of Thermal Treatments on the Second and on the Millisecond Scales on the Precipitation ofInterstitial Oxygen – G. Kissinger, D. Kot (IHP), and W. Von Ammon (Siltronic AG)

15:20  Intermiission (20 Minutes)

Point Defects in Si and Ge – 15:40 – 17:30
Co-Chairs: R. Job and J. Murphy

15:40  2645  Thermal Budget of Hydrogen-Related Defect Profiles – Diffusion Limited Activation and Thermal Dissociation – J. Laven (Infineon Technologies AG), R. Job (Muenster University of Applied Sciences), H. Schulze, F. Niedernostheide (Infineon Technologies AG), W. Schustereder (Infineon Technologies Austria AG), and L. Frey (University of Erlangen-Nuremberg)

16:10  2646  Difficulties in Characterizing High-Resistivity Silicon – P. Nayak, R. Richert, and D. K. Schroder (Arizona State University)

16:30  2647  Investigation of Doping Type Conversion of Hydrogen Implanted Cz-Silicon by EBIC – S. Kirstnorter, M. Faccinelli, P. Hadley (Graz University of Technology), J. Laven, H. Schulze (Infineon Technologies AG), R. Job (Muenster University of Applied Sciences), and W. Schustereder (Infineon Technologies Austria AG)

16:50  2648  Characterization of Deep Levels Introduced by RTA and by Subsequent Anneals in n-Type Silicon – D. Kot (IHP), T. Mchedlidze (TU Dresden), G. Kissinger (IHP), and W. Von Ammon (Siltronic AG)

17:10  2649  Deep-Level Transient Spectroscopy of MOS Capacitors on GeSn Epitaxial Layers – E. Simoen, B. Vincent, C. Merckling, F. Gencarelli (imec), L. Chu (National Tsing Hua University), and R. Loo (imec)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

E6 – Poster Session – 18:00 – 20:00

•  2650  Low Temperature Fluorinated Silicon Film Synthesis – D. E. Milovozorov (Fluens Technology Group Ltd)

•  2651  Chemical Vapor Deposition of Silicon by the Reaction of Bromosilanes and Hydrogen – K. Tomono, H. Furuya, S. Miyamoto, T. Ogawa, Y. Okamura, R. Komatsu, and M. Nakayama (Yamaguchi University)

•  2652  Diode Characteristics and Thermal Donor Formation in Germanium-Doped Silicon Substrates – J. Rafi (Institut de Microelectrònica de Barcelona (IMB-CNMC-SCIC)), J. Vanhellemont (Ghent University), E. Simoen (imec), J. Chen (State Key Laboratory of Silicon Materials), M. Zabala (Institut de Microelectrònica de Barcelona (CNM-CSIC)), and D. Yang (State Key Laboratory of Silicon Materials)

Low-Dimensional Nanoscale Electronic and Photonic Devices 5
Electronics and Photonics / Dielectric Science and Technology / Sensor
304A, Level 3, Hawaii Convention Center

Low-Dimensional Materials for Nanoelectronics/Optoelectronics I – 08:20 – 09:40
Co-Chairs: Jr-Hau He and Yu-Lun Chueh

08:20  2669  GaN-based Nanorods: From High-Gain Photoconductor to Solar Hydrogen Generation – Y. Huang (National Taiwan University), Y. Huang (Academia Sinica), W. Tu (National Taiwan University), K. Chen (Academia Sinica), and L. Chen (National Taiwan University)

08:45  2670  From Organic Powders to Geometrically Well Defined Low-Dimensional Structures: A Way for Unprecedented Optical and Chemical Properties – J. Park, H. Moon, and H. Choi (Pohang University of Science and Technology)
09:10  2671  Hybrid Silicon Solar Cells with Hierarchical Structure for Energy Harvesting – W. Wei, C. Ho, S. Tai (National Taipei University of Technology), H. Wang (Photonics and Optoelectronics), A. Li, R. Chung (National Taiwan University of Technology), and J. He (National Taiwan University)

09:25  2672  Three-dimensional Silicon Phononic Crystal – Y. Lin, H. Ting, L. Chou, and L. Chen (National Tsing Hua University)

Low-Dimensional Materials for Nanoelectronics/Optoelectronics II – 10:00 – 12:00
Co-Chairs: Li-Chyong Chen and Hee Cheul Choi

10:00  2673  One-Dimensional Semiconductor Heterostructures: Challenges and Opportunities – S. Dayeh (Los Alamos National Laboratory)

10:25  2674  Chemical Vapor Deposited MoS2 Thin Layers and Their Applications – L. Li (Academia Sinica)

10:50  2675  Epitaxial Growth of Iron-Silicide Nanodots on Si Substrates Using Ultrathin SiO2 Film Technique and Their Physical Properties – Y. Nakamura (Osaka University) and M. Ichikawa (University of Tokyo)

11:15  2676  Au@SnO2 Core-Shell Nanowires: Novel Material for Gas Sensor – W. Liu, C. Hsu, and L. Chou (National Tsing Hua University)

11:30  2677  DC and RF Characteristics of Ga2O3/GaN Single Nanowire MOSFET – J. Yu, C. Li, P. Yeh, Y. Wu, and L. Peng (National Taiwan University)

11:45  2678  Controllable Surface Plasmon Resonance Properties of Hexagonal Close-packed Metal Nanosphere Arrays – H. Ting, Y. Lin, L. Chou, C. Tsai, and L. Chen (National Tsing Hua University)

Low-Dimensional Materials for Nanoelectronics/Optoelectronics III – 14:00 – 15:45
Co-Chairs: Lain-Jong Li and Shadi Dayeh


14:25  2680  Nanoheterostructures of Semiconducting Nanowires for Electronic Sensors and Photodetectors – P. Lee (Nanyang Technological University)

14:50  2681  Implantable and Bio-Integrated Flexible GaN LED – K. Lee (KAIST)


15:30  2683  Field Emission of Core-Shell Ga2O3 Nanowires – K. Cheng, C. Hsu, C. Hsieh, and L. Chou (National Tsing Hua University)

Low-Dimensional Materials: Functional Metal Oxide I – 16:00 – 17:35
Co-Chairs: Katsuhisa Tanaka and Pooi See LEE

16:00  2684  2D Oxide Nanosheets: Controlled Assembly and Applications – M. Osada and T. Sasaki (National Institute for Materials Science)

16:25  2685  Optical Second Harmonic Generation of Pt Nanowires Created by Shadow Deposition on MgO(110) Facetted Templates – G. Mizutani and Y. Ogata (Japan Advanced Institute of Science and Technology)

16:50  2686  SiO2 nano-cylinder structure for low-k dielectric layer – R. Maeno, T. Fujii, and M. Omiya (Keio University)

17:05  2687  Synthesis and Characterization of the Core-Shell Au/Ga2O3 Nanowires – B. Wu, C. Hsu, and L. Chou (National Tsing Hua University)


Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center
E7 – Poster Session – 18:00 – 20:00

-  2689  Study of the active volume for High Bright AlGaNp-based Light Emitting Diodes – H. Oh (Korea Photonics Technology Institute)

-  2690  Near-Infrared Light Detection of n-Type β-FeSi2/i-Si/p-Type Si Heterojunction Photodiodes at Low Temperatures – R. Iwasaki, K. Yamashita, N. Promros, S. Izumi, and T. Yoshitake (Kyushu University)

-  2691  Single-Nanowire CMOS Inverter based on Ambipolar Si Nanowire FETs – H. Yuan, Q. Li, H. Zhu (George Mason University), H. Li (NIST & George Mason University), D. Ioannou (George Mason University), and C. A. Richter (NIST)

-  2692  Visible Light-Induced Immobilization of Gold Nanoparticles on Silicon Substrates – S. Mo, T. Ichii, K. Murase, and H. Sugimura (Kyoto University)

-  2693  Fabrication of Silicon Nanowire Arrays for Photovoltaic Applications – H. Li (National Chiao Tung University), J. Tseng (St. John's University), S. Chiou, H. Liu (National Chung Hsing University), and H. Cheng (National Chiao Tung University)

-  2694  Ultra-Compact Photonic Circuit Components based on Propagation of Exciton Polaritons in Organic Dye Nanofibers – K. Takazawa, J. Inoue, and K. Mitsuishi (George Mason University), D. Ioannou (George Mason University), and H. Li (NIST & George Mason University)

-  2695  Extremely Low Electron Density in a Modulation-Doped Si/ SiGe 2DEG by Effective Schottky Gating – J. Li, C. Huang, and J. Sturm (Princeton University)

-  2696  Influences of Hydrogen Passivation on Near-Infrared Light Detection of n-Type β-FeSi2/p-Type Si Heterojunction Photodiodes – R. Iwasaki, K. Yamashita, N. Promros, S. Izumi, and T. Yoshitake (Kyushu University)
Electrochemical Processing for TSVs – 08:00 – 09:40
Co-Chairs: R. Akolkar and P. Ramm

08:00  2727 Bath Stability Monitoring for Electroless Cu Seed Formation in High Aspect Ratio TSV – F. Inoue (Kansai University), H. Philipson, S. Armini, A. Radisic, Y. Civate, P. Leunissen (IMEC), and S. Shingubara (Kansai University)

08:20  2728 Via Filling Electrodeposition of 4μm Diameter via by Periodical Reverse Current – T. Hayashi, K. Kondo (Osaka Prefecture University), M. Takeuchi (Nittobo Medical Co., Ltd.), T. Saito, N. Okamoto (Osaka Prefecture University), M. Bunya (Nittobo Medical Co., Ltd.), and M. Yokoi (Osaka Prefecture University)

08:40  2729 The Effect of Polymer Additives on TSV Filling by Copper Electroplating – C. Lin, W. Dow (National Chung Hsing University), J. Lin, W. Chang, and H. Lee (Industrial Technology Research Institute)

09:00  2730 Periodic Pulse Reverse Cu Electroplating for Through Hole Filling – F. Shen, W. Dow (National Chung Hsing University), J. Lin, W. Chang, and H. Lee (Industrial Technology Research Institute)

09:20  2731 Copper-free Through Silicon Via Filling by Ni-W Electrodeposition – H. Huang, W. Dow (National Chung Hsing University), J. Lin, W. Chang, and H. Lee (Industrial Technology Research Institute)

Electrochemical Processes for Damascene Interconnects – 10:00 – 12:00
Co-Chairs: S. Shingubara and M. Hayase

10:00  2732 High Density Copper Nucleation on Ruthenium Using Commercial Plating Chemistry and Its Application to Metallization of High Aspect Ratio Through-Silicon Vias – P. Shi (Atotech USA Inc.)

10:20  2733 Exploration of Process Window for Fill of Sub 30 nm Features by Direct Plating – M. Nagar, A. Radisic (imec), K. Stubbe (Ghent University), and P. Vereecken (imec)

10:40  2734 The Impact of Electrolyte Acidity on Bottom-up Metallization of Copper Interconnects – L. Boehme (Case Western Reserve University), J. Wu, X. Kang, R. Preisser (Atotech USA Inc.), and U. Landau (Case Western Reserve University)

11:00  2735 Temperature Effects on Additives Induced Polarization in Copper Electroplating of Interconnects – L. Boehme and U. Landau (Case Western Reserve University)

11:20  2736 Effect of Additives on Direct Copper Electrodeposition on Transition Metal Diffusion Barriers for Silicon-based Integrated Devices – B. Im and S. Kim (University of Ulsan)

11:40  2737 Superconformal Film Growth – T. Moffat and D. Josell (National Institute of Standards and Technology)

Modeling and Characterization of Novel Interconnect Processes – 14:00 – 18:00
Co-Chairs: K. Kondo and S. Shingubara

14:00  2738 Multi-Scale Modeling of Direct Copper Plating on Resistive Non-Copper Substrates – L. Yang, A. Radisic, M. Nagar (imec), J. Deconinck (Vrije Universiteit Brussel), L. Leunissen, P. Vereecken (imec), and A. West (Columbia University)


14:40  2740 Ultrathin Copper Layers Deposited by Galvanic Displacement: Characterization by Atom Probe Tomography – J. Ai, Y. Zhang, A. C. Hillier, and K. R. Hebert (Iowa State University)

15:00  2741 Simulation of Shape Evolution in Through-Mask Electrochemical Deposition – G. J. Wilson, P. McHugh, S. Lee, and T. L. Ritzdorf (Applied Materials)

15:20  2742 Inverse Analysis of Accelerator Distribution for Through Silicon Via Filling – M. Hayase, T. Matsuoka, K. Otsubo (Tokyo University of Science), Y. Onishi, and K. Amaya (Tokyo Institute of Technology)

15:40  2743 Cu Electroplating for Through Silicon Vias (TSVs) Filling Using a Dimensionally Stable Anode (DSA) – W. Hsiung, W. Dow (National Chung Hsing University), J. Lin, W. Chang, H. Lee (Industrial Technology Research Institute), and S. Lin (Waste Recovery Technol)

16:00  2744 Lead Free Solder Deposited by ECD – Material Analysis – T. L. Ritzdorf, S. Lee, and I. Drucker (Applied Materials)

16:20  2745 Evaluation of Grain Size Distributions of 50nm Wide Cu Interconnects by X-ray Diffraction Method – T. Inami and J. Ouku (Ibaraki University)

16:40  2746 A Novel Synthesis Method of Cu Nanoparticles with High Stability and Their Applications Acting as Seed Layer of TSV – C. Hsieh, W. Dow, and Y. Chang (National Chung Hsing University)

17:00  2747 Halide-Free Flux Activity at Copper and Tin Surface – S. Vegunta, G. Gu, K. Mai, J. Nguyen, and J. Flake (Louisiana State University)


17:40  2749 Failure Mechanism of Copper Through-Silicon Vias Under Biased Thermal Stress – S. Seo, J. Hwang (Sejong University), J. Yang (National NanoFab Center), and W. Lee (Sejong Univ.)
3D Systems Part 2 – 08:30 – 10:00

08:30 2793 Multi-physics Equivalent Circuit Models for MEMS Sensors and Actuators – T. Konishi, K. Machida (NTT Advanced Technology Corp.), K. Masu (Tokyo Institute of Technology), and H. Toshiyoshi (The University of Tokyo)

09:05 2794 ThruChip Interface for Heterogeneous Chip Stacking – T. Kuroda (Keio University)

09:40 Intermission (20 Minutes)

Novel Devices and Processing Part 1 – 10:00 – 11:45

10:00 2795 Energy-efficient Novolatile Logic systems based on CMOS/spintrons Hybrid technology – S. Sugahara, Y. Shuto, and S. Yamamoto (Tokyo Institute of Technology)

10:35 2796 Programmable Cell Array using Rewritable Atom Switch – M. Miyamura, T. Sakamoto (Low-power Electronics Association & Project), M. Tada (LEAP), N. Banno, K. Okamoto, N. Iguchi, and H. Hada (Low-power Electronics Association & Project)

11:10 2797 Wafer Processing Photoresist Stripping Requirements – C. L. Arvin (IBM) and G. Banerjee (Air Products and Chemicals)

Novel Materials and Processing – Graphene – 14:00 – 15:30

14:00 2798 Graphene for Nanoelectronic Device Applications – L. Colombo (Texas Instruments Incorporated)


15:10 Intermission (20 Minutes)

Novel Materials and Processing Part 2 – 15:30 – 17:30

15:30 2800 Integration with Diverse Functionalities on Standard CMOS – K. Masu (Tokyo Institute of Technology)

16:05 2801 Heterogeneous Integration of Alternative Materials and Devices on Silicon CMOS Integrated Circuits – T. S. Mayer (The Pennsylvania State University)

16:40 2802 New Technology Trends: Expand and Extend – R. Rhoades (Entrepix, Inc.)

17:15 Concluding Remarks (15 Minutes)

Novel Devices and Processing Part 2 – 10:00 – 11:45

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16:40 2802 New Technology Trends: Expand and Extend – R. Rhoades (Entrepix, Inc.)

17:15 Concluding Remarks (15 Minutes)
Dye Sensitized Solar Cells II – 14:00 – 16:00
Co-Chairs: Druffel and Miyasaka

14:00 2864 Dye-sensitized photocapacitors fabricated with ionic liquid electrolytes for power generation and storage – T. Miyasaka, H. Ina, and M. Ikegami (Toin University of Yokohama)

14:20 2865 Immobilization of Polymer-Protected Platinum Nanocluster on Plastic Substrate for Highly Efficient Dye-Sensitized Plastic Solar Cell – T. Wei, M. Ikegami, and T. Miyasaka (Toin University of Yokohama)

14:40 2866 Atmospheric Processing of Dye Sensitized Solar Cell Photoanode – T. Druffel, V. Vendra, and R. Luptitsky (University of Louisville)

15:00 2867 Electrochemical Analysis for the Realization of Low Temperature Processed ZnO Dye-Sensitized Solar Cells – D. T. Bryant, M. Carnie, T. M. Watson, and D. A. Worsley (Swansea University)


15:40 2869 Study on Central Metal Ions and Electrolytes for Efficient Porphyrin-sensitized Solar Cells – F. AWAI (The University of Tokyo), Y. Arai (Research Center for Advanced Science and Technology (RCAST)), S. Uchida, T. Kubo (The University of Tokyo), and H. Segawa (Research Center for Advanced Science and Technology)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

E12 – Poster Session – 18:00 – 20:00

• 2870 In Situ Observation of Structural Change in N719 Dye Molecule in Dye Sensitized Solar Cells under a Visible Light Exposure – C. Yoshida, S. Nakajima (Sekisui Chemical Co.), Y. Syoji, and F. Hirose (Yamagata University)

• 2871 Gold Nanoparticles Embedded Single Crystalline ZnO (Au NPs@ZnO) Nanowire Arrays for Plasmonic Enhanced Dye-Sensitized Solar Cells (DSSCs) – M. Lu, H. Chen, H. Chen, C. Peng, Y. Chueh, S. Gwo, and H. Chen (National Tsing Hua University)

• 2872 Zinc Oxide Nano-pillar Array prepared by a Microwave-assisted Process for an Organic Photovoltaic Cell – N. Murakami, Y. Imoto, and T. Ohno (Kyushu Institute of Technology)

• 2873 Development of Inverted Organic Photovoltaic Cells Using Amorphous Niobium Oxide as Electron Collection Layer – K. Hamada, N. Murakami, and T. Ohno (Kyushu Institute of Technology)

• 2874 Dye-Sensitized Solar Cell Prepared with TNO Transparent Conductive Film – S. Takemura (Shizuoka University), R. Muramoto, Y. Sekine (Shizuoka University), M. Okuya (Shizuoka University), S. Okazaki, E. Sakai, N. Yamada (KAST), T. Hitosugi (Tohoku University), and T. Hasegawa (University of Tokyo)

• 2875 Reliable and Secure DSSC Sub-Module Assembled by One Drop Filling Method – C. Nishiyama, S. Uchida, T. Kubo (The University of Tokyo), and H. Segawa (Research Center for Advanced Science and Technology)

• 2876 CuS Counter Photocathodes for Quantum-Dot Sensitized Solar Cells – S. Lee and K. Ahn (Yeonnam University)

• 2877 CdS Quantum Dots Deposited by Chemical Bath Deposition for the Application to Quantum Dot-Sensitized Solar Cells – D. Lee and K. Ahn (Yeonnam University)


• 2879 Organic Photovoltaics by Using a Nanoscale Thin Film of Solution-based Titanium Sub-Oxide (Solution based Titanium sub-oxide Nanoscaled Thin Films for Passivation (or Sealant) of Organic Photovoltaic Cells) – K. Foe, V. Potturi, M. Samson, H. Baumgart, and G. Namkoong (Old Dominion University)


• 2882 Molecular Precursors and Their Application to Chalcogenide Solar Cell – C. Kim, J. Park, H. Choi, B. Park, J. Song, T. Chung, and D. Jeon (Korea Research Institute of Chemical Technology)

• 2883 Effect of Post-Treatment for Colloidal PbS Quantum dots on Performance of Schottky Solar Cell – J. Kim, J. Song, H. An (Korea Institute of Machinery & Materials), K. Kim, and S. Jeong (Korea Institute of Machinery and Materials)

• 2884 Analysis of Degradation Products in Electrolyte of Dye Sensitized Solar Cell by High Mass Accuracy MS² and Multivariate Statistical Technique – T. Goda, D. Nakayama, T. Nishine, S. Satoshi (SHIMADZU CORPORATION), C. Nishiyama, S. Uchida (The University of Tokyo), and H. Segawa (Research Center for Advanced Science and Technology)


• 2886 Photovoltaic Properties in Al-doped ZnO/non-doped Zn1-xMgXO/Cu2O Heterojunction Solar Cells – T. Minami, Y. Nishi, T. Miyata, and S. Abe (Kanazawa Institute of Technology)

• 2887 Two-Step Anodization for TiO2 Nanotube Arrays – Y. Lee, J. Kim (Gangneung-Wonju National University), J. Lee (Konkuk University), and W. Choi (Gangneung-Wonju National University)
• 2888 Development of a Cu$_2$O–ZnO Nanorod Heterojunction Solar Cell – D. Marui, N. Murakami, and T. Ohno (Kyushu Institute of Technology)
• 2889 Fabrication of CZTS based Solar Cells Using Nanocrystals – S. Suehiro, M. Yuasa (Kyushu University), T. Tanaka (Saga University), K. Fujita, S. Hata, T. Kida, and K. Shimanoe (Kyushu University)
• 2890 Electrochemically Self-Assembled ZnO/Rhodamine dye Hybrid 2D-Nanostructure towards One-Pot Synthesis of Solar Cells – S. Lima (Yamagata University), T. Sekiya, Y. Kimikado (Gifu University), and T. Yoshida (Yamagata University)
• 2891 Improved Conversion Efficiency of CdS Quantum Dot-Sensitized Solar Cells based on Nanoporous-Layer-Covered TiO$_2$ Nanotube Arrays – S. Jung and K. Ahn (Yeungnam University)
• 2892 Photovoltaic Performances of p-type Nickel Oxide as Photocathode in Photoelectrochemicalsolar Cells – M. Park and K. Ahn (Yeungnam University)
• 2893 The Effect of Cul Layer Deposited from Various Solutions on the Performance of Dye-Sensitized Solid-State Solar Cells – S. Endo, T. Yamamoto, and A. Konno (Shizuoka University)
• 2894 Fabrication of Silicon and Carbon based Wide-Gap Semiconductor Thin Films for High Conversion Efficiency – K. Yoshinaga, H. Naragino, A. Nakahara, S. Tanaka, and K. Honda (Yamaguchi University)
• 2895 Improving the Efficiency of Polymer: Fullerene Bulk Heterojunction Solar Cells by Varying the Material Concentration in the Photoactive Layer – M. Samson, K. Latimer, P. Boland, K. Foe, G. Namkoong, H. Baumgart (Old Dominion University), and T. M. Abdel-Fattah (Christopher Newport University)
• 2896 Optical Management by Localized Surface Plasmon of Metal Nanoparticles and Application to a Solar Cell – K. NAM, H. Hachimura, K. Hirano, M. Ibara, P. Sichanugrist, and M. Konagai (Tokyo Institute of Technology)
• 2897 Novel Method of Synthesis of Zinc Oxide Doped with Nitrogen for photocatalytic Applications – J. Flores, J. Valladares, and P. Nandakumar (Midland College)
• 2898 FTO Film with High Haze and Transmittance Prepared for Dye-Sensitized Solar Cell – R. Murakami (Shizuoka University), R. Muramoto (Shizuoka University), and M. Okuya (Shizuoka University)
• 2899 Dye-Sensitized Solar Cells Based on Polyamline – Single Waller Carbon Nanotubes Composite – T. M. Abdel-Fattah (Christopher Newport University), S. Ebrahim, and M. Soliman (Alexandria University)
• 2900 Electrodeposited ZnO Morphological, Structural and Optical Properties Control by Potential Sweep Rate – E. Matei, M. Enculescu, C. Florica, and I. Enculescu (National Institute of Materials Physics)
• 2901 Photovoltaic R&D Status and Strategy of Korea – C. Park (Yeungnam University)
Mechanics of Wafer Bonding – 14:00 – 16:00

14:00 2972 Mechanics of Wafer Bonding and Layer Transfer Processes – K. T. Turner (University of Pennsylvania)

14:40 2973 A Study of Factors Influencing Micro-Chevron-Testing of Glass Frit Bonded Interfaces – F. Naumann (Fraunhofer Institute for Mechanics of Materials), S. Brand (Fraunhofer Institute for Mechanics of Materials IWM), D. Wünsch (Fraunhofer Institute for Electronic Nano Systems), P. Czurratis (PVA Tepla Analytical Systems GmbH), and M. Petzold (Fraunhofer Institute for Mechanics of Materials IWM)

15:00 2974 Failure Mechanisms and Mechanical Characterization of Reactive Bonded Interfaces – B. Boettge (Fraunhofer Institute for Mechanics of Materials IWM), F. Naumann (Fraunhofer Institute for Mechanics of Materials), F. Schippel, and M. Petzold (Fraunhofer Institute for Mechanics of Materials IWM)


Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

E14 – Poster Session – 18:00 – 20:00

- 2977 Integrating Laser Diode and Optical Isolator by Photosensitive Adhesive Bonding – H. Yokoi, N. Ichishima, and I. Myouzenzono (Shibaura Institute of Technology)

- 2978 Room Temperature Wafer Bonding by Surface Activated ALD- AlOx – Y. Li (InterUniversity Microelectronics Centre of China), S. Wang (Institute of Microelectronics, Chinese Academy of Sciences), B. Sun, H. Chang, W. Zhao (Chinese Academy of Sciences), X. Zhang (Southeast University), and H. Liu (Chinese Academy of Sciences)

- 2979 Interface Morphology and Electrical Properties of Bonded GaAs/GaAs Wafers at Different Temperatures – S. Chang and Y. Wu (National Chiao Tung University)

- 2980 Multi-Wavelength High Resolution Micro-Raman and Optical Reflectance Characterization of Nano-Scale Strained Silicon-on-Insulator Substrates – T. Kim, T. Shim (Hanyang University), W. Yoo (WaferMasters, Inc.), and J. Park (Hanyang University)

- 2981 Advanced Process Control in Megasonic-Enhanced Pre-Bonding Cleaning – D. Dussault (ProSys Inc.), F. Fournel (CEA, LETI), and V. Dragoi (EV Group E. Thallner GmbH)

- 2982 Glass Direct Bonding – G. Kalkowski, C. Rothhardt, R. Eberhardt, P. Jobst, and M. Schürmann (Fraunhofer IOF)

- 2983 Quality Control of Bond Strength in Low-Temperature Bonded Wafers – J. Siegert (ams AG), C. Cassidy, F. Schrank (austriamicrosystems AG), R. Gerbach (Fraunhofer Institute for Mechanics of Materials IWM), F. Naumann (Fraunhofer Institute for Mechanics of Materials), and M. Petzold (Fraunhofer Institute for Mechanics of Materials IWM)

- 2984 Micro-Structural Analysis of AlN Wafer Bonding and Hydrogen Ion-Induced Splitting for Film Exfoliation – M. Mamun, K. Tapliy (Old Dominion University), O. Moutanabibir (Université de Montréal, Canada), D. Gu, H. Baumgart, and A. Elmustafa (Old Dominion University)

- 2985 The Effects of Composition and Design of Experiment on the Quality of Al-Ge Electric Bonding for Wafer Level Packaging – X. Huang, C. Cheng, P. Liu, Y. Hsieh, L. Chao, C. Tsai, D. Huang (Taiwan Semiconductor Manufacturing Company, Ltd.), and C. Colinge (Waferbond)

- 2986 High Resolution Double-Crystal X-ray Diffraction Imaging for Interfacial Defect Detection in Bonded Wafers. – S. Sharma (UCLA) and M. Goorsky (University of California, Los Angeles)

- 2987 Optimization of H+ Implantation Parameters for Exfoliation of 4H-SiC Films – V. P. Aamarasinghe, L. Wielunski (Rutgers University), A. Barcz (Institute of Electron Technology), L. C. Feldman, and G. K. Celler (Rutgers University)

State-of-the-Art Program on Compound Semiconductors 54 (80TAP0CS 54)

Electronics and Photonics / Luminescence and Display Materials
328, Level 3, Hawaii Convention Center

Advances in Compound Semiconductor – 08:45 – 12:00

08:45 3014 Revisiting Impurity Doping of III-Nitride Materials for Optical and Magnetic Device Applications – J. M. Zavada (National Science Foundation)

09:15 3015 Effects of Proton Irradiation on the Reliability of InAlN/GaN High Electron Mobility Transistors – L. Liu, C. Lo, Y. Xi, Y. Wang (University of Florida), H. Kim, H. Kim (Korea University), S. Pearton (University of Florida), O. Laboutin, Y. Cao, J. Johnson (Kopin Corporation), I. Kravchenko (Oak Ridge National Laboratory), and F. Ren (University of Florida)

09:45 3016 Efficiency Droop in GaN-based Light-Emitting Diodes: Mechanisms and Solutions – J. Kim (Pohang University of Science and Technology (POSTECH)), S. Hwang, J. Park, D. Kim (POSTECH), J. Cho, and E. Schubert (Rensselaer Polytechnic Institute)


13:30 3022 Semiconductor Nanostructure Direct-Write Using Scanning Probes and Conducting Stamps – M. Rolandi (University of Washington)

14:00 3023 CMOS-Compatible Precise Placement of Ge Quantum Dots for Nanoelectronic, Nanophotonic, and Energy Conversion Devices – K. Chen, I. Chen, C. Wang, and P. Li (National Central University)

14:30 3024 Why <111> A Pore Propagation Occurs in InP and the Mechanism that Dictates Pore Width – R. Lynch (University of Limerick), N. Quill, C. O’Dwyer, S. Nakahara (Materials and Surface Science Institute, University of Limerick), and D. Buckley (Materials & Surface Science Institute, University of Limerick)

14:45 3025 TiC Electrode Formed by Multi-Stacking Process for Diamond Contact Metal – Y. Tanaka, K. Kakushima, P. Ahmet, Y. Kataoka, A. Nishiyama, N. Sugii, K. Tsutsui, K. Natori, T. Hattori (Tokyo Institute of Technology), S. Yamasaki (Advanced Industrial Science and Technology), and H. Iwai (Tokyo Institute of Technology)


15:15 Intermission (15 Minutes)


16:00 3028 Improvement in Etching Rate of Epilayer Lift-Off for High Concentrated Solar Cell Applications with Low Surface Tension Fluid – R. Horng, F. Wu, and M. Tseng (National Chung Hsing University)

16:30 3029 Band Offsets in Dielectric/InGaZnO4 Heterojunctions – H. Cho (Pusan National University), K. Kim, E. Douglas, B. Gila, V. Craciun, E. Lambers, F. Ren, and S. Pearton (University of Florida)

17:00 3030 Anodic Formation of Porous InP in KCl Solutions – N. Quill, R. Lynch, C. O’Dwyer (University of Limerick), and D. Buckley (Materials & Surface Science Institute, University of Limerick)
11:20 3062 Single-Grain Si TFTs Fabricated by Liquid-Si and Long-Pulse Excimer-Laser – R. Ishihara, J. Zhang, M. Trifunovic, M. Van der Zwan (Delft University of Technology), H. Takagishi, R. Kawajiri (Japan Science and Technology Agency), T. Shimoda (Japan Advanced Institute of Science and Technology), and C. Beenakker (Delft University of Technology)

Si-based TFTs II Continued – 14:00 – 15:50
Co-Chairs: K. Takechi and M. P. Hong

14:00 3063 Materials, Processing, and Characterization for Printed Flexible Electronics – W. S. Wong (University of Waterloo)

14:40 3064 Investigation of Transfer Mechanism of Si Film with Mid-Air Structure Induced by Near-Infrared Semiconductor Diode Laser Irradiation – K. Sakaie, Y. Kobayashi, S. Nakamura, M. Akazawa, and S. Higashi (Hiroshima University)

15:00 3065 Modes of Operation and Optimum Design for Application of Source-Gated Transistors – R. A. Sporea, J. M. Shannon, and S. Silva (University of Surrey)

15:20 Intermission (30 Minutes)

Graphene and Organic TFTs – 15:50 – 17:30
Co-Chairs: M. P. Hong and K. Takechi


16:30 3067 Characterization and Modeling of Organic Field-Effect Transistors – G. Horowitz (CNRS)

17:10 3068 Carrier Behavior in a Highly-Doped P3HT Layer and Its Application to Organic Thin Film Transistors – D. Tadaki, T. Ma, J. Zhang, S. Ino, Y. Kimura, and M. Niwano (Tohoku University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

E16 – Poster Session – 18:00 – 20:00
Co-Chair: H. H. Lee

• 3069 High Performance Low-Voltage Organic Phototransistors: Interface Modification and the Tuning of Electrical, Photosensitive and Memory Properties – X. Liu, G. Dong, L. Duan, L. Wang, and Y. Qiu (Tsinghua University)

• 3070 Influence of Annealing Conditions on the Bias Temperature Stability of MgZnO TFTs – Y. Tsai, J. Chen, and I. Cheng (National Taiwan University)

• 3071 Comparative Study of In$_2$O$_3$, ZnO and In-Zn-O Source Solutions for Oxide Channel Thin Film Transistors – E. Tokumitsu (Japan Advanced Institute of Science and Technology), T. Shimizu, K. Haga (Tokyo Institute of Technology), and T. Shimoda (Japan Advanced Institute of Science and Technology)

• 3072 Thin-Film Transistor Using Dielectricphotoretic Assembly of Single-walled Carbon Nanotubes – T. Toda (School of Environmental Science and Engineering, Institute for Nanotechnology, Kochi University of Technology), T. Kawaharamura (Institute for Nanotechnology, Kochi University of Technology), H. Furusawa (School of Environmental Science and Engineering, Institute for Nanotechnology, Kochi University of Technology), and M. Furuta (Kochi University of Technology)

• 3073 Degradation of p-Channel Low Temperature Poly-Si TFTs with Positive Source Pulse Stress – H. Liu, S. Chiu, P. Chan, C. Kung, F. Wang (National Chung Hsing University), and T. Kang (Feng-Chia University)

• 3074 Simple Patterning Process of the Polymer Source/Drain electrodes for Organic Thin-Film Transistors – Y. Jang (Korea Institute of Machinery & Materials)

• 3075 Influence of Polymer Dielectric Surface Energy on Thin-Film Transistor Performance of Solution-Processed Triethylsilylthynyl Anthradiithiophene (TES-ADT) – L. Chen, P. Lin (Department of Materials Science and Engineering, National Chiao-Tung University, Hsinchu, Taiwan, ROC), C. KIM (Sogang University), M. Chen, P. Huang (Department of Chemistry, National Central University, Chung-Li, Taiwan, ROC), J. Ho, and C. Lee (Process Technology Division, Display Technology Center, Industrial Technology Research Institute, Hsinchu, Taiwan, ROC.)

• 3076 Study of Electronic Structure and Film Composition at Back Channel Surface of Amorphous In-Ga-Zn-O Thin Films – A. Hino, T. Kishi, S. Morita, K. Hayashi, and T. Kugimiya (Kobe Steel, Ltd.)

• 3077 Performance Variations of Amorphous-In$_{Ga-Zn}$O Thin-Film Transistors According to Thin Al$_2$O$_3$ Passivation Layer Deposited by Atomic Layer Deposition – S. Rha, U. Kim, J. Jung, W. Jeon, Y. Yoo, E. Hwang, B. Park, and C. Hwang (Seoul National University)

• 3078 Chemical-Structure Tailored, High Performance Indium Gallium Zinc Oxide Thin-Film Transistors – S. Jeong, J. Lee, Y. Seo, S. Choi, Y. Choi, and B. Ryu (Korea Research Institute of Chemical Technology)

• 3079 Electrospray Deposited Semiconducting Oxide Thin Films For Display Backplane TFT Application – S. LEE (Electronics and Telecommunications Research Institute(ETRI)) and C. Hwang (ETRI)

• 3080 Low-Temperature, Aqueous Solution Processed Amorphous Indium Oxide Thin Film Transistors – K. Choi, S. Chang, T. Oh, S. Jeong, K. Lee, Y. Kim, H. Ha, and B. Ju (Korea University)

• 3081 Characteristics of Nanocrystalline Silicon Films Deposited by Cat-CVD Below 100°C – T. Song, K. Keum, S. Kang, J. Park, J. Kim, and W. Hong (University of Seoul)

• 3082 Influence of Thermal Stress and Kinetic Bias Stress on The Electrical Performance of Mixed Oxide Thin Film Transistors – T. L. Alford, S. Husein, and R. Vemuri (Arizona State University)
FET/Processing/Strain Session 1: SiGe and Ge Channel FET – 08:00 – 10:40
Co-Chairs: Yee-Chia Yeo and Bernd Tillack

08:00 3113 Implant Free SiGe-Quantum Well: From Device Concept To High-Performing pFETs – J. Mitard, G. Hellings, L. Witters, G. Eneman, A. Hikavyy, B. Vincent, R. Loo, N. Collaert, N. Horiguchi, and A. Thean (imec)

08:30 3114 Effective Condensation Process for Higher Ge Concentration and Thin SiGe layer-on-insulator Substrates in Advanced High Mobility MOSFETs – D. LEE, T. Shim, T. Kim, S. Song, S. Lee (Hanyang University), R. Okuyama (Sumco Corporation), and J. Park (Hanyang University)

08:50 3115 SiGe Doped-Channel FET Formed by Sputter Epitaxy Method – M. Yoshikawa, H. Otsuka (Tokyo University of Agriculture & Technology), A. Kasamatsu, N. Hirose, T. Mimura, T. Matsui (National Institute of Information and Communications Technology), and Y. Suda (Tokyo University of Agriculture & Technology)

09:10 3116 Hole Mobility Boost of Ge p-MOSFETs by Composite Uniaxial Stress and Biaxial Strain – H. Lan, Y. Chen, J. Lin, and C. Liu (National Taiwan University)

09:30 Intermission (20 Minutes)


10:20 3118 Physical Mechanism of Enhanced Uniaxial Stress Effect on Carrier Mobility in ETSOI MOSFETs – T. Ohashi, O. Shunri, and U. Ken (Tokyo Institute of Technology)

Surfaces and Interfaces Session I – 10:40 – 12:40
Co-Chairs: Seiichi Miyazaki and Shigeaki Zaima


11:10 3120 Evaluation of Two contact Resistivity References on Si1-xGe, for FDSOI 20nm pMOS – E. Bourjot (STMicroelectronics), F. Nemouchi, V. Carron (CEA-LETI), Y. Morand (STMicroelectronics), S. Bernasconi, M. Vinet, J. Damlencourt, F. Allain, O. Cueto, D. Lafond (CEA-LETI), and D. Mangelink (IM2NP/UMR CNRS)

11:30 3121 Gate Stack and Source/Drain Junction Formations for High-Mobility Ge MOSFETs – H. Nakashima, K. Yamamoto (Kyushu University), H. Yang (Kyushu University), and D. Wang (Kyushu University)

12:00 3122 Thermally Stable NiSi2 for Ge Contact with Schottky Barrier Height Modulation Capability – R. Yoshihara, Y. Tamura, K. Kakushima, P. Ahmet, Y. Kataoka, A. Nishiyama, N. Sugii, K. Tsutsui, K. Natori, T. Hattori, and H. Iwai (Tokyo Institute of Technology)


Processing Session 1: Strain, Defects, and Diffusion – 13:50 – 16:05
Co-Chairs: D. Gruetzmacher and A. Sakai


14:20 3125 Strain Control of Si and Si1-x-Ge, GeC2 Layers in Si/Si1-x-GeC2/Si Heterostructures – J. Murota (Tohoku University), T. Kikuchi, and M. Sakuraba (Tohoku Univ.)

14:50 3126 Phosphorus Profile Control in Ge by Si Delta Layers – Y. Yamamoto, P. Zaumseil, R. Kurps (IHP), J. Murota (Tohoku University), and B. Tillack (IHP)

15:10 3127 Dopant Enhanced Diffusion for High n-typed Doped Ge – Y. Cai, R. E. Camacho-Aguilera, J. Bessette, L. Kimerling, and J. Michel (Massachusetts Institute of Technology)

15:30 3128 A Threading Dislocation Density Study of Ge Epitaxial Layer on Si and The Dependency on Various Post Growth Treatments – A. Silber and E. Ginsburg (Micron Semiconductors Israel Ltd.)

15:50 Intermission (15 Minutes)
**Optoelectronics Session 1: Solar Cells, Emission, and Photonics – 13:50 – 16:05**

**Co-Chair: Gianlorenzo Masini**

- **13:50**
  - 3129 Ge Optical Emitters Fabricated by Ge Condensation and Epitaxial Growth – K. Oda, K. Tani, S. Saito, and T. Ido (PETRA)

- **14:20**
  - 3130 Group-IV Subcells in Multijunction Concentrator Solar Cells – R. R. King, C. Fetzer, P. Chiu, E. Rehder, K. Edmondson, and N. Karam (Spectrolab, Inc.)

- **14:50**
  - 3131 Substrate Design and Thermal Budget Tuning for Integration of Photonic Components in a High-Performance SiGe:C BiCMOS Process – D. Knoll, H. Richter, B. Heinemann, S. Lischke, Y. Yamamoto, L. Zimmermann, and B. Tillack (HHIP)

- **15:10**
  - 3132 Direct Band-gap Electroluminescence from Strained n-Ge Light Emitting Diodes – P. Velha, K. F. Gallacher, D. C. Dumas, D. J. Paul (University of Glasgow), M. Myronov, and D. R. Leadley (University of Warwick)

- **15:30**
  - 3133 Parameters Controlling Emission of Terahertz Frequency Electromagnetic Radiation from InAs and GaAs: An Ensemble Monte Carlo Simulation Study – D. Cortic and R. Lewis (University of Wollongong)

- **15:50**
  - Intermission (15 Minutes)

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**Epitaxy Session 1: Pre-epi Si Surface Cleaning and III-V Compound Semiconductor Hetero-Epitaxy – 16:05 – 18:05**

**Co-Chairs: Yee-Chia Yeo and Alexander Reznicek**

- **16:05**
  - 3134 Selective-Area Epitaxial Latergotrowth of InGaAs Microdiscs on Si – M. Sugiyama (University of Tokyo)

- **16:35**
  - 3135 III-VGaP Epitaxy on Si for Advanced Photovoltaics and Green Light Emitters – S. A. Ringel, T. Grassman, C. Ratcliff, A. Carlin, L. Yang, and M. Mills (The Ohio State University)

- **17:05**
  - 3136 Controlling Epitaxial GaAsPSiGe Heterovalent Interfaces – P. Sharma, T. Milakovich, M. Bulsara, and E. A. Fitzgerald (Massachusetts Institute of Technology)

- **17:25**
  - 3137 High Efficiency Low Temperature Pre-epi Clean Method for Advanced Group IV epi Processing – V. Machkaoutsan (ASM Belgium), D. Weeks, M. Bauer (ASM America), J. Mases (ASM Belgium), J. Tolle (ASM America), S. Thomas (ASM), A. Allan, A. Hikavvy, and R. Loo (imec)

- **17:45**

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**Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center**

**E17 – Poster Session – 18:00 – 20:00**

- **3144** Effects of HCl on the Growth of Epitaxial Ge – D. Franca (Research Foundation of SUNY)

- **3145** Analysis of Local Electric Conductive Property for Si Nanowire Models – Y. Ikeda, M. Senami, and A. Tachibana (Kyoto University)

- **3146** Ge1-xSnx Alloys Pseudomorphically Grown by RTCVD – T. Kim, Y. Kil, W. Hong, H. Yang, S. Kang, T. Jeong, and K. Shim (Chonbuk National University)


- **3148** Accurate Reactive Ion Etching of Si and Ge P Doped Ge in an SF6-O2 Radio-Frequency Plasma – C. Wollongong)

- **3149** Formation of Large Grain SiGe on Insulator by Si Segregation in Seedless-Rapid-Melting Process – R. Kato, M. Kurosawa (Kyushu Univ.), R. Matsumura, T. Sadoh (Kyushu Univ.), and M. Miyao (Kyushu Univ.)
• 3150 Direct Measurement of Silicon Strain Induced by Stressed TiNx Stripes Through Raman – Z. Fu, X. Ma, H. Yin, J. Niu, J. Yan (Institute of Microelectronics of Chinese Academy of Sciences), and C. Zhao (Chinese Academy of Sciences)

• 3151 Nano-Engineered Ge$_{x}$Si$_{1-x}$-on Insulator for Heteroepitaxy – K. Hossain, O. Holland (Amethyst Research Inc), M. Debnath, T. Mishima, and M. Santos (University of Oklahoma)

• 3152 NMOS SiP Epitaxy Process – Optimizing Facet Growth – C. Liao, C. Chien, M. Chan (United Microelectronics corp), C. Yang (United Microelectronics Corp.), J. Wu (United Microelectronics Corp), C. Chung (Applied Materials Inc), and B. Ramachandran (Applied Materials Inc.)

• 3153 Control of Schottky Barrier Height at Al/p-Ge Junctions by Ultrathin Layer Insertion – A. Ohta, M. Matsui, H. Murakami, S. Higashi (Hiroshima University), and S. Miyazaki (Nagoya Univ.)

• 3154 Characterization of Resistance-Switching Properties of SiOx Films Using Pt Nanodots Electrodes – K. Makihara, M. Fukushima (Nagoya University), A. Ohta, M. Ikeda (Hiroshima University), and S. Miyazaki (Nagoya Univ.)

• 3155 X-ray and Raman Characterization of strained SiGe Layers Treated by Stain Etching – W. Zhou, R. Liang, and L. Yan (Tsinghua National Laboratory for information, Institute of Microelectronics, Tsinghua University)

• 3156 Ge-on-Si Bufferless Epitaxial Growth for Photonic Devices – R. E. Camacho-Aguilera, Y. Cai, J. Bessette, X. Duan, L. Kimerling, and J. Michel (Massachusetts Institute of Technology)

• 3157 Formation of Large-Grain Ge(111) Films on Insulator by Gold-Induced Layer-Exchange Crystallization at Low Temperature – J. Park, T. Suzuki, M. Kurosawa, M. Miyao, and T. Sadoh (Kyushu University)

• 3158 Impedance Spectroscopy of GeSn/Ge Heterostructures by a Numerical Method – B. Baert (University of Liege), O. Nakatsuka, S. Zaima (Nagoya University), and N. Nguyen (University of Liege)

• 3159 Improvements in Atomic Layer Deposition Nucleation on Ge(100) and SiGe(100) via HOOH doping – T. Kaufman-Osborn, J. Lee, K. Kiantaj, and A. Kummel (University of California, San Diego)


• 3161 High Throughput SEG of Highly In Situ Doped SiCP/SiP Layers for NMOS Devices Using a Si$_{1-y}$H$_y$SiH$_3$CH$_2$PH$_2$CL$_2$ based CDE Process – M. Bauer (ASM America)

• 3162 Ge-on-Si: Single-Crystal Selective Epitaxial Growth in a CVD reactor – A. Sammak, W. De Boer, and L. K. Nanver (TUDelft)

• 3163 The Structural and Electrical Properties in CeO$_2$ Dielectric on Ge Substrate for MOS Capacitors by Atomic Layer Deposition with Ce(prpCp)$_2$ – I. Oh, M. Kim, J. Park (Yonsei University), J. Gatineaub, K. Changhee (K.K. Air Liquide Laboratories), and H. Kim (Yonsei University)


• 3165 Electronic Band Structure and Effective Masses of Ge$_{1-x}$Sn$_x$ Alloys – K. Low, Y. Yang, G. Han (National University of Singapore), W. Fan (Nanyang Technological University), and Y. Yeo (National University of Singapore)

• 3166 Multi-Wavelength High Resolution Micro-Raman and Optical Reflection Characterization of Nano-Scale Strained Silicon-on-Insulator Substrates – T. Kim, T. Shim (Hanyang University), W. Yoo (WaferMasters, Inc.), and J. Park (Hanyang University)

• 3167 Theoretical Calculation of Defects Formation Under Thermal Equilibrium in Heavily n-type Doped Germanium – K. Takinai, Y. Ishikawa, and K. Wada (The University of Tokyo)

• 3168 Strain Engineering in GeSnSi Materials – H. Radamson, M. Noroozi, A. Jamshidi, and M. Ostling (Royal Institute of Technology (KTH))

• 3169 Optimization of SiC: P Raised Source Drain Epitaxy for Planar 20nm Fully Depleted SOI MOSFET Structures – T. Loubet (STMicroelectronics), T. Nagumo (Renesa), T. Adam (IBM), Q. Liu (STMicroelectronics), M. Raymond (Globalfoundries), K. Cheng, A. Khakifirooz, Z. Zhu (IBM), P. Khare (STMicroelectronics), V. Paruchuri (IBM Research), B. Doris (IBM), and R. Sampson (STMicroelectronics)


• 3171 Strain Evolution of Si$_{1-x}$Ge$_x$ Selective Epitaxial Growth in Steps – S. Koo, S. Kim, and D. Ko (Yonsei University)

• 3172 Formation of Silicene and 2D Si Sheets on Ag(111): Growth Mode, Structural and Electronic Properties – P. Vogt, T. Bruhn (TU-Berlin), A. Resta (CNRS-CNAM), B. Ealet (Aix-Marseille University), P. De Padova (CNAM-ISM), and G. Le Lay (Aix-Marseille University)

• 3173 Investigations on GeO Disproportionation Using X-ray Photoelectron Spectroscopy – S. Wang (Institute of Microelectronics, Chinese Academy of Sciences), H. Liu (Chinese Academy of Sciences), T. Nishimura, K. Nagashio, K. Kita, and A. Toriumi (The University of Tokyo)

• 3174 The Oxidation of Germanium Surfaces Investigated at the Atomic Scale: Site-specific Atomic and Electronic Structure – C. Fleischmann, K. Schouteden (KU Leuven), C. Merckling, S. Sioncke, M. Meuris (imec), C. Van Haesendonck, K. Temst, and A. Vantomme (KU Leuven)
Co-Chairs: John Harb and Sachio Yoshihara


11:20  3252  DNA/Metal Nanoparticles Functionalized Single-Walled Carbon Nanotubes Based Gas Sensor Arrays – H. C. Su, M. Zhang (University of CALIFORNIA, RIVERSIDE), J. Lim (Korea Institute of Materials Science), and N. Myung (University of California – Riverside)

11:40  3253  Use of Galvanic Displacement to Fabricate DNA-Templated Tellurium and Bismuth Telluride Nanowires – J. Liu, B. Upreti (Brigham Young University), N. Myung (University of California – Riverside), and J. N. Harb (Brigham Young University)

Bio-enabled Materials – 14:00 – 16:40
Co-Chairs: John Harb and Sachio Yoshihara

14:00  3254  (Invited) Modification of Solid Surface with Self-Assembled Monolayer for Chiral Sensing – T. Nakanishi and T. Osaka (Waseda University)

14:40  3255  Design of Molecular Recognition Interface for Detecting Carbohydrate and Lectin Weak Interactions – Y. SATO (National Institute of Advanced Industrial Science and Technology (AIST)), K. Yoshioka (National Institute of Advanced Industrial Science and Technology), T. Murakami (National Institute of Advanced Industrial Science and Technology (AIST)), and O. Niwa (National Institute of Advanced Industrial Science and Technology)

15:00  3256  Interfacial Structure and Function of Nano-Structured Membranes of Newly Synthesized Phosphorylcholine Derivatives – T. Sawaguchi and M. Tanaka (National Institute of Advanced Industrial Science and Technology)

15:20  3257  A Study on the Effect of Novel Surface Treatments and Biodegradable Polymer Coatings on Corrosion and Surface Properties of Ternary Nitinol Alloys – C. Pullerikurthi and N. Munroe (Florida International University)

15:40  3258  Using Biocompatible Ionic liquid to Control the Corrosion of Mg Alloys in Simulated Body Fluid – Y. Zhang (ACES/IFM), B. Hinton (IFM/Deakin University), G. Wallace, X. Liu (IPRI/University of Wollongong), and M. Forsyth (Deakin University)

16:00  3259  Development of Novel Guided Tissue Regeneration Membranes for Biomedical Applications – Y. C. Chen and K. Ou (Taipei Medical University)

16:20  3260  Multifunctional Biodegradable Cross-Linked Polymer Research and Development and Clinical Application of Animal Experiments – W. Su and K. K. Ou (Taipei Medical University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

F1 – Poster Session – 18:00 – 20:00

- 3261  Investigating Phosphonate Monolayer Stability as Protective Coatings for Retinal-Neural Sensors – B. A. Branch (The University of New Mexico/ Los Alamos National Laboratory), M. Dubey, A. Aaron, K. Baldwin, A. M. Dattelbaum (Los Alamos National Laboratory), and D. Petsev (The University of New Mexico)

Electrodeposition General Session: Fundamentals and New Materials – Dieter M. Kolb Memorial Symposium

Electrodeposition 313B, Level 3, Hawaii Convention Center

Session III Cont’d: Thin Film Electrodeposition – 08:00 – 11:00
Co-Chairs: G. Zangari and R. Sawaguchi

08:00  3276  Electroforming of Thick Film Bi2Te3-based Thermoelectrics – C. L. Arrington, P. Sharma, J. Coleman, E. Baca, A. Rowen, D. Banga, D. B. Robinson, and Y. Stavila (Sandia National Laboratories)

08:20  3277  Electrodeposition of Sb2Te3 and Bi2Te3 Thin Films for Thermoelectric application – J. Lim (Korea Institute of Materials Science, I. Yoo (KIMS), N. Myung (University of California – Riverside), Y. Song, D. Chang, D. Lim (Korea Institute of Materials Science), Y. Kim (Pusan National University), and K. Lee (Korea Institute of Materials Science)

08:40  3278  Wear and Corrosion Resistance of Cr-C Deposits Obtained from a Trivalent Chromium Electroplating Bath with the Addition of Nanosized Al2O3 Powder – C. Huang, C. Chuang, and C. Lin (Chang Gung University)

09:00  3279  Effects of Sonication on Electrodeposited Nickel-based Carbon Nanotube Composites Coatings – T. Suzuki and M. Kato (Yamagata Research Institute of Technology)

09:20  3280  Application of Artificial Neural Networks to Predict Chemical Composition of Electrodeposited Nanocrystalline Ni-Mo Thin Films – M. Allahyarzadeh (Abadan faculty of Petroleum Engineering), A. Ashrafi (Shahid Chamran University of Ahvaz), B. Roozbehani (Abadan faculty of Petroleum Engineering), and A. Seddighian (Sharif University of Technology)

09:40  3281  Intermission (20 Minutes)

10:00  3282  Stepwise Anodizing Processes for Hierarchical Nanoporous Structures – C. Jeong and C. Choi (Stevens Institute of Technology)

10:20  3282  Dependence of Fermi Level in Conducting Polymers Joined with Oxide Semiconductor on Its Crystal Plane – Y. Fujikawa (Chiba Institute of Technology), J. Kawakita, T. Chikyow (National Institute for Materials Science), and Y. Sakamoto (Chiba Institute of Technology)
Co-Chairs: L. Kibler and M. Mizuhata

Session IV: Deposition – 11:00 – 12:00
Co-Chairs: S. Yoshimoto and S. Brankovic

11:00 3284 Superconformal Film Growth: Challenges and Opportunities – T. Moffat, G. Liu (National Institute of Standards and Technology), S. S. Zou (Miami University), L. Richter (National Institute of Standards and Technology), L. Ou Yang (TSMC), C. Lee (KAERI), and D. Josell (National Institute of Standards and Technology)

11:20 3285 Beyond Interfacial Anion/Cation Pairing: The Role of Cu(I) Coordination Chemistry for the Action of Leveler Additives in Copper Electroplating – M. Hat, F. Janser, T. Brunner (University of Bern), A. Fluegel (BASF SE), F. Simona, M. Cascella, K. Kraemer (University of Bern), D. Mayer, M. Arnold (BASF SE), and P. Broekmann (University of Bern)

11:40 3286 Influence of Glycine as Additive on Cobalt Electrodeposition – R. A. Cirelli and P. Sumodjo (Universidade de São Paulo)

Session IV Cont’d: Deposition – 14:00 – 16:00
Co-Chairs: U. Stimming and T. Kondo

14:00 3287 Mechanistic Studies of Zinc Electrodeposition from Deep Eutectic Electrolytes – L. Vieira (CEST Competence Centre for Electrochemical Surface Technology), B. Gollas (Graz University of Technology), and R. Schennach (Institute of Solid State Physics, Graz University of Technology)


14:40 3289 Electrodeposition of FeRh Alloys: Influence of Ag Underlayer – R. Della Noce (Unesp), D. Cornejo, H. Kumar (USP), and A. Benedetti (Unesp)

15:00 3290 Surface Alloy Formation During Pb UPD on Cu(100) and Its Role in Cu-Pb Alloy Deposition – D. Gokcen, C. Hangarter, and T. Moffat (National Institute of Standards and Technology)

15:20 3291 An Environmentally Friendly Process for Electroplating Copper on Zinc – C. Liao, F. Ernst, and U. Landau (Case Western Reserve University)


Session IV Cont’d: Deposition – 16:00 – 18:00
Co-Chairs: L. Kibler and M. Mizuhata

16:00 3293 Deposition of Metallic Nanoparticles; Variations of Particle Size – T. Brülle, O. Schneider (Technische Universität München), and U. Stimming (TUM CREATE Centre for Electromobility)

16:20 3294 Electrodeposition of Arrays of Au/NiO/ Au Nanowire Heterostructures for ReRAM Applications – D. Perego, S. Franz, M. Bestetti (Politecnico di Milano), S. Brivio, G. Tallarida (Laboratorio MDM, IMM-CNR), and S. Spiga (CNR-IMM)

16:40 3295 Crystal Orientation of Iron Produced by Electrodeoxidation of Hematite Particles – M. Tokushige (Norwegian University Science Technology), O. Kongstein (SINTEF), and G. Haarberg (Norwegian University of Science and Technology)

17:00 3296 Study of the Electrodeposition of Zn-TiO2 Dispersion Coatings – M. K. Camargo (Ilmenau University of Technology), U. Schmidt (Technische Universitaet Ilmenau), and A. Bund (Technische Universität Ilmenau)

17:20 3297 Epitaxial Growth of Au on Pt (111) and Pt (poly) by Surface Limited Redox Replacement of Pb UPD Layer – N. Dimitrov, C. Mitchell, and M. Fayette (SUNY at Binghamton)

17:40 3298 Implications on the Use of 1-D and 2-D Models for Metal Electrodeposition: Voltammetry and Impedance Analysis – J. G. Vazquez and M. Pritzker (University of Waterloo)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

F2 – Poster Session – 18:00 – 20:00

- 3299 Understanding the Mechanism of Functional Molecules in Shape-Controlled Synthesis of Nanomaterials – In Situ FTIR Spectroscopic Study of Citrate Adsorption on Pt Polycrystalline and Single Crystal Electrodes – D. Chen, J. Ye, C. Xu, X. Li, J. Li, C. Zhen, and S. Sun (Xiamen University)

- 3300 Fabrication of Low CTE Metal Masks by the Invar Fe-Ni Alloy Electroforming Process for Large and Fine Pitch OLED Displays – T. Nagayama, T. Yamamoto, T. Nakamura, and Y. Mizutani (Kyoto municipal institute of industrial technology and culture)

- 3301 Synthesis and Characterization of Electrodeposited Cu-O Thin Film for Photo Electrochemical Cells – M. Kim (Korea Institute of Materials Science), S. Yoon (Hanyang University), D. Chang (Korea Institute of Materials Science), N. Myung (University of California – Riverside), D. Lim (Korea Institute of Materials Science), I. Kim (Dong-A University), B. Yoo (Hanyang University), K. Lee (Korea Institute of Materials Science), and J. Lim (Korea Institute of Materials Science)


- 3303 The Electrodeposition of Zinc-Bismuth Alloys – A. Luegger (CEST Competence Centre for Electrochemical Surface Technology), B. Gollas (Graz University of Technology), and J. Zidar (Miba Gleitlager GmbH)
• 3304  Influence of Adatom Supersaturation on Real Activation Energy of Charge Transfer Stage during Metal Electrocrystallization – I. Kryshtop, N. Yurchenko, and V. Trofimenko (Dnipropetrovsk National University)

• 3305  Electrochemical Assembly of Ruthenium Complexes during the Process of Mno2 – K. Tomono, R. Yamaguchi, and M. Nakayama (Yamaguchi University)

• 3306  AFM Analysis for Initial Stage of Electroless Deposition of Silver on Silicon Surface – T. Ego (Graduate school of Engineering, University of Hyogo), S. Yae (University of Hyogo), T. Hagihara (Shinko seiki Co., Ltd.), N. Fukumuro, and H. Matsuda (University of Hyogo)

• 3307  Fabrication of Cu-Ag Film Using Electrodeposition and Characterization of Its Properties – H. Ko (University of Incheon), M. Kim, J. Kim (Seoul National University), and O. Kwon (University of Incheon)

• 3308  Degradation of Additives and Its Influences on Copper Electrodeposition – S. Choe, M. Kim, H. Kim, T. Lim (Seoul National University), A. Lee, S. Jun, K. Woo (LS Mtron Ltd.), and J. Kim (Seoul National University)

• 3309  Electrodeposition of CoNiW Alloys: HCP-FCC Structural Transition – A. M. Sakita (Instituto de Quimica – Unesp), R. Della Noce, C. Sadao Fugivara, and A. Vicente Benedetti (Unesp)

• 3310  Electrochemical Formation of Functional Silver Coatings: Nanostructural Peculiarities – O. Bersrova and V. Kublanovsky (V.I.Vernadskii Institute of General and Inorganic Chemistry NAS of Ukraine)


Electroless Deposition: Principles, Activation, and Applications 2
Electrodeposition
306A, Level 3, Hawaii Convention Center

Co-Chairs: Stojan Djokic, T. Homma, L. Magagnin, and J. Stickney

10:00  3328  Electroless Atomic Layer Deposition: a Scalable Approach to Tailored Structures – D. B. Robinson, P. Cappillino (Sandia National Laboratories), L. Sheridan, and J. Stickney (The University of Georgia)

10:20  3329  Electroless Deposition of Cu and Ag on Valve Metal Substrates – L. Nolan (University of Alberta), S. Djokic (Elchem Consulting Ltd.), K. Cadien, and T. Thundat (University of Alberta)

10:40  3330  Chemical Modification of Nano-Nanowoven Fabrics Using Electrochemical and Electroless Deposition – S. Ndzesse and C. Shannon (Auburn University)

11:00  3331  Miniature Fuel Cell with Monolithically FabricatedSi Electrodes -Reduction of Pt by UPD-SLRR – D. Ogura, T. Honjo, and M. Hayase (Tokyo University of Science)

11:20  3332  Large Scale, Electroless Synthesis of Highly Stable Flower-like Silver Nanostructures by a Templateless Method for SERS Application – C. Desmonda and Y. Tai (National Taiwan University of Science and Technology)

11:40  3333  SERS-Active Substrates Fabricated by Displacement Deposition of Metals on Porous Silicon – K. Artsemyeva (BSUIR), H. Bandarenka (Belarussian State University of Informatics and Radioelectronics), A. Panarin, I. Khodasevich, S. Terekhov (NASB), M. Balucani (University Sapienza), and V. Bondarenko (Belarussian State University of Informatics and Radioelectronics)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

F3 – Poster Session – 18:00 – 20:00
Co-Chair: Stojan Djokic

• 3334  The Kinetic Parameter of the Ni-W Alloy Electrodeposition – H. Xiao, N. Yu, Y. Feng, and Z. Liu (Yunnan University)

• 3335  Cohesion Property of Electroless Plated Ni-P Coating on Fiber Bragg Grating – L. Fang, P. Zhang, A. Tang, and S. Xue (ChongQing University)

• 3336  Oxygen-Assisted Vacuum Ultra-Violet Surface Modification of Polymers as a Pretreatment for Electroless Nickel Plating – A. Nakamura, N. Mukado, T. Ichii, and H. Sugimura (Kyoto University)


• 3338  Preparation and properties of Ni-Co-P-nano-sized SiC electroless composite coatings – J. Hu, L. Fang, P. Zhong, and Y. Yang (ChongQing University)

• 3339  Raman and DFT study of Reductant Adsorption on Metal Surfaces in Electroless Deposition Process – B. Jiang (WASEDE University), M. Kunimoto, M. Yanagisawa, and T. Homma (Waseda University)

Magnetic Materials and Devices 12
Electrodeposition
323C, Level 3, Hawaii Convention Center

Magnetic Recording and Materials 2 – 08:00 – 12:00
Co-Chairs: E. Podlaha, W. Schwartzacher, and T. Osaka

08:00  3399  Development of Thin Film Technology for High-Density Magnetic Recording Media – M. Futamoto (Chuo University)

08:40  3400  Electroplated Hardmask for Bit Patterned Media Nanoimprinting Template Fabrication using Block Copolymer Lithography – C. Bonhote (HGST, a WD company), G. Siddiqi, J. Lille, and R. Ruiz (HGST)

09:00  3401  Microstructural and Magnetic Studies of Electrodeposited, Equiatomic Fe-Pt Films – D. Liang and G. Zangari (University of Virginia)
09:20 3402 Metastable $L_1$ and $B_0$ Ordered Phase Formation in CoPt Alloy Thin Films Epitaxially Grown on Metal Underlayers – M. Ohtake, D. Suzuki (Chuo University), F. Kirino (Tokyo National University of Fine Arts and Music), and M. Futamoto (Chuo University)

09:40 Intermission (20 Minutes)

10:00 3403 Superconformal Electrodeposition of Ni, Co and Fe-Group Alloys – T. Moffat (National Institute of Standards and Technology), C. Lee (KAERI), S. Kim (Chung-Ang University), Y. Liu, and D. Josell (National Institute of Standards and Technology)

10:40 3404 Induced Codeposition of NiMo, NiW and CoW Alloys with a Competing Side Reaction – S. Sun, T. Biairachna (Northeastern University), T. Maliar, H. Cesuilis (Vilnius University), and E. Podlaha (Northeastern University)

11:20 3405 Electrodeposition of Super Invar into Micro- and Nano- Recesses – H. Kim (Northeastern University), M. Murphy (Louisiana State University), S. Soper (University of North Carolina), and E. Podlaha (Northeastern University)

11:40 3406 Aqueous DC Electrodeposition and Mechanism of Magnetic SmCo Alloys – J. Wei, M. Schwartz, and K. Nobe (UCLA)

Magnetic MEMS and Devices – 14:00 – 18:00
Co-Chairs: H. Gatzen and P. Hesketh

14:00 3407 Developments in Integrated On-Chip Inductors with Magnetic Yokes – E. J. O’Sullivan, N. Wang, P. Herget (IBM Research Division), L. Romankiw (IBM, Thomas J. Watson Research Center), B. Webb, R. Fontana (IBM Research Division), N. Sturcken, K. Shepard (Columbia University), and W. Gallagher (IBM Research Division)

14:40 3408 A Unique Magnetic Alloy for Integrated Power Systems on a Chip – A. Panda (Enpirion Inc), T. Liakopoulos (Enpirion Inc), M. Wilkowski, and A. Lotfi (Enpirion Inc)

15:00 3409 Magnetic Micro and Nano Actuator Systems – H. H. Gatzen (Leibniz Universitaet Hannover)


16:00 3411 Nanoporous Alumina Growth in a Magnetic Field – A. Ispas (Technische Universität Ilmenau), I. Vrublevsky (Belarusian State University of Informatics and Radioelectronics Minsk), U. Schmidt (Technische Universität Ilmenau), and A. Bund (Technische Universität Ilmenau)

16:20 3412 Investigation of the Crystalization of NiFe81/19 Depending on the Annealing Temperature – M. Wurz (Leibniz University of Hanover), A. Shaganov, A. Filimonov (Physics of Nanocomposite Materials), and L. Rissing (Leibniz Universitaet Hannover)

16:40 3413 Integration of Electroplated CoFe in Trench Type Flux Guides for Magnetic MEMS Applications – J. Chen, S. Cvetkovic, and L. Rissing (Leibniz Universitaet Hannover)

17:00 3414 Microfabrication of High-Performance Thick Co$_{50}$Pt$_{50}$ Permanent Magnets for Microsystems Applications – O. D. Oniku and D. P. Arnold (University of Florida)

17:20 3415 Fabrication and Characterization of an Improved Micro Inductosyn® Sensor – D. Miletic (Leibniz Universitaet Hannover), J. Flügge (Physikalisch-Technische Bundesanstalt (PTB)), and H. H. Gatzen (Leibniz Universitaet Hannover)

17:40 3416 Embossing of Soft-magnetic Structures and Influence on Magnetic Properties – M. Kaiser (Leibniz Universitaet Hannover), M. Wurz (Leibniz University of Hanover), S. Cvetkovic (Leibniz Universitaet Hannover), R. Schwaiger (Karlsruhe Institute for Technology), and L. Rissing (Leibniz Universitaet Hannover)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

F5 – Poster Session – 18:00 – 20:00
Co-Chairs: C. Bonhote and G. Zangari

• 3417 Magnetic Properties of Ni-Cu Alloy Nanowires Obtained by the Template Method – I. Enculescu, E. Matei (National Institute of Materials Physics), M. Toimil Molares (GSI Darmstadt), A. Leca, and V. Kuncser (National Institute of Materials Physics)

• 3418 CPP-GMR of Co/Cu Multilayered Nanowires Electrodeposited into Anodized Aluminum Oxide Nanochannels with Large Aspect Ratio – N. Goya, Y. Zenimoto, K. Takao, T. Ohgai (Nagasaki University), M. Nakai, and S. Hasuo (Kyushu Mitsui Aluminium Co. Ltd.)

• 3419 Electroplating of Cu/Sn Layers for Hermetic Encapsulation for Vacuum Applications – M. Wurz (Leibniz University of Hanover), S. Cvetkovic, L. Rissing (Leibniz Universitaet Hannover), and F. Bach (Leibniz University of Hanover)

• 3420 Anisotropic Magnetoresistance of Ni-Co-Fe Alloy Nanowires Electroplated into Anodized Aluminum Oxide Membrane Thin Films – Y. Ikeda, T. Egawa, K. Takao, T. Ohgai (Nagasaki University), M. Nakai, and S. Hasuo (Kyushu Mitsui Aluminium Co. Ltd.)

• 3421 Current-Induced Magnetization Switching in CPP Junctions based on Fe$_3$Si/FeSi$_2$ Multilayered Films – Y. Noda (Kyushu University), K. Sakai (Kurume National College of Technology), T. Sonoda (Kyushu University), K. Takeda (Fukuoka Institute of Technology), and T. Yoshitake (Kyushu University)
Session I – 08:00 – 12:20
Co-Chairs: T. Akasaka, D. Guidi, and F. D’Souza

08:00  3471  N-type Graphene Induced by Molecular Hydrogen Exposure at Room Temperature – B. Kim (Ulsan National Institute of Science and Technology), S. Hong, S. Baek (Seoul National University), H. Jeong, N. Park, M. Lee (Ulsan National Institute of Science and Technology), S. Lee (Konkuk University), J. Lim, Y. Jun (Ulsan National Institute of Science and Technology), and Y. Park (Seoul National University)

08:20  3472  DFT Calculation for Various Adatom Adsorptions on Graphene for Using Graphene as Substrate – A. Ishii, K. Nakada, and T. Torobu (Tottori University)

08:40  3473  Theoretical Study of a Zigzag Graphene Nanoribbon Field Effect Transistor – H. Karamitaheri, M. Pourfath, N. Neophytou, and H. Kosima (IUE/TU Wien)


09:20  3475  Nitrogen-Containing Graphene for Electrochemical Oxygen Reduction – S. M. Lyth, J. Liu, and K. Sasaki (Kyushu University)

09:40  3476  Graphene Thermal Interface Materials – A. A. Balandin (University of California)

10:00  3477  Towards Novel Pillared Nanomaterials based on Graphene – K. Spyrou (RUG University), P. Rudolf (RUG University/The Netherlands), D. Gournis (University of Ioannina Greece), P. Maurizio, L. Kang (Università degli Studi di Trieste), and E. Diamanti (University of Ioannina Greece)

10:40  3478  Chemically Prepared Reduced Graphene Oxide as Ultra Fast Temperature Sensor – S. Saloo, S. Barik, G. Sharma, G. Khurana, and J. Scott (University of Puerto Rico)


11:20  3480  Non-Monotonic Size Dependence of Thermal Conductivity of Graphene Ribbons – D. Nika, A. Askerov (Moldova State University), and A. A. Balandin (University of California)

11:40  3481  Layer by Layer Etching of CVD Graphene for Full Graphene Device Fabrication – J. OH, J. Lim, J. Park, and G. Yeom (SungKyunKwan University)

12:00  3482  Wafer-Scale Graphene Synthesis and Tailoring via Segregation Methods Extended to Metals with Low Carbon Solubility – A. Zenasni (CEA), A. Delamoreanu (CNRS/LTM), and C. Rabot (CEA)

Session II – 14:00 – 18:20
Co-Chairs: S. De Gendi, M. T. Carter, and S. Fukuzumi

14:00  3483  Study of the Point Defects Induced by Electrochemical Potential in Graphene Monolayers – J. J. Velasco-Velez, Y. Zhang, I. Martin-Fernandez, C. Martinez, and M. Salmeron (Lawrence Berkeley National Laboratory)

14:20  3484  Interfacing Nanocarbons with Organic and Inorganic Semiconductors – From Extended Tetrahiafulvalenes to Nanocrystals / Quantum Dots – D. M. Guidi (Universität Erlangen-Nürnberg)

14:40  3485  Mechanochemical Synthesis of Carbon Nanomaterials by a High-Speed Ball-Milling Process – S. Ohara, Z. Tan, K. Yamamoto (Osaka University), and T. Hashishin (Joining and Welding Research Institute, Osaka University)

15:00  3486  Far-Infrared Absorption of Single-Walled Carbon Nanotube Films – T. Morimoto, S. Joung (TASC/AIST), and T. Okazaki (AIST)

15:20  3487  Intermission (20 Minutes)


16:00  3489  Electrochemical Property of Well-Coated Multi-Walled Carbon Nanotube with Polyaniiline-Cyclodextrin Polymer Composites – W. Zhang, M. Chen, X. Gong, and G. Diao (Yangzhou University)

16:20  3490  Advantage of Carbon Nanotubes as Catalyst Support in Polymer Electrolyte Membrane Fuel Cells – M. Berber, T. Fujigaya, and N. Nakashima (Kyushu University)

16:40  3491  Effect of Charge of Solubilizers on the Electronic States of Single-Walled Carbon Nanotubes – Y. Hirana, Y. Niidome, and N. Nakashima (Kyushu University)

17:00  3492  Enlargement of Space Charge Layer by P-N Junction of Multi-walled Carbon Nanotubes Modified with Tin Oxide Nanoparticles – T. Hashishin (Joining and Welding Research Institute, Osaka University), H. Ikenoko, K. Kojima, and J. Tamaki (Ritsumeikan University)


18:00  3495  One-Step Liquid-Phase Synthesis of Carbon Nanomaterials with Carbon Paper – K. Yamagiwa, Y. Ayato (Tokyo University of Science), H. Shiroishi (Tokyo National College of Technology), and J. Kuwano (Tokyo University of Science)
**Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center**

**H1 – Poster Session – 18:00 – 20:00**

Co-Chairs: F. D’Souza and D. Guldi

- 3495 PVDF/MWCNT Composite Films for Infrared Sensing and Energy Harvesting Applications – A. K. Batra, A. Chilvery, and M. Thomas (Alabama A&M University)
- 3496 The Investigation of Partial Reduced Graphene Oxide (GO)/PEDOT:PSS Nanocomposite – J. Seo, H. Yun, W. Hong (Korea Basic Science Institute), J. Jung (Chonbuk National University), B. Sohn, J. Lee (Korea Basic Science Institute), and C. Choi (Chonbuk National University)
- 3497 Evaluations of Nonbonding Interactions in Endohedrally and Exohedrally Functionalized Fullerences – N. Mizorogi, T. Akasaka (University of Tsukuba), and S. Nagase (Kyoto University)
- 3498 Synthesis and Structural Characterization of Fullerene derivatives EncapsulatingTrimetallic Nitride Cluster – T. ABE (University of Tsukuba), S. Sato (National Institute for Materials Science), C. Saito, Z. Slanina, T. Tsuchiya, T. Akasaka (University of Tsukuba), and S. Nagase (Kyoto University)
- 3499 Catalytic Synthesis of Carbon Nanotube and Nanofilm Over Oxidized Diamond-Supported Catalysts – K. Nakagawa, T. Tortiyama, G. Tsuino (Kansai University), T. Ando (National Institute for Materials Science), and H. Oda (Kansai University)
- 3500 Large-Area Graphene Grown with a Novel rapid Cooling Method – M. C. Chen (National Taitung University), Y. Huang, C. Chen, S. Hung (Department of Physics, National Central University), C. Cheng, C. Li, H. Hsieh, H. Wu (Department of Applied Science, National Taitung University), and G. Chi (Department of Photonics, National Chiao Tung University)
- 3501 Synthesis and Properties of Paramagnetic Metallofullerene/Electron Donor Dyad – Y. Kawana, T. Tanaka, T. Tsuchiya, T. Akasaka, N. Mizorogi (University of Tsukuba), and S. Nagase (Kyoto University)
- 3502 Complexation Studies of Endohedral Metallofullerene with Concave r-System – N. Umekita, T. Tsuchiya, N. Mizorogi (University of Tsukuba), H. Sakurai (Institute for Molecular Science), N. Martin (Universidad Complutense de Madrid), D. M. Guldi (Universität Erlangen-Nürnberg), S. Nagase (Kyoto University), and T. Akasaka (University of Tsukuba)
- 3503 Framework Transformation of Non-IPR Structured Metallofullerene – Y. Muto, H. Kirihara, Z. Slanina, T. Tsuchiya (University of Tsukuba), S. Nagase (Kyoto University), and T. Akasaka (University of Tsukuba)
- 3504 Thermally Reduced Graphene Oxide as Energy Storage Materials – W. Hong (Korea Basic Science Institute), B. Kim (Ulsan National Institute of Science and Technology), J. Kim, S. Lee, and H. Kim (Korea Basic Science Institute)

**Tuesday, October 9**

- 3505 Soft Lithographic Patterning and Transfer Process of Graphene Sheets – H. Kim, M. Jung (Korea Research Institute of Chemical Technology), D. Jung (Sung Kyun Kwan University), S. Lee, J. Lim, J. Lee, and K. An (Korea Research Institute of Chemical Technology)
- 3506 Novel Growth Process of Carbon Nanotubes in Atmosphere – S. Lu and W. Hsu (National Tsing Hua University)
- 3509 Multiple Auger Decay at Resonant Photo-Excitation in Carbon Thin Films – M. Richter, D. Friedrich, and D. Schmieder (Brandenburg University of Technology)
- 3511 Enhancement of Diamond Crystalite Size of Ultrananocrystalline Diamond/Amorphous Carbon Composite Films by Controlling Arc Discharge Energy of Coaxial Arc Plasma Gun – K. Hanada, A. Tominaga, T. Sugiyama (Kyushu University), K. Sumitani, H. Setoyama (Kyushu Synchrotron Light Research Center), and T. Yoshitake (Kyushu University)
- 3512 p-Type Semiconducting Properties of Boron Doped Ultrananocrystalline Diamond/Amorphous Carbon Composite Films Prepared by Coaxial Arc Plasma Deposition – Y. Katamune, S. Ohmagari (Kyushu University), H. Setoyama, K. Sumitani, Y. Hirai (Kyushu Synchrotron Light Research Center), and T. Yoshitake (Kyushu University)
- 3513 Controllable Synthesis of High-Quality Graphene Using Inductively-Coupled Plasma Chemical Vapor Deposition – L. Nang, N. Park (Chungnam National University), Z. Lee (UNIST), and E. Kim (Chungnam National University)
- 3514 High Reactive Catalysts Based on Gold Nanoparticles Supported Over Carbon Nanotubes – T. M. Abdel-Fattah (Christopher Newport University)
Tuesday, October 9

09:00 3541 Preparation and Electrochemical Behavior of Water-Soluble Inclusion Complex of Imidacloprid with β-cyclodextrin Polymer – M. Chen, J. Wang, W. Zhang, and G. Diao (Yangzhou University)

09:20 3542 Fabrication of Porous Conductive Diamond Hollow Fibers – T. Kondo, Y. Kodama, and M. Yuasa (Tokyo University of Science)

09:40 Intermission (20 Minutes)

10:00 3543 | Electroanalytical Performance of Nitrogen-Containing Tetrahedral Amorphous Carbon Thin-Film Electrodes – X. Yang, G. DeVivo (Michigan State University), L. Haubold (The Fraunhofer Center for Coatings and Laser Applications), and G. Swain (Michigan State University)

10:20 3544 | Synthesis of Pt-Ir Catalysts by Coelectrodeposition: Application to Ammonia Electrooxidation in Alkaline Media – S. Le Vot (Université du Québec à Montréal), L. Roué (INRIS- Énergie Matériaux et Télécommunications), and D. Bélanger (Université du Québec à Montréal)

10:40 3545 | Electrochemical Study of Ilmenite using Carbon Paste Electrode Under Reducing Condition – N. Jabit, G. Senanayake, and M. Nicol (Murdock University)

11:00 3546 | | Experiments and Modeling of Electrochemical Impedance Spectroscopy on Pressurized SOFC – C. Willich, M. Henke, C. Westner, L. Florian, W. Bessler, J. Kallo, and K. Friedrich (German Aerospace Center (DLR))

11:20 3547 | Diffusion Impedance Analyzed by Equivalent Circuit Involving CPE using Microelectrode – Y. Hoshi, S. Kawakita, I. Shtanda, and M. Itagaki (Tokyo University of Science)

11:40 3548 | Electrochemical Behavior of Samarium and Ytterbium in the 1-(1-Butyl)trimethylammonium Bis[trifluoromethylsulfonyl]imide Ionic Liquid Containing TODGA – Y. Pan and C. Hussey (The University of Mississippi)

PAED General Session 3 – 09:00 – 12:00
Co-Chairs: C. Hussey and T. Chung

14:00 3549 | Electrochemical Behavior of Praseodymium and Neo-Dymium in the 1-butyl-3-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide Ionic Liquid Containing Chloride – L. Chou and C. Hussey (The University of Mississippi)

14:20 3550 | In-depth Study on Nano-structured Electrode Reaction Mechanism in Lithium-Ion Batteries – H. Cho (University of California, San Diego) and Y. Meng (University of California San Diego)

14:40 3551 | Investigation on Polyoxometalates for the Application in Redox Flow Batteries – J. Friedl (TUM-CREATE), C. Bauer (TUM CREATE Centre for Electromobility), R. Al-Oweini (Jacobs University), D. Yu (Energy Research Institute @ NTU), U. Kortz (Jacobs University), H. Hoster, and U. Stimming (TUM CREATE Centre for Electromobility)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

PAED General Session 4 – 14:00 – 15:00
Co-Chairs: P. Atanassov and P. Kulesza

14:40 3552 | Electrode Reactions of Dissolved p-Dimethoxybenzene on a Polyaniiline-Modified Electrode – J. Yano (Niigama National College of Technology)

14:50 3553 | Equivalent Circuits of Zinc-Air Battery and Analysis of Zinc-Air Battery Oxygen Sensor using the Equivalent Circuits – M. Takahashi and M. Yamauchi (Tokyo National College of Technology)

15:00 3554 | The Electrocatalytic Activity of Ligand-Protected Gold Particles: Formaldehyde Oxidation – K. Luo (Guilin University of Technology), X. Li, and Y. Gong (College of Materials Science and Technology, Guilin University of Technology)

15:10 3555 | Nanocomposite Coatings based on the Conductive Polymers and Functionalized Carbon Nanotubes for Obtained of Modified Electrodes – V. Branzoi (University of Politehnica Bucharest), F. Branzoi (Institute of Physical Chemistry), and A. Musina (University Politehnica of Bucharest)


15:30 3557 | Comparison between Palladium Electrode and Nanoparticles in the Ethanol Detection to Biosensor and Sensor Applications – I. Feliciano, D. Diaz, Y. De la Torre, and C. Cabrera (UPR Rio Piedras)

15:40 3558 | Preparation of Bismuth Tungstate Nanocrystallites by Ball Milling of Flake-ball Particles and Their Photocatalytic Activity – H. Hori (Hokkaido University Catalysis Research Center) and B. Ohtani (Hokkaido University)


16:00 3560 | Study on the Effects of Electrochemical Realkalization Method with Alcaines Inhibitors as Electrolyte – J. Lu, Y. Zhang (Shanghai Harbor Engineering Design & Research Institute Co., Ltd.), J. Zhang, and J. Jiang (Shanghai University of Electric Power)

16:10 3561 | Transcutaneous Vein Imaging and Venepuncture System for Blood Test – H. Saito, S. Yamamoto, and H. Takagi (Tokyo National College of Technology)
Bioelectroanalysis and Bioelectrocatalysis
Physical and Analytical Electrochemistry
317B, Level 3, Hawaii Convention Center

Biofuel Cells – 08:00 – 12:00
Co-Chairs: S. Minteer and S. Higgins

08:00  3588  Characterization of Microbial Fuel Cell Anodic Biofilms Grown on Pure and Mixed Cultures – S. R. Higgins, R. Lopez, D. Foerster, M. Cooney (Hawaii Natural Energy Institute), P. Atanassov, C. Lau (The University of New Mexico), S. Minteer (University of Utah), K. Nealson, A. Cheung (University of Southern California), O. Bretschger (J. Craig Venter Institute), T. Yan, and E. Pagaling (University of Hawaii)

08:20  3589  In Vivo Operating Miniature, Direct Electron Transfer based, Membrane-less Glucose/Oxygen Biofuel Cell – M. Falk, V. Andoralov (Biomedical Sciences), M. Granmo (Neuronano Research Center), D. Suyatin (Division of Solid State Physics), J. Schouenborg (Neuronano Research Center), J. Sotres (Biomedical Sciences), R. Ludwig (Food Biotechnology Laboratory), O. Morozova (Kurchatov NBIC Centre), Z. Blum, and S. Shleev (Biomedical Sciences)

08:40  3590  Enhanced Electrical Contact of Microbes using Magnete Particle Coated with Polyelectrolyte onto Multi-Walled Carbon Nanotube Nanohybrid (MaPoNT) in Microbial Fuel Cell – I. Park, Y. Heo, P. Kim, and K. Namh (Chonbuk National University)

09:00  3591  Ammonia Production at Anabaena variabilis Modified Electrodes – T. Paschekewitz and J. Leddy (University of Iowa)

09:20  3592  Solar Bioelectrocatalysis Utilizing Thylakoids – S. Minteer (University of Utah)

09:40  Intermission (20 Minutes)

10:00  3593  Investigating Separators to Improve Performance of Flat-Plate Microbial Fuel Cells – S. Kazemi (University of British Columbia), K. Fatih (National Research Council Canada (NRC)-University of British Columbia (UBC)), M. Mohseni (University of British Columbia (UBC)), and H. Wang (National Research Council Canada (NRC)-University of British Columbia (UBC))

10:20  3594  Direct Electron-Transfer Reactions from Solid Electrodes to Chemoautotrophic CO2 Fixation Microbes – T. ISHII (University of tokyo), K. Hashimoto, and R. Nakamura (The University of Tokyo)

10:40  3595  A Novel Recombinant PQQ Alcohol Dehydrogenase as Catalyst for Bioanode: Two-Step Electrochemical Oxidation of Alcohols – K. Takeda (Tokyo University of Agriculture and Technology), H. Matsumura (Oregon Health and Science University), K. Igarashi, M. Samejima (The University of Tokyo), N. Nakamura, and H. Ohno (Tokyo University of Agriculture and Technology)

11:00  3596  Surface Modification of Carbon Black toward Retention of Enzyme Activity in High-Surface-Area Enzymatic Biofuel Cell Electrodes – T. Tamaki, H. Fujimoto, H. Ohashi, and T. Yamaguchi (Tokyo Institute of Technology)

11:20  3597  Simultaneous 3-D Impedance Measurement of Whole Biofuel Cell, Anode and Cathode using Porous Carbon Electrode – I. Shiitanda, H. Yanai, Y. Yoshihata, Y. Hoshi, M. Itagaki (Tokyo University of Science), and S. Tsujimura (University of Tsukaba)

11:40  3598  Polyaniline Nanofiber/Carbon Black Composite as an Air Cathode Material for Microbial Fuel Cells – J. Ahmed and S. Kim (Konkuk University)
**I2 – Poster Session – Bioelectroanalysis and Bioelectrocatalysis – 18:00 – 20:00**

**Co-Chair: S. Minteer**

- **3599** Catechol Biosensor based on Polyphenol Oxidase Immobilized by Combining Electropolymerization and Cross-Linking Process – S. Wang and J. Kan (Yangzhou University)
- **3600** A Bioanode for an Ethanol Biofuel Cell Operating at High Temperature – A. Kontani, M. Masuda, N. Nakamura, M. Yohda, and H. Ohno (Tokyo University of Agriculture and Technology)
- **3601** Immobilization of NAD⁺ on an Electrode Using Hydrophobic Ionic Liquids – M. Masuda, N. Nakamura, and H. Ohno (Tokyo University of Agriculture and Technology)
- **3602** Investigation of Impedance Spectra of Mediator-type Amperometric Biosensor by Faradaic Impedance Analysis – I. Shtyanda, Y. Hoshi, and M. Itagaki (Tokyo University of Science)
- **3603** The Direct Electron Transfer Reaction of Bilirubin Oxidase in Protic Ionic Liquids – R. Ikari, J. Kuwahara, N. Nakamura, and H. Ohno (Tokyo University of Agriculture and Technology)

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**Molten Salts and Ionic Liquids 18**

**Physical and Analytical Electrochemistry / Electrodeposition / Energy Technology**

**301A, Level 3, Hawaii Convention Center**

**Electrodeposition – 08:00 – 12:00**

**Co-Chairs: M. Ueda and H. De Long**

- **08:00 3628** Recent Developments in Low-Temperature Electrolysis of Aluminum – A. Redkin, A. Apisarov, A. Dedyukhin, V. Kovrov, Y. Zaikov (Institute of High Temperature Electrochemistry), O. Tkacheva, and J. Hryn (Argonne National Laboratory)
- **08:20 3629** AlCl₃/Trimethylhydrochloride Ionic Liquid as an Electrolyte for Electrodeposition of Aluminum Wires – C. Su (National Cheng Kung University), T. Wu (National Yunlin University of Science and Technology), Y. Sun, and I. Sun (National Cheng Kung University)
- **08:40 3630** Electrodeposition of Lead from Chloride Melts – G. Haarberg, L. Owe, B. Qin, J. Wang, and R. Tunold (Norwegian University of Science and Technology)
- **09:00 3631** The Interface Ionic Liquids / Au(111) and nano-structured materials made from ionic liquids – F. Endres (Clausthal University of Technology)
- **09:40** Intermission (20 Minutes)
- **10:00 3632** Electrodeposition on Tantalum in Alkali Halide Melts – J. H. Von Barner, A. H. Jensen, and E. Christensen (Technical University of Denmark)
- **10:20 3633** Electrochemical Deposition of Niobium onto the Surface of Copper Using a Novel Choline Chloride-Based Ionic Liquid – A. I. Wixtrom, J. Buhler (Christopher Newport University), C. E. Reece (Thomas Jefferson National Accelerator Facility), and T. M. Abdel-Fattah (Christopher Newport University)

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**Biomass – 14:00 – 16:40**

**Co-Chairs: K. Brown and L. Haverhals**

- **14:00 3638** Polysaccharide Ecosystem Materials: Synthesis, Characterization and Application in Removal of Pollutants and Bacteria – C. D. Tran and S. Duri (Marquette University)
- **14:20 3639** Impact of Anti-Solvents on the Structural Features and Enzyme Digestibility of Regenerated Cellulose from Ionic Liquid Dissolution – X. Geng and W. A. Henderson (North Carolina State University)
- **14:40 3640** Electrospinning of Biopolymers from Ionic Liquid – Co-Solvent Systems – E. K. Brown (United States Naval Academy), L. Haverhals (U.S. Naval Academy), M. P. Foley (U.S. Naval Academy), H. De Long (AFRL/AFOSR), and P. Trulove (US Naval Academy)
- **15:00 3641** Ionic Liquid-based Solvents for Natural Fiber Welding – L. M. Haverhals (United States Naval Academy), M. P. Foley (U.S. Naval Academy), L. Nevin, E. K. Brown (United States Naval Academy), D. Fox (American University), H. De Long (AFRL/AFOSR), and P. Trulove (US Naval Academy)
- **15:20** Intermission (20 Minutes)
- **15:40 3642** Formation of Surface Structures on Biopolymer Substrates Through the Inkjet Printing of Ionic Liquids – E. K. Brown (United States Naval Academy), L. Haverhals (U. S. Naval Academy), M. P. Foley (U.S. Naval Academy), K. Sweely (United States Naval Academy), H. De Long (AFRL/AFOSR), and P. Trulove (US Naval Academy)
- **16:00 3643** Chitin to Plastic: Utilization of Ionic Liquids for the Depolymerization of Chitin – W. M. Reichert, A. Mirjafari, T. Goode, N. Williams, and M. La (University of South Alabama)
- **16:20 3644** Selective Removal and Recovery of Lignin Using Protic Ionic Liquids (PILs) for a Cost–Effective Biomass Pretreatment Method – E. C. Achiniu, G. Li, and W. A. Henderson (North Carolina State University)
I3 – Poster Session 1 – 18:00 – 20:00

Co-Chairs: D. Fox and M. Foley

• 3645 Electrochemical Behavior of Vanadium Oxides in (NH₂)₂CO – KCl Melt – A. Savchuk and S. V. Devyatkin (Institute of General and Inorganic Chemistry)

• 3646 Effect of the Second Coordination Sphere on the Standard Rate Constants of Charge Transfer for the Cr(III)/Cr(II) Redox Couple in Chloride Melts – Y. Stulov, V. Kremenetsky (Institute of Chemistry, Kola Science Centre RAS), and S. Kuznetsov (KSC RAS)

• 3647 Characteristic of Steam-Activated Boron-Doped Diamond Electrode in a Molten NH₄F·2HF – A. Oishi (Doshisha University), H. Kazuhiro, M. Uno, T. Nakai (Permelec Electrode LTD), W. Sugimoto (Shinshu University), M. Saito, M. Inaba, and A. Tasaka (Doshisha University)

• 3648 Corrosion of Nickel-Chromium-Molybdenum Based Alloy in Chloride Melts Containing Transition Metal Ions – A. Abramov, V. Karpov, I. B. Polovov, D. Vinogradov, V. A. Volkovich, and O. Rebrin (Ural Federal University)

• 3649 Electronic Absorption Spectra of Niobium Species in Halide Melts – N. Brevnova, I. B. Polovov, M. Chernyshov, V. A. Volkovich, B. Vasin (Ural Federal University), and T. Griffiths (Redston Trevor Consulting, Ltd.)

• 3650 Corrosion of Ferritic and Ferritic-Martensitic Steels in NaCl-KCl-VCl₂ Melts – I. B. Polovov, D. Vinogradov, A. Abramov, A. Shak, V. A. Volkovich, O. Rebrin (Ural Federal University), and T. Griffiths (Redston Trevor Consulting, Ltd.)

• 3651 Corrosion of Austenitic Steels and Their Components in Vanadium-Containing Chloride Melts – A. Abramov, I. B. Polovov, V. A. Volkovich, O. Rebrin, E. Denisov (Ural Federal University), and T. Griffiths (Redston Trevor Consulting, Ltd.)

• 3652 Evaluation of NaTFSI-TBATFSI Ionic Liquid as an Electrolytic Melt for Na Electrodrefining – R. Inaba, M. Ueda, and T. Ohutsuka (Hokkaido University)

• 3653 Induction of Liquid-Crystalline Bicontinuous Cubic Phases into Zwitterions by Addition of Lithium Salts – T. Matsumoto (Tokyo University of Agriculture and Technology), T. Ichikawa (Tokyo University of Agriculture and Technology), T. Kato (The University of Tokyo), and H. Ohno (Tokyo University of Agriculture and Technology)

• 3654 Influence of Nonflammable Diluents on Properties of Phosphonium Ionic Liquids as Lithium Battery Electrolytes – K. Tsunashima, H. Taguchi (Wakayama National College of Technology), and F. Yonekawa (Nippon Chemical Industrial Co., Ltd.)

• 3655 Absorption and Desorption of Water by 1-Alkyl-3-Methylimidazolium⁺ Ionic Liquids, and Studies of Their Electrochemical and Physical Properties – J. DeCerbo and V. Katovic (Wright State University)

• 3656 Electrochemical Behavior of Bis(trifluoromethylsulfonyl)imide-based ILs at Gold Single Crystal Electrodes – H. Ueda (Graduate School of Science and Technology, Kumamoto University), K. Nishiyma (Kumamoto Univ.), and S. Yoshimoto (Kumamoto University)

• 3657 Hysteresis Effects in the In Situ SFG and Differential Capacitance measurements on Metal electrode/Ionic Liquids Interface – W. Zhou, Y. Wang, R. Yin (Shanghai University), and Y. Ouchi (Nagoya University)

• 3658 Spatial Distribution of Chemical Species at Ionic Liquid / Electrode Interface Studied by In Situ X-ray Photoelectron Spectroscopy – M. Hirogaki, T. Tsuda, S. Kuwabata, K. Fukui, and A. Imanishi (Osaka University)

• 3659 Visualization of Ionic-Liquid/Solid Interfaces by Frequency Modulation Atomic Force Microscopy – M. Negami, T. Ichii, K. Murase, and H. Sugimura (Kyoto University)

• 3660 Electrochemical Studies of Cyclic Ammonium Based Ionic Liquids with Allyl Substituents – T. Wu (National Yunlin University of Science and Technology), C. Su, C. Chen (National Cheng Kung University), C. Kuo (National Kaohsiung University of Applied Sciences), and I. Sun (National Cheng Kung University)

• 3661 Electrochemical Oxidation of Glucose by Nitroxide Radicals or Gold Nanoparticles in Ionic Liquids – A. Konno, M. Abe, and H. Ohno (Tokyo University of Agriculture and Technology)

• 3662 Characterization of Au Nanoparticles Prepared by X-ray-Induced Reduction in Ionic Liquid at Nanopore – T. Arimura, T. Sakamoto, T. Tsuda, S. Kuwabata, K. Fukui, and A. Imanishi (Osaka University)

• 3663 Electrode Kinetics of Oxygen/Superoxide Ion Redox Couple in Some Amide-Type Ionic Liquids – T. Nakagawa, Y. Katayama, and T. Miura (Keio University)

• 3664 Molten Salts as a Promising Medium for the Synthesis of High Active Catalytic Coatings – A. Dubrovskiy (Institute of Chemistry, Kola Science Centre RAS) and S. Kuznetsov (KSC RAS)

• 3665 Synthesis of Carbides Refractory Metal Nanocoatings on Carbon Fibers and Nanoneedles of Silicon in Molten Salts – V. Dolmatov (Tananaev Institute of Chemistry and Technology of Rare Elements and Mineral Raw Materials) and S. Kuznetsov (KSC RAS)

• 3666 Facile Synthesis of Cu-based Semiconductor Nanoparticles by the Oxidation of Cu Metal Sputter-deposited in an Ionic Liquid – A. Morimoto, K. Okazaki (Nagoya University), S. Kuwabata (Osaka University), and T. Torimoto (Nagoya University)

• 3667 Reaction Entropies of some Redox Couples in Ionic Liquids – Y. Yamato, Y. Katayama, and T. Miura (Keio University)

• 3668 Effect of Ion Structures on Phase Behaviors of Hydrophobic and Polar Ionic Liquids after Mixing with Water – Y. Fukaya, T. Nakano, N. Nakamura, and H. Ohno (Tokyo University of Agriculture and Technology)
Electrocatalysts Structural Effects II – 08:20 – 12:00
Co-Chairs: G. Brisard and D. Guay

08:20 3752 (Invited) Application of Ordered Intermetallic Phases to Electrocatalysis – F. Matsumoto (Kanagawa University) and H. Abe (National Institute for Materials Science (NIMS))

09:00 3753 Activation of Noble Metal Centers through Modification with Metal Oxo Species towards Electrocatalytic Oxidation of Alcohols and Formic Acid – P. J. Kulesza, I. Rukowska (University of Warsaw), A. Wadas, D. Marks, K. Klak (Department of Chemistry, University of Warsaw), and S. Zoladek (University of Warsaw)


09:40 3755 Electrode Surface Control by Platinum Nanoparticles Protected by Polycrylic Acid for Electrocatalytic Hydrogen Generation – M. Kajita and M. Yagi (Niigata University)

10:00 Intermission (20 Minutes)


11:00 3757 Unique Properties of Reduced SnO₂; CO Oxidation on Nanostructured SnO₂/Pt(111) – S. A. Xanadu, W. Zhou, M. G. White (Brookhaven National Laboratory), Z. Zhu (University of California, Berkeley), and Z. Liu (Lawrence Berkeley National Laboratory)


11:40 3759 Electrooxidation of CO on Epitaxial Bilayer Oxide Formed on Platinum Nanofacets – V. Komanicky (Safarik University), D. Hennessy, and H. You (Argonne National Laboratory)

Theoretical Aspects in Electrocatalysis – 14:00 – 17:20
Co-Chairs: N. Hoshi and T. Ohsaka

14:00 3760 Multiscale Modeling of the H₂ Oxidation Reaction at the Ni/YSZ Interface in the Presence and Absence of Sulfur – A. Heyden and S. C. Ammal (University of South Carolina)

14:20 3761 Theoretical Investigation of the H₂ Oxidation on the Sr₀.₈₁Fe₂₋₀.₁₈M₀.₇₂O₆₋₀.₀₂ (001) Perovskite Surface under Anodic Solid Oxide Fuel Cell Conditions – S. Suthirakun, S. C. Ammal, and A. Heyden (University of South Carolina)

14:40 3762 Electrochemistry by First-Principles Calculations: Electrochemical Oxidation of Ammonia at Pt(hkl)/Alkaline Solution Interfaces – D. Skachkov, C. Venkateswara Rao, and Y. Ishikawa (University of Puerto Rico)

15:00 3763 Density Functional Theory Computation of Electrolyte Competitive Adsorption and Electrochemical Activation Barriers – M. J. Janik, K. Yeh, and G. Rostamikia (The Pennsylvania State University)

15:20 Intermission (20 Minutes)

15:40 3764 A DFT Calculation Study of the Hydrogen Electrode Processes on Pt (111) and Pt (100) Surfaces – Q. Zhang, J. Chen, and S. Chen (Wuhan University)

16:00 3765 DFT Study of Water Dissociation and Diffusion on Metal Surfaces, Kinks and Step – L. Arndottur (Oregon State University)

16:20 3766 Cost Effective Computational Method for Performing First-Principles Molecular-Dynamics Simulations under Constant Potential Bias – N. Bonnet, T. Morishita (AIST), O. Sugino (University of Tokyo), and M. Otani (National Institute of Advanced Industrial Science and Technology)

16:40 3767 Vibration Analysis of (Bi)Sulfate Adsorption on Pt (111) Surface in Aqueous Solution from the First Principles Simulation – Y. Qian (FC-Cubic Cutting-Edge Center Technology Research Association), M. Otani, and T. Ikeshoji (National Institute of Advanced Industrial Science and Technology)

17:00 3768 Fundamental Insights on the Electrochemical Water Splitting using Solid Oxide Electrolyzers – E. Nikolla (Wayne State University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

I4 – Poster Session – Electrocatalysis VI – Poster – 18:00 – 20:00
Co-Chairs: G. Brisard and A. Wieckowski

• 3769 Electrochemically Fabricated Metal Catalysts for Glucose Oxidation in Bio Fuel Cell Application – J. Lim, S. Pyo, D. Lee, H. Park, and S. Kim (Chung-Ang University)

• 3770 Redox Catalysis for Dehydrogenation of Liquid Hydrogen Carrier for Fuel Cell Applications – E. Deuf (Lawrence Berkeley National Laboratory / University California Berkeley), L. Rubin (University of California Berkeley), D. Pete (Lawrence Berkeley National Laboratory), J. Arnold (University of California Berkeley), and J. Kerr (Lawrence Berkeley National Laboratory)
• **3771** The Graphene-supported PdSn Nanoparticles as Efficient Catalysts for Ethanol Electrooxidation – Y. Kim, S. Choi, E. Lim, S. Lee (Gwangju Institute of Science and Technology (GIST)), and W. Kim (Gwangju Institute of Science and Technology)

• **3772** Structural Effects on the Oxygen Reduction Reaction on the High Index Planes of Pt3Co – Y. Takesue, T. Rurigaki (Chiba University), A. Hototsuyanagi, M. Nakamura (Chiba University), and N. Hoshi (Chiba University)

• **3773** Controlling Diffusion Profile of Electroactive Species for Selective Anodic Stripping Voltammetry of Cd[sup]2+[sup] – A. Sugitani, T. Watanabe, and Y. Einaga (Keio University)

• **3774** Moleculer Self-Assembling Control Over the Surface States and Field Effects at N-Gaas (100) Electrodes – V. Lazarescu, M. Enache, G. Dobrescu, M. Gartner (Institute of Physical Chemistry “Ilie Murgulescu”), C. Negrila, and M. Lazarescu (National Institute of Material Physics)

• **3775** One-Step Electrodeposition of Multilayered Surfactant/MnO2 Composite and Its Electrochemistry – M. Shamoto, S. Mito, K. Tomono, and M. Nakayama (Yamaguchi University)

• **3776** Tungsten Carbide Promoted Co@Pd Core-Shell Nanoparticles as Highly Active ORR Electrocatalyst – Z. Li and P. Shen (Sun Yat-Sen University)


• **3778** Surface Modification of Diamond Nanoparticle and Its Electrochemical Properties – J. Urai, T. Kondo, and M. Yuasa (Tokyo University of Science)

• **3779** Electrocatalytic Water Oxidation on a Mesoporous IrO2 Film Fabricated Using a Triblock Copolymer Template – D. Chandra, N. Abe, and M. Yagi (Niigata University)

• **3780** *In Situ* Observation of Adsorption Behaviors of Nafion Side-Chain Model Compounds on Electrodes by ATR-SEIRAS – K. Nomura, N. Ohta, H. Notsu (FC-Cubic TRA), T. Kondo (Ochanomizu University), and I. Yagi (FC-Cubic TRA)

• **3781** Electrochemical Activity and Stability of Pt Catalysts Supported on Silica-CNF Hybrid Materials – A. Kim, S. Lim, D. Peck, S. Kim, B. Lee, and D. Jung (Korea Institute of Energy Research)

• **3782** Intermediates of Ethanol Electro-oxidation on SnOx/Pt Catalysts Studied by *In Situ* FTIR Spectroscopy – J. Magee, W. Zhou, and M. G. White (Brookhaven National Laboratory)

• **3783** Synthesis and Electrocatalytic Activity of Shape Controllable Gold Nanoparticles Enclosed by High-index Facets – B. C. Solomon, F. Ke, and X. Zhou (University of South Carolina)

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**J1 Chemical Sensors 10 – Chemical and Biological Sensors and Analytical Systems**

**Sensor**

319B, Level 3, Hawaii Convention Center

**J1-3 – Gas and Liquid Phase Chemical Sensors – 08:00 – 12:20**

**Co-Chairs:** J. Li and L. Nagahara

08:00 **3845** (Sensor Division Outstanding Achievement Award Presentation) Ceramic Gas Sensors to Oxide Nanostructures: Opportunities and Challenges – S. Akbar (Ohio State University)

08:40 **3846** The Characteristics of Nanocomposite Chemical Sensors – A. K. Batra, J. Stephens (Alabama A&M University), and J. Currie (NASA-MSFC)

09:00 **3847** Diminishing Ethanol Cross-sensitivity via Lamination of Selective Oxidation Catalyst layer on Zirconia-based VOC Sensor – T. Sato (Kyushu University), M. Breedon (Japan Society for the Promotion of Science), Y. Kugimiya (Sasebo Heavy Industries), and N. Miura (Kyushu University)

09:20 **3848** Rapid and Simple Immunoassay Based on Negative Dielectrophoresis with Three-Dimensional Interdigitated Array Electrodes – T. Yasukawa (University of Hyogo), H. Shiku, T. Matsue (Tohoku University), and F. Mizutani (University of Hyogo)


10:00 Intermission (20 Minutes)

10:20 **3850** High-Throughput Separation Assay for NO Metabolites in Blood using Microfluidic Dielectrophoresis – S. Wakida (National Institute of Advanced Industrial Science and Technology (AIST)), T. Miyado (Kinki Polytechnic College), K. Shimazu, Y. Shibutani (Osaka Institute of Technology), T. Mizukami, K. Nose, and A. Shimouchi (National Cerebral and Cardiovascular Center)


11:00 **3852** Application of Electrospun Carbon Nanofiber and Its Composites in Electroanalytical Chemistry – J. Huang, Y. Liu, and T. You (Changchun Institute of Applied Chemistry)

11:20 **3853** Soluble Polyaniline for a State of Health Sensor – M. Kane (Sandia National Laboratories)

11:40 **3854** Potentiometric YSZ-based Sensors Using Zn-Ta-O-based Sensing Electrode for Selective H2 Detection – S. A. Anggraini (Kyushu University), M. Breedon (Japan Society for the Promotion of Science), and N. Miura (Kyushu University)

12:00 **3855** Solid Electrolyte Type Ammonia Gas Sensor with High Water Durability – S. Tamura, T. Nagai, and N. Imanaka (Osaka University)
J1-4 – Gas and Liquid Phase Chemical Sensors – 14:00 – 18:00
Co-Chairs: M. Carter and Z. M. Sailor

14:00 3856 Low Cost 8 nm Radius Nanoelectrodes Arrays by Sol-Gel Chemistry: To Fundamental Understanding of Mass Transport Toward Direct DNA Hybridization Detection Electrochemical Sensor – O. Fontaine (University of St. Andrews), C. Laberty, H. Perrot, and C. Sanchez (University of Pierre et Marie Curie)

14:20 3857 Direct Comparison of Anti-Interference Property for Bimetallic PtAu, PtIr, and PtRu Nanoparticle catalysts in Amperometric Detection for H2O2 Based Biosensors – M. Janyasupab (Case Western Reserve University), Y. Zhang (Shanghai University), C. Liu (National Central University), and C. Liu (Case Western Reserve University)


15:00 3859 Printed Amperometric Gas Sensors – M. T. Carter, J. Stetter, M. Findlay, and V. Patel (KWJ Engineering, Inc.)

15:20 3860 Interaction of Water Vapor with SnO2 Sensor Materials: A Comparison of DRIFTS and Resistance Measurements – R. G. Pavelko (Kyushu University), K. Grossmann, N. Barsan (University of Tuebingen), and K. Shimanoe (Kyushu University)

15:40 3861 pH Sensing Characteristics and Biosensing Application of Solution-Gated Reduced Graphene Oxide Field-Effect Transistors – I. Sohn, D. Kim, J. Jung, O. Yoon, and N. Lee (Sungkyunkwan University)

16:00 3862 Development of Micro Hydrogen Gas Sensor Utilizing Polymerized Gel with Ionic Liquid as a Solvent – T. Yamauchi (Niigata University)

16:20 3863 Iridium Oxide pH Sensor Development and Its Application in Corrosion Study – F. Huang, Y. Jin, and L. Wen (University of Science and Technology Beijing)

16:40 3864 Surface-enhanced Raman Scattering on Ordered Metal Nanodot Array Obtained Using Anodic Porous Alumina – T. Kondo (KAST), K. Nishio, and H. Masuda (Tokyo Metropolitan University)

17:00 3865 Enzyme-Encapsulated Quantum Dot Hydrogels in the Development of Biosensors: A Multifunctional Platform for Both Bio-Catalysis and Fluorescent Probing – J. Yuan, N. Gaponik, and A. Eychemüller (TU Dresden)

17:20 3866 Adaptive Chemical Sampling Device Inspired by Crayfish – R. Takemura, K. Takahashi, T. Makishita, and H. Ishida (Tokyo University of Agriculture and Technology)

17:40 3867 Carbohydrate Immobilization on the Surface of Field Effect Transistor Biosensor for Detection of Virus-related Protein – S. Hideshima (Research Institute for Science and Engineering, Waseda University), H. Hinou (Graduate School of Life Science, Hokkaido University), D. Ebihara, R. Sato, S. Kuroiwa (Department of Applied Chemistry, Graduate School of Advanced Science and Engineering, Waseda University), S. Nishimura (Graduate School of Life Science, Hokkaido University), and T. Osaka (Waseda University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

J1 – Poster Session – 18:00 – 20:00
Co-Chairs: J. Li and L. Nagahara

• 3868 Block Co-polymer Enhanced 3D Carbon Nanostructure Electronics – S. Guo, A. George, M. Penchev, C. Ozkan, and M. Ozkan (University of California, Riverside)

• 3869 Self-Assembled Monolayers of Oligonucleotides as Receptor Layers for Metal Ions Sensors – L. Gorski, R. Ziolkowski, and E. Malinowska (Warsaw University of Technology)


• 3871 Chalcogenide Glass Chemical Sensor for Cadmium Detection in Industrial Environment – M. Milochova, M. Kassem, and E. Bychkov (University of Littoral)

• 3872 Electrochemical Pump Consisting of Cu2+–Poly(acrylic acid) Gel – K. Takada, N. Yamamura, A. Hayashi, T. Yasui, and A. Yuchi (Nagoya Institute of Technology)

• 3873 The pH Sensing Characteristics of Extended-Gate Field-Effect Transistor Base on The Electrode with Copper Oxide Nanowires – Y. Huang, H. Lin, H. Li, W. Dai, C. Chou, and H. Cheng (National Chiao Tung University)

• 3874 Multiplexed Cantilever Sensors with a Peptide Receptor and Humidity Effects on Binding Kinetics – Y. Yoo, M. Chae, J. Kang, K. Hwang, T. Kim (Korea Institute of Science and Technology), and J. Lee (Kwangwoon University)


• 3877 Characterization and Electrochemical Response of Sonogel Carbon Electrode Modified with Nanostructured TiO2 and ZrO2 Film to Detect Common Neurotransmitters – M. Hughes, N. Vincent, and S. K. Lunsford (Wright State University)
Meeting Program  PRIME 2012  October 7-12, 2012  Honolulu, Hawaii

**J2 Poster Session – 18:00 – 20:00**

- 3893 Investigation of Ion Dependence of Electronic Structure for 3d Ions in Mg2TiO4 based on First-principles Calculations – M. Novita (Kwansei Gakuin University), H. Yoshida (Mitsubishi Chemical Group), and K. Ogawasara (Kwansei Gakuin University)

- 3894 Comparison of Simulation and Experimental Results of Crystalline Si Solar Module with YVO3:Bi12+,Eu2+ Nanophosphor Spectral Shifter – Y. Iso, S. Takeshita, and T. Isobe (Keio University)

- 3895 Simple-Structure Light-Emitting Diodes Based on a Blend of Nanocrystal Quantum Dots and ZnO – J. Kwak (Dong-A University), W. Bae (Los Alamos National Laboratory), and C. Lee (Seoul National University)

- 3896 Optimizing the Synthesis of Europium Dibenzoylmethide Triethylammonium – K. Bhat, R. Fontenot (Alabama A&M University), W. A. Hollerman (University of Louisiana at Lafayette), and M. Aggarwal (Alabama A&M University)

- 3897 Comparison of Hydrothermal and Glycothermal Syntheses of YBO3:Ce3+,Tb3+ with Green Fluorescence under Near UV Excitation – H. Hara, S. Takeshita, T. Isobe (Keio University), T. Sawayama, and S. Niikura (SINOIHO Co., Ltd.)

- 3898 Practical Multiplet Energy Level Diagrams for V2+, Cr3+, Mn4+ in Oxides and in Fluorides – H. Nagoshi (Kwansei Gakuin University), H. Yoshida (Mitsubishi Chemical Group), and K. Ogawasara (Kwansei Gakuin University)

- 3899 The Influence of Phosphor Decay Time on the Cross-Talk in 3D-PDP – J. Yoo (Chung-Ang University), C. Ji (LG Electronics), G. Aanoop, I. Cho, S. Lee (Chung-Ang University), Y. Cho, W. Kim, and E. Park (LG Electronics)
• 3910 Synthesis of InP Multi-Shell Structured Quantum Dot and Their Application for White LEDs – K. Kim and S. Jeong (Korea Institute of Machinery and Materials)

• 3911 Improved Optical Properties of InP Quantum Dot Through Transition Metal Doping – J. No, K. Kim, and S. Jeong (Korea Institute of Machinery and Materials)

• 3912 Synthesis and Spectroscopy of Nanoscale Y$_2$O$_3$:Nd$^{3+}$ Phosphors – G. Bilir (Istanbul Technical University), G. Ozen (Istanbul Technical University), J. Collins (Wheelaton College), and B. Di Bartolo (Boston College)

• 3913 Preparation and Photoluminescence Property of Praseodymium doped Calcium Titanate Nanocrystals – Y. Hakuta (National Institute of Advanced Industrial Science and Technology (AIST)), M. Ohara, M. Aoki, K. Minami, K. Sue, and H. Takashima (AIST)

• 3914 Effects of Preparing Conditions on the Luminescent Properties of Mn$^{4+}$ Ion Doped CaAl$_2$O$_4$ Phosphors – J. Park, G. Kim, and Y. Kim (Kyonggi University)

• 3915 The Luminescent Properties of Eu$^{2+}$ Doped Ca$_5$SiO$_4$ Nanopowders Synthesized by a Sol-Gel Method – J. Park, J. Lee, and Y. Kim (Kyonggi University)

• 3916 3D Visualization of 4-Component Relativistic Wave Functions of the Free Ce$^{3+}$ Ion and the Ce$^{3+}$ Ion in YAG – T. Katakami, K. Higashitani, and K. Ogasawara (Kwansei Gakuin University)

• 3917 Low Electric Field Driving Transparent Thin Films Electroluminescence Devices with Perovskite Oxides – H. Takashima (National Institute of Advanced Industrial Science and Technology) and I. Mitsuru (Tokyo Institute of Technology)

• 3918 Luminescence study of Ca$_{3.01±0.09}$(VO$_4$)$_2$:xEu$^2+$ (0.01≤x≤0.09) Red-Phosphors Prepared by Solution Combustion Method – K. Kim, S. Yoon (Sejong University), Y. Shin (Ceramics), and K. Park (Sejong University)

• 3919 Microstructure and Photoluminescence Properties of Sr$_{2.91}$Y$_2$O$_3$:Eu$_{0.06}$ Phosphors Prepared by the Solution Combustion Method – K. Park, S. Yoon, K. Kim (Sejong University), and Y. Shin (Ceramics)

• 3920 Electroluminescence from Cr$^{3+}$ in New Perovskite Thin-Film Phosphors using LaAlO$_3$ and LaGaO$_3$ as the Host – T. Miyata, Y. Nishi, T. Mori, and T. Minami (Kanazawa Institute of Technology)

• 3921 Development of Novel Electrochromic Hyperbranched Polymer for Displays – S. Kim (Kumamoto University), A. Tanaka (Nissan Chemical Industries, Ltd.), and T. Nagamura (Kitakyushu National College of Technology (KCT))

• 3922 Electric and Electroluminescence Properties of Ca$_{0.9}$Sr$_{0.5}$TiO$_3$:Pr Thin Films Prepared by Sol-Gel Method – T. Kyomen, M. Hanaya (Gunma University), and H. Takashima (National Institute of Advanced Industrial Science and Technology)

• 3923 Optical Phonon Emission of ZnO Thin Films – S. Munsamy, S. Kasilingam (Nagoya Institute of Technology), T. Rajalingam (National Chiao Tung University), and T. Masaki (Nagoya Institute of Technology)

• 3924 Synthesis of Sr$_2$Si$_5$N$_2$:Eu$^{2+}$ Red-Emitting Phosphor by Induction Heating – J. Choi (University of California, San Diego), A. Piquette, M. Hannah, K. C. Mishra (Osmar Sylvania), J. B. Talbot, and J. McKittrick (University of California, San Diego)

• 3925 Morphology and Particle Size Dependent Luminescence Properties of Y$_2$O$_3$:Eu Phosphors Prepared by Various Synthetic Methods – Y. Kim, J. Han, J. Talbot, and J. McKittrick (University of California, San Diego)

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**J3 – Poster Session – 18:00 – 20:00**

• 3972 Bandgap Estimates and Ce$^{3+}$ Quenching in Ca$_5$CoCl$_3$-based Phosphors – U. Happek (University of Georgia) and A. Setlur (GE Global Research)

• 3973 Single Phase, Highly Efficient Li[Ca$_{0.99}$,Sr$_{0.01}$]PO$_4$ Blue Emitting Phosphors for Near UV-Emitting LEDs – J. Han (University of California, San Diego), M. Hannah, A. Piquette (Osmar Sylvania), J. Talbot (University of California, San Diego), K. C. Mishra (Osmar Sylvania), and J. Mckittrick (University of California, San Diego)

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**Materials for Solid State Lighting**

**Oxide and Oxynitrides – 08:00 – 09:40**

Co-Chairs: Kyota Ueda and John Collins


- 08:40 3970 Synthesis and Luminescence of Eu$^{2+}$ Activated Yellow Oxynitride Phosphor – P. Nammalwar, S. Manepalli, D. Porob (GE ITC Pvt Ltd), Y. Gao, and A. Setlur (GE Global Research Niskayuna)

- 09:00 3971 Sr-Containing Sialon Phosphors with High Quantum Efficiencies for White LEDs – Y. Fukuda, K. Albeassrd, A. Okada, T. Sato, R. Hiramatu, and N. Matsuda (Toshiba Corporation)

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**Oxide Materials – 09:40 – 10:40**

Co-Chairs: Naotoshi Matsuda and Kailash Mishra

- 09:40 3972 Bandgap Estimates and Ce$^{3+}$ Quenching in Ca$_5$CoCl$_3$-based Phosphors – U. Happek (University of Georgia) and A. Setlur (GE Global Research Niskayuna)

- 10:00 3973 Single Phase, Highly Efficient Li[Ca$_{0.99}$,Sr$_{0.01}$]PO$_4$ Blue Emitting Phosphors for Near UV-Emitting LEDs – J. Han (University of California, San Diego), M. Hannah, A. Piquette (Osmar Sylvania), J. Talbot (University of California, San Diego), K. C. Mishra (Osmar Sylvania), and J. Mckittrick (University of California, San Diego)

- 10:20 3974 Luminescence Quenching in Highly Doped YAG:Ce – A. Setlur (GE Global Research), M. Pasricha, M. Perera, G. Levitt, and U. O. Happek (The University of Georgia)

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**Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center**

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**J3 – Poster Session – 18:00 – 20:00**

• 3975 Enhancement of Photoluminescence Properties of Green-Emitting Oxynitride Phosphor using Eu$_2$O$_3$@B$_2$O$_3$ Core-Shell for White LED Applications – D. Yoon (SungKyunKwan University)
• 3976 Silica-Overcoated Copper-Indium-Sulfide Quantum Dot-Polymer Composite Plate as a Robust Wavelength Converter of White Light-Emitting Diode – W. Song, E. Jang, and H. Yang (Hongik University)

• 3977 Tunable Green-Red-Emitting Ca_{9.5}Mg_{0.5}SiO_{12}:Eu^{2+},Mn^{2+} Phosphor: the Structural and Optical Properties, and Their Application to Near-UV LED-based White LEDs – K. Lee and W. Im (Chonnam National University)

• 3978 The Formation of the Hexagonal Pyramid Facets on Wet Etching Patterned Sapphire Substrate – Y. Chen (Nation Chiao Tung University), F. Hsiao, and Y. Wu (National Chiao Tung University)

• 3979 High Brightness III–V Light-Emitting Diodes on Diamond/Silicon Composite Substrate – T. Chang, J. Hu (Nation Chiao Tung University), Y. Wu, and B. Lin (National Chiao Tung University)

• 3980 Organic Light-Emitting Diodes with Contact-Printed Red Emissive Layer – S. Peng, J. Jou, S. Chen, and P. Wu (National Tsing Hua University)

• 3981 Color Tuning of Red-Emission Eu_{0.5}Ba_{0.5}Si_{0}O_{2}N_{2} Phosphors for White-Light-Emitting Diode – K. Park, K. Seo, J. Kim (Pukyong National University), T. Kim (Lumimicro Co., LTD), and G. Kim (Korea University of Technology and Education)

• 3982 Blue Excitability of Yellow Zn_{1-x}Mn_{x}S Phosphor and It’s LED Application – K. Park, K. Seo, H. Lim, J. Kim (Pukyong National University), T. Kim (Lumimicro Co., LTD), and G. Kim (Korea University of Technology and Education)

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