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 Intermission (20 Minutes)

10:00 **254** Fabrication of Hollow Spheres with Ordered Porous Structures by Anodizaiton of Small Metal Particles – T. Yanagishita, 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 MnO_2/CNT MEA Ultracapacitors – S. Raina, S. Hsu, W. Kang, and J. Huang (Vanderbilt University)

11:20 **258** Formation of a Vertically Oriented Anodic TiO_2 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 Ag_2ZnSnS_4 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)

15:20 **264** Adhesion Energy and Etching-Free Renewable Transfer of Graphene As-Grown on Copper – T. Yoon, W. Shin, T. Kim, J. Mun, B. Cho, and T. Kim (KAIST)

15:40 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)

16:20 **266** Low Temperature Synthesis of Nanoscaled Carbon Thin Films by Chemical Vapor Deposition Using Solid Carbon Source – S. Vijapur, D. Wang, and G. G. Botte (Ohio University)

16:40 **267** Deterministic Placement of Doping Atoms on Silanol Surfaces – L. Mathey, L. Veyre (CNRS), H. Fontaine, V. Enyedi, K. Yckache, J. Guerrero, F. Martin, J. Barnes, F. Bertin (CEA-LETI), C. Thieuleux, and C. Copéret (CNRS)

17:00 **268** Optimization of Electrochromic Materials by Molecular Design: The Naphthalenediimide-Functionalized EDOT – R. Ruffo, M. Sassi, M. M. Salamone, and L. Beverina (University of Milano Bicocca)

B1 Batteries and Energy Technology Joint General Session – In Honor of James McBreen

Battery / Energy Technology

Coral 1, Mid-Pacific Conference Center, Hilton Hawaiian Village

Emerging Battery Technologies – 08:00 – 12:20
Co-Chairs: A. Manivannan and P. Kumta

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. Ichitsubo, 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 ^{63}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. Hosoi, 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)

Coral 2, Mid-Pacific Conference Center, Hilton Hawaiian Village

Aqueous Battery – 08:00 – 12:20
Co-Chairs: S. Narayan and Y. Meng

08:00 **365** Barium Hydroxide and the Rechargeable Performance of the Alkaline γ-MnO_2 Electrode – M. R. Bailey and S. W. Donne (University of Newcastle)

08:20 **366** **Optimizing Heat Treatment Environment and** Atmosphere of Electrolytic Manganese Dioxide for Primary Li/MnO_2 Batteries – W. M. Dose and S. W. Donne (University of Newcastle)

08:40 **367** Current Collectors for Secondary Zinc Electrodes – P. J. Bonnick and J. Dahn (Dalhousie University)

09:00 **368** Comparison of Pocket Plate and Sintered Plate Ni Electrodes Used in NiFe Cells for PV Back up Applications – I. Mabbett, J. Malone, and D. A. Worsley (Swansea University)

09:20 **369** Development of a Zinc-Based Battery System for Grid-Scale Energy Storage and Application of Flexographic Printing for the Fabrication – Z. Wang, R. Winslow, B. Kim, J. W. Evans, and P. K. Wright (University of California at Berkeley)

09:40 Intermission (20 Minutes)

10:00 **370** Effect of Substitution of Cobalt by Manganese on the Properties of Calcium-Doped Lanthanum Cobalt Oxide for Oxygen Evolution Reaction in Alkaline Medium – P. Trinh, S. Malkhandi, N. Moreno, A. Manohar, G. Prakash, S. Narayanan (University of Southern California), and A. Manivannan (U.S. Department of Energy)

10:20 **371** Mechanism of Formation of Carbonyl Iron Electrodes in Alkaline Batteries – A. Manohar, C. Yang, S. Malkhandi, B. Yang, G. Prakash, and S. Narayanan (University of Southern California)

10:40 **372** Exploring the Role of Ionic Interfaces of the High Voltage Lead Acid-Metal Hydride Hybrid Battery – G. Weng, C. V. Li, and K. Chan (The University of Hong Kong)

11:00 **373** Zinc Electrodeposition in Zinc-Nickel Flow-Assisted Batteries – X. Wei, A. Couzis, and S. Banerjee (The City College of New York)

11:20 **374** Modeling and Simulation of an Aqueous Li-Ion Battery with a Complex Electrolyte – A. Yermukhambetova, J. H. Pu, and Z. Bakenov (Nazarbayev University)

11:40 **375** A High Voltage Grid-Tied Stationary Energy Storage Demonstration Based on The Aqueous Hybrid Ion Battery System – J. F. Whitacre (Carnegie Mellon University), S. Shanbhag, D. Blackwood, W. Campbell, W. Yang, J. Gulakowski (Aquion Energy), A. Mohamed (Carnegie Mellon University), M. Sibenac, J. Weber, and T. Wiley (Aquion Energy)

12:00 **376** Elucidating Failure Mechanisms in the Soluble Lead- Acid Flow Battery – Formation of PbO_2 at the Cathode – M. Verde, K. Carroll, D. Keogh, A. Sathrum (University of California, San Diego), and Y. Meng (University of California San Diego)

Coral 5, Mid-Pacific Conference Center, Hilton Hawaiian Village

Li Battery Cathodes – 10:00 – 12:20
Co-Chairs: H. Arai and Manickam Minakshi

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)

10:20 **378** Nanostructured CFx Provides Breakthrough in Performance of Li-CFx Cells – D. Meshri (Advance Research Chemicals, Inc.), E. Shembel (Enerize Corporation), S. Meshri, N. C. Mathur, R. Adams (Advance Research Chemicals, Inc.), V. Redko, T. Pastushkin (Enerize Corporation), I. Maksyuta, A. Markevich, L. Neduzko (Ukrainian State Chemical Technology University), V. Mitkin, and L. Levchenko (Russian Academy of Sciences)

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 $LiNi_{0.66}Co_{0.17}Mn_{0.17}O_2$ Cathode for Lithium-Ion Batteries – C. Venkateswara Rao, J. Shojan, and R. Katiyar (University of Puerto Rico)

11:20 **381** Olivine type $LiMn_{1/3}Co_{1/3}Ni_{1/3}PO_4$ 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 $LiMn_2O_4$ Cathode Material – M. Reddy, M. Prabu (National University of Singapore), S. Selvasekarapandian (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)

Coral 1, Mid-Pacific Conference Center, Hilton Hawaiian Village

Supercapacitor – 14:00 – 17:00
Co-Chairs: A. Manivannan and Christina M. Johnston

14:00 **384** Advanced Proton Conducting Membrane for Solid Electrochemical Capacitors – H. Gao and K. Lian (University of Toronto)

14:20 **385** Nanostructured Transition Metal Nitride Supercapacitors: Effects of Composition, Structure, and Electronic Properties on Supercapacitor Response – P. Jampani Hanumantha (University of Pittsburgh), A. Manivannan (U.S. Department of Energy), and P. N. Kumta (University of Pittsburgh)

14:40 **386** Influence of Chemical Composition of the Electrolyte and Room-Temperature Ionic Liquids on the Electrical Double Layer Structure and Supercapacitor Characteristics – E. Lust, H. Kurig, A. Laheäär, I. Tallo, V. Ivaništšev, L. Siinor, C. Siimenson, A. Jänes, T. Thomberg, K. Lust, and J. Eskusson (University of Tartu)

15:00 **387** Carbon /MnO_2 Core-Shell Nanofibers for Supercapacitors – M. Zhi (West Virginia University), A. Manivannan, F. Meng (U.S. Department of Energy), and N. Wu (West Virginia University)

15:20 **388** Distortion of Solvated Structures by Microporous Structures of Carbon Materials – N. Ide, J. Nishioka, K. Urita, H. Furukawa, H. Yamada, and I. Moriguchi (Nagasaki University)

15:40 Intermission (20 Minutes)

16:00 **389** Bio-Enabled, Nanostructured Electrodes for Electrochemical Energy Storage Devices – M. Song and M. Liu (Georgia Institute of Technology)

16:20 **390** Polymorphic Behavior and Morphology of Electrospun Poly(Vinylidene Fluoride) Separator Materials for Non-Aqueous Based Electric Double Layer Capacitors – K. Tõnurist, T. Thomberg, T. Romann, A. Jänes, and E. Lust (University of Tartu)

16:40 **391** Conducting Polymers Based on Natural Membranes and Eu^{3+} – R. Leones (University of Minho), M. Fernandes (University of Trás-os-Montes e Alto Douro), R. A. Ferreira (Universidade de Aveiro), F. Sentanin, A. Pawlicka (Universidade de São Paulo), L. D. Carlos (Universidade de Aveiro), V. De Zea Bermudez (University of Trás-os-Montes e Alto Douro), and M. M. Silva (Universidade do Minho)

Coral 2, Mid-Pacific Conference Center, Hilton Hawaiian Village

Flow Battery Cell – 14:00 – 17:40
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)

14:20 **393** Recent Progress in Redox Flow Battery Research and Development at Pacific Northwest National Lab – W. Wang, Q. Luo, Z. Nie, M. Vijayakumar, X. Wei, B. Li, F. Chen, B. Chen, Y. Shao, G. Xia, L. Li, and Z. Yang (Pacific Northwest National Laboratory)

14:40 **394** New Discharge/Charge Performance Data for a H_2-Br_2 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)

15:20 **396** Grid-Scale Energy Storage Requirements and the Potential for Halogen-Based Flow Batteries – J. Rugolo, B. Huskinson, 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)

16:40 **399** Characterization of Vanadium Redox Flow Batteries: An AC Impedance Spectroscopy Study – C. Sun (Oak Ridge National Laboratory), D. S. Aaron (The University of Tennessee Knoxville), A. Papandrew, and T. A. Zawodzinski Jr. (The University of Tennessee)

17:00 **400** Performance Enhancement, Limitations, and Diagnostics of Vanadium Redox Flow Batteries – J. T. Clement, A. M. Pezeshki, Q. Liu, A. B. Papandrew, A. Turhan, T. A. Zawodzinski Jr., and M. M. Mench (The University of Tennessee)

17:20 **401** Coulombic Efficiency of a Vanadium Redox Flow Cell – X. Gao, R. Lynch, M. Leahy (University of Limerick), and D. Buckley (Materials & Surface Science Institute, University of Limerick)

B2 Electrochemical Capacitors

Battery / Physical and Analytical Electrochemistry
South Pacific 4, Mid-Pacific Conference Center, Hilton Hawaiian Village

Carbon I – 08:00 – 09:40
Co-Chairs: N. L. Wu and S. Donne

08:00 **501** Electrochemical Characteristics and Application of Linear Carbon for Electrochemical Capacitors – S. Park (Chungbuk National University), J. Yang (Chunghuk National University), H. Kim, and H. Kimm (PureEchem Co. Ltd.)

08:40 **502** Chemical Modification of Carbons with Quinones by the Diazonium Chemistry for Application in Electrochemical Capacitors – M. Weissmann, A. Le Comte, G. Pognon, C. Cougnon (Université du Québec à Montréal), T. Brousse (University of Nantes), and D. Bélanger (Université du Québec à Montréal)

09:00 **503** Nitrogen Doped Graphene a High Efficient Electrode for Next Generation Supercapacitors – A. Yu, F. M. Hassan, Z. Chen, and V. Chabot (University of Waterloo)

09:20 **504** Fine-Tuning the Carbon – Electrolyte Interface for Designing High Energy Density Double Layer Capacitors – P. Simon, B. Daffos, R. Lin, P. Taberna (Université Paul Sabatier), and Y. Gogotsi (Drexel University)

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. Lota (Poznan University of Technology), G. Gao, L. Demarconnay, E. Raymundo (CRMD 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. Matsushita, and S. Kawasaki (Nagoya Institute of Technology)

10:40 **507** Three Dimentional 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)

11:20 **509** First Principles-Inspired Design Strategies for Carbon Aerogel Supercapacitors – B. C. Wood, T. Ogitsu, J. Lee (Lawrence Livermore National Laboratory), M. Otani (National Institute of Advanced Industrial Science and Technology), T. Baumann, M. Stadermann, M. A. Worsley, A. Wittstock, M. Merrill, and J. Biener (Lawrence Livermore National Laboratory)

11:40 **510** Temperature effects in Activated Carbon Supercapacitors – 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. Lota (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)

15:20 **514** Influence of the Organic Solvent Additives on the Properties of 1-Ethyl-3-Methylimidazolium Tetrafluoroborate as Supercapacitor Electrolyte – R. Palm, H. Kurig, A. Jänes, and E. Lust (University of Tartu)

B4 Intercalation Compounds for Rechargeable Batteries

Battery
South Pacific 2, Mid-Pacific Conference Center, Hilton Hawaiian Village

Advanced Characterization – 08:20 – 12:20
Co-Chairs: Nina Balke and Jordi Cabana

08:20 **634** High Resolution Chemical Imaging of Phase Transformations during Intercalation Reactions – J. Cabana (Lawrence Berkeley National Laboratory)

09:00 **635** Time Resolved XRD and XAFS Study on Phase Transition Dynamics in Li_xFePO_4 – Y. Orikasa, T. Maeda, Y. Koyama, H. Murayama, H. Tanida, H. Arai, E. Matsubara, Y. Uchimoto, and Z. Ogumi (Kyoto University)

09:20 **636** Scanning Near-Field Infrared Microscopy of a $LixFePO_4$ Single Particle – I. T. Lucas (Lawrence Berkeley National Laboratory), J. S. Syzdek (Lawerence Berkeley National Laboratory), S. F. Lux, N. S. Norberg, A. S. McLeod (Lawrence Berkeley National Laboratory), Z. Fei, D. N. Basov (University of California), and R. M. Kostecki (Lawrence Berkeley National Laboratory)

09:40 Intermission (20 Minutes)

10:00 **637** Nanoscale Single Crystal Electrochemistry as a Diagnostic Tool for Li-Ion Batteries – J. S. Syzdek (Lawerence 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)

10:40 **639** *In Situ* TEM Studies of Capacity Fading Mechanisms of Nano-Structured Anode and Cathode for Lithium-Ion Battery – C. Wang, M. Gu, Z. Wang, X. Li, S. Hu, W. Xu, F. Gao, J. Liu, J. Zhang, S. Thevuthasan, and D. Baer (Pacific Northwest 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)

11:20 **641** Interest of Auger Electron Spectroscopy to Study Silicon Electrodes Used in Li-Ion Batteries – E. Radvanyi, E. De Vito, W. Porcher, and S. Jouanneau (CEA/LITEN)

11:40 **642** Local Probing of Activation Energy of Ionic Transport in Cathode Materials for Li-Ion Batteries – N. Balke, S. Kalnaus, S. Jesse, N. J. Dudney, C. Daniel, and S. Kalinin (Oak Ridge National Laboratory)

12:00 **643** Use of *In Situ* XAS to Elucidate Surface Structural Changes and Capacity Loss during Electrochemical Cycling of nanoscale $LiCoO_2$ – 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 $A_xM_y(SO_4)_z.xH_2O$ (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 ($LiMBO_3$; M= Fe, Mn, Co) Cathode Systems: Synthetic 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 $Li_2(Mn_yFe_{1-y})P_2O_7$ – 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 $LiMgSO_4F$ – 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 $LiFePO_4$ 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 $LiFePO_4$ and $LiMnPO_4$ – S. Chung (Korea Advanced Institute of Science & Technology) and S. Choi (Korea Institute of Materials Science)

B5 Interfaces and Interphases in Battery Systems

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)

08:40 **733** *In Situ* Neutron Reflectometry Analysis of $Li_4Ti_5O_{12}$/Electrolyte Interface Using Two-Dimensional Model Electrode – M. Hirayama, K. Suzuki, K. Kim, S. Taminato, R. Kanno (Tokyo Institute of Technology), N. Yamada, and M. Yonemura (High Energy Accelerator Research Organization)

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

09:20 **735** Time-Dependent Determination of HF Formation in $LiPF_6$-Containing Electrolytes by Spectroscopic Ellipsometry – S. F. Lux, I. T. Lucas, J. Chevalier, T. J. Richardson, and R. M. Kostecki (Lawrence Berkeley National Laboratory)

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. Jeong, H. Song (Soonchunhyang 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 $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ 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 $LiCoO_2$ 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. Ichitsubo, 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. Tavassol, B. R. Long, J. W. Buthker, and L. Huff (University of Illinois)

14:40 **742** Porous Silicon Impregnated Carbon Nano-Spheres 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 (Soonchunhyang 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 Intermission (20 Minutes)

16:00 **745** 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 **746** 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 **747** *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 $Li_7La_3Zr_2O_{12}/LiCoO_2$ 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)
- **750** Enhanced Electrochemical Properties of $Li_4Ti_5O_{12}$ Epitaxial Thin Film Electrode with Surface Modification – K. Kim, K. Suzuki, S. Taminato (Tokyo Institute of Technology), K. Tamura, J. Mizuki (Japan Atomic Energy Agency), J. Son (Japan Synchrotron Radiation Research Institute), M. Hirayama, and R. Kanno (Tokyo Institute of Technology)
- **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 if 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 Li_3PO_4/Li_2RuO_3 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. Bose (The University of Rhode Island), W. Euler (University of Rhode Island), and P. R. Guduru (Brown University)
- **755** Capacity Fading Mechanism of Graphite Negative-Electrodes in Electrolytes Containing Trialkyl Phosphates – H. Nakagawa, M. Ochida, S. Tsubouchi, Y. Domi, T. Yamanaka, T. Doi, T. Abe, and Z. Ogumi (Kyoto 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), T. Okumura (National Institute of Advanced Industrial Science and Technology (AIST)), T. Nakatsutsumi, Y. Orikasa, H. Arai (Kyoto University), Y. Iriyma (Shizuoka University), T. Uruga (Japan Synchrotron Radiation Research Institute), H. Tanida, Z. Ogumi, and Y. Uchimoto (Kyoto University)

B6 Lithium-Ion Batteries

Battery / Energy Technology
Coral 3, Mid-Pacific Conference Center, Hilton Hawaiian Village

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 $0.5Li_2MnO_3$•$0.5LiMO_2$ (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 xLi_2MnO_3·(1-x) $LiMO_2$ 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 $Li_{1.2}Ni_{0.15}Co_{0.1}Mn_{0.55}O_2$ 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 $Li_{1.20}Ni_{0.16}Mn_{0.56}Co_{0.8}O_2$ and $Li_{1.17}Ni_{0.25}Mn_{0.58}O_2$ – J. Camardese, R. Shunmugasundaram, and J. Dahn (Dalhousie 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)

08:20 **810** Nanocrystalline Solid Electrolyte: β-Li_3PS_4 – Z. Liu, W. Fu, Z. Lin, N. J. Dudney, E. Payzant, and C. Liang (Oak Ridge National Laboratory)

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 $LiBH_4$-LiI Solid Solution – D. Sveinbjornsson, 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 $LaMeO_3$ as Stabilizer Phase in $0.5[Li_{0.33}Mn_{0.67}]O_2$•$0.5Li[Ni_{0.33}Co_{0.33}Mn_{0.33}]O_2$ 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 $Li[Li_{1/3}Mn_{2/3}]O_2$-$LiMO_2$ 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 $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$-$LiMn_2O_4$ Cathodes for Li-ion Batteries – L. Liu, A. Drews, and R. Kudla (Ford Motor Company)

11:00 **817** Optimizing $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ Capacity by Controlling Cathode Porosity through Calendaring – 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 (Calfornia Institute of Technology)

11:40 **819** Structure Studies of Reaction Mechanism for Surface-Modified $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ Epitaxial Thin-Film Electrode – M. Abe (Toyota Motor Corporation), K. Suzuki, H. Minamishima, M. Hirayama, R. Kanno (Tokyo Institute of Technology), K. Tamura, and J. Mizuki (Japan Atomic Energy Agency)

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)

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

Lithium-Ion Batteries: Electrolytes I – 10:00 – 12:20
Co-Chairs: Marshall Smart and Brett Lucht

10:00 **821** Electrochemical Intercalation of Lithium-Ion in Propylene Carbonate Based Electrolytes — Effect of Addition of Bivalent-Ions — – S. Takeuchi, F. Sagane, K. Miyazaki, T. Fukutsuka, and T. Abe (Kyoto University)

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-Bruer (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 $LiNi_{0.5}Mn_{1.5-x}TixO_4$ Cathode – T. Noguchi, M. Uehara, Y. Katoh, H. Sasaki, and K. Utsugi (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: Cathodes II (Lithium NMC-Based Systems) – 14:00 – 15:40
Co-Chairs: Doron Aurbach and Jun Liu

14:00 **828** (ECS Battery Division Technology Award Presentation) Case Studies in Developing Battery Technologies – Y. Chiang (Massachusetts Institute of Technology)

14:40 **829** Relaxation Phase Analysis for Li inserted Li-Mn-O Cathode Material – I. Seo, S. Park, and T. Yao (Kyoto University)

15:00 **830** Study on the Transport Properties of $LiNi_{0.8}Co_{0.15}Al_{0.05}O_2/LiMn_2O_4$ Blends with Different Compositions – H. Tran, C. Taeubert (Zentrum für Sonnenenergie und Wasserstoff-Forschung BW (ZSW)), and M. Wohlfahrt-Mehrens (ZSW-Center for Solar Energy and Hydrogen Research)

15:20 **831** Structural Modification and Electrochemical Characteristics of Co-substituted Hollandite-type Manganese Oxides using a Hydrothermal Method – Y. Kadoma, H. Watanabe, K. Ui, and N. Kumagai (Iwate University)

Coral 4, 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)

14:40 **834** Intensive Dry and Wet Mixing Enhancing the Electrochemical Performance of Secondary Lithium-Ion Battery Electrodes – H. Bockholt, L. Kleinfeldt, W. Haselrieder, and A. Kwade (TU Braunschweig)

15:00 **835** Structure, Disorder, and Crystallization; Lessons Learned from Analysis of Lithium Triflurormethanesulfonate – M. P. Foley (U.S. Naval Academy), C. Worosz, 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)

15:20 **836** Synthesis and Characterization of Ionic Liquid for Lithium-Ion Batteries – X. Sun, C. Liao, and S. Dai (Oak Ridge National Laboratory)

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 $LiCoO_2$ 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 $LiNi_{0.5}Mn_{1.5}O_4$ – 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 $LiNi_2O_4$ – 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 (Univeristy of Louisville), and M. K. Sunkara (University of Louisville)

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

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. Bettge, and Y. Zhu (Argonne National Laboratory)

16:20 **843** Electrochemical Characterization of Semi-Solid Li-Ion Electrodes – N. Baram, W. Carter, and Y. Chiang (MIT)

16:40 **844** Influence of Anode/Cathode Balancing on Cycling Stability of Lithium Ion Cells – M. D. Wilka, A. Hoffmann, R. Stern (Center for Solar Energy and Hydrogen Research), and M. Wohlfahrt-Mehrens (ZSW-Center for Solar Energy and Hydrogen Research)

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)

B7 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-O_2 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)

09:20 **1116** The Effects of Electrolyte Salts on the Performance of Li-Air Batteries – E. Nasybulin, W. Xu, M. H. Engelhard, Z. Nie, J. Hu, J. Xiao, M. Gross, and J. Zhang (Pacific Northwest National Laboratory)

09:40 Intermission (20 Minutes)

10:00 **1117** (Invited) A Reversible Lithium-Air Battery with Low Charge Polarization using Ether-Based Electrolytes – K. Amine (Argonne National Laboratory), J. Lu (Argonne National Lab), H. Jung (Hanyang University), K. C. Lau, Z. Zhang, J. Schlueter, P. Du, R. Assary, J. Greeley, G. Ferguson, H. Wang (Argonne National Laboratory), J. Hassoun (University of Rome Sapienza), H. Iddir (Argonne National Laboratory), Y. Sun, B. Scrosati (Hanyang University), and L. A. Curtiss (Argonne National Laboratory)

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-O_2 Cell – G. M. Veith, J. Nanda, and N. J. Dudney (Oak Ridge National Laboratory)

11:20 **1120** Stability of Pyr_{14}TFSI Ionic Liquid in Li-O_2 Cells and Its effect on the Cycling Behavior – M. Piana, N. Tsiouvaras, 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

13:20 **1122** (Invited) Investigation of ORR and OER in Non-Aqueous (and Aqueous) Li-O_2 Cells Using Metal Oxide Catalysts – B. D. Adams, S. Oh, R. W. Black, A. Baran- Harper, and L. F. Nazar (University of Waterloo)

14:00 **1123** Metal Nitrides as Alternative Catalyst for Air Cathodes – C. Pozo-Gonzalo, A. A. Torriero, 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)

14:40 **1125** Highly Performance and Stable Core-corona Bifunctional Catalyst for Rechargeable Metal-air Batteries – Z. Chen, Z. Chen, D. Higgins, and A. Yu (University of Waterloo)

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

15:20 **1126** Graphene-Metal Oxide Catalysts for Li-O_2 Batteries – R. W. Black, J. Lee, B. D. Adams, A. Baran- Harper, and L. F. Nazar (University of Waterloo)

15:40 **1127** The effect of the Surface Area of $LaNiO_3$ Support on the Oxygen Reduction/Evolution Activity of Air Electrode for Rechargeable Metal-Air Batteries – M. Yuasa, H. Imamura, T. Kida, and K. Shimanoe (Kyushu University)

16:00 **1128** Graphene/Metal Oxide Catalyst Based High Capacity Cathode for Li-O_2 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 Dycyanamide 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)
- **1132** Carbon Air Electrodes for Alkaline Aqueous Electrolyte Lithium/Air Secondary Batteries – H. Ohkuma, I. Uechi, N. Imanishi, Y. Takeda, and O. Yamamoto (Mie University)
- **1133** Microwave-Assistanted Synthesis of Ag-MnO_2/SWNT Electrocatalyst for Metal-Air Cells – G. Zhang and Y. Jiang (Yangtze Normal University)
- **1134** Carbon Sphere Dotted with Co_3O_4 and RuO_2 Nano Particles for Rechargeable Li/Air Batteries – C. Park and Y. Park (Kyonggi University)
- **1135** Synthesis and Properties of Garnet-Type $Li_{7-x-y}La_3Zr_{2-y}Nb_yO_{12-0.5x}$ – K. Ishiguro, Y. Nakata, N. Imanishi, A. Hirano, Y. Takeda, and O. Yamamoto (Mie University)
- **1136** Air Electrode with Oxide 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 Urchin-Like MnO_2 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 $Li_{1.4}Ti_{1.6}Al_{0.4}(PO_4)_3$ 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. Hwang, J. Choi, and K. Nahm (Chonbuk National University)
- **1142** An Effort to Understand the Basic Characteristics of Hybrid Li-air Cell Performance – D. Yoon, K. 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/O_2 Batteries – C. Ahn, R. S. Kalubarme, and C. Park (Chonnam National University)
- **1145** Effects of Nb_2O_5 Addition on the Electrochemical Properties of $Li_{1.5}Al_{0.5}Ge_{1.5}P_3O_{12}$ Glass Ceramic for Li-Air Batteries – T. Kim, R. S. Kalubarme, and C. Park (Chonnam National University)
- **1146** Rechargeable Li/O_2 Cell Based on a LiTFSI-DMMP/PFSA-Li Composite Electrolyte – H. Wang (Shanghai Jiao Tong University), X. Liao (Shanghai Jiaotong University), L. Li, and Z. Ma (Shanghai Jiao Tong University)
- **1147** MnO_2-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)
- **1148** Multifunctional Carbon Nanoarchitectures as Air-Breathing Cathodes for Rechargeable Zn-Air and Li-Air Batteries – C. N. Chervin, J. W. Long, M. J. Wattendorf, N. W. Kucko, and D. R. Rolison (U.S. Naval Research Laboratory)
- **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, C. Chung (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. Hsieh (Institute of Nuclear Energy Research)
- **1152** Manganese Oxide Nanosheets: Applications in High Energy Density Zn-Air Batteries – Y. Korenblit (Ulsan National Institute of Science & Technology), G. Yushin (Georgia Institute of Technology), and J. Cho (Ulsan National Institute of Science & Technology)

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. Bieker, T. Placke, O. Fromm, H. Meyer (University of Münster), P. Isken, A. Lex-Balducci, 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. Ardebili (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)

15:20 **1213** Cycle Performance of Lithium-Ion Batteries Containing Ionic Liquids with Improved Reduction Stability – T. Itakura, K. Ito, R. Yokoi, J. Ishikawa, H. Inoue, H. Kadoma, J. Momo, T. Moriwaka, K. Nanba, M. Takahashi, and S. Yamazaki (Semiconductor Energy Laboratory Co., Ltd.)

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. Forgie, 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. Nishikoori, 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)

17:20 **1218** Compatibility of Room Temperature Ionic Liquid Electrolytes with Sulfur Cathode for Lithium Secondary Batteries – J. Park, N. Tachikawa, K. Ueno, K. Dokko, and M. Watanabe (Yokohama National University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

B8 – Poster Sesison – 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)

- **1220** Application of Nonflammable Gel Electrolytes Containing Fluorinated Alkylphosphates to Lithium-Ion Batteries – N. Yoshimoto, Y. Abiru, M. Egashira (Yamaguchi University), M. Aoki, H. Mimura, H. Eguchi (TOSOH F-TECH, Inc.), and M. Morita (Yamaguchi University)
- **1221** Ion Transport Behavior in Polymerized Imidazolium Ionic Liquids – J. Lee, M. Kim, J. Lee, S. Hong, and C. Koo (Korea Institute of Science and Technology)
- **1222** Highly Stable Cycling of Si-C Composite Anode for Lithium-Ion Batteries by Using FSI-Based Ionic Liquid – K. Koga (Kansai University), T. Sugimoto, M. Kikuta (Dai-ichi Kogyo Seiyaku Co., Ltd.), T. Higashizaki, M. Kono (Elexcel Co., Ltd.), M. Yamagata, and M. Ishikawa (Kansai University)

B9 Polymer Electrolyte Fuel Cells 12 (PEFC 12)

Energy Technology / Corrosion / Physical and Analytical Electrochemistry / Battery / Industrial Electrochemistry and Electrochemical Engineering

Tapa 1, Tapa Conference Center, Hilton Hawaiian Village

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. Djilali (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)

10:20 **1286** Diffusive – Kinetic Evaporation Models for Fuel Cells – E. Medici, D. Frtiz, and J. S. Alllen (Michigan Technological University)

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)

Tapa 3, Tapa Conference Center, Hilton Hawaiian Village

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)

08:20 **1292** Characterizing Leachant Contaminants from Fuel Cell Assembly Aids, a Prelude to Effects on Performance – C. S. Macomber, J. Christ, H. Wang, B. S. Pivovar, and H. N. Dinh (National Renewable Energy Laboratory)

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 Electrocatalysts 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. Baturina (Naval Research Laboratory), P. Northrup (Stony Brook University), and K. Swider-Lyons (Naval Research Laboratory)

11:20 **1300** Effect of Cationic Contaminants on PEM Fuel Cell Performance – J. Qi, X. Wang, U. Pasaogullari, L. Bonville, and T. Molter (University of Connecticut)

11:40 **1301** The Impact of Low Levels of NH_3 in an Operating Polymer Electrolyte Fuel Cell as the Platinum Loading/Ionomer is Varied – T. Rockward, C. Quesada, K. C. Rau, and F. H. Garzon (Los Alamos National Laboratory)

Honlulu 2, Tapa Conference Center, Hilton Hawaiian Village

C-1.1 Perfluorosulfonic Acid Membranes 1 – 08:00 – 12:00
Co-Chairs: Mark Edmundson and Deborah Jones

08:00 **1302** Advances in Proton Exchange Membrane Technology – S. Banerjee, D. Prugh, and S. Frisk (DuPont Company)

08:40 **1303** Nanofiber Composite Membranes Using Low EW PFSA – J. Ballengee and P. Pintauro (Vanderbilt University)

09:00 **1304** Novel System for Characterizing Electro-Osmotic Drag Coefficient of Proton Exchange Membranes – H. Xu, J. Ma, and C. Mittelsteadt (Giner Inc.)

09:20 **1305** Mechanism of Perfluorsulfonic Acid Membrane Chemical Degradation Under Low RH Conditions – F. D. Coms (General Motors Company), H. Xu, T. McCallum, and C. Mittelsteadt (Giner Inc.)

09:40 Intermission (20 Minutes)

10:00 **1306** Challenges to High-Volume Production of Fuel Cell Materials: Quality Control – M. Ulsh (National Renewable Energy Laboratory), B. Sopori, N. Aieta (NREL), and G. Bender (National Renewable Energy Laboratory)

10:40 **1307** 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 **1308** Nafion Polymer Backbone Degradation Mechanism in PEM Fuel Cell from Quantum Mechanics Calculations – T. Yu, Y. Sha, W. Liu, B. V. Merinov (California Institute of Technology), P. Shirvanian (Ford Motor Co.), and W. Goddard III (California Institute of Technology)

11:20 **1309** 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 **1310** Investigation of PEM Degradation Kinetics and Degradation Mitigation Using *In Situ* Fluorescence Spectroscopy and Real-Time Monitoring of Fluoride-Ion Release – V. Prabhakaran, C. G. Arges, and V. Ramani (Illinois Institute of Technology)

Tapa 2, Tapa Conference Center, Hilton Hawaiian Village

D-1.1 Durability of Pt-Based Cathodes 1 – 08:00 – 12:00
Co-Chairs: David A. Muller and Yu Morimoto

08:00 **1311** Imaging Catalyst Degradation at the Atomic Scale – D. A. Muller, Y. Yu, H. Xin, D. Wang, and H. D. Abruña (Cornell University)

08:40 **1312** 3-D Tracking and Visualization of Hundreds of Fuel Cell Nanocatalysts during Electrochemical Aging – Y. Yu, H. Xin, R. Hovden, D. Wang, J. Mundy, D. A. Muller, and H. D. Abruña (Cornell University)

09:00 **1313** Correlating Catalyst and Catalyst-Support Structures with Observed Degradation in PEM Fuel Cell – K. L. More, D. A. Cullen, J. Idrobo, K. A. Perry, and K. Reeves (Oak Ridge National Laboratory)

09:20 **1314** Quantifying Catalyst Losses in Polymer Electrolyte Membrane Fuel Cells – D. A. Cullen and K. L. More (Oak Ridge National Laboratory)

09:40 Intermission (20 Minutes)

10:00 **1315** Catalyst Degradation: Nanoparticle Population Dynamics and Kinetic Processes – S. G. Rinaldo (Simon Fraser University), W. Lee (Automotive Fuel Cell Cooperation Corporation, 9000 Glenlyon Parkway Burnaby, B.C. Canada V5J 5J8), J. Stumper (Automotive Fuel Cell Cooperation Corp.), and M. Eikerling (Simon Fraser University, 8888 University Drive, Burnaby, B.C. Canada V5A 1S6)

10:20 **1316** 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 **1317** *In Situ* Anomalous Small-Angle X-ray Scattering Study of Fuel Cell Catalyst Degradation in Aqueous and Membrane Electrode Assembly Environments – J. Gilbert (University of Wisconsin – Madison), N. Kariuki, A. Kropf (Argonne National Laboratory), D. Morgan (University of Wisconsin-Madison), D. J. Myers (Argonne National Laboratory), S. Ball, J. Sharman, B. Theobald, and G. Hards (Johnson Matthey Technology Center)

11:00 **1318** Cathode Catalysts Degradation Mechanism from Liquid Electrolyte to Polymer Electrolyte Membrane Fuel Cells – A. A. Marcu and G. Toth (Daimler AG)

11:20 **1319** Rotating Disk Electrode Techniques Designed to Simulate Fuel Cell Startup/Shut-Down Transient Conditions – D. A. Stevens, J. Harlow, R. J. Sanderson, T. C. Crowtz, J. Dahn (Dalhousie University), G. D. Vernstrom, L. L. Atanasoska, G. M. Haugen, and R. T. Atanasoski (3M Company)

11:40 **1320** 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.)

Honolulu 3, Tapa Conference Center, Hilton Hawaiian Village

E-1.1 Alkaline Electrocatalysis – 08:00 – 12:00
Co-Chairs: Karen Swider-Lyons and Elena Baranova

08:00 **1321** Electrocatalysis of Small Organic and Inorganic Molecules for Direct Oxidation Fuel Cells – E. A. Baranova, A. Allagui, and B. Middleton (University of Ottawa)

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. Fujiwara, 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 Intermission (20 Minutes)

10:00 **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)

10:40 **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. Stadlhofer, M. Bodner, H. Schröttner, and V. Hacker (Graz University of Technology)

11:40 **1329** High Performance Pt on Composite Ni-Pb / C Support for Methanol Oxidation in Alkaline Media – M. Lee, B. Mikes, D. Abbott, and S. Mukerjee (Northeastern University)

Tapa 1, Tapa Conference Center, Hilton Hawaiian Village

A-1.2 Modeling 2 – 14:00 – 18:00
Co-Chairs: Shawn Litster and Aimy Bazylak

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)

15:40 **1334** Numerical Simulation of the Interfacial Oxygen Transport Resistance for a PEMFC Cathode Incorporating Water Coverage – M. Koz and S. Kandlikar (Rochester Institute of Technology)

16:00 Intermission (20 Minutes)

16:20 **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. Lehnert, 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)

17:40 **1339** A Case Study of Validation of Multiphase PEMFC Computer Models Using Through-Plane Liquid Water Measurements – B. Carnes, K. Chen (Sandia National Labs), D. Spernjak (Los Alamos National Laboratory), G. Luo, L. Hao, and C. Wang (The Pennsylvania State University)

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), K. Wippermann, U. Reimer, and W. Lehnert (Forschungszentrum Jülich GmbH)

14:40 **1342** Impact of Polymer Electrolyte Membrane Degradation Products on the Activity of the Oxygen Reduction Reaction on Platinum Catalysts – J. M. Christ (Colorado School of Mines), K. Neyerlin, H. Wang (National Renewable Energy Laboratory), R. M. Richards (Colorado School of Mines), and H. N. Dinh (National Renewable Energy Laboratory)

15:00 **1343** Internal Currents, CO_2 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)

15:20 **1344** MEA Design for Improved Cathode Durability under Startup Shutdown Automotive Conditions – J. Roberts, F. Berretta, H. Haas, A. Yang, S. Ronasi, S. Kundu, A. Leow (Automotive Fuel Cell Cooperation Corp.), Z. Moreland (McGill University), G. Orha, Y. Hsieh (Automotive Fuel Cell Cooperation Corp.), and N. Barsan (Steinbeis AO Action)

15:40 **1345** Relation between Local Loss of Performances in a Segmented PEMFC and Local Degradations 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 University), 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)

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 (U.Yamanashi), B. Bae (U. Yamanashi), K. Miyatake, and M. Watanabe (University of Yamanashi)

17:20 **1356** Synthesis of Polyethylene-Based Proton Exchange Membranes Containing PE Backbone and Sulfonated Poly(arylene ether sulfone) Side Chains for Fuel Cell Applications – H. Kim, S. N. Lvov, and T. Chung (The Pennsylvania State University)

17:40 **1357** New Ionically and Covalently Cross-Linked Polyaromatic Membranes for Fuel Cells and Electrolysis – J. A. Kerres (University of Stuttgart)

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. Sivasubramanian 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)

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)

16:20 **1364** PtCo Alloy Stability in PEMFCs under Automotive Cyclic Conditions – C. Chuy, M. Davis, M. Guenther (AFCC Automotive Fuel Cell Cooperation Corp.), H. Haas (Automotive Fuel Cell Cooperation Corp.), D. Susac (AFCC), C. Talpalaru, and H. Zhang (AFCC Automotive Fuel Cell Cooperation Corp.)

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. Crowtz, J. Dahn (Dalhousie University), G. M. Haugen, L. L. Atanasoska, G. D. Vernstrom, and R. T. Atanasoski (3M Company)

17:00 **1366** Effect of Nanosheet Size on Activity and Durability of RuO_2 Nanosheet Pt/C Catalyst – C. Chauvin, T. Saida, K. Lokesh, and W. Sugimoto (Shinshu University)

17:20 **1367** Time Resolved Corrosion of Electrode Supports in PEM Fuel Cells – J. D. Fairweather, D. Spernjak, R. Mukundan (Los Alamos National Laboratory), R. K. Ahluwalia, S. Arisetty (Argonne National Laboratory), and R. L. Borup (Los Alamos National Laboratory)

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. Whelligan (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. Skovgard (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)

16:20 **1373** Anion Conducting Pore-Filling Membranes for Solid Alkaline Fuel Cells – Y. Choi, M. Lee, C. Kim, T. Yang, and S. Park (Korea Institute of Energy Research)

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)

17:40 **1376** Development of Alkaline Exchange Ionomers for use in Alkaline Polymer Electrolyte Fuel Cells – S. D. Poynton, R. Zeng, J. Kizewski, A. Ong, and J. R. Varcoe (University of Surrey)

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

- **1377** Electrochemical Performance of Pt Extended Network Catalysts from Spontaneous Galvanic Displacement in MEAs – K. Neyerlin, B. A. Larsen, S. S. Kocha, and B. S. Pivovar (National Renewable Energy Laboratory)
- **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)

- **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)
- **1385** Real-time CO_2 Detection from Carbon Support Oxidation in PEM Fuel Cell Cathodes During Potential Cycling – E. Niangar, T. Han, N. Dale, and K. Adjemian (Nissan Technical Center North America)
- **1386** Investigation of Role of Cathode Microporous Layers in PEMFC – E. Nishiyama (Fukui University of Technology), M. Hara (Fukui University of Techonology), and T. Murahashi (Fukui University of Technology)
- **1387** Multi-Analytical Study of Gas Diffusion Layers PTFE Content Variation – K. Artyushkova, 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)
- **1400** A 3D Two-Phase Model for a Membraneless Fuel Cell Using Decomposition of Hydrogen Peroxide with Y-Shaped Microchannel – J. Peng, Z. Zhang, and H. Niu (Tsinghua University)
- **1401** A Study of Electrochemical Recycle for Noble Metals in PEFCs – H. Shiroishi, H. Matsumoto (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 Polyphosphate 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)
- **1405** Flow Field Design for a Polymer Electrolyte Unitized Reversible Fuel Cell – C. Hwang, H. Ito, T. Maeda, A. Nakano (National Institute of Advanced Industrial Science and Technology (AIST)), A. Kato (Takasago Thermal Engineering Co., Ltd.), and T. Yoshida (Daiki Ataka Engineering Co., Ltd.)
- **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)

- **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. Hara (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)
- **1413** Investigation of the Corrosion of Carbon Supports in Polymer Electrolyte Fuel Cells Using Simulated Start-Up/Shut-Down Cycling – Y. Park, K. Kakinuma, M. Hara, M. Uchida, H. Uchida, and M. Watanabe (University of Yamanashi)
- **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)
- **1415** Kinetics and Mass Transport Investigation of Pt/Carbon Electrocatalyst by Rotating Disk Electrode – C. Wang (Nissan Technical Center North America, Inc), N. Dale, and K. Adjemian (Nissan Technical Center North America)
- **1416** Oxygen Reduction Reaction Activity and Durability of Electrocatalysts Supported on SnO_2 – 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. Herring (Colorado School of Mines)
- **1419** Performance Evaluation of Pt-Deposited SiO_2 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 (ishi-huku metal industry), H. Inoue (Ishifuku 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)
- **1422** Electrochemical Stability for Pt-Enriched Ni/ Pt(111) Topmost Surface Prepared by Molecular Beam Epitaxy – N. Todoroki, Y. Iijima, R. Takahashi, K. Matsumoto, Y. Yamada, T. Hayashi, and T. Wadayama (Tohoku University)
- **1423** Platinum Dissolution in Nitrogen Oxides-Containing $HClO_4$ 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 K. 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 (ishifuku 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 Delware), and Y. Yan (University of Delaware)
- **1432** Oxygen Reduction on Pt-Pd Electrode for PEFC Cathode – A. Hyono, Y. Sugawara, M. Ueda, and T. Ohtsuka (Hokkaido University)

- **1433** Improvement in Activity of Highly Durable Silica-Coated Pd/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. Arao, 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 Resaerch Center), A. Ishihara (Yokohama National University), M. Matsumoto, M. Arao, 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. Iyatani, 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. Niwa, 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** NH_3-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. Ranjbar 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. Chiku, 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)
- **1448** New Manganese Oxide-based Cathode Catalysts for Anion-Exchange Membrane Fuel Cells – T. Kenko, M. Hagiwara, T. Takakuwa, M. Saito, H. Daimon, A. Tasaka, M. Inaba (Doshisha University), Y. Kadoma, N. Kumagai (Iwate University), H. Shiroishi (Tokyo National College of Technology), T. Hatai, and J. Kuwano (Tokyo University of Science)
- **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 CO_2 Generation during Ethanol Electrooxidation on Pt-Sn/C and Pt-SnO_2/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 CeO_2 for the Electro-Oxidation of Ethylene Glycol in Acid Electrolyte – A. Chávez Villanueva, A. Ramírez (Universidad de la Ciénega de Michoacán de Ocampo), G. Vargas Gutiérrez, and F. Rodríguez Varela (Cinvestav Unidad Saltillo)
- **1455** Investigation of Electrocatalytic Activity of the Nanostructured Au-Cu Catalyst Deposited on the Titanium Surface towards Borohydride Oxidation – L. Tamašauskaitė-Tamašiūnaitė, A. Balčiūnaitė, A. Vaiciukevičienė, I. 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-Gomez, B. Escobar (Instituto Tecnologico de Cancun), A. Chávez Villanueva (Universidad de la Ciénega de Michoacán de Ocampo), and F. Rodríguez Varela (Cinvestav Unidad Saltillo)
- **1457** Chemisorption Studies of Dissolved Pt Species on RuO_2 nanosheet – L. K. Sannegowda, C. Chauvin, and W. Sugimoto (Shinshu University)
- **1458** Electro-Oxidation of Borohydride by Rh Porphyrins – S. Yamazaki, H. Senoh, N. Fujiwara, M. Yao, Z. Siroma, K. Yasuda, and T. Ioroi (National Institute of Advanced Industrial Science and Technology)
- **1459** Enhanced Performance of MEAs Using Non-Platinum Catalyst for Direct Alcohol Alkaline Fuel Cell – T. Mizukami, S. Suzuki, J. Kawaji, O. Taigo, and K. Yamaga (Hitachi, Ltd.)
- **1460** Fabrication and Electrochemical Properties of Electro-Spun RuO_2-Carbon Nanofibers Supported Pt Nanoparticles – G. An and H. Ahn (Seoul National University of Science and Technology)
- **1461** Synthesis and Characterization of Cross-Linked Polyethyleneimine Based Membranes for Alkali Anion Exchange Fuel Cells – A. M. Maes, M. Vandiver, A. Krosovski, J. L. Horan, and A. Herring (Colorado School of Mines)
- **1462** Alkaline Membrane Fuel Cells with Several Alternative Fuels – K. Fukuta, T. Negishi, Y. Kikkawa, K. Oda, S. Watanabe, and H. Yanagi (Tokuyama Corp.)
- **1463** Synthesis and Characterization of Perfluoro Quaternary Ammonium Ion Exchange Membranes for Fuel Cell Applications – M. A. Vandiver, M. Liberatore, and A. Herring (Colorado School of Mines)
- **1464** Transport properties of Plasma Polymerized Anion Exchange Membrane for Direct Methanol Alkaline Fuel Cells – T. Kurozumi, Y. Okajima, H. Nagai, and M. Sudoh (Shizuoka University)
- **1465** Investigation of Mechanical Properties of Alkaline Exchanges Membranes for Fuel Cell Applications – B. R. Caire, M. A. Vandiver, S. Lustgraaf, A. Herring, and M. Liberatore (Colorado School of Mines)
- **1466** Preparation and Characterization of Anionic Binder Based Electrodes for Anion-Exchangeable Membrane Fuel Cells – M. Shin, Y. Byun, J. Park, M. Kang (Sangmyung 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 [dema][TfO]/Solid Acid-Base Composite Membrane – A. Fujisawa, K. Matsuzawa, and S. Mitsushima (Yokohama National University)
- **1472** A Proton Conductive 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-Conducting 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)

- **1477** Radiolytic Preparation and Characterization of Silane-Crosslinked ETFE-g-PSSA/PTMSPM Membrane for Proton Exchange Membrane Fuel Cell – J. Sohn, J. Song, Y. Nho, and J. Shin (Korea Atomic Energy Research Institute)
- **1478** Cross-Linked Poly(Arylene Ether Ketone) Membranes Containing Pendant Sulfonic Acid Groups for Fuel Cell Applications – H. Dang and D. Kim (Sungkyunkwan University)
- **1479** Electron Beam-Induced Crosslinked SPEEK Membrane for PEMFC – J. Song (Korea Atomic Energy Research Institute), D. Shin (Hanyang University), J. Sohn, Y. Nho (Korea Atomic Energy Research Institute), Y. Lee (Hanyang University), and J. Shin (Korea Atomic Energy Research Institute)
- **1480** The Compatibility of the Composite Membrane Based on Sulfonated Poly(Ether Ether Ketone) (sPEEK) / Poly(Vinylidenefluoride) (PVdF) / Urethane Acrylate Non-Ionomer (UAN) for a Unitized Regenerative Fuel Cell (URFC) – H. Jung (Kangwon National University) and J. Choi (Kyungil University)
- **1481** Catalyst Coated PBI Membrane High Temperature Assemblies – N. Sephane, A. Kreisz, N. Donzel, J. Bernard d'Arbigny, D. J. Jones, and J. Rozière (University Montpellier 2)
- **1482** Microelectrode Analysis of Oxygen Permeation through Nafion® Thin Films – A. Oda, H. Okada, H. Daimon, A. Tasaka, and M. Inaba (Doshisha University)
- **1483** Water Uptake and Transport in Nafion® – G. Hwang, D. Parkinson, A. Kusoglu, A. MacDowell, and A. Weber (Lawrence Berkeley National Laboratory)
- **1484** Theoretical Study on the Degradation Mechanism of Polymer Electrolyte Membrane – H. Motegi and M. Yoneda (Mizuho Information and Research Institute, Inc.)
- **1485** Membrane Science for Liquid Organic Fuel Cells – K. T. Clark (Lawrence Berkeley National Laboratory), L. Krishnan (GE Global Research), G. W. Yeager (General Electric), and J. Kerr (Lawrence Berekeley National Laboratory)

B10 Renewable Fuels from Sunlight and Electricity

Energy Technology / High Temperature Materials / Physical and Analytical Electrochemistry / New Technology Subcommittee

Nautilus 2, Mid-Pacific Conference Center, Hilton Hawaiian Village

Carbon Dioxide Conversion in Liquid – 08:00 – 09:50
Co-Cairs: Xiao-Dong Zhou and A. Manivannan

08:00 **1729** The Electrocatalytic Conversion of CO_2 to Fuels and Chemicals – T. F. Jaramillo, K. P. Kuhl, E. R. Cave, and D. N. Abram (Stanford University)

08:30 **1730** Graphene-Supported Copper Catalysts for Electrochemical Reduction of Carbon Dioxide – S. Huang and P. Fedkiw (North Carolina State University)

08:50 **1731** Room Temperature Electrochemical Conversion of CO_2 to Fuels – X. Zhou, J. Wu, and F. Risalvato (University of South Carolina)

09:10 **1732** Photoreduction of CO_2 over Morphology Controlled TiO_2 or Nanocomposite System of g-C_3N_4 and WO_3 – T. Ohno and N. Murakami (Kyushu Institute of Technology)

09:30 **1733** Photoelectrochemical Enzyme Biofuel Cell with the Function of CO_2 Conversion to Formic Acid – Y. Amao (Oita University Dannoharu), Y. Sakai (Oita University), and N. Shuto (Oita Unversity)

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)

10:30 **1735** Photoelectrochemical Water Splitting Using Electrodes Prepared by Particle Transfer Method – T. Minegishi, N. Nishimura, J. Kubota, and K. Domen (The University of Tokyo)

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)

11:20 **1737** Hydrogen Production Promoted by Visble Light-Responsive MOF (Metal-Organic Framework) Photocatalyst – T. Toyao, M. Saito, Y. Horiuchi (Osaka Prefecture University), K. Mochizuki, M. Iwata, H. Higashimura (Sumitomo-Chemical Co., Ltd.), and M. Matsuoka (Osaka Prefecture 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 Electrocatalysts in Photoelectrochemical Water Oxidation of Oxide Semiconductor Electrodes – S. Choi, T. Jeon, U. Kang, H. Jeong, and H. Park (Kyungpook National University)

Photoelectrochemical Cells – 14:00 – 15:40
Co-Chairs: Heli Wang and Teruhisa 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 ($CuWO_4$) 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 $BiVO_4$ Photoanodes – F. F. Abdi, N. Firet, and R. Van de Krol (Delft University of Technology)

15:20 **1743** Photoelectrolysis on p-$GaInP_2$; 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)

Photoelectrochemical Cells – 16:00 – 18:00
Co-Chairs: Heli Wang and Jae-Joon Lee

16:00 **1744** Development of Nanostructured Photocatalysts for Hydrogen Generation by Water Splitting under Visible Light – Y. Wang, J. Hong, S. Goh, and R. Xu (Nanyang Technological University)

16:30 **1745** Co-Alloying Approach for Bandgap Engineering of Metal Oxides for Improved Photoelectrochemical Water Splitting – Y. Yan (The University of Toledo)

17:00 **1746** Corrosion Protection of p-$GaInP_2$ for Durable Photoelectrochemical Water Splitting – H. Wang, T. G. Deutsch, A. Welch, and J. A. Turner (National Renewable Energy Laboratory)

17:20 **1747** Photoelectrochemical Modeling of a Multi-Junction Architecture for Artificial Photosynthesis – A. Berger and J. Newman (University of California, Berkeley)

17:40 **1748** Toward a General Strategy for Chemical Stabilization of Non-Oxide Photoanodes for Water Oxidation – N. C. Strandwitz and N. S. Lewis (California Institute of Technology)

B12 Solid State Ionic Devices 9 – Ion Conducting Thin Films and Multilayers

High Temperature Materials
South Pacific 1, Mid-Pacific Conference Center, Hilton Hawaiian Village

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. Briand, 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. Gür, 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)

Ion Conducting Thin Film Multilayers and Devices – 10:00 – 12:00
Co-Chairs: Noriko Sata and Michel Prestat

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)

10:40 **1897** Electrochemical Performance of Free-standing Micro-Solid Oxide Fuel Cell Membranes using De-alloyed Pt-Y-Al Electrodes – R. Tölke, M. Prestat, H. Galinski, J. Martynczuk, and L. Gauckler (ETH Zurich)

11:00 **1898** Thin Pulsed Laser Deposited Bilayer Electrolytes in Anode-Supported SOFCs – J. S. Hardy (Pacific Northwest National Laboratory), Z. Lu (Praxair Inc.), J. W. Templeton, and J. W. Stevenson (Pacific Northwest National Laboratory)

11:20 **1899** Morphological and Compositional Changes on YSZ/GDC Bi-layered SOFC Electrolytes in Various Temperature and Reducing Environments – Y. Jee (Seoul National University), J. An (Stanford University), J. Choi, T. Park, G. Cho (Seoul National University), M. Lee (University of California, Merced), F. B. Prinz (Stanford University), and S. Cha (Seoul National University)

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)

Ion Conducting Thin Film Electrodes – 14:00 – 16:40
Co-Chairs: Daniele Pergolesi and Bilge Yildiz

14:00 **1901** Nanostructured $La_{0.6}Sr_{0.4}CoO_{3-\delta}$ Cathodes Prepared by Spray Pyrolysis for Thin Film SOFC – M. Prestat, Z. Yáng, 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)

14:40 **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 (PNNL), 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 $La_{0.5}Sr_{0.5}Mn_{0.5}Co_{0.5}O_{3-\delta}$ Thin Film Anodes for Solid Oxide Fuel Cells – Z. Yáng, 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)

Modeling and Devices – 16:40 – 18:20
Co-Chairs: Dane Morgan and Keith Duncan

16:40 **1908** Atomistic Investigation of Oxygen Vacancy Induced Volume Changes in CeO_2 Grain Boundaries – S. Kim and V. B. Shenoy (Brown University)

17:00 **1909** Obtaining Mixed Ionic/Electronic Conductivity in Perovskite Oxides at Anodic Solid Oxide Fuel Cell Conditions: A Computational Approach – S. Suthirakun, S. C. Ammal, and A. Heyden (University of South Carolina)

17:20 **1910** Electrochromic Films Produced by Ultrasonic Spray Deposition of Mesoporous Tungsten Oxide – C. Li, F. Lin, R. M. Richards (Colorado School of Mines), R. Tenent, A. Dillon (National Renewable Energy Laboratory), and C. Wolden (Colorado School of Mines)

17:40 **1911** Development of Safe All Inorganic Li-Ion Batteries – L. Castro (CEMES/CNRS), G. Jouan (LRCS/CNRS), A. Kubanska (MADIREL/CNRS), V. Seznec (LRCS/CNRS), L. Tortet (MADIREL/CNRS), M. Morcrette, V. Viallet (LRCS/CNRS), R. Bouchet (MADIREL/CNRS), and M. Dollé (CEMES/CNRS)

18:00 **1912** Stabilization of NASICON-Type $LiZr_2(PO_4)_3$ at Room Temperature – L. Castro (CEMES/CNRS), A. Kubanska, L. Tortet, R. Bouchet (MADIREL/CNRS), and M. Dollé (CEMES/CNRS)

C2 Bioengineering Based on Electrochemistry

Organic and Biological Electrochemistry / Sensor
324, Level 3, Hawaii Convention Center

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

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. Shionoiri, 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)

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

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), T. Kihara (Osaka University), K. Fukazawa, K. Ishihara (The University of Tokyo), N. Nakamura (Tokyo University of Agriculture and Technology), and J. 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 Univerisity), T. Kajiro (Tokyo University of Technology), K. Miyajima, H. Kudo (Tokyo Medical and Dental Univerisity), K. Yano (Tokyo University of Technology), and K. Mitsubayashi (Tokyo Medical and Dental Univerisity)

11:40 **2019** Development of Human-Environment Interface by Sensing and Multivariate Analysis of Bio-Ecosystem – M. Koshiba, G. Karino, A. Seno, Y. Shirakawa, K. Mimura, T. Sagawa, W. Tsugawa, K. Sode, and S. Nakamura (Tokyo University of Agriculture and Technology)

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 (Ultizyme 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 (Ultizyme 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 (Nogoya University)

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

16:00 Intermission (20 Minutes)

16:20 **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. Wainright, N. Bhadra, N. Bhadra, and K. Kilgore (Case Western Reserve University)

17:20 **2027** Electrochemical Approach to Fabricate Stacked Thick Cell Sheets – N. Mochiuzki, 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)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

C2 – Poster Session – 18:00 – 20:00
Co-Chairs: K. Sode, M. Meyerhoff, K. Kerman, I. Hsing, I. Kubo, and E. Tamiya

- **2029** Fabrication of Semi-Invasive Micro-Needle Array Using Gradation Exposure – M. Yamaguchi, Y. Sasaki, Y. Kimura, and M. Sasaki (Iwate University)
- **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)
- **2036** Optimizing Functionalized Carbon Nanotube Matrix for Enhancing Direct Ethanol Fuel Cell Performance – L. Q. Hoa, H. Yoshikawa, M. Saito, and E. Tamiya (Osaka 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. Takahashi, 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 Universitty 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 Immunochromatographic Assay for Amplified Gene by PCR – Y. Ogido (Okayama University of Science), H. Ushijima (Biodevaicetechnology Ltd.), K. Yamanaka, 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 Femtoinjection – 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 Femtoinjected 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 (Tohoku 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 (Tohoku University)
- **2047** Dynamic Properties of Fluorescent Reporter Proteins Femtoinjected into ES Single-Cells – S. Hisatomi (Tokyo University of Agriculture and Trchnology), 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 Nanoengineered Carbon Fabric – T. Yamada, S. Yoshino, T. Ofuji, T. Miyake, H. Kaji, and M. Nishizawa (Tohoku University)
- **2050** Evaluating the Insertion Efficiencies of Silicon Nanoneedles 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. Shimooku (Tokyo University of Agricuture 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 Cytcochrome *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 Electron Transfer between Proteins and Carbon Electrodes – H. Shimofusa, M. Inukai, M. Yoshida (Tokyo University of Agriculture and Technology), K. Igaraqshi, M. Samejima (The University of Tokyo), N. Nakamura, and H. Ohno (Tokyo University of Agriculture and Technology)
- **2056** Comparison of Quantitative Imaging Analysis and Electrochemical Sensing for the Beatings of Cardiomyocyte Derived from Mouse Embryonic Stem Cells – Y. Yamaguchi, E. Shimizu, T. Ikeuchi, A. Hashimoto, M. Saito, and E. Tamiya (Osaka University)
- **2057** Turning Glucose Oxidase into Essentially Dehydrogenase – Y. Horaguchi, S. Saito, S. Ferri (Tokyo University of Agriculture and Technology), K. Mori, K. Kojima (Ultizyme International Ltd.), W. Tsugawa, and K. Sode (Tokyo University of Agriculture and Technology)
- **2058** Enhancement of Wettability on Titanium Substrates by Femtosecond Laser Micron/Nano Machining – K. Fung, Y. Su, C. Liu, C. Ni (National Cheng Kung University), C. Lin, P. Wu, and C. Cheng (Industrial Technology Research Institute)
- **2059** Correlation between Spectroscope Absorbance and Biofilm to Anode Microbial Fuel Cell – R. J. Marassi, J. M. Santos, C. E. Teodoro, F. S. Santos, and G. C. Silva (Universidade Federal Fluminense)
- **2060** Assessment of Cell Behaviors on TiO_2 Nanotube Arrays by Using Atomic Force Microscopy, Raman Spectroscopy, Fluorescence Microscopy – R. Li, Q. Li, L. Xiao, S. Williams, E. Suasnavas, C. Isom, D. Larson, L. Rickords, and A. Zhou (Utah State University)
- **2061** Sucarcane Waste as Substrate for Microbial Fuel Cell – J. M. Santos, R. J. Marassi, C. E. Teodoro, 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. Uenoyama (Department of Applied Physics, Graduate school of engineering, Osaka University), K. Yamanaka, M. Saitou, Y. Yamaguchi, M. Wada, and E. Tamaiya (Osaka University)

- **2063** Implantable Nerve Cuff Electrode Deposited with Electrospun Nanofiber to Control Drug Release for Long-Term Implantation – S. Lee, S. Park, S. Lim, K. Hwang, and J. Kang (Korea Institute of Science and Technology)
- **2064** Amino Acid Sensing Based on 2D-SPR Imaging – Y. Hida and H. Shinohara (University of Toyama)
- **2065** Non-FET Electrochemical DNA Detection Using Metal-Gap-Oxide-Silicon Structures – K. Kawai, Y. Doi, T. Furukawa, J. Uchikoshi, K. Arima, and M. Morita (Osaka University)

C4 New Synthetic and Mechanistic Approaches to Molecular Electroorganic Chemistry

Organic and Biological Electrochemistry

306B, Level 3, Hawaii Convention Center

Co-Chairs: M. Atobe and H. Shimakoshi

10:00 **2078** Synthesis of Multinuclear Metalladithiolenes and Control of Their Internuclear Electronic Communication – S. Tsukada, Y. Shibata, T. Kambe, R. Sakamoto, and H. Nishihara (The University of Tokyo)

10:20 **2079** Redox Active Dendronized Polymers Equipped with Peripheral Triarylamines – T. Nokami, N. Musya, T. Morofuji, K. Takeda, and J. Yoshida (Kyoto University)

10:40 **2080** Synthesis of Alkaloids Skeletons Using the Hyper-Valent Iodobenzene Oxidant – D. Kajiyama, T. Saitoh, S. Yamaguchi, and S. Nishiyama (Keio University)

11:00 **2081** Rapid Access to the Pyrene Cored Dendrimers Using Dendritic Diarylcarbenium Ion Pools – K. Takeda, T. Nokami, and J. Yoshida (Kyoto University)

11:20 **2082** Preparation of Nanoemulsion Using Tandem Acoustic Emulsification and Its Application to Templated Electropolymerization – K. Nakabayashi, T. Fuchigami, and M. Atobe (Tokyo Institute of Technology)

11:40 **2083** Electrochemical Nickel-Induced Fluoroalkylation – D. Y. Mikhaylov, Y. H. Budnikova, Y. B. Dudkina, T. V. Gryaznova, and O. G. Sinyashin (A.E.Arbuzov Institute of Organic and Physical Chemistry)

Co-Chairs: H. Nishihara and B. Ohtani

14:00 **2084** Synthesis and Properties of Nitrogen-Bridged Terthiophenes – K. Mitsudo, S. Shimohara, and S. Suga (Okayama University)

14:20 **2085** Regioselective Cross-Coupling Reaction of Azulene and α, β-Unsaturated Ketone by Electron Transfer from Magnesium – H. Maekawa, J. Honda (Nagaoka University of Technology), and R. Akaba (Gunma College of Technology)

14:40 **2086** Prediction of Reduction Potentials from Calculated Electron Affinities for Metal-Salen Compounds – J. A. Miranda, J. M. Yates, and B. F. Gherman (Sacramento State University)

15:00 **2087** Anodic Oxidation of Carbamates in the Presence of Solid-Supported Acids and Its Application to Carbon-Carbon Bond Forming Reactions – T. Tajima, A. Takabayashi, and K. Yamazaki (Shibaura Institute of Technology)

15:20 **2088** Paired Electrochemical Reaction of a Poly(Fluorenol) Derivative – H. Nagai, S. Inagi, and T. Fuchigami (Tokyo Institute of Technology)

15:40 Intermission (20 Minutes)

Co-Chairs: H. Maekawa and T. Nokami

16:00 **2089** Fabrication of Gradient Surface Using Bipolar Electrochemistry – N. Shida, Y. Ishiguro, S. Inagi, and T. Fuchigami (Tokyo Institute of Technology)

16:20 **2090** Synthetic Study of O-Methylthalibrine Using Anodic Oxidation – Y. Kawabata, Y. Naito, T. Saitoh, Y. Ishikawa, and S. Nishiyama (Keio University)

16:40 **2091** Preparation and Reaction of Titania Particles Encapsulated in Hollow Silica Shells as an Efficient Photocatalyst for Stereoselective Synthesis of Pipecolinic Acid – S. Chandren and B. Ohtani (Hokkaido University)

17:00 **2092** Electrochemical Oxidation of Poly(*p*-phenylene-vinylene) Derivatives Containing Tetraphenylethylene Units – S. Wakana, S. Inagi, T. Fuchigami, and I. Tomita (Tokyo Institute of Technology)

17:20 **2093** Voltammetry of Nitrofluorenes: Simulation – I. U. Haque (Leiden University) and A. Dar (University of Engineering and Technology Lahore)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

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 Materials Degradation in Energy Systems: Corrosion and Hydrogen-Material Interactions

Corrosion / Battery / Energy Technology

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

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 Characterstics of Solid Oxide Fuel Cell Anode – K. Nakao, T. Ishimoto, and M. Koyama (Kyushu University)

- **2146** Density Functional Theory Study and Model Development on Pt Nano-Particles – G. Brunello, J. Choi, S. Jang (Georgia Institute of Technology), and D. B. Harvey (Queen's University)
- **2147** Density Functional Theory Study of Pt Dissolution at Water-Pt Interface – J. Choi, G. Brunello, S. Jang (Georgia Institute of Technology), and D. B. Harvey (Queen's University)

D3 Corrosion, Passivity, and Energy: A Symposium in Honor of Digby Macdonald

Corrosion

301B, Level 3, Hawaii Convention Center

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 (ENSM-SE), M. L. Taylor, and D. D. Macdonald (The Pennsylvania State University)

08:15 **2200** Optimization of Impedance Models with Differential Evolution – M. L. Taylor, S. Sharifi, 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. Qidwai, 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. Frateur (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. Emmanuel (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 Auonoma 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** (Corosion Division H. H. Uhlig Award Presentation) Understanding of Passivity Due to the Application of Surface Methods, a Review – H. Strehblow (Heinrich-Heine-University Duesseldorf)

14:30 **2215** (Corrision Divisin 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. Birbilis (Monash University), and A. Stuart (Origma Pty Ltd.)

Energy – 15:30 – 18:15
Co-Chairs: Jing-Li Luo and Tim Burstein

15:30 **2218** Corrosion Behavior of High Level Waste (HLW) Storage Tank Materials – J. Grant and D. Chidambaram (University of Nevada Reno)

15:45 **2219** Nuclear Corrosion and Electrochemistry: Achievements and Challenges – D. Feron (CEA)

16:00 **2220** Probabilistic Model for SCC: Integration of the Several Environment and Fracture Processes – S. Jain, F. Ayello, J. A. Beavers, and N. Sridhar (Det Norske Veritas)

16:15 **2221** Chloride-Induced Stress Corrosion Cracking of Austenitic Stainless Steel for Dry Storage of Spent Nuclear Fuel – T. M. Ahn, G. Oberson, and S. DePaula (U.S. Nuclear Regulatory Commission)

16:30 **2222** Dynamic Polarization Behaviors of Stainless Steels in Water Film Simulating the Water Treatment Plants – Y. Kim (POSCO Technical Research Laboratory) and Y. Park (Waterworks Research Institute SMG)

16:45 **2223** Electrochemical Characterization of UNS S32760 and UNS S31603 Alloys in Presence of Fluoride and Bromide Solutions – E. Maya Visuet, A. Karayan, and H. Castaneda-Lopez (National Center for Corrosion Research and Education and Materials Performance, The University of Akron)

17:00 **2224** Determination of Kinetic Parameters for Water Reduction and Oxygen Reduction on Copper – S. Sharifiasl and D. D. Macdonald (The Pennsylvania State University)

17:15 **2225** *In Situ* Spectroscopic Ellipsometry and Electrochemical Studies of the Barrier Layer on Iron in Borate Buffer Solutions – Z. Lu (Ford Motor Company), S. Sharifiasl, and D. D. Macdonald (The Pennsylvania State University)

17:30 **2226** Copper Alloys Corrosion and Passivation Monitoring by Electrochemical Integrated Probes in Chlorinated Condenser Cooling Circuits – P. Cristiani, M. Carvalho (RSE- Ricerca sul Sistema Elettrico S.p.A.), and G. Perboni (CESI SpA)

17:45 **2227** State of Health Estimation of $LiFePO_4$/Graphite Cells – Y. Zhang and C. Wang (The Pennsylvania State University)

18:00 **2228** On the Stability of the Passive Film on Iron as Indicated by Electrochemical Impedance Spectroscopy – M. Urquidi-McDonald and D. D. Macdonald (The Pennsylvania State University)

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 Cr_2O_3 – 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 Type304 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. Pacha-Olivenza (CIBER-BBN), A. Gallardo-Moreno, V. Vadillo-Rodríguez, 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)

D5 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

08:00 **2306** Fabrication of Vertically Aligned Nano-Oxide Arrays via Internal Oxidation of Dilute Alloys – M. Nanko and D. T. Do (Nagaoka University of Technology)

08:40 **2307** High-Temperature Oxidation Kinetics for Recovery of Mechanical Strength on Nano-Ni Dispersed Al_2O_3 Hybrid Materials – D. Maruoka and M. Nanko (Nagaoka University of Technology)

09:00 **2308** Early Oxidation Stages of Alumina Formers and the effect of the Additions: A Brief Survey – J. Jedliński (AGH University of Science and Technology)

09:20 **2309** The Influence of KCl(s) on the Oxidation of a FeCrAl Alloy at 600 °C in Dry and Wet Environment – N. Israelsson, L. Johansson, and J. Svensson (Chalmers University of Technology)

09:40 Intermission (20 Minutes)

10:00 **2310** Deposit-Induced Corrosion of Nickel-Base Alloys at Low Temperatures (650-750˚C) – B. S. Lutz, M. N. Task, N. M. Yanar, F. S. Pettit (University of Pittsburgh), G. R. Holcomb (National Energy Technology Laboratory), and G. H. Meier (University of Pittsburgh)

10:20 **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)

10:40 **2312** Accelerated Corrosion of Low Alloy and Stainless Steel by $PbCl_2$-Containing Salt Mixtures – D. P. Bankiewicz, P. Yrjas, and M. Hupa (Åbo 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)

14:20 **2317** Oxygen Activity Distribution from Atmosphere to Scale Surface on High Temperature Oxidation of Iron – K. Kawamura, S. Sonota, M. Ueda, and T. Maruyama (Tokyo Institute of Technology)

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

15:20 **2319** The Activity of Rh_2O_3 in Boro-Silicate Glass at 1373 K – H. Kimura, S. Yamamoto, M. Ueda, K. Kawamura, T. Maruyama (Tokyo Institute of Technology), K. Minami, and E. Ochi (Japan Nuclear Fuel Limited)

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 Iniversity 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. Chidambaram (University of Nevada Reno)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

D5 – Poster Session – 18:00 – 20:00
Co-Chairs: E. Opila and J. Fergus

- **2323** Fabrication of Nano-Rod Array Structure Used Aluminizing and Internal Oxidation of Alloy for Micro-Channel – T. Ishizaki, D. T. Do, and M. Nanko (Nagaoka University of Technology)
- **2324** Measuring Cr Volatility from Ferritic Stainless Steels: Novel and Conventional Methods Compared – J. J. Eziashi, C. Key, R. Smith, and P. Gannon (Montana State University)

D7 Pits and Pores 5: A Symposium in Honor of David Lockwood

Corrosion / Luminescence and Display Materials
323B, Level 3, Hawaii Convention Center

Optical, Magnetic and Electronic Properties – 08:00 – 10:00
Co-Chairs: D. Lockwood and N. Koshida

08:00 **2379** Tuning of Optical Properties of Silicon Photonic-Crystal Devices by Infiltration of Grooves and Pores with Liquid Crystals – T. S. Perova (Trinity College Dublin), V. Tolmachev (Ioffe Physical Technical Institute), and A. V. Baldycheva (Trinity College Dublin)

08:30 **2380** Size-Dependent Assessment of Fe_3O_4-Nanoparticles Loaded into Porous Silicon – P. Granitzer, K. Rumpf (Karl-Franzens-University Graz), Y. Tian, G. Akkaraju, J. L. Coffer (Texas Christian University), P. Poelt (University of Technology Graz), P. Morales (CSIC Madrid), and M. Reissner (Vienna University of Technology)

08:50 **2381** Magnetic Properties of an Iron Oxide/Porous Silicon System Controlled by Magnetic Interactions – K. Rumpf, P. Granitzer (Karl-Franzens-University Graz), P. Poelt (University of Technology Graz), P. Morales (CSIC Madrid), and M. Reissner (Vienna University of Technology)

09:10 **2382** The effects of Confinement and Coulomb Blockade on the Transport in Ensembles of Si Quantum Dots – I. Balberg (The Hebrew University)

09:40 Intermission (20 Minutes)

Pore Formation and Characterization – 10:00 – 15:20
Co-Chairs: P. Granitzer and T. S. Perova

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. Chazalviel, 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)

11:10 **2386** Enhanced Suppression of the Formation of Porous Silicon Based on Secondary Knocked-On effect in FIB – J. Wang, J. Jiao, P. Yan, M. Wang, W. Liu, D. Ge (Shanghai Institute of Microsystem and Information Technology), and J. Xu (Shanghai University)

11:30 **2387** Conversion Kinetics and Characterisation of Pt/Pb Nanoparticles on Fluorine Doped Tin Oxide Glass – K. Yliniemi (Aalto University), D. Wragg, T. M. Watson, D. A. Worsley, H. McMurray (Swansea University), B. P. Wilson (Aalto University), P. Schmuki (University of Erlangen-Nuremberg), and K. Kontturi (Aalto University)

11:50 **2388** Low-Lying Electronic Excitations and Optical Absorption Spectra of the Black Dye Sensitizer: A First-Principles Study – A. Delgado, S. Corni, and G. Goldoni (CNR-NANO S3 Center)

12:20 Lunch Break (90 Minutes)

13:50 Award Ceremony (90 Minutes)

Applications of Silicon and Metal Oxide Nanostructures – 15:20 – 18:10
Co-Chairs: F. Ozanam and B. Gelloz

15:20 **2389** Applications of Porous Silicon to Multicrystalline Silicon Solar Cells: State of the Art – C. Levy-Clement (CNRS)

15:50 **2390** Deposition of Ternary Alloys of Cadmium Seleno-Sulfide Thin Films on Nanoporous TiO_2 for Solar Cells Applications – A. Sepehrifard, 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. Kyerematen 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 LaF_3 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 Mesosponge Structure – T. N. Nguyen, M. Kim, J. Ahn (Korea Electrotechnology Research Institute), J. Kaewsuk (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. Tuji, 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 V_2O_5 Plus HF Solution – W. B. Barclay and K. W. Kolasinski (West Chester University)
- **2401** Anodic Porous Etching of n-InP: A Chemical-Assisted Dissolution Process – L. Santinacci (CNRS – Aix-Marseille University), M. Bouttemy, 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)

E2 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 O_3 – R. Xu, S. Selvaraj, N. Azimi, and C. G. Takoudis (University of Illinois at Chicago)

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. Haume (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 RuO_2 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/Al_2O_3/TiN Nanolaminates for Capacitor Applications – L. Assaud, M. Hanbücken, and L. Santinacci (CNRS – Aix-Marseille University)

14:40 **2476** Impact of Direct Plasma Densification on Resistivity and Conformality of PEALD Tantalum Nitride – O. Van der Straten (IBM Research), X. Zhang (Global Foundries), C. Penny, J. Maniscalco (IBM Systems & Technology Group), S. Chiang, J. Ren, and P. Ma (Applied Materials, Inc.)

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

15:50 **2478** *In Situ* FTIR Characterization of Growth Inhibition in Atomic Layer Deposition Using Reversible Surface Functionalization – A. Yanguas-Gil, J. A. Libera, and J. W. Elam (Argonne National Laboratory)

16:30 **2479** Substrate Reactivity effects in the ALD of Al_2O_3 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)

E2 – Poster Session – 18:00 – 20:00

- **2481** Tungsten Nitride Films Prepared by Cyclic-Pulsed Chemical Vapor Deposition for IC Metallization – E. Kim, H. Woo, and D. Kim (Chonnam National University)
- **2482** Highly Uniform Self-Assembled Gold Nanoparticles over High Surface Area ZnO Nanorods as Novel Catalysts – T. M. Abdel-Fattah (Christopher Newport University), K. Zhang, W. Cao, and H. Baumgart (Old Dominion University)
- **2483** Characterization of Complex Magnetic Nanotubes – K. Pitzschel, J. Bachmann, S. Martens, J. Moreno Montero (University of Hamburg), J. Escrig (Universidad de Santiago de Chile), K. Nielsch, and D. Görlitz (University of Hamburg)
- **2484** Synthesis of VO_2 Thin Films by Atomic Layer Deposition with TEMAV as Precursor – K. Zhang, M. Tangirala, D. Nminibapiel (Old Dominion University), V. Pallem, C. Dussarrat (American Air Liquide), and H. Baumgart (Old Dominion University)

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)

08:40 **2530** Quasi-Vertical GaN-on-Silicon Transistors for Compact Enhancement-mode Power Switches – B. Brar, D. Kim, C. Neft, C. Nguyen, and V. Mehrotra (Teledyne Scientific)

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)

GaN Crystal Growth and Characterization – 10:00 – 12:00
Co-Chairs: Mike Dudley and Ken Jones

10:00 **2533** III-Nitride High Voltage Power Electronics – M. Spencer and W. Schaff (Cornell University)

10:20 **2534** Hydrophobic Growth of GaN Material: Current Status and Future Potential – J. M. Mann (US Air Force Research Laboratory), B. Wang (Solid State Scientific Corporation), and D. Bliss (US Air Force Research Laboratory)

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. Derluyn, 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.)

GaN Power Transistor Reliability and Control – 14:00 – 16:00
Co-Chairs: Aivars Lelis and Durga Misra

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, R. Kaplar, S. DasGupta, M. Marinella, A. Armstrong, L. Biedermann (Sandia National Labs), M. Sun, T. Palacios (Massachusetts Institute of Technology), and M. Smith (Sandia National Labs)

15:00 **2542** Device Breakdown and Dynamic effects in GaN Power Switching Devices: Dependencies on Material Properties and Device Design – J. Würfl, E. Bahat-Treidel, F. Brunner, M. Cho, O. Hilt, A. Knauer, P. Kotara, M. Weyers, and R. Zhytnytska (Ferdinand-Braun-Institut)

15:20 **2543** Degradation Study of Single and Double-Heterojunction InAlN/GaN HEMTs by Two-Dimensional Simulation – V. Palankovski and J. Kuzmik (TU Wien)

15:40 **2544** Temperature Dependence of Kink Effect for AlGaN/GaN/SiC High Electron Mobility Transistors – C. Cheng, T. Chang, S. Liao, H. Chang, W. Ho, Y. Shiau, and J. Sen (Chung-Shan Institute of Science & Technology)

Panel # 2: Safe Operating Area (SOA) – Silicon vs. SiC and GaN – 16:00 – 18:00
Co-Chairs: Reenu Garg and Mike Dudley

16:00 Introduction of Panelists (15 Minutes)

16:15 Mietek Bakowski (10 Minutes)

16:25 Joachim Wurfl (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)

E5 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** Conduction 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. Kiantaj, 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 $In_{0.53}Ga_{0.47}As$ 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)

Metal Work Function Tuning – 14:00 – 15:30
Co-Chairs: Akira Toriumi and Atif Noori

14:00 **2591** Interface Dipole Cancellation in SiO_2/High-k/SiO_2/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. Jagannathan, P. Jamison, and V. Paruchuri (IBM Research)

14:40 **2593** Conformal Metal Gate Process Technology for 14nm Logic Node and Below – A. M. Noori, A. Brand, Y. Lei, M. Chen, W. Tang, X. Lu, X. Fu, S. Ganguli, J. Anthis, D. Thompson, N. Yoshida, M. Xu, M. Chang, and S. Gandikota (Applied Materials)

15:10 **2594** Investigation of Mg Diffusion in Ta(N) based Electrodes on HfO_2 for sub-32nm CMOS Gate-Last Transistors – R. Gassilloud, C. Maunoury, C. Leroux (CEA France), P. Chevalier (STMicroelectronics), C. Dressler, F. Aussenac, F. Martin (CEA France), D. Bensahel (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)

16:40 **2597** Electrical Characterization and Reliability Assessment of Double-gate FinFETs – C. D. Young, K. Akarvardar, K. Matthews (SEMATECH), M. Baykan (U. of Florida – Gainesville), J. Pater, I. Ok, T. Ngai, K. Ang, M. Minakais, G. Bersuker, C. Hobbs, P. Kirsch, and R. Jammy (SEMATECH)

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 Bi_2O_3-ZnO-Nb_2O_5 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)
- **2602** Process to Etch Ni and Pt Residues during Silicide Contact Electrode Processing using Low Temperature Aqueous Solutions – A. N. Duong (Intermolecular Inc), C. Fitz, S. Metzger (Globalfoundries), O. Karlsson, J. C. Foster, G. Nowling (Intermolecular Inc), V. Sih, and P. Besser (Globalfoundries)
- **2603** Correlation between Electrical and Optical Properties of Tantalum Anodic Oxide and Electron Cyclotron Resonance Etching Studies of E-beam Deposited Ta_2O_5 Films – A. Kulpa and N. Jaeger (The University of British Columbia)
- **2604** Area Dependence of Reliability characteristics for Atomic Layer Deposition HfO_2 Film under Static and Dynamic Stress – Y. Cheng, Y. Chang, C. Hsieh, and J. Lin (National Chi-Nan University)
- **2605** Characterization of Sol-Gel-Derived Crystalline HfO_2 -Y_2O_3 Thin Films on Si(001) Substrates – H. Shimizu and T. Nishide (Nihon University)
- **2606** Comparison on Physical and Electrical Properties of Sputtered Ru and RuO_2 Gate Electrodes Grown on HfO_2/Si for p-MOSFET – H. Kim, S. Lee, I. Yu, J. Lee (Seoul National University), T. Park (Hanyang University), and C. Hwang (Seoul National University)
- **2607** MOSFETs on InP Substrate with $LaAlO_3$/HfO_2 Bilayer of Different $LaAlO_3$ Thickness and Single $La_XAl_{1-X}O$ Layer with Different La Doping Level – Y. Wang, Y. Chen, F. Xue, F. Zhou, Y. Chang, and J. Lee (The University of Texas at Austin)
- **2608** Thiol-Ene Reaction Derived Sol-Gel Hybrid Dielectric Layer for Oragnic Thin Film Transistors – J. Kim, Y. Kim, J. Ko (Korea Advanced Institute of Science and Technology), and B. Bae (Korea Advanced Institute of Science ad Technology (KAIST))
- **2609** Comprehensive Study on Chemical Structures of Compositional Transition Layer at SiO_2/Si(100) Interface – T. Suwa, A. Teramoto (Tohoku University), T. Muro, T. Kinoshita (Japan Synchrotron Radiation Research Institute), S. Sugawa, T. Hattori, and T. Ohmi (Tohoku University)

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. Claeys (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. Claeys, 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. Galeti (University of Sao Paulo), M. Aoulaiche, E. Simoen, and C. Claeys (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. Krain (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 of Interstitial Oxygen – G. Kissinger, D. Kot (IHP), and W. Von Ammon (Siltronic AG)

15:20 Intermission (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 Donor 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. Kirnstoetter, 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. Milovzorov (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-CNM-CSIC)), 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)

E7 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 Taipei 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 MoS_2 Thin Layers and Their Applications – L. Li (Academia Sinica)

10:50 **2675** Epitaxial Growth of Iron-Silicide Nanodots on Si Substrates Using Ultrathin SiO_2 Film Technique and Their Physical Properties – Y. Nakamura (Osaka University) and M. Ichikawa (University of Tokyo)

11:15 **2676** Au@SnO_2 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 Ga_2O_3/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

14:00 **2679** Surface Plasmon-Enhanced Optical Properties of Composite Materials Containing Metal Nanoparticles: Birefringence and Laser Oscillation – K. Tanaka, K. Fujita, S. Murai, X. Meng, Y. Moriguchi, and T. Komine (Kyoto University)

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)

15:15 **2682** Photoacoustic Emission from Local Plasmon Resonators Nanostructured by Glancing Angle Deposition – K. Namura, M. Suzuki, K. Nakajima, and K. Kimura (Kyoto University)

15:30 **2683** Field Emission of Core-Shell Ga_2O_3 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** SiO_2 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/Ga_2O_3 Nanowires – B. Wu, C. Hsu, and L. Chou (National Tsing Hua University)

17:20 **2688** Horizontal-Slot Disk Resonators Incorporating Nanocrystals for Low-Cost, On-Chip Bio-Sensors – S. Lee, G. Kim, and J. H. Shin (KAIST)

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 AlGaInP-based Light Emitting Diodes – H. Oh (Korea Photonics Technology Institute)
- **2690** Near-Infrared Light Detection of n-Type β-$FeSi_2$/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 (National Institute for Materials Science)
- **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-$FeSi_2$/p-Type Si Heterojunction Photodiodes – R. Iwasaki, K. Yamashita, N. Promros, S. Izumi, and T. Yoshitake (Kyushu University)

E8 Processing Materials of 3D Interconnects, Damascene and Electronics Packaging 4

Dielectric Science and Technology / Electrodeposition / Electronics and Photonics

310, Level 3, Hawaii Convention Center

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. Philipsen, S. Armini, A. Radisic, Y. Civale, P. Leunissen (IMEC), and S. Shingubara (Kansai University)

08:20 **2728** Via Filling Electrodeposotion 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)

14:20 **2739** Synergistic Effects of Additives on the Filling Process of High-Aspect-Ratio TSV – Kinetic Monte Carlo Simulation – - Y. Fukiage, Y. Kaneko (Kyoto University), K. Ohara, and F. Asa (C. Uyemura & Co., Ltd.)

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. Onuki (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. Qu, K. Mai, J. Nguyen, and J. Flake (Louisiana State University)

17:20 **2748** Investigation of the Mechanism of Cu Eruption-Induced Copper Void Defects in Memory Applications. – K. Chung, J. Park, T. Yoon, G. Oh, D. Park, S. Kim, D. Im, D. Lee, J. Kim, M. Park, D. Kim, Y. Chung, J. Baek, S. Kwon, H. Jeong, J. Kim, S. Nam (Samsung Electronics Co., LTD), H. Kang (Samsung Electronics Co., Ltd.), and C. Chung (Samsung Electronics Co., Ltd)

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.)

E10 More than Moore

Dielectric Science and Technology / Electronics and Photonics / Sensor / New Technology Subcommittee
319A, Level 3, Hawaii Convention Center

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/spintronics 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)

14:35 **2799** Improving I_{on}/I_{off} in Bilayer Graphene Transistors by Molecular Functionalization – M. Cantoro, A. Nourbakhsh, A. Klekachev, I. Asselberghs, C. Huyghebaert, M. Heyns, and S. De Gendt (imec)

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)

E12 Photovoltaics for the 21st Century 8

Dielectric Science and Technology / Electrodeposition / Electronics and Photonics / Energy Technology / Industrial Electrochemistry and Electrochemical Engineering
314, Level 3, Hawaii Convention Center

Dye Sensitized Solar Cells I – 08:00 – 12:00
Co-Chairs: Miyasaka, Druffel, and Rajeshwar

08:00 **2853** Microstructural Controls of a Titania Electrode for Dye-Sensitized Solar Cells – A. Nakamura, T. Hyodo, and Y. Shimizu (Nagasaki University)

08:20 **2854** Rapid Synthesis of High Performance TiO_2 Nanoparticles for Dye-Sensitized Solar Cells Employing Microwave and Supercritical Water – K. Manseki, Y. Kondo, D. Ishihama, T. Ban, T. Sugiura (Gifu University), and T. Yoshida (Yamagata University)

08:40 **2855** Protonated Carboxyl Anchor for Stable Adsorption of Ru N749 dye on TiO_2 Anatase (101) Surface – K. Sodeyama, M. Sumita, and Y. Tateyama (National Institute for Materials Science (NIMS))

09:00 **2856** High Efficiency Dye-sensitized Solar Cells Using Thin TiO_2 Films Co-sensitized by Indoline Dyes – S. MORITA, M. Ikegami, A. Ishii, and T. Miyasaka (Toin University of Yokohama)

09:20 **2857** Preparation of Non-annealed Anatase TiO_2 Films on ITO substrates by Anodizing in Hot Phosphate/glycerol – E. Tsuji, N. Hirata, and H. Habazaki (Hokkaido University)

09:40 Intermission (20 Minutes)

10:00 **2858** Enhanced Hole Transport in Nickel Oxide Electrodes for Photoelectrochemical Sensitized Cells – K. Zhu, S. Kang, N. Neale, and A. Frank (National Renewable Energy Laboratory)

10:20 **2859** Alkylation of Chlorin e6 for Higher Efficiency Dye-Sensitized Solar Cells – X. Wang (Yamagata University), H. Tamiaki (Ritsumeikan University), and S. Sasaki (Nagahama Institute of Bio-Science and Technology)

10:40 **2860** Tin Oxide Nanowires and Their Hybrid Architectures for Kinetically Fast Redox Couples in Dye-Sensitzed Solar Cells – V. Vendra (University of Louisville), T. Nguyen, D. Amos (Univeristy of Louisville), T. Druffel, and M. K. Sunkara (University of Louisville)

11:00 **2861** Nano-Clay Electrolyte for High Performance Dye-Sensitized Solar Cells – S. Uchida, T. Kubo (The University of Tokyo), and H. Segawa (Research Center for Advanced Science and Technology)

11:20 **2862** Integration of Polymer Electrolytes in Nanostructured Electrodes of Dye Sensitized Solar Cells – S. Nejati, D. Martin (Drexel University), C. Prejean (Drexel Univeristy), J. Deshmukh (Drexel University), and K. K. Lau (Drexel Unversity)

11:40 **2863** Conductivity Enhanced CuSCN for Improved Performance in Dye-Sensitized Solid-state Solar Cells – A. Konno, E. Premalal, and N. Dematage (Shizuoka University)

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. Lupitskyy (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)

15:20 **2868** Nanostructured Photoelectrodes for Dye Sensitized Solar Cells – I. Turkevych, K. Matsubara, and M. Kondo (National Institute of Advanced Industrial Science and Technology)

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 (Ymagata 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 Univercity), 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** Cu_2S Counter Photocathodes for Quantum-Dot Sensitized Solar Cells – S. Lee and K. Ahn (Yeungnam University)
- **2877** CdS Quantum Dots Deposited by Chemical Bath Deposition for the Application to Quantum Dot-Sensitized Solar Cells – D. Lee and K. Ahn (Yeungnam University)
- **2878** Effects of High Pressure Annealed for Electrodeposited $CuInSe_2$ Solar Cell – T. Chang, W. Lee, and Y. Su (National Cheng Kung 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)
- **2880** The Effect of TiO_2 Microstructure and Introduction of Silver Nanoparticles on Conversion Efficiency of Sb_2S_3 Sensitized Semiconductor Solar Cells – S. Yoshioka, T. Mishima, and M. Ihara (Tokyo Institute of Technology)
- **2881** ZnS Films Deposited by ALD for Solar Cell Applications – Y. Erkaya, D. Nminibapiel, N. Hegde, K. Aryal, G. Rajan, P. Boland, K. Zhang, H. Baumgart, and S. Marsillac (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 MS^n 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)
- **2885** Application of Electrochemical Impedance Spectroscopy in Characterization of Mass- and Charge Transfer Processes in Dye-Sensitized Solar Cell – N. T. Hoang, H. Tran, and T. Nguyen (Vietnam National University)
- **2886** Photovoltaic Properties in Al-doped ZnO/non-doped Zn1-XMgXO/Cu_2O Heterojunction Solar Cells – T. Minami, Y. Nishi, T. Miyata, and S. Abe (Kanazawa Institute of Technology)
- **2887** Two-Step Anodization for TiO_2 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_2OZnO 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. Lina (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 CuI 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. Ihara, 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 Univercity), and M. Okuya (Shizuoka University)
- **2899** Dye-Sensitized Solar Cells Based on Polyaniline – 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)

E14 Semiconductor Wafer Bonding 12: Science, Technology, and Applications

Electronics and Photonics

312, Level 3, Hawaii Convention Center

Metal and 3D Integration – 08:00 – 09:40

08:00 **2964** Cu Surface Passivation with Self-Assembled Monolayer (SAM) and Its Application for Wafer Bonding at Moderately Low Temperature – C. Tan (Nanyang Technological University) and D. Lim (NTU)

08:40 **2965** Evaluation of Titanium Direct Bonding Mechanisms – F. Baudin, L. Di Cioccio, P. Gergaud, N. Chevalier, V. Delaye, D. Mariolle, J. Fabbri, B. Imbert (CEA, LETI, Minatec Campus), and Y. Bréchet (SIMaP)

09:00 **2966** A New Combined Process of Formic Acid Pretreatment for Low-temperature Bonding of Copper Electrodes – W. Yang, M. Akaike, M. Fujino (The University of Tokyo), and T. Suga (University of Tokyo)

09:20 **2967** Low-Temperature Cu-Cu Wafer Bonding – B. Rebhan (EV Group), G. Hesser (Center of Surface- and Nanoanalytics, Johannes Kepler University), J. Duchoslav (Center of Surface- and Nanoanalytics, Johannes Kepler University; and Christian Doppler Laboratory for Microscopic and Spectroscopic Material Characterization), V. Dragoi (EV Group E. Thallner GmbH), M. Wimplinger (EV Group), and K. Hingerl (Center of Surface- and Nanoanalytics, Johannes Kepler University)

Materials and Device Integration – 10:20 – 12:00

10:20 **2968** Advanced Heterogeneous Integration of InP HBT and CMOS/SiGeBiCMOS Technologies – A. Gutierrez-Aitken, P. Chang-Chien, B. Oyama, D. Scott, K. Hennig, E. Kaneshiro, P. Nam, K. Thai, B. Poust, A. K. Oki, and R. Kagiwada (Northrop Grumman Aerospace Systems)

11:00 **2969** Wafer Level 3D Stacking using Smart CutTM and Metal-Metal Direct Bonding Technology – L. Di Cioccio, F. Mazen (CEA,LETI,Minatec), F. Baudin (CEA, LETI, Minatec Campus), A. Mounier, T. Lacave (CEA,LETI,Minatec), V. Delaye (CEA, LETI, Minatec Campus), B. Imbert (Cea.leti.Minatec), N. Chevalier (CEA, LETI, Minatec Campus), M. Denis (CEA,LETI,Minatec), G. Gaudin, I. Radu, S. Thieffry, and T. Signamarcheix (Soitec)

11:20 **2970** Cu-Sn Transient Liquid Phase Wafer Bonding: Process Parameters Influence on Bonded Interface Quality – C. Floetgen, K. Corn, M. Pawlak, and V. Dragoi (EV Group E. Thallner GmbH)

11:40 **2971** Laser Transmission Bonding of Silicon with Titanium and Copper Layer for Wafer-Level Packaging – A. Wissinger (RWTH Aachen University), M. Schmitz, A. Olowinsky, A. Gillner (Fraunhofer Institute for Laser Technology ILT), and R. Poprawe (Aachen 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)

15:20 **2975** Low Temperature Fusion Wafer Bonding Quality Investigation for Failure Mode Analysis – V. Dragoi (EV Group E. Thallner GmbH), P. Czurratis (PVA Tepla Analytical Systems GmbH), S. Brand, A. Graff, C. Patzig, and M. Petzold (Fraunhofer Institute for Mechanics of Materials IWM)

15:40 **2976** Using of Different Nano Scale Energetic Material Systems for Reactive Bonding – J. Braeuer, J. Besser, M. Wiemer, and T. Gessner (Fraunhofer ENAS)

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. Myouenzono (Shibaura Institute of Technology)
- **2978** Room Temperature Wafer Bonding by Surface Activated ALD- Al_2O_3 – 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. Moutanabbir (Universite de Montreal, 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 Eutectic 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. Amarasinghe, L. Wielunski (Rutgers University), A. Barcz (Institute of Electron Technology), L. C. Feldman, and G. K. Celler (Rutgers University)

E15 State-of-the-Art Program on Compound Semiconductors 54 (SOTAPOCS 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)

10:15 **3017** GaN HEMT Degradation: Effect of RF Stress – E. Douglas (Sandia National Laboratories), B. Gila, F. Ren, C. Abernathy, and S. Pearton (University of Florida)

10:45 **3018** A Survey of Electrical Signatures Characteristic of Step-Stressed InGaP/GaAs HBTs – A. G. Baca, A. Scruggs, A. Gorenz, T. Fortune, J. Klem, R. Briggs, J. Clevenger, G. Patrizi, and C. Sullivan (Sandia National Laboratories)

11:15 **3019** Direct Die Solder of GaAs Power Amplifier Dies and Application of Electrolessly Plated Nickel Barrier – H. Shen and S. Maganti (Skyworks Solutions, Inc.)

11:30 **3020** Resistive Switching Characteristics of N-doped ZnO Films Using Atomic Layer Depsition – T. Huang (Photonics and Optoelectronics), W. Chang (National Taiwan University), J. Chien (Materials Science and Engineering), C. Kang, P. Yang (National Taiwan University), M. Chen (Materials Science and Engineering), and J. He (National Taiwan University)

11:45 **3021** Influence of Catalystic Effect on Transport Behaviors of InAs NWs For High Performance Nanoscale Transistors – Y. Chueh (National Tsing Hua University)

Compound Semiconductor Process – 13:30 – 17:15

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)

15:00 **3026** Application of Inline X-ray Metrology for Defect Characterization of III-V/Si Heterostructures – P. Hung (Sematech), M. Wormington, K. Matney, P. Ryan (Jordan Valley Semiconductors Ltd), K. Dunn (CNSE), A. Wang, R. Hill, M. Wong, J. Price, W. Wang, and G. Bersuker (SEMATECH)

15:15 Intermission (15 Minutes)

15:30 **3027** Advanced Compound Semiconductor and Silicon Fabrication Techniques for Next-Generation Solar Power Systems – G. N. Nielson (Sandia National Laboratories)

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)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

E15 – SOTAPOCS 54 Poster Session – 18:00 – 20:00
Co-Chair: Pablo Chang

- **3031** Cytotoxicity Study of Zinc Oxide Nanoparticles Modified with Biological Coatings – R. Chung, W. Wei, R. Lin (National Taipei University of Technology), W. Shih (Metal Industries Research and Development Centre), and H. Wang (Mackay Memorial Hospital)
- **3032** 4H-SiC Lateral JFET for Low Power Operational Amplifier Applications – W. Lien (University of California, Berkeley), D. G. Senesky (Stanford University), and A. Pisano (University of California, Berkeley)
- **3033** Visible-Blind Ultraviolet Photodetector Fabricated on n-ZnO/$LaAlO_3$/p-Si Heterojunction – D. Tsai, C. Kang, H. Wang (National Taiwan University), Y. Chu (National Chiao Tung University), and J. He (National Taiwan University)

E16 Thin Film Transistors 11 (TFT 11)

Electronics and Photonics
327, Level 3, Hawaii Convention Center

Si-Based TFTs I – 08:00 – 10:20
Co-Chairs: R. Ishihara and O. Bonnaud

08:00 **3056** Twenty five Years of Improvement of the Silicon Based TFT: From As-Deposited Polycrystalline Silicon to Nanostructured Silicon Deposited at Very Low Temperature – T. Mohammed-Brahim and O. Bonnaud (University Rennes 1)

08:40 **3057** Beyond the Current Horizontal of Silicon Thin Film Technology: Light-Soaking Free Nano-Crystal Embedded Polymorphous Silicon Thin Film and TFT by Neutral Beam Assisted CVD at Room Temperature – M. Hong and J. Jang (Korea University)

09:20 **3058** Impacts of Channel Thickness on the Characteristics of N-Type Planar Junctionless Poly-Si Thin-Film Transistors – C. Lin, H. Lin, and T. Huang (National Chiao Tung University, Hsinchu, Taiwan, R.O.C.)

09:40 Intermission (40 Minutes)

Si-Based TFTs II – 10:20 – 11:40
Co-Chairs: O. Bonnaud and R. Ishihara

10:20 **3059** Grain Growth Control during Micro-Thermal-Plasma-Jet Irradiation Using Amorphous Si Strips and Slit Masks – Y. Fujita, S. Hayashi, K. Sakaike, and S. Higashi (Hiroshima University)

10:40 **3060** Decreasing the Off-Current for Vertical TFT by Using an Insulating Layer between Source and Drain – P. Zhang, E. Jacques, R. Rogel, and O. Bonnaud (University Rennes 1)

11:00 **3061** Thick Single Grain Silicon Formation with Microsecond Green Laser Crystallization – A. Arslan (Delft University of Technology), H. Kahlert, P. Oesterlin (Innovavent GmbH), D. Mofrad, R. Ishihara, and C. Beenakker (Delft University of Technology)

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. Sakaike, 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

15:50 **3066** CVD Produced Graphene/Silicon Nitride TFTs – W. Milne, M. T. Cole, P. Kidambi (Cambridge University), K. Ying, M. Drapeko, S. Hofmann, and A. Nathan (University of Cambridge)

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. Iino, 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_2O_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 Dielectrophoretic 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. Chiou, 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 Triethylsilylethynyl Anthradithiophene (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-$In_2Ga_2ZnO_7$ Thin-Film Transistors According to Thin Al_2O_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 Insitute(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** Characteristiscs 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)

- **3083** Composition Dependence of the Negative Bias Light Illumination Instability of Indium Zinc Oxide Transistors – S. Oh, B. Yang, Y. Kim, and H. Kim (Seoul National University)
- **3084** SKPM Study on Oxide TFT – J. Park and H. Cha (ETRI)
- **3085** The Change of Electrical Performance and Stability of Ti, B-doped In-Zn Oxide Thin Film Transistors Depending on Gate Insulators – B. Kim, J. Shin, C. Hong, K. Kim, N. Park, and W. Cheong (Electronics and Telecommunications Research Institute)
- **3086** Aqueous Inorganic Inks for Low Temperature Fabrication of Metal Oxide-Based High-Mobility Transparent Thin-Film Transistors – C. Liu, W. Lee, and T. Shih (National Cheng Kung University)

E17 SiGe, Ge, and Related Compounds: Materials, Processing, and Devices 5

Electronics and Photonics

316A, Level 3, Hawaii Convention Center

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)

09:50 **3117** Modeling of Field-Effect-Transistors with Strained and Alternative Channel Materials – F. Conzatti, D. Esseni, P. Palestri, and L. Selmi (University of Udine)

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

10:40 **3119** Reliability of SiGe channel MOS – J. Franco, B. Kaczer, J. Mitard, M. Toledano-Luque, G. Eneman, P. Roussel, M. Cho, T. Kauerauf (imec), T. Grasser (T.U. Wien), L. Witters, G. Hellings, L. Ragnarsson, N. Horiguchi, M. Heyns, and G. Groeseneken (imec)

11:10 **3120** Evaluation of Two contact Resistivity References on $Si_{1-x}Ge_x$ 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. Mangelinck (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 Univerisy), and D. Wang (Kyushu University)

12:00 **3122** Thermally Stable $NiSi_2$ 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)

12:20 **3123** Effect of an Atomically Matched Structure on Fermi-level Pinning at Metal/p-Ge Interfaces – K. Kasahara, H. Yoshioka, S. Yamada, T. Nishimura, M. Miyao, and K. Hamaya (Kyushu University)

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

13:50 **3124** Understanding Diffusion, Activation, and Related Phenomena in SiGe Alloys: Models and Challenges – H. W. Kennel (Intel Corporation)

14:20 **3125** Strain Control of Si and $Si_{1-x-y}Ge_xC_y$ Layers in $Si/Si_{1-x-y}Ge_xC_y/Si$ 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)

316B, Level 3, Hawaii Convention Center

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 (IHP)

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. Cortie and R. Lewis (University of Wollongong)

15:50 Intermission (15 Minutes)

316A, Level 3, Hawaii Convention Center

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 Lateral Overgrowth of InGaAs Microdiscs on Si – M. Sugiyama (University of Tokyo)

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

17:05 **3136** Controlling Epitaxial GaAsP/SiGe 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. Maes (ASM Belgium), J. Tolle (ASM America), S. Thomas (ASM), A. Alian, A. Hikavyy, and R. Loo (imec)

17:45 **3138** Heteroepitaxy of III-V Compound Semiconductors on Si for Logic Applications: Selective Area Epitaxy in Shallow Trench Isolation Structures vs. Direct Epitaxy mediated by Strain Relaxed Buffers – M. Cantoro, C. Merckling, S. Jiang, W. Guo, N. Waldron, H. Bender, J. Dekoster, R. Loo, W. Vandervorst, M. Caymax, and M. Heyns (imec)

316B, Level 3, Hawaii Convention Center

Optoelectronics Session 2: Lasing, Strain and Interconnects – 16:05 – 18:05
Co-Chair: Gianlorenso Masini

16:05 **3139** Electrically Pumped Lasing from Ge-on-Si – J. Michel (Massachusetts Institute of Technology)

16:35 **3140** Strain Engineering for Optical Gain in Germanium – P. Boucaud (CNRS), M. El Kurdi, M. De Kersauson, A. Ghrib (Univ Paris-Sud), S. Sauvage, R. Jakomin, G. Beaudoin, O. Mauguin, L. Largeau, I. Sagnes (CNRS), G. Ndong, M. Chaigneau, and R. Ossikovski (Ecole Polytechnique)

17:05 **3141** Silicon Compatible High Performance Optical Interconnect Technology – B. Dutt (APIC Corporation)

17:25 **3142** Optical Characterization of Ge-on-Si Grown by using RTCVD – T. Kim, Y. Kil, W. Hong, H. Yang, S. Kang, T. Jeong, and K. Shim (Chonbuk National University)

17:45 **3143** High Extinction Ratio, Low Energy Consumption Ge Quantum Well Electro-Absorption Modulator with 23 GHz Bandwidth – G. Isella (Politecnico di Milano), P. Chaisakul, D. Marris-Morini, M. Saïd Rouifed (Univ. Paris-Sud), D. Chrastina, J. Frigerio (L-NESS Dip. di Fisica – Politecnico di Milano), X. Le Roux, S. Edmond, J. Coudevylle, and L. Vivien (Univ. Paris-Sud)

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** $Ge_{1-x}Sn_x$ Alloys Pseudomorphically Grown by R. F. Magnetron Sputtering – H. Pérez Ladrón de Guevara (Universidad de Guadalajara), Á. Rodríguez Vázquez, H. Navarro Contreras, and M. Vidal Borbolla (Universidad Autónoma de San Luís Potosí)
- **3147** High Quality Silicon Cap Layer for 28nm and Beyond PMOS Processes – C. Liao, T. Hsuan, C. Chien, M. Chan (United Microelectronics corp), C. Yang (United Microelectronics Corp.), J. Wu (United Microelectronics Corp), and B. Ramachandran (Applied Materials Inc.)
- **3148** Accurate Reactive Ion Etching of Si, Ge and P Doped Ge in an SF_6-O_2 Radio-Frequency Plasma – C. Wongwanitwattana, V. A. Shah, M. Myronov, E. H. Parker, T. E. Whall, and D. R. Leadley (University of Warwick)
- **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 University), 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_xSi_{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 dosing – T. Kaufman-Osborn, J. Lee, K. Kiantaj, and A. Kummel (University of California, San Diego)
- **3160** Orientation Dependence of $Si_{1-x}C_x$:P Growth and the Impact on FinFET Structures – J. Tolle, D. Weeks, M. Bauer (ASM America), V. Machkaoutsan, J. Maes (ASM Belgium), M. Togo, A. Hikavyy, S. Brus, and R. Loo (imec)
- **3161** High Throughput SEG of Highly *In Situ* Doped SiCP/SiP Layers for NMOS Devices Using a $Si_3H_8SiH_3CH_3/PH_3/Cl_2$ 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 $Ce(iprCp)_3$ – I. Oh, M. Kim, J. Park (Yonsei University), J. Gatineaub, K. Changhee (K.K. Air Liquide Laboratories), and H. Kim (Yonsei University)
- **3164** Point-of-Use Sampling and Organic Impurity Analysis for Bulk Gases in Semiconductor Processing – J. PARK, S. Shin*, Y. Lee*, P. Jun*, and J. Kim* (Samsung Electronics Co.,Ltd)
- **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 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)
- **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 – N. Loubet (STMicroelectronics), T. Nagumo (Renesas), 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)
- **3170** Evidence of Boron Cluster Formation in Ultra-Shallow Ion Implanted Ge – B. R. Yates, B. L. Darby, N. Rudawski (University of Florida), D. H. Petersen, O. Hansen (Technical University of Denmark), R. Lin, P. F. Nielsen (CAPRES A/S), A. Kontos (Applied Materials), and K. S. Jones (University of Florida)
- **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-CINaM), B. Ealet (Aix-Marseille University), P. De Padova (CNR-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)

F1 Bio-Enabled Materials, Processes, and Devices

Electrodeposition / Physical and Analytical Electrochemistry / Sensor

311, Level 3, Hawaii Convention Center

Biological Templates for Device Fabrication – 10:00 – 12:00
Co-Chair: Nosang Myung

10:00 **3250** (Invited) Rational Design of Proteins for Modulation of Materials Growth Processes – D. T. Schwartz (University of Washington)

10:40 **3251** (Invited) Selective Metallization of Scaffolded DNA Origami to Form Self-Assembled Nanoelectronic Systems – A. T. Woolley, Y. Geng, E. Pound, M. Lydiksen, A. Pearson, J. Liu, B. Uprety, R. Davis, and J. N. Harb (Brigham Young University)

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 Institutte 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. Uprety (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 Phosporylcholine 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. Pulletikurthi 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)

F2 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 Bi_2Te_3-based Thermoelectrics – C. L. Arrington, P. Sharma, J. Coleman, E. Baca, A. Rowen, D. Banga, D. B. Robinson, and V. Stavila (Sandia National Laboratories)

08:20 **3277** Electrodeposition of Sb_xTe_y and Bi_xTe_y Thin Films for Thermoelectric application – J. Lim (Korea Institutte 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 Al_2O_3 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 Intermission (20 Minutes)

10:00 **3281** 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)

10:40 **3283** Photoluminescence Properties of Electrodeposited Porous Silicon/ Cerium oxide Composite – M. Mizuhata and Y. Kubo (Kobe University)

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. 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. Hai, 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. Critelli 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)

14:20 **3288** Theoretical Analysis of the Solvent Effect on Hypophosphite Ion Adsorption on Pd and Cu Surfaces – M. Kunimoto, K. Seki, H. Nakai, and T. Homma (Waseda University)

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)

15:40 **3292** Study of the Copper Electrodeposition Mechanism on Molybdenum Substrate – E. Delbos, H. El Belghiti (OMG Ultra Pure Chemicals), D. Mercier, J. Vigneron, M. Bouttemy, and A. Etcheberry (Institut Lavoisier de Versailles)

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-TiO_2 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_2O 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 Institutte of Materials Science)
- **3302** Characterization of Zn-Ni-P alloys Electrodeposited in Alkaline Solutions – Y. Kamimoto, K. Yamamoto, S. Yamashita, and R. Ichino (Nagoya University)
- **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 Multilayering Process of MnO_2 – K. Tomono, R. Yamaguchi, and M. Nakayama (Yamaguchi University)
- **3306** AFM Analysis for Initial Stage of Electroless Displacement 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 Química – Unesp), R. Della Noce, C. Sadao Fugivara, and A. Vicente Benedetti (Unesp)
- **3310** Electrochemical Formation of Functional Silver Coatings: Nanostructural Peculiarities – O. Bersirova and V. Kublanovsky (V.I.Vernadskii Institute of General and Inorganic Chemistry NAS of Ukraine)
- **3311** High Temperature Hardness of Electrodeposited Nickel-based Carbon Nanotube Composite Coatings – T. Suzuki, M. Kato, T. Matsuda, and S. Kobayashi (Yamagata Research Institute of Technology)

F3 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 Surface 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-Nonwoven 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 Platimg – A. Nakamura, N. Mukado, T. Ichii, and H. Sugimura (Kyoto University)
- **3337** Enhanced Pd Distribution by Three-Step Activation Process for Electroless Cu Plating – C. Lee, H. Lee, M. Lee, J. Hur, and H. Lee (Korea Institute of Industrial Technology)
- **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)

F5 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. Schwarzacher, 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 $L1_1$ and B_h 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. Bairachna (Northeastern University), T. Maliar, H. Cesiulis (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)

15:40 **3410** Evaluation of the Effects of Electroplating Conditions on the Material Properties of Iron Cobalt Thick Films using Design of Experiments – W. C. Patterson and D. P. Arnold (University of Florida)

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 Universitaet Ilmenau), and A. Bund (Technische Universität Ilmenau)

16:20 **3412** Investigation of the Crystallization 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 $Co_{80}Pt_{20}$ 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 Electrodeposited into Anodized Aluminium 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 $Fe_3Si/FeSi_2$ 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)

H1 Carbon Nanotubes and Graphene: From Fundamental Properties and Processes to Applications and Devices

Fullerenes, Nanotubes, and Carbon Nanostructures / Dielectric Science and Technology / Energy Technology / Sensor

317A, Level 3, Hawaii Convention Center

Session I – 08:00 – 12:20
Co-Chairs: T. Akasaka, D. Guldi, 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. Kosina (IUE/TU Wien)

09:00 **3474** Hierarchical Graphene Macroassemblies – M. A. Worsley, M. Merrill, M. Suss, J. Lee, S. Kucheyev, C. Valdez, H. Mason, B. Mayer, J. Lewicki, A. Wittstock, M. Stadermann, J. Satcher, J. Biener, and T. Baumann (Lawrence Livermore National Laboratory)

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

09:40 Intermission (20 Minutes)

10:00 **3476** Graphene Thermal Interface Materials – A. A. Balandin (University of California)

10:20 **3477** Towards Novel Pillared Nanostructures 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. Sahoo, S. Barik, G. Sharma, G. Khurana, and J. Scott (University of Puerto Rico)

11:00 **3479** Comparison of Epitaxial Graphene growth on non-Polar and Polar 6H-SiC – L. O. Nyakiti (U.S. Naval Research Laboratory), V. Wheeler, R. Myers-Ward, N. Garces, F. Bezares, J. Caldwell, C. Eddy Jr., and D. Gaskill (U.S Naval Research Laboratory)

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 Gendt, 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 Tetrathiafulvalenes to Nanocrystals / Quantum Dots – D. M. Guldi (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 Intermission (20 Minutes)

15:40 **3487** Photosensitized Hydrogen Evolution from Water Using Single-Walled Carbon Nanotube/Fullerodendron/SiO_2 Coaxial Nanohybrid – Y. Takaguchi, T. Wada, W. Sakata, and T. Tajima (Okayama University)

16:00 **3488** Electrochemical Property of Well-Coated Multi-Walled Carbon Nanotube with Polyaniline-Cyclodextrin Polymer Composites – W. Zhang, M. Chen, X. Gong, and G. Diao (Yangzhou University)

16:20 **3489** Advantage of Carbon Nanotubes as Catalyst Support in Polymer Electrolyte Membrane Fuel Cells – M. Berber, T. Fujigaya, and N. Nakashima (Kyushu University)

16:40 **3490** 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 **3491** 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)

17:20 **3492** Single Molecule Lysozyme Monitoring by a Carbon Nanotube Circuit – Y. Choi, P. Sims, I. Moody, T. Olsen, G. Weiss, and P. G. Collins (Univ. of California, Irvine)

17:40 **3493** Application of Carbonaceous Nanomaterials in Biomedicine – J. Zhen, Q. Liu, D. Chen, C. Wang, and C. SHU (Institute of Chemistry, Chinese Academy of Sciences)

18:00 **3494** 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 Fullerenes – N. Mizorogi, T. Akasaka (University of Tsukuba), and S. Nagase (Kyoto University)
- **3498** Synthesis and Structural Characterization of Fullerene derivatives Encapsulating Trimetallic 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 Nanofilament Over Oxidized Diamond-Supported Catalysts – K. Nakagawa, T. Toriyama, G. Tsujino (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 π-System – N. Umekita, T. Tsuchiya, N. Mizorogi (University of Tsukuba), H. Sakurai (Institute for Molecular Science), N. Martín (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. Kurihara, 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)
- **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)
- **3507** The Organic Additives Effects during Electroless Nickel and Silver Deposition on Carbon Nanotube – T. Saito, Y. Takagi, N. Okamoto, K. Kondo (Osaka Prefecture University), Y. Kobayashi, and Y. Fujiwara (Osaka Municipal Technical Research Institute)
- **3508** Integrated Field Emission Diode with a Nano-graphite-diamond-like Emitters Process Development and Its Electrical Characteristics Study – N. Zaytsev, S. N. Orlov, S. Yanovich, A. Krasnikov, I. Matyushkin, I. Khomyakov, K. Svechkarev (Molecular Electronics Research Institute JSC), and R. Yafarov (RAS, Kotel'nikov Institute of Radio Engineering and Electronics)
- **3509** Multiple Auger Decay at Resonant Photo-Excitation in Carbon Thin Films – M. Richter, D. Friedrich, and D. Schmeißer (Brandenburg University of Technology)
- **3510** Photo-Thermo-Voltaic Effects in Carbon Nanotube Films – M. Omari, T. Hosseini, and N. Kouklin (University of Wisconsin-Milwaukee)
- **3511** Enhancement of Diamond Crystallite 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)

I1 Physical and Analytical Electrochemistry General Session

Physical and Analytical Electrochemistry
318B, Level 3, Hawaii Convention Center

PAED General Session 3 – 09:00 – 12:00
Co-Chairs: C. Hussey and T. Chung

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 (INRS- 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 (Murdoch 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. Shitanda, 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 4 – 14:00 – 15:00
Co-Chairs: P. Atanassov and P. Kulesza

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 Insitute @ NTU), U. Kortz (Jacobs University), H. Hoster, and U. Stimming (TUM CREATE Centre for Electromobility)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

I1 – Poster Session – 18:00 – 20:00
Co-Chairs: S. Minteer and A. Hillier

- **3552** Electrode Reactions of Dissolved p-Dimethoxybenzene on a Polyaniline-Modified Electrode – J. Yano (Niihama National College of Technology)
- **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)
- **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)
- **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)
- **3556** Solar Driven Hydrogen Production with co-doped Gallium and Nitrogen in Zinc Oxide films prepared by Reactive RF Magnetron Sputtering – S. Shet (National Renewable Energy Laboratory)
- **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)
- **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)
- **3559** Electrochemical Properties of Free-Standing Boron-Doped Heteroepitaxial Diamond Electrode – H. Kodama (Aoyama Gakuin University), K. Suzuki (Toplas Engineering Co., Ltd), S. Kono, and A. Sawabe (Aoyama Gakuin University)
- **3560** Study on the Effects of Electrochemical Realkalization Method with Alcamines 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)
- **3561** Transcutaneous Vein Imaging and Venepuncture System for Blood Test – H. Saito, S. Yamamoto, and H. Takagi (Tokyo National College of Technology)

- **3562** Reduction of Perchlorate by Electrochemically Generated Zero-Valent Iron on Conducting Polymer Electrode – E. Kim, S. Choi (Yonsei University), S. Kim (Hannam University), and K. Paeng (Yonsei University)
- **3563** Anomalous Codeposition of Ni-Zn in Acid Solutions – Y. ADDI (ENPEI-USTHB) and A. Khouider (USTHB)
- **3564** Irregular-Stairs Method: A More Precise Method of Measuring the Performance of Dye-Sensitized Solar Cells – J. Shimura and K. Noda (Sony Corporation)
- **3565** Cyclic Voltmogram for HUPD on Pt(111) Calculated from Total Gibbs Energies – H. A. Asiri (CWRU) and A. Anderson (Case Western Reserve University)
- **3566** Long Term Evaluation of Potentiometric Oxygen Sensors in Molten Lead – A. Verdaguer, S. Colominas, and J. Abella (Universitat Ramon Llull)
- **3567** Electrochemical Reduction of Selenite and Selenate Accelerated by Methyl Viologen – F. Koshikumo, W. Murata, A. Ooya, and S. Imabayashi (Shibaura Institute of Technology)
- **3568** Effect of pH on Absorption and Reductive Desorption Processes for Self-assembled Monolayer of Aromaticthiol Studied by Surface Enhanced IR Spectroscopy – K. Nishiyama, A. Kumatabara (Kumamoto Univ.), H. Ueda (Graduate School of Science and Technology, Kumamoto University), and S. Yoshimoto (Kumamoto University)
- **3569** Crystalline Composition Analysis of Titanium(IV) Oxide Photocatalyst Particles by X-ray Diffraction Analysis – M. SANO and B. Ohtani (Hokkaido University)
- **3570** Photoelectrochemical Water Splitting with Aluminum and Nitrogen co-doped Zinc Oxide prepared by Sputtering Technique – S. Shet (National Renewable Energy Laboratory)
- **3571** Potentiometric Determination of Potassium Ions in Biodiesel at a Nickel(II) Hexacyanoferrate Modified Electrode Using Microemulsions – G. Sedenho, L. Paim, and N. R. Stradiotto (Institute of Chemistry)

I2 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 Magnetite Particle Coated with Polyelectrolyte onto Multi-Walled Carbon Nanotube Nanohybrid (MaPoNT) in Microbial Fuel Cell – I. Park, Y. Heo, P. Kim, and K. Nahm (Chonbuk National University)

09:00 **3591** Ammonia Production at Anabaena variabilis Modified Electrodes – T. Paschkewitz 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 CO_2 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. Shitanda, H. Yanai, Y. Yoshihata, Y. Hoshi, M. Itagaki (Tokyo University of Science), and S. Tsujimura (University of Tsukuba)

11:40 **3598** Polyaniline Nanofiber/Carbon Black Composite as an Air Cathode Material for Microbial Fuel Cells – J. Ahmed and S. Kim (Konkuk University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

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. Shitanda, 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)

I3 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** $AlCl_3$/Trimethanyl Hydrochloride Ionic Liquid as an Electrolyte for Electrodepoisiton of Aluminium 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)

10:40 **3634** Ta and Nb Electrodeposition from Ionic Liquids – S. Krischok, A. Ispas, A. Zühlsdorff, A. Bund (Technische Universität Ilmenau), and F. Endres (Clausthal University of Technology)

11:00 **3635** Al-W Alloy Deposition from Lewis Acidic Room-Temperature Chloroaluminate Ionic Liquid – T. Tsuda, Y. Ikeda, T. Arimura, A. Imanishi, S. Kuwabata (Osaka University), C. Hussey (The University of Mississippi), and G. Stafford (NIST)

11:20 **3636** An Inverted Aluminium Electrolysis Cell Using a High Density Electrolyte and an Inert Anode – S. Rolseth (SINTEF Materials and Chemistry), H. Gudbrandsen (SINTEF), and J. Thonstad (Norwegian University of Science and Technology)

11:40 **3637** Al-Pt Alloy Deposition in $AlCl_3$-NaCl-KCl Molten Salt – M. Ueda, H. Hayashi, and T. Ohtsuka (Hokkaido University)

Biomass – 14:00 – 16:40
Co-Chairs: K. Brown and L. Haverhals

14:00 **3638** Polysaccharide Ecocomposite 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. Achinivu, G. Li, and W. A. Henderson (North Carolina State University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

I3 – Poster Session 1 – 18:00 – 20:00
Co-Chairs: D. Fox and M. Foley

- **3645** Electrochemical Behavior of Vanadium Oxides in $(NH_2)_2CO$ – 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 $NH_4F·2HF$ – 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-VCl_2 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 Electrorefining – R. Inaba, M. Ueda, and T. Ohtsuka (Hokkaido University)
- **3653** Induction of Liquid-Crystalline Bicontinuous Cubic Phases into Zwitterions by Addition of Lithium Salts – T. Matsumoto (Tokyo University of Agricuture 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. Nishiyama (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)

- **3669** Synthesis of Ionic Liquids as Solvents for Poly(3-Hydroxybutyrate) under Mild Condition – H. Mokudai, Y. Fukaya, N. Nakamura (Tokyo University of Agriculture and Technology), and H. Ohno (Tokyo University of Agriculture and Technology, JST CREST)
- **3670** Design of Ionic Liquid-Based Polyelectrolytes Showing Dynamic Phase Transition with Water – Y. Kohno and H. Ohno (Tokyo University of Agriculture and Technology)

I4 Electrocatalysis 6

Physical and Analytical Electrochemistry / Energy Technology / Industrial Electrochemistry and Electrochemical Engineering

315, Level 3, Hawaii Convention Center

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)

09:20 **3754** Synthesis, Characterization and Electrocatalytic Properties of Electrodeposited Pt Thin Films with Preferential {100} Orientation – E. Bertin, S. Garbarino (INRS-EMT), J. Solla-Gullón, F. Vidal-Iglesia, J. Feliu (University of Alicante), A. Ponrouch, M. H. Martin, and D. Guay (INRS-EMT)

09:40 **3755** Electrode Surface Control by Platinum Nanoparticles Protected by Polyacrylic Acid for Electrocatalytic Hydrogen Generation – M. Kajita and M. Yagi (Niigata University)

10:00 Intermission (20 Minutes)

10:20 **3756** (Invited) Electrochemical Behavior of Pt-Skin Layers on Pt-Co Alloy Single-Crystal Electrodes in Acid Media – M. Wakisaka, S. Morishima, Y. Hyuga, H. Uchida, and M. Watanabe (University of Yamanashi)

11:00 **3757** Unique Properties of Reduced SnO_x: CO Oxidation on Nanostructured SnO_x/Pt(111) – S. Axnanda, W. Zhou, M. G. White (Brookhaven National Laboratory), Z. Zhu (University of California, Berkeley), and Z. Liu (Lawrence Berkeley National Laboratory)

11:20 **3758** Clarification of Two-Consecutive Potential Driven Phase Transition Processes of Diphenyl Viologen at a Au (111) Electrode Surface – T. Higashi and T. Sagara (Nagasaki University)

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)

Theoritical Aspects in Electrocatalysis – 14:00 – 17:20
Co-Chairs: N. Hoshi and T. Ohsaka

14:00 **3760** Multiscale Modeling of the H_2 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 H_2 Oxidation on the $Sr_2Fe_{1.5}Mo_{0.5}O_{6-\delta}$ (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. Arnadottur (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. Deunf (Lawrence Berkeley National Laboratory / University California Berkeley), L. Rubin (University of California Berkeley), D. Pete (Lawrence Berekeley National Laboratory), J. Arnold (Universoty of California Berkeley), and J. Kerr (Lawrence Berekeley 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 (Gwagnju 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 Univeristy), 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** Molecuar 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/MnO_2 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)
- **3777** Hydrazine Oxidation at {100} Preferentially Oriented Pt Black Surfaces – C. Roy, E. Bertin, M. H. Martin, S. Garbarino, and D. Guay (INRS-EMT)
- **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 IrO_2 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)

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)

09:40 **3849** Bismuth-film electrodes for Sn^{2+} Sensing: The Roles of Grain Size, Preferred Orientation Ratio, and Surface Roughness – C. H. Lien, K. Chang, C. Hu, Y. Tsai, and D. Wang (National Tsing Hua University)

10:00 Intermission (20 Minutes)

10:20 **3850** High-Throughput Separation Assay for NO Metabolites in Blood using Microfluidic Electrophoresis – 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)

10:40 **3851** Effects of Surface Modification of Noble-Metal Electrodes with Au on the H_2 Sensing Properties of Diode-type Gas Sensors – T. Hyodo, T. Yamashita, and Y. Shimizu (Nagasaki University)

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 H_2 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 Currie)

14:20 **3857** Direct Comparison of Anti-Interference Property for Bimetallic PtAu, PtIr, and PtRu Nanoparticle catalysts in Amperometric Detection for H_2O_2 Based Biosensors – M. Janyasupab (Case Western Reserve University), Y. Zhang (Shanghai University), C. Liu (National Central University), and C. Liu (Case Western Reserve University)

14:40 **3858** A High-Throughput Assay for Evaluation of Embryoid Bodies using Local Redox Cycling-Based Electrochemical Chip Device – K. Ino, T. Nishijo, Y. Kanno, H. Shiku, and T. Matsue (Tohoku 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 SnO_2 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. Eychmüller (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)
- **3870** Development of Highly-Sensitive Electrochemical Measurement System on Dry Chemistry using Ionic Liquid – S. Arimoto, M. Takahashi, A. Kamei, and T. Yoshioka (Panasonic Corporation)
- **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 Cu^{2+}-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)
- **3875** High Sensitive Amperometric Detection of Glucose using Conductive DLC Electrode in Higher Potential Region – K. Honda, H. Naragino, K. Yoshinaga, A. Nakahara, and S. Tanaka (Yamaguchi University)
- **3876** Electrochemical Immunosensor for Diagnostic of Parasitical Human Diseases – C. A. Erdmann, J. Inaba, A. G. Viana, C. A. Pessoa, K. Wohnrath, and J. R. Garcia (State University of Ponta Grossa)
- **3877** Characterization and Electrochemical Response of Sonogel Carbon Electrode Modified with Nanostructured TiO_2 and ZrO_2 Film to Detect Common Neurotransmitters – M. Hughes, N. Vincent, and S. K. Lunsford (Wright State University)

- **3878** A Novel Approach of Pb(II) Determination in Environmental Samples by Lead Selective Electrodes – G. Lisak and J. Bobacka (Åbo Akademi University)
- **3879** Functionalization of Pyrolyzed Carbon Structures for Bio-nano-electronics Platforms – M. Hirabayashi, B. Mehta (San Diego State University), S. Kassegne (MEMS Lab, San Diego State University), and A. Khosla (Simon Fraser University)
- **3880** Micromechanical Detection of 2,4-Dinitrotoluene by a Cantilever-based Artificial Olfactory System with Micro-Preconcentrator – M. Chae, Y. Yoo (Korea Institute of Science and Technology), J. Lee (Kwangwoon University), S. Lee, J. Kang, T. Kim, and K. Hwang (Korea Institute of Science and Technology)
- **3881** Layer-by-Layer Catalytic Interface for Electrochemical Detection of Multiple Substrates Featuring Bio-Functionalized Carbon Nanotubes – J. Kirsch and A. Simonian (Auburn University)
- **3882** Improved Electrocatalytic Performance for H_2O_2 Detection Based on Bimetallic PtM (M = Pd, Au or Ir) Nanoparticles – Y. Zhang (Shanghai University), M. Janyasupab (Case Western Reserve University), C. Liu (National Central University), J. Xu (Shanghai University), and C. Liu (Case Western Reserve University)
- **3883** Superoxide Anion Radical Sensor using GC Electrode Modified with Heparin/PEDOT and Polymerized Iron Porphyrin – R. Matsuoka, T. Kondo, and M. Yuasa (Tokyo University of Science)
- **3884** Ultra-Sensitive Label-Free Detection of Proteins by Chemically Derived Graphene Based Field-Effect Transistor – D. Kim, I. Sohn, J. Jung, O. Yoon (Sungkyunkwan University), J. Park (Korea Electronics Technology Institute), and N. Lee (Sungkyunkwan University)
- **3885** New Application of Produced Pigment from Bacteria to Detect of Ammonia in Combination with Flow Injection for Ammonia Analysis – Y. Iida and I. Satoh (Kanagawa Institute of Technology)
- **3886** Preparation of Fine Implantable Needle Type Biosensors for Blood Vessel Glucose Monitoring – K. Edagawa and M. Yasuzawa (University of Tokushima)

J2 Luminescence and Display Materials: Fundamentals and Applications

Luminescence and Display Materials

323A, Level 3, Hawaii Convention Center

Phosphors for Lighting – 10:40 – 15:40
Co-Chairs: John Collins and Baldassare DiBartolo

10:40 Intermission (20 Minutes)

11:00 **3897** Novel Synthesis Methods of Silicate and Silicon Oxynitride Phosphors Using Silicon Monoxide (SiO) as a Raw Material – T. Ishigaki, T. Sakamoto, S. Kamei, K. Uematsu, K. Toda, and M. Sato (Niigata University)

11:40 **3898** Synthesis of Nitride and Oxynitride Phosphors Using Fluidized Bed Furnace – K. Toda, S. Kamei, K. Uematsu, T. Ishigaki, and M. Sato (Niigata University)

12:00 Lunch Break (120 Minutes)

14:00 **3899** Synthesis of Highly Efficient Red Phosphor $SrCaSiO_4:Eu^{2+}$ by Aqueous Solution Method – S. Tezuka, K. Hideki, Y. Takatuka, and M. Kakihana (Tohoku University)

14:20 **3900** Effects of Preparation Condition for Photoluminescent Properties of White Light Emitting Mesoporous Carbon¬-Silica Nanocomposites – Y. Ishii (Nagoya Institute of Technology), K. Sato, Y. Ishikawa (Japan Fine Ceramics Center, Mutsuno), and S. Kawasaki (Nagoya Institute of Technology)

14:40 **3901** Luminescence Properties of New Thioaluminate Phosphors $(Ba_{1-X}Sr_X)_4Al_2S_7:Eu$ – T. Hasegawa, H. Kato, M. Kobayashi, H. Yamane, and M. Kakihana (Tohoku University)

15:00 **3902** Anomalous Rare Earth Doping in Nitride and Oxynitride Phosphors – T. Takeda, R. Xie, N. Hirosaki, K. Kimoto (National Institute for Materials Science), and M. Saito (Tohoku University)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

J2 – Poster Session – 18:00 – 20:00

- **3903** Investigation of Ion Dependence of Electronic Structure for $3d^3$ Ions in Mg_2TiO_4 based on First-principles Calculations – M. Novita (Kwansei Gakuin University), H. Yoshida (Mitsubishi Chemical Group), and K. Ogasawara (Kwansei Gakuin University)
- **3904** Comparison of Simulation and Experimental Results of Crystalline Si Solar Module with $YVO_4:Bi^{3+},Eu^{3+}$ Nanophosphor Spectral Shifter – Y. Iso, S. Takeshita, and T. Isobe (Keio University)
- **3905** 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)
- **3906** 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)
- **3907** Comparison of Hydrothermal and Glycothermal Syntheses of $YBO_3:Ce^{3+},Tb^{3+}$ with Green Fluorescence under Near UV Excitation – H. Hara, S. Takeshita, T. Isobe (Keio University), T. Sawayama, and S. Niikura (SINLOIHI Co., Ltd.)
- **3908** Practical Multiplet Energy Level Diagrams for V^{2+}, Cr^{3+}, Mn^{4+} in Oxides and in Fluorides – H. Nagoshi (Kwansei Gakuin University), H. Yoshida (Mitsubishi Chemical Group), and K. Ogasawara (Kwansei Gakuin University)
- **3909** The Influence of Phosphor Decay Time on the Cross-Talk in 3D-PDP – J. Yoo (Chung-Ang University), C. Ji (LG Electronics), G. Anoop, 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_2O_3:Nd^{3+} Phosphors – G. Bilir (Istanbul Technical University), G. Ozen (Instanbul Technical University), J. Collins (Wheaton 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 $CaAl_4O_7$ Phosphors – J. Park, G. Kim, and Y. Kim (Kyonggi University)
- **3915** The Luminescent Properties of Eu^{2+} Doped Ca_2SiO_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. Higashiura, 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 Technology)
- **3918** Luminescence study of $Ca_{3-3x/2}(VO4)_2$:xEu ($0.01 \leq x \leq 0.09$) Red-Phosphors Prepared by Solution Combustion Method – K. Kim, S. Yoon (Sejong University), Y. Shin (Ceronics), and K. Park (Sejong University)
- **3919** Microstructure and Photoluminescence Properties of $Sr_{2.91}V_2O_8$:$Eu_{0.06}$ Phosphors Prepared by the Solution Combustion Method – K. Park, S. Yoon, K. Kim (Sejong University), and Y. Shin (Ceronics)
- **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 $Ca_{0.6}Sr_{0.4}TiO_3$: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. Munisamy, S. Kasilingam (Nagoya Institute of Technology), T. Rajalingam (National Chaio Tung University), and T. Masaki (Nagoya Institute of Technology)
- **3924** Synthesis of $Sr_2Si_5N_8$:Eu^{2+} Red-Emitting Phosphor by Induction Heating – J. Choi (University of California, San Diego), A. Piquette, M. Hannah, K. C. Mishra (Osram Sylvania), J. B. Talbot, and J. McKittrick (University of California, San Diego)
- **3925** Morphology and Particle Size Dependent Luminescence Properties of Y_2O_3:Eu Phosphors Prepared by Various Synthetic Methods – Y. Kim, J. Han, J. Talbot, and J. Mckittrick (University of California, San Diego)

J3 Materials for Solid State Lighting

Luminescence and Display Materials / New Technology Subcommittee

316B, Level 3, Hawaii Convention Center

Oxide and Oxynitrides – 08:00 – 09:40
Co-Chairs: Kyota Ueda and John Collins

08:00 **3969** Synthesis, Luminescence Mechanism and Application of β-sialon Green Phosphor with Sharp Line-Width – K. Takahashi, K. Yoshimura, M. Harada, Y. Tomomura (Sharp), T. Takeda, R. Xie, and N. Hirosaki (National Institute for Materials Science)

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. Albessard, A. Okada, T. Sato, R. Hiramatsu, and N. Matsuda (Toshiba Corporation)

Oxide Materials – 09:40 – 10:40
Co-Chairs: Naotoshi Matsuda and Kailash Mishra

09:40 **3972** Bandgap Estimates and Ce^{3+} Quenching in Cs_3CoCl_5-based Phosphors – U. Happek (University of Georgia) and A. Setlur (GE Global Research Niskayuna)

10:00 **3973** Single Phase, Highly Efficient $Li(Ca_{0.99-x}Sr_xEu_{0.01})PO_4$ Blue Emitting Phosphors for Near UV-Emitting LEDs – J. Han (University of California, San Diego), M. Hannah, A. Piquette (Osram Sylvania), J. Talbot (University of California, San Diego), K. C. Mishra (Osram 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)

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

J3 – Poster Session – 18:00 – 20:00

- **3975** Enhancement of Photoluminescence Properties of Green-Emitting Oxynitride Phosphor using Eu_2O_3@B_2O_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 $Ca_{14}Mg_2[SiO_4]_8:Eu^{2+}$,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 $Eu_{1-x}Ba_xSi_2O_2N_2$ 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_xS 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)
- **3983** Green $CaSc_2O_4$: Ce^{3+} Phosphor for White-Light-Emitting Diode – K. Park, K. Seo, S. Lim, H. Lim, J. Lim, J. Kim, L. Jiang, J. Kim (Pukyong National University), T. Kim (Lumimicro Co., LTD), and G. Kim (Korea University of Technology and Education)
- **3984** Luminescence Properties and Stability Improvement by SiO_2 Coating on Various Phosphors for Near UV-Emitting LEDs – J. Han (University of California, San Diego), M. Hannah, A. Piquette (Osram Sylvania), J. Talbot (University of California, San Diego), K. C. Mishra (Osram Sylvania), and J. Mckittrick (University of California, San Diego)

Wednesday, October 10

09:00h..... Technical Exhibit

09:00h..... Professional Development Series: Career Fair

09:30h..... Technical Session Coffee Break

18:00h..... General Poster Session

A2 Nanotechnology General Session

All Divisions / New Technology Subcommittee

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

A2 – Nanotechnology General Session Poster Session – 18:00 – 20:00
Co-Chairs: Fanglin (Frank) Chen, Oana Leonte, Sirikanda Nuansaeng, and William Mustain

- **269** Functionalized Nanoporous Membrane Electrodes for ASV Analysis of Water – H. Bessbousse, T. Wade, and M. Clochard (CEA-CNRS-Ecole Polytechnique)
- **270** Silicon Nanowire Based Thermoelectric Device – M. Jang, Y. Park, Y. Hyun (ETRI), W. Choi (KAIST), and T. Zyung (ETRI)
- **271** Studies of Boron Diffusivities on (001) and (110) Substrate Orientation in Si and Ge along Vertical/Out-Of Plane and Lateral/In-Plane Directions by SIMS and C-V Measurement on the Designed Test Pattern – M. Liao, C. Chen, L. Chang, C. Yang (National Taiwan University), C. Hsieh (Industrial Technology Research Institute), and M. Lee (National Taiwan Normal University)
- **272** Measurement of the Band Gap of Amorphous Silicon Based Thin Film with STEM-EELS – T. Motoya, T. Furuhata (Mitsubisi Electric Corporation), and H. Kurata (Kyoto University)
- **273** Electrical Properties and Microstructures of ZnO:Ga Films Formed by Magnetron Sputtering – N. Yamamoto, K. Morisawa, H. Makino, and T. Yamamoto (Kochi University of Technology)
- **274** Size effect on Photocatalytic Activity of Magnetite Nanoparticles under Visible-Light Irradiation – Y. Chen (National Cheng Kung University)
- **275** Liquid Phase Synthesis of Quantum Dots without Rare Metals and Toxic Elements – T. Makimura, S. Takeshita, and T. Isobe (Keio University)
- **276** Diameter-Dependent Performance of the Metal Oxide Nanowire Lithium-Ion Battery Anodes Controlled by a Simple Contact Printing Method – S. Lee, J. Kim, and W. Kim (Gwagnju Institute of Science and Technology)
- **277** Quantum Chemical Molecular Dynamics Simulations of Mechano-Chemical Reactions during Copper Chemical Mechanical Polishing Processes – K. Kawaguchi, T. Ishikawa, Y. Higuchi, N. Ozawa, T. Shimazaki, and M. Kubo (Tohoku University)