Monday, October 8

07:30h..... Professional Development Series: Great Minds Do Not Think Alike

08:45h..... Professional Development Series: Resume/On-Line Profile Writing and Strategies for Cultivating and Maintaining Professional Contacts

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

12:00h..... *ECS Transactions* Tutorial Session for Authors

13:00h..... Technical Exhibit

13:00h..... Professional Development Series: Career Fair

14:00h..... Professional Development Series: Resume Workshop

14:05h..... ECS Edward Goodrich Acheson Award Lecture: "Plasmas for Thin Film Processing and Surface Modification" by Dennis W. Hess

14:45h..... ECS Charles W. Tobias Young Investigator Award Lecture: "Past, Current, and Future Research in Polymer Electrolyte Fuel Cells" by Bryan S. Pivovar

15:25h..... ECS Charles W. Tobias Young Investigator Award Lecture: "Mechanochemistry at Oxide Thin Film Interfaces" by Bilge Yildiz

17:00h..... PRiME 2012 Lecture: "Cell Bioelectrochemistry and Biomagnet" by Tadashi Matsunaga

18:00h..... Monday Evening Mixer, Technical Exhibit, and Student Poster Session

18:00h..... Professional Development Series: Career Fair

A0 Special Lectures

All Divisions

Kalakaua Ballroom B, Level 4, Hawaii Convention Center

Award Presentations – 14:00 – 16:10

14:00		Introductory Remarks (5 Minutes)
14:05	**1**	(Edward Goodrich Acheson Award Presentation) Plasmas for Thin Film Processing and Surface Modification D. Hess (Georgia Institute of Technology)
14:45	**2a**	(Charles W. Tobias Young Investigator Award Presentation) Past, Current, and Future Research in Polymer Electrolyte Fuel Cells B. S. Pivovar (National Renewable Energy Laboratory)
15:25	**2b**	(Charles W. Tobias Young Investigator Award Presentation) Mechanochemistry at Oxide Thin Film Interfaces B. Yildiz (Massachusetts Institute of Technology)
16:05		Concluding Remarks (5 Minutes)

A1 General Student Poster Session

All Divisions

Kamehameha Exhibit Hall 3, Level 1, Hawaii Convention Center

A1 – Poster Session – 18:00 – 20:00

- **3** Analysis of Carbon Electrode and Organic Electrolyte of Electric Double Layer Capacitors after Aging Test – H. Yoshitama, Y. Tanaka, and D. Tashima (University of Miyazaki)
- **4** Atomic Layer Deposition of Vanadium Oxide on Carbon Nanotubes for High-Power Supercapacitor Electrodes – S. Boukhalfa, K. Evanoff, and G. Yushin (Georgia Institute of Technology)
- **5** Growth and Fabrication of GaN Light Emitting Diode on Patterned-Sapphire Substrate – B. Tran, K. Lin (National Chiao Tung University), C. Wang, C. Chen, C. Huang (Industrial Technology Research Institute), C. Chung, and E. Yi Chang (National Chiao Tung University)
- **6** Conversion Reaction of Methane with Carbon Dioxide in Glow Discharge at Atmospheric Pressure – D. Nguyen, J. Park, and W. Lee (Kangwon National University)
- **7** Surface Treatment for Sterilization of Microorganism with Plasma Plume in Atmospheric Pressure – J. Park, H. Kwon, and W. Lee (Kangwon National University)
- **8** Indium Tin Oxide-Coated Glass Modified with Reduced Graphene Oxide Sheets and Gold Nanoparticles for Dopamine Sensing – J. Yang and S. Gunasekaran (The University of Wisconsin-Madison)
- **9** Electrochemical Detection of Phenol and Phenol Derivatives Modified with TiO_2, ZrO_2, and Mixed Metal Oxides (TiO_2 + ZrO_2) – M. K. Hughes, V. Nguyen, and S. K. Lunsford (Wright State University)
- **10** Characteristics of Low-Temperature($\leq$200°C) PECVD Silicon Nitride for Gate Dielectric of TFTs by Using N_2 Highly Diluted SiH_4 – K. Keum, K. No, J. Park, S. Kang, T. Song, and W. Hong (University of Seoul)
- **11** Charge Induced Closing of *Dionaea Muscipula* Ellis Trap – C. Mitchell, N. E. Williams, and A. G. Volkov (Oakwood University)
- **12** Lithium-Sulfur Batteries with Glyme-Li Salt Equimolar Complexes – A. Yamazaki, M. Tsuchiya, K. Yamauchi, K. Ueno, N. Tachikawa, K. Dokko, and M. Watanabe (Yokohama National University)
- **13** Effect of Hydrothermal Synthesis Condition on $LiMnPO_4$ Particle Size – S. Yanaka, K. Yoshida, K. Dokko, and M. Watanabe (Yokohama National University)
- **14** Design of Catalyst Layer of Non-Humidified Intermediate Temperature Fuel Cells – Y. Honda, R. Tatara, S. Nakamura, T. Yasuda, K. Dokko, and M. Watanabe (Yokohama National University)
- **15** Color Changes during Voltammograms of Prussian Yelow on ITO Electrode – J. Agrisuelas, J. García-Jareño, C. Moreno-Guerrero (University of Valencia), A. Roig (UJI), and F. Vicente (University of Valencia)

- **16** Effective Hydrogen Generation and Resource Circulation from Photocatalytic Decomposition of H_2S Aqueous Solution – H. Takahashi, T. Mabuchi, T. Hayashi, S. Yokoyama, and K. Tohji (Tohoku University)
- **17** Control Method for the Amount of Cu Site on the ZnS Stratified Photocatalysts – Y. Kajino (Touhoku University), H. Takahashi, and K. Tohji (Tohoku University)
- **18** Synthesis of Cu Supported Stratified Photocatalysts and Its Application for the CO_2 Conversion into Alcohol – Y. Kajino (Touhoku University), H. Takahashi, and K. Tohji (Tohoku University)
- **19** Improvement of Efficiency of Photo-Excited Electrons Transfer from Thin Film Consisted by the Semiconductor Particles on Electrode Surface to Developing Electrons Pathway – T. Mabuchi, T. Hayashi, H. Takahashi, and K. Tohji (Tohoku University)
- **20** Relation between the Condition of Pd and Te Metal Complexes in the Aqueous Solution and Reduction Mechanism of $Pd_{20}Te_7$ Alloy – T. Mabuchi, S. Yokoyama, H. Takahashi, and K. Tohji (Tohoku University)
- **21** Oxidation of Bulk Amorphous $Ni_{57}Ti_{18}Zr_{20}Si_3Sn_2$ Coating – S. Kim, S. Bong, M. Kim, and D. Lee (Sungkyunkwan University)
- **22** Sodium-Sulfur Batteries with Room-Temperature Ionic Liquid Electrolytes – R. Nozawa, R. Harimoto, M. Tsuchiya, K. Yoshida, N. Tachikawa, K. Dokko, and M. Watanabe (Yokohama National University)
- **23** Single-Crystal Field-Effect Transistors of 21DNTT Derivatives – A. Maeda, T. Arakawa (Tokai University), M. Tsutsui, K. Okamoto (Ushio Chemix Corporation), and Y. Kunugi (Tokai University)
- **24** Conductivity of Ceria Based Composite Electrolytes for Intermediate-Temperature-Solid Oxide Fuel Cells – S. Baek, T. Lee, and J. Park (Sejong University)
- **25** Effect of Synthesis Method and Fe_2P Phase on the Electrochemical Properties of $LiFexMn_{1-x}PO_4$-C Electrode – J. P. Välikangas (University Of Oulu), S. Tuomaala (Kokkola University Consortium Chydenius), M. T. Andersson, S. Manner (Aalto University), P. A. Tanskanen (University of Oulu), T. Kallio, M. Karppinen (Aalto University), and U. Lassi (Kokkola University Consortium Chydenius)
- **26** Co-Ionic Neodymium-Doped Ceria/Carbonate Composite Electrolytes – J. Kim, N. Kim, and J. Park (Sejong University)
- **27** Fabrication of High Performance $BaLaIn_2O_{5.5}$ Electrolyte Single Chamber Solid Oxide Fuel Cell by Using Sublimation Materials as Pore Former in Electrode Preparation – X. Shen, K. Takasu, and T. Yao (Kyoto University)
- **28** Morphology Control of Palladium Nanostructures by Potential Adjustment – X. Pham, M. Bui, C. Li, K. Han, and G. Seong (Hanyang University)
- **29** Preparation of Organoboron Ion-Gels Using PVA and Their Ion Conductive Properties – H. Tsutakawa and N. Matsumi (Japan Advanced Institute of Science and Technology)
- **30** Structure and Electrochemistry of $NaNiO_2$ – R. I. Fielden and M. N. Obrovac (Dalhousie University)
- **31** Fabrication of Ruthenium Oxide Nanosheet Electrodes by Electrophoretic Deposition – S. Ikuta, N. Ishigaki, K. Fukuda, T. Sato, and W. Sugimoto (Shinshu University)
- **32** Characterization Attributes of Metal Oxide Nanocomposites – M. Hockey, Q. Lin, and E. Calderas (Brewer Science Inc.)
- **33** Improvement in ORR Performance of 1-1.5 nm Pt Nanoparticles by Modification with Ruthenium Oxide Nanosheets – D. Takimoto, M. Ohuchi, L. Koodlur, C. Chauvin, and W. Sugimoto (Shinshu University)
- **34** Pt/TiO_2 Nanohybrid Structures on Single-Walled Carbon Nanotubes: Preparation and Electrocatalytic Characteristics – K. Han, C. Li, M. Bui, X. Pham, and G. Seong (Hanyang University)
- **35** Direct Synthesis of Nanostructures in a Microfluidic Device for Electrochemical Analysis – C. Li, K. Han, M. Bui, X. Pham, and G. Seong (Hanyang University)
- **36** Influence of Surface Structure and Ion Type on the Capacitance of Doped SWCNTs Electrode of Electrochemical Capacitors – A. Al-zubaidi, Y. Ishii, T. Matsushita, and S. Kawasaki (Nagoya Institute of Technology)
- **37** Electrochemical Study on Oxygen Reduction in a Pt/Nafion/Humidified Air System – Y. Sugiyama, E. Tada, A. Nishikata, and T. Tsuru (Tokyo Institute of Technology)
- **38** Solid Phase Growth of Nickel Silicides in Polycrystalline Si Film on SiO_2 with Cl Plasma Containing NiCl – K. Kanomata, K. Momiyama, S. Kubota, T. Suzuki, and F. Hirose (Yamagata University)
- **39** Enhancement of Dye-Sensitized Photocurrents by Gold Nanoparticles: Effects of Particle Size and Density – T. Kawawaki (The University of Tokyo), Y. Takahashi (Kyushu University), and T. Tatsuma (University of Tokyo)
- **40** The Synthesizing Process and Electrochemical Characteristics of Si Active Material Particles Covered with Silicon Oxide as Anode Electrodes in a Lithium-Ion Battery – N. Shimoi and Y. Tanaka (Tohoku University)
- **41** Electrochemical Property of the Composition by Ground Process of Active Materials Based on Silicon and Oxides – N. Shimoi, Q. Zhang, and Y. Tanaka (Tohoku University)
- **42** Characterizations of Al_2O_3/Zn_O Grown on Si Substrate by Plasma Enhanced Atomic Layer Deposition – C. Chung, B. Tran, K. Lin (National Chiao Tung University), C. Wang, C. Chen, C. Huang, S. Lee (Industrial Technology Research Institute), and E. Yi Chang (National Chiao Tung University)
- **43** Preparation of π -Conjugated Polycarbzole – Boron Complexes as Fluoride Anion Sensor – Y. Hosono and N. Matsumi (Japan Advanced Institute of Science and Technology)

- **44** Preparation of Marimo Carbon Supported PtCo Bimetal Catalyst by the Nanocolloidal Solution Method – K. Sato, T. Onuma (Ibaraki University), K. Komatsu, M. Kobori (Toyo University), K. Iwasawa, M. Eguchi, Y. Kobayashi (Ibaraki University), M. Nishitani-Gamo (Toyo University), and T. Ando (National Institute for Materials Science)
- **45** Changes in the Conduction Properties of $LaBaGaO_4$ Based Proton Conductor by Liquid-Phase Synthesis – N. Hamao, N. Kitamura, and Y. Idemoto (Tokyo University of Science)
- **46** The effect of the Relationship between Ionomer and Carbon in the PEFC Catalyst Layer – K. Baba, T. Onuma, K. Iwasawa, M. Eguchi, Y. Kobayashi (Ibaraki University), K. Komatsu, M. Kobori, M. Nishitani-Gamo (Toyo University), and T. Ando (National Institute for Materials Science)
- **47** Effects of Misaligned Electrode for Measurement in PEFC with Reference Electrode – K. Baba, S. Ueda, M. Eguchi, Y. Kobayashi (Ibaraki University), and Y. Tsutsumi (FC Development Co., Ltd.,)
- **48** Low-Temperature Synthesis and Study of Apatite-Type Lanthanum Silicates – N. Kitamura, K. Kaneko, and Y. Idemoto (Tokyo University of Science)
- **49** Anodic Oxidation of Alcohols on Ni-Sn Electrocatalysts Prepared by Electrodeposition – K. Maruyama, N. Yoshimoto, M. Egashira, and M. Morita (Yamaguchi University)
- **50** A New 4.3 V Aqueous Hybrid Capacitor Based on Manganese Dioxide Positive and Lithium Negative Electrode – Y. Shinohara, S. Makino, W. Shimizu, and W. Sugimoto (Shinshu University)
- **51** Synthesis and Characteristics of Novel Boric Ester Type Ionic Liquids – Y. Toyota and N. Matsumi (Japan Advanced Institute of Science and Technology)
- **52** Aqueous Electrolytes for Ultracapacitor Devices Using Manganese Oxide as Electrode Material – A. Boisset (Université de Tours), L. Athouël (University of Nantes), J. Jacquemin (Queen's University Belfast), T. Brousse (University of Nantes), and M. Anouti (Université de Tours)
- **53** Molecular Weight Dependence of P-Type Semiconductive Polymer on High Efficiency Thin Film Organic Photovoltaic Cells – M. Sugimoto, H. Nakamura, K. Yamada, and H. Yamane (Kitakyushu National College of Technology)
- **54** Effect of Gold Nano-Seed Particles on Electrochemical Characteristics of Conducting Substrates – Y. Nakayama and M. Oyama (Kyoto University)
- **55** Sn-CNT Fabric for Multifunctional Anodes in Li-ion Batteries – J. Benson, Y. Zhao, B. Hertzberg (Georgia Institute of Technology), M. Schauer, D. Lashmore (Nanocomp Technologies, Inc.), and G. Y. Yushin (Georgia Institute of Technology)
- **56** High Temperature Protonic Conduction and Clystal Structure of Eulytite-Type Phosphates – N. Kitamura, Y. Yamada, and Y. Idemoto (Tokyo University of Science)
- **57** Composition Dependence of Average and Local Structure and Thermodynamic Stability for $xLi(Li_{1/3}Mn_{2/3})O_2$-$(1-x)Li(Mn_{1/3}Ni_{1/3}Co_{1/3})O_2$ as a Cathode Active Material for Li-Ion Battery – M. Inoue, N. Kitamura, and Y. Idemoto (Tokyo University of Science)
- **58** Non-Pacman Type Co-Porphyrin Bilayers for Oxygen Reduction Reaction – S. Satoh, K. Murakoshi, and K. Ikeda (Hokkaido University)
- **59** Stress Durability of Electrolyte Structure in Flexible Sheet Type Direct Methanol Fuel Cell (FS-DMFC) – Y. Sakurai and A. Kawai (Nagaoka University of Technology)
- **60** Fabrication of TiO_2 Layers for Dye Sensitized Solar Cells using Electrostatic Inkjet Printing Method – A. Ishii (Tokai University), S. Umezu (Tokai Univ.), and Y. Kunugi (Tokai University)
- **61** Construction of the Copper (I) Oxide/C_{60} Hybrid Photovoltaic Devices – T. Saitoh, T. Ohata, F. B. Mohamad, J. Sasano, and M. Izaki (Toyohashi University of Technology)
- **62** Electrochemical Oxidation of Ammonia by Multi-Walled Carbon Nanotubes-Supported Pt-Core/Ir-Shell and Pt-Core/Pd-Shell Nanoparticles – S. Morita, S. Azuma, H. Shiroishi (Tokyo National College of Technology), M. Yonekawa, and K. Nagai (Tokyo Institute of Technology)
- **63** A Study of Photochemical Proton Reduction and Oxidation of Water Using $Pb_2Ru_2O_{7-\delta}$ Synthesized by Neutralization Method – S. Hanyu, H. Shiroishia (Tokyo National College of Technology), T. Hatai, Y. Ayato, and J. Kuwano (Tokyo University of Science)
- **64** Performance of Proton Conductive Intermediate Temperature Fuel Cell Using ZrO_2-$1.6P_2O_5$ Electrolyte with 1% CO-H_2 and Methanol as Fuels – Y. Houshi (Tokyo National College of Technology), M. Yonekawa (Tokyo Institute of Technology), H. Shiroishi (Tokyo National College of Technology), M. Kunimatsu (Kanagawa Industrial Technology Center), K. Matsushima, Y. Ayato (Tokyo University of Science), M. Saito (Doshisha University), and J. Kuwano (Tokyo University of Science)
- **65** Electrochemical Studies of Epoxy Based Lignosulfonate Doped Double Stranded Polyaniline-Montmorillonite Nanocomposite Coatings on AA 2024 Alloy – G. Gupta (IITB-Monash Research Academy), A. Khanna (IIT Bombay), and N. Birbilis (Monash University)
- **66** Carbon Nanotube Synthesis over Nickel-Ferrite Loaded Oxidized Diamond Catalyst – G. Tsujino, K. Nakagawa (Kansai University), T. Ando (National Institute for Materials Science), and H. Oda (Kansai University)
- **67** Cycle Performance of Nano Inclusion containing $LiMn_2O_4$ Cathode Material – J. Harada, H. Tsubouchi, Y. Kawai, and T. Yao (Kyoto University)
- **68** Peeling Force of Polymer Micro Pattern by Direct Peeling by using AFM Tip (DPAT) – T. Aiba (Nagaoka University of Technology) and K. Akira (Nagaoka University of Technology Department of Electrical Engineering)
- **69** Monitoring and Modeling for Response Time of Biopotential in Plant Cells – Y. Noguchi and A. Kawai (Nagaoka University of Technology)

- **70** A New High Energy Density Aqueous Hybrid Capacitor Based on Lithium Negative and Ruthenium Oxide Positive Electrode – T. Ban, S. Makino, W. Shimizu, and W. Sugimoto (Shinshu University)
- **71** Construction and Photovoltaic Performance of Hybrid ZnO:CuPc Bulk Heterojunction Solar Cells – H. Ryo, K. Murata, J. Sasano (Toyohashi University of Technology), S. Watase (Osaka Municipal Technical Research Institute), and M. Izaki (Toyohashi University of Technology)
- **72** VOC Sensing Characteristics of $SmFeO_3$ Film Covered with SiC Powder – J. Iseda, M. Mori, and Y. Sadaoka (Ehime University)
- **73** Adsorption States and Reactivity of Nitric Oxide on Pd and Pd-based Binary Electrodes as Studied by Infrared Absorption Spectroscopy – K. Yamaki (Hokkaido University), A. Okubo, S. Notani (Graduate School of Environmental Science, Hokkaido University), K. Nakata (Faculty of Environmental Earth Science, Hokkaido University), M. Osawa, and K. Shimazu (Hokkaido University)
- **74** Platinum Nanodot and Nanohoneycomb Structures: Construction Using a Cyclodextrin Monolayer as a Molecular Template – R. Saito, Y. Domi, T. Kawaguchi, and K. Shimazu (Hokkaido University)
- **75** Design of Polymer Inclusion Complex of Curcumin Using Amylose – Y. Morita and N. Matsumi (Japan Advanced Institute of Science and Technology)
- **76** Electrochemical Quartz Crystal Microbalance Studies on Pt and Pd Ultra-Thin Films on Gold – A. Kurokawa, M. Shibata, T. Wada, and T. Kondo (Ochanomizu University)
- **77** Change of Crystal and Electronic Structure of Layered Cathode Material $0.4Li_2MnO_3$-$0.6LiMn_{1/3}Ni_{1/3}Co_{1/3}O_2$ by Charge and Discharge Process – R. Yamamoto, N. Kitamura, and Y. Idemoto (Tokyo University of Science)
- **78** Structural Studies on Self-Assembled Monolayer of Porphyrin Derivative on Au(111) – N. Aoki, B. Zhang, R. Kuwana, T. Wada, and T. Kondo (Ochanomizu University)
- **79** Electrocatalytic Activity for Oxygen Reduction of Pseudomorphic Pt Monolayer Electrochemically Prepared on a Au(111) Surface – T. Wada, M. Shibata, M. Kawabuchi (Ochanomizu University), I. Yagi (FC-Cubic TRA), and K. Toshihiro (Ochanomizu University)
- **80** Performance of Nb and Mo Alloyed Ferritic Stainless Steel for SOFC Interconnect by Using Button Cell Configuration – D. Yun, H. Seo (Pohang University of Science and Technology), J. Jun (Research Institute of Industrial Science and Technology), and K. Kim (Pohang University of Science and Technology)
- **81** Development of 4 V-class Aqueous Hybrid Electrochemical Capacitor with Porous Positive Electrode and Li Negative Electrode – S. Makino, Y. Shinohara, T. Ban, W. Shimizu, and W. Sugimoto (Shinshu University)
- **82** Electrochemical Properties of Reduced Graphite Oxide Nanosheet Electrodes Prepared by Layer-by-Layer Assembly – T. Mitsui (Shinshu Univeristy), K. Higurashi, J. Sato, K. Fukuda, and W. Sugimoto (Shinshu University)
- **83** A Comparison of Steam and CO_2 Activation of Boron Doped Diamond Electrodes – J. Zhang and W. Sugimoto (Shinshu University)
- **84** Electrochemical Properties of Nanocarbon Produced from Organic Waste and its Application in Electric Double-Layer Capacitor – D. Mishima, Y. Hamasuna, D. Tashima (University of Miyazaki), S. Kumagai (Akita University), and J. Madden (University of British Columbia)
- **85** Amorphous Titanium Oxide Prepared from Peroxo-Polytitanic Acid and Its Electrochemical Properties – K. Kobayashi and I. Tsuyumoto (Kanazawa Institute of Technology)
- **86** One Dimensional Silver/Silver Halide Nanocomposites: Synthesis and Electrocatalytic Activity – S. Kim (Ewah womans University), J. Shim (Daegu University), C. Lee, and Y. Lee (Ewha Womans University)
- **87** Terminal Redox Moiety effects on the Long-Range Electron Conduction of π-Conjugated Bis(Terpyridine) Metal Complex Oligomer Wires on Electrode – S. Katagiri, R. Sakamoto, and H. Nishihara (The University of Tokyo)
- **88** Pyrimidine Ring Motion Correlated with Electron Transfer at the Copper(II)/(I) Coordination Site Immobilized on Au Electrode Surface – Y. Takara, M. Nishikawa (Department of Chemistry, School of Science, The University of Tokyo), S. Kume (Department of Chemistry, Graduate School of Science, Hiroshima University), and H. Nishihara (The University of Tokyo)
- **89** Preparation of Glass-Coated CdSe/CdZnS Quantum Dots and Their Photostability – T. Gunshi (Kwansei Gakuin University), C. Li (National Institute of Advanced Industrial Science and Technology), K. Ogasawara (Kwansei Gakuin University), M. Ando, and N. Murase (National Institute of Advanced Industrial Science and Technology)
- **90** Development and Application of an Electrochemical Dual Microsensor for Simultaneous O_2/pH Measurements – Y. Ha, S. Park (Ewha Womans University), J. Shim (Daegu University), and Y. Lee (Ewha Womans University)
- **91** Electrochemical Impedance Analysis for Corrosion on Current Collecting Electrodes in Dye-sensitised Solar Cells – K. Inoue, I. Shitanda, Y. Hoshi, and M. Itagaki (Tokyo University of Science)
- **92** Preparation of Polymer Nanoparticles Composite Coating Films for Investigation of the Co-Deposition Theory – K. Iwasaki, I. Shitanda, Y. Hoshi, and M. Itagaki (Tokyo University of Science)
- **93** Glancing Angle Sputter-Deposition of Titanium Dioxide Films with Rotating Substrate Holder for Photocatalytic Application – Y. Yasuda, N. Kitahara, and Y. Hoshi (Tokyo Polytechnic University)

- **94** The Synthesis of SnO_2-TiO_2 Core-Shell Nanotubes Using PAN Fiber and Its Cycling Performance for the Anode of Lithium-Ion Batteries – J. Jeun, W. Kim, D. Kim, K. Park, B. Lee, K. Kang, W. Yu, and S. Hong (Seoul National University)
- **95** An InGaP Sub-Wavelength Structure (SWS) Realized by Colloidal Lithography for Solar Cell Applications – D. Kim, S. Eo, and J. Jang (GIST)
- **96** LbL Film with PtNPs as a Sensor of the Dopamine Encapsulated in Liposomes – V. Dos Santos, M. Dos Santos, B. Sandrino, C. De Jesus, J. R. Garcia, S. T. Fujiwara, C. A. Pessôa, and K. Wonhrath (State University of Ponta Grossa)
- **97** Effect of Lateral Size of Reduced Graphite Oxide Nanosheet on the Electrochemical Capacitance – Z. Lei, T. Sakai, and W. Sugimoto (Shinshu University)
- **98** A Model for the Influence of Steel Corrosion Products on Nuclear Fuel Corrosion under Permanent Disposal Conditions – L. Wu (Western University), Y. Beauregard (NOVA Chemicals), Z. Qin, S. Rohani (Western University), and D. W. Shoesmith (University of Western Ontario)
- **99** CO_2 Reduction at Glassy Carbon Electrode in the Presence of Pyridine – J. Agullo, M. Morin, and D. Bélanger (Université du Québec à Montréal)
- **100** Utilizing a Rotating Ring Disk Electrode (RRDE) to Simultaneously Measure Contaminate Species Adsorption effects on Two Different Catalyst Surfaces – 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)
- **101** Carbon Deposition and Gasification over Ni-YSZ Cermet during Methane Reforming Reaction – K. Song and J. Jung (Postech)
- **102** Influence of Relaxation Time on the Lifetime of Commercial Lithium-Ion Cells – M. J. Reichert, H. Bremes, S. Passerini, and M. Winter (University of Münster)
- **103** 3-D Electrochemical Impedance Spectroscopy Calculated by Wavelet Transformation -Influence of Scale and Time Parameters on Impedance Spectra- – K. Isobe, Y. Hoshi, I. Shitanda, and M. Itagaki (Tokyo University of Science)
- **104** *In Situ* ATR-IR Analysis of Graphite/ Electrolyte Interface in Li-Ion Batteries – Y. Akita, H. Munakata, and K. Kanamura (Tokyo Metropolitan University)
- **105** Sol-Gel Synthesis of Li_2MnO_3-$LiMO_2$ Cathode with Good Cycle Performance – K. Ando, Y. Jin, T. Nishioka, H. Munakata, and K. Kanamura (Tokyo Metropolitan University)
- **106** Electrochemical Evaluation of $Li_4Ti_5O_{12}$ Single Particle at Various Temperatures – K. Annaka, H. Munakata, and K. Kanamura (Tokyo Metropolitan University)
- **107** 3DOM Polyimide Separator for Rechargeable Lithium Batteries with High Rate Performance – K. Miyahara, Y. Jin, H. Munakata, and K. Kanamura (Tokyo Metropolitan University)
- **108** A Semi-Empirical Model of Ammonia Electrolysis in Comparison to Water Electrolysis – A. Estejab, D. A. Daramola, and G. G. Botte (Ohio University)
- **109** RRDE Studies on Oxygen Reduction Reaction of Pd Single Crystal Electrodes – M. Kawabuchi, T. Wada, M. Shibata, and T. Kondo (Ochanomizu University)
- **110** Synthesis and Characterization of Core-Shell Structured Ni-$Ce_{0.8}Gd_{0.2}O_{1.9}$ SOFC Anodes by Ultrasonic Spray Pyrolysis – C. Lim and K. Lee (Chonbuk National University)
- **111** Broadband Terahertz Antireflection Structure Fabricated By Utilizing Stamping Method – D. Kim (Gwangju Institute of Science and Technology), D. Kim, and J. Jang (GIST)
- **112** Fabrication of GDC Electrolyte Thin Films on NiO-GDC Anode Support by Electrophoretic Deposition for Solid Oxide Fuel Cells – S. Yu and K. Lee (Chonbuk National University)
- **113** Characterization of $Ca_{1-x}La_xTiO_3$ Anode Materials for Hydrocarbon-Fueled Solid Oxide Fuel Cells – J. Koo and K. Lee (Chonbuk National University)
- **114** Design of Ion-gel Electrolytes Using Non-flammable Organoboron Bio-based Polymer as Polymer Support – Y. Yoshinaga and N. Matsumi (Japan Advanced Institute of Science and Technology)
- **115** Enhanced Photocurrent Generation of Porphyrins – Ag Nanoparticles Composite Layers on an Electrode – S. Yagyu, M. Ishizaki, K. Kanaizuka, M. Kurihara, and M. Sakamoto (Yamagata University)
- **116** Electrochemical behavior of Spin-coated Hybrid Thin Film of Prussian-blue Analog Nanoparticles – S. Soma, M. Ishizaki, K. Ono, K. Kanaizuka (Yamagata University), M. Sakamoto, and M. Kurihara (Yamagata University)
- **117** Electrochemical Intercalation of Bis(Fluorosulfonyl)Amide Anion into Graphite – F. Yamane, K. Miyazaki, T. Fukutsuka, and T. Abe (Kyoto University)
- **118** Preparation of Perovskite Type Oxide Thin-Films as Bi-Functional Air Electrodes by Pulsed Laser Deposition Method and Their Electrochemical Properties – Y. Miyahara, K. Miyazaki, T. Fukutsuka, and T. Abe (Kyoto University)
- **119** $MgBr_2$/Ether-Based Electrolyte Solutions for Mg-Rechargeable Batteries – K. Asaka, K. Miyazaki, T. Fukutuka, T. Abe, K. Nihio, and Y. Uchimoto (Kyoto University)
- **120** Electrochemical Properties of $LiCoPO_4$ in the Anion Receptor-Based Organic Electrolyte Solution – T. Nakagawa, K. Miyazaki, T. Fukutsuka, and T. Abe (Kyoto University)
- **121** Anisotropic Anion Conduction of MgAl-CO_3^{2-} Layered Double Hydroxides with Different Cation Ratios – Y. Asada, K. Miyazaki, T. Fukutsuka, and T. Abe (Kyoto University)
- **122** Redox Reaction of Metal Cations on the Surface of $LiCoO_2$ Thin-Film Electrodes – J. Inamoto, K. Miyazaki, T. Fukutsuka, and T. Abe (Kyoto University)
- **123** Electrochemical Behavior of Magnesium Metal in Alkaline Aqueous Solutions – Y. Taniguchi (Graduate School of Engineering, Kyoto University), K. Miyazaki, T. Fukutsuka, and T. Abe (Kyoto University)

- **124** Frequency-Tunable Multicolor Light-Emitting Cell Based on AC-Driven Electrochemiluminescence – M. Nakakomi, T. Nobeshima, K. Nakamura, and N. Kobayashi (Chiba University)
- **125** Electrochemical Properties of Graphite Electrode in Ionic Liquid Containing Bis(Fluorosulfonyl) Amide Anion – K. Ono, K. Miyazaki, T. Fukutsuka, and T. Abe (Kyoto University)
- **126** A Study on Electrochemical Performance of Hard Carbon / $Na_x[Fe_{1/2}Mn_{1/2}]O_2$ Cells as Rechargeable Na-Ion Batteries – M. Kajiyama, N. Yabuuchi (Tokyo University of Science), J. Iwatate (Tokyo Univ. of Science), and S. Komaba (Tokyo University of Science)
- **127** Fabrication of Electroless Cu/CNT Composite Plating Films Containing Different Sized CNTs – T. Osaki and S. Arai (Shinshu University)
- **128** Electrochemical Properties of AZO Films Functionalized with Redox-Active Molecules – H. Kaneko, T. Tsuda, K. Kanaizuka, M. Kurihara, and M. Sakamoto (Yamagata University)
- **129** Fabrication of Silicon Composite Films for Lithium-Ion Batteries by Electrodeposition – T. Kitamura and S. Arai (Shinshu University)
- **130** Molecular Assembly of Porphyrin Derivative on a Substrate by Polymerization Reaction and Its Electrochemical Properties – A. Izumi, M. Ishizaki, K. Kanaizuka, M. Kurihara, and M. Sakamoto (Yamagata University)
- **131** Surface Modification of Vapor Grown Carbon Nanofibers by Plasma Treatment – D. Shimizu (Shinshu University), Y. Suzuki (Shinshu univeristy), M. Endo, and S. Arai (Shinshu University)
- **132** Newly Developed Carbon-Nanocoating of Si Nanoparticles – Y. Sasaki, H. Tabuchi, H. Furukawa, K. Urita, and I. Moriguchi (Nagasaki University)
- **133** Study on the Formation of Self-Assembled Monolayers on Anodized Aluminum – H. Satoh, T. Fujii, E. Tsuji, and H. Habazaki (Hokkaido University)
- **134** Synthesis and Charge-Discharge Property of Si/Carbon Nanocomposites – H. Tabuchi, T. Enjoji, K. Kiyota, Y. Sasaki, K. Urita, H. Yamada, and I. Moriguchi (Nagasaki University)
- **135** Electrochemical Hybrid Capacitor Using Closest-Packed Ferrocene Terminated Monolayer on Carbon Electrode – Y. Sato, T. Kawaguchi, and K. Shimazu (Hokkaido University)
- **136** Electrochemical Properties of Zinc Oxide Electrodes Coated with Anion-Conducting Ionomer in Alkaline Solutions – Y. Lee, K. Miyazaki, T. Fukutsuka, and T. Abe (Kyoto University)
- **137** Field Emission Properties of Nickel/Carbon Nanotube Composite Films Electrodeposited from a Citrate Bath – S. Tanabe and S. Arai (Shinshu University)
- **138** Effects of Interferents on H_2O_2 Quantification by Electrochemical Reduction on IrO_2 Electrodes – M. Ueda, T. Zhang, and M. Morimitsu (Doshisha University)
- **139** Electrochemical Features of Nanoporous Electrodes and Their Applications – J. Han, J. Bae, and T. Chung (Seoul National University)
- **140** All-Solid-State Chloride Ion-Selective Electrodes Using Polycation-Doped Manganese Oxides – T. Akatsuka, C. Suzuki, N. Yabuuchi, and S. Komaba (Tokyo University of Science)
- **141** Development of Titanium Wire-based Dye-sensitized Solar Cells and the Enhancement of the Performance by Surface Plasmon Resonance of Ag Nanoparticles – Y. Kawakami, M. Takeuchi, Y. Horiuchi, and M. Matsuoka (Osaka Prefecture University)
- **142** Study on Deterioration of Electric Double-Layer Capacitor Cells – A. Haruta (Miyazaki – University), Y. Suenaga (Miyazaki University), D. Tashima (University of Miyazaki), T. Kawaji (UD Truks Corporation), and H. Toyama (UD Trucks Corporaion)
- **143** Electrochemical Construction of Pt Nanoparticles As a Catalyst for Oxygen Reduction Reaction – H. Aso, T. Wada, and T. Kondo (Ochanomizu University)
- **144** Segmented Electrode Developed for Complementary Use of Small-Angle Neutron Scattering Measurement – S. Ueda, K. Baba, M. Eguchi, Y. Kobayashi, S. Koizumi (Ibaraki University), and Y. Tsutsumi (FC Development Co., Ltd.,)
- **145** Fundamental Research on Development of Novel Analysis Method for Hyaluronan Production with Use of Human Dermal Fibroblasts – M. Naruoka (Kanagawa Institute of Technology), Y. Nakamura (JUJU Cosmetics Co.), and Y. Iida (Kanagawa Institute of Technology)
- **146** Electrodeposition of Zn-Mg Alloy in Ethylene Glycol-$ZnCl_2$-$MgCl_2$ Non-Aqueous Solution – H. Yamamoto, M. Morishita, T. Miwa, and K. Isono (University of Hyogo)
- **147** Relaxation Structure Analysis for Li Inserted α-Fe_2O_3 – K. Takasu, S. Park, and T. Yao (Kyoto University)
- **148** GroEL Mutant Can Encapsulates Metal Nano Particles in Each Cavity – H. Yoda (Kanagawa Institute of Technology), O. Yamamoto (Yamagata University), and A. Koike-Takeshita (Kanagawa Institute of Technology)
- **149** EIS and CV Characteristics of Pt Cathode Catalyst in PEMFC – S. Kanazawa, E. Tada, A. Nishikata, and T. Tsuru (Tokyo Institute of Technology)
- **150** Pt-Loaded Carbon Nanofilament as an Electrocatalyst for Direct Methanol Fuel Cell – T. Toriyama, K. Nakagawa (Kansai University), T. Ando (National Institute for Materials Science), and H. Oda (Kansai University)
- **151** Fabrication of Sexithiophene/Zr(IV) Hybrid Thin Films and Their Photofunctional Properties – A. Kodaira, T. Harada (Toho University), C. Pac (Toho University, Korea University), H. Moriyama (Toho University), G. Sahara, T. Yui, and O. Ishitani (Tokyo Tech.)
- **152** Corrosion Behavior and Sacrificial Ability of Hot-Dip Al-Mg-Si Coated Steel – K. Chihara, Y. Kyo, E. Tada, A. Nishikata, and T. Tsuru (Tokyo Institute of Technology)
- **153** Morphology of Self-ordered Nano Oxide Coatings for Oxygen and Chlorine Evolution – N. Ohnishi, M. Matsuda, T. Zhang, and M. Morimitsu (Doshisha University)

- **154** Selection of B16 Melanoma Cells by Single Cell Manipulation and Analysis of Tyrosinase Gene Expression and Epigenetic Regulation – M. Hillary, K. Makoto, and Y. Iida (Kanagawa Institute of Technology)
- **155** Co-Electrolysis of CO_2 and H_2O for Syngas Production – S. Nakamura (Tokyo University of Science), Y. Tanaka, K. Sato, K. Nozaki, A. Yamamoto, and T. Kato (National Institute of Advanced Industrial Science and Technology)
- **156** Detailed Observation and Analysis of the Reaction Distribution in $LiFePO_4$ Composite Electrodes – Y. Gogyo, H. Yamashige (Kyoto University), M. Katayama (Ritsumeikan University), Y. Orikasa (Kyoto University), Y. Inada, T. Ota (Ritsumeikan University), H. Arai, Y. Uchimoto, and Z. Ogumi (Kyoto University)
- **157** Metal-Semiconductor-Metal Photodetectors on Flexible Substrats – T. Oh, W. Shin, J. Park, S. Chang, K. Choi, H. Ha, K. Lee, and B. Ju (Korea University)
- **158** Effects of Gas Diffusion Electrodes with Hydrophilic Layer on Cold Start Behavior and Cell Performance of Polymer Membrane Fuel Cells – S. Hirakata, T. Mochizuki, M. Uchida, H. Uchida, and M. Watanabe (University of Yamanashi)
- **159** Surface Oxidization Diamond for Dye-Sensitized Solar Cell – M. Mori, K. Nakagwa (Kansai University), T. Andou (National Institute for Materials Science), and H. Oda (Kansai University)
- **160** Dynamics of Phase Transition in LixFePO4 Using Time-Resolved X-Ray Diffraction – T. Maeda, Y. Koyama, Y. Orikasa, H. Murayama, H. Tanida, H. Arai, E. Matsubara, Y. Uchimoto, and Z. Ogumi (Kyoto University)
- **161** Hydrogen Starvation Tests on PEMFCs Using Segmented Cell Hardware – M. Geymayer, A. Stadlhofer, and V. Hacker (Graz University of Technology)
- **162** Effect of SiO_2 on the Properties of Sulfonated Polyimide and Poly(Arylene Ether) Block Copolymer Membranes – M. Sakamoto, S. Nohara, K. Miyatake, M. Uchida, H. Uchida, and M. Watanabe (University of Yamanashi)
- **163** Electrochemical Quartz Crystal Microbalance Analysis of Degradation Reactions of Pt/C Cathode Catalysts for Polymer Electrolyte Fuel Cells – J. Omura, H. Yano, M. Watanabe, and H. Uchida (University of Yamanashi)
- **164** Relaxation Phase Analysis of Li-Co-O Cathode for Secondary Lithium-ion Battery – S. Nagashima, S. Park, T. Iwai, and T. Yao (Kyoto University)
- **165** Evaluation of Corrosion Resistance of Galvanized Steel under Wet-Dry Cyclic Condition – T. Okazaki, E. Tada, A. Nishikata, and T. Tsuru (Tokyo Institute of Technology)
- **166** The Detection of Odor Vapors, H_2S and CH_3SH, by the Planar-Type Zirconia Sensor – Y. Nagai, M. Mori, and Y. Sadaoka (Ehime University)
- **167** Electrochemical Reaction Mechanism of FeS_2 Cathode Material in $AlCl_3$ – EMIC Ionic Liquids – T. Mori, Y. Orikasa, K. Nakanishi (Kyoto University), T. Ohta (Ritsumeikan University), and Y. Uchimoto (Kyoto University)
- **168** ZrO_2 coating Effect of $LiCoO_2$ Thin-film Model Electrode prepared by PLD – S. Mori (Kyoto University), D. Takamatsu (Office of Society-Academia Collaboration for Innovation, Kyoto University), Y. Orikasa, Y. Koyama, H. Tanida (Kyoto University), T. Uruga (Japan Synchrotron Radiation Research Institute), H. Arai, Z. Ogumi, and Y. Uchimoto (Kyoto University)
- **169** Novel Gel Polymer Electrolytes Based on Ethylene Oxide Containing Block-Copolymers for Lithium-Ion Batteries – M. Schaefer (Institut für Physikalische Chemie WWU Münster), P. Isken (Westfälische Wilhelms-University Münster), M. Winter, S. Passerini (University of Münster), and A. Lex-Balducci (Westfälische Wilhelms-University Münster)
- **170** Phase Transformation Mechanism during Cycling of Li_2FeSiO_4 – T. N. Masese, H. Arai, Y. Orikasa, T. Ina, C. Tassel (Kyoto University), K. Nakanishi, T. Ohta (Ritsumeikan University), K. Hiroshi, Y. Uchimoto, and Z. Ogumi (Kyoto University)
- **171** *In Situ* XAS Study on Effect of Platinum Catalyst on Cathodic Reaction in Nonaqueous Li – Air Batteries – J. Oyama (Graduate School of Human and Environmental Studies, Kyoto University), Y. Orikasa (Kyoto University), and Y. Uchimoto (Graduate School of Human and Environmental Studies, Kyoto University)
- **172** Bioelectrocatalytic Conversion of Atmospheric CO_2 into Extracellular Organic compounds by Acidithiobacillus ferrooxidans – T. Ishii, T. Mogi (University of tokyo), K. Hashimoto, and R. Nakamura (The University of Tokyo)
- **173** Newly Found Electrochemical Oscillations during Reduction of Nitrate ions – S. Yamamoto, Y. Mukouyama, R. Nakazato (Tokyo Denki University), S. Nakanishi (The University of Tokyo), and H. Okamoto (Tokyo Denki University)
- **174** Electrochemical and Surface Properties of Mg – Li Alloys – H. Endo, Y. Sugawara, I. Muto, and N. Hara (Tohoku University)
- **175** Evaluation of Influence of Activated Carbon on Plant Growth – K. Oino and Y. Iida (Kanagawa Institute of Technology)
- **176** Relaxation Structure Analysis for Li Inserted $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ Cathode Material – I. Seo, S. Park, and T. Yao (Kyoto University)
- **177** Performance Evaluation of an Anode-supported Honeycomb Solid Oxide Fuel Cell – A. Fukushima, H. Nakajima, and T. Kitahara (Kyushu University)
- **178** Synthesis of Co-Doped LaP_3O_9 by Precipitation in Phosphoric Acid Solutions – Y. Adachi, N. Hatada, T. Onishi, A. Kuramitsu, and T. Uda (Kyoto University)
- **179** Effect of Particle Size on the Relaxation of $LiFePO_4$ Cathode – S. Park, K. Kameyama, and T. Yao (Kyoto University)
- **180** Electrical Performance Change by the Difference in the Production Methods of the Anode for SOFC – G. Watanabe, N. Takahasi, T. Takatsuka, and H. Fukunaga (Shinshu University)

- **181** Structure and Electrochemical Properties of $La_2Li_{2x}(CO)_{1-x}O_4$ with Layered Structure – M. Iqbal (Tokyo Institute of Technology), G. Kobayashi (Kanagawa University), H. Masaaki, R. Kanno (Tokyo Institute of Technology), and M. Yonemura (High Energy Accelerator Research Organization)
- **182** Li-Air Battery Using Stabilized Acetonitrile Electrolyte – K. Furukawa, Y. Yamada, M. Yaegashi, F. Li (The University of Tokyo), H. Zhou (National Institute of Advanced Industrial Science and Technology), and A. Yamada (The University of Tokyo)
- **183** Control of Growth Density of Multi-walled Carbon Nanotubes Array and Its Gas Sensing Properties – M. Omae (Ritsumeikan University), T. Hashishin (Joining and Welding Research Institute, Osaka University), K. Kojima, and J. Tamaki (Ritsumeikan University)
- **184** Electrochemical Stability of Au sub-ML on Pt/QC Electrode – T. KOBAYASHI, A. Kawamura, K. Katakura, and H. YAMADA (Nara National College of Technology)
- **185** A Novel Gas and Flow Sensor of Penetrating a Porous Polypyrrole Nanofiber Mat – T. Jun and Y. Kim (hanyang University)
- **186** Hydrogen in Platinum Films Electrodeposited from Dinitorosulfatoplatinate Solution – N. Hisanaga (Graduate school of Engineering, University of Hyogo), N. Fukumuro, S. Yae, and H. Matsuda (University of Hyogo)
- **187** Evaluation of Stress Condition of Operated Anode Supported-Type SOFC under Operating Conditions Based on Raman Scattering Spectroscopy – S. Onodera, M. Nagai, F. Iguchi, N. Sata, T. Kawada, and H. Yugami (Tohoku University)
- **188** Development of Low-Temperature Operating Micro-SOFC with Perovskite-Type Proton Conductive Electrolytes – Y. Inagaki, F. Iguchi, K. Kubota, S. Tanaka, N. Sata, M. Esashi, and H. Yugami (Tohoku University)
- **189** Study on Phase Diagram of Li-Rich Layered $Li[Li_{0.2}Ni_{0.18}Co_{0.03}Mn_{0.58}]O_2$ – Y. Irii, G. Kobayashi, T. Kataoka, T. Ikehara, F. Matsumoto (Kanagawa University), A. Ito (Nissan Motor Co., Ltd.), Y. Ohsawa, M. Hatano (Nissan Motor Co., Ltd), and Y. Sato (Kanagawa University)
- **190** Preparation and Photoluminescence Properties of Sn/Mn Phosphate Zirconium Phosphor – T. Nishizaki, S. Takase, and Y. Shimizu (Kyushu Institute of Technology)
- **191** Synthesis and Electrochemical Properties of Organogel Electrolytes Based on Low Molecular Weight Molecules – M. Miura, A. Iuchi, Y. Morita, K. Kasatani, and H. Okamoto (Yamaguchi University)
- **192** Electrochemical Characterization of Lanthanum Calcium Titanium Manganite as Potential Dual Electrode Material in Symmetrical Solid Oxide Fuel Cell – H. Yoon, J. Zou, and J. Chung (Pohang University of Science and Technology)
- **193** Depth-Resolved XAFS Study on Surface Segregation of $La_{1-x}Sr_xCoO_{3-d}$ Electrode – S. Sakou, Y. Orikasa (Kyoto University), E. J.Crumlin (Mechanical Engineering Department,Massachusetts Institute of Technology), Y. Shao-Horn (Massachusetts Institute of Technology), K. Amezawa (Tohoku University), and Y. Uchimoto (Kyoto University)
- **194** Synthesis and Physical Properties of Ionic Liquid Gels Based on Novel Low Molecular Weight Gelators – T. Yoshida, T. Hirakawa, T. Nakamura, Y. Yamada, H. Tatsuno, Y. Morita, and H. Okamoto (Yamaguchi University)
- **195** Single Crystal Silicon based Sensor-Transistor Circuit by Thin Film Transfer Process – S. Jeong, T. Oh, S. Chang, K. Choi, K. Lee, Y. Kim, H. Ha, and B. Ju (Korea University)
- **196** The effect of Au Nanoparticle on Metal Organic Semiconductor Field effect Transistor on Plastic Substrate by Transfer Method – H. Ha, S. Jeong, T. Oh, S. Chang, Y. Kim, K. Lee, K. Choi, and B. Ju (Korea University)
- **197** Increasing Both Anodic and Cathodic Stability of Ether-Based Electrolyte for Li-Air and Li-Ion Batteries – M. Yaegashi, Y. Yamada, S. Nishimura (The University of Tokyo), T. Abe (Kyoto University), and A. Yamada (The University of Tokyo)
- **198** Solvent Extraction Using Microchannel System for High Purification of Silica – N. Matsuo, Y. Matsui, Y. Fukunaka, and T. Homma (Waseda University)
- **199** Control of the Morphology of Si Nanostructure Using Single-Step Metal Assisted Etching Method – T. Yamaguchi, T. Shimizu, F. Inoue, C. Wang, S. Otsuka, Y. Tada (Kansai University), M. Inada (Kansai Univeristy), and S. Shingubara (Kansai University)
- **200** Maintaining Proper Hardness and Frictional Properties as a Noncyanide Gold Bath is Aged – J. R. Pillars (Sandis National Laboratories) and W. Yelton (Sandia National Laboratories)
- **201** Polyoxometalates in Asymmetric Supercapacitors – J. Suarez-Guevara, V. Ruiz, and P. Gomez-Romero (CIN2-CSIC)
- **202** Electrochemical Construction and Characterizations of P-Copper(I) Oxide/N-Zinc Oxide Nano-Pillar Photovoltaic Device – T. Ohta, M. Kondo, J. Sasano (Toyohashi University of Technology), T. Shinagawa (Osaka Municipal Technical Reserch Institute), T. Pauporté (Centre National de la Recherche Scientifique), and M. Izaki (Toyohashi University of Technology)
- **203** A Kinetic Study of Hydroxide, Bicarbonate and Carbonate Ion Inter-Conversion in Anion Exchange Membranes for Fuel Cells Using FT-IR Microscope – T. P. Pandey, J. L. Horan, M. Liberatore, and A. Herring (Colorado School of Mines)
- **204** Effect of Dissolved Gas in an Ionic Liquid Electrolyte for Lithium and Lithium/Sodium Metal Anode – J. K. Stark and P. Kohl (Georgia Institute of Technology)

- **205** Effect of Doping on the Ionic Conductivity and Bonding of Reactively Sputter Deposited Lithium Phosphorus Oxynitride Thin Films – P. Mani, V. Singh, M. Real-Robert, S. Duranceau, S. Seal, and K. Coffey (University of Central Florida)
- **206** Room Temperature Fabrication of Crystalline Germanium Nanowires by Electrochemical Deposition and its Application as Li Ion Battery Anode – J. Gu, S. Collins, A. Carim, X. Hao, B. Bartlett, and S. Maldonado (University of Michigan)
- **207** Wet-Chemical Preparation of $Li_{1.5}A_{10.5}Ti_{1.5}(PO_4)_3$ Lithium Ionic Ceramic Thin-Films – C. Kubo, R. Aono, S. Takase, and Y. Shimizu (Kyushu Institute of Technology)
- **208** 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)
- **209** Direct Evaluation of Oxygen Chemical Potential in an SOFC Cathode by *In Situ* Micro XAS – Y. Fujimaki, H. Watanabe, Y. Kimura, K. Amezawa (Tohoku University), Y. Terada (JASRI), S. Hashimoto, and T. Kawada (Tohoku University)
- **210** An Entirely Printed, Rechargeable Zinc-based Battery – Z. Wang, B. Kim, J. W. Evans, and P. K. Wright (University of California at Berkeley)
- **211** The effect of the Deposition Conditions on the Electrodeposition of Si Nanopillars in TMHATFSI – Y. Ishibashi, T. Akiyoshi, J. Komadina, Y. Fukunaka, and T. Homma (Waseda University)
- **212** Construction of Zinc Oxide/Phthalocyanine Hybrid Photovoltaic Device – R. Chizaki, K. Murata, J. Sasano (Toyohashi University of Technology), T. Shinagawa (Osaka Municipal Technical Reserch Institute), S. Watase (Osaka Municipal Technical Research Institute), and M. Izaki (Toyohashi University of Technology)
- **213** Novel Surface Modification Technique Based on the Liquid Phase Deposition Using Solid Fluorine Scavenger – T. Hasegawa (Graduate School of Engineering, Kobe University), S. Matsumoto, and M. Mizuhata (Kobe University)
- **214** Electro-Oxidation of CO on Pt in Alkaline Media Studied by *In Situ* Surface-Enhanced Infrared Absorption Spectroscopy – J. Joo, T. Uchida (Hokkaido University), M. T. Koper (Leiden University), and M. Osawa (Hokkaido University)
- **215** Ultra-Strong Silicon-Coated Carbon Nanotube Fabric as Multi-Functional Lithium Ion Battery Anodes – K. Evanoff, J. Benson (Georgia Tech), M. Schauer (Nanocomp), I. Kovalenko (Georgia Institute of Technology), D. Lashmore (Nanocomp), J. Ready (Georgia Tech), and G. Y. Yushin (Georgia Institute of Technology)
- **216** Modification effects on Structural Changes of $LiMn_2O_4$ Electrode during the Electrochemical Process – K. Suzuki, K. Kim, S. Taminato, M. Komo, A. Hagiwara (Tokyo Institute of Technology), J. Son (Japan Synchrotron Radiation Research Institute), T. Inami, H. Konishi, K. Tamura, J. Mizuki (Japan Atomic Energy Agency), M. Hirayama, and R. Kanno (Tokyo Institute of Technology)
- **217** Variation of Crack Voltage in Anodic Aluminum Oxide/Aluminum Sheet for High Power LED Applications – H. Lee, H. Shin, and H. Lee (Korea Institute of Industrial Technology)
- **218** Visualization of Bubble Behavior in Water Electrolyzer with High-Speed Camera – Y. Maeda, S. Tsukamoto, and K. Ito (Kyushu University)
- **219** Memory Effect on Charge Storage in Layer-By-Layer Films of Rod-Shaped Multinuclear Complexes on Electrodes – T. Suzuki, T. Ryo, and M. Haga (Chuo University)
- **220** Nanoporous α-Alumina Membrane with High Chemical Resistance Prepared by Anodizing – T. Masuda, H. Asoh, and S. Ono (Kogakuin University)
- **221** Biocompatibility and Corrosion Resistance of Magnesium Coated with Hydroxyapatite using Alternative Immersion Method – D. Kobayashi, H. Asoh, and S. Ono (Kogakuin University)
- **222** Application of Argon (70) + Nitrogen (30) Plasma Coagulation in Swine Mucosa – K. K. Ou and M. M. Colley (Taipei Medical University)
- **223** Preparation of Flexible Micro-Glucose Sensor – T. Toba, N. Shiba, H. Matsuki, K. Edagawa, and M. Yasuzawa (University of Tokushima)
- **224** Preparation of Nonspecific Adsorption Eliminating Surface Using Perhydropolysilazane – N. Shinsuke, K. Ikebata, K. Rikitake, S. Nomoto, T. Koike (The University of Tokushima), and M. Yasuzawa (University of Tokushima)
- **225** Stability of Different Bis-Terpyridine Metal Cations under Alkaline Solution – Y. Liu, M. Liberatore, and A. Herring (Colorado School of Mines)
- **226** Physical and Electrolytic Properties of Partially Fluorinated Chain Ethers as Solvents for Lithium Secondary Batteries – T. Satoh, N. Nambu (Tokyo Polytechnic University), M. Takehara, M. Ue (Mitsubishi Chemical Group Science and Technology Research Center, Inc.), and Y. Sasaki (Tokyo Polytechnic University)
- **227** Positive-Tone, Aqueous-Developable, Polynorbornene Dielectric – B. K. Mueller, A. Grillo (Georgia Institute of Technology), E. Elce (Promerus LLC), and P. Kohl (Georgia Institute of Technology)
- **228** Fabrication of Nano-Structured (La,Sr)(Zn,Fe) O_3 Cathodes for Intermediate-Temperature SOFC – S. Hwang, J. Jang, G. Choi, S. Lee, O. Kwon, D. Lee (Daegu Gyeongbuk Institute of Science & Technology), S. Mukherjee, and S. Park (University of Louisville)
- **229** Shape Selective Formation and Growth of High Index Polyhedral Gold Nanoparticles and Their Activity to Oxygen Evolution – B. C. Solomon, F. Ke, and X. Zhou (University of South Carolina)
- **230** Study of Optical and Structural Properties of SRSN Fabricated by Cat-CVD below 200 °C – S. Kang, K. Keum, J. Park, T. Song, J. Kim, and W. Hong (University of Seoul)
- **231** The Structure, Thermal Expansion Property and Polymorphism of Solid Solution $Ho_2Mo_{3-x}W_xO_{12}$ – X. Liu, G. Yu (Shanghai Institute of Technical Physics), and Y. Liu (China Institute of Atomic Energies)

A2 Nanotechnology General Session

All Divisions / New Technology Subcommittee

313C, Level 3, Hawaii Convention Center

Nanoparticles, Nanowires and Nanocomposite – 08:00 – 12:00
Co-Chairs: Guoliang Xiao and Fanglin (Frank) Chen

08:00 **232** Growth of Pt Subnano-Clusters on Surface Limited Areas of Prussian-Blue Nanoparticles – M. Ishizaki, S. Tsuruta, K. Kananizuka, M. Kurihara, and M. Sakamoto (Yamagata University)

08:20 **233** Novel Synthesis Method of Copper Nanoparticles by Controlling Metal Complexes in Aqueous Solution – S. Yokoyama, H. Takahashi, and K. Tohji (Tohoku University)

08:40 **234** Characterization Attributes of Metal Oxide Nanocomposites – M. Hockey, Q. Lin, and E. Calderas (Brewer Science Inc.)

09:00 **235** Fabrication and Optical Characteristics of Ordered Crystalline ZrO_2 Nanowires and Nanoporous Films on Glass – S. Chu, Y. Hitoshi (Iwate University), H. Segawa, S. Inoue, and K. Wada (National Institute for Materials Science)

09:20 **236** Electrochemical Synthesis of Crystalline and Compositionally-Uniform $Bi_{1-x}Sb_x$ Nanowire Arrays – W. Yelton, S. Limmer, M. P. Siegal, D. Medlin, J. L. Lensch-Falk, M. Hekmaky, D. L. Overmyer, and J. M. Rivera (Sandia National Laboratories)

09:40 Intermission (20 Minutes)

10:00 **237** Effects of Thermal Annealing on Conducting ZnO Nanowires: Conductor-To-Semiconductor Transition and Its Device Applications – P. Jeon, Y. Lee, R. Ha, H. Choi, and S. Im (Yonsei University)

10:20 **238** Oxygen Activation on Nanometer-Size Gold Nanoparticles – A. T. Staykov, K. Yoshizawa, and T. Ishihara (Kyushu University)

10:40 **239** Synthesis of Tailored Intermetallic Nanoparticles with Core-Shell Structure by Electrochemical Selective Phase Dissolution – G. Pigozzi (EMPA Swiss Federal Laboratories for Materials Science and Technology), D. Mukherji (Technical University Braunschweig), and P. Schmutz (EMPA Swiss Federal Laboratories for Materials Science and Technology)

11:00 **240** Annealing-Induced Interfacial Fracture Energy of Silver Nanoparticle Films on Substrate for Reliable Printed Electronics – I. Lee, S. Kim, J. Yun, I. Park, and T. Kim (Kaist)

11:20 **241** Atomistic Simulation Studies on Oxidation of Metal Nanoparticles – R. Subbaraman, S. A. Deshmukh, and S. Sankaranarayanan (Argonne National Laboratory)

11:40 **242** Photoinduced Spectral and Morphological Changes of Single Plasmonic Silver Nanoparticles on TiO_2: Towards Single Particle Photochromism – T. Tatsuma and I. Tanabe (University of Tokyo)

Characterization of Nanomaterials – 14:00 – 16:00
Co-Chairs: Fanglin (Frank) Chen and Sirikanda Nuansaeng

14:00 **243** Electooptic Study of Charge Carriers in Aligned Liquid Crystalline Polymers Transistors via Polarized Charge Modulation Spectroscopy – M. Lee (Kookmin University), Z. Chen (Université Aix-Marseille III), J. Lee (Kookmin University), and H. Sirringhaus (University of Cambridge)

14:20 **244** Use of Förster Resonance Energy Transfer (FRET) as a New Characterization Method for the Interface in Sustainable Nanocomposites – J. W. Gilman, M. Zammarano (National Institute of Standards and Technology), P. H. Maupin (U.S. Department of Energy), L. Sung, E. McCarthy, Y. S. Kim (National Institute of Standards and Technology), D. Fox (American University), A. J. Berro, and I. Sacui (National Institute of Standards and Technology)

14:40 **245** Nanoimaging and Analysis of Localized Surface Plasmon-Induced Charge Separation and Application to Versatile Photochromism – E. Kazuma (The University of Tokyo) and T. Tatsuma (University of Tokyo)

15:00 **246** Characterization of TiO_2 Particles Irradiated with N_2 Plasma by Newly Developed Plasma-Treatment System – K. Matsubara, M. Inoue, Y. Honda, and T. Abe (University of Toyama)

15:20 **247** Mapping of Electrochemical Interfaces at Nanoscale Dimensions Using Atom Probe Tomography – A. C. Hillier and Y. Zhang (Iowa State University)

15:40 **248** Measurements of Hydrogen Solubility in PdCu Thin Films – J. Galipaud (INRS- Énergie Matériaux et Télécommunications), M. H. Martin (INRS-EMT), L. Roué, and D. Guay (INRS-Énergie Matériaux et Télécommunications)

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

Li Battery Cell – 08:00 – 12:20
Co-Chairs: Sanjeev Mukerjee and Manickam Minakshi

08:00 Memory of James McBreen (20 Minutes)

08:20 **320** A Wonderful Life Dedicated to Energy Research In Memery of James McBreen – X. Yang, K. Nam (Brookhaven National Laboratory), S. Mukerjee (Northeastern University), M. Balasubramanian (Argonne National Laboratory), W. Yoon (Sungkyunkwan University), and K. Chung (Korea Institute of Science and Technology)

09:00 **321** Recent Advances in Neutron Imaging for Battery Characterization – D. S. Hussey, J. Kahn, O. Zilcha, D. Jacobson (National Institute of Standards and Technology), B. Khaykovich (Massachusetts Institute of Technology), M. V. Gubarev (NASA), J. Gagliardo, and J. Owejan (General Motors Electrochemical Energy Research Laboratory)

09:20 **322** Application of Synchrotron-Based X-Ray Techniques to Study Thermal Behavior of Electrode Materials for Lithium Rechargeable Batteries – W. Yoon (Sungkyunkwan University), K. Nam (Brookhaven National Laboratory), K. Chung (Korea Institute of Science and Technology), M. Balasubramanian (Argonne National Laboratory), D. Jang (Sungkyunkwan University), J. Hanson, and X. Yang (Brookhaven National Laboratory)

09:40 Intermission (20 Minutes)

10:00 **323** Solid-State Batteries: A Fifty Year Perspective – B. B. Owens and O. Yamamoto (Mie University)

10:20 **324** Rechargeable Lithium Battery Electrodes Using a Multifunctional Polymer Binder – A. E. Javier, S. N. Patel (University of California – Berkeley), and N. P. Balsara (Lawrence Berkeley National Laboratory)

10:40 **325** An Empiric Approach to the Estimation of State of Charge of Lithium Cells and Range of an Electric Vehicle – G. Davolio, R. Giovanardi (Università di Modena e Reggio Emilia), and C. Lanciotti (KEMET Electronics Italia)

11:00 **326** Designing Advanced Hybrid Materials for Rechargeable Lithium Batteries – Y. Guo (Chinese Academy of Sciences)

11:20 **327** Substation Installations of Electrovaya's MWh-Scale Lithium-Ion SuperPolymer Batteries for Smart Grid Applications – R. DasGupta (Electrovaya Inc.)

11:40 **328** Nanostructured Composites for Energy Storage Applications – D. Wang, S. Chen, Z. Song, T. Xu, J. Song, R. Yi, F. Dai, and M. Gordin (The Pennsylvania State University)

12:00 **329** Polymer Gel Electrolytes for Lithium-Ion Batteries – M. Gnanavel, M. Patel, and A. J. Bhattacharyya (Indian Institute of Science)

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

Li Battery Cathodes – 08:00 – 12:00
Co-Chairs: Hajime Arai and A. Manivannan

08:00 **330** Nanostructured β-Li_3PS_4 for All-Solid Lithium-Sulfur Batteries – C. Liang, Z. Lin, Z. Liu, N. J. Dudney, A. J. Rondinone, and E. Payzant (Oak Ridge National Laboratory)

08:20 **331** Kinetically Asymmetric Reaction Pathways on Charging and Discharging $LiNi_{0.5}Mn_{1.5}O_4$ Electrodes – K. Sato, H. Arai, Y. Orikasa, H. Murayama, Y. Koyama, Y. Uchimoto, and Z. Ogumi (Kyoto University)

08:40 **332** High-Capacity $0.4Li_2MnO_3 \cdot 0.6LiNi_{2/3}Mn_{1/3}O_2$ with Excellent Cyclability for Lithium-Ion Batteries – Y. Jiang, Z. Yang, and Y. Huang (Huazhong University of Science and Technology)

09:00 **333** Fabrication of Macroporous Li_2FeSiO_4/Carbon Monoliths for a Lithium-Ion Battery – G. Hasegawa, M. Sannohe, K. Kanamori, K. Nakanishi, and T. Abe (Kyoto University)

09:20 **334** $Ag_xV_yO_zPO_4$: Silver Vanadium Phosphorous Oxides as Cathode Materials in Lithium Batteries – E. S. Takeuchi, A. C. Marschilok, and K. J. Takeuchi (Stony Brook University)

09:40 Intermission (20 Minutes)

10:00 **335** Selenium and Selenium Sulfide − A New Class of Positive Electrode Material for Room Temperature Lithium and Sodium Rechargeable Batteries – A. Abouimrane, D. Dambournet, K. W. Chapman, P. J. Chupas, W. Weng, Y. Cui, H. El Tayeb, and K. Amine (Argonne National Laboratory)

10:20 **336** Open Framework Electrodes for Stationary Storage Devices – C. D. Wessells, M. Pasta, R. A. Huggins, and Y. Cui (Stanford University)

10:40 **337** Solid State Lithium Sulfur Batteries Using a Nanostructured Block Copolymer Electrolyte – A. A. Teran (University of California, Berkeley) and N. P. Balsara (Lawrence Berkeley National Laboratory)

11:00 **338** Spherical Carbon/Sulfur Composite Cathodes for Rechargeable Lithium Batteries – M. A. Loth, F. Rogers, R. Chen, C. Swartz, U. Graham, and S. M. Lipka (University of Kentucky)

11:20 **339** SnS_2-Graphene Nanocomposite for Advanced Lithium-Ion Battery – L. Ji, H. L. Xin, T. R. Kuykendall, S. Wu, H. Zheng, M. Rao, E. J. Cairns, V. Battaglia, and Y. Zhang (Lawrence Berkeley National Laboratory)

11:40 **340** V_2O_5 Network Structure as Cathode for Lithium-Ion Batteries – Y. Xu, M. Dunwell, and H. Luo (New Mexico State University)

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

Li Battery Anodes – 14:00 – 16:00
Co-Chairs: A. K. Shukla and V. Battaglia

14:00 **341** Enhancement of Li Insertion Capacity of Carbon Anode on the Basis of Faradaic Adsorption Combined with Nano-Ionics Mechanism – T. Takamura (Harbin Institute of Technology), J. Suzuki, K. Sumiya, and K. Sekine (Rikkyo University)

14:20 **342** Microwave Synthesis of Graphene/Sn Nanocomposite Anodes for Lithium-Ion Batteries – F. R. Beck, R. Epur (University of Pittsburgh), A. Manivannan (U.S. Department of Energy), and P. N. Kumta (University of Pittsburgh)

14:40 **343** Understanding Cycle Life Failure Mechansims in Graphite-Silicon Alloy Composite Electrodes by Electrochemical Calorimetry – L. J. Krause (3M Corporate Research Laboratory), L. Liu, L. Jensen (3M Co.), V. L. Chevrier (3M Corporate Research Laboratory), and J. Singh (3M Co.)

15:00 **344** Tough Solid Composite Electrolytes to Enable Lithium Metal Anodes – W. E. Tenhaeff, K. A. Perry (Oak Ridge National Laboratory), E. Herbert (The University of Tennessee), S. Kalnaus, and N. J. Dudney (Oak Ridge National Laboratory)

15:20 **345** Study of Conversion Reactions in NiO Using Transmission Electron Microscopy and Electron Energy Loss Spectroscopy – A. K. Shukla, U. Boesenberg, and J. Cabana (Lawrence Berkeley National Laboratory)

15:40 **346** Electrochemical Versitility of Carbon for Energy Storage Application – L. A. Riley, H. Constantino, and A. Feaver (EnerG2)

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

Electrolyzer – 14:00 – 16:00
Co-Chairs: G. Botte and Kathy Ayers

14:00 **347** Combined Experimental and Theoretical Study of Nitrogen Reduction on Novel Mo-N Catalyst Material – I. Matanovic, K. Armstrong, L. Daemon (Los Alamos National Laboratory), J. Eckert (University of South Florida), F. H. Garzon, A. H. Mueller, and N. J. Henson (Los Alamos National Laboratory)

14:20 **348** Challenges in Water Electrolysis and Its Development Potential as a Key Technology for Renewable Energies – J. Mergel (Forschungszentrum Jülich) and D. Stolten (Forschungszentrum Jülich GmbH)

14:40 **349** Electrochemical Modeling of Anode Supported Solid Oxide Electrolyzer Cells (SOEC) in Electrolysis of Carbon Dioxide – J. Njodzefon (Karlsruhe Institute of Technology), A. Weber (Karlsruher Institut für Technologie), and E. Ivers-Tiffée (Karlsruhe Institute of Technology)

15:00 **350** Novel Fluorine Doped Transition Metal Oxide ($Ru_xSn_{1-x}O_2$:F) Oxygen Evolution Electro-Catalysts for Hydrogen Generation from PEM Based Water Electrolysis – K. Kadakia, M. Datta, O. Velikokhatnyi, and P. N. Kumta (University of Pittsburgh)

15:20 **351** Nanostructured Nickel Hydroxides for Urea Electrolysis – D. Wang, W. Yan, S. Vijapur, and G. G. Botte (Ohio University)

15:40 **352** Synthesis of Active Fibrous Perovskite Catalyst and Its Application for Hydrogen Production – Y. Jeon, D. Park, M. Park, G. Lee (Yonsei University), J. Park (Kyushu University), and Y. Shul (Yonsei University)

B2 Electrochemical Capacitors

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

Pseudocapacitance I – 08:00 – 09:40
Co-Chairs: J. Long and W. Sugimoto

08:00 **487** A Critical View on Graphene-Metal Oxide Based Electrochemical Supercapacitors – P. Gao (Institut Charles Gerhardt Montpellier), S. Baek, N. Pinna (Seoul National University), F. Moser, T. Brousse (University of Nantes), and F. Favier (Institut Charles Gerhardt Montpellier)

08:40 **488** Tuning the Electrolytic Manganese Oxide/ Graphene Oxide Nanocomposites for High-Energy Asymmetric Electrochemical Capacitors in Aqueous Electrolytes – K. I. Ozoemena (Council for Scientific and Industrial Research), C. J. Jafta (CSIR), M. K. Mathe (Council for Scientific and Industrial Research), and S. Chen (University of California)

09:00 **489** Pseudocapacitive Behavior of Hierarchical Porous Carbide-Derived Carbon with Integrated Niobium Pentoxide Nanoparticles – V. Presser (Drexel University), E. Perre (University of California), M. Lukatskaya (Drexel University), B. Dunn (University of California), and Y. Gogotsi (Drexel University)

09:20 **490** MnO_2/Carbon Nanocomposite Electrode Prepared Via Molecular Bridging – C. Ramirez Castro (University of Nantes), R. Retoux (Université de Caen Basse-Normandie), A. Morel, O. Crosnier, L. Athouël, P. Guillemet, F. Moser, C. Martin (University of Nantes), D. Bélanger (Université du Québec à Montréal), and T. Brousse (University of Nantes)

Pseudocapacitance II – 10:00 – 12:00
Co-Chairs: F. Favier and J. M. Ko

10:00 **491** Hydrous Ruthenium Oxide: A Pseudocapacitance Champ with Lessons of Relevance for the Redesign of Energy-Storage Architectures – D. R. Rolison (U.S. Naval Research Laboratory)

10:40 **492** An Investigation of Nanostructured Thin Film α-MoO_3 Based Supercapacitor Electrodes in an Aqueous Electrolyte – B. Mendoza Sanchez (University of Oxford), T. Brousse, C. Ramirez Castro (University of Nantes), V. Nicolosi, and P. Grant (University of Oxford)

11:00 **493** Kinetic and Mass Transport Phenomena in Different Phases of Manganese Dioxide for Application in Electrochemical Capacitors – M. Dupont and S. W. Donne (University of Newcastle)

11:20 **494** Transition Metal Nitrides Thin Films for Supercapacitor Applications – S. Bouhtiyya (Université de Lorraine), R. Lucio-Porto, J. Ducros (Université de Nantes), P. Boulet, F. Capon (Université de Lorraine), T. Brousse (University of Nantes), and J. Pierson (Université de Lorraine)

11:40 **495** New Developments in Colloidal Fabrication of Manganese Dioxide-Carbon Nanotube Electrodes of Supercapacitors – I. Zhitomirsky (McMaster University)

Pseudocapacitance III – 14:00 – 18:00
Co-Chairs: S.-G. Park and A. Balducci

14:00 **496** Research on Conducting Polymer/Carbon Composite Supercapacitors: Toward Enhanced Cycle Stability and Power Performance – N. N. Wu and Y. Weng (National Taiwan University)

14:40 **497** Polyaniline-MnO_2 Nanocomposite Supercapacitor Electrodes Prepared by Galvanic Pulse Polymerization – G. Pandey and A. Rastogi (Binghamton University (SUNY))

15:00 **498** Electrochemical Codeposition of Polyaniline and Tungsten Oxide for Supercapacitor – B. Zou and X. Liu (Northestern University)

15:20 **499** Aqueous Hybrid Capacitor Based on Doping/ Dedoping of Lithium- Ion into Conducting Polymer – J. Ahn (Korea Institute of Industrial Technology), Y. Shul (Yonsei University), and H. Kim (Korea Institute of Industrial Technology)

15:40 **500** Binder Free Thick Electrodes of Polyaniline Nanofibers/ Multiwalled Carbon Nanotubes – M. Hyder, S. Lee, Y. Shao-Horn, and P. Hammond (Massachusetts Institute of Technology)

B4 Intercalation Compounds for Rechargeable Batteries

Battery

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

Cathode I – 08:00 – 12:25
Co-Chairs: Christopher Johnson and Shirley Meng

08:00 Introductory Remarks (5 Minutes)

08:05 **619** Iron and Manganese Based Cathode Materials for Electrochemical Energy Storage – K. J. Takeuchi, A. C. Marschilok, and E. S. Takeuchi (Stony Brook University)

08:25 **620** Electrochemical and Structural Properties of Li-Rich Layered Cathode Material $Li_{1.2}Ni_{0.2}Mn_{0.6}O_2$ – T. Sasakawa, Y. Harada, H. Inagaki, N. Takami (Toshiba Corporation), N. Kitamura, and Y. Idemoto (Tokyo University of Science)

08:45 **621** Electrochemical Property of Nano Size Multiple Transition Metal Oxides Synthesized from Layered Double Hydroxide – N. Sonoyama, S. Hayashi, T. Toba, and Z. Quan (Nagoya Institute of Technology)

09:05 **622** Ion-Exchange Synthesis and Intercalation Process of $Li_{1.05}Na_{0.02}Ni_{0.21}Mn_{0.63}O_2$ Cathodes for Li-Ion Batteries – M. Slater, S. Rood, D. Kim, S. Kang, E. Lee, V. Maroni, D. Bass (Argonne National Laboratory), A. DeWahl, S. Hackney (Michigan Technological University), and C. S. Johnson (Argonne National Laboratory)

09:45 Intermission (20 Minutes)

10:05 **623** Li_2MnO_3-Based Positive Electrode Materials; Materials Design, Synthesis, and Structural Stability – N. Yabuuchi, Y. Aoki, R. Hara, and S. Komaba (Tokyo University of Science)

10:45 **624** Change of Local, Average and Electronic Structures, and Property by Heat-Treatment under Vacuum Reducing Condition and Charge-Discharge Process in $Li_{1.2}Mn_{0.567}Ni_{0.167}Co_{0.067}O_2$ – Y. Idemoto, T. Kashima, and N. Kitamura (Tokyo University of Science)

11:05 **625** Surface Control and Multi-Composite Cathodes – A. Mauger (Université Pierre et Marie Curie), K. Zaghib (Institut de Recherche d'Hydro-Québec), H. Groult, and C. M. Julien (Université Pierre et Marie Curie)

11:25 **626** Improvement in Electrochemical Performances of $Li[Ni_xMn_yCo_z]O_2$ Upon Cycling and Storage – J. Kim (Mitsubishi Chemical Group Science and Technology Research Center Inc.)

11:45 **627** Structural and Electrochemical Properties of $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ Positive Electrode Material Modified by Coating with Al Oxides (2) – Y. Sasaki (Hitachi Maxell Energy, Ltd.), Y. Kikuzono (Research Institute for Ubiquitous Energy Devices, AIST,1-8-31, Midorigaoka, Ikeda, Osaka 563-8577 Japan), N. Fukiya (Research Institute for Ubiquitous Energy Devices, AIST, 1-8-31, Midorigaoka, Ikeda, Osaka 563-8577 Japan), N. Taguchi (National Institute of Advanced Industrial Science and Technology (AIST)), K. Araki, K. Okamura (Kyoto University), K. Kojima, F. Kita (Hitachi Maxell Energy Ltd.), T. Takeuchi, H. Sakaebe, K. Tatsumi (National Institute of Advanced Industrial Science and Technology (AIST)), and Z. Ogumi (Kyoto University)

12:05 **628** Epitaxial Growth of $LiCoO_2$ Thin Film on Single Crystal Substrate by Sol-Gel Method – T. Kwon, T. Ohnishi, K. Akatsuka, R. B. Cervera, and K. Takada (National Institute for Materials Science)

Computation – 14:00 – 16:00
Co-Chairs: Katsuyo Thornton and Yukinori Koyama

14:00 **629** Simulations of Charge-Discharge Processes in an Intercalation Compound at the Nanoscale – B. Orvananos (Universiy of Michigan), H. Yu (University of Michigan), R. Malik (Massachusetts Institute of Technology), C. P. Grey (University of Cambridge), G. Ceder (Massachusetts Institute of Technology), and K. Thornton (University of Michigan)

14:40 **630** First-Principles Calculations on Defect Chemistry in Layered Lithium Transition-Metal Oxides – Y. Koyama, H. Arai, I. Tanaka, Y. Uchimoto, and Z. Ogumi (Kyoto University)

15:00 **631** First-Principles Study of Two-Phase Interface in $LiFePO_4$ – Y. Asari, Y. Suwa, T. Hamada (Hitachi, Ltd.), V. Dinh, J. Nara, and T. Ohno (National Institute for Materials Science)

15:20 **632** Design Criteria for Electrochemical Shock Resistant Battery Electrode Particles – W. H. Woodford, W. Carter, and Y. Chiang (Massachusetts Institute of Technology)

15:40 **633** Electronic Model of Intercalation of Alkaline Ions into Transition Metal Oxides – J. Molenda (AGH University of Science and Technology)

B5 Interfaces and Interphases in Battery Systems

Battery / Energy Technology

Honolulu 1, Tapa Conference Center, Hilton Hawaiian Village

Interfaces and Interphases in Battery Systems I – 08:00 – 12:00
Co-Chairs: Robert Kostecki and Jason Graetz

08:00 **718** Studies on Reactions and Structures at Electrode/Electrolyte Interface Using Epitaxial Model Electrodes – R. Kanno, M. Hirayama (Tokyo Institute of Technology), and K. Tamura (Japan Atomic Energy Agency)

08:40 **719** *In Situ* XAS and XRD Studies on Electrode/Electrolyte Interface of Li_xCoO_2 Thin-Film Electrode – D. Takamatsu, S. Mori, K. Shimada, Y. Orikasa, T. Kawaguchi, H. Murayama (Kyoto University), T. Hirano (Hitachi, Ltd.), M. Sato (JASRI/SPring-8), H. Tanida, Y. Koyama, H. Arai, E. Matsubara, Y. Uchimoto, and Z. Ogumi (Kyoto University)

09:00 **720** Revealing Positive Electrode Oxide Changes on Electrochemical Cycling by *In Situ* Electron Microscopy – D. J. Miller, C. Proff, J. Wen, and D. P. Abraham (Argonne National Laboratory)

09:20 **721** Lithium Depletion in the Solid Electrolyte Adjacent to Cathode Materials – H. Yamada, K. Suzuki, Y. Oga, I. Saruwatari, and I. Moriguchi (Nagasaki University)

09:40 Intermission (20 Minutes)

10:00 **722** Advanced Characterization and First Principles Modeling of Surface and Interfaces of Lithium Intercalation Compounds – Y. Meng (University of California San Diego)

10:40 **723** Electrochemical Impedance Analysis and Applications of Porous Electrodes for Lithium-Ion Batteries – N. Ogihara, Y. Itou, S. Kawauchi, C. Okuda, Y. Takeuchi, and Y. Ukyo (Toyota Central R&D Labs., Inc.)

11:00 **724** *In Situ* Atomic Force Microscopy Studies of Surface Layer Formation on $LiMn_2O_4$ Thin Films – N. Missert, R. Garcia, and J. M. Rivera (Sandia National Laboratories)

11:20 **725** The Effect of ZrO_2 Coating on Nano Size $LiCoO_2$ Cathode for Lithium-Ion Batteries – Y. Kusachi, T. Shimizu, Y. Orikasa, and Y. Uchimoto (Kyoto University)

11:40 **726** Phosphate-Based Additives for High Voltage Li-Ion Batteries and Their Derivatives – A. V. Cresce (U.S. Army Research Laboratory) and K. Xu (U. S. Army Research Laboratory)

Interfaces and Interphases in Battery Systems II – 14:00 – 16:00
Co-Chairs: Bor Yann Liaw and Shirley Meng

14:00 **727** Two-Layer/Two-Mechanism Model of Li-Ion Diffusion in Solid Electrolyte Interphase – S. Shi (Brown University), Y. Qi (General Motors R&D Center), P. Lu (Trison Business Solution Inc.), Z. Liu (General Motors), L. G. Hector Jr., and S. J. Harris (General Motors R&D Center)

14:40 **728** Effect of Graphite Orientation on Solid-Electrolyte-Interphase Formation and Characterization – M. Tang (Lawrence Berkeley National Laboratory), K. Miyazaki (Kyoto University), J. Newman (University of California, Berkeley), and T. Abe (Kyoto University)

15:00 **729** Real-Time Dynamics during Recharging Cycles – J. Keist, B. El Dasher, S. Torres (Lawrence Livermore National Laboratory), J. W. Evans, P. K. Wright (University of California at Berkeley), F. Ross (IBM Watson), D. Steingart (City College New York), and C. Orme (Lawrence Livermore National Laboratory)

15:20 **730** Simultaneous Coupling of Kinetic Monte-Carlo Simulations with Continuum Models to Examine Capacity Fade – P. Northrop (Washington University), R. Braatz (Massachusetts Institute of Technology), and V. Subramanian (Washington University)

15:40 **731** Diffusion Limitations of the Liquid Metal Battery – G. A. Thompson, S. A. Barriga, U. P. Muecke, and D. R. Sadoway (Massachusetts Institute of Technology)

B6 Lithium-Ion Batteries

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

Lithium-Ion Batteries: Cathodes I (Lithium Metal Phosphate Systems)– 08:00 – 09:40
Co-Chairs: Gao Liu and Vince Battaglia

08:00 **773** Phase Transition Behavior of $LiFePO_4$ Based Cathode Materials – Y. Zhou, X. Wang, X. Yu, K. Nam, E. Hu, J. Liu, and X. Yang (Brookhaven National Laboratory)

08:20 **774** Multi-Scale, Multiphase Mathematical Modeling of $LiFePO_4$ Cathodes – T. W. Farrell and S. Dargaville (Queensland University of Technology)

08:40 **775** Phase Transition Study of $LiFePO_4$ Nanowires in Li-Ion Battery – J. Niu, A. Kushima, L. Qi (Massachusetts Institute of Technology), J. Huang (Sandia National Laboratories), and J. Li (Massachusetts Institute of Technology)

09:00 **776** Thermal Stability of Binary Olivine $Li_{1-y}Fe_{1-x}Mn_xPO_4$ [$0 \leq x, y \leq 1$] for Li Rechargeable Battery – J. Kim, K. Park, I. Park (Seoul National University), J. Yoo (KAIST), J. Hong, and K. Kang (Seoul National University)

09:20 **777** A Novel Double-Structured $LiMn_{0.85}Fe_{0.15}PO_4$: $LiFePO_4$ Core-Shell Materials for Rechargeable Lithium-Ion Batteries – S. Oh (Hanyang University), S. Myung (Sejong University), J. Park (Hanyang University), B. Scrosati (University of Rome Sapienza), K. Amine (Argonne National Laboratory), and Y. Sun (Hanyang University)

Lithium Batteries: Alternative Chemistries – 08:00 – 09:40
Co-Chairs: Yong Yang and Faisal Alamgir

08:00 **778** 3D Nanoporous Current Collectors for Advanced Thin Film Microbatteries – S. Gowda, A. Reddy, and P. Ajayan (Rice University)

08:20 **779** High Energy Cells: Lithium-Sulfur and Lithium-Sulfur-Silicon – M. Hagen (Fraunhofer ICT), S. Dörfler (Fraunhofer IWS), E. Quiroga-González (Christian-Albrechts-University of Kiel), H. Althues (Fraunhofer IWS), J. Tübke (Fraunhofer ICT), and H. Föll (Christian-Albrechts-University of Kiel)

08:40 **780** Effect of Initial Sulfur Morphology on Capacity and Cycle-Life of Lithium-Sulfur Batteries – H. Jha, A. Eberle, S. Eckstein, H. A. Gasteiger (Technische Universität München), C. Poggi, and O. Gröger (Volkswagen Aktiengesellschaft, D-38436 Wolfsburg, Germany)

09:00 **781** Large Self-Weaving Sulfur-MWCNT Composite Cathodes for High Rate Lithium-Sulfur Batteries – Y. Su and A. Manthiram (The University of Texas at Austin)

09:20 **782** Hollow Carbon Balls-Sulfur Composite in Advanced Configuration Lithium Battery – D. Lee (Hanyang University), J. Hassoun (University of Rome Sapienza), J. Park (Hanyang University), B. Scrosati (University of Rome Sapienza), and Y. Sun (Hanyang University)

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

Lithium-Ion Batteries: Cathodes I (Lithium Metal Phosphate Systems) – 10:00 – 12:00
Co-Chairs: Vince Battaglia and Gao Liu

10:00 **783** Experimental Observation of Coherent Strain Effects on Phase Separation in $LiFePO_4$ Electrode – K. Tokuda, T. Kawaguchi, T. Ichitsubo, E. Matsubara, K. Fukuda, Y. Uchimoto, and Z. Ogumi (Kyoto University)

10:20 **784** Hydro Thermal Synthesized $LiFePO_4$ Modified by $Li_4P_2O_7$ and Carbon Coatings – J. Chong, S. Xun, X. Song, G. Liu, and V. Battaglia (Lawrence Berkeley National Laboratory)

10:40 **785** Comparison of Charge Transfer Resistance for Different $LiFePO_4$-Electrodes – J. Illig, M. Ender, and E. Ivers-Tiffée (Karlsruhe Institute of Technology (KIT))

11:00 **786** A Comparative Study on A_2MnPO_4F (A = Na and Li) Cathodes for Rechargeable Batteries – S. Kim (State University of New York at Stonybrook), D. Seo, H. Kim, K. Park, H. Kim, and K. Kang (Seoul National University)

11:20 **787** Olivine Type Cathodes for Stationary Lithium-Ion Batteries – D. Choi, Y. Choi, Q. Huang, W. Wang, J. Liu, J. Zhang, L. Pederson, and V. Sprenkle (Pacific Northwest National Laboratory)

11:40 **788** Nanosized Effect on Charge-Discharge Property of $LiMnPO_4$ Embedded in Porous Carbons – S. Aono, K. Urita, H. Yamada, and I. Moriguchi (Nagasaki University)

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

Lithium Batteries: Alternative Chemistries – 10:00 – 12:00
Co-Chairs: Faisal Alamgir and Yong Yang

10:00 **789** Synthesis and Characterization of Hybrid Organic-Inorganic Composite Electrodes for Li-Based Batteries – C. M. Lopez (CIC Energigune), P. Sánchez-Fontecoba (University of the Basque Country), S. Pérez-Villar, V. Roddatis, and T. Rojo (CIC Energigune)

10:20 **790** Modeling Failure due to Redistribution in Lithium-metal Batteries – A. Ferrese (UC Berkeley) and J. Newman (University of California, Berkeley)

10:40 **791** Solid State Fluoride Ion Batteries – A. Munnangi, R. Witter, and M. Fichtner (Karlsruhe Institute of Technology)

11:00 **792** Rechargeable, Lithium-ion Molten Salt Battery for High Temperature Applications – J. Caja (Electrochemical Systems, Inc.), T. J. Dunstan (Electrochemical Systems Inc.), and M. Caja (Electrochemical Systems, Inc.)

11:20 **793** Fabrication of $Li_{1+x}Ti_{2-x}O_4$ Electrode for All-Solid-State Lithium-Ion Rechargeable Batteries Using a Novel Flux Coating Method – H. Kojima, K. Teshima, H. Wagata, Y. Mizuno, and S. Oishi (Shinshu University)

11:40 **794** In Operando, Naked, and Hot: High Temperature Batteries Without Packaging – C. F. Petersburg, K. Bogaert, and F. M. Alamgir (Georgia Institute of Technology)

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

Lithium-Ion Batteries: Cathodes I (Lithium Metal Phosphate Systems) – 14:00 – 15:40
Co-Chairs: Linda Nazar and Stefano Passerini

14:00 **795** (ECS Battery Division Research Award) High Capacity Intercalation Materials for Li-Ion and Na-ion Batteries – S. Passerini (University of Münster)

14:40 **796** Improvement of Battery Performances of $LiCoPO_4$ as Cathode Material for Lithium Ion Batteries – J. Yoshida, S. Nakanishi, and H. Iba (Toyota Motor Corporation)

15:00 **797** Combined First-Principle Calculations and Experimental Study of Doping Effect in $LiFe_{0.95}M_{0.05}PO_4$ (M = Na, Mg, Zn, Mn, Ni) – Z. Wang, L. Yuan, and Y. Huang (Huazhong University of Science and Technology)

15:20 **798** Lithium Iron Phosphate Wired by Carbon Nanotubes for High Rate Capability Lithium-ion Batteries – A. J. Bhattacharyya and M. Gnanavel (Indian Institute of Science)

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

Lithium-Ion Batteries: Cell Design Aspects – 14:00 – 15:40
Co-Chairs: Gen Inoue and Jan Prochazka

14:00 **799** Rapid Charge and Discharge Property of High Capacity Lithium Ion Battery applying 3D-Patterned Electrode – M. Sanada (Dainippon Sreen Mfg. Co., Ltd), K. Furuichi, K. Teraki, T. Matsuda, K. Hiramatsu, D. Ueda, A. Izumi (Dainippon SCREEN Mfg. Co., Ltd.), H. Munakata, and K. Kanamura (Tokyo Metropolitan University)

14:20 **800** Advances in 3D Lithium Battery Technology – J. Prochazka (HE3DA, Ltd)

14:40 **801** High Power 3D Lithium Battery – J. Prochazka (HE3DA, Ltd)

15:00 **802** Lithium Ion Batteries: 3-D Multi-scale Tomography – F. Tariq (Imperial College London), P. Shearing (University College London), V. Yufit (Imperial College London), J. Gelb (Xradia Inc), R. Bradley, P. Withers (University of Manchester), and N. Brandon (Imperial College London)

15:20 **803** Effect of Binder Distribution in LIB Electrode on Mass Transport Performance – G. Inoue (Kyoto University), T. Matsuoka, Y. Matsukuma, and M. Minemoto (Kyushu University)

B7 Metal-Air Batteries

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

Air Electrode – 08:00 – 11:40
Co-Chairs: Jie Xiao and Fanny Barde

08:00 **1099** (Invited) Metal-Air Batteries: A Reality Check – S. Whittingham (SUNY)

08:40 **1100** Very High Specific Surface Area Capacity Lithium-Air Battery – P. Stevens, G. Toussaint (Electricité de France), P. Vinatier, and L. Puëch (Université de Bordeaux)

09:00 **1101** A Versatile Composite Electrode Design for Metal-Air Batteries – A. C. Marschilok, E. S. Takeuchi, and K. J. Takeuchi (Stony Brook University)

09:20 **1102** Comparison of Air Cathodes and Aluminium Anodes for High-Power Density Alkaline Aluminium-Air Batteries – D. MacAodhagáin, C. Ponce-de-Leon-Albarran, R. J. Wood (University of Southampton), K. R. Stokes (DSTL, UK), and F. C. Walsh (University of Southampton)

09:40 Intermission (20 Minutes)

10:00 **1103** (Invited) Cycling Stability and Charging Behavior of Carbon Nanotube Electrodes for Li-O_2 Batteries – B. M. Gallant, R. R. Mitchell, C. V. Thompson, and Y. Shao-Horn (Massachusetts Institute of Technology)

10:40 **1104** N-Doped Graphene Nanosheet for Li-Air Fuel Cell under Acidic Conditions – E. Yoo (Advanced Industrial Science And Technology), J. Nakamura (University of Tsukuba), and H. Zhou (National Institute of Advanced Industrial Science and Technology)

11:00 **1105** Structure of Li_2O_2 Discharge Products on Free-Standing Aligned Carbon Nanotube Electrodes for Li-Air Batteries – R. R. Mitchell, B. M. Gallant, Y. Shao-Horn, and C. V. Thompson (Massachusetts Institute of Technology)

11:20 **1106** Graphene and N-Doped Graphene as Cathodes for Li-Air Batteries – Y. Li, J. Wang, X. Li, D. Geng, R. Li, and X. A. Sun (University of Western Ontario)

Reaction Meachanism – 13:00 – 15:30
Co-Chairs: Yang Shao-Horn and Nobuyuki Imanishi

13:00 **1107** (Invited) Promoting Ideal Reaction Processes in the Rechargeable Non-Aqueous Li-Air Battery – F. Bardé (Toyota Motor Europe), Y. Chen, S. A. Freunberger, and P. Bruce (University of St. Andrews)

13:30 **1108** (Invited) Fundamental Electrochemistry in Non-Aqueous Li-air – B. McCloskey (IBM Research), A. Speidel, R. Scheffler (Volkswagen of America), V. Viswanathan, J. S. Hummelshøj, J. K. Nørskov (Stanford University), and A. Luntz (IBM Almaden Research)

14:00 **1109** (Invited) Metal-Air Technologies-- Reversibility of Zinc Electrode – J. Yamaki, A. Nakata, T. Yamane, T. Hirai, and Z. Ogumi (Kyoto University)

14:30 **1110** Electrochemistry of Cathode Materials for Lithium-Oxygen Batteries Using Microelectrode Voltammetry – E. Nemanick (The Aerospace Corporation)

14:50 **1111** Decomposition Kinetics of Li-Air Cell Discharge Products in Non-Catalyzed and Catalyzed Carbon Cathodes – S. Meini (Technische Universität München), H. Beyer, N. Tsiouvaras, M. Piana (Technical University Munich), and H. A. Gasteiger (Technische Universität München)

15:10 **1112** Toward Efficiently Rechargeable Li-O_2 Batteries: Freely Diffusing Catalysts and O_2 Electrode-Stable Solvents – W. Walker (Liox Power Inc.), V. Giordani, V. S. Bryantsev, J. Uddin, S. Zecevic, D. Addison, and G. V. Chase (Liox Power, Inc.)

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, Ceramic 1 – 08:00 – 09:40
Co-Chairs: Dr. Ue and Dr. Hayashi

08:00 **1188** Development of Sulfide Glass Electrolytes for All-Solid-State Lithium Batteries – A. Hayashi and M. Tatsumisago (Osaka Prefecture University)

08:40 **1189** Suppression of H_2S Gas from Li_2S-P_2S_5 Glass Electrolytes by the Addition of Li_2O – T. Ohtomo, K. Kawamoto (Toyota Motor Corporation), A. Hayashi, and M. Tatsumisago (Osaka Prefecture University)

09:00 **1190** New Lithium Superionic Conductor and Its Application to All Solid-State Batteries – R. Kanno, M. Hirayama (Tokyo Institute of Technology), M. Yonemura (High Energy Accelerator Research Organization), Y. Kato, and K. Kawamoto (Toyota Motor Corporation)

Solid Electrolytes, Ceramic 2 – 10:00 – 12:00
Co-Chairs: Dr. Kanno and Dr. Takada

10:00 **1191** Interface Structures in Solid-State Lithium Batteries with Sulfide Electrolytes – K. Takada, X. Xu (National Institute for Materials Science), K. Fukuda (Kyoto University), K. Kumagai, K. Watanabe, K. Akatsuka, B. Hang, M. Osada, I. Sakaguchi, T. Ohnishi, T. Sekiguchi, and T. Sasaki (National Institute for Materials Science)

10:40 **1192** Enlarged Lithium-Ions Migration Pathway by Substitution of B^{3+} for P^{5+} in Li_3PS_4 – K. Homma, T. Yamamoto, S. Watanabe, and T. Tanaka (Fujitsu Laboratories Ltd.)

11:00 **1193** First Principles Investigations of the $Li_{10}GeP_2S_{12}$ Superionic Conductor and Related Materials – S. Ong, Y. Mo, W. D. Richards, and G. Ceder (Massachusetts Institute of Technology)

11:20 **1194** First-Principles Molecular Dynamics Simulations for Li^+ Diffusion in Li_3PO_4 and Li_3PS_4 Elctrolytes – M. Ikeda, T. Yamasaki, C. Kaneta, K. Homma, T. Yamamoto, and T. Tanaka (Fujitsu Laboratories Ltd.)

11:40 **1195** Analysis of Lithium-Ion Conduction in LISICON-Based Solid Electrolytes by First-Principles Molecular Dynamics Simulation – K. Fujimura, A. Kuwabara, H. Moriwake (Japan Fine Ceramics Center), A. Seko, Y. Koyama, and I. Tanaka (Kyoto University)

Solid Electrolytes, Ceramic 3 – 14:00 – 16:00
Co-Chairs: Dr. Takada and Dr. Kanno

14:00 **1196** Research on Electrode-Electrolyte Interfaces of Innovative New Generation Batteries – F. Mizuno (Toyota Research Institute of North America) and H. Iba (Toyota Motor Corporation)

14:40 **1197** The Preparation of $Li_7La_3Zr_2O_{12}$ by Sol-Gel Method and Its Electrochemical Performance – T. Nishioka, J. Wakasugi, N. Saito, H. Munakata, and K. Kanamura (Tokyo Metropolitan University)

15:00 **1198** Flux Growth of Idiomorphic Garnet-Type Solid Electrolyte Crystals for All-Solid-State Lithium-Ion Rechargeable Batteries – H. Onodera, K. Teshima, H. Wagata, Y. Mizuno (Shinshu University), K. Yubuta, T. Shishido (Tohoku University), and S. Oishi (Shinshu University)

15:20 **1199** High Lithium-Ion Conducting Garnet-type Oxide; $Li_{7+X}La_{3-Y}A_YZr_{2-Z}Nb_ZO_{12}$ (A = Alkali Earth Metals) – Y. Kihira, S. Ohta, H. Imagawa, and T. Asaoka (Toyota Central R&D Labs., Inc.)

15:40 **1200** Electrochemical Performance of an All-Solid-State Lithium-Ion Battery with Garnet-Type Oxide Electrolyte – S. Ohta, T. Saeki, S. Morishita, J. Seki, and T. Asaoka (Toyota Central R&D Labs., Inc.)

B9 Polymer Electrolyte Fuel Cells 12 (PEFC 12)

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

Tapa 2, Tapa Conference Center, Hilton Hawaiian Village

Plenary Session – 08:20 – 12:00
Co-Chairs: Hiroyuki Uchida and Hubert Gasteiger

08:20 **1274** Hyundai's FCEVs: A Pathway to New Possibilities – T. Lim and B. Ahn (Hyundai-Kia Motors)

09:00 **1275** Development of Advanced Materials and Devices for Cost Reduction of PEFC CHP System – H. OHARA (Panasonic Corporation) and T. Omura (Tokyo Gas Co., LTD)

09:40 Intermission (20 Minutes)

10:00 **1276** Polymer Electrolyte Fuel Cell Lifetime Limitations: The Role of Electrocatalyst Degradation – D. J. Myers, X. Wang, N. Kariuki, S. DeCrane, T. Nowicki, S. Arisetty, R. Subbaraman, R. K. Ahluwalia (Argonne National Laboratory), J. Gilbert (University of Wisconsin-Madison), B. Puchala (Univeristy of Wisconsin-Madison), E. Holby, D. Morgan (University of Wisconsin-Madison), S. Ball, J. Sharman, B. Theobald, G. Hards (Johnson Matthey Technology Center), M. Gummalla, Z. Yang, S. Zhitnik (United Technologies Research Center), D. Groom, S. Rajasekhara (University of Texas at Austin), P. Ferreira (University of Texas-Austin), J. P. Meyers (The University of Texas at Austin), P. Mathew, S. Kim (University of Texas at Austin), Y. Shao-Horn, W. Sheng, and B. Han (Massachusetts Institute of Technology)

10:40 **1277** Membrane Fuel Cells – Options for Bipolar Plate Materials and Production Technology – A. Heinzel (University Duisburg-Essen), L. Kühnemann, T. Derieth, T. Grimm, and P. Butzen (ZBT GmbH)

11:20 **1278** Limiting Current as a Tool to Study Oxygen Transport in PEM Fuel Cells – D. R. Baker and D. Caulk (General Motors R&D Center)

Plenary Session – 14:00 – 16:00
Co-Chairs: Deborah Jones and Vijay Ramani

14:00 **1279** Ionomer in the Catalyst Layer – S. Holdcroft (Simon Fraser University)

14:40 **1280** Development of Thin, Reinforced PEMFC Membranes through Understanding Structure-Property-Performance Relationships – W. Liu (W. L. Gore & Associates, Inc.), T. Suzuki (W. L. Gore & Associates, Co., Ltd. (Nihon Gore)), H. Mao, and T. Schmiedel (W. L. Gore & Associates, Inc.)

15:20 **1281** Development of Highly Active and Durable Pt Core-Shell Catalysts for Polymer Electrolyte Fuel Cells – M. Inaba and H. Daimon (Doshisha University)

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

Keynote Speech on Solar Fuels – 08:10 – 12:00
Co-Chairs: Nick Wu and Kazunari Domen

08:10 Introductory Remarks (10 Minutes)

08:20 **1719** Hydrogen Production from Photoelectrochemical Cells: Economic and Theoretical Considerations and Experimental Results – J. A. Turner (National Renewable Energy Laboratory)

09:00 **1720** Critical Assessment of Research and Development Needs in Solar to Hydrogen Production Technologies – E. L. Miller, S. Dillich, E. Sutherland, and S. Studer (US Department of Energy)

09:40 Intermission (20 Minutes)

10:00 **1721** Materials for Photocatalytic and Photoelectrochemical Water Splitting – A. Kudo (Tokyo University of Science)

10:40 **1722** Solar Energy Conversion and Environmental Remediation Using Semiconductor-Liquid Interfaces: Design Paradigms for the Photocatalyst Material and Progress Update – K. Rajeshwar (The University of Texas)

11:20 **1723** Solar Energy Materials for High Efficiency Photoelectrochemical Sensitized Solar Cell – N. Park (Sungkyunkwan University)

New Materials for Photocatalysts & Photoelectrochemical Cells – 14:00 – 16:00
Co-Chairs: Pawel Kulesza and Ravi Subramanian

14:00 **1724** Photoelectrochemical Energy Conversion Using Earth-Abundant Semiconductor Nanomaterials – S. Jin (University of Wisconsin-Madison)

14:30 **1725** All-Oxide Quantum-Confined Heteronanostructures for Solar Hydrogen Generation – L. Vayssieres (Xi'an Jiaotong University)

15:00 **1726** Plasmon-Enhanced Photocatalytic Activity of Metal/Metal Oxide Composites – S. Cushing, J. Li, A. Bristow, and N. Wu (West Virginia University)

15:20 **1727** Photooxidation of Water at Nanostructured Hybrid Materials Utilizing Polyoxometallate-Decorated Tungsten Oxide and Gold Nanoparticles – P. J. Kulesza, R. Solarska, K. Miecznikowski, S. Zoladek (University of Warsaw), and S. Fiechter (Helmholtz Zentrum)

15:40 **1728** Plasmonic-Enhancing Efficiency of Water Splitting in Au/Quantum Dots Sensitized ZnO Nanowires-Array Photoelectrodes – R. Liu, H. Chen, C. Chen, D. Tsai (National Taiwan University), and S. Hu (National Taiwan Normal University)

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 1 – 09:00 – 12:00
Co-Chairs: Eric Wachsman and John Kilner

09:00 **1879** Innovative Oxides Materials for Electrochemical Energy Conversion – E. D. Wachsman (University of Maryland)

09:40 Intermission (20 Minutes)

10:00 **1880** Study of Crystal Growth in Oxide Thin Films Fabricated by Pulsed Laser Deposition – N. Sata, S. Tamura, Y. Fujiwara, Y. Shibata, F. Iguchi, H. Yugami (Tohoku University), Y. Nagao (JAIST), H. Kageyama, and K. Nomura (AIST Kansai)

10:40 **1881** Probing $Pr_xCe_{1-x}O_{2-d}$ Thin Film Defect Concentrations Using *In Situ* Optical Absorption and Impedance Spectroscopy Techniques – S. R. Bishop (Kyushu University), D. Chen, J. Kim, N. Thompson, and H. L. Tuller (Massachusetts Institute of Technology)

11:00 **1882** Metastable Thin Films for Energy Applications: On Structural Lattice Anomalies and Electrical Transport – J. L. Rupp, S. Bishop (Massachusetts Institute of Technology), E. Fabbri (Paul Scherrer Institute), J. Han (Massachusetts Institute of Technology), D. Marrochelli (Trinity College Dublin), E. Traversa (National Institute for Materials Science), H. L. Tuller, and B. Yildiz (Massachusetts Institute of Technology)

11:20 **1883** Relating Nanostructures of Yttria-Stabilized-Zirconia Thin Films to Their Proton Conductivity – J. Martynczuk, M. V. Schlupp, B. Scherrer (ETH Zurich), D. Stender (Paul Scherrer Institute), R. Tölke, A. Evans, M. Prestat, and L. Gauckler (ETH Zurich)

11:40 **1884** Ion Conduction in $BaZr_{0.85}Y_{0.15}O_{3-\delta}$ Films Fabricated by Pulsed Laser Deposition in Various Conditions – D. Jang, K. Bae, and J. Shim (Korea University)

Ion Conducting Thin Film Multilayers – 14:00 – 18:00
Co-Chairs: Enrico Traversa and Shu Yamaguchi

14:00 **1885** Do Oxygen-Ion Conductors Feel the Strain – D. Pergolesi (National Institute for Materials Science), E. Fabbri (Paul Scherrer Institute), S. N. Cook (Imperial College London), V. Roddatis (CIC Energigune), E. Traversa (Univeristy of Roma Tor Vergata), and J. A. Kilner (Imperial College London)

14:40 **1886** Epitaxial Zirconia and Ceria Based Thin Films and Multilayers with Arbitrary Composition – W. Shen, J. Jiang, and J. L. Hertz (University of Delaware)

15:00 **1887** Electric Conductivity in Cu- and Ga-Doped Pr_2NiO_4 Nano Film Laminated with Sm-Doped CeO_2 – J. Hyodo and T. Ishihara (Kyushu University)

15:20 **1888** Electronic Activation in the $(La_{0.8}Sr_{0.2})CoO_3/(La_{0.5}Sr_{0.5})_2CoO_4$ Supperlattices at High Temperature – Y. Chen, Z. Cai, Y. Kuru, H. L. Tuller, and B. Yildiz (Massachusetts Institute of Technology)

15:40 **1889** Low Energy Ion Scattering (LEIS) Analysis of $SrTiO_3$ (100) and $NdGaO_3$ (110) Single Crystal Surface Terminations – A. Cavallaro (Imperial College, London) and J. A. Kilner (Imperial College London)

C2 Bioengineering Based on Electrochemistry

Organic and Biological Electrochemistry / Sensor

324, Level 3, Hawaii Convention Center

Co-Chairs: K. Sode, H. Nam, J. Choi, and E. Tamiya

08:00 **1999** Electrochemical-Based Bioprocessing Device Composed of Recombinant Protein/DNA Conjugate – J. Choi (Sogang University)

08:40 **2000** Fabrication of Multilayer Cell Structure Using Electro-Deposited Alginate Gel – F. Ozawa, K. Ino, H. Shiku, and T. Matsue (Tohoku University)

09:00 **2001** Metabolism Feature of Multicellular Tumor Spheroids Assessed by a Comprehensive System – Y. Zhou, T. Arai, Y. Horiguchi, K. Ino, H. Shiku, and T. Matsue (Tohoku University)

09:20 **2002** Development of Voltage Switching Mode Scanning Electrochemical Microscopy for Topographical and Electrochemical Nanoscale Imaging of Living Cells – Y. Takahashi (Tohoku University), A. I. Shevchuk (University of Southampton), P. Novak (Imperial College London), Y. Matsumae (Tohoku University), B. Babakinejad (Imperial College London), J. V. Macpherson, P. R. Unwin (University of Warwick), K. Ino, H. Shiku (Tohoku University), J. Gorelik (Imperial College London), D. Klenerman (Cambridge University), Y. E. Korchev (Imperial College London), and T. Matsue (Tohoku University)

09:40 Intermission (20 Minutes)

Co-Chairs: K. Sode, H. Nam, J. Choi, and E. Tamiya

10:00 **2003** Electrochemically Modulated Release of Nitric Oxide through Polymers to Inhibit Bacterial Biofilm Formation and Prevent Platelet Activation – M. E. Meyerhoff, L. Höfler, D. Koley, H. Ren, T. C. Major, J. Wu, and C. Xi (University of Michigan)

10:40 **2004** Engineering of Catalytic Domain of Cellobiose Dehydrogenase and Its Application for the Direct Electron Transfer Type Enzyme Electrode – S. Ando, S. Ferri, W. Tsugawa, and K. Sode (Tokyo University of Agriculture and Technology)

11:00 **2005** Aptameric Sensor for Detection of VEGF Based on Labeling Technique Using GDH Fused Zinc Finger Protein – A. Tatsumi, K. Abe, T. Fukaya, K. Sode, and K. Ikebukuro (Tokyo University of Agriculture and Technology)

11:20 **2006** Evolution of Cathodic Characteristics (Water and Oxygen Transport) in Microbial Fuel Cell (MFC) – C. Santoro, M. Cremins, A. Mackay, U. Pasaogullari (University of Connecticut), M. Guilizzoni, A. Casalegno (Politecnico di Milano), and B. Li (University of Connecticut)

11:40 **2007** Turning Oxidase into Dehydrogenase for Application to the Electrochemical Measurement – S. Saito, Y. Horaguchi, T. Endo, 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)

Co-Chairs: K. Sode, H. Nam, J. Choi, and E. Tamiya

14:00 **2008** Peroxidase Activity of G-Quadraplex Hemin-Binding DNA Aptamers Determined by Electrochemical Measurement – I. Kubo, Y. Hoshino (Soka University), M. Liu, H. Abe, and Y. Ito (RIKEN Advanced Science Institute)

14:40 **2009** Electron Transfer between Cytoplasm and Electrode via Redox-Active Phospholipid Polymer – K. Nishio, R. Nakamura, S. Nakanishi, X. Lin, T. Konno, K. Ishihara, and K. Hashimoto (The University of Tokyo)

15:00 **2010** *In Situ* Observation of Direct Electron Transfer Reaction between Cytochrome c and ITO Electrode with Electrochemically Controlled Slab Optical Waveguide Spectroscopy – N. Matsuda and H. Okabe (National Institute of Advanced Industrial Science and Technology)

C4 New Synthetic and Mechanistic Approaches to Molecular Electroorganic Chemistry

Organic and Biological Electrochemistry

306B, Level 3, Hawaii Convention Center

Co-Chairs: S. Nishiyama and S. Suga

10:00 **2066** Anodic Oxidation of *gem*-Diaryl Ketones in the Presence of Alcohols – A. J. Fry and B. Sheludko (Wesleyan University)

10:20 **2067** Oxidative Dechlorination of Chlorinated Organic Compound Catalyzed by Vitamin B_{12}-TiO_2 – H. Shimakoshi and Y. Hisaeda (Kyushu University)

10:40 **2068** Controlling and Improvement of Electrosynthetic Reaction by Using Microreactor: Application to Intermolecular Coupling Reaction of Phenol Derivatives – T. Kashiwagi (Tokyo Institute of Technology), S. R. Waldvogel (University of Mainz), and M. Atobe (Tokyo Institute of Technology)

11:00 **2069** Site-Controlled Modification of Conducting Polymer Films Based on Bipolar Electrochemistry – S. Inagi, Y. Ishiguro, and T. Fuchigami (Tokyo Institute of Technology)

11:20 **2070** Electrochemical Dehalogenation of Persistent Organic Pollutants with a Silver Cathode in Aqueous Media – A. A. Peverly and D. G. Peters (Indiana University)

11:40 **2071** Electrochemical Fuorination Using Alkali-Metal Fluorides – T. Fuchigami, T. Sawamura, and S. Inagi (Tokyo Institute of Technology)

Co-Chairs: A. Fry and T. Fuchigami

14:00 **2072** Development of Regioselective Electrochemical Glycosylation Oriented Natural Products Synthesis – K. Kawa, T. Saitoh, E. Kaji, and S. Nishiyama (Keio University)

14:20 **2073** Direct Reduction of 6-Halo-1-Phenyl-1-Hexynes at Silver Cathodes – L. M. Strawsine and D. G. Peters (Indiana University)

14:40 **2074** Application of Methoxy Radical Generation on a Boron-Doped Diamond Electrode – T. Sumi, T. Saitoh, K. Natsui, T. Yamamoto (Keio University), M. Atobe (Tokyo Institute of Technology), Y. Einaga, and S. Nishiyama (Keio University)

15:00 **2075** Electrocatalytic Reduction of 1,1,2-Trichloro-1,2,2-Trifluoroethane (CFC-113) at a Silver Cathode – E. R. Wagoner and D. G. Peters (Indiana University)

15:20 **2076** Coordination Programming of Photo- and Electro-Functional Molecular Materials – R. Sakamoto, M. Hayashi, S. Kusaka, M. Tsuchiya, J. Kakinuma, and H. Nishihara (The University of Tokyo)

15:40 **2077** Evaluation of Bioluminescence Activity of Firefly Luciferin Nucleotide Derivatives – S. Iwano (The University of Electro Communications Chofu), S. Kojima, T. Hirano, S. Maki, and H. Niwa (The University of Electro Communications, Chofu)

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

Corrosion

301B, Level 3, Hawaii Convention Center

Passivity and Passivity Breakdown – 08:00 – 10:00
Co-Chairs: Barry MacDougall and Fouzia Hannour

08:00 **2176** The Semiconducting Properties and Impedance Analysis of Passive Films on Copper in Anaerobic Sulfide Solutions from the Viewpoint of the Point Defect Model – Y. Ling, M. L. Taylor, S. Sharifiasl, and D. D. Macdonald (The Pennsylvania State University)

08:15 **2177** Determining the Coupling Current as a Means of Detecting Crevice Activity and Inhibition – S. Lee (The Pennsylvania State University), J. A. Mathews (Electric Power Research Institute), and D. D. Macdonald (The Pennsylvania State University)

08:30 **2178** Influence of the Microstructure on the Passive Character of Titanium Oxide Films Characterized by EIS – N. Rodríguez de la Cruz, E. M. Arce, J. Torres (Instituto Politécnico Nacional), R. Luna Sánchez (Universidad Autónoma Metropolitana – Azcapotzalco), J. G. Vazquez Arenas (University of Waterloo), J. Hallen, and R. Cabrera Sierra (Instituto Politécnico Nacional)

08:45 **2179** Effects of Solution Temperature on the Kinetic Nature of Passive Film on Ni – K. Park (KAIST), S. Ahn (Korea Institute of Energy Research), and H. Kwon (Korea Advanced Institute of Science and Technology)

09:00 **2180** Effect of Sour Environment pH on Crack Morphology in Ultra Strength Drilling Steel under Cyclic Stress – M. Ziomek-Moroz, J. Hawk (U.S. Department of Energy, National Energy Technology Laboratory), R. Thodla, and F. Gui (DNV)

09:15 **2181** Electrochemical Reduction of Ethanol at Lead Electrodes – S. B. Hall, N. Wise, and M. Waterland (Massey University)

09:30 **2182** IGSCC Caused by Passive Film's Dielectrostrictive Stress – T. M. Devine (University of California Berkeley)

09:45 Intermission (15 Minutes)

Passivity and Passivity Breakdown – 10:00 – 12:00
Co-Chairs: David W. Shoesmith and Bernard Tribollet

10:00 **2183** The Relationship between Nanostructure and Electronic Properties of Passive Films Studied by Scanning Tunneling Microscopy Combined with Scanning Tunneling Spectroscopy – P. Marcus, T. Massoud, and V. Maurice (CNRS Chimie ParisTech)

10:30 **2184** Characterization of Repassivation Process on Fe-Cr Alloys Using Scratching Technique – M. Wada, A. Kawano, M. Saito, and S. Fujimoto (Osaka University)

10:45 **2185** Coupling the Point Defect Model and the Density Functional Theory for Modeling Pit Nucleation – B. Malki, B. Baroux, O. Le Bacq, and A. Pasturel (Grenoble INP)

11:00 **2186** Development of Base Electrocatalysts which are Passive towards Corrosion in Hot Acidic Electrolytes – G. T. Burstein, G. E. Haslam, and X. Y. Chin (University of Cambridge)

11:15 **2187** Characterization of Bound Water in Passive Film of Titanium Formed in H_2SO_4 Solution – T. Haruna, S. Ito, and K. Kimoto (Kansai University)

11:30 **2188** Kinetic Stability of Aluminium and Its Alloys: The Role of "Structural" Features – X. Zhou (Monash University), D. D. Macdonald (The Pennsylvania State University), and N. Birbilis (Monash University)

11:45 **2189** Effect of Galvanostatic Condition on Growth Behavior and Repassivation Potential of Crevice Corrosion of Duplex Stainless Steels – S. Aoki, T. Ehashi, and J. Sakai (Waseda University)

Passivity and Passivity Breakdown – 13:30 – 14:45
Co-Chairs: Ashok Kumar Shukla and Srdjan Nesic

13:30 **2190** Metallographic Characterization of Transgranular Stress Corrosion Cracking on Type316L Stainless Steel in High Temperature and High Pressure Water Environment – S. Fujimoto, N. Okada, T. Saito, and H. Tsuchiya (Osaka University)

13:45 **2191** Corrosion Inhibition of Localized Corrosion and Stress Corrosion Cracking of Steam/Gas Turbine Materials – B. Bavarian, J. Zhang, and L. Reiner (California State University)

14:00 **2192** Comparison of Electrochemical Pitting Characteristics of Alloy 825, Alloy 690 and Titanium for a Concentrated Radioactive Waste Hold-Up Tank – H. Kim and K. Na (KHNP-CRI)

14:15 **2193** Studies of Pitting Initiation on High-Strength Pipeline Steel by Metallurgical Micro-Electrochemistry – Y. Cheng (University of Calgary)

14:30 **2194** Hydrogen Induced Passivity Degradation and Stress Corrosion Cracking – J. Luo, B. Lu (University of Alberta), and S. Shi (The Hong Kong Polytechnic University)

Passivity and Passivity Breakdown – 14:45 – 16:00
Co-Chairs: Damien Feron and Farrel Martin

14:45 **2195** Birth and Death Stochastic Process in Pitting Corrosion and Stress Corrosion Cracking – T. Shibata (Osaka University)

15:15 **2196** Implications for the Initiation of Pitting Corrosion of Composition Changes around Sulphide Inclusions in Stainless Steels – D. E. Williams (University of Auckland)

15:30 **2197** Effect of Sulfate Ion on Pitting Corrosion Behavior of Type 420 Martensitic Stainless Steel in Chloride Solution – W. Ji, S. Pan, and W. Tsai (National Cheng Kung University)

15:45 **2198** Intrinsic Vacancies and Their effect on Corrosion Reactivity at the FeS_2 (100) Surface – A. Krishnamoorthy, F. W. Herbert, and B. Yildiz (Massachusetts Institute of Technology)

D5 High Temperature Corrosion Materials Chemistry 10

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

Solid Oxide Fuel Cells – 08:00 – 12:00
Co-Chairs: E. Opila and S. Yamaguchi

08:00 **2291** *In Situ* Optical Studies of Electrochemically Induced Anode Degradation in High Temperature Solid Oxide Fuel Cells – R. A. Walker, J. D. Kirtley, D. M. Halat, and M. McIntyre (Montana State University)

08:40 **2292** Mechanical Properties of Ni-YSZ Cermets under Simulated Environment of Redox Cycling – T. Miyasaka, S. Sukino, S. Watanabe, T. Kawada, K. Sato, and T. Hashida (Tohoku University)

09:00 **2293** Improved Sintering Property of Y-Doped $BaZrO_3$ by Mn Addition – D. Kim, E. Patrik, S. Miyoshi, T. Tsuchiya, and S. Yamaguchi (The University of Tokyo)

09:20 **2294** Non-Linear Doping effect on the Electrochemical Properties of $BaZr_{1-x}Pr_xO_3$ – M. Tamaru, S. Miyoshi, D. Kim (The University of Tokyo), T. Higuchi (Science University of Tokyo), Y. Oyama, and S. Yamaguchi (The University of Tokyo)

09:40 Intermission (20 Minutes)

10:00 **2295** Study on Electrode Reaction of Perovskite Oxide Electrodes on a Proton Conducting Electrolyte – K. Suzuki, S. Hashimoto, K. Amezawa, and T. Kawada (Tohoku University)

10:20 **2296** Mechano-Electrochemical effect on Materials Property of Ion Conducting Oxides – K. Yashiro, Y. Kawamura, S. Nakakawaji, K. Sato, K. Amezawa, and J. Mizusaki (Tohoku University)

10:40 **2297** Chemical Stability of $Ba_{0.5}Sr_{0.5}Co_{0.8}Fe_{0.2}O_{3-\delta}$ (BSCF) – F. Wang, K. Yashiro, K. Amezawa, and J. Mizusaki (Tohoku University)

11:00 **2298** A Study of Nickel-Substituted Lanthanum Cobaltite as Cathode Materials for SOFCs – Y. Uzumaki, S. Hashimoto, K. Amezawa, and T. Kawada (Tohoku University)

11:20 **2299** La/Sr-Co Perovskite-Based Multi-Layered Super Cathode Fabricated by Sputtering Method – A. Takeshita, S. Miyoshi, and S. Yamaguchi (The University of Tokyo)

11:40 **2300** Oxygen Transport in Perovskite Type Oxide $La_{0.6}Sr_{0.4}Co_{0.2}Fe_{0.8}O_{3-\delta}$ – H. Kudo, K. Yashiro, S. Hashimoto, K. Amezawa, T. Kawada, and J. Mizusaki (Tohoku University)

High Temperature Chemistry of Carbides, Borides, and Nitrides – 14:00 – 18:00
Co-Chairs: E. Wuchina and T. Markus

14:00 **2301** Influence of Phase Crystallography on Precipitation Microstructures and Deformation Mechanisms in Tantalum Carbides – G. B. Thompson, R. A. Morris, N. De Leon, B. Wang (The University of Alabama), and C. Weinberger (Sanda National Laboratories)

14:40 **2302** Preparation and Characterization of Materials in the Ta-Hf-C System – J. A. Zaykoski, M. M. Opeka, and I. Talmy (Naval Surface Warfare Center)

15:00 **2303** Variability in Oxidation Resistance of ZrB_2-SiC – K. N. Shugart and E. J. Opila (University of Virginia)

15:20 **2304** Effect of Silicon Addition on the Oxidation Kinetic and on the Structure of the Oxide Layer Formed on Transition Metal Nitride Coatings – J. Pierson (Université de Lorraine), P. Steyer (INSA de Lyon), A. Mège-Revil (Ecole Centrale de Lille), and D. Pilloud (Université de Lorraine)

15:40 **2305** Oxidation of Cr_2AlC between 700 and 1300°C in Air – S. Kim, S. Bong, and D. Lee (Sungkyunkwan University)

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

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

Silicon Dissolution and Characterization – 08:00 – 10:00
Co-Chairs: C. Lévy-Clément and M. J. Sailor

08:00 Intermission (10 Minutes)

08:10 **2365** Thinking Again of Porous Si Formation – Y. H. Ogata (Kyoto University)

08:40 **2366** Investigation of Pore Diameter Modulation in Depth in p-type Silicon – E. Ossei-Wusu (Universität zu Kiel), J. Carstensen, E. Quiroga-González (Christian-Albrechts-University of Kiel), M. Amirmaleki (Universität zu Kiel), and H. Föll (Christian-Albrechts-University of Kiel)

09:00 **2367** Differential Photoacoustic Electrochemical Cell to Study *In Situ* the Porous Silicon Formation – D. G. Espinosa-Arbelaez and M. E. Rodriguez-Garcia (Universidad Nacional Autónoma de México)

09:20 **2368** Spontaneous Groove Formation on Silicon during Anodic Dissolution Induced by Turing Instability – K. Fukami, T. Urata, T. Sakka (Kyoto University), K. Krischer (Technische Universität München), and Y. H. Ogata (Kyoto University)

09:40 Intermission (20 Minutes)

Metal-Assisted Silicon Dissolution – 10:00 – 12:00
Co-Chairs: Y. Ogata and P. Schmuki

10:00 **2369** Anodic Dissolution of Si: Electrochemical Oscillations and Porous Silica Formation – F. Ozanam and J. Chazalviel (CNRS-Ecole polytechnique)

10:30 **2370** Stain Etching of Silicon with and without the Aid of Metal Catalysts – K. W. Kolasinski, J. Gogola, W. B. Barclay, and C. Somerville (West Chester University)

10:50 **2371** Metal-Assisted Chemical Etching of Silicon Using Oxygen as an Oxidizing Agent – S. Yae, Y. Morii, M. Enomoto, N. Fukumuro, and H. Matsuda (University of Hyogo)

11:10 **2372** On the Metal-Assisted Chemical Etching of Nanoporous Silicon – D. Goryachev, L. Belyakov, O. Yeltsina, J. Vainshtein, and O. M. Sreseli (Ioffe Physical-Technical Institute of the Russian Academy of Sciences)

11:30 **2373** Formation of Group IV Porous Semiconducting Nanowires and Nanotubes: The Role of Etching – X. Huang, R. Gonzalez, and J. L. Coffer (Texas Christian University)

Silicon Etching and Optical Properties – 14:00 – 18:00
Co-Chairs: J. L. Coffer and R. B. Wehrspohn

14:00 **2374** A "Cook's Tour" of Two Decades of Research into the Optical Properties of Nanostructured Materials – D. J. Lockwood (National Research Council)

14:30 **2375** Magnetic Field Assisted Etching of Porous Silicon as a Tool to Enhance Magnetic Characteristics – P. Granitzer, K. Rumpf (Karl-Franzens-University Graz), T. Ohta, N. Koshida (Tokyo University of Agriculture and Technology), P. Poelt (University of Technology Graz), and M. Reissner (Vienna University of Technology)

14:50 **2376** Structural and Morphological Study of Mesoporous Germanium Layers Formed by Bipolar Electrochemical Etching – S. Tutashkonko (INSA de Lyon), A. Boucherif (Université de Sherbrooke), T. Nychyporuk (INSA de Lyon), R. Arès, V. Aimez (Université de Sherbrooke), and M. Lemiti (INSA de Lyon)

15:10 **2377** Morphological Development from Uniform Microporous Structure to Macropore-Like Structure – T. Urata, K. Fukami, T. Sakka, and Y. H. Ogata (Kyoto University)

15:30 **2378** Relaxation Processes and Functions of Blue Phosphorescent Porous Silicon – B. Gelloz (Nagoya University), R. Mentek (Tokyo Univ. of A & T), and N. Koshida (Tokyo University of Agriculture and Technology)

E2 Atomic Layer Deposition Applications 8

Dielectric Science and Technology / Electronics and Photonics
304B, Level 3, Hawaii Convention Center

General Session – 08:30 – 10:00

08:30 Introductory Remarks (10 Minutes)

08:40 **2456** Fabrication of Sb_2Te_3 and Bi_2Te_3 Multilayer Composite Films by Atomic Layer Deposition – K. Zhang, D. Nminibapiel, M. Tangirala, H. Baumgart (Old Dominion University), and V. Kochergin (MicroXact Inc.)

09:00 **2457** Trimethylaluminum-Based Atomic Layer Deposition of Al:MO_2 (M=Zr, Hf): A Viable Route to Integrate High-Permittivity Oxides on $In_{0.53}Ga_{0.47}As$ Substrates – A. Molle, E. Cianci, A. Lamperti, C. Wiemer, S. Baldovino, L. Lamagna, S. Spiga, M. Fanciulli (CNR-IMM), G. Brammertz, C. Merckling, and M. Caymax (imec)

09:40 Intermission (20 Minutes)

Reaction Mechanisms I – 10:00 – 12:00

10:00 **2458** Are Ions Good or Bad during Plasma-Assisted ALD – H. B. Profijt and W. Kessels (Eindhoven University of Technology)

10:40 **2459** Atomic Layer Deposition of Mo: Al_2O_3 Nanocomposites with Tunable Resistivity – A. U. Mane and J. W. Elam (Argonne National Laboratory)

11:00 **2460** *In Situ* Study of ALD Processes Using Synchrotron-based X-ray Fluorescence and Scattering Techniques – J. Dendooven, K. Devloo-Casier, M. Ide (Ghent University), K. Grandfield (University of Antwerp), K. F. Ludwig (Boston University), S. Bals (University of Antwerp), P. Van Der Voort, and C. Detavernier (Ghent University)

11:40 **2461** Reaction Mechanism of Non-Heating SiO_2 Atomic Layer Deposition by Using TDMAS and Plasma Excited Water Vapor – F. Hirose, K. Kanomata, M. Degai, and K. Momiyama (Yamagata University)

Oxides – 14:00 – 18:00

14:00 **2462** Crystallization Study by Transmission Electron Microscopy of $SrTiO_3$ Thin Films Grown by Plasma-Assisted ALD – V. Longo, M. A. Verheijen, F. Roozeboom, and W. Kessels (Eindhoven University of Technology)

14:20 **2463** TiO_2-Based Metal-Insulator-Metal Structures for Future DRAM Storage Capacitors – K. Fröhlich (Institute of Electrical Engineering SAS), B. Hudec, M. Tapajna, K. Hušeková, A. Rosová (Institute of Electrical Engineering, SAS), J. Aarik, R. Rammula, A. Kasikov, T. Arroval (Institute of Physics, University of Tartu), K. Murakami, M. Rommel, and A. J. Bauer (Fraunhoffer Institute for Integrated Systems and Dvice Technology)

15:00 **2464** Application of the Plasma Surface Modification for Uniform Al2O3 Films Grown by Atomic Layer Deposition on Polyethylene Blown Film – G. Lee, K. Son (Korea University), S. Park (Korea University, Mechanical Engineering), J. Shim (Korea University), and B. Choi (Korea University, Mechanical Engineering)

15:20 **2465** Atomic Layer Deposition of Molybdenum Oxide Using Bis(Tert-Butylimido)Bis(Dimethylamido) Molybdenum – A. Bertuch, L. Lecordier, M. Dalberth, G. Sundaram, J. Becker (Cambridge Nanotech), E. Deguns (Unaffiliated), M. Saly, D. Moser, and R. Kanjolia (SAFC Hitech)

15:40 **2466** Room-Temperature ALD of Metal Oxide Thin Films by Energy-Enhanced ALD – S. E. Potts, H. B. Profijt, R. Roelofs, and W. Kessels (Eindhoven University of Technology)

E4 Gallium Nitride and Silicon Carbide Power Technologies 2

Electronics and Photonics / Dielectric Science and Technology

316C, Level 3, Hawaii Convention Center

Plenary Session – 08:00 – 10:00
Co-Chairs: Krishna Shenai and Noboru Ohtani

08:00 **2513** Overview of Three-Dimension Integration for Point-of-Load Converters – F. C. Lee and Q. Li (Virginia Tech)

08:30 **2514** Development of High Power Density All-SiC Three-Phase Inverter – S. Sato, K. Matsui, Y. Zushi, Y. Murakami, and S. Tanimoto (R&D Partnership for Futire Power Electronics Technology)

09:00 **2515** Defect Electronics in SiC and Fabrication of Ultrahigh-Voltage Bipolar Devices – T. Kimoto (Kyoto University)

09:30 Intermission (30 Minutes)

Silicon Carbide Power Devices I – 10:00 – 12:00
Co-Chairs: Mietek Bakowski and Sunny Kedia

10:00 **2516** SiC Trench Devices with Ultra Low R_{on} – T. Nakamura, M. Aketa, and Y. Nakano (ROHM Co., Ltd.)

10:20 **2517** Fabrication of a SiC Double Gate Vertical Channel JFET and It's Application in Power Electronics – A. Schöner and M. Bakowski (Acreo AB)

10:40 **2518** Recent Advances in VJFETs at SemiSouth – K. Chatty, D. C. Sheridan, V. Bondarenko, R. Schrader, K. Speer, and J. B. Casady (SemiSouth Laboratories)

11:00 **2519** Optimization of 4.5kV Si IGBT/SiC Diode Hybrid Module – K. D. Hobart, E. Imhoff (Naval Research Laboratory), T. Duong, and A. Hefner (National Institute of Standards and Technology)

11:20 **2520** Aspects on SIC Switches for Soft-Switching Converters in an Industrial Application – P. Ranstad and J. Linner (Alstom Power)

11:40 **2521** Fast High Voltage Switching With SiC Power Devices – T. Funaki (Osaka University)

Silicon Carbide Crystal Growth – 14:00 – 16:00
Co-Chairs: Mike Dudley and Noboru Ohtani

14:00 **2522** On the De-Rating of Silicon Carbide (SiC) Power Devices – K. Shenai (University of Toledo)

14:20 **2523** Managing Basal Plane Dislocations in SiC: Perspective and Prospects – D. Gaskill, R. Myers-Ward, V. Wheeler (U.S Naval Research Laboratory), R. Stahlbush, N. Mahadik, E. Imhoff, L. O. Nyakiti, and C. Eddy Jr (U.S. Naval Research Laboratory)

14:40 **2524** Growth and Characterization of Thick 4H-SiC Epilayers for Very High Voltage Bipolar Devices – H. Tsuchida, T. Miyazawa, X. Zhang, M. Nagano, R. Tanuma, I. Kamata, and M. Ito (Central Research Institute of Electric Power Industry)

15:00 **2525** Life-Time Killing Defects in Ion-Implanted 4H-SiC; Enhanced Annealing and Lateral Distribution – L. Sundnes Løvlie, L. Vines, I. Pintilie, and B. G. Svensson (University of Oslo)

15:20 **2526** Silicon Carbide Bulk Crystal Growth Modeling from Atomic Scale to Reactor Scale – S. NISHIZAWA (National Institute of Adanced Indusctrial Science and Technology)

15:40 **2527** Modeling of SiC CVD Epitaxial Growth using CFD-ACE+ – A. Bhoj (ESI US R&D Inc), S. Tangli (University of Southern Carolina), and K. Shenai (University of Toledo)

Panel # 1: Can We Eliminate Defects in Bulk SiC and GaN Materials? – 18:00 – 20:00
Co-Chairs: Krishna Shenai and Noboru Ohtani

18:00 Introduction of Panelists (15 Minutes)
18:15 K. Gaskill (10 Minutes)
18:25 T. Kimoto (10 Minutes)
18:35 K. Waldrip (10 Minutes)
18:45 M. Mann (10 Minutes)
18:55 S. Nishizawa (10 Minutes)
19:05 M. Dudley (10 Minutes)
19:15 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

Non Volatile Memory – 10:00 – 12:30
Co-Chairs: Albert Chin and Samares Kar

10:00 Introductory Remarks (10 Minutes)

10:10 **2574** Ultra-Low Switching Power RRAM Using Hopping Conduction Mechanism – A. Chin, Y. Chiu (National Chiao-Tung University), C. Cheng (National Taiwan Normal University), Z. Zheng, and M. Liu (Chinese Academy of Sciences)

10:40 **2575** ALD Grown Functional Oxide Layers for Nonvolatile Resistive Switching Memory Applications – S. Hoffmann-Eifert and R. Waser (Forschungszentrum Juelich)

11:10 **2576** Hafnium Oxide Based CMOS Compatible Ferroelectric Materials – U. Schroeder (Namlab gGmbH), J. Mueller (Fraunhofer CNT), E. Yurchuk, S. Mueller, D. Martin, S. Slesazeck, and T. Mikolajick (Namlab gGmbH)

11:40 **2577** HfO_2-based RRAM for Embedded Nonvolatile Memory: From Materials Science to Integrated 1T1R RRAM Arrays – T. Bertaud, C. Walczyk, D. Walczyk, M. Sowinska, D. Wolansky, B. Tillack, G. Schoof, C. Wenger (IHP), S. Thiess (DESY), and T. Schroeder (IHP)

12:10 **2578** Resistive Switching of Iron Oxide Nanoparticles in Patterned Array Structure on Flexible Substrate – J. Kim, J. Yoo, Y. Baek, H. Kim, Q. Hu, C. Kang, and T. Yoon (Myongji University)

Novel Dielectrics – 13:50 – 16:00
Co-Chairs: Joerg Osten and Sven Van Elshocht

13:50 **2579** Theoretical Perspectives in Defect and Impurity Physics toward Materials Design for Oxides – N. Umezawa (National Institute for Materials Science)

14:20 **2580** Strain-induced effects on dielectric properties of thin, crystalline rare earth oxides on silicon – H. Osten and D. Schwendt (Leibniz University)

14:50 **2581** Epitaxial Si and Gd_2O_3 Heterostructures – Distributed Bragg Reflectors with Stress Management Function for GaN on Si Light Emitting Devices – R. Dargis, A. Clark, E. Arkun, R. Roucka, D. Williams, R. S. Smith, and M. Lebby (Translucent Inc.)

15:10 **2582** Room Temperature Ferromagnetism Induced by Electric Field in Cobalt-Doped TiO_2 – T. Fukumura (University of Tokyo)

15:40 **2583** Enhancement of Dielectric Properties and Magnetic Coupling of $Pb(Fe_{0.5}Nb_{0.5})O_3$ by Doping $Ni_{0.65}Zn_{0.35}Fe_2O_4$ – S. K. Barik, D. K. Pradhan, S. Sahoo, V. Pauli, and R. Katiyar (University of Puerto Rico)

E6 High Purity Silicon 12

Electronics and Photonics
320, Level 3, Hawaii Convention Center

Keynote – 08:50 – 09:40
Co-Chair: E. Simoen

08:50 Introductory Remarks (10 Minutes)

09:00 **2624** Challenges for the Semiconductor Industry in the 21st Century – P. A. Gargini (Intel Corporation)

09:40 Intermission (20 Minutes)

Crystal Growth – 10:00 – 12:00
Co-Chairs: R. Falster and G. Kissinger

10:00 **2625** Si Crystal Growth from a Melt: The Secrets Behind the v/G Criterion – J. Vanhellemont (Ghent University)

10:30 **2626** FZ Crystal Growth of Si and Ge- Current Limitations and Approaches to Overcome – H. Riemann, H. Rost, M. Wuenscher, R. Menzel, and B. Hallmann-Seiffert (Leibniz-Institute for Crystal Growth)

11:00 **2627** Electrolytic Deposition of Silicon for Solar Application – S. Sokhanvaran and M. Barati (University of Toronto)

11:20 **2628** A Study on Density Functional Theory of the effect of Pressure on the Formation and Activation Enthalpies of Intrinsic Point Defects in Growing Single Crystal Si – K. Sueoka, E. Kamiyama, and H. Kariyazaki (Okayama Pref. University)

11:40 **2629** Surface and Gate-Oxide Properties of a Large-Scale, <110>-oriented High-Purity CZ-Si – J. Lee, W. Lee, J. Kim, D. Hwang, and H. Kang (LG Siltron)

12:00 Lunch Break (120 Minutes)

Doping, Impurities and Point Defects – 14:00 – 15:50
Co-Chairs: P. Stallhofer and J. Vanhellemont

14:00 **2630** Schottky Barrier Height Engineering for Low Resistance Contacts to Ge and III-V Devices – K. Saraswat, J. Lin, A. Nainani, A. Roy (Stanford University), B. Yang (Globalfoundries), and Z. Yuan (Stanford University)

14:30 **2631** Challenges and Opportunities for Doping Control in Ge for Micro and Optoelectronics Applications – E. Bruno (University of Catania), G. Scapellato, E. Napolitani, S. Mirabella, A. La Magna (CNR-IMM), M. Mastromatteo, D. De Salvador (University of Padova), S. Boninelli, G. Fortunato, V. Privitera (CNR-IMM), and F. Priolo (University of Catania)

15:00 **2632** Defect Engineering at the Nanoscale: Challenges and Trends – E. G. Seebauer (University of Illinois)

15:30 **2633** Long-Range Interaction between H and (B or P) Dopant Atoms in Silicon Crystals Investigated by First Principles Calculation – E. Kamiyama and K. Sueoka (Okayama Pref. University)

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 Silicide Materials – 10:10 – 11:40
Co-Chairs: Li-Jen Chou and Song Jin

10:10 **2660** Syntheses of a Variety of Silicide Nanowire and Nanosheet Bundles – H. Tatsuoka, W. Li, E. Meng, and D. Ishikawa (Shizuoka University)

10:35 **2661** Bottom-up Process to Fabricate Periodic Arrays of β-$FeSi_2$ Nanopillars for Photonic Applications – Y. Kaneko, M. Suzuki, K. Nakajima, and K. Kimura (Kyoto University)

11:00 **2662** Mn Silicide Nanowires on the Si(001)-2×1 Surface Having Anisotropic Strain Fields with Bi Nanolines – K. Miki, H. Liu (National Institute for Materials Science), and J. Owen (Université de Genève)

11:25 **2663** A Proposal of Schottky Barrier Height Tuning Method with Interface Controlled Ni/Si Stacked Silicidation Process – Y. Tamura, R. Yoshihara, K. Kakushima, P. Ahmet, Y. Kataoka, A. Nishiyama, N. Sugii, K. Tsutsui, K. Natori, T. Hattori, and H. Iwai (Tokyo Institute of Technology)

Low-Dimensional Materials for Energy Conversion – 14:00 – 15:45
Co-Chairs: Hirokazu Tatsuoka and Motofumi Suzuki

14:00 **2664** High-Performance Piezoelectric Nanogenerators Based on Piezoelectric and Semiconducting Coupled Properties – S. Kim (Sungkyunkwan University)

14:25 **2665** Novel Functional Materials and Characterizations for Highly Efficient Dye-Sensitized Solar Cells – E. W. Diau (National Chiao Tung University)

14:50 **2666** WO_3 Nanotubes for Effective Photoelectrochemical Water-Splitting – X. Zheng (Stanford University)

15:15 **2667** Fabrication of Silicon Groove/Pyramid Hierarchical Structures for Solar Cell Applications – Z. Lin (Photonics and Optoelectronic), A. Li, H. Wang (National Taipei University of Technology), and J. He (National Taiwan University)

15:30 **2668** Large Scale Single-Crystal Cu(In,Ga)Se_2 Nanotip Arrays For High Efficiency Solar Cell – Y. Chueh (National Tsing Hua 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

Challenges in Damascene and 3D Integration – 08:00 – 09:40
Co-Chairs: K. Kondo and R. Akolkar

08:00 **2715** Innovation Through Industry and University Collaboration – S. Johnston (Intel Corporation)

08:40 **2716** Heterogeneous 3D Stacking Technology Developments – H. Ikeda (ASET)

09:10 **2717** Metallization for 3D interconnect processing – H. Philipsen, Y. Civale, K. Vandersmissen, M. Honore, F. Inoue, and P. Leunissen (IMEC)

Novel Processes for 3D Packaging – 10:00 – 12:00
Co-Chairs: F. Roozeboom and M. Koyanagi

10:00 **2718** 3D Wafer Stacking via Bonding of Recessed Cu Damascene Structures – C. Tan (Nanyang Technological University)

10:30 **2719** 3D Integration Technologies Based on Surface-Tension Driven Multi-Chip Self-Assembly Techniques – T. Fukushima, K. Lee, J. Bea, T. Tanaka, and M. Koyanagi (Tohoku University)

11:00 **2720** High Aspect Ratio Silicon Etch – B. Wu (Applied Materials, Inc.)

11:30 **2721** Through Silicon Via (TSV) Process Using DRIE and Cathode Coupled PE-CVD – Y. Kusuda (SAMCO INC.)

Electrodeposition and Electroless Plating Advances – 14:00 – 16:00
Co-Chairs: M. Hayase and G. Mathad

14:00 **2722** Advances in Semiconductor Metallization Technologies for New Applications and Device Scaling – R. Preisser (Atotech USA Inc.)

14:30 **2723** Opportunities for Electroless Copper Deposition in Semiconductor Manufacturing – Y. Dordi (Lam Research Corp)

15:00 **2724** Cu Electroless Deposition on Ru Barrier – Investigation of Growth Phenomena and Film Properties – K. Kim, T. Lim, K. Park, H. Koo, M. Kim, and J. Kim (Seoul National University)

15:20 **2725** Control of Adhesion Strength and TSV Filling Morphology of Electroless Barrier Layer – R. Arima, F. Inoue, H. Miyake, T. Shimizu, and S. Shingubara (Kansai University)

15:40 **2726** The Wire Grid Polarizer made by Electro- and Electroless- Deposition Processes – N. Okamoto, Y. Ikeda, Y. Koyama (Osaka Prefecture University), Y. Kawazu (Asahi Kasei E-materials Corp.), T. Saito, and K. Kondo (Osaka Prefecture University)

E10 More than Moore

Dielectric Science and Technology / Electronics and Photonics / Sensor / New Technology Subcommittee

319A, Level 3, Hawaii Convention Center

Roadmaps – 08:00 – 10:00

08:00 **2782** More Moore or More than Moore – C. Hobbs, K. Ang, R. Hill, C. Kang, W. Loh, K. Hummler, S. Arkalgud, P. Kirsch, and R. Jammy (SEMATECH)

08:40 **2783** Technology Roadmapping of ICs "More than Moore" Functional Diversification – B. Bader (iNEMI) and M. Gaitan (National Institute of Standards and Technology (NIST))

09:20 **2784** Emerging Research Devices and Architectures for More-Than-Moore Applications – A. Chen (Globalfoundries)

Bioelectronics – 10:00 – 12:00

10:00 Intermission (15 Minutes)

10:15 **2785** Engineering the Bio-Abio Interface to Enable Next Gen Bionics – A. Guiseppi-Elie, C. Kotanen, O. Karunwei, and A. Wilson (Clemson University)

10:50 **2786** Enabling Long-Term Dielectrophoretic Actuation for Cell Manipulation and Analysis in Microfluidic Biochips – D. R. Reyes (National Institute of Standards and Technology)

11:25 **2787** Microsystem Pathways to a Greener World Using Radioisotopes – A. Lal (Cornell University)

3D Systems – 13:05 – 14:50

13:05 **2788** Superconducting Fault Current Limiter with Fast Nanosecond Switching Time for Communication System Application – T. Chiu, C. Shih (CSIST), C. Cheng, C. Cheng (Chung-Shan Institute of Science & Technology), T. Huang (CSIST), and T. Chang (Chung-Shan Institute of Science & Technology)

13:40 **2789** High-Speed Alkaline Etching for Backside Exposure of through Silicon Vias – K. Yoshikawa (Tohoku University), T. Miyazaki (PRE-TECH AT CO., LTD), N. Watanabe, and M. Aoyagi (National Institute of Advanced Industrial Science and Technology)

14:15 **2790** Development of Novel MOSFET with Front and Back Side Electrodes for 3D-Structured Image Sensors – M. Goto, K. Hagiwara, Y. Iguchi, H. Ohtake (NHK Science and Technology Research Laboratories), T. Saraya, H. Toshiyoshi, and T. Hiramoto (The University of Tokyo)

3D Metrology – 14:50 – 16:00

14:50 **2791** Metrology to Enable "More than Moore" Applications of Resistive Switching Devices – C. A. Richter, J. Tedesco (NIST), H. Jang (NIST & Wake Forest University), H. Li (NIST & George Mason University), O. Jurchescu (Wake Forest University), and Q. Li (George Mason University)

15:25 **2792** Measurement Science for "More-Than-Moore" Technology Reliability Assessments – Y. Obeng (National Institute of Standards and Technology), C. Okoro, and J. Kopanski (National Institute of Standards and Technology (NIST))

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

Electronics and Photonics

312, Level 3, Hawaii Convention Center

Fundamentals – 08:00 – 09:40

08:00 **2952** Direct Bonding Energy Measurement Under Anhydrous Atmosphere – F. Fournel, L. Contini, C. Morales, J. Da Fonseca, H. Moriceau, C. Martin Cocher (CEA, LETI), F. Rieutord (CEA, INAC), A. Barthelemy, and I. Radu (Soitec)

08:40 **2953** Study of Hydrophilic Si Direct Bonding with Ultraviolet Ozone Activation for 3D Integration – J. Fan, G. Chong, and C. Tan (Nanyang Technological University)

09:00 **2954** Hydrophilic Wafer Bonding – An Acid/Base Concept – M. Reiche (Max-Planck-Institut für Mikrostrukturphysik)

09:20 **2955** Surface Activiation for Semiconductor Wafer Direct Bonding Using Polymer-Stripping Wet Chemicals – R. Knechtel, H. Wünschre, and H. Klingner (X-FAB Semiconductor Foundries AG)

Bonded Interface Properties – 10:00 – 12:00

10:00 **2956** *In Situ* Observation of Formation of Bonded Interface using MEMS-in-TEM at the Nanoscale – T. Ishida (Tokyo Institute of Technology)

10:40 **2957** Structure of Directly Bonded Interfaces Between Si and SiC – M. Yoshimoto, R. Araki, T. Kurumi, and H. Kinoshita (Kyoto Institute of Technology)

11:00 **2958** Influence of Interfacial Particles on Unbonded Area in Semiconductor Wafer Bonding: an Experimental Approach – H. Kim-Lee, A. Kim, D. Kim, J. Jeon, K. Woo, and B. Park (Samsung Corning Precision Materials)

11:20 **2959** Strain Characterization of Directly Bonded Germanium-to-Silicon Substrates – I. P. Ferain (Tyndall National Institute-UCC), N. Bennett, P. McNally (Dublin City University), S. Holl (California State University, Sacramento), and C. Colinge (Tyndall National Institute-UCC)

11:40 **2960** The Study on Defects of Germanium-on-Insulator Fabricated by a Low Temperature Smart-Cut Process – X. Zhang, F. Yang, Y. Ou (Institute of Miccroelectronics of Chinese Academy of Sciences), T. Ye (Chinese Academy of Sciences), and S. Zhuang (University of Shanghai for Science and Technology)

Wafer Bonding for Solar Cells – 14:00 – 16:00

14:00 **2961** Advanced III-V Multijunction Solar Cells Fabricated by Semiconductor Wafer Bonding – D. C. Law, D. Bhusari, S. Mesropian, S. Singer, P. Chiu, W. Hong, R. Woo, X. Liu, C. Fetzer, A. Palmer, E. Rehder, R. King, J. Boisvert, and N. Karam (Spectrolab, Boeing)

14:40 **2962** Development of GaInP/GaAs/Si Solar Cells using Surface Activated Wafer Bonding – S. Essig, K. Derendorf, E. Oliva, A. Wekkeli, J. Benick, M. Hermele, G. Siefer, A. Bett, and F. Dimroth (Fraunhofer Institute for Solar Energy Systems ISE)

15:20 **2963** Electrical Conductivity of Direct Wafer-Bonded GaAs/GaAs Structures for Wafer-Bonded Tandem Solar Cells – K. Yeung, J. Mc Kay, C. Roberts (University of California – Los Angeles), and M. Goorsky (University of California, Los Angeles)

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 Wide Bandgap Semiconductors – 08:00 – 12:00

08:00 **3001** Progress in Nonpolar and Semipolar GaN Materials and Devices – J. S. Speck (University of California Santa Barbara)

08:30 **3002** Study of Protein-Peptide Binding Affinity Using AlGaN/GaN High Electron Mobility Transistors – C. Huang (National Tsing Hua University), G. Lee, J. Chyi (National Central University), H. Cheng (National Taiwan University Hospital), C. Hsu (National Tsing Hua University), Y. Hsu (NanoEngineering and MicroSystems, National Tsing Hua University), F. Ren (University of Florida), and Y. Wang (National Tsing Hua University)

09:00 **3003** Science Challenges of Ultra-Efficient Solid-State Lighting – M. H. Crawford and J. Tsao (Sandia National Laboratories)

09:30 **3004** InGaN/GaN Nanostructure Arrays for LEDs – T. Yeh, Y. Lin, and P. D. Dapkus (University of Southern California)

10:00 Intermission (15 Minutes)

10:15 **3005** Wide Bandgap Semiconductors for Sensing within Extreme Harsh Environments – D. G. Senesky (Stanford University)

10:45 **3006** ZnS-based Nanostructures: An Unique UV-Light Sensor – X. Fang, L. Hu, and L. Wu (Fudan University)

11:15 **3007** Detection of SARS Coronavirus Nucleocapsid Protein Using AlGaN/GaN High Electron Mobility Transistors – Y. Hsu (NanoEngineering and MicroSystems, National Tsing Hua University), G. Lee, J. Chyi (National Central University), C. Chang (Institute of Biomedical Sciences, Academia Sinica), C. Huang, C. Hsu (National Tsing Hua University), T. Huang (Institute of Biomedical Sciences, Academia Sinica), F. Ren (University of Florida), and Y. Wang (National Tsing Hua University)

11:30 **3008** n-type Nanostructures / p- GaN or Si Thin Film Positioned by Non-Uniform Electric Field – J. Kim (Korea University)

Advanced ins Wide Bandgap Semiconductors – 13:30 – 18:00

13:30 **3009** Resistive Switching in Zinc-Tin-Oxide and Atomic Layer Deposition of Nanolaminates for Amorphous Oxide Semiconductor Thin Film Transistors – J. Conley Jr. (Oregon State University)

14:00 **3010** Impurity-Induced Disordering in Si- and Mg-doped AlGaN-AlN Superlattices – A. Allerman, J. Wierer, Q. Li, M. H. Crawford, and S. Lee (Sandia National Laboratories)

14:30 **3011** III-Nitride Growth by PAMBE and Characterizations Towards Green Energy Applications – L. Tu, Y. Lin, C. Chang, P. Wadekar, T. Chen, and T. Deng (National Sun Yat-Sen University)

15:00 **3012** Phosphor-Free Green and Yellow LEDs in Nano-Patterned and Polarization Controlled Epitaxy – C. Wetzel and T. Detchprohm (Rensselaer Polytechnic Institute)

15:30 **3013** Improved Hydrogen Sensing Performance of AlGaN/GaN based sensor with Platinum Nanonetworks – S. Jang, H. Kim (Dankook University), S. Pearton, and F. Ren (University of Florida)

E16 Thin Film Transistors 11 (TFT 11)

Electronics and Photonics

327, Level 3, Hawaii Convention Center

Oxide TFTs and Fabrication Process I – 08:00 – 10:20
Co-Chair: Y. Kuo

08:00 Introductory Remarks (10 Minutes)

08:10 **3043** Transparent Amorphous Oxide Semiconductor TFTs: History and current status – H. Hosono (Tokyo Institute of Technology)

08:50 **3044** Top-Gate effects in Dual-Gate Amorphous $InGaZnO_4$ Thin-Film Transistors – K. Takechi (NLT Technologies, Ltd.), S. Iwamatsu, T. Yahagi, Y. Watanabe, S. Kobayashi (Yamagata Research Institute of Technology), and H. Tanabe (NLT Technologies, Ltd.)

09:30 **3045** Deposition of Low Stress Amorphous Zinc Tin Oxide at Ambient Temperature using a Remote Plasma Sputtering Process Suitable for Delicate Substrates – S. M. Pfaendler (University of Cambridge), G. Ercolano, J. Driscoll (Department of Material Science, University of Cambridge), and A. J. Flewitt (Department of Engineering, University of Cambridge)

09:50 Intermission (30 Minutes)

Oxide TFTs and Fabrication Processes II – 10:20 – 12:00
Co-Chairs: S. Fonash and H. Hosono

10:20 **3046** MgZnO/ZnO Heterostructure Field-Effect Transistors Fabricated by RF-Sputtering – B. Wang (Graduate Institute of Photonics and Optoelectronics & Department of Electrical Engineering, National Taiwan University), I. Cheng, and J. Chen (National Taiwan University)

10:40 **3047** a-InGaZnO Thin-Film Transistor with Non-Vacuum Processed InGaZnO/AlOx Gate Dielectric Stack – M. Furuta, T. Kawaharamura (Kochi University of Technology), T. Toda (School of Environmental Science and Engineering, Institute for Nanotechnology, Kochi University of Technology), and W. Dapeng (Kochi University of Technology)

11:00 **3048** Simple Aqueous Solution Route for Fabrication of High Performance Oxide TFT – B. Bae (Korea Advanced Institute of Science ad Technology (KAIST)), Y. Hwang, J. Seo, and G. Choi (KAIST)

11:20 **3049** Fabricating Multiple Channeled Zinc Oxide Thin Film Transistor via Sol-Gel Method – G. Chiou, S. Liu (National Chi Nan University), S. Chen (National Tsing Hua University), and H. Chen (National Chi Nan University)

11:40 **3050** Improvement of Solution-Processed Oxide Thin-Film Transistors by Ultra-Violet Treatment – J. Lee, S. Song, D. Kang, Y. Kim, J. Kwon, and M. Han (Seoul National University)

Oxide TFT Device and Reliability – 14:00 – 16:00
Co-Chairs: H. Hosono and P. Migliorato

14:00 **3051** Light and Bias Induced Defects in a-IGZO Thin Film Transistors – P. Migliorato (Cambridge University), M. Seok, J. Um, M. Chowdhury (Kyung Hee University), and J. Jang (Kyung Hee Univ.)

14:40 **3052** Improvement of the Photo-Bias Stability of Zn-Sn-O Field effect Transistors by an Ozone Treatment – B. Yang, S. Oh, Y. Kim, and H. Kim (Seoul National University)

15:00 **3053** Improvement in the Photo-Induced Bias Instability of Oxide TFT by Controlling Sub-Gap States – K. Son, T. Kim, J. Park, H. Kim, S. Seo, J. Seon (Samsung Advanced Institute of Technology), K. Ji, J. Jeong (Inha University), H. Lee, S. Im (Yonsei University), M. Ryu, and S. Lee (Samsung Advanced Institute of Technology)

15:20 **3054** Mixed Oxide Thin Film Transistors Under Combinatory Optical Irradiation and Electrical Bias – T. L. Alford, R. Vemuri, and W. Mathews (Arizona State University)

15:40 **3055** The effect of Zn/Sn Ratio on the Electrical Performance of Amorphous ZrZnSnO (ZZTO) Thin Film Transistors by RF Sputtering – I. Chiu, I. Cheng, and J. Chen (National Taiwan University)

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

Electronics and Photonics
316A, Level 3, Hawaii Convention Center

Opening and Plenary Session – 08:25 – 10:35
Co-Chair: David Harame

08:25 Introductory Remarks (20 Minutes)

08:45 **3101** Advanced CMOS Scaling and FinFET Technology – E. J. Nowak (IBM)

09:40 **3102** FinFET--How to Make a Very Short Channel MOSFET – C. Hu (Univ. of Calif., Berkeley)

FET/Strain Session 1: FinFET – 10:50 – 12:10
Co-Chairs: Yee-Chia Yeo

10:50 **3103** Effect of Fin Doping Concentration on the Electrical Characteristics of Germanium-on-Insulator Multi-Gate Field-Effect Transistor – B. Liu, X. Gong, C. Zhan (National University of Singapore (NUS)), G. Han (National University of Singapore), N. Daval, C. Veytizou, D. Delprat, B. Nguyen (Soitec), and Y. Yeo (National University of Singapore)

11:10 **3104** Germanium Gate-All-Around FETs on SOI – H. Chang (GIEE,NTU), S. Hsu, C. Chu (National Nano Device Laboratories), W. Tu, Y. Chen (National Taiwan University), P. Sung, G. Luo (National Nano Device Laboratories), and C. Liu (National Taiwan University)

11:30 **3105** Selective Growth Of Strained Ge Channel On Relaxed SiGe Buffer In Shallow Trench Isolation For High Mobility Ge Planar And Fin p-FET – B. Vincent, L. Witters, O. Richard, A. Hikavyy, H. Bender, R. Loo, M. Caymax, and A. Thean (imec)

11:50 **3106** Stress Techniques and Mobility Enhancement in FinFET Architectures – G. Eneman, L. Witters, J. Mitard, G. Hellings, A. De Keersgieter (Imec), D. Brunco (Globalfoundries), A. Hikavyy, B. Vincent, E. Simoen, P. Favia, H. Bender, A. Veloso, T. Chiarella, G. Boccardi, M. Kim, M. Togo, R. Loo, K. De Meyer, N. Horiguchi, N. Collaert, and A. Thean (imec)

HBT Session 1: Advanced SiGe HBT Technology – 13:40 – 16:00
Co-Chairs: Guofu Niu and Mikael Ostling

13:40 **3107** Advanced Transistor Architectures for Half-Terahertz SiGe HBTs – B. Heinemann, A. Fox, and H. Rücker (IHP)

14:10 **3108** Understanding the Effects of Epitaxy Artifacts on SiGe HBT Performance through Detailed Process/Device Simulation – R. Camillo-Castillo, Q. Liu, P. Cheng, J. Adkisson (IBM Microelectronics), and D. Harame (IBM Systems and Technology Group)

14:30 **3109** Improved Frequency Response in a SiGe npn Device through Improved Dopant Activation – J. Adkisson (IBM Microelectronics), M. Khater (IBM T.J. Watson Research Center), J. Gambino, P. Cheng, V. Jain, R. Camillo-Castillo (IBM Microelectronics), C. Lavoie (IBM T.J. Watson Research Center), A. Sutton, O. Gluschenkov (IBM Semiconductor Research and Development Center), Q. Liu, T. McDevitt (IBM Microelectronics), S. Engelmann (IBM T.J. Watson Research Center), J. Pekarik (IBM Microelectronics), and D. Harame (IBM Systems and Technology Group)

14:50 **3110** Evaluation of RF Noise Source Relative Importance in SiGe HBTs Using Various Noise Representations – Z. Xu and G. Niu (Auburn University)

15:10 **3111** Strained Silicon Heterojunction Bipolar Transistors – A. ONeill (Newcastle University)

15:40 **3112** A Self-Aligned Sacrificial Emitter Process for High Performance SiGe HBT in BiCMOS – Q. Liu (IBM Microelectronics) and D. Harame (IBM Systems and Technology Group)

F1 Bio-Enabled Materials, Processes, and Devices

Electrodeposition / Physical and Analytical Electrochemistry / Sensor

311, Level 3, Hawaii Convention Center

Electrochemical Biosensors – 10:00 – 11:40
Co-Chairs: John Harb and Zorida Aguilar

10:00 **3244** (Invited) DNA-Translocation through a Solid-State Nanopore Coated with a Functionally Switchable Self-Assembled Monolayer – S. Harrer (IBM Research Laboratory Melbourne), D. Wang, B. Luan, G. Stolovitzky, H. Peng, and A. Afzali-Ardakani (IBM Research USA)

10:40 **3245** (Invited) Electrochemical Biosensors for Detecting Pathogens – W. R. Heineman, X. Guo, A. Kulkarni, S. Iyer, and H. Halsall (University of Cincinnati)

11:20 **3246** Iridium Oxide Hybrids as Electrodes for the Neural System – N. M. Carretero, J. Moral, A. Cruz, and N. Casañ-Pastor (ICMAB-CSIC)

Biologically Inspired Systems – 14:00 – 15:40
Co-Chair: Daniel Schwartz

14:00 **3247** (Invited) Hierarchically Assembly of Materials Using Biological Building Blocks – S. Kim, M. Vasudev, J. Slocik, S. Jones, T. Bunning, and R. Naik (Air Force Research Laboratory)

14:40 **3248** (Invited) Biologically Inspired Synthesis of a Photocatalytically Active Membrane for Water Treatment – N. Kinsinger, A. Dudchenko, A. Wong (UC Riverside), D. Li (Lawrence Berkeley National Labs), and D. Kisailus (UC Riverside)

15:20 **3249** Bio-Inspired Chemistry for Electrophoretic Nanotechnology – I. Zhitomirsky (McMaster University)

F2 Electrodeposition General Session: Fundamentals and New Materials – Dieter M. Kolb Memorial Symposium

Electrodeposition

313B, Level 3, Hawaii Convention Center

Session I – 08:00 – 10:00
Co-Chairs: R. Alkire and T. Homma

08:00 Introductory Remarks (20 Minutes)

08:20 **3262** On the Structure of the Helmholtz Layer at the Solid-Electrolyte Boundary and its Relation to Electrode Kinetics – H. J. Lewerenz (California Institut of Technology)

09:00 **3263** Metal Deposition on Metal, Semiconductor, Organic Layer – Common Interests with Prof. Dieter Kolb – K. Uosaki (NIMS)

09:40 Intermission (20 Minutes)

Session II: UPD and Adsorption – 10:00 – 12:00
Co-Chairs: T. Homma and R. Alkire

10:00 **3264** Underpotential Deposition of Cu on Au(111) in Acid Sulfate Solution – N. Vasiljevic (University of Bristol), L. Viyannalage (SUNY-Binghamton), N. Dimitrov (SUNY at Binghamton), and K. Sieradzki (Arizona State University)

10:20 **3265** Tuning the Driving Force in Underpotential Codeposition of Alloys via Selective Complexation: Application to Au-Cu Alloys – D. Liang and G. Zangari (University of Virginia)

10:40 **3266** Lead Underpotential Deposition on Sub-Monolayer Pt and Ru Modified Au(111) Surface – Q. Yuan, A. Tripathi, M. Slavkovic, and S. Brankovic (University of Houston)

11:00 **3267** EC-STM Study of Two-Dimensional Complex Adlayer Directly Formed on Au(111) – S. Yoshimoto (Kumamoto University) and K. Nishiyama (Kumamoto Univ.)

11:20 **3268** Characterisation of the Deposition of n-octano-hydroxamate on Copper Surfaces – G. K. Parker (Griffith University), S. Holt (Australian Nuclear Science and Technology Organisation), and G. Hope (Griffith University)

11:40 **3269** Electrochemical Formation of Cu-Corronene Adlayer on Au(111) in Acidic Solution – T. Sawaguchi (National Institute of Advanced Industrial Science and Technology) and S. Yoshimoto (Kumamoto University)

Session III: Thin Film Electrodeposition – 14:00 – 16:00
Co-Chairs: K. Uosaki and L. Kibler

14:00 **3270** E-ALD of Pd on Au Single Crystals – L. Sheridan, Y. Kim, J. Stickney (The University of Georgia), and D. B. Robinson (Sandia National Laboratories)

14:20 **3271** Layer-by-layer Pt Electrodeposition on Au Single Crystal Surfaces Studied by *In Situ* Resonance Surface X-ray Scattering – T. Kondo, M. Shibata (Ochanomizu University), T. Masuda, and K. Uosaki (NIMS)

14:40 **3272** The Evolution of Surface Morphology and Stress in Electrodeposited Copper Nanofilms – M. O'Grady, C. Lenihan (Materials and Surface Science Institute, University of Limerick), and D. Buckley (Materials & Surface Science Institute, University of Limerick)

15:00 **3273** Electrochemical Impedance Spectroscopy Applied to Cantilever Curvature – M. C. Lafouresse, U. Bertocci, C. Beauchamp, and G. Stafford (NIST)

15:20 **3274** Controlling Pt Nucleation and Growth by Solution Chemistry and Deposition Conditions – Y. Liu, D. Gokcen (National Institute of Standards and Technology), U. Bertocci (NIST), and T. Moffat (National Institute of Standards and Technology)

15:40 **3275** XAS Study of Core-Shell PtRu Nanoparticles from Galvanic Pulse Current Deposition – Y. Hsieh (National Chiao Tung University), L. Chang (Graduate Program for Science and Technology of Accelerator Light Source), P. Wu (Department of Materials Science and Engineering National Chiao Tung University), and J. Lee (National Synchrotron Radiation Research Center)

F3 Electroless Deposition: Principles, Activation, and Applications 2

Electrodeposition

306A, Level 3, Hawaii Convention Center

Co-Chairs: Stojan Djokic, John Sickney, T. Homma, and W. Cai

08:00		Introductory Remarks (5 Minutes)
08:05	**3312**	Influence of Added Elements on Electroless Ni-P – P. Cavallotti and L. Magagnin (Politecnico di Milano)
08:25	**3313**	Corrosion of Copper and Nickel During Electroless NiP/Pd Deposition – C. S. Tiwari and R. Nguyen (Micron Technology Inc.)
08:45	**3314**	Electrochemical Evaluation of Electroless Ni-Zn-Cu-P Alloy Deposition – M. Zaimi and K. Noda (Shibaura Institute of Technology)
09:05	**3315**	Deposition of Thin Metallic Films on Semiconductor Substrates – S. Djokic (Elchem Consulting, Ltd.), N. Djokic (Elchem Consulting Ltd.), and T. Thundat (University of Alberta)
09:25	**3316**	Copper Electroless Deposition on a Glass Substrate – P. Chan and W. Dow (National Chung Hsing University)
09:45	**3317**	Co-Ni Electroless Composite Plating of 20 nm Diamond particles on 10 micrometer Plastic Balls and the Application of thus prepared devices to Post CMP Processes – S. Yoshihara (Utsunomiya University)
10:05		Intermission (15 Minutes)
10:20	**3318**	Impact of the Silicon Substrates Cleaning and Activation in the Nickel Electroless Plating – M. Bouttemy (Institut Lavoisier de Versailles), H. El Belghiti (OMG Ultra Pure Chemicals), D. Aureau (CNRS-UVSQ), E. Delbos (OMG Ultra Pure Chemicals), and A. Etcheberry (Institut Lavoisier de Versailles)
10:40	**3319**	Fluoride Free Galvanic Displacement of Copper and Silver as Surface Modifications for MEMS – D. Serrao, A. Raygani, and L. Magagnin (Politecnico di Milano)
11:00	**3320**	Solution-Source Vapor-Phase Mist Deposition Method for Future Roll-to-Roll Process in Semiconductor Device Fabrication – S. Fujita, S. Katori, T. Ikenoue, and J. Piao (Kyoto University)
11:20	**3321**	Effect of Light/Heat on Fast Formation Reaction of Highly-Conductive Polymer with Metal Shell Structure – Y. Hashimoto (Chiba Institute of Technology), J. Kawakita, T. Chikyow (National Institute for Materials Science), and Y. Sakamoto (Chiba Institute of Technology)
11:40	**3322**	Deposition Rate of Metal on Conducting Polymer Under Photo Irradiation – H. Fujihira, J. Kawakita, T. Chikyow (National Institute for Materials Science), and Y. Sakamoto (Chiba Institute of Technology)

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

14:00	**3323**	On the Mechanism of Electroless Deposition of Ni-P: Electrochemical and Computational Investigations – L. Magagnin, C. Cavallotti, and P. Cavallotti (Politecnico di Milano)
14:20	**3324**	Electroless Deposition for Developing ATR Surface Enhanced IR Spectroscopy – W. Cai (Department of Chemistry, Fudan University)
14:40	**3325**	Investigation of Reactions and Additive Effects in Electroless Deposition by *In Situ* Transmittance Measurement – K. Park, T. Lim, M. Kim, and J. Kim (Seoul National University)
15:00		Intermission (20 Minutes)
15:20	**3326**	Factors Affecting Reaction Rates of Chemical Bath Deposition of Copper Oxide Thin Films – J. Sasano, Y. Adachi, and M. Izaki (Toyohashi University of Technology)
15:40	**3327**	The Interaction of Tantalum with Tellurite Ions in Basic Solution – C. Tsang and J. Stickney (The University of Georgia)

F5 Magnetic Materials and Devices 12

Electrodeposition

323C, Level 3, Hawaii Convention Center

Magnetic Recording and Materials 1 – 09:00 – 16:00
Co-Chairs: C. Bonhote, G. Zangari, and S. Brankovic

09:00	**3391**	Thin Film Magnetic Heads – Early Inventions and Their Ongoing Impact on Magnetic Storage and on Electrochemistry – L. Romankiw (IBM, Thomas J. Watson Research Center) and S. Krongelb (IBM Thomas J. Watson Research Center)
09:40		Intermission (20 Minutes)
10:00	**3392**	Beyond Perpendicular Magnetic Recording-Alternative Magnetic Storage Technologies – N. Robertson (HGST Research)
10:40	**3393**	Electrodeposition of Magnetic Alloys Used in Fabrication of Recording Heads – I. Tabakovic, S. Riemer, J. Gong, V. Venkatasamy, and M. Kautzky (Seagate Technology)
11:20	**3394**	Magnetic Tape Heads and Contact Recording – R. G. Biskeborn (IBM Corporation)
12:00		Intermission (120 Minutes)
14:00	**3395**	Electrochemical Deposition of Magnetic Alloy Films with Large Magnetic Anisotropy – D. Liang and G. Zangari (University of Virginia)
14:40	**3396**	Reversible Change of Magnetism in FePt and CoPt Films by Electrochemical Charging – K. Leistner (IFW)
15:20	**3397**	Resistivity Control in CoFeNiX Magnetic Alloys – N. Dole (University of Houston), D. Lee, N. Brockie, A. Papou, W. French (Texas Instruments), and S. Brankovic (University of Houston)
15:40	**3398**	Composition Gradients and Magnetic Properties of 10-100nm NiFe and CoFe Films Obtained by Electrodeposition – J. Gong, S. Riemer, V. Venkatasamy, M. Kautzky, and I. Tabakovic (Seagate Technology)

I1 Physical and Analytical Electrochemistry General Session

Physical and Analytical Electrochemistry

318B, Level 3, Hawaii Convention Center

PAED General Session 1 – 09:00 – 12:00
Co-Chairs: R. Calhoun and S. Chen

09:00	**3527**	Electrochemical Measurements in High Magnetic Fields for Energy Storage – A. Migliori, C. R. Kreller, R. L. Borup, and F. H. Garzon (Los Alamos National Laboratory)

09:20 **3528** The Importance of Electrochemical Surface Potentials in Pressure Solution – K. Kristiansen, M. Valtiner (University of California, Santa Barbara), G. Greene (Deakin University), J. Boles, and J. Israelachvili (University of California, Santa Barbara)

09:40 Intermission (20 Minutes)

10:00 **3529** Surface Intermediates of the Oxygen Evolution Reaction on Iridium as Observed by Surface Interrogation Scanning Electrochemical Microscopy (SI-SECM) – N. Arroyo-Curras and A. Bard (University of Texas at Austin)

10:20 **3530** SECM Footprint Analysis of Reactive Oxygen Species Produced During Multielectronic O_2 Reduction – J. Noel (University of Rennes 1), A. Latus (University of Bucharest), C. Lagrost (University of Rennes 1), E. Volanschi (University of Bucharest), and P. Hapiot (Universite de Rennes 1)

10:40 **3531** New Methods and New Applications of Electrochemiluminescent Analysis – G. Xu, L. Hu, L. Zhang, Y. Yuan, T. Yuan, and S. Parveen (Changchun Institute of Applied Chemistry)

11:00 **3532** Probing The Structure and Composition at the Electrode Interface: Understanding the Importance of Through-Space Interactions – M. R. Anderson, M. De La Rosa, M. Tomlinson, and M. Anderson (University of Colorado Denver)

11:20 **3533** Surface-Enhanced Raman Spectroscopy Platforms for Studying Electrodeposition and Surface Chemistry of Nanostructured Semiconductors – J. Gu and S. Maldonado (University of Michigan)

11:40 **3534** Detection of Tetryl by Electrogenerated Chemiluminescence (ECL) quenching of Ru(bpy)32+ – P. Lindhome and R. L. Calhoun (US Naval Academy)

PAED General Session 2 – 14:00 – 18:00
Co-Chairs: P. Trulove and R. Mantz

14:00 **3535** Simulation of Electrochemical Micromachining with Nanosecond Pulses – E. L. Hotoiu, S. Van Damme, and J. Deconinck (Vrije Universiteit Brussel)

14:20 **3536** Performance Characterization of the Titanium(IV)-Porphyrin Reagent for Determining Hydrogen Peroxide based on Ab Initio Calculations – K. Takamura (Tokyo University of Pharmacy and Life Sciences) and T. Matsumoto (Institute of Multidisciplinary Research for Advanced Materials, Tohoku University)

14:40 **3537** Quantum Mechanical Analysis on the Effect of Electric Field on the Adsorption of Water and Hydronium on Transition Metal Surfaces – A. Huzayyin, J. Chang, F. Dawson, and K. Lian (University of Toronto)

15:00 **3538** A Temperature Dependent Multi-Ion Model for Time Accurate Numerical Simulation of the Electrochemical Machining Process – D. Deconinck, S. Van Damme, and J. Deconinck (Vrije Universiteit Brussel)

15:20 **3539** Electroless Deposition of the cylindrical Iron Nanotubes using Anodic Aluminium Oxide Template – T. Hussain, A. Shah, and G. Zohra (University of the Punjab)

15:40 **3540** Extract Metals by a Treated Scallop Shell Powder – K. Takeuchi, H. Honda, S. Tamura, T. Ishiguro, Y. Kogo (Tokyo University of Science), H. Koyanaka (Kyoto University), J. Neuefeind, M. Feygenson, and A. Kolesnikov (Oak Ridge National Laboratory)

I2 Bioelectroanalysis and Bioelectrocatalysis

Physical and Analytical Electrochemistry
317B, Level 3, Hawaii Convention Center

Bioelectroanalysis – 08:20 – 12:00
Co-Chairs: L. Mao and A. Brajter-Toth

08:20 **3572** Electrochemical Investigations of Lipid Membranes and Proteins at the Liquid-Liquid Interface – R. Kataky (Durham University)

08:40 **3573** Fabrication of Nanoporous 1- 3 nm Thick Membranes on Nanostructured Microelectrodes for Low nM Detection – A. Boateng (University of Florida), F. Irague (Université Paul Sabatier Toulouse III), and A. Brajter-Toth (University of Florida)

09:00 **3574** Electrochemical Immunoassay of Phosphorylated Proteins – D. Du (Central China Normal University)

09:20 **3575** Intermediate Layers for Immobilization of Biomacromolecules on Various Substrates – A. Nowicka, A. Kowalczyk, M. Fau, and Z. J. Stojek (University of Warsaw)

09:40 Intermission (20 Minutes)

10:00 **3576** Functional Nanomaterials for Sensitive Bioassay – D. Du (Pacific Northwest National Laboratory) and Y. Lin (Pacific Northwest National Lab)

10:20 **3577** In Vivo Electroanalytical Chemistry: Strategies Based on Surface/Interface Chemistry – L. Mao (Institute of Chemistry, Chinese Academy of Sciences (CAS))

10:40 **3578** Development of Nano-Pt/Graphene/Nafion Composite Membrane for Glucose Biosensor – H. Leu, K. Chiu, and C. Lin (Feng Chia University)

11:00 **3579** Electrochemical Techniques as Effective Readout Methods for Aptamer based Biosensors – E. Wang (Changchun Institute of Applied Chemistry)

11:20 **3580** Synthesis Graphene-based Nanocomposites and Apply in Electrochemical Sensors – Z. WANG (Changchun Institute of Applied Chemistry, Chinese Academy of Sciences)

11:40 **3581** Electrochemical Surface Plasmon Resonance Sensor based on Nanohole Array Electrode Fabricated by Nanoimprinting Technique – O. Niwa (National Institute of Advanced Industrial Science and Technology), K. Nakamoto (National Institute of Advanced Industrial Science and Technology, University of Tsukuba), and R. Kurita (National Institute of Advanced Industrial Science and Technology)

Bioelectrocatalysis – 14:00 – 18:00
Co-Chairs: D. Cliffel and S. Calabrese Barton

14:00 **3582** Investigation of the Dissimilarity Metal Reduction (DMR) Pathways of *Shewanella* with Spatial Resolution by Scanning Electrochemical Microscopy – G. Chen, D. Kimmel, and D. Cliffel (Vanderbilt University)

14:20 **3583** Facilitation of High-Rate NADH Electrocatalysis at Activated Carbon Electrode – H. Li, R. Li, R. Worden, and S. Calabrese Barton (Michigan State University)

14:40 **3584** Ionic Liquid-Based Electrochemical Biosensors – P. Yu and L. Mao (Institute of Chemistry, Chinese Academy of Sciences (CAS))

15:00 **3585** Electrochemical Biosensor and Biofuel Cell Applications of Nanomaterials Modified Electrodes – S. Chen, Y. Li, V. Mani, and M. Rajkumar (National Taipei University of Technology)

15:20 **3586** Direct Electron Transfer and Electrocatalysis of Hemoglobin on ITO Nanoparticle Electrode – Y. Ayato, K. Yamagiwa (Tokyo University of Science), H. Shiroishi (Tokyo National College of Technology), and J. Kuwano (Tokyo University of Science)

15:40 **3587** A Third Generation L-fucose Biosensor based on a Novel Dehydrogenase from the Basidiomycete Coprinopsis Cinerea – M. Inukai (Tokyo University of Agriculture and Technology), H. Matsumura, K. Igarashi, M. Samejima (The University of Tokyo), 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

Electrochemistry in Molten Salts and Ionic Liquids – 08:00 – 08:40
Co-Chair: W. M. Reichert

08:00 **3615** Fundamental Study on Reduction Rate for Electrolytic Reduction of SiO_2 Powder in Molten $CaCl2_2$ – T. Toba, K. Yasuda, T. Nohira, R. Hagiwara (Kyoto University), K. Ichitsubo, K. Masuda (Taiheiyo Cement Corporation), and T. Homma (Waseda University)

08:20 **3616** Anodic Reactions on Some Materials in LiCl-KCl Melt – T. Takenaka, M. Umehara, D. Araki, and T. Morishige (Kansai University)

New Molten Salts and Ionic Liquids and Properties – 08:40 – 14:00
Co-Chairs: W. M. Reichert and J. Davis

08:40 **3617** Properties of Quaternary Phosphonium Fluorohydrogenate Ionic Liquids and Their Derivatives Giving Ionic Plastic Crystal Phases – R. Hagiwara, T. Enomoto, and K. Matsumoto (Kyoto University)

09:00 **3618** Border between Ionic Liquids and Electrolyte Solutions – M. Watanabe (Yokohama National University)

09:40 Intermission (20 Minutes)

10:00 **3619** Ion Pairs in Ionic Liquids – J. Hallett, I. Villar-Garcia, and T. Welton (Imperial College, London)

10:40 **3620** Bulk and Interfacial Properties of Ionic Liquids and Their Mixtures with Lithium Salts – O. Borodin (U.S. Army Research Laboratory), J. Vatamanu (University of Utah), L. Xing (The University of Utah), G. Smith (Wasatch Molecular Inc), and D. Bedrov (The University of Utah)

11:00 **3621** Polymorphic Behavior of Alkali Metal Bis(Fluorosulfonyl)Amides – K. Matsumoto, T. Oka, T. Nohira, and R. Hagiwara (Kyoto University)

11:20 **3622** Effect of Interaction between Cation-Anion on Ionic Conductivity in Room Temperature Molten Fluorides Containing HF – A. Tasaka, H. Inoue, T. Isogai, T. Nakai, M. Saito, and M. Inaba (Doshisha University)

11:40 **3623** Protic Ionic Liquids as Fuel Cell Electrolytes: Contrast and Similarities between Bulk and Electrochemical Properties – M. Miran, T. Yasuda, M. Susan, K. Dokko, and M. Watanabe (Yokohama National University)

12:00 Lunch Break (120 Minutes)

New Molten Salts and Ionic Liquids/Properties of MS and IL – 14:00 – 16:00
Co-Chairs: D. Fox and M. Watanabe

14:00 **3624** Boronium Based Ionic Liquids: Salts of Boron Centered Cations as Promising Salts for Electrochemical Applications – J. H. Davis Jr. (University of South Alabama), T. Ruether (Commonwealth Scientific and Research Organization, CSIRO, Energy Technology), and S. Dorman (Birmingham Southern College)

14:40 **3625** The Structure of Ionic Liquids on the Nanoscale – C. J. Margulis, H. Kashyap, H. Annapureddy, J. Hettige (University of Iowa), E. Castner Jr., C. Santos, and N. Murthy (Rutgers University)

15:20 **3626** Physicochemical and Electrochemical Properties of Novel Ionic Liquids Containing Aprotic Heterocyclic Anions Doped with Lithium Salts – C. Shi, A. DeSilva, M. Guzman, and J. Brennecke (University of Notre Dame)

15:40 **3627** New Approaches to the Low-melting Inorganic Ionic Liquid Challenge – T. G. Tucker and C. Angell (Arizona State University)

I4 Electrocatalysis 6

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

315, Level 3, Hawaii Convention Center

Electrocatalysis Structural Effects I – 08:15 – 12:00
Co-Chairs: G. Brisard and V. Ramani

08:15 Introductory Remarks (5 Minutes)

08:20 **3737** (Invited) Oxygen Evolution Reaction on Minute Amounts of Ru and Ir Catalyst for Application in Fuel Cell Protection – R. T. Atanasoski (3M Company), D. A. Cullen (Oak Ridge National Laboratory), and L. Atanasoska (3M Company)

09:00 **3738** ORR Activity Enhancement of MBE-prepared Pt monolayer on Au(111) Single Crystal Substrate – Y. Iijima, Y. Takahashi, N. Todoroki, K. Matsumoto, and T. Wadayama (Tohoku University)

09:20 **3739** Facile Synthesis of Pd_xCo@Pd/C Core-Shell Nanoparticles and Pt-Decorated Pd_3Co@Pd/C as Oxygen Reduction Reaction Electrocatalysts – D. Wang, C. Li (Southwest University), and H. D. Abruña (Cornell University)

09:40 Intermission (20 Minutes)

10:00 **3740** Oxygen Reduction for Fuel Cells and Batteries: Mechanistic Studies and the Design of New Catalysts – A. A. Gewirth, C. Tornow, and E. Tse (University of Illinois)

10:20 **3741** Surface Modification of PtRu/C by Mono-layered Decoration of Pt, Au, Pd, and Ir for Oxygen Reduction Reaction – C. Kuo (National Chiao Tung University), L. Chang (Graduate Program for Science and Technology of Accelerator Light Source), Y. Hsieh (National Chiao Tung University), P. Wu (Department of Materials Science and Engineering National Chiao Tung University), and J. Lee (National Synchrotron Radiation Research Center)

10:40 **3742** An Excellent Electrocatalysis of Novel Pt-TaOx Composite Electrocatalysts for Oxygen Reduction Reaction – Z. Awaludin, T. Okajima, and T. Ohsaka (Tokyo Institute of Technology)

11:00 **3743** Carbon Supported Pt-Os Electrocatalysts for Oxygen Reduction Reaction – Y. Lee, C. Kuo, Y. Hsieh (National Chiao Tung University), P. Wu (Department of Materials Science and Engineering National Chiao Tung University), and J. Lee (National Synchrotron Radiation Research Center)

11:20 **3744** Instantaneous One-Pot Synthesis of Fe-N-codoped Graphene as an Efficient Electrocatalyst for Oxygen Reduction Reaction in Acidic Solutions – K. Kamiya, K. Hashimoto, and S. Nakanishi (The University of Tokyo)

11:40 **3745** Strip-Like Nanosized Tungsten Carbide as Catalyst for Oxygen Reduction Reaction – S. Kang and P. Shen (Sun Yat-Sen University)

Surface Characterisation of Electrocatalysts – 14:00 – 16:00
Co-Chairs: P. K. Shen and R. Atanasoski

14:00 **3746** *In Situ* STM Elucidation of the effects of Step Structures on Pt(111) Electrodes for Dissolved CO Oxidation – J. Inukai, D. A. Tryk, T. Abe, M. Wakisaka, H. Uchida, and M. Watanabe (University of Yamanashi)

14:20 **3747** High Speed AFM Study on the Potential Dependence of the Dissolution of Shape-controlled Pt Nanoparticles – Y. Yamada, C. Yoshida (Chiba University), M. Nakamura (Chiba Univeristy), and N. Hoshi (Chiba University)

14:40 **3748** XPS and STEM of the Interface Formation between Ultra-Thin Ru, Ir and Pt Layers and Perylene Red Catalyst Support Whiskers – L. L. Atanasoska (3M Company), D. A. Cullen (Oak Ridge National Laboratory), A. Hester (3M), and R. T. Atanasoski (3M Company)

15:00 **3749** Ethanol Electrooxidation on a (2x2)-Sn/Pt(111) Surface Alloy and a SnO_x/Pt(111) Surface: A Combined Surface Science and *In Situ* FTIR Study – W. Zhou, J. Magee, S. Axnanda, R. R. Adzic, and M. G. White (Brookhaven National Laboratory)

15:20 **3750** Electrochemical and ATR-IR Investigation on Decontaminated Shape-Controlled Pd Nanocrystals – H. Zhang and W. Cai (Department of Chemistry, Fudan University)

15:40 **3751** Molecular Structures of Fluorinated Self-Assembled Monolayers (SAMs) Constructed on Metal Surfaces Investigated by Surface Vibrational Spectroscopies – I. Yagi, K. Nomura, and K. Inokuma (FC-Cubic TRA)

J1 Chemical Sensors 10 – Chemical and Biological Sensors and Analytical Systems

Sensor

319B, Level 3, Hawaii Convention Center

J1-1 – Nano/Bio Sensors – 08:00 – 12:00
Co-Chairs: A. Simonian and B. Chin

08:00 **3827** Phytosensors and Phytoactuators – A. G. Volkov, M. Volkova (Oakwood University), and V. Markin (University of Texas)

08:20 **3828** Biofuel Cell Providing a Platform for Self-Powered Biosensors – S. Dong (Changchun Institute of Applied Chemistry)

08:40 **3829** Miniature Enzymatic Biosensors for Tear Glucose Measurement in Capillary Tubes – B. Peng, Q. Yan (University of Michigan), B. Cohan (EyeLab Group), T. C. Major, and M. E. Meyerhoff (University of Michigan)

09:00 **3830** Real-time and Ultra-sensitive detection of Cancer Marker Using a Novel Silicon Nanobelt Field Effect Transistor – Y. Yu (Graduate Institute of Biomedical Materials and Tissue Engineering), J. Wu (Department of Dentistry, Taipei Medical University Hospital), and C. Wu (Graduate Institute of Biomedical Materials and Tissue Engineering)

09:20 **3831** Graphene Oxide-Based Aptasensor for Heavy Metal Detection – M. Li and N. Wu (West Virginia University)

09:40 **3832** Time Sensors: Circadian Rhythms in Biologically Closed Electrochemical Circuits of Plants – A. Waite, J. Wooten, A. G. Volkov (Oakwood University), and V. S. Markin (The University of Texas)

10:00 Intermission (20 Minutes)

10:20 **3833** Immobilization of Enzymes and Redox Proteins and Their Electrochemical Biosensor Applications – S. Chen, V. Mani, S. Palanisamy, and Y. Li (National Taipei University of Technology)

10:40 **3834** Salmonella Typhimurium Detection on Food Surface using Magnetoelastic Biosensors – Y. Chai, S. Horikawa, M. Park, S. Li, and B. Chin (Auburn University)

11:00 **3835** Bio-Inspired Autonomous Sentinel System for Screening Invasive Pathogens – S. Li, H. Wikle, Y. Chai, M. Park, S. Horikawa, and B. Chin (Auburn University)

11:20 **3836** New Multimode Sensors based on Nanostrucured Materials for Simultaneous Screening of Biological Fluids for Specific Breast Cancer and Hepatitis B Biomarkers – R. I. Stefan – van Staden (National Institute of Research for Electrochemistry and Condensed Matter) and M. Enachescu (Center for Surface Science and Nanotechnology, University "Politehnica" of Bucharest)

11:40 **3837** Direct Detection of Salmonella Typhimurium on Tomato and Spinach using a Phage-based Magnetoelastic Biosensor Method – M. Park, S. Li, K. Weerakoon, S. Horikawa, Y. Chai, and B. Chin (Auburn University)

J1-2 – Nano/Bio Sensors – 13:40 – 16:00
Co-Chairs: G. Hunter and Y. Shimizu

13:40 **3838** Development of Electrochemical Cantilever Sensors for DNA Applications – X. Quan, Y. Sun (Technical University of Denmark), A. Labuda (McGill University), A. Heiskanen, A. Wolff (Technical University of Denmark), J. Jorge Dulanto, P. Grutter (McGill University), and A. Boisen (Technical University of Denmark)

14:00 **3839** Fabrication of Minimally-Invasive Patch Type Glucose Sensors – M. Yasuzawa, S. Sato, H. Nakanishi, and K. Edagawa (University of Tokushima)

14:20 **3840** Flexprint based Glucose Sensors for Continuous Measurement of Glucose Profiles of Diabetic Patients – P. D. Van der Wal (EPFL), P. Hadvary, H. Tschirky (PharmaSens AG), and N. De Rooij (EPFL Lausanne)

14:40 **3841** Nanodiamond Microelectrode Array with Mesa Structure Fabricated for Bio-Analytical Applications – S. Raina, N. Ghosh, and W. Kang (Vanderbilt University)

15:00 **3842** An Electrochemical Probe Technology for a Label-Free, Point-of-Care Biosensor – J. Wei, S. Singhal (CFD Research Corporation), and H. Liu (Michigan Technological University)

15:20 **3843** Electrical Impedance Sensors for Cancer Cell Study – L. Yang (North Carolina Central University)

15:40 **3844** Terahertz Chemical Imaging and Spectroscopy of Molecular Networks in Pharmaceutical and Biomedical Applications – K. Ajito, Y. Ueno, H. Song, E. Tamechika, N. Kukutsu (NTT Corporation), W. Limwikrant, K. Yamamoto, and K. Moribe (Chiba University)

J3 Materials for Solid State Lighting

Luminescence and Display Materials / New Technology Subcommittee
316B, Level 3, Hawaii Convention Center

Inorganic & Organic Semiconductors – 08:00 – 12:00
Co-Chairs: Anant Setlur and John Collins

08:00 **3955** (Centennial Outstanding Achievement Award Presentation of the LDM Division) Toward Further Breakthroughs in Nitride Phosphors – H. Yamamoto (Tokyo University of Technology)

09:00 **3956** Spatio-Time-Resolved Cathodoluminescence Studies on Freestanding GaN Substrates Grown by Hydride Vapor Phase Epitaxy – S. F. Chichibu, Y. Ishikawa, K. Hazu, M. Tashiro, K. Furusawa (Tohoku University), H. Namirta, S. Nagao, K. Fujito (Mitsubishi Chemical Corporation), and A. Uedono (University of Tsukuba)

09:40 **3957** Electrical Characterization of High-quality InGaN-based Blue Light Emitting Diodes on 8inch Silicon Grown by Metalorganic Chemical Vapor Deposition – J. Kim, J. Kim, Y. Tak, J. Kim, H. Hong, S. Chae, M. Yang, J. Lee, H. Choi, J. Park, Y. Park, and U. Chung (Samsung Advanced Institute of Technology)

10:00 **3958** Simulation and Design of (In,Ga)N-Based Light Emitting Diodes – Z. Liang, E. Stach, T. Sands, and E. García (Purdue University)

10:20 **3959** Tuning of Indium Tin Oxide Work Function with an Ionic Solid Thin Film in Polymer Light-Emitting Diodes – Y. Chou and T. Wen (National Cheng Kung University)

10:40 **3960** First Principles Investigations of the Electronic Structures and Associated Properties of Solid Solutions of AlN and GaN – K. C. Mishra (Osram Sylvania), P. Schmidt (Technische Universität Darmstadt, Darmstadt, Germany), and K. Johnson (MIT, Cambridge, MA, USA)

11:00 **3961** Fabrication Semipolar GaN on Nanoscale Pattern C-sapphire by Using Self-Assembled Ni Pattern as Mask – C. Chen, C. Hsieh, and Y. Wu (National Chiao Tung University)

11:20 **3962** Transparent Electrode for Top Emitting Organic Light Emitting Diodes by Suppression of Surface Plasmons – B. Koo, S. Kim, K. Hong, K. Kim, I. Lee, and J. Lee (Pohang University of Science and Technology)

11:40 **3963** Growth and Electrical Properties of n-type 4H-SiC Single Crystals – X. Xu, Y. Peng, S. Song, X. Chen, and X. Hu (Institude of Crystal Materials)

Nanomaterials and New Downconverters – 13:30 – 15:10
Co-Chairs: Kailash Mishra and Kyota Ueda

13:30 **3964** Nanoco's CFQDs for Solid-State Lighting Applications – N. Pickett (Nanoco Technologies)

14:10 **3965** Fabrication of Efficient, Stable White Light-Emitting Diodes Based on Highly Fluorescent Copper-Indium-Sulfide Quantum Dots – W. Song and H. Yang (Hongik University)

14:30 **3966** Glass Matrices Containing Rare-Earth Ions for White Light-Emitting Diodes with High Color Rendering Indices – J. Heo and S. Yi (Pohang University of Science and Technology)

14:50 **3967** High Color Rendering White LED Based on Silicate/Dye-Bridged Siloxane Hybrid Phosphor Encapsulant – B. Bae (Korea Advanced Institute of Science ad Technology (KAIST)), S. Kwak, N. Kim, and H. Im (KAIST)

New Concepts – 15:10 – 15:30
Co-Chair: Anant Setlur

15:10 **3968** Hybrid Solid-State Lighting Design – W. Hertog, C. Hunt, and J. Carreras (Catalonia Institute for Energy Research (IREC))