Sunday, October 16, 2005

1500 Cover Letter and Resume Workshop
Santa Barbara A, Lobby Level

1600 Job Interviewing Tips Workshop
Santa Barbara A, Lobby Level

1830 Lithium-Ion Battery Materials... "For the Rest of Us"
San Jose, Level 2

1930 Sunday Evening Get-Together, sponsored by Süd-Chemie
Plaza Pool Deck, Level 4

P1 Proton Exchange Membrane Fuel Cells V, in Honor of Supramaniam Srinivasan

Energy Technology / Physical and Analytical Electrochemistry / Battery / Industrial Electrolysis and Electrochemical Engineering / New Technology Subcommittee

San Francisco, Level 2

Electrode Kinetics I
Co-Chairs: S. Mukerjee and E. Stuve

14:00 **895** Zirconium Nitride and Oxynitride for New Cathode of Polymer Electrolyte Fuel Cell - S. Doi, Y. Liu, A. Ishihara, S. Mitsushima, N. Kamiya, and K. Ota (Yokohama National University)

14:20 **896** A Study of Vacuum Deposited Fe-C-N Based Catalysts for Oxygen Reduction - J. Dahn, E. Easton, D. Stevens, T. Buhrmester (Dalhousie University), R. Atanasoski, and D. O'Neill (3M Company)

14:40 **897** Non Noble Metal Catalyst for Oxygen Reduction Reaction in Acidic Medium - S. Kumaraguru (University of South Carolina), M. Curran (University of South Florida), and B. Popov (University of South Carolina)

15:00 **898** A New Non-Precious Cobalt-Composite Electrocatalyst for PEFC Cathodes - R. Bashyam and P. Zelenay (Los Alamos National Laboratory)

15:20 **899** Bimetallic Chelate Catalysts for Oxygen Reduction Raction in PEM Fuel Cells - L. Liu and B. Popov (University of South Carolina)

15:40 **900** Tantalum Nitride and Oxynitride for New Cathode of Polymer Electrolyte Fuel Cell - A. Ishihara, S. Doi, Y. Shibata, S. Mitsushima, N. Kamiya, and K. Ota (Yokohama National University)

16:00 **901** Array Fuel Cells for High Throughput Screening of Fuel Cell Catalysts - E. Smotkin (NuVant Systems Inc.)

16:20 **902** Alloy-Supported Platinum Monolayer Electrocatalysts for Oxygen Reduction - R. Adzic, J. Zhang, M. Vukmirovic, K. Sasaki, J. Wang, and F. Uribe (Brookhaven National Laboratory)

16:40 **903** Synthesis and Characterization of Nanostructured PtW Alloy for Oxygen Reduction in PEMFCs - L. Xiong, E. Kreidler, and T. He (Honda Research Institute USA)

17:00 **904** Improve the Catalysts Utilization of Fuel Cells by Using Coupling Agents - F. Wu, L. Tsai (Industrial Technology Research Institute), K. Hsueh (ITRI), and C. Wan (National Hsing Hua University)

17:20 **905** Performance of PEFC Formed by Using Pt-Loaded Activated Carbon with CF_3SO_3H in Cathode - J. Maruyama and I. Abe (Osaka Municipal Technical Research Institute)

Monday, October 17, 2005

0830 Plenary Lecture by Nathan Lewis,
"Scientific Challenges in Sustainable Energy Technology"
San Francisco, Level 2

0930 Coffee Break
California Foyer, Level 2

1200 Cover Letter and Resume Workshop
Santa Barbara A, Lobby Level

1215 Battery Division Luncheon and Business Meeting
Hollywood Ballroom, Level 3

1215 High Temperature Materials Luncheon and Business Meeting
Palos Verdes, Lobby Level

1300 Job Interviewing Tips Workshop
Santa Barbara A, Lobby Level

1800 Monday Evening Mixer, Technical Exhibit, and General Student Poster Session
Pasadena Room, Lower Lobby Level

1930 Battery Division Award Reception
Palos Verdes, Lobby Level

A1 General Student Poster Session

All Divisions

Pasadena, Lower Lobby Level

Monday Evening Student Poster Session, 18:30-20:30
Co-Chairs: V. Desai and V. R. Subramanian

- **1** The Mechanism of Potential Shifts of Activated Carbon Due to Adsorption of Organic Compounds - M. Goldin (Kellogg Community College), V. Avramenko (Mendeleev University), A. Volkov (Oakwood College), and M. Goldin (Mendeleev University)
- **2** Nanocomposite Proton-Exchange Membranes for Higher Temperature PEM Fuel Cell - N. Jalani (Worcester Polytechnic Institute) and R. Datta (WPI)
- **3** Current Oscillations in Anodic Electrodissolution of Copper in Lithium-ion Battery Electrolyte - Q. Cui and H. Dewald (Ohio University)
- **4** The Localization of Metal Ions at Specific Base Pairs in an Oligonucleotide - M. Dinsmore (University of Saskatchewan)

- **5** Surface Movements of Chopstick-like Islands in Electrochemical Environment - J. Lee and J. Kwak (KAIST)
- **6** A Novel High Capacitive-Coupling Ratio Surrounding Gate Transistor (HiCR-SGT) Flash Memory Cell - T. Ohba, H. Nakamura (Tohoku University), H. Sakuraba and F. Masuoka (Research Institute of Electrical Communication)
- **7** δ-Bi_2O_3 Thin Films Deposited on Dense YSZ Substrates by Means of CVD Method Under Atmospheric Pressure - T. Takeyama, N. Takahashi, and T. Nakamura (Shizuoka University)
- **8** Fabrication Process of Field Induced Source Line Surrounding Gate Transistor Flash Memory Cells - H. Tomizawa, Y. Yamakawa, H. Haneda, N. Gomi, H. Nakamura (Tohoku University), H. Sakuraba, and F. Masuoka (Research Institute of Electrical Communication)
- **9** Improvement of Electron Mobility in a-Si:H Thin Film Transistor Using RACVD Method - J. Kang, K. Park, B. Park, and S. Choi (Kyungpook National University)
- **10** Characterization of Proton Conduction Sites and Proton Diffusion Experiments of the Heteropoly Acid, $H_6P_2W_{21}O_{71}•xH_2O$, for Fuel Cell Applications - J. Horan (Colorado School of Mines), J. Turner (National Renewable Energy Laboratory), A. Herring, and S. Dec (Colorado School of Mines)
- **11** Thickness Dependence of Magnetic and Electronic Properties in $La_{1-x}Sr_xMnO_3$ Thin Films - Y. Chen and T. Wu (National Tsing-Hua University)
- **12** Ni Silicide Formation in Ni(Ti)/Si Using Multiple Pulsed Laser Annealing - Y. Setiawan, P. Lee, K. Pey (Nanyang Technological University), X. Wang, and G. Lim (Singapore Institute of Manufacturing Technology)
- **13** Thermal Decomposition of Electrolyte to Generate Surface Films on $LiNiCoO_2$ Cathode Particles - W. Li and L. Brett (University of Rhode Island)
- **14** Adsorbed Heteropoly Acids and Salts as PEM Fuel Cell Anode Catalysts - R. Stanis, A. Herring, and M. Kuo (Colorado School of Mines)
- **15** Studies on Galvanic Corrosion Effect in CMP of Cu and Barrier Layer Materials - P. Mohan, T. Jiang, and V. Desai (University of Central Florida)
- **16** High-Temperature Oxidation Behavior of $MoSi^{2+}Si_3N_4$ Nanocomposites - T. Jiang, P. Mohan, and V. Desai (University of Central Florida)
- **17** Effects of Magnetic Field on Electroplated Copper Films - B. Park, Y. Cho, and S. Choi (Kyungpook National University)
- **18** Preparation of InN Crystal with Peculiar Morphology by Means of Halide Chemical Vapor Deposition under Atmospheric Pressure - H. Sugiura, N. Takahashi, and T. Nakamura (Shizuoka University)
- **19** Field Induced Source Line Surrounding Gate Transistor Flash Memory - Y. Yamakawa, H. Tomizawa, N. Gomi, H. Haneda, H. Nakamura (Tohoku University), H. Sakuraba, and F. Masuoka (Research Institute of Electrical Communication)
- **20** Preparation of Cuprous Oxide Thin Film by Means of Halide Chemical Vapor Deposition Under Atmospheric Pressure - H. Kobayashi, N. Takahashi, and T. Nakamura (Shizuoka University)
- **21** Drive Current Enhancement in the Surrounding Gate Transistor - W. Sakamoto, H. Haneda, H. Nakamura (Tohoku University), H. Sakuraba, and F. Masuoka (Research Institute of Electrical Communication)
- **22** MISFET Type H_2 Sensor Using Pd-Black Catalytic Metal Gate for High Performance - K. Kang, Y. Cho, B. Park (Kyungpook National University), S. Han (Korea Institute of Energy Research), and S. Choi (Kyungpook National University)
- **23** Numerical Analysis of the Erase Characteristics in Field Induced Source Line Surrounding Gate Transistor Flash Memory - N. Gomi, Y. Yamakawa, H. Tomizawa, H. Haneda, H. Nakamura (Tohoku University), H. Sakuraba, and F. Masuoka (Research Institute of Electrical Communication)
- **24** Tubular Electrochemical Hydrogen Pump Using Porous Alumina Tubing - I. Koo, M. Lee, J. Lee, and W. Lee (Ajou University)
- **25** Electrochemical Performance of Pt/C Electrodes Prepared by Plasma-Chemical Method - J. Shim, I. Koo, and W. Lee (Ajou University)
- **26** Modeling Backward Wave Oscillations in a High Gain TWT - V. Kumar and A. Vohra (Kurukshetra University)
- **27** A Novel Fabrication Process of the Surrounding Gate Transistor with a Self-Aligned Drain Contact - H. Haneda, T. Ohba, H. Tomizawa, M. Satoh, H. Nakamura (Tohoku University), H. Sakuraba, and F. Masuoka (Research Institute of Electrical Communication)
- **28** Methanol Sensor Incorporating PETE Composite Membrane Coated with Plasma-Chemically Prepared Pd Film - Y. Kim, J. Shim, and W. Lee (Ajou University)
- **29** Plasma-Chemical Reduction Method for Preparing Pt Nano Particles Used for Fuel Cell Electrodes - K. Joung, J. Shim, I. Koo, M. Lee, and W. Lee (Ajou University)
- **30** Onboard Energy Storage for Fuel Cell Vehicles via Iron Reduction/Oxidation - M. Thaler (CD Laboratory for Fuel Cell Systems), V. Hacker (Graz University of Technology), and J. Besenhard (Institute for Chemistry and Technology of Inorganic Materials)
- **31** Electrochemical Impedance Spectroscopy Investigation of a Potentiometric Gas Sensor with a La_2CuO_4 Electrode - B. White (University of Florida), E. Traversa (University of Rome Tor Vergata), and E. Wachsman (University of Florida)
- **32** Fabrication of Rare Earth-Transition Metal Alloy Nanowires and Nanotubes - R. Mishra and E. Podlaha (Louisiana State University)
- **33** Photoresist and Residue Removal Using Gas-Expanded Liquids - I. Song (Georgia Institute of Technology), M. Spuller (Applied Materials), G. Levitin, and D. Hess (Georgia Institute of Technology)

- **34** Investigation of Methanol Oxidation on PtRu Using a Dynamic Hydrogen Electrode (DHE) - E. Chung (Illinois Institute of Technology), E. Smotkin (University of Puerto Rico at Rio Piedras), and J. Prakash (Illinois Institute of Technology)
- **35** Characterization of Barium Zirconium Titanate Thin Films as Tunable Materials Prepared by RF Magnetron Sputtering - W. Lan, H. Liu, and T. Wu (National Tsing-Hua University)
- **36** Manganese Dioxide Porosity Changes During Discharge by Electrochemical Impedance Spectroscopy - S. Donne and J. Arnott (University of Newcastle)
- **37** XAS Study and Catalytic Properties of Sulfided Platinum Catalysts for PEFCs - Y. Moriguchi (Tokyo Institute of Technology), Y. Uchimoto (Kyoto University), M. Wakihara (Tokyo Institute of Technology), and K. Bando (Advanced Industrial Science and Technology)
- **38** Preparation and Properties of Transparent, Flexible Ruthenic Acid Nanosheet Thin Films by Electrophoretic Deposition - K. Yokoshima, W. Sugimoto, Y. Murakami, and Y. Takasu (Shinshu University)
- **39** Analysis of Pt-3d Metal Alloy Cathode Material for PEFCs Using XAS - T. Arai, H. Fujita (Tokyo Institute of Technology), Y. Uchimoto (Kyoto University), M. Wakihara, K. Fushinobu, K. Okazaki (Tokyo Institute of Technology), and K. Bando (Advanced Industrial Science and Technology)
- **40** Development of PtRuIr/C Electrocatalysts for DMFC Anodes - T. Kawaguchi, D. Matsuki, M. Dohi, W. Sugimoto, Y. Murakami, and Y. Takasu (Shinshu University)
- **41** Oxygen Reduction Activity of Pt-based Binary Alloy Electrocatalysts - S. Konishi, N. Yoshinaga, M. Ishida, W. Sugimoto, Y. Murakami, and Y. Takasu (Shinshu University)
- **42** Electrical Properties of Composites Prepared from Conducting Polymer and Noble Metal Nanoparticles Probed by Conductive Tip Atomic Force Microscopy - S. Cho and S. Park (Pohang University of Science and Technology)
- **43** Effect of Light Absorption Layer on MILC poly-Si TFTs Using Scanning-RTA - Y. Pyo, M. Kim, Y. Yoon, and S. Joo (Seoul National University)
- **44** Measuring of Methanol Diffusion Coefficients of New Lignin-based Membranes and Nafion 117 DuPont Membranes - T. Schaffer, E. Wallnofer, V. Hacker (Graz University of Technology), X. Zhang, R. Garcia Valls (Rovira i Virgili University), and J. Benavente Herrera (University of Malaga)
- **45** Synthesis and Improvement of Electrochemical Properties of $LiFePO_4$ by Microwave Heating - M. Song, Y. Kang, and H. Kim (Korea Advanced Institute of Science and Technology)
- **46** Electrode Materials for Electrochemical Capacitors - R. Nagireddy and R. Reddy (The University of Alabama)
- **47** Electrochemical Impedance of a Direct Methanol Fuel Cell with a Poly(styrenesulfonic) Acid (PSSA)-Poly(vinylidenefluoride) (PVDF) Composite Membrane - K. McGrath, N. Munichandraiah, G. Prakash, and G. Olah (University of Southern California)
- **48** Investigation of Electrochemical Copper Patination: Effects of PH and Iodine Adsorption Studies - S. Venkataraman and O. Chyan (University of North Texas)
- **49** Selective Wet Etching of Sputtered Ta Thin Films - R. Todi, K. Sundaram, and E. Dein (University of Central Florida)
- **50** Fabrication and Characterization of Three Dimensional Interconnection Structures for Chip Stack Packages Using Electrodeposition - K. Lee, T. Oh, H. Won, J. Lee, and T. Oh (Hongik University)
- **51** Effect of Additives on Electrodeposition of Ni-SiC Composite Coating - T. Oh, G. Chang, S. Jun, J. Lee (Hongik University), J. Byun (Korea Institute of Science and Technology), and T. Oh (Hongik University)
- **52** Probing the Defect Chemistry of Doped Nanostructured Tin Oxides for Sensor Applications - C. Drake, S. Deshpande, S. Seal, S. Shukla, L. Nguyen, and S. Patil (University of Central Florida)
- **53** Effect of RTA on the Electrical Performance of MILC TFT - S. Lee, Y. Kim, J. Yoon, and S. Joo (Seoul National University)
- **54** Photo-Responses Demonstrated by Tetracene-Based vs. Pentacene-based Thin-film Transistors - J. Choi, J. Lee, D. Hwang, S. Jeong (Yonsei University), E. Kim (Hongik University), J. Kim, and S. Im (Yonsei University)
- **55** Reliable Pentacene Thin-Film Transistors with Polymer Gate Dielectric Layers Cured at an Optimum Temperature - D. Hwang (Yonsei University), J. Park (Hongik University), J. Lee, J. Choi, S. Jeong, J. Kim (Yonsei University), E. Kim (Hongik University), and S. Im (Yonsei University)
- **56** Semi-Transparent UV-Detecting ZnO-TFTs with Polymer Gate Dielectric - K. Lee (Institute of Physics & Applied Physics), H. Bae, J. Choi, D. Hwang, J. Kim, and S. Im (Yonsei University)
- **57** Feature Profile Evolution in Chlorine Etching of Shallow Trench Isolation (STI) Structures - J. Hoang (UCLA) and J. Chang (University of California)
- **58** A Study of Crystallization Behavior and Electrical Propertiy of Sb-Doped Ge2Sb2Te5 for Application to Phase Change Memory - E. Jung, K. Do, B. Lee, J. Kwon, and D. Ko (Yonsei University)
- **59** Thermal Stability Improvement of $Ni_{1-x}Ta_x$ (x = 0.05, 0.10, 0.15, and 0.20) Alloy Systems - K. Do, D. Lee, D. Suh, and D. Ko (Yonsei University)
- **60** A Study on the Formation and Thermal Stability of Ni-Germanosilicide in the Ni and NiTa Alloy/Epi-Si_{1-x} Ge_x System - D. Lee, J. Kim, K. Do, B. Min, and D. Ko (Yonsei University)
- **61** Adjacent Impedance Probing on Genosensor - K. Ma, H. Zhou, and M. Madou (University of California, Irvine)

- **62** The Use of Cerium-Exchanged Clay as Corrosion Inhibiting and Sensing Pigments in Organic Coatings - S. Chrisanti (Fontana Corrosion Center) and R. Buchheit (The Ohio State University)
- **63** The Properties of Direct Methanol Polymer Electrolyte Fuel Cell - J. Seong and Y. Bae (Hanyang University)
- **64** Semi-Empiric SOFC Model for Transportation Power System Analysis - M. Monsberger, S. Fraser, and V. Hacker (Graz University of Technology)
- **65** Hydrogen Gas-Rechargeable Metal Hydride Electrodes for Ni-MH Battery - Y. Su (National Chi Nan University)

D2 Rechargeable Lithium and Lithium-Ion Batteries

Battery / Energy Technology

San Diego, Level 2

Opening Session
Co-Chairs: D. Scherson and M. S. Whittingham

10:00 **103** Plenary Address - New Types of Rechargeable Lithium and Lithium-Ion Polymer Batteries - B. Scrosati (University of Rome)

10:45 **104** Battery Research Award Address - The Compositional and Structural Design of Lithium Battery Electrodes: Recollections, Past to Present - M. Thackeray (Argonne National Laboratory)

11:30 **105** Toward Electromechanical Actuation Using Electrochemical Storage Compounds - Y. Chiang, S. Hall, Y. Koyama, K. Song, T. Chin, U. Rhyner, D. Sapnaras, and F. Tubilla (Massachusetts Institute of Technology)

Cathodes
Co-Chairs: J. Dahn and E. Cairns

14:00 **106** Application of Manganese Nickel Cobalt Materials in Commercial Li-Ion Cells - K. Eberman (3M Company)

14:30 **107** Lithium Insertion Material of $LiCo_{1/3}Ni_{1/3}Mn_{1/3}O_2$ for Advanced Lithium-Ion Batteries - N. Yabuuchi and T. Ohzuku (Osaka City University)

14:50 **108** Synthesis and Electrochemical Properties of F-Doped $Li[Ni_xCo_{1-2x}Mn_{x-y}Mg_y]O_2$ Materials via Coprecipitation - Y-K. Sun (Hanyang University)

15:10 **109** Effect of Excess Lithium on Power and Cycleability of $Li_{1+x}(Ni_{1/3}Co_{1/3}Mn_{1/3})O_{2+y}$ - J. Liu, I. Belharouak, and K. Amine (Argonne National Laboratory)

15:30 **110** Influence of Synthesis Temperature on the Crystal Chemistry of Layered $Li_{1-x}Ni_{1-y-z}Mn_yCo_zO_2$ - A. Manthiram and J. Choi (The University of Texas at Austin)

15:50 Intermission (20 Minutes)

Cathodes
Co-Chairs: A. Manthiram and T. Ohzuku

16:10 **111** Effect of Ti on Structure and Electrochemical Properties of $LiNi_{0.5}Mn_{0.5-x}Ti_xO_2$ Synthesized by Emulsion Drying Method - N. Kumagai (Iwate University), S. Myung (VK Coporation), and S. Komaba (Science University of Tokyo)

16:40 **112** Synthesis and Study of Nanostructured $Li_xMn_{1.5}Ni_{0.5}O_4$ 4.7 V Spinels - M. Kunduraci, F. Badway, and G. Amatucci (Rutgers, The State University of New Jersey)

17:00 **113** Coating Technologies of the Cathode Materials in Li-Ion Batteries: Past, Current, and Future - J. Cho (Kumoh National Institute of Technology)

17:20 **114** Microwave Plasma-Assisted Chemical Vapor Deposition of Conductive Carbon Coatings on Cathode Active Materials for Li-Ion Batteries - M. Marcinek and R. Kostecki (Lawrence Berkeley National Laboratory)

17:40 **115** Carbon-Fiber Containing $LiFePO_4$ Cathodes for High-Power Applications - V. Mathur, I. Thorat, D. Wheeler, and J. Harb (Brigham Young University)

E3 Coatings and Inhibitors

Corrosion

Santa Barbara B, Lobby Level

Inorganic Coating and Surface Modification
Co-Chairs: M. Kendig and G. Ilevbare

10:00 **281** Characterization of Thermal Sprayed Zn and Al Coatings after 18 Years Exposure in Marine Environment - S. Kuroda, J. Kawakita, M. Komatsu, T. Aoyagi (National Institute for Materials Science), and H. Saitoh (Japan Association of Corrosion Control)

10:25 **282** High Voltage Anodisation of a NiTi Shape Memory Alloy - J. Kawakita (National Institute for Materials Science), A. Hassel, and M. Stratmann (Max-Planck-Institut fuer Eisenforschung)

10:50 **283** Corrosion Protection of Steel by Using ZnCoFe Alloy Coating (Replacement for Cadium Coating) - Z. Lodhi, H. Terryn, and J. De Wit (Netherlands Institute for Metals Research)

11:15 **284** Corrosion Protection of Aerospace Aluminum Alloys with Laser Surface Melting - A. Davenport, N. Tareelap, C. Padovani, B. Connolly (University of Birmingham), S. Williams, E. Siggs, and D. Price (BAE SYSTEMS)

11:40 **285** Application of Metal Surface Modification in Microdevice Fabrication - G. Zhang (Echemics)

"Smart" Corrosion Protective Coatings
Co-Chairs: G. Ilevbare and M. Kendig

14:00 **286** Corrosion Resistant Zeolite Coatings: A General Coating for Aluminum Alloys - D. Beving (University of California), N. Anderson (Naval Air Warfare Center Weapons Division), C. O'Neill, and Y. Yan (University of California)

14:25 **287** Smart Coatings with Conducting Polymers: A Guideline for Coating Development - M. Rohwerder, A. Michalik, and G. Paliwoda-Porebska (MPI for Iron Research)

14:50 **288** Design of Cathodic Inhibitors for AA2024-T3 Guided by Understanding Heterogeneous Cathodic Reaction Kinetics - J. Scully and M. Jakab (University of Virginia)

15:15 Intermission (20 Minutes)

15:35 **289** Computational Modeling of Active Corrosion Inhibitor Release from an Al-Co-Ce Metallic Coating: Protection of Exposed 2024-T3 - F. Presuel, M. Jakab, R. Kelly, and J. Scully (University of Virginia)

16:00 **290** Characterization of Inhibitor Release from Zn-Al-$[V_{10}O_{28}]^{6-}$ Hydrotalcite Pigments for the Corrosion Resistant Coatings - R. Buchheit and S. Mahajanam (Ohio State University)

16:25 **291** Inhibition by Polyaniline of Corrosion-Driven Coating Delamination on Carbon Steel: Aspects Regarding the Role of the Counter-Anion - A. Cook, A. Gabriel, N. Laycock (Industrial Research Limited), N. McMurray, and G. Williams (University of Wales, Swansea)

E4 Corrosion and Electrochemistry of Advanced Materials, in Honor of Koji Hashimoto

Corrosion

Avalon, Level 3

Amorphous and Nanocrystalline Materials
Co-Chairs: M. Janik-Czachor and C. Clayton

10:00 Introductory Remarks (10 Minutes)

10:10 **319** Pit Initiation on Partially Amorphous Alloys with Solute-Lean Nanocrystals - J. Scully, A. Lucente, and G. Shiflet (University of Virginia)

10:30 **320** A Comparison of the Corrosion Behavior of Nanocrystalline and Conventional Al 5083 Samples - F. Mansfeld, E. Kus, S. Nutt, and Z. Lee (University of Southern California)

10:50 **321** Oxidation and Vacuum Degassing Behavior of Rapidly Solidified Al Alloy Powders - M. Yamasaki, K. Iwamoto, and Y. Kawamura (Kumamoto University)

11:10 **322** Electrochemical Behavior of Nanocrystalline Aluminum - S. Virtanen, J. Brunner, and J. Wloka (University of Erlangen-Nuremberg)

11:30 **323** Corrosion-resistant Bulk Amorphous Ni-Cr-Ta-Mo-Nb-5P Alloys in Concentrated Hydrochloric Acids - H. Shinomiya, A. Nakazawa, Z. Kato, A. El-Moneim, Y. Niizeki (Tohoku Institute of Technology), K. Asami (Tohoku University), and K. Hashimoto (Tohoku Institute of Technology)

Electrochemical Behavior of Light Metals and Others
Co-Chairs: F. Mansfeld, K. Hebert, and H. Habazaki

14:00 **324** Data Mining of Experimental Corrosion Data using Neural Network - M. Kamrunnahar and M. Urquidi-Macdonald (Penn State University)

14:20 **325** Electrochemical Characterization of Nano-Layered Novel Hybrid Gel Coatings - R. Akid and H. Wang (Sheffield Hallam University)

14:40 **326** Using Electron Transfer Mediators for the Corrosion Protection of Aluminum Alloys by Polypyrrole - K. Levine, D. Tallman, and G. Bierwagen (North Dakota State University)

15:00 **327** Purification of Tannery Effluent by Electrolytic Corrosion of Aluminum - G. Mathieson, A. Langdon (University of Waikato), and G. Jamieson (Works Filter Systems Limited)

15:20 **328** Electrochemical Behavior of Boron Carbide and Galvanic Corrosion of Boron Carbide Reinforced 6092 Aluminum Composites - H. Ding and L. Hihara (University of Hawaii at Manoa)

15:40 **329** Electrochemical Response of AA7075-T651 following Immersion in NaCl Solution - N. Birbilis (Fontana Corrosion Center) and R. Buchheit (The Ohio State University)

16:00 Intermission (20 Minutes)

16:20 **330** Formation of Interfacial Voids in Aluminum by Room-Temperature Dissolution - K. Hebert, S. Adhikari (Iowa State University), Y. Jean (University of Missouri-Kansas City), and J. Lee (University of Illinois)

16:40 **331** Interfacial Structure and Composition as Controlling Factors in Void Formation at the Passive Oxide Aluminum Interface - K. Zavadil, P. Kotula, and J. Ohlhausen (Sandia National Laboratories)

17:00 **332** Electrochemical Behavior of Titanium in NaOH Solutions - S. Moon, C. Jeong, E. Byon and Y. Jeong (Korea Institute of Machinery and Materials)

17:20 **333** Corrosion Study of an AZ91 Magnesium Alloy by EIS and LEIS - B. Tribollet, G. Galicia, N. Pebere, and V. Vivier (CNRS)

17:40 **334** Corrosion Behavior of AZ31 Magnesium Alloy - B. Zhang, P. Li, J. Chen, and H. Suzuki (University of Science and Technology Beijing)

G2 Atomic Layer Deposition Applications: Challenges and Opportunities

Dielectric Science and Technology / Electronics and Photonics

Santa Anita A, Lobby Level

ALD Applications Overview
Co-Chairs: A. Londergan and T. Chiang

10:10 Introductory Remarks (10 Minutes)

10:20 **451** Implementation of Atomic Layer Deposition in Advanced Semiconductor Processes - M. Schaekers, A. Van Ammel, J. Schuhmacher, A. Delabie, A. Martin Hoyas, and Z. Chao (IMEC)

11:00 **452** ALD: Emerging Materials, Processes, and Nanoscale Technology Applications - E. Eisenbraun (University at Albany, The State University of New York)

G3 High Dielectric Constant Gate Stacks III

Dielectric Science and Technology / Electronics and Photonics

Sacramento, Level 2

Alternative Substrates
Co-Chairs: D. Landheer and A. Toriumi

10:00 **489** Gate Dielectrics for Ge MOS Technology - K. Saraswat, A. Nayfeh (Stanford University), and C. Chui (Intel)

10:30 **490** Electrical Properties of High-k HfO_2 Films on $Si_{1-x}Ge_x$ Substrates with Pre-treatment Using O_3 and NH_3 - T. Park, C. Hwang and J. Kim (Seoul National University)

10:50 **491** Characterization of Atomic-Beam Deposited $GeO_{1-x}N_x/HfO_2$ Stacks on Ge - M. Houssa, T. Conard, J. Van Steenbergen (IMEC), G. Mavrou, Y. Panayiotatos, T. Dimoulas (NCSR Demokritos), M. Meuris, M. Caymax, and M. Heyns (IMEC)

11:10 **492** Effect of Nitridation on Ge/HfO_2 Interface - R. Garg and D. Misra (New Jersey Institute of Technology)

11:30 **493** Interface Trap Characterization and Fermi Level Pinning in Si-Passivated Ge/HfO_2 Capacitors - K. Martens, B. Kaczer, P. Roussel, G. Groeseneken, and H. Maes (IMEC)

11:50 **494** Characteristics of Thermally Oxidized-Ti as a High-k Gate Dielectric on SiC Metal-Oxide-Semiconductor Devices - R. Mahapatra, N. Poolamai (University of Newcastle upon Tyne), N. Wright (University of Newcastle), P. Coleman and P. Burrows (University of Bath)

12:10 **495** Advanced High-k Dielectrics for Nano-Electronics Science and Technologies - M. Hong and J. Kwo (National Tsing-Hua University)

Joint Session:

G2 Atomic Layer Deposition Applications: Challenges and Opportunities

G3 High Dielectric Constant Gate Stacks III

Dielectric Science and Technology / Electronics and Photonics

Sacramento, Level 2

High-k Materials for Memory I - NVM
Co-Chairs: A. Londergan and S. De Gendt

14:00 **496** High-k Materials for Nonvolatile Memories - M. Specht, M. Staedele, and F. Hofmann (Infineon)

14:30 **497** High-k Materials for Tunnel Barrier Engineering in Floating-Gate Flash Memories - P. Blomme, B. Govoreanu, M. Rosmeulen (IMEC), A. Akheyar (Infineon Technologies), L. Haspeslagh, J. De Vos, M. Lorenzini, J. Van Houdt (IMEC), and K. De Meyer (IMEC/ KULeuven)

15:00 **498** High-k Materials in Flash Memories - M. Alessandri, R. Piagge, S. Alberici, E. Bellandi, M. Caniatti, G. Ghidini, A. Modelli, G. Pavia, E. Ravizza, A. Sebastiani (STMicroelectronics), C. Wiemer, S. Spiga, M. Fanciulli (Laboratorio Nazionale MDM-INFM), V. Fiorentini, E. Cadelano, and G. Lopez (SLACS-INFM, Physics Dpt., Cagliari University)

15:30 **499** Characterization of Charge Modification in ALD Nanolaminates - T. Seidel, A. Srivastava, Z. Zhang (Genus, Inc.), T. Dimitrova (Four Dimensions), A. Londergan, and Z. Karim (Genus, Inc.)

15:50 **500** Modeling of Current Conduction in HfO_2 Stack Structures - Y. Chiou, S. Gaddipati, M. Mansouri, S. Jeedigunta, and A. Kumar (University of South Florida)

High-k Materials for Memory II - DRAM
Co-Chairs: A. Londergan and K. Saraswat

16:30 **501** Recent Developments in ALD Technology for 50 nm Trench DRAM Applications - U. Schroeder, S. Jakschik, and E. Erben (Infineon Technologies)

17:00 **502** High-k Gate Dielectrics for Memory Devices - U. Chung (Samsung Electronics)

17:30 **503** Compatibility of High-k Dielectric with $TiCl_4$ Based TiN for MIS Storage Capacitors for sub 70 nm DT DRAM Technology and Beyond - X. Gay, B. Hintze, E. Erben, H. Bernhardt, S. Kudelka (Infineon Technologies), C. Goupil, and B. Mercey (Laboratoire CRISMAT)

17:50 **504** Deposition Process and Electrical Properties of $(Zr,Ti)O_2$ Thin Film Using $[Zr(OtBu)_4 + Ti(OtBu)_4]$ for Ru/ Insulator/ Ru Capacitor - J. Lim, K. Cho, K. Kim, S. Chung, W. Kim, K. Lee, J. Kim, H. Lim, C. Yoo, S. Kim, U. Chung, and J. Moon (Samsung Electronics)

H1 Copper Interconnections, Low-k Interlevel Dielectrics, and New Contact and Barrier Metallurgies/Structures

Dielectric Science and Technology / Electronics and Photonics / Electrodeposition

San Gabriel B, Lobby Level

Copper Deposition
Co-Chairs: G. Mathad and K. Kondo

10:00 **578** Materials Characterization of Seedless Copper Electrochemical Deposition on Ultra-Thin Air Exposed TaN and Ru Barrier Layers - N. Lay and D. Duquette (Rensselaer Polytechnic Institute)

10:20 **579** Electroless Plated CoWB and COWPB Films for Copper Cap Applications - V. Mathew, L. Michaelson, S. Garcia, E. Acosta, D. Werho, R. Gregory, Z. Jiang, and K. Kim (Freescale Semiconductor, Inc.)

10:40 **580** Leveling with the Step Potential in Damscene Cu Electrodeposition - S. Cho and J. Kim (Seoul National University)

11:00 **581** Comparative Study of Additive impact on Copper Deposition with Low and Medium Acid Electrolytes - S. Dasilva (STMicrolelectronics), P. Haumesser, T. Mourier, D. Fossati, M. Cordeau (CEA Leti), K. Haxaire, G. Passemard (STMicroelectronics), and E. Chainet (LEPMI-ENSEEG)

11:20 **582** Prediction of Microstructure Evolution of Electroplated Copper Films - P. Freundlich (Technical University of Ostrava)

11:40 **583** In Situ AFM Observation of the Morphology of Copper Metallization During Electrodeposition - M. Breathnach, S. Ahmed, S. Nakahara, and D. Buckley (University of Limerick)

12:00 **584** Electroless Deposition of Co-Alloys for Copper Interconnect Encapsulation - Z. Hu, T. Ritzdorf (Semitool, Inc.), N. Petrov, and C. Witt (Cookson Electronics-Enthone)

Etch Stop/Barrier Films
Co-Chairs: M. Engelhardt and P. Kohl

14:00 **585** Electrical Properties of Organic and Silicon Carbide Etch Stop Layers in Copper/Porous MSQ Structures - G. Smith, R. McGowan, S. Hosali, L. Smith, and K. Pfeifer (SEMATECH)

14:20 **586** The Investigation on the Electrical Properties of a-SiCO:H as a Diffusion Barrier to Copper - J. Heo and H. Kim (Seoul National University)

14:40 **587** Fabrication of the Electroless NiMoB Films as a Diffusion Barrier Layer on the Low-k Substrate - M. Yoshino, M. Yoshino, T. Masuda, S. Wakatsuki, J. Sasano, I. Matsuda, Y. Shacham-Diamand, and T. Osaka (Waseda University)

15:00 **588** Novel Barrier Materials for Seedless Superfill - D. Josell, T. Moffat, D. Wheeler (NIST), T. Aaltonen, M. Leskala, and M. Ritala (University of Helsinki, Finland)

15:20 Intermission (20 Minutes)

Reliability
Co-Chairs: H. Rathore and M. Engelhardt

15:40 **589** Electromigration in Sub-Micron Copper Interconnects in Low-k Dielectrics - B. Agarwala (IBM System and Technology Group), K. Chanda, H. Rathore, D. Nguyen, C. Hu, P. Mclaughlin and J. Demarest (IBM)

16:00 **590** Stress Evolution in Electrodeposited Copper Metallization During Room-Temperature Aging - T. Chowdhury, S. Ahmed, D. Buckley, M. Laugier, and S. Nakahara (University of Limerick)

16:20 **591** Degradation of Cu/Ta-N/Ta/Low-k Structure by Outgassing of Low-k Dielectrics - C. Chang (National Cheng Kung University), S. JangJian (Taiwan Semiconductor Manufacturing Company), and J. Chen (National Cheng-Kung University)

16:40 **592** Investigating the Role of Stress in SOG-Filled Shallow- Trench-Isolation Structures of Sub-70 nm Device - A. Das, A. Klipp, H. Sperlich, I. Bartusseck, R. Nitsche, and O. Kuehn (Infineon Dresden)

I1 Electrodeposition of Nanoengineered Materials I

Electrodeposition

Santa Anita C, Lobby Level

Conducting Polymers
Co-Chairs: N. V. Myung and N. H. Tao

10:10 **603** Electrochemically Fabricated Nanostructures for Chemical and Biological Sensing - A. Mulchandani (University of California - Riverside), K. Ramanathan, M. Bangar, C. Hangartar, A. Wankaya, W. Chen (University of California), and A. Mulchandani (University of California - Riverside)

10:50 **604** Morphological Study of Conducting Polymer via Electrochemical Deposition Using Imaging Ellipsometry and RQCM Technique - B. Liaw, V. Svoboda, and M. Cooney (University of Hawaii)

11:10 **605** Electrodeposition of Ultrathin, Conformal Polymer Coatings on Electrically Conductive Nanoarchitectures - J. Long (Naval Research Laboratory), T. McEvoy (Air Products), C. Rhodes, M. Doescher, and D. Rolison (Naval Research Laboratory)

Metal Oxides and Semiconductors
Co-Chairs: N. J. Tao and N. V. Myung

14:00 **606** Electrochemical Formation of Nanoengineered Oxide Films - H. Tsuchiya, J. Macak, L. Taveira, A. Ghicov, and P. Schmuki (University of Erlangen-Nuremberg)

14:20 **607** Nanostructuration of Electrodeposited Zinc Oxide Films in the Presence of Organic Additives - T. Pauporte (Laboratoire d'Electrochimie et Chimie Analytique), D. Lincot (LECA), and T. Yoshida (Gifu University)

14:40 **608** Orientation-Dependent Electrical Properties in Electrodeposited Cuprous Oxide - L. Wang, N. Tacconi, C. R. Chenthamarakshan, K. Rajeshwar, and M. Tao (University of Texas at Arlington)

15:00 **609** Structure and Properties of Electrochemically Synthesized Nickel Oxide Nanowires - T. Devine (University of California), Y. Bhargava, S. Thorne, T. Mintz, T. Cohen-Hyams, Y. Suzuki (University of California, Berkeley), and V. Radmilovic (Lawrence Berkeley National Laboratory)

15:20 **610** Cadmium Selenide Nanowire Arrays by Electrochemical Step Edge Decoration - Q. Li and R. Penner (University of California Irvine)

15:40 Intermission (30 Minutes)

16:10 **611** Fabrication of Metallic and Semiconductor Nanostructures and Nanoparticles - T. N. Khoperia, T. I. Zedginidze, N. T. Khoperia, and L. G. Maisuradze (Institute of Physics)

16:30 **612** Selective Metallization of AFM-Patterned Functionalized Silane Monolayers - K. Nelson, J. Blood, S. Cosby, M. Lee, J. Harb, D. Wheeler, M. Linford, A. Woolley, and R. Davis (Brigham Young University)

16:50 **613** HgTe Deposition by Electrochemical Atomic Layer Epitaxy (EC-ALE) - V. Venkatasamy, M. Mathe, and S. Cox (University of Georgia)

17:10 **614** Electrodeposition of Superlatticed Thermoelectric Nanowires - F. Xiao, B. Yoo (University of California - Riverside), M. Ryan, J. Herman (Jet Propulsion Laboratory), and N. Myung (University of California - Riverside)

J1 State-of-the-Art Program on Compound Semiconductors XLIII (SOTAPOCS XLIII)

Electronics and Photonics

San Gabriel A, Lobby Level

Co-Chairs: A. G. Baca and J. Wang

10:05 **705** Progress on InAs-Based Quantum Dot Light Emitters - J. Chyi, W. Liu, T. Hsieh, H. Hsu, W. Chang, W. Chen, and W. Chang (National Central University)

10:30 **706** Wide Bandgap Technology for Radio-Frequency Applications - B. Luo and K. Boutros (Rockwell Scientific Company)

10:55 **707** Progress and Potentials in Nitride-Based Dilute Magnetic Semiconductors - I. Ferguson, M. Kane, A. Asghar, and M. Strassburg (Georgia Institute of Technology)

11:20 **708** Influence of Dislocations on InP-Based Transistors with High Indium Content ($0.48 < X_{In} < 1$) $In_xAl_{1-x}As$/ $In_xGa_{1-x}As$ Device Layers - R. Sandhu (NGST)

Co-Chairs: J. Chyi and B. Luo

14:00 **709** Micro-Raman Studies of Thermal Stress Effects in GaN Heteroepitaxial Layers and Self-heating Effects in AlGaN/GaN HEMT Structures - J. Kim, J. Freitas, J. Mittereder, E. Glaser, D. Katzer (Naval Research Laboratory), S. Pearton, F. Ren (University of Florida), S. Guo, and B. Albert (Emcore Corporatoin)

14:30 **710** Indium Phosphide Double Heterojunction Bipolar Transistors with T-Shaped Emitter Metal Features having Cutoff Frequencies in Excess of 200 GHz - A. Fung, L. Samoska, J. Velebir, P. Siegel (JPL), M. Rodwell, V. Paidi, Z. Griffith (UCSB), and R. Malik (RJM Semiconductor)

14:50 **711** Novel Oxide Passivation of AlGaN/GaN High Electron Mobility Transistor and Reliability of Passivation - T. Anderson, B. Gila, M. Hlad, C. Abernathy, S. Pearton, and F. Ren (University of Florida)

15:10 **712** Simulation and Fabrication of ZnMgO/ZnCdO and ZnO/GaN Light-Emitting Diodes - S. Han, H. Yang, Y. Heo, K. Baik, D. Norton, S. Pearton, F. Ren (University of Florida), A. Osinsky, J. Dong, B. Hertog, A. Dabiran, P. Chow (SVT Associates, Inc.), L. Chernyak (University of Central Florida), T. Steiner (AFOSR), C. Kao, and G. Chi (National Central University)

15:30 Intermission (15 Minutes)

15:45 **713** UHV-EC Studies of Electrodeposition via EC-ALE on InP(100) - M. Muthuvel, D. Vairavapandian, T. Hayes, and J. Stickney (The University of Georgia)

16:05 **714** Solving the GaAs Corrosion Problem - H. Shen, L. Luu-Henderson, S. O'Neil, S. Tiku, and R. Ramanathan (Skyworks Solutions, Inc.)

16:25 **715** Wet-Cleaning and Surface Characterization of $Si_{1-x}Ge_x$ Alloys (x = 0.2 to 0.5) after Polishing: Applications for SGOI and Strained-Silicon Structures - A. Abbadie (Soitec/CEA-LETI), J. Hartmann (CEA-LETI), and P. Besson (ST Microelectronics)

K1 Physics and Chemistry of SiO_2 and the Si-SiO_2 Interface V

Dielectric Science and Technology / Electronics and Photonics

San Pedro, Lobby Level

Plenary Session
Co-Chairs: H. Z. Massoud and D. Misra

10:00 **725** Gate Dielectrics for Advanced Semiconductor Devices: Thermally-Grown SiO_2 Is a Very Difficult Act to Follow - G. Lucovsky (NC State University)

10:40 **726** Prospect of High-k/Metal Gate Stack Technology for Future CMOS Devices - B. Lee, K. Paul, P. Majhi, S. Song, R. Choi, and G. Bersuker (SEMATECH)

11:20 **727** Ordered Structure in the Thermal Oxide Layer on Silicon Substrates - T. Shimura, E. Mishima, H. Watanabe, K. Yasutake (Osaka University), M. Umeno (Fukui University of Technology), K. Tatsumura, T. Watanabe, I. Ohdomari, K. Yamada (Waseda University), S. Kamiyama, Y. Akasaka, Y. Nara, and K. Nakamura (Semiconductor Leading Edge Technologies)

Ultrathin Dielectric Technology
Co-Chairs: D. Misra and T. Hattori

14:00 **728** Novel Fabrication Process to Realize Ultra-Thin (EOT = 0.7 nm) and Ultra-Low-Leakage SiON Gate Dielectrics - K. Muraoka, D. Matsushita, K. Kato, Y. Nakasaki, S. Inumiya, K. Eguchi, and M. Takayanagi (Toshiba Corporation)

14:40 **729** Quantitative Analysis of Reaction of Hydrogen-Terminated Si(100) with Oxygen During Heating - M. Morita, S. Urabe, K. Nishimura, S. Nishikawa, and S. Morita (Osaka University)

15:00 **730** Focused Electron Beam Induced Deposition of Silicon Oxide - H. Wanzenboeck, M. Fischer (University of Technology of Vienna), J. Gottsbachner, S. Müller, W. Brezna, M. Schramboeck, and E. Bertagnolli (Institute of Solid State Electronics)

15:20 Intermission (20 Minutes)

Co-Chairs: T. Hattori and I. Baumvol

15:40 **731** Improvement in Characteristics of Thin Film Transistors by High Pressure Steam Annealing - N. Yamamoto, A. Yoshinouchi, M. Masaki, and T. Watanabe (Ishikawajima-Harima Heavy Industries Co.)

16:00 **732** Thermal Stability of LaO_x/Si Interfacial Transition Layer - H. Nohira, T. Yoshida, H. Okamoto (Musashi Institute of Technology), J. Ng, Y. Kobayashi, S. Ohmi, H. Iwai (Tokyo Institute of Technology), E. Ikenaga, K. Kobayashi (JASRI/SPring-8), Y. Takata (RIKEN/SPring-8), and T. Hattori (Musashi Institute of Technology)

16:20 **733** Photodetection Characteristics of SnO_2-Ultrathin SiO_2-Si Structures - M. Morita, M. Chikamoto, H. Hashimoto, K. Horikoshi, A. Shinozaki, S. Morita, K. Arima, and J. Uchikoshi (Osaka University)

16:40 **734** Three-Dimensional Simulation of Thermal Oxidation and the Influence of Stress - C. Hollauer, H. Ceric, and S. Selberherr (Institute for Microelectronics)

17:00 **735** Influence of Silicon Ion Implantation on the Dielectric Properties of Al-Ti Composite Oxide Film - J. Chen, Z. Feng and B. Yang (University of Electronic Science and Technology of China)

K2 Cleaning Technology in Semiconductor Device Manufacturing IX

Electronics and Photonics / Dielectric Science and Technology

Emerald Bay, Level 3

Metallic Contamination and Particle Removal
Co-Chairs: J. Ruzyllo and T. Hattori

10:00 Introductory Remarks (5 Minutes)

10:05 **751** Management of Metallic Contamination in Advanced IC Manufacturing - A. Danel, D. Renaud (LETI), P. Besson (ST Microelectronics), C. Bigot (Sumco), A. Grouillet (LETI), M. Claes, T. Bearda (IMEC), and J. Frickinger (IISB)

10:45 **752** A New Semiconductor Cleaning Method by the Use of Defect Passivation Etchless Cleaning Solutions - M. Takahashi, Y. Liu, H. Narita, and H. Kobayashi (Osaka University)

11:05 **753** The Effect of Filter Material Cleanliness on Wafer Surface Metals Contamination - T. Gutowski (Pall Corporation) and T. Roche (Freescale Semiconductor, Inc.)

11:25 **754** Nanoscale Particles Removal on an Extreme Ultra-Violet Lithography (EUVL) Mask Layer - S. Lee, S. Lee, J. Park (Hanyang Univ.), A. Busnaina (NSF Center for Microcontamination Control), J. Lee, T. Kim (IMT Co.), G. Zhang, and F. Eschbach (Intel Co.)

11:45 **755** Laser Cleaning of Nano- and Microcontaminants from Critical Silicon Surfaces - S. Kudryashov, S. Allen (Arkansas State University), and S. Shukla (University of Memphis)

Front End-of-the-Line Cleaning
Co-Chairs: R. Novak and K. Reinhardt

14:00 **756** Surface Preparation Issues Associated with High Metal Gate Devices - J. Barnett (SEMATECH), N. Moumen (SEMATECH, IBM Assignee), M. Hussain (SEMATECH), Z. Zhang (SEMATECH, TI Assignee), S. Song, and H. Huff (SEMATECH)

14:40 **757** Suppression of Surface Micro-Roughness of Silicon Wafer by Addition of Alcohol into Ultra Pure Water for Rinsing Process - M. Yamamoto (Tohoku University), K. Nii (Stella Chemifa Corporation), H. Morinaga, A. Teramoto, and T. Ohmi (Tohoku University)

15:00 **758** Cleaning of Cross-Contamination of High-k Dielectrics in Plasma Etch Tool - V. Pandit, H. Parks (University of Arizona), B. Vermeire (Arizona State University), and S. Raghavan (University of Arizona)

15:20 **759** Selective Removal of Ni for Salicidation and Fully Silicided Gates - H. Kraus (SEZ), V. Fano Leston (University of the Basque Country), J. Snow (IMEC), K. Xu (SEZ AG), and A. Lauwers (IMEC)

15:40 Intermission (20 Minutes)

16:00 **760** The Effect of Oxygen Concentration in Cleaning Process on Silicon Surface - N. Mizutani (Niche), A. Teramoto, and H. Morinaga (Tohoku University)

16:20 **761** Poly Sidewall Chemical Oxidation Technique - R. Mitra (National Semiconductor Corp)

16:40 **762** Improvement of Yield and Quality of Epitaxial Wafers Mass Production - C. Bigot (Sumco), A. Danel (LETI), and M. Nguyen (SUMCO)

17:00 **763** Degradation of Chelating Agents in Hydrogen Peroxide and APM+ Solutions - O. Doll, S. Metzger, and B. Kolbesen (Johann Wolfgang Goethe-University)

17:20 **764** Effect of Silicon Surface Condition on Film Formation Using Mist Deposition - K. Shanmugasundaram, K. Chang, and J. Ruzyllo (The Pennsylvania State University)

17:40 **765** High Dose Implant Strip in FEOL IC Manufacturing Using a Combination of Cryogenic and Wet Cleaning Technologies - S. Banerjee (Eco-Snow Systems), P. Cross (University of Arizona), R. Borade (Eco-Snow Systems), S. Raghavan (University of Arizona), M. Sato, and S. Hirae (Dainippon Screen Mfg. Co. Ltd.)

18:00 **766** Development of High Selective Poly-Si Strip Process by Using Remote Plasma - J. Han, W. Shim (Samsung Electronics), S. Choi, C. Hong, H. Cho, and J. Moon (Samsung Electronics Co.)

M1 Energy Technology and Battery Joint General Session

Energy Technology / Battery

San Bernardino, Lobby Level

Co-Chairs: B. Y. Liaw and C. S. Wang

14:00 **817** Glucose Oxidation on Enzyme Modified Electrodes for Biofuel Cell Applications - E. Yu (Max Planck Institute) and K. Sundmacher (Max Planck Institute for Dynamics of Complex Technical Systems)

14:20 **818** Mechanistic Studies of Proton Reduction in a Biomimetic Model of Hydrogenase - C. Olson, S. Ott, and R. Lomoth (Uppsala University)

14:40 **819** Anodic Formation of High-Aspect-Ratio Titania Nanotubes - K. Nakayama, T. Kubo, A. Tsubokura, Y. Nishikitani (Nippon Oil Corp.), and H. Masuda (Tokyo Metropolitan Univ.)

15:00 **820** Polypyrrole Deposition in Aqueous Solutions: Film Characteristic Dependence on Deposition Conditions - B. Liaw, F. Quinlan and M. Cooney (University of Hawaii)

15:20 **821** Investigation of $CuGaSe_2$ Thin Films for Photoelectrochemical Water Splitting Devices - J. Leisch, J. Abushama and J. Turner (National Renewable Energy Laboratory)

15:40 **822** Low Temperature Electrolytic Hydrogen Production in PEM Electrolyzer - R. Ramasamy, P. Sivasubramanian, and J. Weidner (University of South Carolina)

16:00 Intermission (20 Minutes)

Co-Chairs: J. Prakash and J. J. Xu

16:20 **823** Cathode Optimization for Lithium-Air Batteries - A. Dobley, C. Morein (Yardney Technical Products, Inc./Lithion, Inc.), and K. Abraham (E-KEM Sciences)

16:40 **824** Electrocatalytic Activities of $LiMPO_4$ (M = Mn, Co, Ni) for Oxygen Reduction in Alkaline Electrolytes - J. Xu (Rutgers University), Y. Yang, and J. Yang (Rutgers, The State University of New Jersey)

17:00 **825** Pt-Free Direct Hydrazine Fuel Cells Using Anion Exchange Membrane - K. Asazawa, K. Yamada, and H. Tanaka (Daihatsu Motor Co.)

17:20 **826** Preparation and Characterization of Tungsten Carbides as Alkaline Fuel Cell Catalysts - H. Meng, F. Xie, and P. Shen (Sun Yat-Sen Univeristy)

17:40 **827** Alkaline Direct Methanol Fuel Cell - S. Sarangapani, F. Luczak (ICET, Inc.), M. Enayetullah, T. Vitella, and P. Osenar (Protonex Technology Corporation)

18:00 **828** Peroxide Yields of Transition Metal-Based Chalcogenide Electrocatalysts for Fuel Cell Applications in Contaminated Electrolytes - J. Ziegelbauer (Northeastern University), Y. Garsany (Naval Research Laboratory), S. Mukerjee (Northeastern University), C. Urgeghe, and A. De Dattisti (University of Ferrara)

M2 Energy for Cleaner Transportation

Energy Technology / Battery

San Gabriel C, Lobby Level

Co-Chairs: K. Zaghib and J. Prakash

10:00 **847** In Situ SEM Analysis of Lithium Metal Polymer Battery - P. Hovington and K. Zaghib (Hydro-Quebec)

10:20 **848** $LiFePO_4$- Li-ion Polymer Technology for Cleaner Transportation - K. Zaghib (Hydro-Quebec)

10:40 **849** Electronic and Magnetic Properties of Carbon-Coated Lithium Iron Phosphates - C. Julien (University P et M Curie), K. Zaghib (IREQ), A. Ait Salah (INSP), A. Mauger, and F. Gendron (UPMC)

11:00 **850** Synthesis of Birnessite-Type Layered Manganese Oxide and Their Composites for Supercapacitors - F. Favier, Y. Zhou, C. Fournier, G. Dorval-Douville, S. Shanley, D. Jones, B. Mula (LAMMI UMR 5072 CNRS UM2), J. Roziere (CNRS), T. Brousse (LGMPA, Ecole Polytech Nantes), and D. Belanger (UQAM)

11:20 **851** The Influence of Binders on the Performances of Ni $(OH)_2$ Positive Electrode in Super-Capacitor - W. Yu, X. Yang and P. Wang (Beijing University of Aeronautics and Astronautics)

11:40 **852** Development of High-Capacity Metal Hydride Electrodes Using Various Rare Earth-Mg-Ni Based Super-Lattice Alloys - M. Kanemoto, T. Kakeya, M. Kuzuhara, M. Watada (GS Yuasa Corporation), T. Ozaki, and T. Sakai (National Institute of Advanced Industrial Science and Technology)

Co-Chairs: Y. K. Sun and K. Kanamura

14:00 **853** Carbon Monoxide Removal from Reformate on Nickel Catalyst for PEM Fuel Cell - A. Nafees, S. Rahman, and S. Zaidi ((King Fahd University of Petroleum and Minerals)

14:20 **854** Kinetic and Mechanistic Investigations of Methanol Oxidation on a Smooth Polycrystalline Pt Surface Using Rotating Disc Electrode Technique - G. Hou and J. Prakash (Illinois Institute of Technology)

14:40 **855** Electrochemical Analysis of Hydrogen Membrane Fuel Cell - N. Ito, M. Iijima, K. Kimura, and S. Iguchi (Toyota Motor Corporation)

15:00 **856** The Effect on In-Cell Measurements from Water and Methanol Transport in Direct Methanol Proton Exchange Membrane Fuel Cells - M. Lefebvre (PolyFuel, Inc.)

15:20 **857** Carbon Nanotube Based Electrodes for Proton Exchange Membrane Fuel Cells - M. Waje (University of California Riverside), X. Wang (Nanyang Technological University), W. Li, and Y. Yan (University of California Riverside)

15:40 **858** Hydrogen Absorption into Alpha Titanium Alloys - L. Yan, J. Noel and D. Shoesmith (University of Western Ontario)

16:00 **859** The Thermodynamics and Kinetics of Pd-Coated Mg_ySc_{1-y} Thin Film Electrodes - P. Notten (Philips Research), R. Niessen, and P. Vermeulen (Eindhoven University of Technology)

16:20 **860** Modeling of Hydrogen Absorption/Desorption Isotherms of Hydride-Forming Materials - P. Notten (Philips Research), A. Ledovskikh (Eindhoven University of Technology), D. Danilov, and W. Rey (Eurandom)

16:40 **861** Structure and Phase Stability in Rare Earth-Mg-Ni-based Hydrogen Storage Alloys - T. Ozaki, Y. Kitano, S. Tanase, T. Sakai (National Institute of Advanced Industrial Science and Technology), M. Kanemoto, T. Kakeya, M. Kuzuhara, and M. Watada (GS Yuasa Corporation)

P1 Proton Exchange Membrane Fuel Cells V, in Honor of Supramaniam Srinivasan

Energy Technology / Physical and Analytical Electrochemistry / Battery / Industrial Electrolysis and Electrochemical Engineering / New Technology Subcommittee

San Francisco, Level 2

Electrode Kinetics II
Co-Chairs: S. Mukerjee and S. R. Narayanan

10:00 **906** Time-Resolved Kinetics of Electrode Reactions - E. Gileadi (Tel Aviv University)

10:40 **907** Factors Affecting Activities of Nano-size Fuel Cell Catalysts and Diagnosis Methods - Y. Tsou, L. Cao, and E. Deo Castro (De Nora North America, Inc.)

11:00 **908** Development of Nanoengineered Platinum Array Electrodes for Proton Exchange Membrane Fuel Cells - O. Paschos (College of Nanoscale Science and Engineering), P. Choi (Albany Nanotech), H. Efstathiadis, and P. Haldar (College of Nanoscale Science and Engineering)

11:40 **909** X-Ray Photoelectron Spectroscopy and Reactivity Measurements of Ru/Pt Nanoparticles Supported on a Gold Disk - A. Lewera, A. Wieckowski, W. Zhou (University of Illinois at Urbana-Champaign), R. Haasch (Frederick Seitz Materials Research Laboratory), J. Chung (University of Illinois at Urbana-Champaign), and P. Bagus (University of North Texas)

Electrode Kinetics III
Co-Chairs: S. Mukerjee and S. R. Narayanan

14:00 **910** Enhancing the Performance of Low Pt Loading Prepared by Dual Ion-Beam Assisted Deposition in PEM Fuel Cells - M. Saha, S. Mukerjee (Northeastern University), A. Gulla, and R. Allen (De Nora North America)

14:40 **911** Electrocatalyst Materials for PEM Fuel Cells Based on Iron or Vanadium Substituted Heteropoly Acids - A. Herring, R. Stanis (Colorado School of Mines), J. Ferrell III (CSM/NREL), M. Kuo (Colorado School of Mines), and J. Turner (National Renewable Energy Laboratory)

15:00 **912** Leveraging Metal-Support Interactions to Improve the Activity of PEMFC Cathode Catalysts - K. Swider-Lyons, M. Teliska, W. Baker, J. Pietron, and Y. Garsany (Naval Research Laboratory)

15:20 **913** Nanostructured Electrocatalysts for Fuel Cells: Silica Templated Synthesis of Platinum / Carbon Nano-Composites - E. Switzer, A. Datye, and P. Atanassov (University of New Mexico)

15:40 **914** Magnetron Sputtered Ta-O-N Films for PEMFC Cathode Electrocatalysts - A. Bonakdarpour, B. Easton, and J. Dahn (Dalhousie University)

16:00 Intermission (20 Minutes)

16:20 **915** New Strategies to Activation and Assembling of Catalytic Metal Nanoparticles Through Modification with Polyoxometallate Monolayers - P. Kulesza, B. Baranowska, M. Skunik, K. Miecznikowski, K. Karnicka, and M. Chojak (University of Warsaw)

17:00 **916** In Situ X-ray Absorption Spectroscopic Studies of Water Activation on Novel Electrocatalysts for Oxygen Reduction Reaction in Acid Electrolyte - J. Ziegelbauer (Northeastern University), Y. Garsany (Naval Research Laboratory), S. Mukerjee (Northeastern University), D. Gatewood, D. Ramaker, and F. Scott (George Washington University)

17:20 **917** Development of Metal-Free Catalysts for Oxygen Reduction Cathodes in PEMFCs - N. Subramanian, V. Nallathambi, and B. Popov (University of South Carolina)

17:40 **918** A Low Cost Novel Air Electrode Based on Charcoal-like Catalyst for Fuel Cells - T. Ohsaka, D. Zhang, D. Chi, M. El-deab, T. Okajima (Tokyo Institute of Technology), and T. Sotomura (Matsushita Electric Industrial Co.)

Q1 Solid-State Ionic Devices IV

High Temperature Materials / Sensor / Battery / Physical and Analytical Electrochemistry

San Jose, Level 2

Solid-State Sensors
Co-Chairs: E. D. Wachsman and F. Garzon

10:00 **1027** J. B. Wagner Award Address - Mixed Potential Sensors: From Understanding to Applications - R. Mukundan, E. Brosha, and F. Garzon (Los Alamos National Laboratory)

10:40 **1028** Electrical Characterization of Semiconducting La_2CuO_4 for Potentiometric Gas Sensor Applications - B. White, F. Van Assche IV (University of Florida), E. Traversa (University of Rome Tor Vergata), and E. Wachsman (University of Florida)

11:00 **1029** Optimization of La_2CuO_4 Sensing Electrodes for a NO_x Potentiometric Sensor - E. Macam, F. Van Assche, J. Yoo, and E. Wachsman (University of Florida)

11:20 **1030** A NO_x Sensor Using Solid Electrolyte Impedance Transducer and Perovskite-Type Oxide Receptor - Y. Shimizu, S. Takase, and D. Koba (Kyushu Institute of Technology)

Co-Chairs: F. Garzon and E. D. Wachsman

14:00 **1031** CO Gas Sensing Characteristics of ITO Electrode Coupled with Sc_2O_3-ZrO_2 Solid Electrolyte - G. Kale and X. Li (The University of Leeds)

14:20 **1032** NO_2 Sensor Using Sc_2O_3-ZrO_2 Solid Electrolyte and CuO-$CuCr_2O_4$ Sensing Electrode - G. Kale and W. Xiong (The University of Leeds)

14:40 **1033** Investigation on the Sensing Mechanism of Potentiometric Sensors with an Nb_2O_5 Sensing Electrode - L. Chevallier, E. Di Bartolomeo, M. Grilli, M. Mainas (University of Rome Tor Vergata), B. White, E. Wachsman (University of Florida), and E. Traversa (University of Rome Tor Vergata)

15:00 **1034** Potentiometric NO_x Sensing Behavior and TPR/TPD of Metal Oxide-based Sensors - J. Yoo, F. Van Assche, E. Macam, and E. Wachsman (University of Florida)

15:20 **1035** Heterogeneous Catalytic Evaluation of Potentiometric La_2CuO_4 Sensor Electrodes - F. Van Assche, J. Yoo, S. Chatterjee, and E. Wachsman (University of Florida)

Fundamentals of Point Defects
Co-Chairs: H. Seifert and X. Guo

16:00 **1036** Atomistic Simulation of Ion Transport in Yttria- and Scandia-Stabilized Zirconia - R. Devanathan, W. Weber, and S. Singhal (Pacific Northwest National Laboratory)

16:20 **1037** Thermodynamic Assessment of the Ce-O System - H. Seifert and P. Nerikar (University of Florida)

16:40 **1038** Thermo-Chemical Expansion of SOFC Materials - S. Bishop, K. Duncan, and E. Wachsman (University of Florida)

17:00 **1039** The Effect of Lattice Vacancy Concentration on Mechanical Properties of Fluorite-Structured Oxides - Y. Wang, K. Duncan, E. Wachsman, and F. Ebrahimi (University of Florida)

17:20 **1040** Ion Irradiation Effects on Yttria-Stabilized Zirconia Thin Films - J. Cheng, R. Pornprasertsuk, H. Huang, Y. Saito, and F. Prinz (Stanford University)

17:40 **1041** Schottky Barrier Formed by Network of Screw Dislocations in $SrTiO_3$ - X. Guo, E. Wachsman (University of Florida), Z. Zhang, W. Sigle (Max-Planck-Institut fuer Metallforschung), and R. Waser (Forschungszentrum Juelich)

T1 Physics and Chemistry of Luminescent Materials XIV

Luminescence and Display Materials

Santa Barbara C, Lobby Level

Persistent Phosphors and Electronic Structure
Chair: U. Happek

10:00 **1108** Crystal Structure and Associated Electronic Structure of $Sr_6B(PO_4)_5:Eu^{2+}$ Phosphor - K. Mishra (Osram Sylvania), H. Ehrenberg, S. Laubach, P. Schmidt (Technical University of Darmstadt), and R. McSweeney (Osram Sylvania)

10:20 **1109** Experimental Elucidation of the Mechanism for Persistent Luminescence in $SrAl_2O_4:Eu^{2+}$ and $SrAl_2O_4:Eu^{2+},Dy^{3+}$ - A. Setlur, A. Srivastava, H. Comanzo (GE Global Research), U. Happek, and P. Schmidt (University of Georgia)

10:40 **1110** Theoretical Investigation of Intercalated Water Molecules in $BaMgAl_{10}O_{17}:Eu^{2+}$ Phosphor and Associated Degradation Processes - K. Mishra (Osram Sylvania) and P. Schmidt (Technical Univesitat Darmstadt)

11:00 **1111** Mechanism for Persistent Luminescence in $Sr_2MgSi_2O_7:Eu^{2+}$, Dy^{3+} - P. Schmidt, U. Happek, P. Schmidt (University of Georgia), A. Setlur, A. Srivastava, and H. Comanzo (GE Global Research)

Solid-State Lighting
Co-Chairs: A. Setlur and L. Shea

13:00 **1112** On the Synthesis and Luminescence of Red LED Phosphors Based Upon Garnet Hosts - A. Setlur, W. Heward, A. Srivastava, H. Comanzo, G. Chandran, S. Venugopal (GE Global Research), U. Happek, and P. Schmidt (University of Georgia)

13:20 **1113** High Efficiency Top-Emitting Polymer Light Emitting Devices - S. Hsieh and T. Wen (National Cheng Kung University)

13:40 **1114** High Luminescence Polarized Polymer Light-Emitting Diodes Using Aligned Polyfluorene - S. Chung and T. Wen (National Cheng Kung University)

14:00 **1115** Electrochemical Properties, Photoluminescence, and Electroluminescence in Novel Luminescent Polymers - V. Cimrova, D. Vyprachticky, H. Hlidkova (Institute of Macromolecular Chemistry), J. Mikroyannidis, P. Karastatiris, and I. Spiliopoulos (University of Patras)

14:20 Intermission (20 Minutes)

14:40 **1116** Donors for Terbium Luminescence Based on Polymers Containing Quinolinone Fluorophore - D. Vyprachticky, V. Cimrova, S. Kukla, P. Pavlackova, and H. Hlidkova (Institute of Macromolecular Chemistry)

15:00 **1117** A New Green Phosphor for UV-LEDs: $Na_2Gd_2B_2O_7:Ce^{3+},Tb^{3+}$ - A. Srivastava, A. Setlur, H. Comanzo (GE Global Research), U. Happek, and P. Schmidt (University of Georgia)

15:20 **1118** Poly(fluorene derivative)s for Electrogenerated Chemiluminescence Devices - Y. Mizuno, N. Saito, Y. Kizaki, S. Enomoto, S. Uchikoga (Toshiba Corporation), and N. Naga (Shibaura Institute of Technology)

15:40 **1119** Electrochemistry for the Design and Synthesis of Luminescent Films - T. Pauporte (Laboratoire d'Electrochimie et Chimie Analytique), and T. Yoshida (Gifu University)

X1 Physical and Analytical Electrochemistry General Session

Physical and Analytical Electrochemistry

Beaudry B, Lobby Level

Co-Chairs: G. Brisard and E. Gonzales

10:00 **1143** Could $Ru(OH)_3$ Be the Active Species in PtRu Electrocatalysts? - Y. Tolmachev, E. Timofeeva, R. Hoover (Kent State University), and A. Frenkel (Yeshiva University)

10:20 **1144** Modeling of Fuel Cell Systems - E. Gonzalez and R. Sousa, Jr. (Instituto de Quimica de Sao Carlos)

10:40 **1145** Effect of OH- Concentration on the Kinetics of Oxygen Reduction Catalyzed by Co(II) Fluoro-phthalocyanine Adsorbed on Graphite - C. Song, L. Zhang, J. Zhang, H. Wang, and D. Wilkinson (Institute for Fuel Cell Innovation)

11:00 **1146** Automated Combinatorial Electrochemical Deposition of Metal Nanoclusters with Size Selectivity - A. Ranasinghe, J. Chou, S. Jayaraman, E. McFarland (University of California), S. Buratto, and H. Metiu (University of California, Santa Barbara)

11:20 **1147** Nanocrystalline Oxides as Oxygen Evolution Electrocatalysts for PEM Water Electrolysis - A. Marshall, B. Borresen, G. Hagen, M. Tsypkin, and R. Tunold (NTNU)

11:40 **1148** Surface Oxide Formation on Ru and Its Effect on Copper Electrodeposition - O. Chyan, S. Venkataraman, P. Nalla, and K. Yu (University of North Texas)

12:00 **1149** Electroless and Electrodeposition of Tin on Gold Surfaces Sputtered onto Aluminum Nitride Substrates: A Comparison - S. Djokic (Elchem Consulting Ltd.)

Co-Chairs: S. Djokic and G. Brisard

13:40 **1150** Calculations of Oxidation Potentials of Redox Shuttle Additives for Li-Ion Cells - R. Wang, C. Buhrmester, and J. Dahn (Dalhousie University)

14:00 **1151** Three Phase Interface Phenomena in Alkaline Fuel Cell - W. Majima (Kyoto University), E. Kusaka (Graduate School of Energy Science), Y. Fukunaka (Kyoto University), and J. Selman (Illinois Institution of Technology)

14:20 **1152** Hydrotalcite Mineral Stabilization of Titanium Dioxide Photo-Catalyzed Degradation of Unplasticized Poly-Vinyl-Chloride. - D. Worsley, G. Martin and A. Robinson (University of Wales Swansea)

14:40 **1153** Voltammetric Study of Titanium Chlorides in the Ionic Liquid 1-Ethyl-3-methylimidazolium Tetrafluoroborate - G. Cheek (US Naval Academy) and W. O'Grady (Naval Research Laboratory)

15:00 **1154** Morphology of Nanoholes Formed in Silicon by Wet Etching Using Metal Nanoparticles as Catalyst - K. Tsujino and M. Matsumura (Osaka University)

15:20 **1155** Kinetic Effects of Alcohol Addition on the Anodic Behavior of Silicon in Acid Fluoride Media - M. Musiani (CNR) and S. Cattarin (CNR IENI)

15:40 **1156** Oxidation and Dissolution of Silicon by Liquid and Vapor Water at Room Temperature - M. Matsumura (Osaka University), Y. Sawada (Japan Storage Battery Co.), and K. Tsujino (Osaka University)

16:00 **1157** Use of Microelectrode for Studying Electrochemical Kinetics of Type 304 SS in Humid Environments - T. Tatsuoka, Y. Takagi (Tokyo Electric Power Company), and Y. Kim (GE Global Research)

16:20 **1158** Carbon Dioxide-Metal Carbonate Systems in Chemical Processes and Environmental Applications - J. Salminen (University of California Berkeley) and P. Kobylin (Helsinki University of Technology)

16:40 **1159** Direct Incorporation of Electroactive Species and Dyes Inside Nafion Langmuir-Schaefer Films - P. Bertoncello and P. Unwin (University of Warwick)

17:00 **1160** Superior Performance Characteristics for the Poly(2,5-dimethoxyaniline)-Poly(styrene sulfonic acid) Based Electrochromic Device - L. Huang and T. Wen (National Cheng Kung University)

17:20 **1161** A New Graph Language for Representing the Macroscopic Formalism in Physico-Chemistry and Physics - E. Vieil (CNRS)

17:40 **1162** Coulomb Staircase Behavior of Polyaniline Quantum Dots at Room Temperature - J. Zhou, C. Cai, L. Qi, and Z. Lin (Xiamen University)

Y1 Three-Dimensional Micro- and Nanoscale Battery Architectures

Physical and Analytical Electrochemistry / Battery / Industrial Electrolysis and Electrochemical Engineering

Santa Anita B, Lobby Level

3-D Concepts and Structures
Chair: B. Dunn

10:00 **1218** Theoretical Predictions of New Electron-Transfer and Mass-Transfer Phenomena in Nanometer-Wide Electrochemical Cells - H. White, C. Smith, and R. White (University of Utah)

10:40 **1219** Three-Dimensional Thin-Film Li-Ion Microbatteries Formed in Perforated Substrates - E. Peled, M. Nathan, D. Golodnitsky, V. Yufit, E. Strauss, T. Ripenbein, I. Shechtman, and S. Menkin (Tel Aviv University)

11:20 **1220** Three-Dimensionally Interpenetrating Battery Nanoarchitectures - D. Rolison, C. Rhodes (Naval Research Laboratory), J. Lytle (University of Minnesota), J. Long, K. Pettigrew, and R. Stroud (Naval Research Laboratory)

3-D Integrated Components
Co-Chairs: H. White and D. Scherson

14:00 **1221** Developing Electrode Arrays for 3D Battery Architecture - B. Dunn, Y. Yeh, F. Chamran, H. Min, E. Falcao, D. Sun, S. Tolbert, F. Wudl, and C. Kim (University of California, Los Angeles)

14:40 **1222** Anode and Cathode Templated Three-Dimensional Lithium Ion Batteries Based on Nano-fibrous Electrodes - K. White, A. Newman, J. Boehme, C. Middleton, R. Pawle, E. Middleton, J. Lennhoff, Q. Horn (Physical Sciences Inc.), and Y. Horn (Massachusetts Institute of Technology)

15:20 **1223** Combining MD and FEA in 3-D Micro- and Nanoscale Battery Design - J. Thomas, H. Kasemegi, and A. Aabloo (Uppsala University)

16:00 Intermission (20 Minutes)

16:20 **1224** Strategies Toward Solid State Li-Ion Batteries Assembled from Interpenetrating Nanostructured Battery Materials: Coating Monolithic Macroporous Carbon Electrodes with Polymeric and Inorganic Electrolytes - A. Stein, J. Lytle, N. Ergang (University of Minnesota), and K. Lee (Seoul National University)

17:00 **1225** Three Dimensionally Ordered Composite of $LiCoO_2$ and Solid Electrolyte - K. Kanamura, N. Akutagawa, Y. Issiki, K. Hoshina, and K. Dokko (Tokyo Metropolitan University)

17:20 **1226** Three-Dimensional Nickel-Zinc Microbattery Fabrication - F. Chamran, H. Min, B. Dunn, and C. Kim (University of California, Los Angeles)

17:40 **1227** Synthesis and Characterization of Multifunctional Polymers and Insertion Oxides Electrodeposited within Confined Nanoarchitectures - J. Lytle (University of Minnesota), C. Rhodes, J. Long, K. Pettigrew, R. Stroud, and D. Rolison (Naval Research Laboratory)

AB1 Sensors Based on Nanotechnology II

Sensor / Physical and Analytical Electrochemistry

San Fernando, Lobby Level

Nanoscale Electrodes and Nanocomposite Electrodes
Co-Chairs: C. Bruckner-Lea and J. Stetter

10:00 **1317** A Stable Ultra Low Flow Reference Electrode Using A Nanochannel Glass Array Junction - F. Gao, S. Broadley, T. Chen, P. Payne (Broadley-James Corporation), and H. Silverman

10:20 **1318** Pyramidal Clusters of Ga and In with As and P Atoms as Pre-Designed Virtual Templates of Sub-Nanoscale Heterostructure Units for Sensors and Sources - L. Pozhar (Western Kentucky University)

10:40 **1319** Nonlithographic Fabrication of Nanostructured Arrays Using Anodic Aluminum Oxide Films Containing Highly Ordered Arrays of Pores of 10 to 50 nm - A. Yin, P. Kossyrev, S. Cloutier, R. Guico, J. Kim, and J. Xu (Brown University)

11:00 **1320** Electrochemical Detection of Short-Lived Species Produced by Dye-Sensitization Using TiO_2/Au Mosaic Electrode Array from Ideally Ordered Anodic Porous Alumina - M. Harada (Tokyo Metropolitan University), F. Matusmoto (Kanagawa Academy of Science and Technology), K. Nishio, and H. Masuda (Tokyo Metropolitan University)

11:20 **1321** The Gas Sensing Characteristics of Tungsten Trioxide Nanowires and Nanoparticles - B. Deb, S. Desai, R. Thurman, S. Vaddiraju, G. Sumanasekhara, and M. Sunkara (University of Louisville)

11:40 **1322** Synthesis and Properties of Polyaniline/Gold Composites - M. Josowicz, J. Smith, and J. Janata (Georgia Institute of Technology)

12:00 **1323** Individually Addressable Conducting Polymer Nanowires for FET Based Label-Free Sensing - M. Bangar, A. Wanekaya, W. Chen, A. Mulchandani, and N. Myung (University of California - Riverside)

Sensors Including Nanowires and Nanotubes
Co-Chairs: Z. Aguilar and C. Kranz

14:00 **1324** Development of a Novel SWNT-MPC Complexed Nanoscale Sensor for High Sensitivity and Selectivity Gas Detection - P. Young (San Jose State University), Y. Lu, and J. Li (NASA AMES)

14:20 **1325** Sensing Bending, Buckling, and Slip-Stick Motion of Carbon Nanotubes and Nanosprings - L. Bottomley, J. Barber, M. Poggi, A. McFarland, J. Colton (Georgia Institute of Technology), C. Nguyen (Eloret Corporation/NASA Ames Research Center), and P. Lillehei (NASA Langley Research Center)

14:40 **1326** Chemical and Biological Sensing Using Conducting Polymer Coated Single-Walled Carbon Nanotubes (SWNTs) Based FET Devices - A. Wanekaya, W. Chen, A. Mulchandani, and N. Myung (University of California - Riverside)

15:00 **1327** Immunosensor for Prostate Cancer Biomarker Based on Single-Wall Carbon Nanotube Forests - J. Rusling, X. Yu, A. Bhirde, J. Gong (University of Connecticut), S. Kim (Institute of Materials Science, University of Connecticut), V. Patel, S. Gutkind (National Institute for Dental and Craniofacial Research, NIH), and F. Papadimitrakopoulos (Institute of Materials Science, University of Connecticut)

15:20 Intermission (20 Minutes)

Biosensors Based on Nanotechnology
Co-Chairs: M. Josowicz and J. Li

15:40 **1328** Electrochemical Immunosensors Based on Nanostructured Carbonaceous Supports - B. Branch and P. Atanassov (University of New Mexico)

16:00 **1329** Nanoarray Electrochemical Sensor for the Rapid Detection of Neurological Solutes - R. Lowe, Jr. (University of Louisville), R. Mani (University of California, Santa Barbara), M. Sunkara, and R. Baldwin (University of Louisville)

16:20 **1330** Impedimetric Detection of Biomolecules via Ionic Conductance Through Alumina Nanoporous Arrays - P. Takmakov, I. Vlassiouk, S. Smirnov (New Mexico State University), D. Brevnov, and P. Atanassov (University of New Mexico)

16:40 **1331** Photoelectrochemical Detection of DNA Hybridization - L. de la Garza, Z. Saponjic, N. Dimitrijevic, M. Thurnauer, and T. Rajh (Argonne National Laboratory)

17:00 **1332** Rapid, Sensitive Immunoassays Using Magnetic and Fluorescent Particles - C. Bruckner-Lea, N. Anheier, C. Batishko, B. Dockendorff, G. Dunham, H. Edberg, J. Grate, M. Lind, G. Morgen, R. Ozanich, T. Stewart, and M. Wojcik (Pacific Northwest National Lab)

Tuesday, October 18, 2005

0900 Technical Exhibit
Pasadena, Lower Lobby Level

0930 Coffee Break
Exhibit Hall / Pasadena, Lower Lobby Level

1215 Corrosion Division Luncheon and Business Meeting
Hollywood Ballroom, Level 3

1215 Sensor Division Luncheon and Business Meeting
Los Cerritos, Lobby Level

1900 Technical Exhibit and General Poster Session
Pasadena, Lower Lobby Level

B1 Battery Safety and Abuse Tolerance

Battery
Santa Barbara A, Lobby Level

Thermal Behavior During Abuse Conditions
Co-Chairs: D. Doughty and J. I. Yamaki

08:20 **66** Thermal Behaviors of a C/$LiCoO_2$ Cell, Its Components, and Their Combinations - M. Ue, Y. Shigematsu, and S. Kinoshita (Mitsubishi Chemical Group Science and Technology Research Center)

09:00 **67** A Safety Improvement of Lithium-Ion Battery - H. Suzuki, T. Tanaka, T. Meguro, S. Hatake, Y. Dokko, and K. Nakajima (Sony Corporation)

09:40 Intermission (20 Minutes)

10:00 **68** The Effects of Cation Migration in Layered $Li_{1-x}Co_{1/3}Ni_{1/3}Mn_{1/3}O_2$ on Thermal Stabilities - H. Yoshizawa (Matsushita Battery Industrial Co.) and T. Ohzuku (Osaka City University)

10:20 **69** Modeling of Thermal Abuse Response of 18650 Li-Ion Cells - E. Roth, D. Doughty (Sandia National Laboratories), R. Spotnitz, and G. Yeduvaka (Battery Design Co.)

11:00 **70** Modeling for Thermal Behavior of Lithium-Ion Batteries - T. Kawai (Mitsubishi Chemical Group Science and Technology Research Center, Inc.)

11:20 **71** Improvement of Thermal Stability of Graphite Anode in Li-Ion Cell by Using Methyl Difluoroacetate Mixed Solvent Electrolyte - J. Yamaki, T. Shimokawa, I. Watanabe, and S. Okada (Kyushu University)

11:40 **72** Thermal Reactions of Electrolyte with the Surface of Electrode Materials: Investigation and Methods of Inhibition - B. Lucht, W. Li, C. Campion, and A. Xiao (University of Rhode Island)

Abuse Test Results and Methods
Co-Chairs: B. Barnett and T. Horiba

14:00 **73** Safety Aspect of Large-Sized Lithium Ion Batteries - T. Horiba (Hitachi Vehicle Energy, Ltd.)

14:40 **74** New Perspectives on Safety in Lithium-Ion Batteries - K. Thomas-Alyea, S. Dalton-Castor, P. Onnerud, S. Singh, J. Treger, S. Sriramulu, D. Ofer, and B. Barnett (TIAX)

15:20 **75** Evaluation of Cylindrical Cells with Additives for Self-Extinguishing and Low Voltage Tolerance Properties - J. Jeevarajan (NASA-JSC) and A. Hall (Jacobs Engineering)

15:40 **76** Destructive Physical Analysis of Components of Cycled and Abused Li-ion Cells - J. Jeevarajan (NASA-JSC) and H. Vaidyanathan (Lockheed Martin/Comsat Technical Services)

16:00 Intermission (20 Minutes)

16:20 **77** Abuse Test Manual for Electric and Hybrid Electric Vehicle Applications - D. Doughty (Sandia National Laboratories) and C. Crafts (Consultant)

16:40 **78** Safety Testing of Large Batteries by Accelerating Rate Calorimetry - M. Ottaway and P. Sears (Thermal Hazard Technology)

17:00 **79** Comparison of Safety of Two Primary Lithium Batteries for the Orbiter Wing Leading Edge Impact Sensors - J. Jeevarajan (NASA-JSC)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Abuse and Tolerance
Co-Chairs: B. Barnett and D. Doughty

- **80** Performance of Saphion Type Batteries using SEPARION Separators - V. Hennige, S. Augustin, G. Hoerpel, C. Hying, J. Tarabocchia (Degussa AG), J. Swoyer, and Y. Saidi (Valence Technology Inc.)
- **81** Thermal Analysis to Investigate the Unique Performance of SEPARION Separators - V. Hennige, S. Augustin, G. Hoerpel, C. Hying (Degussa AG), M. Kasper (Center for Solar Energy and Hydrogen Research, ZSW), and M. Wohlfahrt-Mehrens (ZSW)
- **82** A New Preparing Method for $LiFePO_4$ - W. Zhu, H. Shang, Q. Tian, X. Hu, S. Zhang, and Z. Huang (Chongqing University)
- **83** Thermal Stability of Ceramic Powder Based Composite Separator for Lithium-Ion Batteries - D. Takemura (Mitsubishi Electric Corporation), S. Aihara, K. Hamano, M. Kise, and T. Nishimura (Mitsubishi Electric Corporation Advanced Technology R&D Center)
- **84** Improved Abuse Tolerance of PoLiFlex Batteries using SEPARION Separators - V. Hennige, S. Augustin, G. Hoerpel, C. Hying (Degussa AG), P. Haug, A. Perner, M. Pompetzki, T. Woehrle, C. Wurm, and D. Ilic (VARTA Microbattery GmbH)

D2 Rechargeable Lithium and Lithium-Ion Batteries

Battery / Energy Technology

San Diego, Level 2

Anodes
Co-Chairs: R. Yazami and J. Vaughey

08:00 **116** TiO_2-B Nanotubes and Nanowires and Possible Anodes for Li-Ion Batteries - P. Bruce, R. Armstrong, and G. Armstrong (University of St. Andrews)

08:20 **117** New Titanium Oxyphosphate Material for Lithium Batteries - I. Belharouak, M. Balasubramanian, D. Abraham, and K. Amine (Argonne National Laboratory)

08:40 **118** Preparation of Nano-sized Negative Electrode Materials by a Spray Pyrolysis Method - Z. Ogumi, T. Doi, T. Abe, and Y. Iriyama (Kyoto University)

09:00 **119** Modification of the Electrochemical Behavior of Carbon Nanofibers for Lithium-Ion Batteries by Impregnation, and Thermal and Hydrothermal Treatments - J. Tirado, P. Lavela, and R. Alcantara (Universidad de Cordoba)

09:20 **120** SiCN-Coated Graphite as Anode Material for Lithium Batteries - R. Kolb, V. Liebau-Kunzmann, C. Fasel, and R. Riedel (Technical University Darmstadt)

09:40 Intermission (20 Minutes)

Co-Chairs: P. Bruce and J. Cho

10:00 **121** Electron Microscopy Contributions to the Characterization and Performance Improvement of Anode and Cathode Active Materials in the Design of Better Lithium Ion Batteries - L. Dupont, S. Grugeon (UPJV & UMR CNRS 6007), S. Laruelle (UMR CNRS 6007), A. Debart (University of St Andrews), M. Morcrette (UPJV & UMR CNRS 6007), and J. Tarascon (UMR CNRS 6007)

10:30 **122** Phenomenological Model for the Capacity of Sputtered Si-Al-M (M = Cr, Fe, Mn, Ni) Thin Film Negative Electrodes - M. Fleischauer and J. Dahn (Dalhousie University)

10:50 **123** Modeling Self Discharge Capacity Loss of the Anode in a Lithium Ion Cell - R. Ramasamy and B. Popov (University of South Carolina)

11:10 **124** Structural and Electrochemical Properties of a-Si Alloyed with Sn, Zn, or Ag - T. Hatchard (University of Alberta) and J. Dahn (Dalhousie University)

11:30 **125** The Role of Carbon Paper as Current Collector-Substrate in Tin-Based Anodes for Lithium-Ion Batteries - C. Arbizzani, S. Beninati, and M. Mastragostino (University of Bologna)

11:50 **126** Pre-lithiation Reactions of Lithium-Ion Battery Electrodes - J. Vaughey, C. Johnson, and M. Thackeray (Argonne National Laboratory)

Cathodes
Co-Chairs: G. Ceder and Y. Shao-Horn

14:00 **127** Local Electronic Structure of Layered $Li_xNi_{0.33}Mn_{0.33}Co_{0.33}O_2$ - B. Fultz, S. Miao (Caltech), M. Kocher, P. Rez (Arizona State Univ.), Y. Ozawa, R. Yazami, and C. Ahn (Caltech)

14:30 **128** Does Ni Change Its Charge State in $Li_x(Ni_{0.5}Mn_{0.5})O_2$ Cathode Materials? - P. Rez and M. Kocher (Arizona State University)

14:50 **129** Investigation of the Charge Compensation Mechanism on the Lithium Transition Metal Oxide Electrode During Li-Ion Deintercalation by Soft X-ray Absorption Spectroscopy - W. Yoon, K. Chung, X. Yang, and J. McBreen (Brookhaven National Laboratory)

15:10 **130** Processing Conditions, Structure, and Electrochemical Performance of Layered O_3 $LiNi_{0.5}Mn_{0.5}O_2$ - S. Kumar, Y. Meng, G. Ceder (Massachusetts Institute of Technology), C. Grey, J. Breger (State University of New York at Stony Brook), and Y. Shao-Horn (MIT)

15:30 **131** In Situ-XRD of Highly Charged and Discharged $Li_xNi_{0.8}Co_{0.2}O_2$ (x Close to 0) - K. Nikolowski, N. Bramnik (Darmstadt University of Technology), C. Baehtz (Deutsches Elektronen Synchrotron DESY), H. Ehrenberg, and H. Fuess (Darmstadt University of Technology)

15:50 Intermission (20 Minutes)

Co-Chairs: X. Q. Yang and K. Amine

16:10 **132** Phase Diagram of Li_xFePO_4 - J. Dodd, B. Fultz, and R. Yazami (Caltech)

16:40 **133** Morphological Optimization of $LiFePO_4$ for High Rate Applications - J. Treger, P. Onnerud, K. Thomas-Alyea, and D. Novikov (TIAX)

17:00 **134** Synchrotron Based In Situ X-ray Diffraction Studies on $LiFePO_4$ During Lithium Extraction/Insertion - K. Chung, W. Yoon, J. McBreen, H. Lee, and X. Yang (Brookhaven National Laboratory)

17:20 **135** The Electronic Properties of Chemically Delithiated $LiFePO_4$ - C. Julien (University P et M Curie), J. Dodd (Caltech), A. Ait Salah (INSP), A. Mauger, F. Gendron (UPMC), B. Fultz, and R. Yazami (Caltech)

17:40 **136** Effect of Surface Carbon Content in $LiFePO_4$/C Composite Electrodes Prepared by Spark-Plasma-Sintering Process - T. Takeuchi, M. Tabuchi, K. Ado, and K. Tatsumi (National Institute of Advanced Industrial Science and Technology)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Cathodes
Co-Chairs: M. M. Thackeray, K. Edstrom, and R. Kostecki

- **137** Thermal and Structural Stability of $Li_{1+x}Ni_{1/3}Co_{1/3}Mn_{1/3}O_2$ Advanced Cathode - I. Belharouak, W. Lu, D. Vissers, and K. Amine (Argonne National Laboratory)
- **138** Characterization of $LiCoO_2$ Coating and In-Situ XAS on $Li_{1.05}Ni_{0.35}Co_{0.25}Mn_{0.4}O_2$ Cathode Material - E. Cairns, A. Deb (Lawrence Berkeley National Laboratory), and U. Bergmann (Stanford Synchrotron Radiation Laboratory)
- **139** Electrochemical Analysis and Characterization of Layered-Spinel Composite Electrodes for Li-Ion Batteries - C. Johnson, S. Odeen, J. Vaughey, M. Thackeray (Argonne National Laboratory), J. Breger, and C. Grey (State University of New York at Stony Brook)
- **140** Electrochemical Properties of $Li(Ni_{1/3}Co_{1/3}Mn_{1/3})O_2$ Synthesized by Hydrothermal Process - J. Kim and H. Kwon (Korea Advanced Institute of Science and Technology)
- **141** Structure Changes of $LiNi_{0.6}Co_{0.25}Mn_{0.15}O_2$ Cathode Materials during Cycling - P. Liao, J. Duh (National Tsing Hua University), and S. Sheen (Academia Sinica)
- **142** Lithium De-intercalation Mechanism in $LiNi_{0.5}Mn_{0.5}O_2$ - Y. Shao-Horn, S. Kumar, Y. Meng, G. Ceder (Massachusetts Institute of Technology), C. Grey, and J. Breger (State University of New York at Stony Brook)
- **143** Lithium Nickel Manganese Oxides for Advanced Lithium-Ion Batteries - K. Ariyoshi, Y. Makimura, and T. Ohzuku (Osaka City University)
- **144** Isolating the O1 CoO_2 Phase - R. Yazami (Caltech), Y. Ozawa (Caltech-CNRS), S. Miao, B. Fultz (Caltech), and H. Gabrisch (University of New Orleans)
- **145** Structure Evolution of the 12 V Overcharged Bare and Coated Li_xCoO_2 Cathodes - J. Cho, Y. Kim, H. Lee (Kumoh National Institute of Technology), N. Shin (Pohang University of Science and Technology), Y. Kim, Y. Kim (Kumoh National Institute of Technology), C. Yoon (Hanyang Univeristy), and H. Lee (Kumoh National Institute of Technology)
- **146** Sugar Combustion Synthesis for Cathode Materials of the Lithium Secondary Battery - S. Yi, G. Kim, J. Yoo (Korea Advanced Institute of Science and Technology), H. Chung (Dongshin University), and H. Kim (Korea Advanced Institute of Science and Technology)
- **147** ^7Li NMR and Microstructure Study on $LiCoO_2$ Nanoparticles - H. Chen and C. Grey (State University of New York at Stony Brook)
- **148** Capacity Fade of $Li_{1+x}Mn_2O_4$/C Lithium-Ion Batteries - Z. Chen and K. Amine (Argonne National Laboratory)
- **149** A Comparative Study of AC Impedance Spectroscopic Studies on $LiMVO_4$ (M:Ni, Co) - M. Bhuvaneswari, S. Subramanian, and G. Gurusamy (Bharathiar University)
- **150** Correlation Between Structural and Electrochemical Properties Spinel $LiMN_2O_4$ Synthesizes Based on Chemical Manganese Dioxide - E. Shembel, P. Novak (Ener1), I. Maksuta (Ukrainian State Chemical Technology University), V. Maslov, V. Pisny, N. Globa (Ener1), and L. Neduzko (Ukrainian State Chemical Technology University)
- **151** In Situ Synchrotron X-ray in Copper Manganese Oxide Spinel Cathode Material for Li-Ion Batteries - H. Chan, J. Duh (National Tsing Hua University), and S. Sheen (Academia Sinica)
- **152** A Novel Method to Improve Cycling Performance of $LiMn_2O_4$ Cathode - Y. Xu, X. Li, L. Zhang, J. Wang, and X. Du (Xi'an Jiaotong University)
- **153** Hydrothermal Synthesis of $LiFePO_4$ under Inert Atmosphere - K. Dokko, K. Shraishi, S. Koizumi, and K. Kanamura (Tokyo Metropolitan University)
- **154** Toward a High-Rate $LiFePO_4$ Electrode - J. Wilcox and M. Doeff (Lawrence Berkeley National Laboratory)

- **155** Electrochemical Performance of $LiFePO_4$ Olivine Cathode with Compositional and Surface Modifications - T. Nakamura (University of Hyogo), M. Tabuchi (National Institute of AIST), Y. Miwa, and Y. Yamada (University of Hyogo)
- **156** Electrolytes for Operation of Li/$LiFePO_4$ Cell in Wide Temperature Range - S. Zhang, K. Xu, J. Allen, and T. Jow (U.S. Army Research Lab)
- **157** The Capacity Loss Mechanism in the $LiFePO_4$/Fe_2P Cathode System - B. Kang, G. Ceder and K. Kang (Massachusetts Institute of Technology)
- **158** Mixed Conducting Nanocomposites: Enabling the Electrochemical Properties of CuF_2 - G. Amatucci, F. Badway, J. Al-Sharab, N. Pereira, and F. Cosandey (Rutgers, the State University of New Jersey)
- **159** Investigating Stability and Intercalation of Semiconductor Crystalline Materials as Cathode for Rechargeable Batteries - A. El-Meligi (National Research Centre)
- **160** High-Density Positive Electrodes Containing Carbon Nanotubes as a Conducting Agent for Lithium Ion Cell - K. Sheem, Y. Lee (Sungkyunkwan University), and H. Lim (Samsung SDI Corporate R&D Center, Energy Lab.)
- **161** Electronic Properties of $LiFePO_4$ and Li Doped $LiFePO_4$ - V. Zhuang (Lawrence Berkeley National Lab), J. Allen (U.S. Army Research Lab), P. Ross, Jr., J. Guo, and T. Jow (University of California)

Anodes
Co-Chairs: M. M. Thackeray, K. Edstrom, and R. Kostecki

- **162** Aging Behavior of Carbonaceous Anodes at Elevated Temperature - Z. Chen, W. Lu, and K. Amine (Argonne National Laboratory)
- **163** Characterization of Graphite Anodes at Low Temperature by Pulse Power Testing and FTIR Spectroscopy - H. Yang, V. Zhuang, and P. Ross (Lawrence Berkeley National Laboratory)
- **164** Graphitic Li-Ion Negative Electrodes Blended with Fullerene Soot - M. Erickson, R. Doe (George Washington University), L. Rendek (Harris Corporation), and M. Wagner (George Washington University)
- **165** Effect of the Shape of Graphite Powders on Active Surface Area - H. Satou (Mitsubishi Chemical Group Science and Technology Research Center, Inc.), T. Kamada (Mitsubishi Chemical Corporation), and M. Ue (Mitsubishi Chemical Group Scinence and Technology Research Center, Inc.)
- **166** Charge of Graphite Electrode at Low Temperatures Down to -60 Degrees Celsius - C. Siret, C. Tessier, and P. Biensan (SAFT)
- **167** A Sub-Fluorinated Graphite Electrode for High Rate Capability Lithium Batteries - R. Yazami (Caltech), K. Lam (Quallion), and A. Hamwi (Universite Blaise Pascal Clermont-Ferrand)
- **168** Monitoring Decomposition of Solvated Graphite Intercalation Compounds by On-line and In Situ Methods - E. Lanzer, R. Wagner, P. Raimann, K. Moeller, M. Winter (Technical University Graz), and J. Besenhard (Institute for Chemistry and Technology of Inorganic Materials)
- **169** The Electrolyte Decomposition Reactions on Hard Carbon and Graphite Are Different - P. Raimann, R. Wagner, E. Lanzer, K. Moeller, M. Winter(Technical University Graz), and J. Besenhard (Institute for Chemistry and Technology of Inorganic Materials)
- **170** Characterization of the SEI Formed on Graphite Using Synchrotron PES - I. Baglien, M. Hedlund, H. Rensmo, H. Siegbahn, and K. Edstrom (Uppsala University)
- **171** Si-Graphite Composite as a New Anode Material for Lithium Secondary Batteries - K. Lee, O. Kwon, Y. Lee, W. Chang, K. Kim, and S. Lee (LG Chemical)
- **172** Sn-C Composite Electrodeposition for Anode Material of Li-Ion Battery - J. Park, S. Lee, and H. Kwon (Korea Advanced Institute of Science and Technology)
- **173** Synthesis of Sn-Carbon Anode Materials for Li-Ion Batteries - E. Huang, J. Chen, C. Hsieh, and P. Lo (ITRI)
- **174** Effect of Capping Agents in Sn Particles on Electrochemical Properties - Y. Kwon (Kumoh National Institute of Technology), M. Kim (Beamline Research Division), Y. Kim, and J. Cho (Kumoh National Institute of Technology)
- **175** $La_3Ni_2Sn_7$ Ternary Intermetallic Phase as Anode Materials for Li-Ion Battery - S. Matsuno, T. Kohno, N. Takami (Toshiba Corp.), F. Kawashima, and T. Sawa (Toshiba Materials Co.)
- **176** The Electrochemical Reaction of the Si_{1-x} Zn_x Binary System with Li - T. Hatchard (University of Alberta) and J. Dahn (Dalhousie University)
- **177** Thin Film Cu_6Sn_5 Electrodes Prepared by RF Sputtering for Li-Ion Batteries - I. Kim, O. Auciello, and J. Vaughey (Argonne National Laboratory)
- **178** Electrochemical Lithium Insertion in Zn_3P_2 Zinc Phosphide - F. Favier, M. Bichat, J. Pascal (LAMMI UMR 5072 CNRS UM2), F. Gillot (LRCS Univ. Jules Verne), and L. Monconduit (LAMMI UMR 5072 CNRS UM2)
- **179** The Influence of SBR on the Recycling Performances of Co_3O_4 Negative Electrode in Lithium -Ion Batteries - W. Yu, J. Qian, and S. Zhang (Beijing University of Aeronautics and Astronautics)
- **180** Electrode Reactions in Lithium-Ion Batteries - T. Ogasawara, A. Debart, and P. Bruce (University of St. Andrews)

Electrolytes
Co-Chairs: M. M. Thackeray, K. Edstrom, and R. Kostecki

- **181** Cyclic Quaternary Ammonium Ionic Liquids with Perfluoroalkyltrifluoroborate - Z. Zhou, H. Matsumoto and K. Tatsumi (National Institute of Advanced Industrial Science and Technology)
- **182** A Study of Electrochemical Reduction of Ethylene and Propylene Carbonate Electrolytes on Graphite Using ATR-FTIR Spectroscopy - V. Zhuang , H. Yang, B. Blizanac, and P. Ross (Lawrence Berkeley National Laboratory)

- **183** Thermal Studies of $LiPF_6$ and $LiPF_6$ Based Electrolytes by On-line TGA-FTIR - H. Yang, V. Zhuang, and P. Ross (Lawrence Berkeley National Laboratory)
- **184** Nanocomposite Gel Electrolytes for Lithium-Ion Batteries - Y. Li, S. Khan, and P. Fedkiw (North Carolina State University)
- **185** Non-Ideal Redox Shuttles: Anisole and 10-Acetylphenothiazine - L. Moshurchak, C. Buhrmester, and J. Dahn (Dalhousie University)
- **186** Enhanced Ion Transport in Ordered Polymer Electrolytes Cast Under Magnetic Field - R. Kovarsky, E. Livshits, and D. Golodnitsky (Tel Aviv University)
- **187** Do PC and EC Differ in Their Surface Chemistry on Graphitic Anode? - K. Xu, S. Zhang, and R. Jow (U.S. Army Research Lab)
- **188** Effect of Passivation Films on Cathode and Anode Charged in Siloxane-Based Electrolyte - M. Tanaka, H. Nakahara, S. Yoon, H. Tsukamoto (Quallion LLC), and S. Nutt (University of Southern California)
- **189** New Electrolyte Additive for Lithium Rechargeable Battery - Y. Ryu, J. Choi, S. Lee, and S. Doo (Samsung Advanced Institute of Technology)
- **190** The Effect of Dimethyl Methanedisulfonate as Additive to Electrolyte for Lithium Ion Batteries - Y. Kusachi (NEC Lamilion Energy, Ltd.), T. Kato, H. Ishikawa, and K. Utsugi (NEC Corporation)
- **191** Nonvolatile Additives Based on Ionic Liquids Including Carbonate Structure for Graphite Anode - H. Matsumoto, H. Sakaebe, and K. Tatsumi (National Institute of Advanced Industrial Science and Technology)
- **192** Novel Coated Separator with Poly(ethylene glycol)Borate Ester for Lithium Secondary Batteries - J. Lee, Y. Lee, J. Lee, and J. Park (Korea Advanced Institute of Science and Technology)
- **193** Characteristics of LLT Thin Film as Electrolyte of Li Secondary Battery Deposited by Sputtering Method - M. Park, H. Jung, and S. Joo (Seoul National University)
- **194** Improvement of Electrochemical Cycleability with Fluoroethylene Carbonate for Li-ion Battery Electrolytes - C. Lee, S. Moon, H. Kim (Korea Electrotechnology Research Institute), Y. Kim, and B. Kim (Techno Semichem)

Miscellaneous
Co-Chairs: M. M. Thackeray, K. Edstrom, and R. Kostecki

- **195** Resistance Growth In Lithium Ion Satellite Cells. II. Electrode Characterization after Cell Wear Out - J. Hall, A. Schoen, A. Powers (Boeing Company), K. Kirby, P. Liu (HRL Laboratories, LLC), P. Biensan, and F. Bonhomme (SAFT)
- **196** The Inhibition of Dendrites Using Bipolar Pulse Current for Charge Lithium Electrode - Z. Jiang, L. Chen, X. Li, and Q. Zhao (Fudan University)
- **197** Use of New Boundary Condition in Predicting the Electrochemical Behavior of Porous Electrodes - V. Subramanian, K. Potukuchi and V. Diwakar (Tennessee Technological University)
- **198** Surface Study of Positive Electrodes of Degraded Lithium-Ion Batteries by FTIR - M. Rahman and Y. Saito (National Institute of Advanced Industrial Science & Technology)
- **199** Mechanical and Electromechanical Characterization of Rechargeable Lithium Ion Batteries - T. Chin, U. Rhyner, Y. Koyama, and Y. Chiang (Massachusetts Institute of Technology)
- **200** Intrinsic Electrochemical Actuation Properties of Graphite for Applications in Electromechanical Actuators - Y. Koyama and Y. Chiang (Massachusetts Institute of Technology)
- **201** Surface Stabilized Amorphous Germanium Nanoparticle for Lithium Storage Material - H. Lee (Kumoh National Institute of Technology), M. Kim (Beamline Research Division), C. Choi (Kyungpook National University), and J. Cho (Kumoh National Institute of Technology)
- **202** Electrochemical Entropymetry: A New Tool for Characterizing the Degree of Graphitization in Carbonaceous Materials - R. Yazami (Caltech), Y. Reynier, and B. Fultz (CNRS)

Batteries
Co-Chairs: M. M. Thackeray, K. Edstrom, and R. Kostecki

- **203** Synthesis of Phosphorous Sulfide Solid Electrolyte and All-Solid-State Lithium Batteries with Graphite Electrode - Y. Seino (Idemitsu Kosan Co.), K. Takada, B. Kim, N. Ohta, L. Zhang, H. Wada, and M. Osada (Advanced Materials Laboratory, National Institute for Materials Science)
- **204** High Power Organic Radical Battery for Emergency Power Source - M. Satoh, K. Nakahara, J. Iriyama, S. Iwasa, and M. Suguro (NEC)
- **205** All Solid State Thin Film Lithium Polymer Batteries Using Spin Coated Polymer Electrolytes - C. Park, M. Park, S. Yoo, and S. Joo (Seoul National University)
- **206** Electrochemical Performance of Li/S Batteries with Vapor Grown Carbon Fibers (VGCFs) - K. Kim, Y. Choi, H. Ahn, J. Ahn, and K. Cho (Gyeongsang National University)
- **207** Reliability of Lithium Secondary Batteries - S. Eom, C. Lee, S. Moon, and M. Yun (Korea Electrotechnology Research Institute)
- **208** Silver and Vanadium Deposition on Lithium Anode in Li/SVO Primary Batteries - H. Yumoto, T. Piao, H. Tsukamoto (Quallion LLC), and B. Koel (University of Southern California)
- **209** $Li_{1+x}V_3O_8$ and $(CF)_n$ Hybrid Cathode Materials for ICD Batteries - H. Yumoto, N. Bourgeon, T. Tan, and H. Tsukamoto (Quallion LLC)
- **210** $Li/(CF)_n$ Battery for Low Temperature and High Power Application - T. Tan, K. Lam, and H. Yumoto (Quallion LLC)

E1 Corrosion General Poster Session

Corrosion

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: P. Schmuki

- **262** Electrochemical Impedance Study of Copper Corrosion in the Chloride Ion Contained Solution at the Presence of Benzotriazole - K. Yin (Yuan-Ze University)
- **263** Electrochemical Corrosion of the Ti-xAl-yFe Alloys Fabricated by Direct Metal Deposition in Hanks Solution - N. Pimenova and T. Starr (University of Louisville)
- **264** Application of Scanning Kelvin Probe for Monitoring Atmospheric Corrosion - T. Tatsuoka, Y. Takagi (Tokyo Electric Power Company), and Y. Kim (GE Global Research)
- **265** Control of Pitting Sites on Al for Electrolytic Capacitors - K. Nishio (Tokyo Metropolitan University), F. Tatsuro (Tokyo Metropolitan University and CREST, JST), and H. Masuda (Tokyo Metropolitan Univ.)
- **266** Iron Carbonate/Sulfide Film Formation in CO_2/H_2S Environments - W. Sun, S. Nesic (Ohio University), and S. Papavinasam (CANMET Materials Technology Laboratory)
- **267** Hydrogen Absorption into Alpha Ti Alloy During Crevice Corrosion - L. Yan, J. Noel, and D. Shoesmith (University of Western Ontario)
- **268** High Temperature Oxidation of Cr-ZrO_2-Al_2O_3 Composite - A. Martinez-Villafane, U. Arce-Colunga, V. Orozco-Carmona, F. Almeraya-Calderon, J. Chacon-Nava (Advanced Materials Research Center-CIMAV), R. Saucedo-Acuna (Universidad Autonoma de Cd. Juarez), and S. Diaz de la Torre (Intituto Politecnico Nacional)
- **269** Measurement of the Polarization Resistance of Iron and Nickel in Subcritical and Supercritical Water - K. Lee and D. Chang (Korea Institute of Machinery and Materials)

E2 Biological and Microbial Effects on Materials

Corrosion

Beaudry A, Lobby Level

Biological Corrosion
Co-Chairs: D. C. Hansen and J. C. Earthman

08:40 **270** Polarization Behavior of Biometals with Culturing Fibroblasts and Coated Collagen - S. Hiromoto, A. Yamamoto (National Institute for Materials Science), and T. Hanawa (Tokyo Medical and Dental University)

09:20 **271** Investigation of a Biological Active Sol Gel Coating for Mitigation of Microbial Induced Corrosion (MIC) - R. Akid, H. Wang, T. Smith (Sheffield Hallam University), and J. Earthman (University of California)

09:40 Intermission (20 Minutes)

10:00 **272** Electrochemical Study on Biomedical Implant Materials under Simulated Implant Conditions - Y. Tang, S. Katsuma, M. Sakamoto, and S. Fujimoto (Osaka University)

10:20 **273** Effect of Active Current Peaks on the Cytotoxicity of Stainless Steels in Simulated Bio-Solution - Y. Yoo, H. Cho, and Y. Kim (Andong National University)

10:40 **274** Environmental Effects on the Tribocorrosion of Implant Alloys - S. Mischler (EPFL)

Biocompatibility and Monitoring
Co-Chairs: J. C. Earthman and T. Hanawa

15:20 **275** Study on Blood Compatibility of Diamond-like Carbon and Titanium Nitride Films - J. Yun (Korea Research Institute of Standards and Science), J. Bae, K. Park (Ajou University), and K. Chung (Korea Research Institute of Standards and Science)

15:40 **276** Inhibition of Protein Adsorption to Titanium with Electrodeposition of PEG - T. Hanawa (Tokyo Medical and Dental University), Y. Tanaka (Shibaura Institute of Technology), Y. Iwasaki (Tokyo Medical and Dental University), S. Hiromoto (National Institute for Materials Science), and H. Imai (Shibaura Institute of Technology)

16:00 **277** Surface Film Breakdown and Repairing on Ti and Ti Alloys Induced by Rapid Straining in Simulated Body Fluid - S. Fujimoto, H. Kusu, and Y. Tang (Osaka University)

16:20 Intermission (10 Minutes)

16:30 **278** Development of a Sensor for the Detection of Biofilm Formation - J. Lee, R. Ray, and B. Little (Naval Research Laboratory)

Biological Fuel Cells
Co-Chairs: T. Hanawa and D. C. Hansen

16:50 **279** An Electrochemical Evaluation of the Bacterial Battery - E. Kus, R. Abboud, R. Popa, K. Nealson, and F. Mansfeld (University of Southern California)

17:10 **280** Factors Affecting the Performance of a Microbial Fuel Cell - O. Bretschger, E. Kus, F. Mansfeld, and K. Nealson (University of Southern California)

E3 Coatings and Inhibitors

Corrosion

Santa Barbara B, Lobby Level

Corrosion Inhibition - Non Ferrous Metals
Co-Chairs: S. Kuroda and J. Scully

08:00 **292** Inhibition of Pitting and Filiform Corrosion on AA2024-T3 by Copper Complexing Organic Compounds - H. Mcmurray, G. Williams, and A. Coleman (University of Wales Swansea)

08:25 **293** The Effects of CPC Coatings on the Corrosion/Fatigue Behavior of AA7075-T6 - S. Galyon, F. Cui, and R. Kelly (University of Virginia)

08:50 **294** Development and Characterization of Corrosion Resistant Coatings Using the Natural Biopolymer Chitosan - G. Kumar and R. Buchheit (The Ohio State University)

09:15 **295** Corrosion Protection of AA2024-T3 by Metavanadates and Vanadium-Based Conversion Coatings - G. Frankel and M. Iannuzzi (The Ohio State University)

09:40 Intermission (20 Minutes)

10:00 **296** Evaluation of the Protective Properties of Chromate-Free Polymer Coatings on Steel and Aluminum Samples Using EIS - E. Kus, M. Grunlan, W. Weber (University of Southern California), N. Anderson, P. Zarras (Naval Air Warfare Center Weapons Division), and F. Mansfeld (University of Southern California)

10:25 **297** High Throughput Screening Methods to Assess Corrosion Inhibitors for AA2024-T3 - B. Chambers and S. Taylor (University of Mississippi Medical Center)

10:50 **298** Improvement of Superhydrophobic Behavior on Carbon Nanofibers via the Design of Experiment and Analysis of Variance - T. Lin, C. Wu, and C. Hsieh (ITRI)

11:15 **299** Inhibition of Oxygen Reduction on Copper in Neutral Sodium Chloride - M. Kendig, M. Hon (Rockwell Scientific Company), and J. Sinko (Wayne Pigment Corporation)

Corrosion Inhibition - Galvanized Steel
Co-Chairs: N. McMurray and R. Taylor

15:00 **300** Evaluation of the Corrosion Resistance of Different Galvanized Steels Treated in Cerium Salt Solutions - F. Mansfeld and Y. Song (University of Southern California)

15:25 **301** Enhanced Inhibition of Zinc Corrosion in Alkaline Solutions Containing Carboxylic Acid Modified PEG - Y. Ein-Eli and M. Auinat (Technion)

15:50 **302** Fundamental Investigations of Different Film Formation Kinetics of Amorphous Conversion Layers on Zinc Coated Steel due to Grain Orientation - N. Fink, B. Wilson, C. Stromberg, and G. Grundmeier (Max-Planck-Institut fur Eisenforschung)

16:15 Intermission (15 Minutes)

16:30 **303** Investigation into the Effect Metallic Coating Thickness Has on the Corrosion Properties of Zn Al Alloys - D. Worsley and J. Sullivan (University of Wales - Swansea)

16:55 **304** Cut Edge Corrosion Protection in Organically Coated Galvanized Steels Using Ion Exchanged and Naturally Occurring Clay Mineral Pigments - D. Worsley and N. McMurray (University of Wales, Swansea)

17:20 **305** Drying Effects on Corrosion Properties of Cr(VI) and Cr(III) Treated Electrogalvanized Steel - X. Zhang (NIMR), C. van den Bos, W. Sloof (TU Delft), A. Hovestad (TNO), H. Terryn, and J. De Wit (Netherland Institute for Metals Research)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: M. Kendig

- **306** Characteristics of Sol Gel Dip Coated Ceria Films - M. Ramakrishna and D. Trivedi (Central Electrochemical Research Institute)
- **307** Preparation of TiO_2/SiO_2 Core-shell Nanoparticle via a Solution-Coating Seeded-Growth Process - R. Kuo, J. Chen, C. Hsieh, and P. Lo (ITRI)
- **308** Enhancement of Water-Repellent Performance on Functional Coating by Using the Taguchi Method - L. Ta-Sen, C. Wu, and C. Hsieh (ITRI)
- **309** BTA-Containing Microcapsule Composite Copper Coating - M. Itagaki, G. Sato, and K. Watanabe (Tokyo University of Science)
- **310** The Inhibition Activity of Low- and High-Molecular Compounds with Triazole Cycle Under Acidic Iron Corrosion - S. Kaluzhina (Voronezh State University)

E4 Corrosion and Electrochemistry of Advanced Materials, in Honor of Koji Hashimoto

Corrosion

Avalon, Level 3

Atmospheric Corrosion
Co-Chairs: D. Shifler and T. Shinohara

08:00 **335** Corrosion Monitoring of Stainless Steels in Marine Atmospheric Environment - A. Nishikata, Y. Tsutsumi, and T. Tsuru (Tokyo Institute of Technology)

08:20 **336** Corrosion Products on Copper in Humid Air Containing SO_2 -Effect of Variation in Environments - T. Sasaki, Y. Horiguchi and T. Ohtsuka (Hokkaido University)

08:40 **337** Hydrogen Accumulation in Steels During Wet and Dry Cycles - T. Tsuru (Tokyo Institute of Technology), A. Komatsu, Y. Maeda, M. Kaneko (Tokyo Tech), and A. Nishikata (Tokyo Institute of Technology)

09:00 **338** Scanning Probe Studies of Water at Aluminum and Gold Surfaces - N. Missert and R. Copeland (Sandia National Laboratories)

09:20 **339** Structure of Steel Rusts with Good Atmospheric Corrosion Resistance - T. Nakayama (Kobe Steel, Ltd.)

09:40 Intermission (20 Minutes)

Non Metallic and Electrodeposited Materials
Co-Chairs: T. Tsuru and R. Buchheit

10:00 **340** Analytical Characterization of the Corrosion Mechanisms of WC-Co by Electrochemical Methods and Inductively-Coupled Plasma Mass Spectroscopy - S. Hochstrasser (Swiss Federal Institutes for Materials Science and Technology), C. Latkoczy (ETH, Swiss Federal Institute of Technology Zurich), S. Virtanen (University of Erlangen-Nuremberg), P. Uggowitzer (ETH, Swiss Federal Institute of Technology Zurich), and P. Schmutz (Empa, Swiss Federal Institutes for Materials Science and Technology)

10:20 **341** Inhibiting Effect of Various Compounds on the Corrosion of Cobalt Silicide in a Fluoride System - J. Liu, M. Rajaratnam, M. King, D. Bernhard, and T. Baum (ATMI, Inc.)

10:40 **342** EIS Corrosion Study of Co, Ni, CoNi and CoNiMo Electrodeposited Thin Films - M. Esteves (Instituto de Quimica) and P. Sumodjo (USP)

11:00 **343** Parametric Aqueous Electrodeposition Studies of Co-Sm Alloys – J. C. Wei, M. Schwartz, and K. Nobe (UCLA)

11:20 **344** Corrosion Mechanism and Lifetime Estimation for 70%Sn-30%Zn Alloy Electrodeposit - A. Simsek Gokcesu, E. Maurer, K. Weil, and H. Pickering (The Pennsylvania State University)

11:40 **345** MO Simulation of Surface Diffusion of Zinc Adatoms on Zinc Surface - K. Azumi, K. Iokibe, and M. Seo (Hokkaido University)

Corrosion Division Awards Session
Chair: R. Kelly

14:00 **346** H. H. Uhlig Award Address - Passivation of Metals and Alloys and Passivity Breakdown at the Nanoscale: Experiments and Modeling - P. Marcus (Ecole Nationale Superieure de Chimie de Paris-CNRS)

14:30 **347** Morris Cohen Graduate Student Award Address - Surface Chemistry and Corrosion Behavior of Aluminum-Copper Systems: Air Formed Films to Complex Conversion Coatings - D. Chidambaram (Brookhaven National Laboratory)

Oxide Films and Passivity Breakdown
Co-Chairs: M. Seo and P. Schmuki

15:10 **348** Developing Concepts of Passivity and Passivity Breakdown to Improve Alloy Performance - D. Shifler (Naval Surface Warfare Center)

15:30 **349** Effects of Manganese on the Passivity of Fe-18Cr-xMn (x = 0, 6, 12) - H. Kwon and K. Park (KAIST)

15:50 **350** Influence of Co Content on the Microstructure and Corrosion Resistance of Stainless Steels - H. Chang (Korea Power Engineering Company Inc.), Y. Yoo, H. Cho, and Y. Kim (Andong National University)

16:10 Intermission (20 Minutes)

16:30 **351** Copper Surface Oxidation Induced by a Local Alkalization - N. Vasiljevic (Sandia National Laboratories), L. T. Viyannalage (SUNY Binghamton), N. Dimitrov (SUNY at Binghamton), N. Missert, and R. Copeland (Sandia National Laboratories)

16:50 **352** Growth and Properties of Self-Organized TiO_2 Nanotube Layers - P. Schmuki (University of Erlangen-Nuremberg)

17:10 **353** Formation and Dielectric Properties of Anodic Oxide Films on Nb-O Substrates - H. Habazaki (Hokkaido University)

17:30 **354** Formation of Self-Organized Zirconia Nanostructure - H. Tsuchiya, J. Macak, and P. Schmuki (University of Erlangen-Nuremberg)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: E. Akiyama

- **355** The Effect of Cathodic Treatment and Annealing of the $Fe_{76}Nb_3Cu_1Si_{13.8}B_{6.2}$ Alloy on Its Electrochemical Behavior - N. Pimenova (University of Louisville) and N. Skryabina (Perm State University)
- **356** Polarization Behavior of Powder Consolidated Zr Base Amorphous Alloy with Culturing Fibroblasts - S. Hiromoto (National Institute for Materials Science), T. Hanawa (Tokyo Medical and Dental University), N. Maruyama, and A. Yamamoto (National Institute for Materials Science)
- **357** Micromachining of Aluminum by Anodizing, Laser Irradiation, and Electrochemical Etching - T. Kikuchi and H. Takahashi (Hokkaido University)
- **358** Conventional and Pulse Cathodic Protection of Reinforced Concrete: Electrochemical Approach and Microstructural Investigations - D. Koleva, J. Hu, K. van Breugel (Delft University of Technology), N. Boshkov (Bulgarian Academy of Sciences), and H. de Wit (Delft University of Technology)
- **359** Initial Stage of Localized Corrosion on Titanium in Phosphate Buffer Solutions by Photon Rupture - M. Sakairi, H. Miyata, and H. Takahashi (Hokkaido University)
- **360** Electrochemical Noise Study on Galvanic Corrosion of Aluminum Alloy in Chloride Environments - Effect of Oxide Film Structure - M. Sakairi, Y. Shimoyama, and H. Takahashi (Hokkaido University)
- **361** Chloride-Induced Pitting Corrosion of Iron in Mildly Alkaline Borate Buffer Solutions: Localized Dissolution Kinetics - J. Soltis, S. Hodges, S. White, A. Cook, and N. Laycock (Industrial Research Limited)
- **362** Current Transients from Passive Iron Surface During Micro-Indentation - K. Fushimi, K. Takase, K. Azumi, and M. Seo (Hokkaido University)
- **363** Corrosion Multi-Monitoring of Carbon Steel in Coastal Area - H. Katayama (National Institute for Materials Science), M. Endou (Tokyo University of Science), H. Masuda (National Institute for Materials Science), M. Itagaki, and K. Watanabe (Tokyo University of Science)
- **364** Atmospheric Corrosion of Electroplated Cu Thin Film in Moist Oxygen Environment - S. Fujimoto, H. Umemura (Osaka University), and T. Shibata (Fukui University of Technology)
- **365** Design of Visible Light Sensitive Photocatalyst on Mesoporous Silica Using a Photo-Assisted Deposition (PAD) Method - H. Yamashita, Y. Masui, N. Mimura, O. Chiyoda, and I. Katayama (Osaka University)

F1 Dielectrics and the Dielectric-Electrolyte Interface in Biological and Biomedical Applications

Dielectric Science and Technology

Palos Verdes, Lobby Level

Bio-Functional Surfaces
Co-Chairs: J. Deen and D. Greve

07:55 Introductory Remarks (5 Minutes)

08:00 **382** Tethered Lipid Bilayers for Functional Analysis of Ion Channels - S. Terrettaz and H. Vogel (EPFL)

08:40 **383** Engineering the Interfacial Properties of Materials Using Polyelectrolyte Brushes - O. Azzaroni (University of Cambridge)

09:20 **384** The Direct and Selective Electrical Detection of Biomolecules Using Bacteriophage-Modified Microelectrodes - L. Yang, P. Tam, B. Murray, E. Walter, G. Weiss, and R. Penner (University of California - Irvine)

09:40 Intermission (20 Minutes)

Co-Chairs: S. Seal and P. Schmuki

10:00 **385** New Surface Chemistries for Dynamic Substrates - M. Yousaf (University of North Carolina at Chapel Hill)

10:40 **386** Modification of Silicon Surfaces for Electrically Based Chemical and Biological Sensing - G. Lopinski (National Research Council Canada)

11:20 **387** A Microscale Glucose Biofuel Cell Using Reconstituted Glucose Oxidase on Anode and Activated Palladium on Cathode - J. Choi and N. Korivi (Louisiana State University)

Bio-Sensor Arrays I
Co-Chairs: S. Terrettaz and O. Leonte

14:00 **388** Requirements of Interfaces and Electrokinetic Phenomena in Proteomics on a Chip Devices - R. Schasfoort, J. Beusink, S. Schlautmann, D. Kohlheyer, G. Besselink, and A. Tudos (University of Twente)

14:40 **389** Development of an Active-Matrix Biosensor Array - D. Greve (Carnegie Mellon University), X. Huang (Freescale Semiconductor), M. Domach (Carnegie Mellon University), and D. Nguyen (Allegheny-Singer Research Institute)

15:20 Intermission (20 Minutes)

Co-Chairs: J. Voros and R. Boukherroub

15:40 **390** The Bioelectronic Interface - Biomolecules and Excitable Cells on Electronic Devices - A. Offenhausser (Forschungszentrum Juelich)

16:20 **391** On-Chip Electrical Field Sensing for Lab-on-a-Chip Applications - W. Badawy and Y. Ghallab (University of Calgary)

F2 Thermal and Plasma CVD of Nanostructures

Dielectric Science and Technology

San Gabriel A, Lobby Level

Co-Chairs: M. Sunkara and L. Delzit

14:00 **412** SiO_2 Dielectric Film Deposition Using 100% O_3 - TEOS CVD - N. Kameda, T. Nishiguchi, T. Noyori, Y. Morikawa, M. Kekura (Meidensha Corporation), H. Nonaka, and S. Ichimura (Advanced Industrial Science and Technology)

14:20 **413** Nanocrystalline Poly-Silicon Process Engineering - M. Li, Y. Ma, K. Zhang, S. Panayil, and R. Iyer (Applied Materials, Inc.)

14:40 **414** Local FEB-CVD of Nanostructures - M. Fischer (University of Technology of Vienna), J. Gottsbachner, S. Mueller, W. Brezna, M. Schramboeck, H. Wanzenboek, and E. Bertagnolli (Institute of Solid State Electronics)

15:00 **415** Electrical Transport Through a Ge Self-Assembled Quantum Dot - H. Chung and C. Liu (National Cheng Kung University)

15:20 Intermission (20 Minutes)

15:40 **416** Mechanisms of Nucleation and Growth of Nanowires in Self-Catalysis Schemes: Indium Nitride - S. Vaddiraju (University of Louisville), M. Meyyappan (NASA Ames Research Center), and M. Sunkara (University of Louisville)

15:55 **417** Fabrication of Aligned Carbon Nanotube Trees by Continually Supplying the Catalyst Growth Method - N. Jiang (Kochi University of Technology)

16:15 **418** Carbon Nanotube Used as a Reinforcement for Biodegradable Poly(L-Lactide) - Y. Shieh and G. Liu (National Yunlin University of Science and Technology)

G1 Solid-State Joint General Poster Session

Electronics and Photonics / Dielectric Science and Technology

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: C. Claeys

- **419** Enhanced Dopant Activation in Strained-$Si/Si_{1-x}Ge_x$ Substrate Using Non-Melt Laser Annealing - K. Pey, K. Ong, P. Lee (Nanyang Technological University), A. Wee (National University of Singapore), X. Wang (Singapore Institute of Manufacturing Technology), A. Chong (Chartered Semiconductor Manufacturing Ltd), L. Wong, and C. Wong (Nanyang Technological University)
- **420** Atomic Nanolithography Using Organic Self-Assembled Monolayers Patterned by Cold, Bright Cs Atom Beams - C. O'Dwyer (Tyndall National Institute)
- **421** Realization of an Atom Scribe for Serial Pattern Writing in the Sub-Micron Domain - C. O'Dwyer (Tyndall National Institute)
- **422** Using Dynamic Signal Analyzers for Electrochemical Impedance Spectroscopy - J. Lee (Stanford Research Systems)
- **423** In-Situ Observation of the Etching of Alkanethiol Monolayer Covered Au{111} by Scanning Probe Microscopy - C. O'Dwyer (Tyndall National Institute)
- **424** Visible Light Photocatalysis of TiO_2 - SnO_2 Composite Films - M. Maeda and K. Hirota (Kanazawa Institute of Technology)
- **425** Dosage Dependent Etching Mechanism of Alkanethiol Covered Au after Exposure to a Neutral Atomic Cs Beam - C. O'Dwyer (Tyndall National Institute)
- **426** High K Dielectric Thin Films for Affordable Wireless Mobile Communications Systems - M. Cole and W. Nothwang (U.S. Army Research Laboratory)
- **427** Thin Film Silicon Solar Cells on ZnO/SnO_2/Glass Substrate - Y. Lee, J. Shin (Korea Electronics Technology Institute), and K. Lim (Korea Advanced Institute of Science and Technology)
- **428** Novel Approach for Silicon Contamination Monitoring Using Surface Photo-Voltage Measurements - I. Rapoport, P. Taylor, S. Kim, B. Orschel, and J. Kearns (SUMCO USA)

- **429** Iron Cross-Contamination Dynamics at Elevated Temperatures in Oxygen Gas Flow - I. Rapoport, P. Taylor, and J. Kearns (SUMCO USA)
- **430** Fabrication Process for the NAND-type DRAM-on-SGT - H. Nakamura (Tohoku University), H. Sakuraba, and F. Masuoka (Research Institute of Electrical Communication)
- **431** Characterization of SAMs with Small and Bulky Terminal Functional Groups - G. Bang, H. Lee, J. Park, J. Lee, N. Choi, and H. Baek (Electronics and Telecommunications Research Institute)
- **432** An Intermediate-Temperature Fuel Cell with Fast Proton Conductors Based on SnP_2O_7 - M. Nagao, P. Heo, A. Takeuchi, T. Hibino, and M. Sano (Nagoya University)
- **433** Carbon Dioxide Sorption Property and Densification Behavior of Lithium Zirconate - S. Woo, J. Yu, and S. Lee (Korea Institute of Energy Research)
- **434** Latest Developments in Manufacturing of Nanosized Ceramic Materials for Battery Applications Using the Altair Industrial Process - J. Prochazka and M. Stewart (Altair Nanomaterials, Inc.)
- **435** Influence of Negative Ion Impurities on the SPV Signal Intensity from an N-type Silicon Wafer Surface - M. Narita (Toshiba Ceramics, Co.), H. Iida, and T. Urabe (Sumika Chemical Analysis Service Co.)
- **436** Surface Roughness Effect for PDMS Direct Bonding - K. Kang, K. Yoo, S. Paek, and N. Min (Korea University)
- **437** Chemical Derivatization of Hydrogen-Terminated Diamond Surfaces - R. Boukherroub (Interdisciplinary Research Institute), X. Wallart (Institut d'Electronique de Microelectronique et de Nanotechnologie), S. Szunerits, B. Marcus, P. Bouvier, and M. Mermoux (INP Grenoble)
- **438** Performance of OTFT Manufactured on a Surface-treated FRP Substrate - I. You, S. Kang, S. Ahn, J. Oh, K. Kim, C. Kim, C. Hwang, K. Suh, and K. Kang (Electronics and Telecommunications Research Institute)
- **439** Selective Epitaxial Growth of Arsenic-Doped SiGe-Structures with LPCVD - M. Schindler, O. Senftleben, I. Eisele (Universitaet der Bundeswehr Muenchen), and W. Taylor (Freescale Inc.)
- **440** Mechanisms of Ge and Ge Oxide Quantum Dot Formation by Oxidizing SiGe Films - C. Wang, H. Chung, and C. Liu (National Cheng Kung University)
- **441** Synthesis of In and InN Quantum Dots by Ion Implantation in Silicon - Y. Huang and C. Liu (National Cheng Kung University)
- **442** Preparation and Properties of Low Dielectric Constant Polybenzoxazole-Silica Hybrid Nanocomposites via Sol-Gel Process - P. Lee and S. Hsu (National Cheng Kung University)
- **443** Abstract Withdrawn
- **444** Low Temperature Deposition of Sillicon Nitride Films by Catalytic CVD Technique - W. Hong, S. Lee, C. Cho, K. Lee, S. Kim (Sejong University), K. Lee, and S. Im (Yonsei University)
- **445** The Super-Fast Crystallization of Amorphous Silicon Using Novel Metal Induced Lateral Crystallization at 400ºC - Y. Kim, M. Kim, S. Lee, S. Joo, and Y. Pyo (Seoul National University)
- **446** CAFM Study on Various SAMs on Au Substrate - J. Park, G. Bang, N. Choi, J. Lee, H. Lee, and H. Baek (Electronics and Telecommunications Research Institute)
- **447** Nano-Patterned Electronic Device Using Nano-Imprint Lithography - N. Choi, H. Lee, J. Park, G. Bang, J. Lee, H. Baek (Electronics and Telecommunications Research Institute), and J. Jeong (Korea Institute of Machinery and Materials)
- **448** Sputter Deposition of Fe_2O_3 Films for Photoelectrochemical Hydrogen Production - W. Ingler Jr., X. Deng, and D. Sporar (The University of Toledo)
- **449** Organic Thin Film Transistors on Plastic Substrate Using Pressure Control Organic Vapor Deposition - S. Ahn, K. Seung Youl, O. Ji Young, Y. In Kyu, K. Gi Heon, B. Kyu Ha, K. Chul Am, and S. Kyung Soo (Electronics and Telecommunications Research Institute)
- **450** Studies of Cu Atomic Layer Replacement, Formed by Underpotential Deposits, to Form Pt Nanofilms Using Electrochemical Atomic Layer Epitaxy (EC-ALE) - J. Kim, Y. Kim, and J. Stickney (The University of Georgia)

G2 Atomic Layer Deposition Applications: Challenges and Opportunities

Dielectric Science and Technology / Electronics and Photonics

Santa Anita A, Lobby Level

Emerging ALD Applications
Co-Chairs: H. Zolla and J. Chang

08:00 **453** Atomic Layer Deposition of W/Al_2O_3 Nanolaminates: Applications and Challenges - S. George, F. Fabreguette and R. Wind (University of Colorado)

08:40 **454** Erbium Incorporation in Yttrium Oxide Thin Films by Radical-Enhanced Atomic Layer Deposition - T. Van, R. Ostroumov (UCLA), J. Bargar (Stanford University), K. Wang (UCLA), and J. Chang (University of California)

09:00 **455** Characteristics of Zirconium Oxide Films Deposited by Plasma-Enhanced Atomic Layer Deposition - S. Yun (ETRI), J. Lim, and J. Lee (Electronics and Telecommunications Research Institute)

09:20 **456** Organic Thin Film Transistors Using an ALD Aluminum Oxide Film as a Gate Dielectric Layer - W. Hong (Sejong University) and S. Lee (Samsung Advanced Institute of Technology)

Progress in ALD Equipment and Precursor Development
Co-Chairs: T. Chiang and P. Kirsch

10:30 **457** ALD: Moving from R&D to Mainstream - M. Chang and C. Knepfler (Applied Materials)

11:10 **458** Solid Source Vessel Design Impact on Atomic Layer Deposition - M. Verghese, C. Wang, E. Shero, and G. Wilk (ASM America)

11:30 **459** ALD Precursor Development: Challenges, Opportunities, and Managing Uncertainty - C. Hoover (Praxair, Inc.)

ALD Interconnect Applications
Co-Chairs: T. Chiang and G. S. Mathad

14:00 **460** Metal-Organic Atomic Layer Deposition of Metals for Applications in Interconnect Technology - O. van der Straten, S. Rossnagel, J. Doyle, and K. Rodbell (IBM Research)

14:40 **461** Novel Barrier Materials for Seedless Superfill by ALD: Ruthenium, Iridium and Beyond - D. Josell, T. Moffat, D. Wheeler (NIST), T. Aaltonen, M. Ritala, and M. Leskala (University of Helsinki)

15:00 **462** Platinum Liner Deposited by Atomic Layer Deposition for Cu Interconnect Application - Y. Zhu, K. Dunn, and A. Kaloyeros (University at Albany - SUNY)

15:20 **463** LEIS Study of ALD WN_xC_y on Dielectric Layers - M. Stokhof, H. Sprey (ASM-Belgium BV), W. Li, S. Haukka (ASM-Microchemistry), M. Ridder, de and H. Brongersma (Calipso BV)

15:40 **464** Low-k SiBN (Silicon Boron Nitride) Film Synthesized by a Plasma Assisted Atomic Layer Deposition - S. Yang, J. Kim, J. Noh, H. Kim, S. Lee, J. Ahn, K. Hwang, Y. Shin, U. Chung, and J. Moon (Samsung Electronics Co.)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Co-Chairs: A. Londergan and G. S. Mathad

- **465** Chemical Compatibility and Vapor Phase Stability Considerations for ALD Processes Utilizing Hafnium, Titanium, and Silicon Amide Precursors - S. Meiere, J. Peck, and M. Litwin (Praxair)
- **466** Thermal Stability of MIM Capacitor Fabricated by ALD System at High Temperature - C. Lin, C. Wang, P. Tzeng, C. Liang, W. Lo, H. Li, L. Lee, S. Lo, Y. Chou, M. Tsai, and Y. Chan (Industrial Technology Research Institute)
- **467** Precise Delivery of Liquid Precursors for ALD Applications - D. Smith, A. Shajii, P. Meneghini, S. Nagarkatti, and H. Zarrin (MKS Instruments, Inc.)
- **468** Plasma-Enhanced Atomic Layer Deposition of HfO_2 Thin Films Using Oxygen Plasma - P. Park and S. Kang (Korea Advanced Institute of Science and Technology)
- **469** A 3-Dimensional Model for Step Coverage by Atomic Layer Deposition in a Patterned Structure - J. Kim, S. Kang, J. Kim, and J. Ahn (Korea Advanced Institute of Science and Technology)
- **470** Two-Step Atomic Layer Deposition for Tantalum Nitride by Nitridation of Tantalum with Ammonia - J. Kwon and S. Kang (Korea Advanced Institute of Science and Technology)
- **471** Characteristics of ZnO Thin Films by Means of Plasma Enhanced Atomic Layer Deposition - S. Park, H. Kwack, J. Lee, C. Hwang, and H. Chu (ETRI)
- **472** Nickel Silicide Properties of Ni Thin Film Deposited Atomic Layer Deposition - S. Park, H. Kwack, J. Lee, C. Hwang, and H. Chu (ETRI)
- **473** Properties of Aluminum Silicate Deposited by Plasma Enhanced Atomic Layer Deposition - J. Lim, S. Yun, and J. Lee (ETRI)
- **474** Atomic Layer Deposition of NbN and Nb(Si)N for Metal Electrodes - H. Huotari, S. Haukka, and M. Tuominen (ASM Microchemistry Oy)
- **475** Oxidant Effect on Characteristics of Thin HfO_2 Film Grown by Atomic Layer Deposition - I. Park (Information Display Research Institute), H. Ko, T. Lee (Division of Advanced Material Science and Engineering), K. Kim (Division of Information Display Engineering), and J. Ahn (Division of Advanced Material Science and Engineering)
- **476** Scale-up of the $BaTiO_3$ ALD Process onto 200 mm Wafer - R. Matero, A. Rahtu, S. Haukka, and M. Tuominen (ASM Microchemistry Oy)
- **477** Atomic Layer Deposition Stacked Tantalum Nitride Thin Film Resistor - C. Lai (Chang Gung University)
- **478** Plasma-Enhanced Atomic Layer Deposition for Compositionally Controlled Metal Oxide Thin Films - R. Martin, R. Martin, K. Cross, M. Sawkar (University of California, Los Angeles), S. Lao (Intel), and J. Chang (University of California)
- **479** The Characteristics of Hafnium-Silicate Films Grown by ALD System - D. Lee, D. Suh, and D. Ko (Yonsei University)
- **480** The Characteristics of Hafnium-Aluminate Films Grown by ALD System Using TEMAH, TMA and O_3 - D. Lee, D. Suh, and K. Dae-Hong (Yonsei University)
- **481** Charaterization of New Thienothiophene Oligomer as Semiconducting Layer for Organic Thin Film Transistor - L. Do, S. Yun, J. Lim, Y. Yang, J. Lee, K. Baek (ETRI), E. Lim, B. Jung, and H. Shim (KAIST)

G3 High Dielectric Constant Gate Stacks III

Dielectric Science and Technology / Electronics and Photonics

Sacramento, Level 2

High-k Materials and Processing I
Co-Chairs: W. Tsai and M. Specht

08:00 **505** Rare-earth Metal Scandate High-k Layers: Promises and Problems - C. Zhao (IMEC), T. Heeg, M. Wagner, J. Schubert (FZ Juelich), T. Witters, B. Brijs, H. Bender, O. Richard (IMEC), V. Afanasiev (KU Leuven), M. Caymax, and S. De Gendt (IMEC)

08:30 **506** Bulk and Interface Material and Electrical Properties of Hafnium-Doped Tantalum Oxide High-k Films - J. Lu and Y. Kuo (Texas A&M University)

08:50 **507** Properties of Lanthanum Aluminate Deposited by ALD and MBD - Z. Yu, D. Triyoso (Freescale Semiconductor Inc.), H. Li (Motorola), K. Moore, R. Hegde, J. Grant, B. White, Jr., and P. Tobin (Freescale Semiconductor Inc.)

09:10 **508** Doped HfO_2 for Higher-k Dielectrics - A. Toriumi, Y. Yamamoto, Y. Zhao, K. Tomida, and K. Kita (The University of Tokyo)

High-k Materials and Processing II
Co-Chairs: W. Tsai and P. Lysaght

10:00 **509** New Precursors for the MOCVD and ALD of Rare Earth Oxides - A. Jones and P. Chalker (University of Liverpool)

10:30 **510** A Chemist's View of Precursors and Processes for the Production of Hf-Based High k Dielectrics - R. Clark, A. Hochberg, M. Jahl, K. Cuthill, and T. Kok (Air Products and Chemicals, Inc.)

10:50 **511** Annealing Effect and Suppression of Hydration of La_2O_3 Thin Films - D. Eom, S. No, C. Hwang, and H. Kim (Seoul National University)

11:10 **512** High-Temperature Processing Effects on Lanthanum Silicate Gate Dielectric MIS Devices - D. Lichtenwalner, J. Jur (North Carolina State University), N. Inoue (North Carolina State University, NEC), and A. Kingon (North Carolina State University)

11:30 **513** Al/La_2O_3 Analysis of Post Metallization Annealed MISFET by XPS - Y. Kuroki, J. Ng, and K. Kakushima (Tokyo Institute of Technology)

11:50 **514** Y-Doped HfO_2 Thin Films Grown by Injection MOCVD - E. Rauwel Buzin, C. Millon (Laboratoire des Materiaux et du Genie Physique), F. Ducroquet (Laboratoire de Physique de la Matiere), B. Pelissier (Laboratoire des Technologies de la Microelectronique), M. Rossell, J. Verbeeck, G. Van Tendeloo (RUCA-EMAT), B. Hollaender (Forschungszentrum Juelich), S. Rushworth (Epichem Oxide and Nitrides), and C. Dubourdieu (Laboratoire des Materiaux et du Genie Physique)

12:10 **515** Study on the Chemical Interaction Between an Atomic-Layer-Deposited HfO_2 Film and Si Substrate Depending on the Interfacial SiN Layer Formation - S. Hong, J. Jang, T. Park (Seoul National University), J. Won, R. Jung (Samsung Advanced Institute of Technology), M. Kim, and C. Hwang (Seoul National University)

Gate Electrode Materials I
Co-Chairs: D. Misra and M. Alessandri

14:00 **516** Prospect of Hf-based Gate Dielectric by PVD with FUSI Gate for LSTP Application - M. Niwa, M. Niwa, R. Mitsuhashi, K. Yamamoto, S. Hayashi, Y. Harada, M. Kubota (Matsushita Electric), A. Rothchild, T. Hoffmann, S. Kubicek, S. De Gendt, M. Heyns, and S. Biesemans (IMEC)

14:30 **517** Thermal Robustness of VFB and EOT in $HfO_x(N)$ p-MOS Devices with Partially Silicided Pt Gate Electrodes - M. Kadoshima, T. Nabatame, M. Takahashi, A. Ogawa, K. Iwamoto (MIRAI-ASET), H. Ota (MIRAI-ASRC, AIST), H. Satake (MIRAI-ASET), and A. Toriumi (The Univ. of Tokyo)

14:50 **518** Workfunction Tuning of Nickel Silicide by Varying Nickel and Silicon Composition - N. Biswas, S. Novak and V. Misra (North Carolina State University)

15:10 **519** Threshold Voltage Control in PMOSFETs with Polysilicon or Fully-Silicided Gates on Hf-Based Gate Dielectric Using Controlled Lateral Oxidation - V. Kaushik (Freescale Semiconductor/IMEC), E. Rohr, S. Hyun, S. DeGendt, S. Van Elshocht, A. Delabie, J. Everaert, A. Veloso, S. Brus, L. Ragnarsson, O. Richard, M. Caymax, and M. Heyns (IMEC)

Physical/Chemical Characterization
Co-Chairs: S. De Gendt and Y. Nara

15:50 **520** The Influence of N Incorporation on the Crystallization Kinetics of Hf Based Gate Dielectric Films - P. Lysaght, J. Barnett (SEMATECH), M. Quevedo-Lopez (TI assignee to SEMATECH), P. Kirsch (IBM assignee to SEMATECH), G. Bersuker, M. Gardner, and B. Lee (SEMATECH)

16:20 **521** Crystallinity and Defects in Hafnium Oxide and Hafnium Silicate Films - N. Nguyen, D. Chandler-Horowitz, A. Davydov, C. Hacker, S. Park, H. Xiong, J. Ehrstein, J. Kopanski, J. Suehle, E. Vogel (National Institute of Standards and Technology), and M. Frank (IBM)

16:40 **522** Effect of Nitrogen on the Electronic Properties of Hafnium Oxynitrides - J. Choi (UCLA), R. Puthenkovilakam (Intel), and J. Chang (University of California)

17:00 **523** Advanced Nano-analysis of High-k Dielectric Stacks - M. MacKenzie, F. Docherty, A. Craven (University of Glasgow), D. McComb, and C. McGilvery (Imperial College London)

17:20 **524** Structural Effects in the Dielectric Constant of Rare-Earth Oxides: Nd_2O_3 - T. Busani (UNM), P. Gonon (CNRS / UJF), and R. Devine (UNM)

17:40 **525** Probing Point Defects in Stacks of Ultrathin High-k Metal Oxides on Semiconductors by Electron Spin Resonance: The Si/HfO_2 vs the Ge/HfO_2 System - A. Stesmans and V. Afanas'ev (University of Leuven)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: D. Misra

- **526** Charge Capture Kinetics of Nitride Trap in Oxide-Nitride-Oxide(ONO) Structures by Deep Level Transient Spectroscopy - H. Cho (Dongguk University), C. Park, H. Oh, D. Kwak, Y. Lee, W. Yang (Dongguk University), and C. Kim (Samsung Advanced Institute of Technology)
- **527** A Novel Iridium Precursor for MOCVD - K. Kawano, T. Furukawa, M. Takamori, K. Tada, T. Yamakawa (Sagami Chemical Research Center), N. Oshima (TOSOH corporation), H. Fujisawa, and M. Shimizu (University of Hyogo)
- **528** Improvement in Thermal Stability of MOCVD HfO_2 Films Using an ALD SiN_x Interfacial Layer - H. Jang, S. Hong, T. Park (Seoul National University), J. Heo, S. Yang (Samsung Electronics Co.), M. Kim, and C. Hwang (Seoul National University)
- **529** Dielectric Properties of Cu/Amorphous $BaTiO_3$/Cu Structures - T. Busani (UNM), P. Gonon (CNRS / UJF), F. El Kamel (LEMD - CNRS/UJF), and F. Jomni (LEMD -(CNRS/UJF)
- **530** Structural and Electrical Properties of $(HfO_2)_{1-x}(TiO_2)_x$ Alloy Films - Y. Lo and T. Wu (National Tsing-Hua University)
- **531** Formation of Pedestal Oxynitride Layer by Extremely Shallow Nitrogen Implantation in Planar R.F. Plasma Reactor - T. Bieniek, R. Beck, A. Jakubowski (Warsaw University of Technology), P. Hoffmann, D. Schmeisser (Brandenburg Technical University Cottbu), P. Konarski, and M. Cwil (Industrial Institute of Electronics)

- **532** Stress Modulation of PECVD Silicon Nitride - M. Balseanu, L. Xia, V. Zubkov, M. Le, J. Lee, and H. M'Saad (Applied Materials)
- **533** Effects of the Defects at HfO_xN_y/Si Interface on Electrical and Reliability Characteristics of MOS Devices - K. Chang-Liao (National Tsing Hua Univ.)
- **534** Crystallization and Wet Etching Characteristics of Atomic Layer Deposited HfO_2 Films using $Hf([N(CH_3)(C_2H_5)]_3[OC(CH_3)_3])$ Precursor and O_3 Oxidant - M. Seo, S. Kim, K. Kim, T. Park, J. Kim, C. Hwang (Seoul National University) and H. Cho (Hynix Semiconductor)
- **535** Influence of Deposition Temperature of Atomic-Layer-Deposited HfO_2 Films on Interfacial Chemical Structure and Interface Trap Density - J. Kim, T. Park, C. Hwang, S. Hong, and M. Seo (Seoul National University)
- **536** Characteristics of the HfO_2 Thin Films Grown by Remote Plasma Atomic Layer Deposition Method on the Plasma Oxidized Si Substrate - H. Kang, S. Kim, J. Kim, J. Choi, and H. Jeon (Hanyang University)
- **537** Post Metallization Anneal Effects in HfO_2 Based Capacitors with Various Gate Electrodes - Y. Lu, O. Buiu, I. Mitrovic, S. Hall, P. Chalker, R. Potter (University of Liverpool), A. Nazarov, and V. Lysenko (National Academy of Sciences of Ukraine)
- **538** CAFM Study on High-k Oxide HfO Film - J. Park (Electronics and Telecommunications Research Institute)
- **539** A Radar for Ultra-Thin High-k Dielectric Film: Zero-Bias Thermally Stimulated Current Spectroscopy (ZBTSC) - W. Lau (Nanyang Technological University) and T. Han (Lam Research Corporation)
- **540** Ruthenium and Ruthenium Oxide Film Deposition by MOCVD Using $Ru(DMPD)_2$ - K. Kawano (Sagami Chemical Research Center), H. Kosuge, N. Oshima (TOSOH Corporation), and H. Funakubo (Tokyo Institute of Technology)

H1 Copper Interconnections, Low-k Interlevel Dielectrics, and New Contact and Barrier Metallurgies/Structures

Dielectric Science and Technology / Electronics and Photonics / Electrodeposition

San Gabriel B, Lobby Level

Low-k and Planarization
Co-Chairs: H. Rathore and G. Banerjee

08:40 **593** Porogen Extraction Mechanisms in Spin-on ULK Materials - A. Zenasni (LETI), F. Ciaramella, V. Jousseaume, C. Le Cornec (CEA/LETI) and G. Passemard (STMicroelectronics)

09:00 **594** Development of Full Sequence Electrochemical Mechanical Polishing for Advanced Copper Planarization - R. Jia, Y. Wang, Z. Wang, S. Tsai, J. Diao, D. Mao, L. Karuppiah, and L. Chen (Applied Materials)

09:20 **595** Fan Formation During Cu-CMP: A Galvanic Corrosion Problem? - G. Banerjee (Air Products & Chemicals Inc.)

09:40 Intermission (20 Minutes)

Interconnect Processes
Co-Chairs: G. Banerjee and H. Rathore

10:00 **596** Air-Gaps for Ultra Low-k Interconnects Fabricated with Hardened Sacrificial Polymer - P. Kohl, S. Park (Georgia Institute of Technology), J. Krotine (Promerus LLC), and S. Allen (Georgia Institute of Technology)

10:20 **597** Fabrication of Deep Sub-Lithographic Al-Based Nano Interconnects Utilizing a Wet Chemical Hard Mask Trim Process - M. Engelhardt, G. Steinlesberger, and U. Kirchner (Infineon Technologies)

10:40 **598** Electrografting, A Unique Wet Technology for Seed and Direct Plating in Copper Metallization - J. Gonzalez, F. Raynal, H. Monchoix, A. Ben Hamida, J. Daviot, P. Rabinzohn, and C. Bureau (Alchimer S.A.)

11:00 **599** Low Temperature ALD MoN for Applications in Nanoscale Devices - W. Zeng, X. Wang (University at Albany - SUNY), S. Meiere (Praxair), and E. Eisenbraun (University at Albany - SUNY)

11:20 **600** Sidewall Profile Control During Plasma Etching of Copper - G. Liu and Y. Kuo (Texas A&M University)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Co-Chairs: G. Mathad and H. Rathore

- **601** Ultra Thin Copper Film Deposition by Metal-Organic Chemical Vapor Deposition on Ruthenium Thin Film - D. Kwak, S. Kang, and H. Lee (Korea Advanced Institute of Science and Technology)
- **602** FTIR Study of Porous Low Dielectric Constant SiOC Film under Various Post-Deposition Curing Conditions - M. Sardo, A. Lagha (STMicroelectronics), A. Humbert, M. Desbois (Philips Semiconductorss), and N. Laurent (Accent Optical Technologies)

I1 Electrodeposition of Nanoengineered Materials I

Electrodeposition

Santa Anita C, Lobby Level

Metallic Nanostructures
Co-Chairs: R. Penner and D.-Y. Park

08:00 **615** Properties of ECD Au/n-C (A4) Composites: Microindentation, Wear, and Thermal Stability of ECD Nanosized Diamond \ Gold Composites - P. Cojocaru, A. Vicenzo, and P. Cavallotti (Politecnico di Milano)

08:20 **616** Controlled Generation of Metallic Nanostructures with the Tip of an Electrochemical AFM - C. Obermair, A. Wagner, C. Klinke, and T. Schimmel (University of Karlsruhe)

08:40 **617** Epitaxial Growth of Ag on Au(111) by Monolayer Restricted Galvanic Displacement - R. Vasilic and N. Dimitrov (SUNY at Binghamton)

09:00 **618** An Examination of Co and Fe Core Nanoparticles with a Protecting Shell - Z. Guo (Louisiana State University), L. Henry (Southern University), and E. Podlaha (Louisiana State University)

09:20 **619** Influence of Anodic Polarizations on the Electrodeposition of Platinum Nanoparticles on BDD Films - M. Ribeiro, P. de Oliveira, and P. Sumodjo (University of Sao Paulo)

09:40 **620** Quantized Conductance in Atomic-Scale Point Contacts Formed by Local Electrochemical Deposition of Silver - C. Obermair, R. Kniese, H. Kuhn, F. Xie, and T. Schimmel (University of Karlsruhe)

10:00 Intermission (20 Minutes)

10:20 **621** GMR in Multilayered CoNi(Fe)Cu/Cu Nanotubes and Nanowires - D. Davis, M. Moldovan, D. Young, and E. Podlaha (Louisiana State University)

10:40 **622** Electrodeposition of FePd Alloy Thin Films and Nanowires - S. Hernandez Figueroa (University of California), B. Yoo, and N. Myung (University of California - Riverside)

11:00 **623** Electrodepositon in Nanostructured Templates Using Novel Cathode Preparation - K. Bartley, J. Lee, and O. Palusinski (University of Arizona)

11:20 **624** Use of a Latex-Microsphere Template for Deposition of Ni and Pt Architectures - L. Tsagalas, D. Hill, A. Miller, J. Jiang, and T. Hall (University of Notre Dame)

11:40 **625** Electrochemical Processing of Ni Nanotube Arrays - M. Motoyama (Kyoto University), Y. Fukunaka, T. Sakka, and Y. Ogata (Kyoto Universuty)

Nanodevices
Co-Chairs: R. Penner and N. J. Tao

14:00 **626** Electrodeposition Research Award Address - Templated Electrodeposition - P. Bartlett (University of Southampton)

14:40 **627** Demonstration of a Single-Atom Transistor - T. Schimmel, F. Xie, L. Nittler, and C. Obermair (University of Karlsruhe)

15:20 **628** Chemical Sensor Applications using Functionalized Conducting Polymer Nanojunction Arrays - A. Diaz Aguilar, N. Tao, E. Forzani, X. Li (Arizona State University), R. Tsui, L. Nagahara, and I. Amlani (Motorola Labs)

15:50 **629** Nanonose: Electrochemically Functionalized Single-Walled Carbon Nanotube Gas Sensor Array - M. Nix, T. Zhang, M. Deshusses, and N. Myung (University of California - Riverside)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Co-Chairs: N. V. Myung and D. Y. Park

- **630** Preparation of CdTe Films by Sonoelectrochemical Synthesis - M. Ramakrishna (Central Electrochemical Research Institute)
- **631** Characteristics of Brush Plated ZnS Films – K. R. Murali (Central Electrochemical Research Institute)
- **632** Brush Plated ZnTe Films and Their Characteristics - K. R. Murali (Central Electrochemical Research Institute), M. Ziaudeen, and N. Jayaprakash (Government Arts College)
- **633** Pd Nanoparticles of Hydrophilic and Hydrophobic Modification for Catalyzing Electroless Cu and Ni Deposition - C. Lee, Y. Huang, L. Kuo, and J. Oung (ITRI)
- **634** Electrochemical Deposition of Copper Nanowire Arrays and Their Field Emission Properties - F. Maurer (Darmstadt University of Technology)
- **635** Direct Growth of Thin Copper Wires by Electrodeposition - T. Schimmel (University of Karlsruhe), S. Zhong, T. Koch, E. Nold, T. Scherer, H. Roesner, S. Walheim, H. Hahn (Forschungszentrum Karlsruhe), and M. Wang (Nanjing University)
- **636** Electrodeposition Behavior and Thermoelectric: Characteristics of Bi_2Te_3 for Nanowire Applications - S. Jun, K. Lee (Hongik University), J. Byun, J. Kim (Korea Institute of Science and Technology), and T. Oh (Hongik University)

I3 Science, Technology, and Tools for Electrodeposition: From Lab to Factory

Electrodeposition

San Gabriel B, Lobby Level

Chip Metallization and Tools
Co-Chairs: J. Dukovic and A. West

14:00 **664** Future Directions in Electrochemical Technology on Semiconductor Chips - H. Deligianni (IBM)

14:40 **665** Advanced Electrochemical Processes for Sub-50 nm On-chip Metallization - R. Akolkar, V. Dubin, C. Cheng, S. Johnston, R. Chebiam, and A. Fajardo (Intel Corporation)

15:20 **666** Electrochemical Evolution for 45 nm-Node Technology and Beyond - C. Shih (AMTD/TSMC), M. Tsai, W. Shue, C. Yu, and M. Liang (METD/AMTD/TSMC)

15:50 **667** Direct Copper Plating on Highly Resistive Barrier Layers - R. Palmans (IMEC)

16:10 Intermission (10 Minutes)

16:20 **668** Advanced Waveform and Uniformity Control in the Initial Stage of Copper Electrodeposition - H. Hafezi, J. Behnke, J. Dukovic, and A. Rosenfeld (Applied Materials, Inc.)

16:40 **669** An Innovative Technology for Copper Electroplating on Wafer Substrates - T. Dretschkow, O. Worm, T. Saito, and R. Preisser (Atotech Deutschland GmbH)

17:00 **670** Pad Induced Surface Additive Concentration Differential in Electrochemical Mechanical Deposition - B. Basol, A. Durmus, T. Wang, and R. Zhang (ASM NuTool)

17:20 **671** Planarization of Copper Deposits by Electropolishing for Interconnect Applications - N. Kovarsky, L. Zhu, A. Rosenfeld, and M. Yang (Applied Materials, Inc.)

17:40 **672** Copper Electrochemical Mechanical Polishing (e-CMP) Technology - K. Musaka, E. Cooper, K. Namiki, M. Kumekawa, and H. Deligianni (Ebara Technologies, Inc.)

J1 State-of-the-Art Program on Compound Semiconductors XLIII (SOTAPOCS XLIII)

Electronics and Photonics

San Gabriel A, Lobby Level

Co-Chairs: P. Chang and J. Kim

08:30 **716** Dry Etching of Sub-Micron Emitter in InP Heterojunction Double Bipolar Transistor Using Inductively Coupled Plasma - P. Nam, P. Chang, and D. Sawdai (Northrop Grumman Space Technology)

08:50 **717** Thermal Simulations of 3-D Integrated Multi-Chip Module with GaN Power Amplifier and Si Modulator - T. Anderson, F. Ren, L. Covert, J. Lin, and S. Pearton (University of Florida)

09:10 **718** Photoelectrochemical (PEC) Etching of n-GaN in H_3PO_4 and KOH Electrolytes - D. Buckley, C. Heffernan (University of Limerick), and C. O'Raifeartaigh (Waterford Institute of Technology)

09:30 **719** Material and Electrical Properties of Ultrathin HfO_2 Films on 4H-SiC (0001) - C. Tanner, J. Choi (UCLA) and J. Chang (University of California)

09:50 Intermission (20 Minutes)

10:10 **720** Novel Tungsten Boride Based High Thermal Stability Ohmic Contacts to n-GaN - R. Khanna, S. Pearton, F. Ren (University of Florida), C. Kao, G. Chi (National Central University), and I. Kravchenko (University of Florida)

10:30 **721** Multi-Scale Analysis of GaAs MOVPE Process by Using Wide-Stripe Selective Area Growth and Computational Fluid Dynamics Simulation - H. Song (The University of Tokyo), I. Im (Iksan National College, Korea), M. Sugiyama, Y. Nakano, and Y. Shimogaki (The Univ. of Tokyo)

10:50 **722** Ohmicity of Au-NiO Composite Thin Film Contacting to P-type GaN - J. Yang and J. Chen (National Cheng-Kung University)

11:10 **723** Characterization of Polyimides as a Gate Insulator for Organic Transistors - S. Maeda and G. Ono (Nissan Chemical Industries)

11:30 **724** Electrical Anisotropy of W-doped Rhenium Diselenide - S. Hu (Tung Nan Institute of Technology) and J. Liang (National Taiwan Ocean University)

K1 Physics and Chemistry of SiO_2 and the Si-SiO_2 Interface V

Electronics and Photonics / Dielectric Science and Technology

San Pedro, Lobby Level

NBTI
Co-Chairs: I. Baumvol and J. Stathis

09:00 **736** A Statistical Mechanics Model for NBTI in Oxides - S. Zafar, J. Stathis, A. Callegari, and T. Ning (IBM)

09:40 **737** On Saturation of Negative Bias Temperature Degradation - M. Alam (Purdue University)

10:20 **738** New NBTI Lifetime Prediction Method for Ultra Thin SiO_2 Films - K. Watanabe, R. Kuroda, A. Teramoto, S. Sugawa, and T. Ohmi (Tohoku University)

Ultrathin Oxide Breakdown
Co-Chairs: I. Baumvol and T. Hattori

10:40 **739** Characterization of Charge Trapping and Dielectric Breakdown of $HfAlO_x$/SiON Dielectric Gate Stack - Y. Pei, S. Nagamachi, H. Murakami, S. Higashi, S. Miyazaki (Hiroshima University), T. Kawahara, and K. Torii (Semicondutor Leading Edge Technologies, Inc.)

11:00 **740** Progressive Breakdown in Ultra-Thin Gate Oxynitrides - S. Lombardo (CNR) and F. Palumbo (CNR-IMM)

11:20 **741** Roles of Predominant and Subordinate Carriers in Breakdown Mechanism of High-k Gate Dielectrics Studied with $HfAlO_x/SiO_2$ Stacks - K. Okada (MIRAI-ASET), H. Ota (MIRAI-ASRC-AIST), A. Ogawa (MIRAI-ASET), W. Mizubayashi, T. Horikawa (MIRAI-ASRC-AIST), H. Satake, T. Nabatame (MIRAI-ASET), and A. Toriumi (The Univ. of Tokyo)

11:40 **742** Characterization of Microstructural and Oxide Damage of Breakdown Spot in Mosfets Using Nano-Analytical Techniques - K. Pey (Nanyang Technological University), C. Tung, and L. Tang (Institute of Microelectronics)

Ultrathin Oxide Reliability
Co-Chairs: H. Z. Massoud and D. Misra

14:00 **743** New Features on the SILC in MOSFETs with Ultrathin Oxides - D. Bauza (IMEP-ENSERG), G. Ghibaudo, F. Lime, and F. Rahmoune (IMEP)

14:20 **744** Annealing Effect on Reliability Study for Deuterium Implanted Silicon - T. Kundu and D. Misra (New Jersey Institute of Technology)

14:40 **745** Impact of Plasma Nitridation Method on Vfb Shift and the Reliability of CMOSFETs - D. Kim, J. Heo, B. Koo (Samsung Electronics Co.), and M. Cho (Korea Research Institute of Standards and Science Surface Analysis Group)

15:00 **746** The Influence of Complimentary Contamination on Oxide Integrity - J. Naughton and J. Towner (AMI Semiconductor)

15:20 Intermission (20 Minutes)

Ultrathin Oxide Characterization
Co-Chairs: D. Misra and I. Baumvol

15:40 **747** Morphological Change in Surface and Interface During Ultrathin SiO_2 Film Growth - R. Hasunuma, J. Okamoto (University of Tsukuba), N. Tokuda (National Institute of Advanced Industrial Science and Technology), and K. Yamabe (Univ of Tsukuba)

16:00 **748** High Resolution X-Ray Photoelectron Spectroscopy Study on Si_3N_4/Si Interface Structures and Its Correlation with Hysteresis in C-V Curves - M. higuchi, A. Teramoto, M. Komura (Tohoku University), S. Shinagawa (Musashi Institute of Technology), E. Ikenaga (JASRI/SPring-8), H. Nohira (Musashi Institute of Technology), K. Kobayashi (JASRI/SPring-8), T. Hattori, S. Sugawa, and T. Ohmi (Tohoku University)

16:20 **749** Characterization of Tunneling Current Through Ultrathin Silicon Dioxide Films by Different-Metal Gates Method - T. Hirokane, N. Yoshii, T. Okazaki, S. Urabe, K. Nishimura, S. Morita, and M. Morita (Osaka University)

16:40 **750** On the Effects of Carrier Tunneling on the Capacitance-Voltage Characteristics of Ultrathin-Oxide MOSFETs - H. Massoud, M. Shen, and J. Jopling (Duke University)

K2 Cleaning Technology in Semiconductor Device Manufacturing IX

Electronics and Photonics / Dielectric Science and Technology

Emerald Bay, Level 3

Single Wafer Processing
Co-Chairs: J. Barnett and A. Danel

08:00 **767** An Investigation of the Critical Parameters of an Atomized, Accelerated Liquid Spray to Remove Particles - S. Verhaverbeke (Applied Materials)

08:20 **768** Single Wafer Wet Cleaning for a High Particle Removal Efficiency on Hydrophobic Surface - K. Sano (IMEC), A. Izumi, A. Eitoku (Dainippon Screen), J. Snow, E. Kesters, and P. Mertens (IMEC)

08:40 **769** A Damage-Free Ultra-Diluted HF/N_2 Jet Spray for Particle Removal with Minimal Silicon/ Oxide Loss - H. Hirano, K. Sato, T. Osaka, H. Kuniyasu, and T. Hattori (Sony Corporation)

09:00 **770** Single-Wafer Tool Performs Re-Contamination Free in Wet Wafer Cleaning - L. Liu, A. Walter and R. Novak (Akrion, Inc.)

09:20 **771** The Key for Advanced Single Wafer Cleaning: Gas Contend, Bubble Size Distribution and Chemistry - A. Lippert, H. Okorn-Schmidt, R. Obweger, F. Kumnig, R. Rogatschnig, P. Engesser, and A. Pfeuffer (SEZ AG)

09:40 Intermission (20 Minutes)

10:00 **772** Efficient Cleaning of Low-k Materials Using Single-Wafer Cleaning Solution: A Compatibility Study and Electrical Characterization - Q. Le, J. Van Olmen, R. Vanderheyden, E. Kesters, K. Kenis, W. Boullart, M. Baklanov, and S. Vanhaelemeersch (IMEC)

10:20 **773** Meeting the Critical Cleaning Challenges for 65 nm and Beyond Using a Single Wafer Processing with Novel Megasonics and Drying Technologies - Y. Lu (SCP Global Technologies), I. Park, S. Choi, C. Hong, H. Cho (Samsung Electronics Co.), E. Baiya (SCP Global Technologies, Inc), J. Rosato, R. Yalamanchili, and E. Hansen (SCP Global Technologies)

10:40 **774** Benefits of Single-Wafer Polymer Removal with Inorganic Chemicals on FEOL and BEOL Structures of DRAMs - S. Henry (SEZ AG), C. Haigermoser, E. Rho (SEZ Korea), J. Song, and H. Kim (Samsung Electronic)

11:00 **775** Air Flow in a Spin Cleaner for a Square Quartz Plate - H. Habuka, H. Pan (Yokohama National University), K. Fujita, M. Kato (Pre-Tech Co., Ltd.), T. Takeuchi, and M. Aihara (Yokohama National University)

11:20 **776** Improved Defectivity for BEOL Cleans Using Single Wafer Megasonics - I. Kashkoush (Akrion, Inc.), L. Yee, T. Thanigaivelan (SilTerra Malaysia Sdn. Bhd.), J. So, and B. Fraser (Akrion, Inc.)

Processing of Materials Other Than Silicon
Co-Chairs: P. Mertens and R. Ridley

14:00 **777** A Study on Selective SiGe Etch for Three-Dimensional Si Structure Application - H. Lee, J. Han, and W. Shim (Samsung Electronics)

14:20 **778** Selective Etching of SiGe for Removal of Dummy Layers in Fully Silicided Gate Architectures - J. Snow, R. Vos, K. Anil (IMEC), H. Kraus, K. Xu, F. Grinninger, G. Wagner, F. Kovacs (SEZ), and P. Mertens (IMEC)

14:40 **779** Study of Germanium Surface in Wet Chemical Solutions for Surface Cleaning Applications - J. Kim, K. Saraswat, and Y. Nishi (Stanford University)

15:00 **780** Study on the Metal Deposition Behavior on Ge Surfaces - S. Sioncke, B. Onsia (Imec), K. Struys (Technische Hogeschool Leuven), M. Meuris, P. Mertens (IMEC), and A. Theuwis (Umicore)

15:20 **781** Surface Roughness in Silicon Carbide Technology - K. Chang (The Pennsylvania State University), T. Witt (Fairchild Semiconductor), A. Hoff (University of South Florida), R. Woodin, R. Ridley, G. Dolny (Fairchild Semiconductor), K. Shanmugasundaram (The Pennsylvania State University), E. Oborina (University of South Florida), and J. Ruzyllo (The Pennsylvania State University)

15:40 **782** Wafer Surface Contamination Reduction from Silicon Carbide Components at Elevated Temperatures - I. Rapoport, P. Taylor, J. Kearns (SUMCO USA) and Y. Narendar (Saint-Gobain Ceramics)

16:00 Intermission (20 Minutes)

Analysis and Characterization
Co-Chairs: H. Okorn-Schmidt and H. Morinaga

16:15 **783** Real-Time Chemical Monitoring by NIR Spectroscopy - Y. Shekel, I. Hartman, E. Shalyt, J. Berkmans, and P. Bratin (ECI Technology)

16:35 **784** Detection and Mapping of Low Levels of Contaminants on Si Wafers Using the Scanning CPDI Technique - C. Yang, J. Hawthorne, B. Steele, and G. Deltoro (Qcept Technologies Inc)

16:55 **785** The Characterization of 65 nm Particles on Polished Silicon Wafer - K. Bae, Y. Kim, J. Lee, and J. Binns (MEMC Electronic Materials Inc.)

17:15 **786** Particle-Substrate Interactions in Non-Aqueous Media Studied by Colloidal Probe AFM - F. Barbagini (IMEC/KU Leuven), J. van Hoeymissen, W. Fyen (IMEC), J. Fransaer (IMEC/KU Leuven), and P. Mertens (IMEC)

L1 Nitride and Wide Bandgap Semiconductors for Sensors, Photonics, and Electronics VI

Electronics and Photonics / Sensor

Santa Barbara C, Lobby Level

Co-Chairs: R. Fitch and P. Shen

14:00 **799** Very Low Pressure Magnetron Reactive Ion Etching of GaN Using Dichlorofluorometane (Halocarbon-12) - P. Batoni (University of North Carolina at Charlotte), E. Stokes (The University of North Carolina), K. Patel, C. Burkhart, T. Shah, V. Iyengar, M. Ahrens (The University of North Carolina at Charlotte), T. Morton (The University of North Carolina at Charlotte & Armament and Technical Products, Research, General Dynamics), B. Martin, and S. Bobbio (The University of North Carolina at Charlotte)

14:30 **800** Combinatorial Study of Nickel-Gold P-Contacts for Blue Indium Gallium Nitride Light-Emitting Diodes - M. Ahrens (The University of North Carolina at Charlotte), E. Stokes (The University of North Carolina), A. Davydov, P. Schenck (National Institute of Standards and Technology), A. Motayed (University of Maryland), T. Harris, and T. Morton (University of North Carolina at Charlotte)

14:50 **801** Epitaxial Growth and Doping of GaN(001) Layers Grown on Si(111) Using Surface Reconstruction Induced Epitaxy - B. Martin (The University of North Carolina at Charlotte), C. Sykes (University of North Carolina), M. Sardela, Jr. (University of Illinois at Urbana-Champaign), and M. Hasan (Univ. of North Carolina)

15:10 **802** Hydrogen Sensitive Schottky Diodes on Free-Standing GaN - L. Voss, H. Wang, S. Pearton, and F. Ren (University of Florida)

15:30 Intermission (15 Minutes)

15:45 **803** Algan Light Emitters Based on Nanoscale Compositional Inhomogeneties - M. Wraback, G. Garrett, A. Sampath, C. Collins, W. Sarney, and H. Shen (U.S. Army Research Laboratory)

16:15 **804** Enhanced UV Emission by Means of Infrared Optical Pumping in UV Light Emitting Diodes - P. Batoni (University of North Carolina at Charlotte), E. Stokes (The University of North Carolina), V. Yang, J. Pagan (The University of North Carolina at Charlotte), R. Hudgins (UNC Charlotte), and S. LeBoeuf (GE Global Research)

16:35 **805** Growth of Single Crystalline Cubic SiC on Si Using Compliant Nanoscale Seed Crystals - M. Hasan (Univ. of North Carolina), K. Cherukuvada (University of North Carolina), and M. Sardela, Jr. (University of Illinois at Urbana-Champaign)

M1 Energy Technology and Battery Joint General Session

Energy Technology / Battery

San Bernardino, Lobby Level

Co-Chairs: K. Zaghib and B. Barnett

08:00 **829** Electrochemical Intercalation of Lithium into Silver Vanadium Oxides Used for Primary Batteries - J. Lee, G. Sikha, B. Popov (University of South Carolina), C. Feger (St. Jude Medical CRMD), and T. Strange (St. Jude Medical)

08:20 **830** Correlation Between Structural and Electrochemical Properties Chemical Manganese Dioxide as Promising Cathode Material for Lithium Primary and Secondary Batteries - E. Shembel, P. Novak, N. Globa, K. Kylyvnyk (Ener1), V. Tysyachny, N. Zaderey, and O. Chervakov (Ukrainian State Chemical Technology University)

08:40 **831** Hybrid Cathode Batteries for Implantable Medical Devices - D. Merritt, W. Howard, C. Schmidt, and P. Skarstad (Medtronic, Inc.)

09:00 **832** Electrochemical Properties of Sodium-Sulfur Battery at Room Temperature - H. Ahn, T. Kim, H. Ryu, K. Kim, J. Ahn, K. Cho, G. Cho, T. Nam, H. Ahn (Gyeongsang National University), and C. Park (SODIFF Advanced Materials Co.)

09:20 **833** Ruthenic Acid Nanosheet Electrodes and Micro-Supercapacitors Prepared by Electrophoretic Deposition - W. Sugimoto, K. Ohuchi, K. Yokoshima (Shinshu University), J. Park, T. Momma, T. Osaka (Waseda University), and Y. Takasu (Shinshu University)

09:40 **834** Quasi-Solid Dye Sensitized Solar Cells with Ionic Liquid Type Gel Electrolytes - S. Hayase, T. Kato, A. Okazaki, Y. Ogomi, T. Kado, S. Tanaka, and T. Beppu (Kyushu Institute of Technology)

10:00 Intermission (20 Minutes)

Co-Chairs: Z. Ogumi and A. Jacobson

10:20 **835** Microstructure and Ion Conductivity of Irradiated Single Crystal Yttria-Stabilized Zirconia - K. Fan, M. Lee, J. Cheng, H. Huang (Stanford University), Y. Saito (Honda Corp.), and F. Prinz (Stanford University)

10:40 **836** Fast Oxygen Ion Diffusion and Surface Exchange Kinetics in the Oxides $LnBaCo_2O_{5+x}$ (Ln = Pr, Nd) with Perovskite Related Structures and Ordered A Cations - G. Kim, S. Wang, A. Jacobson (University of Houston), L. Reimus, P. Brodersen, and C. Mims (University of Toronto)

11:00 **837** Oxygen Exchange Kinetics of $PrBaCo_2O_{5.5+d}$ Thin Films Prepared by Pulsed-Laser Deposition - S. Wang, G. Kim, A. Jacobson, Z. Yuan, W. Donner, C. Chen (Universtiy of Houston), L. Reimus, P. Brodersen, and C. Mims (University of Toronto)

11:20 **838** Direct Conversion of Chemically De-Ashed Coal in Fuel Cells - J. Cooper (Lawrence Livermore National Laboratory)

11:40 **839** Internal Polymer Electrolyte Membrane Fuel Cell/Energy Storage Hybrid Power Systems - C. Wang and S. D'Souza (Tennessee Tech University)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Co-Chairs: K. Zaghib and J. Prakash

- **840** Electrochemical Properties of Obliquely Sputtered Films - J. Broughton and M. Brett (University of Alberta)
- **841** Novel Methods for the Preparation of Anode Catalysts for Use in Direct Methanol Fuel Cells - M. Lo, J. Huang, and I. Liao (ITRI)
- **842** Pulse Performance and Electrochemical Properties of Hybrid Capacitor / Battery - I. Kim, S. Lee, and S. Moon (Korea Electrotechnology Research Institute)
- **843** Preparation of Normally-Aligned Titania Nanotube Layer Formed on Ti Substrate and Its Application to Dye-Sensitized Solar Cells - K. Nakayama, T. Kubo, T. Asano, A. Tsubokura, and Y. Nishikitani (Nippon Oil Corp.)
- **844** Electrochemical and Spectroscopic Research on Stable Nitroxyl Radicals - K. Nakahara (Lawrence Berkeley National Laboratory), J. Iriyama, S. Iwasa, M. Suguro, M. Satoh (NEC), and E. Cairns (Lawrence Berkeley National Laboratory)
- **845** Sulfides Electrodes Showing the Shape Memory Effect and Superelasticity - T. Nam (Gyeongsang National University), C. Yu, K. Kim, H. Ahn, and T. Kim (Gyeongsang National University and ITRC-ESC)
- **846** Novel ZnO Alloys as Anodes for Zn/ Air Secondary Batteries - C. Lee (Korea Electrotechnology Research Institute), K. Sathiyanarayanan (Korea Electrotechnology Research Institute and Vellore Institute of Technology), S. Eom, H. Kim, S. Moon, and M. Yun (Korea Electrotechnology Research Institute)

M2 Energy for Cleaner Transportation

Energy Technology / Battery
San Gabriel C, Lobby Level

Co-Chairs: K. Kanamura and V. Ramani

08:00 **862** First Principles Calculations of Electrochemically Controlled Hydrogen Mobility and Uptake at the Ni(111)/H_2O Interface - C. Taylor, M. Neurock, and R. Kelly (University of Virginia)

08:20 **863** Amorphous MnO_2-Single Walled Carbon Nanotube Composites for Supercapacitor Applications - S. Venkatachalam and B. Wei (Louisiana State University)

08:40 **864** Hydrogen Production from Mill-Scale via Metal-Steam Reforming - S. Kesavan and A. Azad (University of Toledo)

09:00 **865** Investigation of Corannulene for Molecular Hydrogen Storage via Computational Chemistry and Experimentation - L. Scanlon (Air Force Research Laboratory), P. Balbuena, Y. Zhang (Texas A&M University), G. Sandi (Argonne National Laboratory), C. Back (Illinois Institute of Technology), W. Feld (Wright State University), J. Mack (University of Cincinnati), and M. Rottmayer (Air Force Research Laboratory)

09:20 **866** Hybrid Supercapacitors with Ionic Liquid Electrolytes - F. Soavi (University of Bologna), A. Balducci (UCI Scienze Chimiche,University of Bologna/CIRIMAT, UMR CNRS 5085), M. Mastragostino (University of Bologna), S. Passerini (ENEA), and P. Simon (CIRIMAT, UMR CNRS 5085)

09:40 Intermission (20 Minutes)

10:00 **867** Injection of Hydrogen and Vacancy-Type Defects During Dissolution of Aluminum - K. Hebert, S. Adhikari (Iowa State University), Y. Jean (University of Missouri-Kansas City), and J. Lee (University of Illinois)

10:20 **868** Electrochemical Capacitance Properties of Polymer Derived Carbon Electrode Material - R. Nagireddy and R. Reddy (The University of Alabama)

10:40 **869** Ionic Liquid Based Electrolytes for High Energy Electrochemical Storage Devices - S. Passerini, F. Alessandrini, G. B. Appetecchi, and M. Conte (ENEA)

N1 Photovoltaics for the 21st Century III

Energy Technology / Electronics and Photonics
Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: R. McConnell

- **870** High-Voltage Photocapacitor with a Three-Electrode Configuration Based on a Dye-Sensitized Mesoporous TiO_2 Photoelectrode - K. Teshima (Peccell Technologies Inc.), T. Murakami (Toin University of Yokohama) and T. Miyasaka (Toin University of Yokohama, Peccell Technologies Inc.)

O1 Electrochromics for Energy Efficiency: From the Material to the System

Energy Technology / Fullerenes, Nanotubes, and Carbon Nanostructures
Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Co-Chairs: K. Zaghib and J. J. Xu

- **884** Electrochemistry for the Preparation of ZnO/Metallophthalocyanines Hybrid Films with Multicolored Electrochromic Properties - T. Pauporte (Laboratoire d'Electrochimie et Chimie Analytique), D. Lincot (LECA), and F. Bedioui (LPCG-ENSCP)
- **885** Electronic Properties of MoO_3 Thin Films Grown by PLD and ARE Techniques and Their Performance upon Lithium Intercalation - C. Julien (University P et M Curie), C. Ramana (University of Michigan), and M. Hussain (University SV Tirupati)
- **886** Synthesis of Vanadium Oxides Nanorods and Tungsten Oxides Nanowires - S. Pavasupree, Y. Suzuki, and S. Yoshikawa (Kyoto University)
- **887** Synthesis of Titanate, TiO_2 (B), Anatase TiO_2 Nanofibers from Natural Rutile Sand - S. Pavasupree, Y. Suzuki, and S. Yoshikawa (Kyoto University)

- **888** A Complementary Electrochromic Device Based on Heptyl Viologen and Prussian Blue - K. Ho and C. Lin (National Taiwan University)

P1 Proton Exchange Membrane Fuel Cells V, in Honor of Supramaniam Srinivasan

Energy Technology / Physical and Analytical Electrochemistry / Battery / Industrial Electrolysis and Electrochemical Engineering / New Technology Subcommittee /

San Francisco, Level 2

Membranes I
Co-Chairs: S. Motupally and T. Fuller

08:00 **919** Water-Membrane Interactions in PEM Fuel Cells: Operation of an Elevated Temperature, Low Humidity H_2/O_2 Cell - A. Bocarsly, T. Zhang, J. Mann, B. Kirby, P. Majsztrik, H. Ota, and J. Benziger (Princeton University)

08:40 **920** Studying Effect of Sorbates (Water, Methanol, Ethanol, and Propanol) Sorption on Different Cationic Forms of Nafion Membrane - N. Jalani and R. Datta (Worcester Polytechnic Institute)

09:00 **921** Effect of Inorganic Additives on the Properties of Nafion Membranes - N. Jalani and R. Datta (Worcester Polytechnic Institute)

09:20 **922** Pore Size Effect on Improvement of Surface Proton Conductivity for Three-Dimensionally Ordered Macroporous Silica Membrane - H. Munakata, S. Ochiai, and K. Kanamura (Tokyo Metropolitan University)

09:40 Intermission (20 Minutes)

10:00 **923** Composite, Gel Type Membranes - B. Scrosati (University of Rome)

10:20 **924** Fullerenes and Their Composites for Proton Conducting Membranes in Polymer Electrolyte Fuel Cells - R. DeSousa, A. Venkatesan and K. Tasaki (M. C. Research and Innovation Center)

10:40 **925** Proton Conducting Organic/Inorganic Hybrid Membranes in Dry and Wet Environments. - M. Di Vona, A. D'Epifanio, D. Marani (University of Rome Tor Vergata), M. Trombetta (University Campus Bio-Medico), E. Traversa, and S. Licoccia (University of Rome Tor Vergata)

11:00 **926** PTFE-Based High-Temperature Proton-Conducting Membrane - S. Reichman, A. Ulus, and E. Peled (Tel Aviv University)

11:20 **927** Crosslinked Perfluorinated Proton Exchange Membranes for Elevated Temperature PEFC Operation - M. Kawasumi, N. Hasegawa, H. Tanaka, M. Nakano, T. Yamamoto, K. Tsusaka, A. Kamiya, A. Muto, T. Asanao, Y. Morimoto, and K. Kawahara (Toyota Cetral R&D Laboratories)

11:40 **928** Development of Materials Having High Ionic Conductivities for High Temperature Fuel Cell Applications - X. Sun, J. Belieres, D. Gervasio, and C. Angell (Arizona State University)

Membranes II
Co-Chairs: T. Fuller and S. Motupally

14:00 **929** PEM Fuel Cells: Materials Issues - J. McBreen (Brookhaven National Lab.)

14:40 **930** Investigation of the Lateral Water Distribution in a Proton Exchange Membrane in Fuel Cell Operation by 3D-MRI - S. Tsushima, T. Nanjo (Tokyo Institute of Technology), K. Nishida (Kyoto Institute of Technology), K. Teranishi, and S. Hirai (Tokyo Institute of Technology)

15:00 **931** The Role of the Side Chain in Proton Transfer in the Short-Side-Chain Perfluorosulfonic Acid Membrane - S. Paddison (University of Alabama in Huntsville) and J. Elliott (University of Cambridge)

15:20 **932** Synthesis and Investigation of New Proton-Conducting Materials Based on Cationic Interpolymeric Materials Doped by Inorganic Acid for Fuel Cell Membrane - E. Shembel (Ener1), O. Chervakov (Ukrainian State Chemical Technology University), P. Novak (Ener1), V. Ryabenko (Ukrainian State Chemical Technology University), K. Kylyvnyk (Ener1), and Y. Polischuk (Ukrainian State Chemical Technology University)

15:40 **933** Composite Materials for PEM Fuel Cells Operating at High Temperature and Low Relative Humidity - S. Lvov, E. Chalkova, M. Fedkin, S. Komarneni, and M. Chung (Penn State University)

16:00 Intermission (20 Minutes)

16:20 **934** An Interfacial Study on the Structure of Perfluorinated Ionomers Dispersed in Aqueous and Alcoholic Solutions - M. Yoshitake, S. Terazono, Y. Kunisa (Asahi Glass Co., Ltd.), H. Hayashi (Okayama University), S. Takeda (Osaka University), and I. Tari (Okayama University)

16:40 **935** Fullerene Composite Membranes for Low Humidity Operation of Polymer Electrolyte Fuel Cells: Part III - H. Wang (University of California, Los Angeles), A. Venkatesan, K. Tasaki (M. C. Research and Innovation Center), G. Stucky (University of California, Santa Barbara), and F. Wudl (University of California, Los Angeles)

17:00 **936** Findings of the Fuel Cell Workshop - T. Fuller (Georgia Institute of Technology), H. Gasteiger (General Motors Fuel Cell Activities), T. Van Nguyen (University of Kansas), and J. Meyers (UTC Fuel Cells)

17:20 **937** Verification of Generated Water in a Super-Cooled State below Freezing Point in PEFC - Y. Ishikawa (Nippon Soken, Inc.), T. Morita, K. Nakata (Toyota Motor Corporation), K. Yoshida, and M. Shiozawa (Nippon Soken, Inc.)

17:40 **938** The Effect of N_2 Dilution on CO Poisoning in a Proton Exchange Membrane Fuel Cell - W. Wang, J. Van Zee, and W. Lee (University of South Carolina)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Co-Chairs: T. Valdez and J. Whitacre

- **939** Dynamics of Polymer Electrolyte Fuel Cells Undergoing Load Changes - Y. Wang and C. Wang (Penn State University)
- **940** On-Line Mass Spectrometric Analysis of Fuel Crossover in Non-Hydrogen Fuel Cells - H. Rivera (Univ. of Puerto Rico) and E. Smotkin (University of Puerto Rico at Rio Piedras)

- **941** Characterization of Failure MEA for DMFC by Electrochemical Impedance Spectroscopy - K. Hsueh (ITRI), C. Lai (National Central University), C. Hwang, F. Wu, L. Tsai, A. Peng (ITRI), and J. Lin (National Central University)
- **942** Influence of Operating Parameters on Liquid Water Distribution and Flooding in a PEFC - A. Turhan, P. Chuang, K. Heller, J. Brenizer, K. Unlu, and M. Mench (Penn State University)
- **943** Comparing Predictions of PEMFC Behavior Using Maxwell-Stefan and CFD Approximation Equations - M. Martinez, S. Shimpalee, and J. Van Zee (University of South Carolina)
- **944** AC Impedance Diagnosis on a 500 W PEM Fuel Cell Stack - X. Yuan, C. Sun, M. Blanco, H. Wang, J. Zhang, and D. Wilkinson (Institute for Fuel Cell Innovation)
- **945** Methanol Oxidation on High Surface Area Platinum-Ruthenium in the Presence of Oxygen - J. Gallaway and S. Calabrese Barton (Columbia University)
- **946** High Performance Carbon Support Materials for Use in Direct Methanol Fuel Cells - M. Lo, J. Huang, and I. Liao (ITRI)
- **947** X-ray Absorption Spectroscopy of Anode Catalysts in Operating DMFCs - S. Stoupin, E. Chung, S. Chattopadhyay (Illinois Institute of Technology), E. Smotkin (University of Puerto Rico, Rio Piedras), and C. Segre (Illinois Institute of Technology)
- **948** Water and Methanol Balance in a Direct Methanol Fuel Cell - S. Lee, S. Kang, and H. Chang (Samsung Advanced Institute of Technology)
- **949** Ethanol-Tolerant Oxygen Reduction Reaction (ORR) Cathodes for Direct Ethanol Fuel Cell Applications - O. Savadogo and F. Varela (Ecole Polytechnique de Montreal)
- **950** Low Cell Voltage Unit Cell Models - J. St-Pierre, G. Kim (Ballard Power Systems), K. Promislow (Michigan State University), J. Stockie (Simon Fraser University), and B. Wetton (University of British Columbia)
- **951** Non-Platinum Catalysts for Direct Methanol Fuel Cell - C. Kwak, A. Serov, M. Min, C. Park, H. Kweon, and S. Lee (Samsung SDI)
- **952** Experiments Toward Fundamental Validation of PEM Fuel Cell Models - Q. Yan (Mississippi State University)
- **953** Direct Type Fuel Cell Using Ethanol as a Fuel: The Effect of Acetaldehyde and PtSn Anode Catalyst - K. Taneda and Y. Yamazaki (Tokyo Institute of Technology)
- **954** Platinum-Iridium Alloys as Oxygen Reduction Electrocatalysts for Polymer Electrolyte Fuel Cells - T. Ioroi and K. Yasuda (National Institute of Advanced Industrial Science and Technology)
- **955** Analysis and Optimization of Membrane Water Content Utilizing Three-Dimensional Fuel Cell Modeling - S. Fraser, M. Monsberger, and V. Hacker (Graz University of Technology)
- **956** CO Tolerant Electrodes Developed with PhosphoMolybdic Acid for Polymer Electrolyte Fuel Cells (PEFCs) Application - I. Gatto (CNR), A. Sacca, A. Carbone, R. Pedicini, F. Urbani, and E. Passalacqua (CNR ITAE)
- **957** Investigation of Carbon Nanofibers as Catalyst Support for Fuel Cell Electrodes - E. Wallnofer, W. Baumgartner, T. Schaffer, V. Hacker, and J. Besenhard (Graz University of Technology)
- **958** Synthesis and Characterization of Carbide and Nitride Films for Combinatorial Electrocatalyst Studies - E. Kreidler and T. He (Honda Research Institute USA)
- **959** Effects of Co Catalysts on Hydrogen Generation Properties from Hydrolysis of Sodium Borohydride - K. Cho (Korea Advanced Institute of Science and Engineering), H. Kwon (KAIST), and K. Eom (Korea Advanced Institute of Science and Engineering)
- **960** Effects of Cathode Structure and Air Humidity on the Performance of Air-Breathing Fuel Cells - E. Cho (KIST), S. Jung (Korea University), H. Kim, I. Oh, T. Lim (KIST), and S. Kim (Korea University)
- **961** Effect of Flow Channel Pattern on a Cell Performance in Polymer Electrolyte Fuel Cells - M. Yoneda, M. Takimoto, K. Suzuki, Y. Tago, H. Nishikawa (Mizuho Information and Research Institute Corp.), K. Hashimoto, and E. Ejiri (Chiba Intitute of Technology)
- **962** Abstract Withdrawn
- **963** Investigation of Ion Conducting Channels in Proton Exchange Membranes by Scanned Probed Microscopy - J. O'Dea, D. Bussian, S. Buratto, and H. Metiu (University of California, Santa Barbara)
- **964** Low Temperature Membrane Properties - L. Onishi and J. Newman (University of California, Berkeley)
- **965** Comparison of Several Research Approaches for Direct Methanol Fuel Cell Membranes - R. Jiang, R. Kunz (University of Connecticut), and J. Fenton (University of Central Florida)
- **966** Synthesis and Characterization of Nano-Sized RuS/C New Possible Cathode Material for DMFC - A. Serov, C. Kwak, M. Min, C. Park, H. Kweon, and S. Lee (Samsung SDI)
- **967** Platinum Nanoparticles in a Carbon Matrix: A Novel Catalyst Morphology - A. Reiner, F. Hajbolouri, M. Doebeli, A. Wokaun, and G. Scherer (Paul Scherer Institut)
- **968** High Flow Rate per Power Pumping of Aqueous Solutions and Organic Solvents with Electro-osmotic Pumps - D. Kim, J. Posner, J. Santiago, and F. Prinz (Stanford University)
- **969** Composite Membranes Cast from Silicotungstic Acid (STA), Nafion, or Flemion in Dimethylformamide for Polymer Electrolyte Fuel Cells (PEMFCs) - O. Savadogo and H. Tian (Ecole Polytechnique de Montreal)
- **970** Palladium-Alloy Catalysts as Ethanol and Methanol Tolerant Cathodes for Direct Alcohol Fuel Cell Applications - O. Savadogo and F. Valera (Ecole Polytechnique de Montreal)
- **971** Synthesis of PtP Catalyst for Fuel Cell - K. Ugawa and H. Daimon (Hitachi Maxell Ltd.)
- **972** Investigation on Cathode by Methanol Vapor under PEMFC Conditions - J. Park (Korea Institute of Science and Technology), H. Ha (KIST), T. Lee (Yonsei University), and E. Cho (KIST)

- **973** Miniaturized Fuel Cell and Reforming System Based on Silicon Technology - S. Hwang, O. Kwon, J. Kim, and J. Kim (Seoul National University)
- **974** Poly(vinylpyrrolidone)-Silica-Phosphoric Acid Composites as Proton Conducting Materials for PEM Fuel Cells - W. Hong (University of California), K. Tasaki (M. C. Research and Innovation Center), and G. Stucky (University of California, Santa Barbara)
- **975** Spectroscopic Studies of Heteropoly Acid-doped 3M Perfluorinated Sulfonic Acid Polymer Membranes - F. Meng, S. Dec (Colorado School of Mines), M. Frey, S. Hamrock (3M Center), J. Turner (National Renewable Energy Laboratory), and A. Herring (Colorado School of Mines)
- **976** On the Passivation of 349TM Stainless Steel in Simulated PEMFC Cathode Environment - H. Wang and J. Turner (National Renewable Energy Laboratory)

Q1 Solid-State Ionic Devices IV

High Temperature Materials / Sensor
Battery / Physical and Analytical Electrochemistry

San Jose, Level 2

Nano-Ionics
Co-Chairs: X. Guo and E. Traversa

08:00 **1042** Chemical Synthesis of Nanostructured Thin Film for Electrochemical Devices - E. Leite (Universidade Federal de Sao Carlos)

08:40 **1043** Ionic Conduction in Zirconia Films of Nanometer Thickness - X. Guo, E. Wachsman (University of Florida), E. Vasco, S. Mi, K. Szot, and R. Waser (Forschungszentrum Juelich)

09:00 **1044** Observation of Gd Segregation in GDC Using Atomic Force Microscopy Based Analyses - M. Lee, H. Huang and F. Prinz (Stanford University)

09:20 **1045** MEMS Fabrication and Performances of Nano-Thin Solid Oxide Fuel Cells - H. Huang, M. Nakamura, P. Su, R. Fashing, Y. Saito, and F. Prinz (Stanford University)

09:40 Intermission (20 Minutes)

10:00 **1046** Synthesis and Characterization of Nanometric Samaria Doped Ceria (SDC) Microstructure Sintered by Fast Firing Process - V. Esposito, B. Luong, M. Fronzi, and E. Traversa (University of Rome)

10:20 **1047** Nanostructured Materials and Mechanisms for Electrochemical Conversion and Storage - E. Tsagarakis (Cornell University)

Solid Oxide Electrolytes
Co-Chairs: E. D. Wachsman and X. Guo

10:40 **1048** Structural and Electrical Characterization of a New Solid Electrolyte for IT - SOFCs - M. Ramachandran and A. Azad (University of Toledo)

11:00 **1049** A Study on Doubly Doped Bi_2O_3 Electrolytes with Higher Conductivity - D. Jung, K. Duncan, and E. Wachsman (University of Florida)

11:20 **1050** Development of Higher Ionic Conductivity Ceria Electrolyte - S. Omar, E. Wachsman, and J. Nino (University of Florida)

11:40 **1051** Screen-Printed Dense Yittria-Stabilized-Zirconia Electrolytes for Anode-Supported Solid Oxide Fuel Cells - B. White (University of Florida), M. Grilli, E. Traversa (University of Rome Tor Vergata), E. Roncari (CNR ISTEC), and F. Pittalis (ENI Tecnologie)

Solid Oxide Fuel Cells
Co-Chairs: E. D. Wachsman and E. Traversa

14:00 **1052** Co-Sintering of Dense Electrophoretically Deposited LSGMC Films on Porous Ni-O-GDC Substrate for SOFC Applications - F. Bozza, E. Traversa and R. Polini (Universita di Roma Tor Vergata)

14:20 **1053** Anode-Supported Solid Oxide Fuel Cells with Thin Film Electrolyte for Operation at Reduced Temperatures - H. Xiao (UES Corporation) and T. Reitz (Wright Patterson Air Force Research Laboratory)

SOFC Cathodes and Anodes
Co-Chairs: O. Marina and E. Traversa

14:40 **1054** Transport, Thermoelectric and Magnetic Properties of $La(B_1B_2)O_3$ - X. Zhou (University of Missouri-Rolla), Q. Cai (University of Missouri-Columbia), J. Yang, B. Scarfino, W. James, W. Yelon, and H. Anderson (University of Missouri-Rolla)

15:00 **1055** Electrode Performance of Nanostructured $La_{1-a}Sr_aCo_{1-b}Fe_bO_{3-x}$ on a $Ce_{0.8}Sm_{0.2}O_2$ Electrolyte Prepared by Citrate-Nitrate Auto-Combustion - F. Deganello (Italian Nationa Research Council), V. Esposito (University of Rome), E. Traversa (University of Rome Tor Vergata), and M. Miyayama (The University of Tokyo)

15:20 **1056** Oxygen Reduction Kinetics at Sol-Gel Derived LSM/YSZ Cathodes - V. Birss and J. Fournier (University of Calgary)

15:40 **1057** Evaluation of Time Constants Governing the Cathodic Reaction in SOFCs - J. Smith, E. Wachsman, M. Orazem, and K. Duncan (University of Florida)

16:00 Intermission (20 Minutes)

16:20 **1058** Synthesis and Characterization of $Y_2Ru_2O_7$ and Doped $Y_{2-x}Ln_xRu_2O_7$ (Ln = Eu,Pr) for Cathode Application in Intermediate Temperature Solid Oxide Fuel Cells - C. Abate, E. Traversa (University of Rome Tor Vergata), and E. Wachsman (University of Florida)

16:40 **1059** $Bi_2Ru_2O_{7.5}$ Pyrochlore Electrodes for Bi_2O_3 Based Electrolyte IT-SOFC - V. Esposito, B. Luong, E. Di Bartolomeo (University of Rome), E. Wachsman (University of Florida), and E. Traversa (University of Rome Tor Vergata)

17:00 **1060** Ag- $Bi_{1.6}Er_{0.4}O_3$ and AgPd-$Bi_{1.6}Er_{0.4}O_3$ as Potential Cathode Materials for IT-SOFCs - M. Camaratta and E. Wachsman (University of Florida)

17:20 **1061** Characterization of Electrodes for Reversible Solid Oxide Fuel Cells - O. Marina, L. Pederson, G. Coffey, C. Nguyen, and E. Thompson (Pacific Northwest National Laboratory)

17:40 **1062** Sulfur Tolerant Anodes for Solid Oxide Fuel Cells - S. Zha, Z. Cheng, and M. Liu (Georgia Institute of Technology)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Co-Chairs: X. D. Zhou and J. Yoo

- **1063** Performance of SOFC with Electrolyte Film prepared by EB-PVD - S. Woo, T. Shin, J. Yu, S. Lee, D. Seo, K. Hong, and I. Han (Korea Institute of Energy Research)
- **1064** Sintering of Yttria-Stabilized Zirconia/Nickel Oxide Composite Anodes for SOFCs - D. de Florio (IQ/UNESP), V. Esposito (University of Rome), F. Fonseca, E. Muccillo, R. Muccillo (IPEN), J. Varela (IQ/UNESP), and E. Traversa (University of Rome Tor Vergata)
- **1065** Ceramic Foams for SOFC Applications. - A. Rainer (University of Rome Tor Vergata), F. Basoli (University of Rome), S. Licoccia, and E. Traversa (University of Rome Tor Vergata)
- **1066** Combustion Synthesis of $Pr_{0.8}Sr_{0.2}Co_{1-x}Fe_xO_3$ Nanopowders and Their Characterization for Possible Application in Energy Devices - E. Magnone, M. Miyayama (The University of Tokyo), and E. Traversa (University of Rome Tor Vergata)
- **1067** Synthesis and Characterization of Manganese Oxide for Redox Capacitor Prepared by Electrodeposition on Carbon Fibers - M. Urano and K. Waki (Tokyo Institute of Technology)
- **1068** The Crystallographic, Thermal and Electrical Properties of Iron Substituted Lanthanum-Strontium Manganites - A. Demina (The Institute of High Temperature Electrochemistry), E. Filonova, K. Polovnikova (The Ural State University), and A. Demin (Institute of High Temperature Electrochemistry)
- **1069** Intermediate Temperature Electrochemical Reactor for NO_x Decomposition - K. Hamamoto, Y. Fujishiro, and M. Awano (National Institute of Advanced Industrial Science and Technology)
- **1070** G-MnO_2 Synthesized from Raw Ore for Protonic Solid-Battery - K. Singh, H. Malankar (Nagpur University), and S. Acharya (JDEIT)
- **1071** The Stability and Permeation Properties of $SrCe_{0.9}Eu_{0.1}O_3$ - T. Oh, H. Yoon, and E. Wachsman (University of Florida)
- **1072** Fabrication and Hydrogen Permeation Properties of Dense Eu-Doped $SrCeO_3$ Membrane on Ni-$SrCeO_3$ Tubular Type Support - H. Yoon, T. Oh, and E. Wachsman (University of Florida)

T1 Physics and Chemistry of Luminescent Materials XIV

Luminescence and Display Materials

Santa Barbara C, Lobby Level

Nanoluminescent Materials and Luminescence Mechanisms
Co-Chairs: L. Rohwer and A. Srivastava

10:00 **1120** Investigation of Fluorescence Degradation Mechanism of Hydrated BAM - M. Raukas, K. Mishra, and G. Marking (OSRAM Sylvania)

10:20 **1121** Cross-Relaxation Between the $^3P_0$ level of Pr^{3+} and Ce^{3+} - A. Setlur, A. Srivastava, H. Comanzo (GE Global Research), U. Happek and P. Schmidt (University of Georgia)

10:40 **1122** 4f5d, $^1S_0$ Level Assignment from Anomalous Optical Properties of $LaPO_4:Pr^{3+}$ at Low Temperatures - P. Schmidt, U. Happek (University of Georgia), H. Comanzo, A. Setlur, A. Srivastava (GE Global Research) and W. Beers (General Electric Lighting)

11:00 **1123** Photoluminescence Behavior of Ti-Doped Zn_2SiO_4 Thin Film Phosphors - C. Lin, Y. Lai, and J. Chen (National Cheng-Kung University)

11:20 **1124** Characterization of Nano-Sized $LaPO_4:Pr^{3+}$ - P. Schmidt, U. Happek (University of Georgia), H. Comanzo, A. Setlur, A. Srivastava (GE Global Research), W. Beers (General Electric Lighting), R. Garaas, and S. Loureiro (General Electric, Global Research Center)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Co-Chairs: A. Srivastava and K. Mishra

- **1125** Strong and Stable Visible Luminescence from Mesoporous MCM-41 Molecular Sieves - Y. Lee (Tung Nan Institute of Technology), W. Lee and J. Shen (Chung Yuan Christian University)
- **1126** Vibronic Studies of Optical Centers in YAG - J. Collins (Wheaton College), B. Di Bartolo, and G. Ozen (Boston College)
- **1127** Luminescent Properties of $ZnS:Eu^{2+}$ Nanocrystals - G. Sharma, S. Han (Korea Institute of Energy Research), S. Khatkar, and V. Taxak (Maharshi Dayanand University)
- **1128** Luminescence of Bi^{3+} Ions Doped in Alkali Yttrium Fluorides - T. Hirai, K. Chong, N. Ohno (Osaka Electro-Communication University) and S. Hashimoto (Osaka Prefecture University)
- **1129** Luminescent Properties of the Tb^{3+}-Doped $CaYAlO_4$ with a Short Decay Time - R. Yoshimatsu, H. Yoshida, and M. Minamoto (NEC Lighting, Ltd.)
- **1130** Enhancement of Luminance of ZnS:Mn Thick-Film Electroluminescent Displays by Cu Co-Doping - M. Chang, S. Han (Korea Institute of Energy Research), and S. Khatkar (Maharshi Dayanand University)
- **1131** CdS:Mn Thin Film Synthesis Using Pulse Electrodeposition Technique - K. Jain, N. Karar, H. Chandra and R. Rashmi (National Physical Laboratory)

W1 Organic and Biological Electrochemistry General Poster Session

Organic and Biological Electrochemistry

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: A. Fry

- **1132** Electrophoretic Mobility Effect on the Electrophoretic Display Performance - C. Kim, H. Myoung, S. Kang, I. You, J. Oh, K. Kim, S. Ahn, and K. Suh (Electronics and Telecommunications Research Institute)
- **1133** Synthesis and Characterization of Chemical and Electrochemical Polyaniline/Platinum Composites - J. Kinyanjui, N. Wijeratne, and D. Hatchett (University of Nevada, Las Vegas)

- **1134** Voltammetry of Benzenepolycarboxylic Acids at the Solid Electrodes - E. Kvaratskhelia (Institute of Inorganic and Electrochemistry)
- **1135** Voltammetry of 4-nitroimidazole derivatives: Influence of the N-1 substitution. - J. Squella, C. Yanez, S. Bollo, and L. Nunez-Vergara (University of Chile)
- **1136** Electrochemical Study of Inclusion Complexes Cyclodextrin/Steroids - C. Yanez, C. Zamora, and P. Jara (Universidad de Chile)
- **1137** Electrochemical Oxidation of Some 4-hydroxy, Dihydroxyphenyl 1,4-dihydropyridines and Its Reactivity Toward Alkylperoxyl Radicals in Aqueous Medium - L. Nunez, S. Bollo, R. Salazar, P. Navarrete, and J. Squella (University of Chile)
- **1138** Electro-Reduction of Chalcones: Study of the Radical in Aprotic Media - J. Squella, C. Ysnez, P. Quintana, and R. Araya (Universidad de Chile)
- **1139** Direct Electrochemistry of Heme-Proteins in Ionic Liquids: Role of Water in Electron Transfer and Catalytic Transformations - J. Moran, J. Bolden, and M. Bayachou (Cleveland State University)
- **1140** Quenched Electrochemiluminescence for Antibody-Based Homogeneous Diagnostics - D. Jardel, D. Riley and B. Randle (University of Bristol)
- **1141** Electrochemical Patterning and Fabrication of Oligonucleotide and DNA Microarrays - W. Meuleman, M. Moorcroft, S. Latham, T. Nicholls, R. Egeland (Oxford Gene Technology Ltd), and E. Southern (University of Oxford)
- **1142** Characterization of High Efficient Red Phosphorescent OLEDs Fabricated on Flexible Substrates - S. Kim, Y. Lee, K. Byun, Y. Lee, S. Jung, and H. Yoo (Korea Electronics Technology Institute)

X1 Physical and Analytical Electrochemistry General Session

Physical and Analytical Electrochemistry

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: G. Brisard

- **1163** Studies on Electrochemical Kinetics by the Measurement of Fast Electrochemistry - B. Chang and S. Park (Pohang University of Science and Technology)

X2 Durability and Reliability of Low-Temperature Fuel Cells and Fuel Cell Systems

Physical and Analytical Electrochemistry

Beaudry B, Lobby Level

Catalyst and Catalyst Support Durability in PEMFCs
Co-Chairs: J. Dahn and H. Gasteiger

08:00	**1164**	Development of Durable and High-Performance Electrocatalysts and Electrocatalyst Support Materials - J. Dahn, D. Stevens, A. Bonakdarpour, B. Easton (Dalhousie University), M. Hicks, G. Haugen, R. Atanasoski, and M. Debe (3M Company)
08:40	**1165**	Durable Polymer Electrolyte Membrane (PEM) Fuel Cell Materials: Requirements and Benchmarking Methodologies - R. Makharia (General Motors), S. Kocha (GM Fuel Cell Activities), P. Yu, C. Gittleman, D. Miller, C. Lewis, F. Wagner (General Motors), and H. Gasteiger (General Motors Fuel Cell Activities)
09:10	**1166**	Durability and Degradation Mechanisms in High-Temperature Polymer Electrolyte Fuel Cells - T. Schmidt (PEMEAS GmbH)
09:40		Intermission (20 Minutes)
10:00	**1167**	Limiting Factors in PEM Fuel Cell Durability - S. Motupally and T. Jarvi (UTC Fuel Cells)
10:20	**1168**	Durability Investigation of Carbon Nanotube as Catalyst Support for Proton Exchange Membrane Fuel Cell Electrode - M. Waje (University of California Riverside), X. Wang (Nanyang Technological University), W. Li, Z. Chen, and Y. Yan (University of California Riverside)
10:40	**1169**	Electrochemical Oxidation Resistance of Carbonaceous Materials - M. Dowlapalli, P. Atanassov (University of New Mexico), J. Xie, and G. Rice (Cabot SMP)
11:00	**1170**	Durability Aspects of Nanostructured Thin Film Catalysts - M. Debe, S. Hendricks, A. Schmoeckel, R. Atanasoski, G. Vernstrom, and G. Haugen (3M Company)
11:20	**1171**	Electrocatalyst Stability in PEMFCs - T. Ralph (Johnson Matthey)
11:40	**1172**	Consumption of Pt Catalyst under Electrolysis and Fuel Cell Operation - S. Kawahara, K. Ota, N. Kamiya, and S. Mitsushima (Yokohama National University)

Impact of Contaminants on PEMFC Durability
Co-Chairs: T. Schmidt and Y. Shao-Horn

14:00	**1173**	Impact of Contaminants on the Performance of PEMFC Cathodes - Y. Garsany, M. Teliska, and K. Swider-Lyons (Naval Research Laboratory)
14:20	**1174**	The Effect of Ionomer Content on the Performance of a PEMFC Exposed to Ammonia - H. Soto, S. Greenway, V. Sethuraman, and J. Van Zee (University of South Carolina)
14:40	**1175**	Cleaning PEMFC Pt-Electrodes with Adsorbed S-Species - T. Rockward and F. Uribe (Los Alamos National Laboratory)
15:00	**1176**	Adsorption, Desorption, and Oxidation of Hydrogen Sulfide on PEM Electrodes - V. Sethuraman, J. Weidner, S. Balasubramanian, and L. Wise (University of South Carolina)

15:20 **1177** A Model for SO_2 Impurity in Air Fed to a Proton Exchange Membrane Fuel Cell - W. Wang, W. Lee, and J. Van Zee (University of South Carolina)

15:40 Intermission (20 Minutes)

Pt and Pt-Alloy Degradation Mechanisms in PEMFCs
Co-Chairs: T. Schmidt and Y. Shao-Horn

16:00 **1178** Enhanced Durability of PtCo Catalysts for PEMFC - S. Ball, B. Theobald, D. Thompsett, and S. Hudson (Johnson Matthey)

16:20 **1179** Fuel Cell Catalyst Particle Size Growth Characterized by X-Ray Scattering Methods - F. Garzon, J. Davey, and R. Borup (Los Alamos National Laboratory)

16:40 **1180** Stability and Dissolution of the Platinum Single Crystal Surfaces and Platinum Nanoparticles in Perchloric Acid - V. Komanicky, K. Chang, A. Menzel, H. You, X. Wang, and D. Myers (Argonne National Laboratory)

17:00 **1181** Stability of Platinum Particles in Cathode Catalyst Layer of PEMFC - Z. Siroma, A. Taniguchi, T. Akita, K. Yasuda (National Institute of Advanced Industrial Science and Technology), K. Ishii, M. Tanaka, M. Inaba, and A. Tasaka (Doshisha University)

17:20 **1182** Coarsening of Pt Nanoparticles Supported on Carbon and Degradation of Proton Exchange Membrane Fuel Cells - Y. Shao-Horn, P. Ferreira, G. la O' (MIT), R. Makharia (General Motors), S. Kocha, and H. Gasteiger (General Motors Fuel Cell Activities)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Co-Chairs: H. Gasteiger and T. Jarvi

- **1183** A Study on Degradation of PEMFC During a Non-Humidified Operation - E. Cho (KIST), J. Ha (Seoul National University), H. Kim, S. Lee, T. Lim, I. Oh (KIST), and H. Lee (Seoul National University)
- **1184** PEM Electrode Durability Measurements - J. Davey, R. Borup, and F. Garzon (Los Alamos National Laboratory)
- **1185** Degradation of Nafion Membranes in Hydrogen Peroxide - K. Kodama, F. Miura, N. Hasegawa, M. Kawasumi, and Y. Morimoto (Toyota Central R&D Labs)

Y1 Three-Dimensional Micro- and Nanoscale Battery Architectures

Physical and Analytical Electrochemistry / Battery / Industrial Electrolysis and Electrochemical Engineering

Santa Anita B, Lobby Level

3-D Microscale Structures
Co-Chairs: D. Rolison and J. Thomas

08:20 **1228** Preparation and Performances of Three Dimensional Structured Cathode Films for Lithium Batteries - S. Koike (UBIQEN) and K. Tatsumi (National Institute of Advanced Industrial Science and Technology)

08:40 **1229** Recent Developments in C-MEMS Technology for Li Ion Microbatteries - M. Madou (UC Irvine)

09:20 **1230** Use of Carbon Microrods in 3D Electrodes - E. Falcao, Y. Yeh, H. Min, B. Dunn, and F. Wudl (University of California, Los Angeles)

09:40 Intermission (20 Minutes)

10:00 **1231** Elaboration of Nano-Architectured Electrodes/ Current Collectors by Electrochemically Assisted Template Synthesis - J. Tarascon (UMR CNRS 6007), P. L. Taberna (CIRIMAT), P. Simon (CIRIMAT, UMR CNRS 5085), S. Mitra, A. Finke, P. Poizot, and C. Guery (LRCS)

10:40 **1232** Toward a 3-D Nanostructured Battery - C. Martin, C. Sides, and F. Xu (University of Florida)

11:20 **1233** The Development of 3-D Nickel-Zinc Microbatteries - H. Min, Y. Yeh, F. Chamran, C. Kim, and B. Dunn (University of California, Los Angeles)

11:40 **1234** The High Power and High Energy Densities Li Rechargeable Battery by Nanocrystalline and Mesoporous Ni/NiO Covered Structure - E. Hosono (National Institute of Advanced Industrial Science and Technology), S. Fujihara (Keio University), I. Honma, and H. Zhou (National Institute of Advanced Industrial Science and Technology)

3-D Nanoscale Structures
Co-Chairs: S. Tolbert and M. Anderson

14:00 **1235** Synthesis of 3-D Nanoporous Functional Materials for Li Storage Device with High Power and High Energy Densities - H. Zhou (National Institute of Advanced Industrial Science and Technology)

14:40 **1236** Colloidal-Scale Self-Organized Lithium Batteries - Y. Chiang, R. Wartena, and Y. Cho (MIT)

15:20 Intermission (20 Minutes)

15:40 **1237** Self-Assembly as a Route to Complex Architectures with Applications for 3-Dimensional Nanoscale Batteries - S. Tolbert, E. Richman, A. Clark, D. Sun, B. Dunn, F. Wudl, and R. Jost (University of California, Los Angeles)

16:20 **1238** Templated Nanocomposite Electrodes for Rechargeable Lithium Batteries - E. Olivetti (Massachusetts Institute of Technology), J. Kim (Yonsei University), A. Mayes, and D. Sadoway (Massachusetts Institute of Technology)

16:40 **1239** Microstructural Modeling and Design of Advanced Three-Dimensional Batteries - R. Garcia (Purdue University) and Y. Chiang (MIT)

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
3-D Microbatteries
Chair: B. Dunn

- **1240** Investigation of Surface Forces between Battery Materials for the Development of Self-Organizing Devices - Y. Cho, R. Wartena, M. Spencer, and Y. Chiang (Massachusetts Institute of Technology)

Z1 Molecular Structure Effects in Heterogeneous Electron Transfer Kinetics

Physical and Analytical Electrochemistry / Organic and Biological Electrochemistry

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: G. Brisard

- **1249** Experimental Studies of Modifying Effect of Multidrug Resistance of Human Ovarian Cancer Cell Line by Sub-Lethal Dose of Steep Pulse - Y. Xiaojun, H. Lina, and L. Jun (Chongqing University of Medical Science)
- **1250** Electrochemistry of Self-Assembled Monolayers (SAMs) and Solutions of Surface Active Metallocyclodextrins for the Construction of Opto- and Electro- Active Wires - P. Bertoncello (University of Warwick), C. Milios, E. Kefalas, Z. Pikramenou (The University of Birmingham), R. Forster (Dublin City University), and P. Unwin (University of Warwick)

AA1 Acoustic Wave-Based Sensors and Sensor Systems

Sensor

San Fernando, Lobby Level

TSM and SAW Sensor Applications
Co-Chairs: R. Hillman and J. Grate

08:30 Introductory Remarks (10 Minutes)

08:40 **1266** Lipid-Derived Materials as Coatings for QCM Odor-Sensors - B. Wyszynski (Technical University of Szczecin), P. Somboon, and T. Nakamoto (Tokyo Institute of Technology)

09:00 **1267** Ion, Solvent, and Polymer Dynamics in Polyaniline Conducting Polymer Films - A. Hillman, M. Mohamoud, and I. Efimov (University of Leicester)

09:20 **1268** Investigation of Ion Selective Electrode Ageing by Using Dynamic QCM and Electroacoustic Measurements - H. Perrot, C. Gabrielli (CNRS), and P. Hemery (Paris 6)

09:40 Intermission (20 Minutes)

10:00 **1269** Measurement of Quartz Crystal Impedance Using the Tools for Electrochemical Impedance - P. Vanysek and L. Delia (Northern Illinois University)

10:20 **1270** Love-Wave Sensor Coated with a Mesoporous Material - F. Razan (Universite Bordeaux 1), D. Rebiere (UMR 5818-ENSEIRB), C. Dejous (Laboratoire IXL-UMR 5818-ENSEIRB), B. Pavageau, M. Destarac (Centre de Recherche d'Aubervilliers), C. Boissiere, D. Grosso, and C. Sanchez (Laboratoire de la Chimie de la Matiere Condensee)

10:40 **1271** Acoustoelectric Effect in Hydrogen Surface Acoustic Wave Sensors (SAW) with Phthalocyanine-Palladium Sensing Bi-Layers - W. Jakubik, M. Urbanczyk (Silesian University of Technology), S. Cular, and V. Bhethanabotla (University of South Florida)

11:00 **1272** Measurements of Particles in Liquid Using Shear-Horizontal Surface Acoustic Wave Sensor - J. Kondoh (Shiauoka University), T. Oyama (Shizuoka University), and S. Shiokawa (SAW&SPR-Tech)

SAW Devices, Designs, and Systems
Co-Chairs: R. Cernosek and D. Malocha

14:00 **1273** Multiple Frequency Acoustic Analysis of Chemical Solutions - A. Pantazis (FORTH), K. Melzak (IMBB-FORTH), G. Konstantinidis (MRG-IMBB-FORTH), and E. Gizeli (IMBB-FORTH)

14:20 **1274** SAW Comb Filter Designs for Multi-Frequency Chemical Sensors and Polymer Viscoelasticity Probes by Combining Remez-Rung Ladder and FM Chirp Transducers - R. Yadava (Solid State Physics Laboratory), R. Kshetrimayum (Delhi University), and M. Khaneja (Solid-State Physics Laboratory)

14:40 **1275** Hexagonal Surface Acoustic Wave (SAW) Devices for Enhanced Sensing - S. Cular (University of South Florida), D. Branch (Sandia National Laboratories), and V. Bhethanabotla (University of South Florida)

15:00 **1276** Spread Spectrum Techniques and Applications to SAW Sensor Device Platforms - D. Malocha, D. Puccio, and N. Saldanha (University of Central Florida)

15:20 Intermission (20 Minutes)

15:40 **1277** A 3-D Finite Element Model of Surface Acoustic Wave (SAW) Sensor Response. - S. Sankaranarayanan, V. R. Bhethanabotla, and B. Joseph (University of South Florida)

16:00 **1278** Surface Acoustic Wave (SAW) Based Biosensor Chips: A Versatile Solution for Future Biomedical Applications - M. Rapp (Research Center Karlsruhe), G. Blaess, and K. Laenge (Institute of Instrumental Analysis)

16:20 **1279** Chemical Sensor Data Processing: Drifts and Influence of Interfering Species Rejection. Application to Love Wave Gas Sensors - J. Pistre (ENSEIRB), P. Mazein (IXL), C. Dejous (Laboratoire IXL-UMR 5818-ENSEIRB), C. Zimmermann, and D. Rebiere (IXL)

16:40 **1280** Virtual Chemical Sensors Using a GC/SAW Sensor System - E. Staples (Electronic Sensor Technology) and S. Viswanathan (National University)

AB1 Sensors Based on Nanotechnology II

Sensor / Physical and Analytical Electrochemistry

Pasadena, Lower Lobby Level

Tuesday Evening Poster Session, 19:00-21:00
Chair: C. Bruckner-Lea

- **1333** Electrodeposited Thermocouple Arrays - M. Bourg, R. Penner, B. Murray, Q. Li, and E. Menke (University of California, Irvine)
- **1334** Preparation of Titanium Oxide Nanotubes by Photo-induced Sol-Gel Processing Using Ultraviolet Light - R. Kuo, J. Chen, and C. Hsieh (ITRI)

Wednesday, October 19, 2005

0830 Honors and Award Session
San Jose, Level 2

0900 Technical Exhibit
Pasadena, Lower Lobby Level

0930 Coffee Break
Exhibit Hall / Pasadena, Lower Lobby Level

1215 Electrodeposition Division Luncheon and Business Meeting
San Bernardino, Lobby Level

1215 Luminescence and Display Materials Division Luncheon and Business Meeting
La Brea, Lobby Level

1800 Olin Palladium Award Reception
Catalina Foyer, Level 3

1800 Corrosion Division Award Reception
Los Cerritos, Lobby Level

1900 Srinivasan Symposium Banquet
Hollywood Ballroom, Level 3

1900 Hashimoto Symposium Banquet
San Bernardino, Lobby Level

B1 Battery Safety and Abuse Tolerance

Battery
Santa Barbara A, Lobby Level

Materials Effects on Abuse Tolerance
Co-Chairs: J. I. Yamaki and P. Roth

14:00 **85** Investigation of Flame-retardant Additives for Safety Usage of Lithium Ion Batteries - M. Otsuki, T. Ogino (Bridgestone Corporation) and K. Amine (Argonne National Laboratory)

14:40 **86** $LiCoO_2$/$LiFePO_4$ Cathodes in Multi-Layered Structure and the Effect on Tolerance for Battery Overcharging - N. Imachi, Y. Takano, H. Fujimoto, S. Yoshimura, S. Fujitani, and I. Yonezu (SANYO Electric Co.)

15:20 **87** Comparative Abuse Response of Cathode Materials in 18650 Li-Ion Cells - E. Roth, D. Doughty and G. Nagasubramanian (Sandia National Laboratories)

15:40 Intermission (20 Minutes)

16:00 **88** A Versatile Approach to Overcharge Protection for Rechargeable Lithium Batteries - G. Chen and T. Richardson (LBNL)

16:20 **89** Laminated Prismatic Lithium Manganese Cells with Improved Abuse Tolerance Using SEPARION Separator - V. Hennige, S. Augustin, G. Hoerpel, C. Hying, and M. Saito (Degussa AG)

D1 Primary and Secondary Aqueous Batteries

Battery / Energy Technology
San Gabriel C, Lobby Level

Anode Materials
Co-Chairs: J. J. Xu and Y. Ein-Eli

10:00 **90** The Effect of Additives on the Electrochemical Properties of Fe/C Composites for FE/Air Battery Anodes - T. Watanabe, H. Bui Thi (Interdisciplinary Graduate School of Engineering Sciences), M. Egashira (Yamaguchi University), I. Watanabe, S. Okada, and J. Yamaki (Kyushu University)

10:20 **91** Electrochemical Performances of Zinc-Air Fuel Cells: Correlation with In-Situ STM Studies of Zinc in Aqueous Solutions Containing PEG DiAcid Inhibitor - Y. Ein-Eli, T. Cohen-Hyams (Technion), and Y. Ziengerman (Electric-Fuel Ltd.)

10:40 **92** Layered $Li[Li_yMn_{1-y}]O_2$ Compounds as Oxygen Reduction Electrocatalysts - K. Ngala, S. Alia (University of Connecticut), and A. Dobley (Yardney Technical Products, Inc. /Lithion, Inc.)

11:00 **93** Development of Fibre Shaped Zinc Particles as Anode Material for Zn/MnO_2 Cells to Improve High Rate Discharge Performances - M. Malservisi (Noranda Inc) and J. Huot (Chimia)

11:20 **94** A Microfabricated Nickel-Hydrogen Battery Using Thick Film Printing Techniques - W. Tam and J. Wainright (Case Western Reserve University)

11:40 **95** Electrochemical Preparation of Potassium Ferrate - W. Zhu, H. Shang, and Z. Huang (Chongqing University)

Cathode Materials
Co-Chairs: R. Bugga and Y. Ein-Eli

14:00 **96** High-Energy Bismuth(V) Metal Oxide Cathode Materials for Alkaline Cells - P. Christian, C. Eylem, X. Wang, I. Bae, J. Sunstrom, and R. Komm (The Gillette Company)

14:20 **97** Electrochemical and Spectroscopic Investigations of the Pseudocapacitance Mechanisms for MnO_2 Films in Aqueous Electrolytes - J. Long and D. Rolison (Naval Research Laboratory)

14:40 **98** Modelling the Stepped Potential Discharge of Primary Alkaline Battery Cathodes - J. Johansen and T. Farrell (Queensland University of Technology)

15:00 **99** Short Time Frame Electrodeposition of Manganese Dioxide - S. Donne, C. Clarke, G. Browning, M. Owen, and G. Lawrance (University of Newcastle)

15:20 **100** Electrochemical Kinetics of the Alkaline Manganese Dioxide Electrode - S. Donne and G. Browning (University of Newcastle)

15:40 **101** New Alkaline Electrochemical Cells Using Stabilized CuO-CuS Cathodes - W. Bushong, M. Destephen, Z. Jin, E. Ndzebet, J. Kennedy, K. Ramaswami, J. Scherer, D. Boone, E. Mortensen, D. Gilbert, and V. Vu (Spectrun Brands Inc.)

16:00 **102** Electrochemical Behavior of Ag_3O_4 - Z. Jiang, Y. Cheng, and M. Yan (Fudan University)

D2 Rechargeable Lithium and Lithium-Ion Batteries

Battery / Energy Technology

San Diego, Level 2

New Materials and Strategies
Co-Chairs: B. Scrosati and M. M. Thackeray

10:00 **211** Justus von Liebig Award Address (Süd-Chemie) - New Materials and Strategies for the Next Generation of Lithium-Ion Batteries - M. Wachtler (Zentrum fur Sonnenenergie und Wasserstoff)

10:30 **212** Optimizing a Nickelate Cathode for Lithium-Ion Batteries for Hybrid-Electric Vehicles - K. Thomas-Alyea, S. Dalton-Castor, P. Onnerud, S. Singh, J. Treger, M. Menard, A. Beltran, J. Drennan, D. Novikov, and B. Barnett (TIAX)

10:50 **213** Advanced Composite Materials for High Capacity Rechargeable Li-Ion Batteries Enabled by Stabilized Lithium Metal Powder (SLMP) - M. Yakovleva, Y. Gao, and B. Fitch (FMC Corporation)

11:10 **214** The Electrophoretic Assembly of Rechargeable Batteries - R. Wartena, D. Kim, and Y. Chiang (MIT)

11:30 **215** Reversible Conversion Bismuth Fluoride and Oxyfluoride Nanocomposites for Li Batteries - G. Amatucci, M. Bervas, F. Badway (Rutgers, the State University of New Jersey), A. Mansour (Navy Surface Warfare Center Carderock), W. Yoon (Brookhaven National Lab.), J. Al-Sharab, F. Cosandey, and L. Klein (Rutgers University)

11:50 **216** $LiFePO_4$ and Graphite Anode Using Water Soluble Binder for Low-Cost Li Polymer Batteries - K. Zaghib (Hydro-Quebec)

Redox Shuttles and Electrolytes
Co-Chairs: G. Amatucci and K. Eberman

14:00 **217** Studies of the 2,5-ditertbutyl-1,4-dimethoxybenzene Overcharge Shuttle in 18650-sized $LiFePO_4$/Graphite Cells - J. Dahn, J. Jiang, C. Buhrmester, and L. Moshurchak (Dalhousie University)

14:30 **218** Design and Use of Three Electrode Coin Cells for Studying Redox Shuttles - L. Moshurchak, J. Dahn (Dalhousie University), M. Obrovac, and L. Christensen (3M Co.)

14:50 **219** Recent Progress in LiBOB-based Electrolytes - K. Xu, U. Lee, S. Zhang, and R. Jow (U.S. Army Research Lab)

15:10 **220** LiBOB Based Electrolyte for Li Ion Batteries - F. Azeez, Y. Li, and P. Fedkiw (North Carolina State University)

15:30 **221** Corrosion and Passivation of Aluminum in LiBOB/EC+DMC Electrolyte - T. Devine (University of California) and Z. Xueyuan (Lawrence Berkeley National Laboratory)

15:50 Intermission (20 Minutes)

Electrolytes
Co-Chairs: Z. Ogumi and M. Wakihara

16:10 **222** Safe Electrolytes for Large Format Batteries - U. Wietelmann, J. Panitz (Chemetall GmbH), M. Wachtler (Zentrum fur Sonnenenergie und Wasserstoff), and M. Wolfahrt-Mehrens (ZSW)

16:40 **223** Advanced Electrolyte Salts with Inherent Overcharge Protection for Lithium Ion Batteries - G. Dantsin, K. Jambunathan, S. Ivanov, W. Casteel (Air Products and Chemicals, Inc.), K. Amine, J. Liu, A. Jansen, and Z. Chen (Argonne National Laboratory)

17:00 **224** Anodic Polymerization of Vinyl Ethylene Carbonate in Li-Ion Battery Electrolyte - V. Zhuang, G. Chen, T. Richardson, G. Liu, and P. Ross (Lawrence Berkeley National Lab)

17:20 **225** Studies of Ionic Liquids in Lithium Ion Battery Test Systems - J. Salminen, J. Prausnitz, and J. Newman (University of California, Berkeley)

17:40 **226** TPD-MS Study on the Existent State of Solvents in Graphite Anodes - S. Kinoshita, Y. Sakata, M. Ue (Mitsubishi Chemical Group Scinence and Technology Research Center), and S. Tobishima (Gunma University)

E3 Coatings and Inhibitors

Corrosion

Santa Barbara B, Lobby Level

Coating and Inhibition of Steels - Part I
Co-Chairs: R. Taylor and F. Mansfeld

10:00 **311** Degradation of Organic Coatings on Steel Investigated by Dynamic Electrochemical Impedance Spectroscopy - M. Itagaki, A. Ono, K. Watanabe (Tokyo University of Science), H. Katayama (National Institute for Materials Science), and K. Noda (Shibaura Institute of Technology)

10:25 **312** An Electrochemical Impedance Study on the Influence of Flow on the Corrosion Inhibition of Carbon Steel by Fatty Amines in Association with Phosphonocarboxylic Acid Salts - N. Pebere (CNRS), N. Ochoa (University Simon Bolivar), and B. Tribollet (CNRS)

10:50 **313** Corrosion Monitoring of Coated Pipeline in Soil Environment - M. Alodan, G. Almutairy, and F. Abdullsalam (KSU)

11:15 **314** Corrosion Inhibitor Fe Interactions: A Study Combining Surface Science and Electrochemistry - G. Bhargava (Princeton University), T. Ramanarayanan (University of Pennsylvania), I. Gouzman (Soreq Nuclear Research Center), and S. Bernasek (Princeton University)

Coating and Inhibition of Steels - Part II
Co-Chairs: G. Frankel and M. Kendig

14:00 **315** Dissolution and Inhibition Mechanism of 1018 Steel in Simulated Cooling Water by Adding Phosphonic Acid Compound under Two Flow Conditions - M. Galicia, R. Hernandez, H. Castaneda, and L. Zamudio (Instituto Mexicano del Petroleo)

14:25 **316** Mechanism of Inhibition of Corrosion of Carbon Steel in CO_2-Saturated Brine by Phosphate Monoester - T. Devine (University of California), P. Chou, and A. Agrawal (University of California, Berkeley)

14:50 **317** The Mechanism of Inhibitor: Scale Interaction in Carbon Dioxide Corrosion - W. Sun, K. Chokshi, and S. Nesic (Ohio University)

15:15 **318** Relative Inhibitors Efficiencies in Systems Containing Stainless Steels - G. Ilevbare (10XX) and G. Burstein (University of Cambridge)

E4 Corrosion and Electrochemistry of Advanced Materials, in Honor of Koji Hashimoto

Corrosion

Avalon, Level 3

Localized Corrosion
Co-Chairs: T. Nakayama and S. Virtanen

10:00 **366** An Atomistic Approach to Pitting Corrosion: The Role of Metal-Metal Bond Strength - R. Lillard (Los Alamos National Lab), G. Wang (Lawrence Berkeley National Laboratory), and M. Baskes (Los Alamos National Laboratory)

10:20 **367** Effects of Cr_2N on Pitting Corrosion of High Nitrogen Stainless Steel Investigated by Micro-droplet Cell - H. Ha and H. Kwon (KAIST)

10:40 **368** Effect of Sensitization on Stress Corrosion Cracking of Type 316 Austenitic Stainless Steel in Sulphuric Acid Solution - R. Nishimura (Osaka Prefecture University)

11:00 **369** Detection of Currents from a Model Pit Using the Scanning Vibrating Electrode Technique (SVET) - J. Sullivan, D. Penney, N. McMurray, and D. Worsley (University of Wales, Swansea)

11:20 **370** Effect of Electrode Potential on Solution Chemistry Inside a Crevice - T. Shinohara and Y. Fukaya (National Institute for Materials Science)

11:40 **371** Depassivation and Repassivation of Titanium under Particle Impingements - E. Akiyama (National Institute for Materials Science) and K. Tsuzaki (National Institute for Materials Research)

Mechanical and Chemical Aspects on Surface Breakdown
Chair: S. Fujimoto

14:00 **372** Local Cathodic Corrosion of n-Type InP (001) by Scratching - M. Seo and T. Yamaya (Hokkaido University)

14:20 **373** Copper Passivity in Carbonate Base Solutions and Its Application to Chemical Mechanical Planarization (CMP) - E. Abelev, D. Starosvetsky, M. Auinat, and Y. Ein-Eli (Technion)

14:40 **374** Electrochemical Testing of Tantalum and Copper in Chemical Mechanical Polishing Slurries - Z. Liu, H. Li, R. Schmidt, and R. Baker (Rohm and Haas Electronic Materials)

Advanced Catalyst and Electrode
Co-Chairs: B. MacDougall and A. Molnar

15:10 **375** Cathodic Hydrogen Charging as a Tool to Activate Cu-Ti Amorphous Alloy Catalysts - M. Janik-Czachor, M. Pisarek (Polish Academy of Sciences), A. Molnar, and B. Rac (University of Szeged)

15:30 **376** New Nanocrystalline Manganese-Molybdenum-Tin Oxide Anodes for Oxygen Evolution in Neutral Seawater Electrolysis - A. El-Moneim (Tohoku Institute of Technology), N. Kumagai (Daiki Engineering Co. Ltd.), K. Asami (Tohoku University), and K. Hashimoto (Tohoku Institute of Technology)

15:50 **377** The Effect of Tungsten Addition to the Intermediate IrO_2 Layer of Mn-Mo-O/IrO_2/Ti Electrodes on the Performance for Oxygen Evolution in Seawater Electrolysis - Z. Kato (Tohoku Institute of Technology), N. Kumagai (Daiki Engineering Co. Ltd.), K. Asami (Tohoku University), and K. Hashimoto (Tohoku Institute of Technology)

16:10 **378** Si-C-O Glass-like Compounds as a Negative Electrode Material for Li Ion Battery - H. Konno (Hokkaido University), O. Morishita (Aichi Institute of Technology), S. Sato, H. Habazaki (Hokkaido University), and M. Inagaki (Aichi Institute of Technology)

16:30 Intermission (20 Minutes)

16:50 **379** M-Mg (O)(M = Cu, Pd or Ni) Catalysts Prepared by Mechanochemistry: Characterization and Synthetic Applications - A. Molnar (University of Szeged)

17:10 **380** Sn-P Alloys for Rapid and Stable Production of Tin Solution for Tin Plating - N. Kumagai (Daiki Engineering Co. Ltd.), Z. Kato, and K. Hashimoto (Tohoku Institute of Technology)

17:30 **381** Corrosion Prevention for the Use of Renewable Energy - K. Hashimoto (Tohoku Institute of Technology)

F1 Dielectrics and the Dielectric-Electrolyte Interface in Biological and Biomedical Applications

Dielectric Science and Technology

Palos Verdes, Lobby Level

Bio-Sensor Arrays II
Co-Chairs: R. Schasfoort and C. C. Liu

10:00 **392** Large-Scale, Multiplexed, Electrical Detection of Proteins and Viruses by Ultrasensitive Nanowire Sensor Arrays - F. Patolsky, G. Zheng, and C. Lieber (Harvard University)

10:40 **393** Dielectrophoretic Manipulation and Integration of Nanodevices with CMOS VLSI Circuitry - S. Evoy (University of Alberta)

11:20 **394** Highly Sensitive Integrated Biosensors - J. Ranuarez and J. Deen (McMaster University)

Nanostructured Bio-Interfaces
Co-Chairs: J. Buriak and R. Bashir

14:00 **395** Porous Silicon Optical and Electrical Biosensors - P. Fauchet (University of Rochester)

14:40 **396** Surface Chemistry of Hydrogen-Terminated Semiconductor Surfaces - R. Boukherroub (Interdisciplinary Research Institute)

15:20 Intermission (20 Minutes)

Co-Chairs: P. Fauchet and D. Landheer

15:40 **397** Self-Organized TiO_2 Nanotube Layers for Biomedical Applications - P. Schmuki (University of Erlangen-Nuremberg)

16:20 **398** Toward Nanobiofunctional Materials: Porous Semiconductor Formation for Biotechnological Applications - C. O'Dwyer (Tyndall National Institute)

16:40 **399** Influence of Nanophase on Titanium Surface with Multimeshworked and Nanoporous Structure Prepared by Cathodic-Anodization Treatment - K. Ou (Graduate Institute of Oral Science)

17:00 **400** Immobilization of Glycosaminoglycans in Nanostructured Conducting Polymers - S. Panero, J. Serra Moreno, and B. Scrosati (University of Rome)

G2 Atomic Layer Deposition Applications: Challenges and Opportunities

Dielectric Science and Technology / Electronics and Photonics

Santa Anita A, Lobby Level

ALD Gate Stack Engineering
Co-Chairs: A. Londergan and M. Schaekers

10:00 **482** Atomic Layer Deposited HfO_2 and HfSiO to Enable CMOS Gate Dielectric Scaling, Mobility, and Vt Stability - P. Kirsch (IBM assignee to SEMATECH), M. Quevedo-Lopez (TI assignee to SEMATECH), and S. Krishnan (SEMATECH)

10:40 **483** Modeling and Engineering of Hafnium Silicate (HfSiO) Gate Dielectrics Deposited by Nano-Laminated Atomic-Layer Deposition (NL-ALD) - V. Chang, Y. Hou, P. Hsu, P. Lim, L. Yao, F. Yen, C. Hung, H. Lin, J. Jiang, Y. Jin, C. Chen, H. Tao, S. Chen, S. Jang (Taiwan Semiconductor Manufacturing Company), and M. Liang (METD/AMTD/TSMC)

11:00 **484** Improvements of MOS Capacitors with Stacked ALD/Sputtering TaN Metal Gates - C. Lai (Chang Gung University)

11:20 **485** Atomic Layer Deposition of Multifunctional Oxides - J. Chang (University of California)

ALD Productivity Enhancement
Co-Chairs: H. Zolla and T. Seidel

15:00 **486** ALD for Data Storage Applications - M. Mao, R. Bubber, and T. Schneider (Veeco Instruments)

15:40 **487** Atomic Vapor Deposition (AVD) for Next Generations of Advanced Semiconductor Devices - M. Schumacher, P. Baumann, J. Lindner, C. Lohe, U. Weber (Aixtron AG), S. Ramanathan, Z. Karim, A. Londergan, and T. Seidel (Genus, Inc.)

16:20 **488** High-Speed Atomic Layer and Chemical Vapor Processing (ALCVP) Reactor - Design, Real-Time Simulation and Potential Applications - P. Gadgil (Atomic Precision Systems Inc.)

G3 High Dielectric Constant Gate Stacks III

Dielectric Science and Technology / Electronics and Photonics

Sacramento, Level 2

Interfaces and Defects
Co-Chairs: S. De Gendt and A. Stesmans

10:00 **541** Advanced Gate Dielectric Stacks: Interactions at the Nanometer Scale - S. Guha (IBM T. J. Watson Research Center)

10:30 **542** Interfacial Layer Formation on Silicon by Halogen Activation - A. Thorsness and A. Muscat (University of Arizona)

10:50 **543** Interfacial Layer in High-k Dielectrics: Characterization and Suppression - G. Larrieu, M. Tao (University of Texas at Arlington), N. Moumem (SEMATEC), G. Song, X. Yang, E. Moldonado, W. Kirk (University of Texas at Arlington), M. Kim (University of Texas at Dallas), W. Bai, and D. Kwong (University of Texas at Austin)

11:10 **544** Interfacial Trapping at Spectroscopically-Detected Oxygen Vacancies in Nano-Crystalline ZrO_2 and HfO_2: An Engineering Solution for Elimination of Vacancy Defects in Non-Crystalline Ternary Silicate Alloys - G. Lucovsky (NC State University)

11:30 **545** A Simple Approach to Reduce Interlayer Formation of Sputtered Hf-based Gate Dielectrics by Nitrogen Incorporation - J. Chen, C. Lu, and Y. Lai (National Cheng-Kung University)

11:50 **546** Interface Engineering for High-k Gate Dielectric Device Performance and Reliability Enhancement - H. Tseng (Freescale Semiconductor)

High-k Materials and Processing III
Co-Chairs: R. Jammy and S. Kar

14:00 **547** Studies and Optimization of HfO_2 Grown by $HfCl_4/H_2O$ Atomic Layer Deposition - A. Delabie, M. Caymax, B. Brijs, D. Brunco, T. Conard, E. Sleeckx, L. Ragnarsson, S. Van Elshocht, S. De Gendt, and M. Heyns (IMEC)

14:30 **548** Sub 2 nm Thick Zirconium Doped Hafnium Oxide High-K Gate Dielectrics - Y. Kuo, J. Lu, J. Yan, T. Yuan, H. Kim (Texas A&M University), J. Peterson, and M. Gardner (SEMATECH)

14:50 **549** Ultra-Thin HfON Films Formed with He/FG Plasma Jet Assisted PVD Process - Y. Liu, S. Wang, and T. Ma (Yale University)

15:10 **550** Quality Improvement and Electrical Characteristics of High-k Films after Receiving Direct Superimposed with Alternative Current Anodic Oxidation (DAC-ANO) Compensation - C. Chang, T. Wang, and J. Hwu (National Taiwan University)

15:30 **551** The Effect of Nitrogen Incorporation on the Material and Electrical Properties of HfO_2 on Si - M. Sawkar (University of California, Los Angeles), J. Choi (UCLA), R. Puthenkovilakam (Intel), and J. Chang (University of California)

Gate Electrode Materials II
Co-Chairs: H. Iwai and S. Guha

16:10 **552** Theoretical Studies on the Physical Properties of Poly-Si and Metal Gates/HfO_2 Related High-k Dielectrics Interfaces - K. Shiraishi (University of Tsukuba), K. Torii (Selete, Hitachi), Y. Akasaka (Semiconductor Leading Edge Technologies), T. Nakayama (Chiba University), T. Nakaoka (University of Tsukuba), S. Miyazaki (Hiroshima University), T. Chikyow (NIMS), K. Yamada (Waseda University), and Y. Nara (Semiconductor Leading Edge Technologies)

16:40 **553** Evaluation of Nb(Si)N as Metal Gate Material - N. Van Hoornick (IMEC vzw), H. De Witte (ASM Belgium), T. Witters (IMEC), C. Zhao (IMEC vzw), T. Conard (IMEC), H. Huatori (ASM Microchemistry Oy), J. Swerts (ASM Belgium), T. Schram (IMEC vzw), J. Maes (ASM Belgium), S. De Gendt, and M. Heyns (IMEC)

17:00 **554** Impact of Al, Ni, and TiN Gates on MOCVD-ZrO_2-MOS-Capacitors - S. Abermann (TU Vienna), J. Efavi, M. Lemme (Advanced Microelectronic Center), and E. Bertagnolli (Institute of Solid State Electronics)

17:20 **555** Dielectric Evolution Characteristics of HfCN Metal Electrode Gated MOS Stacks - W. Wang (the University of Tokyo), T. Nabatame (MIRAI-ASET), and Y. Shimogaki (The Univ. of Tokyo)

17:40 **556** Dual Workfunction CMOS High-k - Metal Gates for High Performance Logic Technologies - R. Jammy, V. Narayanan, and E. Cartier (IBM)

I1 Electrodeposition of Nanoengineered Materials I

Electrodeposition

Santa Anita C, Lobby Level

Metallic Thin Films
Co-Chairs: N. V. Myung and D. Y. Park

10:10 **637** Electrodeposition of Amorphous CoNiMo Films with High Magnetic Saturation - M. Esteves (Instituto de Quimica) and P. Sumodjo (USP)

10:30 **638** Electrodeposition of Magnetic CoPd Thin Films: Influence of Plating Condition - F. Takata (Instituto Tecnologico de Aeronautica - ITA) and P. T. A. Sumodjo (Insituto de Quimica - USP)

10:50 **639** Coordination Chemistry in the Electrodeposition of Nanostructured IG-V, W, and Mo Alloys from Aqueous Hydroxy-Carboxylate Solutions - M. Schwartz and K. Nobe (UCLA)

11:10 **640** Electrodeposition of CoP Film from Alkaline Electrolytes - X. Xu and G. Zangari (The University of Virginia)

11:30 **641** Influence of Chloride Ions on the Morphology of Electrodeposited Copper on n-Si (100) from Acidic Sulfate Solution - W. Shao, G. Pattanaik, and G. Zangari (The University of Virginia)

11:50 **642** Diameter Dependent Optical Constants of Gold Meso-Particles Electrodeposited on Aluminum Films Containing Copper - D. Brevnov (University of New Mexico) and C. Bungay (J.A. Woollam Co.)

Co-Chairs: N. V. Myung and D. Y. Park

14:10 **643** Modeling Growth of Gold-Copper Nanocrystalline Coatings - A. Jankowski (Lawrence Livermore National Laboratory)

14:50 **644** Selective Electroless Deposition Using Amorphous TiO_2 Layer - J. Kim (Samsung Advanced Institute of Technology)

15:10 **645** Formation of Metal Atomic Layer Thin Films Using EC-ALE by Redox Replacement of upd Cu or Pb on Au(111) Electrode Surfaces - Y. Kim, J. Kim, and J. Stickney (The University of Georgia)

15:30 Intermission (20 Minutes)

15:50 **646** Fractal Growth of Pt Structure by Pulsed Electrodeposition and Enhancement of the Oxidation of Methanol - T. Hall, L. Tsagalas, A. Miller, J. Jiang, and D. Hill (University of Notre Dame)

16:10 **647** Effects of a Supporting Electrolyte and Additives on Crystal Growth of Electrodeposited Ag - T. Wakatsuki (Kyoto University), E. Kusaka (Graduate School of Energy Science), and Y. Fukunaka (Kyoto Universuty)

16:30 **648** Deposition of Nanocrystals of Platinum on High Oriented Pyrolytic Graphite - X. Zhou and F. Zhang (Florida International University)

16:50 **649** Electrochemical Metallization of Au Electrodes Modified with Self-Assembled Organic Monolayers - G. Pattanaik and G. Zangari (The University of Virginia)

I3 Science, Technology, and Tools for Electrodeposition: From Lab to Factory

Electrodeposition

San Gabriel B, Lobby Level

Additives and Metrology I
Co-Chairs: A. West and H. Hafezi

10:00 **673** Additive Design for Copper Interconnect Electrodeposition - C. Witt (Cooksonelectronics - Enthone), X. Lin, V. Paneccasio, J. Srinivasan, M. Cicoria (Enthone), and M. King (ATMI, Inc.)

10:20 **674** Desorption of Polyethylene Glycol During Copper Electrodeposition: Effects of Potential and SPS - K. Hebert and K. Ganesan (Iowa State University)

10:40 **675** Superconformal Film Growth - T. Moffat, D. Wheeler, and D. Josell (NIST)

11:00 **676** MPSA Behavior Near a Copper Surface Through Molecular Simulation and Experiment - C. Guymon, J. Harb, and D. Wheeler (Brigham Young University)

11:20 **677** A Microfluidic Device for Measuring Adsorption and Desorption Kinetics of Additives - M. Willey and A. West (Columbia University)

11:40 **678** Effects of Oxygen and Cuprous Ion on Copper Deposition in the Presence of PEG and MPSA - D. Barkey (University of New Hampshire), K. Kondo (Osaka Prefecture University), T. Matsumoto (University of Okayama), and M. Pritzker (University of Waterloo)

Additives and Metrology II
Co-Chairs: H. Hafezi and A. West

14:40 **679** Copper ECD Process of ULSI Circuits Controlled by Electroanalysis Combined with Chemometrics: Calibration Transfer - A. Jaworski and H. Wikiel (Technic, Inc.)

15:00 **680** Absorption Investigation of ViaForm Organic Additives on the Pt Microelectrode by Differential Capacitance Measurement - J. Han (ATMI) and M. King (ATMI, Inc.)

15:20 **681** Detection of Organic Electroactive Species in Acidic Copper Plating Baths by HPLC with an Electrochemical Detector - M. Hilgarth, M. King (ATMI, Inc.), and P. Figura (Enthone, Inc.)

15:40 Intermission (20 Minutes)

Thick Film Processes
Co-Chairs: H. Hafezi and J. Dukovic

16:00 **682** Recent Progress in the Development of ECPR (ElectroChemical Pattern Replication) Metal Printing for Microelectronics - M. Fredenberg, P. Moller (Replisaurus Technologies AB) and P. Leisner (Acreo AB)

16:20 **683** New Chip-on-Glass and Flip-Chip Processes Using Interlocking Bump Structure Fabricated by Electrodeposition - K. Lee, H. Won, and T. Oh (Hongik University)

16:40 **684** Formation of Copper Pillar Bumps by High Speed Copper Electroplating - B. Wu, Z. Liu, and A. Keigler (Nexx Systems)

17:00 **685** An Economical Wafer Electroplating System for Thick Film Structures - A. Keigler, Z. Liu, J. Harrell, and B. Wu (NEXX Systems Inc.)

17:20 **686** Electrodeposition of Copper Line Using Semi-Additive Method for FCB Application - J. Lee, S. Byun (Hongik University), S. Kang, and S. Kim (LG Micron)

17:40 **687** Morphology Evolution of Single Crystal Copper by Etching - K. Kondo (Osaka Prefecture University), K. Hiroaki (MitsuiMCS Inc.), and H. Murakami (Osaka Prefecture University)

18:00 **688** Microvia Filling by Copper Electroplating over SPS Self-Assembly Monolayer on Au and Cu Seed Layers - W. Dow and M. Yen (National Yunlin University of Science and Technology)

K2 Cleaning Technology in Semiconductor Device Manufacturing IX

Electronics and Photonics / Dielectric Science and Technology

Emerald Bay, Level 3

Supercritical Fluids
Co-Chairs: K. Saga and A. Muscat

10:00 **787** Ion-Implanted Photoresist Stripping Using Supercritical Carbon Dioxide - K. Saga, H. Kuniyasu, T. Hattori (Sony Corporation), M. Korzenski, and T. Baum (ATMI, Inc.)

10:40 **788** Chemical Formulations for Stripping Post-Etch Photoresists on a Low-k Film in Supercritical Carbon Dioxide - M. Korzenski, T. Baum (ATMI, Inc.), K. Saga (Sony Corporation), H. Kuniyasu (SONY-Japan), and T. Hattori (Sony Corporation)

11:00 **789** Repair of Porous MSQ Films Using Supercritical CO_2 - B. Xie and A. Muscat (University of Arizona)

11:20 **790** Supercritical CO_2 Low-k Dielectric Repair and Post-Etch Residue Removal - S. Malhouitre (BOC Edwards, at IMEC), J. Van Hoeymissen (IMEC), A. Muscat (University of Arizona), P. Granger (BOC Edwards), and P. Mertens (IMEC)

11:40 **791** Abstract Withdrawn

Back End-of-the-Line Cleaning
Co-Chairs: R. Novak and J. J. Park

14:00 **792** Evaluation of the Degree of Damage after Different Conditions of He/H_2 Dry Strip Plasma on Silica-Based Porous Low-k Materials - E. Kesters, Q. Le, W. Boullart (IMEC), H. Qingyuan, I. Berry, C. Waldfried (Axcelis), P. Mertens, and M. Heyns (IMEC)

14:20 **793** A Novel Surface Cleaning for Copper Interconnection Using Atomic Hydrogen - A. Izumi, T. Ueno, A. Tsukinari, and A. Takada (Kyushu Institute of Technology)

14:40 **794** The Effects of pH Adjustors in Post Cu CMP Cleaning Solutions on Particle Adhesion and Removal - Y. Hong, J. Song, Y. Kang, I. Kim, J. Park (Hanyang Univ.), H. Song, K. Kim, J. Myung, H. Lee, and S. Song (Research Center, Dongwoo Fine-Chem Co.)

15:00 **795** Effect of BTA on Particle Adhesion in Cu CMP - J. Song, Y. Hong, T. Kim, Y. Kang, I. Kim, J. Park (Hanyang Univ.), and A. Busnaina (NSF Center for Microcontamination Control)

15:20 Intermission (20 Minutes)

15:40 **796** A New Failure Mechanism by Tungsten Bridging in a Plug Process Due to Incomplete Post-Metal Etch Residue Clean Causing Corrosion and Tungsten Re-Deposition - D. Florence, B. Williams, C. Belisle, C. Hatcher, and J. Prasad (AMI Semiconductor)

16:00 **797** Investigation of the Impact of Barrier Slurry Properties on Post-CMP Cleaning Efficiency - D. Peters, K. Bartosh, C. Tran, and C. Watts (ATMI)

16:20 **798** Study of the Kinetics of the Copper Cleaning by X-Ray Reflectometry - D. Rebiscoul (CEA/LETI), L. Broussous (StMicroelectronics), and D. Louis (CEA/LETI)

L1 Nitride and Wide Bandgap Semiconductors for Sensors, Photonics, and Electronics VI

Electronics and Photonics / Sensor

Santa Barbara C, Lobby Level

Co-Chairs: E. Stokes and K. Shiojima

10:00 **806** Dipole Engineering in Nitride-based HEMTs - T. Palacios, S. Rajan, L. Shen, A. Chakraborty, S. Keller, S. DenBaars, and U. Mishra (University of California - Santa Barbara)

10:30 **807** Determination of Band Offsets at the AlN/SiC Interface - J. Choi (UCLA), R. Puthenkovilakam (Intel), and J. Chang (University of California)

10:50 **808** Properties of Porous GaAs Substrate for III-N Epitaxy - V. Kidalov (Berdyansk State Pedagogical University), G. Suckach (Physics Semiconductors Institute), L. Beji (Laboratoire de Physique et Chimie des Linterfaces), A. Revenko, and A. Bayda (Berdyank State University)

11:10 **809** Homoepitaxial Growth of Iron Doped Semi-Insulating 4H-SiC by Bis-Trimethylsilylmethane and T-Butylferrocene Precursors - H. Song, J. Moon, J. Yim, and H. Kim (Seoul National University)

11:30 **810** Highly Sensitive Hydrogen Sensor Using Pt Nanoparticles Coated ZnO Single- and Multi-Nanowires - H. Wang, B. Kang, and F. Ren (University of Florida)

Co-Chairs: P. Asbeck and J. Han

14:00 **811** Effect of T-Shaped Gate Structure on RF Characteristics of AlGaN/GaN Short-Gate HEMTs - K. Shiojima, T. Makimura (NTT Photonics Laboratories), T. Maruyama (NTT Advanced Technology), T. Suemitsu, N. Shigekawa, M. Hiroki, and H. Yokoyama (NTT Photonics Laboratories)

14:20 **812** Simulations of Field Plate Effects on Surface Charge in AlGaN/GaN HFETs - A. Conway and P. Asbeck (UCSD)

14:40 **813** Design, Characterization, and Analysis of AlGaN/GaN HEMTs with Field Plate Gate Structures via Physical Device Simulation - M. Yannuzzi, G. Jessen, N. Moser, Lt., A. Crespo, R. Fitch, J. Gillespie, D. Langley, Lt., and M. Williams, Lt. (Air Force Research Laboratory)

15:00 **814** AlGaN/GaN HEMTs with Recessed Ohmic Electrodes on Si Substrates - K. Kaifu, J. Mita, M. Ito, Y. Sano (Oki Electric Industry), H. Ishikawa, and T. Egawa (Nagoya Institute of Technology)

15:20 Intermission (20 Minutes)

15:40 **815** X-ray and Electrical Characterization of Optimized Ti/Al/Ti/Au Ohmic Contacts for AlGaN/GaN HEMTs - J. Bardwell, S. Haffouz, H. Tang, and R. Wang (National Research Council)

16:00 **816** Hydrogen-Induced Reversible Changes in Drain Current of Pt-Gated AlGaN/GaN High Electron Mobility Transistors (HEMT) - H. Wang, B. Kang, and F. Ren (University of Florida)

01 Electrochromics for Energy Efficiency: From the Material to the System

Energy Technology / Fullerenes, Nanotubes, and Carbon Nanostructures

Beaudry A, Lobby Level

Co-Chairs: K. Zaghib and C. Julien

10:00 **889** Studies on the Electrochromic Behavior of Lithium and Proton Based Solid State Devices - G. Somasundaram (GE India Technology Centre Pvt.Ltd), A. Subrahmanyam, C. Suresh Kumar and K. Muthu (Indian Institute of Technology-Madras)

10:20 **890** Ionic Liquid for Electrochromic Devices under European Community Program - K. Zaghib (Hydro-Quebec)

10:40 **891** Investigation of Temperature Induced Structural Transformations in Tungsten Oxide (WO_3) Thin Films - R. Chintalapalle, S. Utsunomiya (University of Michigan), C. Julien (University P et M Curie), and U. Becker (University of Michigan)

11:00 **892** Isolation, Spectroscopic Characterization, and Study of Island Formation of Two Isomers of the Metallofullerene Nd@C82 - K. Porfyrakis, D. Leigh (University of Oxford), J. Owen (National Institute for Materials Science), S. Lee (Korea Research Institute of Standards and Science), M. Kanai (University of London), G. Morley (National High Magnetic Field Laboratory at Florida State University), A. Ardavan (Clarendon Laboratory), J. Dennis (University of London), D. Pettifor, and A. Briggs (University of Oxford)

11:20 **893** A Complementary Electrochromic Device Based on Poly(Butyl Viologen) and Prussian Blue - C. Hsu and K. Ho (National Taiwan University)

11:40 **894** Sputtering Deposition Parameters and Their Interactions in Amorphous Tungsten Oxide Thin Film as Electrochromic Electrode - E. Widjaja, G. Delporte, and A. Larsson (NV Bekaert SA)

P1 Proton Exchange Membrane Fuel Cells V, in Honor of Supramaniam Srinivasan

Energy Technology / Physical and Analytical Electrochemistry / Battery / Industrial Electrolysis and Electrochemical Engineering / New Technology Subcommittee

San Francisco, Level 2

Direct Methanol Fuel Cells I
Co-Chairs: R. Jalan and E. Gonzalez

10:00 **977** Correlation Between Catalyst Intrinsic Properties and Fuel Cell Performance - E. Gonzalez (Instituto de Quimica de Sao Carlos)

10:40 **978** Direct Methanol Fuel Cells: What's New Since Ten Years? - C. Lamy and J. Leger (CNRS-University of Poitiers)

11:00 **979** Investigation of Fuel and Electrode Modification to Reduce Crossover in Direct Methanol Fuel Cells - A. Lam and D. Wilkinson (University of British Columbia)

11:20 **980** Influence of Ionomer Loading on the Performance of Pt-Ru and Pt-Fe Electrodes Used in DMFCs - A. Di Blasi, V. Baglio, A. Stassi, C. D'Urso, V. Antonucci, and A. Arico (CNR-ITAE)

11:40 **981** Investigation of Ruthenium Dissolution in Advanced Membrane Electrode Assemblies for Direct Methanol Based Fuel Cell Stacks - T. Valdez, S. Firdosy (Jet Propulsion Laboratory), B. Koel (University of Southern California), and S. Narayanan (Jet Propulsion Laboratory)

12:00 **982** Methanol Oxidation on Pt(111) and Pt(111)/Ru in Alkaline Electrolytes - J. Spendelow, J. Goodpaster (University of Illinois), P. Kenis, and A. Wieckowski (University of Illinois at Urbana-Champaign)

Direct Methanol Fuel Cells II
Co-Chairs: E. Gonzales and R. Jalan

14:00 **983** Proton Conductivity of Hydrous Ruthenium Oxide in Direct Methanol Fuel Cells - Y. Wang and J. Zheng (Florida A&M University and Florida State University)

14:20 **984** High-Energy DOFC: Battery Hybrid Power Unit (PU) for Portable Computing Based on a Unique Membrane - E. Peled, A. Blum, V. Livshits, T. Duvdevani, and H. Terkel (Tel Aviv University)

14:40 **985** Fullerene Composite Membranes for DMFC - K. Tasaki, A. Venkatesan, and R. DeSousa (MC Research & Innovation Ctr.)

15:00 **986** Embedded Polymerization Driven Asymmetric Polymer Electrolyte Membranes for Direct Methanol Fuel Cells - H. Pei, J. Lee, and L. Hong (National University of Singapore)

15:20 **987** Influence of Interfacial Water Activity on the Electrocatalysis of Methanol Oxidation - K. Ramamoorthy and S. Mukerjee (Northeastern University)

15:40 **988** Characteristics of High Performance PtRu Methanol Catalysts and Mechanistic Understanding - Y. Tsou, L. Cao, and E. De Castro (De Nora North America, Inc.)

16:00 **989** Development of a High Temperature Electrochemical Reactor with Differential Electrochemical Mass Spectrometry for Kinetic Rate Analysis of Methanol Oxidation - L. Roen and E. Stuve (University of Washington)

16:20 **990** Mixed-Feed Direct Methanol Fuel Cell: Materials and Design Solutions - S. Barton, J. Gallaway, W. Deng (Columbia University), S. Levendosky, T. Olson, P. Atanassov (University of New Mexico), M. Sorkin, A. Kaufman, and H. Gibbard (Gibbard R&D Corp.)

16:40 **991** High-Power Ethylene Glycol - Air Fuel Cell - E. Peled and V. Livshits (Tel Aviv University)

Q1 Solid-State Ionic Devices IV

High Temperature Materials / Sensor / Battery / Physical and Analytical Electrochemistry

San Jose, Level 2

SOFC Interconnects
Co-Chairs: R. Mukundan and E. D. Wachsman

10:00 **1073** Manganese-Cobalt Mixed Spinel Oxides as Surface Modifiers for Stainless Steel Interconnects of SOFCs - G. Xia, Z. Yang, G. Maupin, S. Simner, and J. Stevenson (Pacific Northwest National Lab)

Ceramic Membranes and MIECs
Co-Chairs: R. Mukundan and T. H. Lee

10:20 **1074** ITM Ceramic Membrane Technology to Produce Synthesis Gas - C. Miller, M. Carolan, C. Chen, E. Minford, W. Waldron (Air Products and Chemicals, Inc.), and J. Steppan (Ceramatec, Inc.)

11:00 **1075** Hydrogen Permeation of Ceramic/Metal Composite Thin Films - L. Chen, S. Song, T. Lee, S. Dorris, and B. Balachandran (Argonne National Laboratory)

11:20 **1076** Hydrogen Production by Water Dissociation Using Mixed Oxygen Ion-Electron Conducting Membranes - T. Lee, L. Chen, S. Song, S. Dorris, and B. Balachandran (Argonne National Laboratory)

11:40 **1077** Electrochemical Hydrogen Pumping Characteristics of $BaCe_{0.8}Y_{0.2}O_3$ Thin Film - T. Lee, R. Koritala, S. Dorris, and B. Balachandran (Argonne National Laboratory)

Inorganic Proton Conductors
Co-Chairs: E. D. Wachsman and T. H. Lee

14:00 **1078** Conductivity of Stabilized Proton Conducting Oxides Sintered at Lower Temperatures - S. Tao and J. Irvine (University of St Andrews)

14:40 **1079** A-Site Doping by Alkali Ion in Barium Zirconate Perovskites - A. Patnaik and A. Virkar (University of Utah)

15:00 **1080** High Temperature Proton Conductors Based on Rare Earth Polyphosphate - K. Amezawa, Y. Uchimoto, Y. Agari, and Y. Tomii (Kyoto University)

15:20 **1081** Proton Conducting Material $Ba_3Ce(PO_4)_3$ Synthesized by Co-Precipitation - G. Zhang and E. Wachsman (University of Florida)

PEM Fuel Cells and Electrocatalysis
Co-Chairs: V. I. Birss and E. Traversa

16:00 **1082** Nanostructured Materials for High Temperature Direct Methanol Fuel Cells - V. Antonucci, V. Baglio, A. Di Blasi, and A. Arico (CNR-ITAE)

16:40 **1083** Design of Novel Fuel Cell Electrocatalysts: Probing Electronic and Geometric Structure - A. Fojas, P. McGrath (University of California - Berkeley), A. Deb (Lawrence Berkeley National Laboratory), K. Lux (University of Wisconsin - Madison), E. Cairns (Lawrence Berkeley National Laboratory), and J. Reimer (University of California - Berkeley)

17:00 **1084** Intermediate Temperature Polymer Electrolyte Membranes via Inorganic Cross-Linking of Hybrid Polymers - D. Marani, M. Di Vona, Z. Ahmed, S. Bellitto (University of Rome Tor Vergata), M. Trombetta (University Campus Bio-Medico), E. Traversa, and S. Licoccia (University of Rome Tor Vergata)

17:20 **1085** Novel Catalysts for Polymer Electrolyte Membrane Fuel Cells by Using Pt/Tin Oxide Composite - K. Waki, K. Ke, K. Matsubara, and Y. Yamazaki (Tokyo Institute of Technology)

X2 Durability and Reliability of Low-Temperature Fuel Cells and Fuel Cell Systems

Physical and Analytical Electrochemistry

Beaudry B, Lobby Level

PEMFC Membrane Degradation Mechanisms
Co-Chairs: S. Cleghorn and S. Burlatsky

10:00 **1186** Polymer Electrolyte Membrane Degradation Mechanisms: Findings over the Past 30 Years and Comparison with Electrolyzers - A. Laconti, H. Liu, C. Mittelsteadt, and R. McDonald (Giner, Inc./Giner Electrochemical Systems, LLC)

10:40 **1187** Development of Highly Durable MEA for PEMFC under High Temperature Operations (2) - E. Endoh, H. Kawazoe, and H. Nakagawa (Asahi Glass Co., Ltd.)

11:00 **1188** MEA Accelerated Testing and Lifetime Modeling - M. Hicks, D. Pierpont, P. Turner, M. Yandrasits, and T. Watschke (3M Company)

11:20 **1189** Multi-Scale Modeling Considerations for PEM Fuel Cell Durability - S. Burlatsky, N. Cipollini, D. Condit, T. Madden (United Technologies Research Center), and V. Atrazhev (Russian Academy of Science)

Operating Conditions and Catalyst Impact on Membrane Degradation
Co-Chairs: S. Cleghorn and S. Burlatsky

14:00 **1190** High Durability of Asahi Kasei Aciplex Membrane - N. Miyake, M. Wakizoe, E. Honda, and T. Ohta (Asahi Kasei Chemicals Co.)

14:30 **1191** Effect of Operation Conditions on Membrane Durability in PEM Fuel Cells - W. Liu and S. Cleghorn (W. L. Gore & Associates, Inc.)

15:00 **1192** Factors Accelerating Membrane Degradation Rate and the Underlying Degradation Mechanism in PEMFC - V. Mittal, R. Kunz (University of Connecticut), and J. Fenton (University of Central Florida)

15:20 **1193** Impacting Factors for Chemical Degradation of Perfluorinated Sulfonic Acid Ionomer - H. Liu (Giner Electrochemical Systems, LLC), H. Gasteiger (General Motors Fuel Cell Activities), A. Laconti (Giner, Inc./Giner Electrochemical Systems, LLC), and J. Zhang (General Motors Fuel Cell Activities)

15:40 **1194** H_2O_2 Formation Mechanism in PEMFC - V. Mittal, R. Kunz (University of Connecticut), and J. Fenton (University of Central Florida)

16:00 **1195** Strategies for Mitigation of Perfluorosulfonic Acid Degradation in PEM Fuel Cells - K. Schwiebert, K. Raiford, G. Escobedo, and G. Nagarajan (DuPont Fuel Cells)

16:30 Intermission (10 Minutes)

Materials Characterization with Respect to Membrane Degradation
Co-Chairs: S. Cleghorn and S. Burlatsky

16:40 **1196** Hydrogen Peroxide Formation as a Degradation Factor of Polymer Electrolyte Fuel Cells - M. Inaba, H. Yamada, J. Tokunaga, R. Umebayashi, K. Matsuzawa, A. Hatanaka, and A. Tasaka (Doshisha University)

17:10 **1197** In Situ Micro-Raman on the Membrane in a Working PEM-Cell - H. Matic (Chalmers University of Technology), A. Lundblad, and G. Lindbergh (Royal Institute of Technology)

17:30 **1198** Temperature and Water Content Measurements of Nafion Membrane in PEM Fuel Cells - J. Kim, G. Barbastathis, Y. Shao-Horn, and L. Waller (MIT)

Y1 Three-Dimensional Micro- and Nanoscale Battery Architectures

Physical and Analytical Electrochemistry / Battery / Industrial Electrolysis and Electrochemical Engineering /

Santa Anita B, Lobby Level

New Directions for 3-D Nanoscale Systems
Chair: J. Long

10:00 **1241** New Concept and Chemistries for Self Assembled 3D Microbatteries - G. Amatucci, I. Plitz, and F. Badway (Rutgers, The State University of New Jersey)

10:40 **1242** Single-Particle Electrode Aqueous Microbatteries - D. Scherson and A. Palencsar (Case Western Reserve University)

11:20 **1243** Qualitatively Different Behavior of Electrode Materials at the Nanoscale: Implications for 3D Battery Nanoarchitectures - J. Xu, G. Jain (Rutgers, The State University of New Jersey), M. Balasubramanian (Argonne National Laboratory), and J. Yang (Rutgers, The State University of New Jersey)

2-D Microbatteries
Co-Chairs: V. Srinivasan and Y-M. Chiang

14:00 **1244** Materials and Fabrication Approaches for Microbatteries - K. Swider-Lyons and A. Stux (Naval Research Laboratory)

14:40 **1245** Modeling and Stencil/Screenprint Fabrication of Thick Film Lithium Polymer Ion MicroBatteries for Smart Dust Applications - D. Steingart, C. Ho, J. Evans, and P. Wright (UC Berkeley)

15:20 Intermission (20 Minutes)

15:40 **1246** A New Architecture of Thin Film Battery with Organic Radical Plastic Cathode - K. Nakahara, J. Iriyama, S. Iwasa, M. Suguro, and M. Satoh (NEC)

16:00 **1247** Fabrication of Lithium Micro-array Battery by Sol-Gel Process - J. Sugaya, K. Dokko, and K. Kanamura (Tokyo Metropolitan University)

16:20 **1248** Three-Dimensional, Nanostructured Electrochemical Energy Storage Devices - H. In, S. Kumar, Y. Shao-Horn, and G. Barbastathis (Massachusetts Institute of Technology)

Z1 Molecular Structure Effects in Heterogeneous Electron Transfer Kinetics

Physical and Analytical Electrochemistry / Organic and Biological Electrochemistry

San Pedro, Lobby Level

Co-Chairs: G. Brisard and D. Evans

10:00 **1251** The Reproducible Preparation of Self-Assembled Alkanethiolate Monolayers on Gold: Mass Transfer Effects - E. Cox, A. Bergren, G. Edwards, and P. Marc (Iowa State University)

10:20 **1252** SAMs of Thiols with Electronic Conduction for Micro- and Nano-Applications Studied with Electrochemical and Surface Analytical Methods - H. Strehblow (Heinrich-Heine-Universitaet)

10:40 **1253** Oxygen Reduction at Highly Ordered Interfaces: The Immersed vs. the Emersed Case - M. Rohwerder, H. Ehahoun, and A. Laaboudi (MPI for Iron Research)

11:00 **1254** Surprising Odd-Even Oscillation in the Heterogeneous Electron Transfer Rate of Solution-Based Redox Couples at Short-Chain Alkanethiolate Monolayers on Gold - A. Bergren, E. Cox, G. Edwards, and M. Porter (Iowa State University)

11:20 **1255** Electron-Transfer Reactions Accompanied by Large Structural Changes: Distinguishing Concerted vs. Two-Step Reactions - D. Evans and N. Macias Ruvalcaba (University of Arizona)

11:40 **1256** Treatment of Data on Heterogeneous Electron Transfer in Viscous Media Formed by Carbohydrates - N. Titova, G. Tsirlina (Moscow State University), R. Nazmutdinov, M. Bronshtein, and I. Manyurov (Kazan State Technological University)

Co-Chairs: R. Fawcett and G. Brisard

14:00 **1257** Solvent Dynamics Effects in the Heterogeneous Electron Transfer: Interplay Between the Solvent Nature and Intramolecular Reorganization - R. Nazmutdinov, M. Bronshtein, I. Manyurov (Kazan State Technological University), and G. Tsirlina (Moscow State University)

14:20 **1258** Determination of the Effective Charge on Polyatomic Reactants in Elecrode Reactions - W. Fawcett (University of California) and M. Rusanova (UC Davis)

14:40 **1259** The Double Layer and Ionic Association vs Overvoltage Effects in Normal Marcus Region and in the Vicinity of Activationless Discharge - G. Tsirlina, P. Zagrebin (Moscow State University), and R. Nazmutdinov (Kazan State Technological University)

15:00 **1260** Potential-Dependent Activation Energy Calculations by Second Order Gradient Method - M. Aryanpour, V. Rai, and H. Pitsch (Stanford University)

15:20 Intermission (20 Minutes)

15:40 **1261** Time-Resolved In Situ Reflectance Microspectroscopy: Oxidation of Carbon Monoxide Adsorbed on Polycrystalline Platinum Microelectrodes - D. Scherson, P. Shi, and I. Fromondi (Case Western Reserve University)

16:00 **1262** A Systematic Study of Potential-Sependent CO Adsorption on a Smooth Polycrystalline Pt Surface Using PEM-FTIR Technique - G. Hou (Illinois Institute of Technology) and E. Smotkin (University of Puerto Rico at Rio Piedras)

16:20 **1263** Adsorption of S-Containing Amino Acids on Au(110) as Monitored by Reflection Anisotropy Spectroscopy - C. Smith (University of Liverpool), R. LeParc (Universite de Montpellier), M. Cuquerella, D. Fernig, C. Edwards, R. Williams, and P. Weightman (University of Liverpool)

16:40 **1264** Beyond Bilayers: Interfacial Water Dynamics and Aggregation from First Principles - C. Taylor, M. Neurock, and R. Kelly (University of Virginia)

17:00 **1265** Electroreduction of Complex Ions at Bismuth and Cadmium Single Crystal Plane Electrodes - E. Lust, J. Nerut, E. Hark, R. Jager, K. Lust, and K. Tahnas (University of Tartu)

AA2 Microcantilever Sensors

Sensor

San Gabriel A, Lobby Level

Co-Chairs: T. Thundat and P. Hesketh

10:00 Introductory Remarks (5 Minutes)

10:05 **1281** Chemical Vapor Sensor Arrays Based on Microfabricated Wristwatch Tuning Forks - N. Tao, M. Ren, E. Forzani, and F. Tsow (Arizona State University)

10:35 **1282** Engineering of Heated Atomic Force Microscope Cantilevers - W. King (Georgia Institute of Technology)

11:05 **1283** Microcantilever Response Generated from Thermally Induced Transitions of Large DNA Hairpins - M. George, J. Ng, J. Dowell, A. Kar (University of Alabama), K. Hansen, and T. Thundat (Oak Ridge National Laboratory)

11:35 **1284** Surface Stress in Microcantilevers During Electrochemical Redox Processes - F. Tian, G. Brown, and T. Thundat (Oak Ridge National Laboratory)

Co-Chairs: J. Hsu and W. King

13:30 **1285** The Veriscan 3000 System: Revealing the Potential of Microcantilever Assays - R. Cain, G. Kellog, M. Natesan, and T. Seeley (Protiveris, Inc.)

14:00 **1286** Prospects of Nanomechanics Based Carbon Nanotube Sensors - L. Nagahara (Motorola Labs)

14:30 **1287** Microcantilever Technology for Chemical, Biological, and Explosive Material Detection - J. Adams, B. Rogers, and R. Whitten (Nevada Nanotech Systems, Inc.)

15:00 Intermission (15 Minutes)

15:15 **1288** Serum-Based Cancer Diagnostics Using Cantilever Array Platforms - R. Datar and M. Phil (University of Southern California)

15:45 **1289** Micromechanical Sensors for Environmental Monitoring - G. Brown, V. Boiajiev, P. Bonnesen, G. Goretzki, F. Tian, and T. Thundat (Oak Ridge National Laboratory)

16:15 **1290** High Sensitivity Multi-Channel Piezoresistive Cantilever CMOS Readout System - Z. Hu (Oak Ridge National Labs), W. Qu, N. Islam, S. Islam (University of Tennessee), and T. Thundat (Oak Ridge National Laboratory)

16:35 **1291** Design and Fabrication of Piezoresistive Microcantilever Array for Stress-Based Biochemical Detection - A. Chaudhury, P. Hesketh, Z. Hu, and T. Thundat (Georgia Institute of Technology)

16:55 **1292** Batch Fabricated Bifunctional AFM Cantilevers for the Application of SECM-AFM - H. Shin and P. Hesketh (Georgia Institute of Technology)

17:15 **1293** The Micro-Cantliver Laboratory - A. Passian and T. Thundat (Oak Ridge National Laboratory)

AA3 Sensors, Actuators, and Microsystems General Session

Sensor
San Fernando, Lobby Level

Chair: D. Makel

10:00 **1294** Micro-hydrogen Gas Sensor Using SiO_2 Coated F-doped SnO_2 - H. Chi-Hwan and S. Han (Korea Institute of Energy Research)

10:20 **1295** IrOx Based Fuel Acidity Sensor - J. Widera and J. Johnson (University of Dayton Research Institute)

10:40 **1296** Synthesis and Controlling the Morphology of SnO_2 Nanocrystals via Hydrothermal Treatment - K. Jain, A. Shrivastava and R. Rashmi (National Physical Laboratory)

11:00 **1297** Zirconia-Based Mixed Potential Sensors for the Detection of Energetic Materials - E. Brosha, R. Mukundan, and F. Garzon (Los Alamos National Laboratory)

11:20 **1298** Synthesis and Characterization of Iron Molybdate Aerogels Synthesized by the Sol-Gel Chemistry and High Temperature Supercritical Drying - U. Kersen (Helsinki University of Technology) and R. Keiski (University of Oulu)

Co-Chairs: G. Hunter and R. Mukundan

14:00 **1299** Disposable Electrochemical Sensor for Rapid Determination of Levodopa - N. Stradiotto (UNESP), M. Bergamini, and A. Santos (UNESP - Araraquara)

14:20 **1300** LaF_3 Based SO_2 Sensor Operative at Low Temperature - C. Wang, M. Zhou, and Y. Tian (Northeastern University)

14:40 **1301** Redox-Mediated Oxidation of Ethylene in Liquid and Gas Phase Using Ferrocene Derivatives - B. Loetanantawong, W. Surareungchai, and M. Somasundrum (KMUTT)

15:00 **1302** Surface Characterization and Manipulation of SWCNT for Sensor Applications - W. Buttner, G. Chung (Illinois Institute of Technology), L. Evan, G. Hunter (NASA Glenn Research Center), J. Stetter, J. Jeong (Illinois Institute of Technology), J. Xu (NASA Glenn Research Center), and R. Wang (Illinois Institute of Technology)

15:20 Intermission (20 Minutes)

15:40 **1303** Synthesis, Processing and Characterization of Gas/Chemical Sensors - A. Ahmad, M. Zhou, and J. Walsh (Natural Resources Canada)

16:00 **1304** A Small, Low Cost Wireless Galvanostat Based on Open Source Hardware and Software - D. Steingart, A. Redfern, C. Ho, P. Wright, and J. Evans (UC Berkeley)

16:20 **1305** In Situ, On Line, Raman Scattering in a Channel-Type Electrochemical Cell - Q. Shi, H. Zhu, and D. Scherson (Case Western Reserve University)

16:40 **1306** Charge Transport in Spatially Non-Uniform Quantum Systems: The Linearized Longitudinal Conductivity of Small Clusters of Ga and In with As - L. Pozhar (Western Kentucky University)

Thursday, October 20, 2005

0930 Coffee Break
Foyer, *Lobby Level and California Foyer, Level 2*

D2 Rechargeable Lithium and Lithium-Ion Batteries

Battery / Energy Technology
San Diego, Level 2

Thermal Studies
Co-Chairs: K. Zaghib and C. Julien

08:00 **227** Low-Temperature Performance Limitations of Lithium-Ion Batteries - K. Gering (Idaho National Laboratory)

08:20 **228** Poor Cycling Performance of C-$LiFePO_4$/Graphite Li-Ion Cells at High Temperature - K. Amine, J. Liu, and I. Belharouak (Argonne National Laboratory)

08:40 **229** Investigation of Thermal Stability of $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$ Compared with $LiNi_{0.80}Co_{0.15}Al_{0.05}O_2$ and $LiMn_{1.88}Al_{0.12}O_4$ - K. Okahara, T. Tatsumi, K. Shizuka, A. Inoue, and H. Imura (Mitsubishi Chemical Group Science and Technology Research Center, Inc.)

09:00 **230** Studies of Cycling Temperature Effects on Structural Changes and Rate Capability of $LiMn_2O_4$ Cathode Materials in Comparison with Layered Materials Using In Situ X-Ray Diffraction - X. Yang, K. Chung, W. Yoon, H. Lee, and J. McBreen (Brookhaven National Lab.)

09:20 **231** What Cathode Material Would be the Best Choice for Large Lithium-Ion Batteries? - N. Ravet (University of Montreal), M. Gauthier, D. Geoffroy (Phostech Lithium), S. Lavallee (University of Montreal), and G. Nuspl (Sud-Chemie)

09:40 Intermission (20 Minutes)

Electrochemical Modeling and Design
Co-Chairs: D. Dees and K. Thomas-Alyea

10:00 **232** Lithium-Ion Cell Design for Safety, Long Life, and Low Cost - P. Nelson, A. Jansen, and D. Dees (Argonne National Labs)

10:30 **233** Conduction and Destruction of Packed Particle Electrodes: Toward Fully Integrated Modeling of Mechanics and Electrochemistry - A. Sastry, C. Wang, Y. Yi, K. Striebel, and K. Zaghib (The University of Michigan)

11:00 **234** A Model-Based Comparison of Various Li-Ion Chemistries - V. Srinivasan (Lawrence Berkeley National Lab) and J. Newman (University of California, Berkeley)

11:20 **235** Structures and Electrochemical Properties in $Li(Ni_{1/2}Mn_{1/2})O_2$: Theory and Experiment - G. Ceder, Y. Meng, Y. Hinuma, A. Van der Ven, and Y. Shao-Horn (MIT)

11:40 **236** First Principles Study of the Factors Affecting Li Mobility in Layered Lithium Transition Metal Oxides - K. Kang and G. Ceder (Massachusetts Institute of Technology)

Electrochemical Modeling and High Power Lithium Batteries
Co-Chairs: V. Srinivasan and A. M. Sastry

14:00 **237** Electrochemical Modeling of Lithium-Ion Positive Electrodes During Hybrid Pulse Power Characterization Tests - D. Dees (Argonne National Laboratory), E. Gunen (Illinois Institute of Technology), D. Abraham, A. Jansen (Argonne National Laboratory), and J. Prakask (Illinois Institute of Technology)

14:30 **238** System Level Component Models for Electrochemical Power Sources - V. Subramanian and V. Diwakar (Tennessee Technological University)

14:50 **239** A Practical Longevity Model for Lithium-Ion Batteries: De-coupling the Time and Cycle-Dependence of Capacity Fade - E. Scott, J. Brown, C. Schmidt, and W. Howard (Medtronic Incorporated)

15:10 **240** Comparison of Model Predictions with Experimental Data from Lithium-Ion Battery/ Electrochemical Capacitor Hybrid System - G. Sikha, B. Popov, and R. White (University of South Carolina)

15:30 **241** Differential Voltage Analysis of High Power Lithium Ion Cells - I. Bloom (Argonne National Laboratory), J. Christophersen, and K. Gering (Idaho National Laboratory)

15:50 Intermission (20 Minutes)

Analytical and Diagnostic Studies
Co-Chairs: K. Edstrom and D. Abraham

16:10 **242** Resistance Growth in Lithium Ion Satellite Cells. I. Non Destructive Data Analyses - J. Hall, A. Schoen, P. Allen (The Boeing Company), P. Liu, and K. Kirby (HRL Laboratories, LLC)

16:40 **243** In-Situ Atomic Force Microscopy of Li_xCoO_2 Single Crystals During Li^+ De-intercalation and Intercalation - Y. Shao-Horn, A. Clemencon, and S. Kumar (Massachusetts Institute of Technology)

17:00 **244** In-Situ Thermal Study of $LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ Using Isothermal Micro Calorimetric Techniques - W. Lu, I. Belharouak, D. Vissers, and K. Amine (Argonne National Laboratory)

17:20 **245** Probing the Self-Discharge Current in $LiMn_2O_4$ and $LiCoO_2$ Cathodes - R. Yazami and Y. Ozawa (Caltech)

17:40 **246** Coin Cell with Two Reference Electrodes for Fundamental Study of Lithium-Ion Cells - B. Ravdel, S. Trebukhova (Yardney Technical Products, Inc.), K. Abraham (E-KEM Sciences), and J. DiCarlo (Yardney Technical Products, Inc.)

F1 Dielectrics and the Dielectric-Electrolyte Interface in Biological and Biomedical Applications

Dielectric Science and Technology
Palos Verdes, Lobby Level

Patterning of Functional Surfaces
Co-Chairs: A. Offenhausser and D. Landheer

08:00 **401** Turn Your Screen into a Biosensor: Electronically Controlled Indium Tin Oxide Surfaces for Biomedical Applications - J. Voros (Dynamic BioInterfaces Group)

08:40 **402** Molecular Imprinting and Its Applications in Biomolecular Sensing and Purification - T. Chou, J. Rick, and P. Chou (National Cheng Kung University)

09:20 **403** Electrochemically Switchable Surfaces Based on Beta-Cyclodextrin SAMS for Biomicrofluidic Applications - K. Zavadil, M. Farrow, and B. Bunker (Sandia National Laboratories)

09:40 Intermission (20 Minutes)

Co-Chairs: R. Bashir and M. Yousaf

10:00 **404** Thick Film and Ink-Jet Printing Technologies for Biosensor Development - C. Liu, J. Shen (Case Western Reserve University), M. Chuang (National Chiao Tung University), and L. Dudik (Case Western Reserve University)

10:40 **405** Exploring Biology Using Surface Chemistry - A. Wong (Harvard University)

11:20 **406** Nanoscale Patterning of Semiconductor Surfaces for Biomedical Applications - J. Buriak (University of Alberta), M. Aizawa (National Institute for Nanotechnology), Y. Qiao (University of Alberta), and D. Wang (National Institute for Nanotechnology)

Detection of Bio-Molecules
Co-Chairs: C. C. Liu and J. W. Choi

14:00 **407** Nanogap Junctions for Biomolecular Sensor Array - L. Lee (University of California, Berkeley)

14:40 **408** Quantification of Biological Luminescence Using Complementary Metal Oxide Semiconductor (CMOS) Sensors - U. Lu (University of Southern California) and Y. Yang (Chiao Tung University)

15:20 **409** Direct Observation of Calf Thymus DNA on Au(110) - C. Smith, M. Cuquerella, D. Fernig, C. Edwards, and P. Weightman (University of Liverpool)

15:40 Intermission (20 Minutes)

Co-Chairs: J. Deen and L. P. Lee

16:00 **410** Integrated Micro and Nanosensor and Systems for Detection of Biological Entities using BioMEMS to Bionanotechnology - R. Bashir (Purdue University)

16:40 **411** Analysis of Field-Effect from Biological Macromolecules on the Floating Gates of MOS Transistors - D. Landheer and G. Aers (National Research Council of Canada)

17:20 Concluding Remarks (5 Minutes)

G3 High Dielectric Constant Gate Stacks III

Dielectric Science and Technology / Electronics and Photonics
Sacramento, Level 2

Electrical and Reliability Characterization I
Co-Chairs: M. Houssa and S. C. Song

08:00 **557** Composition Dependence of Physical and Electrical Properties of HfSiON Films as Alternative Gate Dielectrics - A. Nishiyama, M. Koike, Y. Kamimuta, M. Suzuki, T. Ino, and M. Koyama (Toshiba Corporation)

08:30 **558** Determination of the Channel Doping Density in MOS Devices with High-k Gate Dielectrics - D. Reddy and S. Kar (Indian Institute of Technology)

08:50 **559** Study of Charge and Its Effect on the Inversion Layer Mobility of HfO_2 Gate Stacks - Z. Zhang and S. Campbell (University of Minnesota)

09:10 **560** Charge Trapping, Negative Bias Temperature Instability (NBTI), and Breakdown Related Reliability Issues in High k /Gate Dielectric Stacks - S. Zafar, A. Vayshenker, A. Callegari, E. Gusev, V. Narayanan, and G. Singco (IBM)

High-k Transistor Performance
Co-Chairs: M. F. Li and H. Iwai

10:00 **561** High Performance Metal Gate CMOSFETs with Aggressively Scaled Hf-Based High-k - S. Song (SEMATECH), Z. Zhang (SEMATECH, TI Assignee), C. Huffman, S. Bae, J. Sim (SEMATECH), P. Kirsch (IBM assignee to SEMATECH), P. Majhi (SEMATECH), N. Moumen (SEMATECH, IBM Assignee), and B. Lee (SEMATECH)

10:30 **562** Ion-Enhanced Plasma Etching of Metal Oxides in Chlorine Based Plasmas - R. Martin, M. Sawkar (University of California, Los Angeles), H. Blom (Uppsala University), and J. Chang (University of California)

10:50 **563** Influence of Ta(N) Metal Gate Microstructure on Its Etch Properties - D. Shamiryan, V. Paraschiv, Z. Tokei, and W. Boullart (IMEC)

11:10 **564** Wet Etch Characteristics of Hf-Silicates - M. Claes, V. Paraschiv, D. Dictus, T. Conard, W. Boullart, S. Vanhaelemeersch, and S. De Gendt (IMEC)

11:30 **565** HfSiON Gate Dielectrics for hp45 Node and Beyond - Y. Nara, S. Inumiya (Semiconductor Leading Edge Technologies), K. Torii (Selete, Hitachi), and K. Nakamura (Semiconductor Leading Edge Technologies)

12:00 **566** CMOS Integration Issues with High-k/ Metal Gate Stack - D. Kwong (Institute of Microelectronics)

Electrical and Reliability Characterization II
Co-Chairs: S. Zafar and M. Houssa

14:00 **567** Charge Trapping Effects in High-k Transistors - G. Bersuker, J. Sim, C. Young, R. Choi, R. Harris, B. Lee, P. Zeitzoff, G. Brown, and H. Huff (SEMATECH)

14:30 **568** Effect of Nitridation on 1/f Noise in n-MOSFETs with High-k Dielectric - P. Srinivasan (New Jersey Institute of Technology), E. Simoen, L. Pantisano, C. Claeys (IMEC), and D. Misra (New Jersey Institute of Technology)

14:50 **569** Efficient Calculation of Quasi-Bound State Tunneling through Stacked Dielectrics - M. Karner (Institute for Microelectronics), A. Gehring (AMD Saxony LLC & Co. KG), S. Holzer, H. Kosina, and S. Selberherr (Institute for Microelectronics)

15:10 **570** Implications of Non-Linear Poole-Frenkel Plots on High-k Dielectric Leakage - W. Harrell, T. Cordella, and K. Poole (Clemson University)

15:30 **571** Charge Trapping and Bias Temperature Instability in High-k Dielectric CMOS Transistors - M. Li, C. Zhu, C. Shen, X. Yu, Y. Feng, Y. Yeo, A. Chin (National University of Singapore), and D. Kwong (Institute of Microelectronics)

Electrical and Reliability Characterization III
Co-Chairs: G. Bersuker and D. L. Kwong

16:20 **572** Charge Trapping: A Major Reliability Challenge for High-k Gate Dielectrics - T. Ma, S. Wang, H. Bu, and L. Song (Yale University)

16:50 **573** Salient Features in the Capacitance Characteristics of Ultrathin High-k Devices - S. Kar, D. Reddy, and S. Rawat (Indian Institute of Technology)

17:10 **574** Electrical Breakdown and Reliability of Metal Gate - La_2O_3 Thin Films after Post Deposition Annealing in N_2 - J. Molina, K. Tsutsui, and H. Iwai (Tokyo Institute of Technology)

17:30 **575** Evidence of Deep Energy States from Low Temperature Measurements and Its Role in Charge Trapping in Metal Gate/Hf-Silicate Gate Stacks - N. Chowdhury, P. Srinivasan, and D. Misra (New Jersey Institute of Technology)

17:50 **576** Asymmetric Distribution of Charge Trap in HfO_2-Based High-k Gate Dielectrics - K. Higuchi, T. Naito, A. Uedono, K. Shiraishi (University of Tsukuba), K. Torii (Selete), M. Boero (Univ of Tsukuba), T. Chikyow (NIMS), S. Yamasaki (AIST), K. Yamada (Waseda University), R. Hasumuma, and K. Yamabe (Univ of Tsukuba)

18:10 **577** Indication of Lateral Nonuniformity of Effective Oxide Charges in High-k Gate Dielectrics by Terman's Method - S. Huang and J. Hwu (National Taiwan University)

I2 Green Electrodeposition

Electrodeposition
Santa Barbara B, Lobby Level

Co-Chairs: G. Zangari and C. Hussey

08:00 Introductory Remarks (5 Minutes)

08:05 **650** Cesium Recovery from Tank Waste Using the CsHg Alloying Reaction in Hydrophobic Room-Temperature Ionic Liquids: A Green Chemistry Approach - T. Tsuda, C. Hussey (The University of Mississippi), H. Luo, and S. Dai (Oak Ridge National Laboratory)

08:40 **651** Solid-State Electrochemical Sensor for Monitoring Li and Mg in Al Refining Process - G. Kale (The University of Leeds)

09:00 **652** Improving the Morphology of Copper Electrodeposits from Halide Media Using Additives and Mass Transport Control - M. Free, R. Bhide, and A. Rodchanarowan (University of Utah)

09:20 **653** Neutral Surfactants Removal Kinetic from Sodium Chloride Solution by Galvanochemical Process - A. Pikelny (WEHO) and O. Pikelnaya (UCLA)

09:40 Intermission (20 Minutes)

10:00 **654** Non-Cyanide Electrolytes for Electrolytic and Electroless Gold Deposition Processes - T. Osaka, Y. Okinaka (Waseda University), and M. Kato (Kanto Chemical Co.)

10:40 **655** The Recovery of Metals from Waste Streams by Electrochemical Methods - R. Buckle and S. Roy (University of Newcastle upon Tyne)

11:00 **656** Electrocodeposition of Silver Particles with Tin for Fabrication of Lead-Free Solder Bumps - D. Barkey (University of New Hampshire), B. Wu, A. Keigler, and Z. Liu (Nexx Systems)

11:20 **657** Recovery of Gold from a Spent Thiosulphate-Sulphite Electrolyte Using a Flow-by Cell - S. Sobri and S. Roy (University of Newcastle upon Tyne)

11:40 **658** Electrochemical Formation of Prussian Blue Films with a Single Ferricyanide Solution on Gold Electrode - M. Kamyabi and A. Abbaspour (Shiraz University)

Co-Chairs: G. Zangari and C. Hussey

15:00 Introductory Remarks (5 Minutes)

15:05 **659** Whisker Formation in Pb-Free Surface Finishes - G. Stafford, M. Williams, C. Johnson, K. Moon, and W. Boettinger (NIST)

15:40 **660** Novel Silica Based Coatings as a Substitute for Chrome Passivates: Role of Surface Activation. - S. Kumaraguru and B. Popov (University of South Carolina)

16:00 **661** Electrodeposition of Copper-Manganese Alloy Coatings for Sacrificial Corrosion Protection - J. Gong (The University of Alabama) and G. Zangari (The University of Virginia)

16:20 **662** A Novel Approach to Deposit Compositionally Modulated Zn-Ni Multilayer as a Replacement for Cadmium Coating - P. Ganesan, S. Kumaraguru, and B. Popov (University of South Carolina)

16:40 **663** Improvement of Corrosion Resistance of Trivalent Chromium Electrodeposits on ABS Plastics for Automotive Exterior Parts. - K. Lee (Korea Institute of Machinery and Materials) and D. Chang (KIMM)

17:00 Concluding Remarks (5 Minutes)

I3 Science, Technology, and Tools for Electrodeposition: From Lab to Factory

Electrodeposition

San Gabriel B, Lobby Level

Electroless / General
Co-Chairs: A. West and J. Dukovic

08:00 **689** Real Time Monitoring of Electroless CoWP Deposition Process - Y. Gu, M. Birang, A. Shanmugasundram, D. Lubomirsky, and R. Cheboli (Applied Materials)

08:20 **690** On Compensation of Copper Crystallographic Orientation Effect in CoWP Electroless Deposition - I. Ivanov and A. Kolics (Blue29, LLC)

08:40 **691** DMAB Oxidation for Electroless Deposition from Alkaline Solutions - J. Rohan, B. Ahern, and L. Nagle (Tyndall National Institute)

09:00 **692** Electroless Deposition of Interconnected Silver Particles on Aluminum Alloyed with Copper - D. Brevnov and T. Olson (University of New Mexico)

09:20 **693** Thermal Stability and Crystallization Behavior of Electroless Ni-Ce-P and Ni-W-P Alloy Films - S. Antonelli, T. Allen, and D. Johnson (University of Oregon)

09:40 **1335** Electroless Nickel and Cobalt Thin Film Barrier and Capping Layers: Composition Effects - Y. Shacham-Diamand (Waseda University and Tel-Aviv University), H. Einati (Tel-Aviv University), A. Shanmugasundram, T. Weidman (Applied Materials, Inc.), M. Yoshino, and T. Osaka (Waseda University)

10:00 **694** Preparation of Anisotropic Conductive Particles using a Treatment as Photo-catalyst Mechanism by Electroless Ni Plating - K. Tanaka, H. Inaba, I. Koiwa, and H. Honma (Kanto-gakuin Surface Engineering Research Institute)

10:20 **695** Magnetic Abrasive Finishing by use of Co-Ni Electroless plated Active Carbon and their Application to Post CMP Processes - S. Yoshihara, Y. Zhang and T. Shinmura (Utsunomiya University)

10:40 **696** In Situ Stress Measurements During Electrochemical Processing - G. Stafford and C. Beauchamp (NIST)

11:00 **697** Mesoporous Metal Formation in Microfabricated Channels - T. Momma, Y. Yamauchi, H. Kitoh, K. Kuroda, and T. Osaka (Waseda University)

11:20 **698** The Formation Nanometer Thickness Thin Films of Compound Semiconductors and Metals Using Electrochemical Atomic Layer Epitaxy (EC-ALE) - J. Stickney, Y. Kim (The University of Georgia), J. Kim, and C. Thambidurai (The Unviversity of Georgia)

11:40 **699** Reducing the Order of Current-Potential Distribution Models - V. Subramanian (Tennessee Technological University)

Magnetics and MEMS
Co-Chairs: A. West and S. Brankovic

14:00 **700** Fe^{3+} Influence on Magnetic Moment and Nanostructure Morphology of the Electrodeposited CoFe Alloys - S. Brankovic, F. Wiatrowski, and K. Trumbull (Seagate Research Center)

14:20 **701** Electrodeposition of Co/Cu Multilayered Thin Films and Micro-Posts - Y. Li, M. Moldovan, D. Young, and E. Podlaha (Louisiana State University)

14:40 **702** Appearance and Remediation of Voids in Electroplated Copper Microstructures - K. Sasaki and J. Medina (Western Digital Corp.)

15:00 **703** Pre- and Post-Treatment for Electrodeposition of Organic Dielectric on Gold Electrodes - T. Sakata, H. Ishii, Y. Okabe, N. Sato, K. Kuwabara (NTT), T. Kamei, K. Kudou, M. Yano (NTT Advanced Techmplogy Corp.), and K. Machida (NTT)

15:20 **704** Metal Matrix Nanocomposites as Thin Films and Microstructures from Basic Electrolytes - A. Lozano-Morales, J. Fitzgerald, and E. Podlaha (Louisiana State University)

N1 Photovoltaics for the 21st Century III

Energy Technology / Electronics and Photonics

Santa Anita B, Lobby Level

Chair: G. Rumbles

08:00 **871** Carl Wagner Award Address–Supramolecular Porphyrinic Assemblies as Broadly Absorbing Chromophores for Excitonic Solar Cells - J. Hupp (Northwestern University)

08:40 **872** Optimization of Photovoltaic Devices from Layered PTEBS and Nanocrystalline TiO_2 - Q. Qiao, J. Beck, and J. McLeskey (Virginia Commonwealth University)

09:00 **873** Effects of Substrates on Dye-Sensitized Solar Cell Performance Using Nanocrystalline Titania - S. Ngamsinlapasathian, A. Kitiyanan, T. Fujieda, Y. Suzuki, and S. Yoshikawa (Kyoto University)

09:20 **874** Fabrication of Large-Area Full-Plastic Dye-Sensitized Photovoltaic Cells Using the Low-Temperature Binder-Free TiO_2 Coating Paste - T. Miyasaka (Toin University of Yokohama, Peccell Technologies Inc.) and Y. Kijitori (Peccell Technologies Inc.)

09:40 **875** Monte-Carlo Simulations of Electron Transport in Arrays of Colloidal Quantum Dots - J. van de Lagemaat (NREL)

10:00 Intermission (20 Minutes)

Chair: R. McConnell

10:20 **876** Recombination Dynamics in Polymer and Dye Sensitized Photovoltaic Cells - B. O'Regan (Imperial College), S. Veenstra, W. Verhees, J. Kroon, H. Smit, K. Bakker (Energy Research Center Netherlands), J. Durrant, J. Nelson, and C. Shuttle (Imperial College London)

11:00 **877** Preparation, Characterization, and Photoelectrochemistry of CdSe Nanocrystals: A Potential Gratzel Cell Sensitizer - R. Doherty and D. Riley (University of Bristol)

11:20 **878** An Investigation on the Potential Applications of Near Infrared PbSe Nanocrystal Quantum Dots in Photovoltaic Cells - J. Xu, D. Cui (Penn State University), and M. Gerhold (NCSU)

11:40 **879** Hydrogen-Evolving Photoelectrochemical Cells Based on p-Cu_2O Films - K. Rajeshwar, S. Somasundaram, N. Tacconi, and C. Raman Nair (The University of Texas at Arlington)

Chair: V. Kapur

14:00 **880** Electrodeposited Ordered Defect Chalcopyrite CIS Absorbers for Flexible Solar Cells - S. Menezes, Y. Li, S. Menezes, S. Kodigala, and S. Shaikh (InterPhases Research)

14:20 **881** Deposition and Testing of Combinatorial Libraries of Photovoltaic Devices - T. Hatchard, N. Gerein, M. Versavel, G. Gelves, and J. Haber (University of Alberta)

14:40 **882** Chemically Deposited Solar Cells. An Initiative Toward a Simpler Technology - M. Nair, P. Nair (Universidad Nacional Autonoma de Mexico), D. Avellaneda, S. Messina, G. Delgado, J. Campos, O. GomezDaza, and A. Sanchez (UNAM)

15:00 **883** Dependence of RF Power Bias on Hydrogenated Amorphous Silicon by High-Density Plasma Chemical Vapor Deposition - W. Hsiao, C. Liu (National Cheng Kung University), and Y. Wang (National Chia Yi University)

P1 Proton Exchange Membrane Fuel Cells V, in Honor of Supramaniam Srinivasan

Energy Technology / Physical and Analytical Electrochemistry / Battery / Industrial Electrolysis and Electrochemical Engineering / New Technology Subcommittee

San Francisco, Level 2

Modeling
Co-Chairs: C. Bock and T. Nguyen

08:00 **992** Atomistic Dynamic Simulation of Transport Processes in Polymer Electrolyte Fuel Cell and Experimental Validation - X. Zhou, Z. Chen, F. Delgado, D. Brenner, and R. Srivastava (Florida International University)

08:20 **993** A Simulation of Two-Phase Flow in the Flow Field of a Polymer Electrolyte Fuel Cell and Its Effect on Cell Performance - K. Suzuki, M. Yoneda, and M. Takimoto (Mizuho Information and Research Institute Corp.)

08:40 **994** Simplifying PEM Fuel Cell Models Without Compromising Accuracy - V. Diwakar, V. Maddirala, and V. Subramanian (Tennessee Technological University)

09:20 **995** Transient Model for MEA Hydration During Fuel Cell Operation - R. Bradean (Ballard Power Systems)

09:40 **996** Modelling the Effect of Microporous Layer in PEM Fuel Cells - R. Jain and T. Nguyen (University of Kansas)

10:00 Intermission (20 Minutes)

10:20 **997** Modeling Nonisothermal Effects in Polymer-Electrolyte Fuel Cells - A. Weber (Lawrence Berkeley National Lab) and J. Newman (University of California, Berkeley)

10:40 **998** Cold Start of Polymer Electrolyte Fuel Cells: Three-Phase Modeling and Experiments - L. Mao, K. Tajiri, S. Ge, X. Yang (The Pennsylvania State University), and C. Wang (Penn State University)

11:00 **999** Numerical Studies of Fuel Cell Sub-Freezing Start Process - J. Wu and Q. Liu (Mississippi State University)

11:40 **1000** Modeling and Simulation Approach for Standardized Testing and Analysis of PEMFC CHP Systems - P. Konig, A. Weber, and E. Ivers-Tiffee (Universitat Karlsruhe)

Cell Design
Co-Chairs: S. Motupally and T. Fuller

14:00 **1001** Optimized Catalyst Layer Structure for PEM Fuel Cells - R. Jain and T. Nguyen (University of Kansas)

14:20 **1002** Gas-Phase Particle Image Velocimetry (PIV) in Microchannels for Application to Fuel Cell Reactant Flow Channel Design - K. Sharp, S. Yoon, J. Ross, and M. Mench (Penn State University)

14:40 **1003** Synthesis of Highly Porous Catalytic Layers for Polymer Electrolyte Fuel Cell Based on Carbon Aerogels - J. Marie, S. Berthon-Fabry, P. Achard (ENSMP), M. Chatenet, E. Chainet (LEPMI-ENSEEG), R. Pirard (University of Liege), and N. Cornet (Renault)

15:00 **1004** Design and Development of a Novel Flow Field for PEM Fuel Cells to Obtain Uniform Flow Distribution - T. Herdtle and M. Debe (3M Company)

15:20 **1005** Measurement of the Current Distribution along a Quad-Serpentine Flow Field of a Polymer Electrolyte Membrane Fuel Cell - M. Hicks and K. Kropp (3M Company)

15:40 Intermission (20 Minutes)

16:00 **1006** Studies on Rib and Channel Characteristic of Flow Field on PEMFC Performance - S. Shimpalee and J. Van Zee (University of South Carolina)

16:20 **1007** Thermally Nitrided Stainless Steel Bipolar Plates for Proton Exchange Membrane Fuel Cells - B. Yang, M. Brady (Oak Ridge National Laboratory), D. Young (The University of New South Wales), K. More (Oak Ridge National Laboratory), H. Wang, and J. Turner (National Renewable Energy Laboratory)

16:40 **1008** Microfabricated Fuel Cells with Composite Proton Exchange Membranes - P. Kohl, J. Li, C. Moore, D. Bhusari, and S. Prakash (Georgia Institute of Technology)

17:00 **1009** The Effect of Dissimilar Anode/Cathode Flow Field Designs in PEM Fuel Cells - S. Greenway, S. Shimpalee, W. Lee, J. Van Zee (University of South Carolina), Y. Goo, S. Jeoung, and S. Yoo (Korea Automotive Technology Institute)

17:20 **1010** Characterization of Gas Diffusion Layers and Membrane Electrode Assemblies for Long-Term Operation - D. Wood, J. Davey, F. Garzon (Los Alamos National Laboratory), P. Atanassov (University of New Mexico), and R. Borup (Los Alamos National Laboratory)

17:40 **1011** Preparation and Characterization of Microporous Layers for Gas Diffusion Media - S. Park, J. Lee, J. Yeager, H. Colon-Mercado, P. Ganesan, B. Popov (University of South Carolina), R. Mammarella, and K. Miyamoto (Fuji Photo Film Inc.)

R1 Multiscale Simulations of Electrochemical Systems: Computational Aspects

Industrial Electrolysis and Electrochemical Engineering / Energy Technology / Electrodeposition / Corrosion

Santa Anita C, Lobby Level

Co-Chairs: V. Subramanian and R. Alkire

08:00 **1086** Computational Aspects of Multiscale Simulations of Electrochemical Systems - R. Braatz (University of Illinois at Urbana-Champaign)

08:40 **1087** Numerical Calculation for a State of SOFCs under a Depletion of Fuels in Anodes - H. Yakabe (Tokyo-Gas)

09:00 **1088** Computation Modeling of Localized Corrosion Stability on Wetted SS316L at 25 and 95°C - F. Presuel, F. Cui, and R. Kelly (University of Virginia)

09:20 **1089** A Mathematical Model for Cathodic Delamination of Coated Zinc - V. Huang (University of Florida), K. Ogle (Arcelor Research), and M. Orazem (University of Florida)

09:40 Intermission (20 Minutes)

Co-Chairs: V. Subramanian and K. Hebert

10:00 **1090** Numerical Simulation of Pitting Corrosion: Interactions Between Pits - N. Laycock, S. White, and D. Krouse (Industrial Research Limited)

10:20 **1091** Quantum Simulation and Isotope Exchange Depth Profiling Studies of Irradiated Yttria Stabilized Zirconia - R. Pornprasertsuk, J. Cheng, Y. Saito, T. Gur, and F. Prinz (Stanford University)

10:40 **1092** Analysis of Electrokinetic Data of Coal Slurry Oxidation by Parameter Estimation and Modeling Discrimination Techniques - P. Patil and G. Botte (Ohio University)

11:00 **1093** Current Density Distribution and Current Efficiency Modeling of Aluminum Electrodeposition in Ionic Liquids - M. Zhang and R. Reddy (The University of Alabama)

11:20 **1094** Modeling Gas-Phase Transport in Polymer-Electrolyte Fuel Cells - A. Weber (Lawrence Berkeley National Lab) and J. Newman (University of California, Berkeley)

11:40 **1095** Multi-Scale Model of PEM Fuel Cell Performance - S. Burlatsky (United Technologies Research Center), T. Jarvi (UTC Fuel Cells), and V. Atrazhev (Russian Academy of Science)

Co-Chairs: G. Botte and J. Meyers

14:00 **1096** Numeric Symbolic Solution for Analyzing AC Impedance Response of Electrochemical Devices - V. Diwakar, K. Potukuchi, and V. Subramanian (Tennessee Technological University)

14:20 **1097** A Novel Semi-Analytical Method for Predicting Current Density Distributions and Shape Changes - V. Subramanian (Tennessee Technological University)

14:40 **1098** Modeling the Cathodic Region in Crevice Corrosion under a Thin Electrolyte Film Including Particulates - A. Agarwal, U. Landau, X. Shan, and J. Payer (Case Western Reserve University)

S1 Environmental Electrochemistry

Industrial Electrolysis and Electrochemical Engineering / Physical and Analytical Electrochemistry / Organic and Biological Electrochemistry / Sensor

San Gabriel A, Lobby Level

Chair: P. Vanysek

08:00 **1099** Electrolysis of Ammonia Effluents: A Remediation Process with Co-Generation of Hydrogen - G. Botte, E. Bonnin, and E. Cellar (Ohio University)

08:20 **1100** Electrolysis of Coal and Graphite on Novel Carbon Fiber Electrodes - P. Patil, N. Sathe, Y. De Abreu, M. Prudich, and G. Botte (Ohio University)

08:40 **1101** Degradation of Disperse Dyes Present as Contaminants in Drinking Water by Conventional Chlorination and by Photoeletrocatalysis - M. Zanoni (Instituto de Quimica, UNESP), P. Alves Carneiro (UNESP), D. Oliveira (CETESB- SP), and G. A. Umbuzeiro (CETESB-SP)

09:00 **1102** Combination of the Electro-, Photoelectro-Fenton and Peroxi-Coagulation Processes for the Treatment of Organic Compounds in Aqueous Effluents - J. Juan Manuel Peralta, L. Godinez, and Y. Meas-Vong (CIDETEQ)

09:20 **1103** Photodegradation of Organic Effluents in a Photoelectrochemical Cell under Visible Light Irradiation - R. Solarska and J. Augustynski (University of Geneva)

09:40 Intermission (10 Minutes)

09:50 **1104** Separation and Purification of Multi-Component Waste Acids in Liquid Crystal Display Manufacturing Process - J. Kim, C. Shin, J. Kim (Daeil Development Co.), J. Ahn (Daejin), S. Park (RIST), and J. Shibata (Kansai University)

10:10 **1105** Potential Distribution Inside a RVC/Polyanaline Modified Electrode Used for Cr(VI) Remediation - L. Ruotolo and J. Gubulin (Federal University of Sao Carlos)

10:30 **1106** A Simultaneous Electroanalysis of Disinfectants for Water Treatments - T. Ohsaka, M. Awad, S. Sata (Tokyo Institute of Technology), and T. Okajima (Institute of Technology)

10:50 **1107** TiO_2-Clay Composite for Photocatalytic Coatings - S. Tsushima, and Y. Hirose (Kansai Paint Co.)

X2 Durability and Reliability of Low-Temperature Fuel Cells and Fuel Cell Systems

Physical and Analytical Electrochemistry

Beaudry B, Lobby Level

PEMFC Stack and System Membrane Degradation/Reliability
Co-Chairs: J. Meyers and T. Jarvi

08:00 **1199** Applying the Lessons Learned from PAFC to PEM Fuel Cells - T. Fuller (Georgia Institute of Technology), M. Perry, and C. Reiser (UTC Fuel Cells)

08:40 **1200** Characteristics of Electrode Potential and Degradation under Hydrogen Starved Operation in PEFC - Y. Takagi, S. Okada, and Y. Sato (Musashi Inst. of Tech.)

09:00 **1201** Carbon Corrosion Induced by Partial Hydrogen Coverage - T. Fuller and G. Gray (Georgia Institute of Technology)

09:20 **1202** Flow Control in a Fuel Cell Flow Field for Improved Performance and Reliability - M. Blanco (National Research Council - Institute for Fuel Cell Innovation), D. Wilkinson (University of British Columbia), R. Rahbari, and H. Wang (National Research Council - Institute for Fuel Cell Innovation)

09:40 Intermission (20 Minutes)

10:00 **1203** New Approach for Detection of Different Critical Stack Operating Conditions for Large Volume Fuel Cell Applications - E. Ramschak, V. Peinecke, P. Prenninger (AVL List GmbH), W. Baumgartner, T. Schaffer, and V. Hacker (Graz University of Technology)

10:20 **1204** Methods of Analyzing Long-Term Performance Behavior and Degradation in H_2-Air PEMFCs - D. Wood, J. Davey (Los Alamos National Laboratory), P. Atanassov (University of New Mexico), and R. Borup (Los Alamos National Laboratory)

10:40 **1205** Durability Studies of PEM Fuel Cell Using Specified Flow Plate - Q. Yan and J. Wu (Mississippi State University)

11:00 **1206** Accelerated Life Tests for Fuel Cells - M. Heneka and E. Ivers-Tiffee (Universitaet Karlsruhe)

11:20 **1207** PEMFC Stack Field Experiences: A. Maekawa and T. Aoki (Toshiba Fuel Cell Power Systems)

PEMFC Freeze Degradation
Co-Chairs: P. Zelenay and T. Jarvi

14:00 **1208** Freeze/Thaw Effects in PEM Fuel Cells - R. Mukundan, Y. Kim, F. Garzon, and B. Pivovar (Los Alamos National Laboratory)

14:20 **1209** Effects of Freeze-Thaw Cycling on Performance Degradation of Polymer Electrolyte Fuel Cells - M. Mench and S. Kim (Penn State University)

14:40 **1210** 1-D Transient Model of Shutdown to a Frozen State in a Polymer Electrolyte Fuel Cell - S. He and M. Mench (Penn State University)

15:00 **1211** Performance of a PEM Fuel Cell Stack at Sub-Freezing Conditions - Q. Yan and J. Wu (Mississippi State University)

15:20 Intermission (20 Minutes)

DMFC Durability
Co-Chairs: P. Zelenay and T. Jarvi

15:40 **1212** Ruthenium Crossover in DMFCs Operating with Different Proton Conducting Membranes - J. Choi, Y. Kim, R. Bashyam, and P. Zelenay (Los Alamos National Laboratory)

16:00 **1213** Ruthenium Mobility in Direct Methanol Fuel Cells - L. Gancs, T. Arruda, N. Hakim, M. Saha, and S. Mukerjee (Northeastern University)

16:20 **1214** Performance of DMFC with TiN Coated Aluminum Bipolar/End Plates - B. Padhy and Ramana G. Reddy (The University of Alabama)

16:40 **1215** Durability of Membrane-Electrode Interface under DMFC Operating Conditions - Y. Kim and B. Pivovar (Los Alamos National Laboratory)

17:00 **1216** Durability Evaluation of Direct Methanol Fuel Cells - R. Jiang and D. Chu (ARL)

17:20 **1217** Performance Durability of Direct Methanol Fuel Cells - P. Zelenay (Los Alamos National Laboratory)

AA3 Sensors, Actuators, and Microsystems General Session

Sensor
San Fernando, Lobby Level

Chair: W. J. Buttner

08:00 **1307** Micro-Thermoelectric Gas Sensor with B- and P-doped SiGe Thin Film Deposited by Helicon Sputtering - K. Tajima (Advanced Manufacturing Research Institute), W. Shin, M. Nishibori, N. Murayama, T. Itoh, N. Izu, and I. Matsubara (National Institute of Advanced Industrial Science and Technology)

08:20 **1308** Texture and Microstructure Design of Electrochemical Actuators - R. Garcia (Purdue University) and Y. Chiang (MIT)

08:40 **1309** Fabrication of Comb-Shaped 3-D Micromesh Ni Electrodes - T. Otsuka, H. Sato, and S. Shoji (Waseda University)

09:00 **1310** FET Based Microchemical pH Sensor and Electrowetting on Dielectric (EWOD) Microfluidic Actuator Multifunctional Device Using Ultra-Thin PEALD HfO2 on p-Si - V. Jankovic (Northrop Grumman Space Technology) and J. Chang (University of California)

09:20 **1311** Biofunctionalization of PMMA-Based BioMEMS Devices for Breast Cancer Diagnosis - S. Wei, R. McCarley, and S. Soper (Louisiana State University)

09:40 Intermission (20 Minutes)

10:00 **1312** Highly Sensitive Portable Sensing System Using Gas Detector Tube and CCD Image Sensor for Bad-Smell Sensing Network - Y. Tanaka, T. Nakamoto, and T. Moriizumi (Tokyo Institute of Technology)

10:20 **1313** Lab in a Tube for Serum Separation from Whole Blood - T. Kim (Hanyang Univ.), W. Ji, S. Hwang (Div. of Molecular and Life Science), and J. Park (Hanyang Univ.)

10:40 **1314** Bi-Layer Structured Biosensor for the Direct Measurement of Macromolecule and Effects from Macromolecules of Different Levels of Branching and Size - Y. Cui, J. Barford, and R. Renneberg (Hong Kong Unversity of Science and Technology)

11:00 **1315** Oxygen-Rich Enzyme or Microbial Matrix for Extending Detection Range Based on Clark Oxygen Electrode - Y. Cui, J. Barford, and R. Renneberg (Hong Kong Unversity of Science and Technology)

11:20 **1316** Design of Blood Glucose Sensor for Multichannel Healthcare Chip - M. Takai, Y. Himuro (The University of Tokyo), H. Ogawa, M. Nagai (Adbic Corp.), K. Ishihara (The University of Tokyo), and Y. Horiike (National Institute for Materials Science)

Friday, October 21, 2005

0930 Coffee Break
California Foyer, Level 2

D2 Rechargeable Lithium and Lithium-Ion Batteries

Battery / Energy Technology
San Diego, Level 2

Lithium Batteries: Applications and Performance
Co-Chairs: E. Scott and E. Takeuchi

08:00 **247** Advanced Battery Technology for Medium Rate Implantable Medical Devices Using Unique Laminated Cathode Construction - H. Gan, A. Shah, Y. Zhang, R. Rubino, S. Davis, and E. Takeuchi (Wilson Greatbatch Technologies, Inc.)

08:20 **248** Mechanistic Study of the First Voltage Plateau in the Discharge of SVO and the Consequences on Electrical Conductivity - N. Gleason, M. Palazzo, R. Leising, E. Takeuchi (Greatbatch, Inc.), and K. Takeuchi (SUNY at Buffalo)

08:40 **249** Study of V_2O_5 Thin Films Deposited by ALCVD and Used as Positive Electrode in Li Battery - H. Groult, K. Le Van, A. Mantoux, L. Perrigaud, and D. Lincot (Universite Pierre et Marie Curie)

09:00 **250** Influence of Size on Electrode Performance - A. Debart, F. Jiao, and P. Bruce (University of St Andrews)

09:20 **251** Performance Behavior of Sandia Coated Electrodes for Li-Ion Cells - G. Nagasubramanian and B. Sanchez (Sandia National Laboratories)

09:40 Intermission (20 Minutes)

Interfacial Studies
Co-Chairs: R. Kostecki and J. Hall

10:00 **252** Studies of Interfacial Chemistry in Lithium and Li-Ion Battery Systems Using Infrared Spectroscopy - P. Ross (LBNL)

10:30 **253** TG-MS Analysis on SEI of Graphite Carbon Anode in Lithium Ion Batteries - L. Zhao, I. Watanabe, and J. Yamaki (Kyushu University)

10:50 **254** Peaks and Pit-falls in Using PES for the Study of Li-Ion Battery Electrode Interfaces - K. Edstrom (Materials Chemistry)

11:10 **255** Interfacial Impedance Study of Composite Cathodes upon Aging - M. Kerlau, M. Marcinek, and R. Kostecki (LBNL)

11:30 **256** Interfacial Studies of Positive Electrodes Harvested from Aged High-Power Lithium-Ion Cells - D. Abraham (Argonne National Laboratory)

11:50 **257** Effects of Anion Receptors on SEI Layer Formation on Electrodes in Lithium Secondary Batteries - Y. Lee, J. Seo, J. Lee, W. Seol, D. Ko, and J. Park (Korea Advanced Institute of Science and Technology)

Solid-State Lithium Batteries
Co-Chairs: M. Thackeray and V. Zhuang

14:00 **258** Recent Progress of All-Solid-State Lithium Polymer Secondary Batteries in CRIEPI - Y. Kobayashi (Central Research Institute of Electric Power Industry), S. Seki (CRIEPI), M. Tabuchi (National Institute of AIST), Y. Ohno (Electric Power Engineering Systems), Y. Mita, A. Usami, H. Miyashiro, and N. Terada (CRIEPI)

14:30 **259** Non-Flammable Solid Polymer Electrolyte Containing Alminate Easter Groups for Lithium Ion Battery - M. Wakihara, Y. Masuda, M. Seki, and M. Nakayama (Tokyo Institute of Technology)

14:50 **260** Sulfonate-Modified Fumed Silicas as Nanocomposite Electrolytes - X. Zhang and P. Fedkiw (NC State University)

15:10 **261** Preparation of Thin Film All Solid State Rechargeable Lithium Batteries - K. Hoshina, K. Dokko, and K. Kanamura (Tokyo Metropolitan University)

P1 Proton Exchange Membrane Fuel Cells V, in Honor of Supramaniam Srinivasan

Energy Technology / Physical and Analytical Electrochemistry / Battery / Industrial Electrolysis and Electrochemical Engineering / New Technology Subcommittee

San Jose, Level 2

Transport
Co-Chairs: T. Nguyen and S. Barton

08:00 **1012** Transport Phenomena and Performance Study in High Temperature PEM Fuel Cells - P. Sinha (The Pennsylvania State University), C. Wang (Penn State University), and U. Beuscher (W.L.Gore & Associates, Inc.)

08:20 **1013** Capillary Pressure Properties of Gas Diffusion Materials used in PEM Fuel Cells - H. Ohn, T. Nguyen (University of Kansas), D. Jacobson, and D. Hussey (National Institute of Standards and Technology)

08:40 **1014** Liquid Water Distribution and Flooding as a Function of Flowfield Design in a PEFC - A. Turhan, P. Chuang, K. Heller, J. Brenizer, K. Unlu, M. Mench (Penn State University), and T. Trabold (General Motors Fuel Cell Activities)

09:00 **1015** Potential Artifacts in Applying Helium/ Oxygen Diagnostic under Sub-Saturated Conditions in Polymer Electrolyte Fuel Cells - R. Carter, D. Baker, R. Reid, and M. Mathias (General Motors)

09:20 **1016** Platform for Rapid Prototyping of PEM Fuel Cell Designs with Enhanced Cold-Start Performance and Durability - N. Gupta, C. York, J. Needham, and P. Hagans (UTRC)

09:40 Intermission (20 Minutes)

10:00 **1017** Impact of Freezing on Nafion: Transport Properties and Film Integrity - J. Leddy and D. Dunwoody (University of Iowa)

10:20 **1018** Water Management and Mass Transport Studies in Free Convection Proton-Exchange Membrane Fuel Cells - D. Modroukas (ATK GASL), V. Modi (Columbia University), and L. Frechette (Universite de Sherbrooke)

10:40 **1019** Effects of Temperature Difference on Water Management in PEMFCs - R. Zaffou (Universtity of Connecticut), J. Yi (UTC Fuel Cells), R. Kunz (University of Connecticut), and J. Fenton (University of Central Florida)

11:00 **1020** Water Removal from Proton Exchange Membrane Fuel Cells via Electro-osmotic Pumping - C. Buie, J. Posner, T. Fabian, S. Cha, F. Prinz, J. Eaton, and J. Santiago (Stanford University)

11:20 **1021** Operation of a PEMFC Stack under Various Practical Conditions - Q. Yan and J. Wu (Mississippi State University)

11:40 **1022** In-Situ Diagnostic Methods for Water Management in PEM Fuel Cells - J. Stumper (Ballard Power Systems) and P. Sauriol (University of British Columbia)

Electrode Kinetics IV
Co-Chairs: C. Bock and S. Motupally

14:00 **1023** Alternative Catalysts for PEM FCs: Performance and Durability at Normal and High Temperature Operations - A. Haug and L. Protsailo (UTC Fuel Cells)

14:20 **1024** Oxygen Reduction at the Pt/Recast-Nafion Film Interface at Different Temperatures and Relative Humidities. - J. Chlistunoff, F. Uribe, and B. Pivovar (Los Alamos National Laboratory)

15:00 **1025** Impact of Machine Coating GDE/MEA on Commercialization of Fuel Cells or Electrolyzers - Y. Tsou, E. De Castro, C. Hou, and Z. Zhu (De Nora North America, Inc.)

15:20 **1026** A Novel Photographic Printing Process for the Preparation of Catalysts for Fuel Cell Applications - J. Jiang, T. Hall, L. Tsagalas, D. Hill, and A. Miller (University of Notre Dame)