

# **222nd ECS Meeting Abstracts 2012**

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## Meeting Abstracts — MA 2012-02

### PRiME 2012 — Joint International Meeting Honolulu, Hawaii — October 7-12, 2012

#### 222nd Meeting of ECS — The Electrochemical Society 2012 Fall Meeting of The Electrochemical Society of Japan (ECSJ)

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- 286 Polymer-Nanocrystal Composites for Electrochromic Devices  
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- 288 Effect of Sintering Temperature on the Microstructure of Nanocrystalline Ni-yttria Stabilized Zirconia Cermets  
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- 289 Synthesis, Characterization and Electrochemical Property of Graphene-Doped LiFePO<sub>4</sub> Cathode Material  
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- 290 Electrochemical Characteristics of Zn Doped TiO<sub>2</sub> for Dye-Sensitized Solar Cells  
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- 291 Electrochemical Properties of Quasi-Solid Electrolyte Containing Graphene Oxide Dye Sensitized Solar Cell  
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- 296 Gallium Phosphide Nanowires for Solar Energy Conversion  
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- 298 Controllable Variable Memory States Using Capacitive Coupling of Trapped Electrons  
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- 299 Electrical Conductivity and Microstructure of NiO-CGO Composites Prepared By One Step Synthesis  
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- 300 Toxicity Assay-On-Chip for Engineered Nanomaterials  
*K. Garde and S. Aravamudhan*
- 301 n-Type Ultrananocrystalline Diamond/Hydrogenated Amorphous Carbon Composite Films Prepared by Pulsed Laser Deposition  
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- 302 Active Targeting, Fluorescence Imaging, and NIR Photothermal Therapy of Malignant Tumors  
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- 304 Fuel Cell Technology Readiness  
*S. Petrovic*
- 305 Catalysis Research for Polymer Electrolyte Fuel Cell (CaRPE-FC): A Case Study on an Academic Led, Tri-Party Research Program in Canada  
*T. Navessin and S. Holdcroft*
- 306 (Invited) Next Generation Heavy Duty Bus Fuel Cells: An Industry-Academic Collaboration  
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- 307 (Invited) Academia-Industry Synergy for Innovative PEFC Catalyst Layer and its Materials  
*A. Ohma*
- 308 Creating a Sustainable Business in the Hydrogen and Fuel Cell Market  
*K. E. Ayers, E. B. Anderson, C. B. Capuano, L. T. Dalton, and A. Roemer*
- 309 DMFC Power Modules for Materials Handling Vehicles  
*J. Mergel*
- 310 Technology Transfer between University and Industry in Uzbekistan: Techno Park Model  
*N. Mahamatov*
- 311 Electrochemical Discrimination of Ascorbic Acid Diastereomers Using Dihydroxyalkanedithiol-modified Au Electrode  
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- 312 Through the Looking Glass: A Journey into Innovation  
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- 313 (Invited) From Lab Bench to Marketplace: Building New Electrochemical Technologies  
*Y. Chiang*
- 314 Turning the Tides: New Mexico Materials for Japanese Cars  
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- 315 A Case Study of Technological Innovation Related to ElectroPolishing of Stainless Steel Valves and Fittings  
*E. J. Taylor and M. Inman*

- 316 Electrochemical Cesium Recovery Using Nanoparticle Film of Copper Hexacyanoferrate  
*H. Tanaka, R. Chen, C. Fukushima, M. Asai, T. Kawamoto, M. Kurihara, M. Arisaka, T. Nankawa, and M. Watanabe*
- 317 Integration of a New Electroplated Magnetic Alloy with Power Semiconductor Wafer Manufacturing Processes  
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- 318 A Novel Technique of Quantifying Micro Insulation Defects on Grain-Oriented Electrical Steel Using the Scanning Vibrating Electrode Technique  
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- 319 Role of Dimensional Parameters for Determination of Diffusion Coefficient (D) and Surface Exchange Coefficient (K) Case Study for Oxygen Storage Materials, Electrode Materials for SOFCs, and Materials for Li-Ion and Na Batteries  
*K. Zheng, D. Baster, J. Molenda, and K. Swierczek*

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- 320 A Wonderful Life Dedicated to Energy Research In Memery of James McBreen  
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- 321 Recent Advances in Neutron Imaging for Battery Characterization  
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- 322 Application of Synchrotron-Based X-Ray Techniques to Study Thermal Behavior of Electrode Materials for Lithium Rechargeable Batteries  
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- 323 Solid-State Batteries: A Fifty Year Perspective  
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- 325 An Empiric Approach to the Estimation of State of Charge of Lithium Cells and Range of an Electric Vehicle  
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- 326 Designing Advanced Hybrid Materials for Rechargeable Lithium Batteries  
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- 327 Substation Installations of ElectroVaya's MWh-Scale Lithium-Ion SuperPolymer Batteries for Smart Grid Applications  
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- 328 Nanostructured Composites for Energy Storage Applications  
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- 329 Polymer Gel Electrolytes for Lithium-Ion Batteries  
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- 330 Nanostructured  $\beta$ -Li<sub>3</sub>PS<sub>4</sub> for All-Solid Lithium-Sulfur Batteries  
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- 331 Kinetically Asymmetric Reaction Pathways on Charging and Discharging LiNi<sub>0.5</sub>Mn<sub>1.5</sub>O<sub>4</sub> Electrodes  
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- 332 High-Capacity 0.4Li<sub>2</sub>MnO<sub>3</sub>·0.6LiNi<sub>2/3</sub>Mn<sub>1/3</sub>O<sub>2</sub> with Excellent Cyclability for Lithium-Ion Batteries  
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- 333 Fabrication of Macroporous Li<sub>2</sub>FeSiO<sub>4</sub>/Carbon Monoliths for a Lithium-Ion Battery  
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- 334 Ag<sub>x</sub>V<sub>y</sub>O<sub>z</sub>PO<sub>4</sub>: Silver Vanadium Phosphorous Oxides as Cathode Materials in Lithium Batteries  
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- 343 Understanding Cycle Life Failure Mechanisms in Graphite-Silicon Alloy Composite Electrodes by Electrochemical Calorimetry  
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- 344 Tough Solid Composite Electrolytes to Enable Lithium Metal Anodes  
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- 345 Study of Conversion Reactions in NiO Using Transmission Electron Microscopy and Electron Energy Loss Spectroscopy  
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- 352 Synthesis of Active Fibrous Perovskite Catalyst and Its Application for Hydrogen Production  
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- 353 Electrochemical Behavior of Nanocrystalline  $\text{MgMnO}_3$  Cubic Defect Spinel Cathode for Rechargeable Magnesium Battery  
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- 390 Polymorphic Behavior and Morphology of Electrospun Poly(Vinylidene Fluoride) Separator Materials for Non-Aqueous Based Electric Double Layer Capacitors  
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- 777 A Novel Double-Structured  $\text{LiMn}_{0.85}\text{Fe}_{0.15}\text{PO}_4$ :  $\text{LiFePO}_4$  Core-Shell Materials for Rechargeable Lithium-Ion Batteries  
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- 815 Effect of Carbon Coating on  $\text{Li}[\text{Li}_{1/3}\text{Mn}_{2/3}]\text{O}_2\text{-LiMO}_2$  Cathode Materials for Lithium Ion Batteries  
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*K. Maeda, W. Imamura, K. Tanaka, H. Akimoto, and H. Horie*
- 1080 Modeling of Fracture Initiation and Propagation in Lithium Ion Battery Electrodes  
*P. Barai, S. Simunovic, and P. Mukherjee*
- 1081 Modeling of the Interactions of Uniformly Sized Nanoparticles  
*B. Orvananos, H. Yu, T. Ferguson, M. Bazant, and K. Thornton*
- 1082 Dynamic Optimization Using Efficient Reformulated Models for Maximizing Energy Storage and Life of Lithium-Ion Batteries  
*V. Ramadesigan, P. Northrop, R. Braatz, and V. Subramanian*

- 1083 Synthesis of  $\text{Co}_3\text{O}_4\text{-SnO}_2$  Multi-Layered Hollow Sphere and Their High Reversible Capacity for Anode of Li-Ion Battery  
*W. Kim, Y. Hwa, J. Jeun, H. Sohn, and S. Hong*
- 1084 Development of Li-Ion Rechargeable Battery Using Glassy  $\text{SnO-P}_2\text{O}_5$  Anode and Glass-Ceramic  $\text{LiFePO}_4$  Cathode and Their Safety Evaluation  
*A. Yamano, M. Morishita, H. Yamauchi, T. Nagakane, A. Sakamoto, M. Ohji, and T. Sakai*
- 1085 Development of Li-Ion Rechargeable Battery Using Glassy  $\text{SnO-P}_2\text{O}_5$  Anode and Glass-Ceramic  $\text{LiFePO}_4$  Cathode Materials  
*T. Nagakane, H. Yamauchi, A. Sakamoto, M. Ohji, A. Yamano, M. Morishita, and T. Sakai*
- 1086 Study of the Factors that Enable Carbon-Free Insulating Li-Ion Battery Electrodes  
*C. Kim, C. Alexander, N. S. Norberg, R. M. Kostecki, and J. Cabana*
- 1087 Single-Crystalline Porous Indium Phosphide as Novel Anode Material for Li-Ion Batteries  
*M. Gerngross, E. Quiroga-González, J. Carstensen, and H. Föll*
- 1088 A Thermodynamics-based Approach to Predicting Path Dependence of Aging in Electrochemical Cells: Part 2. Large-scale Simulation of Cell Aging Across Multiple US Cities  
*K. L. Gering*
- 1089 Cycle-Life Study and Aging Mechanism Diagnosis of NCM Composite/Graphite Cells  
*J. Wang, P. Liu, J. Hicks-Garner, L. Westman, E. Sherman, S. Soukiasian, M. W. Verbrugge, and H. Tataria*
- 1090 Characterization of Cycle-Life Aging in Automotive Lithium-Ion Pouch Cells  
*J. Marcicki, A. Bartlett, M. Canova, A. Conlisk, G. Rizzoni, Y. Guezennec, X. Yang, and T. Miller*
- 1091 A Common Capacity Loss Trend:  $\text{LiFePO}_4$  Cell's Cycle and Calendar Aging  
*Y. Miyaki, K. Hayashi, T. Makino, K. Yoshida, M. Terauchi, T. Endo, and Y. Fukushima*
- 1092 Capacity Fading of Mechanically Stressed Lithium-Ion Pouch Cells  
*J. Cannarella and C. B. Arnold*
- 1093 Battery Cycle Life Prediction with Coupled Chemical Degradation and Fatigue Mechanics  
*R. D. Deshpande, M. W. Verbrugge, Y. Cheng, J. Wang, and P. Liu*
- 1094 Lithium Storage Properties of Defect-Introduced Graphene Sheets  
*W. Lee, S. Suzuki, and M. Miyayama*
- 1095 Study of Solid Electrolyte Interface (SEI) on Graphite Anodes  
*J. Benson, J. Lee, N. Nitta, A. Magasinski, I. Kovalenko, T. Joshi, T. Fuller, and G. Yushin*

- 1096 Origin of Voltage Hysteresis of the Li-Cu-TiS<sub>2</sub> Displacement Reaction System: A Multi-Scale Simulation Based on Thermodynamics and Kinetics  
*H. Yu, J. Bhattacharya, C. Ling, A. Van Der Ven, and K. Thornton*
- 1097 The Effect of the Active Material of Lithium battery to the Contact Resistance between Carbon and Aluminum Current Collector  
*C. Honda, S. Onodera, K. Tachibana, and T. Nishina*
- 1098 Entangled Structures of Germanium Nanowires & Graphite Nanofibers for the Anode of Lithium Ion Batteries  
*S. Woo, S. Choi, J. Park, S. Hwang, and D. Whang*

### **B7 - Metal-Air Batteries**

*ECS Battery, ECS Energy Technology, ECS Fullerenes, Nanotubes, and Carbon Nanostructures, ECSJ Battery*

- 1099 (Invited) Metal-Air Batteries: A Reality Check  
*S. Whittingham*
- 1100 Very High Specific Surface Area Capacity Lithium-Air Battery  
*P. Stevens, G. Toussaint, P. Vinatier, and L. Puëch*
- 1101 A Versatile Composite Electrode Design for Metal-Air Batteries  
*A. C. Marschilok, E. S. Takeuchi, and K. J. Takeuchi*
- 1102 Comparison of Air Cathodes and Aluminium Anodes for High-Power Density Alkaline Aluminium-Air Batteries  
*D. MacAodhagáin, C. Ponce-de-Leon-Albarran, R. J. Wood, K. R. Stokes, and F. C. Walsh*
- 1103 (Invited) Cycling Stability and Charging Behavior of Carbon Nanotube Electrodes for Li-O<sub>2</sub> Batteries  
*B. M. Gallant, R. R. Mitchell, C. V. Thompson, and Y. Shao-Horn*
- 1104 N-Doped Graphene Nanosheet for Li-Air Fuel Cell under Acidic Conditions  
*E. Yoo, J. Nakamura, and H. Zhou*
- 1105 Structure of Li<sub>2</sub>O<sub>2</sub> Discharge Products on Free-Standing Aligned Carbon Nanotube Electrodes for Li-Air Batteries  
*R. R. Mitchell, B. M. Gallant, Y. Shao-Horn, and C. V. Thompson*
- 1106 Graphene and N-Doped Graphene as Cathodes for Li-Air Batteries  
*Y. Li, J. Wang, X. Li, D. Geng, R. Li, and X. A. Sun*
- 1107 (Invited) Promoting Ideal Reaction Processes in the Rechargeable Non-Aqueous Li-Air Battery  
*F. Bardé, Y. Chen, S. A. Freunberger, and P. Bruce*

- 1108 (Invited) Fundamental Electrochemistry in Non-Aqueous Li-air  
*B. McCloskey, A. Speidel, R. Scheffler, V. Viswanathan, J. S. Hummelshøj, J. K. Nørskov, and A. Luntz*
- 1109 (Invited) Metal-Air Technologies-- Reversibility of Zinc Electrode  
*J. Yamaki, A. Nakata, T. Yamane, T. Hirai, and Z. Ogumi*
- 1110 Electrochemistry of Cathode Materials for Lithium-Oxygen Batteries Using Microelectrode Voltammetry  
*E. Nemanick*
- 1111 Decomposition Kinetics of Li-Air Cell Discharge Products in Non-Catalyzed and Catalyzed Carbon Cathodes  
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- 1112 Toward Efficiently Rechargeable Li-O<sub>2</sub> Batteries: Freely Diffusing Catalysts and O<sub>2</sub> Electrode-Stable Solvents  
*W. Walker, V. Giordani, V. S. Bryantsev, J. Uddin, S. Zecevic, D. Addison, and G. V. Chase*
- 1113 (Invited) Dual-Electrolyte Lithium-Air Batteries with Buffer Catholytes  
*A. Manthiram, L. Li, and Y. Fu*
- 1114 Investigations of Li-O<sub>2</sub> Batteries Using Polyethylene Oxide in Structured Three-Phase Electrodes  
*J. R. Harding, Y. Lu, P. T. Hammond, and Y. Shao-Horn*
- 1115 Recent Developments in Solid Li-Ion Electrolytes  
*V. Thangadurai*
- 1116 The Effects of Electrolyte Salts on the Performance of Li-Air Batteries  
*E. Nasybulin, W. Xu, M. H. Engelhard, Z. Nie, J. Hu, J. Xiao, M. Gross, and J. Zhang*
- 1117 (Invited) A Reversible Lithium-Air Battery with Low Charge Polarization using Ether-Based Electrolytes  
*K. Amine, J. Lu, H. Jung, K. C. Lau, Z. Zhang, J. Schlueter, P. Du, R. Assary, J. Greeley, G. Ferguson, H. Wang, J. Hassoun, H. Iddir, Y. Sun, B. Scrosati, and L. A. Curtiss*
- 1118 A Long Life, High Capacity, High Rate Lithium-Air Battery Using a Stable Glyme Electrolyte  
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- 1119 Stability of Li-Salts during the Discharge Reaction in a Li-O<sub>2</sub> Cell  
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- 1120 Stability of Pyr<sub>14</sub>TFSI Ionic Liquid in Li-O<sub>2</sub> Cells and Its effect on the Cycling Behavior  
*M. Piana, N. Tsiouvaras, S. Meini, I. Buchberger, J. Wandt, H. A. Gasteiger, and A. Garsuch*

- 1121 Electrochemical Performance of All-Solid-State Lithium-Air Batteries  
*H. Kitaura and H. Zhou*
- 1122 (Invited) Investigation of ORR and OER in Non-Aqueous (and Aqueous) Li-O<sub>2</sub> Cells Using Metal Oxide Catalysts  
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- 1123 Metal Nitrides as Alternative Catalyst for Air Cathodes  
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- 1124 Role of Manganese Oxides in the Oxygen Electrode for Li-Air Batteries  
*I. Bae and K. Nam*
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*Z. Chen, Z. Chen, D. Higgins, and A. Yu*
- 1126 Graphene-Metal Oxide Catalysts for Li-O<sub>2</sub> Batteries  
*R. W. Black, J. Lee, B. D. Adams, A. Baran- Harper, and L. F. Nazar*
- 1127 The effect of the Surface Area of LaNiO<sub>3</sub> Support on the Oxygen Reduction/Evolution Activity of Air Electrode for Rechargeable Metal-Air Batteries  
*M. Yuasa, H. Imamura, T. Kida, and K. Shimanoe*
- 1128 Graphene/Metal Oxide Catalyst Based High Capacity Cathode for Li-O<sub>2</sub> Batteries  
*R. S. Kalubarme, C. Ahn, and C. Park*
- 1129 Activated and Nitrogen Doped Carbon Nanofibers as Oxygen Reduction Electrode Materials for Zinc-Air Batteries  
*D. C. Higgins, Y. Liu, Z. Chen, and Z. Chen*
- 1130 Nickel Cobalt Oxide Nanostructures on Graphene as an Active Bifunctional Electrocatalyst  
*D. Lee, A. Yu, H. Park, and Z. Chen*
- 1131 Cyclic Voltammetry of Zn/Zn(II) Couple in Dicyanamide Anion and Bis-(trifluoromethylsulfonyl)Imide Anion Based Ionic Liquids  
*M. Xu, D. Ivey, Y. Bing, Z. Xie, and W. Qu*
- 1132 Carbon Air Electrodes for Alkaline Aqueous Electrolyte Lithium/Air Secondary Batteries  
*H. Ohkuma, I. Uechi, N. Imanishi, Y. Takeda, and O. Yamamoto*
- 1133 Microwave-Assistanted Synthesis of Ag-MnO<sub>2</sub>/SWNT Electrocatalyst for Metal-Air Cells  
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- 1134 Carbon Sphere Dotted with Co<sub>3</sub>O<sub>4</sub> and RuO<sub>2</sub> Nano Particles for Rechargeable Li/Air Batteries  
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- 1135 Synthesis and Properties of Garnet-Type  $\text{Li}_{7-x-y}\text{La}_3\text{Zr}_{2-y}\text{Nb}_y\text{O}_{12-0.5x}$   
*K. Ishiguro, Y. Nakata, N. Imanishi, A. Hirano, Y. Takeda, and O. Yamamoto*
- 1136 Air Electrode with Oxide Catalyst for Aqueous Lithium-Air Rechargeable Batteries  
*S. Sunahiro, H. Ohkuma, I. Uechi, N. Imanishi, Y. Takeda, and O. Yamamoto*
- 1137 Lithium Nitride Formation on Lithium Metal  
*N. Futamura, T. Ichikawa, N. Imanishi, Y. Takeda, and O. Yamamoto*
- 1138 Role of Metal Decoration in the Catalytic Activity of Urchin-Like  $\text{MnO}_2$  for Oxygen Reaction in Aqueous Lithium-Oxygen Batteries  
*K. Jung, J. Lee, A. Riaz, S. Lee, T. Lim, S. Park, R. Song, and K. Shin*
- 1139 Tape-Cast Lithium Conducting Solid Electrolyte  $\text{Li}_{1.4}\text{Ti}_{1.6}\text{Al}_{0.4}(\text{PO}_4)_3$  for Aqueous Lithium-Air Batteries  
*K. Takahashi, N. Imanishi, Y. Takeda, and O. Yamamoto*
- 1140 Rechargeable, All-Solid Li-Air Battery  
*W. Chang, D. Hallinan, Y. Lee, T. Yen, and C. Yang*
- 1141 Mesoporous Nitrogen Doped Carbon as Cathode Materials for High Capacity Lithium-Air Batteries  
*A. Zahoor, M. Christy, Y. Hwang, J. Choi, and K. Nahm*
- 1142 An Effort to Understand the Basic Characteristics of Hybrid Li-air Cell Performance  
*D. Yoon, K. Kim, M. Park, S. Kim, and H. Sun*
- 1143 Electrodeposited Manganese Oxide Catalysts for Oxygen Reduction Aqueous Alkaline Media  
*S. H. Pulkadang and S. W. Donne*
- 1144 Electrochemical Properties of Graphene Based Catalyst for Rechargeable Li/O<sub>2</sub> Batteries  
*C. Ahn, R. S. Kalubarme, and C. Park*
- 1145 Effects of  $\text{Nb}_2\text{O}_5$  Addition on the Electrochemical Properties of  $\text{Li}_{1.5}\text{Al}_{0.5}\text{Ge}_{1.5}\text{P}_3\text{O}_{12}$  Glass Ceramic for Li-Air Batteries  
*T. Kim, R. S. Kalubarme, and C. Park*
- 1146 Rechargeable Li/O<sub>2</sub> Cell Based on a LiTFSI-DMMP/PFSA-Li Composite Electrolyte  
*H. Wang, X. Liao, L. Li, and Z. Ma*
- 1147  $\text{MnO}_2$ -Based Nanostructures as Catalysts for Oxygen Oxidation-Reduction Reaction in Rechargeable Lithium-Oxygen Battery  
*B. Huang, X. Liao, and Z. Ma*
- 1148 Multifunctional Carbon Nanoarchitectures as Air-Breathing Cathodes for Rechargeable Zn-Air and Li-Air Batteries  
*C. N. Chervin, J. W. Long, M. J. Wattendorf, N. W. Kucko, and D. R. Rolison*

- 1149 Modeling of Bifunctional Electrode in Metal Air Battery  
*D. Chan, K. Hsueh, C. Wu, and W. Chang*
- 1150 Inhibiting Ability of Chelating Agent on Aluminum Corrosion in Alkaline Solution and Testing of Aluminum-Air Single Cell  
*C. Wu, C. Chung, K. Hsueh, and W. Chang*
- 1151 The Kinetic Reaction of Aluminum-Air Battery in Different Aqueous Solution  
*C. Wang, K. Hsueh, and C. Hsieh*
- 1152 Manganese Oxide Nanosheets: Applications in High Energy Density Zn-Air Batteries  
*Y. Korenblit, G. Yushin, and J. Cho*
- 1153 (Invited) Protective Layers for the Lithium Electrode Based on Ceramic Phases  
*J. Cabana*
- 1154 (Invited) Factors Affecting the Cycle Life of a Nonaqueous Li-Air Cell with a Protected Anode  
*D. Im, D. Lee, T. Kim, V. Røev, S. Ma, and S. Doo*
- 1155 Lithium Dendrite Formation between PEO<sub>18</sub>LiTFSI and Lithium Metal  
*H. Wang, N. Imanishi, Y. Takeda, and O. Yamamoto*
- 1156 (Invited) Ultra-High Energy Density Lithium-Air Batteries Based on Protected Lithium Electrodes (PLEs)  
*S. J. Visco, E. Nimon, B. Katz, M. Chu, and L. De Jonghe*
- 1157 Ionic Conductivity of Garnet-Type Li<sub>7-x</sub>La<sub>3</sub>Zr<sub>2</sub>O<sub>12-0.5x</sub> Solid Electrolyte for Lithium Metal Electrode  
*Y. Nakata, K. Ishiguro, N. Imanishi, Y. Takeda, and O. Yamamoto*
- 1158 Nickel Foam, a Probable Current Collector in Rechargeable Li-Air Batteries  
*X. Liu and D. Wang*
- 1159 Degradation Products on Li-Negative Electrode and the Carbon Cathode in Li-O<sub>2</sub> Batteries  
*R. Younesi, M. Hahlin, and K. Edström*
- 1160 Metal-Free "Li-Ion" Air Battery Realized by Controlling Solvation State in Electrolyte  
*Y. Yamada, M. Yaegashi, K. Furukawa, F. Li, H. Zhou, and A. Yamada*
- 1161 (Invited) Investigation of Rechargeable Li-Air Battery  
*D. Zheng, Q. Wang, D. Qu, and X. Yang*
- 1162 Effect of Substitution of Cobalt by Manganese on the Properties of Calcium-Doped Lanthanum Cobalt Oxide for Oxygen Reduction Reaction in Alkaline Medium  
*S. Malkhandi, P. Trinh, A. Manohar, G. Prakash, S. Narayanan, and A. Manivannan*

- 1163 Towards Understanding the Mechanism of the Electrochemical Oxygen Reduction: DFT Modeling and Spectroelectrochemical Validation  
*P. Biedermann, S. Nayak, and A. Erbe*
- 1164 Predictive Modeling of Size-Dependent Dendritic Growth in Dilute-Electrolyte Lithium Metal Batteries with Potentiostatic Cycling  
*A. Aryanfar, M. Hoffmann, and A. Colussi*
- 1165 Computational Investigations of the Electronic Transport in Lithium-Air Battery Materials  
*T. Vegge, J. Garcia-Lastra, J. Myrdal, and K. Thygesen*
- 1166 A Transient Model of an Aqueous Li/Air Battery Forming LiOH (aq) and LiOH•H<sub>2</sub>O  
*P. Albertus, V. Viswanathan, and J. Christensen*
- 1167 Oxygen Reduction Catalyst Selection for Lithium Air Batteries via Rotating Ring Disc Electrode Voltammetry and In Situ X-ray Absorption Spectroscopy  
*M. Trahan, S. Mukerjee, and K. Abraham*
- 1168 Probing Reaction Mechanisms of Li-O<sub>2</sub> Batteries via In Situ Ambient Pressure X-ray Photoelectron Spectroscopy  
*Y. Lu, E. J. Crumlin, G. M. Veith, J. R. Harding, E. Mutoro, L. Baggetto, N. J. Dudney, Z. Liu, and Y. Shao-Horn*
- 1169 Electrochemistry and Transport Limitations of Non-Aqueous Li-Air Batteries from First-Principles  
*V. Viswanathan, J. S. Hummelshøj, A. C. Luntz, and J. K. Nørskov*
- 1170 Electrochemical Strain Spectroscopy: Monitoring Partially Reversible Electrochemical Processes In Situ on Li-Air Battery Electrolytes  
*T. M. Arruda, A. Kumar, S. Jesse, and S. V. Kalinin*
- 1171 (Invited) Critical Components of Rechargeable Li-Air Batteries  
*J. Zhang, W. Xu, J. Xiao, E. Nasybulin, Y. Shao, D. Mei, and J. Zhang*
- 1172 A High Energy Density Rechargeable Zinc-Air Battery for Automotive Application  
*G. Toussaint, P. Stevens, R. Rouget, and F. Fourgeot*
- 1173 Examining the Interplay of Electrolyte, Electrocatalyst, and Cathode Architecture En Route to High-Capacity, Rechargeable Li-O<sub>2</sub> Batteries  
*C. N. Chervin, J. W. Long, M. J. Wattendorf, N. W. Kucko, and D. Rolison*
- 1174 Air Dehydration Membranes for Ambient Operation of Non-Aqueous Lithium-Air Batteries  
*J. Zhang, W. Xu, J. Xiao, X. Chen, E. Nasybulin, and J. Zhang*
- 1175 (Invited) Understanding the Cathode Processes in the Non-Aqueous Li-O<sub>2</sub> Battery  
*O. Fontaine, Y. Chen, S. A. Freunberger, Z. Peng, and P. Bruce*

- 1176 The effect of Layered Structures of Perovskite Oxide Catalyst on Activity for Oxygen-Reduction Reaction  
*M. Matsuda, T. Murota, and T. Takeguchi*
- 1177 Understanding of Electrolyte Stability and Its Impact to Lifespan of Li-O<sub>2</sub> Battery  
*J. Shui, J. Okasinski, D. Zhao, J. Almer, and D. Liu*
- 1178 Electrospun Nanofibrous Bifunctional LaNiO<sub>3</sub> Catalysts for Oxygen Reduction Reaction and Oxygen Evolution Reaction  
*J. Wu and Z. Chen*
- 1179 Synthesis and Oxygen Reduction Catalytic Properties of La<sub>0.6</sub>Ca<sub>0.4</sub>CoO<sub>3</sub> Fine Powders by Sintering with Carbonate  
*S. Takase, Y. Kanda, and Y. Shimizu*
- 1180 (Invited) Recent Progress in as Highly Efficient Non-Precious Catalysts for Oxygen Reduction Reactions in Alkaline Solutions  
*J. Cho*
- 1181 (Invited) Secondary Li-Air Batteries with Acidic Aqueous Catholytes  
*O. Crowther and M. Salomon*
- 1182 (Invited) Aqueous Electrolyte-Based Metal-Air Batteries: Challenges for Rechargeable Zinc Electrodes and Reversible Air Electrodes  
*T. Abe and K. Miyazaki*
- 1183 Enhancement of Oxygen Transport in the Storage Electrode of a High Temperature Secondary Metal-Air Battery Based on an Oxygen Ion Conducting Electrolyte  
*H. Landes, R. Reichenbacher, C. Schuh, T. Soller, G. Zhang, and C. Lu*
- 1184 Hybrid Li-air Battery with Sulfuric Acid Electrolyte and Buckypaper Air Cathode  
*Y. Li, K. Huang, and Y. Xing*
- 1185 Improvement in Discharge Performance of an MH/Air Secondary Battery with Multiple Electrodes  
*M. Mizutani, M. Morimitsu, and Y. Wada*
- 1186 Comparison of Room Temperature Sodium/Oxygen- and Lithium/Oxygen-Batteries with Liquid Electrolyte  
*P. Hartmann, C. Bender, A. Garsuch, A. Dürr, J. Janek, and P. Adelhelm*
- 1187 Effect of Bismuth Additives on the Performance of Iron Electrodes in Alkaline Batteries  
*A. Manohar, C. Yang, S. Malkhandi, B. Yang, G. Prakash, and S. Narayanan*

## B8 - Non-Aqueous Electrolytes for Lithium Batteries

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- 1188 Development of Sulfide Glass Electrolytes for All-Solid-State Lithium Batteries  
*A. Hayashi and M. Tatsumisago*
- 1189 Suppression of H<sub>2</sub>S Gas from Li<sub>2</sub>S-P<sub>2</sub>S<sub>5</sub> Glass Electrolytes by the Addition of Li<sub>2</sub>O  
*T. Ohtomo, K. Kawamoto, A. Hayashi, and M. Tatsumisago*
- 1190 New Lithium Superionic Conductor and Its Application to All Solid-State Batteries  
*R. Kanno, M. Hirayama, M. Yonemura, Y. Kato, and K. Kawamoto*
- 1191 Interface Structures in Solid-State Lithium Batteries with Sulfide Electrolytes  
*K. Takada, X. Xu, K. Fukuda, K. Kumagai, K. Watanabe, K. Akatsuka, B. Hang, M. Osada, I. Sakaguchi, T. Ohnishi, T. Sekiguchi, and T. Sasaki*
- 1192 Enlarged Lithium-Ions Migration Pathway by Substitution of B<sup>3+</sup> for P<sup>5+</sup> in Li<sub>3</sub>PS<sub>4</sub>  
*K. Homma, T. Yamamoto, S. Watanabe, and T. Tanaka*
- 1193 First Principles Investigations of the Li<sub>10</sub>GeP<sub>2</sub>S<sub>12</sub> Superionic Conductor and Related Materials  
*S. Ong, Y. Mo, W. D. Richards, and G. Ceder*
- 1194 First-Principles Molecular Dynamics Simulations for Li<sup>+</sup> Diffusion in Li<sub>3</sub>PO<sub>4</sub> and Li<sub>3</sub>PS<sub>4</sub> Electrolytes  
*M. Ikeda, T. Yamasaki, C. Kaneta, K. Homma, T. Yamamoto, and T. Tanaka*
- 1195 Analysis of Lithium-Ion Conduction in LISICON-Based Solid Electrolytes by First-Principles Molecular Dynamics Simulation  
*K. Fujimura, A. Kuwabara, H. Moriwake, A. Seko, Y. Koyama, and I. Tanaka*
- 1196 Research on Electrode-Electrolyte Interfaces of Innovative New Generation Batteries  
*F. Mizuno and H. Iba*
- 1197 The Preparation of Li<sub>7</sub>La<sub>3</sub>Zr<sub>2</sub>O<sub>12</sub> by Sol-Gel Method and Its Electrochemical Performance  
*T. Nishioka, J. Wakasugi, N. Saito, H. Munakata, and K. Kanamura*
- 1198 Flux Growth of Idiomorphic Garnet-Type Solid Electrolyte Crystals for All-Solid-State Lithium-Ion Rechargeable Batteries  
*H. Onodera, K. Teshima, H. Wagata, Y. Mizuno, K. Yubuta, T. Shishido, and S. Oishi*
- 1199 High Lithium-Ion Conducting Garnet-type Oxide; Li<sub>7+x</sub>La<sub>3-y</sub>A<sub>y</sub>Zr<sub>2-z</sub>Nb<sub>z</sub>O<sub>12</sub> (A = Alkali Earth Metals)  
*Y. Kihira, S. Ohta, H. Imagawa, and T. Asaoka*
- 1200 Electrochemical Performance of an All-Solid-State Lithium-Ion Battery with Garnet-Type Oxide Electrolyte  
*S. Ohta, T. Saeki, S. Morishita, J. Seki, and T. Asaoka*

- 1201 Nanostructured Solid Electrolytes for Lithium Batteries  
*N. P. Balsara*
- 1202 Block Copolymer-Ceramic Nanocomposites as Solid Electrolytes for Lithium Batteries  
*I. Gurevitch, J. Cabana, and N. P. Balsara*
- 1203 Conductivity of Electronic and Ionic Conducting Block Copolymer Electrolytes through Electrochemical Doping in the Solid-State  
*S. N. Patel, A. E. Javier, and N. P. Balsara*
- 1204 High Temperature Cycling of Solid Polymer Lithium Batteries  
*Q. Hu, A. Caputo, and D. R. Sadoway*
- 1205 Preparation, Performance in Various Cell Configurations and Limitations of Novel Electrolyte Components for Liquid and Gel Polymer Electrolytes  
*R. Schmitz, E. Krämer, R. Müller, R. W. Schmitz, J. Kasnatscheew, R. Wagner, M. Amereller, P. Janßen, P. Bieker, T. Placke, O. Fromm, H. Meyer, P. Isken, A. Lex-Balducci, I. Profatilova, T. Langer, A. Schmitz, C. Stock, U. Vogl, T. S*
- 1206 Organoboron Ion-Gel Electrolytes as Lithium-Ions Transport Media  
*N. Matsumi*
- 1207 Design of Borosilicate Type Organic-Inorganic Hybrid Ion-Gel Electrolytes  
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- 1773 Catalytic Reduction of Carbon Dioxide to Carbon Monoxide Using the Rhenium(I) Complex (5,5'-Bisphenylethynyl-2,2'-Bipyridyl)Re(CO)<sub>3</sub>Cl  
*E. Portenkirchner, K. Oppelt, C. Ulbricht, D. A. Egbe, H. Neugebauer, G. Knör, and N. Sariciftci*
- 1774 New Polyethylene Based Anion Exchange Membranes (PE-AEMs) with High Ionic Conductivity  
*M. Zhang, H. Kim, E. Chalkova, F. Mark, S. N. Lvov, and T. Chung*
- 1775 Ruthenium-Based Materials for Oxygen and Hydrogen Evolution Catalysis in Photoelectrochemical Applications  
*Y. Chang, J. M. Kaneshiro, and N. M. Gaillard*
- 1776 Membranes for Solar Water Splitting Devices  
*S. Ardo, M. McDonald, S. Park, M. DiFranco, M. Freund, and N. S. Lewis*
- 1777 A Non-Combustible Process for Generating Energy from Bio-Waste  
*A. Kumar, V. Kamavaram, V. Veedu, and K. Cheung*
- 1778 Electrochemistry of Molybdenum and Its Oxides for CIGS Solar Cells  
*V. S. Saji, S. Lee, Y. Yeon, and C. Lee*
- 1779 Interhalogen-Based Binary-Redox Couples for High-Voltage Solar Cells  
*N. C. Deb Nath, S. Sarker, H. Lee, and J. Lee*
- 1780 Development of an Artificial Co-Enzyme for Formate Dehydrogenase with the Function of CO<sub>2</sub> Reduction  
*S. Ikeyma and Y. Amai*
- 1781 Photoelectrochemical Dehydrogenation of Ammonia Borane with Pt/n-Si  
*H. Inoue, C. Matsuda, M. Shimada, M. Chiku, and E. Higuchi*
- 1782 The Activity of Ash-free Coal in Direct Carbon Fuel Cells  
*H. Ju, J. Kim, J. Lee, S. Lee, R. Song, and J. Lee*

- 1783 In-situ FTIR Analysis of CO<sub>2</sub> Electrochemical Reduction at Copper Electrodes  
*M. Ren, E. Andrews, and J. Flake*
- 1784 Theoretical Characterization of Ammonia Oxidation Intermediates and Products on Platinum Clusters  
*D. A. Daramola and G. G. Botte*
- 1785 Evaluation of Current Efficiency of SOEC Using Precise On-Line Gas Analysis  
*Y. Tanaka, S. Nakamura, K. Sato, K. Nozaki, T. Kato, and A. Yamamoto*
- 1786 Metal Tungstates as Oxygen Evolution Catalysts  
*H. Jia, T. Sekito, J. Stark, L. Zhou, and L. Chen*
- 1787 Modified Fe<sub>2</sub>O<sub>3</sub> Photoanodes Prepared by Pulse Electrodeposition  
*W. J. Lee, P. Shinde, and G. Go*
- 1788 Polycrystalline Cu(In, Ga)Se<sub>2</sub> Thin Films and PV Devices Sputtered from a Binary Target without Additional Selenization  
*P. Liu, B. B. Jheng, and M. Wu*
- 1789 Theoretical Investigations of Transition Metal Nano-Clusters for Electrochemical NH<sub>3</sub> Production  
*J. G. Howalt and T. Vegge*
- 1790 Choline Chloride Enhancement of Carbon Dioxide Reduction on Platinum Catalysts  
*W. Zhu, B. Rosen, A. Salehi-Khojin, and R. Masel*
- 1791 Structure Sensitivity of CO<sub>2</sub> Conversion on EMIM-BF<sub>4</sub> Silver Co-Catalyst System  
*A. salehi-khojin, B. Rosen, W. Zhu, and R. Masel*
- 1792 Basic Study of Alkaline Water Electrolysis  
*A. Manabe, T. Hashimoto, M. Kashiwase, M. Kurosaki, T. Hayashida, K. Hirao, I. Shimomura, and I. Nagashima*
- 1793 CO<sub>2</sub> Reduction at Glassy Carbon Electrode in the Presence of Pyridine  
*J. Agullo, M. Morin, and D. Bélanger*
- 1794 Cu Monolayer on Au/C and Pt/C for the Electrochemical Reduction of CO<sub>2</sub> to Hydrocarbons  
*I. L. Escalante-Garcia, J. S. Wainright, and R. F. Savinell*
- 1795 Ti-Doped Hematite Nanostructures for Solar Water Splitting with High Efficiency  
*J. Deng, J. Zhong, A. Pu, D. Zhang, and X. Sun*
- 1796 Electrochemical Synthesis of Disordered Three-Dimensional Cuprous Oxide (Cu<sub>2</sub>O) Film and Its Photoelectrochemical Properties  
*S. Yoon, M. Kim, J. Lim, K. Lee, and B. Yoo*

- 1797 Impact of Nitrogen Treatment on the Electronic and Chemical Structure of GaInP<sub>2</sub> Thin-Film Surfaces  
*M. G. Weir, K. E. George, T. G. Deutsch, A. Welch, R. G. Wilks, D. C. Hanks, M. Blum, W. Yang, M. Bär, L. Weinhardt, J. A. Turner, and C. Heske*
- 1798 A Ceramic-Anode Supported Low Temperature Solid Oxide Fuel Cell  
*H. Ding, J. Ge, and X. Xue*
- 1799 Electrochemical Decomposition of Urea with Ni-Based Catalysts  
*W. Yan, D. Wang, and G. G. Botte*
- 1800 Transport Phenomena in Acid-Alkaline Membrane Bi-Cell Configurations for Portable Power Sources  
*K. N. Grew and D. Chu*
- 1801 Effect of Photodeposited Metal Catalysts on Oxygen Evolution at Well-Defined TiO<sub>2</sub> (110) Surfaces  
*M. A. Rigsby, G. E. Alliger, and G. M. Brown*
- 1802 Renewable Fuels for SOFCs: Fuel Flexibility by Gradual Internal Reforming  
*S. Georges, N. Bailly, M. Steil, F. Fonseca, S. D. Nobrega, J. Viricelle, A. Hadjar, and P. Gélín*
- 1803 The Co<sub>2p</sub> Oxidation State in Co-PI Catalysts  
*M. Richter and D. Schmeißer*
- 1804 Quasi Fermi Energy Tuning of Carbon Nanotubes for Solar Cells  
*N. C. Deb Nath, S. Sarker, H. Lee, and J. Lee*
- 1805 Photocatalytic Reduction of CO<sub>2</sub> Using Shape Controlled Anatase TiO<sub>2</sub> with Co-Catalyst Loading  
*D. Saruwatari, N. Murakami, and T. Ohno*
- 1806 CO<sub>2</sub> Reduction on Tin Oxide-Based Catalysts  
*Y. Chen and M. Kanan*
- 1807 Fabrication and Characterization of Metal/Ceramic Composite Electrodes for New Electrochemical Cells  
*A. Lapina, C. Chatzichristodoulou, P. Holtappels, and M. Mogensen*
- 1808 Photoelectrochemical Activity of Hematite Nanowire Arrays Synthesized Using Plasmas  
*H. B. Russell, U. Cvelbar, J. B. Jasinski, T. G. Deutsch, and M. K. Sunkara*
- 1809 Mechanistic Studies during Electro-Oxidation of Urea on Ni-Co Catalyst in Alkaline Medium  
*V. Vedharathinam and G. G. Botte*
- 1810 Development of Methanol Electrolysis System for Hydrogen Production  
*T. I. Valdez, K. J. Billings, and A. K. Kisor*

- 1811 Electrochemical Reduction of CO<sub>2</sub> to Value-Added Products: The effect of Electrode Structure and Electrolyte  
*H. Jhong, M. R. Thorson, S. Ma, A. Salehi, and P. J. Kenis*
- 1812 Carbon Dioxide Decomposition and Oxygen Generation Via SOEC  
*H. Guo and B. Kang*
- 1813 Low Overpotential CO<sub>2</sub> Reduction on Nanostructured Copper Electrodes  
*C. W. Li and M. Kanan*
- 1814 Room Temperature Electrochemical Synthesis of Oxygenates through a Carbonate Anion Pathway  
*N. Spinner and W. E. Mustain*
- 1815 Degradation of Solid Oxide Electrolysis Cells Applied for H<sub>2</sub>O/CO<sub>2</sub> Co-Electrolysis  
*Y. Tao, S. D. Ebbesen, and M. Mogensen*
- 1816 Hydrogen Production Via Electrolysis in Cu-Cl Thermochemical Cycle  
*S. N. Lvov, R. Schatz, S. Kim, S. Khurana, A. Morse, M. Chung, and M. Fedkin*
- 1817 Nanostructured Molybdenum Carbide as Pt-Free Catalysts for Hydrogen Evolution  
*W. Chen, C. Wang, K. Sasaki, N. Marinkovic, W. Xu, J. Muckerman, Y. Zhu, and R. R. Adzic*
- 1818 Reverse Combustion: The Efficient Electrochemical Conversion of Carbon Dioxide and Water to Organic Fuels Using an Aromatic Amine Catalyst  
*A. B. Bocarsly, T. Shaw, E. Zeitler, K. Liao, Y. Hu, Z. Detweiler, M. Baruch, J. Herb, and J. White*
- 1819 Reactive Molecular Dynamics Modeling of Interfacial Phenomena in Solid Oxide Fuel Cells  
*B. V. Merinov, A. C. van Duin, and W. Goddard III*
- 1820 Modeling the Behavior of a Solar-Hydrogen Generator  
*S. Haussener, C. Xiang, A. Berger, J. Newman, N. S. Lewis, and A. Weber*
- 1821 Renewable Liquid Fuels from Sunlight  
*P. G. Hoertz, J. Bittle, A. Miller, D. Murry, C. Bonino, J. Newman, and J. Trainham*
- 1822 Low-Cost Renewable Hydrogen from Sunlight and Water  
*S. Y. Reece*
- 1823 Thermochemical Water Splitting with Zirconium-Substituted Cerium Oxides  
*Y. Hao, W. Chueh, and S. M. Haile*
- 1824 Heterogeneous Nanostructures: Fast Electrochemistry for High-To-Ultrahigh Power Electrical Energy Storage  
*S. Lee*

- 1825 Kinetics of Oxidation of CO and H<sub>2</sub> and Reduction of CO<sub>2</sub> and H<sub>2</sub>O in Ni/YSZ Based Solid Oxide Cells  
*S. D. Ebbesen and M. Mogensen*
- 1826 Understanding Trends in Electrocatalytic Activity for CO Evolution  
*H. A. Hansen, J. Varley, A. A. Peterson, and J. K. Nørskov*
- 1827 The Status of Direct Methanol Fuel Cell System Lessons Learned and the Road Ahead  
*D. Chu and R. Jiang*
- 1828 X-ray Absorption Measurements on Perovskite Electrodes for the Oxygen Evolution Reaction  
*M. Risch, K. Stoerzinger, K. May, A. Mansour, and Y. Shao-Horn*
- 1829 Crossover in a Homogeneous-Catalyst Reactor  
*J. Newman*
- 1830 Proton Conductive Niobium Phosphates as Electrolytes for Fuel Cells Operating with Renewable Biofuels  
*Y. Huang, Q. Li, T. Anfimova, A. H. Jensen, J. Jensen, E. Christensen, and N. Bjerrum*

### **B11 - Sodium Batteries**

*ECS Battery, ECS Energy Technology, ECS High Temperature Materials, ECSJ Battery*

- 1831 Sodium Ion Batteries for Grid Applications  
*M. M. Doeff, M. Shirpour, and J. Cabana*
- 1832 Towards the Development of the Na-Ion Technology: In Search of Suitable Electrodes and Electrolytes  
*A. Ponrouch, P. Senguttuvan, E. Marchante, M. Courty, J. Tarascon, and M. Palacin*
- 1833 Understanding the Difference in Intercalation Behavior between Layered Na- and Li-Transition Metal Oxides  
*S. Kim, X. Ma, S. Ong, and G. Ceder*
- 1834 P2-type Na<sub>2/3</sub>[Fe<sub>1/2</sub>Mn<sub>1/2</sub>]O<sub>2</sub> Made from Earth-Abundant Elements for High-Energy Na-Ion Batteries  
*N. Yabuuchi, M. Kajiyama, Y. Yamada, and S. Komaba*
- 1835 Structure and Electrochemistry of Na<sub>x</sub>Fe<sub>x</sub>Mn<sub>1-x</sub>O<sub>2</sub> Na-Ion Cathode Materials  
*J. S. Thorne, R. A. Dunlap, and M. N. Obrovac*
- 1836 Layered Na<sub>1-x</sub>Li<sub>x</sub>Ni<sub>0.5</sub>Mn<sub>0.5</sub>O<sub>2</sub> Electrodes with O3- and P2- Composite Structure for Na-Ion Batteries  
*E. Lee, D. Kim, M. Slater, S. Rood, V. Maroni, D. Bass, S. Hackney, and C. S. Johnson*

- 1837 A Study of the Reactivity of De-Intercalated  $\text{NaNi}_{0.5}\text{Mn}_{0.5}\text{O}_2$  with Non-Aqueous Solvent and Electrolyte by Accelerating Rate Calorimetry  
*X. Xia and J. Dahn*
- 1838 Cathode Properties of Disodium Rhodizonate for Sodium Secondary Battery  
*K. Chihara, N. Chujo, A. Kitajou, E. Kobayashi, and S. Okada*
- 1839 Electrochemical Behavior of Olivine  $\text{FePO}_4$  Cathode Material for Na-Ion Batteries  
*P. Kubiak, M. Casas-Cabanas, V. Roddatis, J. Carretero-Gonzalez, D. Saurel, and T. Rojo*
- 1840 First Principles Investigations of the Electrochemical Properties of Sodium-Ion Cathode Materials  
*A. J. Toumar, W. D. Richards, S. Kim, X. Ma, X. Li, S. Ong, and G. Ceder*
- 1841 Development of High Capacity Positive Electrode Material for Sodium Ion Battery  
*R. Kataoka, T. Mukai, K. Nakatani, A. Yoshizawa, and T. Sakai*
- 1842 Na-Ion Intercalation Cathode with High Rate and Excellent Structural Stability  
*D. Lee, J. Xu, and Y. Meng*
- 1843 Nanostructured Na-Ion Full-Cells  
*S. Tepavcevic, H. Xiong, C. J. Johnson, and T. Rajh*
- 1844 Sodium Manganese Oxide Thin Film Cathodes: Characterization of a Na-Ion Intercalation Model System  
*L. Baggetto, C. A. Bridges, R. R. Unocic, F. Delnick, N. J. Dudney, and G. M. Veith*
- 1845 Phase Change of  $\text{NaFeO}_2$  during Electrochemical Na Intercalation and Deintercalation: An In Situ X-ray Diffraction Study  
*N. Takeichi, K. Kuratani, M. Yao, M. Tabuchi, and T. Kiyobayashi*
- 1846 Microstructure Evolution with Electrochemical Desodiation Process in  $\text{Na}_x\text{MnO}_2$   
*X. Li, X. Ma, A. J. Toumar, S. Ong, and C. Gerbrand*
- 1847 Novel Cathode Materials of Sodium-Containing Metal Phosphates as Highly Voltage Sodium-Ion Batteries  
*M. Nose, H. Nakayama, K. Nobuhara, S. Nakanishi, and H. Iba*
- 1848 Structural Investigation of  $\text{NaCrO}_2$  as a Positive Electrode for Rechargeable Sodium Battery Using Molten NaFSA-KFSA  
*C. Chen, K. Matsumoto, T. Nohira, R. Hagiwara, K. Numata, E. Itani, A. Fukunaga, S. Sakai, K. Nitta, and S. Inazawa*
- 1849 Electrochemical Properties of Sn-Based Electrodes for Na-Ion Batteries  
*Y. Matsuura, T. Ishikawa, W. Murata, N. Yabuuchi, S. Kuze, and S. Komaba*

- 1850 Na Insertion Mechanism in Alpha NaFeO<sub>2</sub> as Positive Electrode Materials for Na-Ion Batteries  
*H. Yoshida, N. Yabuuchi, and S. Komaba*
- 1851 Synthesis, Characterizations and Electrochemical Studies of Na<sub>2</sub>Ti<sub>6</sub>O<sub>13</sub> for Sodium Ion Batteries  
*N. Trinh, O. Crosnier, S. Schougaard, and T. Brousse*
- 1852 High Capacity Negative Electrodes for Na-Ion Batteries: Insertion Mechanism and SEI Layer  
*S. Komaba, T. Ishikawa, Y. Matsuura, W. Murata, N. Yabuuchi, S. Shimazu, J. Son, Y. Cui, H. Oji, K. Gotoh, and K. Takeda*
- 1853 Reversible Insertion of Sodium in Tin  
*L. D. Ellis, T. D. Hatchard, and M. N. Obrovac*
- 1854 First-Principles Study on Alkali Metal-Graphite Intercalation Compounds  
*K. Nobuhara, H. Nakayama, S. Nakanishi, and H. Iba*
- 1855 Electrochemical Properties of Titanium-Based Anode Materials for Rechargeable Na Ion Battery  
*H. Nakayama, M. Nose, K. Nobuhara, S. Nakanishi, and H. Iba*
- 1856 GaV<sub>4</sub>S<sub>8</sub> : A New Class of Anode Material for Sodium-Ion Batteries  
*C. Michelet, O. Crosnier, T. Brousse, P. Moreau, and D. Guyomard*
- 1857 Electrochemical Insertion of Na Ion into Nanocarbon Materials for Sodium Ion Batteries  
*T. Matsushita, Y. Ishii, and S. Kawasaki*
- 1858 Reaction of Li and Na with Iron Oxide/ Carbon Nanotube Composite Electrode in Ionic Liquid Electrolyte  
*M. Egashira, Y. Tsubouchi, D. Ogawa, N. Yoshimoto, and M. Morita*
- 1859 Microwave Synthesized NaTi<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub> Anode Materials For Rechargeable Aqueous Electrolyte Sodium-Ion Battery  
*W. Wu, A. Mohamed, and J. F. Whitacre*
- 1860 Na<sub>3</sub>V<sub>2</sub>(PO<sub>4</sub>)<sub>3</sub>/C : A Novel Porous Sodium Ion Insertion Host For Sodium Ion Battery Applications  
*K. Saravanan, L. Bing, and P. Balaya*
- 1861 Quinone-Based Organic Active Materials for Use in Sodium and Magnesium Batteries  
*M. Yao, H. Senoh, H. Sano, K. Kuratani, T. Kiyobayashi, and H. Sakaebe*
- 1862 Na-Ion Capacitor Using Activated Carbon and Na Pre-Doped Hard Carbon  
*K. Kuratani, M. Yao, H. Senoh, N. Takeichi, T. Sakai, and T. Kiyobayashi*
- 1863 Synthesis and Characterization of Na<sub>3+x</sub>M<sub>x</sub>Zr<sub>2-x</sub>Si<sub>2</sub>PO<sub>12</sub> for Solid State Na-Ion Battery Applications  
*G. Hitz, K. Lee, and E. D. Wachsman*

- 1864 Electrochemical Sodium Ion Intercalation Property of  $\text{Na}_{2.7}\text{Ru}_4\text{O}_9$  in Nonaqueous and Aqueous Electrolytes  
*Y. Jung, S. Hong, and D. Kim*
- 1865 Charge and Discharge Properties of Sodium Secondary Batteries Using Molten NaFSA-KFSA  
*A. Fukunaga, T. Yamamoto, T. Nohira, R. Hagiwara, K. Numata, E. Itani, S. Sakai, K. Nitta, and S. Inazawa*
- 1866 New Sodium Imidazolium Salts for Battery Electrolytes  
*A. Plewa-Marczewska, T. Trzeciak, L. Niedzicki, J. S. Szydek, E. Sasim, M. Dranka, G. Z. Zukowska, M. Marcinek, and W. Wieczorek*
- 1867 Conductivity and Viscosity of Perchlorate Salts Dissolved in Nonaqueous Solvents  
*N. Uemura, K. Kuratani, T. Kiyobayashi, and H. T. Takeshita*
- 1868 Low-Temperature, Low-Cost Liquid Metal Batteries  
*B. L. Spatocco, P. J. Burke, and D. R. Sadoway*
- 1869 In Situ Measurements to Extract Potential, Local Current and Charging Current Distributions in the Electric and Electrolyte Phases of an EDL Capacitance Electrode  
*K. C. Hess, J. F. Whitacre, and S. Litster*
- 1870 Advanced Electrochemical Energy Storage Development at Pacific Northwest National Laboratory for Renewable Integration and Smart Grid Applications  
*V. Sprenkle, S. Kim, W. Wang, G. Xia, J. Kim, and D. Choi*
- 1871 The Effect of Discharge Duration Distribution on Sodium Metal Halide Battery Cycle Life for Uninterruptible Power Supplies  
*D. B. Hall*
- 1872 Solid Electrolytes for Sodium Batteries  
*J. W. Fergus*
- 1873 Novel Sodium-Zinc Chloride Battery  
*X. Lu, G. Li, J. Kim, J. Lemmon, V. Sprenkle, and Z. Yang*
- 1874 Development of Sodium-Metal Halide Batteries for Energy Storage  
*G. G. Tao, N. Weber, and A. V. Virkar*
- 1875 Molten Sodium Battery with NaSICON Ceramic Membrane  
*A. Eccleston, M. Robins, S. V. Bhavaraju, Y. Kim, W. Koh, J. Chae, and J. Kim*
- 1876 Effects of Nickel Content and Operating Conditions on Cathode Degradation of Sodium-Nickel Chloride (Zebra) Battery  
*G. Li, X. Lu, J. Kim, and V. Sprenkle*
- 1877 Development of a Brass Supported Zinc-Chloride Sodium Cell  
*D. C. Bogdan Jr., M. Vallance, K. Gourishankar, H. Seshadri, G. Sundararajan, and A. Viswanathan*



- 1878 Influence of Sulfur Concentration on Low Temperature Operation of the Cell Na/ $\beta$ "-Alumina/S(IV) in AlCl<sub>3</sub>-NaCl Melt  
*T. J. Dunstan and J. Caja*

## **B12 - Solid State Ionic Devices 9 - Ion Conducting Thin Films and Multilayers**

*ECS High Temperature Materials, ECSJ Solid-State Chemistry*

- 1879 Innovative Oxides Materials for Electrochemical Energy Conversion  
*E. D. Wachsman*
- 1880 Study of Crystal Growth in Oxide Thin Films Fabricated by Pulsed Laser Deposition  
*N. Sata, S. Tamura, Y. Fujiwara, Y. Shibata, F. Iguchi, H. Yugami, Y. Nagao, H. Kageyama, and K. Nomura*
- 1881 Probing Pr<sub>x</sub>Ce<sub>1-x</sub>O<sub>2-d</sub> Thin Film Defect Concentrations Using In Situ Optical Absorption and Impedance Spectroscopy Techniques  
*S. R. Bishop, D. Chen, J. Kim, N. Thompson, and H. L. Tuller*
- 1882 Metastable Thin Films for Energy Applications: On Structural Lattice Anomalies and Electrical Transport  
*J. L. Rupp, S. Bishop, E. Fabbri, J. Han, D. Marrochelli, E. Traversa, H. L. Tuller, and B. Yildiz*
- 1883 Relating Nanostructures of Yttria-Stabilized-Zirconia Thin Films to Their Proton Conductivity  
*J. Martynczuk, M. V. Schlupp, B. Scherrer, D. Stender, R. Tölke, A. Evans, M. Prestat, and L. Gauckler*
- 1884 Ion Conduction in BaZr<sub>0.85</sub>Y<sub>0.15</sub>O<sub>3- $\delta$</sub>  Films Fabricated by Pulsed Laser Deposition in Various Conditions  
*D. Jang, K. Bae, and J. Shim*
- 1885 Do Oxygen-Ion Conductors Feel the Strain  
*D. Pergolesi, E. Fabbri, S. N. Cook, V. Roddatis, E. Traversa, and J. A. Kilner*
- 1886 Epitaxial Zirconia and Ceria Based Thin Films and Multilayers with Arbitrary Composition  
*W. Shen, J. Jiang, and J. L. Hertz*
- 1887 Electric Conductivity in Cu- and Ga-Doped Pr<sub>2</sub>NiO<sub>4</sub> Nano Film Laminated with Sm-Doped CeO<sub>2</sub>  
*J. Hyodo and T. Ishihara*
- 1888 Electronic Activation in the (La<sub>0.8</sub>Sr<sub>0.2</sub>)CoO<sub>3</sub>/(La<sub>0.5</sub>Sr<sub>0.5</sub>)<sub>2</sub>CoO<sub>4</sub> Supperlattices at High Temperature  
*Y. Chen, Z. Cai, Y. Kuru, H. L. Tuller, and B. Yildiz*

- 1889 Low Energy Ion Scattering (LEIS) Analysis of SrTiO<sub>3</sub> (100) and NdGaO<sub>3</sub> (110) Single Crystal Surface Terminations  
*A. Cavallaro and J. A. Kilner*
- 1890 Enhanced Oxygen Surface Exchange Kinetics in Surface Modified Yttria Stabilized Zirconia by Atomic Layer Deposition  
*J. Park, C. Chao, X. Tian, J. Shim, and F. Prinz*
- 1891 Thin Film Electrolyte Membranes of Yttria-Stabilized Zirconia Prepared by Aerosol Assisted Chemical Vapor Deposition  
*M. V. Schlupp, J. Courbat, D. Briand, N. de Rooij, M. Prestat, and L. Gauckler*
- 1892 Ion Conduction in Nanoscale Yttria-Stabilized Zirconia Thin Films Fabricated by Atomic Layer Deposition  
*K. Son, M. Bae, K. Bae, J. Ha, and J. Shim*
- 1893 Atomic Resolution Imaging of Oxygen Columns in Oxide Ion Conductor Using HRTEM  
*J. An, A. Koh, J. Park, H. Jung, T. M. Gür, and F. B. Prinz*
- 1894 Detecting Li-Ion Currents on the Nanoscale through a Thin Film Battery  
*N. Balke, S. Jesse, A. Tselev, N. J. Dudney, and S. Kalinin*
- 1895 Lateral Oxygen Tracer Diffusion in a Multilayered SDC/PNCG Film Displaying Enhanced Electrical Conductivity  
*S. N. Cook, J. Druce, T. Ishihara, and J. A. Kilner*
- 1896 Analysis of Lateral Diffusion of Oxide Ions along YSZ-MgO(100) Interface  
*K. Bae, J. Park, F. B. Prinz, J. Son, and J. Shim*
- 1897 Electrochemical Performance of Free-standing Micro-Solid Oxide Fuel Cell Membranes using De-alloyed Pt-Y-Al Electrodes  
*R. Tölke, M. Prestat, H. Galinski, J. Martynczuk, and L. Gauckler*
- 1898 Thin Pulsed Laser Deposited Bilayer Electrolytes in Anode-Supported SOFCs  
*J. S. Hardy, Z. Lu, J. W. Templeton, and J. W. Stevenson*
- 1899 Morphological and Compositional Changes on YSZ/GDC Bi-layered SOFC Electrolytes in Various Temperature and Reducing Environments  
*Y. Jee, J. An, J. Choi, T. Park, G. Cho, M. Lee, F. B. Prinz, and S. Cha*
- 1900 Cation Interdiffusion Model for Enhanced Oxygen Kinetics at Oxide Heterostructure Interfaces  
*M. Gadre, Y. Lee, and D. Morgan*
- 1901 Nanostructured La<sub>0.6</sub>Sr<sub>0.4</sub>CoO<sub>3-δ</sub> Cathodes Prepared by Spray Pyrolysis for Thin Film SOFC  
*M. Prestat, Z. Yang, O. Pecho, L. Holzer, J. Martynczuk, A. Evans, L. Gauckler, T. Hocker, J. Hwang, and J. Son*

- 1902 Cation Segregation and Electrochemical Activity of Ruddlesden Popper Phase Cobalt Oxides in Oxygen Reduction and Oxygen Evolution  
*Z. Cai, Y. Chen, and B. Yildiz*
- 1903 In Situ Ambient Pressure X-ray Photoelectron Spectroscopy of Epitaxial Strontium Substituted Lanthanum Cobalt Oxides Near Operating Conditions Under Applied Potentials  
*E. J. Crumlin, E. Mutoro, Z. Liu, M. D. Biegalski, W. T. Hong, H. M. Christen, H. Bluhm, and Y. Shao-Horn*
- 1904 Hard X-ray Surface Composition and Electronic Structure Measurements of Heteroepitaxial Solid Oxide Fuel Cell Cathode Material  
*J. N. Davis, L. Saraf, T. Kaspar, S. Gopalan, U. B. Pal, J. Woicik, S. Basu, and K. F. Ludwig*
- 1905 Spray Pyrolysis Deposition and Electrochemistry of  $\text{La}_{0.5}\text{Sr}_{0.5}\text{Mn}_{0.5}\text{Co}_{0.5}\text{O}_{3-\delta}$  Thin Film Anodes for Solid Oxide Fuel Cells  
*Z. Yang, S. Bisig, M. Prestat, and L. Gauckler*
- 1906 Synthesis and Characterization of Ruthenium - Gadolinia-doped Ceria Composite Thin Film Anode for Direct Methane SOFCs  
*Y. Takagi and S. Ramanathan*
- 1907 Nanostructured Vanadium Oxide Anodes for Thin Film Solid-Oxide Fuel Cells  
*Q. Van Overmeere and S. Ramanathan*
- 1908 Atomistic Investigation of Oxygen Vacancy Induced Volume Changes in  $\text{CeO}_2$  Grain Boundaries  
*S. Kim and V. B. Shenoy*
- 1909 Obtaining Mixed Ionic/Electronic Conductivity in Perovskite Oxides at Anodic Solid Oxide Fuel Cell Conditions: A Computational Approach  
*S. Suthirakun, S. C. Ammal, and A. Heyden*
- 1910 Electrochromic Films Produced by Ultrasonic Spray Deposition of Mesoporous Tungsten Oxide  
*C. Li, F. Lin, R. M. Richards, R. Tenent, A. Dillon, and C. Wolden*
- 1911 Development of Safe All Inorganic Li-Ion Batteries  
*L. Castro, G. Jouan, A. Kubanska, V. Seznec, L. Tortet, M. Morcrette, V. Viallet, R. Bouchet, and M. Dollé*
- 1912 Stabilization of NASICON-Type  $\text{LiZr}_2(\text{PO}_4)_3$  at Room Temperature  
*L. Castro, A. Kubanska, L. Tortet, R. Bouchet, and M. Dollé*
- 1913 Open-Circuit Voltage Anomalies in Dense Bilayered Electrolytes: Explanation and Implications  
*K. Duncan and E. D. Wachsman*

- 1914 Conductivity of New Electrolyte Material  $\text{Pr}_{1-x}\text{M}_{1+x}\text{InO}_4$  ( $\text{M}=\text{Ba}, \text{Sr}$ ) with Related Perovskite Structure for Solid Oxide Fuel Cells  
*X. Li, H. Shimada, and M. Ihara*
- 1915 Fabrication and Characterization of Nanosized  $(\text{DyO}_{1.5})_x(\text{WO}_3)_y(\text{BiO}_{1.5})_{1-x-y}$  for Lower Temperature SOFC Application  
*A. A. Lidie, K. Lee, and E. D. Wachsman*
- 1916 Investigation of Electrolyte and Electrode Effects on GDC Electrolyte by Electrochemical Impedance Spectroscopy  
*L. Zhang, F. Liu, and A. V. Virkar*
- 1917 Mapping Thermodynamics and Kinetics of Oxygen Vacancies in Fuel Cell Electrolytes on the Nanoscale  
*S. Jesse, A. Kumar, M. D. Biegalski, A. Morozovska, E. Eliseev, F. Ciucci, and S. Kalinin*
- 1918 Effect of Sulfur Poisoning on Exchange Current Density of SOFC Anodes  
*T. Hosoi, T. Yonekura, T. Yoshizumi, Y. Tachikawa, S. Taniguchi, Y. Shiratori, and K. Sasaki*
- 1919 Thin Film Ceria Based Anodes for a Single Direct Carbon Fuel Cell  
*M. G. Werhahn, O. Schneider, and U. Stimming*
- 1920 Anode Materials and Design for Lower Temperature, Hydrocarbon-Fueled Solid Oxide Fuel Cells  
*C. Gore, K. Lee, H. Yoon, and E. D. Wachsman*
- 1921 Degradation Induced by Sintering of Ni-YSZ Anode in SOFCs  
*Y. Lee, H. Muroyama, T. Matsui, and K. Eguchi*
- 1922 Electrical Performance of La-Substituted  $\text{SrTiO}_3$  Anode Material with Deficient in A-Site  
*G. Chen, H. Kishimoto, K. Yamaji, K. Kuramoto, and T. Horita*
- 1923 Infiltrated Ni-ScYSZ Fuel-Electrodes with Improved Carbon and Sulfur Tolerance  
*C. Graves, S. Ricote, and T. Ramos*
- 1924 Synergy Effects of  $\text{Pr}_2\text{NiO}_4$  and  $\text{Ba}(\text{La})\text{CoO}_3$  on Cathodic Activity for Intermediate Temperature Solid Oxide Fuel Cells  
*T. Ishihara, J. Xie, Y. Ju, and S. Ida*
- 1925 Electrochemical Study on LSCF Cathode Reaction as a Function of Microstructure, Temperature and Oxygen Partial Pressure  
*D. Marinha, L. Dessemond, and E. Djurado*
- 1926 Effects of Strontium Dopant Concentration on the Oxygen Reduction Reaction Rate Limiting Steps in  $\text{La}_x\text{Sr}_{1-x}\text{Co}_{0.2}\text{Fe}_{3.8}$  Cathodes  
*A. Dynkin, S. Basu, U. B. Pal, and S. Gopalan*

- 1927 Control of Activity and Stability by Tailoring Microstructure of Electrocatalyst-Modified Composite Cathode of SOFC  
*S. Lee, P. Ohodnicki, and K. Gerdes*
- 1928 Characterization and Modeling of Infiltrated SOFC Cathode  
*X. Liu, Y. Li, M. Gong, K. Gerdes, R. Gemmen, R. Pakalapati, I. Celik, and T. Horita*
- 1929 Ab Initio Based Modeling of  $\text{LaMnO}_{3(\text{plus minus})\delta}$  Defect Chemistry for Solid Oxide Fuel Cell Cathodes  
*Y. Lee and D. Morgan*
- 1930 A-Site Diffusion in  $\text{La}_{1-x}\text{Sr}_x\text{MnO}_3$ : Ab Initio and Kinetic Monte Carlo Calculations  
*B. Puchala, Y. Lee, and D. Morgan*
- 1931 Influence of Water Vapor on Sulfur Distribution Within  $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_3$  Cathode  
*F. Wang, K. Yamaji, D. Cho, T. Shimonosono, M. Nishi, H. Kishimoto, M. Brito, T. Horita, and H. Yokokawa*
- 1932 Electrochemical Operation of  $\text{La}(\text{Ni,Fe})\text{O}_3$  under Cr-Poisoning Conditions  
*M. K. Stodolny, B. A. Boukamp, D. H. Blank, and F. P. van Berkel*
- 1933 Nonlinear Electrochemistry Impedance Spectroscopy and Its Applications  
*N. Xu, J. Riley, and J. A. Kilner*
- 1934 Ultra Small Angle X-ray Scattering Studies of Solid Oxide Fuel Cell Cathode Powders  
*K. Chang, B. Ingram, M. Hopper, J. Ilavsky, and H. You*
- 1935 In Situ Examination of Oxygen Kinetics in  $\text{La}_{1-x}\text{Sr}_x\text{CoO}_{3-\delta}$  Thin Films at Intermediate and Low Temperatures by X-ray Diffraction  
*M. D. Biegalski and S. V. Kalinin*
- 1936 Preparation of  $\text{A}_2\text{BB}'\text{O}_6$  Oxides by Pechini Method for Solid Oxide Fuel Cells  
*S. Kim, A. Dorai, D. Seo, I. Han, J. Yu, S. Kim, J. Joo, and S. Woo*
- 1937 Crystal Structure and Electrical Properties of Al-Doped Lanthanum Silicate Solid Electrolytes  
*T. Funahashi, A. Mineshige, H. Mieda, Y. Daiko, H. Yoshioka, and T. Yazawa*
- 1938 Power Generation of Rechargeable Direct Carbon Fuel Cells with Batch-type Charging System  
*H. Tanaka, A. Yabuki, X. Li, and M. Ihara*
- 1939 A Comparative Study on Microstructural Change of LSM/SDC and LSCF/SDC Interfaces  
*M. Komoto, H. Muroyama, T. Matsui, and K. Eguchi*
- 1940 Study of  $\text{La}_{0.1}\text{Sr}_{0.9}\text{Co}_{0.8}\text{Fe}_{0.2}\text{O}_{3-\delta}$  for Ceria-Based IT-SOFC Cathode  
*M. Choi, H. Im, K. Lee, and S. Song*

- 1941 Evaluation of Y and Fe Co-Doped SrTiO<sub>3</sub> as Anode Material for SOFC  
*H. Im, M. Choi, S. Jeon, and S. Song*
- 1942 Resistivity and Interfacial Properties of CGO-YSZ Bilayers in Solid Oxide Fuel Cells  
*J. Hjelm, P. Hjalmarsson, K. Brodersen, and S. Foghmoes*
- 1943 Cathode Performance and Deposited Cr under Cr Poisoning Condition in the (La<sub>0.6</sub>Sr<sub>0.4</sub>)(Co<sub>0.2</sub>Fe<sub>0.8</sub>)O<sub>3</sub> Cathode  
*D. Cho, T. Horita, M. Brito, K. Yamaji, H. Kishimoto, M. Nish, T. Shimonosono, F. Wang, and H. Yokokawa*
- 1944 Performance Degradation and Microstructural Change of Ni-YSZ Anode upon Thermal and Redox Cycles  
*M. Kubota, H. Muroyama, T. Matsui, and K. Eguchi*
- 1945 Electrochemical Studies of LSCF Powder Prepared using Pechini Process for IT-SOFC Unit Cell  
*H. Jeon, H. Kim, T. Kim, and H. Kim\**
- 1946 Correlation between Protonic Conductivity and Structure of Phosphate Glasses for Intermediate Temperature Fuel Cells  
*H. Sumi, Y. Fujishiro, T. Oine, and T. Kasuga*
- 1947 Proton Conduction in CsH(PO<sub>3</sub>H) under Dry or Humid Conditions  
*M. Nagao, A. Ikeda, and S. M. Haile*
- 1948 Structure and Electrochemical Property of Various Valence Metal Ion Co-doped Scandia Stabilized Zirconia  
*N. Sonoyama, M. Ikeda, Y. Ota, N. Imanishi, A. Hirano, Y. Takeda, and O. Yamamoto*
- 1949 Fabrication of a Micro-tubular Bi-Layered Membrane by Electrophoretic Deposition  
*K. Lee, J. Seo, J. Yoon, and H. Hwang*
- 1950 Analysis of Electrical Conduction Mechanism of LaNi<sub>1-x</sub>M<sub>x</sub>O<sub>3-δ</sub> (M = Fe, Mn)  
*E. Niwa, H. Maeda, C. Uematsu, and T. Hashimoto*
- 1951 Oxygen Transport Properties of Al doped La<sub>2</sub>NiO<sub>4+δ</sub>  
*S. Jeon, M. Choi, H. Im, and S. Song*
- 1952 Transport Properties of the Proton Conducting BaCe<sub>0.45</sub>Zr<sub>0.4</sub>Y<sub>0.15</sub>O<sub>3-δ</sub>  
*D. Lim, M. Choi, H. Im, K. Lee, and S. Song*
- 1953 Performance of BaCe<sub>0.85</sub>Y<sub>0.15</sub>O<sub>3-δ</sub> Electrolyte for the Proton Conducting Ceramic Fuel Cells  
*K. Lee, M. Choi, D. Lim, and S. Song*
- 1954 Molecular Dynamics Simulation on Oxygen Ion Diffusion in LaInO<sub>3-δ</sub> Perovskite Structure Doped with Ba and Sr  
*S. Jeong, K. Hwang, M. Yoon, and H. Hwang*

- 1955 Hydrothermal Synthesis and 3D-Arrangement of CeO<sub>2</sub> Nanocrystals  
*K. Kobayashi, M. Haneda, and M. Ozawa*
- 1956 Thin Film Electrodes for Li-Ion Batteries: Improved Electrochemical Properties and Mechanism Study  
*Z. Cui, P. Yu, and X. Guo*
- 1957 A Novel All-Solid-State Lithium-Ion Battery with In Situ Formed Negative Electrode Material  
*Y. Amiki, F. Sagane, and Y. Iriyama*
- 1958 Ionic and Electronic Conductivity in Telluride Glass Systems: Interfacial Materials for All-Solid-State Devices  
*I. Alekseev, E. Bychkov, D. Le Coq, M. Kassem, M. Fourmentin, and T. Usuki*
- 1959 Mechanistic Study of the Electrochemical Promotion of Catalysis Using Isotopic Exchange  
*M. Tsampas, F. Sapountzi, A. Boréave, and P. Vernoux*
- 1960 Defect Chemistry and Transport Properties in MnO<sub>2</sub> Nanowires  
*B. C. Solomon, J. Wu, E. Thomsen, J. Yang, and X. Zhou*
- 1961 Enhanced Proton Conductivity by Hydrogenation in Anodic ZrO<sub>2</sub>-WO<sub>3</sub>-SiO<sub>2</sub> Nanofilms  
*K. Ye, Y. Aoki, E. Tsuji, S. Nagata, and H. Habazaki*
- 1962 Water-Absorbing Porous Electrolyte Based on Sulfated Hydrous Titania and Application to Water Electrolysis  
*S. Kim, T. Sakai, J. Hamagami, Y. Okuyama, H. Oda, T. Ishihara, and H. Matsumoto*
- 1963 Current-Voltage Relation in (La,Ce)PO<sub>4</sub> Mixed-Conducting Ceramics  
*H. L. Ray and L. De Jonghe*
- 1964 Proton Conductivity and Stability of In<sup>3+</sup> Doped SnP<sub>2</sub>O<sub>7</sub> with Varying P:M  
*C. R. Kreller, M. Wilson, R. Mukundan, E. L. Brosha, and F. H. Garzon*
- 1965 Simulations of Proton Conduction in Tin Pyrophosphates  
*N. J. Henson, F. H. Garzon, and R. Mukundan*
- 1966 First-Principles Defect Equilibrium Calculations in Rare-Earth Phosphate Electrolytes with Mixed Conductivity  
*N. Adelstein, H. L. Ray, M. Asta, and L. De Jonghe*
- 1967 Effect of Multi-Site Doping on The Conductivity of ABO<sub>3</sub> Perovskite Mixed Proton/Electron Conductors  
*K. Pan and E. D. Wachsman*
- 1968 Nanoionics Applied to Proton Conducting Ceramics  
*J. Tong, D. Clark, S. Nikodemski, M. Shang, A. Herring, C. Wolden, A. Bunge, and R. O'Hayre*

- 1969 Functional Relationships between Structure and Transport in the BZY and BCY Proton Conductors  
*A. Braun and Q. Chen*
- 1970 Improving the Performance of Solid Oxide Fuel Cells with BaZrO<sub>3</sub> Electrolyte by Using Sinteractive Anodic Powders  
*L. Bi, E. Fabbri, and E. Traversa*
- 1971 Magnesium Manganese Spinel Coatings for Solid Oxide Fuel Cell Interconnects  
*S. Joshi, C. Silva, and A. Petric*
- 1972 Increased Performance Stability of SOFC Cathodes by Use of Protective Coatings on Metallic Interconnectors  
*M. Kornely, N. Menzler, A. Weber, and E. Ivers-Tiffée*
- 1973 Imaging of Oxide Ionic Diffusion at Cathode/Interlayer/Electrolyte Interfaces for Solid Oxide Fuel Cells: long-term operation effects  
*T. Horita, D. Cho, T. Shimonosono, M. Nishi, H. Kishimoto, K. Yamaji, and H. Yokokawa*
- 1974 Novel Anode Material for Direct Hydrocarbon Solid Oxide Fuel Cells  
*C. Yang, Z. Yang, G. Xiao, L. Zhang, M. Han, and F. Chen*
- 1975 Efficient High Power Density SOFCs with Zirconia/Bismuth Oxide Bilayered Electrolytes  
*K. Lee and E. D. Wachsman*
- 1976 Process Integration for Scale-Up of Ce<sub>0.9</sub>Gd<sub>0.1</sub>O<sub>1.95</sub> Electrolyte-Based LT-SOFCs  
*H. Yoon, C. M. Gore, A. A. Lidie, K. Lee, and E. D. Wachsman*
- 1977 Performance of Solid Oxide Fuel Cells on H<sub>2</sub>, NH<sub>3</sub> and Hydrocarbon Fuels  
*M. Han, J. Xiong, and S. C. Singhal*
- 1978 Improved Power Density by (Mn, Fe) Doped CeO<sub>2</sub> as a Oxide Anode for Ni-Fe Metal Support SOFC  
*Y. Ju, S. Ida, and T. Ishihara*
- 1979 Effect of Co Addition on Sintering and Electrical Properties of La-Doped CeO<sub>2</sub> as a Buffer Layer for Doped LaGaO<sub>3</sub> Electrolyte Films of Solid Oxide Fuel Cells  
*J. Hong, S. Ida, and T. Ishihara*
- 1980 Effect of Fuel Utilization on the Performance of Nickel/Zirconia Anode-Supported SOFCs  
*O. A. Marina, C. Coyle, D. Edwards, and J. Stevenson*
- 1981 Durability of SOFC Against Thermal and Redox Cycling  
*M. Hanasaki, C. Uryu, S. Taniguchi, Y. Shiratori, and K. Sasaki*
- 1982 Sulfur-Poisoning in Reformate Fuelled Anode Supported Solid Oxide Fuel Cells  
*A. Kromp, S. Dierickx, A. Leonide, A. Weber, and E. Ivers-Tiffée*



## C1 - Organic and Biological Electrochemistry General Poster Session

All ECS Divisions, ECSJ Organic and Biological Electrochemistry

- 1983 The Electrolytic Dissociation of 1,3-Cyclobutanedicarboxylic Acids  
*E. Kvaratskhelia and R. Kvaratskhelia*
- 1984 Propagation and Collision of Nonlinear Electrical Responses in *Aloe Vera* L. and *Arabidopsis Thaliana*  
*L. O'Neal, M. I. Volkova, V. S. Markin, and A. G. Volkov*
- 1985 Effect of Surfactants on the Voltammetric Response and Determination of an Antihypertensive Drug Phentolamine at Boron Doped Diamond Electrode  
*R. Shrivastav, S. Satsangee, and R. Jain*
- 1986 Potential-Induced Conformational Changes in Self-Assembled Monolayers of L-Cysteine at p-GaAs(100) Electrodes  
*M. Enache, L. Preda, V. Lazarescu, C. Negrila, and M. Lazarescu*
- 1987 Effect of Humidity of Atmosphere on Characteristics of Cathodic Film Formed on Ti in  $\text{Ca}^{2+}$ /Ethanol Solution  
*T. Haruna and A. Nonaka*
- 1988 Evolution of Cathode Surface Hydrophobicity in Microbial Fuel Cell Using Sessile Drop Technique  
*C. Santoro, M. Cremins, A. Mackay, U. Pasaogullari, M. Guilizzoni, A. Casalegno, and B. Li*
- 1989 Electrodeposition of Poly (Ethyleneglycol) for Constructing the Artificial Scaffold onto Titanium  
*S. Migita, S. Okada, Y. Tsutsumi, H. Doi, N. Nomura, and T. Hanawa*
- 1990 Monitoring of the Processes of Proliferation and Differentiation of Immunocytes by the Impedance Measurement Method  
*S. Kasai, K. Shoji, M. Tada, H. Kiriu, R. Ishii, and H. Kodama*
- 1991 Photocurrent Characteristics of Thin Films Produced from Aqueous Colloidal Dispersion of Indolino[60]Fullerene by Using Electrospray Deposition Method  
*H. Matsutaka, Y. Shigemitsu, T. Orii, T. Aoyama, H. Takaku, and Y. Tajima*
- 1992 Electrochemical Characteristics of Vinylferrocene-Terminated Si(111) Prepared in Diethyl Ether and Dibutyl Ether Grafting Media  
*M. U. Herrera, T. Ichii, K. Murase, and H. Sugimura*
- 1993 A Green Electrochemical Method to Remove Protein Surface Fouling and Industrial Dye Wastes  
*J. Yang and S. Gunasekaran*
- 1994 Effects of Cathodic Platinum Loadings and Organic Substrate Concentrations on the Performance of Single Chamber Microbial Fuel Cells Fed with Raw Wastewater  
*C. Santoro, B. Li, U. Karra, A. G. Agrios, G. Squadrito, and P. Cristiani*

- 1995 Electrosynthesis of Polypyrrole in Low-Viscosity Ionic Liquids  
*K. Tsunashima, T. Matsubayashi, Y. Ono, and M. Matsumiya*
- 1996 Disc-Like and Bent-Shape Semiconducting Liquid Crystals for Organic Electronics  
*F. Ely, M. O. da Silva, R. Cristiano, A. Vieira, and H. Gallardo*
- 1997 Irreversible Thermodynamics Microbial Fuel Cell Anode Model  
*J. E. Velez and C. Sanchez*
- 1998 Graphene Nanohybrids based on Genetically Engineered Protein for Agrichemical Biosensing  
*N. Heo, S. Lee, K. Lee, and T. Park*

## **C2 - Bioengineering Based on Electrochemistry**

*ECS Organic and Biological Electrochemistry, ECS Sensor, ECSJ Bioengineering*

- 1999 Electrochemical-Based Bioprocessing Device Composed of Recombinant Protein/DNA Conjugate  
*J. Choi*
- 2000 Fabrication of Multilayer Cell Structure Using Electro-Deposited Alginate Gel  
*F. Ozawa, K. Ino, H. Shiku, and T. Matsue*
- 2001 Metabolism Feature of Multicellular Tumor Spheroids Assessed by a Comprehensive System  
*Y. Zhou, T. Arai, Y. Horiguchi, K. Ino, H. Shiku, and T. Matsue*
- 2002 Development of Voltage Switching Mode Scanning Electrochemical Microscopy for Topographical and Electrochemical Nanoscale Imaging of Living Cells  
*Y. Takahashi, A. I. Shevchuk, P. Novak, Y. Matsumae, B. Babakinejad, J. V. Macpherson, P. R. Unwin, K. Ino, H. Shiku, J. Gorelik, D. Klenerman, Y. E. Korchev, and T. Matsue*
- 2003 Electrochemically Modulated Release of Nitric Oxide through Polymers to Inhibit Bacterial Biofilm Formation and Prevent Platelet Activation  
*M. E. Meyerhoff, L. Höfler, D. Koley, H. Ren, T. C. Major, J. Wu, and C. Xi*
- 2004 Engineering of Catalytic Domain of Cellobiose Dehydrogenase and Its Application for the Direct Electron Transfer Type Enzyme Electrode  
*S. Ando, S. Ferri, W. Tsugawa, and K. Sode*
- 2005 Aptameric Sensor for Detection of VEGF Based on Labeling Technique Using GDH Fused Zinc Finger Protein  
*A. Tatsumi, K. Abe, T. Fukaya, K. Sode, and K. Ikebukuro*
- 2006 Evolution of Cathodic Characteristics (Water and Oxygen Transport) in Microbial Fuel Cell (MFC)  
*C. Santoro, M. Cremins, A. Mackay, U. Pasaogullari, M. Guilizzoni, A. Casalegno, and B. Li*

- 2007 Turning Oxidase into Dehydrogenase for Application to the Electrochemical Measurement  
*S. Saito, Y. Horaguchi, T. Endo, S. Ferri, K. Mori, K. Kojima, W. Tsugawa, and K. Sode*
- 2008 Peroxidase Activity of G-Quadruplex Hemin-Binding DNA Aptamers Determined by Electrochemical Measurement  
*I. Kubo, Y. Hoshino, M. Liu, H. Abe, and Y. Ito*
- 2009 Electron Transfer between Cytoplasm and Electrode via Redox-Active Phospholipid Polymer  
*K. Nishio, R. Nakamura, S. Nakanishi, X. Lin, T. Konno, K. Ishihara, and K. Hashimoto*
- 2010 In Situ Observation of Direct Electron Transfer Reaction between Cytochrome c and ITO Electrode with Electrochemically Controlled Slab Optical Waveguide Spectroscopy  
*N. Matsuda and H. Okabe*
- 2011 Recent R&D on Disposable Electrochemical Biosensors  
*H. Nam, G. Cha, M. Kim, M. Lee, and S. Chung*
- 2012 Floated Electrochemical Cell for On-Line Electrospray Mass Spectrometry for Detection of Biological Radical Reactions  
*D. Looi, I. Iftikhar, G. Garbellini, and A. Brajter-Toth*
- 2013 High Efficient Glucose Oxidation by Ordered Molecular Assembly inside Carbon Nanotube Forests  
*S. Yoshino, T. Miyake, H. Kaji, T. Yamada, K. Hata, and M. Nishizawa*
- 2014 Evaluation of Electrochemical Disinfection of Feline Calicivirus in Aqueous Conditions  
*N. Shionoiri, T. Tanaka, T. Sato, Y. Fujimori, T. Nagao, T. Nakayama, and T. Matsunaga*
- 2015 Electrochemistry-Based and Signal-Amplified Sensing Strategies for DNA-Based Point-of-Care Biosensors  
*I. Hsing*
- 2016 Electrochemical and Physical Assessment on Electrode Coating Materials for Neuromodulation Application  
*A. Shi, B. Li, P. Cong, and D. Seeley*
- 2017 Mechanical Force-Based Probing of Cytoskeletal Proteins in Living Cells Using Antibody-Immobilized Nanoneedles  
*C. Nakamura, Y. R. Silberberg, R. Kawamura, S. Mieda, Y. Amemiya, T. Kihara, K. Fukazawa, K. Ishihara, N. Nakamura, and J. Miyake*
- 2018 A Spatio and Temporal Gaseous Ethanol Visualization System for Real-Time Analysis from Human Breath and Body  
*T. Arakawa, X. Wang, T. Kajiro, K. Miyajima, H. Kudo, K. Yano, and K. Mitsubayashi*

- 2019 Development of Human-Environment Interface by Sensing and Multivariate Analysis of Bio-Ecosystem  
*M. Koshiba, G. Karino, A. Seno, Y. Shirakawa, K. Mimura, T. Sagawa, W. Tsugawa, K. Sode, and S. Nakamura*
- 2020 Electrochemical Impedance Spectroscopy on Nanomaterial-Modified Surfaces  
*A. J. Veloso, X. Chen, V. Hung, N. Li, and K. Kerman*
- 2021 Second Generation Continuous Glucose Sensing System Employing Direct Electron Transfer Principle  
*W. Tsugawa, K. Kojima, and K. Sode*
- 2022 Engineering Fungi Derived FAD Glucose Dehydrogenase and Its Application for Glucose Sensor Strip Employing Screen Printed Carbon Electrode  
*Y. Onishi, M. Nakajima, W. Tsugawa, K. Mori, K. Kojima, and K. Sode*
- 2023 Profile of IgE and IgG4 Binding Epitopes in Cow's Milk Allergens Using Peptide Array  
*M. Okochi, Y. Yoshida, and H. Honda*
- 2024 Fiber-Optic Fluoroimmunoassay System for *On-Site* Determination of the Indoor Allergen  
*K. Miyajima, K. Tamari, E. Kiyomiya, M. Hayashi, T. Arakawa, H. Kudo, K. Shiba, and K. Mitsubayashi*
- 2025 Self-Assembled Synthetic Protein Scaffolds: Biosynthesis and Applications  
*W. W. Su and Z. Han*
- 2026 Use of High Surface Area Electrodes for Safe Delivery of Direct Current for Nerve Conduction Block  
*T. Vrabc, J. Wainright, N. Bhadra, N. Bhadra, and K. Kilgore*
- 2027 Electrochemical Approach to Fabricate Stacked Thick Cell Sheets  
*N. Mochiuzki, H. Suzuki, and J. Fukuda*
- 2028 Electrical Bioassay System Using a Hydrogel-Supported Skeletal Muscle Cells  
*K. Nagamine, H. Kaji, M. Kanzaki, and M. Nishizawa*
- 2029 Fabrication of Semi-Invasive Micro-Needle Array Using Gradation Exposure  
*M. Yamaguchi, Y. Sasaki, Y. Kimura, and M. Sasaki*
- 2030 Higher Catalytic Activity by Fluctuation effect of Captured Enzyme Molecules in Designed Self-Organized Membrane on an Electrode Surface  
*Y. Takatsuji, R. Yamasaki, A. Iwanaga, M. Lienemann, M. Linder, and T. Haruyama*
- 2031 Nano-Structured Protein Layer on an Electrode Surface Taking Advantage of Self-Organized HFBI and Its Electrochemical Property  
*R. Yamasaki, Y. Takatsuji, A. Iwanaga, M. Lienemann, M. Linder, and T. Haruyama*

- 2032 Analysis of Cell Exfoliation Specifically Observed during the Formation of Spermine-Induced Multilayer Muscle Fiber Sheet  
*A. Ishida, N. Abe, H. Matsuoka, and M. Saito*
- 2033 Quantitative Analysis of Cell Death Observed during the Formation of Spermine-Induced Multilayer Muscle Fiber Sheet  
*N. Abe, A. Ishida, H. Matsuoka, and M. Saito*
- 2034 In Vivo Delivery of RNAi Reagents into a Mouse  
*M. Kaburagi, Y. Kakutani, H. Matsuoka, and M. Saito*
- 2035 Surface Modification of Titanium Dioxide Nanoparticles with Gold Nanoparticles for Bio Fuel Cell Application  
*H. Park, S. Pyo, D. Lee, S. Kim, and H. Park*
- 2036 Optimizing Functionalized Carbon Nanotube Matrix for Enhancing Direct Ethanol Fuel Cell Performance  
*L. Q. Hoa, H. Yoshikawa, M. Saito, and E. Tamiya*
- 2037 Evaluation of Activity of RNAi Against Diabetes Related Genes in MIN6 Cells  
*Y. Kakutani, M. Kaburagi, H. Matsuoka, and M. Saito*
- 2038 Electrochemical Detection of Cell Membrane Proteins using Scanning Electrochemical Microscopy  
*Y. Matsumae, Y. Takahashi, K. Ino, H. Shiku, and T. Matsue*
- 2039 Electrochemical Monitoring of Loop-Mediated Isothermal Amplification for Influenza Virus Detection  
*K. Yamanaka, M. Saito, N. Nagatani, K. Ikuta, and E. Tamiya*
- 2040 Cell-Based Assay Using Cells Adjusted at a Specific Stage during Differentiation to  $\beta$ -Cells  
*N. Hanata, H. Matsuoka, and M. Saito*
- 2041 Development of High-Throughput Toxicity Assay System Integrated with a Chemical Gradient Generator  
*Y. Sugamura, M. Hosokawa, A. Arakaki, T. Tanaka, and T. Matsunaga*
- 2042 Detection of *E. coli* Using Electrochemical and Immunochromatographic Assay for Amplified Gene by PCR  
*Y. Ogido, H. Ushijima, K. Yamanaka, M. Saito, E. Tamiya, S. Katayama, T. Miyahara, and N. Nagatani*
- 2043 Suppression of an Oct3/4 Transcription Activity in ES Cells by Decoy DNA Femtoinjection  
*S. Oura, H. Funabashi, M. Saito, and H. Matsuoka*
- 2044 Production of a Differentiation Regulating Protein to Be Femtoinjected into ES Single-Cells  
*T. Tanaka, H. Funabashi, M. Saito, and H. Matsuoka*

- 2045 PEDOT Microelectrodes Anchored to Hydrogel for Efficient Cellular Electrical Stimulation  
*D. Takahashi, M. Sasaki, R. Suzuki, K. Nagamine, T. Miyake, H. Kaji, and M. Nishizawa*
- 2046 Development of a Patch-Type Gel Sheet Sensor for Detection of Extracellular Metabolites  
*S. Otani, S. Ito, K. Nagamine, H. Kaji, and M. Nishizawa*
- 2047 Dynamic Properties of Fluorescent Reporter Proteins Femtoinjected into ES Single-Cells  
*S. Hisatomi, H. Funabashi, M. Saito, and H. Matsuoka*
- 2048 Development of Cell Analysis Method by Using CMOS Sensor for High-Throughput Blood Cell Profiling  
*T. Saeki, M. Hosokawa, T. Lim, K. Tomita, M. Harada, T. Yoshino, T. Tanaka, and T. Matsunaga*
- 2049 Flexible Biofuel Cell Using Enzyme-Modified Nanoengineered Carbon Fabric  
*T. Yamada, S. Yoshino, T. Ofuji, T. Miyake, H. Kaji, and M. Nishizawa*
- 2050 Evaluating the Insertion Efficiencies of Silicon Nanoneedles into Living Single Cells  
*S. Ryu, R. Kawamura, T. Kitagawa, N. Nakamura, and C. Nakamura*
- 2051 Development of a Method to Modify Nanoneedle Arrays with Molecular Probes for the Analysis of Living Cells  
*M. Shimooku, S. Ramachandra Rao, R. Kawamura, K. Ishihara, K. Fukazawa, and C. Nakamura*
- 2052 Feasibility Study of Dual-FRET Molecular Beacon for the Dynamic Analysis of Oct3/4 mRNA in ES Cells  
*H. Koike, H. Funabashi, M. Saito, and H. Matsuoka*
- 2053 Effect of Particle Size on the Electrochemical Responses of Cytochrome *c* and Pyrroloquinoline Quinone Immobilised on Gold Nanoparticle-Modified Electrodes  
*M. Suzuki, K. Murata, N. Nakamura, and H. Ohno*
- 2054 Hydrophilicity and Osteoconductivity of Ti Anodized in Various Aqueous Solutions  
*D. Yamamoto, K. Kuroda, R. Ichino, and M. Okido*
- 2055 Effect of a Carbohydrate-Binding Domain on Electron Transfer between Proteins and Carbon Electrodes  
*H. Shimofusa, M. Inukai, M. Yoshida, K. Igaraqshi, M. Samejima, N. Nakamura, and H. Ohno*
- 2056 Comparison of Quantitative Imaging Analysis and Electrochemical Sensing for the Beatings of Cardiomyocyte Derived from Mouse Embryonic Stem Cells  
*Y. Yamaguchi, E. Shimizu, T. Ikeuchi, A. Hashimoto, M. Saito, and E. Tamiya*
- 2057 Turning Glucose Oxidase into Essentially Dehydrogenase  
*Y. Horaguchi, S. Saito, S. Ferri, K. Mori, K. Kojima, W. Tsugawa, and K. Sode*

- 2058 Enhancement of Wettability on Titanium Substrates by Femtosecond Laser Micron/Nano Machining  
*K. Fung, Y. Su, C. Liu, C. Ni, C. Lin, P. Wu, and C. Cheng*
- 2059 Correlation between Spectroscopy Absorbance and Biofilm to Anode Microbial Fuel Cell  
*R. J. Marassi, J. M. Santos, C. E. Teodoro, F. S. Santos, and G. C. Silva*
- 2060 Assessment of Cell Behaviors on TiO<sub>2</sub> Nanotube Arrays by Using Atomic Force Microscopy, Raman Spectroscopy, Fluorescence Microscopy  
*R. Li, Q. Li, L. Xiao, S. Williams, E. Suasnavas, C. Isom, D. Larson, L. Rickords, and A. Zhou*
- 2061 Sucarcane Waste as Substrate for Microbial Fuel Cell  
*J. M. Santos, R. J. Marassi, C. E. Teodoro, F. S. Santos, and G. C. Silva*
- 2062 Development of a POCT Diagnostic System for Periodontal Disease Using a Printed Electrode  
*T. Uenoyama, K. Yamanaka, M. Saitou, Y. Yamaguchi, M. Wada, and E. Tamaiya*
- 2063 Implantable Nerve Cuff Electrode Deposited with Electrospun Nanofiber to Control Drug Release for Long-Term Implantation  
*S. Lee, S. Park, S. Lim, K. Hwang, and J. Kang*
- 2064 Amino Acid Sensing Based on 2D-SPR Imaging  
*Y. Hida and H. Shinohara*
- 2065 Non-FET Electrochemical DNA Detection Using Metal-Gap-Oxide-Silicon Structures  
*K. Kawai, Y. Doi, T. Furukawa, J. Uchikoshi, K. Arima, and M. Morita*

#### **C4 - New Synthetic and Mechanistic Approaches to Molecular Electroorganic Chemistry**

*ECS Organic and Biological Electrochemistry, ECSJ Electroorganic Chemistry*

- 2066 Anodic Oxidation of *gem*-Diaryl Ketones in the Presence of Alcohols  
*A. J. Fry and B. Sheludko*
- 2067 Oxidative Dechlorination of Chlorinated Organic Compound Catalyzed by Vitamin B<sub>12</sub>-TiO<sub>2</sub>  
*H. Shimakoshi and Y. Hisaeda*
- 2068 Controlling and Improvement of Electrosynthetic Reaction by Using Microreactor: Application to Intermolecular Coupling Reaction of Phenol Derivatives  
*T. Kashiwagi, S. R. Waldvogel, and M. Atobe*
- 2069 Site-Controlled Modification of Conducting Polymer Films Based on Bipolar Electrochemistry  
*S. Inagi, Y. Ishiguro, and T. Fuchigami*

- 2070 Electrochemical Dehalogenation of Persistent Organic Pollutants with a Silver Cathode in Aqueous Media  
*A. A. Peeverly and D. G. Peters*
- 2071 Electrochemical Fluorination Using Alkali-Metal Fluorides  
*T. Fuchigami, T. Sawamura, and S. Inagi*
- 2072 Development of Regioselective Electrochemical Glycosylation Oriented Natural Products Synthesis  
*K. Kawa, T. Saitoh, E. Kaji, and S. Nishiyama*
- 2073 Direct Reduction of 6-Halo-1-Phenyl-1-Hexynes at Silver Cathodes  
*L. M. Strawsine and D. G. Peters*
- 2074 Application of Methoxy Radical Generation on a Boron-Doped Diamond Electrode  
*T. Sumi, T. Saitoh, K. Natsui, T. Yamamoto, M. Atobe, Y. Einaga, and S. Nishiyama*
- 2075 Electrocatalytic Reduction of 1,1,2-Trichloro-1,2,2-Trifluoroethane (CFC-113) at a Silver Cathode  
*E. R. Wagoner and D. G. Peters*
- 2076 Coordination Programming of Photo- and Electro-Functional Molecular Materials  
*R. Sakamoto, M. Hayashi, S. Kusaka, M. Tsuchiya, J. Kakinuma, and H. Nishihara*
- 2077 Evaluation of Bioluminescence Activity of Firefly Luciferin Nucleotide Derivatives  
*S. Iwano, S. Kojima, T. Hirano, S. Maki, and H. Niwa*
- 2078 Synthesis of Multinuclear Metalladithiolenes and Control of Their Internuclear Electronic Communication  
*S. Tsukada, Y. Shibata, T. Kambe, R. Sakamoto, and H. Nishihara*
- 2079 Redox Active Dendronized Polymers Equipped with Peripheral Triarylamines  
*T. Nokami, N. Musya, T. Morofuji, K. Takeda, and J. Yoshida*
- 2080 Synthesis of Alkaloids Skeletons Using the Hyper-Valent Iodobenzene Oxidant  
*D. Kajiyama, T. Saitoh, S. Yamaguchi, and S. Nishiyama*
- 2081 Rapid Access to the Pyrene Cored Dendrimers Using Dendritic Diarylcarbenium Ion Pools  
*K. Takeda, T. Nokami, and J. Yoshida*
- 2082 Preparation of Nanoemulsion Using Tandem Acoustic Emulsification and Its Application to Templated Electropolymerization  
*K. Nakabayashi, T. Fuchigami, and M. Atobe*
- 2083 Electrochemical Nickel-Induced Fluoroalkylation  
*D. Y. Mikhaylov, Y. H. Budnikova, Y. B. Dudkina, T. V. Gryaznova, and O. G. Sinyashin*



- 2084 Synthesis and Properties of Nitrogen-Bridged Terthiophenes  
*K. Mitsudo, S. Shimohara, and S. Suga*
- 2085 Regioselective Cross-Coupling Reaction of Azulene and  $\alpha$ ,  $\beta$ -Unsaturated Ketone by Electron Transfer from Magnesium  
*H. Maekawa, J. Honda, and R. Akaba*
- 2086 Prediction of Reduction Potentials from Calculated Electron Affinities for Metal-Salen Compounds  
*J. A. Miranda, J. M. Yates, and B. F. Gherman*
- 2087 Anodic Oxidation of Carbamates in the Presence of Solid-Supported Acids and Its Application to Carbon-Carbon Bond Forming Reactions  
*T. Tajima, A. Takabayashi, and K. Yamazaki*
- 2088 Paired Electrochemical Reaction of a Poly(Fluorene) Derivative  
*H. Nagai, S. Inagi, and T. Fuchigami*
- 2089 Fabrication of Gradient Surface Using Bipolar Electrochemistry  
*N. Shida, Y. Ishiguro, S. Inagi, and T. Fuchigami*
- 2090 Synthetic Study of O-Methylthallibrine Using Anodic Oxidation  
*Y. Kawabata, Y. Naito, T. Saitoh, Y. Ishikawa, and S. Nishiyama*
- 2091 Preparation and Reaction of Titania Particles Encapsulated in Hollow Silica Shells as an Efficient Photocatalyst for Stereoselective Synthesis of Pipecolic Acid  
*S. Chandren and B. Ohtani*
- 2092 Electrochemical Oxidation of Poly(*p*-phenylene-vinylene) Derivatives Containing Tetraphenylethylene Units  
*S. Wakana, S. Inagi, T. Fuchigami, and I. Tomita*
- 2093 Voltammetry of Nitrofluorenes: Simulation  
*I. U. Haque and A. Dar*
- 2094 The Electrochemical Oxidation of Pyrogallol: Formation of Long-Lived Oxygen Radicals and Application to Assess the Radical Scavenging Abilities of Antioxidants  
*S. Mu*

### **D1 - Corrosion General Poster Session**

*All ECS Divisions, ECSJ Corrosion*

- 2095 Corrosion Protection of Steel by Conducting Polypyrrole Film Doped with Poly-acids of Mo and W  
*M. Sasaki, A. Hyono, M. Ueda, and T. Ohtsuka*
- 2096 Corrosion under Water-Repellent Coating  
*H. Saito*

- 2097 Monolayer and Bilayer Conducting Polymer Coatings for Corrosion Protection of Copper in Various Aggressive Media  
*F. Branzoi, V. Branzoi, and Z. Pahom*
- 2098 Local Bond Structure of BaZrO<sub>3</sub> Doped with Various Dopant Probed by Raman Spectroscopy  
*D. Kim, E. Patrik, S. Miyoshi, T. Tsuchiya, and S. Yamaguchi*
- 2099 Analysis of Nickel Electrodeposition Process by Using Quartz Crystal Microbalance  
*M. Shiina, T. Tanabe, and K. Noda*
- 2100 Analysis of Corrosion Behavior of Zn Thin Film by Using QCM  
*R. Inoue, T. Tanabe, and K. Noda*
- 2101 Passivation of AA5083 Aluminium Alloy by Anodic Pre-Treatments in Ionic Liquids  
*P. Huang, P. Howlett, D. MacFarlane, and M. Forsyth*
- 2102 Passivity and Local Activation of Aluminum in Borate Buffer Solution under Action of Bromide-Ions Additives  
*A. Chikova, T. A. Minakova, and S. A. Kaluzhina*
- 2103 Material Performance of Alloys in NaNO<sub>3</sub>/KNO<sub>3</sub> at 600°C  
*A. M. Kruiženga and D. Gill*
- 2104 Determination of Current Efficiency of Anodic Film Formation in the Molten Melt by ICP-AES  
*S. Han and H. Kim*
- 2105 Electron Beam Induced Texture Change of the Anodic Films Formed in the Molten Melt  
*S. Han and H. Kim*
- 2106 Evaluation of Zinc Rich Paint (ZRP) Efficiency on Mild Steel in Seashore Environment  
*A. H. Sofian and K. Noda*
- 2107 Evaluation of Degradation of High Performance Organic Coatings under Outdoor Salt Spray Test  
*D. Ito, Y. Akira, Y. Miyata, T. Yokoyama, and S. Okazaki*
- 2108 A Novel Nanomaterial Hybrid Corrosion Resistant Coating for Marine Applications  
*V. Kamavaram, G. Arumugam, V. Veedu, and K. Cheung*
- 2109 Electrochemical and Microstructural Characterization of Cr(VI) Free Passivation Layers Applied on Electrogalvanized Steel  
*V. E. Hernandez, M. P. Segundo, C. R. Tomachuk, and H. G. de Melo*
- 2110 Evaluation of Corrosion Protection of Zinc Rich Paint Coated Steel  
*A. Tanaka, A. H. Sofian, and K. Noda*

- 2111 Evaluation of Corrosion Protection Property on Galvanized Steels in Atmospheric Environment  
*K. Ito and K. Noda*
- 2112 Effect of Alloy Element in Low Alloy Steels on Corrosion Behavior  
*A. Sunahara, T. Ohmori, K. Noda, H. Katayama, and H. Masuda*
- 2113 Potential Measurement of High Corrosion Resistance Metals Surface in Atmospheric Environment  
*Y. Hirohata, K. Noda, H. Katayama, and H. Masuda*
- 2114 Corrosion Inhibition of Carbon Steel in Cooling Water Systems by New Organic Polymers as Green Inhibitors  
*F. Branzoi, V. Branzoi, M. Iordoc, and Z. Pahom*
- 2115 In Situ Electrochemical Detection of Molybdate in an Absorption Refrigerator  
*Y. Hitoshi, Y. Hatakeyama, H. Inabe, K. Sekiguchi, T. Hishinuma, M. Itoh, and N. Ohnaka*
- 2116 Sodium Nitrite-Based Corrosion Inhibitor for Reinforcing Steel in Simulated Concrete Pore Solutions  
*R. Du, Y. Guo, Y. Zhu, W. Chen, X. Wang, and C. Lin*
- 2117 Effect of Stress on Oxide Film Growth on SUS 316L Stainless Steel under High Pressure-High Temperature Water  
*Y. Hamaguchi and T. Ohtsuka*
- 2118 The effect on Impurities of the Properties of Passive Oxides on Stainless Steels  
*M. Abe, A. Hyono, M. Ueda, T. Ohtsuka, and T. Ishii*
- 2119 Synthesis and Characterization of Modified Nano-TiO<sub>2</sub> Films for Corrosion Protection of Stainless Steel  
*Y. Zhu, J. Zhang, R. Du, H. Qi, L. Xu, and C. Lin*
- 2120 Effects of Tritiated Water on Passivation Behavior of SUS304 Stainless Steel  
*M. Oyaidzu, K. Isobe, and T. Yamanishi*
- 2121 Localized Corrosion Behavior of Austenitic Stainless Steel Containing Martensitic Phases in NaCl Solution  
*S. Abe, T. Saito, K. Noda, and Y. Watanabe*
- 2122 Analysis of Localized Corrosion Behavior of Stainless Steel in Atmospheric Environment  
*Y. Nakajima, T. Saito, and K. Noda*
- 2123 Analysis of Passivation Behavior of Stainless Steel in Na<sub>2</sub>SO<sub>4</sub> Solutions  
*A. Moriyasu, T. Saito, and K. Noda*
- 2124 Low Temperature Deposition of SiO<sub>2</sub> Matrix onto the Surface of Stainless Steel as Protective Coating  
*T. M. Abdel-Fattah and H. Elsayed-Ali*

- 2125 The Electrochemical Properties of the Main Constituent Phases in Magnesium Alloys  
*Y. Chou, H. Yang, S. Pan, S. Chung, and W. Tsai*
- 2126 Corrosion Resistance of Mg(OH)<sub>2</sub>/Mg-Al LDH Film Formed on Magnesium alloy by Steam Coating Method  
*T. Ishziaki and K. Teshima*
- 2127 Characterization of a New Polypropylene+Graphite+Zinc Ternary Composite  
*J. Agrisuelas, J. García-Jareño, M. Llop, M. Piedras, and F. Vicente*
- 2128 Non-Destructive Evaluation for Corroded Metal Surface Using Terahertz Wave  
*H. Kariya, A. Sato, T. Tanabe, K. Saito, K. Nishihara, A. Taniyama, and Y. Oyama*
- 2129 The Influences of Roughness of Ti Substrate and Thickness of IrO<sub>2</sub> Intermediate Layer on Oxygen Evolution Anode Performance in Seawater Electrolysis  
*Z. Kato, K. Izumiya, N. Kumagai, and K. Hashimoto*
- 2130 Electrochemical Impedance Spectroscopy to Characterize Different Materials in Soybean Biodiesel Medium  
*A. H. Akita, C. Fugivara, I. Aoki, and A. Benedetti*
- 2131 Graphite Layer on Metal Plates for PEMFC Applications  
*W. Wang and C. Lan*
- 2132 Surface Morphology Changes during Dealloying  
*F. U. Renner, G. Ankah, and A. Pareek*
- 2133 Using LEIS to Evaluate Local Electrochemical Activity of Al 7475 T761/Cu Model Electrodes  
*J. Ferrari, H. G. de Melo, N. Pébère, B. Tribollet, and V. Vivier*
- 2134 Triboelectrochemical Characterization of Copper Surface  
*S. Joo and H. Liang*
- 2135 Application to Non-Destructive Inspection of Copper Corrosion via Coherent Terahertz Light Sources  
*K. Saito, T. Yamagata, H. Kariya, T. Tanabe, and Y. Oyama*
- 2136 Effect of Alloying Elements on Corrosion Behavior of Zr-Based Binary Alloys in Simulated Body Fluid  
*Y. Tsutsumi, S. Yalatu, S. Migita, H. Doi, N. Nomura, K. Noda, and T. Hanawa*
- 2137 Corrosion Behavior of Nanocrystalline Hydroxyapatite Coating on New Ti Alloy Surface in Ringer Solution  
*M. Popa, J. Calderon Moreno, C. Vasilescu, and S. Drob*
- 2138 Corrosion Study of Ni-Ti Orthodontic Archwires: An In Vitro Study  
*K. M. Britto, D. A. Macedo, R. M. Nascimento, A. E. Martinelli, and H. S. Júnior*

- 2139 A Three-Electrode Implantable Micro-Chip for Obtaining Real Time Corrosion Rates during Small Animal Testing  
*B. A. Shaw, E. Sikora, M. W. Horn, H. A. Basantani, A. Hartsock, D. R. Cook, B. J. Gluckman, and B. A. Bimber*
- 2140 In Vitro Galvanic Corrosion of Metallic Biomaterials  
*N. Shida, S. Miyabe, and S. Fujimoto*
- 2141 Analysis of Electrochemical Impedance Spectroscopy Results and Ion Release In Vitro of Si<sup>+</sup> Ion Implanted Medical 316 LVM Steel  
*J. C. Galván, M. Larrea, M. Multigner, I. Braceras, L. Saldaña, N. Vilaboa, and J. González-Carrasco*
- 2142 Electrochemical Behavior of Ti-6Al-7Nb in Simulated Physiological Body Fluid Environment  
*N. A. Al-Mobarak, A. Al-Swayih, and F. Al-Rashoud*
- 2143 Evaluation of Corrosion Resistance of Co-Cr Alloy in NaCl Solution  
*R. Suzuki, K. Noda, Y. Tsutsumi, and T. Hanawa*

## **D2 - Materials Degradation in Energy Systems: Corrosion and Hydrogen-Material Interactions**

*ECS Corrosion, ECS Battery, ECS Energy Technology, ECSJ Corrosion*

- 2144 First-Principles Molecular Dynamics Simulation of the Chemical Degradation of Polymer Electrolyte Membranes  
*A. Kobayashi, T. Ishikawa, Y. Higuchi, N. Ozawa, T. Shimazaki, and M. Kubo*
- 2145 Molecular Dynamics Study for Sintering Characteristics of Solid Oxide Fuel Cell Anode  
*K. Nakao, T. Ishimoto, and M. Koyama*
- 2146 Density Functional Theory Study and Model Development on Pt Nano-Particles  
*G. Brunello, J. Choi, S. Jang, and D. A. Harvey*
- 2147 Density Functional Theory Study of Pt Dissolution at Water-Pt Interface  
*J. Choi, G. Brunello, S. Jang, and D. A. Harvey*
- 2148 Degradation Mechanisms in PEM Fuel Cells  
*R. L. Borup, R. K. Ahluwalia, K. L. More, C. M. Johnston, and R. Mukundan*
- 2149 Regarding the Enhanced Durability of Platinum Monolayer Electrocatalysts for the Oxygen Reduction Reaction  
*K. Sasaki, H. Naohara, K. A. Kuttiyiel, Y. Choi, D. Su, P. Liu, and R. R. Adzic*
- 2150 Dissolution Mechanism of Platinum in Simulated PEFC Conditions  
*Y. Sugawara, T. Okayasu, A. P. Yadav, A. Nishikata, and T. Tsuru*
- 2151 Selective Dissolution of Binary Pt Alloys in Sulfuric Acid Solution  
*Y. Hoshi, R. Ozawa, T. Yoshida, E. Tada, A. Nishikata, and T. Tsuru*

- 2152 Influence of Cathode Polarization on the Chromium Poisoning of SOFC Cathode Materials LSM, LSCF and LNF  
*E. Park, S. Taniguchi, Y. Tachikawa, Y. Shiratori, and K. Sasaki*
- 2153 Micro Modeling Study of Cathode/Electrolyte Interfacial Stresses for Solid Oxide Fuel Cells  
*X. Jin, J. Shi, and X. Xue*
- 2154 High Temperature Oxidation of Ferritic Steels for Solid Oxide Electrolysis Stacks  
*S. Molin, M. Chen, J. J. Bentzen, and P. Hendriksen*
- 2155 On the Shape of Stress Corrosion Cracks in Water-Cooled Nuclear Power Reactor Piping  
*D. Kramer, S. Lee, and D. D. Macdonald*
- 2156 Electrochemical Impedance Modeling of the Passivity of Iron in Simulated Concrete Pore Water  
*D. D. Macdonald, S. Sharifiasl, and G. R. Engelhardt*
- 2157 Comparative Study of Oxide Film Formation as a Function of Potential on High-Purity Co and Stellite-6  
*M. Behazin, X. Zhang, M. Biesinger, J. J. Noël, and J. Wren*
- 2158 Materials and Interfaces Degradation in High-Energy Cathodes for Li-ion Batteries  
*R. M. Kostecky, I. T. Lucas, N. S. Norberg, and J. S. Syzdek*
- 2159 Corrosion Behavior of Nitride Coatings for Anodic Protection in Liquid Metal Batteries  
*S. Phadke and D. R. Sadoway*
- 2160 Metal-Oxide-Semiconductor Nanocomposites for Photoelectrochemical Water Splitting  
*P. C. McIntyre*
- 2161 Materials Degradation in Solar Panels  
*H. G. Wheat*
- 2162 Degradation of Electrocatalysts Used in the Reduction of CO<sub>2</sub> - A Review  
*N. Sridhar, A. S. Agarwal, S. Guan, and E. Rode*
- 2163 Computational Study on Nickel Catalyst Degradation Mechanism by Carbon Deposit in Hydrogen Production  
*T. Ogura, H. Tsukikawa, and M. Tajima*
- 2164 Electrochemistry of Ferroelectric PbZr<sub>0.52</sub>Ti<sub>0.48</sub>O<sub>3</sub> Thin Films in Sulfuric Acid  
*L. J. Small, C. Apblett, J. Ihlefeld, G. Brennecke, and D. Duquette*
- 2165 Electrochemical Mechanism and Model of H<sub>2</sub>S Corrosion of Carbon Steel  
*Y. Zheng, B. Brown, and S. Nestic*
- 2166 Corrosivity Comparison between Petroleum and Blended Hydro-Refined Diesel and Jet Fuels  
*J. S. Lee, R. Ray, and B. Little*

- 2167 Electrochemical and Metal-Phase Processes Accompanying Hydrogen Absorption in Aluminum During Aqueous Corrosion  
*K. R. Hebert, O. O. Capraz, P. Shrotriya, and G. Zhang*
- 2168 Effect of Absorbed Hydrogen on Cavity Formation at High Temperature Water and Its Role on SCC Growth  
*K. Arioka*
- 2169 The Effects of Chromate, Molybdate, and other Selected Inhibitors on Surface and Crack Tip Corrosion Inhibition  
*S. B. Madden and J. R. Scully*
- 2170 Hydrogen Diffusion and Trapping in High Purity Al and Aluminum Alloy 5083-H131  
*J. Ai, M. Lim, and J. R. Scully*
- 2171 Lattice Defects Induced by Hydrogen Absorption in Metallic Materials  
*H. Suzuki, K. Takai, and M. Fujinami*
- 2172 The Hydriding of Uranium: Bulk Transport and Trapping of Hydrogen in Uranium  
*R. Lillard, C. D. Taylor, J. R. Wermer, N. A. Mara, and J. C. Cooley*
- 2173 The Influence of Hydrogen on Nuclear Fuel Corrosion Inside a Failed Waste Container  
*M. E. Broczkowski, L. Wu, Z. Qin, and D. W. Shoesmith*
- 2174 ZrO<sub>2</sub> Passive Layer Stability Loss in the Presence of Hydrogen Defects - Connections to Pit Initiation  
*M. Youssef and B. Yildiz*
- 2175 The effect of Thermal Hydrogenation Processing on the Oxide Layer Formation of Ti-6Al-4V Alloy  
*L. Wang, S. Yu, C. Shen, C. Chang, and C. Tsai*

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

- 2176 The Semiconducting Properties and Impedance Analysis of Passive Films on Copper in Anaerobic Sulfide Solutions from the Viewpoint of the Point Defect Model  
*Y. Ling, M. L. Taylor, S. Sharifiasl, and D. D. Macdonald*
- 2177 Determining the Coupling Current as a Means of Detecting Crevice Activity and Inhibition  
*S. Lee, J. A. Mathews, and D. D. Macdonald*
- 2178 Influence of the Microstructure on the Passive Character of Titanium Oxide Films Characterized by EIS  
*N. Rodríguez de la Cruz, E. M. Arce, J. Torres, R. Luna Sánchez, J. G. Vazquez Arenas, J. Hallen, and R. Cabrera Sierra*
- 2179 Effects of Solution Temperature on the Kinetic Nature of Passive Film on Ni  
*K. Park, S. Ahn, and H. Kwon*

- 2180 Effect of Sour Environment pH on Crack Morphology in Ultra Strength Drilling Steel under Cyclic Stress  
*M. Ziomek-Moroz, J. Hawk, R. Thodla, and F. Gui*
- 2181 Electrochemical Reduction of Ethanol at Lead Electrodes  
*S. B. Hall, N. Wise, and M. Waterland*
- 2182 IGSCC Caused by Passive Film's Dielectrostrictive Stress  
*T. M. Devine*
- 2183 The Relationship between Nanostructure and Electronic Properties of Passive Films Studied by Scanning Tunneling Microscopy Combined with Scanning Tunneling Spectroscopy  
*P. Marcus, T. Massoud, and V. Maurice*
- 2184 Characterization of Repassivation Process on Fe-Cr Alloys Using Scratching Technique  
*M. Wada, A. Kawano, M. Saito, and S. Fujimoto*
- 2185 Coupling the Point Defect Model and the Density Functional Theory for Modeling Pit Nucleation  
*B. Malki, B. Baroux, O. Le Bacq, and A. Pasturel*
- 2186 Development of Base Electrocatalysts which are Passive towards Corrosion in Hot Acidic Electrolytes  
*G. T. Burstein, G. E. Haslam, and X. Y. Chin*
- 2187 Characterization of Bound Water in Passive Film of Titanium Formed in H<sub>2</sub>SO<sub>4</sub> Solution  
*T. Haruna, S. Ito, and K. Kimoto*
- 2188 Kinetic Stability of Aluminium and Its Alloys: The Role of "Structural" Features  
*X. Zhou, D. D. Macdonald, and N. Birbilis*
- 2189 Effect of Galvanostatic Condition on Growth Behavior and Repassivation Potential of Crevice Corrosion of Duplex Stainless Steels  
*S. Aoki, T. Ehashi, and J. Sakai*
- 2190 Metallographic Characterization of Transgranular Stress Corrosion Cracking on Type316L Stainless Steel in High Temperature and High Pressure Water Environment  
*S. Fujimoto, N. Okada, T. Saito, and H. Tsuchiya*
- 2191 Corrosion Inhibition of Localized Corrosion and Stress Corrosion Cracking of Steam/Gas Turbine Materials  
*B. Bavarian, J. Zhang, and L. Reiner*
- 2192 Comparison of Electrochemical Pitting Characteristics of Alloy 825, Alloy 690 and Titanium for a Concentrated Radioactive Waste Hold-Up Tank  
*H. Kim and K. Na*



- 2193 Studies of Pitting Initiation on High-Strength Pipeline Steel by Metallurgical Micro-Electrochemistry  
*Y. Cheng*
- 2194 Hydrogen Induced Passivity Degradation and Stress Corrosion Cracking  
*J. Luo, B. Lu, and S. Shi*
- 2195 Birth and Death Stochastic Process in Pitting Corrosion and Stress Corrosion Cracking  
*T. Shibata*
- 2196 Implications for the Initiation of Pitting Corrosion of Composition Changes around Sulphide Inclusions in Stainless Steels  
*D. E. Williams*
- 2197 Effect of Sulfate Ion on Pitting Corrosion Behavior of Type 420 Martensitic Stainless Steel in Chloride Solution  
*W. Ji, S. Pan, and W. Tsai*
- 2198 Intrinsic Vacancies and Their effect on Corrosion Reactivity at the FeS<sub>2</sub> (100) Surface  
*A. Krishnamoorthy, F. W. Herbert, and B. Yildiz*
- 2199 Predicting the Steady State Thickness of Passive Films with the Point Defect Model in Fretting Corrosion Experiments  
*J. Geringer, M. L. Taylor, and D. D. Macdonald*
- 2200 Optimization of Impedance Models with Differential Evolution  
*M. L. Taylor, S. Sharifi, and D. D. Macdonald*
- 2201 Neural Network as a Data Mining Tool for Prediction of Corrosion Behavior  
*M. (. Kamrunnahar and M. Urquidi-Macdonald*
- 2202 Vacancy Formation and Electronic Structure on FeS<sub>2</sub> Surfaces - Model System for Iron Sulfide Corrosion Films  
*F. W. Herbert, A. Krishnamoorthy, K. J. Van Vliet, and B. Yildiz*
- 2203 Deterministic Prediction of Localized Corrosion Damage in Oil and Gas Pipelines  
*G. R. Engelhardt, R. Wollam, and D. D. Macdonald*
- 2204 Application of the Kramers-Kronig Relations to Impedance Spectroscopy  
*M. E. Orazem*
- 2205 Microstructure-Influenced Numerical Modeling of Pitting Corrosion in 316 Stainless Steel  
*N. Kota, S. Qidwai, and V. DeGiorgi*
- 2206 The Role of MnS Inclusions and Passive Films in the Initiation of Pitting Corrosion of Stainless Steels  
*N. Hara, Y. Sugawara, and I. Muto*
- 2207 CPE Behavior of Oxide Layer Impedance  
*B. Tribollet, I. Frateur, M. Musiani, M. E. Orazem, and V. Vivier*

- 2208 A Spectroscopic and Electrochemical Investigation of the Structure of Ni(OH)<sub>2</sub> Materials  
*D. S. Hall, C. Bock, B. MacDougall, D. J. Lockwood, and S. Poirier*
- 2209 Electrochemical and Surface Study of the Oxide Growth and Conversion on 316L Stainless Steel  
*Q. W. Knapp, J. J. Noël, and J. Wren*
- 2210 Constant Phase Elements and Impedance of Rough Surfaces : A Numerical Study  
*M. Venkatraman, I. S. Cole, D. Sherwood, I. G. Bosco, and B. Emmanuel*
- 2211 Mathematical Models for Under-Deposit Corrosion  
*Y. Chang and M. E. Orazem*
- 2212 Weight Loss Model for Atmospheric Corrosion of Steel in Mexico Using Artificial Neural Networks  
*E. BOLAÑOS RODRIGUEZ and J. González Islas*
- 2213 Electrochemical Correlation Study of On-Line Corrosion Monitoring Probes  
*D. Bai, J. Wu, and F. Chen*
- 2214 (Corrosion Division H. H. Uhlig Award Presentation) Understanding of Passivity Due to the Application of Surface Methods, a Review  
*H. Strehblow*
- 2215 (Corrosion Division Morris Cohen Award Presentation) Evaluation of Thiosulfate as a Substitute of Hydrogen Sulfide in Sour Corrosion Fatigue Studies  
*M. Kappes, G. Frankel, R. Thodla, N. Sridhar, and R. Carranza*
- 2216 Marine Biofilms Mimic Metal/Air Battery Current Enhancement Strategies: A Study of Peroxide Degradation via Manganese Dioxide Catalysis in Seawater  
*M. J. Strom, G. W. Luther, and S. C. Dexter*
- 2217 Dissolution Behavior of Novel Lead Anodes for Copper Electrowinning  
*M. Clancy, C. Bettles, N. Birbilis, and A. Stuart*
- 2218 Corrosion Behavior of High Level Waste (HLW) Storage Tank Materials  
*J. Grant and D. Chidambaram*
- 2219 Nuclear Corrosion and Electrochemistry: Achievements and Challenges  
*D. Feron*
- 2220 Probabilistic Model for SCC: Integration of the Several Environment and Fracture Processes  
*S. Jain, F. Ayello, J. A. Beavers, and N. Sridhar*
- 2221 Chloride-Induced Stress Corrosion Cracking of Austenitic Stainless Steel for Dry Storage of Spent Nuclear Fuel  
*T. M. Ahn, G. Oberson, and S. DePaula*

- 2222 Dynamic Polarization Behaviors of Stainless Steels in Water Film Simulating the Water Treatment Plants  
*Y. Kim and Y. Park*
- 2223 Electrochemical Characterization of UNS S32760 and UNS S31603 Alloys in Presence of Fluoride and Bromide Solutions  
*E. Maya Visuet, A. Karayan, and H. Castaneda-Lopez*
- 2224 Determination of Kinetic Parameters for Water Reduction and Oxygen Reduction on Copper  
*S. Sharifiasl and D. D. Macdonald*
- 2225 In-Situ Spectroscopic Ellipsometry and Electrochemical Studies of the Barrier Layer on Iron in Borate Buffer Solutions  
*Z. Lu, S. Sharifiasl, and D. D. Macdonald*
- 2226 Copper Alloys Corrosion and Passivation Monitoring by Electrochemical Integrated Probes in Chlorinated Condenser Cooling Circuits  
*P. Cristiani, M. Carvalho, and G. Perboni*
- 2227 State of Health Estimation of LiFePO<sub>4</sub>/Graphite Cells  
*Y. Zhang and C. Wang*
- 2228 On the Stability of the Passive Film on Iron as Indicated by Electrochemical Impedance Spectroscopy  
*M. Urquidi-McDonald and D. D. Macdonald*
- 2229 Density Functional Theory Calculations of Defects Formation Energies in Cr<sub>2</sub>O<sub>3</sub>  
*B. Malki, B. Baroux, O. Le Bacq, and A. Pasturel*
- 2230 Electrical Microdischarge Characterization during Spark Anodization of Zirconium  
*J. S. Santos, S. G. Lemos, W. N. Gonçalves, O. M. Bruno, and E. C. Pereira*
- 2231 Preparation of Pt-Ru/CNT/Carbon Cloth Catalysts by Electrodeposition Method for Use in Fuel Cell  
*Y. Lin, T. Yeh, and M. Tsai*
- 2232 Effect of Passivation Potential on Amount of Bound Water in Passive Film on Titanium  
*T. Haruna and S. Ito*
- 2233 Prediction of Stress Corrosion Cracking of Type304 Stainless Steel Weld Components Exposed to Chloride Environments  
*G. Nakayama and Y. Sakakibara*
- 2234 Electrochemical Studies of the Alloy Ti6Al4V after Being Subjected to UV-C Irradiation Treatment  
*M. Pacha-Olivenza, A. Gallardo-Moreno, V. Vadillo-Rodríguez, M. González-Martín, C. Pérez Giraldo, and J. C. Galván*

- 2235 Effects of Cu on the Localized Corrosion and Repassivation kinetics of Ferritic Stainless Steels  
*S. Ahn, K. Oh, and H. Kwon*
- 2236 Electrochemical Corrosion Measurements in Supercritical CO<sub>2</sub> - Water Systems with and without Membrane Coating  
*J. Beck, M. Fedkin, and S. N. Lvov*
- 2237 Enhanced Corrosion Resistance of Interstitially Hardened 316L Stainless Steel: Gas Phase Nitridation under Paraequilibrium Conditions  
*N. R. Tailleart, F. Martin, R. Rayne, P. M. Natishan, H. Kahn, and A. Heuer*
- 2238 Corrosion Maps for Aluminium Alloys: Defining the Property Space and the Role of Microstructure and Chemistry in Corrosion  
*N. L. Sukiman, R. K. Gupta, R. G. Buchheit, and N. Birbilis*
- 2239 Corrosion Protection by Trivalent Chromium Process (TCP) Coatings on Aluminum Alloys  
*L. Li and G. Swain*
- 2240 Corrosion Resistance of Nanoporous Superhydrophobic Surfaces of Anodic Aluminum Oxide  
*C. Jeong, W. Xu, K. Du, and C. Choi*
- 2241 Enhanced Corrosion Resistance of Stainless Steels Interstitially Hardened with Carbon or Nitrogen under Paraequilibrium Conditions  
*P. M. Natishan, N. R. Tailleart, F. Martin, R. Bayles, R. Rayne, H. Kahn, and A. Heuer*
- 2242 Effect of Acetic Acid on the Cathodic Reaction of Carbon Steel Corrosion  
*T. Tran, B. Brown, and S. Nestic*
- 2243 Corrosion of Nickel and Iron Based Superalloys in High Temperature Gas Environments  
*H. Chang and T. Yeh*
- 2244 Investigation of the Corrosion Behavior of Zinc Magnesium Aluminium Alloys with a Novel Quaternary Addition Using SVET and Time-Lapse Microscopy  
*J. H. Malone, S. Mehraban, J. H. Sullivan, J. Elvins, and D. Penney*
- 2245 Redox Transformations in the Oxide Films on Ni-Cr-Mo Alloys and Their Influence on Corrosion Susceptibility  
*X. Zhang, A. Mishra, D. Zagidulin, J. J. Noël, and D. W. Shoesmith*
- 2246 Transition Metal Inhibition of Titanium Corrosion: Electrochemical Behavior of Titanium in Alkaline Electrolyte  
*W. B. Utomo and S. W. Donne*
- 2247 Overview of the Mg Corrosion Mechanism  
*A. Atrens*

- 2248 Investigation of Zinc Dimercaptothiadiazole as a Corrosion Inhibitor for Steel  
*R. L. Mercado, J. Fury, M. B. Kiely, D. Buhrmaster, C. E. Miller, and P. Zarras*
- 2249 In-Situ Electrochemical Measurement of Acid Dew Point Corrosion of Carbon Steel  
*T. Zhang*
- 2250 Incorporation of Modifiers to Improve the Anticorrosion Behavior of Organic-Inorganic Hybrid Coatings Applied to High Strength Al Alloys  
*R. P. Hernandez, B. M. Vasconcelos, V. R. Capelossi, M. Olivier, and H. G. de Melo*
- 2251 Effect of Halogen Ions and Inhibitors on Corrosion Behavior of 13 Cr Stainless Steel in Packer Fluid  
*M. Sakairi, R. Fujita, A. Kageyama, M. Kimura, and Y. Miyata*
- 2252 Hydration and Structural Transformations during Titanium Anodization under Alkaline Conditions  
*P. Acevedo Peña, J. G. Vazquez Arenas, R. Cabrera Sierra, and I. Gonzalez Martinez*
- 2253 The Palladium Hydrogen System; Corrosion Monitoring and Energy Production  
*M. C. McKubre, J. Bao, S. Crouch-Baker, P. Jayaweera, A. Sanjurjo, and F. Tanzella*
- 2254 A 12 V / Kilo-Farad Range Lead-Carbon Hybrid Ultracapacitor and Their Envisaged Applications  
*A. K. Shukla, A. Banerjee, A. Jalajakshi, and M. K. Ravikumar*
- 2255 In Situ Monitoring of Phosphate Inhibitor Surface Deposition in the Cathodic Region during Corrosion of a Zinc Magnesium Aluminium Alloy Using Time-Lapse Microscopy and Energy Dispersive X-ray Spectroscopy  
*S. Mehraban, J. H. Sullivan, and J. Elvins*
- 2256 An Investigation into the Individual and Synergistic effects of Organically Coated Steel Systems Using the Scanning Vibrating Electrode Technique (SVET)  
*A. W. Littlehales, J. H. Sullivan, D. A. Worsley, and J. Elvins*
- 2257 Inhibition of Corrosion-Driven Organic Coating Delamination on Hot Dip Galvanized Steel by Phenyl Phosphonic Acid  
*C. F. Glover and G. Williams*
- 2258 Self-organized Anodic Structures  
*P. Schmuki*
- 2259 Development of Zn-Mn Alloy Based Sacrificial Coatings  
*S. Ganesan, P. Ganesan, and B. N. Popov*
- 2260 Study of the Inhibition of Mild Steel Corrosion by Molybdate and Nitrite Anions  
*A. Al-Refaie*

- 2261 Oxygen Sensors for Accelerator Driven System (ADS) Reactors  
*A. Verdaguer, S. Colominas, and J. Abellà*
- 2262 Prussian Blue Films in Ammonium Aqueous Solution  
*J. Agrisuelas, C. Delgado, J. García-Jareño, and F. Vicente*
- 2263 Towards Tritium Electrochemical Sensors: Synthesis and Characterization of Proton Conducting Ceramic Elements  
*L. Llivina, S. Colominas, and J. Abellà*
- 2264 In Situ Coupling Current Studies in AA5083 and AA2024  
*K. Williams, R. Bayles, and D. D. Macdonald*
- 2265 On the Corrosion of Iron in Physically-Constrained Locations  
*D. D. Macdonald and G. R. Engelhardt*
- 2266 Mechanisms of Depassivation  
*D. D. Macdonald*
- 2267 Two Manifestations of the Passivity of the Metal in Aqueous Solution  
*H. Hua and H. Hua*
- 2268 Could this Fuel Replace Gasoline  
*J. O. Bockris*

#### **D4 - High Resolution Characterization of Corrosion Processes 3**

*ECS Corrosion, ECSJ Corrosion*

- 2269 Kelvin Probe Force Microscopic Study on Galvanic Action between MnS Inclusions and Stainless Steel Matrix  
*Y. Sugawara, I. Muto, and N. Hara*
- 2270 Analysis of Pit Corrosion Using Temporal Series of Micrographs Coupled with Electrochemical Methods to Estimate the Three-Dimensional Evolution of Pits  
*A. M. Zimer, E. Rios, M. A. de Carra, L. H. Mascaro, and E. C. Pereira*
- 2271 Microscopic Polarization Behavior and Thermodynamic Stability of TiS and Ti<sub>4</sub>C<sub>2</sub>S<sub>2</sub> Inclusions in Stainless Steels  
*N. Shimahashi, I. Muto, Y. Sugawara, and N. Hara*
- 2272 Microelectrochemical Investigation of Pit Initiation and Selective Dissolution between MnS and Stainless Steel  
*A. Chiba, I. Muto, Y. Sugawara, and N. Hara*
- 2273 In Situ Ex-Polarized TEM Observation on Dissolution of MnS Inclusions and Metastable Pitting of Authentic Stainless Steel  
*B. Zhang, Y. Zhou, and X. Ma*

- 2274 Corrosion and Dealloying of Crystallized Amorphous Steel  
*F. U. Renner, M. Duarte, J. Lengsfeld, K. J. Mayrhofer, and P. Choi*
- 2275 Combining Microelectrochemical Methods with Electron Microscopy to Explore Pit Initiation in Aluminum  
*K. R. Zavadil*
- 2276 Observation of Metal Dissolution under LaminarFlow in a Microfluidic Channel - Copper with Chloride Solution -  
*S. Sakugawa, N. Kotake, and M. Hayase*
- 2277 The effect of Sulfate and Chloride Ions on the Rust Composition of Weathering Steel  
*T. Ohtsuka, S. Tanaka, M. Koya, A. Hyono, and M. Ueda*
- 2278 Marine Aerosol Drop Size Effects on the Corrosion Behavior of Plain Carbon Steel  
*E. schindelholz, B. Risteen, R. Kelly, and I. S. Cole*
- 2279 Corrosion Inhibition by Zinc Corrosion Products on Zinc-Coated Steel  
*Y. Sato and K. Azumi*
- 2280 Improving the Corrosion Protection Properties of Al<sub>2</sub>O<sub>3</sub> ALD Nanocoatings on Steel  
*J. Swiatowska, B. Díaz, V. Maurice, A. Seyeux, E. Härkönen, M. Ritala, S. Tervakangas, J. Kolehmainen, S. E. Potts, W. Kessels, and P. Marcus*
- 2281 Environmental and Temporal Characterization of a Self-Healing Coating with Galvanic Protection  
*A. J. Maisano, R. Srinivasan, M. W. Patchan, L. M. Baird, E. D. LaBarre, and J. J. Benkoski*
- 2282 Application of Mg-Ion Selective and Antimony Electrodes for the Characterization of Corrosion Reactions by Scanning Electrochemical Microscopy  
*J. Izquierdo, L. Nagy, J. Santana, I. Bitter, G. Nagy, and R. M. Souto*
- 2283 High Resolution Characterization of Pitting Corrosion Using a Novel Environmental SVET and White Light Interferometry  
*S. Geary, H. N. McMurray, and A. de Vooy*
- 2284 Studies with the Three-Dimensional Scanning Vibrating Technique: Investigation into the effect of Spot Weld Electrode Life and Quality on the Corrosion Behavior of Galvanized Automotive Steel  
*B. P. Wilson, J. R. Searle, K. Yliniemi, D. A. Worsley, and H. McMurray*
- 2285 The Influence of Rare-Earth Doping and Non-Stoichiometry on the Corrosion of Uranium Dioxide  
*H. He, K. O'Neil, O. Semnikhin, and D. W. Shoesmith*
- 2286 EDTA as a Tool to Probe Cathodic Corrosion (Trenching) on AA2024-T3  
*H. N. McMurray, G. Williams, and A. Coleman*

- 2287 Localised SKP Studies of Cathodic Disbondment on Chromium/Chromium Oxide Coated Steel  
*D. J. Warren and H. N. McMurray*
- 2288 Investigation of Copper Corrosion Inhibition by Ethyl Xanthate with Frequency-Dependent Alternating-Current Scanning Electrochemical Microscopy  
*J. J. Santana and R. M. Souto*
- 2289 Damage Evolution Quantification of Hybrid Coatings on Aluminum Alloy by Surface and Electrochemical Techniques  
*I. Barraza-Fierro, T. Gao, M. Soucek, and H. Castaneda*
- 2290 Study of Electrochemical Corrosion Behavior of Nanocrystalline Thin Film by Electrochemical Techniques and In Situ AFM  
*L. Liu, Y. Li, and F. Wang*

### **D5 - High Temperature Corrosion Materials Chemistry 10**

*ECS High Temperature Materials, ECS Corrosion*

- 2291 In Situ Optical Studies of Electrochemically Induced Anode Degradation in High Temperature Solid Oxide Fuel Cells  
*R. A. Walker, J. D. Kirtley, D. M. Halat, and M. McIntyre*
- 2292 Mechanical Properties of Ni-YSZ Cermets under Simulated Environment of Redox Cycling  
*T. Miyasaka, S. Sukino, S. Watanabe, T. Kawada, K. Sato, and T. Hashida*
- 2293 Improved Sintering Property of Y-Doped BaZrO<sub>3</sub> by Mn Addition  
*D. Kim, E. Patrik, S. Miyoshi, T. Tsuchiya, and S. Yamaguchi*
- 2294 Non-Linear Doping effect on the Electrochemical Properties of BaZr<sub>1-x</sub>Pr<sub>x</sub>O<sub>3</sub>  
*M. Tamaru, S. Miyoshi, D. Kim, T. Higuchi, Y. Oyama, and S. Yamaguchi*
- 2295 Study on Electrode Reaction of Perovskite Oxide Electrodes on a Proton Conducting Electrolyte  
*K. Suzuki, S. Hashimoto, K. Amezawa, and T. Kawada*
- 2296 Mechano-Electrochemical effect on Materials Property of Ion Conducting Oxides  
*K. Yashiro, Y. Kawamura, S. Nakakawaji, K. Sato, K. Amezawa, and J. Mizusaki*
- 2297 Chemical Stability of Ba<sub>0.5</sub>Sr<sub>0.5</sub>Co<sub>0.8</sub>Fe<sub>0.2</sub>O<sub>3-δ</sub> (BSCF)  
*F. Wang, K. Yashiro, K. Amezawa, and J. Mizusaki*
- 2298 A Study of Nickel-Substituted Lanthanum Cobaltite as Cathode Materials for SOFCs  
*Y. Uzumaki, S. Hashimoto, K. Amezawa, and T. Kawada*
- 2299 La/Sr-Co Perovskite-Based Multi-Layered Super Cathode Fabricated by Sputtering Method  
*A. Takeshita, S. Miyoshi, and S. Yamaguchi*



- 2300 Oxygen Transport in Perovskite Type Oxide  $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$   
*H. Kudo, K. Yashiro, S. Hashimoto, K. Amezawa, T. Kawada, and J. Mizusaki*
- 2301 Influence of Phase Crystallography on Precipitation Microstructures and Deformation Mechanisms in Tantalum Carbides  
*G. B. Thompson, R. A. Morris, N. De Leon, B. Wang, and C. Weinberger*
- 2302 Preparation and Characterization of Materials in the Ta-Hf-C System  
*J. A. Zaykoski, M. M. Opeka, and I. Talmy*
- 2303 Variability in Oxidation Resistance of  $\text{ZrB}_2\text{-SiC}$   
*K. N. Shugart and E. J. Opila*
- 2304 Effect of Silicon Addition on the Oxidation Kinetic and on the Structure of the Oxide Layer Formed on Transition Metal Nitride Coatings  
*J. Pierson, P. Steyer, A. Mège-Revil, and D. Pilloud*
- 2305 Oxidation of  $\text{Cr}_2\text{AlC}$  between 700 and 1300°C in Air  
*S. Kim, S. Bong, and D. Lee*
- 2306 Fabrication of Vertically Aligned Nano-Oxide Arrays via Internal Oxidation of Dilute Alloys  
*M. Nanko and D. T. Do*
- 2307 High-Temperature Oxidation Kinetics for Recovery of Mechanical Strength on Nano-Ni Dispersed  $\text{Al}_2\text{O}_3$  Hybrid Materials  
*D. Maruoka and M. Nanko*
- 2308 Early Oxidation Stages of Alumina Formers and the effect of the Additions: A Brief Survey  
*J. Jedliński*
- 2309 The Influence of KCl(s) on the Oxidation of a FeCrAl Alloy at 600 °C in Dry and Wet Environment  
*N. Israelsson, L. Johansson, and J. Svensson*
- 2310 Deposit-Induced Corrosion of Nickel-Base Alloys at Low Temperatures (650-750°C)  
*B. S. Lutz, M. N. Task, N. M. Yanar, F. S. Pettit, G. R. Holcomb, and G. H. Meier*
- 2311 High-Temperature Corrosion Behavior of Sputtered Ni-Based Nanocrystalline Coating with Yttrium Addition in Chloride at 900°C  
*P. Yu, W. Wang, F. Wang, and S. Zhu*
- 2312 Accelerated Corrosion of Low Alloy and Stainless Steel by  $\text{PbCl}_2$ -Containing Salt Mixtures  
*D. P. Bankiewicz, P. Yrjas, and M. Hupa*
- 2313 An Electrochemical Impedance Spectroscopy Study on the effect of Condensate on Oxides Formed on a 25Cr/20Ni Cast Stainless Steel in Exhaust Environments  
*M. Ekström, B. Zhu, P. Szakalos, and S. Jonsson*

- 2314 The effect of Water Vapor on the Distribution of Oxide Precipitates during Internal Oxidation of Ni-5Cr Alloy at 1073 K  
*M. Ueda, Y. Kurata, K. Kawamura, and T. Maruyama*
- 2315 Oxidation Behaviour of Sanicro 25 in CO<sub>2</sub> and H<sub>2</sub>O-Rich Environments  
*L. Intiso, L. Johansson, and M. Halvarsson*
- 2316 Behaviors of SOFC Interconnect Steels and Coatings with Contacting Electrodes and Seals in Single and Dual Atmosphere Exposures  
*R. Amendola, A. Weinstein, S. Sofie, and P. Gannon*
- 2317 Oxygen Activity Distribution from Atmosphere to Scale Surface on High Temperature Oxidation of Iron  
*K. Kawamura, S. Sonota, M. Ueda, and T. Maruyama*
- 2318 Kinetics and Mechanisms of Copper Catastrophic Oxidation in the Presence of Low-Melting Oxides  
*V. V. Belousov*
- 2319 The Activity of Rh<sub>2</sub>O<sub>3</sub> in Boro-Silicate Glass at 1373 K  
*H. Kimura, S. Yamamoto, M. Ueda, K. Kawamura, T. Maruyama, K. Minami, and E. Ochi*
- 2320 High Temperature Electrolysis for Liquid Iron Production  
*G. Haarberg, E. Kvalheim, A. Martinez, S. Rolseth, and H. Gudbrandsen*
- 2321 Corrosion Behavior of Construction Materials for Intermediate Temperature Steam Electrolysers  
*A. V. Nikiforov, I. M. Petrushina, J. Jensen, and N. Bjerrum*
- 2322 Evaluation of Electrode Materials for Electrolytic Reduction of Nuclear Fuels  
*A. Merwin and D. Chidambaram*
- 2323 Fabrication of Nano-Rod Array Structure Used Aluminizing and Internal Oxidation of Alloy for Micro-Channel  
*T. Ishizaki, D. T. Do, and M. Nanko*
- 2324 Measuring Cr Volatility from Ferritic Stainless Steels: Novel and Conventional Methods Compared  
*J. J. Eziashi, C. Key, R. Smith, and P. Gannon*
- 2325 Thermodynamic Modeling of Chromate Salt Mixtures in High-Temperature Corrosion of Superheater Materials  
*D. K. Lindberg, J. Lehmusto, and M. Hupa*
- 2326 Investigation of the effect the Polarisability of Dipoles on the Local Microstructures of Molten Slags Using Density Functional Theory Molecular Dynamics  
*A. A. Gray-Weale, J. Krahl, A. Jacob, and P. J. Masset*

- 2327 Thermodynamic Modeling for Liquid Phase Sintering and Joining of Silicon Carbide  
*H. J. Seifert*
- 2328 Multiscale Analysis on Gas Phase and Surface Chemistry of SiC-CVD Process  
*Y. Fukushima, K. Hotozuka, Y. Funato, N. Sato, T. Momose, and Y. Shimogaki*
- 2329 Study of  $\text{La}_2\text{Zr}_2\text{O}_7$  and  $\text{La}_2\text{Hf}_2\text{O}_7$  Melting by Thermal Analysis and X-ray Diffraction  
*S. V. Ushakov, P. Saradhi, A. Navrotsky, R. J. Weber, and C. J. Benmore*
- 2330 In Situ Investigation of a High Temperature Phase Transformation Using Laser Heating and Synchrotron Diffraction  
*P. Saradhi, S. V. Ushakov, A. Navrotsky, R. J. Weber, and C. J. Benmore*
- 2331 Hydration and Dehydration Behavior of Amorphous Tantalum Oxide with Various Oxygen Contents  
*T. Ozato, T. Tsuchiya, S. Miyoshi, and S. Yamaguchi*
- 2332 Determination of Vapor Pressures of Fe-Oxides in Humid Atmospheres  
*T. Markus, W. Quadackers, and L. Singheiser*
- 2333 Reaction Syntheses with Carbon Materials Chemistry: Intragranular Nanocomposites and 'Carbon Copies'  
*D. W. Lipke and K. H. Sandhage*
- 2334 Thermochemical Interactions of Rare Earth Based TBCs with Molten CMAS Deposits  
*E. M. Zaleski, C. Ensslen, and C. G. Levi*
- 2335 Ceramic Dusting Corrosion of Yttria Stabilized Zirconia in Ultra-High Temperature Reverse-Flow Pyrolysis Reactors  
*C. Chun, S. Desai, and T. A. Ramanarayanan*
- 2336 Chemical Densification of Oxide Based Coatings for High Temperature Wear and Corrosion Resistance  
*P. J. Masset, M. Faulstich, K. Fehr, C. Weih, G. Wolf, and Y. Ye*
- 2337 Relationship between Electrical Properties and Stress Field in Solid Electrolyte Thin Films  
*F. Iguchi, Y. Osawa, and H. Yugami*
- 2338 Oxygen Gas Sealing between YSZ and Fe-Cr Alloy by Liquid-Phase-Oxidation Joining via  $\text{ZrO}_2$ -Dispersed Al Interlayer  
*Y. Hashimoto and T. Akashi*
- 2339 Microstructures and Phase Evolution in NiAl-Based Overlay Coatings  
*M. L. Weaver and J. P. Alfano*
- 2340 Transition Metal Spinel Oxide Coatings for Solid Oxide Fuel Cell Interconnects  
*J. W. Fergus, C. Dileep Kumar, Y. Liu, W. Tilson, A. Dekich, and H. Wang*

- 2341 Microstructural Investigation of Co- and RE-Nanocoatings on FeCr Steels  
*S. Canovic, J. Froitzheim, R. Sachitanand, M. Nikumaa, L. Johansson, and J. Svensson*
- 2342 Protection of Ferritic Steels by Nano-Structured Coatings: Supercritical Steam Turbines Applications  
*M. Mato, M. Hierro, S. Castañeda, G. Alcalá, I. Lasanta, M. Tejero, J. Sánchez, M. Brizuela, and F. J. Pérez*
- 2343 Improvement of the Resistance of Titanium Aluminides to Environmental Embrittlement  
*P. J. Masset, F. Bleicher, L. Bortolotto, G. Geiger, A. Kolitsch, C. Langlade, J. Paul, B. Pelic, F. Pyczak, D. Rafaja, P. Schumacher, M. Schütze, G. Wolf, and R. Yankov*

**D6 - Light Alloys 4**  
*ECS Corrosion, ECSJ Corrosion*

- 2344 High Resolution SEM Investigation of Intercrystalline Corrosion on 6000-Series Aluminum Alloy with Low Copper Content  
*K. Shimizu and K. Nisancioglu*
- 2345 Effect of Additive Elements on Corrosion Behavior for Aluminum in Weak Alkaline Solution at High Temperature  
*Y. Honkawa, T. Yaegashi, and Y. Kojima*
- 2346 Combined Role of Trace Elements Pb and Sn in Low Temperature Activation of Aluminum  
*K. Kurt, J. C. Walmsley, S. Diplas, and K. Nisancioglu*
- 2347 Interactions of Sulfide with Aluminum Alloys  
*J. S. Lee, R. Ray, and B. Little*
- 2348 The Role of Environmental Aspects and Atmospheric Contaminants on the Corrosion of 2024, 6061 and 7075 Aluminum Alloys  
*Y. Yoon and D. C. Hansen*
- 2349 Pitting Corrosion of Aluminum Alloy in Chloride Environment  
*Y. Oya and Y. Kojima*
- 2350 Effect of Surface Topography, Cleaning, and Conversion Coatings in the Adhesion Strength of Organic Polymers to AA2024-T3 using the Blister Test  
*B. C. Rincon Troconis and G. Frankel*
- 2351 Self-Healing Nature of Molybdate Conversion Coatings for Aluminum Alloys  
*D. Rodriguez, R. Misra, and D. Chidambaram*

- 2352 Organic-Inorganic Sol-Gel Coatings Modified with TiO<sub>2</sub> Nanoparticles for Corrosion Protection of a Powder Metallurgical Aluminum Alloy  
*A. Jiménez-Morales, F. García-Galván, D. Carbonell, D. Montoya, and J. C. Galván*
- 2353 The Role of Environmental and Atmospheric Conditions on the Corrosion of AA 2024-T3 with Various Pre-Treatments and Coating Systems  
*L. Petry and D. C. Hansen*
- 2354 Corrosion Control Studies of Aluminum-Composite Interfaces in Diverse Micro-Climates  
*R. Srinivasan and L. H. Hihara*
- 2355 Metal Dissolution and Repassivation Behavior of Ti6Al4V Alloy during Rapid Straining in Simulated Body Fluid  
*K. Doi, S. Miyabe, and S. Fujimoto*
- 2356 Investigation of the Corrosion of Magnesium and Titanium in Simulated Body Fluids  
*R. Feser, M. Ceylan, and S. Virtanen*
- 2357 Magnesium and Mg Alloys "Biocorrosion" in Protein Containing Body Fluids  
*P. Schmutz, N. Ott, R. Grisch, and P. Uggowitzer*
- 2358 Influence of Chemistry, Microstructure and Texture on the Durability of Mg-Alloys: An overview  
*K. Gusieva, C. H. Davis, and N. Birbilis*
- 2359 A Cumulative Approach to Tracking the Corrosion of Mg Alloys on the Microscale  
*R. M. Asmussen, P. Jakupi, and D. W. Shoesmith*
- 2360 Local, Time-Resolved and Element-Specific Investigations of Corrosion Processes for the Development of Biodegradable Mg Alloys  
*N. Ott, P. Schmutz, C. Ludwig, and A. Ulrich*
- 2361 Improvement in Corrosion Characteristics of AZ31 Mg Alloy by Square Pulse Anodizing between Transpassive and Active Regions  
*Y. Choi, S. Salman, K. Kuroda, and M. Okido*
- 2362 The Development of Ionic Liquid Generated Conversion Coatings for Magnesium Alloys  
*P. Howlett, J. Latham, D. MacFarlane, and M. Forsyth*
- 2363 Corrosion Inhibition of Mg Alloys by Inorganic and Organic Inhibitors  
*J. Hu, D. Huang, G. Song, and X. Guo*
- 2364 Biocompatible Coatings for Mg Alloys for Tailored Degradation Behavior  
*S. Virtanen*

**D7 - Pits and Pores 5: A Symposium in Honor of David Lockwood**  
*ECS Corrosion, ECS Luminescence and Display Materials, ECSJ Corrosion*

- 2365 Thinking Again of Porous Si Formation  
*Y. H. Ogata*
- 2366 Investigation of Pore Diameter Modulation in Depth in p-type Silicon  
*E. Ossei-Wusu, J. Carstensen, E. Quiroga-González, M. Amirmaleki, and H. Föll*
- 2367 Differential Photoacoustic Electrochemical Cell to Study In Situ the Porous Silicon Formation  
*D. G. Espinosa-Arbelaez and M. E. Rodriguez-Garcia*
- 2368 Spontaneous Groove Formation on Silicon during Anodic Dissolution Induced by Turing Instability  
*K. Fukami, T. Urata, T. Sakka, K. Krischer, and Y. H. Ogata*
- 2369 Anodic Dissolution of Si: Electrochemical Oscillations and Porous Silica Formation  
*F. Ozanam and J. Chazalviel*
- 2370 Stain Etching of Silicon with and without the Aid of Metal Catalysts  
*K. W. Kolasinski, J. Gogola, W. B. Barclay, and C. Somerville*
- 2371 Metal-Assisted Chemical Etching of Silicon Using Oxygen as an Oxidizing Agent  
*S. Yae, Y. Morii, M. Enomoto, N. Fukumuro, and H. Matsuda*
- 2372 On the Metal-Assisted Chemical Etching of Nanoporous Silicon  
*D. Goryachev, L. Belyakov, O. Yeltsina, J. Vainshtein, and O. M. Sreseli*
- 2373 Formation of Group IV Porous Semiconducting Nanowires and Nanotubes: The Role of Etching  
*X. Huang, R. Gonzalez, and J. L. Coffey*
- 2374 A "Cook's Tour" of Two Decades of Research into the Optical Properties of Nanostructured Materials  
*D. J. Lockwood*
- 2375 Magnetic Field Assisted Etching of Porous Silicon as a Tool to Enhance Magnetic Characteristics  
*P. Granitzer, K. Rumpf, T. Ohta, N. Koshida, P. Poelt, and M. Reissner*
- 2376 Structural and Morphological Study of Mesoporous Germanium Layers Formed by Bipolar Electrochemical Etching  
*S. Tutashkonko, A. Boucherif, T. Nychyporuk, R. Arès, V. Aimez, and M. Lemiti*
- 2377 Morphological Development from Uniform Microporous Structure to Macropore-Like Structure  
*T. Urata, K. Fukami, T. Sakka, and Y. H. Ogata*

- 2378 Relaxation Processes and Functions of Blue Phosphorescent Porous Silicon  
*B. Gelloz, R. Mentek, and N. Koshida*
- 2379 Tuning of Optical Properties of Silicon Photonic-Crystal Devices by Infiltration of Grooves and Pores with Liquid Crystals  
*T. S. Perova, V. Tolmachev, and A. V. Baldycheva*
- 2380 Size-Dependent Assessment of Fe<sub>3</sub>O<sub>4</sub>-Nanoparticles Loaded into Porous Silicon  
*P. Granitzer, K. Rumpf, Y. Tian, G. Akkaraju, J. L. Coffe, P. Poelt, P. Morales, and M. Reissner*
- 2381 Magnetic Properties of an Iron Oxide/Porous Silicon System Controlled by Magnetic Interactions  
*K. Rumpf, P. Granitzer, P. Poelt, P. Morales, and M. Reissner*
- 2382 The effects of Confinement and Coulomb Blockade on the Transport in Ensembles of Si Quantum Dots  
*I. Balberg*
- 2383 Optical Characterization of Self-Assembled Systems: Nanoparticles and Monolayers  
*N. Rowell*
- 2384 XPS Analysis of Porous Silicon  
*D. Aureau, J. Chazalviel, F. Ozanam, and A. Etcheberry*
- 2385 Transient Surface Photovoltage Studies of Nano-Porous Silicon with Embedded Metal Nanoparticles  
*P. R. Chapagain, E. Davis, A. Nemashkalo, Y. Strzhemechny, P. Granitzer, K. Rumpf, and E. Nguyen*
- 2386 Enhanced Suppression of the Formation of Porous Silicon Based on Secondary Knocked-On effect in FIB  
*J. Wang, J. Jiao, P. Yan, M. Wang, W. Liu, D. Ge, and J. Xu*
- 2387 Conversion Kinetics and Characterisation of Pt/Pb Nanoparticles on Fluorine Doped Tin Oxide Glass  
*K. Yliniemi, D. Wragg, T. M. Watson, D. A. Worsley, H. McMurray, B. P. Wilson, P. Schmuki, and K. Kontturi*
- 2388 Low-Lying Electronic Excitations and Optical Absorption Spectra of the Black Dye Sensitizer: A First-Principles Study  
*A. Delgado, S. Corni, and G. Goldoni*
- 2389 Applications of Porous Silicon to Multicrystalline Silicon Solar Cells: State of the Art  
*C. Levy-Clement*
- 2390 Deposition of Ternary Alloys of Cadmium Seleno-Sulfide Thin Films on Nanoporous TiO<sub>2</sub> for Solar Cells Applications  
*A. Sepehrifard, A. Aushana, and S. Morin*

- 2391 Fabrication of Highly Ordered Porous Si and Its Application to Anodes in Lithium-Ion Battery  
*H. Masuda, S. Tagawa, and K. Nishio*
- 2392 Silicon and Porous Silicon/Carbon Nanocomposites for Rechargeable Li- and Mg-Ion Batteries  
*S. Polisski and T. Abe*
- 2393 Silicon Nanowires for Innovative Energy Applications  
*V. Sivakov, M. Kulmas, B. Hoffmann, F. Talkenberg, R. Kirchgeorg, C. Lee, P. Schmuki, and S. Christiansen*
- 2394 Transition Metal Oxide Particles Deposited onto Titania Nanotubes as High Performance Electrodes for Li-Ion Microbatteries  
*N. Kyeremateng and T. Djenizian*
- 2395 Designing Structure and Composition of Nanoporous Anodic Alumina for Optical Applications  
*D. Routkevitch*
- 2396 Deposition of LaF<sub>3</sub> to Passivate the Pore-Walls of Porous Silicon Using a Simple Single-Source Chemical Bath Technique  
*A. Ismail, M. Rahman, M. Hossain, M. Nain, and S. Mou*
- 2397 Preparation and Characteristics of Anodic Aluminum Oxide Membranes with Mesosponge Structure  
*T. N. Nguyen, M. Kim, J. Ahn, J. Kaewsuk, J. Kim, and D. Jeong*
- 2398 Fabrication of Flexible Alumina Microlens Array by Laser Irradiation and Aluminum Anodizing  
*T. Kikuchi, Y. Wachi, T. Takahashi, M. Sakairi, and R. O. Suzuki*
- 2399 Formation of Self-Organized Nanoporous Anodic Films on Carbon Steels  
*S. Yang, Y. Konno, E. Tuji, Y. Aoki, H. Shoji, P. Skeldon, G. E. Thompson, and H. Habazaki*
- 2400 Metal Assisted Etching of Silicon in a V<sub>2</sub>O<sub>5</sub> Plus HF Solution  
*W. B. Barclay and K. W. Kolasinski*
- 2401 Anodic Porous Etching of n-InP: A Chemical-Assisted Dissolution Process  
*L. Santinacci, M. Bouttemy, and A. Etcheberry*
- 2402 Mathematical Model for <111>A Pore Propagation and Relation to Current for InP in Aqueous KOH Electrolytes  
*R. Lynch, N. Quill, C. O'Dwyer, and D. Buckley*
- 2403 Differential Photoacoustic Electrochemical Cell to Study In Situ the Wetting Process in Different Materials  
*D. G. Espinosa-Arbelaes and M. Rodriguez-Garcia*



- 2404 Study of the Microstructural and Optical Properties of Porous Silicon Bragg Reflectors Obtained by Differential Photoacoustic Electrochemical Cell  
*M. Rodriguez-Garcia and D. G. Espinosa-Arbelaez*
- 2405 Solid-State Nanopores: Electronic Tools for Single-Molecule Analysis  
*V. Tabard-Cossa*
- 2406 Transport in Surface Passivated Porous Silicon Membranes  
*A. Kovacs, W. Kronast, A. Filbert, and U. Mescheder*
- 2407 New Cheap Composite Membranes Using Nanoporous Anodic Aluminum Oxide Films  
*M. Kim, T. N. Nguyen, J. Ahn, J. Kaewsuk, J. Kim, and D. Jeong*
- 2408 Importance of Pore Morphology for Super-Liquid Repellency of Solid Surfaces  
*H. Habazaki, T. Fujii, and E. Tsuji*
- 2409 Morphological Instability Leading to Formation of Porous Anodic Oxide Films  
*K. R. Hebert and A. Macrostie*
- 2410 A Continuum Model of Anodic Pore Growth in Alumina  
*S. J. DeWitt and K. Thornton*
- 2411 Controlled Fabrication of Ordered 3D Porous Alumina Nanostructures with Designed Cell Ratios by Stepwise Anodization  
*S. Chu, Y. Hitoshi, K. Wada, S. Inoue, and H. Segawa*
- 2412 Self-Ordered Sub-10 nm Nanoporous Anodic Alumina Membranes: A New Tool for Nanotechnology  
*E. Moyen, L. Assaud, K. Pitzschel, L. Masson, M. Hanbücken, and L. Santinacci*
- 2413 Electrochemical Formation of Ordered Pore Arrays on Metallic Substrates  
*H. Tsuchiya, M. Kim, Y. Terada, and S. Fujimoto*
- 2414 New Cheap Anodic Aluminum Oxide Composite Membranes by Lithography Technique  
*J. Kaewsuk, J. Kim, M. Kim, T. N. Nguyen, J. Ahn, and D. Jeong*
- 2415 Dependence of the Reactivity of Silicon Dioxide Layers on the Porous Structure  
*F. N. Dultsev*
- 2416 Nanostructure Modified Porous Interfaces for Enhanced Sensing and Directed Microcatalysis  
*J. Gole and W. Laminack*
- 2417 Miniaturization of Hydrogen Gas Sensors by Using Anodization Processes of Titanium  
*Y. Kimura, S. Kimura, R. Kojima, and M. Niwano*
- 2418 Photoelectric-conversion Devices Based on InP Porous Structure  
*T. Sato, R. Jinbo, and Z. Yatabe*

- 2419 Multi-Functionality of Nanosilicon and Its Device Applications  
*N. Koshida*
- 2420 The Effect of Temperature and Electrolyte Concentration on Porous Layers Formed on InP in KOH  
*N. Quill, R. Lynch, C. O'Dwyer, and D. Buckley*
- 2421 Current-Line Oriented Pore Formation in n-InP Anodized in KOH  
*N. Quill, R. Lynch, C. O'Dwyer, and D. Buckley*
- 2422 Fabrication of a Single-Crystalline Porous InP Membrane by Electrochemical and Photoelectrochemical Etching  
*M. Gerngross, J. Carstensen, and H. Föll*
- 2423 SVET Analysis of Tinsplate Flow Melted Using Resistance Heating and Induction Vs Novel Near Infrared Heat Treatment  
*I. Mabbett, D. J. Warren, S. Geary, J. H. Sullivan, D. Penney, T. M. Watson, and D. A. Worsley*
- 2424 Imaging Metastable Pits on Austenitic Stainless Steel In Situ at the Open-Circuit Corrosion Potential Using Scanning Electrochemical Microscopy  
*R. M. Souto, J. Izquierdo, and S. González*
- 2425 Porous Silicon as a Biomaterial  
*M. J. Sailor*
- 2426 Silicon Nanowires: A General Platform for Biosensing  
*R. Boukherroub*
- 2427 Innovative Applications of Porous Structures of Alumina and Silicon  
*R. B. Wehrspohn, S. Schweizer, B. Gesemann, P. Göring, and M. Lelonek*
- 2428 Three-Dimensional Structure of (110) Porous Silicon with In-Plane Optical Birefringence  
*M. Fujii, S. Shichi, T. Nishida, H. Yasuda, K. Imakita, and S. Hayashi*
- 2429 Formation of Area and Thickness Controlled Porous Type Aluminum Anodic Oxide Films by Sf-MDC  
*M. Sakairi, T. Yamaguchi, T. Murata, and K. Fushimi*
- 2430 Irregularity and Defects of Porous Anodic Oxide Films Formed on Metals  
*S. Ono and H. Asoh*
- 2431 Scan Rate and Fluoride Concentration effect on the Anodic Growth of Self-Aligned Titanium Dioxide Nanotubes in Phosphates  
*E. Krasicka-Cydzik, A. Kaczmarek, I. Glazowska, and K. Bialas Heltowski*
- 2432 Pit Initiation at MnS Nano-Inclusions in Carbon Steel under Exposure to Sulfate-Reducing Bacterium *D. alkanexedens*  
*B. H. Davis, Z. Suo, I. Beech, D. Paul, J. Hammond, and R. Avci*

- 2433 Bulk Diffusion Controlled Dealloying  
*Q. Chen and K. Sieradzki*
- 2434 The Strong Rashba Spin-Orbit Interaction in  $\text{Hg}_{0.77}\text{Cd}_{0.23}$  Te Inversion Layer  
*G. Yu, X. Liu, L. Wei, T. Lin, J. Chu, Y. Wei, and J. Yang*
- 2435 Pitting Corrosion Behavior and Grain Evolution of Shot Peened 304 Type Stainless Steel  
*T. D. Widodo and K. Noda*
- 2436 Formation of Interconnected Nano-Channels in Highly-Ordered Anodic Alumina  
*B. Huang, Y. Tian, B. Shan, and R. Chen*
- 2437  $\text{TiO}_2$  Nanotubes and Other Self-organized Anodic Structures: Formation and Applications  
*P. Schmuki*

### **E1 - Solid State Topics General Session**

*ECS Dielectric Science and Technology, ECS Electronics and Photonics, ECS Energy Technology, ECSJ Solid-State Chemistry, ECSJ Functional Ceramics*

- 2438 Characteristics of Zinc Oxide Films Grown on Sapphire Substrates Using High-Energy  $\text{H}_2\text{O}$  Generated by a Catalytic Reaction on Platinum Nanoparticles  
*K. Yasui, H. Miura, S. Satomoto, and T. Kato*
- 2439 Dielectric Constant Studies of BCN Thin Films  
*K. B. Sundaram and V. Todi*
- 2440 Effect of Wet Surface Treatments on Amorphous Silicon Anneal and Gate Breakdown  
*C. S. Tiwari, T. Guo, C. Breyfogle, J. Zhang, H. Mitro, L. Olmer, V. Kumar, D. Pohlman, and M. Rutte*
- 2441 Ultrasonic Spray-Assisted Vapor-Deposition Method as a Cost-Effective and Environmental-Friendly Technology for Semiconductor and Dielectric Materials for Devices  
*S. Fujita, S. Katori, J. Piao, T. Ikenoue, and K. Kaneko*
- 2442 UV-Visible Faraday Rotators Based on Rare-Earth Fluoride Single Crystals:  $\text{LiREF}_4$  (RE=Tb, Dy, Ho, Er and Yb),  $\text{PrF}_3$  and  $\text{CeF}_3$   
*V. Vasyliiev, E. G. Villora, Y. Sugahara, and K. Shimamura*
- 2443 The Characterization Study of Polycrystalline Silicon Grain Growth with Electron Backscatter Diffraction Patterns and Crystallinity  
*S. Yang, J. Chang, J. Lim, J. Shin, Y. Yoo, J. Kim, B. Chung, H. Choi, K. Hwang, and H. Kang*
- 2444 Electrical Breakdown of Anodic Aluminum Oxide Films for Electrowetting Systems  
*M. Mibus, E. Nein, A. Sapkota, C. Knospe, M. Reed, and G. Zangari*
- 2445 Ultrafast Carrier Dynamics in Green-Sensitive Organic Photodiodes  
*S. Sul, K. Lee, D. Leem, K. Kim, and H. Han*

- 2446 Single Chamber HFCVD Process for Growth of Diamond, Graphene and CNTs  
*S. Albin, R. Vispute, and A. Seiser*
- 2447 The Systematic Study and Simulation Modeling on Dislocation Edge Stress Effects for Si N-MOSFETs  
*M. Liao, C. Chen, L. Chang, C. Yang, C. Hsieh, and M. Lee*
- 2448 The Investigation on the Relaxation of Intrinsic Compressive Stress in CMOS Transistors by Additional N IMP Treatment and AFM-Raman Stress Extraction  
*M. Liao, C. Chen, L. Chang, C. Yang, C. Hsieh, and M. Lee*
- 2449 Plasmonic Color Filters for OLED by Laser Interference Lithography  
*J. Park, Y. Do, B. Hwang, K. Choi, and B. Ju*
- 2450 Hot Carrier effects by Gate Induced Drain Leakage Current  
*K. Kim, C. Han, J. Lee, D. Kim, H. Kim, H. Lee, and B. Choi*
- 2451 Development of Visual Inspection System for Metal Surface with Multivariate Pattern Analysis  
*K. Shigyo, T. Matsumoto, K. Sakiyama, and H. Kobayashi*
- 2452 Effects of Tungsten Composition Ratio on the Properties of W-In-Zn-O Films Deposited by RF Magnetron Sputtering  
*G. Heo, B. Oh, J. Park, Y. Lee, Y. Lee, and D. Shin*
- 2453 Fabrication of n-type Semiconductive Polycrystalline Diamond by Incorporating Phosphorous Atoms  
*A. Nakahara, H. Naragino, K. Yoshinaga, S. Tanaka, and K. Honda*
- 2454 Carrier Transport Mechanism at Metal/Amorphous Gallium Indium Zinc Oxide Interfaces  
*S. Kim, C. Choi, and H. Kim*
- 2455 Growth of AlN Single Crystals by Sublimation Method  
*Y. Oshima, M. Nakamura, Y. Masa, E. G. Villora, K. Shimamura, and N. Ichinose*

## **E2 - Atomic Layer Deposition Applications 8**

*ECS Dielectric Science and Technology, ECS Electronics and Photonics*

- 2456 Fabrication of Sb<sub>2</sub>Te<sub>3</sub> and Bi<sub>2</sub>Te<sub>3</sub> Multilayer Composite Films by Atomic Layer Deposition  
*K. Zhang, D. Nminibapiel, M. Tangirala, H. Baumgart, and V. Kochergin*
- 2457 Trimethylaluminum-Based Atomic Layer Deposition of Al:MO<sub>2</sub> (M=Zr, Hf): A Viable Route to Integrate High-Permittivity Oxides on In<sub>0.53</sub>Ga<sub>0.47</sub>As Substrates  
*A. Molle, E. Cianci, A. Lamperti, C. Wiemer, S. Baldovino, L. Lamagna, S. Spiga, M. Fanciulli, G. Brammertz, C. Merckling, and M. Caymax*

- 2458 Are Ions Good or Bad during Plasma-Assisted ALD  
*H. B. Profijt and W. Kessels*
- 2459 Atomic Layer Deposition of Mo: Al<sub>2</sub>O<sub>3</sub> Nanocomposites with Tunable Resistivity  
*A. U. Mane and J. W. Elam*
- 2460 In Situ Study of ALD Processes Using Synchrotron-based X-ray Fluorescence and Scattering Techniques  
*J. Dendooven, K. Devloo-Casier, M. Ide, K. Grandfield, K. F. Ludwig, S. Bals, P. Van Der Voort, and C. Detavernier*
- 2461 Reaction Mechanism of Non-Heating SiO<sub>2</sub> Atomic Layer Deposition by Using TDMAS and Plasma Excited Water Vapor  
*F. Hirose, K. Kanomata, M. Degai, and K. Momiyama*
- 2462 Crystallization Study by Transmission Electron Microscopy of SrTiO<sub>3</sub> Thin Films Grown by Plasma-Assisted ALD  
*V. Longo, M. A. Verheijen, F. Roozeboom, and W. Kessels*
- 2463 TiO<sub>2</sub>-Based Metal-Insulator-Metal Structures for Future DRAM Storage Capacitors  
*K. Fröhlich, B. Hudec, M. Tapajna, K. Hušeková, A. Rosová, J. Aarik, R. Rammula, A. Kasikov, T. Arroval, K. Murakami, M. Rommel, and A. J. Bauer*
- 2464 Application of the Plasma Surface Modification for Uniform Al<sub>2</sub>O<sub>3</sub> Films Grown by Atomic Layer Deposition on Polyethylene Blown Film  
*G. Lee, K. Son, S. Park, J. Shim, and B. Choi*
- 2465 Atomic Layer Deposition of Molybdenum Oxide Using Bis(Tert-Butylimido)Bis(Dimethylamido) Molybdenum  
*A. Bertuch, L. Lecordier, M. Dalberth, G. Sundaram, J. Becker, E. Deguns, M. Saly, D. Moser, and R. Kanjolia*
- 2466 Room-Temperature ALD of Metal Oxide Thin Films by Energy-Enhanced ALD  
*S. E. Potts, H. B. Profijt, R. Roelofs, and W. Kessels*
- 2467 Growth Characteristics and Properties of Yttrium Oxide Thin Films by Atomic Layer Deposition from Novel Y(iPrCp)<sub>3</sub> Precursor and O<sub>3</sub>  
*R. Xu, S. Selvaraj, N. Azimi, and C. G. Takoudis*
- 2468 Electrocatalytic Activity of Platinum Grown by Atomic Layer Deposition on Carbon Nanotubes for Si-Based DMFC Applications  
*A. Johansson, R. Yang, B. Dalslet, J. V. Larsen, K. Haume, L. H. Christensen, and E. V. Thomsen*
- 2469 Atomic Layer Deposition of Copper (I) Sulfide Using Commercially Produced Precursors  
*S. Christensen, A. Dameron, T. Gennett, and I. Repins*
- 2470 High Performance Core-Shell Nanowire Array Devices Prepared by Atomic Layer Deposition  
*H. Kim*

- 2471 Metal Oxide ALD Films for Low Power Sensor Applications  
*S. H. Brongersma*
- 2472 Enabling High Performance Detectors and Optics for Astronomy and Planetary Exploration with ALD  
*F. Greer*
- 2473 Nanomechanical Properties of Ultra Thin Films Synthesized by Atomic Layer Deposition  
*H. Baumgart*
- 2474 Study on Growth Characteristics of ALD RuO<sub>2</sub> Thin Films with Deposition Conditions  
*W. Kim, B. Kim, J. Chang, Y. Tak, H. Yang, S. Moon, O. Kwon, K. Cho, C. Yoo, and H. Kang*
- 2475 Atomic Layer Deposition of TiN/Al<sub>2</sub>O<sub>3</sub>/TiN Nanolaminates for Capacitor Applications  
*L. Assaud, M. Hanbücken, and L. Santinacci*
- 2476 Impact of Direct Plasma Densification on Resistivity and Conformality of PEALD Tantalum Nitride  
*O. van der Straten, X. Zhang, C. Penny, J. Maniscalco, S. Chiang, J. Ren, and P. Ma*
- 2477 Atomic Layer Deposition of Ruthenium in Various Precursor and Oxygen Doses  
*J. Kim, K. Son, B. Kim, W. Kim, and J. Shim*
- 2478 In Situ FTIR Characterization of Growth Inhibition in Atomic Layer Deposition Using Reversible Surface Functionalization  
*A. Yanguas-Gil, J. A. Libera, and J. W. Elam*
- 2479 Substrate Reactivity effects in the ALD of Al<sub>2</sub>O<sub>3</sub> Revealed by In Situ ALD  
*M. Tallarida, M. Michling, C. Das, and D. Schmeisser*
- 2480 New Reaction Chemistries for Late Transition Metal Atomic Layer Deposition  
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- 2618 Band Lineup Issues Related with High-k/SiO<sub>2</sub>/Si Stack  
*J. Xiang, X. Wang, T. Li, C. Zhao, W. Wang, Q. Liang, J. Li, D. Chen, and T. Ye*
- 2619 Schottky Barrier Height at TiN/HfO<sub>2</sub> Interface of TiN/HfO<sub>2</sub>/SiO<sub>2</sub>/Si Structure  
*K. Han, X. Wang, W. Wang, J. Zhang, J. Xiang, H. Yang, C. Zhao, D. Chen, and T. Ye*
- 2620 SiC MOS Interface States: Similarity and Dissimilarity from Silicon  
*T. Umeda, Y. Satoh, R. Kosugi, Y. Sakuma, M. Okamoto, S. Harada, and T. Ohshima*
- 2621 Controlled Lateral Etching of Titanium Nitride in a CMOS Gate Structure using DSP+  
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- 2622 The Electrochemical Kinetics of Selectively Corroding Poly-Silicon in Generating Lonely Crater-Defects  
*L. Sheng and E. Glines*
- 2623 Local-Loading Effects for Pure-Boron-Layer Chemical-Vapor Deposition  
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*ECS Electronics and Photonics*

- 2624 Challenges for the Semiconductor Industry in the 21st Century  
*P. A. Gargini*
- 2625 Si Crystal Growth from a Melt: The Secrets Behind the v/G Criterion  
*J. Vanhellemont*
- 2626 FZ Crystal Growth of Si and Ge- Current Limitations and Approaches to Overcome  
*H. Riemann, H. Rost, M. Wuenscher, R. Menzel, and B. Hallmann-Seiffert*
- 2627 Electrolytic Deposition of Silicon for Solar Application  
*S. Sokhanvaran and M. Barati*
- 2628 A Study on Density Functional Theory of the effect of Pressure on the Formation and Activation Enthalpies of Intrinsic Point Defects in Growing Single Crystal Si  
*K. Sueoka, E. Kamiyama, and H. Kariyazaki*

- 2629 Surface and Gate-Oxide Properties of a Large-Scale, <110>-oriented High-Purity CZ-Si  
*J. Lee, W. Lee, J. Kim, D. Hwang, and H. Kang*
- 2630 Schottky Barrier Height Engineering for Low Resistance Contacts to Ge and III-V Devices  
*K. Saraswat, J. Lin, A. Nainani, A. Roy, B. Yang, and Z. Yuan*
- 2631 Challenges and Opportunities for Doping Control in Ge for Micro and Optoelectronics Applications  
*E. Bruno, G. Scapellato, E. Napolitani, S. Mirabella, A. La Magna, M. Mastromatteo, D. De Salvador, S. Boninelli, G. Fortunato, V. Privitera, and F. Priolo*
- 2632 Defect Engineering at the Nanoscale: Challenges and Trends  
*E. G. Seebauer*
- 2633 Long-Range Interaction between H and (B or P) Dopant Atoms in Silicon Crystals Investigated by First Principles Calculation  
*E. Kamiyama and K. Sueoka*
- 2634 Manufacturing of Ultra Thin SOI  
*O. Bonnin, W. Schwarzenbach, V. Barec, N. Daval, X. Cauchy, B. Nguyen, and C. Maleville*
- 2635 Hybrid-Formation of Ge-on-Insulator Structures on Si Platform by SiGe-Mixing-Triggered Rapid-Melting Growth --- A Road to Artificial Crystal ---  
*M. Miyao, M. Kurosawa, K. Toko, and T. Sadoh*
- 2636 The Pseudo-MOSFET: Principles and Recent Trends  
*S. Cristoloveanu, I. Ionica, A. Diab, and F. Liu*
- 2637 Interface and Border Traps in Ge pMOSFETs  
*D. M. Fleetwood, E. Simoen, S. Francis, X. Zhang, R. Arora, E. Zhang, R. D. Schrimpf, K. F. Galloway, J. Mitard, and C. Claeys*
- 2638 Radiation Influence on Biaxial+uniaxial Strained Silicon MuGFETs  
*C. Bordallo, P. G. Agopian, J. A. Martino, E. Simoen, and C. Claeys*
- 2639 Wafer Level Statistical Evaluation of the Proton Radiation Hardness of a High-k Dielectric/Metal Gate 45 nm Bulk CMOS Technology  
*C. Claeys, S. Iacovo, D. Kobayashi, A. Mercha, A. Griffoni, P. Roussel, F. Crupi, and E. Simoen*
- 2640 Transistor-Based Extraction of Carrier Lifetime and Interface Traps in Silicon-on-Insulator Materials  
*J. A. Martino, V. Sonnenberg, M. Galeti, M. Aoulaiche, E. Simoen, and C. Claeys*
- 2641 Physical Mechanisms of Charge Pumping and DCIV Currents in Floating-Body SOI MOSFETs  
*E. Zhang, D. M. Fleetwood, R. D. Schrimpf, E. Simoen, and D. Linten*

- 2642 Lifetime-Degrading Boron-Oxygen Centres in p-types and n-type Silicon  
*V. V. Voronkov, R. J. Falster, B. Lim, and J. Schmidt*
- 2643 Impact of Oxide Precipitates on Minority Carrier Lifetime in Silicon  
*J. D. Murphy, K. Bothe, R. Krain, M. Olmo, V. V. Voronkov, and R. J. Falster*
- 2644 Comparison of the Impact of Thermal Treatments on the Second and on the Millisecond Scales on the Precipitation of Interstitial Oxygen  
*G. Kissinger, D. Kot, and W. von Ammon*
- 2645 Thermal Budget of Hydrogen-Related Donor Profiles - Diffusion Limited Activation and Thermal Dissociation  
*J. G. Laven, R. Job, H. Schulze, F. Niedernostheide, W. Schustereder, and L. Frey*
- 2646 Difficulties in Characterizing High-Resistivity Silicon  
*P. Nayak, R. Richert, and D. K. Schroder*
- 2647 Investigation of Doping Type Conversion of Hydrogen Implanted Cz-Silicon by EBIC  
*S. Kirnstötter, M. Faccinelli, P. Hadley, J. G. Laven, H. Schulze, R. Job, and W. Schustereder*
- 2648 Characterization of Deep Levels Introduced by RTA and by Subsequent Anneals in n-Type Silicon  
*D. Kot, T. Mchedlidze, G. Kissinger, and W. von Ammon*
- 2649 Deep-Level Transient Spectroscopy of MOS Capacitors on GeSn Epitaxial Layers  
*E. Simoen, B. Vincent, C. Merckling, F. Gencarelli, L. Chu, and R. Loo*
- 2650 Low Temperature Fluorinated Silicon Film Synthesis  
*D. E. Milovzorov*
- 2651 Chemical Vapor Deposition of Silicon by the Reaction of Bromosilanes and Hydrogen  
*K. Tomono, H. Furuya, S. Miyamoto, T. Ogawa, Y. Okamura, R. Komatsu, and M. Nakayama*
- 2652 Diode Characteristics and Thermal Donor Formation in Germanium-Doped Silicon Substrates  
*J. Rafi, J. Vanhellemont, E. Simoen, J. Chen, M. Zabala, and D. Yang*
- 2653 Introduction of New Materials into CMOS Devices  
*H. Iwai*
- 2654 Cu Contamination Assessment and Control in 3-D Integration  
*M. Koyanagi, K. Lee, J. Bea, T. Fukushima, and T. Tanaka*
- 2655 Modeling of Boron and Phosphorus Diffusion Gettering of Iron in Silicon  
*A. Haarahiltunen, V. Vähänissi, H. Talvitie, M. Yli-Koski, and H. Savin*

- 2656 Defect Generation in Device Processing and Impact on the Electrical Performances  
*M. Polignano, I. Mica, G. P. Carnevale, A. Mauri, E. Bonera, and S. Speranza*
- 2657 Segregation Behavior of Copper and Tantalum in Oxide Film and Si Substrate after Device Heat-treatment  
*I. Lee, S. Baek, G. Lee, U. Paik, and J. Park*
- 2658 The Characteristics of Gettering Ability in Advanced Multi-Chip Packaging Thinned Wafer  
*J. An, J. Kim, J. Kim, K. Lee, H. Kang, S. Lee, B. Moon, Y. Shin, S. Hwang, and H. Park*
- 2659 Effects of Slow Diffusivity Metallic Contaminant on Electrical Characteristic Degradation for Silicon C-MOS Image Sensor  
*G. Lee, I. Lee, S. Baek, I. Kim, and J. Park*

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*ECS Electronics and Photonics, ECS Dielectric Science and Technology, ECS Sensor*

- 2660 Syntheses of a Variety of Silicide Nanowire and Nanosheet Bundles  
*H. Tatsuoka, W. Li, E. Meng, and D. Ishikawa*
- 2661 Bottom-up Process to Fabricate Periodic Arrays of  $\beta$ -FeSi<sub>2</sub> Nanopillars for Photonic Applications  
*Y. Kaneko, M. Suzuki, K. Nakajima, and K. Kimura*
- 2662 Mn Silicide Nanowires on the Si(001)-2×1 Surface Having Anisotropic Strain Fields with Bi Nanolines  
*K. Miki, H. Liu, and J. Owen*
- 2663 A Proposal of Schottky Barrier Height Tuning Method with Interface Controlled Ni/Si Stacked Silicidation Process  
*Y. Tamura, R. Yoshihara, K. Kakushima, P. Ahmet, Y. Kataoka, A. Nishiyama, N. Sugii, K. Tsutsui, K. Natori, T. Hattori, and H. Iwai*
- 2664 High-Performance Piezoelectric Nanogenerators Based on Piezoelectric and Semiconducting Coupled Properties  
*S. Kim*
- 2665 Novel Functional Materials and Characterizations for Highly Efficient Dye-Sensitized Solar Cells  
*E. W. Diau*
- 2666 WO<sub>3</sub> Nanotubes for Effective Photoelectrochemical Water-Splitting  
*X. Zheng*
- 2667 Fabrication of Silicon Groove/Pyramid Hierarchical Structures for Solar Cell Applications  
*Z. Lin, A. Li, H. Wang, and J. He*

- 2668 Large Scale Single-Crystal Cu(In,Ga)Se<sub>2</sub> Nanotip Arrays For High Efficiency Solar Cell  
*Y. Chueh*
- 2669 GaN-based Nanorods: From High-Gain Photoconductor to Solar Hydrogen Generation  
*Y. Huang, Y. Huang, W. Tu, K. Chen, and L. Chen*
- 2670 From Organic Powders to Geometrically Well Defined Low-Dimensional Structures: A way for Unprecedented Optical and Chemical Properties  
*J. Park, H. Moon, and H. Choi*
- 2671 Hybrid Silicon Solar Cells with Hierarchical Structure for Energy Harvesting  
*W. Wei, C. Ho, S. Tai, H. Wang, A. Li, R. Chung, and J. He*
- 2672 Three-dimensional Silicon Phononic Crystal  
*Y. Lin, H. Ting, L. Chou, and L. Chen*
- 2673 One-Dimensional Semiconductor Heterostructures: Challenges and Opportunities  
*S. A. Dayeh*
- 2674 Chemical Vapor Deposited MoS<sub>2</sub> Thin Layers and Their Applications  
*L. Li*
- 2675 Epitaxial Growth of Iron-Silicide Nanodots on Si Substrates Using Ultrathin SiO<sub>2</sub> Film Technique and Their Physical Properties  
*Y. Nakamura and M. Ichikawa*
- 2676 Au@SnO<sub>2</sub> Core-Shell Nanowires: Novel Material for Gas Sensor  
*W. Liu, C. Hsu, and L. Chou*
- 2677 DC and RF Characteristics of Ga<sub>2</sub>O<sub>3</sub>/GaN Single Nanowire MOSFET  
*J. Yu, C. Li, P. Yeh, Y. Wu, and L. Peng*
- 2678 Controllable Surface Plasmon Resonance Properties of Hexagonal Close-packed Metal Nanosphere Arrays  
*H. Ting, Y. Lin, L. Chou, C. Tsai, and L. Chen*
- 2679 Surface Plasmon-Enhanced Optical Properties of Composite Materials Containing Metal Nanoparticles: Birefringence and Laser Oscillation  
*K. Tanaka, K. Fujita, S. Murai, X. Meng, Y. Moriguchi, and T. Komine*
- 2680 Nanoheterostructures of Semiconducting Nanowires for Electronic Sensors and Photodetectors  
*P. Lee*
- 2681 Implantable and Bio-Integrated Flexible GaN LED  
*K. Lee*
- 2682 Photoacoustic Emission from Local Plasmon Resonators Nanostructured by Glancing Angle Deposition  
*K. Namura, M. Suzuki, K. Nakajima, and K. Kimura*

- 2683 Field Emission of Core-Shell Ga<sub>2</sub>O<sub>3</sub> Nanowires  
*K. Cheng, C. Hsu, C. Hsieh, and L. Chou*
- 2684 2D Oxide Nanosheets: Controlled Assembly and Applications  
*M. Osada and T. Sasaki*
- 2685 Optical Second Harmonic Generation of Pt Nanowires Created by Shadow Deposition on MgO(110) Facetted Templates  
*G. Mizutani and Y. Ogata*
- 2686 SiO<sub>2</sub> nano- cylinder structure for low-k dielectric layer  
*R. Maeno, T. Fujii, and M. Omiya*
- 2687 Synthesis and Characterization of the Core-Shell Au/Ga<sub>2</sub>O<sub>3</sub> Nanowires  
*B. Wu, C. Hsu, and L. Chou*
- 2688 Horizontal-Slot Disk Resonators Incorporating Nanocrystals for Low-Cost, On-Chip Bio-Sensors  
*S. Lee, G. Kim, and J. H. Shin*
- 2689 Study of the active volume for High Bright AlGaInP-based Light Emitting Diodes  
*H. Oh*
- 2690 Near-Infrared Light Detection of n-Type β-FeSi<sub>2</sub>/i-Si/p-Type Si Heterojunction Photodiodes at Low Temperatures  
*R. Iwasaki, K. Yamashita, N. Promros, S. Izumi, and T. Yoshitake*
- 2691 Single-Nanowire CMOS Inverter based on Ambipolar Si Nanowire FETs  
*H. Yuan, Q. Li, H. Zhu, H. Li, D. Ioannou, and C. A. Richter*
- 2692 Visible Light-Induced Immobilization of Gold Nanoparticles on Silicon Substrates  
*S. Mo, T. Ichii, K. Murase, and H. Sugimura*
- 2693 Fabrication of Silicon Nanowire Arrays for Photovoltaic Applications  
*H. Li, J. Tseng, S. Chiou, H. Liu, and H. Cheng*
- 2694 Ultra-Compact Photonic Circuit Components based on Propagation of Exciton Polaritons in Organic Dye Nanofibers  
*K. Takazawa, J. Inoue, and K. Mitsuishi*
- 2695 Extremely Low Electron Density in a Modulation-Doped Si/SiGe 2DEG by Effective Schottky Gating  
*J. Li, C. Huang, and J. C. Sturm*
- 2696 Influences of Hydrogen Passivation on Near-Infrared Light Detection of n-Type β-FeSi<sub>2</sub>/p-Type Si Heterojunction Photodiodes  
*R. Iwasaki, K. Yamashita, N. Promros, S. Izumi, and T. Yoshitake*

- 2697 Transparent Conductive CNT/PMMA Nanocomposite Via Electrostatic Adsorption Technique  
*H. Muto, N. Hakiri, G. Kawamura, and A. Matsuda*
- 2698 Transfer Printing of Compound Semiconductor Nanostructures on Heterogeneous Substrates  
*H. Ko*
- 2699 Electrochemical Growth of Vertically Standing Ni Nanorod Arrays on Si Substrate and the Low-Dimensional Effect on Their Enhanced Cold Field Electron Emission Properties  
*A. N. Banerjee and S. Joo*
- 2700 Formation of Ge-Nanodots Capped with SiC Layer by Gas-Source MBE Using MMGe and MMSi  
*K. Yasui, Y. Anezaki, K. Sato, A. Kato, T. Kato, M. Suemitsu, Y. Narita, and H. Nakazawa*
- 2701 Extremely Stretchable Electrodes beyond Intrinsic Limit Originated from Three Dimensional Nanonetworks  
*J. Park, C. Ahn, K. Hyun, and S. Jeon*
- 2702 Synthesis and Characterizations of InGaAs Nanowire Parallel Arrays for High Performance Electronic Devices  
*J. J. Hou, N. Han, F. Wang, S. Yip, F. Xiu, T. Hung, and J. C. Ho*
- 2703 Self-Assembly of Gold Nanoparticle Arrays Covalently Bonded to Silicon Surface  
*H. Sugimura*
- 2704 Carbon Nanotube Field Emitters: Fundamental Properties and Applications  
*Y. Saito*
- 2705 Optically Pumped Lasing in Gallium Nitride Nanorods Structure  
*Y. Hsu, S. Chang, K. Sou, M. Shih, H. Kuo, K. Hsu, and C. Chang*
- 2706 Three-Dimensional Nanowire Architectures for Highly-Efficiency Photoelectrochemical Electrodes  
*X. Wang*
- 2707 Piezoelectronics of Obliquely-Aligned InN Nanorod Array  
*C. Liu and N. Ku*
- 2708 Self-organized 3-D Nanostructures for Photon Management and Cost-effective Photovoltaics  
*S. Leung, M. Yu, Q. Lin, K. Kwon, K. Ching, K. Yu, and Z. Fan*
- 2709 Optical and Surface Recombination Properties of Compound Surface Textures for Heterojunction Solar Cells  
*H. Wang, C. Lin, and J. He*

- 2710 Gold Nanoparticle 2D-Arrays Chemically Immobilized as Large-Area Near-Field Light Source  
*K. Miki, K. Isozaki, T. Ochiai, T. Taguchi, and K. Nittoh*
- 2711 Light- and Energy-Harvesting Scheme Employing the Nanoscale Photon Management in the Solar Cells and the Photodetectors  
*J. He*
- 2712 Self-Powered Flexible Strain Sensor  
*J. Zhou*
- 2713 Thermal Properties of In<sub>2</sub>O<sub>3</sub> Nanowires  
*C. Hsu, C. Hung, and L. Chou*
- 2714 Optical Characterization of Si Quantum Dots  
*S. Hu, T. Lin, D. Tsai, and R. Liu*

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

*ECS Dielectric Science and Technology, ECS Electrodeposition, ECS Electronics and Photonics, ECSJ Electronics*

- 2715 Innovation Through Industry and University Collaboration  
*S. Johnston*
- 2716 Heterogeneous 3D Stacking Technology Developments  
*H. Ikeda*
- 2717 Metallization for 3D interconnect processing  
*H. Philipsen, Y. Civale, K. Vandersmissen, M. Honore, F. Inoue, and P. Leunissen*
- 2718 3D Wafer Stacking via Bonding of Recessed Cu Damascene Structures  
*C. Tan*
- 2719 3D Integration Technologies Based on Surface-Tension Driven Multi-Chip Self-Assembly Techniques  
*T. Fukushima, K. Lee, J. Bea, T. Tanaka, and M. Koyanagi*
- 2720 High Aspect Ratio Silicon Etch  
*B. Wu*
- 2721 Through Silicon Via (TSV) Process Using DRIE and Cathode Coupled PE-CVD  
*Y. Kusuda*
- 2722 Advances in Semiconductor Metallization Technologies for New Applications and Device Scaling  
*R. Preisser*
- 2723 Opportunities for Electroless Copper Deposition in Semiconductor Manufacturing  
*Y. Dordi*



- 2724 Cu Electroless Deposition on Ru Barrier - Investigation of Growth Phenomena and Film Properties  
*K. Kim, T. Lim, K. Park, H. Koo, M. Kim, and J. Kim*
- 2725 Control of Adhesion Strength and TSV Filling Morphology of Electroless Barrier Layer  
*R. Arima, F. Inoue, H. Miyake, T. Shimizu, and S. Shingubara*
- 2726 The Wire Grid Polarizer made by Electro- and Electroless- Deposition Processes  
*N. Okamoto, Y. Ikeda, Y. Koyama, Y. Kawazu, T. Saito, and K. Kondo*
- 2727 Bath Stability Monitoring for Electroless Cu Seed Formation in High Aspect Ratio TSV  
*F. Inoue, H. Philipsen, S. Armini, A. Radisic, Y. Civale, P. Leunissen, and S. Shingubara*
- 2728 Via Filling Electrodeposition of 4 $\mu$ m Diameter via by Periodical Reverse Current  
*T. Hayashi, K. Kondo, M. Takeuchi, T. Saito, N. Okamoto, M. Bunya, and M. Yokoi*
- 2729 The Effect of Polymer Additives on TSV Filling by Copper Electroplating  
*C. Lin, W. Dow, J. Lin, W. Chang, and H. Lee*
- 2730 Periodic Pulse Reverse Cu Electroplating for Through Hole Filling  
*F. Shen, W. Dow, J. Lin, W. Chang, and H. Lee*
- 2731 Copper-free Through Silicon Via Filling by Ni-W Electrodeposition  
*H. Huang, W. Dow, J. Lin, W. Chang, and H. Lee*
- 2732 High Density Copper Nucleation on Ruthenium Using Commercial Plating Chemistry and Its Application to Metallization of High Aspect Ratio Through-Silicon Vias  
*P. Shi*
- 2733 Exploration of Process Window for Fill of Sub 30 nm Features by Direct Plating  
*M. Nagar, A. Radisic, K. Stubbe, and P. Vereecken*
- 2734 The Impact of Electrolyte Acidity on Bottom-up Metallization of Copper Interconnects  
*L. Boehme, J. Wu, X. Kang, R. Preisser, and U. Landau*
- 2735 Temperature Effects on Additives Induced Polarization in Copper Electroplating of Interconnects  
*L. Boehme and U. Landau*
- 2736 Effect of Additives on Direct Copper Electrodeposition on Transition Metal Diffusion Barriers for Silicon-based Integrated Devices  
*B. Im and S. Kim*
- 2737 Superconformal Film Growth  
*T. Moffat and D. Josell*

- 2738 Multi-Scale Modeling of Direct Copper Plating on Resistive Non-Copper Substrates  
*L. Yang, A. Radisic, M. Nagar, J. Deconinck, L. Leunissen, P. Vereecken, and A. West*
- 2739 Synergistic Effects of Additives on the Filling Process of High-Aspect-Ratio TSV - Kinetic Monte Carlo Simulation -  
*Y. Fukiage, Y. Kaneko, K. Ohara, and F. Asa*
- 2740 Ultrathin Copper Layers Deposited by Galvanic Displacement: Characterization by Atom Probe Tomography  
*J. Ai, Y. Zhang, A. C. Hillier, and K. R. Hebert*
- 2741 Simulation of Shape Evolution in Through-Mask Electrochemical Deposition  
*G. J. Wilson, P. McHugh, S. Lee, and T. L. Ritzdorf*
- 2742 Inverse Analysis of Accelerator Distribution for Through Silicon Via Filling  
*M. Hayase, T. Matsuoka, K. Otsubo, Y. Onishi, and K. Amaya*
- 2743 Cu Electroplating for Through Silicon Vias (TSVs) Filling Using a Dimensionally Stable Anode (DSA)  
*W. Hsiung, W. Dow, J. Lin, W. Chang, H. Lee, and S. Lin*
- 2744 Lead Free Solder Deposited by ECD - Material Analysis  
*T. L. Ritzdorf, S. Lee, and I. Drucker*
- 2745 Evaluation of Grain Size Distributions of 50nm Wide Cu Interconnects by X-ray Diffraction Method  
*T. Inami and J. Onuki*
- 2746 A Novel Synthesis Method of Cu Nanoparticles with High Stability and Their Applications Acting as Seed Layer of TSV  
*C. Hsieh, W. Dow, and Y. Chang*
- 2747 Halide-Free Flux Activity at Copper and Tin Surface  
*S. Vegunta, G. Qu, K. Mai, J. Nguyen, and J. Flake*
- 2748 Investigation of the Mechanism of Cu Eruption-Induced Copper Void Defects in Memory Applications.  
*K. Chung, J. Park, T. Yoon, G. Oh, D. Park, S. Kim, D. Im, D. Lee, J. Kim, M. Park, D. Kim, Y. Chung, J. Baek, S. Kwon, H. Jeong, J. Kim, S. Nam, H. Kang, and C. Chung*
- 2749 Failure Mechanism of Copper Through-Silicon Vias Under Biased Thermal Stress  
*S. Seo, J. Hwang, J. Yang, and W. Lee*
- 2750 Stability of Glassy Ta-Rh Diffusion Barriers for Cu Metallization  
*N. Dalili, Q. Liu, and D. Ivey*

- 2751 Investigation of Tetrahedral Amorphous Carbon (ta-C) as Diffusion Barrier for Advanced Cu Metallization Technology  
*X. Ma, H. Yin, Z. Fu, X. Zhang, K. Du, J. Yan, C. Zhao, D. Chen, and T. Ye*
- 2752 Positive-Tone, Aqueous-Developable, Polynorbornene Dielectric  
*B. K. Mueller, A. Grillo, E. Elce, and P. Kohl*
- 2753 Ladder-like Polymethylsilsequioxane (PMSQ) for Interlayer Dielectric (ILD) Application  
*H. Lee, S. Hwang, and K. Baek*
- 2754 Effect of Thermal Treatment on Physical, Electrical Properties and Reliability of Porogen-Containing and Porogen-Free Ultralow-k Dielectrics  
*Y. Cheng, W. Chang, Y. Chang, and J. Leu*
- 2755 System-in-Package concept for a Carbon Nanotube resonator  
*R. Gueye, S. Lee, T. Akiyama, D. Briand, M. Muoh, C. Roman, C. Hierold, and N. de Rooij*
- 2756 Concept of Spatially Divided Deep Reactive Ion Etching of Si using Oxide Atomic Layer Deposition in the Passivation Cycle  
*F. Roozeboom, B. Kniknie, R. Knaapen, M. Smets, A. Illiberi, P. Poodt, G. Dingemans, W. Keuning, and W. Kessels*
- 2757 Adhesion Reliability Enhancement of Silicon/Epoxy/Polyimide Interfaces for Flexible Electronics  
*S. Kim and T. Kim*
- 2758 The Effects of Levelers on Copper Via Filling in 3D SiP  
*M. Jung, K. Kim, and J. LEE*
- 2759 Direct Measurement and Enhancement of Adhesion Energy of Bi-Te Thermoelectric Thin Films  
*C. Kim, S. Jeon, H. Lee, S. Hyun, and T. Kim*

### **E9 - Fundamentals and Applications of Microfluidic and Nanofluidic Devices**

*ECS Electronics and Photonics, ECS Physical and Analytical Electrochemistry, ECS Sensor*

- 2760 Molecular Dynamics Simulation of Effects of Nanoparticles on Pulmonary Surfactant  
*G. Hu, B. Jiao, and Y. Zuo*
- 2761 Molecular Theory of Fluid Transport and Electrokinetic Potential for Microfluidics and Nanofluidics  
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- 2762 Effect of Solvent Polarization in Nano-Confined Electric Double Layer with Finite Ion Sizes  
*S. Das and S. Mitra*

- 2763 Influence of Slippage and Charge Leakage on the Electric Field Induced Patterns in Thin Bilayers  
*K. Mondal, S. Sen, P. Kumar, and D. Bandyopadhyay*
- 2764 Insulator-based Dielectrophoresis in Microfluidics  
*X. Xuan*
- 2765 Microfluidic Cell Electrofusion Chip based on Discrete Sidewall Microelectrodes  
*N. Hu, S. Qian, S. Joo, J. Yang, and X. Zheng*
- 2766 A Microfluidic Device for Dielectric Spectroscopy of Jurkat Cells  
*A. Beskok, A. C. Sabuncu, J. Zhuang, and J. Kolb*
- 2767 Triaxial Magnetic Fields Enable Mixing and Controlled Flows in Microfluidic Devices  
*J. Martin, K. Solis, and L. Rohwer*
- 2768 Novel Non-equilibrium Electrokinetic Micromixer with Nanoporous Membrane  
*S. Hwang and S. Song*
- 2769 Template-Based Synthesis of Aligned Carbon Nanotube Arrays for Microfluidic and Nanofluidic Applications  
*M. Golshadi and M. Schrlau*
- 2770 Sensing Performance of EGFET pH Sensors with CuO Nanowires Fabricated on glass substrate  
*T. Yang, S. Chang, C. Li, and S. Chang*
- 2771 Manipulation of DNA Translocation Through Polyelectrolyte Brushes-Functionalized Nanopores  
*L. Yeh, M. Zhang, S. Qian, J. Hsu, S. Joo, and S. Tseng*
- 2772 A Low Voltage Portable Nano-Pore Electroosmotic Pump with Passive Zeta Potential Control  
*D. Gu, S. Yalcin, H. Baumgart, S. Qian, A. Beskok, and O. Baysal*
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- 2804 A Two Terminal Vertical Selector Device for Bipolar RRAM  
*S. Chopra, P. Bafna, P. Karkare, S. Srinivasan, S. Lashkare, P. Kumbhare, Y. Kim, S. Srinivasan, S. Kuppurao, S. Lodha, and U. Ganguly*
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- 2807 Material Engineering of GexSbyTez and GaxSby Phase Change Materials for High Performance Phase Change Memory  
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- 2830 Pulse Switching Property of Reset Process in Resistive Random Access Memory (ReRAM) Consisting of Binary-Transition-Metal-Oxides  
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- 2840 Self-rectifying Flexible Nonvolatile Small-molecule Memory-cell Embedded with Ni Nanocrystals Surrounded by NiO Tunneling Barrier  
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- 2842 Effect of Buffer LiF Layer on Nonvolatile Memory Characteristics for Polymer Memory-cell with Au Nanocrystals Embedded in Polystyrene  
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- 2843 Crossbar Memory Using TiO<sub>2</sub> Thin Film-based Schottky Diode and Unipolar Switching Cell  
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- 2851 Engineering Dielectric Stacks for Charge-Trapping Non-Volatile Memory  
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- 2870 In Situ Observation of Structural Change in N719 Dye Molecule in Dye Sensitized Solar Cells under a Visible Light Exposure  
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- 2871 Gold Nanoparticles Embedded Single Crystalline ZnO (Au NPs@ZnO) Nanowire Arrays for Plasmonic Enhanced Dye-sensitized Solar Cells (DSSCs)  
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- 2879 Organic Photovoltaics by Using a Nanoscale Thin Film of Solution-based Titanium Sub-Oxide (Solution based Titanium sub-oxide Nanoscaled Thin Films for Passivation (or Sealant) of Organic Photovoltaic Cells)  
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- 2881 ZnS Films Deposited by ALD for Solar Cell Applications  
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- 2897 Novel Method of Synthesis of Zinc Oxide Doped with Nitrogen for photocatalytic Applications  
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- 2898 FTO Film with High Haze and Transmittance Prepared for Dye-Sensitized Solar Cell  
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- 2907 Controlled Synthesis of Chalcogenide Nanocrystal Inks for High-Performance Photodetectors and Solar Energy Conversion  
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- 2916 Enhancement of Thermal and Chemical Stabilities of Gold Nanorods Embedded in Titanium Oxide Film  
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- 2923 Hydrogen Plasma-Based Etching of Copper  
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- 2924 Inductively Coupled Plasma Etching of InP with Cl<sub>2</sub>/H<sub>2</sub>/Ar Plasma  
*E. A. Douglas, J. Stevens, R. Shul, and S. Pearton*
- 2925 Extreme Nano Etching  
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- 2926 Investigation of Synchronized Pulsed Plasma for High Selective Etching of Silicon Nitride Spacers  
*R. Blanc, O. Joubert, T. David, F. Leverd, and C. Vérove*
- 2927 Systematic Approach to TDM Process Development  
*C. W. Johnson, D. Pays-Volard, L. Martinez, and J. Plumhoff*
- 2928 Advanced Dual Hard Mask Patterning Scheme to Enable High Resolution Lithography for sub 30 nm Technology Nodes  
*J. Paul, M. Rudolph, S. Riedel, S. Wege, C. Hohle, and V. Beyer*
- 2929 Towards New Plasma Technologies for 22 nm Gate Etch Processes and Beyond  
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- 2930 Precision, Damage-Free Etching and Cleaning by Electron-Enhanced Reactions: Results and Simulations.  
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*H. Lee, Y. Han, M. Lee, J. Hur, H. Kim, and H. Lee*
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*Y. Honda, S. Akamaru, M. Inoue, and T. Abe*
- 2938 Enhanced Optical and Electrical Property of ITO by Hydrogen Plasma and Post-Wet Treatment  
*D. Lee, S. Yang, J. Kim, and J. Lee*
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- 2959 Strain Characterization of Directly Bonded Germanium-to-Silicon Substrates  
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- 2960 The Study on Defects of Germanium-on-Insulator Fabricated by a Low Temperature Smart-Cut Process  
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- 2961 Advanced III-V Multijunction Solar Cells Fabricated by Semiconductor Wafer Bonding  
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- 2965 Evaluation of Titanium Direct Bonding Mechanisms  
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- 2966 A New Combined Process of Formic Acid Pretreatment for Low-temperature Bonding of Copper Electrodes  
*W. Yang, M. Akaike, M. Fujino, and T. Suga*
- 2967 Low-Temperature Cu-Cu Wafer Bonding  
*B. Rebhan, G. Hesser, J. Duchoslav, V. Dragoi, M. Wimplinger, and K. Hingerl*
- 2968 Advanced Heterogeneous Integration of InP HBT and CMOS/SiGeBiCMOS Technologies  
*A. Gutierrez-Aitken, P. Chang-Chien, B. Oyama, D. Scott, K. Hennig, E. Kaneshiro, P. Nam, K. Thai, B. Poust, A. K. Oki, and R. Kagiwada*

- 2969 Wafer Level 3D Stacking using Smart Cut™ and Metal-Metal Direct Bonding Technology  
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- 2980 Multi-Wavelength High Resolution Micro-Raman and Optical Reflectance Characterization of Nano-Scale Strained Silicon-on-Insulator Substrates  
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- 2982 Glass Direct Bonding  
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- 2985 The Effects of Composition and Design of Experiment on the Quality of Al-Ge Eutectic Bonding for Wafer Level Packaging  
*X. Huang, C. Cheng, P. Liu, Y. Hsieh, L. Chao, C. Tsai, D. Huang, and C. Colinge*
- 2986 High Resolution Double-Crystal X-ray Diffraction Imaging for Interfacial Defect Detection in Bonded Wafers.  
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- 2989 Mechanisms for Ultra-Low Temperature Plasma Activated Direct Wafer Bonding  
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- 2993 Development of Porous InP for Subsequent Epitaxial Layer Transfer onto Flexible Substrates  
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- 2994 Effect of Two-step Oxidation in Ge Condensation on Surface Roughness Property of Relaxed SiGe layer-on-insulator Substrates  
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- 2995 Advanced Characterization of a Direct Wafer Bonding-compatible Germanium Exfoliation Process  
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- 2996 Low-Temperature Bonding Technologies for Photonics Applications  
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- 2997 Adhesive Wafer Bonding Applied for Fabrication of True-Chip-Size Packages for SAW Devices  
*T. Heuser, C. Bauer, V. Dragoi, and G. Mittendorfer*
- 2998 Distortion Free Wafer Bonding Technology for Backside Illumination Image Sensors  
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- 2999 Monitoring Inner Pressure of MEMS Devices Sealed by Wafer Bonding  
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*C. Huang, G. Lee, J. Chyi, H. Cheng, C. Hsu, Y. Hsu, F. Ren, and Y. Wang*
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*M. H. Crawford and J. Tsao*
- 3004 InGa<sub>N</sub>/Ga<sub>N</sub> Nanostructure Arrays for LEDs  
*T. Yeh, Y. Lin, and P. D. Dapkus*
- 3005 Wide Bandgap Semiconductors for Sensing within Extreme Harsh Environments  
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- 3006 ZnS-based Nanostructures: An Unique UV-Light Sensor  
*X. Fang, L. Hu, and L. Wu*
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- 3009 Resistive Switching in Zinc-Tin-Oxide and Atomic Layer Deposition of Nanolaminates for Amorphous Oxide Semiconductor Thin Film Transistors  
*J. Conley Jr.*
- 3010 Impurity-Induced Disorder in Si- and Mg-doped AlGa<sub>N</sub>-Al<sub>N</sub> Superlattices  
*A. Allerman, J. Wierer, Q. Li, M. H. Crawford, and S. Lee*

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- 3012 Phosphor-Free Green and Yellow LEDs in Nano-Patterned and Polarization Controlled Epitaxy  
*C. Wetzel and T. Detchprohm*
- 3013 Improved Hydrogen Sensing Performance of AlGaIn/GaN based sensor with Platinum Nanonetworks  
*S. Jang, H. Kim, S. Pearton, and F. Ren*
- 3014 Revisiting Impurity Doping of III-Nitride Materials for Optical and Magnetic Device Applications  
*J. M. Zavada*
- 3015 Effects of Proton Irradiation on the Reliability of InAlN/GaN High Electron Mobility Transistors  
*L. Liu, C. Lo, Y. Xi, Y. Wang, H. Kim, H. Kim, S. Pearton, O. Laboutin, Y. Cao, J. Johnson, I. Kravchenko, and F. Ren*
- 3016 Efficiency Droop in GaN-based Light-Emitting Diodes: Mechanisms and Solutions  
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- 3017 GaN HEMT Degradation: Effect of RF Stress  
*E. A. Douglas, B. Gila, F. Ren, C. Abernathy, and S. Pearton*
- 3018 A Survey of Electrical Signatures Characteristic of Step-Stressed InGaP/GaAs HBTs  
*A. G. Baca, A. J. Scruggs, A. Gorenz, T. R. Fortune, J. F. Klem, R. D. Briggs, J. B. Clevenger, G. A. Patrizi, and C. T. Sullivan*
- 3019 Direct Die Solder of GaAs Power Amplifier Dies and Application of Electrolessly Plated Nickel Barrier  
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- 3020 Resistive Switching Characteristics of N-doped ZnO Films Using Atomic Layer Deposition  
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- 3021 Influence of Catalytic Effect on Transport Behaviors of InAs NWs For High Performance Nanoscale Transistors  
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- 3022 Semiconductor Nanostructure Direct-Write Using Scanning Probes and Conducting Stamps  
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- 3024 Why  $\langle 111 \rangle_A$  Pore Propagation Occurs in InP and the Mechanism that Dictates Pore Width  
*R. Lynch, N. Quill, C. O'Dwyer, S. Nakahara, and D. Buckley*
- 3025 TiC Electrode Formed by Multi-Stacking Process for Diamond Contact Metal  
*Y. Tanaka, K. Kakushima, P. Ahmet, Y. Kataoka, A. Nishiyama, N. Sugii, K. Tsutsui, K. Natori, T. Hattori, S. Yamasaki, and H. Iwai*
- 3026 Application of Inline X-ray Metrology for Defect Characterization of III-V/Si Heterostructures  
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- 3027 Advanced Compound Semiconductor and Silicon Fabrication Techniques for Next-Generation Solar Power Systems  
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- 3028 Improvement in Etching Rate of Epilayer Lift-Off for High Concentrated Solar Cell Applications with Low Surface Tension Fluid  
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- 3029 Band Offsets in Dielectric/InGaZnO<sub>4</sub> Heterojunctions  
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- 3030 Anodic Formation of Porous InP in KCl Solutions  
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- 3036 Direct Observation of Conducting Nano filaments in BMO Resistive Switching Memory  
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- 3037 Bloch Oscillations in Two-Dimensional Antidot Arrays  
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- 3039 Sulfide Quantum Dots as a Sensitizer for Titanium Dioxide Photoanodes of Solar Cells  
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- 3040 Multi-Shelled Metal Oxide Hollow Microsphere: Design, Preparation and Property  
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- 3041 Fully Transparent Non-Volatile Memory Using Multi-Layer Graphene Electrode  
*P. Yang, S. Jen, W. Chang, P. Chiu, and J. He*
- 3042 Hybrid Silicon Solar Cells with Hierarchical Structure for Energy Harvesting  
*W. Wei, C. Ho, S. Tai, H. Wang, A. Li, R. Chung, and J. He*

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- 3043 Transparent Amorphous Oxide Semiconductor TFTs: History and current status  
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- 3044 Top-Gate effects in Dual-Gate Amorphous InGaZnO<sub>4</sub> Thin-Film Transistors  
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- 3045 Deposition of Low Stress Amorphous Zinc Tin Oxide at Ambient Temperature using a Remote Plasma Sputtering Process Suitable for Delicate Substrates  
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- 3046 MgZnO/ZnO Heterostructure Field-Effect Transistors Fabricated by RF-Sputtering  
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- 3047 a-InGaZnO Thin-Film Transistor with Non-Vacuum Processed InGaZnO/AlO<sub>x</sub> Gate Dielectric Stack  
*M. Furuta, T. Kawaharamura, T. Toda, and W. Dapeng*
- 3048 Simple Aqueous Solution Route for Fabrication of High Performance Oxide TFT  
*B. Bae, Y. Hwang, J. Seo, and G. Choi*
- 3049 Fabricating Multiple Channeled Zinc Oxide Thin Film Transistor via Sol-Gel Method  
*G. Chiou, S. Liu, S. Chen, and H. Chen*
- 3050 Improvement of Solution-Processed Oxide Thin-Film Transistors by Ultra-Violet Treatment  
*J. Lee, S. Song, D. Kang, Y. Kim, J. Kwon, and M. Han*
- 3051 Light and Bias Induced Defects in a-IGZO Thin Film Transistors  
*P. Migliorato, M. Seok, J. Um, M. Chowdhury, and J. Jang*

- 3052 Improvement of the Photo-Bias Stability of Zn-Sn-O Field effect Transistors by an Ozone Treatment  
*B. Yang, S. Oh, Y. Kim, and H. Kim*
- 3053 Improvement in the Photo-Induced Bias Instability of Oxide TFT by Controlling Sub-Gap States  
*K. Son, T. Kim, J. Park, H. Kim, S. Seo, J. Seon, K. Ji, J. Jeong, H. Lee, S. Im, M. Ryu, and S. Lee*
- 3054 Mixed Oxide Thin Film Transistors Under Combinatory Optical Irradiation and Electrical Bias  
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- 3055 The effect of Zn/Sn Ratio on the Electrical Performance of Amorphous ZrZnSnO (ZZTO) Thin Film Transistors by RF Sputtering  
*I. Chiu, I. Cheng, and J. Chen*
- 3056 Twenty five Years of Improvement of the Silicon Based TFT: From As-Deposited Polycrystalline Silicon to Nanostructured Silicon Deposited at Very Low Temperature  
*T. Mohammed-Brahim and O. Bonnaud*
- 3057 Beyond the Current Horizontal of Silicon Thin Film Technology: Light-Soaking Free Nano-Crystal Embedded Polymorphous Silicon Thin Film and TFT by Neutral Beam Assisted CVD at Room Temperature  
*M. Hong and J. Jang*
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- 3193 Effect of Two-step Oxidation in Ge Condensation on Surface Roughness Property of Relaxed SiGe layer-on-insulator Substrates  
*T. Shim, T. Kim, D. LEE, R. Okuyama, and J. Park*
- 3194 Simple Fabrication of Suspended Germanium Structures and Their Electrical Properties from High Quality Ge on Si(001) Layers  
*V. A. Shah, M. Myronov, C. Wongwanitwatana, R. Morris, M. Prest, J. S. Richardson-Bullock, E. H. Parker, T. E. Whall, and D. R. Leadley*
- 3195 Formation of Graded SiGe on Insulator by Segregation-Controlled Rapid-Melting-Growth  
*R. Matsumura, Y. Tojo, H. Yokoyama, M. Kurosawa, T. Sadoh, and M. Miyao*

- 3196 Modeling Two Dimensional Solid Phase Epitaxial Growth for Patterned Ge Substrates  
*B. L. Darby, B. R. Yates, A. Kumar, A. Kontos, R. Elliman, and K. S. Jones*
- 3197 Germanium/Silicon Heterostructures for Terahertz Emission  
*R. W. Kelsall, V. Dinh, P. Ivanov, A. Valavanis, L. Lever, Z. Ikonic, P. Velha, D. Dumas, K. F. Gallacher, D. J. Paul, J. Halpin, M. Myrnov, and D. R. Leadley*
- 3198 Ge Photodiodes for CMOS Photonics Optical Engines and Interconnects  
*S. Sahni and G. Masini*
- 3199 Long Wavelength {greater than or equal to}1.9  $\mu\text{m}$  Germanium for Optoelectronics Using Process Induced Strain  
*P. Velha, D. J. Paul, M. Myronov, and D. R. Leadley*
- 3200 Single Photon Emitters on Si substrate  
*S. Bietti, L. Cavigli, M. Abbarchi, G. Isella, J. Frigerio, C. Frigeri, A. Vinattieri, M. Gurioli, and S. Sanguinetti*
- 3201 Advanced GE-ON-SI Telecommunication Receivers  
*C. R. Doerr*
- 3202 Heteroepitaxial Lattice Mismatch Stress Relaxation in Nonpolar and Semipolar GaN by Dislocation Glide  
*J. S. Speck*
- 3203 Channel Strain Evolution of Recessed Source/Drain  $\text{Si}_{1-x}\text{C}_x$  Structures by Modifying Scaling Factors  
*S. Kim, D. Byeon, M. Jung, I. Lee, D. Ko, Y. Kim, and H. Lee*
- 3204 High Ge Content SiGe Selective Processes for Manufacturing Source/Drain in the Next Generations of pMOS Transistors  
*A. Hikavy, W. Vanherle, L. Witters, B. Vincent, J. Dekoster, and R. Loo*
- 3205 Formation of Uniaxially Strained Si/Ge Channels on SiGe Buffers Strain-Controlled with Selective Ion Implantation  
*K. Sawano, Y. Hoshi, S. Nagakura, K. Arimoto, K. Nakagawa, N. Usami, and Y. Shiraki*
- 3206 Coherent Manipulation of a Si/SiGe-based Singlet-Triplet Qubit  
*M. G. Borselli*
- 3207 Spin Generation and Relaxation in Ge/SiGe Quantum Wells  
*G. Isella, F. Bottegoni, S. Cecchi, A. Ferrari, F. Ciccacci, F. Pezzoli, A. Giorgioni, E. Gatti, E. Grilli, M. Guzzi, C. Lange, N. Koester, R. Woscholski, S. Chatterjee, D. Trivedi, P. Li, Y. Song, and H. Dery*
- 3208 Enhancement-Mode Buried Strained Silicon Channel Double Quantum Dot with Integrated Electrometer  
*M. Carroll, N. Bishop, T. Lu, T. Pluym, and P. Kotula*

- 3209 Local Quantity Analysis of Nanosize Electronics and Spintronics Material  
*M. Senami and A. Tachibana*
- 3210 (Panel Discussion) How Far Can We Push Si CMOS and What are the Alternatives for Future ULSI  
*D. Harame*
- 3211 GeSn Materials: Challenges and Applications  
*R. Loo, V. Benjamin, F. Gencarelli, E. Geert, W. Liesbeth, C. Matty, H. Marc, and T. Aaron*
- 3212 GeSn Alloys on Si Using Deuterated Stannane and Higher-Order Germanes: Synthesis and Properties  
*G. Grzybowski, R. Beeler, L. Jiang, A. Chizmeshya, J. Kouvetakis, and J. Menendez*
- 3213 Crystalline Properties and Strain Relaxation Mechanism of CVD Grown GeSn  
*F. Gencarelli, B. Vincent, A. Kumar, J. Demeulemeester, A. Vantomme, A. Franquet, J. Meerssaut, W. Vandervorst, R. Loo, M. Caymax, K. Temst, and M. Heyns*
- 3214 Reduced Pressure CVD Epitaxial Growth of  $\text{Ge}_{1-x}\text{Sn}_x$  Using  $\text{SnCl}_4$  and  $\text{Ge}_2\text{H}_6$   
*S. Wirths, D. Buca, A. Tiedemann, P. Bernardy, B. Holländer, T. Stoica, D. Grützmacher, and S. Mantl*
- 3215 Thermal Chemical Vapor Deposition of Epitaxial Germanium Tin Alloys  
*Y. Huang, C. Wang, M. Jin, E. Sanchez, and Y. Kim*
- 3216 Growth and Optical Properties of  $\text{Ge}_{1-x}\text{Sn}_x$  Alloy Thin Films with a High Sn Content  
*S. Zaima, O. Nakatsuka, M. Nakamura, W. Takeuchi, Y. Shimura, and N. Taoka*
- 3217 Growth of  $\text{Ge}_{1-x}\text{Sn}_x$  Alloys Using Combined Sources of Solid Tin and Gaseous Germane  
*S. Su, B. Cheng, D. Zhang, G. Zhang, C. Xue, and Q. Wang*
- 3218 Growth and Characterization of Heteroepitaxial Layers of  $\text{Ge}_{1-x-y}\text{Si}_x\text{Sn}_y$  Ternary Alloy  
*T. Yamaha, O. Nakatsuka, S. Takeuchi, W. Takeuchi, N. Taoka, K. Araki, K. Izunome, and S. Zaima*
- 3219 Single Crystalline GeSn on Silicon by Solid Phase Crystallization  
*R. Lieten, S. Decoster, M. Menghini, J. Seo, A. Vantomme, and J. Locquet*
- 3220 Tin Deuteride ( $\text{SnD}_4$ ) Stabilization  
*R. F. Spohn and C. B. Richenberg*
- 3221 Tin-Incorporated Source/Drain and Channel Materials for Field-Effect Transistors  
*Y. Yeo, G. Han, X. Gong, L. Wang, W. Wang, Y. Yang, P. Guo, B. Liu, S. Su, G. Zhang, C. Xue, and B. Cheng*

- 3222 GeSn Channel n and p MOSFETs  
*S. Gupta, R. Chen, B. Vincent, D. Lin, B. Magyari-Kope, M. Caymax, J. Dekoster, J. S. Harris, Y. Nishi, and K. Saraswat*
- 3223 High Hole Mobility in Strained Germanium-Tin (GeSn) Channel pMOSFET Fabricated on (111) Substrate  
*G. Han, S. Su, Y. Yang, P. Guo, X. Gong, L. Wang, W. Wang, C. Guo, G. Zhang, C. Xue, B. Cheng, and Y. Yeo*
- 3224 Negative Bias Temperature Instability Study on Ge<sub>0.97</sub>Sn<sub>0.03</sub> P-MOSFETs with Si<sub>2</sub>H<sub>6</sub> Passivation, HfO<sub>2</sub> High-k Dielectric and TaN Metal Gate  
*X. Gong, S. Su, B. Liu, L. Wang, W. Wang, Y. Yang, E. Kong, B. Cheng, G. Han, and Y. Yeo*
- 3225 Si/SiGe Thermoelectric Generators  
*D. J. Paul, A. Samarelli, L. Ferre Llin, Y. Zhang, J. Weaver, P. Dobson, S. Cecchi, J. Frigerio, F. Isa, D. Chrastina, G. Isella, T. Etzelstorfer, J. Stangl, and E. Müller Gubler*
- 3226 SiGe Band-to-Band Tunneling Calibration based on p-i-n Diodes: Fabrication, Measurement and Simulation  
*K. Kao, A. Verhulst, R. Rooyackers, A. Hikavy, R. Loo, A. Milenin, J. Tolle, H. Dekkers, E. Simoen, V. Machkaoutsan, J. Maes, K. De Meyer, N. Collaert, M. Heyns, C. Huyghebaert, and A. Thean*
- 3227 Tunneling Field-Effect Transistor with Novel Ge/In<sub>0.55</sub>Ga<sub>0.47</sub>As Tunneling Junction  
*P. Guo, Y. Yang, Y. Cheng, G. Han, C. Chia, and Y. Yeo*
- 3228 Germanium Tin Tunneling Field Effect Transistor for Sub-0.4 V Operation  
*Y. Yang, K. Low, G. Han, and Y. Yeo*
- 3229 Si/SiGe Tunneling Static Random Access Memories  
*G. Ternent and D. J. Paul*
- 3230 Ge Surface-Energy-Driven Secondary Grain Growth for Vertical Channel in 3D NAND Flash Memories  
*S. Lee, Y. Son, and E. Yoon*
- 3231 Epitaxial Growth and Applications of Low-Resistivity Phosphorous-Doped Si<sub>1-x</sub>C<sub>x</sub>  
*T. N. Adam, N. Loubet, A. Reznicek, V. K. Paruchuri, R. Sampson, and D. Sadana*
- 3232 Selective Epitaxial Growth of Heavily Boron-Doped Silicon with Uniform Doping Depth Profile  
*Z. Zhu, Z. Cong, and R. Balasubramanian*
- 3233 High Tensile Strained In-Situ Phosphorus Doped Silicon Epitaxial Film for nMOS Applications  
*Z. Ye, S. Chopra, R. Lapena, Y. Kim, and S. Kuppurao*

- 3234 Microstructure Development and Its Effects on the Electrical Properties in Epitaxially Grown In-Situ Boron and Carbon (co)-doped Highly Strained High Percentage Silicon-Germanium Layers  
*A. Reznicek, T. N. Adam, J. Li, Z. Zhu, H. Hovel, J. de Souza, S. W. Bedell, V. Paruchuri, and D. Sadana*
- 3235 In Situ Boron (B) Doped Germanium (Ge:B) Grown on (100), (110), and (111) Silicon: Crystal Orientation and B Incorporation Effects  
*G. Han, Q. Zhou, P. Guo, W. Wang, Y. Yang, and Y. Yeo*
- 3236 Materials Integration for III-V/SiGe+CMOS Integrated Circuit Platforms (Invited)  
*E. A. Fitzgerald, P. Sharma, M. Bulsara, T. Milakovich, S. Ringel, A. Pitera, J. Hennessy, and A. Malonis*
- 3237 Heterogeneous Integration of III-V Devices and Si CMOS on a Silicon Substrate  
*T. Kazior*
- 3238 Heterogeneous Integration of InP HBTs on CMOS: Leveraging and Providing Value to Conventional Silicon Technologies  
*J. C. Li, Y. Royter, P. Patterson, T. Hussain, J. Duvall, M. Montes, I. Valles, F. Ku, M. Boag-O'Brien, A. Lopez, D. Le, D. Zehnder, S. Kim, S. Chen, T. Oh, M. Akmal, E. Wang, D. Hitko, M. Sokolich, D. Chow, P. Brewer, and K. Elliott*
- 3239 Wafer-level Heterogeneous Integration of GaN HEMTs and Si (100) MOSFETs  
*H. Lee, Z. Li, M. Sun, K. Ryu, and T. Palacios*
- 3240 Scalable GaN-on-Silicon Using Rare Earth Oxide Buffer Layers  
*F. Arkun, M. Lebbby, R. Dargis, R. Roucka, R. S. Smith, and A. Clark*
- 3241 Formation and Characterization of Nickel Germanosilicide on  $\text{Si}_{1-x}\text{Ge}_x/\text{Si}/\text{SiO}_2/\text{Si}$   
*W. Yoo, N. Hasuike, H. Harima, and M. Yoshimoto*
- 3242 Low Specific Ohmic Contacts to n-type Germanium Using a Low Temperature NiGe Process  
*K. F. Gallacher, P. Velha, D. J. Paul, I. Maclaren, M. Myronov, and D. Leadly*
- 3243 Formation of 1.7-nm-thick-EOT Germanium Dioxide Film with a High-Quality Interface Using a Direct Neutral Beam Oxidation Process  
*A. Wada, R. Zhang, S. Takagi, and S. Samukawa*

### **F1 - Bio-Enabled Materials, Processes, and Devices**

*ECS Electrodeposition, ECS Physical and Analytical Electrochemistry, ECS Sensor, ECSJ*

- 3244 (Invited) DNA-Translocation through a Solid-State Nanopore Coated with a Functionally Switchable Self-Assembled Monolayer  
*S. Harrer, D. Wang, B. Luan, G. Stolovitzky, H. Peng, and A. Afzali-Ardakani*
- 3245 (Invited) Electrochemical Biosensors for Detecting Pathogens  
*W. R. Heineman, X. Guo, A. Kulkarni, S. Iyer, and H. Halsall*



- 3246 Iridium Oxide Hybrids as Electrodes for the Neural System  
*N. M. Carretero, J. Moral, A. Cruz, and N. Casañ-Pastor*
- 3247 (Invited) Hierarchical Assembly of Materials Using Biological Building Blocks  
*S. Kim, M. Vasudev, J. Slocik, S. Jones, T. Bunning, and R. Naik*
- 3248 (Invited) Biologically Inspired Synthesis of a Photocatalytically Active Membrane for Water Treatment  
*N. Kinsinger, A. Dudchenko, A. Wong, D. Li, and D. Kisailus*
- 3249 Bio-Inspired Chemistry for Electrophoretic Nanotechnology  
*I. Zhitomirsky*
- 3250 (Invited) Rational Design of Proteins for Modulation of Materials Growth Processes  
*D. T. Schwartz*
- 3251 (Invited) Selective Metallization of Scaffolded DNA Origami to Form Self-Assembled Nanoelectronic Systems  
*A. T. Woolley, Y. Geng, E. Pound, M. Lydiksen, A. Pearson, J. Liu, B. Uprety, R. Davis, and J. N. Harb*
- 3252 DNA/Metal Nanoparticles Functionalized Single-Walled Carbon Nanotubes Based Gas Sensor Arrays  
*H. C. Su, M. Zhang, J. Lim, and N. Myung*
- 3253 Use of Galvanic Displacement to Fabricate DNA-Templated Tellurium and Bismuth Telluride Nanowires  
*J. Liu, B. Uprety, N. Myung, and J. N. Harb*
- 3254 (Invited) Modification of Solid Surface with Self-Assembled Monolayer for Chiral Sensing  
*T. Nakanishi and T. Osaka*
- 3255 Design of Molecular Recognition Interface for Detecting Carbohydrate and Lectin Weak Interactions  
*Y. SATO, K. Yoshioka, T. Murakami, and O. Niwa*
- 3256 Interfacial Structure and Function of Nano-Structured Membranes of Newly Synthesized Phosphorylcholine Derivatives  
*T. Sawaguchi and M. Tanaka*
- 3257 A Study on the Effect of Novel Surface Treatments and Biodegradable Polymer Coatings on Corrosion and Surface Properties of Ternary Nitinol Alloys  
*C. Pulletikurthi and N. Munroe*
- 3258 Using Biocompatible Ionic liquid to Control the Corrosion of Mg Alloys in Simulated Body Fluid  
*Y. Zhang, B. Hinton, G. Wallace, X. Liu, and M. Forsyth*

- 3259 Development of Novel Guided Tissue Regeneration Membranes for Biomedical Applications  
*Y. C. Chen and K. Ou*
- 3260 Multifunctional Biodegradable Cross-Linked Polymer Research and Development and Clinical Application of Animal Experiments  
*W. Su and K. Ou*
- 3261 Investigating Phosphonate Monolayer Stability as Protective Coatings for Retinal-Neural Sensors  
*B. A. Branch, M. Dubey, A. Aaron, K. Baldwin, A. M. Dattelbaum, and D. Petsev*

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

*ECS Electrodeposition, ECSJ Nano-Micro Fabrication*

- 3262 On the Structure of the Helmholtz Layer at the Solid-Electrolyte Boundary and its Relation to Electrode Kinetics  
*H. J. Lewerenz*
- 3263 Metal Deposition on Metal, Semiconductor, Organic Layer - Common Interests with Prof. Dieter Kolb  
*K. Uosaki*
- 3264 Underpotential Deposition of Cu on Au(111) in Acid Sulfate Solution  
*N. Vasiljevic, L. Viyannalage, N. Dimitrov, and K. Sieradzki*
- 3265 Tuning the Driving Force in Underpotential Codeposition of Alloys via Selective Complexation: Application to Au-Cu Alloys  
*D. Liang and G. Zangari*
- 3266 Lead Underpotential Deposition on Sub-Monolayer Pt and Ru Modified Au(111) Surface  
*Q. Yuan, A. Tripathi, M. Slavkovic, and S. Brankovic*
- 3267 EC-STM Study of Two-Dimensional Complex Adlayer Directly Formed on Au(111)  
*S. Yoshimoto and K. Nishiyama*
- 3268 Characterisation of the Deposition of n-octanohydroxamate on Copper Surfaces  
*G. K. Parker, S. Holt, and G. Hope*
- 3269 Electrochemical Formation of Cu-Corrone Adlayer on Au(111) in Acidic Solution  
*T. Sawaguchi and S. Yoshimoto*
- 3270 E-ALD of Pd on Au Single Crystals  
*L. Sheridan, Y. Kim, J. Stickney, and D. B. Robinson*
- 3271 Layer-by-layer Pt Electrodeposition on Au Single Crystal Surfaces Studied by In situ Resonance Surface X-ray Scattering  
*T. Kondo, M. Shibata, T. Masuda, and K. Uosaki*

- 3272 The Evolution of Surface Morphology and Stress in Electrodeposited Copper Nanofilms  
*M. O'Grady, C. Lenihan, and D. Buckley*
- 3273 Electrochemical Impedance Spectroscopy Applied to Cantilever Curvature  
*M. C. Lafouresse, U. Bertocci, C. Beauchamp, and G. Stafford*
- 3274 Controlling Pt Nucleation and Growth by Solution Chemistry and Deposition Conditions  
*Y. Liu, D. Gokcen, U. Bertocci, and T. Moffat*
- 3275 XAS Study of Core-Shell PtRu Nanoparticles from Galvanic Pulse Current Deposition  
*Y. Hsieh, L. Chang, P. Wu, and J. Lee*
- 3276 Electroforming of Thick Film Bi<sub>2</sub>Te<sub>3</sub>-based Thermoelectrics  
*C. L. Arrington, P. Sharma, J. Coleman, E. Baca, A. Rowen, D. Banga, D. B. Robinson, and V. Stavila*
- 3277 Electrodeposition of Sb<sub>x</sub>Te<sub>y</sub> and Bi<sub>x</sub>Te<sub>y</sub> Thin Films for Thermoelectric application  
*J. Lim, I. Yoo, N. Myung, Y. Song, D. Chang, D. Lim, Y. Kim, and K. Lee*
- 3278 Wear and Corrosion Resistance of Cr-C Deposits Obtained from a Trivalent Chromium Electroplating Bath with the Addition of Nanosized Al<sub>2</sub>O<sub>3</sub> Powder  
*C. Huang, C. Chuang, and C. Lin*
- 3279 Effects of Sonication on Electrodeposited Nickel-based Carbon Nanotube Composites Coatings  
*T. Suzuki and M. Kato*
- 3280 Application of Artificial Neural Networks to Predict Chemical Composition of Electrodeposited Nanocrystalline Ni-Mo Thin Films  
*M. Allahyarzadeh, A. Ashrafi, B. Roozbehani, and A. Seddighian*
- 3281 Stepwise Anodizing Processes for Hierarchical Nanoporous Structures  
*C. Jeong and C. Choi*
- 3282 Dependence of Fermi Level in Conducting Polymers Joined with Oxide Semiconductor on Its Crystal Plane  
*Y. Fujikawa, J. Kawakita, T. Chikyow, and Y. Sakamoto*
- 3283 Photoluminescence Properties of Electrodeposited Porous Silicon/ Cerium oxide Composite  
*M. Mizuhata and Y. Kubo*
- 3284 Superconformal Film Growth: Challenges and Opportunities  
*T. Moffat, G. Liu, S. Zou, L. Richter, L. Ou Yang, C. Lee, and D. Josell*
- 3285 Beyond Interfacial Anion/Cation Pairing: The Role of Cu(I) Coordination Chemistry for the Action of Leveler Additives in Copper Electroplating  
*M. Hai, F. Janser, T. Brunner, A. Fluegel, F. Simona, M. Cascella, K. Kraemer, D. Mayer, M. Arnold, and P. Broekmann*

- 3286 Influence of Glycine as Additive on Cobalt Electrodeposition  
*R. A. Critelli and P. Sumodjo*
- 3287 Mechanistic Studies of Zinc Electrodeposition from Deep Eutectic Electrolytes  
*L. Vieira, B. Gollas, and R. Schennach*
- 3288 Theoretical Analysis of the Solvent Effect on Hypophosphite Ion Adsorption on Pd and Cu Surfaces  
*M. Kunimoto, K. Seki, H. Nakai, and T. Homma*
- 3289 Electrodeposition of FeRh Alloys: Influence of Ag Underlayer  
*R. Della Noce, D. Cornejo, H. Kumar, and A. Benedetti*
- 3290 Surface Alloy Formation During Pb UPD on Cu(100) and Its Role in Cu-Pb Alloy Deposition  
*D. Gokcen, C. Hangarter, and T. Moffat*
- 3291 An Environmentally Friendly Process for Electroplating Copper on Zinc  
*C. Liao, F. Ernst, and U. Landau*
- 3292 Study of the Copper Electrodeposition Mechanism on Molybdenum Substrate  
*E. Delbos, H. El Belghiti, D. Mercier, J. Vigneron, M. Bouttemy, and A. Etcheberry*
- 3293 Deposition of Metallic Nanoparticles; Variations of Particle Size  
*T. Brülle, O. Schneider, and U. Stimming*
- 3294 Electrodeposition of Arrays of Au/NiO/Au Nanowire Heterostructures for ReRAM Applications  
*D. Perego, S. Franz, M. Bestetti, S. Brivio, G. Tallarida, and S. Spiga*
- 3295 Crystal Orientation of Iron Produced by Electrodeoxidation of Hematite Particles  
*M. Tokushige, O. Kongstein, and G. Haarberg*
- 3296 Study of the Electrodeposition of Zn-TiO<sub>2</sub> Dispersion Coatings  
*M. K. Camargo, U. Schmidt, and A. Bund*
- 3297 Epitaxial Growth of Au on Pt (111) and Pt (poly) by Surface Limited Redox Replacement of Pb UPD Layer  
*N. Dimitrov, C. Mitchell, and M. Fayette*
- 3298 Implications on the Use of 1-D and 2-D Models for Metal Electrodeposition: Voltammetry and Impedance Analysis  
*J. G. Vazquez and M. Pritzker*
- 3299 Understanding the Mechanism of Functional Molecules in Shape-Controlled Synthesis of Nanomaterials -- In Situ FTIR Spectroscopic Study of Citrate Adsorption on Pt Polycrystalline and Single Crystal Electrodes  
*D. Chen, J. Ye, C. Xu, X. Li, J. Li, C. Zhen, and S. Sun*

- 3300 Fabrication of Low CTE Metal Masks by the Invar Fe-Ni Alloy Electroforming Process for Large and Fine Pitch OLED Displays  
*T. Nagayama, T. Yamamoto, T. Nakamura, and Y. Mizutani*
- 3301 Synthesis and Characterization of Electrodeposited Cu<sub>2</sub>O Thin Film for Photo-Electrochemical Cells  
*M. Kim, S. Yoon, D. Chang, N. Myung, D. Lim, I. Kim, B. Yoo, K. Lee, and J. Lim*
- 3302 Characterization of Zn-Ni-P alloys Electrodeposited in Alkaline Solutions  
*Y. Kamimoto, K. Yamamoto, S. Yamashita, and R. Ichino*
- 3303 The Electrodeposition of Zinc-Bismuth Alloys  
*A. Luegger, B. Gollas, and J. Zidar*
- 3304 Influence of Adatom Supersaturation on Real Activation Energy of Charge Transfer Stage during Metal Electrocrystallization  
*I. Kryshchok, N. Yurchenko, and V. Trofimenko*
- 3305 Electrochemical Assembly of Ruthenium Complexes during the Multilayering Process of MnO<sub>2</sub>  
*K. Tomono, R. Yamaguchi, and M. Nakayama*
- 3306 AFM Analysis for Initial Stage of Electroless Displacement Deposition of Silver on Silicon Surface  
*T. Ego, S. Yae, T. Hagihara, N. Fukumuro, and H. Matsuda*
- 3307 Fabrication of Cu-Ag Film Using Electrodeposition and Characterization of Its Properties  
*H. Ko, M. Kim, J. Kim, and O. Kwon*
- 3308 Degradation of Additives and Its Influences on Copper Electrodeposition  
*S. Choe, M. Kim, H. Kim, T. Lim, A. Lee, S. Jun, K. Woo, and J. Kim*
- 3309 Electrodeposition of CoNiW Alloys: HCP-FCC Structural Transition  
*A. M. Sakita, R. Della Noce, C. Sadao Fugivara, and A. Vicente Benedetti*
- 3310 Electrochemical Formation of Functional Silver Coatings: Nanostructural Peculiarities  
*O. Bersirova and V. Kublanovsky*
- 3311 High Temperature Hardness of Electrodeposited Nickel-based Carbon Nanotube Composite Coatings  
*T. Suzuki, M. Kato, T. Matsuda, and S. Kobayashi*

### **F3 - Electroless Deposition: Principles, Activation, and Applications 2**

*ECS Electrodeposition, ECSJ, CSE*

- 3312 Influence of Added Elements on Electroless Ni-P  
*P. Cavallotti and L. Magagnin*

- 3313 Corrosion of Copper and Nickel During Electroless NiP/Pd Deposition  
*C. S. Tiwari and R. Nguyen*
- 3314 Electrochemical Evaluation of Electroless Ni-Zn-Cu-P Alloy Deposition  
*M. Zaimi and K. Noda*
- 3315 Deposition of Thin Metallic Films on Semiconductor Substrates  
*S. Djokic, N. Djokic, and T. Thundat*
- 3316 Copper Electroless Deposition on a Glass Substrate  
*P. Chan and W. Dow*
- 3317 Co-Ni Electroless Composite Plating of 20 nm Diamond particles on 10 micrometer Plastic Balls and the Application of thus prepared devices to Post CMP Processes  
*S. Yoshihara*
- 3318 Impact of the Silicon Substrates Cleaning and Activation in the Nickel Electroless Plating  
*M. Boutemy, H. El Belghiti, D. Aureau, E. Delbos, and A. Etcheberry*
- 3319 Fluoride Free Galvanic Displacement of Copper and Silver as Surface Modifications for MEMS  
*D. Serrao, A. Raygani, and L. Magagnin*
- 3320 Solution-Source Vapor-Phase Mist Deposition Method for Future Roll-to-Roll Process in Semiconductor Device Fabrication  
*S. Fujita, S. Katori, T. Ikenoue, and J. Piao*
- 3321 Effect of Light/Heat on Fast Formation Reaction of Highly-Conductive Polymer with Metal Shell Structure  
*Y. Hashimoto, J. Kawakita, T. Chikyow, and Y. Sakamoto*
- 3322 Deposition Rate of Metal on Conducting Polymer Under Photo Irradiation  
*H. Fujihira, J. Kawakita, T. Chikyow, and Y. Sakamoto*
- 3323 On the Mechanism of Electroless Deposition of Ni-P: Electrochemical and Computational Investigations  
*L. Magagnin, C. Cavallotti, and P. Cavallotti*
- 3324 Electroless Deposition for Developing ATR Surface Enhanced IR Spectroscopy  
*W. Cai*
- 3325 Investigation of Reactions and Additive Effects in Electroless Deposition by In-Situ Transmittance Measurement  
*K. Park, T. Lim, M. Kim, and J. Kim*
- 3326 Factors Affecting Reaction Rates of Chemical Bath Deposition of Copper Oxide Thin Films  
*J. Sasano, Y. Adachi, and M. Izaki*

- 3327 The Interaction of Tantalum with Tellurite Ions in Basic Solution  
*C. Tsang and J. Stickney*
- 3328 Electroless Atomic Layer Deposition: a Scalable Approach to Tailored Surface Structures  
*D. B. Robinson, P. Cappillino, L. Sheridan, and J. Stickney*
- 3329 Electroless Deposition of Cu and Ag on Valve Metal Substrates  
*L. Nolan, S. Djokic, K. Cadien, and T. Thundat*
- 3330 Chemical Modification of Nano-Nonwoven Fabrics Using Electrochemical and Electroless Deposition  
*S. Ndzesse and C. Shannon*
- 3331 Miniature Fuel Cell with Monolithically Fabricated Si Electrodes -Reduction of Pt by UPD-SLRR-  
*D. Ogura, T. Honjo, and M. Hayase*
- 3332 Large Scale, Electroless Synthesis of Highly Stable Flower-like Silver Nanostructures by a Templateless Method for SERS Application  
*C. Desmonda and Y. Tai*
- 3333 SERS-Active Substrates Fabricated by Displacement Deposition of Metals on Porous Silicon  
*K. Artsemyeva, H. Bandarenka, A. Panarin, I. Khodasevich, S. Terekhov, M. Balucani, and V. Bondarenko*
- 3334 The Kinetic Parameter of the Ni-W Alloy Electrodeposition  
*H. Xiao, N. Yu, Y. Feng, and Z. Liu*
- 3335 Cohesion Property of Electroless Plated Ni-P Coating on Fiber Bragg Grating  
*L. Fang, P. Zhang, A. Tang, and S. Xue*
- 3336 Oxygen-Assisted Vacuum Ultra-Violet Surface Modification of Polymers as a Pretreatment for Electroless Nickel Plating  
*A. Nakamura, N. Mukado, T. Ichii, and H. Sugimura*
- 3337 Enhanced Pd Distribution by Three-Step Activation Process for Electroless Cu Plating  
*C. Lee, H. Lee, M. Lee, J. Hur, and H. Lee*
- 3338 Preparation and properties of Ni-Co-P/nano-sized SiC electroless composite coatings  
*J. Hu, L. Fang, P. Zhong, and Y. Yang*
- 3339 Raman and DFT study of Reductant Adsorption on Metal Surfaces in Electroless Deposition Process  
*B. Jiang, M. Kunimoto, M. Yanagisawa, and T. Homma*

#### **F4 - Emerging Materials and Processes for Energy Conversion and Storage**

*ECS Electrodeposition, ECS Battery, ECS Energy Technology, ECSJ*

- 3340 (Invited) The Battery of the Future: Using Computational Modeling to Understand the Limits of Intercalation Systems Across a Wide Range of Chemistries  
*G. Ceder*
- 3341 Single-Step and Low-Temperature Synthesis of Layered LiCoO<sub>2</sub> Thin Film Electrodes: An Electrochemical-Hydrothermal Route  
*H. Porthault, F. Le Cras, and S. Franger*
- 3342 (Invited) Fabrication of Rechargeable Micro Lithium-Ion Battery with 3D Anode and 3D Cathode  
*K. Kanamura, K. Yoshima, and H. Munakata*
- 3343 Energy Harvesting Device  
*Y. Garsany and K. Swider-Lyons*
- 3344 Fundamental Study of Li Dendrite Growth in Ionic Liquid  
*T. Nishida, K. Nishikawa, T. Homma, Y. Fukunaka, and M. Rosso*
- 3345 Effect of Dissolved Gas in an Ionic Liquid Electrolyte for Lithium and Lithium/Sodium Metal Anode  
*J. K. Stark and P. Kohl*
- 3346 Two-dimensionally Patterned Electrodeposition of Sn Film from Aqueous Acid Bath  
*S. Yagi, E. Takeda, T. Okada, D. Mu, N. Okamoto, T. Saito, and K. Kondo*
- 3347 Porous Li<sub>2</sub>MnO<sub>3</sub> as a High Capacity and High Rate Capability Cathode Material  
*M. Nookala, T. Penki, and S. Duraisamy*
- 3348 Synthesis and Electrochemical Properties of Cation Doped Spinel LiM<sub>x</sub>Mn<sub>2-x</sub>O<sub>4</sub> (M=Ni, Al; 0 ≤ x ≤ 0.5) Cathode Materials for Li-Ion Battery  
*M. A. Kebede, N. Kunjuzwa, K. I. Ozoemena, and M. K. Mathe*
- 3349 Improved Lithium Storage and Cyclability in Graphene/Graphene Oxide Wired Mesoporous SnO<sub>2</sub>  
*K. Shiva and A. J. Bhattacharyya*
- 3350 (Electrodeposition Division Research Award Presentation) Electrodeposition for the Synthesis of Thin Film Solar Cells  
*L. Deligianni*
- 3351 (Invited) New Paradigms for Cost-Effective III-V Photovoltaic Technology  
*D. Shahrjerdi, S. W. Bedell, B. Hekmatshoar, C. Bayram, N. Li, K. Fogel, P. Lauro, J. Ott, M. Hopstaken, and D. Sadana*
- 3352 Silicon Bonding State in Films Electrodeposited from SiCl<sub>4</sub> in Ionic Liquid  
*J. Komadina, T. Akiyoshi, Y. Ishibashi, X. Wang, Y. Fukunaka, P. Pianetta, and T. Homma*



- 3353 Novel Front Side Metallization Processes for Silicon based Solar Cells  
*A. Bund, M. Fritz, U. Schmidt, O. Luehn, and H. Kuehnlein*
- 3354 (Invited) CIGS-Based Solar Cells Prepared from Electrodeposited Precursor Films  
*R. N. Bhattacharya and Y. Kim*
- 3355 One-Step Electrochemical Deposition of Cu-In-Ga Mixed Oxide Thin Films for Low-Cost CIGS Solar Cells  
*E. Chassaing, A. Duchatelet, T. Sidali, G. Savidand, and D. Lincot*
- 3356 Electrophoretic Deposition: A Bottom-up Approach to Functional Nanocomposite Films  
*M. A. Worsley, A. Pascall, K. Sullivan, T. Olson, C. Orme, J. Satcher, and J. Kuntz*
- 3357 Electrodeposition of Elements for Thin Film, Photovoltaic Applications: Citrate Complexation and Partial Current Densities  
*S. S. Zahmi and E. Podlaha*
- 3358 Wet Clean Efficiency Monitor by SP3 SM  
*Y. Chang Chien, M. Yeh, C. Yang, S. Ku, C. Wan, C. Hu, E. Chen, J. Yan, E. Khuan, K. Joyce, and C. Hu*
- 3359 Tuning of Mesopore Size in WO<sub>3</sub>-based Photoanodes for Enhanced Visible Light Driven Water Oxidation  
*D. Chandra and M. Yagi*
- 3360 CIS Thin Film Solar Cells from Electrodeposited Cu/In Stacked Precursors  
*Y. Kim, S. Chae, S. Yoon, M. Jeon, and R. N. Bhattacharya*
- 3361 Various Metal Oxides based Dye-Sensitized Solar Cells  
*S. Kang*
- 3362 Fabrication Mediated by Self-Assembly of Block Copolymer and Photoelectrochemical Properties of Mesoporous WO<sub>3</sub> Films  
*D. Chandra, K. Ouchi, and M. Yagi*
- 3363 Preparation and Photoanodic Properties of a Chromium-Electrodeposited TiO<sub>2</sub> Electrode  
*R. Tsuruya, M. Kajita, N. Abe, A. Shoji, and M. Yagi*
- 3364 Energy Storage Devices from Biomass Conversion Byproducts, Lignin  
*J. Yang, S. Gunasekaran, and S. Gunasekaran*
- 3365 Pore-Filling Anion-Exchange Membranes for Non-Aqueous Redox Flow Batteries (RFBs)  
*M. Kang, M. Lee, J. Kim, H. Cha, and J. Park*
- 3366 Novel Graphene - Polyethylene Oxide Composite Electrolyte for Highly Efficient Solid State Dye Sensitized Solar  
*M. Akhtar, Z. Li, J. Jang, and O. Yang*

- 3367 Designing the Far-red Sensitive Squaraine Dyes for Dye-Sensitized Solar Cells in the Light of Photo-Physical Investigations  
*S. S. Pandey, R. Watanabe, Y. Ogomi, G. Miguel, M. Marchena, A. Douhal, and S. Hayase*
- 3368 Graphene-Quantum Dots Composite for Photovoltaic Devices  
*S. Guo, W. Wang, C. Ozkan, and M. Ozkan*
- 3369 Electrodeposition of Zn-based Chalcogenide Materials  
*K. Park, D. Kim, and B. Yoo*
- 3370 Electrodeposition and Growth of Widegap Copper Indium Selenide Thin Films  
*S. Menezes and Y. Li*
- 3371 Possibility of Large-Size Single Crystal Growth in Seed Cast-Grown Monocrystalline Silicon  
*B. Gao, H. Harada, Y. Miyamura, S. Nakano, and K. Kakimoto*
- 3372 High Performance of "Intelligent" Conductive Ceramic Anodes for Solid Oxide Fuel Cells Based on Infiltration  
*L. Adijanto, V. Balaji Padmanabhan, R. Küngas, J. Vohs, and R. Gorte*
- 3373 Synthesis and Characterization of Molybdenum Nitride for Electrosynthesis Applications  
*M. Sykora, A. H. Mueller, C. R. Kreller, E. L. Brosha, and F. H. Garzon*
- 3374 Enhancement of Visible-Light-Induced Oxygen Evolution at a WO<sub>3</sub> Film by Cobalt Ions in an Electrolyte Solution  
*M. Yagi and M. Kajita*
- 3375 Investigation of Carbon Deposition in Three-Dimensionally Ordered Macroporous Ni-YSZ Anode  
*H. Munakata, Y. Katsuki, and K. Kanamura*
- 3376 Phase Analysis and Electrical Conductivity of Mn-doped and Fe-doped Ceria  
*L. Zhao, S. R. Bishop, and K. Sasaki*
- 3377 Sulfonated Polyether Ether Ketone (SPEEK) Membrane for Water Electrolysis  
*R. Venkatkarthick, A. Sankari, S. Meenakshi, S. D. Bhat, P. Sridhar, S. Pitchumani, S. Vasudevan, D. Jonas Davidson, G. Sozhan, and S. Ravichandran*
- 3378 Effects of Sr Doping on Crystallization, Conductivity and Vanadium Reduction of La<sub>1-x</sub>Sr<sub>x</sub>VO<sub>3</sub> Electrode in Reducing Atmosphere  
*K. Fung, C. Liu, C. Ni, and S. Tsai*
- 3379 Effect of Nickel Surface Structure on Urea Electrolysis: An Experimental Study  
*B. Hassler, D. A. Daramola, A. Miller, and G. G. Botte*

- 3380 (Invited) A Bilayer Membrane of Photocatalytic Nanotube Array and Hydrogen Permeable Metal for High-Purity Hydrogen Production  
*K. Noda and M. Hattori*
- 3381 Electrodeposited Pt<sub>100-x</sub>Pb<sub>x</sub> Alloys and Intermetallics for Direct Formic Acid Fuel Cell  
*S. Hwang, J. Bonevich, J. Kim, and T. Moffat*
- 3382 Characterization of the Electronic and Electrochemical Properties of Cu<sub>2</sub>O and Fe<sub>2</sub>O<sub>3</sub> modified TiO<sub>2</sub> Nanotubes  
*L. Tsui and G. Zangari*
- 3383 Direct Electrodeposition of Porous Platinum  
*L. Jones, A. Ott, T. Junk, and S. Bhargava*
- 3384 The Effect of Surface Modification on the Properties of a Nickel Catalyst: A Theoretical Study  
*D. A. Daramola, B. Hassler, and G. G. Botte*
- 3385 Preparation of Nanostructured Pd Anodes for Alkaline Direct Ethanol Fuel Cells (DEFC) by Electrochemical Milling and Faceting (ECMF)  
*Y. Chen, A. Lavacchi, F. Vizza, A. Marchionni, J. Filippi, M. Bevilacqua, M. Innocenti, and H. Miller*
- 3386 Bringing Conjugated Polymers and Oxide Nanoarchitectures into Intimate Contact: Light Induced Electrodeposition of Polypyrrole and Polyaniline on Nanoporous WO<sub>3</sub> or TiO<sub>2</sub> Nanotube Arrays  
*C. Janaky, N. de Tacconi, W. Chanmanee, and K. Rajeshwar*
- 3387 The Mechanism of Visible-Light-Derived Photocurrent Generation at an Antimony Sulfide / Metal Oxide Electrode  
*A. Shoji, T. Ueno, H. Kabaki, S. Okuyama, and M. Yagi*
- 3388 Carbon-Supported Iron(III)-Corrole as a Non-Precious Metal Catalyst for Fuel Cell Application  
*I. Shown, H. Huang, S. Wang, S. Chang, H. Hsu, H. Du, C. Wang, L. Chen, and K. Chen*
- 3389 Photoelectrochemical Generation of Hydrogen Using p-type CaFe<sub>2</sub>O<sub>4</sub> Photocathodes  
*R. Venkatkarthick, C. Krithiga Devi, L. John Berchmans, S. Vasudevan, D. Jonas Davidson, G. Sozhan, and S. Ravichandran*
- 3390 Development of Electrically Controlled Energetic Materials (ECEM)  
*E. Rozumov, K. Chung, D. Kaminsky, P. Anderson, P. Cooke, K. Griswold, M. Donadio, M. Sussman, J. Laquidara, C. Adam, D. Thompson, T. Manning, J. Wyckoff, V. Panchal, E. Caravaca, W. Sawka, M. McPherson, and T. Buescher*

## F5 - Magnetic Materials and Devices 12

*ECS Electrodeposition, ECSJ Magnetic Materials Processes and Devices*

- 3391 Thin Film Magnetic Heads - Early Inventions and Their Ongoing Impact on Magnetic Storage and on Electrochemistry  
*L. T. Romankiw and S. Krongelb*
- 3392 Beyond Perpendicular Magnetic Recording- Alternative Magnetic Storage Technologies  
*N. robertson*
- 3393 Electrodeposition of Magnetic Alloys Used in Fabrication of Recording Heads  
*I. Tabakovic, S. Riemer, J. Gong, V. Venkatasamy, and M. Kautzky*
- 3394 Magnetic Tape Heads and Contact Recording  
*R. G. Biskeborn*
- 3395 Electrochemical Deposition of Magnetic Alloy Films with Large Magnetic Anisotropy  
*D. Liang and G. Zangari*
- 3396 Reversible Change of Magnetism in FePt and CoPt Films by Electrochemical Charging  
*K. Leistner*
- 3397 Resistivity Control in CoFeNiX Magnetic Alloys  
*N. Dole, D. Lee, N. Brockie, A. Papou, W. French, and S. Brankovic*
- 3398 Composition Gradients and Magnetic Properties of 10-100nm NiFe and CoFe Films Obtained by Electrodeposition  
*J. Gong, S. Riemer, V. Venkatasamy, M. Kautzky, and I. Tabakovic*
- 3399 Development of Thin Film Technology for High-Density Magnetic Recording Media  
*M. Futamoto*
- 3400 Electroplated Hardmask for Bit Patterned Media Nanoimprinting Template Fabrication using Block Copolymer Lithography  
*C. Bonhote, G. Siddiqi, J. Lille, and R. Ruiz*
- 3401 Microstructural and Magnetic Studies of Electrodeposited, Equiatomic Fe-Pt Films  
*D. Liang and G. Zangari*
- 3402 Metastable  $L1_1$  and  $B_2$  Ordered Phase Formation in CoPt Alloy Thin Films Epitaxially Grown on Metal Underlayers  
*M. Ohtake, D. Suzuki, F. Kirino, and M. Futamoto*
- 3403 Superconformal Electrodeposition of Ni, Co and Fe-Group Alloys  
*T. Moffat, C. Lee, S. Kim, Y. Liu, and D. Josell*
- 3404 Induced Codeposition of NiMo, NiW and CoW Alloys with a Competing Side Reaction  
*S. Sun, T. Bairachna, T. Maliar, H. Cesiulis, and E. Podlaha*

- 3405 Electrodeposition of Super Invar into Micro- and Nano- Recesses  
*H. Kim, M. Murphy, S. Soper, and E. Podlaha*
- 3406 Aqueous DC Electrodeposition and Mechanism of Magnetic SmCo Alloys  
*J. Wei, M. Schwartz, and K. Nobe*
- 3407 Developments in Integrated On-Chip Inductors with Magnetic Yokes  
*E. J. O'Sullivan, N. Wang, P. Herget, L. T. Romankiw, B. C. Webb, R. E. Fontana, N. Sturcken, K. L. Shepard, and W. J. Gallagher*
- 3408 A Unique Magnetic Alloy for Integrated Power Systems on a Chip  
*A. Panda, T. Liakopoulos, M. Wilkowski, and A. Lotfi*
- 3409 Magnetic Micro and Nano Actuator Systems  
*H. H. Gatzert*
- 3410 Evaluation of the Effects of Electroplating Conditions on the Material Properties of Iron Cobalt Thick Films using Design of Experiments  
*W. C. Patterson and D. P. Arnold*
- 3411 Nanoporous Alumina Growth in a Magnetic Field  
*A. Ispas, I. Vrublevsky, U. Schmidt, and A. Bund*
- 3412 Investigation of the Crystallization of NiFe<sub>81/19</sub> Depending on the Annealing Temperature  
*M. C. Wurzt, A. Shaganov, A. Filimonov, and L. Rissing*
- 3413 Integration of Electroplated CoFe in Trench Type Flux Guides for Magnetic MEMS Applications  
*J. Chen, S. Cvetković, and L. Rissing*
- 3414 Microfabrication of High-Performance Thick Co<sub>80</sub>Pt<sub>20</sub> Permanent Magnets for Microsystems Applications  
*O. D. Oniku and D. P. Arnold*
- 3415 Fabrication and Characterization of an Improved Micro Inductosyn® Sensor  
*D. Miletić, J. Flügg, and H. H. Gatzert*
- 3416 Embossing of Soft-magnetic Structures and Influence on Magnetic Properties  
*M. Kaiser, M. C. Wurzt, S. Cvetković, R. Schwaiger, and L. Rissing*
- 3417 Magnetic Properties of Ni-Cu Alloy Nanowires Obtained by the Template Method  
*I. Enculescu, E. Matei, M. Toimil Molaes, A. Leca, and V. Kuncser*
- 3418 CPP-GMR of Co/Cu Multilayered Nanowires Electrodeposited into Anodized Aluminum Oxide Nanochannels with Large Aspect Ratio  
*N. Goya, Y. Zenimoto, K. Takao, T. Ohgai, M. Nakai, and S. Hasuo*
- 3419 Electroplating of Cu/Sn Layers for Hermetic Encapsulation for Vacuum Applications  
*M. C. Wurzt, S. Cvetković, L. Rissing, and F. Bach*

- 3420 Anisotropic Magnetoresistance of Ni-Co-Fe Alloy Nanowires Electrodeposited into Anodized Aluminium Oxide Membrane Thin Films  
*Y. Ikeda, T. Egawa, K. Takao, T. Ohgai, M. Nakai, and S. Hasuo*
- 3421 Current-Induced Magnetization Switching in CPP Junctions based on Fe<sub>3</sub>Si/FeSi<sub>2</sub> Multilayered Films  
*Y. Noda, K. Sakai, T. Sonoda, K. Takeda, and T. Yoshitake*
- 3422 Aligning Superparamagnetic Nanoparticles at Temperatures Much Higher than the Blocking Temperature  
*W. Schwarbacher, J. Eloi, M. Okuda, and S. Ward Jones*
- 3423 Giant Magnetoelectric Effect in Thin Film Composites  
*E. Lage, A. Piorra, C. Kirchhof, E. Yarar, D. Meyners, and E. Quandt*
- 3424 SiGe Spintronics with Single-Crystalline Ferromagnetic Schottky-Tunnel Contacts  
*K. Hamaya, S. Yamada, and M. Miyao*
- 3425 Generation and Detection of a Pure Spin Current Using Co-based Heusler-alloy Spin Injector and Detector: Comparison of Co<sub>2</sub>FeSi and Co<sub>2</sub>MnSi  
*S. Oki, M. Kawano, K. Tanikawa, H. Aoki, S. Yamada, M. Miyao, and K. Hamaya*
- 3426 Electrochemical Synthesis of Ferromagnetic Metal-Metal Oxide Nanocontacts for Magnetic Field Sensor Application  
*J. George, R. Sharma, S. Elhalawaty, R. Carpenter, D. Litvinov, and S. Brankovic*
- 3427 Giantmagnetoimpedance Effect of La<sub>0.6</sub>Bi<sub>0.1</sub>Sr<sub>0.3</sub>MnO<sub>3</sub> at Room Temperature  
*S. K. Barik, R. Katiyar, and R. Mahendiran*
- 3428 Lipid-based Magnetic Nanomedicines for Cancer  
*Y. Namiki, T. Fuchigami, M. Nakagawa, and Y. Kitamoto*
- 3429 FePt Magnetic Hollow Spheres Designed for Nano-Scale Drug Delivery System Targeted to Cancer Tumor  
*T. Fuchigami, M. Nakagawa, Y. Namiki, and Y. Kitamoto*
- 3430 Fabrication of Magnetic Nanoparticle-Assembly with Biodegradable Polymer Core  
*C. Oka, N. Horiishi, and Y. Kitamoto*
- 3431 Development of Specific Delivery of Magnetic Nanoparticles in Cancer Tissue for Hyperthermia and Their Establishment of System for Safety Assessment  
*H. Zhang, T. Nakanishi, and T. Osaka*
- 3432 Separation of Magnetic Nano Beads by Using Soft Magnetic Flux Concentrators  
*M. Kaiser, J. Chen, P. Taptimthong, and L. Rissing*

## G2 - Synthesis and Engineering General Session

*ECS Industrial Electrochemistry and Electrochemical Engineering, ECSJ Industrial Electrolysis and Electrochemical Engineering*

- 3433 Electroplated Ni-W-S Alloy Cathode for Alkaline Water Electrolysis  
*D. Suzuki, K. Someya, T. Suzuki, A. Horie, R. Miyamoto, Y. Ishikawa, and S. Yoshihara*
- 3434 Size Control of Hydrogen Nanobubble by Pt-nanoparticle/Ru Electrode  
*K. Kikuchi and T. Okamoto*
- 3435 Degradation of Nickel Anode for Alkaline Water Electrolysis under Potential Cycling  
*H. Ichikawa, K. Matsuzawa, I. Nagashima, A. Manabe, Y. Nishiki, and S. Mitsushima*
- 3436 Water Electrolysis to Produce the Dry Oxygen for the Human Activities under the Closed Environment  
*Y. Sone, S. Masato, Y. Tetsuya, and S. Naoki*
- 3437 Low Voltage Electrochemical Process for Manufacturing Sodium Hydroxide and Halogenated Hydrocarbons  
*B. K. Boggs, S. Gorer, M. Kostowskyj, R. King, J. Miller, and R. Gilliam*
- 3438 Theoretical Study on Pressurized Operation of Solid Oxide Electrolysis Cells  
*M. Henke, C. Willich, C. Westner, F. Leucht, W. Bessler, J. Kallo, and K. Friedrich*
- 3439 Electrolytic Conversion of Sodium Salts in a Kraft Mill  
*J. Cloutier*
- 3440 Scale-up of Low Energy Process for Generation of Alkalinity  
*R. L. King, D. Martinez, J. Miller, S. Gorer, M. Kostowskyj, B. K. Boggs, and R. Gilliam*
- 3441 Design of Rechargeable Air Diffusion Cathode of Metal-Air Battery in Alkaline Solution  
*Y. Takeshita, S. Fujimoto, and M. Sudoh*
- 3442 Development of a High Performance Salt Electrolysis Cell Using Soft-Zero-Gap Method  
*H. Matsui, H. Tanaka, and H. Okido*
- 3443 Electrochemical Processes in Waste Water Treatment: Process Development at Pilot Plant Scale  
*D. Woisetschlaeger, M. Koncar, and M. Siebenhofer*
- 3444 Recycling Electrochemical Machining Electrolyte for Metal Recovery and Elimination of Waste  
*E. J. Taylor, B. Skinn, H. Garich, and M. Inman*
- 3445 Anodic Reactivity of Ferrous Sulfide Particles Generated in Wastewater Treatment  
*E. Mejia Likosova, Y. Poussade, J. Keller, and S. Freguia*

- 3446 Enhanced Electrochemical Oxidation of Rhodamine B by TiO<sub>2</sub>-Coated Granular Activated Carbon  
*X. Li, C. Wang, L. Zhang, Y. Qian, and Y. Wang*
- 3447 A Novel Chlorine Evolution Anode for Electrowinning of Non-ferrous Metals  
*M. Matsuda and M. Morimitsu*
- 3448 Preparation of Shape-Controlled Pt Nanoparticles by Galvanostatic Electrolysis  
*T. Nishimura, T. Nakade, T. Morikawa, and H. Inoue*
- 3449 Development of an Electrolysis-Reversible Hydrogen Electrode (E-RHE)  
*N. Kamiya*
- 3450 Effect of Pt Dissolution on H<sub>2</sub>O<sub>2</sub> Formation by Using RRDE Method  
*K. Ono, N. Takeuchi, K. Sekizawa, T. Yoshida, and M. Sudoh*
- 3451 Characterization and Performance of Non-Iridium Oxide Based Oxygen Evolution Anodes  
*T. Zhang and M. Morimitsu*
- 3452 Mathematical Modeling of Ammonia Electro-Oxidation in a Rotating Disk Electrode (RDE) System  
*L. A. Diaz Aldana, M. Muthuvel, and G. G. Botte*
- 3453 Electrocatalytic Synthesis of Hydrogen Peroxide on Non-Precious Catalysts  
*F. Hasché, T. Fellinger, M. Oezaslan, P. Strasser, and M. Antonietti*
- 3454 Cathodic Characteristic and Structural Analyses of a New Catalyst for Chlorate Electrolysis  
*K. Terada, S. Hatano, K. Hara, A. Kimura, M. Saito, H. Daimon, M. Inaba, and A. Tasaka*
- 3455 TiZO/Ag/TiZO Multilayer Films for the Application of a Very Low Resistance Transparent Electrode  
*G. Heo, Y. Lee, J. Park, J. Oh, D. Shin, and T. Kim*
- 3456 Synthesis and Properties of Pentacenes Having Alkyl- chains at 2, 3, 9, 10-Positions  
*S. Katsuta, C. Ohashi, K. Nakayama, and H. Yamada*
- 3457 Preparation and Characterization of Cathode Active Materials from Spent Lithium Ion Batteries  
*J. Moon, J. Ahn, S. Son, H. Lee, H. Kim, and H. Kim*
- 3458 Enhancement of Electrical Conductivity and Electrochemical Activity of Hydrogenated Amorphous Carbon by Incorporating Boron Atoms  
*H. Naragino, K. Yoshinaga, A. Nakahara, S. Tanaka, and K. Honda*
- 3459 Direct Preparation of Highly Fluorescent Pyrene-Dyes from Non-Fluorescent Precursors Upon Photoirradiation  
*T. Aotake, D. Kuzuhara, and H. Yamada*



- 3460 Two Dimensional Electrochemical-Thermal Coupled Models for Lithium-Ion Battery and Battery Stacks  
*S. De, P. Northrop, S. Santhanagopalan, and V. Subramanian*
- 3461 Experimental Investigation of Two-Phase Electrolysis Under Normal and Zero Gravity  
*P. Mandin, Z. Derhoumi, and H. Roustan*
- 3462 Performance of Acid-doped Polybenzimidazole Membranes for the Hybrid Sulfur Electrolyzer  
*J. Jayakumar, A. Gullede, J. Staser, B. Benicewicz, and J. Weidner*
- 3463 On A Few Innovations of Chlor-alkali Membrane Process in Japan  
*N. Kawasaki and Y. Nakajima*
- 3464 In-situ Structural Analysis on the Growth Mechanism Pathways of Hydrothermal Synthesized CeO<sub>2</sub> Nanocrystals  
*E. Teo, M. Lin, Z. Fu, S. Ng, J. Tan, and H. Tan*
- 3465 Electrochemical Oxidation of Phenol at Boron-doped Diamond Electrode in Exponential Decay Modulated Current Supply  
*X. Xing, H. Li, and J. Ni*
- 3466 Photooxidation Treatment of Organic Materials on Titanium Dioxide Photoelectrode in Aqueous Solution Containing Sodium Chloride  
*D. Kodama, Y. Kohno, and Y. Maeda*
- 3467 Wear Resistant, Functional Hard Chrome Plated from a Trivalent Bath  
*M. Inman, T. Hall, B. Kagajwala, and E. J. Taylor*
- 3468 Suppression of PbO<sub>2</sub> Deposition on Nano-Structured IrO<sub>2</sub>-Ta<sub>2</sub>O<sub>5</sub>/Ti Anodes in Acidic Solutions  
*K. Kawaguchi, G. Haarberg, and M. Morimitsu*
- 3469 Investigating the Surface Structure of the Ti/SnO<sub>2</sub>-Sb<sub>2</sub>O<sub>5</sub> Anode and the Effect on its Electro-catalysis  
*Q. Ni, D. W. Kirk, and S. Thorpe*
- 3470 Growth Mechanism of WO<sub>3</sub>•0.33H<sub>2</sub>O Hierarchical Structure Prepared by Hydrothermal Method  
*X. He and C. Hu*

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

*ECS Fullerenes, Nanotubes, and Carbon Nanostructures, ECS Dielectric Science and Technology, ECS Energy Technology, ECS Sensor, CSE*

- 3471 N-type Graphene Induced by Molecular Hydrogen Exposure at Room Temperature  
*B. Kim, S. Hong, S. Baek, H. Jeong, N. Park, M. Lee, S. Lee, J. Lim, Y. Jun, and Y. Park*
- 3472 DFT Calculation for Various Adatom Adsorptions on Graphene for Using Graphene as Substrate  
*A. Ishii, K. Nakada, and T. Torobu*
- 3473 Theoretical Study of a Zigzag Graphene Nanoribbon Field Effect Transistor  
*H. Karamitaheri, M. Pourfath, N. Neophytou, and H. Kosina*
- 3474 Hierarchical Graphene Macroassemblies  
*M. A. Worsley, M. Merrill, M. Suss, J. Lee, S. Kucheyev, C. Valdez, H. Mason, B. Mayer, J. Lewicki, A. Wittstock, M. Stadermann, J. Satcher, J. Biener, and T. Baumann*
- 3475 Nitrogen-Containing Graphene for Electrochemical Oxygen Reduction  
*S. M. Lyth, J. Liu, and K. Sasaki*
- 3476 Graphene Thermal Interface Materials  
*A. A. Balandin*
- 3477 Towards Novel Pillared Nanostructures based on Graphene  
*K. Spyrou, P. Rudolf, D. Gournis, P. Maurizio, L. Kang, and E. Diamanti*
- 3478 Chemically Prepared Reduced Graphene Oxide as Ultra Fast Temperature Sensor  
*S. Sahoo, S. Barik, G. Sharma, G. Khurana, and J. Scott*
- 3479 Comparison of Epitaxial Graphene growth on non-Polar and Polar 6H-SiC  
*L. O. Nyakiti, V. Wheeler, R. Myers-Ward, N. Garces, F. Bezares, J. Caldwell, C. Eddy Jr., and D. Gaskill*
- 3480 Non-Monotonic Size Dependence of Thermal Conductivity of Graphene Ribbons  
*D. Nika, A. Askerov, and A. A. Balandin*
- 3481 Layer by Layer Etching of CVD Graphene for Full Graphene Device Fabrication  
*J. OH, J. Lim, J. Park, and G. Yeom*
- 3482 Wafer-Scale Graphene Synthesis and Tailoring via Segregation Methods Extended to Metals with Low Carbon Solubility  
*A. Zenasni, A. Delamoreanu, and C. Rabot*
- 3483 Study of the Point Defects Induced by Electrochemical Potential in Graphene Monolayers  
*J. J. Velasco-Velez, Y. Zhang, I. Martin-Fernandez, C. Martinez, and M. Salmeron*

- 3484 Interfacing Nanocarbons with Organic and Inorganic Semiconductors - From Extended Tetrathiafulvalenes to Nanocrystals / Quantum Dots  
*D. M. Guldi*
- 3485 Mechanochemical Synthesis of Carbon Nanomaterials by a High-Speed Ball-Milling Process  
*S. Ohara, Z. Tan, K. Yamamoto, and T. Hashishin*
- 3486 Far-Infrared Absorption of Single-Walled Carbon Nanotube Films  
*T. Morimoto, S. Joung, and T. Okazaki*
- 3487 Photosensitized Hydrogen Evolution from Water Using Single-Walled Carbon Nanotube/Fullerodendron/SiO<sub>2</sub> Coaxial Nanohybrid  
*Y. Takaguchi, T. Wada, W. Sakata, and T. Tajima*
- 3488 Electrochemical Property of Well-Coated Multi-Walled Carbon Nanotube with Polyaniline-Cyclodextrin Polymer Composites  
*W. Zhang, M. Chen, X. Gong, and G. Diao*
- 3489 Advantage of Carbon Nanotubes as Catalyst Support in Polymer Electrolyte Membrane Fuel Cells  
*M. Berber, T. Fujigaya, and N. Nakashima*
- 3490 Effect of Charge of Solubilizers on the Electronic States of Single-Walled Carbon Nanotubes  
*Y. Hirana, Y. Niidome, and N. Nakashima*
- 3491 Enlargement of Space Charge Layer by P-N Junction of Multi-walled Carbon Nanotubes Modified with Tin Oxide Nanoparticles  
*T. Hashishin, H. Ikenoko, K. Kojima, and J. Tamaki*
- 3492 Single Molecule Lysozyme Monitoring by a Carbon Nanotube Circuit  
*Y. Choi, P. Sims, I. Moody, T. Olsen, G. Weiss, and P. G. Collins*
- 3493 Application of Carbonaceous Nanomaterials in Biomedicine  
*J. Zhen, Q. Liu, D. Chen, C. Wang, and C. SHU*
- 3494 One-Step Liquid-Phase Synthesis of Carbon Nanomaterials with Carbon Paper  
*K. Yamagiwa, Y. Ayato, H. Shiroishi, and J. Kuwano*
- 3495 PVDF/MWCNT Composite Films for Infrared Sensing and Energy Harvesting Applications  
*A. K. Batra, A. Chilvery, and M. Thomas*
- 3496 The Investigation of Partial Reduced Graphene Oxide (GO)/PEDOT:PSS Nanocomposite  
*J. Seo, H. Yun, W. Hong, J. Jung, B. Sohn, J. Lee, and C. Choi*
- 3497 Evaluations of Nonbonding Interactions in Endohedrally and Exohedrally Functionalized Fullerenes  
*N. Mizorogi, T. Akasaka, and S. Nagase*

- 3498 Synthesis and Structural Characterization of Fullerene derivatives Encapsulating Trimetallic Nitride Cluster  
*T. ABE, S. Sato, C. Saito, Z. Slanina, T. Tsuchiya, T. Akasaka, and S. Nagase*
- 3499 Catalytic Synthesis of Carbon Nanotube and Nanofilament Over Oxidized Diamond-Supported Catalysts  
*K. Nakagawa, T. Toriyama, G. Tsujino, T. Ando, and H. Oda*
- 3500 Large-Area Graphene Grown with a Novel rapid Cooling Method  
*M. C. Chen, Y. Huang, C. Chen, S. Hung, C. Cheng, C. Li, H. Hsieh, H. Wu, and G. Chi*
- 3501 Synthesis and Properties of Paramagnetic Metallofullerene/Electron Donor Dyad  
*Y. Kawana, T. Tanaka, T. Tsuchiya, T. Akasaka, N. Mizorogi, and S. Nagase*
- 3502 Complexation Studies of Endohedral Metallofullerene with Concave  $\pi$ -System  
*N. Umekita, T. Tsuchiya, N. Mizorogi, H. Sakurai, N. Martín, D. M. Guldi, S. Nagase, and T. Akasaka*
- 3503 Framework Transformation of Non-IPR Structured Metallofullerene  
*Y. Muto, H. Kurihara, Z. Slanina, T. Tsuchiya, S. Nagase, and T. Akasaka*
- 3504 Thermally Reduced Graphene Oxide as Energy Storage Materials  
*W. Hong, B. Kim, J. Kim, S. Lee, and H. Kim*
- 3505 Soft Lithographic Patterning and Transfer Process of Graphene Sheets  
*H. Kim, M. Jung, D. Jung, S. Lee, J. Lim, J. Lee, and K. An*
- 3506 Novel Growth Process of Carbon Nanotubes in Atmosphere  
*S. Lu and W. Hsu*
- 3507 The Organic Additives Effects during Electroless Nickel and Silver Deposition on Carbon Nanotube  
*T. Saito, Y. Takagi, N. Okamoto, K. Kondo, Y. Kobayashi, and Y. Fujiwara*
- 3508 Integrated Field Emission Diode with a Nano-graphite-diamond-like Emitters Process Development and Its Electrical Characteristics Study  
*N. Zaytsev, S. N. Orlov, S. Yanovich, A. Krasnikov, I. Matyushkin, I. Khomyakov, K. Svechkarev, and R. Yafarov*
- 3509 Multiple Auger Decay at Resonant Photo-Excitation in Carbon Thin Films  
*M. Richter, D. Friedrich, and D. Schmeißer*
- 3510 Photo-Thermo-Voltaic Effects in Carbon Nanotube Films  
*M. Omari, T. Hosseini, and N. Kouklin*

- 3511 Enhancement of Diamond Crystallite Size of Ultrananocrystalline Diamond/Amorphous Carbon Composite Films by Controlling Arc Discharge Energy of Coaxial Arc Plasma Gun  
*K. Hanada, A. Tominaga, T. Sugiyama, K. Sumitani, H. Setoyama, and T. Yoshitake*
- 3512 p-Type Semiconducting Properties of Boron Doped Ultrananocrystalline Diamond/Amorphous Carbon Composite Films Prepared by Coaxial Arc Plasma Deposition  
*Y. Katamune, S. Ohmagari, H. Setoyama, K. Sumitani, Y. Hirai, and T. Yoshitake*
- 3513 Controllable Synthesis of High-Quality Graphene Using Inductively-Coupled Plasma Chemical Vapor Deposition  
*L. Nang, N. Park, Z. Lee, and E. Kim*
- 3514 High Reactive Catalysts Based on Gold Nanoparticles Supported Over Carbon Nanotubes  
*T. M. Abdel-Fattah*
- 3515 Effect of Boric Acid on the Nucleation and Growth of Ni Nanoparticles for CNT Growth  
*J. Vanpaemel, M. van der Veen, C. Huyghebaert, S. De Gendt, and P. Vereecken*
- 3516 The Effect of Carbon-Nanotubes on the Electrochemical Impedance Behavior of Glass and Carbon fibers with AA2024 and AA7075  
*Y. Yoon, K. Lafdi, and M. Bouchard*
- 3517 Carbon Nanotube Enhanced Functional Carbon Fibers from Renewable Resources  
*O. Rios, W. E. Tenhaeff, M. McGuire, P. Menchhofer, A. Johs, K. L. More, and D. White*
- 3518 Highly Conductive, Super Stiff Carbon Nanotube-based Macroassemblies and Their Composites  
*M. A. Worsley, M. Merrill, S. Kucheyev, J. Kuntz, T. Han, J. Satcher, M. Stadermann, A. Hamza, J. Biener, and T. Baumann*
- 3519 Vertically Aligned Carbon Nanofiber Based Electrode for Biosensor Applications  
*D. Suazo, J. Rivera, J. Koehne, M. Meyyappan, and C. Cabrera*
- 3520 Indene-C<sub>60</sub>/C<sub>70</sub> Bisadduct as Acceptor in Polymer Solar Cells  
*Y. Li*
- 3521 Synthesis and Separation Strategies for New Fullerenes Created in Oxidizing Atmospheres  
*S. Stevenson*
- 3522 Design of Robust Functional Structures on Carbon Substrates Using Sylil-Protected Aryldiazonium Electroreduction  
*Y. Leroux and P. Hapiot*
- 3523 Preparation of Hydrophilic Nano-Carbon Particles by Electrolysis and Their Environmental Applications  
*S. Ikeda, S. Kawasaki, Y. Hayashi, S. Kita, A. Nobumoto, H. Ono, and S. Ono*

- 3524 Synthesis and Functions of Hybrid Assemblies Composed of Metalloporphyrin and Heteropolyoxometallates  
*T. Kojima, A. Yokoyama, T. Ishizuka, K. Ohkubo, and S. Fukuzumi*
- 3525 Synthesis and Properties of Acenes Photochemically Prepared from Diketone Precursors  
*H. Yamada, T. Aotake, S. Katsuta, Y. Kaneshige, C. Ohashi, and K. Nakayama*
- 3526 Stability Computations for La@C<sub>76</sub>  
*Z. Slanina, F. Uhlik, T. Akasaka, and S. Nagase*

## **II - Physical and Analytical Electrochemistry General Session**

*ECS Physical and Analytical Electrochemistry, ECSJ, CSE, KECS*

- 3527 Electrochemical Measurements in High Magnetic Fields for Energy Storage  
*A. Migliori, C. R. Kreller, R. L. Borup, and F. H. Garzon*
- 3528 The Importance of Electrochemical Surface Potentials in Pressure Solution  
*K. Kristiansen, M. Valtiner, G. Greene, J. Boles, and J. Israelachvili*
- 3529 Surface Intermediates of the Oxygen Evolution Reaction on Iridium as Observed by Surface Interrogation Scanning Electrochemical Microscopy (SI-SECM)  
*N. Arroyo-Curras and A. Bard*
- 3530 SECM Footprint Analysis of Reactive Oxygen Species Produced During Multielectronic O<sub>2</sub> Reduction  
*J. Noel, A. Latus, C. Lagrost, E. Volanschi, and P. Hapiot*
- 3531 New Methods and New Applications of Electrochemiluminescent Analysis  
*G. Xu, L. Hu, L. Zhang, Y. Yuan, T. Yuan, and S. Parveen*
- 3532 Probing The Structure and Composition at the Electrode Interface: Understanding the Importance of Through-Space Interactions  
*M. R. Anderson, M. De La Rosa, M. Tomlinson, and M. Anderson*
- 3533 Surface-Enhanced Raman Spectroscopy Platforms for Studying Electrodeposition and Surface Chemistry of Nanostructured Semiconductors  
*J. Gu and S. Maldonado*
- 3534 Detection of Tetryl by Electrogenerated Chemiluminescence (ECL) quenching of Ru(bpy)<sub>3</sub><sup>2+</sup>  
*P. Lindhome and R. L. Calhoun*
- 3535 Simulation of Electrochemical Micromachining with Nanosecond Pulses  
*E. L. Hotoiu, S. Van Damme, and J. Deconinck*
- 3536 Performance Characterization of the Titanium(IV)-Porphyrin Reagent for Determining Hydrogen Peroxide based on Ab Initio Calculations  
*K. Takamura and T. Matsumoto*

- 3537 Quantum Mechanical Analysis on the Effect of Electric Field on the Adsorption of Water and Hydronium on Transition Metal Surfaces  
*A. Huzayyin, J. Chang, F. Dawson, and K. Lian*
- 3538 A Temperature Dependent Multi-Ion Model for Time Accurate Numerical Simulation of the Electrochemical Machining Process  
*D. Deconinck, S. Van Damme, and J. Deconinck*
- 3539 Electroless Deposition of the cylindrical Iron Nanotubes using Anodic Aluminium Oxide Template  
*T. Hussain, A. Shah, and G. Zohra*
- 3540 Extract Metals by a Treated Scallop Shell Powder  
*K. Takeuchi, H. Honda, S. Tamura, T. Ishiguro, Y. Kogo, H. Koyanaka, J. Neufeind, M. Feygenson, and A. Kolesnikov*
- 3541 Preparation and Electrochemical Behavior of Water-Soluble Inclusion Complex of Imidacloprid with  $\beta$ -cyclodextrin Polymer  
*M. Chen, J. Wang, W. Zhang, and G. Diao*
- 3542 Fabrication of Porous Conductive Diamond Hollow Fibers  
*T. Kondo, Y. Kodama, and M. Yuasa*
- 3543 Electroanalytical Performance of Nitrogen-Containing Tetrahedral Amorphous Carbon Thin-Film Electrodes  
*X. Yang, G. DeVivo, L. Haubold, and G. Swain*
- 3544 Synthesis of Pt-Ir Catalysts by Coelectrodeposition: Application to Ammonia Electrooxidation in Alkaline Media  
*S. Le Vot, L. Roué, and D. Bélanger*
- 3545 Electrochemical Study of Ilmenite using Carbon Paste Electrode Under Reducing Condition  
*N. Jabit, G. Senanayake, and M. Nicol*
- 3546 Experiments and Modeling of Electrochemical Impedance Spectroscopy on Pressurized SOFC  
*C. Willich, M. Henke, C. Westner, L. Florian, W. Bessler, J. Kallo, and K. Friedrich*
- 3547 Diffusion Impedance Analyzed by Equivalent Circuit Involving CPE using Microelectrode  
*Y. Hoshi, S. Kawakita, I. Shitanda, and M. Itagaki*
- 3548 Electrochemical Behavior of Samarium and Ytterbium in the 1-(1-Butyl)trimethylammonium Bis(trifluoromethylsulfonyl)imide Ionic Liquid Containing TODGA  
*Y. Pan and C. Hussey*

- 3549 Electrochemical Behavior of Praseodymium and Neo-Dymium in the 1-butyl-3-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide Ionic Liquid Containing Chloride  
*L. Chou and C. Hussey*
- 3550 In-depth Study on Nano-structured Electrode Reaction Mechanism in Lithium-Ion Batteries  
*H. Cho and Y. Meng*
- 3551 Investigation on Polyoxometalates for the Application in Redox Flow Batteries  
*J. Friedl, C. Bauer, R. Al-Oweini, D. Yu, U. Kortz, H. Hoster, and U. Stimming*
- 3552 Electrode Reactions of Dissolved p-Dimethoxybenzene on a Polyaniline-Modified Electrode  
*J. Yano*
- 3553 Equivalent Circuits of Zinc-Air Battery and Analysis of Zinc-Air Battery Oxygen Sensor using the Equivalent Circuits  
*M. Takahashi and M. Yamauchi*
- 3554 The Electrocatalytic Activity of Ligand-Protected Gold Particles: Formaldehyde Oxidation  
*K. Luo, X. Li, and Y. Gong*
- 3555 Nanocomposite Coatings based on the Conductive Polymers and Functionalized Carbon Nanotubes for Obtained of Modified Electrodes  
*V. Branzoi, F. Branzoi, and A. Musina*
- 3556 Solar Driven Hydrogen Production with co-doped Gallium and Nitrogen in Zinc Oxide films prepared by Reactive RF Magnetron Sputtering  
*S. Shet*
- 3557 Comparison between Palladium Electrode and Nanoparticles in the Ethanol Detection to Biosensor and Sensor Applications  
*I. Feliciano, D. Diaz, Y. De la Torre, and C. Cabrera*
- 3558 Preparation of Bismuth Tungstate Nanocrystallites by Ball Milling of Flake-ball Particles and Their Photocatalytic Activity  
*H. Hori and B. Ohtani*
- 3559 Electrochemical Properties of Free-Standing Boron-Doped Heteroepitaxial Diamond Electrode  
*H. Kodama, K. Suzuki, S. Kono, and A. Sawabe*
- 3560 Study on the Effects of Electrochemical Realkalization Method with Alcamines Inhibitors as Electrolyte  
*J. lu, Y. Zhang, J. Zhang, and J. Jiang*
- 3561 Transcutaneous Vein Imaging and Venepuncture System for Blood Test  
*H. Saito, S. Yamamoto, and H. Takagi*



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

## **I2 - Bioelectroanalysis and Bioelectrocatalysis**

*ECS Physical and Analytical Electrochemistry, ECSJ Bioengineering, CSE*

- 3572 Electrochemical Investigations of Lipid Membranes and Proteins at the Liquid-Liquid Interface  
*R. Katakya*
- 3573 Fabrication of Nanoporous 1- 3 nm Thick Membranes on Nanostructured Microelectrodes for Low nM Detection  
*A. Boateng, F. Irague, and A. Brajter-Toth*
- 3574 Electrochemical Immunoassay of Phosphorylated Proteins  
*D. Du*

- 3575 Intermediate Layers for Immobilization of Biomacromolecules on Various Substrates  
*A. Nowicka, A. Kowalczyk, M. Fau, and Z. J. Stojek*
- 3576 Functional Nanomaterials for Sensitive Bioassay  
*D. Du and Y. Lin*
- 3577 In Vivo Electroanalytical Chemistry: Strategies Based on Surface/Interface Chemistry  
*L. Mao*
- 3578 Development of Nano-Pt/Graphene/Nafion Composite Membrane for Glucose Biosensor  
*H. Leu, K. Chiu, and C. Lin*
- 3579 Electrochemical Techniques as Effective Readout Methods for Aptamer based Biosensors  
*E. Wang*
- 3580 Synthesis Graphene-based Nanocomposites and Apply in Electrochemical Sensors  
*Z. Wang*
- 3581 Electrochemical Surface Plasmon Resonance Sensor based on Nanohole Array Electrode Fabricated by Nanoimprinting Technique  
*O. Niwa, K. Nakamoto, and R. Kurita*
- 3582 Investigation of the Dissimilarity Metal Reduction (DMR) Pathways of *Shewanella* with Spatial Resolution by Scanning Electrochemical Microscopy  
*G. Chen, D. Kimmel, and D. Cliffl*
- 3583 Facilitation of High-Rate NADH Electrocatalysis at Activated Carbon Electrode  
*H. Li, R. Li, R. Worden, and S. Calabrese Barton*
- 3584 Ionic Liquid-Based Electrochemical Biosensors  
*P. Yu and L. Mao*
- 3585 Electrochemical Biosensor and Biofuel Cell Applications of Nanomaterials Modified Electrodes  
*S. Chen, Y. Li, V. Mani, and M. Rajkumar*
- 3586 Direct Electron Transfer and Electrocatalysis of Hemoglobin on ITO Nanoparticle Electrode  
*Y. Ayato, K. Yamagiwa, H. Shiroishi, and J. Kuwano*
- 3587 A Third Generation L-fucose Biosensor based on a Novel Dehydrogenase from the Basidiomycete *Coprinopsis Cinerea*  
*M. Inukai, H. Matsumura, K. Igarashi, M. Samejima, N. Nakamura, and H. Ohno*
- 3588 Characterization of Microbial Fuel Cell Anodic Biofilms Grown on Pure and Mixed Cultures  
*S. R. Higgins, R. Lopez, D. Foerster, M. Cooney, P. Atanassov, C. Lau, S. Minteer, K. Nealson, A. Cheung, O. Bretschger, T. Yan, and E. Pagaling*

- 3589 In Vivo Operating Miniature, Direct Electron Transfer based, Membrane-less Glucose/Oxygen Biofuel Cell  
*M. Falk, V. Andoralov, M. Granmo, D. Suyatin, J. Schouenborg, J. Sotres, R. Ludwig, O. Morozova, Z. Blum, and S. Shleev*
- 3590 Enhanced Electrical Contact of Microbes using Magnetite Particle Coated with Polyelectrolyte onto Multi-Walled Carbon Nanotube Nanohybrid (MaPoNT) in Microbial Fuel Cell  
*I. Park, Y. Heo, P. Kim, and K. Nahm*
- 3591 Ammonia Production at Anabaena variabilis Modified Electrodes  
*T. Paschkewitz and J. Leddy*
- 3592 Solar Bioelectrocatalysis Utilizing Thylakoids  
*S. Minteer*
- 3593 Investigating Separators to Improve Performance of Flat-Plate Microbial Fuel Cells  
*S. Kazemi, K. Fatih, M. Mohseni, and H. Wang*
- 3594 Direct Electron-Transfer Reactions from Solid Electrodes to Chemoautotrophic CO<sub>2</sub> Fixation Microbes  
*T. ISHII, K. Hashimoto, and R. Nakamura*
- 3595 A Novel Recombinant PQQ Alcohol Dehydrogenase as Catalyst for Bioanode: Two-Step Electrochemical Oxidation of Alcohols  
*K. Takeda, H. Matsumura, K. Igarashi, M. Samejima, N. Nakamura, and H. Ohno*
- 3596 Surface Modification of Carbon Black toward Retention of Enzyme Activity in High-Surface-Area Enzymatic Biofuel Cell Electrodes  
*T. Tamaki, H. Fujimoto, H. Ohashi, and T. Yamaguchi*
- 3597 Simultaneous 3-D Impedance Measurement of Whole Biofuel Cell, Anode and Cathode using Porous Carbon Electrode  
*I. Shitanda, H. Yanai, Y. Yoshihata, Y. Hoshi, M. Itagaki, and S. Tsujimura*
- 3598 Polyaniline Nanofiber/Carbon Black Composite as an Air Cathode Material for Microbial Fuel Cells  
*J. Ahmed and S. Kim*
- 3599 Catechol Biosensor based on Polyphenol Oxidase Immobilized by Combining Electropolymerization and Cross-Linking Process  
*S. Wang and J. Kan*
- 3600 A Bioanode for an Ethanol Biofuel Cell Operating at High Temperature  
*A. Kontani, M. Masuda, N. Nakamura, M. Yohda, and H. Ohno*
- 3601 Immobilization of NAD<sup>+</sup> on an Electrode Using Hydrophobic Ionic Liquids  
*M. Masuda, N. Nakamura, and H. Ohno*

- 3602 Investigation of Impedance Spectra of Mediator-type Amperometric Biosensor by Faradaic Impedance Analysis  
*I. Shitanda, Y. Hoshi, and M. Itagaki*
- 3603 The Direct Electron Transfer Reaction of Bilirubin Oxidase in Protic Ionic Liquids  
*R. Ikari, J. Kuwahara, N. Nakamura, and H. Ohno*

### **I3 - Molten Salts and Ionic Liquids 18**

*ECS Physical and Analytical Electrochemistry, ECS Electrodeposition, ECS Energy Technology, ECSJ Molten Salts*

- 3604 Dynamic Atomic Force Microscopy (AFM) Studies to Characterize Multi-Layered Structures at Ionic Liquid/Solid Interfaces  
*W. Zhang, L. Chen, K. Smith, J. J. Sangiovanni, and G. S. Zafiris*
- 3605 Local Structure of Ionic Liquid / Electrode Interfaces Analyzed by Frequency-Modulation AFM and Photoelectron Spectroscopy  
*T. Harada, Y. Kanai, Y. Mino, A. Imanishi, Y. Yokota, and K. Fukui*
- 3606 An Arrhenius Argument to Explain Electrical Conductivity Maxima versus Temperature  
*A. L. East*
- 3607 Electrochemical Investigation of Quinone Complexation by Lewis Acids in a Chloroaluminate Ionic Liquid  
*G. T. Cheek*
- 3608 Effects of the Charge Density of the Anions of Ionic Liquids on the Electrode Kinetics of Ruthenium 2,2'-Bipyridine Complexes  
*Y. Katayama, Y. Toshimitsu, and T. Miura*
- 3609 Voltammetric Studies of Proton Reduction in 1-Butyl-1-methylpyrrolidinium Triflate  
*G. T. Cheek, D. F. Roeper, and W. E. O'Grady*
- 3610 Robust Microelectrodes for Molten Salt Analysis  
*A. Relf, D. Corrigan, C. L. Brady, J. G. Terry, and A. J. Walton*
- 3611 PTFE Bound Activated Carbon - A Quasi Reference Electrode for Ionic Liquids and Its Application  
*D. Weingarh, A. Foelske-Schmitz, A. Wokaun, and R. Kötz*
- 3612 Critical Evaluation of Metallocenes as Internal Reference Scales for Voltammetric Measurements in Ionic Liquids  
*A. A. Torriero and M. Forsyth*
- 3613 Electrochemical Conversion of Carbon Dioxide to Oxygen in Ionic Liquid Media  
*D. Carr, B. Slote, K. Jayne, and M. C. Kimble*
- 3614 Influence of Temperature on the Electrochemical Characteristics of Bi(111) | 1-Butyl-3-Methylimidazolium Tetrafluoroborate Interface  
*L. Siinor, R. Arendi, C. Siimenson, K. Lust, and E. Lust*

- 3615 Fundamental Study on Reduction Rate for Electrolytic Reduction of SiO<sub>2</sub> Powder in Molten CaCl<sub>2</sub>  
*T. Toba, K. Yasuda, T. Nohira, R. Hagiwara, K. Ichitsubo, K. Masuda, and T. Homma*
- 3616 Anodic Reactions on Some Materials in LiCl-KCl Melt  
*T. Takenaka, M. Umehara, D. Araki, and T. Morishige*
- 3617 Properties of Quaternary Phosphonium Fluorohydrogenate Ionic Liquids and Their Derivatives Giving Ionic Plastic Crystal Phases  
*R. Hagiwara, T. Enomoto, and K. Matsumoto*
- 3618 Border between Ionic Liquids and Electrolyte Solutions  
*M. Watanabe*
- 3619 Ion Pairs in Ionic Liquids  
*J. Hallett, I. Villar-Garcia, and T. Welton*
- 3620 Bulk and Interfacial Properties of Ionic Liquids and Their Mixtures with Lithium Salts  
*O. Borodin, J. Vatamanu, L. Xing, G. Smith, and D. Bedrov*
- 3621 Polymorphic Behavior of Alkali Metal Bis(Fluorosulfonyl)Amides  
*K. Matsumoto, T. Oka, T. Nohira, and R. Hagiwara*
- 3622 Effect of Interaction between Cation-Anion on Ionic Conductivity in Room Temperature Molten Fluorides Containing HF  
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- 3695 Application of Electrochemical Transient Techniques for Studying Niobium Speciation in Chloride Melts  
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- 3724 Separation of Dy and Nd (La) Using Molten Salt and an Alloy Diaphragm  
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- 3726 Processing Al-Sc Alloys at Liquid Aluminum Cathode in KF-AlF<sub>3</sub> Molten Salt  
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- 3733 Use of Ionic Liquid as a New Medium under Vacuum Conditions  
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- 3745 Strip-Like Nanosized Tungsten Carbide as Catalyst for Oxygen Reduction Reaction  
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- 3749 Ethanol Electrooxidation on a (2x2)-Sn/Pt(111) Surface Alloy and a SnO<sub>x</sub>/Pt(111) Surface: A Combined Surface Science and In Situ FTIR Study  
*W. Zhou, J. Magee, S. Axnanda, R. R. Adzic, and M. G. White*
- 3750 Electrochemical and ATR-IR Investigation on Decontaminated Shape-Controlled Pd Nanocrystals  
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- 3753 Activation of Noble Metal Centers through Modification with Metal Oxo Species towards Electrocatalytic Oxidation of Alcohols and Formic Acid  
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- 3754 Synthesis, Characterization and Electrocatalytic Properties of Electrodeposited Pt Thin Films with Preferential {100} Orientation  
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- 3757 Unique Properties of Reduced SnO<sub>x</sub>: CO Oxidation on Nanostructured SnO<sub>x</sub>/Pt(111)  
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- 3760 Multiscale Modeling of the H<sub>2</sub> Oxidation Reaction at the Ni/YSZ Interface in the Presence and Absence of Sulfur  
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- 3761 Theoretical Investigation of the H<sub>2</sub> Oxidation on the Sr<sub>2</sub>Fe<sub>1.5</sub>Mo<sub>0.5</sub>O<sub>6-δ</sub> (001) Perovskite Surface under Anodic Solid Oxide Fuel Cell Conditions  
*S. Suthirakun, S. C. Ammal, and A. Heyden*
- 3762 Electrochemistry by First-Principles Calculations: Electrochemical Oxidation of Ammonia at Pt(hkl)/Alkaline Solution Interfaces  
*D. Skachkov, C. Venkateswara Rao, and Y. Ishikawa*
- 3763 Density Functional Theory Computation of Electrolyte Competitive Adsorption and Electrochemical Activation Barriers  
*M. J. Janik, K. Yeh, and G. Rostamikia*
- 3764 A DFT Calculation Study of the Hydrogen Electrode Processes on Pt (111) and Pt (100) Surfaces  
*Q. Zhang, J. Chen, and S. Chen*
- 3765 DFT Study of Water Dissociation and Diffusion on Metal Surfaces, Kinks and Step  
*L. Arnadottur*
- 3766 Cost Effective Computational Method for Performing First-Principles Molecular-Dynamics Simulations under Constant Potential Bias  
*N. Bonnet, T. Morishita, O. Sugino, and M. Otani*
- 3767 Vibration Analysis of (Bi)Sulfate Adsorption on Pt (111) Surface in Aqueous Solution from the First Principles Simulation  
*Y. Qian, M. Otani, and T. Ikeshoji*
- 3768 Fundamental Insights on the Electrochemical Water Splitting using Solid Oxide Electrolyzers  
*E. Nikolla*
- 3769 Electrochemically Fabricated Metal Catalysts for Glucose Oxidation in Bio Fuel Cell Application  
*J. Lim, S. Pyo, D. Lee, H. Park, and S. Kim*
- 3770 Redox Catalysis for Dehydrogenation of Liquid Hydrogen Carrier for Fuel Cell Applications  
*E. Deunf, L. Rubin, D. Pete, J. Arnold, and J. Kerr*
- 3771 The Graphene-supported PdSn Nanoparticles as Efficient Catalysts for Ethanol Electrooxidation  
*Y. Kim, S. Choi, E. Lim, S. Lee, and W. Kim*



- 3772 Structural Effects on the Oxygen Reduction Reaction on the High Index Planes of Pt<sub>3</sub>Co  
*Y. Takesue, T. Rurigaki, A. Hototsuyanagi, M. Nakamura, and N. Hoshi*
- 3773 Controlling Diffusion Profile of Electroactive Species for Selective Anodic Stripping Voltammetry of Cd<sup>2+</sup>  
*A. Sugitani, T. Watanabe, and Y. Einaga*
- 3774 Molecular Self-Assembling Control Over the Surface States and Field Effects at N-GaAs (100) Electrodes  
*V. Lazarescu, M. Enache, G. Dobrescu, M. Gartner, C. Negri, and M. Lazarescu*
- 3775 One-Step Electrodeposition of Multilayered Surfactant/MnO<sub>2</sub> Composite and Its Electrochemistry  
*M. Shamoto, S. Mito, K. Tomono, and M. Nakayama*
- 3776 Tungsten Carbide Promoted Co@Pd Core-Shell Nanoparticles as Highly Active ORR Electrocatalyst  
*Z. Li and P. Shen*
- 3777 Hydrazine Oxidation at {100} Preferentially Oriented Pt Black Surfaces  
*C. Roy, E. Bertin, M. H. Martin, S. Garbarino, and D. Guay*
- 3778 Surface Modification of Diamond Nanoparticle and Its Electrochemical Properties  
*J. Urai, T. Kondo, and M. Yuasa*
- 3779 Electrocatalytic Water Oxidation on a Mesoporous IrO<sub>2</sub> Film Fabricated Using a Triblock Copolymer Template  
*D. Chandra, N. Abe, and M. Yagi*
- 3780 In Situ Observation of Adsorption Behaviors of Nafion Side-Chain Model Compounds on Electrodes by ATR-SEIRAS  
*K. Nomura, N. Ohta, H. Notsu, T. Kondo, and I. Yagi*
- 3781 Electrochemical Activity and Stability of Pt Catalysts Supported on Silica-CNF Hybrid Materials  
*A. Kim, S. Lim, D. Peck, S. Kim, B. Lee, and D. Jung*
- 3782 Intermediates of Ethanol Electro-oxidation on SnOx/Pt Catalysts Studied by in situ FTIR Spectroscopy  
*J. Magee, W. Zhou, and M. G. White*
- 3783 Synthesis and Electrocatalytic Activity of Shape Controllable Gold Nanoparticles Enclosed by High-index Facets  
*B. C. Solomon, F. Ke, and X. Zhou*
- 3784 Electrocatalytic Oxidation of Phenol within the Interlayer Space of Surfactant/MnO<sub>2</sub> Multilayer Films  
*M. Nakayama, S. Mito, M. Shamoto, and K. Tomono*

- 3785 Electrochemical Studies of Ternary And Quaternary Pt Based Catalysts for Glycerol Oxidation  
*C. Caliman and J. Ribeiro*
- 3786 Highly Active Pd-based Metallic Glass Nanowires for Alcohol Oxidation in Alkaline Media  
*R. C. Sekol, M. Carmo, G. Kumar, F. Gittleson, K. Sun, J. Schroers, and A. D. Taylor*
- 3787 Influence of Peroxodisulfate Electro-Generation on the Electrochemical Oxidation of Formic Acid on Boron Doped Diamond Electrodes  
*Y. Honda, S. Fierro, C. Comninellis, and Y. Einaga*
- 3788 Effect of pH on Electrooxidation of Formic Acid/Formate on Platinum  
*J. Joo, T. Uchida, A. Cuesta, M. T. Koper, and M. Osawa*
- 3789 Investigation on MEA-performances of Highly Durable Silica-coated Pd/C Electrocatalysts  
*Y. Sato, K. Fujii, M. Ito, S. Takenaka, and M. Kishida*
- 3790 Durable Oxide-Based Catalysts for Application as Cathode Materials in Polymer Electrolyte Membrane Fuel Cells (PEFCs)  
*E. Fabbri, A. Rabis, A. Foelske-Schmitz, D. Kramer, R. Kötz, and T. J. Schmidt*
- 3791 NO Conversion in Porous Cell Stacks  
*R. M. Werchmeister, K. B. Andersen, and K. Kammer Hansen*
- 3792 Photoelectrochemistry Applied to Organic Dye Oxidation and Concomitant Hydrogen Generation  
*M. B. Zanoni and T. Guaraldo*
- 3793 Preparation of Photocatalytic TiO<sub>2</sub>/WO<sub>3</sub> Hollow Fiber Using Polysulfone as Template  
*K. I. Liu, P. Chen, Y. Hsueh, H. Chen, and T. Perng*
- 3794 Composite Thin Film Ir<sub>1-x</sub>Nb<sub>x</sub>O<sub>2</sub> Electrocatalysts for the Oxygen Evolution Electrode  
*A. Zlotowicz, F. Seland, and S. Sunde*
- 3795 A Comparative Study of Nickel and Cobalt based Nanoparticles as Electrocatalyst for Alkaline Water Electrolysis  
*A. Patru, F. Favier, and N. Jerez*
- 3796 Chemical Amplitude: A Quantitative Descriptor for the Surface Reactivity of Metals  
*L. Zhuang, B. Huang, L. Xiao, and J. Lu*
- 3797 Nanostructured and Hybrid Carbon Films for Electrocatalytic Reaction with Biomolecules  
*O. Niwa, T. Kamata, D. Kato, A. Ueda, K. Yoshioka, S. Umemura, and S. Hirono*
- 3798 Electrochemical Characterization of Cup-Stacked Carbon Nanofiber-Modified Electrodes and its Application to Biosensing  
*K. Komori, S. Ko, S. Komatsu, T. Tatsuma, A. Sakoda, and Y. Sakai*

- 3799 Large-Scale Self-Assembly of the Nitrogen-Doped Graphene with High Electrocatalytic Activity for Oxygen Reduction  
*C. He and P. Shen*
- 3800 Plasmonic Application of Pt-Group Metal Nanostructures  
*K. Ikeda, S. Uchiyama, and K. Murakoshi*
- 3801 Pit Falls in the Use of Point Electrodes  
*K. Kammer Hansen*
- 3802 Recent Development on Electroanalytical Application of Boron-Doped Diamond Electrodes  
*Y. Einaga*
- 3803 Redox Properties and Catalytic Activity for Oxygen Reduction Reaction of Electropolymerized Aromatic Diamines  
*S. Kishioka*

### **15 - Electrochemical Atomic Layer Epitaxy and Quantum Confinement**

*ECS Physical and Analytical Electrochemistry, ECS Electrodeposition*

- 3804 Electrochemical Liquid-Liquid Solid Deposition of Crystalline Semiconductor Materials  
*J. Gu, E. Fahrenkrug, S. Collins, and S. Maldonado*
- 3805 Kesterite Group Materials Thin Films by Electrodeposition for Photovoltaic Applications  
*M. Innocenti, I. Bencistà, F. Di Benedetto, S. Cinotti, A. De Luca, S. Bellandi, A. Lavacchi, M. Muniz Miranda, F. Vizza, and M. Foresti*
- 3806 New Route for Low Cost Fabrication of Semiconducting Materials for Photovoltaic Applications  
*R. Salazar, S. Sanchez, D. Rouchon, C. Levy-Clement, and V. Ivanova*
- 3807 Electrochemical Atomic Layer Deposition of PV Materials  
*B. Perdue, V. Stickney, J. Stickney, and D. Banga*
- 3808 Characterization of Electrochemical ALD Processes on Bipolar Electrodes Using Confocal Raman Microscopy  
*S. Ndzesse and C. Shannon*
- 3809 Cadmium Telluride Nanowire Electrodeposition for Advanced Photovoltaics  
*E. Menke, L. Reed, and J. Hujdic*
- 3810 Ultra-long Hollow Chalcogen and Chalcogenide Nanofibers by Galvanic Displacement Reaction  
*H. Park, M. Zhang, C. Chang, H. Jung, J. Lim, Y. Choa, and N. Myung*
- 3811 Pulsed Electrodeposition of  $\text{Bi}_2\text{Te}_3/\text{Sb}_2\text{Te}_3$  Superlattices in Flow Cells vs. Single Baths  
*D. Banga, J. Sugar, D. Medlin, V. Stavila, D. B. Robinson, and P. Sharma*

- 3812 Bismuth Thin Films: Growth, Structure and Properties  
*M. Saini, S. Zheng, S. Huang, W. Wang, C. Chien, and S. Morin*
- 3813 Electrochemical Routes to the Reduction of Resistance in Single-Walled Carbon Nanotube Networks  
*D. Asheghali, N. Bhatt, P. Vichchulada, and M. D. Lay*
- 3814 Thermodynamics and Kinetics Aspects of Metal Deposition via Surface Limited Redox Replacement Reaction  
*S. Brankovic*
- 3815 Deposition of Ultra Thin Pt Films via Surface Limited Redox Replacement of UPD Layers on Au  
*N. Vasiljevic, J. Nutariya, M. Fayette, B. Rawlings, and N. Dimitrov*
- 3816 The Electrochemical Atomic Layer Deposition of Pt and Pd Nanoparticles on Ni Foam for the Electro-Oxidation of Alcohols  
*R. M. Modibedi, E. Louw, K. I. Ozoemena, and M. K. Mathe*
- 3817 Electrodeposition of Metals in Catalysts Syntheses: Platinum Monolayer Electrocatalysts for the Oxygen Reduction Reaction  
*M. Vukmirovic, S. Bliznakov, K. Sasaki, J. Wang, and R. R. Adzic*
- 3818 Highly-Active Pt Coated NPG Catalyst for HCOOH Oxidation: Synthesis, SLRR Coating, Activity and Durability  
*N. Dimitrov, M. Kamundi, L. Bromberg, D. McCurry, M. Fayette, and E. Fey*
- 3819 Epitaxial Ag(111) Overlayers on Noble Metals  
*K. Soliman and L. A. Kibler*
- 3820 Electrodeposition of Pt Thin Films by Pulsed Potential  
*Y. Liu, D. Gokcen, U. Bertocci, and T. Moffat*
- 3821 NEAR-Surface Equilibrium Phases in Electrochemically Fabricated Low-dimensional Multi-Component Catalysts  
*F. M. Alamgir, R. Rettew, and A. Vitale*
- 3822 Self-Limiting Electroless Deposition of Nanoscale Ruthenium Oxide: Catalyst, Electron/Proton Conductor, Broadband Transparent Oxide  
*D. R. Rolison, C. N. Chervin, J. W. Long, M. Osofsky, J. Melinger, J. Owrusky, F. Rachford, J. Pietron, and M. Pomfret*
- 3823 In Situ Stress Measurement During Pt Deposition Using Surface Limited Redox Replacement  
*G. Stafford, M. C. Lafouresse, Y. Liu, J. Shin, and U. Bertocci*
- 3824 First Principles Studies of Trends in Metal Electrodeposition and Reactivity  
*J. Greeley*

- 3825 Reduction of Nitrate Mediated By Metal UPD on Pd-Modified Au Electrodes In Aqueous Electrolytes  
*A. J. Jebaraj and D. J. Scherson*
- 3826 Preparation of Size-quantized Lead Sulfide Thin Layer on Silver Nanocubes via Electrochemical Atomic Layer Deposition  
*M. Nakano, K. Okazaki, and T. Torimoto*

**J1 - Chemical Sensors 10 - Chemical and Biological Sensors and Analytical Systems**  
*ECS Sensor, ECSJ Chemical Sensor*

- 3827 Phytosensors and Phytoactuators  
*A. G. Volkov, M. I. Volkova, and V. S. Markin*
- 3828 Biofuel Cell Providing a Platform for Self-Powered Biosensors  
*S. Dong*
- 3829 Miniature Enzymatic Biosensors for Tear Glucose Measurement in Capillary Tubes  
*B. Peng, Q. Yan, B. Cohan, T. C. Major, and M. E. Meyerhoff*
- 3830 Real-time and Ultra-sensitive detection of Cancer Marker Using a Novel Silicon Nanobelt Field Effect Transistor  
*Y. Yu, J. Wu, and C. Wu*
- 3831 Graphene Oxide-Based Aptasensor for Heavy Metal Detection  
*M. Li and N. Wu*
- 3832 Time Sensors: Circadian Rhythms in Biologically Closed Electrochemical Circuits of Plants  
*A. Waite, J. Wooten, A. G. Volkov, and V. S. Markin*
- 3833 Immobilization of Enzymes and Redox Proteins and Their Electrochemical Biosensor Applications  
*S. Chen, V. Mani, S. Palanisamy, and Y. Li*
- 3834 Salmonella Typhimurium Detection on Food Surface using Magnetoelastic Biosensors  
*Y. Chai, S. Horikawa, M. Park, S. Li, and B. Chin*
- 3835 Bio-Inspired Autonomous Sentinel System for Screening Invasive Pathogens  
*S. Li, H. Wickle III, Y. Chai, M. Park, S. Horikawa, and B. Chin*
- 3836 New Multimode Sensors based on Nanostructured Materials for Simultaneous Screening of Biological Fluids for Specific Breast Cancer and Hepatitis B Biomarkers  
*R. I. Stefan - van Staden and M. Enachescu*
- 3837 Direct Detection of Salmonella Typhimurium on Tomato and Spinach using a Phage-based Magnetoelastic Biosensor Method  
*M. Park, S. Li, K. Weerakoon, S. Horikawa, Y. Chai, and B. Chin*

- 3838 Development of Electrochemical Cantilever Sensors for DNA Applications  
*X. Quan, Y. Sun, A. Labuda, A. Heiskanen, A. Wolff, J. Jorge Dulanto, P. Grutter, and A. Boisen*
- 3839 Fabrication of Minimally-Invasive Patch Type Glucose Sensors  
*M. Yasuzawa, S. Sato, H. Nakanishi, and K. Edagawa*
- 3840 Flexprint based Glucose Sensors for Continuous Measurement of Glucose Profiles of Diabetic Patients  
*P. D. van der Wal, P. Hadvary, H. Tschirky, and N. de Rooij*
- 3841 Nanodiamond Microelectrode Array with Mesa Structure Fabricated for Bio-Analytical Applications  
*S. Raina, N. Ghosh, and W. Kang*
- 3842 An Electrochemical Probe Technology for a Label-Free, Point-of-Care Biosensor  
*J. Wei, S. Singhal, and H. Liu*
- 3843 Electrical Impedance Sensors for Cancer Cell Study  
*L. Yang*
- 3844 Terahertz Chemical Imaging and Spectroscopy of Molecular Networks in Pharmaceutical and Biomedical Applications  
*K. Ajito, Y. Ueno, H. Song, E. Tamechika, N. Kukutsu, W. Limwikrant, K. Yamamoto, and K. Moribe*
- 3845 (Sensor Division Outstanding Achievement Award Presentation) Ceramic Gas Sensors to Oxide Nanostructures: Opportunities and Challenges  
*S. A. Akbar*
- 3846 The Characteristics of Nanocomposite Chemical Sensors  
*A. K. Batra, J. Stephens, and J. Currie*
- 3847 Diminishing Ethanol Cross-sensitivity via Lamination of Selective Oxidation Catalyst layer on Zirconia-based VOC Sensor  
*T. Sato, M. Breedon, Y. Kugimiya, and N. Miura*
- 3848 Rapid and Simple Immunoassay Based on Negative Dielectrophoresis with Three-Dimensional Interdigitated Array Electrodes  
*T. Yasukawa, H. Shiku, T. Matsue, and F. Mizutani*
- 3849 Bismuth-film electrodes for Sn<sup>2+</sup> Sensing: The Roles of Grain Size, Preferred Orientation Ratio, and Surface Roughness  
*C. H. Lien, K. Chang, C. Hu, Y. Tsai, and D. Wang*
- 3850 High-Throughput Separation Assay for NO Metabolites in Blood using Microfluidic Electrophoresis  
*S. Wakida, T. Miyado, K. Shimazu, Y. Shibutani, T. Mizukami, K. Nose, and A. Shimouchi*

- 3851 Effects of Surface Modification of Noble-Metal Electrodes with Au on the H<sub>2</sub> Sensing Properties of Diode-type Gas Sensors  
*T. Hyodo, T. Yamashita, and Y. Shimizu*
- 3852 Application of Electrospun Carbon Nanofiber and Its Composites in Electroanalytical Chemistry  
*J. Huang, Y. Liu, and T. You*
- 3853 Soluble Polyaniline for a State of Health Sensor  
*M. Kane*
- 3854 Potentiometric YSZ-based Sensors Using Zn-Ta-O-based Sensing Electrode for Selective H<sub>2</sub> Detection  
*S. A. Anggraini, M. Breedon, and N. Miura*
- 3855 Solid Electrolyte Type Ammonia Gas Sensor with High Water Durability  
*S. Tamura, T. Nagai, and N. Imanaka*
- 3856 Low Cost 8 nm Radius Nanoelectrodes Arrays by Sol-Gel Chemistry: To Fundamental Understanding of Mass Transport Toward Direct DNA Hybridization Detection Electrochemical Sensor  
*O. Fontaine, C. Laberty, H. Perrot, and C. Sanchez*
- 3857 Direct Comparison of Anti-Interference Property for Bimetallic PtAu, PtIr, and PtRu Nanoparticle catalysts in Amperometric Detection for H<sub>2</sub>O<sub>2</sub> Based Biosensors  
*M. Janyasupab, Y. Zhang, C. Liu, and C. Liu*
- 3858 A High-Throughput Assay for Evaluation of Embryoid Bodies using Local Redox Cycling-Based Electrochemical Chip Device  
*K. Ino, T. Nishijo, Y. Kanno, H. Shiku, and T. Matsue*
- 3859 Printed Amperometric Gas Sensors  
*M. T. Carter, J. R. Stetter, M. W. Findlay, and V. Patel*
- 3860 Interaction of Water Vapor with SnO<sub>2</sub> Sensor Materials: A Comparison of DRIFTS and Resistance Measurements  
*R. G. Pavelko, K. Grossmann, N. Barsan, and K. Shimanoe*
- 3861 pH Sensing Characteristics and Biosensing Application of Solution-Gated Reduced Graphene Oxide Field-Effect Transistors  
*I. Sohn, D. Kim, J. Jung, O. Yoon, and N. Lee*
- 3862 Development of Micro Hydrogen Gas Sensor Utilizing Polymerized Gel with Ionic Liquid as a Solvent  
*T. Yamauchi*
- 3863 Iridium Oxide pH Sensor Development and Its Application in Corrosion Study  
*F. Huang, Y. Jin, and L. Wen*

- 3864 Surface-enhanced Raman Scattering on Ordered Metal Nanodot Array Obtained Using Anodic Porous Alumina  
*T. Kondo, K. Nishio, and H. Masuda*
- 3865 Enzyme-Encapsulated Quantum Dot Hydrogels in the Development of Biosensors: A Multifunctional Platform for Both Bio-Catalysis and Fluorescent Probing  
*J. Yuan, N. Gaponik, and A. Eychmüller*
- 3866 Adaptive Chemical Sampling Device Inspired by Crayfish  
*R. Takemura, K. Takahashi, T. Makishita, and H. Ishida*
- 3867 Carbohydrate Immobilization on the Surface of Field Effect Transistor Biosensor for Detection of Virus-related Protein  
*S. Hideshima, H. Hinou, D. Ebihara, R. Sato, S. Kuroiwa, S. Nishimura, and T. Osaka*
- 3868 Block Co-polymer Enhanced 3D Carbon Nanostructure Electronics  
*S. Guo, A. George, M. Penchev, C. Ozkan, and M. Ozkan*
- 3869 Self-Assembled Monolayers of Oligonucleotides as Receptor Layers for Metal Ions Sensors  
*L. Górski, R. Ziolkowski, and E. Malinowska*
- 3870 Development of Highly-Sensitive Electrochemical Measurement System on Dry Chemistry using Ionic Liquid  
*S. Arimoto, M. Takahashi, A. Kamei, and T. Yoshioka*
- 3871 Chalcogenide Glass Chemical Sensor for Cadmium Detection in Industrial Environment  
*M. Milochova, M. Kassem, and E. Bychkov*
- 3872 Electrochemical Pump Consisting of  $\text{Cu}^{2+}$ -Poly(acrylic acid) Gel  
*K. Takada, N. Yamamura, A. Hayashi, T. Yasui, and A. Yuchi*
- 3873 The pH Sensing Characteristics of Extended-Gate Field-Effect Transistor Base on The Electrode with Copper Oxide Nanowires  
*Y. Huang, H. Lin, H. Li, W. Dai, C. Chou, and H. Cheng*
- 3874 Multiplexed Cantilever Sensors with a Peptide Receptor and Humidity Effects on Binding Kinetics  
*Y. Yoo, M. Chae, J. Kang, K. Hwang, T. Kim, and J. Lee*
- 3875 High Sensitive Amperometric Detection of Glucose using Conductive DLC Electrode in Higher Potential Region  
*K. Honda, H. Naragino, K. Yoshinaga, A. Nakahara, and S. Tanaka*
- 3876 Electrochemical Immunosensor for Diagnostic of Parasitological Human Diseases  
*C. A. Erdmann, J. Inaba, A. G. Viana, C. A. Pessoa, K. Wohnrath, and J. R. Garcia*



- 3877 Characterization and Electrochemical Response of Sonogel Carbon Electrode Modified with Nanostructured TiO<sub>2</sub> and ZrO<sub>2</sub> Film to Detect Common Neurotransmitters  
*M. K. Hughes, N. Vincent, and S. K. Lunsford*
- 3878 A Novel Approach of Pb(II) Determination in Environmental Samples by Lead Selective Electrodes  
*G. Lisak and J. Bobacka*
- 3879 Functionalization of Pyrolyzed Carbon Structures for Bio-nano-electronics Platforms  
*M. Hirabayashi, B. Mehta, S. Kassegne, and A. Khosla*
- 3880 Micromechanical Detection of 2,4-Dinitrotoluene by a Cantilever-based Artificial Olfactory System with Micro-Preconcentrator  
*M. Chae, Y. Yoo, J. Lee, S. Lee, J. Kang, T. Kim, and K. Hwang*
- 3881 Layer-by-Layer Catalytic Interface for Electrochemical Detection of Multiple Substrates Featuring Bio-Functionalized Carbon Nanotubes  
*J. S. Kirsch and A. L. Simonian*
- 3882 Improved Electrocatalytic Performance for H<sub>2</sub>O<sub>2</sub> Detection Based on Bimetallic PtM (M = Pd, Au or Ir) Nanoparticles  
*Y. Zhang, M. Janyasupab, C. Liu, J. Xu, and C. Liu*
- 3883 Superoxide Anion Radical Sensor using GC Electrode Modified with Heparin/PEDOT and Polymerized Iron Porphyrin  
*R. Matsuoka, T. Kondo, and M. Yuasa*
- 3884 Ultra-Sensitive Label-Free Detection of Proteins by Chemically Derived Graphene Based Field-Effect Transistor  
*D. Kim, I. Sohn, J. Jung, O. Yoon, J. Park, and N. Lee*
- 3885 New Application of Produced Pigment from Bacteria to Detect of Ammonia in Combination with Flow Injection for Ammonia Analysis  
*Y. Iida and I. Satoh*
- 3886 Preparation of Fine Implantable Needle Type Biosensors for Blood Vessel Glucose Monitoring  
*K. Edagawa and M. Yasuzawa*
- 3887 CO Sensing Properties of Electrochemical Gas Sensors using an Anion-Conducting Polymer as an Electrolyte  
*T. Goto, T. Hyodo, K. Kaneyasu, H. Yanagi, and Y. Shimizu*
- 3888 Investigation of ZnO-Nanowire-Based Extended-Gate Field-Effect-Transistor pH Sensors  
*C. Li, S. Chang, T. Yang, and S. Chang*
- 3889 NO<sub>2</sub> Sensing Properties of Porous In<sub>2</sub>O<sub>3</sub>-based Powders Prepared by Utilizing Ultrasonic-Spray Pyrolysis Employing PMMA Microsphere Templates: Effects of the Size of the PMMA Microspheres on Their Gas-Sensing Properties  
*E. Fujii, T. Hyodo, K. Matsuo, and Y. Shimizu*

- 3890 Biosensors for Health Monitoring  
*S. Anastasova and P. Vadgama*
- 3891 Redox-Active Alkali Insertion Materials as Inner Contact Layer in All-Solid-State Ion-Selective Electrodes  
*S. Komaba, C. Suzuki, N. Yabuuchi, S. Kanazawa, T. Hasegawa, and T. Akatsuka*
- 3892 Sensing Characteristics of a Fiber Bragg Grating Hydrogen Gas Sensor using Sol-Gel Derived Pt/WO<sub>3</sub> Film  
*S. Okazaki, Y. Maru, and T. Mizutani*
- 3893 Zirconia-based Electrochemical Oxygen Sensor for Accurately Determining Water Vapor Concentration  
*R. E. Soltis*
- 3894 Fabrication of Surface Enhanced Raman Scattering (SERS)-active substrates by using Dip-Pen Nanolithography  
*K. Chao and K. Ou*
- 3895 Application of Commercial Manufacturing Methods to Mixed-Potential NO<sub>x</sub> Sensors  
*C. R. Kreller, P. K. Sekhar, W. Li, P. Palanisamy, E. L. Brosha, R. Mukundan, and F. H. Garzon*
- 3896 Research on Filter Materials for LP Gas Sensors  
*M. Sai, K. Shinnishi, K. Kaneyasu, T. Suzuki, and M. Takeuchi*

## **J2 - Luminescence and Display Materials: Fundamentals and Applications**

*ECS Luminescence and Display Materials, ECSJ Phosphor Research*

- 3897 Novel Synthesis Methods of Silicate and Silicon Oxynitride Phosphors Using Silicon Monoxide (SiO) as a Raw Material  
*T. Ishigaki, T. Sakamoto, S. Kamei, K. Uematsu, K. Toda, and M. Sato*
- 3898 Synthesis of Nitride and Oxynitride Phosphors Using Fluidized Bed Furnace  
*K. Toda, S. Kamei, K. Uematsu, T. Ishigaki, and M. Sato*
- 3899 Synthesis of Highly Efficient Red Phosphor SrCaSiO<sub>4</sub>:Eu<sup>2+</sup> by Aqueous Solution Method  
*S. Tezuka, K. Hideki, Y. Takatuka, and M. Kakihana*
- 3900 Effects of Preparation Condition for Photoluminescent Properties of White Light Emitting Mesoporous Carbon-Silica Nanocomposites  
*Y. Ishii, K. Sato, Y. Ishikawa, and S. Kawasaki*
- 3901 Luminescence Properties of New Thioaluminate Phosphors (Ba<sub>1-x</sub>Sr<sub>x</sub>)<sub>4</sub>Al<sub>2</sub>S<sub>7</sub>:Eu  
*T. Hasegawa, H. Kato, M. Kobayashi, H. Yamane, and M. Kakihana*
- 3902 Anomalous Rare Earth Doping in Nitride and Oxynitride Phosphors  
*T. Takeda, R. Xie, N. Hirotsuki, K. Kimoto, and M. Saito*

- 3903 Investigation of Ion Dependence of Electronic Structure for  $3d^3$  Ions in  $Mg_2TiO_4$  based on First-principles Calculations  
*M. Novita, H. Yoshida, and K. Ogasawara*
- 3904 Comparison of Simulation and Experimental Results of Crystalline Si Solar Module with  $YVO_4:Bi^{3+},Eu^{3+}$  Nanophosphor Spectral Shifter  
*Y. Iso, S. Takeshita, and T. Isobe*
- 3905 Simple-Structure Light-Emitting Diodes Based on a Blend of Nanocrystal Quantum Dots and ZnO  
*J. Kwak, W. Bae, and C. Lee*
- 3906 Optimizing the Synthesis of Europium Dibenzoylmethide Triethylammonium  
*K. Bhat, R. Fontenot, W. A. Hollerman, and M. Aggarwal*
- 3907 Comparison of Hydrothermal and Glycothermal Syntheses of  $YBO_3:Ce^{3+},Tb^{3+}$  with Green Fluorescence under Near UV Excitation  
*H. Hara, S. Takeshita, T. Isobe, T. Sawayama, and S. Niikura*
- 3908 Practical Multiplet Energy Level Diagrams for  $V^{2+}, Cr^{3+}, Mn^{4+}$  in Oxides and in Fluorides  
*H. Nagoshi, H. Yoshida, and K. Ogasawara*
- 3909 The Influence of Phosphor Decay Time on the Cross-Talk in 3D-PDP  
*J. Yoo, C. Ji, G. Anoop, I. Cho, S. Lee, Y. Cho, W. Kim, and E. Park*
- 3910 Synthesis of InP Multi-Shell Structured Quantum Dot and Their Application for White LEDs  
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*J. No, K. Kim, and S. Jeong*
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*G. Bilir, G. Ozen, J. Collins, and B. Di Bartolo*
- 3913 Preparation and Photoluminescence Property of Praseodymium doped Calcium Titanate Nanocrystals  
*Y. Hakuta, M. Ohara, M. Aoki, K. Minami, K. Sue, and H. Takashima*
- 3914 Effects of Preparing Conditions on the Luminescent Properties of  $Mn^{4+}$  Ion Doped  $CaAl_4O_7$  Phosphors  
*J. Park, G. Kim, and Y. Kim*
- 3915 The Luminescent Properties of  $Eu^{2+}$  Doped  $Ca_2SiO_4$  Nanopowders Synthesized by a Sol-Gel Method  
*J. Park, J. Lee, and Y. Kim*

- 3916 3D Visualization of 4-Component Relativistic Wave Functions of the Free  $Ce^{3+}$  Ion and the  $Ce^{3+}$  Ion in YAG  
*T. Katakami, K. Higashiura, and K. Ogasawara*
- 3917 Low Electric Field Driving Transparent Thin Films Electroluminescence Devices with Perovskite Oxides  
*H. Takashima and I. Mitsuru*
- 3918 Luminescence study of  $Ca_{3-3x/2}(VO_4)_2:xEu$  ( $0.01 \leq x \leq 0.09$ ) Red-Phosphors Prepared by Solution Combustion Method  
*K. Kim, S. Yoon, Y. Shin, and K. Park*
- 3919 Microstructure and Photoluminescence Properties of  $Sr_{2.91}V_2O_8:Eu_{0.06}$  Phosphors Prepared by the Solution Combustion Method  
*K. Park, S. Yoon, K. Kim, and Y. Shin*
- 3920 Electroluminescence from  $Cr^{3+}$  in New Perovskite Thin-Film Phosphors using  $LaAlO_3$  and  $LaGaO_3$  as the Host  
*T. Miyata, Y. Nishi, T. Mori, and T. Minami*
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*S. Kim, A. Tanaka, and T. Nagamura*
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*T. Kyomen, M. Hanaya, and H. Takashima*
- 3923 Optical Phonon Emission of ZnO Thin Films  
*S. Munisamy, S. Kasilingam, T. Rajalingam, and T. Masaki*
- 3924 Synthesis of  $Sr_2Si_5N_8:Eu^{2+}$  Red-Emitting Phosphor by Induction Heating  
*J. Choi, A. Piquette, M. Hannah, K. C. Mishra, J. B. Talbot, and J. McKittrick*
- 3925 Morphology and Particle Size Dependent Luminescence Properties of  $Y_2O_3:Eu$  Phosphors Prepared by Various Synthetic Methods  
*Y. Kim, J. Han, J. Talbot, and J. McKittrick*
- 3926 Optoelectronic and Persistent Luminescence Properties in  $Ce^{3+}$ -Doped Garnet Ceramics  
*J. Ueda, K. Aishima, and S. Tanabe*
- 3927  $Ce^{3+}$ - $Tb^{3+}$  Energy Transfer in Aluminate Garnets  
*A. Setlur and J. Shiang*
- 3928 Systematic Studies of Structural and Optical Properties of Pure and Doped Pyrochlore Crystals  
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*M. G. Brik, M. Kirm, M. True, and G. Zimmerer*

- 3930 Improvement of Luminescence Properties of  $\text{KSrPO}_4\text{:Eu}$  by a Polymerizable Complex Method Employing a Water Soluble Phosphorus Oligomer  
*M. Kim, M. Kobayashi, H. Kato, and M. Kakihana*
- 3931 Relationship between Emission Properties and Host Structure for  $\text{Eu}^{2+}$ -doped Phosphate Investigated by Quantitative Structure Relationship and First Principles Calculation  
*H. Takaba, R. Miura, A. Suzuki, N. Hatakeyama, and A. Miyamoto*
- 3932 Transparent Inorganic Downconverters for Luminescent Solar Concentrators  
*L. Shea-Rohwer, J. Martin, and M. Nyman*
- 3933 Spectroscopy of Pr-doped  $\text{CaTiO}_3$  Nano-particles under Excitation into the Charge Transfer State  
*J. Collins, Y. Tsehay, P. Boutinaud, G. Chadeyron, and R. Boosin*
- 3934 Development of  $\text{YVO}_4\text{:Bi}^{3+},\text{Eu}^{3+}$  Nanophosphor and Its Application as a Spectral Down-Shifter for Solar Cells  
*S. Takeshita and T. Isobe*
- 3935 Liquid Phase Synthesis and Characterization of  $\text{LaPO}_4\text{:Yb}^{3+}/\text{GdPO}_4$  Nanoparticles with NIR Emission under NIR Excitation  
*T. Isobe, T. Shimizu, K. Hara, and S. Takeshita*
- 3936 Photoluminescence of single InAsP quantum dots in InP nanowires  
*P. Poole, D. Dalacu, J. Lapointe, and K. Mnaymneh*
- 3937 Fast Luminescence in Silicon-Germanium Nanostructures  
*D. J. Lockwood, X. Wu, J. Baribeau, N. Modi, and L. Tsybeskov*
- 3938 XANES and XEOL Studies of Luminescent Silicon Carbonitride ( $\text{SiCN}$ ) Thin Films  
*Z. Khatami, P. Wilson, J. Wojcik, and P. Mascher*
- 3939 Design Rule of Ti/Al Ohmic contacts on N-face n-GaN : Solution for Thermal Degradation  
*B. Kim, Y. Song, J. Son, C. Yoo, and J. Lee*
- 3940 Colloidal Synthesis of  $(\text{CuAg})_x\text{In}_{2x}\text{Zn}_{2(1-2x)}\text{S}_2$  Solid Solution Nanocrystals with Tunable Band Gap  
*M. Dai, K. Okazaki, A. Kudo, S. Kuwabata, and T. Torimoto*
- 3941 Core/Shell structured Nanoparticles and Hybrid Electrode Materials for Electrically Tunable Photonic Crystal Display  
*H. Shim, M. Han, J. Lim, C. Heo, H. Jin, C. Shin, S. Jeon, J. Kim, J. Lee, and S. Lee*
- 3942 Enhanced Electrochemiluminescence Light-Emitting Device Driven by Application of AC Voltage and Its Emission Mechanism  
*T. Nobeshima, K. Nakamura, and N. Kobayashi*
- 3943 Efficient Materials for High Quality Light Sources: Present Status and Future Prospects  
*J. Carreras and C. Hunt*

- 3944 Highly Efficient Phosphor-Converted White Light Emitting Diode by Electrophoretic Deposition  
*J. Choi, M. Anc, A. Piquette, M. Hannah, K. C. Mishra, J. B. Talbot, and J. McKittrick*
- 3945 Nano-Pyramids Structure for Enhancement of Light Extraction Efficiency by Nanoimprint Lithography  
*C. Yoo, Y. Song, B. Kim, K. Kim, J. Son, and J. Lee*
- 3946 Highly Reliable Encapsulation Films for OLEDs Composed of SiN<sub>x</sub> and SiO<sub>x</sub>C<sub>y</sub> Prepared Using SWP-CVD  
*S. Ueno, M. Yomogida, M. Suzuki, Y. Konishi, and K. Azuma*
- 3947 Green-Color Selective Organic Photodetector with High Sensitivity for Image Sensor Application  
*K. Lee, D. Leem, K. Park, S. Lim, Y. Jin, S. Lee, K. Kim, and S. Park*
- 3948 Thermo-switchable Emission and Coloration of Composite Material Containing Luminescent Europium(III) Complex and Fluoran Dye  
*K. Nakamura, Y. Kobayashi, K. Kanazawa, and N. Kobayashi*
- 3949 Color tunable organic plasmon-emitting diodes  
*I. Lee, K. Kim, S. Kim, B. Koo, B. Lee, and J. Lee*
- 3950 Electroswitchable Emission of the Luminescent Eu(III) Complex based on Electrochemical Reaction  
*K. Kanazawa, K. Nakamura, and N. Kobayashi*
- 3951 Ultrafine Silver Nanowire Networks as Scattering Core in Organic Light Emitting Diodes  
*B. Lee, K. Kim, S. Kim, I. Lee, B. Koo, and J. Lee*
- 3952 Enhancing Light Outcoupling of Flexible Organic Light Emitting Diodes by Domain Selective-Etching  
*I. Lee, K. Kim, S. Kim, B. Koo, B. Lee, and J. Lee*
- 3953 Triboluminescent Properties of EuD<sub>4</sub>TEA and ZnS:Mn and Their Use for Smart Sensors  
*R. Fontenot, K. Bhat, W. A. Hollerman, and M. Aggarwal*
- 3954 Using Triboluminescence To Detect Ballistic and Hypervelocity Impacts  
*W. A. Hollerman and R. Fontenot*

### **J3 - Materials for Solid State Lighting**

*ECS Luminescence and Display Materials, ECS New Technology Subcommittee, ECSJ Phosphor Research*

- 3955 (Centennial Outstanding Achievement Award Presentation of the LDM Division) Toward Further Breakthroughs in Nitride Phosphors  
*H. Yamamoto*

- 3956 Spatio-Time-Resolved Cathodoluminescence Studies on Freestanding GaN Substrates Grown by Hydride Vapor Phase Epitaxy  
*S. F. Chichibu, Y. Ishikawa, K. Hazu, M. Tashiro, K. Furusawa, H. Namirta, S. Nagao, K. Fujito, and A. Uedono*
- 3957 Electrical Characterization of High-quality InGaN-based Blue Light Emitting Diodes on 8inch Silicon Grown by Metalorganic Chemical Vapor Deposition  
*J. Kim, J. Kim, Y. Tak, J. Kim, H. Hong, S. Chae, M. Yang, J. Lee, H. Choi, J. Park, Y. Park, and U. Chung*
- 3958 Simulation and Design of (In,Ga)N-Based Light Emitting Diodes  
*Z. Liang, E. Stach, T. Sands, and E. García*
- 3959 Tuning of Indium Tin Oxide Work Function with an Ionic Solid Thin Film in Polymer Light-Emitting Diodes  
*Y. Chou and T. Wen*
- 3960 First Principles Investigations of the Electronic Structures and Associated Properties of Solid Solutions of AlN and GaN  
*K. C. Mishra, P. Schmidt, and K. Johnson*
- 3961 Fabrication Semipolar GaN on Nanoscale Pattern C-sapphire by Using Self-Assembled Ni Pattern as Mask  
*C. Chen, C. Hsieh, and Y. Wu*
- 3962 Transparent Electrode for Top Emitting Organic Light Emitting Diodes by Suppression of Surface Plasmons  
*B. Koo, S. Kim, K. Hong, K. Kim, I. Lee, and J. Lee*
- 3963 Growth and Electrical Properties of n-type 4H-SiC Single Crystals  
*X. Xu, Y. Peng, S. Song, X. Chen, and X. Hu*
- 3964 Nanoco's CFQDs for Solid-State Lighting Applications  
*N. Pickett*
- 3965 Fabrication of Efficient, Stable White Light-Emitting Diodes Based on Highly Fluorescent Copper-Indium-Sulfide Quantum Dots  
*W. Song and H. Yang*
- 3966 Glass Matrices Containing Rare-Earth Ions for White Light-Emitting Diodes with High Color Rendering Indices  
*J. Heo and S. Yi*
- 3967 High Color Rendering White LED Based on Silicate/Dye-Bridged Siloxane Hybrid Phosphor Encapsulant  
*B. Bae, S. Kwak, N. Kim, and H. Im*
- 3968 Hybrid Solid-State Lighting Design  
*W. Hertog, C. Hunt, and J. Carreras*

- 3969 Synthesis, Luminescence Mechanism and Application of  $\beta$ -sialon Green Phosphor with Sharp Line-Width  
*K. Takahashi, K. Yoshimura, M. Harada, Y. Tomomura, T. Takeda, R. Xie, and N. Hirotsuki*
- 3970 Synthesis and Luminescence of  $\text{Eu}^{2+}$  Activated Yellow Oxynitride Phosphor  
*P. Nammalwar, S. Manepalli, D. Porob, Y. Gao, and A. Setlur*
- 3971 Sr-Containing Sialon Phosphors with High Quantum Efficiencies for White LEDs  
*Y. Fukuda, K. Albessard, A. Okada, T. Sato, R. Hiramatsu, and N. Matsuda*
- 3972 Bandgap Estimates and  $\text{Ce}^{3+}$  Quenching in  $\text{Cs}_3\text{CoCl}_5$ -based Phosphors  
*U. Happek and A. Setlur*
- 3973 Single Phase, Highly Efficient  $\text{Li}(\text{Ca}_{0.99-x}\text{Sr}_x\text{Eu}_{0.01})\text{PO}_4$  Blue Emitting Phosphors for Near UV-Emitting LEDs  
*J. Han, M. Hannah, A. Piquette, J. Talbot, K. C. Mishra, and J. Mckittrick*
- 3974 Luminescence Quenching in Highly Doped YAG:Ce  
*A. Setlur, M. Pasricha, M. Perera, G. Levitt, and U. O. Happek*
- 3975 Enhancement of Photoluminescence Properties of Green-Emitting Oxynitride Phosphor using  $\text{Eu}_2\text{O}_3@ \text{B}_2\text{O}_3$  Core-Shell for White LED Applications  
*D. Yoon*
- 3976 Silica-Overcoated Copper-Indium-Sulfide Quantum Dot-Polymer Composite Plate as a Robust Wavelength Converter of White Light-Emitting Diode  
*W. Song, E. Jang, and H. Yang*
- 3977 Tunable Green-Red- Emitting  $\text{Ca}_{14}\text{Mg}_2[\text{SiO}_4]_8:\text{Eu}^{2+}, \text{Mn}^{2+}$  Phosphor : the Structural and Optical Properties, and Their Application to Near-UV LED-based White LEDs  
*K. Lee and W. Im*
- 3978 The Formation of the Hexagonal Pyramid Facets on Wet Etching Patterned Sapphire Substrate  
*Y. Chen, F. Hsiao, and Y. Wu*
- 3979 High Brightness III - V Light-Emitting Diodes on Diamond/Silicon Composite Substrate  
*T. Chang, J. Hu, Y. Wu, and B. Lin*
- 3980 Organic Light-Emitting Diodes with Contact-Printed Red Emissive Layer  
*S. Peng, J. Jou, S. Chen, and P. Wu*
- 3981 Color Tuning of Red-Emission  $\text{Eu}_{1-x}\text{Ba}_x\text{Si}_2\text{O}_7$  Phosphors for White-Light-Emitting Diode  
*K. Park, K. Seo, J. Kim, T. Kim, and G. Kim*
- 3982 Blue Excitability of Yellow  $\text{Zn}_{1-x}\text{Mn}_x\text{S}$  Phosphor and It's LED Application  
*K. Park, K. Seo, H. Lim, J. Kim, T. Kim, and G. Kim*



- 3983 Green CaSc<sub>2</sub>O<sub>4</sub>: Ce<sup>3+</sup> Phosphor for White-Light-Emitting Diode  
*K. Park, K. Seo, S. Lim, H. Lim, J. Lim, J. Kim, L. Jiang, J. Kim, T. Kim, and G. Kim*
- 3984 Luminescence Properties and Stability Improvement by SiO<sub>2</sub> Coating on Various Phosphors for Near UV-Emitting LEDs  
*J. Han, M. Hannah, A. Piquette, J. Talbot, K. C. Mishra, and J. Mckittrick*

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*ECS Sensor, ECS Dielectric Science and Technology, ECS Electronics and Photonics, ECS Physical and Analytical Electrochemistry, ECSJ Bioengineering, CSE*

- 3985 Micro-systems and Nanotechnologies in ELISA and Droplet Generation Applications  
*C. Yeh and Y. Lin*
- 3986 A Novel Microdevice for the Treatment of Hydrocephalus  
*J. Oh, F. Kralick, and H. Noh*
- 3987 Wafer Scale Processing of Plasmonic Nanopore Arrays in 200mm CMOS Fab Environment  
*K. Malachowski, R. Verbeeck, T. Dupont, C. Chen, S. Musa, Y. Li, T. Stakenborg, D. Sabuncuoglu Tezcan, and P. Van Dorpe*
- 3988 Tunable Young's Modulus in Carbon MEMS using Graphene-based Stiffeners  
*C. M. Washburn, T. Lambert, J. Blecke, D. Davis, P. S. Finnegan, B. G. Hance, and J. M. Strong*
- 3989 Residue-Free Dry Etching of Polymer Sacrificial Layer for Microelectromechanical-System Device Fabrication  
*K. Takagahara, K. Ono, K. Kuwabara, T. Sakata, H. Ishii, Y. Sato, and Y. Jin*
- 3990 Low Cost UV Laser Direct Write Photolithography System for Rapid Prototyping of Microsystems  
*J. Waynelovich, A. Sepehri, B. Mehta, S. Kassegne, and A. Khosla*
- 3991 The Carbonized SU-8 Electrospun Nano-Fiber for an Electrode in the Energy Storage Device  
*H. Kim, J. Woo, Y. Joo, Y. Chun, and C. Kim*
- 3992 Hydrodynamic Cell Enrichment in Double Spiral Microfluidic Channels  
*J. Sun, M. Li, C. Liu, G. Hu, and X. Jiang*
- 3993 Nanostructured Columnar Thin Films for Biological and Chemical Sensing Applications  
*P. Shah, H. Knachel, A. Sarangan, and K. Hansen*
- 3994 Thermal Conductivity Engineering via Nano Patterning  
*B. Kim, I. El-Kady, and R. H. Olsson III*

- 3995 Photothermal Cantilever Deflection Spectroscopy  
*T. Thundat, M. Bagheri, S. Kim, D. Lee, and S. Jeon*
- 3996 Development of Insulated Conductive AFM Probes for Molecular Electronics  
*Y. Wu, T. Akiyama, P. D. van der Wal, S. Gautsch, and N. de Rooij*
- 3997 All Thin Film Micromachined Cantilever Using PZT/Terfenol-D Multilayer for High Sensitive Magnetoelectric Sensors  
*D. Lee, S. Kim, Y. Yoo, J. Han, W. Jo, and J. Lee*
- 3998 Characterization and Response of Metal Organic Frameworks Based Microcantilever Sensors for the Detection of Volatile Organic Compounds  
*I. Ellern*
- 3999 Manipulation of Micro Condensed Matter by Direct Peeling Method by using Atomic Force Microscope Tip  
*A. Kawai*
- 4000 A MEMS-based Platform for Multi-physics Characterization of Ultra-thin Freestanding Films  
*M. Haque*
- 4001 Effects of Adsorbate Surface Diffusion in Focused Electron-Beam-Induced-Deposition  
*A. Szkudlarek, M. Gabureac, and I. Utke*
- 4002 Electroplating of Microstructured Nickel Phase Gratings for X-Ray Phase Contrast Tomography  
*M. Amberger, K. Bade, J. Meiser, D. Kunka, and J. Mohr*
- 4003 The Defect and Transport Properties of TlBr  
*S. R. Bishop, G. Ciampi, M. Kuhn, H. L. Tuller, W. Higgins, and K. Shah*
- 4004 Microfabricated Systems to Measure Marine Variables  
*S. Aravamudhan*
- 4005 Nanoporous Alumina as a Platform for 3-D Ceramic Microdevices  
*D. Routkevitch*
- 4006 Radiophotoluminescence in Ag<sup>+</sup>-Doped Phosphate Glass Dosimeter  
*T. Ohno, Y. Miyamoto, T. Kurobori, Y. Takei, K. Hirasawa, T. Yamamoto, and H. Nanto*
- 4007 Characterization and Process Optimization of UV Patternable Electrically Conducting SU-8 Silver Nanocomposite Polymer  
*A. Khatri, S. Kassegne, and A. Khosla*
- 4008 Effects of Added Uranium on the Triboluminescent Properties of EuD<sub>4</sub>TEA  
*R. Fontenot, W. Hollerman, K. Bhat, and M. Aggarwal*

4009 Micropatternable, Electrically Conducting Polyaniline Photoresist Blends for MEMS Applications

*C. V. Patel, S. Kassegne, and A. Khosla*

4010 Micro-Structures for Electrophoretic Display: Case Studies of the Response Speed/Time and Contrast Ratio Depending on Micro-Structures

*J. Kim, C. Kim, and K. Suh*