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# Meeting Abstracts — MA 2013-02

**224th ECS Meeting**

**October 27 - November 1, 2013 — San Francisco, CA**

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## Table of Contents

### A0 - Special Lectures

*All Divisions*



### A1 - General Student Poster Session

*All Divisions*

114 A Study of Morphology and Transport Properties of Perfluorosulfonic Acid PEM Doped With Heteropoly Acids
*Y. Liu, S. V. Sambasivarao, C. M. Maupin, J. L. Horan, Y. Yang, S. J. Hamrock, G. M. Haugen, S. Seifert, and A. M. Herring*

115 Electron Transport Across Electrode-Active Material Interfaces in Lithium-Air Batteries
*S. E. Doris and B. A. Helms*

116 Electrochemical Incineration of Tetracycline Hydrochloride Using Titanium Based Anode in Saline Medium: Kinetic and Energy Consumption Evolution
*S. Gul, K. N. Parra, D. W. Miwa, and A. D. J. Motheo*

117 $LiAlCl_4$-$NaAlCl_4$-$NaAlBr_4$-$KAlCl_4$: A Low-Melting Molten Salt Mixture for the Electrodeposition of Aluminum
*C. Wang*

118 Structural Impacts of Electrochemically Doping Simultaneous Ionic and Electronic Conducting Block Copolymer Electrolytes in the Solid-State
*J. L. Thelen, S. N. Patel, A. E. Javier, and N. P. Balsara*

119 Effect of Neutral Beam Treatment On Nanocrysallization of Silicon Thin Film By Neutral Beam Assisted CVD At Near Room Temperature
*D. H. Lee, J. N. Jang, and M. Hong*

120 Modified Imidazolium Functionalized AEM and Investigation of Influences On the Conductivity
*Y. Liu, J. Wang, Y. Yan, M. W. Liberatore, and A. M. Herring*

121 Synthesis and Electrical Testing of Silver-Based Composite Electrodes for Reduced-Temperature Solid Oxide Electrolysis Cells
*M. Keane and P. Singh*

122 Influence Of The Axial Ligand On Iron PHTHALOCYANINE TOWARD The Reduction Of Molecular Oxygen
*I. Ponce, R. Oñate, J. F. Silva Sr., C. Castro, M. Caroli, J. H. Zagal Sr., and J. Pavez*

123 Enhanced Photocurrent and Crystallinity of Modified Selenium Films With Underpotential Deposited Bismuth Or Lead
*D. Coelho and S. A. S. Machado*

124 Redox-Magnetohydrodynamic (RMHD) Pumping With PEDOT-Modified Electrodes
*C. K. Nash and I. Fritsch*

125 Investigation of Vesicles Adsorption On Immersed Gold Surface
*P. S. Casagrande, D. M. Soares, and W. E. Gomes*

126 Analysis of the Reduction of 1,2-Dimethyl-5-Nitroimidazole Using Cyclic Voltammetry
*K. A. C. Ronquillo and D. K. Smith*

140 Preparation and Characterization of An Electroactive Ureidopyrimidinone Derivative, A Four Hydrogen Bond Array Containing a Dimethylaminophenylurea
*L. A. Clare, A. Pham, and D. K. Smith*

141 Simultaneous Measurements of Positive and Negative Electrodes of LIRB By in-situ EIS During Charge-Discharge Cycle
*K. Honda, Y. Hoshi, I. Shitanda, M. Itagaki, A. Okuyama, H. Kawai, and Y. Aoki*

142 Nakajima Diagram 3D As a Diagnosis of Water Quality for Pitting Corrosion Risk of Cupper Used in Heat Exchanger of Air Conditioner
*K. Ochi, Y. Hoshi, I. Shitanda, and M. Itagaki*

143 A New Supramolecular Chemistry Motif: Horizontally Linked Viologen Radical Dimers
*J. M. Vasquez, P. A. Staley, S. U. Keenawinna, and D. K. Smith*

144 Solvent Effects On the Oxidation of Electroactive Ureas
*A. T. Pham, L. A. Clare, F. Magdaleno, J. Acosta, J. E. Woods, and D. K. Smith*

145 Precipitation of Nanocrystallites in Amorphous Silicon Carbide Films by Low Temperature Catalytic CVD
*T. H. Song and W. S. Hong*

146 Preparation and Electrochemical Behavior of Carbonaceous Fiber Sheets Derived From Bamboo
*T. Kinumoto, T. Matsumura, M. Matsuoka, T. Tsumura, and M. Toyoda*

147 Relaxation Stage Analysis of Li Inserted Graphite
*T. Kitamura, S. Park, S. Takai, and T. Yao*

148 Demonstration of Enhanced Sensitivity to CO in $H_2$ of an Electrochemical Analyzer
*C. Quesada, T. Rockward, F. H. Garzon, and R. Mukundan*

## A2 - Nanotechnology General Session

*All Divisions, New Technology Subcommittee*

149 Plasma Co-Sputtering Methods for the One-Step Synthesis of Pt-C Nanowires Composites With Enhanced Electrocatalytic Properties
*C. Coutanceau, A. Caillard, M. Mougenot, S. Cuynet, P. Andreazza, C. andreazza-Vignolle, S. Baranton, and P. Brault*

150 Preparation of M@$Cu_2$o (M= Au, Ag, Pd ) Core-Shell Nanocrystals By a Facile Citrate-Chelating Approach
*Y. K. Lin and Y. J. Hsu*

151 Fabrication of Gaooh-Au Nanoheterostructures and Their Photocatalytic Performance in Methanol Oxidation
*A. T. Nguyen, Y. H. Hsu, and Y. J. Hsu*

152 Coal Derived Graphene - Pt Nanocomposites for Hydrogen Production Via Ammonia Electro-Oxidation
*S. H. Vijapur, D. Wang, and G. G. Botte*

153 Fabrication of Graphene-PtPd Alloys With High Electro-Catalytic Activity for Ethanol Oxidation
*X. Chen, M. Oyama, and X. Chen*

154 Nano-Sized Titanium Oxides As Electrocatalyst for Oxygen Reduction Reaction Toward PEFC
*K. Suito, A. Ishihara, T. Hayashi, M. Matsumoto, M. Arao, H. Imai, Y. Kohno, K. Matsuzawa, S. Mitsushima, and K. I. Ota*

155 Facile Route to Grow Crystalline ZnO Nanorod Arrays Via Corrosion and Their Photocatalytic Activity Under Visible Light
*D. Iqbal and A. Erbe*

156 Fabrication of Dealloyed $Pt_2$os Nanoparticles for Oxygen Reduction Reaction in Acidic Electrolytes
*Y. J. Lee, Y. C. Hsieh, Y. Sun, L. C. Chang, P. W. Wu, and J. F. Lee*

157 Ordered Porous Electrodes By Design for Electrocatalysis
*B. D. Gates, B. Kinkead, J. VanDrunen, G. Jerkiewicz, M. T. Y. Paul, A. Nazemi, and K. Dowling*

158 Photocatalytic Water Oxidation With Suspended $Fe_2O_3$ (hematite) Nanocrystals
*B. L. Harrod, N. Brune, C. Wong, and F. E. Osterloh*

159 Photocatalytic Degradation Of Chlorinated Organic Compounds Using NEWLY-Developed Nanoporous ZINC OXIDE-Laponite Composites
*J. C. Joo and H. Ahn*

160 Rh-Doped $SrTiO_3$ Nanocrystals As Photocatalysts for Visible Light-Driven Hydrogen Evolution
*J. Wang and F. E. Osterloh*

161 Nanostructure Designing of $C_{60}$/Poly(3-hexylthiophene) Supramolecular On Au(111) Surfaces Via Iodine Modification
*Y. F. Liu, M. Yoshimura, and Y. L. Lee*

162 Light Scattering Investigation of 2D and 3D Opal Template Formation On Hydrophilized Surfaces for Ordered Porous Nanostructured Materials
*E. Armstrong, W. Khunsin, M. Osiak, C. M. Sotomayor Torres, and C. O'Dwyer*

163 Electrochemical Dealloying of Gold-Silver Alloy Nanoparticles - Selective Dissolution of the Lesser and More-Noble Species
*C. A. Starr and D. Buttry*

## A3 - The Energy Water Nexus

*All Divisions, New Technology Subcommittee*

244 Integrated Ozone Microreactor Technology for Water Treatment
*A. G. Shirke, S. Li, D. D. Ebeling, M. T. Carter, and J. R. Stetter*

245 NADH Regeneration for Use in Bioelectrofuels Production
*S. D. Minteer and B. Ohlsen*

246 Photocatalytic Reduction and Removal of Cr(VI) and Se(VI) Using TiO2 and NaTaO3 Nanopowder
*Q. Cheng and C. Chan*

247 Understanding Chlorite, Chlorate and Perchlorate Formation When Generating Hypochlorite Using Boron Doped Diamond Film Electrodes
*J. Farrell, D. K. Hubler, J. C. Baygents, and B. P. Chaplin*

248 Energy Minimization in the Electrochemical Disinfection of Human Liquid Waste Using Boron-Doped Diamond Electrodes
*A. S. Raut, E. J. D. Klem, G. B. Cunningham, C. B. Parker, B. R. Stoner, M. A. Deshusses, and J. T. Glass*

249 Deammonification of Wastewater Through Ammonia Electrolysis
*A. Estejab, L. A. Diaz, and G. G. Botte*

250 Old Solutions to New Problems?
*J. McHardy*

## B1 - Energy Technology/Battery - Joint General Session

*Battery, Energy Technology*

251 Three Dimensional Simulation and Optimization of Microbatteries
*K. Lange, B. Trembacki, M. Stadermann, M. Merrill, and E. Duoss*

252 Thermally Accelerated Life Testing for Rechargeable li-Ion Batteries
*H. Ye, G. Jain, and C. Schmidt*

253 Optimal Charging Profile for Mechanically Constrained Lithium Ion Batteries
*B. K. Suthar, V. Ramadesigan, S. De, R. D. Braatz, and V. R. Subramanian*

254 In-Situ Synchrotron X-Ray Diffraction Study of the Heat Treated Electrolytic Manganese Dioxide Cathode Used in Primary Li/$MnO_2$ Batteries
*S. W. Donne and W. M. Dose*

255 *In-Situ* Study of Electrochemically-Driven Phase Transitions in $LiMn_yFe_{1-y}PO_4$
*D. B. Ravnsbaek, K. Xiang, W. Xing, O. J. Borkiewicz, K. Wiaderek, P. J. Chupas, K. W. Chapman, and Y. M. Chiang*

256 Model Reformulation for Lithium-Ion Battery Simulation
*P. W. C. Northrop, B. K. Suthar, and V. R. Subramanian*

326 A Green Lib Fabrication Process Using An Efficient, Low Cost and Environmentally Benign Polymer Binder
*M. Ling, G. Liu, and S. Zhang*

327 Facile Synthesis of Aliovalent Vanadium Doped High Voltage $LiNi_{0.5}Mn_{1.5}O_4$ Cathode With Extraordinary High Temperature Performance
*M. C. Kim, W. H. Jang, H. S. Kim, K. J. Kim, and Y. S. Lee*

328 Improving Electrochemical Performances of $0.25Li(Mn_{1.5}Ni_{0.5})O_4 - 0.75[Li_2MnO_3\text{-}Li(Mn_{0.5}Ni_{0.5})O_2]$ Cathode Materials for Lithium Secondary Batteries By $ZrO_2$ Coating
*S. H. Kim, A. Samuthira Pandian, J. Y. An, S. N. Lee, and Y. S. Lee*

329 Dilatometric Study of Lithium Electrode During Its Cycling in Electrolyte Containing Lithium Polysulfides
*V. Kolosnitsyn, A. Ivanov, S. Mochalov, and E. Kuzmina*

330 Effect of Physicochemical Properties of Electrolyte Systems On Behavior of Lithium Sulfur Cells
*V. Kolosnitsyn, E. Kuzmina, E. Karaseva, and L. Sheina*

331 On Measurement Possibility of Internal Resistance of Lithium Sulfur Cells By Pulsed Method
*V. Kolosnitsyn, E. Kuzmina, and S. Mochalov*

332 Electrochemical Reactivity of Magnesium Ions With Sn-Based Binary Alloys
*A. Kitada, Y. Kang, Y. Uchimoto, and K. Murase*

333 $Mn_{3-x}Cu_xO_4$ ($x$ = 1.0 – 1.5) Spinel Coatings On Metallic Interconnects for Solid Oxide Fuel Cells
*J. W. Lee, N. S. Waluyo, B. K. Park, S. B. Lee, T. H. Lim, S. J. Park, and R. H. Song*

334 Ni-YSZ Anodes With 3-Dimensional Ordered Macropores for Direct Carbon Fuel Cells
*J. W. Lee, J. Y. Lee, S. B. Lee, T. H. Lim, S. J. Park, and R. H. Song*

335 Direct Growth of Carbon Electrodes for Battery Applications
*J. Komadina, J. Flores, V. Limsakoune, Y. Liu, and J. Lu*

336 Synthesis and Characterization of Magneli Phase Titania Powder/Activated Carbon Composite Materials for Electrochemical Applications
*M. Asilturk*

337 Zinc Oxide Nanorod Arrays Based Dye-Sensitized Solar Cells and Its Photovoltaic Performance in Indoline Dye System
*H. Kim, S. S. Mali, and C. K. Hong*

338 The Influence of Zinc Ions On the Properties of Non-Sintered $Ni(OH)_2$ Electrodes
*L. Chladil and V. Novak*

## B2 - Battery Chemistries Beyond Lithium Ion

*Battery, Energy Technology*

353 Understanding the Electrochemical Processes in Li-S Batteries By *Operando* Methods
*M. Cuisinier, P. E. Cabelguen, S. Evers, M. Kolbeck, A. Garsuch, T. Bolin, M. Balasubramanian, and L. F. Nazar*

354 High Efficiency Lithium Sulfur Batteries
*R. Xu, I. Belharouak, J. C. M. Li, and X. Zhang*

355 Rock-Salt Type $Li_2TiS_3$ As New Positive Electrode Materials for Lithium-Metal Sulfides Secondary Batteries
*A. Sakuda, T. Takeuchi, K. Okamura, H. Kobayashi, H. Sakaebe, K. Tatsumi, and Z. Ogumi*

356 A Fresh Look On Liquid-Electrolyte-Li/S-Batteries: Non- Equilibrium Thermodynamics Based Modeling of Transport and Reactions
*A. F. Hofmann and A. Latz*

357 Hydroxylated Graphene-Sulfur Nanocomposites for High-Rate Lithium-Sulfur Batteries
*C. Zu and A. Manthiram*

358 Cathode and Anode Design for High Capacity Lithium-Sulfur Batteries With Enhanced Cycle Life
*H. Althues, S. Kaskel, S. Thieme, and J. Brückner*

359 High Performance Lithium/Sulfur Cells With Sulfur-Graphene Oxide Nanocomposite Cathodes and Ionic Liquid-Based Electrolytes
*M. K. Song, Y. Zhang, and E. J. Cairns*

360 Performance Booster: A Different Role of Polysulfide in Rechargeable Lithium-Sulfur Batteries
*S. Chen, F. Dai, M. L. Gordin, and D. Wang*

361 Carbon-Coated Sulfur Nanowire Array for Lithium-Sulfur Battery
*S. Moon, Y. H. Jung, W. K. Jung, and D. K. Kim*

362 Role of Polysulfides in Self-Healing Lithium-Sulfur Batteries
*I. Belharouak, R. Xu, J. C. M. Li, N. Dietz, J. Bareno, and I. Bloom*

363 Electrode Performance of Lithium Containing Layered Sodium Iron Manganese Oxides for Rechargeable Na-Ion Batteries
*K. Kubota, T. Kaneko, N. Yabuuchi, R. Hara, and S. Komaba*

364 Tailoring the Electrochemical Performance of P2- $Na_{0.45}Ni_{0.22}Co_{0.11}Mn_{0.66}O_2$ as High Voltage Or High Capacity Cathode Material for Sodium-Ion Batteries
*D. Buchholz, L. G. Chagas, L. Wu, M. Winter, and S. Passerini*

365 Ordering in Na-Ion Intercalation Materials Studied By TEM and DFT Computations
*X. Li, A. J. Toumar, X. Ma, S. P. Ong, and G. Ceder*

457 Effect of Cathode Structure On Electrochemical Properties of Solid-State Li-Air Batteries
*S. B. Ma, C. Jung, D. J. Lee, T. Y. Kim, W. S. Jeon, D. Im, and S. K. Doo*

458 Chemical and Electrochemical Properties of a Dual Electrolyte Cell Employing a Solid Electrolyte Membrane for Large Scale Energy Storage
*K. S. Park, J. H. Cho, K. Shanmuganathan, C. J. Ellison, and J. B. Goodenough*

459 Quantifying Polarization Losses At Liquid Electrolyte / Single Ion Conductor (SIC) Interface
*A. Mehrotra and V. Srinivasan*

460 Effect of Composite Electrode Thickness On the Electrochemical Performances of All-Solid- State Li-Ion Batteries
*R. Bouchet, A. Kubanska, L. Castro, L. Tortet, and M. Dollé*

461 Electrolytes for Mg-Secondary Batteries Based On Emimcl Ionic Liquid, $AlCl_3$ and $\delta$-$MgCl_2$
*F. Bertasi, E. Negro, K. Vezzù, S. Lavina, G. Pace, and V. Di Noto*

462 Electrochemical Modeling of Insertion/Extraction Reactions of Mg in Mg/Bi Electrode
*M. Ramanathan, A. Benmayza, J. Prakash, N. Singh, T. S. Arthur, and F. Mizuno*

463 Electrochemical Deposition and Dissolution of Magnesium Metal in Various Ether-Based Electrolytes
*R. Yasui, K. Asaka, K. Miyazaki, T. Fukutsuka, T. Abe, K. Nishio, and Y. Uchimoto*

464 Fabrication of Ether-Based Electrolyte Solutions for Mg-Rechargeable Batteries
*T. Abe, K. Miyazaki, T. Fukutsuka, K. Nishio, and Y. Uchimoto*

465 All Solid-State Iron-Air Redox Battery for Advanced Energy Storage
*X. Zhao, Y. Gong, N. Xu, X. Li, and K. Huang*

466 Charge Transfer Resistance Reduction By Bromine Complexation in Zinc/Bromine Flow Battery
*J. H. Yang, J. D. Jeon, J. Shim, B. S. Lee, and M. S. Jeon*

467 Hierarchically Meso-Macroporous $LaMnO_3$ Electrode Prepared By Surfactant-Templated Method
*W. S. Chang, C. M. Haung, Y. C. Lee, P. Y. Peng, M. H. Lu, and K. L. Hsueh*

468 Inexpensive Flow Batteries Based On Organic Redox Couples
*B. Yang, L. Hoober-Burkhardt, G. K. S. Prakash, and S. R. Narayanan*

469 Impact of Cycling Conditions On the Lifetime of Aqueous Rechargeable Lithium-Air Cells
*P. Stevens, G. Toussaint, L. Puech, and P. Vinatier*

470 Improving Lithium-Air Batteries By Correlated Modeling and Experiment
*M. Kane, D. Ward, K. Reyes, J. Templeton, R. Jones, and J. Lee*

471 Enhanced Oxygen Evolution in Lithium-Oxygen Battery Using $RuO_2$ Nanoparticles and Its Mechanism
*E. Yilmaz and H. R. Byon*

472 Reduced Graphene Oxide for Li-Air Batteries: The Effect of Oxidation Time and Reduction Conditions for Graphene Oxide
*M. M. Storm, M. Overgaard, R. Younesi, N. E. A. Reeler, T. Vosch, and P. Norby*

473 Chemical Stability of DMSO and Acn Solvents Incontact With $Li_2O_2$
*R. Younesi, P. Norby, and T. Vegge*

474 Inverse Opal Carbons As Cathodes in Lithium/Oxygen Batteries
*M. Olivares-Marín, M. Aklalouch, E. Eduardo Enciso, and D. Tonti*

475 Analysis of Aqueous Rechargeable Li-Air Batteries
*Y. Xing, M. Salomon, and O. Crowther*

476 Intercalation $Na_2Ti_3O_7$ Anode for Na-Ion Batteries With Ultra Low Voltage
*C. Ma, J. Xu, D. H. Lee, and S. Meng*

477 Electrochemical Properties of Stable Organic Radicals for Rechargeable Na Ion Battery
*S. Nakanishi*

478 Electrochemical Properties of Tin Oxide Anodes for Sodium-Ion Batteries
*Y. C. Lu, N. Dimov, and S. Okada*

479 Electrochemical Behavior of Sb Anode Synthesized By Electrodeposition for Na-Ion Batteries
*K. S. Hong, D. H. Nam, S. J. Lim, and H. Kwon*

480 Olivine-Structured $Mg_xFePO_4$: Cathode Material for Mg-Ion Batteries
*R. Ranjan*

481 Investigation of Performance and Stability of Li-$O_2$ Batteries in Terms of Electrolyte and Catalyst Material
*R. S. Kalubarme and C. J. Park*

482 Li/Lipon/Li-Conducting Glass Ceramic Composite for Li-Air Batteries With Non-Aqueous Electrolyte
*H. S. Jadhav, R. S. Kalubarme, Y. H. Kim, and C. J. Park*

483 $PEO_{18}$ LiTFSI- $Pyr_{14}$TFSI Ternary Polymer As An Interlayer for Lithium Protected Electrode in Li-Air Battery
*Y. H. Kim, H. S. Jadhav, R. S. Kalubarme, and C. J. Park*

484 $La_{1.7}Sr_{0.3}NiO_4$ Layered Perovskite : a Potential Electrocatalyst for Metal-Air Batteries
*K. N. Jung, S. Yoon, K. H. Shin, and J. W. Lee*

485 $^{23}$na NMR Mobility Studies On New Electrolytes for Sodium-Ion Batteries
*M. B. Berman, X. Bogle, and S. Greenbaum*

500 Synthesis and Electrochemical Characterization of Spinel-Type Mg Complex Oxides As Positive Electrode Active Materials for Mg Batteries
*Y. Ichikawa, S. Yagi, T. Ichitsubo, and E. Matsubara*

501 Advanced Lithium Sulfur Batteries With a Ternary Sulfur/Polyaniline/Carbon Composite As Cathode Material
*J. H. Ahn and X. Zhao*

502 Optimization of Block Copolymers As Electrolytes for Lithium Metal Batteries
*R. Bouchet, D. Devaux, D. Gle, T. N. T. Phan, D. Gigmes, and M. Deschamps*

503 Effect of Manganese Oxides On the Performance of Lithium-Air Battery
*J. Li*

504 Lithium-Oxygen Battery Chemistry for High Pressure $O_2$ Cells
*E. J. Nemanick*

505 Electrochemical Properties of $Na_4Co_{3-X}M_x(PO_4)_2P_2O_7$ [M = Ni and Mn] for Sodium-Ion Battery
*M. Nose, H. Nakayama, K. Nobuhara, S. Nakanishi, and H. Iba*

506 Fabrication of Porous Carbon Supported Fe Nanoparticles By Arc Plasma Deposition (APD): Application for Rechargeable Li-Air Battery
*X. Luo, J. Lu, E. Sohm, and K. Amine*

507 Characteristics of Nitrogen-Doped Graphene Cathode Synthesized Via Microwave-Hydrothermal Method for Li-Air Battery
*I. T. Kim, Y. B. Kim, M. J. Song, and M. W. Shin*

508 Bis(oxalato)Borate Containing Solid Polymer Electrolytes for Lithium Metal Batteries
*R. Jakelski, P. Bieker, and M. Winter*

509 Electrically Rechargeable Zinc-Air Battery
*G. Toussaint, P. Stevens, F. Fourgeot, and R. Rouget*

510 α-$MnO_2$ Nanorods Decorated With Ag Nanoparticles As a Bifunctional Catalyst for Lithium Air Battery Application
*A. Zahoor, K. Nahm, Y. Hwang, H. Jang, J. Jeon, and M. Christy*

511 Redox Active Molecular Engineer for Energy Storage
*L. Zhang, J. T. Vaughey, and A. K. Burrell*

512 High Performance Zn-Based Batteries Using 3D Monolithic Sponge Anodes
*J. F. Parker, C. N. Chervin, E. S. Nelson, D. R. Rolison, and J. W. Long*

513 Seeing Inside a Liquid Metal Battery
*B. H. V. Chung, H. Yin, and D. R. Sadoway*

## B3 - Battery Safety

*Battery, Industrial Electrochemistry and Electrochemical Engineering*

## B4 - Computational Science of Battery Materials

*Battery, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry*

555 Atomic-Level Characterization of Interfaces in $LiCoO_2$
*C. A. J. Fisher, S. Zheng, A. Kuwabara, H. Moriwake, Y. H. Ikuhara, H. Oki, and Y. Ikuhara*

556 Thermodynamic Theory and Simulation of Transport and Intercalation of Solvated Ions in Li Ion Batteries
*A. Latz and J. Zausch*

557 Lithium Segregation Induced Structure and Strength Change At Amorphous-Si/Cu Interface
*M. E. Stournara, X. Xiao, Y. Qi, P. Johari, P. Lu, B. W. Sheldon, H. Gao, and V. B. Shenoy*

558 Comparison of Phase Stability in Layered $NaCrO_2$ and $LiCrO_2$ Oxides By First-Principles DFT Calculations
*H. Shiiba, S. Hotta, T. Nakamura, S. Chizawa, M. Nakayama, N. Yabuuchi, and S. Komaba*

559 Computational Modeling of the Layer-Spinel Interface Properties for Cathode Materials in Lithium Ion Batteries
*D. Qian and S. Meng*

560 First-Principles Calculations Study On the Electrochemical Activity and Structural Stability of the $Li_2MnO_3$
*E. Lee and K. Persson*

561 Combining First Principles Computation and Advanced Characterization to Understand Disorder and Interfaces in Batteries
*M. K. Y. Chan*

562 First-Principles Study On Doping and Defect Chemistry in $LiCoO_2$
*Y. Koyama, H. Arai, I. Tanaka, Y. Uchimoto, and Z. Ogumi*

563 First Principles Modeling of the Interface Between a Solid State Lithium Thiophosphate Electrolyte and a Lithium Metal Anode
*N. A. W. Holzwarth and N. D. Lepley*

564 Integrating State of Charge (SOC) Dependent Material Properties Into Li-Ion Battery Failure Modeling
*Y. Qi*

565 Computational Thermodynamics for Material Design of Energy Storage Materials
*T. Markus*

566 Application of the Reaxff Reactive Force Field in Li-Based Rechargeable Batteries
*M. M. Islam and A. C. T. van Duin*

567 Parameterization of a Physico-Chemical Model for Lithium-Ion Batteries
*M. Ecker, S. Käbitz, D. Tran, and D. U. Sauer*

568 First-Principles Thermodynamic Analysis of Hydrogen-fluoride Scavenging Cathode Coatings for Lithium-Ion Batteries
*M. Aykol and C. Wolverton*

569 Computational Study On the Properties and Kinetic Behavior of Carbon-Based Li-Ion Batteries Electrolytes Solvents, Unraveling Their Differences
*A. Goldberg, M. D. Halls, and K. Tasaki*

570 Influence of Morphology and Microstructure On the Lithium-Ion Battery Electrode Damage Behavior
*P. Barai and P. P. Mukherjee*

571 Analysis of Long-Range Interaction in Lithium-Ion Battery Electrodes
*M. Stein IV, S. Cho, A. Wiegmann, and P. P. Mukherjee*

572 Optimization of Tab Placement in Li-Ion Battery Using Multi-Physics Simulations
*S. Allu, W. Elwasif, S. Pannala, S. Kalnaus, S. Simunovic, and J. A. Turner*

573 Analysis of the Influence of Microstructures On the Impedance Response in Lithium-Ion Battery Electrodes
*S. Cho and P. P. Mukherjee*

574 Lithium and Rare-Earth Oxides Thermodynamics and Kinetics Studied By Density Functional Theory
*F. Grosse*

575 Phase transformation kinetics and morphology in LiFePO4
*G. Ceder, A. Abdellahi, O. Akyildiz, R. Malik, and K. Thornton*

576 Effect of Rb and Ta Doping On the Ionic Conductivity and Stability of the Garnet $Li_{7+2x-Y}(La_{3-x}Rb_x)(Zr_{2-y}Ta_y)O_{12}$ ($0 \leq x \leq 0.375$, $0 \leq y \leq 1$) Superionic Conductor – a First Principles Investigation
*L. J. Miara, S. P. Ong, Y. Mo, W. D. Richards, Y. Park, J. M. Lee, H. S. Lee, and G. Ceder*

577 *Ab Initio* Molecular Dynamics Study of Garnet-Type $Li_{7-X}La_3Zr_{2-X}Ta_xO_{12}$ ($0 \leq x \leq 2$)
*R. Jalem, M. Nakayama, T. Kasuga, and K. Kanamura*

578 Computational Investigation and Design of Solid Lithium-Ion Electrolytes Based On the $Li_{10}GeP_2S_{12}$ Superionic Conductor
*S. P. Ong, Y. Mo, W. D. Richards, L. J. Miara, H. S. Lee, and G. Ceder*

579 Phase-Field Modeling of Li Deposits Growth in Li-Ion Batteries
*L. Liang, Y. Qi, S. J. Harris, and L. Q. Chen*

593 Simulation of Electrolyte Composition Effects On High Energy Lithium-Ion Cells
*R. Spotnitz, K. L. Gering, S. Hartridge, and G. Damblanc*

594 DFT-MD Study of Additive Effects On Reductive Decomposition of Carbonate-Based Solvent Toward Solid Electrolyte Interphase Formation
*K. Sodeyama, K. Ushirogata, Y. Okuno, and Y. Tateyama*

595 Effects of Delithiation On Lithium Manganese Oxides: A Combined DFT and NMR Based Study
*I. D. Seymour, D. S. Middlemiss, M. Leskes, and C. P. Grey*

596 Atomistic Simulation Studies On Lithiation of $MnO_2$ Nano-Architectures
*P. E. Ngoepe, K. M. Kgatwane, and D. C. Sayle*

597 Computational Thermodynamic Modeling of Mixed Polyanion Glasses for Lithium Ion Battery Cathode Materials
*D. Shin, A. K. Kercher, J. Kiggans Jr., and N. J. Dudney*

598 Evaluation of Carbon Nanotube-Encapsulated Silicon and Germanium Nanowires As Proposed Lithium-Ion Battery Anode Materials
*J. Hur and S. J. Stuart*

## B5 - Electrochemical Capacitors: Fundamentals to Applications

*Battery, Energy Technology*

599 Electrochemical Capacitor Power Performance At Low Temperature: Commercial Product Differences
*J. R. Miller and S. M. Butler*

600 Improved Low Temperature Performance of Supercapacitors
*E. J. Brandon, M. C. Smart, W. C. West, and J. Gnanaraj*

601 Methods for Enhancing the Flowable Electrode Capacitance in the Electrochemical Flow Capacitor
*K. B. Hatzell, M. Beidaghi, M. Boota, C. R. Dennison, E. C. Kumbur, and Y. Gogotsi*

602 Asymmetrical Aqueous-Based Electrochemical Capacitors Using Modified-Carbon As Negative Electrode Material
*A. Le Comte, T. Brousse, and D. Bélanger*

603 Aqueous Asymmetric Electrochemical Capacitors: Fundamental Design and Practical Considerations En Route to Safe, High-Performance Pulse Power
*M. B. Sassin, J. W. Long, H. F. Haddad, J. M. Wallace, and D. R. Rolison*

604 Application of Multistep Electrospinning Method for Preparation of Electrical Double-Layer Capacitor Half-Cells
*K. Tõnurist, I. Vaas, A. Jänes, T. Thomberg, and E. Lust*

605 Electrochemical Properties Enhancement of Flexible Textile Based Supercapacitor
*T. G. Yun, M. Oh, S. Hyun, and S. M. Han*

606 Asymmetric Supercapacitor Containing Carbon Nanotube-Embedded Polyacrylonitrile-Based Carbon Nanofiber and δ-MnO2 As Electrodes
*C. H. Wang, H. C. Hsu, and J. H. Hu*

607 CDCs From Silicon Carbide With Tunable Ordered Meso and Macroporosity for High-Power Supercapacitor
*P. GAO, W. Y. Tsai, P. Simon, B. Daffos, C. R. Perez, Y. Gogotsi, P. L. Taberna, and F. Favier*

608 Electrochemical Modification of Carbon Fiber Electrode and Its Application to Capacitor
*S. G. Park*

609 Electrodeposited Thin Films of Carbon for Use in Electrical Double Layer Capacitors
*S. W. Donne and M. F. Dupont*

610 D-Glucose Derived Micro/Mesoporous Carbons for Ultra-High Rate Supercapacitor Application
*T. Thomberg, T. Tooming, T. Romann, R. Palm, A. Jänes, and E. Lust*

611 Activated Biochar: A Green and Low-Cost Electrode Material for Capacitor Applications
*A. M. Dehkhoda, N. Ellis, and E. Gyenge*

612 Activated Carbon Synthesized From Banana Peel as Electrodes in Li-Ion Capacitors
*A. A. Arie*

613 Pseudocapacitive Charge Storage in Two-Dimensional Materials
*G. Muller and B. Dunn*

614 Cycle Behavior of Aqueous and Nonaqueous Vanadium Oxide Electrochemical Capacitors
*A. M. Engstrom and F. M. Doyle*

615 Screening of Transition Metal Nitride As Possible Electrodes for Electrochemical Capacitors
*J. F. Pierson, S. Bouhtiyya, R. Lucio Porto, E. Eustache, F. Capon, and T. Brousse*

616 Pretreatment Effects On Charge Storage of Early Transition-Metal Carbides and Nitrides
*A. Djire, P. Pande, A. Sleightholme, A. Deb, J. Penner-Hahn, P. Rasmussen, and L. T. Thompson*

617 $MnO_2$ - Carbon Nanofiber Composites for Flexible supercapacitors
*O. Ghodbane, M. Louro, L. Coustan, A. Patru, and F. Favier*

618 Electrochemically Deposited Phosphotungstic Acid – Manganese Dioxide Hybrid Materials for Application in Electrochemical Capacitors
*S. W. Donne and A. J. Gibson*

685 "On Recent Work Related to Super and Pseudo Capacitors"
*D. Aurbach, M. Noked, S. Okashi, and A. Borenstein*

686 Effect of Pore Size Distribution in Carbon/Carbon Supercapacitors Operating in Phosphododecatungstic Acid
*M. Skunik-Nuckowska*

687 Sizing Calculations for Substrate-Integrated Lead-Carbon Hybrid Ultracapacitors and Their Experimental Validation
*A. Banerjee and A. K. Shukla*

688 3D Microstructure Reconstruction Based Numerical Investigation On the Energy Storage in Electric Double Layer of Super Lithium Ion Capacitor
*M. Jia, Y. Cheng, S. Du, Y. Tang, and J. Li*

## B6 - Electrochemical Synthesis of Fuels 2

*High Temperature Materials, Energy Technology, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry*

689 (Invited) Catalysis for Sustainable Energy
*J. Nørskov*

690 Electrochemical Reduction of CO2 On Transition Metal Catalysts
*E. Cave, K. Kuhl, D. Abram, T. Hatsukade, and T. F. Jaramillo*

691 Surface Chemistry of Nafion-Immobilized $Au^{25}$ Clusters for Use in Electrochemical Reduction of $CO_2$
*E. M. Andrews and J. Flake*

692 Catalysts for the Electrochemical Reduction of $CO_2$ to CO
*M. Jhong and P. J. A. Kenis*

693 Investigation of Copper Catalyst Degradation With Time for $CO_2$ Reduction
*J. B. Steed and A. C. Co*

694 Morphological Stability of Sn Electrode for Electrochemical Conversion of $CO_2$
*J. Wu, B. Harris, P. P. Sharma, and X. D. Zhou*

695 (Invited) Reversible Potentials for Adsorbed Intermediates During Methanol and Formic Acid Electrooxidation On Platinum. Implications for Fuel Cells and Carbon Dioxide Reduction
*A. B. Anderson and H. Asiri*

696 Electrochemical Reduction of $CO_2$ Using Supported $Cu_2O$ Nanoparticles
*G. L. Griffin and J. Bugayong*

697 The Effect of Support Materials On the Electrocatalytic Activity of Ag for the Reduction of $CO_2$ to CO
*S. Ma, Y. Lan, and P. J. A. Kenis*

712 Enabling Sustainable $H_2O_2$ Production via Rational Electrocatalyst Design
*S. Siahrostami, A. Verdaguer-Casadevall, M. Karamad, I. Chorkendorff, I. E. L. Stephens, and J. Rossmeisl*

713 Graphene Supported $MnO_2$ Nanowires for Enhanced Water Oxidation in Both Alkaline and Neutral Solutions
*W. Yuan and S. P. Jiang*

714 Effects of Transition Metal-Based Catalysts On the Hydrogen Permeability of V Membranes
*K. W. Cho, K. H. Kim, K. S. Moon, H. C. Park, E. S. Cho, and S. M. Lee*

715 (Invited) Recent Developments in Solid Oxide Fuel Cells and Solid Oxide Electrolyzer Cells: An Overview of SOFC-XIII Symposium
*S. C. Singhal*

716 Progress Toward Enabling Storage of Off Peak Nuclear and Intermittent Renewable Energy As Sustainable Domestic Transportation Fuels
*J. J. Hartvigsen, S. Elangovan, D. Milobar, and L. J. Frost*

717 Chemical Storage of Electrical Energy With Carbon Monoxide As An Intermediate Product
*I. Lubomirsky and V. Kaplan*

718 Electrochemical Systems for Production of Syngas and Co-Products
*T. E. Lister, E. J. Dufek, and S. G. Stone*

719 (Invited) From Power to Fuels and Fuels to Power Via Soec/Syntheses/SOFC
*J. B. Hansen*

720 Electrosynthesis of Ammonia Using Solid-State Proton Conductors
*C. R. Kreller, R. Mukundan, and F. H. Garzon*

721 Reverse Water Gas Shift Reaction Over Pt Nanoparticles Supported On Oxygen Ion Conductive Ceramics
*E. Baranova, M. Lortie, S. Ntais, and R. Isaifan*

722 Stability of Air Electrode in Solid Oxid Electrolysis Cell
*S. J. Kim and G. M. Choi*

723 Investigating $CO_2$ Stability in Donor Doped $BaCe_{1-(x+y)}Zr_xNb_yO_3$ Proton Conductors Using X-Ray Photoelectron Spectroscopy
*C. M. Gore, J. O. White, H. Singh, V. Thangadurai, and E. D. Wachsman*

724 (Invited) Plasmon-Enhanced Photoelectrochemical Fuel Generation
*N. Wu*

725 Electrochemical and Photoelectrochemical Properties of the Copper Hydroxyphosphate Mineral Libethenite
*M. Li, Q. Cheng, R. Wittman, X. Peng, and C. Chan*

726 Effect of Temperature Treatment on $CoTiO_x$ Catalyst for the Oxygen Evolution Reaction
*L. C. Seitz, B. A. Pinaud, D. Nordlund, and T. F. Jaramillo*

727 Simulations of the Irradiation and Temperature Dependence of the Efficiency of Tandem Photoelectrochemical Watersplitting Systems
*S. Haussener, S. Hu, C. Xiang, A. Z. Weber, and N. S. Lewis*

728 Enhanced Carbon Dioxide Photoconversion Efficiency By 1D Structured Platinized $TiO_2$ Films
*W. N. Wang, W. J. An, B. Ramalingam, S. Mukherjee, D. M. Niedzwiedzki, S. Gangopadhyay, and P. Biswas*

729 Transient Performance Modeling of Photoelectrochemical Hydrogen Generation Systems
*M. Dumortier, J. Rongé, J. Martens, and S. Haussener*

730 Evaluation of Micro- and Nanostructured Nickel Oxide As Photocatalyst for Hydrogen Evolution From Water
*F. E. Osterloh, J. M. Fields, and B. A. Nail*

731 Solid Oxide Fuel Cells Based On Perovskite Components for Intermediate Temperature Operation
*G. Monforte, M. Lo Faro, V. Antonucci, and A. S. Aricò*

732 A Novel Perovskite Structure Anode of SOFC for Production of Electricity and Separation of CO from Syngas
*Y. Sun, N. Yan, G. Wang, J. Luo, and K. T. Chuang*

733 Electrochemical Conversion of Carbon Dioxide to Methane By Depolarized Anode Alkaline Membrane $CO_2$ Electrolizer *(DAAM-CE)*
*M. Bevilacqua, F. Vizza, A. Marchionni, J. Filippi, H. A. Miller, A. Lavacchi, W. Oberhauser, and S. Moneti*

734 Crystal and Electronic Structures of $LaP_3O_9$-Based Protonic Conductors Synthesized By Liquid-Phase Method
*N. Kitamura, J. Yamamoto, and Y. Idemoto*

735 Surface Modification of NiO Cathode for Molten Carbonate Fuel Cells (MCFCs)
*H. S. Choi, K. Kim, and C. W. Yi*

736 MEA Technology and Power Performance of Core-Shell catalyst
*K. Kobayashi, A. Daimaru, M. Hori, M. Inaba, and H. Daimon*

737 3-D Numerical Analysis of Solid Oxide Electrolysis Cell(SOEC) With Co-Electrolysis Operation
*J. Kang and J. Bae*

738 Electrochemical Property Evaluation of Continuously Graded Functional Electrode Deposited By Electrostatic Slurry Spray Deposition
*I. Park, S. Lee, H. Lee, and D. Shin*

## B7 - High Temperature Experimental Techniques and Measurements

*High Temperature Materials, Energy Technology, Physical and Analytical Electrochemistry*

791 Theory and Application of Nonlinear Electrochemical Impedance Spectroscopy (NLEIS)
*S. Adler*

792 New Structure of Cathode Function Layer of SOFC By Nanoporous Columnar YSZ Films
*H. Jiang, M. Li, and B. Xie*

793 Development of Hermetic Sealant Material Based on the Temperature Distribution in IT-SOFC
*A. Bakal Sr.*

794 Iso-Octane Internal Reforming in a Solid Oxide Fuel Cell Using $Co/CeO_2$ as Anodic Composites
*A. A. Al-Musa, V. Kyriakou, M. Al-Saleh, R. Al-Shehri, G. Marnellos, and N. Kaklidis*

795 Nonlinear Analysis of Porous $La_{0.9}Ca_{0.1}FeO_{3-\delta}$ Electrodes in Oxygen Environments
*T. Geary and S. Adler*

796 Effects of Humidified Gas Environments On the Electrode Behavior of $La_{0.6}Sr_{0.4}CoO_{3-\delta}$
*T. McDonald and S. Adler*

797 Metal-Doped Pyrochlore As Novel Electrode Materials for Intermediate Temperature Solid Oxide Fuel Cell
*C. K. Hao and C. S. Lee*

798 B-Site Doped Pyrochlore for IT-SOFC Application
*C. S. Lee, C. K. Hao, and H. E. Hung*

799 Thermochemistry of Alkaline Earth Silicate and Sub – Orthosilicate Glasses
*N. K. Nasikas and A. Navrotsky*

800 Characterization of Novel LSM/GDC Composite and Electrochemical Characterization of LSM/GDC Based Cathode-Supported Direct Carbon Fuel Cells
*S. B. Lee, B. Ahmed, R. H. Song, J. W. Lee, T. H. Lim, and S. J. Park*

801 Characterization of $(La,Sr)(Ti,Co)O_3$ Oxides for Symmetrical Solid Oxide Fuel Cell Electrodes
*F. Napolitano, A. Soldati, J. Geck, L. Suescun, L. Acuña, A. Fernandez Zuvich, D. G. Lamas, and A. Serquis*

802 Investigation of SOFC Interconnect Coating Material for Protecting Cathode From Cr Deposition
*K. Lee and J. Bae*

## B8 - Intercalation Compounds for Rechargable Batteries

*Battery, Industrial Electrochemistry and Electrochemical Engineering*

803 Bulk Sample Phase Diagrams of Li-Mn-Ni-O Positive Electrode Materials
*A. W. Rowe, E. McCalla, L. R. P. Hacquebard, and J. Dahn*

804 Consequences of the Li-Mn-Ni-O Phase Diagram On the Synthesis of Positive Electrode Material
*E. McCalla, A. W. Rowe, and J. Dahn*

805 The Role of Metal Site Vacancies in Layered Li-Mn-Ni-O Solid Solution
*E. McCalla, A. W. Rowe, J. Camardese, and J. Dahn*

806 Composition Dependence of Local, Average and Electronic Structures and Thermodynamic Stability for $X$li$(Li_{1/3}Mn_{2/3})O_2$-$(1-x)$Li$(Mn_{1/3}Ni_{1/3}Co_{1/3})O_2$
*Y. Idemoto, M. Inoue, and N. Kitamura*

807 Transformation Mechanisms in Composite $xLi_2M'O_3 \bullet (1-x)LiMO_2$ Electrode Structures
*J. R. Croy, K. G. Gallagher, M. Balasubramanian, B. R. Long, and M. M. Thackeray*

808 Measuring the Impact of Voltage Fade for Selected Li-Intercalating Layered Oxides
*M. Bettge, Y. Li, K. G. Gallagher, Y. Zhu, Q. Wu, W. Lu, I. Bloom, and D. P. Abraham*

809 Solid State NMR Studies of Li-Rich NMC Cathodes: Investigating Structure Change and Its Effect On Voltage Fade Phenomenon
*B. Key, F. Dogan, J. R. Croy, M. Slater, M. Balasubramanian, Y. Ren, C. Johnson, and J. T. Vaughey*

810 Unravelling the Behaviour of Layered $X\ Li_2MnO_3 \bullet (1-x)\ LiMO_2$ High Capacity Cathode Material Through Correlated Electrochemistry and Characterization of Single Particles
*D. J. Miller, C. Proff, J. G. Wen, and L. Trahey*

811 Lithium Magic-Angle Spinning Nuclear Magnetic Resonance Studies of Layered Composite $Li_2MnO_3$-$LiMO_2$ (M=Mn, Ni, Co) Cathode Materials for Li-Ion Batteries: the Effect of Molten Salt Flux Synthesis
*T. Nosach, M. Gobet, S. Greenbaum, E. O. Ortiz-Quiles, J. Soler, and W. C. West*

812 Surface Modified $Li[Ni_{0.6}Co_{0.2}Mn_{0.2}]O_2$ As a Positive Electrode for Rechargeable Lithium Batteries
*C. H. Jo and S. T. Myung*

813 Lithium Rich Layered NMC Cathode Active Materials With Improved Performance for Li-Ion Batteries
*M. N. Ates, A. Shah, A. A. Busnaina, S. Mukerjee, and K. M. Abraham*

829 Nanoscale Visualization and Intercalation in Many-Particle $LiFePO_4$ Electrodes
*Y. Li, F. El Gabaly, J. D. Sugar, T. Tyliszczak, and W. C. Chueh*

830 Interparticle Phase-Separation Dynamics in Dense Agglomerates of Lithium Iron Phosphate Nanoparticles
*B. Orvananos, H. C. Yu, R. Malik, C. P. Grey, G. Ceder, and K. Thornton*

831 Comparative Study On the Phase Diagram of $A_xFePO_4$ ($A$ = Li, Na)
*J. Lu, S. Chung, S. Nishimura, and A. Yamada*

832 Challenges in High Voltage Lithium-Ion Chemistry Development
*D. Ofer, J. Treger, L. Nation, and S. Sriramulu*

833 A Combined Solid-State Nuclear Magnetic Resonance and in Situ X-Ray Diffraction Study of the Lithium Deintercalation Mechanism for $LiFe_xCo_{1-X}PO_4$ ($0 \leq x \leq 1$)
*F. C. Strobridge, M. Leskes, O. J. Borkiewicz, K. Wiaderek, K. W. Chapman, P. J. Chupas, and C. P. Grey*

834 Substituted $LiCoPO_4$ as Li-Ion Cathode
*J. L. Allen, S. A. Delp, T. R. Jow, and J. Wolfenstine*

835 Beyond One-Lithium Reaction Mechanism in $Li_2FeSiO_4$
*T. Masese, Y. Orikasa, C. Tassel, H. Arai, T. Minato, K. Yamamoto, T. Mori, K. Nakanishi, T. Ohta, J. Kim, Y. Kobayashi, H. Kageyama, Y. Uchimoto, and Z. Ogumi*

836 Structures and Performances of Vanadium Substituted $Li_2FeSiO_4$ Prepared By Different Vanadium Sources
*X. Cheng, H. Yang, Y. Zhang, and S. Gu*

837 Characterization of $Li_2MSiO_4$ Compounds for Cathodes in Li Based Batteries
*R. Gauvin, N. Brodusch, G. P. Demopoulos, and K. Zaghib*

838 Mixed Polyanion Glasses As Lithium Ion Battery Cathode Materials
*A. K. Kercher, J. Kiggans Jr., J. Ramey, L. Boatner, D. Shin, and N. J. Dudney*

839 Silver Vanadium Phosphates $Ag_wV_xP_yO_z$: Electrochemistry and Characterization of Reduced Material Providing Mechanistic Insights
*E. S. Takeuchi, A. C. Marschilok, and K. J. Takeuchi*

840 Beyond the Inductive Effect to Increase the Working Voltage of Cathode Materials
*M. L. Doublet, M. Saubanère, M. Ben Yahia, and F. Lemoigno*

841 Identifying Defect Sites in Lithium Intercalation Electrodes: Local Disorder in $LiVPO_4F$ and Its Influence On Bulk Properties
*R. Messinger, M. Ménétrier, D. Carlier, J. M. Ateba Mba, L. Croguennec, C. Masquelier, D. Massiot, and M. Deschamps*

842 *In Situ* Study of High Voltage Performance of $Li_3Fe_2(PO_4)_3$ Cathodes for Li Ion batteries
*A. S. Christiansen, R. E. Johnsen, P. Norby, S. H. Jensen, C. Frandsen, S. Mørup, K. K. Hansen, and P. Holtappels*

843 Oxidative Processes in $LiFeBO_3$
*S. H. Bo, K. W. Nam, O. J. Borkiewicz, Y. Y. Hu, X. Q. Yang, P. J. Chupas, K. W. Chapman, C. P. Grey, and P. Khalifah*

844 Electrochemical Properties of Copper Hydroxysulfate Mineral Brochantite Upon Reaction With Lithium
*R. Zhao, T. Yang, and C. Chan*

845 First Principles Investigation of the Electronic and Structure Changes for Ti-Substituted Lithium Nickel Manganese Cobalt Oxide Cathodes
*I. M. Markus, F. Lin, M. Asta, and M. Doeff*

846 Spectroscopy and Microscopy to Unravel the Advantages of Ti Substitution in $LiNi_{0.4}Mn_{0.4}Co_{0.2}O_2$ Cathode Materials
*F. Lin, I. M. Markus, D. Nordlund, T. C. Weng, M. Asta, and M. Doeff*

847 Bulk and Surface Structural Changes of Layered $Li_{1.20}Mn_{0.55}Ni_{0.16}Co_{0.09}O_2$ Material With Cycles
*H. Kobayashi, T. Okumura, M. Shikano, Y. Arachi, K. Takada, and H. Nitani*

848 Facile Synthesis of Li-Rich layered $Li_{1.23}Ni_{0.09}Co_{0.12}Mn_{0.56}O_2$ and Its Structural Transformation At First Cycle Measured By in Situ X-Ray Diffraction
*C. H. Shen and L. Huang*

849 Coprecipitation and Characterization of Nickel-Cobalt- Manganese Hydroxides Precursor for Battery Cathode Materials
*H. J. Kim, K. M. Nam, E. J. Lee, Y. S. Kim, D. H. Kang, and S. W. Song*

850 Electrochemical Performances of the Acid-Treated and Ceramic-Coated $0.3Li_2MnO_3 \bullet 0.7LiMn_{0.60}Ni_{0.25}Co_{0.15}O_2$ Cathode Materials for Li-Ion Batteries
*M. Choi, B. S. Jin, and H. S. Kim*

851 Preparation of Cathode Film With Use of Aqueous Solvent System
*T. Nakamura, Y. Oka, H. Matsumoto, and Y. Watanabe*

852 Improved Performance of $LiNi_{0.5}Mn_{1.5}O_4$ Spinel With Electrolytes Containing 1,3,5 Trihydroxybenzene
*A. Perea, K. Zaghib, and D. Bélanger*

853 In-Situ XRD Study of the Phase Evolution in Undoped and Cr-Doped $Li_xMn_{1.5}Ni_{0.5}O_4$ As 5-Volt Cathode Materials for Li-Ion Batteries
*W. Zhu, D. Liu, J. Trottier, P. Hovington, C. Gagnon, K. Zaghib, A. Mauger, and C. M. Julien*

867 NiO Nanowire As a High Performance Anode Materials for Lithium Ion Batteries
*H. J. Oh, S. J. Kim, and S. T. Myung*

868 A Facile Synthesis of Silicon Oxide-Graphene Composite for Rechargeable Lithium Battery Anode
*D. T. Nguyen, C. C. Nguyen, and S. W. Song*

869 Potential Step Study Of Intercalation Processes
*S. M. Lipkin, Y. Y. Gerasimenko, and S. V. Kucherenko*

870 Novel Fluorophosphate-Based Cathode Materials for Li- and Na-Ion Batteries
*K. Kang*

871 The Electrochemical Behavior of Sodium Vanadium Oxides in Sodium Batteries
*C. Delmas, M. Guignard, C. Didier, D. Carlier, F. Weill, M. Suchomel, E. Elkaim, and J. Darriet*

872 *In Situ* Monitoring of Fast Delithiation (sodiation) Process in Electrode Materials for Li- and Na-Ion Batteries By Using Time-Resolved X-Ray Techniques
*X. Yu, K. W. Nam, S. M. Bak, Y. Zhou, and X. Q. Yang*

873 Crystal Structure and Electrochemical Properties of $Li_{2-X}Na_xm[PO_4]F$ (*M*= Mn, Fe, Co, Ni, and Mg)
*H. Ben Yahia, M. Shikano, H. Sakaebe, S. Koike, M. Tabuchi, K. Tatsumi, and H. Kobayashi*

874 Synthesis, Electrochemical Properties, and Reaction Mechanisms of New Lithium-Excess Transition Metal Oxides With Cation Disordered Rock-Salt-Type Structure
*N. Yabuuchi, M. Takeuchi, D. Endo, T. Ozaki, T. Inamasu, J. Y. Son, Y. T. Cui, H. Oji, and S. Komaba*

875 Versatile 3D Oxoanion Framework for Li-Ion Intercalation
*P. Khalifah, J. Liu, D. Chang, X. Q. Yu, Y. Zhou, J. M. Bai, J. Ko, K. W. Nam, X. Q. Yang, A. van der Ven, G. Amatucci, and C. P. Grey*

876 Investigations Into Structure and Chemistry of 1D, 2D and 3D Structured Vanadium Oxide Nanomaterials for Li-Ion Batteries
*E. Armstrong, M. Osiak, C. Glynn, and C. O'Dwyer*

877 A Potential 3D Cathode Material for Li-Ion Microbatteries Based On $TiO_xS_y$ Nanotubes
*T. Djenizian, N. A. Kyerematen, N. Plylahan, A. C. S. Santos, L. Taveira, and L. F. P. Dick*

878 Ion Transport in Polymeric Nitroxide-Radical Organic Materials
*H. A. S. Platt, R. E. Larsen, T. Kemper, W. Braunecker, M. Olsen, and T. Gennett*

879 High Rate Ti-Based Anode Materials for Rechargeable Batteries
*K. T. Kim, S. M. Oh, Y. K. Sun, and S. T. Myung*

893 Degradation Mechanism of Graphite Negative-Electrodes in $LiPF_6$-Based Electrolyte At Higher Potential Region
*Y. Domi, H. Nakagawa, S. Tsubouchi, M. Ochida, T. Doi, T. Yamanaka, T. Abe, and Z. Ogumi*

894 How Do the Graphite Characteristics Influence the Anion Intercalation Into a Graphite-Based Cathode in Dual-Ion Cells?
*T. Placke, S. Rothermel, O. Fromm, P. Meister, J. Huesker, H. W. Meyer, and M. Winter*

895 Lithium Storage Mechanism of Reduced Graphene Oxides
*S. L. Kuo, N. L. Wu, H. C. Wu, and W. R. Liu*

896 Electro-Optical in-Situ Measurements of Li-Intercalation in Graphite Anodes
*D. Manka, P. Berg, A. Weber, and E. Ivers-Tiffée*

897 A New Room Temperature and Solvant FREE Carbon Coating Process
*A. Ponrouch, A. Goñi, and M. R. Palacín*

898 In Situ Broadband Dielectric Spectroscopy of Electrodes for Lithium Batteries From Low Frequencies to Microwaves
*J. C. Badot, K. Seid, O. Dubrunfaut, S. Levasseur, D. Guyomard, and B. Lestriez*

899 Application of the Methodology of Design Of Experiments to the Development of Li-Ion Battery Active Materials
*S. Martinet, C. Bourbon, M. Amuntencei, D. Peralta, L. Simonin, M. Rey-Chapuis, and S. Patoux*

900 Determination of Lithium Diffusion Coefficients in Commercial Electrodes By Impedance Modelling
*M. Weiss, J. Illig, J. P. Schmidt, M. Ender, A. Weber, and E. Ivers-Tiffée*

## B9 - Interfacial Phenomena in Battery Systems

*Battery, Physical and Analytical Electrochemistry*

901 SEI Layer Formation On Si Anodes
*P. B. Balbuena, J. M. Martinez de la Hoz, Y. Ma, L. Espinoza, and J. M. Seminario*

902 Interfacial Processes On Single Crystal Si Electrodes in Organic Electrolytes
*U. S. Vogl, S. F. Lux, M. Winter, and R. Kostecki*

903 In-Situ Transmission Electron Microscopy Observation of Solid Electrolyte Interface Formation On Si Nanowire Electrode in the Li-Ion Battery Using Liquid Confining Cell
*A. Kushima and J. Li*

904 In-Situ Observation of Single Silicon Particle During Charging and Discharging
*K. Nishikawa, H. Munakata, and K. Kanamura*

919 A Novel 2-Dimensional Combinative Analytical Method (IR imaging-Raman mapping-SEM) for the Characterization of Solid Electrolyte Interphases (SEIs)
*W. S. Jeon, C. Jung, E. S. Moon, S. Byun, and H. Han*

920 Li-Ion Battery Solid Electrolyte Interface (SEI) Investigation With in-Situ Attenuated Total Reflection-Infrared (ATR-IR) Spectroscopy
*F. Shi, K. Komvopoulos, P. N. Ross, and G. Somorjai*

921 Ambient-Pressure "Tender" X-Ray Photoelectron Spectroscopy (APXPS) for *in Situ* study of Liquid-Solid Interface of Pt Foil in 6 M KF
*S. Axnanda, E. J. Crumlin, B. Mao, S. Rani, R. Chang, Z. Liu, P. N. Ross, and Z. Hussain*

922 *In Situ* Fluorescence Spectroscopy Studies of Interfacial Processes On $LiNi_{0.5}Mn_{1.5}O_4$ High-Voltage Cathodes
*A. Jarry, R. Kostecki, S. F. Lux, H. Duncan, and G. Chen*

923 *in situ* Total-Reflection Fluorescence X-Ray Absorption Spectroscopic Study On Stability At $LiFePO_4$ / Electrolyte Interface
*K. Yamamoto, S. Mori, D. Takamatsu, Y. Orikasa, T. Minato, T. Masese, T. Mori, H. Tanida, H. Arai, Z. Ogumi, and Y. Uchimoto*

924 In-Situ Atomic Force Microscopy Study of Surface Microstructure Stability On $LiMn_2O_4$ Thin Films
*J. Velmurugan, N. Missert, and R. Garcia*

925 Tender XPS Studies of the Interfacial Reactivity Between the High-Voltage Cathode, $LiMn_{1.5}Ni_{0.5}O_4$, and the Electrolyte
*E. J. Crumlin, H. Duncan, P. N. Ross, G. Chen, and Z. Liu*

926 Improved Conductive Carbon Additives for High-Energy Lithium-Ion Batteries
*S. F. Lux, Y. Fu, A. K. Shukla, T. Richardson, V. Battaglia, and R. Kostecki*

927 Improved Performance of $LiNi_{0.5}Mn_{1.5}O_4$ With Electrolytes Containing 1,3,5-Trihydroxybenzene
*A. Perea, K. Zaghib, and D. Bélanger*

928 Solid Electrolyte Interphase Evolution in the Presence of Vinylene Carbonate and Vinyl Ethylene Carbonate Electrolyte Additives in Li-Ion Battery Anodes
*H. Tavassol, J. W. Buthker, D. G. Cahill, and A. Gewirth*

929 Defect Thermodynamics and Diffusion Mechanisms in $Li_2CO_3$ and Implications for the Solid Electrolyte Interphase in Li-Ion Batteries
*Y. Qi, S. Shi, H. Li, and L. G. Hector Jr.*

930 The Study of Thin Film high–voltage Li-Ion Cathodes to Reveal Surface Reactions and Coating Performance
*J. Li, Y. Kim, C. Liang, and N. J. Dudney*

931 Surface-Facet Dependent Reactivity Between $LiMn_{1.5}Ni_{0.5}O_4$ and Carbonate Electrolytes
*H. Duncan, S. F. Lux, R. Kostecki, and G. Chen*

932 Correlating Electrochemical and Spectroscopic Ellipsometry Signals to Evaluate Energy Storage Interfaces
*E. J. Dufek and L. M. Petkovic*

933 Solid Electrolyte Interphase Formation in Iron (II) Fluoride Conversion Electrodes
*S. Boyd, G. Amatucci, N. Pereira, and S. Greenbaum*

934 Source of Additional Capacities Seen in Metal Oxide/Fluoride Electrodes
*Y. Y. Hu, Z. Liu, K. W. Nam, O. J. Borkiewicz, J. Cheng, M. D. Dunstan, X. Q. Yang, P. J. Chupas, K. W. Chapman, and C. P. Grey*

935 Controlling Conversion Reactions With Multilayer Electrodes
*T. Fister, P. Fenter, B. Shi, X. Chen, M. Bedzyk, J. Esbenshade, B. R. Long, and A. Gewirth*

936 Ethylene Carbonate Decomposition On $LiMn_2O_4$ (111) Surface
*N. Kumar, K. Leung, and D. Siegel*

937 Atomic-Level Real-Time Observation of Crystal Growth and Evaporation in $LiFePO_4$ at High Temperature
*S. Y. Chung*

938 A Novel Ionic Host Solid Electrolyte Interface Formation On Reduced Graphene Oxide of Lithium Ion Battery
*F. M. Wang*

939 PES/XPS Studies of the Interface Chemistry in PEO-Based Polymer Electrolyte Lithium Ion Batteries
*C. Xu*

940 A Simple Method of Electrochemical Lithium Intercalation Within Graphite From a Propylene Carbonate-Based Solution
*S. K. Jeong, H. Y. Song, S. I. Kim, T. Abe, W. S. Jeon, R. Z. Yin, and Y. S. Kim*

941 AC Impedance Spectroscopic Study of Electrodeposition Process of Lithium Metal
*H. Kuwata, M. Matsui, and N. Imanishi*

942 A Phase Field Model To Simulate Transport At The Electrode/Electrolyte Interface
*D. Kar and D. M. Saylor*

943 Thin Layers of $Cu_2o$ On Three-Dimensional Copper Current Collectors for Li-Ion Microbatteries
*M. Valvo, D. Rehnlund, U. Lafont, M. Hahlin, K. Edström, and L. Nyholm*

944 *In Situ* Light Microscopy On Lithium Plating and Dendrite Growth: New Insights Into An Old Problem
*J. Steiger, D. Kramer, and R. Mönig*

945 Improving Nano/Micro Porous Silicon Electrode Properties By Ultra-Thin Atomic Layer Deposited (ALD) High-k Oxide Passivation for High Energy Density Li-Ion Battery Application
*M. Lim, B. Lee, and V. Misra*

946 Understanding the Initial Interfacial Reaction Behavior of Tin-Nickel Battery Anode
*S. Hong, M. H. Choo, Y. H. Kwon, S. W. Woo, J. Y. Kim, and S. W. Song*

947 Potential Dependence of Electrochemical Behavior of Porous Electrodes for Li-Ion Batteries
*N. Ogiahra, Y. Itou, S. Kawauchi, T. Kobayashi, and Y. Takeuchi*

948 Electrochemical and Interfacial Reaction Behavior of High-Voltage $LiNi_{0.5}Co_{0.2}Mn_{0.3}O_2$ Cathode for Lithium-Ion Batteries
*K. M. Nam, Y. M. Lee, E. H. Hwang, Y. G. Kwon, D. H. Kang, and S. W. Song*

949 Self-Discharge Phenomenon of a High Voltage Li(MnNi)O Spinel Investigated By Raman Spectroscopy
*R. Baddour-Hadjean, Y. Dridi, and J. P. Pereira-Ramos*

950 Investigation of $LiCoO_2$ Thin-Film Electrode Using Redox Reaction of Metal Cation
*J. I. Inamoto, K. Miyazaki, T. Fukutsuka, and T. Abe*

951 Influence of Electrolyte, Additives and Cycling Conditions On the Chemistry of the Solid Electrolyte Interphase Layer Formed On a-Si:H Films
*C. P. Nabais, J. Swiatowska, A. Seyeux, S. Zanna, M. Rosso, F. Ozanam, A. Gohier, M. Cassir Sr., and P. Marcus*

## B10 - Lithium-Ion Batteries

*Battery*

952 (2013 ECS Battery Division Technology Award Lecture) Lithium Metal Vs. Li-Ion Batteries: Challenges and Opportunities
*K. Zaghib*

953 Robust Si Anode Design for Li-Ion Battery On Polyimide Substrate: Villus-Like Polymer/Si Core/Shell Hybrid Nano-Structure
*M. S. Jung, I. S. Choi, and Y. C. Joo*

954 Reversible High Capacity Si Nanocomposite Anodes Enabled By Molecular Layer Deposition
*D. Molina Piper, J. J. Travis, M. Young, S. B. Son, S. C. Kim, K. H. Oh, S. M. George, C. Ban, and S. H. Lee*

955 Fabrication and Characterization of Silicon Nanoparticles Embedded in Siox Matrix for Li-Ion Batteries
*S. S. Suh, D. H. Kim, C. U. Jeong, S. U. Kwon, Y. U. Kim, J. H. Kim, Y. H. Park, Y. C. You, and S. H. Kang*

956 Three-Dimensional Silicon Anode Architectures Via Electrodeposition On Copper Foam Current Collectors
*F. Dogan, D. Sanjewaa, L. Trahey, and J. T. Vaughey*

957 Evidence of Slow Layered-to-Spinel Phase Transformation in High Energy $Xli[Li_{1/3}Mn_{2/3}]O_2$ - (1-x) $LiMn_{1/3}Ni_{1/3}Co_{1/3}O_2$ Cathodes Accompanied By a Drastic Rise of Serial Resistance
*P. Nayak, M. D. Levi, J. Grinblat, E. Levi, D. Aurbach, and Y. Wu*

958 Hysteresis and Voltage Fade in Lithium- and Manganese-Rich Transition Metal Oxide Electrodes
*K. G. Gallagher, J. R. Croy, M. Balasubramanian, and M. M. Thackeray*

959 Hierarchical Functional Layers On High-Capacity Lithium-Excess Cathodes for Superior Lithium Ion Batteries
*J. Zhao, S. Aziz, and Y. Wang*

960 Electrochemical Characterization of Lithium and Manganese Rich Composite Material for Lithium Ion Batteries
*W. Lu, Q. Wu, and D. W. Dees*

961 Surface Modification of Li-Mn-Rich $Li_{1.2}Ni_{0.13}Mn_{0.54}Co_{0.13}O_2$ Cathode Material By Atomic Layer Deposition
*X. Zhang, I. Belharouak, Y. Lei, X. Meng, R. Xu, and J. W. Elam*

962 Preparation and Electrochemical Performance of Si/Graphite/Disordered Carbon Composite Anode for Lithium-Ion Batteries
*J. Yang*

963 Electrospinning of Silicon and Sulfur Nanofibers for Lithium Ion Battery Applications
*K. J. Rhodes, J. Sulek, P. Gase, and J. Adams*

964 The Effect of Transition Metals Addition On Electrochemical Properties of Si-Ti-Ni Alloy Anode for Lithium Ion Batteries
*J. S. Cho, S. H. Hong, Y. Y. Chu, H. G. Ahn, C. S. Kang, S. C. Kim, S. B. Son, S. S. Suh, J. H. Kim, S. U. Kwon, Y. U. Kim, K. H. Oh, S. Lee, and S. H. Lee*

965 Silicon Nanocomposites Induced Highly Conductive Matrix As Anode Materials for Li-Ion Batteries
*H. Jung and J. H. Park*

966 New Design of Si Negative Electrodes With Copper Foam As Current Collector
*D. Mazouzi, M. Gauthier, P. Moreau, D. Pilon, L. Roue, D. Guyomard, and B. Lestriez*

967 Microstructure Study of Si-Alloy Thin Film Anode Electrode for Li-Ion Batteries
*M. Oh, Y. Song, T. G. Yun, C. S. Woo, J. H. Jeong, S. S. Kim, S. Hyun, and H. J. Lee*

968 Thermal Stability of High Voltage Spinel With Disordered and Ordered Phase
*E. Y. Hu, S. M. Bak, X. Q. Yu, Y. Zhou, K. W. Nam, and X. Q. Yang*

969 Analysis of Voltage Depression Mechanism After Charge-Discharge Cycling Tests for Li and Mn-Rich Cathode Materials
*Y. Kadoma, A. Matsutomo, H. Watanabe, Y. Takei, K. Nomura, M. Nakano, and K. Ui*

970 *In Situ* x-Ray Absorption Spectroscopy and First-Principles Calculations On Structural Changes of $Li_2MnO_3$ During Charge and Discharge Processes
*K. Kubobuchi, M. Mogi, M. Matsumoto, H. Imai, and T. Matsumoto*

971 Soft X-Ray Absorption Spectroscopic Studies of Spinel-Type Lithium Nickel Manganese Oxides for Li Rechargeable Batteries
*C. Kim and J. Cabana*

972 *Nanoscale X-Ray Microscopy of High Voltage Lithium-Rich MNC Composite Cathodes With 2D/3D Chemical/Elemental Sensitivity*

*Y. Liu, S. K. Martha, J. Nelson, F. Yang, Z. Wu, D. T. Morris, J. C. Andrews, P. A. Pianetta, and J. Nanda*

973 Ab initio study of doping effects on $LiMnO_2$ and $Li_2MnO_3$ in OLO cathode for Li ion batt eries
*F. Kong, R. P. Longo, M. S. Park, J. Yoon, J. H. Park, S. K. Doo, and K. Cho*

974 Performance and Safety Evaluation of $Li_2FeSiO_4$/Sio Battery
*T. Kojima, Y. Ikeuchi, A. Kojima, and T. Sakai*

975 Stabilization of Graphene / Silicon Electrodes for Li-Ion Battery Applications
*M. Weissmann, O. Crosnier, B. Lestriez, J. Gaubicher, B. Humbert, D. Guyomard, A. Nanjundan, F. Duclairoir, L. Dubois, G. Bidan, and T. Brousse*

976 Electrodeposition of Thin Silicon Films As Anode Materials for Lithium Ion Batteries
*C. A. Vlaic, S. D. Ivanov, and A. Bund*

977 Multi-Amp Hour Cell Construction Using PSI's Silicon Whisker and Carbon Nanofiber Composite Anode
*C. M. Lang, A. B. Cheimets, P. D. Moran, and J. A. Vega*

978 Towards High-Capacity Silicon Anodes for Lithium-Ion Batteries: Comparative Performance Study of Commercially Available Polymer Binders and Silicon Nanopowders
*T. Brezesinski, C. Erk, H. Sommer, C. Weidmann, and J. Janek*

979 Graphene-Oxide-Coated $LiNi_{0.5}Mn_{1.5}O_4$ As High Voltage Cathode for Lithium Ion Batteries With High Energy Density and Long Cycle Life
*X. Fang, M. Ge, J. Rong, and C. Zhou*

980 Reason and Improvement of Capacity Fading in LiNi0.5Mn1.5O4/Graphite Batteries
*K. Dai, J. Mao, Y. Zhai, V. Battaglia, and G. Liu*

981 Ultrathin Lithium Ion Conductor Coatings On $LiNi_{1/2}Mn_{3/2}O_4$ for High Energy Li-Ion Batteries
*J. S. Park, C. Kim, X. Meng, J. W. Elam, and J. Cabana*

982 Crystal Study of "Nano Inclusion" in $LiMn_2O_4$ Cathode Material of Lithium Ion Battery
*S. Esaki, Y. Kawai, J. Harada, M. Nishijima, and T. Yao*

983 Analysis of the Manganese Dissolution and Deposition in $LiMn_2O_4/Li_4Ti_5O_{12}$ Based Lithium-Ion Batteries
*M. Börner, S. Klamor, B. Hoffmann, M. Schroeder, M. Winter, and F. Schappacher*

984 Macroporous Silicon As Highly Stable Anodes for lithium Rechargeable Batteries
*X. Li, M. Gu, R. Kennard, S. Hu, X. Chen, C. Wang, M. J. Sailor, J. Liu, and J. G. Zhang*

985 Silica As Anode Precursor for Lithium Ion batteries
*M. Schrandt, P. Kolla, W. Rhine, R. Cook, and A. Smirnova*

986 High Throughput Synthesis of Silicon Nanotubes: A High Capacity and Stable Anode System
*P. N. Kumta and R. Epur*

987 Stress and Strain in Silicon Electrode Models
*K. Higa and V. Srinivasan*

988 Micro-Sized Si-C Composite With Interconnected Nanoscale Building Blocks As High-Performance Anodes for Lithium-Ion Batteries
*R. Yi, F. Dai, M. L. Gordin, S. Chen, and D. Wang*

989 In-Situ TEM Observation of LiMn2O4 Nanowire Battery
*S. Lee, Y. Oshima, E. Hosono, H. Zhou, K. Kim, H. Chang, R. Kanno, Y. Tanishiro, and K. Takayanagi*

990 Ternary Nanocomposite Cathode Material Composed of LiMn2O4/MnO2/Carbon Black With High Performance and Long-Term Stability Via Low-Temperature Synthesis On Flexible Conducting Carbon Fibers Current Collector
*Y. T. Weng and N. L. Wu*

991 Understanding the Mechanism and Effects of Transition Metal Dissolution and SEI Growth in Li-Ion Batteries
*T. Joshi, J. Benson, J. T. Lee, N. Nitta, S. Tighe, I. Kovalenko, G. Yushin, and T. F. Fuller*

992 The Effect of Microwave Treatment On the $Mn^{3+}$ Concentration of Spinel Cathode Material Studied By XPS, XRD and Electrochemical Methods
*C. J. Jafta, M. K. Mathe, N. Manyala, and K. I. Ozoemena*

993 Improving the Stability of $LiNi_{0.5}Mn_{1.5}O_4$ As a High-Power Cathode Material for Li-Ion Batteries By MgO Coating
*G. Alva, C. Kim, T. Yi, and J. Cabana*

994 Non-Olivine $LiFePO_4$ With Alluaudite Structure for Li Rechargeable Battery
*J. Kim, H. Kim, I. Park, Y. U. Park, J. K. Yoo, K. Y. Park, S. Lee, and K. Kang*

995 Understanding the Influence of Conductive Carbon Additives Surface Area On the Rate Performance of $LiFePO_4$ Cathodes for Lithium Ion Batteries
*X. Qi, B. Blizanac, J. Li, and M. Winter*

996 A New Low Cost Synthesis Method for $LiFePO_4$
*J. Barker, R. J. Heap, and N. Roche*

997 Cycling Performance of $LiCoPO_4$ Cathodes: Reasons for Capacity Fading and Effect of the Electrolyte Composition
*D. Aurbach*

998 Effect of $Ni(NO_3)_2 \cdot 6H_2o$ On Hydrothermal Synthesis of $LiMnPO_4$
*Y. Namiki, S. Yoshida, D. Shibata, H. Munakata, and K. Kanamura*

999 Nano-Sized Vs. Micro-Sized Powders - Agglomerated $LiFePO_4$ for Lithium Ion Batteries
*M. Pfanzelt, R. Forbert, G. Nuspl, and N. Schall*

1000 Effect of the Crystal Chemistry of $LiNi_{1/2}Mn_{3/2}O_4$ Spinels on its Electrochemical Properties
*C. Kim, M. Leskes, E. Castillo-Martínez, C. P. Grey, and J. Cabana*

1001 Self-Assembled $SnO_2$/Graphene Composites With Alternating Oxide and Amine Layers for High Li-Storage and Excellent Stability
*R. Prabakar and M. Pyo*

1002 Electrochemically Synthesized Sn-O-C Composite With Nano Core/Shell Structure for Anode of Lithium Secondary Batteries
*M. Jeong, H. Nara, T. Yokoshima, T. Momma, and T. Osaka*

1003 Development of Newly-Designed Li-Ion Battery Using Glassy Sno-$P_2O_5$ Anode Without Pre-Doping Technique and Their Safety Evaluation
*A. Yamano, M. Morishita, H. Yamauchi, T. Nagakane, A. Sakamoto, M. Ohji, and T. Sakai*

1004 Sn Nanowire-Based Anode With Ti Adhesion Layer for Li-Ion Batteries
*Y. Song, M. Oh, T. G. Yun, C. S. Woo, J. H. Jeong, S. Hyun, and H. J. Lee*

1005 Conductive Polymer and Silicon Composite Secondary Particles for a High Area-Loading Negative Electrode
*S. Xun, B. Xiang, A. Minor, V. Battaglia, and G. Liu*

1006 Si Content Effect On the Performance of the Thin Film Anodes for Rechargeable Lithium Ion Batteries
*D. B. Polat, L. Eryilmaz, and KeleÅ□*

1007 Use of Tin Based Composite Nanorod Anodes for Rechargeable Lithium Applications
*KeleÅ□, D. B. Polat, and N. Sezgin*

1008 Atomic Layer Deposition of $V_2O_5$-Carbon Nanotube Cathode With $TiO_2$ Protecting Layer for Lithium Ion Batteries
*M. Xie, X. SUN, J. Lian, and S. M. George*

1009 X-Ray Diffraction Measurements Below Ambient Temperature On Over-Stoichiometric $LiCoO_2$
*K. Mukai*

1010 Synthesis and Characterization of Ni-Rich Nano-$Li(NiCoMn)O_2$ Cathode Materials for Lithium Ion Batteries
*K. Manimaran, M. Abdul Wahab Johny, and R. Kiruthika*

1011 Mechanical Degradation of $LiMn_{1.95}Al_{0.05}O_4$ electrodes
*D. Chen, Z. Choi, D. Kramer, and R. Mönig*

1012 A New Approach to the Preparation of High Capacity Conversion Electrodes
*C. A. Bridges, Z. Bi, R. R. Unocic, G. M. Veith, and M. P. Paranthaman*

1013 Sb-Based Nanocomposite Alloy Anodes for Li-Ion Batteries
*E. Allcorn and A. Manthiram*

1014 A New Observation of Reaction Mechanism and Structure Analysis of Mesoporous $SnO_2$ By Using Synchrotron X-Ray Techniques
*H. Kim, Y. Kim, S. Muhammad, J. Yoo, G. O. Park, M. Balasubramanian, J. M. Kim, and W. S. Yoon*

1015 Enhanced Performance of Sn/Graphene Composite Anodes by Surface Treatment
*K. Hu, G. Zeb, P. Gaskell, Y. Kim, X. Xiao, M. Cerruti, and T. Szkopek*

1016 Electrospun Novel Nanostructured Sn-Based Perovskites ($MSnO_3$) As Anodes for High-Performance Lithium Ion Batteries
*L. L. Li, Y. L. Cheah, and M. Srinivasan*

1017 Sonochemical Deposition of Lithium Alloying Nanoparticles On the Surface of Spherical Carbon Anodes for Li-Ion Batteries
*V. G. Pol, S. R. Gowda, J. G. Wen, D. J. Miller, and M. M. Thackeray*

1018 $FeSn_5$ and $CoSn_5$ New Phases and Their Applications As High-Performance Anodes for Li-Ion Batteries
*W. Han, X. L. Wang, and F. X. Xin*

1019 $Cu_6Sn_5$-$SnO_2$/Carbon Nanocomposite As High Performance Anode for Lithium Ion Batteries
*R. Hu, M. Zhu, H. Liu, and W. Sun*

1020 Enhanced the Electrochemical Performance of Nano-Sn Film Anodes By Simply Surface Coating of Metallic Layers
*R. Hu, H. Liu, and M. Zhu*

1021 $SnO_2$/Reduced Graphene Oxide Composites Prepared By Ball-Milling Method for Lithium Ion Battery
*S. Li, S. Zhang, and J. Han*

1022 Graphene/$Fe_2O_3$/$SnO_2$/ Ternary Nanocomposite As A High-Performance Anode for Lithium Ion Batteries
*G. Wu, G. Xia, Q. Li, and N. Mack*

1023 Deposition Of Graphite/$SnO_2$ Composite ANODE Thin FILMS For Li ION Batteries
*M. Jahn and K. L. Choy*

1024 Measuring the Lithium Ion Diffusion Coefficient in Tin Thin Films: Comparisons Between Using Impedance Spectroscopy and Galvanostatic Intermittent Titration Technique
*E. C. W. Fok, A. R. Usgaocar, A. Mahmoudzadeh, and J. D. W. Madden*

1025 Synthesis and Electrode Properties of Thick (104)-Oriented $LiCoO_2$ Epitaxial Films
*K. Nishio, N. Ohta, T. Ohnishi, and K. Takada*

1026 Active Cathode Copper Coated Powder for Improving Lithium Ion Battery Performances
*M. Spreafico, P. Cojocaru, F. Triulzi, M. Apostolo, and L. Magagnin*

1027 Enhanced Electrochemical Performance of Cd-Modified $Li_2FeSiO_4$/C Cathode Material for Lithium-Ion Batteries
*S. Duan, L. L. Zhang, G. Liang, X. L. Yang, S. B. Ni, M. Li, and G. Peng*

1028 Atomic Layer Deposited $Cu_2s$ As a Superior Electrode Material With High Capacity and Excellent Cycleability for Lithium-Ion Batteries
*X. Meng, S. Riha, T. Fister, L. Trahey, A. Martinson, P. Fenter, and J. W. Elam*

1029 Characterization of Lithium Ion Cathodes Interfaces With Different Liquid Ions By DC and AC Techniques
*R. Hernandez-Maya*

1030 Enhancing the Cathode Functionality of Glycol Synthesized $LiFeSO_4F$ by Controlling the Surface Chemistry
*A. Sobkowiak, M. Roberts, R. Younesi, T. Ericsson, L. Häggström, C. W. Tai, A. Andersson, K. Edström, T. Gustafsson, and F. Björefors*

1031 (2013 ECS Battery Division Student Research Award Lecture) Synthesis, Structure and Properties of LiMSO4F Phases (M = 3d Metal) as Positive Electrode Materials for Li-ion Batteries
*M. Ati*

1044 Core-Shell Structured Carbon Coated $LiFePO_4$-Rgo Hybrids for High Power Lithium Ion Battery Cathodes
*S. H. Ha, J. Nham, and Y. J. Lee*

1045 Nano-Structured Carbon Materials As An Additive Conductor in Organic Lithium Ion Battery
*D. I. Cheong, S. H. Ha, H. G. Yoon, J. S. Yeo, E. J. Yoo, S. B. Cho, and K. Kang*

1046 Electrodeposition of a Tin/Tin(IV) Oxide Composite On Gold
*S. Böhme*

1047 Bicontinuous Carbon Electrode Structures Fabricated From High Internal Phase Emulsion Polymer (polyHIPE®) Templates and Their Use for 3D Microbattery Applications
*H. D. Asfaw, M. Roberts, L. Nyholm, and K. Edström*

1048 Si/C Nanocomposites Internally-Wired With Graphene for High Capacity Li-Ion Battery Anode
*J. K. Lee and C. Chae*

1049 Fabrication of Ncm ($LiNi_xCo_yMn_zO_2$)Cathode Materials Prepared By Degradation Oxalate Anion
*S. T. Lim, J. S. Sim, and S. H. Kim*

1050 Structural Changes and Thermal Stability of Ni Based Cathode Material for Li-Ion Batteries Studied By *in-Situ* XRD
*T. Kim, H. Kim, J. Yoon, Y. Kim, D. Kim, D. Jang, W. S. Yoon, J. S. Yu, and T. Yim*

1051 A Comparative Study of the Thermal Properties and Electrochemical Characteristics of $LiNi_{0.80}CoAl_{0.15}Al_{0.05}O_2$ and $LiNi_{0.85}CoAl_{0.10}Al_{0.05}O_2$ electrode in Lithium Ion Secondary Batteries
*J. T. Son, T. J. Park, K. W. Yoo, and C. Kim*

1052 A High-Rate, Nanofiber $Li_{1.2}Ni_{0.17}Co_{0.17}Mn_{0.5}O_2$/Carbon Cathode for Lithium-Ion Battery Applications
*J. W. Min, C. J. Yim, and W. B. Im*

1053 Preparation and Characterization of Flower-Like $Li_{1.2}Ni_{0.17}Co_{0.17}Mn_{0.5}O_2$ Microstructures As Cathode Materials By Electrospining
*J. W. Min, C. J. Yim, and W. B. Im*

1054 $GeO_2$/C Composite Fabricated By Sol-Gel Method As An Anode Material for Lithium Ion Batteries
*D. T. Ngo, M. G. Chourashiya, S. W. Kim, C. N. Park, and C. J. Park*

1055 Irreversible Behaviors of Silicon Monoxide With Controlling the Amount of Inserting Li Ion At Various Current Densities
*W. Yoon and J. K. Lee*

1068 Development of Electronically Conductive Polymer Binders for Anode Materials in Lithium Ion Batteries
*S. J. Park and G. Liu*

1069 Stability of $LiNi_{0.5}Mn_{1.5}O_4$ in 1.2M 3:7 EC/EMC Electrolyte Solution
*B. Knight, H. Duncan, G. Chen, and B. L. Lucht*

1070 Poly-Siloxane-Graft-Alkylene Oxide As Solid Polymer Electrolytes for Lithium Battery
*Y. H. Li, M. Y. Lu, and C. R. Yang*

1071 Investigation to a High Performanceelectrolyte Additive On Solid Electrolyteinterface Formation in Lithium Ion Batteries
*C. S. Cheng and F. M. Wang*

1072 Carbon-Coated Magnéli Phases $Ti_4O_7$ As Anodes in Lithium-Ion Batteries
*H. Tian, H. Ying, and W. Han*

1073 Composite Li-Ion Anodes Made With Recycled Silicon
*W. Xu, J. Fussell, and J. Komidor*

1074 Facile Spray Drying Route for the bath Lily-Like Graphene Sheet-Wrapped Nano-Si composite for Lithium Ion Battery Anode
*Y. S. He, P. Gao, X. Yang, X. Z. Liao, J. Yang, and Z. F. Ma*

1075 Floating Charge Voltage Dependency On Lithium-Ion Battery Lifetime
*T. Tsujikawa, K. Yabuta, and M. Arakawa*

1076 Effects of Preparing Process On the Properties of *O*-$LiMnO_2$ Via Pechini's Method
*T. S. Chou, W. K. Pang, and S. H. Wu*

1077 Ac Impedance Spectroscopic Analysis of $LiMn_2O_4$ Positive-Electrodes for Deterioration Diagnosis of Lithium-Ion Batteries
*T. Maekawa, N. Yoshimoto, T. Doi, T. Chuzawa, N. Nagaoka, and M. Inaba*

1078 Iron Oxide Nanostructures As High Performance Anode Materials for Lithium Ion Batteries
*Z. G. Lu*

1079 Investigation of Local Changes in Crystal and Electronic Structures of Charged $Li_xNi_{0.8}Co_{0.15}Al_{0.05}O_2$ Cathode Materials for Li-Ion Batteries By TEM-Eels
*S. Hwang, W. Chang, and E. A. Stach*

1080 Electrochemical Behaviors of $SiO_x$ Nanoparticles as an Anode Material for Lithium-Ion Battery
*E. Park, M. S. Park, Y. J. Kim, and H. Kim*

1081 Study of the Electrodeposition Process of Lithium Metal On Silicon Negative Electrodes
*F. Mizukoshi, M. Matsui, M. Kawakubo, and N. Imanishi*

1082 Impedance Analysis and Characterization of Electrodes On Degraded Laminated Li-Ion Battery With Micro Reference Electrode
*N. Takei, H. Nara, D. Mukoyama, T. Yokoshima, T. Momma, and T. Osaka*

1083 Effects On Wet-Coated $0.5Li_2MnO_3 \cdot 0.5LiNi_{1/3}Co_{1/3}Mn_{1/3}O_2$ Cathode Material for Li-Ion Batteries
*J. Li*

1084 Optimizing the Performance of Organic Li-Battery Electrode Materials: the Example of Dilithium Trans-Trans Benzenediacrylate
*S. Renault, A. Mihali, D. Brandell, and K. Edström*

1085 Synthesis and Electrochemical Properties of Sn-Fe-P Anode for Lithium Ion Batteries
*G. Park*

1086 Activation Mechanism of $Li_2MnO_3$ Cathode for Lithium Ion Battery
*S. H. Wu, J. L. Chen, and W. K. Pang*

1087 Preparation of Carbon-Coated Ramsdellite $Li_2Ti_3O_7$ and Their Charge/Dischcage Properties for Lithium-Ion Batteries
*T. Doi, R. Kanazawa, M. Saito, and M. Inaba*

1088 Overcoming the Current Limitations of Li-Ion Batteries Using Alternative Synthesis Routes for Conversion Electrode Materials
*M. Muñoz Márquez, B. Acebedo, C. Bernuy-López, P. Bline, E. Castillo-Martínez, M. Galcerán, E. C. Gonzalo, E. Lefebvre, and M. Casas-Cabanas*

1089 Investigation of Novel Nanostructured Tungsten Oxides As High Volumetric and Safe Anode Materials in Lithium Ion Batteries
*S. Yoon, S. G. Pyo, H. Son, and J. Min*

1090 Effect of Electrode Area and Capacity Ratios On Electrochemical Properties of Lithium-Ion Battery Unit Cells
*B. Son, J. Choi, S. H. Kim, and Y. M. Lee*

1091 A New Polymer Binder for Ceramic Coated Separator in Lithium Ion Batteries
*B. Son, J. Kim, J. M. Ko, and Y. M. Lee*

1092 Fast Lithium Ion Conducting Ceramics for All-Solid-State Lithium-Ion Battery
*K. Hamamoto, T. Yamaguchi, H. Sumi, T. Suzuki, and Y. Fujishiro*

1093 Thin Ceramic Layer-Coated Separators for Lithium-Ion Batteries By RF Sputtering
*T. Lee, D. J. Lee, Y. Lee, and Y. M. Lee*

1094 Electrospun $TiO_2$ Nanofiber Electrode With Optimized Diameters for Lithium Ion Battery
*Y. Cui, K. Sun, Q. Sun, X. Liu, and Z. W. Fu*

1095 In-Situ Lithium Ion Concentration Profiles Via Confocal Raman Microscopy
*J. D. Forster, J. J. Urban, and S. J. Harris*

1109 Investigation of New Guanidinium-Based Ionic Liquids As Possible Electrolytes in Lithium-Ion Batteries
*S. Hess, M. Wachtler, M. Wohlfahrt-Mehrens, M. Arkhipova, and G. Maas*

1110 Advanced Amorphous Thin Film Electrolytes for the Solid State Batteries
*I. Seo*

1111 In Situ SEM Observation of Solid-State Lithium Polymer Batteries
*M. Kawakubo, T. Ichikawa, M. Matsui, and N. Imanishi*

1112 Synthesis of $LiMn_2O_4$ Cathode Material for Lithium Ion Batteries By Solid State Process
*Y. Kim and J. Park*

1113 Binder-Free Silicon-Based Composite Anodes in Ionic Liquid Electrolytes for Li-Ion Battery
*H. Usui, M. Shimizu, M. Narita, and H. Sakaguchi*

1114 A Study On Electrochemical Reaction Mechanism of $RuO_2$ using Synchrotron Based X-Ray Techniques
*Y. Kim, H. Kim, K. Palanisamy, W. Oh, W. Lee, and W. S. Yoon*

1115 Controlling Morphology and Enhancing Electrochemical Performance of Cobalt Oxide By Addition of Graphite
*L. Fei and H. Luo*

1116 Can $LiFePO_4$ be Aliovalently Doped?
*J. Bhattacharya and C. Wolverton*

1117 Multiscale Modeling of Magnetic Susceptibility of a $LiFePO_4$ Battery
*T. Kadyk and M. Eikerling*

1118 A Facile Microwave-Assisted Route to $Co(OH)_2$ and $Co_3O_4$ Nanosheet for Li-Ion Battery
*G. Chen and H. Luo*

1119 (2013 ECS Fellow Inductee) Active, Inactive and Passive Electrode Materials in Lithium Ion Batteries
*M. Winter*

1120 Preparation and Electrochemical Performances of TiO2-Graphene Composite As Anode Material for High-Power Lithium Ion Batteries
*Q. Dong Sr., L. Qin Jr., and M. Zheng Jr.*

1121 Electrospun Polymer/Particle Composite Nanofiber Anodes for Li-Ion Batteries
*E. C. Self, R. Wycisk, and P. N. Pintauro*

1122 Nanostructure-Surface Modified Cu Thin Film for Lithium-Ion Negative Electrode Application
*G. Liu and Z. Zheng*

1135 The Use of Methyl Propionate-Based Electrolytes With Additives to Improve the Low Temperature Performance of $LiNiCoAlO_2$-Based Li-Ion Cells
*M. C. Smart, M. R. Tomcsi, L. D. Whitcanack, R. V. Bugga, M. Nagata, and V. Visco*

1136 Perfluoroalkyl-Substituted Ethylene Carbonates:Novel Electrolyte Additives for High-Capacity Lithiumionbatteries
*Y. Zhu, M. D. Casselman, Y. Li, A. Wei, and D. P. Abraham*

1137 Investigations On Electrolyte Decomposition During Aging Via Headspace GC-MS
*S. Theil and M. Wohlfahrt-Mehrens*

1138 Lithium Alkyl Carbonates: Preparation and Investigation of Stability
*B. L. Lucht, D. Chalasani, B. S. Parimalam, D. M. Seo, R. Kadam, and M. Xu*

1139 The Impact of Electrolyte Additives Determined Using Isothermal Microcalorimetry
*L. Downie, K. Nelson, V. Chevrier, and J. Dahn*

1140 The Use of Methyl Butyrate-Based Electrolytes With Additives to Enable the Operation of Li-Ion Cells With High Voltage Cathodes Over a Wide Temperature Range
*F. C. Krause, C. Hwang, R. V. Bugga, M. C. Smart, D. W. McOwen, and W. A. Henderson*

1141 Improved Performance of Graphite/ $LiNi_{0.5}Mn_{1.5}O_4$ Cells With Electrolyte Additives
*B. L. Lucht, A. Garsuch, M. Xu, and L. Zhou*

1142 *Manganese Trapping By Polymeric Macrocycles in Li-Ion Batteries: What Works, What Doesn't, and Why*

*Z. Li, T. J. Fuller, A. Pauric, Z. Yan, N. Ellison, M. P. Balogh, J. M. Ziegelbauer, N. P. Irish, G. R. Goward, and I. C. Halalay*

1143 High Precision Studies On a Family of Borate Electrolyte Additives
*N. N. Sinha, C. Burns, and J. Dahn*

1144 Electrochemical in-Situ Raman Spectroscopic Studies At the Lithium Ion Active Material Particle Surface During the Charge-Discharge Processes
*T. Awatani, R. Kitano, H. Imai, J. Ye, and T. Matsumoto*

1145 Fabrication of Copolymer-Embedded Titania Nanotubes As a Negative Electrode for 3D Li-Ion Microbatteries
*N. Plylahan, N. A. Kyerematen, M. Letiche, M. Barr, F. Dumur, P. Knauth, and T. Djenizian*

1146 Electrochemical Behavior of Titania Nanotubes in Organic Carbonate and Ionic Liquid Based Li Ion Containing Electrolytes
*S. D. Ivanov, L. Cheng, H. Wulfmeier, D. Albrecht, H. Fritze, and A. Bund*

1147 Novel Porous Nano-Sized Materials Development for Lithium Ion Battery Anode Application
*J. Wu, C. Du, Y. Cui, and A. Baker*

1148 Mesoporous Lithium Titanate - Carbon Composite With Controlled Microstructure
*C. K. Ho, H. Yung, M. Zhou, V. C. Y. Li, and K. Y. Chan*

1149 Anatase $TiO_2$ Colloidal Nanocrystal-Based Architectures: Models to Assess the Role of Porosity and Nanocrystal Morphology in Li Battery Electrode
*N. Krins, R. Buonsanti, C. Kim, T. Pick, T. Richardson, B. A. Helms, J. Cabana, and D. J. Milliron*

1150 The Effect of Some Electrolyte Additives On $LiCoO_2$/Graphite Pouch Cells
*R. Petibon, E. C. Henry, N. N. Sinha, C. Burns, and J. Dahn*

1151 Long Term Cycling Performance of High-Capacity Lithium-Ion Full Cells With Lidfob- and Libob- Electrolyte Additives
*Y. Li, Y. Zhu, M. Bettge, J. C. M. Li, and D. P. Abraham*

1152 Transport Property Measurements for $LiPF_6$ in EC:DEC (1:1)
*A. Mehrotra and V. Srinivasan*

1153 Mixed Litfsi and Libob Salts for High-Temperature $LiFePO_4$-Based Lithium-Ion Battery
*X. Chen, W. Xu, Y. Zhang, J. Zheng, E. N. Nasybulin, and J. G. Zhang*

1154 Solution Structure/Properties of Nitrile-Lithium Bis(fluorosulfonyl)Imide (LiFSI) Electrolytes for Li-Ion Batteries
*S. D. Han, O. Borodin, D. M. Seo, Z. B. Zhou, and W. A. Henderson*

1155 Structural Transformation of Conversion $FeO_{0.7}F_{1.3}$/C nanocomposite Electrode Upon Lithiation/Delithiation
*M. Sina, N. Pereira, G. Amatucci, and F. Cosandey*

1156 Nanastructured $H_2Ti_8O_{17}$ Nanoarrays As Three-Dimensional Anodes for Lithium-Ion Batteries
*Z. Chen, J. Liao, and X. Xiao*

1157 $GeO_2$-Sncoc Composite Anode Material for Lithium Batteries: Li Insertion and De-Insertion Study
*A. Abouimrane, B. Liu, M. Balasubramanian, Y. Ren, Z. Fang, and K. Amine*

1158 The Structure and Morphology of $TiO_2$-B Nanoparticles
*Y. Andreev, P. Panchmatia, Z. Liu, S. Parker, M. S. Islam, and P. Bruce*

1159 Direct Spark Plasma Erosion Synthesis of High Performance Tin and Silicon Alloy Nano-Particulate Materials for Lithium Ion Batteries
*E. M. H. White, L. Rueschhoff, J. Vetter, S. W. Martin, and I. E. Anderson*

1160 Electrochemical Activity of Carbon Blacks in $LiPF_6$-Based Organic Electrolytes
*J. Syzdek, M. Marcinek, and R. Kostecki*

1187 Simulating Transport Behavior of Room Temperature Ionic Liquids for Li-Ion Applications
*V. L. George and T. F. Fuller*

1188 Electroactive Imidazolium Salts Based On 1,4-Dimethoxybenzene Redox Groups : Synthesis, Electrochemical Characterization and Overcharge Protection in Li-Ion Batteries
*J. Forgie, S. El Khakani, D. Rochefort, and D. MacNeil*

1189 Accelerating Rate Calorimetry and Electrochemical Study of Imidazolium Ionic Salts Based On 2,5-Di-Tert-Butyl-1,4-Dimethoxybenzene Used As Additives in Lithium-Ion Batteries for Overcharge Protection
*S. EL Khakani, J. Forgie, D. Rochefort, and D. MacNeil*

1190 Thermal Conductivity, Heat Sources and Temperature Profiles of Li-Ion Secondary Batteries
*O. S. Burheim, M. A. Onsrud, J. G. Pharoah, F. Vullum-Bruer, and P. J. S. Vie*

1191 Simcal Project: Calendar Aging Results Obtained On a Panel of 6 Commercial Li-Ion Cells
*A. Delaille, S. Grolleau, F. Duclaud, J. Bernard, R. Revel, S. Pélissier, E. Redondo-Iglesias, J. M. Vinassa, A. Eddahech, C. Forgez, M. Kassem, S. Joly, D. Porcellato, P. Gyan, S. Bourlot, and M. Ouattara-Brigaudet*

1192 Coupling of Dynamic Electrical and Thermal Processes in Prismatic Batteries
*S. U. Kim, L. Secondo, A. Stefanopoulou, and C. Monroe*

1193 Area-Specific Impedance of a Single Lithium Insertion Electrode: A Measure to Evaluate Polarization
*T. Ohzuku, F. Ohgaki, and K. Ariyoshi*

1194 Morphological Analysis for the Evaluation of Electrode Structures
*E. J. Dufek, M. V. Glazoff, and K. L. Gering*

1195 Lithium-Ion Cells With High Charge/Discharge Performance At Extreme Low Temperature
*D. Ofer, L. Nation, S. Dalton-Castor, Y. Hyung, S. Sriramulu, and B. Barnett*

1196 Simultaneous Substitution in High Lithium Ion Conducting Garnet-Type Oxides; $Li_{7+X}La_{3-Y}A_YZr_{2-Z}Nb_ZO_{12}$ (A = Sr, Ca)
*Y. Kihira, S. Ohta, Y. Yagi, H. Imagawa, and T. Asaoka*

1197 First Principle Analysis of Electrochemical Stability of $Li_{10}GeP_2S_{12}$
*M. Osaki, Y. Kato, T. Ohtomo, M. Sakano, and Y. Kawamura*

1198 Lithium Ion Battery Degradation Due to Anode-Electrolyte Reaction
*J. W. Fergus, S. Y. Choe, V. Agubra, and R. Fu*

1199 Bulk Ionic Conductivity and Crystallization of Lithium Thiophosphate Solid Electrolytes
*S. S. Berbano, M. Mirsaneh, M. T. Lanagan, and C. A. Randall*

1200 Particle-Particle Interaction Within the Electrodes of Lithium-Ion Batteries
*C. Zhang and A. T. Conlisk*

1201 A New Rechargeable Li-Ion Battery Using Dendrimer-Linked Nitroxide As Cathode Material Through Li-Ion Adsorption/Desorption Mechanism
*Y. Liu, G. Rosen, D. Bigio, and C. Wang*

1202 Lithium Resources Recovery From Seawater By Electrodialysis Using Novel Ion Exchange Membrane
*T. Hoshino*

1203 Influence of Temperature and Cycling On Electrode Degradation - Experimental and Modeling Study
*M. Klett, T. G. Zavalis, M. H. Kjell, R. W. Lindström, M. Behm, and G. Lindbergh*

1204 A New and Fast Entropy Measurement Method for Lithium-Ion Cell
*J. P. Schmidt, A. Weber, and E. Ivers-Tiffée*

1205 Heterogeneous Degradation of Mechanically Constrained Lithium-Ion Cells
*J. Cannarella and C. B. Arnold*

1206 Capacity Fading Mechanism and Side Reaction Research On Graphite/ $LiNi_{0.5}Mn_{1.5}O_4$ Full Cell
*Y. Fu, X. Song, P. Ridgeway, G. Liu, and V. Battaglia*

1207 Fingerprinting Electronic State Evolution During Battery Operations Through Soft x-Ray Spectroscopy
*W. Yang, G. Liu, X. Liu, and R. Qiao*

1208 Effect of VC in Graphite / NMC Cells: Coulombic Efficiency and Rate Performance
*R. D. Deshpande and V. Battaglia*

1209 Investigation of Particle Size and Coating Thickness for Pulse Performance of Automotive Lithium Ion Batteries
*B. C. Sisk and Z. Zhang*

1210 Three Dimensional Thermal, Electrical and Electrochemical Modeling of Li-Ion Batteries
*S. Kalnaus, S. Allu, W. Elwasif, S. Simunovic, S. Pannala, and J. A. Turner*

1211 Predicting and Extending the Lifetime of Li-Ion Cells
*C. Burns, A. Kassam, N. N. Sinha, L. Downie, L. Solnickova, B. Way, and J. Dahn*

1212 Three-Dimensional Multi-Physics Model for Li-Ion Battery
*M. Guo*

1213 Life Modeling of Ncm Composite/Graphite Cell: A Semi-Empirical Approach
*J. Wang*

1228 Lattice Boltzmann Simulation of Tortuous Flow Within Stochastic Porous Media and the Examination of the Tortuosity-Porosity Relationship
*A. Ebrahimi and A. Bazylak*

1229 *Understanding the Effect of Temperature Gradients in Modules On Cell Balance Using Coupled Multi-Physics Modeling approach*

*S. Pannala, S. Allu, W. Elwasif, S. Kalnaus, S. Simunovic, and J. A. Turner*

1230 An Electrochemical Model Considering the Electric Double Layer of Nano-Size Materials for Lithium Ion Battery
*M. Jia, Y. Cheng, S. Du, Y. Tang, and J. Li*

1231 Preparation and Characterization of the Sulfur-Carbon Nano-Composite Material for Li/S Battery
*Y. Yuan*

1232 Investigation of $Na_xFe_xTi_{1-X}O_2$ ($1.0 \geq x \geq 0.75$) for Na-Ion Battery Positive Electrodes
*J. Thorne, S. Chowdhury, R. Dunlap, and M. Obrovac*

1233 Electropolymerized Solid Polymer Electrolytes for Three-Dimensional Microbatteries
*B. Sun, D. Rehnlund, H. D. Asfaw, L. Nyholm, K. Edström, and D. Brandell*

1234 X-Ray Absorption Spectroscopy of Lithium-Sulfur Battery Discharge/Charge Reaction Intermediates
*K. Wujcik and N. P. Balsara*

1235 Improvement of Discharge Properties of Thin-Film Lithium Rechargeable Battery With Thicker Cathode Film for Higher Capacity
*T. Jimbo, S. Sasaki, A. Suzuki, I. Kimura, and K. Suu*

1236 Fabrication of 3D Electrodes for All-Solid State Lithium Thin Film Batteries
*Y. Cui, J. Liu, X. Li, Y. Deng, Z. Shi, X. Liu, R. Li, and X. A. Sun*

1237 Dynamics of Al Anode Degradation in Thin-Film Solid-State Batteries
*M. Leite, D. Ruzmetov, Z. Li, L. Bendersky, N. Bartelt, and A. A. Talin*

## B11 - Polymer Electrolyte Fuel Cells 13

*Industrial Electrochemistry and Electrochemical Engineering, Battery, Corrosion, Energy Technology, Physical and Analytical Electrochemistry*

1238 Standardizing Thin-Film Rotating Disk Electrode Measurements of the Oxygen Reduction Activity of Pt/C
*Y. Garsany, J. Ge, J. St-Pierre, R. Rocheleau, and K. Swider-Lyons*

1239 Enhanced Oxygen Reduction Activity on Pt/C for Nafion-free, Thin, Uniform Films in Rotating Disk Electrode Studies
*K. Shinozaki, B. S. Pivovar, and S. S. Kocha*

1280 Optimized Flow Distribution for Enhancing Temperature Uniformity Across An Open Cathode PEM Fuel Cell Stack
*S. Thomas, O. Kwon, S. C. Lee, S. Park, G. H. Choi, and J. Y. Choi*

1281 Short Side Chain Ionomers
*L. Merlo*

1282 Non-Crosslinked Perfluoro-Polymer Electrolytes With Two Acid Groups and Their Properties
*A. Shinohara, K. Kudo, M. Kawasumi, Y. Morimoto, and N. Hasegawa*

1283 Morphology and Swelling of Perfluorosulfonic-Acid (PFSA) Ionomer Thin Films
*A. Kusoglu and A. Z. Weber*

1284 Solvation of Vanadium Cations in Aqueous and Perfluorosulfonic Acid Membranes
*S. J. Paddison and F. Sepehr*

1285 A Revised EVB Model for Proton Transport in Hydrated Nafion Membrane
*T. Mabuchi and T. Tokumasu*

1286 Nafion/Titanium Oxide Nanotube Hybrid Electrolyte Membranes for PEFC Operating At Elevated Temperature
*K. Ketpang, A. K. Sahu, O. Kwon, S. C. Lee, and S. Shanmugam*

1287 Nafion-1,2,3-Triazole Composite Membrane for Fuel Cell
*J. D. KIM, M. S. Jun, and H. W. Rhee*

1288 Spatially and Temporally Resolved Measurement of Water Distribution in Nafion Using NMR Imaging
*M. Klein, J. C. Perrin, S. Leclerc, L. Guendouz, J. Dillet, and O. Lottin*

1289 Neutron Imaging of Water Transport in Polymer-Electrolyte Membranes and Membrane-Electrode Assemblies
*D. S. Hussey, D. L. Jacobson, D. Liu, B. Khaykovich, M. V. Gubarev, D. Spernjak, G. Wu, J. D. Fairweather, R. Mukundan, R. Lujan, P. Zelenay, and R. L. Borup*

1290 Evaluation of Transient Water Content During PEMFC Operational Cycles By Stroboscopic Neutron Imaging
*J. D. Fairweather, D. Spernjak, J. Spendelow, R. Mukundan, D. S. Hussey, D. L. Jacobson, and R. L. Borup*

1291 Distinction of Liquid Water and Ice Based On Dual Spectrum Neutron Imaging
*J. Biesdorf, P. Oberholzer, F. Bernauer, A. Kästner, P. Vontobel, E. Lehmann, T. J. Schmidt, and P. Boillat*

1292 Neutron Imaging and Performance of PEM Fuel Cells With Nanostructured Thin Film Electrodes At Low Temperatures
*R. Mukundan, D. Spernjak, R. Lujan, J. D. Fairweather, D. S. Hussey, D. L. Jacobson, A. J. Steinbach, A. Z. Weber, and R. L. Borup*

1346 Separation Analysis of Electro-Osmosis and Diffusion of Water in Electrolyte Membrane of PEMFC Under Low-Humidity Operation
*K. Nishida, T. Hosotani, M. Asa, S. Tsushima, and S. Hirai*

1347 Surface Structure and the Oxygen Reduction Reaction of Pt-Based Catalysts
*N. Hoshi, M. Nakamura, Y. Takesue, T. Rurigaki, and A. Hitotsuyanagi*

1348 Oxygen Reduction Reaction Activity of MBE-Prepared Ni/Pt(111) : Dependence of Surface Pt-Layer Thickness
*N. Todoroki, T. Wadayama, and Y. Asakimori*

1349 Understanding the Durability and ORR Reactivity of Four Different Dealloyed $PtNi_x$ Cathodic Catalysts
*D. E. Ramaker, K. M. Caldwell, S. Mukerjee, Q. Jia, and J. M. Ziegelbauer*

1350 Dealloying and Annealing Optimization of High Mass Activity $Pt_3Ni_7$/Nstf ORR Cathodes for Pemfcs
*A. J. Steinbach, D. van der Vliet, S. M. Luopa, J. Erlebacher, and D. A. Cullen*

1351 Electrochemical Properties and Electronic Structure of $Ni_{70}Pt_{30}$ Thin Films On High Surface Area Nstf Supports
*C. C. Hays, P. Bahrami, J. Foley, M. A. Johnson, and M. Errico*

1352 Structural and Compositional Behaviors of Shaped Pt Alloy Nanoparticle Electrocatalysts
*C. Cui, L. Gan, M. Heggen, and P. Strasser*

1353 Dealloying of Pt Bimetallic Catalysts at Constant Electrode Potentials
*S. Rudi, L. Gan, C. Cui, and P. Strasser*

1354 Pt-Cu Alloys As Catalysts for the Oxygen Reduction Reaction – A Thin-Film Study of Activity and Stability
*A. K. Schuppert, A. A. Topalov, A. Savan, A. Ludwig, and K. J. J. Mayrhofer*

1355 Chemically Ordered Intermetallic Ptfeco Catalyst With Improved Activity and Durability for Electroreduction of Oxygen
*B. Arumugam, B. A. Kakade, T. Tamaki, and T. Yamaguchi*

1356 Facile Preparation of Ordered Intermetallic Nanostructures for High Performance Fuel Cell Catalysts
*J. Lee*

1357 Ethanol Electrooxidation Over Pd Nanoparticles Deposited By Atomic Layer Deposition On $TiO_2$ Nanotubes
*E. Baranova, L. Assaud, N. Brazeau, K. Pitzschel, V. Heresanu, M. Hanbücken, and L. Santinacci*

1358 Palladium-Based Bimetallic Catalysts for Alkaline Direct Alcohol Fuel Cell (ADAFC)
*T. Jurzinsky, C. Cremers, K. Pinkwart, and J. Tübke*

1372 Effect of Compression Cycling On High-Temperature Polymer Electrolyte Membrane Fuel Cells
*F. J. Pinar, M. Rastedt, N. Bruns, A. Diedrichs, and P. Wagner*

1373 Development and Optimization of a Novel PEM Fuel Cell Using Printed Circuit Board Technology
*O. Obeisun, C. Attingre, F. A. Daniels, J. Robinson, T. Mason, C. Gibbs, A. R. Kucernak, and D. J. L. Brett*

1374 Performance and Durability of HT-PEM Fuel Cells
*G. W. Yeager, L. Krishnan, T. Early, C. Zhang, H. A. Hjuler, C. Terkelsen, J. Yang, Q. Li, and T. Steenberg*

1375 Affect of Feature Dimensions On PEM Fuel Cell Performance Under Flow Fields Capable of Switching Between Parallel and Interdigitated Configurations
*A. Santamaria, N. Cooper, M. Becton, and J. W. Park*

1376 A Study of the Durability and Performance of a Proton Exchange Membrane Electrode Assembly Used in the Separation of Hydrogen From Helium
*M. Angelo, K. Bethune, and R. Rocheleau*

1377 Designing Transition Metal Oxides for Oxygen Reduction and Evolution Electrocatalysis
*J. Suntivich and Y. Shao-Horn*

1378 Templated Non Precious Cathode Catalysts Prepared By Transition Metal and Poly(ethyleneimine) for Oxygen Reduction Reaction in Alkaline Electrolyte
*J. Shi, P. Xu, M. Zheng, Y. Liu, J. Qiao, and J. Qiao*

1379 "Sandwich-structure" Nanocomposites of Graphene Nanosheets and Alkaline Exchange Ionomer As Superior Catalyst Supporting Materials for Alkaline Exchange Membrane Fuel Cells
*L. Zeng and T. Zhao*

1380 The Role of Heat Treatment in Enhanced Activity of Manganese Oxides for the Oxygen Reduction and Evolution Reactions
*Y. Gorlin, D. Nordlund, and T. F. Jaramillo*

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*M. Vikkisk, I. Kruusenberg, U. Joost, E. Shulga, I. Kink, and K. Tammeveski*

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*J. Sanetuntikul and S. Shanmugam*

1383 Oxygen Reduction On Pt/[$TaOPO_4$/VC], Pt/[$NbOPO_4$/VC], Pt/[$Ta_2O_5$/VC], and Pt/[$Nb_2O_5$/VC] Electrocatalysts in Alkaline Electrolyte
*Y. Garsany, A. Ephsteyn, and K. Swider-Lyons*

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*M. Oezaslan, C. Bonnaud, P. B. P. Rodriguez, W. Liu, A. K. Herrmann, N. Gaponik, A. Eychmüller, R. Koetz, and T. J. Schmidt*

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*M. Schrandt, P. Kolla, and A. Smirnova*

1400 The Effects of Polymer Electrolyte Fuel Cell Fabrication On Pt and Pt Alloy Electrocatalysts
*D. Myers, N. Kariuki, and X. Wang*

1401 Mesostructured Multimetallic Thin Films As Electrocatalysts for Fuel Cells
*J. D. Snyder, Y. Kang, D. Li, N. M. Markovic, and V. R. Stamenkovic*

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*B. N. Popov, T. Xie, T. Kim, W. S. Jung, J. C. Rotchford, A. Kriston, H. Kim, and P. Ganesan*

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*X. Wang, Y. Orikasa, Y. Takesue, H. Inoue, M. Nakamura, T. Minato, N. Hoshi, and Y. Uchimoto*

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*H. Daimon, N. Aoki, K. Nakamura, A. Shirai, T. NIshikawa, and Y. Ikehata*

1405 Flame Based Synthesis of Core-Shell Structures Using Pd-Ru and Pd Cores Prepared From the Vapor Phase With Reactive Spray Deposition Technology
*J. M. Roller, R. Maric, H. Yu, M. Vukmirovic, C. B. Carter, and R. Adzic*

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*K. Page, S. Kim, B. Rowe, J. Dura, C. Soles, K. Yager, A. Kusoglu, and A. Z. Weber*

1407 Characterization and Performance of Catalyst Layers Prepared By Inkjet Printing Technology
*M. S. Saha, M. Tam, V. Berejnov, D. Susac, S. McDermid, A. P. Hitchcock, and J. Stumper*

1408 Improving MEA Kinetic Performance Through Removing Nafion Ionomer Binders in a Catalyst Layer
*J. Xie*

1409 Structure-Property-Performance Correlations - Towards Rational Catalyst Layer Design
*J. Stumper*

1410 Effect of PEFC Water Management On Oxygen Transport Resistance in Ultra-Low Loading Catalyst Layer
*A. K. Srouji, L. Zheng, R. Dross, and M. M. Mench*

1411 Characterization of Thin Ionomer Layers
*D. A. Cullen, R. Koestner, R. S. Kukreja, S. Minko, O. Trotsenko, A. Tokarev, H. M. Meyer III, and K. L. More*

1412 Effect of Ionomer On Mass Transfer of PEFC Catalyst Layer and Design of Optimal Structure
*G. Inoue and T. Matsuoka*

1413 CV or not CV: Development of Electrode Diagnostics for High-Temperature Polymer Electrolyte Fuel Cells
*T. Engl, K. Waltar, L. Gubler, and T. J. Schmidt*

1414 In Situ, Ionic Conductivity Measurement of Ionomer/Binder-Free Pt Catalyst Under Fuel Cell Operating Condition
*S. J. An and S. Litster*

1415 Effective Diffusivity Measurement of Partially-Saturated Diffusion Media
*G. S. Hwang, J. Grant, and A. Z. Weber*

1416 Design of Experiments to Evaluate Material Characteristics of Porous Transport Layers in Polymer Electrolyte Membrane Fuel Cells
*S. Flick and W. Mérida*

1417 The Impact of Fibre Surface Morphology On the Effective Thermal Conductivity of a PEM Fuel Cell Gas Diffusion Layer
*S. J. Botelho and A. Bazylak*

1418 Effect of Gdl Material On Thermal Gradients Along the Reactant Flow Channels in Pemfcs
*E. See and S. G. Kandlikar*

1419 PTFE Distribution in High Temperature PEM Electrodes and Its Effect On the Cell Performance
*F. Mack, T. Morawietz, R. Hiesgen, D. Kramer, and R. Zeis*

1420 Measurement Technique of Oxygen Diffusion Resistance Through Gas Diffusion Layer
*H. Ohira, K. Kikuchi, A. Ida, J. Tomiyasu, and A. Yamamoto*

1421 Ice-Crystallization Kinetics During Cold-Start of a Proton-Exchange-Membrane Fuel Cell
*T. J. Dursch Jr., J. F. Liu, G. J. Trigub, C. J. Radke, and A. Z. Weber*

1422 Novel Characterization Technique for the Hydrophilic/Hydrophobic Properties of a Gdl
*R. Kuwertz, T. Turek, and U. Kunz*

1423 Microfluidic Investigation of Oxygen Bubble Transport through the Gas Diffusion Layer of PEM Electrolyzers
*F. Arbabi, A. Kalantarian, R. Abouatallah, R. Wang, J. Wallace, and A. Bazylak*

1450 Pd-based Bimetallic Catalysts for Direct Formic Acid Fuel Cells
*S. Hu, H. Gao, S. Dai, L. Scudiero, and S. Ha*

1451 Effect of pH On the Electrocatalytic Oxidation of Hcooh/$HCOO^-$ On Platinum: A Mechanistic Study
*J. Joo, T. Uchida, A. Cuesta, M. T. M. Koper, and M. Osawa*

1452 Increase Porosity of Anodes in Direct Formic Acid Fuel Cells
*C. A. Rice, A. Bauskar, P. Mandal, and S. Litster*

1453 The Effect of Nafion Content On DMFC Electrode Characteristics
*A. Glüsen, M. Müller, and D. Stolten*

1454 PtRu/Cu Nws Catalysts for Methanol Oxidation Reaction in Direct Methanol Fuel Cells
*J. Zheng and Y. Yan*

1455 Carbon Supported Pd-Pt-Cu Nanocatalysts for Efficient Formic Acid Electrooxidation: Facile Syntheses, Componental Functions and Structural Evolutions
*K. Jiang and W. B. Cai*

1456 The Influence of the Liquid Water Interaction Between Channel, Gdl and CL On Cell Performance
*T. Kotaka, Y. Tabuchi, U. Pasaogullari, and C. Y. Wang*

1457 The Electrostatic Double Layer of Pt/Water Interfaces From First Principles Molecular Dynamics
*C. S. Cucinotta, S. Sanvito, and P. Ballone*

1458 Effect of Perforation Structure of Cathode GDL on Liquid Water Removal in PEFC
*G. Okuhata, T. Tonoike, K. Nishida, S. Tsushima, and S. Hirai*

1459 Effect of Through-Plane Polytetrafluoroethylene Distribution in a Gas Diffusion Layer On a Polymer Electrolyte Unitized Reversible Fuel Cell
*C. Hwang, H. Ito, T. Maeda, A. Nakano, A. Kato, and T. Yoshida*

1460 Fabrication of the Carbon Paper by Wet-Laying of Ozone-Treated Carbon Fibers with Hydrophilic Functional Groups
*H. Kim, Y. J. Lee, D. C. Lee, G. G. Park, and Y. Yoo*

1461 Multi-Layered Membrane Electrode Assembly Fabrication By Electro-Spraying
*J. W. Oh, H. Na, S. Nahm, Y. Kim, and H. Choi*

1462 Atomic Force Microscopy Detection of Electronic Short-Circuits in Solid Polymer Electrolytes Fuel Cell Membranes After Accelerated Degradation
*T. Morawietz, R. Hiesgen, S. Helmly, I. Galm, and K. A. Friedrich*

1463 Manufacturing Study of Membrane Electrode Assembly With Support-Less Pt Catalysts Using Ultrasonic Spray Technique
*X. Huang, W. A. Rigdon, Y. Song, B. Wynne, and S. Ferguson*

1477 Optimal Pre-Treatment of Sulfonated Poly(ether ether ketone) Membranes for Decal Processes
*Y. J. Byun, M. S. Shin, D. H. Lee, H. M. Cho, M. S. Lee, M. S. Kang, and J. S. Park*

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*M. Hara, M. Hara, J. Inukai, T. Miyahara, T. Hoshi, K. Miyatake, and M. Watanabe*

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*F. A. M. Loureiro Sr., H. Costa Sr., and A. M. Rocco*

1480 Polyethyleneimine-based semi-interpenetrating network membranes for fuel cells
*F. A. M. Loureiro Sr., R. Pacheco Pereira Sr., and A. M. Rocco*

1481 Molecular Dynamics Study of Oxygen Permeation of Ionomer of Hydrocarbon
*Y. Sugaya and T. Tokumasu*

1482 Preparation and Characterization of Speek/Silicotunstic Acid/Acid Functionalized Polysilsesquioxane Hybrid Composite Membranes for PEM Fuel Cells
*S. Seesukphronrarak*

1483 Nafion-Azole-$H_3PO_4$ Composite Membranes Using Solution Processing for High Temperature Pemfcs
*J. D. KIM, A. Suzuki, and M. S. Jun*

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*M. S. Jun and J. D. KIM*

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*H. Niwa, H. Kiuchi, J. Miyawaki, Y. Harada, M. Oshima, Y. Nabae, K. Terakura, T. Ikeda, and T. Aoki*

1486 Kinetic Study of Oxygen Reduction Reaction On Cobalt-Porphyrin-Modified Electrodes
*S. Shino, K. Murakoshi, and K. Ikeda*

1487 Co/N/C Catalysts On a Vertically Aligned Carbon Support for Oxygen Reduction Reaction
*T. Kawasaki, M. Aizawa, R. Hinogami, and H. Gyoten*

1488 Alkaline Membranes Based On Poly(vinyl alcohol) for PEM Fuel Cells
*O. Bencik, M. Musil, M. Kunovjanek, J. Subarda, L. Chladil, and V. Novak*

1489 Synthesis of Durable Nb-$TiO_2$ Support for Pemfcs By Electrospinning
*C. Kwon, S. Yoo, J. Jang, H. Kim, J. Kim, and E. Cho*

1490 Highly Active Tantalum Oxide-Based Electrocatalysts Toward Oxygen Reduction Reaction for PEFC
*N. Uehara, A. Ishihara, Y. Kohno, K. Matsuzawa, S. Mitsushima, and K. I. Ota*

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*M. Matsumoto, H. Imai, T. Miyazaki, S. Fujieda, A. Ishihara, and K. I. Ota*

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*N. Leonard, S. Ganesan, and S. Calabrese Barton*

1493 Oxygen Adsorption Characteristics of Nitrogen-Doped Graphite Revealed By N 1*s* X-Ray Absorption Spectroscopy
*H. Kiuchi, T. Kondo, M. Sakurai, H. Niwa, J. Miyawaki, Y. Harada, T. Ikeda, Z. Hou, K. Terakura, J. Nakamura, and M. Oshima*

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*M. Yoshimura and T. Sato*

1495 Stabilization and Activation of Zirconium Oxide Based Electrocatalysts As PEFC Cathode By Re-Heat Treatment
*Y. Okada, A. Ishihara, M. Matsumoto, M. Arao, H. Imai, Y. Kohno, K. Matsuzawa, S. Mitsushima, and K. I. Ota*

1496 Supercritical Hydrothermal Synthesis of $ZrO_2$/C Cathode Catalyst Without Non-Precious-Metal for PEFCs
*H. Maki, Y. Ito, S. Omura, and K. I. Ota*

1497 Scale-Up Synthesis of Au Core/Pt Shell Structured Catalysts and Their Electrochemical Properties
*Y. Ikehata, N. Aoki, H. Inoue, H. Daimon, and M. Inaba*

1498 ORR Measurements Reproducibility Using a Rrde
*J. Ge, Y. Garsany, Y. Zhai, J. St-Pierre, and K. Swider-Lyons*

1499 Bimodal Pt Synthesized On Heat Treated Carbon Black Support in Arc Plasma Process
*H. NA, J. W. OH, Y. Cho, and H. CHOI*

1500 FC Catalyst With Mesoporous Carbon
*M. Hori, H. Kato, S. Matsumoto, and N. Nishi*

1501 Sol-Gel Syntheses of Durable Metal-Oxide Hybrid Platinum Catalysts for PEFC
*T. Trefz, N. Kremliakova, D. Susac, and J. Jankovic*

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*N. Hoshi, H. Tanaka, N. Sakai, S. Suzuki, T. Nakamura, M. Nakamura, S. Sugawara, T. Sekiba, K. Shinohara, and K. Ikeda*

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*T. Tsukatsune, Y. Takabatake, Z. Noda, A. Hayashi, and K. Sasaki*

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*Y. Senoo, Y. Chino, K. Kakinuma, M. Uchida, H. Uchida, S. Deki, and M. Watanabe*

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*Y. Chino, K. Kakinuma, M. Uchida, H. Uchida, S. Deki, and M. Watanabe*

1506 Investigation of Graphene Supported Platinum, Platinum-Nickel and Platinum-Nickel-Titania Nanoparticles As Electrocatalysts for Fuel Cells
*L. Tamasauskaite-Tamasiunaite, J. Jablonskiene, M. Semasko, A. Balciunaite, A. Zabielaite, J. Vaiciuniene, R. Kondrotas, R. Juskenas, and E. Norkus*

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*W. A. Rigdon, X. Huang, and T. I. Valdez*

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*T. Ioroi, T. Nagai, M. Asahi, S. I. Yamazaki, N. Fujiwara, and Z. Siroma*

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*T. Kinumoto, N. Eguchi, M. Matsuoka, T. Tsumura, and M. Toyoda*

1510 ORR Kinetics Investigation of Pt/Carbon Electrocatalysts With Varying Pt Loading and Electrode Thickness By Rotating Disk Electrode
*C. Wang, N. Dale, and K. Adjemian*

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*S. J. Yoo, S. J. Hwang, S. C. Lee, J. H. Jang, T. H. Lim, and S. K. Kim*

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*S. N. Stamatin and E. M. Skou*

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*X. Wang, T. Nakai, Y. Orikasa, T. Minato, and Y. Uchimoto*

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*Y. C. Park, K. Kakinuma, M. Hara, M. Uchida, H. Uchida, and M. Watanabe*

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*C. Chauvin, Q. Liu, and W. Sugimoto*

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*N. I. Kim, J. Seong, M. J. Yang, S. H. Cho, J. Y. Park, H. CHOI, S. H. Joo, and K. Kwon*

1530 Graphene-Supported Pt-Pd Nanostructures With Enhanced Catalytic Activities for Methanol Electrooxidation in Alkaline Medium
*W. B. Kim, Y. Kim, E. J. Lim, S. Lee, and Y. Noh*

1531 Highly Efficienty Palladium-Based ANODE Electrocatalyts For Direct Ethylene Glycol and Glycerol FUEL CELLS
*F. Vizza, M. Bellini, M. Bevilacqua, J. Filippi, M. Innocenti, A. Lavacchi, A. Marchionni, H. A. Miller, W. Oberhauser, and L. Wang*

1532 Gold-Graphene Modified Titania Nanotubes As Electrocatalysts for Borohydride Oxidation
*L. Tamasauskaite-Tamasiunaite, A. Balciunaite, A. Zabielaite, A. Selskis, and E. Norkus*

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*M. Saito, T. Takakuwa, T. Kenko, H. Daimon, A. Tasaka, M. Inaba, H. Shiroishi, T. Hatai, and J. Kuwano*

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*R. Chen*

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*J. Qiao, X. Qin, J. Shi, and P. Xu*

1536 High Durable Anion-Conducting Ionomer Binder Formed By On-Site Crosslinking
*M. S. Shin, Y. W. Choi, M. S. Kang, and J. S. Park*

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*S. He, S. Mao, A. Spakowitz, and C. Frank*

1538 Effect of $SiO_2$ Additive in Catalyst Layer and Electrolyte On the Performance for Mesothermal Fuel Cell Using Room Temperature Molten Salts
*H. Uryu, Y. Kohno, K. Matsuzawa, and S. Mitsushima*

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*T. P. Pandey, M. W. Liberatore, and A. M. Herring*

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*H. N. Sarode and A. M. Herring*

1541 Low Pressure Liquid Extrusion Porosimetry for Determination of Pore Size Distribution in Gas Diffusion and Microporous Layers
*G. Laskey, C. P. Quesnel, and J. T. Gostick*

1555 Atomic Imaging and Spectroscopy of Size- and Shape-Dependent Degradation of Pt Bimetallic Fuel Cell Catalysts
*L. Gan, M. Heggen, C. Cui, S. Rudi, and P. Strasser*

1556 Identical Location Transmission Electron Microscopy in Polymer Electrolyte Environment – Application to the Degradation of Pt/C and $Pt_3co$/C Electrocatalysts Under Accelerated Aging Tests
*F. R. Nikkuni, M. Chatenet, E. A. Ticianelli, and L. Dubau*

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*B. Jayasankar, K. Karan, and D. Harvey*

1558 Microstructure and Performance of Catalyst Layer Based On Highly Graphitized Carbon Support
*J. Song, H. Kim, Y. Park, K. Song, Y. Kim, S. Lee, N. Kong, T. Kim, Y. Yoshida, and C. Pak*

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*H. Wang, T. Tamaki, B. A. Kakade, and T. Yamaguchi*

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*A. Seifitokaldani, M. Perrier, and O. Savadogo*

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*S. Yin, A. Ishihara, Y. Kohno, K. Matsuzawa, S. Mitsushima, K. I. Ota, M. Matsumoto, and H. Imai*

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*A. Ishihara, S. Yin, K. Suito, N. Uehara, Y. Okada, Y. Kohno, K. Matsuzawa, S. Mitsushima, K. I. Ota, M. Chisaka, Y. Ohgi, M. Matsumoto, and H. Imai*

1563 Preparation of Ta, Nb, Ti, and Zr--Based Catalysts for Cathode of Polymer Electrolyte Fuel Cells
*J. Kubota*

1564 Pt-Free Cathode Catalyst Prepared From Polyimide Fine Particles
*Y. Nabae, M. Chokai, T. Ichihara, T. Hayakawa, and T. Aoki*

1565 The Role of Oxygen Functionalities for Enhanced Oxygen Reduction Activity in Carbon Nanotubes
*H. S. Oktaviano, R. A. Wong, and K. Waki*

1566 Graphene Oxide-Derived Non-Precious Metal Oxygen Reduction Catalysts
*G. Wu, Q. Li, and P. Zelenay*

1567 N-Doped Carbon Nanotubes Prepared At Different Temperatures for Oxygen Reduction Reaction
*H. Li, X. Cheng, F. B. Weng, and A. Su*

1595 Influence of Transition Metal on Oxygen Reduction Activity of Metal-Nitrogen-Carbon Electrocatalyst
*S. Ganesan, N. Leonard, and S. Calabrese Barton*

1596 Phenylenediamine as a Promising Ligand for Non-Noble Metal ORR Catalysts
*S. Gharaibeh and V. Birss*

1597 In Situ Spectroscopic Observation of the Fe-N Switching Behaviors of Fe-$N_4$ and Fe-$N_{2+2}$ Sites During Oxygen Reduction
*Q. Jia, U. Tylus, K. Strickland, N. Ramaswamy, and S. Mukerjee*

1598 Investigation of a cathodic bimetallic catalyst based on Platinum and cobalt for application in direct methanol fuel cells
*C. D'urso, V. Baglio, A. Stassi, D. Sebastian, and A. S. Aricò*

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*T. Mittermeier, P. Madkikar, X. Wang, M. Piana, and H. Gasteiger*

1600 Reaction Pathways and Current Efficiency for Electrooxidation of Ethylene Glycol At Intermediate Temperatures
*E. M. Stuve and K. A. Spies*

1601 Ir-Sn Nanoparticles for the Ethanol Oxidation Reaction
*X. Teng and W. Du*

1602 Closely Interacted Pt-$SnO_2$ Electrocatalysts for Methanol Oxidation
*Y. Chen and Y. Xing*

1603 N-Doped Graphene-Supported PtRu Direct Methanol Fuel Cell Electrocatalysts
*S. Pylypenko, K. N. Wood, A. Serov, P. Atanassov, and R. O'Hayre*

1604 A Study of Au/C Nanoparticles With Pt Monolayer and Sub-Monolayer Electrocatalysts for Ethanol Oxidation Reaction
*R. Loukrakpam, S. R. Brankovic, and P. Strasser*

1605 EDTA Assisted Ce(III)/Pt Vulcan Xc-72 Catalyst Synthesis for Direct Methanol Fuel Cell Applications
*C. R. Cabrera, C. Menendez, R. Guzman-Blas, K. Sasaki, D. J. Stacchiola, S. D. Senanayake, D. Suazo-Dávila, and C. A. Vélez*

1606 Performance Stability of Carbon-Supported *Vs.* Metal-Black DMFC Catalysts
*Q. Li, D. Spernjak, Y. S. Kim, and P. Zelenay*

1607 Synthesis of Nanostructured Platinum and Platinum-Based Electrocatalyst for Dafc
*M. V. Tran, G. H. Nguyen Thi, H. P. Vu Thi, P. M. L. Le, and T. T. P. Nguyen*

1608 Pd-Bi Catalysts for Electrooxidation of Alcohols
*A. Zalineeva, U. Martinez, A. Serov, S. Baranton, C. Coutanceau, and P. Atanassov*

1609 Corrosion Study of Mesoporous Carbon Supports for Use in PEM Fuel Cells
*F. Forouzandeh, D. Banham, F. Feng, X. Li, S. Ye, and V. Birss*

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*E. Negro, M. de Vries, R. Latsuzbaia, and G. Koper*

1611 Development of Ultra-Low Loading Pt/AGC Catalyst for PEM Fuel Cells
*T. Kim, W. S. Jung, T. Xie, and B. N. Popov*

1612 Pt Catalysts Supported On High Surface Area Graphene Composites for PEFCs
*J. Xie*

1613 Pt-Decorated graphene-like foam for Electrochemical Oxygen Reduction With High Mass Activity
*J. Liu, K. Sasaki, and S. M. Lyth*

1614 Development of Durable Electrocatalysts for PEFC By Controlling Nanostructure of Carbon Supports
*A. Hayashi, X. Zhao, Y. Minamida, Z. Noda, and K. Sasaki*

1615 Durable and Water Manageable Ordered Mesoporous Supports for Polymer Electrolyte Fuel Cells
*S. M. Hwang, S. Lee, Y. J. Sohn, T. H. Yang, and G. G. Park*

1616 Development of Graphitic-Carbon Nitride Materials as Catalyst Supports for Polymer Electrolyte Fuel Cells
*N. Mansor, A. Belen Jorge, F. Corà, C. Gibbs, R. Jervis, P. F. McMillan, X. Wang, and D. J. L. Brett*

1617 Application of Mesoporous Carbon Nano Dendrites(MCND) As Catalyst Supporting Materials for PEFCs
*K. Matsumoto, T. Iijima, and M. Hiyoshi*

1618 Highly Dispersed Pt on $Mo_2C$: Durable Catalyst for Oxygen Reduction Reaction
*A. Roy, U. Martinez, E. L. Brosha, P. Atanassov, and T. L. Ward*

1619 Evidence of Enhanced Activity of *In-Situ* formed Pt Nano-Rafts On Molybdenum Carbide Support
*L. Elbaz, T. Rockward, N. J. Henson, K. Artyushkova, K. L. More, J. Phillips, and E. L. Brosha*

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*C. Xu, P. Pietrasz, J. Yang, R. Soltis, K. Sun, M. Sulek, and R. Novak*

1621 Characterization and Modeling of Mass Transport in Gas Diffusion Layer and Catalyst Layer of PEM Fuel Cells
*J. Kleemann*

1635 Chaos During H2/CO Electroxidation: Trends and Usefulness
*A. Mota, T. A. Rocha, and E. R. Gonzalez*

1636 Reformate Hydrogen Fuel in PEM Fuel Cells: the Effect of Alkene Impurities on Anode Activity
*K. Kortsdottir, F. J. Perez Ferriz, C. Lagergren, and R. W. Lindström*

1637 A Perspective of TM-$N_x$ (TM=Fe, Co, and x=2, 4) Non-PGM Electrocatalysts From First-Principles Calculations
*B. Kiefer, S. J. Paddison, and P. Atanassov*

1638 Role of Transition Metal in Non-Noble Metal Electro-Catalysts in Proton Exchange Membrane (PEM) Fuel Cells
*D. Singh, J. Tian, K. Mamtani, and U. S. Ozkan*

1639 Mechanistic Studies On Fe-PEI Derived Non-PGM Catalysts for Oxygen Reduction
*U. Tylus, A. Serov, K. Artyushkova, S. Mukerjee, and P. Atanassov*

1640 Modeling Non-Precious Metal Catalyst Structures and Their Relationship to ORR Activity
*E. F. Holby, G. Wu, P. Zelenay, and C. D. Taylor*

1641 Structure-to-Property Relationships in Non-Platinum Group Fuel Cell Catalysts: Examination of Length Scale Correlations
*M. J. Workman, A. Serov, M. S. Rojas Carbonell, P. Atanassov, and K. Artyushkova*

1642 Scale-Up of Metal-Nitrogen-Carbon Electrocatalyst Synthesis By High-Pressure Pyrolysis
*S. Ganesan, N. Leonard, and S. Calabrese Barton*

1643 Scale Up of Non-PGM ORR Catalysts
*B. Halevi, P. Short, A. Serov, P. Atanassov, S. Ganesan, S. Mukerjee, and S. Calabrese Barton*

1644 Novel Non-Platinum Group Metal Cathode Catalyst for Fuel Cell Electric Vehicle Application
*A. Serov, K. Artyushkova, P. Atanassov, E. Niangar, C. Wang, and N. Dale*

1645 Effect of High-Voltage Cycling On Non-Precious Metal Catalysts for the ORR
*F. Jaouen, V. Goellner, and D. J. Jones*

1646 Corrugated Pore Model for Design of Non-Precious Oxygen Reduction Cathodes
*N. Leonard, S. Calabrese Barton, A. Serov, P. Atanassov, and S. Mukerjee*

1647 Structure and Reactivity of Fe-N-C Non-PGM Cathode CatalystsDerived by the Sacrificial Support Method
*P. Atanassov, A. Serov, K. Artyushkova, B. Kiefer, and S. Mukherjee*

1648 Alkaline Membrane Fuel CellsTechnology Challenges and Approaches to Their Resolution
*S. Gottesfeld*

1649 Enhanced Efficiency With Autonomous Oscillations: Challenges for Dafc
*A. Mota and E. R. Gonzalez*

1650 Effect of the Membrane Thickness on the Over-Potential Behavior of the Direct Formic Acid Fuel Cell
*T. Tsujiguchi, T. Iwakami, and N. Nakagawa*

1651 The Promotion Effect of An Oxide Phase On Pd Electrocatalysts for the Oxidation of Ethanol: *in Situ* irras Studies in An Alkaline Environment
*U. Martinez, A. Serov, M. Padilla, and P. Atanassov*

1652 *In Situ* Degradation Measurements of a DMFC By a Dynamic Hydrogen Reference Electrode
*N. Aoun, U. Kunz, and T. Turek*

1653 Nickel-Cerium Alloys for Borohydride Oxidation
*D. M. F. Santos, B. Sljukic, D. Macciò, A. Saccone, C. Sequeira, and L. Amaral*

1654 Progress in The Development of Alkaline Membrane Fuel Cells and Regenerative Fuel Cells
*K. Scott, X. Wu, M. Mamlouk, and R. Espiritu*

1655 The Electrocatalytic Oxidation of Ethanol in a Proton Exchange Membrane Electrolysis Cell (PEMEC): A Way to Produce Clean Hydrogen for PEFC
*C. Lamy, S. Baranton, and C. Coutanceau*

1656 Synthesis of Cobalt Nanoparticle Embedded Carbon Nanofiber Catalysts With High Oxygen Reduction Reaction Activity
*M. Kim, D. Nam, H. Park, K. Eom, E. Cho, C. Kwon, S. J. Yoo, and H. Kwon*

1657 Palladium Alloy Catalysts Synthesized By Sacrificial Support Method for the Electrooxidation of Ethylene Glycol in Alkaline Environment
*C. Cremers, D. Bayer, F. Jung, T. Jurzinsky, A. Serov, P. Atanassov, K. Pinkwart, and J. Tübke*

## B12 - Stationary and Large-scale Electrical Energy Storage Systems 3

*Battery, Energy Technology, Industrial Electrochemistry and Electrochemical Engineering*

1658 Advances in PNNL's Vanadium Redox Flow Battery Stack
*V. Sprenkle, E. Thomsen, W. Wang, B. Li, B. J. Koeppel, K. P. Recknagle, X. Wei, Z. Nie, Q. Luo, and D. Reed*

1659 Redox Flow Cell Component Validation At Sub-Stack Level
*V. Sprenkle, E. Thomsen, W. Wang, B. Li, B. J. Koeppel, K. P. Recknagle, X. Wei, Z. Nie, Q. Luo, and D. Reed*

1673 A Precious-Metal Free Regenerative Fuel Cell for Storing Renewable Electricity
*D. Ng, Y. Gorlin, T. Hatsukade, and T. F. Jaramillo*

1674 Comparison of Acid and Alkaline Hydrogen-Bromine Fuel Cell Systems
*T. V. Nguyen, V. Yarlagadda, G. Lin, G. Weng, V. C. Y. Li, and K. Y. Chan*

1675 Effect of Operating Condition On Cyclic Performance of a Hydrogen-Bromine Flow Battery
*K. T. Cho, M. S. Ding, A. Z. Weber, V. Battaglia, and V. Srinivasan*

1676 Investigation of the Active Site of Rhodium Sulfide Electrocatalysts
*N. Singh, D. C. Upham, R. F. Liu, H. Metiu, and E. McFarland*

1677 Synthesis and Characterization of $Rh_xS_y$/C Catalysts for HOR/HER in HBr
*J. Masud, J. Walter, T. V. Nguyen, G. Lin, N. Singh, E. McFarland, H. Metiu, M. Ikenberry, K. Hohn, C. J. Pan, and B. J. Hwang*

1678 Charge Transfer and Storage in the Electrochemical Flow Capacitor – A New Concept for Grid-Scale Energy Storage
*C. R. Dennison, M. Beidaghi, K. B. Hatzell, J. W. Campos, Y. Gogotsi, and E. C. Kumbur*

1679 Assessment of the Iron-Ion/Hydrogen Redox Flow Cell
*M. C. Tucker, K. T. Cho, V. Srinivasan, P. N. Ross, and A. Z. Weber*

1680 Advanced Redox Flow Battery R&D At Pacific Northwest National Laboratory
*W. Wang, Q. Luo, Z. Nie, M. Vijayakumar, X. Wei, B. Li, B. Chen, Y. Shao, E. Thomsen, D. Reed, and V. Sprenkle*

1681 Roles of Cathode Addivtives for Sodium-Nickel Chloride (Zebra) Battery
*G. Li, X. Lu, J. Y. Kim, J. P. Lemmon, and V. Sprenkle*

1682 Performance Stability of Novel Sodium-Zinc Chloride Battery
*X. Lu, G. Li, J. Y. Kim, J. P. Lemmon, and V. Sprenkle*

1683 Analysis of Electrochemical Properties of Zn-Br Flow Battery
*S. Mukherjee, A. Bates, S. C. Lee, O. Kwon, and S. Park*

1684 A Large Format Stationary Energy Storage Device Based On a Composite Sodium Titanium Phosphate Anode Materials System
*J. Whitacre*

1685 Performance Assessment of Solid Oxide Cells for Electrical Energy Storage
*P. Kazempoor, C. Wendel, and R. J. Braun*

1686 Identifying and Suppressing Side Reactions in Soluble Lead Flow Batteries to Achieve High Efficiency and Cyclability
*M. Verde, K. Carroll, and S. Meng*

1687 Applications of Quinone Redox Chemistry for Flow Batteries
*M. P. Marshak, B. Huskinson, M. R. Gerhardt, and M. J. Aziz*

1688 A Quinone-Based Flow Battery for Large-Scale Electrochemical Energy Storage
*B. Huskinson, M. P. Marshak, M. R. Gerhardt, and M. J. Aziz*

1689 New TYPE Of LOW Cost, LONG CYCLE Life, High POWER, and SAFE Battery
*R. Huggins*

1690 Double-Membrane Design for High-Voltage and Low-Crossover Redox Flow Batteries
*S. Gu, K. Gong, E. Z. Yan, and Y. Yan*

1691 Nanoporous Separator Development for Various Redox Flow Batteries At Pacific Northwest National Laboratory
*X. Wei, W. Wang, B. Li, Q. Luo, Z. Nie, B. Chen, and V. Sprenkle*

1692 Improved Membranes for Redox Flow Batteries
*M. L. Perry, W. Xie, W. Li, and R. M. Darling*

1693 Modeling and Optimal Control of Energy Storage Devices for a Lithium-Ion Battery-Photovoltaic Hybrid System
*M. T. Lawder, A. Jagwani, P. W. C. Northrop, V. Ramadesigan, P. Biswas, and V. R. Subramanian*

1694 Comparing Limits of Performance in Aqueous and Non-Aqueous Redox Flow Batteries
*C. N. Sun, M. M. Mench, and T. A. Zawodzinski*

1695 Cardo-Polyetherketone Anion Exchange Membranes With Suitable Chemical/Mechanical Stability and Performance for All-Vanadium Redox Flow Battery
*S. Yun, J. Parrondo, and V. K. Ramani*

1696 Importance of Ion-Ion Interactions in Membranes for All-Vanadium Redox Flow Batteries
*L. D. Griffith, S. U. Kim, H. Y. Chen, and C. Monroe*

1697 Comparing Membrane Properties for Redox Flow Batteries
*T. A. Zawodzinski, Z. Tang, J. S. Lawton, M. Bright, A. Jones, A. Schnyder, C. N. Sun, and C. Fujimoto*

1698 Broadband Electrical Spectroscopy (BES) Studies On Hydroxide-Conducting Membrane
*V. Di Noto, A. Maes, S. Lavina, E. Negro, B. E. Coughlin, A. M. Herring, and G. Pace*

## D1 - Corrosion General Poster Session

*Corrosion*

1699 Formation of An Anti-Bacterial Oxide Film On Ti-Ta Alloy By Anodic Oxidation
*S. F. Ou, F. Y. Fan, and K. L. Ou*

1700 Oxidation Behavior of Ni-Base Single Crystal Superalloys At 1000°c
*Y. Hwang, S. Won, and D. B. Lee*

1701 Influence of the pH On the Corrosion Protection of Epoxy-Silica-Zirconia Sol-Gel Coatings Applied On EN Aw-6063 Aluminium Alloy
*I. R. Fontinha, M. M. Salta, M. L. Zheludkevich, M. G. S. Ferreira, R. B. Figueira, E. V. Pereira, and C. J. R. Silva*

1702 Mesoporous Titania Film As Photoanodes for Cathodic Protection of Stainless Steel
*Z. Feng, C. LEI, H. Zhou, and C. WANG*

1703 Electrochemical Growth of β-$Ni(OH)_2$ and NiOOH On Ni Electrodes At Well-Defined Polarization Potential, Polarization Time, and Temperature Conditions
*M. Alsabet*

1704 Comparison of Corrosion Resistance of Stainless Steels in Sour Environments With Various Chloride Concentration and Temperature
*J. W. Rho, G. E. Park, K. Y. Kim, and C. J. Park*

1705 Dissolution Behavior of Pt-Co Binary Alloy Thin Films in Sulfuric Acid
*A. Ooi*

1706 Preparation and Evaluation of Zn Doped Hap Plasma Spray Biocombatible Coatings On Titanium
*S. TAKE, K. Kikuchi, S. Suda, and Y. Itoi*

1707 Thin-Film Ceramic Coatings Based On Sol-Gel Chemistries for Corrosion Protection of Low-Grade Carbon Steels
*R. E. Pérez-Roa, M. I. Tejedor, and M. A. Anderson*

1708 Fast Macropore Etching Via Large Current and High HF Concentration On p-Type Silicon
*D. Ge, N. Ren, and Q. Wang*

1709 Corrosion Resistance and Mechanism of Zinc Rich Paint in Corrosive Media
*A. H. Sofian and K. Noda*

1710 Compositional Characterization of Inclusion/Matrix Boundaries and Relation to Pit Initiation At Mns in Stainless Steel
*M. Tohjoh, I. Muto, A. Chiba, Y. Sugawara, and N. Hara*

1711 Controlling the Corrosion of Metals With Polyphenolic Proteins
*W. F. Nelson and D. C. Hansen*

1712 The Effect of Potential Scan Rate and Temperature At Aluminum Passive State in Borate Buffer Solution
*S. Kaluzhina and T. Minakova*

1713 Corrosion Behavior of Bipolar Plate Materials in Acid Media
*M. V. Tran, T. Q. Tran, H. T. Nguyen, and T. T. P. Nguyen*

1727 Dissolution/Deposition of Zinc in the Deionized Water (60 < T (°C) < 93.3)
*J. H. Park, P. Mast, and J. Poska*

1728 Corrosion Behavior of Copper-Silver-Phosphorus Brazing Alloy in Chloride Containing Electrolyte At Various Temperature
*A. Nurrochman and K. Cho*

1729 Hydrogen Diffusion Coefficients Through Inconel 718 in Different Metallurgical Conditions
*J. J. M. Jebaraj, D. J. Morrison, and I. I. Suni*

1730 Effect of ECAP On the Pitting Corrosion of 304 Stainless Steel
*Z. Zheng and Y. Gao*

1731 Bipolar Electrochemistry for High-Throughput Corrosion Screening
*S. Munktell, M. Tydén, J. Högström, L. Nyholm, and F. Björefors*

1732 Corrosion of Buried Plumbing Materials By Soil Chemistry and Leakage Current
*Y. B. Park, Y. J. Choi, H. J. Jang, Y. S. Park, and I. S. Park*

## D2 - Atmospheric Corrosion

*Corrosion, Physical and Analytical Electrochemistry*

1733 Revisiting Atmospheric Corrosion of Active Metals : What We Have Learn't and What We Need to Learn
*I. S. Cole*

1734 Improving the Corrosion Resistance of Weathering Steel Bridges
*S. Ramamurthy, D. Shoesmith, C. Coomarasamy, and D. Lai*

1735 Atmospheric Corrosion of Plain Carbon Steel Below the Deliquescence Point of Sodium Chloride
*E. Schindelholz, B. Risteen, and R. G. Kelly*

1736 Marine Aerosol Drop Size Effects On the Corrosion Behavior of Plain Carbon Steel
*B. Risteen, E. Schindelholz, and R. G. Kelly*

1737 Identification of Hydrogen Uptake Sites and Local Hydrogen Concentrations During Atmospheric Exposure of Steels Using Scanning Kelvin Probe Microscopy and Electrochemical Extraction
*R. F. Schaller and J. R. Scully*

1738 Hydrogen Uptake During Atmospheric Corrosion of Galvanized steel
*M. Rohwerder and S. Evers*

1739 Evaluation of hydrogen absorption Into Steel With Alternating Current Responses
*E. Tada*

1752 Corrosion Performance of Zinc Magnesium Aluminium Coated Steel: Effect of Chloride Deposition and $CO_2$
*D. Thierry*

1753 Corrosion Performance of Zinc Magnesium Aluminium Coated Steel: Discussion of Fundamental mechanisms
*M. Rohwerder, R. Krieg, A. Vimalanandan, D. Thierry, and N. Le Bozec*

1754 Molecular Studies of Self Assembled Monolayers As Corrosion Inhibitors for Copper
*S. Hosseinpour, M. C. Johnson, and C. Leygraf*

1755 Characterization of the Inhibition Effect of $CaSO_4$ On Pitting Damage Accumulation of Aluminum Alloy 7075-T6
*P. Klomjit and R. Buchheit*

1756 Atmospheric Corrosion of Different Zinc Coating On Steel
*P. Zabinski, K. Mech, and R. Kowalik*

1757 Comparison of Atmospheric Parameters On the Corrosion of Epoxy Coated 2024-T3 Al Alloy
*L. Petry, D. C. Hansen, S. A. Hayes, Y. Yoon, and J. D. Angel*

1758 Chromate Mitigation in Atmospheric Corrosion By the Use of Smart-Release Pigments
*H. N. McMurray and G. Williams*

1759 Atmospheric Corrosion of Top Coats Used to Protect Carbon Steel and Stainless Steels in Chloride Containing Environments
*L. F. Garfias-Mesias, J. Warren, and J. V. Cauich-Rodriguez*

1760 Predicting Atmospheric Corrosion Rates for 1010 Steel Using a Cumulative Damage Approach
*D. H. Rose, S. J. McCombie, J. D. Angel, and D. C. Hansen*

1761 Dynamic Characterization for Soil/Environmental Conditions in Coating/Substrate Metal Interface Systems By Stochastic Modeling
*H. Castaneda, X. Li, A. Yajima, and R. Liang*

1762 Evaluation of the Maximum Pit Size Model On Stainless Steel Under Atmospheric Conditions
*M. T. Woldemedhin, J. Srinivasan, M. E. Shedd, M. McGrath, and R. G. Kelly*

## D3 - Degradation of Carbon Structural Materials

*Corrosion, New Technology Subcommittee*

1763 Corrosion Studies On Alumina and Carbon Fibres/Magnesium Metal Matrix Composites
*V. W. Neubert and A. Bakkar*

1764 Development of the Atmospheric Corrosion Model of Nickel-Coated Carbon Reinforced Aluminum (Al/C/50f) MMCs
*S. Tiwari and L. H. Hihara*

1765 Corrosion Protection of Interfaces Between Aluminum and Mechanically-Coupled Polymer Matrix Composites (PMCs)
*R. Srinivasan, L. H. Hihara, and J. Nelson*

1766 Evaluating Adhesive Bonds With Carbon-Composites Using Electrochemical Impedance Spectroscopy
*G. Davis, FECS*

1767 Electrochemical Corrosion Investigations On Metal Doped a-C:H Coatings for Bipolar Plates in Redox-Flow Batteries
*J. Richards, K. Schmidt, P. Fischer, and J. Tübke*

## D4 - Mass Transport Phenomena in Localized Corrosion

*Corrosion*

1768 Mass Transport and Electrochemical Factors Influencing Stainless Steel Pitting and Repassivation in Neutral Chloride Media
*J. Srinivasan, M. McGrath, and R. G. Kelly*

1769 Imaging of Mass Transport Process for Localized Corrosion of Stainless Steel
*C. Lin*

1770 The Effect of $NaNO_3$ On Salt Films in Pitting Corrosion of 304 Stainless Steel Using Synchrotron X-Ray Diffraction
*S. Street, W. Xu, L. Guo, P. Quinn, F. Mosselmans, T. Rayment, and A. J. Davenport*

1771 Investigation of Localized Corrosion and the Role of Transport in Lightweight Alloys Using Microkinetic Models With First-Principles Link
*S. Chaudhuri, A. Sumer, J. Xiao, and M. Losada*

1772 Coupling of Dissolution and Mass Transport for Pitting of Nickel Base Alloys in Solutions Containing Thiosulfate Ions
*R. Newman, A. G. Carcea, and W. Zhang*

1773 The Role of Elemental Sulfur and Chloride Ions on Pit Initiation at MnS Inclusion in Stainless Steel
*A. Chiba, I. Muto, Y. Sugawara, and N. Hara*

1774 The Local Redox Conditions Within Spent Nuclear Fuel Inside a Failed Nuclear Waste Container – a Modelling Study
*L. Wu, Z. Qin, and D. Shoesmith*

1775 Effect of Applied Stress On Dissolution Morphology and Pit Initiation Behavior of Mns Inclusion in Stainless Steel
*N. Shimahashi, I. Muto, Y. Sugawara, and N. Hara*

1776 Chloride Ion Concentration Effects On Passivity Breakdown in Magnesium
*G. Williams, H. Dafydd, and H. N. McMurray*

1777 Effects of Sulphide and Chloride Concentrations On the Morphology and Growth Kinetics of Sulphide Films During Copper Corrosion in Anaerobic Aqueous Solutions
*J. Chen, Z. Qin, and D. Shoesmith*

1778 Corrosion Behavior of Copper Patina in Presence of Marine Biofouling
*L. P. Veleva, D. L. Sauri, and J. L. Lopez*

1779 Quantitative Chemical Speciation of Copper Electro-Deposition Studied By Stxm
*Z. Qin, V. Lee, and A. P. Hitchcock*

1780 Development Of Semi-Elliptical Surface Cracks In Lightly Sensitized Al-Mg Alloys
*S. Lee and D. D. Macdonald*

1781 Stress Corrosion Cracking of Alloy 22
*S. K. Lee and D. D. Macdonald*

1782 Modeling of the Effect of Crystallographic Orientation On Pit Growth and Shape
*S. M. Qidwai, N. Kota, and V. G. DeGiorgi*

1783 Influence of the Microstructure On Stress Concentration Due to Localized Corrosion
*N. Kota, S. M. Qidwai, and V. G. DeGiorgi*

1784 A Model of Damage Evolution During Crevice Corrosion of Nickel Base Alloys
*R. S. Lillard, A. Stenta, K. L. Kreider, and G. Young*

1785 Monitoring Crevice Corrosion Via the Coupling Current: Effect of Anodamine
*W. Kuang, S. Lee, J. Mathews, and D. D. Macdonald*

## D5 - Oxide Films: A Symposium in Honor of Clive Clayton on his 65th Birthday

*Corrosion*

1786 An XAS Study of the Surface of Low-Temperature Carburized Stainless Steel
*D. F. Roeper, W. E. O'Grady, K. I. Pandya, and P. M. Natishan*

1787 Effect of Non-Random Atomic Arrangements On the Initiation of Passivation in Solid-Solution Alloys
*D. Artymowicz, K. Sieradzki, and R. Newman*

1788 Characterization of Electric Conduction of Passive Films and Oxide Films Formed On Fe-Cr Alloys
*S. Fujimoto, Y. Iwamizu, Y. Tai, and M. Saito*

1817 Corrosion Films On Single Crystal Magnesium
*E. A. McNally and J. Kish*

1818 Modeling the Chloride Ion Attack of Aluminum Oxide By Experimental and Theoretical XANES Analysis
*D. F. Roeper, W. E. O'Grady, and P. M. Natishan*

1819 Effects of Aging Temperature and Time On the Corrosion Protection Provided By Trivalent Chromium Process Coatings On AA2024-T3
*L. Li and G. M. Swain*

1820 Pretreatment Effects On the Corrosion Protection Provided By Trivalent Chromium Process Coatings On AA2024-T3
*L. Li, A. L. Desouza, and G. M. Swain*

1821 Effects of Chromate and Molybdate Ions On Scratch Repassivation Behavior of Precipitation Hardened Aluminum Alloys
*S. B. Madden*

1822 Synthesis and Electrochemical Characterizaction of TiO2 Materials
*I. E. Castañeda and J. U. Uruchurtu*

1823 Parameters and Underlying Mechanisms Affecting the Morphology of Bifurcating $TiO_2$ Nanotube
*D. J. LeClere, A. Ashari, G. Kawamura, H. Muto, and A. Matsuda*

1824 TiO2 Nanotubes and Mesosponges: Modification Approaches to a Strongly Enhanced Water Splitting Activity
*P. Schmuki*

1825 $TiO_2$-$WO_3$ Nanotubular Composite Synthesized By Anoidzation of Simultaneous Multi-Target Sputtered Thin Films Characterized By Laser Ablation ICP-MS
*Y. R. Smith, K. N. Chappanda, S. K. Mohanty, and M. Misra*

1826 Stability of Photoactive Oxide Semiconductors
*D. Chidambaram and R. Gakhar*

1827 Investigating Surfaces By Complimentary Chemical Spectroscopies
*G. P. Halada*

1828 Growth and Characterization of Tubular Oxide Layers On Ti Substrates
*H. Tsuchiya, S. Yamamoto, and S. Fujimoto*

1829 Porous Anodic Oxide Films Grown On Compound Semiconductor
*S. Ono, K. Sugawara, and H. Asoh*

1830 Evaluation of Corrosion Resistance of Multilayered Sn/$Ag_3$sn Electroplating On Cu Alloys for Electric Connectors
*S. Z. CHU and H. Yashiro*

1831 Electrical Stability Enhancement of the Thin Filmtransistor With the Back-Channel Deposited By Cosputteringamorphous In-Ga-Zn-O and Siox
*H. R. Lee, J. H. Kim, J. H. Park, Y. H. Ko, J. S. Park, and J. G. Park*

1832 Interstitially Hardened 316L Stainless Steel: A Surface Analytical Study of the Oxide
*N. R. Tailleart, P. M. Natishan, F. J. Martin, R. J. Rayne, H. Kahn, and A. H. Heuer*

1833 A Super Austenitic 6 Mo Stainless Steel (UNS N08367) Passivity-Breakdown Characterization in Acidic Fluoride Solutions
*E. M. Maya Visuet and H. Castaneda*

1834 The Point Defect Model for the Passive Sulfide Films On Copper
*S. sharifi-Asl and D. D. Macdonald*

1835 Thin Surface Films Over copper–nickel Alloys: Corrosion Behavior in Neutral and Acidic Medium in Presence of Chloride Ions
*F. M. Al-Kharafi, A. Abdel Nazeer, R. M. Abdullah, and A. Galal*

1836 The Corrosion of Carbon Steel in Simulated Concrete Pore Water Under Anoxic Conditions
*P. Lu, A. Almarzooqi, B. Kursten, and D. D. Macdonald*

1837 Steady State Analysis of Thin Oxide Barrier Layers Formed in Neutral and Weakly Alkaline Solutions
*C. Albu, J. Deconinck, and V. Topa*

1838 Repassivation On Type 316L Stainless Steel With Cyclic Deformation in Simulated Body Fluid Including Cells
*K. Doi, S. Miyabe, and S. Fujimoto*

1839 Electrochemically Fabricated of $TiO_2$ Nano-Layers On Ti-6Al-4V
*S. Roy, J. Varia, and J. Portoles*

1840 Effect of Anaerobic Microbial Corrosion On the Surface Film Formed On Steel
*D. D. Bala and D. Chidambaram*

1841 $ZrO_2$ Hybrid Sol-Gel Coatings for Active Corrosion Protection of Ti6Al4V Biomedical Alloy in Simulated Body Fluids
*J. C. Galván, F. R. García-Galván, A. A. El hadad, R. Montoya, and A. Jiménez-Morales*

## D6 - Biodegradable and Bioabsorbable Metals and Materials

*Corrosion*

1842 Critical Factors in Mg Alloy Corrosion and Biocompatibility
*S. Virtanen*

1843 Effect of Alloying Element Ca and Anodization On Corrosion Resistance and Bioactivity of AZ61 Alloy
*A. Anawati, H. Asoh, and S. Ono*

1844 Switch of Guanine and Adenine Current Caused By Temperature Change in DNA/NIPA and PAM-Based Hydrogels
*E. Zabost, M. Karbarz, M. Donten, and Z. Stojek*

1845 Evaluation of Transparent Polyimide Film As a Biologicalcell Culture Sheet With Microstructures
*H. Maenosono, H. Saito, and Y. Nishioka*

1846 A Study On the Affect of Novel Surface Treatments and Biodegradable Polymer Coatings On Corrosion and Surface Properties of Ternary Nitinol Alloy
*C. Pulletikurthi and N. Munroe*

## E1 - Solid State Topics General Session

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

1847 Enhancement-Mode Algaas/Ingaas Pseudomorphic High-Electron-Mobility Transistor With a Liquid Phase Oxidized GaAs As Gate Oxide
*J. S. Huang, K. W. Lee, J. J. Lin, and Y. H. Wang*

1848 Enhancement-Mode Metal-Oxide-Semiconductor Metamorphic High-Electron-Mobility Transistor
*J. S. Huang, K. W. Lee, H. W. Chen, and Y. H. Wang*

1849 Negative Capacitance Tunnel Field Effect Transistor: A Novel Device With Low Subthreshold Swing and High On Current
*N. Chowdhury, S. M. F. Azad, and Q. D. M. Khosru*

1850 An Analytical Model to Determine the Quantized Energy Levels and Wave Functions for Quantum Well Devices
*N. Chowdhury, I. Ahmed, Z. A. Azim, M. H. Alam, I. A. Niaz, and Q. D. M. Khosru*

1851 A Stacked Sputtered Process for β-$FeSi_2$ Formation
*T. Inamura, A. Sasaki, K. Aoki, K. Kakushima, Y. Kataoka, A. Nishiyama, N. Sugii, H. Wakabayashi, K. Tsutsui, K. Natori, and H. Iwai*

1852 Photo-Anode Nanostructure Design and Electron Transport Mechanism of Photoelectrochemical Cells
*C. T. Liu and C. W. Hong*

1853 Modulation Doped Hydrogenated Amorphous Silicon Germanium Superlattice Contacts and Application to Optoelectronic Devices
*B. Hekmatshoar, W. Rieutort-Louis, D. Shahrjerdi, and R. Haight*

1854 Epinephrine Detection In Copper Self Assembled Monolayers
*J. F. Silva Sr.*

1855 High Quality of $Ge_{1-X}$ $Si_x$ $(0.9 \leq x \leq 0.95)$ Buffers Grown On $6^0$ off Si(100) By Using Low Temperature Ge Seed Layer
*C. L. Nguyen*

1856 Hot Hole-Induced Device Degradation By Drain Junction Reverse Current
*K. S. Kim, J. Song, D. Song, and B. Choi*

## E2 - Atomic Layer Deposition Applications 9

*Dielectric Science and Technology, Electronics and Photonics*

1857 ALD Growth of PbTe and PbSe Superlattices for Thermoelectric Applications
*K. Zhang, A. D. Ramalingom Pillai, D. Nminibapiel, M. Tangirala, V. S. Chakravadhanula, C. Kübel, H. Baumgart, and V. Kochergin*

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*J. W. Elam, A. U. Mane, J. A. Libera, O. H. Siegmund, J. McPhate, M. J. Wetstein, A. Elagin, M. J. Minot, A. O'Mahony, R. G. Wagner, W. M. Tong, A. D. Brodie, M. A. McCord, and C. F. Bevis*

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*T. Blomberg*

1860 *In Situ* Characterization of Plasma-Assisted Pt ALD on W ALD Adhesion Layers with Spectroscopic Ellipsometry
*A. S. Cavanagh, L. Baker, J. W. Clancey, J. Yin, A. Kongkanand, F. T. Wagner, and S. M. George*

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*G. M. Sundaram, L. Lecordier, and R. Bhatia*

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*M. Yamaji, T. Tanikawa, T. Yakushijin, T. Funakoshi, S. Yamashita, A. Hidaka, M. Nagase, N. Ikeda, S. Sugawa, and T. Ohmi*

1863 ZnO Nanorods Grown On ZnO Seed Layer Derived By Atomic Layer Deposition Process
*K. Zhang, S. Khadka, D. Nminibapiel, M. Tangirala, and H. Baumgart*

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*K. Zhang, M. Tangirala, D. Nminibapiel, V. Pallem, C. Dussarrat, W. Cao, H. Elsayed-Ali, H. Baumgart, T. N. Adam, and C. S. Johnson*

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*T. M. Abdel-Fattah and H. Baumgart*

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*K. Zhang, D. Nminibapiel, M. Tangirala, V. S. Chakravadhanula, C. Kübel, H. Baumgart, and V. Kochergin*

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*S. Emaminejad, M. Javanmard, R. W. Dutton, and R. W. Davis*

1868 Physical, Electrical, and Reliability Characteristics of Multi-Step Deposition-Annealed $HfO_2$ Film
*Y. L. Cheng, C. Y. Hsieh, and T. C. Bo*

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*A. G. Scheuermann, J. P. Lawrence, M. Gunji, C. E. D. Chidsey, and P. C. McIntyre*

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*G. Ham, S. Shin, J. Park, and H. Jeon*

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*E. Thimsen*

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*A. Illiberi, T. Grehl, A. Sharma, B. Cobb, G. Gelinck, P. Poodt, H. Brongersma, and F. Roozeboom*

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*G. Y. Cho, J. Y. Paek, J. Park, T. Park, Y. H. Lee, and S. W. Cha*

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*P. M. Vereecken and C. Huyghebaert*

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*E. Eustache, P. Tilmant, L. Morgenroth, P. Roussel, N. Rolland, T. Brousse, and C. Lethien*

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*M. Popovici, J. Swerts, M. Aoulaiche, A. Redolfi, B. Kaczer, M. S. Kim, B. Douhard, A. Delabie, S. Clima, M. Jurczak, and S. Van Elshocht*

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*V. Longo, M. Verheijen, F. Roozeboom, and E. Kessels*

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*A. K. Pradhan and C. White*

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*Electronics and Photonics, Dielectric Science and Technology*

1892 A Thermodynamic Interpretation of PVT Growth of Single Crystal SiC Material and Challenges in Reducing Dislocations
*T. Fujimoto, M. Katsuno, H. Tsuge, S. Sato, S. Ushio, K. Tani, H. Yashiro, H. Hirano, and T. Yano*

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*R. E. Stahlbush and N. A. Mahadik*

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*M. Kitabatake*

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*A. Usui, H. Goto, T. Matsueda, H. Sunakawa, T. Nakagawa, A. Okada, J. Mizuno, A. A. Yamaguchi, H. Shinohara, and H. Goto*

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*S. Tanimoto, K. Watanabe, H. Tanisawa, K. Matsui, and S. Sato*

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*S. Dhar*

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*H. M. Przewlocki, T. Gutt, K. Piskorski, P. Borowicz, and M. Bakowski*

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*C. Strenger, V. Uhnevionak, A. Burenkov, A. Bauer, P. Pichler, T. Erlbacher, H. Ryssel, and L. Frey*

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*V. Uhnevionak, A. Burenkov, C. Strenger, A. Bauer, and P. Pichler*

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*A. Lelis, D. Habersat, R. Green, and E. Mooro*

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*M. P. D'Evelyn, D. Ehrentraut, W. Jiang, D. S. Kamber, B. C. Downey, R. T. Pakalapati, and H. D. Yoo*

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*K. Shenai*

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*H. R. Harris, D. W. Johnson, R. J. W. Hill, E. Piner, M. H. Wong, and R. T. P. Lee*

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*D. S. Lee, J. Su, B. Krishnan, G. D. Papasouliotis, and A. Paranjpe*

1937 Performance, Reliability and YIELD Considerations In The Manufacturing Of POWER Electronics Based On SiC and GaN
*R. Singh and G. F. Alapatt*

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*M. Dudley, B. Raghothamachar, H. Wang, F. Wu, S. Byrappa, G. Chung, E. K. Sanchez, S. Mueller, D. Hansen, and M. Loboda*

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*N. A. Mahadik, A. Nath, E. A. Imhoff, R. E. Stahlbush, and R. Nipoti*

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*J. A. Malen and Z. Su*

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*Q. Zhou, W. Chen, S. Liu, B. Zhang, Z. Feng, S. Cai, and K. J. Chen*

## E4 - Low-Dimensional Nanoscale Electronics and Photonic Devices 6

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

1956 Scalable and Direct Growth of Graphene Microribbons and Nanoribbons On Dielectric Substrates
*H. Tian, Y. Yang, D. Xie, M. F. Inigo, D. Wang, T. L. Ren, and Y. Zhang*

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*L. C. Chen and K. H. Chen*

1958 High Efficiency Silicon Heterojunction Solar Cell with Omnidirectional Light Harvesting By Hierarchical Structures
*H. P. Wang, T. Y. Lin, M. Y. Huang, and J. H. He*

1959 Functionalization of Thermally Carbonized Porous Silicon Optical Multilayer Structures for Sensing Applications
*J. Salonen, E. Mäkilä, T. Urata, V. Torres-Costa, and T. Jalkanen*

1960 Waveguide-Mode Sensors with a Waveguide Layer Nanostructured by Dynamic Oblique Deposition
*M. Suzuki, M. Takagaki, S. Kuriyama, K. Nakajima, and K. Kimura*

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*W. Lu*

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*K. Takei*

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*T. Y. Chen and J. G. Hwu*

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*S. W. Kim*

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*Z. Fan, Q. Lin, S. F. Leung, and Q. Zheng*

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*D. H. Lien, J. H. He, D. Wang, and Z. Dong*

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*S. Shin and J. Nah*

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*Y. L. Chueh*

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*Z. Fan, H. Fu, K. H. Tsui, and S. F. Leung*

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*Q. Lin, S. F. Leung, B. Hua, and Z. Fan*

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*Y. T. Yen, Y. C. Wang, Y. Z. Chen, H. W. Tsai, F. Hu, and Y. L. Chueh*

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*J. Wu, S. Tongay, J. Zhou, W. Fan, and J. Suh*

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*X. Xu*

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*D. Yu, Y. Yang, and X. Peng*

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*M. K. Date, H. C. Chen, C. H. Hsu, C. H. Lai, H. C. Kuo, and Y. L. Chueh*

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*H. W. Jang*

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*Y. H. Chu*

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*A. N. Hattori and H. Tanaka*

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*C. Guedj*

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*C. W. Cheng, K. T. Shiu, N. Li, S. J. Han, L. Shi, and D. K. Sadana*

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*Y. C. Chou, C. Y. Wen, M. C. Reuter, E. A. Stach, and F. M. Ross*

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*Z. Rousslang, J. Hanson, and P. J. Pauzauskie*

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*D. Sirbuly*

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## E5 - Nonvolatile Memories

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*R. Gleixner and C. Mouli*

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*B. de Salvo*

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*K. Takeuchi*

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*M. N. Kozicki, P. Dandamudi, H. J. Barnaby, and Y. Gonzalez-Velo*

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*H. Shima and H. Akinaga*

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*M. Kudo, Y. Ohno, K. Hamada, M. Arita, and Y. Takahashi*

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*B. T. Kacha, W. Z. Chang, S. F. Wang, and J. P. Chu*

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*Y. Sato, A. Yamashita, T. Tsukamoto, and Y. Suda*

1995 Challenges of Stt-Mram for High Density Memory
*S. C. Oh*

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*M. Hayashi*

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*D. Y. Lee, T. H. Shim, and J. G. Park*

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*S. E. Lee, D. Y. Lee, M. S. Jeon, Y. Takemura, K. S. Chae, T. H. Shim, and J. G. Park*

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*M. Tada, T. Sakamoto, and H. Hada*

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*B. Xiao*

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*J. Ouyang*

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*M. J. Song, H. M. Seung, K. C. Kwon, J. S. Lee, D. H. Park, and J. G. Park*

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*H. M. Seung, D. H. Park, M. J. Song, K. H. Kwon, H. V. Jeoung, and J. G. Park*

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*J. Y. Ryoo, S. K. Sung, Y. S. Yim, J. E. Song, W. C. Shin, J. H. Song, D. H. Song, J. H. Choi, and Y. Roh*

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*H. S. Park, K. Y. Kim, O. C. Hong, H. S. Kim, H. Lee, K. P. Lee, I. S. Cho, and B. D. Choi*

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*S. Otsuka, Y. Hamada, T. Shimizu, and S. Shingubara*

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*K. Kobayashi, S. Naito, S. Nakiri, and Y. Ito*

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*M. Park, D. H. Lee, T. S. Yoon, Y. J. Choi, B. H. Park, and C. J. Kang*

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*G. Bersuker*

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*B. Long, W. Chen, Y. Li, S. Mandal, G. Bersuker, D. Gilmer, and R. Jha*

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*T. Liu, T. Potnis, Y. Kang, S. El-Helw, and M. Orlowski*

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*J. Y. Kim, B. Magyari-Kope, A. Hazeghi, K. J. Lee, H. S. Kim, S. H. Lee, and Y. Nishi*

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*A. J. Lohn, J. E. Stevens, P. R. Mickel, D. R. Hughart, and M. J. Marinella*

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*Z. H. Ye, L. J. Liu, and K. S. Chang-Liao*

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*J. H. Yoon, H. S. Kim, Y. S. Kim, J. K. Lee, E. S. Han, Y. Jeong, Y. I. Lee, S. J. Jang, H. G. Kim, S. W. Park, S. H. Park, H. B. Lee, K. P. Lee, and I. S. Cho*

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*Y. Kuo and C. C. Lin*

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*Q. Li*

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*E. J. O'Sullivan, M. J. Gajek, J. J. Nowak, S. L. Brown, M. C. Gaidis, G. Hu, J. Z. Sun, P. L. Trouilloud, D. W. Abraham, R. P. Robertazzi, W. J. Gallagher, and D. C. Worledge*

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*J. Koba and K. Kita*

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*K. S. Chae, D. Y. Lee, M. S. Jeon, S. E. Lee, T. H. Shim, and J. G. Park*

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*M. S. Jeon, D. Y. Lee, S. E. Lee, Y. Takemura, K. S. Chae, T. H. Shim, and J. G. Park*

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*R. G. D. Jeyasingh, S. W. Fong, J. Lee, E. Bozorg-Grayeli, C. Ahn, M. Asheghi, K. E. Goodson, and H. S. P. Wong*

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*H. Tanaka*

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*J. Tominaga, P. J. Fons, A. V. Kolobov, and S. Murakami*

2025 Special Electric Characteristics of Superlattice Phase Change Memory
*T. Ohyanagi, M. Kitamura, and N. Takaura*

## E6 - Photovoltaics for the 21st Century 9

*Dielectric Science and Technology, Electrodeposition, Electronics and Photonics, Energy Technology, Industrial Electrochemistry and Electrochemical Engineering*

2026 Bulk-Heterojunction Solar Cells Based On Mixed Donorsof P3HT and Phenylene–Thiophene Oligomer Derivative
*T. Okukawa, S. Fujii, Z. Duan, Y. Ohori, Y. Kaneko, G. Zhao, Y. Yanagi, A. Yoshida, M. Ohzeki, T. Yanagidate, Y. Arai, H. Kataura, and Y. Nishioka*

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*H. Han, S. Sul, K. H. Lee, J. B. Park, Y. Jung, S. Byun, C. Jung, and K. S. Kim*

2028 Construction of Hierarchically Structured $TiO_2$ Nanotube Arrays for Efficient Dye-Sensitized Solar Cells
*M. Ye, D. Zheng, M. Lv, C. Chen, Z. Lin, and C. Lin*

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*J. H. Park, J. H. Kim, H. R. Lee, Y. H. Ko, J. S. Park, and J. G. Park*

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*K. Leong, M. E. Foster, B. M. Wong, E. D. Spoerke, D. Gough, J. C. Deaton, and M. D. Allendorf*

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*T. Pauporté*

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*T. Yanagidate, S. Fujii, M. Ohzeki, R. Nagata, D. Kaneto, T. Sato, T. Hoashi, Y. Yanagi, Y. Arai, T. Okukawa, A. Yoshida, H. Kataura, and Y. Nishioka*

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*D. A. Mengistie, P. C. Wang, and C. W. Chu*

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*D. Josell, R. Debnath, C. Hangarter, J. Y. Ha, B. Yoo, D. U. Kim, M. A. Sahiner, J. Guyer, C. J. Reehil, and W. A. Manners*

2035 Physical Characterization of Thin Films of $Cu_xZn_yS_z$ for Photovoltaic Applications
*F. Di Benedetto, S. Cinotti, A. Guerri, A. De Luca, A. Lavacchi, G. Montegrossi, M. Innocenti, F. Carla', and R. Felici*

2036 Rapid Thermal Processing in CdS/CdTe Thin Film Solar Cells By Intense Pulsed Light Sintering
*R. Dharmadasa, O. K. Echendu, I. M. Dharmadasa, and T. Druffel*

2037 $Cu(InGa)(SeS)_2$ Electrodeposition From a Single Bath
*M. A. Saeed and U. Landau*

2038 Three-Electrode Electrorefining for Ultrapure Solar-Grade Si
*X. Han, B. Zhou, and M. Tao*

2039 Modelling of the Contact Resistance of Screen Printed Ag-Contacts to Si Emitters
*A. M. Svensson, S. Olibet, E. Cabrera, J. Friis, K. Butler, and J. Harding*

2040 SEM Analysis As a Diagnostic Tool for Photovoltaic Cell Degradation
*G. O. Osayemwenre and E. L. Meyer*

2041 Development of Amorphous Carbon-Based Variable Optical Gap Semiconductor Materials
*K. Honda, K. Yoshinaga, and A. Nakahara*

2042 Semi Transparent Electrode of Au nano mesh on Flexible Substrates Fabricated by Transfer Printing Using Self-Organized Porous Polymer Mold
*Y. Yanagi, H. Saito, S. Fujii, A. Yoshida, T. Okukawa, T. Yanagidate, M. Ohzeki, Y. Arai, Y. Ohori, D. Kaneto, R. Nagata, H. Kataura, and Y. Nishioka*

2043 Towards a Photoelectrochemical Tool for Comprehensive Quality Assessment of Solar Cell Absorber Layers
*D. Colombara, A. Crossay, V. Depredurand, and P. J. Dale*

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*G. Riveros, D. L. Ramírez Sr., E. Dalchiele, R. Marotti, L. Peter, P. Grez, F. Martín, and J. R. Ramos-Barrado*

2045 Electrochemical Deposition of Compact and Nanostructured Films of Doped ZnO
*D. L. Ramírez Sr., K. N. Álvarez, G. Riveros, M. Tejos, and M. G. Lobos*

2046 Electrodeposition of Lead Sulfide Thin Film and Application As Counter Electrode for Quantum Dot Solar Cells
*N. V. Le, T. T. Ha, H. T. Nguyen, and T. T. P. Nguyen*

2047 Electron Transport Kinetics in Solid State Dye-Sensitized Solar Cells Utilizing Polymer Electrolyte
*W. Cho, Y. R. Kim, D. H. Song, and Y. S. Kang*

2048 High Efficient Inverted Polymer Solar Cells By Surface Treatment of Zinc Oxide
*S. Woo, W. Kim, and H. K. Lyu*

2049 Dye Sensitized Solar Cell Based On Polyaniline - Carbon Nanotubes Composite
*L. Saad, S. Ebrahim, M. Fetteha, M. Soliman, and T. M. Abdel-Fattah*

2050 Enhanced Absorption Using Gold Nanoparticles Deposited TiO2 Photoanode for Dye-Sensizited Solar cells
*J. Oh and H. Lee*

2051 Improved Photovoltaic Effects of Photonic Crystal Based Photoelectodes in Dye-Sensitized Solar Cell
*J. Kang and H. Lee*

## E7 - Processing, Materials, and Integration of Damascene and 3D Interconnects 5

*Dielectric Science and Technology, Electrodeposition, Electronics and Photonics, High Temperature Materials*

2052 Some Strategic Tracks to Optimize Routing of High Speed Signal Transmission Between Memory and Logic in 3D-IC Stacks
*J. Roullard, A. Farcy, S. Capraro, T. Lacrevaz, C. Bermond, G. Houzet, P. Artillan, J. Charbonnier, C. Fuchs, C. Ferrandon, P. Leduc, and B. Flechet*

2053 Reliability Challenges of 3-D Stacked Chip Package With Through-Silicon-Via (Invited talk)
*M. Suh*

2054 3D Integration and Reliability Challenges
*M. Koyanagi, M. Murugesan, K. Lee, T. Fukushima, and T. Tanaka*

2055 3D Integration for An SOI Pixel Detector (Invited Talk)
*M. Motoyoshi*

2056 Fabrication and Characterization of Grain Growth in Electroplated Cu for 3D IC Interconnect Applications
*T. C. Liu, S. R. Wang, and M. Corey*

2057 Challenges for Scaled Damascene Interconnects
*S. Armini, J. Swerts, N. Jourdan, Y. K. Siew, J. Boemmels, Z. Tokei, and H. Struyf*

2087 Screening Techniques for Selecting Improved Additives for Bottom-Up Copper Metallization
*L. Boehme and U. Landau*

2088 Impurity-Induced Tin Incorporation During Copper Electrodeposition
*S. Kitayaporn, M. Hopstaken, Q. Huang, and B. C. Baker-O'neal*

2089 Copper Plating Uniformity On Resistive Substrate With Segmented Anode
*L. Yang, A. Radisic, J. Deconinck, and P. M. Vereecken*

2090 Diallylamine Levelers Side Chains Effect On Copper Via Filling
*Y. Yamada, K. Kondo, M. Takeuchi, T. Saito, N. Okamoto, M. Bunya, and M. Yokoi*

2091 In-Situ Analysis of Peg Surface Adhesion On Cu
*U. H. Lee, J. Choi, J. Won, H. J. Lee, H. J. Sohn, and T. Kang*

2092 Analysis of Addtive Role for Copper Electroplating Using Microfluidic Channel
*M. Hayase, Y. Agarita, and H. Egoshi*

2093 Combination of AC Voltammetry and Chemometric Classification for Diagnosis of Disturbances of Electrodeposition Process
*A. Jaworski, H. Wikiel, and K. Wikiel*

## E8 - Semiconductor Cleaning Science and Technology 13 (SCST 13)

*Electronics and Photonics*

2094 (Keynote) Roadmap Of Future Devices and Related Cleaning Challenges/Opportunities
*P. W. Mertens*

2095 (Invited) Particle Cleaning Technologies To Meet Advanced Semiconductor Device Process Requirements
*H. F. Okorn-Schmidt, F. Holsteyns, A. Lippert, D. Mui, M. Kawaguchi, C. Lechner, P. E. Frommhold, T. Nowak, and R. Mettin*

2096 A Study of Nanoparticle Removal On Patterned Surfaces
*A. Pacco, F. Holsteyns, and S. De Gendt*

2097 Evaluation of An Effective Wet Cleaning Method for Particle Removal on Various Thin Films
*Y. S. Cho, H. H. Lee, M. S. Yun, H. Hwang, M. S. Kim, B. K. Kang, A. A. Busnaina, and J. G. Park*

2098 Surface Cleaning Using $CO_2$ Gas Cluster For Semiconductor Device
*Y. Cho, H. Choi, and T. Kim*

2099 A Multi-Frequency Megasonic System for Nano-Particle Removal
*H. Kim, Y. Lee, and E. Lim*

2113 Inhibition of Copper Corrosion By Removal of $H_2O_2$ From $CO_2$-Dissolved Water Using Palladium Catalysts
*D. Yano, M. Murayama, M. Takahashi, H. Kobayashi, and K. Yamanaka*

2114 Monitoring of Polymer Removal Process for Copper Interconnect
*E. Shalyt, G. Liang, J. Wang, M. Pavlov, V. Dozortsev, P. Bratin, and C. Bai*

2115 (Invited) Wetting Behavior Of Aqueous Solutions On High Aspect Ratio Nanopillars With Hydrophilic Surface Finish
*G. Vereecke, X. Xu, W. K. Tsai, H. Yang, S. Armini, T. Delande, G. Doumen, F. Kentie, X. Shi, I. Simms, K. Nafus, F. Holsteyns, H. Struyf, and S. De Gendt*

2116 Watermark Formation Mechanism By Evaporation of Ultra-Pure Water: Study the Effect of Ambient
*A. H. Tamaddon, P. W. Mertens, G. Vereecke, F. Holsteyns, G. Doumen, S. De Gendt, and M. Heyns*

2117 Advanced Wafer Drying Technology for 1x Node and Beyond Using Surface Modification Method
*T. Orii, T. Watanabe, T. Toshima, M. Nakamori, K. Egashira, Y. Ido, and N. Matsumoto*

2118 Contamination Control in Supercritical $CO_2$ Drying Process for Nano-Scale Memory Manufacturing
*H. Hayashi, H. Okuchi, H. Tomita, Y. Ono, T. Nakamori, and H. Sugawara*

2119 All Wet Resist Strip for Improved Semiconductor Process and Product Improvement
*M. Bashyam*

2120 Translation of Particles to Wafers During Spin Coating
*C. W. Extrand, S. I. Moon, and L. Monson*

2121 Cryogenic Single-Component Micro-Nano Solid Nitrogen Particle Production Using Laval Nozzle for Physical Resist Removal-Cleaning Process
*J. Ishimoto, U. Oh, T. Koike, and N. Ochiai*

2122 Effects of Plasma and Wet Processes on Si-Rich Anti-Reflective Coating to Address Selective Trilayer Rework for Sub-20nm Technology Nodes
*O. Pollet, R. Sommer, L. Lachal, S. Barnola, C. De Buttet, C. Richard, and C. Jenny*

2123 Characterization of the Descum Process for Various Silicon Substrates
*C. S. Tiwari, Y. S. Lim, R. Fulton, J. Srinivasan, M. Gisinger, P. Flynn, and L. H. Mak*

2124 TiN Metal Hard Mask Removal with Selectivity to Tungsten and TiN Liner
*L. M. Chen, S. Lippy, B. Peethala, M. Sankarapandian, D. L. Rath, K. Boggs, and E. Kennedy*

## E10 - Semiconductors, Dielectrics, and Metals for Nanoelectronics 11

*Dielectric Science and Technology, Electronics and Photonics*

2137 Effects of N-Rich TiN Capping Layer on Reliability in Gate-Last High-k/Metal Gate MOSFETs
*K. Bae, K. T. Lee, H. C. Sagong, M. Choe, H. Lee, S. Kim, K. S. Kim, J. Park, S. Pae, and J. Park*

2138 High Temperature Annealing of the Interface State Component of Negative-Bias Temperature Instability (NBTI) in MOSFET Devices
*D. Nguyen, K. Kambour, C. Kouhestani, H. P. Hjalmarson, and R. A. B. Devine*

2139 Reliability of ALD $Hf_{1-X}Zr_xO_2$ Deposited by Intermediate Annealing or Intermediate Plasma Treatment
*M. Bhuyian, D. Misra, K. Tapily, R. Clark, S. Consiglio, C. Wajda, G. Nakamura, and G. Leusink*

2140 Multiphonon Processes as the Origin of Reliability Issues
*W. Goes, M. Toledano-Luque, F. Schanovsky, M. Bina, O. Baumgartner, B. Kaczer, and T. Grasser*

2141 Similarities between Ionizing Radiation Effects and Negative-Bias Temperature Instability (NBTI) in MOSFET Devices
*H. P. Hjalmarson, D. Nguyen, K. Kambour, C. Kouhestani, and R. A. B. Devine*

2142 SiC MOS Interface States: Difference between Si Face and C Face
*T. Umeda, M. Okamoto, R. Kosugi, S. Harada, R. Arai, Y. Sato, T. Makino, and T. Ohshima*

2143 Reliability of La-Silicate MOS Capacitors with Tungsten Carbide Gate Electrode for Scaled EOT
*S. Hosoda, K. Tuokedaerhan, K. Kakushima, Y. Kataoka, A. Nishiyama, N. Sugii, H. Wakabayashi, K. Tsutsui, K. Natori, and H. Iwai*

2144 Origins for Fermi Level Control in Metal/High-k/Si Stacks with Inserted Dielectric Layers
*M. Eizenberg and L. Kornblum*

2145 Novel Graphene Devices
*C. M. Corbet, M. Ramon, H. C. Movva, D. Reddy, S. Kang, S. F. Chowdhury, D. Akinwande, E. Tutuc, F. Register, and S. K. Banerjee*

2146 The Origin of Linear and Nonlinear Damping in Graphene Nanomechanical Resonators
*M. Bockrath and T. Miao*

2147 Oxidation Models for Crystalline Silicon Nanowires
*R. G. Mertens, V. H. Velez, and K. B. Sundaram*

2186 FTIR-ATR Study on Near-Interface Structure of Thermal Oxides on 4H-SiC Substrates
*H. Hirai and K. Kita*

2187 Investigation on Oxygen Diffusion in a High-k Metal-Gate Stack for Advanced CMOS Technology by XPS
*A. Kechichian, P. Barboux, and M. Gros-Jean*

2188 Lateral Nonuniformity of the Tunneling Current of $Al/SiO_2/p$-Si Capacitor in Inversion Region Due to Edge Fringing Field Effect
*H. W. Lu and J. G. Hwu*

2189 Advanced Physical Characterization of Si-passivated III-V Semiconductors for Low-Power Logic Applications: Defect Chemistry, Band Bending and Surface Photo-voltage
*C. Marchiori, M. El Kazzi, L. Czornomaz, D. Pierucci, M. Silly, F. Sirotti, S. Abel, E. Uccelli, M. Sousa, and J. Fompeyrine*

2190 Electrical Properties and Charge Transport in the $Pd/Al_2O_3/InGaAs$ MOS Structure
*Y. Y. Gomeniuk, Y. V. Gomeniuk, A. N. Nazarov, S. Monaghan, K. Cherkaoui, O'Connor, I. Povey, V. Djara, and P. K. Hurley*

2191 Electrical Characterization of Atomic Layer Deposited $La_2O_3$ Films on $In_{0.53}Ga_{0.47}As$ Substrates
*H. Oomine, D. H. Zadeh, K. Kakushima, Y. Kataoka, A. Nishiyama, N. Sugii, H. Wakabayashi, K. Tsutsui, K. Natori, and H. Iwai*

## E11 - State-of-the-Art Program on Compound Semiconductors (SOTAPOCS) 55

*Electronics and Photonics*

2192 Impact of Proton Irradiation on the dc and rf Performance of AlGaN/GaN High Electron Mobility Transistors
*L. Liu, Y. Y. Xi, F. Ren, S. J. Pearton, H. Y. Kim, J. Kim, and I. I. Kravchenko*

2193 Pre-ALD Trimethylaluminum Passivation of $Al_2O_3$/InGaAs(100) Interfaces
*P. C. McIntyre*

2194 Investigation of the Current Stability of AlGaN/GaN High Electron Mobility Transistors in Various Liquid/Solid Interface on the Gate Area
*J. Y. Fang, C. P. Hsu, Y. W. Kang, K. C. Fang, F. Ren, and Y. L. Wang*

2195 New Designs For Spectral Control In Nanowire Lasers
*P. Yang and A. Fu*

2196 Growth, Properties, and Optoelectronic Applications of III-As and III-N Nanowires
*L. Geelhaar*

2197 Nonpolar Light-Emitting Diodes Using Hydrothermally Grown a-Plane ZnO
*H. Kim, K. H. Baik, and S. Jang*

2212 Lattice-Mismatched Epitaxial Growth On Porous III-V Substrates
*J. Grym, P. Gladkov, J. Vanis, E. Hulicius, J. Pangrac, O. Pacherova, G. Dimitrakopulos, C. Bazioti, and P. Komninou*

## E12 - ULSI Process Integration 8

*Electronics and Photonics*

2213 FDSOI technology: a power efficient solution down to 10nm
*O. Faynot, M. Vinet, C. Fenouillet, O. Weber, P. Perreau, L. Grenouillet, F. Andrieu, T. Poiroux, and S. Deleonibus*

2214 Memristive Devices for Computing: Mechanisms, Applications and Challenges
*J. J. Yang, B. J. Choi, M. X. Zhang, A. C. Torrezan, J. P. Strachan, and R. S. Williams*

2215 Low Temperature Direct Bonding 3D Stacking Technologies for High Density Device Integration
*L. Di Cioccio, I. Radu, G. Gaudin, T. Lacave, F. Baudin, M. Sadaka, and T. Signamarcheix*

2216 $Mn_5Ge_3C_{0.8}$ Contacts for Spin Injection into Ge
*I. A. Fischer, C. Sürgers, M. Petit, V. Le Thanh, and J. Schulze*

2217 Development of Multifunctional Liner/Barrier Systems for Sub-14nm Metallization
*E. Eisenbraun*

2218 Single Electron and Single Atom CMOS Perspectives
*X. Jehl, M. Sanquer, M. Vinet, and R. Wacquez*

2219 High-Speed Operation of Si Single-Electron Transistor
*Y. Takahashi, H. Takenaka, T. Uchida, M. Arita, A. Fujiwara, and H. Inokawa*

2220 Status and Future of IC Analog Technologies
*A. Bergemont*

2221 MEMS and Photonics Module Integration into SiGe BiCMOS Technology for More than Moore Functional Diversification
*B. Tillack, B. Heinemann, M. Kaynak, D. Knoll, S. Lischke, A. Mai, H. Rücker, Y. Yamamoto, and L. Zimmermann*

2222 Bio-MEMS Chip for Bacteria Detection -A Challenge of Si Technology to Biomedical Field-
*H. Ishii, K. Sawada, M. Ishida, K. Machida, K. I. Iida, M. Saito, and S. I. Yoshida*

2223 Performance Enhancement Technologies in III-V/Ge MOSFETs
*S. Takagi, R. Zhang, S. H. Kim, M. Yokoyama, and M. Takenaka*

2224 Ingaas GAA Nanowire Mosfets
*P. D. Ye*

## F1 - Current Trends in Electrodeposition - An Invited Symposium

*Electrodeposition*



## F2 - Emerging Materials and Processes for Energy Conversion and Storage

*Electrodeposition, Battery*

2299 Silver-Ceria Composites for Oxygen Separation From Air
*E. Ruiz-Trejo, P. Boldrin, A. Lubin, F. Tariq, N. P. Brandon, A. Atkinson, S. Fearn, R. Chater, S. Cook, J. Darr, and C. Tighe*

2300 Nano Structuring for Efficient Energy Conversion
*S. F. Bent, T. M. Gur, and F. B. Prinz*

2301 Dynamic Response Characteristics of Distribution Network Including Distributed Generators and Power System Stability
*Y. Shirai*

## F3 - Fundamentals and Applications of Electrophoretic Deposition

*Electrodeposition*

2302 New Developments in Electrophoretic Nanotechnology
*I. Zhitomirsky*

2303 Toward Dynamic Control of Magnetic Nanoparticle Monolayers Fabricated By Electrophoretic Deposition: A New Path to Ordered Superlattices?
*J. H. Dickerson II, A. Krejci, M. Darbandi, C. G. W. Thomas, and J. Mandal*

2304 Light Directed Electrophoretic Deposition: A New Technique for Patterning Materials in 3D
*A. J. Pascall, F. Qian, G. Wang, Y. Li, and J. D. Kuntz*

2305 Electrophoretic Deposition of Polymerically Stabilized Silica Nanoparticles for Anti-Wetting Fabrics
*Y. S. Joung and C. R. Buie*

2306 Electrophoretic Deposition of Cobalt Ferrite and Platinum Cobalt Nanoparticles As Electrocatalysts
*R. Tanakit, W. Luc, and J. B. Talbot*

2307 Electrophoretic Deposition of Quantum Dots for Photovoltaic Applications
*S. W. Lee, H. Hlaing, I. Kymissis, and I. P. Herman*

2308 Electrophoretic Deposition of Multi-Sized Titania Nanoparticles to Fabricate High Performance Electrodes for Dye-Sensitized Solar Cell Application
*N. Parsi Benehkohal and G. P. Demopoulos*

2309 Comparison of Electrophoretic Deposition of Nano- and Micron-Sized $Ba_2SiO_4:Eu^{2+}$ Phosphor Particles
*J. I. Choi, M. Anc, A. Piquette, M. E. Hannah, K. C. Mishra, J. B. Talbot, and J. McKittrick*

2310 Nanoparticle Monolayers of Iron Oxide Fabricated Using Electrophoretic Deposition: A New Path to Superlattices?
*A. Krejci, J. H. Dickerson II, and K. Yager*

2311 Fabrication of $Ti/Al_2O_3$ Gradient Coating Layer Using Electrophoretic Deposition for Implant Abutment Application
*H. Kim and C. S. Lee*

2312 Electrodeposition of Organic-Inorganic Films for Biomedical Applications
*I. Zhitomirsky*

2313 Environmentally-Benign Electrochemical Method for Formation of Catalytic Metal Nanoparticles in a Chitosan Matrix On a Stainless Steel Electrode
*G. P. Halada, M. Cuiffo, and P. Jha*

2314 Dispersion of Carbon Nanotubes in Aqueous Solutions of Ionic Surfactants
*Y. S. Joung and C. R. Buie*

2315 Deposition of Vulcan XC-72 Coatings on Stainless Steel Bipolar Plates by Reverse Pulsed DC Voltage Electrophoretic Deposition (EPD) for Fuel Cell Applications
*W. J. Pech-Rodriguez, D. Gonzalez-Quijano, G. Vargas-Gutierrez, and F. J. Rodriguez-Varela*

2316 Study of the Stability of Highly Oxidized Metals (Ir, Ti, Ta, Sn) in Ethanol-Water and Isopropanol-Water Dispersions Previous to Epd
*M. T. Oropeza-Guzman, J. B. Talbot, and M. R. Perez-Garcia*

2317 Optimization of $BiFeO_3$ Suspensions Stabilization
*C. Ponzoni, M. Cannio, R. Rosa, and C. Leonelli*

2318 Electrodynamics of Colloidal Nanoparticles in Non-Polar Solvents
*E. Johnson, A. Tefera, M. Mochena, and J. H. Dickerson II*

2319 Hydrogen Sensing With Metal Nanoparticles Electrophoretically Deposited Onto Epitaxial Layers of III-V Semiconductors
*J. Grym, R. Yatskiv, J. Lorincik, and O. Cernohorsky*

2320 Surface Charge Formation On Ligand – Dressed CdSe Nanoparticle in Hexane
*A. Tefera, M. Mochena, E. Johnson, and J. H. Dickerson II*

## F4 - Fundamentals of Electrochemical Growth - From UPD to Microstructures 3

*Electrodeposition*

2321 Structural Analysis of Highly Durable Si-O-C Or Sn-O-C Composite Anodes for Lithium Secondary Battery By Means of Electrodeposition
*T. Osaka, T. Yokoshima, H. Nara, and T. Momma*

2322 Electrodeposition in Ionic Liquids: From Nanoscale Processes to Macroporous Materials
*F. Endres*

2323 Recent Advances in the Theory and Simulation of Underpotential Deposition
*E. P. M. Leiva, M. Villarreal, O. A. Oviedo, P. Velez, L. Farigliano, A. Pinto, and L. Reinaudi*

## F5 - Emerging Opportunities in Electrochemical Deposition for Nanofabrication

*Electrodeposition, Physical and Analytical Electrochemistry*

2365 E-ALD of Pd On Au Single Crystals
*J. L. Stickney, L. B. Sheridan, Y. G. Kim, D. Benson, K. Jagannathan, and D. B. Robinson*

2366 Conformal Electroless Deposition On monolayers for TSV Applications
*M. Cervati, G. Carnevali, S. Armini, and L. Magagnin*

2367 Co-Deposition of Carbon Nanotubes With Copper
*Y. Sun and L. Romankiw*

2368 Electroless Deposition On Self-Assembled Monolayers As a Method to Enable Fabrication of Advanced Interconnects
*A. Maestre Caro, R. Chebiam, L. Teugels, S. Clendenning, and J. Clarke*

2369 Towards Molecular Electronics: Using Electroless Deposition to Deposit Nano-Objects
*Z. Shi, K. Borner, A. Ellsworth, and A. V. Walker*

2370 Electrodeposition of Continuous Ultrathin Layers of Functionalized Nanoporus Catalyst On Glassy Carbon Electrodes
*N. Dimitrov, L. Bromberg, M. Kamundi, J. Xia, R. Rooney, and M. Fayette*

2371 Negative Resist Monolayers of Thiols As Templates for Metal Electrodeposition
*Z. She, A. DiFalco, G. Haehner, and M. Buck*

2372 Growth-Inhibited Nucleation of Ni Nanoparticles On TiN Substrates
*J. Vanpaemel, M. van der Veen, S. De Gendt, and P. M. Vereecken*

2373 Electroless and Electrochemical Deposition of Zinc Oxide On Passive Metals As Electrodes in Textile-Based Dye-Sensitized Solar Cells
*D. Schlettwein, M. Stumpp, S. Künze, and J. C. Falgenhauer*

2374 Electrical Properties of ZnO Nanowires Prepared By Templateless Electrodeposition
*I. Enculescu, E. Matei, C. Florica, and A. Costas*

2375 Electroless and Electrolytic Deposition of Silver and Nickel for Solid Oxide Fuel Cells Anodes
*E. Ruiz-Trejo, P. Boldrin, F. Tariq, N. P. Brandon, A. Atkinson, J. Darr, C. Tighe, and M. Millan-Agorio*

2376 Electrochemical Metal Chalcogenides for Electrocatalysis and Energy Storage
*K. J. Stevenson and D. W. Redman*

2377 Templated Electrodeposition of Metal Nanorods Into $TiO_2$ Nanotubes
*N. Liu, S. So, and P. Schmuki*

2391 Electrochemical Processing of Carbon Nanostructures
*P. M. Vereecken, A. Radisic, and D. J. Cott*

2392 Near-Surface Atomic and Electronic Structural Effects in Layer-By-Layer Derived Core-Shell Catalysts
*F. M. Alamgir*

2393 Superconformal Deposition of Au in a Sulfite Electrolyte
*D. Josell and T. P. Moffat*

2394 Electrodeposition of Cobalt-Tungsten Alloys From An Alkaline Citrate-Containing Bath As Barrier Layers in Electronic Application
*N. dadvand, G. jarjoura, and G. J. kipouros*

2395 Cu Electroless Deposition By Using Cu Nanoparticles As Catalysts for a Printed Circuit Board Metallization
*Y. C. Chung and W. P. Dow*

2396 Electroless Co-B-P-W Deposition Using Dmab As reducing Agent
*E. Norkus, A. Jagminiene, I. Stankeviciene, L. Tamasauskaite-Tamasiunaite, and Z. Sukackiene*

2397 The Application of Nico Alloy Electroforming On Products With Microstructure
*H. J. Chen*

2398 Towards An Atomistic Understanding of the Activation of Plating Additives At the Copper/Electrolyte Interface
*H. Nguyen, T. M. T. Huynh, A. Flügel, M. Arnold, D. Mayer, and P. Broekmann*

2399 Using Vibrational Spectroscopy and Electrochemical Stress Measurements to Interrogate Metal Electrode Surfaces
*A. Gewirth, J. Oberst, K. Schmitt, and H. Tavassol*

2400 Optimization of Leveler Concentrations in Copper Via Filling for Deduction of Contamination
*J. H. Lee and K. T. Kim*

2401 Effects of Anodizing Parameters On the Formation of Titanium Dioxide Nanotubes
*Z. Bolukoglu, I. Karakaya, and M. Erdogan*

## G1 - Alkaline Electrolyzers

*Industrial Electrochemistry and Electrochemical Engineering, Battery, Energy Technology, Physical and Analytical Electrochemistry*

2402 Effect of Bubbles Coverage in Gas Evolving Rotating Disk Electrodes
*L. A. Diaz, M. Muthuvel, and G. G. Botte*

2403 Self-Sustainable Production Of Hydrogen and Chemicals From Renewable Alcohols By Alkaline Electrolysis
*H. A. Miller, F. Vizza, A. Lavacchi, J. Filippi, W. Oberhauser, M. Bevilacqua, A. Marchionni, M. Innocenti, and L. Wang*

2404 Electrocatalytic Oxidation Mechanism of Urea On Ni/Co Hydroxide Catalyst in Alkaline Medium
*V. Vedharathinam and G. G. Botte*

2405 Well-Defined $NiFeAlO_4$ Inverse Spinel As Efficient Alkaline Water Oxidation Catalyst
*J. Y. C. Chen, A. Serov, P. Atanassov, and S. S. Stahl*

2406 Efficient Water Oxidation Using Nickel-Hydroxide As An Electrocatalyst
*M. Gao and Y. Yan*

2407 Towards Accurate *Ab-Initio* Prediction of ORR/ Oer Activity of $LaBO_3$ (B=Cr,Mn) Perovskites – Role of Hubbard *U* and Stable Surface Coverage
*M. Gadre, Y. L. Lee, Y. Shao-Horn, and D. Morgan*

2408 Enhanced Oxygen Evolution At 'Aged' Hydrous Nickel Oxide Electrodes in Alkaline Solution: Kinetics and Mechanism
*I. Godwin and M. E. G. Lyons*

2409 Investigation of the Alkaline Interface for Non-PGM Electrocatalysts in AEM Water Electrolysis
*M. Bates and S. Mukerjee*

2410 Mixed Metal Mixed Oxides Electrocatalyst for Water Electrolysis
*R. Kamaraj, D. Jonas Davidson, S. Vasudevan, G. Sozhan, and S. Ravichandran*

2411 Hydrogen Production By Alkaline Membrane Water Electrolysis
*J. Parrondo, C. G. Arges, and V. K. Ramani*

2412 Durability and Activity of Modified Nickel Anode for Alkaline Water Electrolysis
*H. Ichikawa, K. Matsuzawa, Y. Kohno, Y. Sunada, I. Nagashima, Y. Nishiki, A. Manabe, and S. Mitsushima*

## G2 - Synthesis and Electrochemical Engineering General Session

*Industrial Electrochemistry and Electrochemical Engineering*

2413 Performance Analysis of Syngas Fueled Solid Oxide Electrolysis Cells
*P. Kazempoor and R. J. Braun*

2414 Microbial Reverse-Electrodialysis Electrolysis Chemical-Production Cell for $H_2$ Production and $CO_2$ Sequestration
*X. Zhu, M. C. Hatzell, and B. E. Logan*

2415 Ammonia Synthesis From Urea Using An Electrochemical Approach
*F. Lu*

## H1 - Carbon Nanostructures 4 - Fullerenes to Graphene

*Fullerenes, Nanotubes and Carbon Nanostructures, Dielectric Science and Technology, Energy Technology, Physical and Analytical Electrochemistry, Sensor*

2429 Large Surface Area Graphene-Si Anodes for Li-Ion Batteries
*G. Radhakrishnan, P. M. Adams, J. D. Cardema, and M. V. Quinzio*

2430 Novel and Simple Electrografting Monomer Method to Exfoliate HOPG for Lithium-Ion Batteries
*A. Aqil, F. Ouhib, C. Jérôme, C. Detrembleur, and A. Vlad*

2431 CVD Synthesis of Graphene/Carbon Nanofiber Hybrids and "Square" Graphene Domains
*K. Vinodgopal, G. P. Dai, and M. H. Wu*

2432 Graphene Growth On Electrodeposited Polycrystalline Copper and Ruthenium
*D. Pigliafreddo, L. Magagnin, L. Nobili, C. Carraro, and R. Maboudian*

2433 Interfacial Charge Induced Phenomena in Porous Graphene-Based Bulk Materials
*J. Biener, M. A. Worsley, E. Montalvo, P. G. Campbell, B. C. Wood, T. Ogitsu, M. Bagge-Hansen, J. R. I. Lee, M. Stadermann, M. M. Biener, S. Dasgupta, L. Shao, R. K. Kalluri, A. V. Hamza, A. Striolo, J. Weissmueller, H. Hahn, and T. F. Baumann*

2434 Thick, Binder-Free Carbon Nanotube-Based Electrodes for High Power Applications
*M. A. Worsley, M. Merrill, S. Charnvanichborikarn, S. O. Kucheyev, M. Stadermann, T. F. Baumann, and J. Biener*

2435 Carbon and Composite Nanostructured Materials for Energy Applications
*A. Serov, N. Andersen, K. Artyushkova, and P. Atanassov*

2436 Indene Bisadduct of Fullerenes As High Efficiency Acceptor for Polymer Solar Cells
*Y. Li*

2437 Platinum Nanoparticles Immobilized On CVD-Grown Graphene As a Transparent and Efficient Counter Electrode Materials for Dye-Sensitized Solar Cells
*V. D. Dao, J. K. Lee, and H. S. Choi*

2438 Synthesis, Structure, and Properties of $C_{60}$-Pd Spherical Nanoparticles
*K. Winkler, E. Brancewicz, and E. Gradzka*

2439 Electrochemically Generated Highly Fluorescent Boron-Doped Graphene Quantum Dots for Fluorescent Crystal, Sensors and Bioimaging
*L. Fan and Z. Fan*

2440 Application of Positively Charged Carbon Nanotubes to Layer-By-Layer Assemblies of Dehydrogenase Enzymes for Molecular Bioelectronic Devices
*B. Kowalewska, M. Dzwonek, and P. J. Kulesza*

2454 Oxygen Reduction Reaction On Glassy Carbon Electrodes Modified With Amino-functionalized Carbon Nanotubes and Iron Phthalocyanines
*P. Cañete-Rosales, J. F. Silva Sr., and J. H. Zagal Sr.*

## I1 - Physical and Analytical Electrochemistry Division General Session

*Physical and Analytical Electrochemistry*

2455 The Wedge Scheme, a General Framework for Incorporating H-Bonding Into Proton-Coupled Electron Transfer Reaction Mechanisms
*D. K. Smith, L. A. Clare, and A. Pham*

2456 Iodide Effect On the Conduction Band Edge of ZnO Nanomaterials
*P. Chhetri, N. Perera, and M. A. Alpuche-Aviles*

2457 The Incorporation of Bovine Serum Albumin Into a Polypyrrole Film in One Simple Step
*A. Hamilton and C. Breslin*

2458 X-Ray Acceleration On Electrochemical Reaction
*J. Liu, M. Roberts, R. Younesi, M. Dahbi, J. Zhu, T. Gustafsson, and K. Edström*

2459 Nitric OXIDE Reduction and Oxidation ON Polycrystalline Platinum: Differential Reflectance Spectroscopic Studies
*D. A. Scherson and A. Jebaraj*

2460 Nanostructured Monolayer Films Electrografted On Carbon Substrates. Application to the Electrochemical Preparation of Surfaces With Reversible Photo-Switchable Properties
*Y. Leroux and P. Hapiot*

2461 Can Electron Tunneling Occur in a Hundred-Nanometer Thick Nafion Film and be Utilized to Image Nafion/Electrode Interfaces With An Angstrom Level Resolution?
*X. Zhou*

2462 Operation of Scanning Ion Conductance Microscopy (SICM) At Short Tip to Sample Distances
*N. Sa, W. Shi, M. A. Derylo, and L. A. Baker*

2463 Finite-Elements Simulation of Etch Front Propagation in Silicon Electropolishing Process
*A. Ivanov, U. Mescheder, and P. Woias*

2464 Investigating the Mechanism of Thylakoid Direct Electron Transfer for Photocurrent Generation
*M. J. Rasmussen and S. D. Minteer*

2465 Increased Dissociation of Water Due to Large Electric Fields
*N. P. Craig and J. Newman*

2493 Influence of Aromatic and Unsaturated Substituents On Physical and Electrochemical Properties of Phosphonium Ionic Liquids
*K. Tsunashima, S. Kikuchi, C. Nagai, Y. Sakai, and M. Matsumiya*

2494 Quasi-Solid-State Dye-Sensitized Solar Cells Assembled With Polymer Electrolyte Containing Core-Shell Structured Polymeric Ionic Liquid
*S. G. Jo and D. W. Kim*

2495 Dye-Sensitized Solar Cells Assembled With Polymeric Ionic Liquid and Poly(3,4-ethylenedioxythiophene) Counter Electrode
*N. Jeon, S. G. Jo, D. K. Hwang, S. Im, and D. W. Kim*

2496 The Electrolytic Dissociation of 1,3-Cyclopentanedicarboxylic Acids
*E. Kvaratskhelia, R. Kvaratskhelia, and R. Kurtanidze*

2497 Catalytic Oxidation of Liquid Fuels On Palladium Nanoparticles Loaded Carbon Nanotubes
*Q. Wan, M. Han, H. Liao, and N. Yang*

2498 Electrode Surface Fouling for Sensitive Electroanalytical Determination of Phenols
*A. N. M. Kawde*

2499 Heavy Metal Extraction and Electroseparation From Wastewater By Acidic Solutions
*Y. Addi*

2500 Electrochemical Determination of Copper and Thiourea in the Presence of An Animal Glue From Strongly Acidic Solutions Employed in the Electrorefining Processes of Copper
*M. G. Lobos, D. L. Ramírez Sr., G. Riveros, P. Díaz, and H. Gomez*

2501 Degradation Route for Amaranth Dye By Sonoelectrochemical Process Using BDD Anode
*A. D. J. Motheo, J. R. Steter, M. R. V. Lanza, and W. R. P. Barros*

## I2 - Invitational Symposium in Honor of Adam Heller on his 80th Birthday

*Physical and Analytical Electrochemistry, Battery, Energy Technology, Organic and Biological Electrochemistry*

2502 At 80: The Joy of Uncovering Truths and Building People-Serving Products
*A. Heller*

2503 A Long-Life, High-Rate Lithium/Sulfur Cell
*M. K. Song, Y. Zhang, and E. J. Cairns*

2504 Electrochemical Tuning of Metabolisms of Photosynthetic Microbes
*K. Hashimoto, Y. Lu, and S. Nakanishi*

2505 Electrochemical/Enzymatic Amplification Schemes for the Sensitive Detection of Pathogens in Electrochemically Activated Capillaries
*O. Msehli, S. Molina, B. Teixeira-Dias, and I. Katakis*

## I3 - Photoelectrochemistry and Photoassisted Electrocatalysis

*Physical and Analytical Electrochemistry*

2532 (Invited) Critical Metrics and Limiting Physical Parameters in Electrolytic and Photoelectrochemical Solar to Hydrogen Production Technologies
*E. L. Miller, S. Dillich, D. Peterson, and K. Randolph*

2533 (Invited) III-V Nitrides and Tandem Cells for Photoelectrochemical Water Splitting
*J. A. Turner*

2534 (Invited) Scalably Manufacturable Solar-Fuels Generators
*C. Koval*

2535 (Invited) Mechanisms of (Photo)Electrochemical Reduction of Carbon Dioxide From First Principles
*E. A. Carter*

2536 (Invited) Photochemical Charge Transfer in Niobium Oxide Nanocrystal Films Studied With Surface Photovoltage Spectroscopy
*F. E. Osterloh and J. Zhao*

2537 (Invited) Oxygen Evolution At Vertically Aligned Core-Shell Ion-Iron Oxide Nanowire Arrays
*G. Wittstock, G. Denuault, S. Mátéfi-Tempfli, H. Bülter, M. Mátéfi-Tempfli, A. Lesch, I. Schmidt, C. Dosche, M. Ahlf, K. Al-Shamery, A. Fanget, and L. Forro*

2538 Synthesis and Characterization of Highly-Ordered Doped Titania Nanotubes for Solar Hydrogen Generation
*S. Karimi and R. Cuello*

2539 Composite $WO_3/TiO_2$ Nanotubes for Solar Photo-Conversion and Electrochromic Applications
*D. B. Robinson and K. Reyes*

2540 (Invited) Materials Aspects Of Hematite-Based Photoelectrochemical Water Splitting
*D. Wang*

2541 Design, Synthesis, and Characterization of Hematite Nanotubes for Photoelectrochemical Water Splitting
*T. Mushove, S. Blodgett, and L. T. Thompson*

2542 Nanostructured Hierarchical Hematite Photoanode From Hydrothermal Synthesis for Efficient Solar Water Oxidation
*H. Y. Kang, T. Y. Yang, K. Jin, J. H. Lee, U. Sim, H. Y. Jeong, Y. C. Joo, and K. T. Nam*

2543 (Invited) Modified Copper Tungstate Photoanodes For Efficient Solar Driven Water Oxidation
*A. M. Herring, S. K. Pilli, J. A. Turner, T. G. Deutsch, and T. E. Furtak*

2570 Photo/Electrocatalytic Properties of the Hydrogenated $TiO_2$
*K. Bienkowski and P. J. Kulesza*

2571 Effect of the Heterogeneous Catalyst Attachment Method On $O_2$ Production of $WO_3$ Photoanodes in Acidic Aqueous Electrolyte
*J. M. Spurgeon and J. M. Velazquez*

2572 Structure-Activity Relationship in Mixed (Fe,Ni) Oxyhydroxide Catalysts for Electrochemical Oxygen Evolution
*D. Friebel, K. E. Sanwald, A. Bodin, A. M. Wise, D. Sokaras, R. Alonso-Mori, T. C. Weng, R. Davis, J. Bargar, M. Louie, Y. Cai, M. Bajdich, A. T. Bell, J. A. Lercher, and A. Nilsson*

2573 Molybdenum Sulfides Materials As Hydrogen Evolution Catalysts and Surface Protecting Layers for Highly Active and Stable Silicon-Based Water Splitting Photocathodes
*J. D. Benck, J. Kibsgaard, and T. F. Jaramillo*

2574 (Invited) A Study Of Interfacial Processes Between Metal Oxide Nanostructured Thin Films and Ionic Liquids For Potential Applications In Photoelectrochemistry
*C. Santato, J. Pison, D. Isik, Y. Sivalingam, and J. Sayago*

2575 Influence of Surface Structure Geometry On the Performance of Electrodes for Photoactivated Hydrogen Generation
*M. Schieda, A. Rzeszutek, I. Herrmann-Geppert, A. C. Bronneberg, D. L. Olynick, and T. Klassen*

2576 Controlling the Energetics and Activity of Nanocrystal Metal Oxide Water Splitting Catalysts With Potential Determining Ions
*F. E. Osterloh and R. L. Chamousis*

2577 Stochastic Photoelectrochemistry of Colloidal Semiconductor Nanoparticles
*M. A. Alpuche-Aviles, A. Fernando, and S. Parajuli*

2578 (Invited) Investigation Of Plasmonic $Ag@Ag_3(PO_4)_{1-X}/ZnO$ Nanoarchitectures For Solar-Hydrogen Application
*Y. G. Lin, Y. K. Hsu, L. C. Chen, and K. H. Chen*

2579 Highly Stable, Efficient, Visible-Light Driven Water Photoelectrolysis System With Use of Nanocrystalline Semiconducting Oxides
*R. Solarska, K. Bienkowski, P. J. Kulesza, and J. Augustynski*

2580 High Surface Area Transparent Conductive Oxide As Effective Scaffolds for Nanostructured Metal Oxide Photoelectrochemical Electrodes
*P. Chakthranont, A. J. Forman, B. A. Pinaud, and T. F. Jaramillo*

2581 Solution Phase Growth and Photoelectrochemical Energy Conversion of Indium Phosphide Nanowires
*N. Nikolay Kornienko and P. Yang*

2595 Curcumin-Ru Complex for Dye-Sensitized Photoelectrochemical Water Splitting
*R. Vedarajan, Y. Morita, and N. Matsumi*

2596 The Influence of Polysulfide Electrolyte On CdSe QDs
*L. A. King, H. Tellez Lozano, and J. D. Riley*

2597 Photocathodic Activity of Poly(3-Hexylthiophene) in Aqueous Acid
*S. Holdcroft, G. M. Suppes, and E. Ballard*

2598 Synthesis and Preliminary Photoelectrochemical Study of Silver Antimony Sulfide Semiconductor
*S. Parajuli, P. Chhetri, W. L. Stephenson, and M. A. Alpuche-Aviles*

## I4 - Physical and Analytical Electrochemistry in Ionic Liquids 3

*Physical and Analytical Electrochemistry, Battery, Electrodeposition, Sensor*

2599 Improving Magnesium Electrochemistry in Ionic Liquids Through Enhanced Solvation
*T. S. Watkins and D. A. Buttry*

2600 Electrochemical Capture of Carbon Dioxide in An Ionic Liquid Using N-Methyl-4,4'-Bipyridinium Cation
*P. Singh and D. A. Buttry*

2601 Chemical Reactivity of Alkyl Thiolates Used in Electrochemical $CO_2$ Capture in Ionic Liquids
*M. Hasani and D. A. Buttry*

2602 Liquid Metal Salts: High Current Density Electrodeposition of Cu-Sn-Zn Metal Stacks From Ionic Liquids for Kesterite Based Thin Film Photovoltaics
*M. Steichen, N. R. B. Brooks, M. Arasimowicz, J. C. Malaquias, P. J. Dale, L. Van Meervelt, J. Fransaer, and K. Binnemans*

2603 Voltammetry for Quantitative Analysis of Actinides in Molten Salts
*M. M. Tylka, J. L. Willit, M. A. Williamson, and J. Prakash*

2604 Electrochemistry of Ferrocene-Modified Redox Ionic Liquids
*B. Gélinas, J. Forgie, and D. Rochefort*

2605 Electrochemical Studies of 9-Fluorenone Complexation By Aluminum in Ionic Liquids
*G. T. Cheek*

2606 'Polymeric Ionic Liquid/Carbon Black' composite as a Green Supporting Electrolyte
*S. J. Yoo and R. D. Little*

2607 Silylamine Reversible Ionic Liquids As Electrochemical Solvents
*E. J. Biddinger, S. Kattekola, and T. K. Shillingford*

2608 Ionic Liquids for Ammonia Electrosynthesis and Energy Storage
*J. M. Sansiñena, J. Chlistunoff, N. C. Tomson, J. M. Boncellla, and F. H. Garzon*

2609 Enhanced Electrical Conductivity of Carbon-Based Nanoparticles in Ionic Liquid Electrolytes
*P. F. Salazar, S. Kumar, and B. Cola*

2610 Supported Nanoparticle Stability, Assembly and Extended Charge Neutralization in Deep Eutectic Solvents
*J. Hammons*

2611 Gas Diffusion Electrodes and Ionic Liquid Electrolytes for Secondary Zinc-Air Batteries: Electrochemical Characterization
*A. Westphal, D. Fenske, I. Bardenhagen, and O. Yezerska*

2612 Mixture of 1-Ethyl-3-Methylimidazolium Tetrafluoroborate and 1-Ethyl-3-Methylimidazolium Iodide: A New Potential High Capacitance Electrolyte for Edlcs
*L. Siinor, C. Siimenson, K. Lust, and E. Lust*

2613 Spectroelectrochemical Study of Multi-Electron Transfer in Ionic Liquids
*A. Atifi and M. D. Ryan*

2614 Hysteresis of Potential-Dependent Changes in Ion Density and Orientation of Ionic Liquids On An Au Electrode: An Surface-Enhanced Infrared Study
*K. Motobayashi, K. Minami, N. Nishi, T. Sakka, and M. Osawa*

2615 Galvanostatic Pulse Plating of Al Metal in Room-Temperature Chloroaluminate Ionic Liquids
*L. H. Chou*

2616 Heterogeneous and Homogeneous Electron Transfer Kinetics of the $[CeCl_6]^{3-/2-}$ redox Reaction in the 1-Butyl-3-Methylpyrrolidinium Bis(trifluoro-methylsulfonyl)Imide Ionic Liquid
*L. H. Chou*

2617 Amperometric Gas Sensors With Ionic Liquid Electrolytes
*M. T. Carter, J. R. Stetter, M. W. Findlay, and V. Patel*

## I5 - Processes 8

*Physical and Analytical Electrochemistry, Energy Technology*

2618 A Self-Healing Phenomenon of Thin δ-$MnO_2$ Film in the Oxidative Decomposition of Hydrogen Peroxide
*M. Nakayama and A. Sato*

2619 Electrolytic Formation of Pt-Li Alloy and Its Excellent Electrocatalysis for Formic Acid Oxidation
*Z. Awaludin, T. Okajima, and T. Ohsaka*

2620 Photo-Assisted Boosting of Formic Acid Electrooxidation On $TiO_2$ Nanotube-Pt Electrode
*N. Mojumder, S. Sarkar, S. Abbas, and V. Subramanian*

## J1 - Sensors, Actuators, and Microsystems General Session

*Sensor*

2682 Reduced Graphene Oxide and Single-Walled Carbon Nanotubes Composite Material for Electrocatalytic Oxidation of NADH
*T. Y. Huang, K. Ho, and C. W. Chu*

## J2 - Impedance Techniques, Diagnostics, and Sensing Applications

*Sensor, Corrosion, Industrial Electrochemistry and Electrochemical Engineering, Physical and Analytical Electrochemistry*

2683 The Influence of Coupled Faradaic and Charging Currents On Impedance Spectroscopy
*S. L. Wu, M. E. Orazem, B. Tribollet, and V. Vivier*

2684 The Role of the Reference and Counter Electrodes in Electrochemical Impedance Measurement
*P. Vanýsek, H. Tavassol, and K. L. Pilson*

2685 Investigation of Transport/Insertion Processes in Mixed and Ionic Conducting Thin Films By Ac Electrogravimetry
*L. K. To, O. Sel, C. Gabrielli, and H. Perrot*

2686 Diffusion Impedance of Microband Electrode Array By FEM
*Y. Hoshi, M. Ohya, I. Shitanda, and M. Itagaki*

2687 Carbon Nanotube Coated Paper Sensor for Damage Diagnosis Using Electrical Impedance Tomography
*B. Kim, Y. Lu, T. Kim, J. W. Han, M. Meyyappan, and J. Li*

2688 (2013 ECS Fellow Inductee) Information from Noise
*J. Janata and R. West*

2689 Impedance Analysis of Copper Alloys At the Corrosion Potential in Seawater
*I. Frateur, B. E. Torres Bautista, M. L. Carvalho, and B. Tribollet*

2690 Study of Pickling and Over-Pickling Mechanisms of Silicon High Alloyed Steel Grade By Electrochemical Impedance Spectroscopy
*A. A. Mouyad, M. E. Orazem, E. Sutter, B. Tribollet, and A. Koltsov*

2691 Galvanic Deposition of Mo Atop Al 6061 Alloy
*B. D. Falola, A. Krishnamurthy, R. Radhakrishnan, and I. I. Suni*

2692 Phosphate Adsorption On Thin Films Made of Transition Metal Oxides, As Measured By Electrochemical Impedance Spectroscopy
*R. E. Pérez-Roa, R. E. Moss, J. Ma, D. R. Noguera, and M. A. Anderson*

2693 Applications of AC Impedance Spectroscopy As Characterization and Diagnostic Tool in Rechargeable Energy Storage Devices
*V. Lvovich*

## J3 - Luminescence and Display Materials - Fundamentals and Applications

*Luminescence and Display Materials*

2707 Development of Phosphors for White Emitting Near UV LEDs
*J. Han, M. E. Hannah, J. I. Choi, A. Piquette, M. Anc, J. B. Talbot, K. C. Mishra, and J. McKittrick*

2708 Blue Light Excitable Red-Emitting Oxide Phosphor
*K. Toda, S. W. Kim, T. Hasegawa, K. Uematsu, T. Ishigaki, and M. Sato*

2709 Looking for Red Line-Phosphors for LED-Based Systems
*A. A. Setlur, J. Murphy, R. Lyons, F. Garcia-Santamaria, P. K. Nammalwar, and N. Karkada*

2710 "UV Or Blue LEDs With Phosphors: An Interesting Way to Develop Smart Lighting."
*G. Chadeyron*

2711 Synthesis of Green-Emitting $La_2O_2s:Tb^{3+}$ Phosphors By Two-Step Flux Method
*S. W. Kim, T. Abe, K. Seki, K. Toda, K. Uematsu, T. Ishigaki, and M. Sato*

2712 Photoluminescence of Li+ and Eu3+ Co-Doped Nala (WO4)2 As Near-UV Excited Red Phosphors
*Y. Liu, Y. Y. Gu, and Z. G. Lu*

2713 Luminescence Characteristics of Color Tunable $Eu^{2+}$ Activated $KSrPO_4$-$(Ba,Sr)_2SiO_4$ Phosphors for Near-UV Light Emitting Diode Applications
*J. Han, M. E. Hannah, A. Piquette, J. B. Talbot, K. C. Mishra, and J. McKittrick*

2714 Oxyfluoride Phosphors for Lighting
*T. Vogt*

2715 Efficient Luminescence in $Eu^{2+}$ Activated $(Ba,Ca)_2Si_5N_8$ phosphor
*P. K. Nammalwar, D. G. Porob, S. K. Manepalli, and A. Setlur*

2716 Publishing Luminescence and Display Materials Content in ECS Journals: Past, Present, and Future
*D. W. Hess*

2717 Interconfigurational d-f Luminescence of $Ce^{3+}$ and $Pr^{3+}$ in Double Phosphate Hosts
*M. Bettinelli*

2718 Optical Spectroscopy of Six Coordinated $Eu^{2+}$ and $Ce^{3+}$ in $M^{2+}Al_2B_2O_7$ ($M^{2+}$=Ca, Sr, Ba)
*S. J. Camardello and A. Srivastava*

2719 Systematic Crystal Field Studies of $Mn^{4+}$-Doped Perovskites
*A. Srivastava and M. G. Brik*

2720 The Sensitization of the $Pr^{3+}$ Photon Cascade Emission in $YF_3$
*S. J. Camardello and A. Srivastava*

2747 Phosphor Crystals for Tailored Spectrum LEDs
*P. S. Dutta*

2748 Effect of Flux On Luminescence of $Eu^{2+}$ Activated Yellow Oxynitride Phosphor
*P. K. Nammalwar, S. K. Manepalli, D. G. Porob, and A. A. Setlur*

2749 Novel Synthesis Methods for Luminescent Materials: Spark Plasma Sintering (SPS) and Micro Arc Oxidation (MAO)
*S. H. Hong and E. H. Kang*

2750 Microstructure and Optical Properties of An Oxynitride Ceramic Phosphor
*M. Raukas, M. E. Hannah, D. Johnston, J. Montaner, Z. Yu, S. Tragl, A. Rucki, V. Klueppel, E. Jones, X. Zhou, M. Wang, and S. Gradecak*

2751 Spectral Tuning in Nitride Phosphors By Compositional Tailoring
*R. J. Xie, N. Hirosaki, T. Takeda, and T. Suehiro*

2752 Synthesis of Yellow-Emitting $NaAlSiO_4:Eu^{2+}$ Phosphors Using Sio Powder As a Silica Source
*K. Toda, T. Abe, T. Ishigaki, S. W. Kim, K. Uematsu, M. Sato, T. Masaki, and D. H. Yoon*

## J4 - Microfluidic MEMS/NEMS, Sensors and Devices

*Sensor, Physical and Analytical Electrochemistry, New Technology Subcommittee*

2753 Plenary Talk--Nanosensor Systems. e-Bra, e-Band and Wireless Electronics for Monitoring and Control of Cardiovascular Diseases and Neurological Disorders
*V. K. Varadan*

2754 Keynote--Recent Biomedical Applications of Dielectrophoresis
*R. Pethig*

2755 Distinguished Invited Speaker--Spectroelectrochemistry in Low-Dimensional Nanooptofluidic Devices for Chemical and Biochemical Sensing
*J. Zhao, N. M. Contento, D. A. Grismer, L. P. Zaino III, S. Polisetti, and P. W. Bohn*

2756 An Automated Electrochemical Immunosensing System for Detection of Cortisol At Point-of-Care (POC)
*S. Bhansali*

2757 Real Time Diagnostic Point of Care By Amperometric Immuno-Biosensor Kit By Flow Technology
*H. E. Braustein, K. Levkov, I. E. Braustein, Y. E. Bezalel, M. E. Abo Zaid, G. Fleminger, and J. Rishpon*

## J6 - Sensors for Agriculture

*Sensor, Physical and Analytical Electrochemistry*