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221st ECS Meeting

May 6-10, 2012 — Seattle, Washington

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495 The Lattice Orientation-Controls of Lithium Cobalt Oxide Cathode Thin Films by RF-Magnetron Sputtering for Thin Film Batteries
Y. Yoon, C. Park, J. Kim, and D. Shin

496 In Situ Hydrothermal Synthesis of Defect-Free $LiMPO_4$
J. Chen and J. Graetz

497 Towards the Understanding of Coatings on Rate Performance of $LiFePO_4$
J. Chong, S. Xun, X. Song, P. Ridgway, G. Liu, and V. S. Battaglia

498 Direct Observation of Enhanced Lithium-Ion Intercalation in $LiFePO_4$ Nanocrystals with Controlled Crystallinity
Q. N. Chen, Y. Liu, Y. Liu, S. Xie, G. Cao, and J. Li

499 New Polyanion Compounds as High-Capacity Electrode Materials for Li-Ion Batteries
Y. Yang

500 The Crystal Chemistry of the Lithium-Ion Battery Cathode Li_2MnSiO_4 - an X-ray and Neutron Diffraction Study
R. J. Gummow, N. Sharma, V. K. Peterson, and Y. He

501 Utilizing Carbon Nanotubes to Enhance Rate Capability of Lithium Iron Phosphate for High Power Lithium-Ion Batteries
M. Gnanavel and A. J. Bhattacharyya

502 Decoding the Structure of Novel, High-Capacity, Li-Ion Cathodes Using X-ray Absorption Spectroscopy
J. R. Croy, M. Balasubramanian, D. Kim, S. Kang, and M. Thackeray

503 Techniques for *In Situ* TEM Characterization and Electrochemistry of Nanoscale Battery Materials
J. P. Sullivan, J. Y. Huang, M. J. Shaw, K. R. Zavadil, A. Subramanian, Y. Liu, X. Liu, N. Hudak, and S. J. Hearne

504 In-Situ TEM Electrochemistry of Anode Materials in Lithium-Ion Batteries
J. Huang, X. Liu, Y. Liu, J. P. Sullivan, K. R. Zavadil, T. Zhu, L. Zhong, L. Q. Zhang, S. Mao, A. Kushima, J. Li, and S. T. Picraux

505 *In Situ* Neutron Reflectometry for the Direct Measurement of Cyclic and Evolving Structures in the Lithium Battery Solid Electrolyte Interphase
S. C. DeCaluwe, J. E. Owejan, J. P. Owejan, and J. A. Dura

506 Neutron Imaging of Degraded LFP Pouch Cells Illustrate Dendrite Formation and Internal Shorts
J. B. Siegel, X. Lin, and A. G. Stefanopoulou

507 In Situ Determination of Manganese Dissolution Rates in Lithium Manganese Oxide Batteries Using Electron Paramagnetic Resonance Spectroscopy
G. B. Less, J. G. Gallegos, and A. Sastry

508 Combining Quantitative Electrochemistry and Electron Microscopy to Study Nanostructured Materials Response and Stability: Reversible Lithiation of Silicon Nanowires
K. R. Zavadil, X. Liu, Y. Liu, and J. Huang

509 In Situ EPR Study of a $LiMn_2O_4$ Cathode Battery
J. G. Gallegos, G. B. Less, J. Park, and A. Sastry

510 3D Morphological Evolution of Li-Ion Battery Anode LiVO2 during Oxidation --Using X-ray Nano-Tomography
Y. K. Chen, P. Shearing, Q. Yuan, J. Gelb, C. Eng, and J. Wang

511 α-MnO_2 Electrocatalysts for Oxygen Reaction in Rechargeable Lithium-Air Batteries: Nano-Rods Grown on Spherical Core
J. Lee, A. Riaz, K. Jung, S. Lee, T. Lim, S. Park, R. Song, and K. Shin

512 Computational Modelling Studies of Nanostructured TiO_2
M. G. Matshaba, P. E. Ngoepe, and D. C. Sayle

513 Doped Spinels as Positive Materials for High Voltage Lithium Batteries
P. M. Le, T. Nguyen, V. Tran, L. Huynh, and V. Tran

544 Developing Novel Electrolytes for Rechargeable Mg Batteries
J. Muldoon and C. B. Bucur

545 Electrochemical Study of MnO_2 Based Cathode Active Materials for Rechargeable Mg Battery
R. Zhang, W. Song, A. Knapp, C. Ling, and M. Matsui

546 In Situ Characterization of the Cracking of Battery Electrodes by Acoustic Emission
A. Etiemble, H. Idrissi, and L. Roué

547 Reconstruction of the Active Material, Binder and Pore Space of a $LiCoO_2$ Li-Ion Battery Cathode
T. Hutzenlaub, R. Zengerle, and S. Thiele

1657 Improved Wide Operating Temperature Range of LiNiCoAlO2-Based Li-Ion Cells with Methyl Propionate-Based Electrolytes
M. C. Smart, M. Tomcsi, C. Hwang, L. Whitcanack, B. V. Ratnakumar, M. Nagata, V. Visco, and H. Tsukamoto

B6 - Tutorials on Electrocatalysis in Low Temperature Fuel Cells

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

548 Electrocatalysis in Polymer Electrolyte Fuel Cells: From Fundamentals to Applications
T. J. Schmidt

549 Electrochemical Interfaces for Energy Conversion and Storage
R. Subbaraman, D. Tripkovic, D. Strmcnik, G. K. Wiberg, J. S. Jirkovsky, C. Wang, V. R. Stamenkovic, and N. M. Markovic

550 Improved Catalysts for PEM Fuel Cell Electrodes
M. Watanabe

551 Platinum Monolayer Electrocatalysts for the Oxygen Reduction Reaction
M. B. Vukmirovic, Y. Cai, S. T. Bliznakov, K. Sasaki, J. X. Wang, and R. R. Adzic

552 (Supramaniam Srinivasan Young Investigator Award) Catalyst Supports for PEM Fuel Cell Electrocatalysts
V. K. Ramani

553 State of the Art in Non-Precious Metal Catalysts for Fuel Cells
P. Zelenay

554 Transition Metal Oxide Based Materials for Cathode of Polymer Electrolyte Fuel Cells
K. Ota, Y. Ohgi, K. Matsuzawa, S. Mitsushima, and A. Ishihara

555 Recent Advances in Non-Precious Metal Electrocatalysts for Oxygen Reduction in PEM Fuel Cells
M. Lefèvre and J. Dodelet

569 Investigation of Catalyst Durability under Fuel Cell Operation with Reduced Cathode Platinum Loadings
T. Han, N. Dale, and K. Adjemian

570 Electrocatalytic Activity of Ternary PtSn-Based Materials toward CO and Ethanol Oxidation
T. S. Almeida, L. M. Palma, C. Morais, K. Kokoh, and A. De Andrade

571 Investigation of Electrocatalytic Activity of Titania Nanotube Supported Nanostructured Pt-Ni Catalyst towards Methanol Oxidation
L. Tamašauskaitė-Tamašiūnaitė, A. Balčiūnaitė, A. Vaiciukevičienė, and A. Selskis

572 $Pt/NbO_2/C$ Oxygen Reduction Electrocatalysts with High Activity and Durability
N. Zhang, S. Zhang, F. Kong, Y. Gao, and G. Yin

573 PdCu/C as a Methanol-Tolerant ORR Electrocatalyst
D. C. Martinez-Casillas, A. Oliver-Tolentino, R. Gonzalez-Huerta, and O. Solorza-Feria

574 Synthesis and Characterization of $Ru_5Pd_{10}Pt_2$ Oxygen Reduction Electrocatalyst for PEM Fuel Cells
F. Leyva-Noyola and O. Solorza-Feria

575 Temperature Tuned Reaction Pathways of CO Electrooxidation in Alkaline Media
J. Jiang

576 Development of Non-Precious Catalysts for Oxygen Reduction Reaction in Alkaline Electrolyte
S. Shanmugam and G. Jo

577 Pt-Pd Bimetallic Alloy Nanoelectrocatalyst for Oxygen Reduction Reaction: Study of the Effect of Composition on Electrocatalysis
S. Ghosh and C. Raj

578 Bridge to Fuel Cell Molecular Catalysis: 3D Non-Platinum Group Metal Catalyst in MEAs
X. Zhu, Q. He, G. Hwang, Z. Martin, K. Clark, J. Kerr, R. Kostecki, and A. Z. Weber

579 Highly Active and Stable Non-Precious Catalysts for Oxygen Reduction Reaction in PEM Fuel Cells Using Polypyrrole and a Chelating Agent
J. Oh, H. Oh, and H. Kim

580 Novel Method to Prevent Carbon Corrosion in PEM Fuel Cells Using Water Electrolysis Catalyst
J. Oh, W. Lee, and H. Kim

B7 - Next Generation Portable Power

Energy Technology, Battery

581 Synthesis of Transparent Mesoporous Tungsten Trioxide Films with Enhanced Photoelectrochemical Response: Application to Unassisted Solar Water Splitting
J. Park and P. Yoo

582 Formation of Nanowires Network of Polyaniline and its Derivatives for High Performance Supercapacitors
P. A. Basnayaka, M. Ram, and A. Kumar

583 Theoretical Investigation of the Li-O_2 Reduction and Evolution Reactions Catalyzed by Metal Surfaces
Y. Xu, G. Dathar, and W. A. Shelton

584 Electrochemical Investigation on Stable Nonaqueous Electrolytes for Rechargeable Li-Air Batteries
Y. Shao, W. Xu, F. Ding, Z. Nie, M. Engelhard, J. Xiao, J. Zhang, Y. Wang, and J. Liu

585 Reactions in the Non-Aqueous Lithium-O_2 Battery
Y. Chen, S. Freunberger, Z. Peng, N. E. Drewett, L. J. Hardwick, F. Barde, and P. G. Bruce

586 Using Rotating Ring-Disc Electrode Voltammetry to Quantify the Stability of Aprotic Electrolytes for Li-Air Batteries
J. Herranz, N. Tsiouvaras, M. Piana, A. Garsuch, and H. Gasteiger

587 Exploring Catalyst/Electrolyte Interactions in Li-O_2 Batteries, an Online Electrochemical Mass Spectrometry Study
S. Meini, M. Piana, N. Tsiouvaras, C. Kavakli, H. Gasteiger, and A. Garsuch

588 A High Performance Lithium-Air Battery
J. Hassoun, H. Jung, Y. Sun, and B. Scrosati

589 Transition Metal-Nitrogen-Carbon Cathode Catalysts for Oxygen-Reduction in Lithium-Air Batteries
G. Wu, S. Ma, K. L. More, and P. Zelenay

590 Manganese Oxide with Card-House-Like Structure Reassembled from Nanosheets for Li-Air Battery
S. Ida, Y. Hidaka, Y. Okamoto, A. Thapa, M. Matsuka, H. Hagiwara, and T. Ishihara

591 Thin Film Co-MnO_2 by Combined Electroless-Electrolytic Techniques for Ultracapacitor and Li-Air Battery Applications
J. R. Gomez, E. E. Kalu, R. Nelson, M. H. Weatherspoon, and J. P. Zheng

592 Potential of a Novel Sugar-Air Flow Battery
S. Li, D. Scott, and B. Liaw

593 Aerobic and Anaerobic Operation of an Active Membraneless Direct Methanol Fuel Cell
M. S. Dara, A. Lam, D. Wilkinson, and K. Fatih

594 Direct Dimethyl Ether Fuel Cell with Much Improved Performance
Q. Li, G. Wu, Y. Kim, C. M. Johnston, and P. Zelenay

595 Moving Beyond Current Energy Density Boundaries
E. Takeuchi, A. Marschilok, and K. Takeuchi

596 Synthesis, Structure and Electrochemistry of Lithium Iron Phosphate Material for Lithium-Ion Batteries
J. Thomas, R. Humana, E. Castro, R. Milocco, and A. Visintin

597 Pitch Carbon-Coated Lithium Sulfide Electrode for Advanced, Lithium-Metal Free-Sulfur Batteries
J. Park, J. Kim, J. Hassoun, Y. Sun, and B. Scrosati

598 A Contribution to the Progress of High Energy Batteries: A Metal-Free, Lithium-Ion, Silicon-Sulfur Battery
J. Hassoun, J. Kim, D. Lee, H. Jung, S. Lee, Y. Sun, and B. Scrosati

599 Hollow Carbon Nanospheres/Alloying Metal Anodes for Lithium-Ion Batteries
M. J. Wagner

600 Influence of Dapant on Electrochemical Performance of Li Excess Cathode
B. Song, M. Lai, and L. Lu

601 Influence of the Nanosize Effect on the Electrochemical Kinetics and the Structural Response of V_2O_5 and Rutile TiO_2 as Lithium Intercalation Compounds
J. Pereira-Ramos, R. Baddour-Hadjean, and S. Bach

C1 - Organic and Biological Electrochemistry General Poster Session

Organic and Biological Electrochemistry

602 Spectroscopic Characterization of the Compatibility of Fresh and Aged Novec™ 71IPA with Beryllium, Stainless Uranium, 304L Stainless Steel, and Aluminum Alloy 2024-T3
L. Petry, D. Hansen, T. Wittberg, C. Barklay, D. Kramer, Y. Yoon, H. Knachel, J. Birkbeck, B. Russell, and W. Moddeman

603 Electricity Generation in Microbial Fuel Cell by the Decomposition of Organic Slurry by E-Coli
D. S. Songera, A. Kabra, and A. Choudhary

604 Enhanced Panchromatic Light Harvesting Characteristics from Adsorption Rate Controlled Mixed Dye Solution for Dye-Sensitized Solar Cells
H. Yang, Y. Kim, S. Kim, K. Ahn, and J. Kim

605 Optimization of Electropolymerized Nickel Salen-Based Film for Electro-Oxidation of Aldehydes
N. Wannaprom and P. Vanalabhpatana

606 Molecular Design and Photovoltaic Performances of Organic Dyes Containing Triphenylamine for Dye-Sensitized Solar Cell
M. Jung, Y. Kim, J. Cheon, K. Ahn, and J. Kim

607 Enhanced Light Harvesting Efficiency by Först Resonance Energy Transfer in Quasi-Solid State DSSC Using Blue Dye
S. Choi, S. Kim, J. Lee, T. Trang, and J. Kim

608 Synthesis and Photovoltaic Properties of Organo-Dendritic Photosensitizers Based on Carbazole and Phenothiazine for DSSC
D. Jung, J. Lee, M. Kim, and J. Kim

609 Electrophoretic Display Driven by Commercially Applicable, All-Solution-Processed Organic Thin-Film Transistors
K. Kim, H. Na, J. Lee, C. Park, J. Bae, W. Shin, C. Kim, M. Jun, and Y. Hwang

610 Organic Nonvolatile Memory Devices Fabricated by an Inkjet Printing Method
Y. Yang, J. Koo, T. Kim, S. Jung, K. Baeg, S. Lee, M. Kim, B. Na, and I. You

C2 - 10th Manual M. Baizer Memorial Symposium on Organic Electrochemistry

Organic and Biological Electrochemistry

611 Adventures in Organic Electrochemistry: 50 Years at Indiana University
D. G. Peters

612 Cathodic Grafting of Alkyl Chains onto Glassy Carbon Easy Immobilization of Ferrocene Used as Redox Probe
V. Jouikov and J. Simonet

613 Electron Transfer to and from Au_{25} Nanoclusters
S. Antonello, F. Polo, and F. Maran

614 Decarboxylation Versus Desilylation in the Anodic Oxidation of a-silylacetic acid, $Ph_2(Me)SiCH_2COOH$
L. Brakha and J. Y. Becker

615 Indirect Cation Flow Method Flash Generation of Alkoxycarbenium Ions and Studies on Stability of Glycosyl Cations
J. Yoshida, K. Saito, K. Ueoka, K. Matsumoto, S. Suga, and T. Nokami

616 Electron-Transfer-Induced Intermolecular Cycloaddition Reactions
Y. Okada and K. Chiba

617 Carborane Anions 1-X-12-Y-$CB_{11}Me_{10}^-$: Electrochemical Oxidation in Liquid SO_2
A. Wahab, J. Klíma, J. Michl, and J. Ludvík

C3 - Progress in Fundamental and Applied Bioelectrochemistry

Organic and Biological Electrochemistry, Physical and Analytical Electrochemistry

631 Switchable Electrode Interfaces Controlled by Biological Signals
E. Katz, J. Halámek, V. Bocharova, and L. Halámková

632 Superefficient Electron Transfer through 3_{10}-Helical Peptides
P. Gobbo, S. Antonello, I. Guryanov, M. Hesari, and F. Maran

633 Electrochemical Genotoxicity Screening Microfluidic Array for Arylamine Reactive Metabolites Formed by Multi Enzyme Bioactivation
D. P. Wasalathanthri, A. Joshi, and J. F. Rusling

634 Optimizing Chronocoulometric Solution Detection of Cholesterol at Micro- to Nanoscale Dimensions for Biosensor Applications
R. H. West and J. D. Burgess

635 Nanostructured Microfluidic Arrays for the Detection of Cancer Biomarker Proteins
J. F. Rusling, B. Chikkaveeraiah, V. Mani, R. Malhotra, C. K. Tang, N. Sardesai, and A. Vaze

636 Nanostructured Immunosensor for Attomolar Detection of Cancer Biomarker IL-8 Using Massively Labeled Superparamagnetic Particles
B. Munge, A. Coffey, J. Doucette, B. Somba, R. Malhotra, V. Patel, J. Gutkind, and J. F. Rusling

637 Microfluidic Electrochemical Immunoarray with Microwells from Gold Compact Discs for Detection of Cancer Biomarker Proteins
C. K. Tang, A. Vaze, and J. F. Rusling

638 Ultrasensitive Detection of Peanut Allergen Specific Antibodies in Serum Using Electrochemical Microfluidic Immunoarrays
V. Mani, A. Joshi, M. W. Peczuh, and J. F. Rusling

639 Detection of Antibodies and Nanoparticles by Resistive-Pulse Measurements with Nanopipettes
K. Kececi, Y. Wang, M. V. Mirkin, V. Mani, and J. F. Rusling

640 In Situ Imaging of Electrochemically Controlled Liposome Incorporation into a Lipid-Like Layer
A. Musgrove and D. Bizzotto

641 Molecular Adsorption and Isoelectric Point of Bovine Serum Albumin at the Electrified Air-Water Interface
K. Engelhardt, A. Rumpel, B. Braunschweig, and W. Peukert

642 Investigations of Electrode Size on Chronoamperometric Measurements of Dopamine in Rat Brain Tissue
P. A. Lukus and J. O. Schenk

643 Porous NiO with Tailored Nanostructure and Its Sensitive Hydrogen Peroxide Biosensor
C. Leo, P. Zhang, M. Xu, S. Bao, and D. Jia

D1 - Corrosion General Session

Corrosion

644 Corrosion Performance of Zinc-Rich Paints(ZRP) on Mild Steel in NaCl Solution
A. H. Sofian, A. Tanaka, and K. Noda

645 Corrosion Protection of Steel with Duplex FCAD/ALD Oxide Nanocoatings
V. Maurice, B. Díaz, E. Härkönen, S. Tervakangas, J. Swiatowska, L. Tóth, G. Radnóczi, J. Kohlemainen, M. Ritala, and P. Marcus

646 Potential of Metal Oxide Thin Films For Preventing Corrosion in Carbon, Stainless, and Metal-Plated Carbon Steels
J. J. Jackowski, M. Tejedor, and M. A. Anderson

647 Corrosion of Aluminized Steel in Aggressive Natural Water
M. Akhoondan and A. A. Sagüés

648 Quaternary Alloy of Ni-Zn-Cu-P from Hypophosphite Based Electroless Deposition Method
M. Zaimi and K. Noda

649 On the Fabrication of Highly Ordered Sn-doped and Fe-doped TiO_2 Nanotubes: Toward Improved Optical and Electronic Properties
N. Kyerematenq, V. Hornebecq, P. Knauth, and T. Djenizian

650 Tailoring of the Internal Pore Structure of Anodic Aluminum Oxide (AAO) by Pulsed Anodization of Aluminum
W. Lee

651 New Evidence of Catalase-Mediated Biocorrosion in Escherichia Coli
S. Baeza, M. Azocar, M. Gulppi, F. Melo, N. Vejar, A. Monsalve, J. Pérez, C. Vasquez, J. Pavez, J. H. Zagal, and M. A. Páez

652 Anaerobic Microbial Corrosion of Steel
D. D. Bala and D. Chidambaram

653 Corrosion under Simulated Grout Conditions for Prestressed Concrete
R. D. Kalina, H. G. Wheat, S. MacLean, and J. Breen

654 Investigation of Passivity of Iron and Carbon Steel in Simulated Concrete Pore Solutions
H. Gunay, O. Isgor, and P. Ghods

655 Corrosion of Fe-(8.5~36.9) wt.%Cr Alloys at 600-800°C in H_2S and H_2O Gas Atmospheres
M. Kim, X. Chunyu, S. Kim, and D. Lee

669 Electropolishing Effect on Corrosion Resistance of Electrodeposited Nanocrystalline Ni-Mo Alloy Coatings in NaCl Solution
B. Roozbehani, M. Allahyarzadeh, A. Ashrafi, and S. Shadizadeh

670 Cu - Fe Galvanic Coupling; A Simple Technique to Study the Corrosion Inhibition Mechanism of Benzotriazole for Cu and a Corrosion Inhibition Method for Fe
A. M. Abdullah, N. Atta, A. Galal, and A. Afifi

671 Correlation between Field Exposure and Laboratory Corrosion Tests for Galvanic Couples between Titanium Diboride and Aluminum Using the Zero-Resistance Ammeter Technique in Humid Environments
R. Srinivasan and L. H. Hihara

672 Atomistic Simulations on the Dynamics of Chloride Ion Adsorption onto a MgO Substrate
S. K. Sankaranarayanan, S. Deshmukh, and S. Ramanathan

673 Microstructural Characterization of Atmospheric Corrosion of Nickel Coated Carbon Reinforced Aluminum (Al/C/50f) Metal Matrix Composites
S. Tiwari and L. H. Hihara

674 Molybdenum Based Conversion Coatings for Aerospace Aluminum Alloys
D. Rodriguez and D. Chidambaram

675 Formation and Anti-Corrosion Properties of Self-Assembled Vinilsilicon Nanolayers on Copper Surface
M. A. Petrunin, L. Maksaeva, T. Yurasova, and E. Terekhova

676 Electrochemical Corrosion Properties of Cerium-Based Conversion and PEO Coated AZ31 Mg Alloys
T. Lim, H. Ryu, and S. Hong

E1 - Dielectrics for Nanosystems 5: Materials Science, Processing, Reliability, and Manufacturing

Dielectric Science and Technology

677 New Dielectric Nanomaterials Fabricated from Nanosheet Technique
M. Osada and T. Sasaki

678 Semiconductor Nanocrystals Embedded in High-k Materials
J. Heitmann

679 Low-Temperature Growth of Ge Nanowires by Vapor-Liquid-Solid Chemical Vapor Deposition
M. Simanullang, A. Seyhan, K. Usami, T. Kodera, Y. Kawano, and S. Oda

680 Experimental Determination of the Electronic Density of States for Graphene Oxide
B. W. Alphenaar

681 Nanocontact Epitaxy of Thin Films on Si Substrates Using Nanodot Seeds Fabricated by Ultrathin SiO_2 Film Technique
Y. Nakamura and M. Ichikawa

682 Mechanism of Vfb Shift in HfO_2 Gate Stack by Al Diffusion from $(TaC)_{1-x}Al_x$ Gate Electrode
T. Nabatame, M. Kimura, H. Yamada, A. Ohi, T. Ohishi, and T. Chikyow

683 High-k on InAs 100 and 111B Surfaces
E. Lind, J. Wu, and L. Wernersson

684 Scanning Probe Analysis of Dielectrics on High Mobility Substrates
S. H. Olsen and R. Kapoor

685 Can Metal/Al_2O_3/$In_{0.53}Ga_{0.47}As$/InP MOSCAP Properties Translate to $In_{0.53}Ga_{0.47}As$ MOSFET Characteristics
K. Cherkaoui, V. Djara, É. O'Connor, J. Lin, M. A. Negara, I. M. Povey, S. Monaghan, and P. K. Hurley

686 Effects of the Interfacial Layer on Electrical Properties of TiO_2-based High-k Dielectric Composite Films
C. Kim and I. Yun

687 *In Situ* XPS Study on ALD (Atomic Layer Deposition) of High-k Dielectrics
J. Kim

688 Admittance Spectroscopy of Si/$LaLuO_3$ and Si/GdSiO MOS Structures
F. Ducroquet, O. Engström, H. D. Gottlob, J. J. Lopes, and J. Schubert

689 Comprehensive Demonstration and Physical Origin of HfO_2 Gate Stacks: Band Alignment, V_{FB} Shift and Fermi Level Pinning
X. L. Wang, W. Wang, K. Han, J. Zhang, J. Xiang, X. Ma, H. Yang, D. Chen, and T. Ye

690 Electrical and Optical Characterization of GeON Layers with high-*k* Gate Stacks on Germanium for Future MOSFETs
S. N. Murad, P. T. Baine, J. H. Montgomery, D. W. McNeill, S. Mitchell, B. Armstrong, and M. Modreanu

691 Impact of Si Diffusion Barrier Layer Formed on TiN Surface by *In Situ* Oxygen Treatment Process for Advanced Gate-First Metal/High-k Stacks
N. Kitano, K. Chikaraishi, H. Arimura, T. Hosoi, T. Shimura, T. Seino, H. Watanabe, and T. Nakagawa

692 Fabrication and Investigation of Metal-Insulator-Insulator-Metal (MIIM) Tunnel Diodes Using Atomic Layer Deposition
N. Alimardani, E. Cowell III, J. Wager, and J. Conley Jr.

706 Mechanism of Device Degradation for InGaZnO TFTs by the Drain Bias Stress in Dark and Light Illumination
S. Huang, T. Chang, L. Lin, M. Yang, K. Yang, M. Wu, M. Chen, and F. Jian

707 Polysilicon Nanowires Biosensors for pH Measurement and DNA Detection Utilizing High-k Dielectric Sensing Membrane
C. Wu, P. Hsu, C. Wang, T. Liao, H. Cheng, and Y. Wu

708 HfTiON as Charge-Trapping Layer for Nonvolatile Memory Applications
X. Huang and P. Lai

709 Hybrid Orientation Substrate Fabrication Using Electron Beam Induced Orientation Selective Epitaxial Growth of CeO_2(100) and (110) Areas on Si(100) Substrates
T. Inoue and S. Shida

710 Investigation on Hot Carrier Degradation on Ti_xN_{1-x}/HfO_2 MOSFETs
J. Tsai, T. Chang, W. Lo, C. Dai, C. Chen, H. Chen, J. Hung, O. Cheng, and C. Huang

711 Investigation on AC PBI and NBI Stress on Ti_xN_{1-x}/HfO_2 MOSFETs
S. Ho, T. Chang, C. Wu, W. Lo, C. Chen, C. Dai, J. Tsai, H. Lo, O. Cheng, and C. Huang

712 Changes in SiO_2/Si(100) Interface Structure Induced by Forming Gas Annealing
T. Suwa, Y. Kumagai, A. Teramoto, T. Muro, T. Kinoshita, S. Sugawa, T. Hattori, and T. Ohmi

713 Mechanism of Difficulty to Study the Physics of Leakage Current Reduction by Nitridation of Silicon before High-k Dielectric Deposition Due to Change in Nucleation Characteristics
W. Lau

714 Investigating the Resistance Switching Characteristics for BON-Based Thin Film Nonvolatile Memory Application
H. Tseng, T. Chang, K. Cheng, J. Huang, and Y. Chen

715 Formation of CoSi2/CoSixNy Nanocrystals for Nonvolatile Memory Application
J. Huang, T. Chang, J. Lu, S. Chen, T. Liu, Y. Chen, P. Yang, H. Huang, D. Gan, N. Ho, Y. Shi, and S. Sze

716 Low Work Function between Erbium Silicide and n-type Silicon Control by Cap Film Stress
H. Tanaka, A. Teramoto, S. Sugawa, and T. Ohmi

717 Solution Based Hybrid Dielectric for Soluble ZnO TFTs
J. Oh, S. Lim, C. Kim, K. Cho, and S. An

718 A Compact CMOS 3-D Magnetic Field Sensor
G. Wand and D. Misra

746 Dry Adhesives for MEMS Assembly, Manipulation and Integration: Progress and Challenges
D. Sameoto

747 Impact of Thermal Stability of Isolation Liner on the Electrical Characteristics of TSVs
C. Okoro, A. Afzal, B. Kandel, M. Walsh, and Y. S. Obeng

748 Innovative Gap-Fill Strategy for 28 nm Shallow Trench Isolation
A. Tavernier, L. Favennec, T. Chevolleau, and V. Jousseaume

749 Flexibility Evaluation and Improvement of Hybrid Inverters Based on Organic and Oxide Thin Film Transistors
D. I. Kim, B. Hwang, H. Jeon, K. Yu, H. Moon, B. Bae, H. Lee, and N. Lee

E2 - Graphene, Ge/III-V, Nanowires, and Emerging Materials for Post-CMOS Applications 4

Dielectric Science and Technology, Electronics and Photonics

750 Physical Properties of Bilayer Exciton Condensates
A. H. MacDonald, D. Pesin, I. Sodemann, L. F. Register, and S. K. Banerjee

751 Bilayer PseudoSpin Field Effect Transistor (BiSFET): Concepts and Critical Issues for Realization
L. F. Register, D. Reddy, X. Mau, W. Jung, I. Sodemann, D. Pesin, A. Hassibi, A. H. MacDonald, and S. K. Banerjee

752 Current Switching in Crossed Graphene Nanoribbons
R. K. Lake and K. Habib

753 Graphene Bilayers: Electron Transport and Device Applications
E. Tutuc

754 Wafer-Scale Graphene Nanoribbon Transistor Technology
D. Jena, W. Hwang, K. Tahy, P. Zhao, R. Myers-Ward, P. M. Campbell, C. R. Eddy Jr., D. Gaskill, H. Xing, and A. C. Seabaugh

755 On/Off-Current Ratios of In-Situ CCVD Grown Bilayer Graphene FETs as a Function of Temperature
P. Wessely, F. Wessely, E. Birinci, B. Riedinger, and U. Schwalke

756 Carbon Device Metrology for Direct Measurement of Reconfigurable p-n Junctions in Graphene
Y. Wang and R. E. Geer

757 Performance Analysis of Graphene RF Transistors
M. C. Lemme

758 In Situ Electrical Studies of Ozone Based Atomic Layer Deposition on Graphene
J. Kim, S. Jandhyala, G. Mordi, and B. Lee

759 Direct Graphene Growth on Oxides: Interfacial Interactions and Band Gap Formation
J. A. Kelber, M. Zhou, S. Gaddam, F. L. Pasquale, L. Kong, and P. A. Dowben

760 Aberration Corrected Microscopy of CVD Graphene and Spectroscopic Ellipsometry of Epitaxial Graphene and CVD Graphene for Comparison of the Dielectric Function
F. Nelson, E. Comfort, D. Prasad Sinha, J. Lee, A. Diebold, J. Idrobo, A. Sandin, D. B. Dougherty, D. E. Aspnes, and J. E. Rowe

761 Modeling the Growth of SWNTs and Graphene on the Atomic Scale
E. C. Neyts, A. C. van Duin, and A. Bogaerts

762 Large Area Mapping of Graphene Grain Structure and Orientation
H. Floresca, D. Hinojos, N. Lu, J. Chan, L. Colombo, R. Wallace, J. Kim, and M. J. Kim

763 III-Sb MOSFETS : Opportunities and Challenges
A. Nainani, Z. Yuan, A. Kumar, J. Boos, B. R. Bennett, and K. C. Saraswat

764 Passivation Challenges with Ge and III/V Devices
S. Sioncke, D. Lin, L. Nyns, A. Delabie, M. Caymax, A. Thean, N. Horiguchi, H. Struyf, and S. De-Gendt

765 Investigation of Thermal Stress Relief Mechanism and Corresponding Hole Mobility Improvement in Epitaxially Grown, Wafer-Scale Ge on Si, Using Air-Gapped SiO_2 Nanotemplates
S. Ghosh, D. Leonhardt, and S. M. Han

766 Integration of InGaAs Channel n-MOS Devices on 200mm Si Wafers Using the Aspect-Ratio-Trapping Technique
N. Waldron, G. Wang, N. D. Nguyen, T. Orzali, C. Merckling, G. Brammertz, P. Ong, G. Winderickx, G. Hellings, G. Eneman, M. Caymax, M. Meuris, N. Horiguchi, and A. Thean

767 Adding New Functionality to Silicon CMOS Integrated Circuits via Deterministic Assembly
T. S. Mayer, W. Hu, K. Sun, X. Zhong, T. Morrow, K. Liddell, J. S. Mayer, and C. Keating

768 Desorption of Ge Species during Thermal Oxidation of Ge and Annealing of HfO_2/GeO_2 Stacks
C. Radtke, G. Rolim, S. da Silva, G. Soares, C. Krug, and I. Baumvol

769 Supramolecular Organization of Ultra-narrow PbS Nanowires into Dimension Controlled Sheets Comparable to Three Layers of Graphene
S. Acharya

772 Reduced Perssure-Chemical Vapor Deposition of High Quality Ge Layers on SiGe/Si Superlayers for Microelectronics and Optoelectronics Purposes
D. Chen, X. Zhongying, L. Su, and M. Zhang

E3 - Integrated Optoelectronics 6

Electronics and Photonics, Dielectric Science and Technology

E4 - Nanoscale Luminescent Materials

Luminescence and Display Materials, Dielectric Science and Technology

827 (Invited) Universal Ion Implantation System for Use in the Preparation of Doped Silicon Dielectric Films
A. P. Knights, R. M. Savidge, D. V. Stevanovic, R. N. Kleiman, and D. Chivers

828 (Invited) Photon Management with Si Nanocrystals
T. Gregorkiewicz

829 (Invited) Growing Si Nanocrystals within *a*-Si Nanoclusters Embedded in *a*-SiO_2: Evolution of Photoluminescence
L. Borrero-González, L. Nunes, F. Guimarães, J. Wojcik, P. Mascher, A. Gennaro, M. Tirado, and D. Comedi

830 (Invited) Ultrafast Carrier Dynamics in Silicon Nanocrystal Films
L. V. Titova, T. L. Cocker, X. Wang, A. Meldrum, and F. A. Hegmann

831 Fast Light-Emitting Silicon-Germanium Nanostructures
D. Lockwood, X. Wu, J. Baribeau, N. Modi, and L. Tsybeskov

832 XANES and XEOL Investigation of Cerium and Terbium Co-Doped Silicon Oxide Films
P. R. Wilson, Z. Khatami, R. Dabkowski, K. Dunn, E. Chelomentsev, J. Wojcik, and P. Mascher

833 (Invited) Passivation of III-V Nanowires for Optoelectronics
R. R. LaPierre, A. C. Chia, C. M. Haapamaki, and N. Tajik

834 Emissive Semiconductor Nanocrystals: Recent Progress
A. Eychmüller, S. Panda, S. Hickey, S. Miao, V. Lesnyak, and N. Gaponik

835 Two-Photon Photoluminescence from Hierarchical ZnO Nanostructures
G. Grinblat, M. Tirado, D. Comedi, M. Capeluto, and A. Bragas

836 (Invited) Strategies for Isolating Colloidal Quantum Dot Luminescence from External Fluctuations: $Mn2^{+}$ Doping of ZnSe and Alloyed Shells on CdSe
C. N. Allen, S. A. Lamarre, J. Tessier, V. Veilleux, D. Lachance-Quirion, and M. Lecavalier

837 Photovoltaic Behavior in a Symmetrical CdSe Quantum Dot - ITO Cell
A. J. Giles and E. Stokes

838 (Invited) Si/Ge Quantum Well Light-Emitting Diode for Monolithic Integration in Si Photonics Chips
S. Saito, K. Oda, K. Tani, M. Takahashi, E. Nomoto, T. Okumura, Y. Suwa, Y. Lee, M. Sagawa, T. Sugawara, and T. Ido

839 (Invited) Rolled-up 1.55 µm Semiconductor Quantum Dot Tube Lasers
Z. Mi, P. Bianucci, M. Dastjerdi, S. Mukherjee, M. Djavid, and P. Poole

853 Optical and Luminescence Properties of Electrosynthesized ZnSe Thin Films
T. Mahalingam, V. Dhanasekaran, and G. Ravi

854 (Invited) Ballistic Electron Emission from Nanosilicon Diode and its Application to Ultra-Thin Film Deposition of Silicon and Germanium
N. Koshida, T. Ohta, and B. Gelloz

855 (Invited) Electroluminescence in Metal-Oxide-Semiconductor Tunnel Diodes with Nanometer-Thick Silicon
M. Morita, A. Tsuchida, K. Matsumura, R. Yamada, Y. Oshikane, K. Kawai, J. Uchikoshi, and K. Arima

856 (Invited) Electroluminescence from Micro-Cavities of Photonic Crystals, Micro-Disks and Rings Including Ge Dots Formed on SOI Substrates
Y. Shiraki, J. Xia, X. Xu, T. Tsuboi, and T. Maruizumi

E5 - Silicon Compatible Materials, Processes and Technologies for Advanced Integrated Circuits and Emerging Applications 2

Electronics and Photonics, Dielectric Science and Technology

857 In Quest of a Fast, Low-Voltage Digital Switch
T. N. Theis

858 Ultrathin $Ni_{1-x}Pt_x$ Films as Electrical Contact in CMOS Devices
S. Zhang

859 Characterization of Strain-Engineered Si:C Epitaxial Layers on Si Substrates
W. Yoo, T. Ishigaki, T. Ueda, J. Kajiwara, K. Kang, P. Hung, K. Ang, and B. Min

860 Tensile Strained Si Seed Produced by Ion Implantation Technique
L. Liu, Z. Xue, J. Bian, H. T. Jiang, X. Wei, Z. Di, and M. Zhang

861 Ultra Low-Temperature Epitaxial Growth of Strained Si Directly on Si Substrates
D. Shahrjerdi, B. Hekmatshoar, S. W. Bedell, J. A. Ott, and M. Hopstaken

862 Pattern Dependency of Pure-Boron-Layer Chemical-Vapor Depositions
V. Mohammadi, W. de Boer, T. L. Scholtes, and L. K. Nanver

863 The Enhancement of Etch Rate of Silicon by Heavy Doping of Phosphorus and Arsenic Atoms During Cyclic Selective Epitaxial Growth of Silicon
K. Lee, Y. Kang, H. An, S. Jeong, J. Han, B. Kim, S. Nam, H. Kang, H. Jeong, C. Chung, H. Park, and B. Choi

864 P-type Doping of Silicon Suitable for Structures with High Aspect Ratios by Using a Dopant Source of Boron Oxide Grown by Atomic Layer Deposition
B. Kalkofen, V. Mothukuru, M. Lisker, and E. P. Burte

878 Ultra-thin SOI/BOX Layers and Next Generations Planar Fully Depleted Substrates
W. Schwarzenbach, V. Barec, X. Cauchy, N. Daval, S. Kerdiles, F. Boedt, O. Bonnin, B. Nguyen, and C. Maleville

879 On-Current Variability Sources of FinFETs: Analysis and Perspective for 14nm-Lg Technology
T. Matsukawa, Y. Liu, K. Endo, S. O'uchi, and M. Masahara

880 Dynamical Observation of Epitaxial Growth of Copper Silicide/Silicon Nanowire Heterostructures
C. Chiu, C. Huang, J. Chen, Y. Huang, and W. Wu

881 Nanocrystalline MoO_x Embedded ZrHfO High-*k* Memories
X. Liu, C. Yang, Y. Kuo, and T. Yuan

882 Characterization of Grobal and Local Wafer Shape Change along Through Silicon Via Process Steps
C. Lee, S. Jie, S. Park, H. Yoo, I. Han, and W. Yoo

883 The Effect of Plasma Treatment on Reducing Electroforming Voltage of Silicon Oxide RRAM
F. Xue, Y. Chen, Y. Wang, F. Zhou, B. Fowler, and J. Lee

884 Development of High Selectivity Phosphoric Acid and Its Application to Flash STI Pattern
S. Cho, Y. Lee, J. Han, H. Park, H. Kim, K. Hong, S. Park, and H. Kang

885 Electrical Improvement of MIS Capacitor with HfAlOx Gate Dielectrics Treated by Dual Plasma Treatment
K. Chang, T. Chang, P. Chang, B. Huang, C. Wu, and I. Deng

886 Electrical and Reliability Characterization of Ti/TiN Thin Film Resistor
Y. Cheng, B. Wei, and F. Lu

887 The Bipolar Resistance Switching Behavior with a Pt/$CoSiO_X$/TiN Structure of Nonvolatile Memory Device
Y. Syu, T. Chang, G. Chang, J. Lou, T. Tsai, and Y. Tai

888 Band Gap and Band Offset with Silicon of Amorphous High-k $LaGdO_3$ Thin Films
S. P. Pavunny, R. Thomas, and R. S. Katiyar

889 Bipolar Resistive Switching Characteristics Using Al/Cu/GeO_x/W Memristors
S. Maikap and S. Rahaman

E6 - Thermal and Plasma CVD of Nanostructures and Their Applications

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

890 (Invited) Aerosol Synthesis of Single-walled Carbon Nanotube
A. G. Nasibulin, A. Kaskela, Y. Tian, H. Jiang, and E. Kauppinen

891 (Invited) Ultra-Low Temperature Plasmas for the Processing of Graphene
S. G. Walton

892 Plasma Modification of Carbon Nanotube Networks for Molecule Vapor Detection
U. Cvelbar and P. Slobodian

893 Graphene Composite Materials for Supercapacitor Electrodes
J. Lake, S. Selverston, Z. Tanaka, M. Meyyappan, and B. Chen

894 (Invited) Thermoelectric Properties of Bulk Synthesized Zn_3P_2 Nanowire and Quantum Wire Powders
S. Vaddiraju, M. Van Laer, L. Brockway, and Y. Kang

895 Single-crystalline Nickel Silicide Nanowires : Synthesis and Electrical Properties
W. Chiu, J. Chen, Y. Huang, C. Huang, and W. Wu

896 Scalable Manufacturing of Metal Oxide Nanowire Powders and Arrays
M. K. Sunkara, J. Kim, E. Clark, and J. Absher

897 ZnO Nanostructures Prepared on $LiAlO_2$ Substrates by Chemical Vapor Deposition
C. J. Lu, Y. Tu, C. Chen, T. Huang, T. Yan, M. Chou, and L. Chang

898 Development of Novel Transparent Conducting Oxide (TCO) Precursors and Preparation of TCO Thin Films
T. Chung, C. Kim, K. An, S. Lee, B. Park, and B. Lee

899 (Invited) Controlled Functionalization of Carbon Nanotubes with Nanoparticles Using Gas-Liquid Interfacial Discharge Plasmas
T. Kaneko, Q. Chen, and R. Hatakeyama

900 (Invited) Nanoscale Semiconductors by Atmospheric-Pressure Microplasmas: Synthesis and Surface Engineering
D. Mariotti

901 Plasma Electrochemistry: How Plasmas can be used to Mediate Electrochemical Reactions for Novel Chemical and Materials Applications
S. Lee and R. Sankaran

902 Control of Nano-Porosity in Plasma Enhanced Chemical Vapor Deposition of low-k a-SiC:H Dielectrics
S. King and J. Bielefeld

903 N_2O Plasma Treatment Suppressed Temperature-dependent Point Defects Formation with Amorphous Indium-Gallium-Zinc-Oxide Thin Film Transistors
J. Jhu, T. Chang, G. Chang, and Y. Tai

904 A Kinetic Model for Chemical-Vapor Deposition of Pure-Boron Layers from Diborane
V. Mohammadi, W. de Boer, T. L. Scholtes, and L. K. Nanver

905 Multi-Wall Carbon Nanotube Networks as a Tool for Organic Vapor Detection
R. Olejnik, P. Slobodian, P. Saha, and U. Cvelbar

906 Copper Oxide Nanowire Synthesis by Direct Oxidation of Copper in Oxygen Plasma
G. Filipič and U. Cvelbar

E7 - Wide-Bandgap Semiconductor Materials and Devices 13

Electronics and Photonics, Dielectric Science and Technology, Sensor

907 High-Performance Wide-Bandwidth GaN Power Amplifiers
K. Shenai and S. Leong

908 Effects of Cell Distance on the Performance of GaN High-Voltage Light Emitting Diodes
R. Horng and Y. Kuo

909 GaN Power Schottky Diodes
R. P. Tompkins, J. R. Smith, S. Zhou, K. W. Kirchner, M. A. Derenge, K. A. Jones, G. Mulholland, P. Suvarna, M. Tungare, and S. Shahedipour-Sandvik

910 Design, Fabrication, Characterization, and Evaluation of X-ray Detectors Based on n-type 4H-SiC Epilayers
K. C. Mandal, P. G. Muzykov, and J. Terry

911 Chemical Lift-Off of Blue Light-Emitting Diodes Grown on Sapphire Substrate with an Oxide-Patterned Sacrificial Layer
C. Pan, K. Shen, D. Wuu, H. Hsueh, and R. Horng

912 Ferroelectric Nanolithography for Fabrication of Nanostructures and Nanomaterials
X. Liu, K. Kitamura, and G. Cao

913 Enhanced Optical Properties of Metal Oxide Core-Shell Nanowire Arrays
M. Thomas and J. Cui

914 Optical and Magnetic Properties of MBE Grown GaN:Yb Nanorods
J. Wu, H. Huhtinen, W. M. Jadwisienczak, and R. Palai

915 Aluminum Coating of ZnO Nanorods for High Spectral Purity NanoLasers
G. Visimberga, C. C. Faulkner, M. Boese, and C. O'Dwyer

916 Microstructure Characterization of Nonpolar ZnO and $Zn_{1-x}Mg_xO$ Epilayers Grown on (100) Gamma-$LiAlO_2$ by Chemical Vapor Deposition
T. Huang, W. Lin, J. Wu, M. Chou, T. Yan, and L. Chang

917 Superatmospheric MOCVD Reactor Design for High Quality InGaN Growth
A. G. Melton, P. Davis, M. Uddin, and E. Stokes

918 Healing of Surface States and Point Defects in Single-Crystalline β-Ga_2O_3 Epilayer
P. Ravadgar and R. Horng

919 Ferromagnetic Behavior and Optical Properties in Ytterbium-doped and Ion Implanted GaN Semiconductor
W. M. Jadwisienczak, R. Palai, J. Wu, H. Tanaka, J. Wang, and H. Huhtinen

920 In situ Growth Process Monitoring by RHEED and Magnetoptic Properties of Epitaxial GaN:ErYb Thin Films
K. Dasari, H. Huhtinen, W. M. Jadwisienczak, and R. Palai

921 The Use of a Remote Plasma to Tune the Optical and Electrical Properties of Atomic Layer Deposited ZnO
M. Thomas and J. Cui

922 Carrier Control in Polycrystalline ZnO:Ga Thin Films via Nitrogen Implantation
K. S. Shtereva, I. Novotny, V. Tvarozek, P. Sutta, A. Vincze, C. Jeynes, N. Peng, M. Vojs, and S. Flickyngerova

923 Dilute Magnetic Semiconductors: Electrochemical Routes and ab initio Studies of ZnO
P. Dunne, M. Uhlemann, A. Gebert, and L. Schultz

924 Effects of Alternating Pulse Bias Stress on Amorphous InGaZnO Thin Film Transistors
S. Park, E. N. Cho, and I. Yun

925 Asymmetric Electrical Properties for Dual-Gate InGaZnO TFT Under Gate Bias and Light Illumination
T. Chen, T. Chang, T. Hsieh, C. Lin, F. Jian, and M. Tsai

926 Investigating the Degradation Behavior Under Hot Carrier Stress for InGaZnO TFT with Symmetric and Asymmetric Structure
M. Tsai, T. Chang, A. Chu, T. Chen, T. Hsieh, and Y. Chen

927 Investigating Degradation Behavior of InGaZnO Thin-Film Transistors induced by Charge-Trapping Effect under DC and AC Gate-Bias Stress
T. Hsieh, T. Chang, T. Chen, M. Tsai, Y. Chen, and F. Jian

928 Study of the 700 nm Emitting Spectrum Using GaInP Quantum Dots in the AlGaInP-Based Light Emitting Diodes
H. Oh, J. Park, H. Ryu, H. Lee, Y. Kim, I. Jang, and J. Baek

929 $Cu(In,Ga)Se_2$ Thin Films Preparation from a Cu(In,Ga) Metallic Alloy and Se Thin Film by Atmosphere Pressure Plasma Depositon System
K. Chang, P. Ho, K. Yang, S. Wu, and C. Liu

930 In-Situ TEM Observation of Resistive Switching Behaviors by in Nonvolatile Memory
J. Chen, C. Huang, C. Hsin, Y. Huang, and W. Wu

931 Deposition and Characterization of Low-cost Spray Pyrolyzed Cu_2ZnSnS_4 Thin-films for Large-area high-efficiency Heterojunction Solar Cells
S. Das, C. Frye, P. G. Muzykov, and K. C. Mandal

932 Growth of a-plane ZnO Thin Film on (110) $NdGaO_3$ Substrate by Pulsed Laser Deposition
T. Yen, J. Tian, C. Peng, Y. Ho, Y. Wu, and L. Chang

933 Influence of Cathodic Potential on Structural and Optical Properties of ZnO;Mg Thin Film
H. Ishizaki and S. Ito

934 Suppressed Temperature-dependent Sub-threshold Leakage Current of amorphous Indium-Gallium-Zinc-Oxide Thin Film Transistors by Nitrous Oxide Plasma Treatment
G. Chang, T. Chang, Y. Syu, J. Jhu, Y. Tai, and T. Tsai

935 Band Gap Modulation in ZnO Thin Films Through Cd Doping by sol-gel Method and Its Characterizations
A. Singh, J. Deshwal, D. Kumar, P. Khanna, and M. Kumar

936 Effect of Individual and Bi-layer Stack Gate Dielectric on Device Performance for Amorphous Indium Gallium Zinc Oxide (a-IGZO) TFTs
A. Kiani, S. Pfaendler, B. Bayer, D. Hasko, W. Milne, and A. Flewitt

937 Low-voltage IGZO TFT Prepared by APPJ Using HfO_2 as a Gate Dielectric
K. Chang, S. Huang, W. Chiang, I. Deng, C. Wu, and C. Chang

938 The Effect of Thermal Annealing on the Properties of IGZO TFT Prepared by Atmospheric Pressure Plasma Jet
K. Chang, S. Huang, W. Chiang, C. Wu, and C. Chang

939 Point Defects in Chemical-Vapor Deposited Diamond, High-Purity Semi-Insulating SiC, and Epitaxial GaN
V. I. Polyakov, A. Rukovishnikov, B. Garin, and B. Druz

940 The Effect of Plasma Power on the Morphology of Selenium Thin Films Prepared by Atmosphere Pressure Plasma Depositon System
K. Chang, P. Ho, K. Yang, S. Wu, and C. Liu

941 Drain Leakage Current in Δ-channel SOI nMOSFET Operating at High Temperatures
M. M. Correia and M. Bellodi

942 Structural and Optoelectronic Properties of GZO/SiO_x Bilayer Films by Atmosphere Pressure Plasma Jet
K. Chang, P. Ho, C. Wu, C. Wu, and C. Chang

943 Formation of p-n Junction from n-type Nanostructures (GaN or ZnO) / p-thin Film
J. Ahn and J. Kim

944 The Effect of Oxgen Species on the ZnO TFT Prepared by Atmosphere Pressure Plasma Jet
K. Chang, S. Huang, C. Chi, C. Wu, and C. Chang

945 Effect of Enhanced-mobility Current Path in Transparent a IZGO TFT
J. Park and D. Choi

946 Epitaxial Lateral Overgrowth on the Air Void Embedded SiO_2 Mask for InGaN Light-Emitting Diodes
S. Kim, K. Lee, A. Chang, E. You, and J. Baek

947 The Origin of Threshold Voltage Instability in Amorphous Oxide Semiconductors Thin Film Transistor in Different Ambient Gases
Y. Chen, T. Chang, H. Li, and W. Chung

948 The Influences of Oxygen Incorporation on the Interface Properties of a-IGZO Thin Film Transistors
C. Lo and T. Hsieh

949 Electrical Properties of Vertically- Aligned ZnO Nanowires Investigated by Current Sensing AFM and Kelvin Probe Force Microscopy
V. Jain, G. Kushto, and A. Mäkinen

950 Step-Roughened N-face GaN Surface on InGaN Light-Emitting Diodes Using a Laser Decomposition Process
C. Lin, S. Chen, T. Hsieh, W. Huang, T. Yu, and P. Tsai

951 Dielectric Loss at MM Range and Deep Level Transient Spectroscopy of the Diamond Grown by DC Arc Plasma Jet Technique
B. Garin, V. Parshin, V. I. Polyakov, A. Rukovishnikov, E. Serov, C. Jia, F. Lu, and W. Tang

F1 - Stress-Related Phenomena in Electrochemical Systems 2

Electrodeposition, Corrosion, Battery

952 Effect of Chloride and Polyethylene Glycol (PEG) on Stress and Microstructure in Electrodeposited Copper Nanofilms
M. O'Grady and D. N. Buckley

953 Residual Stress in Fe/GaAs Spin Contacts
S. Majumder, S. Shaw, and K. Kavanagh

954 Electrochemical Impedance Spectroscopy Applied to Cantilever Curvature
G. R. Stafford, U. Bertocci, and M. Lafouresse

970 The Influence of Chemical degradation and Mechanical Fatigue on the Cycle Life of Lithium Ion Batteries
M. Verbrugge, R. Deshpande, Y. Cheng, J. Wang, and P. Liu

971 Continuum Modeling of Strongly-coupled Diffusion, Stress, and Solute Concentration
H. haftbaradaran and H. Gao

972 Fracture Analysis of the Cathode in Li-Ion Batteries: A Simulation Study
M. Zhu, J. Park, and A. Sastry

973 Structural Changes in $Li(Ni_xCo_yMn_z)O_2$ and $LiMn_2O_4$ Mixed Cathodes as Monitored by a Novel In Situ Laboratory XRD Cell
K. J. Rhodes and A. Drews

974 Fracture and Debonding in Coated Hollow Nanostructured Electrodes of Lithium-Ion Batteries
M. Pharr

975 Stress-Induced Capacity Fade Due to Separator Creep in Lithium-Ion Cells
J. Cannarella, C. Peabody, and C. B. Arnold

976 Electrochemical Surface Stress Measurements of Li-Ion Battery Anodes During Li^+ Deposition
H. Tavassol, D. Cahill, and A. Gewirth

977 Stress Evolution in Lithium-Ion Battery Electrode Coatings During Electrochemical Cycling
V. Sethuraman, N. Van Winkle, D. Abraham, A. Bower, and P. Guduru

978 Modeling of Volume Change Behavior of Porous Electrodes
J. Moraveji and J. Weidner

979 In-Situ Measurement of Stress Evolution and Ion Dynamics in Conducting Polymer Films
S. Sen, S. Jin, S. Kim, L. Palmore, N. Jadhav, E. Chason, and G. Palmore

980 Stress Change in Nafion During Water Uptake
G. R. Stafford, J. Shin, S. Eastman, B. Rowe, and K. Page

F2 - Surface Treatments for Biomedical Applications 3

Electrodeposition, Corrosion, Sensor

981 The Effect of Biomolecules on Electrochemical Behavior on CoCrMo Alloy in Simulated Physiological Solution
I. Milosev

982 Investigation of the Seizing of Ti6Al4V Orthopedic Constructs In Vitro: Further Results in Hanks Balanced Salt Solution
D. Hansen, H. Bamberger DO, V. Fongue DO, K. Janek, and P. Sjoblom

997 In Vitro Evaluation of Osteoblast-like Cell Adhesion and Proliferation on Titanium Substrate with Different Surface Treatments
H. Chen, C. Hsieh, and C. Lai

G1 - Industrial Electrochemistry and Electrochemical Engineering General Session

Industrial Electrochemistry and Electrochemical Engineering

998 On the Process of Niobium Anodic Oxidation in Potassium Nitrate Melt
L. Skatkov and V. Gomozov

999 Uranium Electrodeposition for Irradiation Targets
A. M. Saliba-Silva, R. Garcia, E. Bertin, and E. Urano de Carvalho

1000 Characterization of Electroplated Ni- TiO_2 Composite Coating
S. Park and J. Lee

1001 Oxidation of Cr^{3+}-Ions at the Composite TiO_x/PtO_y Electrode
O. Kasian, T. Luk'yanenko, and A. Velichenko

1002 Mathematical Model for the Formation of Porous AIIIBV Semiconductors
V. Vital'yvish, M. Stetsenko, and Y. Suchikova

1003 Preparation and Characterization of Electrosynthesized ZnSeTe Thin Films
M. Mahalingam, V. Dhanasekaran, and J. Chu

1004 Improvement of the durability of IrO_2-Ta_2O_5/Ti Anodes for Oxygen Evolution in Periodically Reversed Electrolysis
N. Mori, Y. Ito, Y. Shimizu, M. Matsunaga, and M. Nagase

1005 A New Energy-Efficient and Environmentally-Friendly Process to Produce Aluminum
T. R. Beck

1006 Sputter Deposited Electrode Material for Electrocatalytic Desulfurization of Crude and its Fractions
Z. Yusuf, A. Hammad, N. Rasheedi, and A. Zahrani

1007 Analysis of Ammonia Electro-Oxidation Mechanism with Rotating Disk Electrode (RDE)
L. A. Diaz Aldana and G. Botte

1008 Multilayer Electrochemically Deposited Copper Structures for Impurity Diffusion Analysis
M. Rizzolo, E. Lifshin, and K. Dunn

1009 Experimental Investigation of Two-Phase Electrolysis Processes
Z. Derhoumi, P. Mandin, and H. Roustan

1010 Influence of Seed Texture on Damascene Copper
B. B. OBrien and K. Dunn

1011 Sulfur Dioxide Diffusion Coefficient and Solubility in a Two Layer Proton Exchange Membrane
J. Jayakumar, C. Kim, and J. Weidner

1012 Gas-Phase Hybrid Sulfur Electrolyzer Stack
S. G. Stone, S. McCatty, J. Hernández-Cintrón, J. Vishnuvarman, and J. Weidner

G3 - Characterization of Porous Materials 5

Industrial Electrochemistry and Electrochemical Engineering, Electrodeposition, Energy Technology

1013 Double Templates Synthesis of Mesoporous Nanowires
J. Lee

1014 Mesoporous-Carbon-PEDOT Composite as Durable Catalyst-Support for PEFCs
T. Kottakkat, A. Jalajakshi, A. K. Sahu, P. Sethuraman, S. Parthasarathi, and A. K. Shukla

1015 Hydrogen Generation from Ammonia Borane by Co/Mesoporous Silica Catalysts
P. Yu, W. Ma, H. Tsai, J. Lee, and Y. Chen-Yang

1016 Sulfidation of Nanoporous Titanium Oxide Films Grown by Anodization for Lithium-Ion Intercalation
A. Santos, L. Taveira, T. Djenizian, and L. P. Dick

1017 Preparation of Nano Porous Metal Oxide Electrode for Supercapacitors
M. Jeong, S. Cherevko, Z. Kai, and C. Chung

1018 Synthesis of Nanostructured Materials from Thioether-Bridged Organosilica and Their Application as a Cathode Support in PEMFC
J. Kim, Y. Kim, and J. Yu

1019 Nanostructured, Porous Palladium Alloys from Consolidation of Dendrimer Encapsulated Nanoparticles for Hydrogen Isotope Separation and Storage
P. J. Cappillino, M. Hekmaty, and D. B. Robinson

1020 Novel Carbon Nanofiber Precursor For Supercapacitor Applications: 6FDA-DAM:DABA
K. Jung, S. Wijenayake, and J. P. Ferraris

1021 Thermal Stability and Adhesion of Low-Emissivity Electroplated Au Coatings
N. Yang, A. M. Morales, T. Johnson, and B. Mills

1022 Synthesis of Copper-Based Metal Sponges with Open-Cell Structure by Electrochemical Process
S. Kim, B. Bui, K. Kim, and B. Im

1023 Hydrophobicity of Heat-treated Colloid-Imprinted Carbons for PEMFC Applications
X. Li, D. Banham, F. Feng, S. Ye, D. Kwok, and V. Birss

1024 Optimisation of Tungsten Carbide-derived Carbon as Electrode Material for Supercapacitors
I. Tallo, T. Thomberg, A. Jänes, and E. Lust

1025 Characterisation of Non-Aqueous Symmetrical Supercapacitors Using Aluminium and Titanium Current Collectors
A. Jänes, J. Eskusson, and E. Lust

1026 Synchrotron Tomography of Porous Lithium-Ion Battery Anodes
L. Trahey, F. Brushett, B. Blaiszik, V. Rose, R. Winarski, X. Xiao, C. Johnson, J. Vaughey, and M. Thackeray

1027 Using Multiple Length Scale X-ray CT to Characterize Electrochemical Devices
P. Shearing, J. Gelb, R. Bradley, F. Tariq, P. Withers, and N. Brandon

1028 Effects of Pore Structure and Myristic Acid on the Wettability of the AAO Surface
F. Behzadi, M. Moradi, M. Noormohammadi, and S. Sabaghi

1029 Numerical Simulation and Analysis of Effective Diffusivity in Porous Diffusion Layers of Fuel Cells
D. Choy, G. Della Rocca, and G. Blanquart

1030 Microscopic Scale Modeling of Effective Transport Properties in Li-Ion Cathodes with Network Theory
W. Du, A. Gupta, N. Xue, J. Martins, A. Sastry, and W. Shyy

G4 - Electrochemical Engineering for the 21st Century 2

Industrial Electrochemistry and Electrochemical Engineering, Electrodeposition, Energy Technology

1031 Multiscale Stochastic Simulation of Surface Diffusion During Early Stages of Electrodeposition
A. Bezzola, R. Alkire, and L. Petzold

1032 Multi-Scale Simulation of Synergistic Effects of Additives in Damascene Electroplating
Y. Kaneko, K. Ohara, and F. Asa

1033 Solder Void Formation in Lead Free Solder
C. L. Arvin, E. Perfecto, R. Davis, B. St. Lawrence, K. Miller, and A. Keigler

1034 Flow Channel Geometry and Rib Design Optimization of a Planar Solid Oxide Fuel Cell Stack Using CFD
H. Kanani and Y. Mollayi Barzi

1035 Electrical Properties and Thermal Expansion of $La_{0.5}Ca_{0.5}TixMn_{(1-x)}O_{3-\delta}$ ($0 \leq x \leq 0.2$) as an SOFC Interconnect Sintered by EDTA/Citrate Method
N. Raeis Hosseini, N. Sammes, and J. Chung

1036 Periodic Modulation of Sb Stoichiometry in $Bi_2Te_3/Bi_{2-x}Sb_xTe_3$ Superlattices Using Pulsed Electrodeposition
D. Banga, J. Lensch-Falk, D. Medlin, V. Stavila, N. Yang, D. B. Robinson, and P. Sharma

1037 Progress in Nanowire Growth and Mechanistic Analysis of Silicon Electrodeposition in Ionic Liquid
J. Komadina, T. Akiyoshi, Y. Ishibashi, Y. Fukunaka, P. Pianetta, and T. Homma

1038 Repeatable Bipolar Resistive Switching with Both Polarity Dependent SET/RESET Scenario Using $Al/Cu/Ge_{0.2}Se_{0.8}/W$ Structure
S. Rahaman, S. Maikap, H. Lee, W. Chen, F. Chen, M. Kao, and M. Tsai

1039 Quinone-Based Redox Catalyst for the Electroreduction of Oxygen to Hydrogen Peroxide
A. Wang, A. Bonakdarpour, D. Wilkinson, and E. Gyenge

1040 Atomistic and Coarse-Grained Molecular Dynamics Simulation of a Cross-Linked Sulfonated Poly (1, 3-Cyclohexadiene)-Based Proton Exchange Membrane
Q. Wang, D. J. Keffer, S. Deng, and J. Mays

1041 Meso-scale Simulations of Nafion Degradation in Polymer Electrolyte Fuel Cells
K. Malek and A. A. Franco

1042 Fuel Cell Reaction Kinetics Using Bayesian Variable Selection
N. Galagali and Y. Marzouk

1043 A New Multiscale Physical Model for the Transient Analysis of PEM Water Electrolyzers
A. A. Franco, L. Lopes Oliveira, and C. Jallut

1044 Composite Co/C Catalysts for Electroreduction of O_2 to H_2O_2
A. Bonakdarpour, E. Gyenge, and D. Wilkinson

1045 Electrosynthesis of Hydrogen Peroxide in a PEM Fuel Cell for Drinking Water Purification
W. Li, A. Bonakdarpour, D. Wilkinson, and E. Gyenge

1046 Intercalate Diffusion in Multiphase Electrode Materials and Application to Lithiated Graphite
D. R. Baker and M. Verbrugge

1047 Model Based Optimal Design of Electrode Architecture of Lithium-Ion Batteries
V. Ramadesigan, P. W. Northrop, S. De, G. Sikha, R. Braatz, and V. R. Subramanian

1048 Modeling of Grain Boundary and Its Effect on Li_+ Effective Diffusivity and Intercalation-Induced Stresses in Li-Ion Battery Isotropic Active Materials
S. Han, J. Park, W. Lu, and A. Sastry

1049 Variational Multi-Scale Enrichment for Electrochemical-Mechanical Li-Ion Battery Cell
S. Lee, J. Park, M. Zhu, and A. Sastry

1050 Electrochemical and Transport Behavior of Lithium Ion Battery 3-D Electrode Architectures
M. Martin, P. P. Mukherjee, S. Pannala, S. Allu, D. Ranjan, and J. Turner

1051 Nano Effects on Li Diffusion and Li-induced Phase Transitions in Titania
H. yildirim, J. Greeley, and S. K. Sankaranarayanan

1052 Electrical and Materials Characterization of PANI Nanoparticles infused Polymers for Battery Applications
R. Ratnadurai, P. K. Sekhar, and E. Stefanakos

1053 Electrical-Thermal Simulation of a Simplified Cell
H. Lo and J. Oung

1054 The Patterning of Al Surface by PDMS Stamp and Electrochemical Etching
G. Park and J. Choi

1055 Cellular Automation for the Self-Organization Processes at the Annealing of Silicon Rich Oxide Layer
O. M. Orlov, I. Matyushkin, S. Korobov, and G. Y. Krasnikov

1056 A New Multiscale Model for the Transient Analysis of Lithium-Ion Batteries
B. Deguilhem, A. A. Franco, and V. Vetere

1057 Phase Field Modeling in Metal-Air Batteries
N. A. Zerihun, U. Preiss, and I. Steinbach

1058 Hydration and Proton Transfer in 3M{trade mark, serif} PEM Ionomers: An Ab Initio Study
J. K. Clark and S. Paddison

1059 Molecular Modeling of Proton and Water Distribution in Catalyst Layer Pores of Polymer Electrolyte Fuel Cells
A. Nouri Khorasani, K. Malek, and M. Eikerling

G5 - Fuel Cell Membranes, Electrode Binders, and MEA Performance

Industrial Electrochemistry and Electrochemical Engineering, Energy Technology

1060 Development of Composite Non-Platinum IrFe (1:16)/C Nanoparticle as Novel Anodic Catalyst in PEMFC
B. Li, D. Yang, R. Lin, Z. Yu, and J. Ma

1061 Synthesis of the Layer - Network Structure Nanomaterial as a Filler for Proton Exchange Membrane
C. Liang, Y. Chen-Yang, C. Tsai, and C. Wang

1062 Preparation of the Novel Nanocomposite Membranes Based on Nafion and Porous Materials with Unsaturated Metal Sites for PEMFC
C. Tsai, Y. Chen-Yang, C. Lin, C. Liang, and C. Wang

1090 Effect of Ion Exchange on Polymer Electrolyte Degradation Rates
M. Tague, A. Yakaboski, H. Rivera, and E. Smotkin

1091 Estimation of the Performance of a Mixed Conductor as Filler in Polymer Electrolytes by 3D Modeling of Impedance Spectroscopy
R. Dugas, A. Tavares, and D. Guay

1092 Nafion Beta-Relaxation as a Function of Relative Humidity Probed by Dielectric Spectroscopy
B. R. Matos, M. André Dresch, E. Inácio Santiago, M. Linardi, D. Zanetti de Florio, and F. Coral Fonseca

1093 Fuel Cell Performance and Water Transport Properties of Asymmetric Bi-Layer Proton Conducting Membranes
Z. Peng, A. Morin, P. Huguet, S. Deabate, and A. K. Sutor

1094 Modeling and Optimization of the DMFC System: Relating Materials Properties to System Size and Performance
B. Bennett, B. Koriashy, and J. Meyers

1095 Computational Fluid Dynamics of Water Droplet Formation and Detachment from Gas Diffusion Layer
Z. Ahmad, S. Didari, J. Moon, and T. Harris

1096 A Microstructural Resolved Model of PFSA Membranes Degradation in PEM Fuel Cells
A. A. Franco, R. Coulon, and K. Malek

1097 Mesoscale Modeling of Hydrated Morphology in Sulfonated Poly(phenylene sulfone) Ionomers
C. Wang, S. J. Paddison, and G. Duscher

1098 Effect of Surface Hydrophilicity on the Formation of Nafion Thin Film Inside PEMFC Catalyst Layers: A Computational Study
D. Damasceno Borges, S. Mossa, K. Malek, G. Gebel, and A. A. Franco

1099 Low Cost Hydrogen Fuel Cell
M. S. Dara, A. Lam, D. Wilkinson, and K. Fatih

1100 Advances in Proton Exchange Membrane Technology for High Efficiency Electrolysis
K. E. Ayers, E. Anderson, C. Capuano, M. Niedzwiecki, M. A. Hickner, and W. Johnson

1101 Impact of Ethylene Glycol Contamination on Proton Exchange Membrane (PEM) Fuel Cells
K. A. O'Leary, B. Lakshmanan, and J. St-Pierre

1102 Characterization of Anion Exchange Membrane Technology for Low Cost Electrolysis
K. E. Ayers, E. B. Anderson, C. Capuano, M. Niedzwiecki, M. A. Hickner, C. Wang, Y. Leng, and W. Zhao

1103 Electrocatalytic Cells for Synthetic Fuel Production from Carbon Dioxide
R. Elder, D. Cumming, K. Omojola, and D. Sinclair

1104 Hybrid Direct Carbon Fuel Cell: Catalytic Effect of Carbonate Cation and Amount of Carbon Fuel in Cell Performance
B. Cantero-Tubilla, C. Xu, J. Zondlo, K. Sabolsky, and E. Sabolsky

H1 - Electron Transfer and Energy Applications of Fullerenes and Nanostructured Materials

Fullerenes, Nanotubes, and Carbon Nanostructures, Energy Technology

1105 (Invited) Adjustable Cavity in Cofacial Bisporphyrinic Tweezers for the Recognition of PhotoActive Guests
R. Rein and N. Solladie

1106 (Invited) The Dynamics of Photoinduced Electron Transfer Processes in Electron Donor-[60]Fullerene Supramolecular Interlocked Systems
D. I. Schuster, J. Megiatto Jr., D. M. Guldi, and S. Kirner

1107 Photoinduced Electron Transfer in Porphyrin-ssDNA- SWCNT Bionano Donor-Acceptor Hybrids
F. Dsouza, S. Das, M. Zandler, A. Sandanayaka, and O. Ito

1108 Covalent and Non-covalent Binding of Tetrathiafulvalene to Carbon Nanotubes
D. M. Guldi

1109 (Invited) Functionalization of Azafullerene $C_{59}N$ with Organic Electron Donors
N. Tagmatarchis

1110 (Invited) Functionalization of Carbon Nanotubes for Energy Conversion
M. Prato

1111 (Invited) Ultrafast Excited State Equilibration in Fullerodendrimers with a Perylenediimide Core
F. Monti, C. Chiorboli, and N. Armaroli

1112 (Invited) Carbon Nanostructures-Perylenebisimides as Artificial Photosynthetic Systems and for Bulk Heterojunction Solar Cells
A. Sastre, S. Pla, L. Martin-Gomis, D. Molina, F. Fernández-Lázaro, K. Ohkubo, S. Fukuzumi, S. Collins, and T. Nguyen

1113 (Invited) Photoinduced Electron Transfer in PDI-C_{60} Dyads
M. Niemi, R. Dubey, N. Tkachenko, A. Efimov, and H. Lemmetyinen

1114 (Invited) Electron-Transfer Reduction of $Li^{+}@C_{60}$
K. Ohkubo, Y. Kawashima, and S. Fukuzumi

1115 (Invited) Structures and Properties of Protonated Phthalocyanines
T. Kojima, T. Honda, N. Kobayashi, and S. Fukuzumi

H2 - Chemistry of Fullerenes and Carbon Nanotubes

Fullerenes, Nanotubes, and Carbon Nanostructures

1127 Thermal Reaction of [60]Fullerene with Amino Acids
S. Zhu, T. Zhang, X. Cheng, C. Mai, and G. Wang

1128 Enantioselective Cycloaddition of N-metalated Azomethine Ylides onto Fullerenes
S. Filippone, M. Izquierdo, E. Maroto, and N. Martin

1129 Challenges and Opportunities in Continuous Functionalization of Carbon Nanostructures Enabled by Flow Chemistry
M. Maggini

1130 Functionalization of Perfluoroalkylfullerenes: Towards Materials Applications
O. Boltalina, T. Clikeman, L. San, J. B. Whitaker, B. W. Larson, I. V. Kuvychko, Y. Chen, A. Popov, and S. Strauss

1131 Mild Methods in the Selective Functionalization of Fullerenes
J. Marco-Martínez, M. Izquierdo Barroso, S. Filippone, and N. Martin

1132 (Young Investigator Award) Fullerene-Driven Molecular Shuttles
A. Mateo-Alonso

1133 Novel Perfluoroalkylfullerene-Based Acids: Preparation, Properties, and Chemical Reactivity
I. V. Kuvychko, L. San, O. Boltalina, and S. Strauss

1134 Receptors for Carbon Nanostructures: The New Collection
N. Martin, E. Pérez, D. Canavet, H. Isla, and M. Gallego

1135 Versatile Fullerene Building Blocks for the Construction of Biologically Active Molecules
J. Nierengarten

1136 Photoinduced Energy and Electron Transfer in Supramolecular Polyads of Covalently linked azaBODIPY-Bisporphyrin 'Molecular Clip' hosting Fullerene
F. D'Souza, A. Amin, V. Bandi, M. El-khouly, N. Subbaiyan, M. Zandler, and S. Fukuzumi

1137 Unusual Chemical Properties of Paramagnetic Fullerenes Encapsulating a Trivalent Metal
X. Lu, H. Nikawa, Z. Slannina, T. Akasaka, and S. Nagase

1138 Selective Adenosine 5′-Triphosphate (ATP) Recognition with a Molecularly Imprinted Polymer Using Derivatized Fullerene Functional Monomers
W. Kutner, P. Sharma, M. Dabrowski, C. Bikram KC, K. Noworyta, and F. D'Souza

1139 Tuning the Molecular Order of C_{60} Functionalized Phosphonic Acids
B. Braunschweig, A. Rumpel, M. Novak, J. Walter, M. Halik, and W. Peukert

1140 Towards Topologically Pristine Carbon Nanotubes
M. Suzuki, K. Tahara, S. Khan, Y. Tobe, and Y. Rubin

1141 Functionalization of Carbon Nanotubes
M. Prato

1142 Photoinduced Charge Separation and Charge Transport in Carbon Nanostructure-Based Composites
H. Imahori

1143 Decoration of Carbon Nanotubes and Carbon Nanohorns
F. Langa, M. Vizuete, M. Barrejón, and M. Gómez-Escalonilla

1144 Exohedral and Endohedral functionalization of Luminescent MWCNTs for Advanced Materials Applications
D. Bonifazi

1145 Non Conventional Techniques for the Modification of Carbon Nanoforms
E. Vazquez

1146 Phthalocyanine-SWNT and Phthalocyanine-Graphene Ensembles: Hybrid Systems for Solar Energy Conversion
M. Ragoussi, G. de la Torre, D. Guldi, and T. Torres

1147 Interaction of *L*-Valine Homopeptides with Fullerene C_{60}: A Molecular Mechanics Study
V. A. Basiuk and A. Cruz-Gregorio

1148 Theoretical Analysis and Experimental Evidence for the Covalent Cross-Linking of C_{60} Fullerene with Diamines
F. Contreras-Torres, E. V. Basiuk, V. A. Basiuk, V. Meza-Laguna, and T. Gromovoy

1149 Noncovalent Functionalization of Single-Walled Carbon Nanotubes with Porphyrins
M. Bassiouk, V. A. Basiuk, E. V. Basiuk, M. Martínez-Herrera, A. Rojas-Aguilar, and I. Puente-Lee

1150 Electronic Structure and stability of Fullerene Dimers via Density Functional Theory Calculations
S. Lee

H3 - Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes

Fullerenes, Nanotubes, and Carbon Nanostructures

1151 (Invited) Catalyst Morphology Oscillation Governed Nucleation of Carbon Nanotubes
E. Pigos, E. Penev, R. Sharma, B. Yakobson, and A. R. Harutyunyan

1152 (Invited) Carbon-based Nanomaterials: Design, Synthesis, and Properties
C. Nuckolls

1153 (Invited) Functional Inks Based on Monodisperse Carbon Nanomaterials
M. C. Hersam

1154 Extraction of Specific Large-Diameter Single-Wall Carbon Nanotubes by Fluorene-Based Copolymers
M. Tange, T. Okazaki, and S. Iijima

1155 Crowding-Induced Self-Assembly of DNA-SWCNT: From Length to Chirality Selectivity
C. Y. Khripin, N. Arnold-Medabalimi, and M. Zheng

1156 (Invited) Optically Active Single-Walled Carbon Nanotubes
N. Komatsu

1157 (Invited) "Fully Flattened" Carbon Nanotubes: A New Syntesis of Graphene Nanoribbon
D. Choi, R. Kitaura, Y. Miyata, Y. Azuma, Y. Majima, and H. Shinohara

1158 GNR Production through Hydrogen Plasma Assisted CNT Unzipping
S. Mohammadi, Z. Kolahdouz Esfahani, S. Darbari, S. Mohajerzadeh, and N. Masoumi

1159 (Invited) Dynamics of Excitons and Trions in Single-Walled Carbon Nanotubes
T. Nishihara, M. Okano, and Y. Kanemitsu

1160 (Invited) Effect of Water-Filling and Trion Generation in Luminescent Single Wall Carbon Nanotubes
L. Cognet

1161 (Invited) Tube Length Dependence of Far-Infrared Absorption of Single-Walled Carbon Nanotubes
T. Okazaki and S. Joung

1162 (Invited) Direct Photoluminescence Imaging of Exciton and Single-Dopant Dynamics in Single-Wall Carbon Nanotubes
S. K. Doorn, J. J. Crochet, J. G. Duque, and J. H. Werner

1163 (Invited) Redox Reaction of SDS-Encased Carbon Nanotubes with Mercury Ions for Optical Sensing
A. A. Kamel, E. Gangluff, and W. Zhao

1164 (Invited) Delayed Fluorescence from Single-Wall Carbon Nanotubes
T. Hertel, F. Späth, and D. Stich

1165 (Invited) Separation and Optical Characterization of Empty and Water-Filled Single-Wall Carbon Nanotubes
J. A. Fagan, J. Huh, J. Simpson, J. L. Blackburn, J. M. Holt, and A. R. Hight Walker

1166 Non-Invasive Spectroscopic Determination of Activation Energies for Plasma Oxidation of Carbon Nanotubes
S. Lee and Y. Liu

1181 Single-Particle Photoluminescence Microscopy of Carbon Nanotubes Under Microfluidic and Potentiostatic Control
N. Rühl and T. Hertel

1182 Raman Studies on Chirality Purified Nanotubes: the Chirality Dependence of the G Modes and Quantum Interference
H. P. Telg, J. G. Duque, H. Chen, X. Tu, M. Zheng, J. Maultzsch, C. Thomsen, A. Swan, and S. K. Doorn

1183 (Invited) Using ^{13}C-labeled Single-walled Carbon Nanotubes to Uncover Fundamental Properties
J. L. Blackburn, C. Engtrakul, J. M. Holt, E. Gjersing, V. Irurzun, D. Resasco, and G. Rumbles

1184 Comparison Between the Performance of Silicon Nanowire, Germanium Nanowire and Carbon Nanotube Junctionless Transistors from First Principle Calculations
L. Ansari, B. Feldman, G. Fagas, J. Colinge, and J. Greer

1185 The Relationship of Morphological Structure, Electronic Structure and Electrical Transport Property: A Sample Study of Carbon Nanotubes
J. Gao, J. Zhong, and X. Sun

H4 - Carbon Nanotubes and Nanostructures: Applications and Devices

Fullerenes, Nanotubes, and Carbon Nanostructures

1186 (Invited) Anomalous Current-Voltage Characteristics and Non-Adiabatic/Adiabatic Phase Transitions in Ultra-Clean Suspended Carbon Nanotubes
R. Dhall, M. Amer, S. Chang, Z. Liu, and S. B. Cronin

1187 (Invited) Optical Properties of Freely Suspended Carbon Nanotubes at Cryogenic Temperatures
A. Hoegele

1188 (Invited) Dramatic Reduction of IR Vibrational Cross-sections of Molecules Encapsulated in Carbon Nanotubes
D. Kazachkin, Y. Nishimura, H. Witek, S. Irle, and E. Borguet

1189 (Invited) Resonance Raman Spectroscopy of Separated SWCNTs
J. Simpson, J. Fagan, R. Stephenson, X. Tu, M. Zheng, and A. R. Hight Walker

1190 Thin Films with Single-walled Carbon Nanotubes for Non-contact Strain Sensing
S. Bachilo, P. Withey, S. Mohan, S. Nagarajaiah, and R. Weisman

1191 (Invited) Optimizing the Carbon Nanotube/Conjugated Polymer Interaction in Organic Solar Cell Active Layers
J. M. Holt, K. Mistry, A. Ferguson, N. Kopidakis, B. Larsen, F. Prehn, M. Heeney, G. Rumbles, and J. L. Blackburn

1192 (Invited) Photocurrent in Macroscopically Aligned Carbon Nanotube Arrays
S. Nanot, C. Pint, L. Hendricks, J. Kono, R. Hauge, A. Cummings, and F. Leonard

1193 (Invited) Light Harvesting with Porphyrin/Carbon Nanotube Compounds
C. Voisin, C. Roquelet, F. Vialla, B. Langlois, J. Lauret, P. Roussignol, and E. Deleporte

1194 Efficiently Harvesting Excitons in Macroscopic Semiconducting Carbon Nanotube Photovoltaic Devices by Rationally Controlling their Morphology and Nanostructuring
D. Bindl, M. Wu, and M. Arnold

1195 Carbon Nanomaterials and Polymers Composite Electrolyte for Dye Sensitized Solar Cells: Electrochemical and Photovoltaic Properties
M. Akhtar, Z. Li, J. Jang, J. Yang, and O. Yang

1196 (Invited) Time-Domain ab initio Studies of Molecule and Quantum Dot Sensitized TiO_2
O. Prezhdo

1197 (Invited) Structural Model, Catalytic CVD Synthesis and Elasticity of Helically Coiled Carbon Nanotubes
I. Milosevic, Z. Popovic, M. Damnjanovic, D. Fejes, Z. Balogh, and K. Hernadi

1198 Nanoscale Radiative Heat Transfer Between a Dielectric Substrate and an SWNT
A. Nemilentsau and S. Rotkin

1199 (Invited) Electrochemical Modification of Individual Carbon Nanotubes, and Their Sensing Properties
P. Collins

1200 (Invited) Engineering Porous Structure and Surface Chemistry of Carbon for Supercapacitors
G. Cao and S. Candelaria

1201 Bismuth-Carbon Nanotube Composite Modified Carbon Paste Electrode for the Determination of Heavy Metal Ions
N. Pikroh and P. Vanalabhpatana

1202 (Invited) Analytical Ultracentrifugation Characterization of Empty and Water-Filled Single-Wall Carbon Nanotubes
J. A. Fagan, V. Rastogi, J. L. Blackburn, and A. R. Hight Walker

1203 (Invited) Single Wall Carbon Nanotube Aerogels and Composites Thereof
K. Kim, Y. Oh, I. Lee, C. Jeong, and M. F. Islam

1204 (Invited) Direct Synthesis and Potential Applications of Thin Highly Transparent Single Walled Carbon Nanotubes Films with High Conductivity
E. Pigos, G. Chen, and A. R. Harutyunyan

1218 Electrochemical Synthesis and Characterization of Polypyrrole/Single-Walled Carbon Nanotube Composites
M. Raicopol, B. Cioaca, M. Ionita, and L. Pilan

1219 Absorption of Radiofrequency Energy by Gold Nanoparticles and Gd^{3+} Loaded Ultra-short Carbon Nanotubes for Applications in Non-invasive Radiofrequency Hyperthermia Cancer Treatment
S. J. Corr, S. Phounsavath, L. Wilson, and S. Curley

1220 Fabrication of Chemical Functionalized Graphene Solution
S. Lee, J. Han, Y. Kwon, M. Kang, I. Lee, and K. An

1221 Tailoring the Microstructure Characteristics of Cu-MWCNT Metal Matrix Composites Through Modified Deposition Parameters
R. Manu and S. Jayakrishnan

H5 - Endofullerenes and Carbon Nanocapsules

Fullerenes, Nanotubes, and Carbon Nanostructures, Sensor

1222 Magnetic Properties of Co_5 Nanocluster Embedded into Carbon Fullerenes in Different Orientations: DFT Calculation
A. V. Kuznetsov

1223 Synthesis and Structure Determination of $Tm@C_{82}(I)$ - Ni(OEP) Co-crystal
Y. Sado, S. Aoyagi, Y. Miyata, R. Kitaura, and H. Shinohara

1224 Dimetallic Sulfide Endohedral Fullerenes with Unusual Cages
L. Echegoyen and N. Chen

1225 Fullerenes Encaging a Carbide Cluster: Molecular Structures and Chemical Properties
X. Lu, K. Nakajima, H. Kurihara, N. Mizorogi, T. Akasaka, and S. Nagase

1226 Recent Advances in Endohedral Metallofullerene Separations
S. Stevenson

1227 Chemically Modified Endohedral Metallofullerenes: Towards the Construction of Photoactive Donor-Acceptor Systems
L. Feng, Z. Slanina, N. Mizorogi, T. Akasaka, D. M. Guldi, and S. Nagase

1228 Endohedral Fullerenes: A Probe for Chemistry at the Nanoscale
K. Porfyrakis

1229 Structural Studies of Samarium Containing Endohedral Fullerenes
A. L. Balch, M. Olmstead, C. Beavers, H. Yang, Z. Liu, and B. Q. Mercado

1230 Computations for Metallofullerenes Derivatized during Extraction: $La@C_{80}$-$C_6H_3C_{l2}$ and $La@C_{82}$-$C_6H_3C_{l2}$
Z. Slanina, T. Akasaka, and S. Nagase

1231 Effect of "Nanotube Field" on Physical Properties of Encapsulated Molecules in Carbon Nanotubes
T. Okazaki

1232 Magnetic Property Investigation of Gadolinium-Based Endohedral Metallofullerenes
J. Zhang, G. Yee, T. Fuhrer, C. Pregot, and H. C. Dorn

1233 Computational Investigation of the Properties of M2C2@Cn (M=Y or Gd) (n=82, 92, infinity)
T. Fuhrer, J. Zhang, and H. C. Dorn

1234 (Keynote) Titanium in the Mixed-Metal Nitride Clusterfullerenes: The Role the Second Metal
A. Popov, A. Svitova, and L. Dunsch

1235 The World-Shortest Metallofullerene-Peapods: (Gd@C82)@[11]cycloparaphenylene
Y. Nakanishi, Y. Miyata, H. Omachi, S. Matsuura, Y. Segawa, K. Itami, R. Kitaura, and H. Shinohara

1236 Urea as a New and Cheap Nitrogen Source for the Synthesis of Metal Nitride Clusterfullerenes
S. Yang, M. Jiao, W. Zhang, Y. Xu, T. Wei, C. Chen, and F. Liu

H6 - Carbon Nanotubes and Nanostructures: Medicine and Biology

Fullerenes, Nanotubes, and Carbon Nanostructures, Sensor

1237 Flavin-induced Superhelices of Single Walled Carbon Nanotubes
F. Papadimitrakopoulos

1238 (Invited) Hybrid Nanobio-devices based on Carbon Nanotubes and Nanostructures
S. Hong

1239 (Invited) Functionalized Single Wall Carbon Nanotubes as Carriers for Biomedical Applications
D. Scheinberg, C. Villa, S. Alidori, J. Mulvey, and M. Mcdevitt

1240 (Invited) SWCNT Near-Infrared Fluorescence as a Tool for Developing Biomedical Applications
R. Weisman

1241 (Invited) Applications of Functionalized Carbon Nanotubes in Nanomedicine
M. Prato

1242 Self-sorting of Cancerous Cells with Functionalized CNTs
D. Bonifazi

1243 Nanoparticle-facilitated Magnetization of Tumor Cells
M. Jebb, W. Wei, G. Villares, M. Lewis, and L. Wilson

1244 Functionalized Fullerenes and Carbon Nanotubes in Biomedicine
T. Da Ros

1245 Endohedral Metallofullerenes: A New Diagnostic and Therapeutic "Theranostic" Platform for Biomedical Applications
H. C. Dorn, J. Zhang, M. Shultz, and J. Wilson

1246 (Invited) Functionalized Fullerenes for Breast Cancer Imaging and Therapy
V. Krishna, A. Qin, A. Georgieva, G. Zhou, H. Zeng, G. Walter, B. Koopman, S. Grobmyer, and B. Moudgil

1247 Decacationic [70]Fullerene Approach for Efficient Photokilling of Infectious Bacteria and Cancer Cells
L. Chiang and M. Hamblin

1248 Electrochemically Generated Highly Fluorescent Graphene Quantum Dots as a Biological Label for Stem Cells
L. Fan and M. Zhang

1249 Chromatographic Separation of Highly Soluble Nanodiamond Prepared by Polyglycerol Grafting
N. Komatsu, L. Zhao, and T. Takimoto

H7 - Porphyrins and Supramolecular Assemblies

Fullerenes, Nanotubes, and Carbon Nanostructures, Sensor

1250 Rigid and Flexible Bis-Porphyrinic Tweezers: Efficient Molecular Recognition of Bidentate Bases
R. Rein and N. Solladie

1251 Influence of Surface Defects on Porphyrin Adsorption and Self-Assembly on Graphite: A Theoretical Analysis
M. Bassiouk, E. Alvarez-Zauco, and V. A. Basiuk

1252 Nanometer-Sized Reactor---A Porphyrin-Based Model System for Anion Species
Y. Li, H. Liu, and Y. Li

1253 Porphyrin-based CuAAC Coupled Layer-by-Layer Molecular Multilayers on Gold (111) Electrodes for Electro-optical Applications
A. Krawicz and P. Dinolfo

1254 (Invited) Chemical Synthesis in Solution and Porphyrin Nanostructures on Surfaces - Similar Concepts, Different Results
M. O. Senge

1255 (Invited) Molecular Organization and Conductivity in Self-Assembled Binary Porphyrin Nanostructures
U. Mazur and K. Hipps

1256 (Invited) Functional Supramolecular and Nano-Scaled Systems and Micro-Scaled Chiral Materials
V. Borovkov, T. Osawa, S. Ikeda, T. Kitamura, and Y. Inoue

1257 (Invited) Self-Quenched, Self-Assembled Pyropheophorbide-Phospholipid Nanovesicles for Theranostic Applications
J. F. Lovell

1258 (Invited) Single Molecular Electronics for Functionality Emergence
T. Ogawa, H. Tanaka, D. Tanaka, S. Gohda, and T. Inose

1259 (Invited) DNA as a Supramolecular Scaffold for Porphyrin and Metal Complex Assemblies
E. Stulz

1260 (Invited) Supramolecular Inclusion Complexes of Cyclic Zn-Bisporphyrins with Fullerenes: Structural and Thermodynamic Characterization
P. Ballester

1261 (Invited) A Charge Transfer Challenge - Combining Fullerenes and Metalloporphyrins in Aqueous Environments
D. M. Guldi

1262 (Invited) Supramolecular Systems of Oxoporphyrinogens, Porphyrins and Fullerenes
J. P. Hill, F. Dsouza, N. Subbaiyan, Y. Xie, S. Ishihara, and K. Ariga

1263 (Invited) Multiporphyrin Macrocycles Using Fullerene Templates
A. Mulholland and S. J. Langford

1264 (Invited) Diporphyrin Nanotweezers for Discrimination of the Diameter and Handedness of Single-Walled Carbon Nanotubes
N. Komatsu

1265 (Invited) Use of Functionalised Carbon Nanotubes in Novel Solar Cells
J. G. Shapter

1266 (Invited) Tailored Assembly of Carbon Nanotubes and Graphene
S. Kim

1267 (Invited) Single Molecules and Molecular Aggregates Studied by Non-Contact Force Microscopy
E. Meyer, R. Pawlak, S. Kawai, and T. Glatzel

1268 (Invited) Enhanced Selectivity of Porphyrins-Functionalized ZnO Nanorods
Y. Sivalingam, G. Magna, E. Martinelli, R. Paolesse, and C. Di Natale

1269 (Invited) Charge Transport through Single Porphyrins at Interfaces
Z. Li and E. Borguet

1270 (Invited) Nucleotidic and Peptidic Multi-Porphyrinic Devices: When the Desired Conformation is Determined by Chiral Flexible Linkers
N. Solladie

1271 (Invited) Porphyrinoid Assemblies: Supramolecular Teams for Chemical Sensor Applications
S. Nardis, D. Monti, G. Pomarico, F. Mandoj, M. Stefanelli, C. Di Natale, and R. Paolesse

1272 (Invited) Self-assembling Porphyrins: Teaching Old Dogs New Tricks
T. S. Balaban

1273 (Invited) Supramolecular Assemblies Composed of Saddle-Distorted Porphyrins with Carboxyl Groups
M. Sankar, T. Ishizuka, T. Hasobe, K. Ohkubo, S. Fukuzumi, and T. Kojima

1274 (Invited) Polymeric Porphyrin Assemblies Driven by Molecular Recognition
T. Haino

1275 (Invited) Transcriptional Regulation by Heme Acting as a Signaling Molecule
S. Aono

1276 (Invited) Physicochemical Properties of Hemoproteins Reconstituted with Metalloporphyrinoid
T. Hayashi, A. Onoda, and K. Oohora

1277 (Invited) Heme Carrier Protein 1 Involves a Cancer Specific Porphyrin Accumulation
H. Matsui, T. Kaneko, and I. Hyodo

1278 (Invited) Structural Basis for Molecular Mechanism of Electron Transfer from Cytochrome c to Cytochrome c Oxidase
K. Ishimori

1279 (Invited) NMR for the Design of Cytochrome c-based Superoxide Biosensors
P. Turano

1280 (Invited) Electropolymerized Metalloporphyrins as Catalysts for the Reduction of Oxygen
S. Swavey

1281 (Invited) Designing Space Around π-Conjugated Molecules
K. Sugiyasu

1282 (Invited) Phthalocyanine-Perylenebisimide Multifunctional Arrays in Energy and Electron Transfer Systems
F. Fernández-Lázaro, V. Blas-Ferrando, N. Zink, L. Martin-Gomis, J. Ortiz, K. Ohkubo, S. Fukuzumi, and A. Sastre-Santos

1283 (Invited) Catalytic Two-Electron Reduction of Dioxygen with a Cobalt(II) Chlorin
S. Fukuzumi, K. Mase, and K. Ohkubo

1284 (Invited) Self-Assembled Light-Harvesting Diphenylalanine Porphyrin for Mimicking Natural Photosynthesis
A. G. Coutsolelos, E. Kasotakis, G. Charalambidis, A. Mitraki, and T. S. Balaban

1285 (Invited) Modulation of Triplet Emissivity in Pt Porphyrin - Rhodamine Dyads by Weak Magnetic Fields
T. Mani, D. Niedzwiedzki, and S. Vinogradov

1286 (Invited) Photoinduced Electron Transfer Processes of Supramolecular Donor-Acceptor Systems: Toward Solar Energy Harvesting Systems
M. E. El-Khouly and S. Fukuzumi

1287 (Invited) Synthesis of Subphthalocyanine pi-Complexes
E. Caballero, M. Rodríguez-Morgade, J. Fernández-Ariza, I. Sanchez-Molina, C. Claessens, J. Sessler, and T. Torres

1288 (Invited) Tuning the Electrochemical Redox Potential of Manganese(III) Coroles for Optimal Decomposition of Reactive Oxygen and Nitrogen Species (ROS/RNS)
Z. Gross

1289 (Invited) Electroreduction of Iron and Free-Base Nitrocorroles in Non-Aqueous Media
K. M. Kadish, M. Manowong, P. Chen, X. Xiao, R. Paolesse, G. Pomarico, S. Nardis, M. Stefanelli, L. Tortora, F. Fronczek, and K. Smith

1290 (Invited) Synthesis, Characterization and Optical Properties of Pyrene-Dendronized Porphyrins
E. Rivera Garcia, N. Solladie, J. Duhamel, R. Rein, G. Zaragoza-Galán, and M. Fowler

1291 (Invited) Porphyrins and Macrocycles: From Basics to Applications
H. Kasai, T. Nguyen, and M. Escano

1292 (Invited) Porphyrinic Metal-Organic Frameworks: Materials Design, Synthetic Strategies, and Emerging Applications
W. Choe

1293 (Invited) Electrochemical, Spectroelectrochemical and Protonation Studies of Planar and Nonplanar Free Base Porphyrins
P. Bhyrappa, Y. Fang, and K. M. Kadish

1294 (Invited) Spectroelectrochemical Characterization of Singly and Doubly Oxidized Free-base Porphyrins
Z. Fu, P. Chen, and K. M. Kadish

H8 - Nanostructures for Energy Conversion

Fullerenes, Nanotubes, and Carbon Nanostructures, Energy Technology

1295 Plasmon-Enhanced Water Oxidation on Gold Nanostructured TiO_2 Single Crystal Substrates
H. Misawa, Y. Nishijima, K. Ueno, K. Murakoshi, and H. Inoue

1296 (Invited) Electrochemical Synthesis of Nanocarbon
S. Yasuda and K. Murakoshi

1297 (Invited) Charge Separation in Type-II Semiconductor Heterodimers Formed by Anion Exchange Reaction
T. Teranishi

1298 (Invited) Gap-Mode Plasmon Enhancement of Photocurrent Generation at Organic Monolayer-Modified Metal Electrodes
K. Ikeda and K. Uosaki

1299 (Invited) Micro-to-Nanostructures to Probe Electrocatalysts by SERS
I. Yagi, K. Inokuma, and N. Ohta

1300 (Invited) Photosensitization of ZnO Nanorod Electrodes with ZnS-$AgInS_2$ Solid Solution Nanoparticles
T. Torimoto, T. Sasamura, K. Okazaki, A. Kudo, and S. Kuwabata

1301 (Invited) Spectroscopic Properties of Au-Ag Core-Shell Nanorods and Their Redox Reactions
Y. Niidome, Y. Tsuru, A. Kiya, Y. Hamasaki, and N. Nakashima

1302 (Invited) Fabrication of Porous Hollow Spheres of Metal Oxide by Anodization of Small Metal Particles
H. Masuda, T. Yanagishita, T. Kondo, and K. Nishio

1303 (Invited) Linker Length Dependence of Photoinduced Electron Injection and Recombination Between MK-Dyes and TiO_2 Nanocrystalline Film
A. Furube, K. Sunahara, R. Katoh, X. Zhang, N. Koumura, K. Hara, and M. Tachiya

1304 (Invited) Enhancement of Dye-Sensitized Photocurrents by TiO_2-Coated Gold Nanoparticles
T. Tatsuma, T. Kawawaki, and Y. Takahashi

1305 Photoelectrochemical Hydrogen Evolution and Reduction of Carbon Dioxide at p-Si(111) modified by Molecular Layer with Metal Complexes
K. Uosaki, T. Masuda, Y. Sun, H. Fukumitsu, S. Takakusagi, T. Kondo, W. Chun, and K. Asakura

1306 (Invited) Nanostructured Semiconductor Materials for Solar Energy Conversion
Z. Lin and X. Xin

1307 (Invited) Simple Construction of Near Unity Photon-to-Electron Conversion Efficiency Performing Photoelectrochemical Cells Built on Porphyrins Electrostatically Stacked onto Nanocrystalline SnO2 Surface
N. Subbaiyan and F. D'Souza

1308 (Invited) Semiconductor Nanowires for Solar Fuels
M. K. Sunkara, H. Russell, C. Pendyala, J. Jasinski, and J. Kim

1309 (Invited) Strategies to Design High Efficiency Quantum Dot Sensitized Solar Cells
P. Kamat, J. Radich, and P. Santra

1310 (Invited) Design and Characterization of Novel Ruthenium and Porphyrin Sensitizers for Highly Efficient Dye-Sensitized Solar Cells
E. W. Diau

1311 Desirable Hole-Conducting Coadsorbents for Highly Efficient Dye-Sensitized Solar Cells through an Organic Redox Cascade Strategy
I. Choi, S. Kim, B. Song, K. Seo, M. Kang, M. Ju, and H. Kim

1312 Enhanced Electrochemical Performance of Si-Nanowires in Fluorinated Carbonate Electrolytes: A Surface Chemical Investigation
V. Etacheri, O. Haik, Y. Goffer, G. Roberts, I. Stefan, R. Fasching, and D. Aurbach

1313 Improved Photoelectrochemical Properties and Ultrafast Charge Carrier Dynamics of Sensitized and Chemically Modified Metal Oxide Nanowire Arrays
J. Z. Zhang, Y. Li, G. Wang, Y. Ling, D. Wheeler, H. Wang, and R. Fitzmorris

1314 Novel Core/Shell Ni@NiO/Pt as High Efficient Electrocatalyst for Alkaline Direct Ethanol Fuel Cells
M. Hasan and K. Razeeb

1315 Specific Surface Energy and Shape Stability of Face Centered Cubic Elemental Solids as a Function of Size
P. Parthasarathy and A. Virkar

1316 Cathode Catalyst Degradation in Proton Exchange Membrane Fuel Cells
P. Parthasarathy and A. Virkar

1317 Hierarchically ZnO Nano Crystalline Aggregates Synthesized Through an Inter-Phase Precipitation Method and Application in Dye-Sensitized Solar Cells
R. Gao, L. Wang, Q. Zhang, and G. Cao

1318 Water Diffusion and Dissociation on Metal Defect Sites, Density Functional Theory Study
L. Arnadóttir

1319 Photoelectrooxidation of Water on Hematite Thin Films
I. Herrmann-Geppert, P. Bogdanoff, and S. Fiechter

1320 Graphene Aerogels as a Highly Effective Counter Electrode Material for Dye- Sensitized Solar Cells
W. Cheng, C. Wang, and S. Lu

1321 Potential and Limit of Cobalt and Nickel Complex Catalysts in Photoelectrochemical Water Oxidation of Oxide Semiconductors
T. Jeon, S. Choi, H. Jeong, and H. Park

1322 Electrochemical Electron and Hole Potentials in Illuminated Niobate and Titanate Nanocrystal Water Splitting Photocatalysts
J. Zhao, R. Chamousis, and F. Osterloh

1323 Surface, Optical, and Photoelectrochemical Properties of CdSe Coated TiO_2 Nanotube Arrays Synthesized Using a One-Pot Solvothermal Process
B. Mukherjee, Y. Smith, and V. (. Subramanian

1324 Metal Nanoparticle Aerogels and Their Applications
A. Eychmüller, W. Liu, A. Herrmann, N. Gaponik, and N. Bigall

1325 Synthesis of Extremely Small Bimetallic Pt-Pd Nanoparticles Colloids and Their Catalytic Properties in the Oxygen Reduction Reaction
P. Laurent, S. Donet, C. Thieuleux, and C. Copéret

1326 Clean Energy Generation and Storage Using Few Layered Graphene (FLG) Nanoflakes: Studies of Oxygen Reduction Reaction and Supercapacitor Behavior
N. Soin, S. Sinh Roy, S. Mitra, T. Thundat, and J. McLaughlin

1327 TiO_2 Nanotubes as Catalyst Support for PEM Fuel Cells
F. J. Nores Pondal, M. Al-Hoshan, and N. Guillet

1328 Photoelectrochemical Hydrogen Generation: Effect of Photocatalyst Dispersion
D. Bruce and D. Wilkinson

1329 Structure and Surfaces of Pt-Fe Catalytic Nanoparticles from Quantitative Aberration Corrected Transmission Electron Microscopy
M. Chan, F. Nan, L. Chen, C. Bock, and G. Botton

1330 Nanostructured Composite Electrode based on Hydrous Manganese Oxide and Mesoporous Carbon for Electrochemical Supercapacitor: Synthesis, Morphology and Electrochemical Characterization
P. M. Le, T. Ha, T. Nguyen, L. Huynh, T. Lam, V. Tran, and T. Nguyen

1331 Bimetallic Platinum-Iron Nano-electrocatalyst Supported on Carbon Fiber for Coal Electrooxidation to Produce Hydrogen
P. Yu and G. Botte

1332 Green Co-Reduction Synthesis Method of PtRu-Graphene Electrocatalysts for DMFCs Applications
V. Bhaghavathi Parambath, R. Nagar, K. Sethupathi, and R. Sundara

1346 Composite-type Hybrid Photoelectrodes for Dye-Sensitized Solar Cells with Plastic Substrates
M. Ko, K. Yoo, and J. Kim

H9 - Chemistry and Physics of Graphene and 2D Nanostructures

Fullerenes, Nanotubes, and Carbon Nanostructures, Energy Technology

1347 (Invited) Preparation and Application of Chemically Functionalized Graphene
M. C. Hersam

1348 (Invited) Stimuli-Responsive Polymer Covalent Functionalization of Graphene Oxide by Ce(IV)-Induced Redox Polymerization
B. Wang, Y. Deng, D. Yang, J. Hu, X. Huang, and J. Z. Zhang

1349 Capture Store and Discharge of Electrons in Graphene Based Assemblies
P. Kamat, I. Lightcap, and S. Krishnamurthy

1350 Theoretical Investigation of the Li-Oxygen Reduction and Redox Activity of Model Carbon Structures
Y. Xu, G. Dathar, and W. A. Shelton

1351 Study of H, O and C Adatoms Surface Diffusion on Graphene by Computer Simulation
V. I. Gorbenko

1352 Fabrication of Graphene Thin Films Based on Layer-by-Layer Self-Assembly of Functionalized Graphene Nanosheets
J. Park, J. Park, C. Chung, and P. Yoo

1353 Theoretical Study of Single and Bilayer Graphene Nanoribbons Photodetectors
M. Moradinasab, H. Nematian, M. Pourfath, M. Fathipour, and H. Kosina

1354 Chemically Functionalized One- and Two-dimensional Carbon-Based Nanostructures for the Development of Effective Nanobiocatalytic Systems
T. Tsoufis, I. Pavlidis, T. Vorhaben, U. Bornscheuer, D. Gournis, H. Stamatis, and P. Rudolf

1355 Functionalization of Graphene Sheets
M. Prato

1356 Advances in Graphene Chemistry
R. C. Haddon

1357 (Invited) Doping and Intercalation of Graphene using Electrolyte Gate
D. Efetov and P. Kim

1358 (Invited) Interfacial Engineering of Organic Nanofibril Heterojunctions into Highly Photoconductive Materials and Beyond
H. Huang, Y. Che, L. Li, M. Xu, B. Bunes, X. Yang, and L. Zang

1359 (Invited) A Novel Route Towards the Formation of Hybrid Materials Consisting of Graphene and Iron Oxide Nanoparticles
T. Tsoufis, Z. Syrgiannis, M. Karakassides, D. Gournis, M. Prato, and P. Rudolf

1360 Facile Synthesis of Graphene/Metal Nanocomposite via Self-Catalysis Reduction at Room Temperature and Its Catalytic Application
Q. Zhuo, J. Gao, Y. Ma, and X. Sun

1361 Atomic Resolution Characterization of Sub-Nanometer Pt Clusters on Nitrogen-Doped Graphene
S. Stambula, N. Gauquelin, S. Gorantla, S. Turner, S. Sun, X. Sun, and G. Botton

1362 Synthesis of Large Sized Graphene Sheets Using Ultrasound
K. Vinodgopal, D. Taylor, K. Le, A. Sapkota, and N. Salleh

1363 Synthesis of Soluble Graphene
E. Billups, A. Mukherjee, Y. Sun, and O. Kuznetsov

1364 Synthesis and Patterning of Laser Converted Graphene for Flexible Energy Storage Devices
M. El-Kady, V. Strong, S. Dubin, J. Wassei, J. Torres, and R. Kaner

1365 Assembly of Graphene-Based Two-Dimensional Nanosheets
X. Feng

1366 (Invited) Topological Band Theory in Twisted Multilayer Graphene
E. J. Mele

1367 (Invited) QED Kapitza Conductance of Graphene
A. Petrov and S. Rotkin

1368 Photoelectron Spectroscopy Studies of Plasma-Treated Graphene
S. D. Sherpa, G. Levitin, and D. W. Hess

1369 Graphene Edges: The Origin of Electronic, Chemical and Magnetic Activities
T. Enoki

1370 Electrical and Optical Properties of Transferable and Dispersible Graphene Nanostructures of Controlled Structure
V. Berry

1371 Characterization of Few-layer Graphene (FLG) starting with Pristine Graphite via Wet Chemical Functionalization
S. Malik, C. Liebscher, G. Kostakis, D. Wang, S. Potratz, C. Balaban, and T. S. Balaban

1372 Transient Absorption Microscopic Study of Carbon Nanostructures
L. Huang, B. Gao, and G. Hartland

1373 (Invited) Graphene PN Junctions
J. Lee

1374 Enhancing Raman Signals with Micron-Scale Graphene-Coated Plasmonic Structures
A. Banerjee and H. Grebel

1375 Toward Atomic Spintronics via Organometallic Complexes of Graphene
A. Popov, S. Avdoshenko, I. Ioffe, G. Cuniberti, and L. Dunsch

I1 - Physical and Analytical Electrochemistry General Session

Physical and Analytical Electrochemistry

1376 Chemical and Structural Influences on the Electrochemical Reactivity of Uranium Dioxide Nuclear Fuel
H. He, K. O'Neil, J. J. Noel, O. Semenikhin, and D. Shoesmith

1377 Electrochemical Assessment of Aqueous Lead Contamination in Golden Triangle Area
J. A. Gomes, G. Graham, D. Couch, A. Nahid, M. H. Mazumdar, S. Shukla, and K. Urbanczyk

1378 Controlled Magneto-Electrochemical Generation of Ni Nano Particles
N. Ijaz, T. Hussain, and R. Jamil

1379 Electrochemical Studies of the Kinetics and Mechanism of Aqueous Iron Hydrolysis Reactions in Mine Water Solutions
M. A. Ashtewi and B. Horrocks

1380 Effect of Cyanide Release on the Electrocrystallization of Au-Cu Alloys Prepared from an Alkaline Cyanide Bath
E. Brun, F. Durut, R. Botrel, M. Theobald, O. Legaie, and V. Vignal

1381 Rapid Small Feature Cu Filling: Implications for "Bottom-up" Deposition Models
R. O. Miller, C. Schieffer, C. Thambidurai, and J. Klocke

1382 Electrochemical Behavior of Cerium in the 1-butyl-3-methylpyrrolidinium Bis(trifluoromethyl)sulfonyl-imide Ionic Liquid Containing Chloride
L. Chou and C. Hussey

1383 Electrochemical Behavior of Europium (III)/(II) in the 1-(1-butyl)trimethylammonium bis(trifluoro-methylsulfonyl)imide Ionic Liquid Containing TODGA
Y. Pan and C. Hussey

1384 Bitrex: A new Levelling Agent for Copper
J. F. Cooper and C. H. Barnes

1385 Modeling Non Equilibrium Potentiometry and Electrochemical Impedance by NPP Model
A. Lewenstam, T. Sokalski, J. Jasielec, P. Lingenfelter, B. Grysakowski, B. Wierzba, R. Filipek, and M. Danielewski

1399 Water-Soluble Monolayer Protected Clusters as Redox Mediators in Scanning Electrochemical Microscopy
J. C. Tuberquia, R. Peterson, D. Crisostomo, and D. E. Cliffel

1400 Bringing Multianalyte Electrochemistry to Pharma
D. E. Cliffel and D. Kimmel

1401 Insights into the Molecular Mechanisms of Heterogeneous Electron Transfer between Multicopper Oxidases and Graphite Electrodes
F. tasca, C. Kjaergaard, N. Mano, and E. Solomon

1402 High Temporal Resolution Bio-Sensing Using Nitrogen-Incorporated Nanodiamond Ultra-Microelectrode Array by Fast Scan Cyclic Voltammetry
S. Raina, W. P. Kang, J. Davidson, and J. Huang

1403 Development of Biosensors for the Detection of Organophosphates in Waterways
J. Crumbley, E. Cho, and A. H. Suroviec

1404 Electrochemiluminescent (ECL) Microfluidic Array for Protein Cancer Biomarkers Using Single-Wall Carbon Nanotube Forests and $[Ru\text{-}(bpy)_3]^{2+}$-Doped Silica Nanoparticles
N. P. Sardesai, J. Barron, and J. F. Rusling

1405 Electrocatalytic Oxidation of NADH Using Alizarin Immobilized Carbon Nanotube Modified Electrode
S. Puchakayala and S. Annamalai

1406 Soft Microelectrode Arrays as SECM Probes for Biological Samples
A. Lesch, D. Momotenko, F. Cortés-Salazar, I. Wirth, U. Tefashe, F. Meiners, B. Vaske, D. Witte, H. Girault, and G. Wittstock

1407 Characterize Cell Function Using SECM-SICM
Y. Takahashi, Y. Matsumae, S. Hitoshi, K. Ino, Y. Korchev, and T. Matsue

1408 Synthesis of Cu-Zeolite / Graphene Nanocomposite and Its Simultaneous Determination of Dopamine and Ascorbic Acid
W. Wang, P. He, F. Dong, L. Du, and T. Zhang

1409 Surface Analysis and Surface Pretreatments for Elimination of Native Cu Oxide Layer
Y. Lee, S. Nho, E. Choi, and S. Rha

1410 The Effects of Ce in $BiFeO_3$ Ferroelectric Films
H. Hsiao, T. Lin, C. Leu, and C. Hu

1411 Unusual Spectral and Electrochemical Properties of Azobenzene-Substituted Porphyrins
K. Chiu, Y. Tu, T. Yang, I. Chao, Y. Su, C. Lee, and L. Lai

1412 Nanocomposite Coatings Based on the Conductive Polymers and Functionalized Carbon Nanotubes
V. Branzoi, F. Branzoi, and A. Musina

1413 Electrodeposition of Ni-Zn Alloys on Steel from Acidic Solution in Presence of Boric Acid
Y. Addi and A. Khouider

1414 Electric Potential Driven Deposition of DNA Molecules on an Electrode by in situ Atomic Force Microscopy
J. Jeong and G. Dietler

1415 Electrochemical Properties of Bi(111) | 1-butyl-3-methylpyrrolidinium tris(pentafluoroethyl) Trifluorophosphate Interface
C. Siimenson, L. Siinor, and E. Lust

1416 Rapid Screening of Dopants for TiO_2 Photocatalysts by Scanning Electrochemical Microscopy
Y. Weng, S. Cheng, and Y. Chou

1417 Electrocoagulation for the Effective Removal of Pollutants
A. Dura and C. Breslin

1418 The Electrochemical Detection of Neurotransmiters on Mix-Monolayers End Functionalized with Copper Phthalocianines
J. F. Silva, S. Albarracin, H. Duran, J. H. Zagal, and C. Gutiérrez

1419 Electrokinetic Phenomena of the Electrophoretic Ink Display
C. Kim

1420 Post Heat Treatment Effect on Electrochemically Synthesized CuO Thin Films
V. Dhanasekaran, T. Mahalingam, and R. Chandramohan

I2 - Biological Fuel Cells 5

Physical and Analytical Electrochemistry, Energy Technology

1421 Co-immobilization of Cellobiose Dehydrogenase with Pyranose Dehydrogenase to Increase the Coulombic Efficiency of Glucose Biofuel Cell Anodes
L. Gorton, M. Shao, M. Zafar, C. Peterbauer, R. Ludwig, M. Toscana, D. Leech, and W. Schuhmann

1422 A DNA-Nickel Complex Based Fuel Cell for Deep Oxidation of Various Fuels
D. Chen and S. D. Minteer

1423 Progress Towards the Development of Deoxyribozyme-Based Biofuel Cells
M. Zhang, I. Emahi, C. Entrinken, D. Bhatnagar, D. Nightingale, and D. A. Baum

1424 Photosystem I Deposition on Electrode Surfaces Towards Solar H_2 Production in the Field
D. R. Baker, A. Manocchi, S. Pendley, J. Sumner, M. Hurley, K. Xu, B. Bruce, K. Nguyen, T. Zhu, and C. Lundgren

1425 Photo-electrochemical Activity of Thylakoids on Carbon Nanotube Modified Electrodes
J. Calkins, Y. Umasankar, and R. P. Ramasamy

1466 Nanobiocatalytic Enzyme Stabilization for Biofuel Cells
J. Kim

1467 Mass-Transport Dependent Biocathodes Based on Hierarchical Carbon Nanotubes Composite Electrode
J. Vivekananthan, W. Jia, W. Schuhmann, and L. Stoica

1468 Paper based Biofuel Cells: Design of Air-Breathing Bio-cathodes
G. P. Ciniciato, A. Cochrane, C. Lau, E. Gonzalez, and P. Atanassov

1469 Biofuel Cells Based on Carbon Nanotube Compressions
S. Cosnier

1470 Materials for Mediator-free Electron Transfer in the Enzymatic Electrodes of Biobatteries and Biofuel Cells
R. Bilewicz, K. Stolarczyk, E. Nazaruk, D. Lyp, M. Karaskiewicz, K. Zelechowska, J. Biernat, and J. Rogalski

1471 Carbon Nanotube Modified Biocatalytic Microelectrodes with Multiscale Porosity
H. Wen, H. Bambhania, and S. C. Barton

1472 Catalytic Activity of Tyrosinase for Potential Biofuel Cell Application
Y. Umasankar and R. P. Ramasamy

1473 Nanostructured Cerium Oxide Thin Films: Synthesis, Characterization and Bioelectrocatalytic Supporting Properties
M. moumene, D. Rochefort, and M. Mohamedi

I4 - Electrocatalysis Applied to Fuel Cells and Electrolyzers

Physical and Analytical Electrochemistry, Energy Technology

1474 Towards Nano-engineered Pt-skin High Surface Area Catalysts
D. F. van der Vliet, C. Wang, D. Li, N. M. Markovic, and V. R. Stamenkovic

1475 Electroreduction of Oxygen on PdNP/MWCNT Nanocomposites in Acid and Alkaline Solutions
K. Jukk, A. Sarapuu, J. Kozlova, V. Sammelselg, P. Ritslaid, and K. Tammeveski

1476 Development of Nano-scale Ni-alloy Electrocatalysts for Anion Exchange Membrane Fuel and Electrolysis Cells
M. K. Bates and S. Mukerjee

1477 Highly Active and Durable Pt/Graphene Electrocatalysts for Fuel Cells
V. Chitturi and Y. Ishikawa

1478 Electrocatalysis on Cubic Pt-M Alloy Nanocrystals
L. Dai, Y. Tang, and S. Zou

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S. Mousavi Ehteshami, S. Chan, and S. Mukerjee

1508 Synthesis of $Ru_xIr_{1-x}O_2$ Anode Electrocatalysts for Proton Exchange Membrane Water Electrolysis
K. Kokoh, N. Mamaca, K. Servat, T. W. Napporn, E. Mayousse, and N. Guillet

1509 Electrocatalytic Water Oxidation on Metal-Oxides: Structure Activity-Relations of Model Film Electrodes
T. Reier, B. Johnson, D. Rosenthal, R. Schloegl, and P. Strasser

1510 Electrocatalysts for the Oxygen Evolution Reaction
N. Danilovic, R. Subbaraman, D. Strmcnik, D. Tripkovic, K. Chang, A. Paulikas, V. R. Stamenkovic, D. J. Myers, and N. M. Markovic

1511 Development and Study of Tantalum and Niobium Carbides as Catalyst Supports for the Oxygen Evolution Reaction (OER) for PEM Water Electrolysis at Elevated Temperatures
A. V. Nikiforov, I. Petrushina, C. Prag, J. Polonsky, E. Christensen, and N. J. Bjerrum

1512 Efficient Oxygen Evolution on Spray Pyrotically Synthesized Ni-Co Oxide on FTO Substrate During Water Electrolysis
M. Frites and S. U. Khan

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M. A. Rigsby, G. Alliger, A. Stack, and G. Brown

1514 Detailed Electrokinetic Study of the Initial Two-Electron Oxidation of an Alcohol Over Well-Defined Ru@Pt Surfaces in Base.
M. Markiewicz and S. H. Bergens

1515 Application of Polyoxometallate Zeolite-Type Cesium Salts as Carriers for PtSn Nanoparticles Catalytic for Electrooxidation of Ethanol
A. Zurowski, A. Kolary-Zurowska, A. Lewera, S. Zoladek, and P. J. Kulesza

1516 High Performance Mesoporous Carbon Supported Pt and PtRu Electrocatalyst Synthesized via Carbonization over PFA-Protected Dispersed Platinum
F. Li, H. Yung, C. Yang, and K. Chan

1517 A Differential Electrochemical Mass Spectrometry of Pt Ensemble Requirements for Methanol and Ethanol Oxidative Adsorption
S. Evarts and E. Smotkin

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J. Hou, A. Gordon, and M. Ellis

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D. Wang, Y. Yu, H. Xin, D. Muller, and H. Abruna

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C. S. Cucinotta, S. Sanvito, and M. Bernasconi

1535 Measuring Hydrogen Oxidation Reaction Kinetics in the Presence of Platinum Oxide in a H_2/N_2 Cell
Y. Liu, W. Gu, R. Jiang, J. Zhang, J. Jorne, and M. Mathias

1536 Activity and Microstructure of Oxygen Evolution Anodes Prepared by a Direct Dry Deposition Technique
J. M. Roller, J. Arellano-Jiménez, R. Jain, R. Maric, and B. Carter

1537 Operando Raman and Theoretical Vibration Spectroscopy of Non-PGM Catalysts
I. Kendrick, E. Smotkin, S. Mukerjee, and M. Diem

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I. Mogi, R. Aogaki, R. Morimoto, and K. Watanabe

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R. Aogaki, K. Motomura, R. Morimoto, A. Sugiyama, I. Mogi, M. Asanuma, M. Miura, Y. Oshikiri, and Y. Yamauchi

1541 Powder-based, MnO_2 Electrodes Modified with $SmCo_5$ Microparticles
G. G. Lee and J. Leddy

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P. Dunne and J. Coey

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K. Tschulik, G. Mutschke, C. Cierpka, M. Uhlemann, L. Schulttz, and A. Gebert

1544 Electrodeposition of Separated Three-Dimensional Magnetic Structures in High Magnetic Gradient Fields
M. Uhlemann, F. Karnbach, K. Tschulik, C. Mickel, A. Gebert, and L. Schultz

1545 Electromagnetic Behavior of Particles and Droplets in Capillary
H. Watarai, M. Funaki, and T. Kato

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M. Weston, C. Nash, J. Homesley, and I. Fritsch

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K. Isaac, N. Leventis, and I. Fritsch

1548 Redox-Modified Electrodes for Magnetohydrodynamic Pumping Systems
C. Nash and I. Fritsch

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S. T. Ochsenbein, Y. Feng, K. Whitaker, E. Badaeva, W. Liu, X. Li, and D. Gamelin

1550 Magnetic Effects on Electron Transfer: Temperature Studies and Model for Self Exchange
H. Lee and J. Leddy

1551 Magnetic Effects on Heterogeneous Electron Transfer Reactions
G. G. Lee, H. Lee, and J. Leddy

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1552 Progress in IR Spectroelectrochemistry
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J. Zeng, D. Jean, and S. Zou

1554 Polarization Characteristics of SERS Photons from Molecules at Liquid/Plasmonic Metal Interface
K. Murakoshi

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1556 Structure of Water and Other Molecules at the Electrified Solid Liquid Interface Using Raman Spectrosocopy
A. Gewirth and D. Butcher Jr.

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1558 Tuning Hydrogen Oxidation and Oxygen Reduction Reaction in Alloy Electrocatalysts for Fuel Cells
S. Yoo and Y. Sung

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A. Cuesta, G. Cabello, M. Osawa, and C. Gutiérrez

1560 Controlling Reactivity of Electrochemical Interfaces by Tuning Non-covalent Interactions
D. Strmcnik, R. Subbaraman, D. Tripkovic, K. Chang, N. Danilovic, D. F. van der Vliet, P. Lopes, A. Paulikas, V. R. Stamenkovic, and N. M. Markovic

1561 In Situ Studies of Lithium-Ion battery Solid-Electrolyte Interphase Formation Using Nonlinear Coherent Vibrational Spectroscopy
P. Mukherjee, A. Lagutchev, and D. D. Dlott

1562 Heterodyne-Detected 2D Sum Frequency Generation of Pt-CO: A Probe of Dynamics at Catalytic Interfaces
J. Laaser, W. Xiong, R. Mehlenbacher, and M. Zanni

1563 Molecular Structure of Charged α-Al_2O_3(0001) Surfaces in Aqueous Electrolytes Probed with Sum-Frequency Vibration Spectroscopy
W. Daum, A. Rumpel, and B. Braunschweig

1564 Probing the Molecular Structure of Electrode−Electrolyte Interfaces with Broadband Sum-Frequency Generation
B. Braunschweig, R. Kutz, P. Mukherjee, D. D. Dlott, and A. Wieckowski

1565 Ultra-broadband Vibrational Sum-Frequency Spectroscopy of OH Groups at a Charged Mineral/Aqueous Interface
O. Isaienko, S. Nihonyanagi, D. Sil, and E. Borguet

1566 Comparative Study on the Reaction Intermediates of Ethanol Electro-Oxidation Over Pt Probed by FTIR and SFG Spectroscopies
J. Fernandes Gomes, G. Tremiliosi-Filho, K. Bergamaski, and P. Barbeitas Miranda

1567 A Combined In Situ Spectroelectrochemical NMR and IR Investigations of Ru@Pt and Au@Pt Nanoparticles
D. Atienza, D. Chen, A. Hofstead-Duffy, I. Park, and Y. J. Tong

1568 Infrared Studies of the Potential Controlled Adsorption of Sodium Dodecyl Sulfate at the Au(111) Electrode Surface
J. Leitch, K. Friedrich, U. Stimming, J. Dutcher, and J. Lipkowski

1569 IR Analysis of Polymer Electrolytes Using a "Color-coded" Coordinate Subset Representation of Functional Groups
E. Smotkin, N. Dimakis, I. Kendrick, T. Mion, and A. Yakaboski

1570 In-situ Infrared Spectroscopy at Solid-Liquid Interfaces as a Tool for Evaluation of Nanoscale Surface Morphology
D. Tripkovic, D. Strmcnik, D. F. van der Vliet, C. Wang, N. M. Markovic, and V. R. Stamenkovic

1571 Interfacial Water Structure at the Aqueous Salt-Fused Silica Interface
P. A. Covert, K. Jena, and D. K. Hore

1572 The Electrochemistry of Hydroxylamine on Au and Pd@Au Surfaces: Electrochemical and In Situ Spectroscopic Studies
A. Jacob Jebaraj, D. Godoi, and D. Scherson

1573 Competitive and Co-Adsorption of Additives for Cu Electrodeposition Investigated by SEIRAS
G. Liu, S. Zou, L. Richter, and T. Moffat

1574 In Situ XAS and IRRAS of Platinum Monolayer Fuel Cell Electrocatalysts
M. Li, K. Sasaki, M. B. Vukmirovic, and R. R. Adzic

1575 In-operando study of PEM Fuel Cells using Ambient Pressure Photoemission
H. G. Sanchez Casalongue, S. Kaya, H. Ogasawara, S. Cho, D. Miller, D. Friebel, and A. Nilsson

1576 Study of Electrode Surface Dynamics Using Coherent Surface X-ray Scattering
M. Pierce, V. Komanicky, A. Barbour, C. Zhu, and H. You

1577 In Situ and Operando Site Specific Surface Probe Using Synchrotron XANES for Investigating Ensemble and Morphology Effects in Electrocatalysis
S. Mukerjee, D. Ramaker, N. Ramaswamy, B. Shyam, and Q. Jia

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1578 Investigation of Artifactual Impedance in High Frequency Range by Highly Resistive Reference Electrode
K. Kasahara, I. Shitanda, and M. Itagaki

1579 Characterization of Cathode Material/Current Collector Interface of Li-ion Rechargeable Battery by Electrochemical Impedance Spectroscopy
T. Kawaguchi, I. Shitanda, M. Itagaki, Y. Hongawa, and Y. Kojima

1580 Investigating the Effect of Accelerated Catalyst Durability Tests on PEM Fuel Cell Performance Using Electrochemical Impedance Spectroscopy
G. DiLeo, R. Yadav, N. Dale, and K. Adjemian

1581 Electrochemical Impedance Study of Direct Electron Transfer Type Enzymes Immobilized on Carbon Cryogel
H. Yanai, I. Shitanda, M. Itagaki, and S. Tsujimura

1582 Dynamic and Coverage Effects in EIS
D. A. Harrington

1597 Electrochemical Oxidation of Zinc in Alkaline Media Studied by Real-Time Impedance Measurements
Y. Ko and S. Park

J1 - Sensors, Actuators, and Microsystems General Session

Sensor

1598 High-Temperature Compatible Electrodes with Various Microstructural Architectures for Electrochemical Sensor Applications
E. Ciftyurek, K. Sabolsky, and E. M. Sabolsky

1599 Influence of Design Parameters on Performance of Mixed Potential Sensors
C. R. Kreller, P. K. Sekhar, R. Mukundan, E. L. Brosha, and F. H. Garzon

1600 Substrate Effects on Electrochemical NO_x Sensor Based on Porous Y_2O_3-Stabilized ZrO_2 (YSZ) and Sr-doped $LaMnO_3$ (LSM)
W. L. Du Frane, L. Woo, R. Glass, R. Novak, and J. Visser

1601 Growth of Epitaxial Orthorhombic Tin Oxide Films on Various YSZ Substrates for Gas Sensing Applications
S. Kim, D. Kim, and S. Hong

1602 Printed Low Power Amperometric Gas Sensors Employing RF Energy Harvesting
M. Carter, J. Stetter, J. Smith, A. Parks, Y. Zhao, M. Findlay, and V. Patel

1603 Multimode Sensors - A New Concept in Sensors' Technology
R.I. Stefan-Van Staden

1604 Micron-Scale, Phage-Immobilized Magnetoelastic Biosensors Enabling Enhanced, Direct Detection of *Salmonella* Typhimurium on Fresh Spinach Leaves
S. Horikawa, S. Li, Y. Chai, M. Park, K. Vaglenov, D. M. Gerken, J. M. Barbaree, V. A. Petrenko, and B. A. Chin

1605 Integration of ZnO-based Gateless Ion-Selective Field-Effect-Transistor pH Sensors
C. Lee, Y. Chiu, S. Ho, and Y. Lee

1606 Electrochemical Sensors as Detectors in Flow Systems
J. F. van Staden

1607 Printed Amperometric Gas Sensors
M. Carter, J. Stetter, M. Findlay, and V. Patel

1608 Versatile In-Situ Engine Lubricant Health Sensor
F. Zhao, M. Hurley, and A. Elangovan

1609 Salmonella Typhimurium detection on Shell Eggs Using Magnetoelastic Biosensors
Y. chai, S. Horikawa, S. Li, V. A. Petrenko, and B. A. Chin

1625 Driving Voltage for Compensating Capacitance Variation Along Sidewall in Electrowetting Microprism Arrays
E. Kim, Y. Choi, K. Choi, H. Song, J. Bae, and S. Lee

1626 Novel Projection Display Pixels Using Micro Vessel Structures
B. Amirsolaimani, S. Mohajerzadeh, and S. Azimi

J2 - Nano/Bio Sensors

Sensor

1627 Graphene Based Materials for Biosensing and Imaging
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1628 Nanoparticles Based Immunosensors for Detection of Biomarkers
D. Du and Y. Lin

1629 Surface Enhanced Raman Scattering Biosensor on Gold@Silica Core-Shell Nanoparticles
M. Li, J. Zhang, D. Ma, and N. Wu

1630 A Comparative Study of Aminosilanes for the Application of Reproducible, Ultralow Detection of Biomolecules
G. A. Mahmud, O. Seitz, R. Chapman, H. Stiegler, E. Vogel, and C. Yves

1631 Nano, Micro, and Thin Film Fluorescent Dye/Polymer Composites as in situ Oxygen Sensors for Life Sciences Research and Applications
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1632 High Performance Single In_2Se_3 Nanowire Photodetector
Q. Li, Y. Li, J. Gao, S. Wang, and X. Sun

1633 Non-Enzymatic Hydrogen Peroxide Sensor based on Nanostructured Metallic Array Electrodes: A Comparative Study
M. Jamal, B. Aslam, M. Hasan, A. Mathewson, and K. Razeeb

1634 pH Sensor Using CdSe/ZnS Quantum Dots
P. Kumar, A. Prakash, and S. Maikap

1635 Quantum Dots-Based Sensors for Prion
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1636 Nanoparticle Effects on Planar Lipid Bilayers in Silicon-Nitride Nanopores
Y. Liu, A. Negoda, Q. Zhang, G. Baker, and R. Worden

1637 Monitoring the Movement of Reductively Desorbed Self Assembled Monolayers via Fluorescence Microscopy
J. R. Casanova-Moreno and D. Bizzotto

1638 Monitoring Electrically Induced DNA "Switching" Using Fluorescence Microscopy
J. R. Casanova-Moreno and D. Bizzotto

1639 Functionalized Three-Dimensional Carbon Microarrays for Cancer Biomarker Detection
V. Penmatsa, R. Rahim, H. Kawarada, M. Beidaghi, and C. Wang

1640 Gigantic Enhancement in Signal Current Output and Room Temperature Gas Sensitivity by Using ZnO Nanowire Arrays
J. Song, W. Wang, W. Wu, and P. Yeh

1641 Spontaneous Growth ZnO Nanobranches Form ZnO Nanowires Humidity Sensor
C. Lai, W. Wu, and P. Yeh

1642 Surface Passivation Effect on SGOI Nanowire Biosensor in High Ge Fraction Fabrication
K. Chang, C. Chen, C. Lai, C. Hsieh, C. Wu, Y. Wang, and C. Liu

1643 Ultrahigh Sensitivity ZnO Nanosensor with Schottky Nanojunction
H. Fu, W. Wang, W. Wu, and P. Yeh

J3 - Sensors for Safety and Security

Sensor, Physical and Analytical Electrochemistry, New Technology Subcommittee

1644 Ionic Liquids as Electrolytes for Electrochemical Gas Sensors
P. Tschuncky

1645 Detection of Propylamine Using a Ni Screen-Printed Sensor
T. Shiu, W. Yuan, C. Hsu, C. Chang, and Y. Weng

1646 Electrochemical Gas Sensors Based Detection and Discrimination of Trace Explosives/Energetic Materials
P. K. Sekhar, E. L. Brosha, R. Mukundan, and F. H. Garzon

1647 Catalyst Development for Thermodynamic Based Gas Sensors Using Combinatorial Chemistry
Y. Chu, C. Pryde, C. Hurley, M. Amani, M. Platek, and O. Gregory

1648 Electrochemical Sensors for Detection of Biomarkers of Exposure to Pesticides and Nerve Agents
D. Du

1649 Prevention of Electrode Fouling Can Significantly Improve an Accuracy of Tricresyl Phosphate Detection
X. Yang, A. Zitova, J. Kirsch, J. W. Fergus, R. A. Overfelt, and A. L. Simonian

1650 Development of a Mitochondria-Based Electrochemical Sensor for Pesticides in Water
S. L. Maltzman and S. D. Minteer

1651 Towards the Design of a Breath Sensor for Acetone
N. Z. Hausmann and S. D. Minteer

1652 CO Gas Sensing by PdO Nanoflake Thin Film
Y. Chiang, B. Shih, S. Lin, and F. Pan