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## Meeting Abstracts — MA 2011-01

219<sup>th</sup> ECS Meeting

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S. Elangovan, J. Hartvigsen, M. Hollist, P. Czernichowski, and L. Frost
- 895 Studies on Direct Ethanol Use in SOFCs  
J. Irvine and G. Corre
- 896 Solid Oxide Fuel Cell Fueled by Diesel Reformate and Anaerobic Digester Gas  
M. LaBarbera, M. Fedkin, X. Wang, X. Chao, C. Song, and S. Lvov
- 897 A Study of the Rheological Properties of NiO/ScSZ Screen-Printing Inks and Their Application to SOFC Anodes  
M. Somalu, N. Brandon, and V. Yufit

- 898 Measurement of Knudsen and Effective Fickian Diffusion Coefficients in Solid Oxide Fuel Cell Anodes Fabricated by Atmospheric Plasma Spraying Using Solution Precursor, Suspension, and Powder Feedstocks  
C. Metcalfe, E. Lay, and O. Kesler
- 899 Electrooxidation of Reformate Gases at Model Anodes  
A. Weber, A. Utz, J. Joos, E. Ivers-Tiffée, H. Störmer, D. Gerthsen, V. Yurkiv, H. Volpp, and W. Bessler
- 900 Gas Transport and Internal Reforming Chemistry in SOFC Anode Supports and Structures  
A. Richards, N. Sullivan, R. Kee, M. McNeeley, and S. Babiniec
- 901 Performance of  $\text{Sm}_{0.95}\text{Ce}_{0.05}\text{Fe}_{1-x}\text{Ni}_x\text{O}_{3-\delta}$  Perovskite as Anode Materials under Methane Fuel for Low Temperature Solid Oxide Fuel Cells (LT-SOFC)  
S. Bukhari and J. Giorgi
- 902 Adsorptive Properties of the  $\text{Ni}_{1-x}\text{Co}_x$ -Based Cermet Anode for the Oxidation of Methane  
T. Sawahata, H. Takayanagi, T. Wah Tzu, and K. Sato
- 903 Gas Products Analysis during the Electrochemical Conversion of Dry Methane with a  $\text{La}_{0.3}\text{Sr}_{0.7}\text{TiO}_3$  and Ni/YSZ Bi-Layer SOFC Anode  
M. Buccheri and J. M. Hill
- 904 Thermal Imaging of Solid Oxide Fuel Cell Anode Degradation with Dry and Wet Ethanol Fuel Flows  
M. Pomfret, D. Steinhurst, and J. Owrutsky
- 905 Determination of Safe Operating Conditions to prevent Ni-YSZ Anode Supported SOFC Damage  
V. Roche, C. Roux, and M. Steil
- 906 Impact of Ni on Accelerated Degradation of 8.5 Mol%  $\text{Y}_2\text{O}_3$ -Doped Zirconia  
A. Lefarth, B. Butz, H. Störmer, A. Utz, and D. Gerthsen
- 907 Novel Materials and Components for SOFCs  
S. Somov, A. Demin, D. Bronin, and F. Gulbis
- 908 Novel SOFCs with 1 Micrometer Thick 8YSZ Electrolyte Layers  
T. Van Gestel
- 909 Development of Planar Solid Oxide Fuel Cell in Niroo Research Institute, Iran  
H. Mohebbi, A. Raoufi, A. Ghobadzadeh, R. Mahmoodi, and H. Aslannejad
- 910 Sol-Gel Process to Prepare an Anode Supported SOFC  
E. Courtin, P. Boy, K. Vallé, N. Poirot, and C. Laberty-Robert
- 911 Fabrication of Solid Oxide Fuel Cell Using the Dual Tape Casting Method  
A. Ghobadzadeh, H. Mohebbi, M. Zhiani, N. Manafi Rasi, and M. Rezaee
- 912 Fabrication and Development of Perovskite Anode Supported Planar SOFCs  
A. Tesfai, C. Savaniu, and J. Irvine
- 913 SOFC Material and Stack Characterization Tests for Micro-CHP Application  
S. McPhail, G. Cinti, G. Discepoli, and A. Moreno
- 914 A New Type of SOFC for Conversion of High Temperature Heat to Electricity without Carnot Limitation  
K. Jacob
- 915 Fundamental Thermodynamic Modifications in Wagner's Equation in Solid State Electrochemistry  
T. Miyashita

- 916 Advanced Thermal Spray Processes and Material Development for Industrialization of SOFC Components  
M. Gindrat and H. Höhle
- 917 Progress toward Inkjet Deposition of Segmented-in-Series Solid-Oxide Fuel Cell Architectures  
N. Faino, B. Gorman, W. Rosensteel, and N. Sullivan
- 918 Challenges of Thin Layers for SOFC Devices: From Low-Cost Chemical Bath Deposition (CBD) to Atomic Layer Deposition (ALD)  
B. Medina-Lott, M. Tassé, M. Benamira, A. Ringuedé, L. Niinistö, and M. Cassir
- 920 Universal SOFC Module for Rapid Start-Ups  
U. Bossel
- 921 High Efficiency CFY-Stack for High Power Applications  
S. Megel, M. Kusnezoff, N. Trofimenko, V. Sauchuk, A. Michaelis, A. Venskutonis, W. Kraussler, M. Brandner, C. Bienert, and L. Sigl
- 922 The Effects of Dynamic Dispatch on the Degradation and Lifetime of Solid Oxide Fuel Cell Systems  
A. Nakajo, F. Muller, D. McLarty, J. Brouwer, J. Van Herle, and D. Favrat
- 923 Electrochemical Performance of Cone-Shaped Tubular Anode Supported Solid Oxide Fuel Cells Fabricated by Low-Pressure Injection Moulding Technique  
J. Xiao, J. Liu, and J. Ding
- 924 Micro-Tubular Solid Oxide Fuel Cells under Redox Conditions  
C. Dikwal, W. Bujalski, G. Nahar, and K. Kenall
- 925 Performance of Anode Microstructure Controlled Ni-ScSZ/LSGM/LSCF-Ag SOFCs by Low Temperature Fabrication Process  
Y. Endo, K. Sasaki, A. Suzuki, and T. Terai
- 926 Evaluation of Fuel Cell Performance and Degradation  
M. Williams, R. Gemmen, and G. Richards
- 927 Impedance Analysis of Practical Segmented-in-Series Tubular Solid Oxide Fuel Cells  
B. Liu, T. Matsui, H. Muroyama, K. Tomida, T. Kabata, and K. Eguchi
- 928 Impedance Behavior of SOFC at High Fuel Utilization and a Way of Evaluating Diffusion Contribution  
A. Momma, Y. Tanaka, K. Takano, and T. Kato
- 929 FIB-TEM y FIB-SEM Characterization of the Electrode/Electrolyte Interface in Solid Oxide Fuel Cell Materials  
A. Soldati, L. Baqué, H. Troiani, C. Cotaro, A. Schreiber, R. Wirth, A. Caneiro, and A. Serquis
- 930 Hydrogen-Oxidation Kinetics in Reformate Fuelled Anode Supported SOFC  
A. Kromp, A. Leonide, A. Weber, and E. Ivers-Tiffée
- 931 Operation of Tubular Segmented-In-Series Solid Oxide Fuel Cell (SOFC) Unit Bundle  
T. Lim, U. Yun, J. Lee, S. Lee, S. Park, R. Song, and D. Shin
- 932 Metal-Supported SOFC with Ceramic-Based Anode  
P. Blennow, T. Klemensø, A. Persson, K. Brodersen, B. Sudireddy, X. Mao, and S. Ramousse
- 933 Fabrication of Direct Carbon Fuel Cell Based on a General Anode-Support Tubular Solid Oxide Fuel Cell (SOFC)  
T. Lim, M. Jo, J. Lee, S. Lee, S. Park, R. Song, and D. Shin

- 934 Analytical Investigation of Cell Performance of Intermediate-Temperature Disk Type Seal-Less SOFC Fueled by Methane  
T. Tanaka, Y. Inui, and N. Chitose
- 935 Anode-Supported Tubular SOFC at Low Temperature Using Ni-Fe-GDC as an Anode Support  
B. Liang, T. Suzuki, K. Hamamoto, T. Yamaguchi, Y. Fujishiro, B. Ingram, and J. Carter
- 936 Power Generating Property of Tubular SOFC Using DME as a Fuel  
- Focus on Portable Device -  
K. Sato, Y. Tanaka, A. Momma, K. Kato, A. Negishi, and T. Kato
- 937 Investigation on the Electrochemical Properties of the Ni-YSZ/Ni-ScSZ/ScSZ/LSM Tubular Solid Oxide Electrolysis Cell for High Temperature Steam Electrolysis  
L. Shao, S. Wang, J. Qian, Y. Xue, and R. Liu
- 938 Combined Theoretical and Experimental Studies of H<sub>2</sub> and CO Oxidation over the YSZ Surface  
A. Gorski, V. Yurkiv, W. Bessler, and H. Volpp
- 939 Numerical Simulation of Anode-Supported Disc-Type Single Cell at Anode Off-Gas Recycle  
Y. Tanaka, A. Momma, K. Sato, and T. Kato
- 940 Measurement and Prediction of Temperature Distribution in a SOFC Short Stack  
S. Celik, B. Timurkutluk, M. Mat, and Y. Kaplan
- 941 Environmental Effects on a Thermally Self-Sustained SOFC Hot Zone  
D. Cui, Y. Du, K. Reifsnider, and F. Chen
- 942 Comparison between FIB-SEM Experimental 3-D Reconstructions of SOFC Electrodes and Random Particle-Based Numerical Models  
H. Choi, D. Gawel, A. Berson, J. Pharoah, and K. Karan
- 943 Exchange Current Density at SOFC Electrodes  
T. Yonekura, Y. Tachikawa, T. Yoshizumi, Y. Shiratori, K. Ito, and K. Sasaki
- 944 Production of Current Collector Supported Micro-Tubular Solid Oxide Fuel Cells with Sacrificial Inner Core  
R. De La Torre, M. Casarin, and V. Sglavo
- 945 Investigations on Single Chamber Solid Oxide Fuel Cells: From Single Cell to Micro-Stack  
Z. Lü, B. Wei, M. Liu, Z. Wang, Y. Tian, and W. Su
- 946 The Performance of a Single-Chamber Solid Oxide Fuel Cell Operated under Thin Oxygen Condition within Methane Fuel  
Y. Liu, Z. Lü, and Y. Tian
- 947 Towards Understanding the Dual Membrane Fuel Cell (IDEAL-Cell) Using a Metallic Central Membrane  
Z. Ilhan, A. Ansar, N. Wagner, S. Presto, M. Viviani, A. Babucci, D. Vladikova, Z. Stoykov, and A. Thorel
- 948 Modeling Elementary Components of Fuel Cells Using DFT: CeO<sub>2</sub>M.Bulk, (111), (110) Surfaces Properties and Adsorption of Hydrogen  
T. Désaunay, A. Ringuedé, M. Cassir, C. Adamo, and F. Labat
- 949 Performance Study and Sensitivity Analysis of Counter-Flow Planar Solid Oxide Fuel Cell by Three Dimensional Simulations  
Y. Mollayi Barzi, N. Manafi Rasi, A. Raoufi, and H. Kanani
- 950 Numerical Approach of a Single-Chamber Solid Oxide Fuel Cell without Mixed Reactant Feeding  
S. Ould Ahmedou, J. Deseure, O. Doche, and Y. Bultel



- 951 Numerical Analysis on the Dynamic Behavior of a Solid Oxide Fuel Cell with a Multivariable Control Strategy  
Y. Komatsu, S. Kimijima, and J. Szmyd
- 952 High-Temperature CO<sub>2</sub> and H<sub>2</sub>O Electrolysis with an Electrolyte-Supported Solid Oxide Cell  
Q. Fu, J. Dailly, A. Brisse, and M. Zahid
- 953 Hydrogen Production by High Temperature Electrolysis Using Solid Oxide Electrolyzer Cells  
S. Kim, J. Yu, I. Han, D. Seo, K. Hong, and S. Woo
- 954 Electrochemical Analysis of Biogas Fueled Anode Supported SOFC  
A. Leonide, A. Weber, and E. Ivers-Tiffée
- 956 A Proposed Method for High Efficiency Electrical Energy Storage Using Solid Oxide Cells  
D. Bierschenk, J. Wilson, E. Miller, E. Dutton, and S. Barnett
- 957 Development of Tubular Solid Oxide Electrolysis Stacks for Hydrogen Production  
T. Kato, K. Sato, T. Honda, A. Negishi, Y. Tanaka, A. Momma, K. Kato, and Y. Iimura
- 958 Novel Structured Micro-Tubular High Temperature Solid Oxide Electrolysis Cells  
C. Jin, C. Yang, and F. Chen
- 959 The Strategic Electrochemical Research Center in Denmark  
M. Mogensen and K. Hansen
- 960 Low Temperature Operating Micro Solid Oxide Fuel Cells with Perovskite Type Proton Conductors  
F. Iguchi, K. Kubota, Y. Inagaki, S. Tanaka, N. Sata, M. Esashi, and H. Yugami
- 961 Internal Methane Reforming High Temperature Proton Conductor (HTPC) Fuel Cells  
I. Luisetto, E. Di Bartolomeo, A. D'Epifanio, F. Basoli, and S. Licocchia
- 962 Performance of Solid Oxide Fuel Cells with In-Doped BaZrO<sub>3</sub> Electrolyte Films on Different Anode Substrates  
L. Bi, E. Fabbri, and E. Traversa
- 963 Improving the Performance of Intermediate Temperature Solid Oxide Fuel Cells Based on BaZrO<sub>3</sub> Proton Conducting Electrolyte  
E. Fabbri, L. Bi, D. Pergolesi, and E. Traversa
- 964 Chemically Stable Electrolytes and Advanced Electrode Architectures for Efficient Proton Ceramic Fuel Cells  
G. Taillades, P. Battochi, M. Taillades, D. Jones, and J. Rozière
- 965 Model-Based Evaluation of the Production of Pure Oxygen through SOFC/SOEC Integration  
M. Taher, C. Adjiman, P. Iora, P. Chiesa, and N. Brandon
- 966 Self-Consistent Field Modeling of a Micro-Tubular Solid Oxide Fuel Cell  
D. Gatewood, C. Turner, and B. Dunlap
- 967 Numerical Simulation of Multi-Channel Planar Solid Oxide Fuel Cell Unit by Integrating Continuum Micro-Scale PEN Sub-Model  
H. Wang, Y. Shi, and N. Cai
- 968 Anode-Supported Micro-Tubular SOFC: Fabrication and Performance Analysis through Mathematical Modeling  
Y. Kim, J. Lee, T. Lim, S. Lee, S. Park, R. Song, and D. Shin
- 971 Phase Field Model of Electrochemical Impedance for SOFC Electrode Studies  
W. Gathright and D. Lewis
- 972 Current Distribution Analysis of a Microtubular Solid Oxide Fuel Cell with Surface Temperature Measurements  
H. Nakajima and T. Kitahara

- 973 Solid Oxide Fuel Cell Electrode 3D Microstructure and Performance Modelling  
K. Rhazaoui, Q. Cai, P. Shearing, C. Adjiman, and N. Brandon
- 974 Effect of the Porous Micro-Structural Properties on the Performance with the Cell Model in Solid Oxide Fuel Cells  
H. Choi, A. Berson, J. Pharoah, and S. Beale
- 975 Modeling SOFC Cathodes Based on 3-D Representations of Electrode Microstructure  
C. Kreller, M. Drake, and S. Adler
- 976 First Principles Modeling of Oxygen Incorporation into SOFC Cathode and Oxygen Permeation Membranes  
E. Kotomin, R. Merkle, Y. Mastrikov, M. Kuklja, and J. Maier
- 977 Three-Dimensional Simulation of SOFC Anode Polarization Characteristics Based on Sub-Grid Scale Model  
M. Kishimoto, H. Iwai, M. Saito, and H. Yoshida
- 978 Modeling the Electrochemistry of an SOFC through the Electrodes and Electrolyte  
E. Ryan, K. Recknagle, and M. Khaleel
- 979 Computational Study on Impurities Poisoning and Degradation of an SOFC Anode Based on Density Functional Theory  
T. Ogura, K. Nakao, T. Ishimoto, and M. Koyama
- 980 Multi-Scale Modeling of Solid Oxide Fuel Cells: From Patterned Anodes to a Power Plant System  
W. Bessler
- 981 Simulation of Two-Dimensional Electrochemical Impedance Spectra of Solid Oxide Fuel Cells Using Transient Physical Models  
Y. Shi, H. Wang, and N. Cai
- 982 Mathematical Modeling and Simulation for Optimization of IDEAL-Cell Performance  
A. Bertei, C. Nicolella, F. Delloro, W. Bessler, N. Bundschuh, and A. Thorel
- 983 Modeling Segmented-in-Series SOFCs with Distributed Charge-Transfer and Internal-Reforming  
H. Zhu and R. Kee
- 984 A Three Dimensional Electrical Model of SOFC Stack  
M. Le-Ny, O. Chadebec, G. Cauffet, J. Dedulle, and Y. Bultel
- 985 Analytical Models for SOFC Electrodes with Variable Cross-Section Microstructures  
G. Nelson, A. Peracchio, B. Cassenti, and W. Chiu
- 986 Development of New Alloys for SOFC Interconnects with Excellent Oxidation Resistance and Reduced Cr-Evaporation  
N. Yasuda, T. Uehara, S. Tanaka, and K. Yamada
- 987 Low-Chromium Alloys for Solid Oxide Fuel Cell Interconnects  
J. Fergus and Y. Zhao
- 988 Oxide Modification by Alloying Molybdenum to Fe-22Cr-0.5Mn for Solid Oxide Fuel Cell Interconnect  
D. Yun, H. Seo, J. Jun, J. Lee, D. Kim, and K. Kim
- 716 High Temperature Oxidation of Plastically Deformed Ferritic Interconnect Steel  
U. Bexell, M. Olsson, and M. Lundberg
- 990 Oxide Protective Coatings for Solid Oxide Fuel Cell Interconnects  
M. Seabaugh, S. Ibanez, M. Beachy, M. Day, and L. Thrun

- 991 On Potential Application of Coated Ferritic Stainless Steel Grades K41X and K44X in SOFC/HTE Interconnects  
P. Santacreu, P. Girardon, M. Zahid, J. Van Herle, J. Mougin, and V. Shemet
- 992 Electrodeposition of CoMn onto Stainless Steels Interconnects for Increased Lifetimes in SOFCs  
T. Hall, H. McCrabb, J. Wu, H. Zhang, X. Liu, and J. Taylor
- 993 Multifunctional Nano-Coatings for SOFC Interconnects  
J. Froitzheim and J. Svensson
- 994 Nanocrystalline  $\text{MnCo}_2\text{O}_{4.8}$  as SOFC Protective Coating  
A. Das Sharma, J. Mukhopadhyay, and R. Basu
- 722 Characteristics of the Sintered Phlogopite Mica- $\text{SiO}_2$ - $\text{B}_2\text{O}_3$ - $\text{Al}_2\text{O}_3$ - $\text{BaO}$ - $\text{La}_2\text{O}_3$  Glasses Blends  
C. Liu, K. Lin, and R. Lee
- 996 Analysis of Joint Strength between a Metallic Interconnect and Glass-Ceramic Sealant for Use in Solid Oxide Fuel Cells  
C. Lin, J. Chen, L. Chiang, and S. Wu
- 997 Multiscale Simulation of Electro-Chemo-Mechanical Coupling Behavior of PEN Structure under SOFC Operation  
K. Terada, T. Kawada, K. Sato, F. Iguchi, K. Yashiro, K. Amezawa, M. Kubo, H. Yugami, T. Hashida, J. Mizusaki, H. Watanabe, H. Aoyagi, and K. Takahashi
- 998 Numerical and Experimental Analysis of a Solid Oxide Fuel Cell Stack  
A. Le, S. Beale, J. Pharoah, H. Choi, L. de Haart, and D. Froning
- 999 Modeling of a SOFC Fuelled by Methane: Influence of the Methane Steam Reforming Kinetics  
K. Girona, J. Toyir, P. Gélin, and Y. Bultel
- 1000 Thermodynamic Influence Analysis of Available Fuels and Reforming Methods on SOFC System Efficiency  
M. Heddrich, M. Jahn, A. Michaelis, and E. Reichelt
- 1001 Multi-Dimensional Micro-Scale Model for Oxygen Reduction on LSM-YSZ Cathode  
S. Pakalapati, I. Celik, H. Finklea, M. Gong, and X. Liu
- 1002 A near Triple-Phase Boundary Region Model for  $\text{H}_2\text{S}$  Poisoning of SOFC Anodes  
D. Monder and K. Karan
- 970 An Innovative Electrochemical Model for Three-Dimensional Modeling of a SOFC Stack Use in Electrolysis Mode  
D. Grondin, J. Deseure, A. Brisse, M. Zahid, B. Grondin-Perez, J. Chabriat, and P. Ozil
- 1004 Materials for Solid Oxide Electrolysis Cells  
S. Elangovan, J. Hartvigsen, D. Larsen, I. Bay, and F. Zhao
- 1005 Experimentally Validated Simulations of Undoped Ceria Electrodes for  $\text{H}_2$  Oxidation and  $\text{H}_2\text{O}$  Electrolysis in Solid Oxide Electrochemical Cell Electrodes  
S. DeCaluwe and G. Jackson
- 1006 Development of Reversible Solid Oxide Fuel Cell (RSOFC) Cells and Stacks  
N. Minh
- 1007 Performance and Durability of High Temperature Steam Electrolysis: From the Single Cell to the Short-Stack Scale  
M. Petitjean, M. Reytier, A. Chatroux, L. Bruguière, A. Mansuy, H. Sassoulas, S. di Iorio, and B. Morel

- 1008 Long Term Testing of Short Stacks with Solid Oxide Cells for Water Electrolysis  
J. Schefold, A. Brisse, M. Zahid, J. Ouweltjes, and J. Nielsen
- 1009 Hydrogen and Power by Fuel-Assisted Electrolysis Using Solid Oxide Fuel Cells  
G. Tao and A. Virkar
- 1010 Production of Sustainable Fuels by Means of Solid Oxide Electrolysis  
J. Hansen, N. Christiansen, and J. Nielsen

## **C1 - Organic and Biological Electrochemistry General Poster Session**

### *Organic and Biological Electrochemistry*

- 1011 Electrochemical Study of Major Fat-Soluble Composition in Salvia  
Z. Jia and W. Li
- 1012 The Regularities of Electrolytic Dissociation of 1,2-Cyclopropanedicarboxylic Acids  
E. Kvaratskhelia and R. Kvaratskhelia
- 1013 Electrodeposition of Organic-Inorganic Films for Biomedical Applications  
I. Deen and I. Zhitomirsky
- 1014 Covalent Attachment of Half-Sandwich Complexes to Electrode Surfaces  
W. Barker
- 1015 Anodic Electrochemistry and Ligand Exchange Reactions of Cymantrenyl Tamoxifen Compounds  
K. Wu, W. Geiger, and E. Hillard
- 1016 Electron Transfer Reactions of Siliranes  
M. Kako and H. Satoh
- 1017 The Chemical and Electrochemical Activity of Citrate on Pt Electrodes  
O. Berkh, L. Burstein, Y. Shacham - Diamand, and E. Gileadi
- 1018 Investigation of Structure and Function of Thin Films of Nitric Oxide Synthase and Polyethylenimine Formed Using the Layer-by-Layer Deposition Method  
B. Gunasekera and M. Bayachou
- 1019 One Atmospheric Pressure Plasma Treatment of FTO Glass for Improving the Efficiency of DSSC  
S. Kim, V. Dao, and H. Choi
- 1020 Preparation of the Bioactive Porous Layer on Titanium by AC Electrolysis in Sulfuric Acid  
S. Tanaka, Y. Fukushima, I. Nakamura, and G. Jerkiewicz
- 1021 Voltammetric Determination of Antioxidant Capacity in Plasma Samples from Stroke Patients  
C. Lete, M. Marin, B. Manolescu, E. Oprea, C. Comninellis, and M. Berteau
- 1022 Synthesis and Characterization of Tetrasulfonated Poly(Arylene Biphenylsulfone Ether)s for Proton Exchange Membranes  
D. Yoo, S. Hyeon, A. Kim, and K. Nahm
- 1023 GDC/LSCF Nanopowder Synthesis for IT-SOFC by Induction Plasma Spraying  
Y. Shen and G. François
- 1024 Anatomical Variations in Dopamine Transporter Functionality in Rat Brain: Electrochemical Investigations of Dopamine Release and Uptake  
P. Lukus and J. Schenk
- 1025 Effects of Applied Potential, Protein Concentration, and Time on Adsorbed Protein Layers on Metal Electrodes  
M. Everist and H. Andreas

## C2 - Recent Progress in Synthetic and Mechanistic Organic Electrochemistry

### *Organic and Biological Electrochemistry*

- 1026 Anodic Electrochemistry: Probing the Chemistry of Radical Cation Intermediates  
K. Moeller
- 1027 Electrochemical Reduction of Arylsulfonyl Chlorides  
A. Houmam and E. Hamed
- 1028 Reactions of Diarylcarbenium Ion Pools with Benzylsilanes. Single Electron Transfer vs. Electrophilic Aromatic Substitution  
T. Suehiro, T. Nokami, and J. Yoshida
- 1029 Synthesis of Electrochemically Modified Prolyl Peptides Based on Hydrophobically Tagged Strategy  
S. Kitada, K. Yamamoto, M. Sugihara, T. Kawai, S. Kim, and K. Chiba
- 1030 Electrochemically Initiated Degradation of a New Energetic Material 2,2-Dinitroethene-1,1-Diamine (FOX-7)  
L. Simkova and J. Ludvik
- 1031 Selective Electrochemical Fluorination of Indole Derivatives  
B. Yin, S. Inagi, and T. Fuchigami
- 1032 Direct Reduction of 6-Halo-1-Phenyl-1-Hexynes at Silver Cathodes  
L. Strawsine and D. Peters
- 1033 Electrochemical Carboxylation of Benzylic Carbonates as an Alternative Method for Efficient Synthesis of Arylacetic Acids  
H. Senboku, M. Ohkoshi, J. Michinishi, and S. Hara
- 1034 Voltammetric Study of Fluorenone Complexation by Lewis Acids in an Ionic Liquid  
G. Cheek
- 1035 The Reduction of Diazonium Salts in Organic Synthesis  
F. Barba and B. Batanero
- 1036 Bioinspired Hydrogen Production and Molecular Transformation Catalyzed by Vitamin B<sub>12</sub>-TiO<sub>2</sub>  
H. Shimakoshi, Y. Nagami, and Y. Hisaeda
- 1037 Controlling the Reactivity of Thiophenoazomethines Radical Cations Contingent on Degree of Conjugation - towards New Easily Prepared Electrochromic Materials  
N. Ayadi, S. Bishop, A. Bolduc, and W. Skene
- 1038 Bipolar Patterning of Conducting Polymer Film via Electrochemical Doping and Reaction  
S. Inagi, Y. Ishiguro, and T. Fuchigami
- 1039 Electrochemical Synthesis of Low-Bandgap Amine Functionalized Poly(Phenylthiophenes)  
O. Lukyanova, M. Lepeltier, and D. Perepichka
- 1040 Phosphoric Acid-Doped Polyamide as the Ion-Exchange Membranes for Potential Use in Fuel Cells  
J. Xie, J. Qiao, and G. Li
- 1041 Dendritic Diarylcarbenium Ion Pools Electrochemical Preparation and Thermal Stability  
N. Musya, T. Watanabe, T. Morofuji, T. Nokami, and J. Yoshida
- 1042 Kolbe Electrolysis of  $\alpha$ -Silylacetic Acids  
A. Shtelman and J. Becker

- 1043 Electroanalytical Contribution to Understanding of Processes in Determination of Amino Acids  
P. Zuman, E. Kulla, and J. Ludvik
- 1044 Electrochemical Reduction of Carborane and Its Mediatory Application  
K. Hosoi, S. Inagi, and T. Fuchigami
- 1045 Electrochemical Reduction of 1,1,2-Trichloro-1,2,2-Trifluoroethane (CFC-113)  
E. Wagoner and D. Peters
- 1046 Investigation of Radical-Radical and Related Crosslinks of Small Biological Molecules Formed On-Line by Electrochemistry Electrospray Ionization FT ICR Mass Spectrometry (EC ESI MS)  
A. Brajter-Toth and D. Looi
- 1047 New Anodic Reactions of Cyclooctatetraenes  
A. Fry, P. Lambert, J. Bours, and B. Sheludko
- 1048 Me<sub>3</sub>SiCl-Promoted Electroreduction of Triphenylphosphine Oxide to Triphenylphosphine  
H. Tanaka, T. Yano, K. Kobayashi, S. Kamenoue, M. Kuroboshi, and H. Kawakubo
- 1049 Electron Transfer-Induced Reversible Intermolecular Olefin Cross-Coupling Reactions Based on "Redox Tag" Strategy  
Y. Okada and K. Chiba
- 1050 Investigation of Anodically Generated Intermediates of Conjugated Polyazomethines - Achieving Reversible Behavior Contingent on Structure  
W. Skene and S. Barik
- 1051 Carbon-Skeleton Rearrangement Reaction Mediated by Simple Vitamin B<sub>12</sub> Model Complex with Electrochemical Duet Process  
Y. Hisaeda, Y. Chen, L. Pan, K. Tahara, T. Masuko, and H. Shimakoshi
- 1052 Comparative Electrochemical Investigation of Pt, Au and Ti Electrodes on Liquid Crystal Polymer for the Application of Neural Prostheses  
S. Mohtashami, M. Howlader, T. Doyle, and M. Taheri
- 1053 Hofer-Moest Oxidative Decarboxylation Dimethyl Methoxymalonate as a Versatile Reagent for Orthoester Synthesis by Organic Electrochemistry(C2)  
C. Mathot and I. Markó
- 1054 Reactivity of Isoquinoline Alkaloids toward Superoxide Anion Radical: An Electrochemical Study  
M. Abasq, P. Courtel, and J. Hurvois

## **D1 - Corrosion General Session**

### *Corrosion*

- 1055 Model for Corrosion of Metals Covered with Thin Electrolyte Layers  
M. Venkatraman, I. Cole, and B. Emmanuel
- 1056 Influence of Electrode Surface Condition on Constant Phase Element Characterization  
K. Allahar, D. Butt, and M. Orazem
- 1057 Progress in Understanding Porous Oxides for Self-Repair on Corroding Metals - An Overview  
I. Cole, M. Venkatraman, S. Thomas, N. Shahzad, N. Birbilis, B. Gabriel, and B. Emmanuel
- 1058 Passive Film Formation on Iron-Based Amorphous Metals  
J. Farmer, S. Menon, L. Brewer, T. Omlor, and L. Hackel

- 1059 Passive Film Formation on Friction Stir Processed and Laser Peened Nickel Aluminum Bronze  
J. Farmer, S. Menon, P. LaGrand-Brown, and L. Hackel
- 1060 Passive Film Formation on Friction Stir Processed and Laser Peened Aluminum Alloys  
J. Farmer, S. Menon, L. Brewer, H. Mattern, and L. Hackel
- 1061 Comments on the Mechanism of Top of the Line Corrosion. Part I: A Possible In situ Production of Organic Acids  
M. Reda
- 1062 A Mechanism for Flow Induced Corrosion and Its Relationship to Corrosion Engineering in 4000 B.C.  
M. Reda
- 1063 Study of Under Deposit CO<sub>2</sub> Corrosion of Mild Steel Using Electrochemical Techniques  
J. Huang, B. Brown, Y. Choi, B. Kinsella, and S. Nešić
- 1064 Effects of Inclusions in HSLA Carbon Steel on Pitting Corrosion in CaCl<sub>2</sub>  
M. Ziomek-Moroz, S. Bullard, K. Rozman, and J. Kruzic
- 1065 Determining the Cause of Faults in the SAE 1018 Carbon Steel Used in Potable Water Pipelines by Means of Digital Image Processing  
E. Bolaños Rodriguez, E. Flores Garcia, E. Felipe Riveron, M. Veloz Rodríguez, V. Reyes Cruz, and J. Hernández-Ávila
- 1066 Control and Monitoring Corrosion in Carbon Steel SAE 1018 Pipelines Using Microcontrollers DSPIC 30F3013  
J. Bautista Lopez, E. Flores Garcia, E. Bolaños Rodriguez, J. Quezada Quezada, and C. Rojas Hernandez
- 1067 Corrosion of Carbon Steel in CO<sub>2</sub> Saturated with Water and in Water Saturated with CO<sub>2</sub>  
J. Beck, M. Fedkin, S. Lvov, M. Ziomek-Moroz, G. Holcomb, J. Tylczak, and D. Almand
- 1068 On-Site Impedance Analysis for Corrosion Assessment of R.C. Structures  
C. Christodoulou, G. Glass, J. Webb, S. Austin, and C. Goodier
- 1069 SCC and Pitting Corrosion of Stainless Steel Alloys 316L and 317L in Chloridized Ammonium Sulfate Solution  
A. Ghahremaninezhad, E. Asselin, J. Budac, and A. Alfantazi
- 1070 Application of Impedance Techniques to Tribocorrosion State-of-the-Art and Perspectives  
M. Keddam, P. Ponthiaux, V. Vivier, F. Wenger, J. Celis, and D. Rose
- 1071 A Research of Corrosion for Generated Condensate at Intercooler in Emission Recirculation Engine System  
M. Oh, Y. Yoon, K. Oh, A. Kim, and S. Ko
- 1072 Investigation of Corrosion Inhibitors and Inhibitive Effect of Some Novel Organic Dyes on the Corrosion of 2S Aluminum in Alkaline Media  
P. Patel
- 1073 The Inhibiting Ability of Hexamethylenetetramine to AZ31 Magnesium Alloy  
X. Feng, Y. Si, and Z. Xiong
- 1074 Facile Routine to Electrochemically Prepare High Density Polypyrrole Film and Its Corrosion Protection on Copper  
J. Wang, Y. Xu, and J. Zhu
- 1075 Synergic Effect of 2-Amino-5-Ethylthio-1,3,4-Thiadiazole and Chloride Ion on Cu Passivation in a Phosphate Electrolyte  
H. Chang, S. Chou, and J. Lin

- 1076 Thiourea as Corrosion Inhibitor for 430 Stainless Steel in 0.5 M H<sub>2</sub>SO<sub>4</sub>  
A. Dadgareenezhad and F. Baghaee
- 1077 Inhibition of Acid Corrosion of Low Alloy Steel by a New Schiff-Base  
F. Baghaei Ravari, A. Dadgareenezhad, and Z. Bhremmand
- 1078 Modeling Based on Markov Chains, for The Evolution of Pitting Corrosion in Buried Pipelines Carrying Gas  
E. Bolaños Rodriguez, J. Gonzalez Islas, G. Vega Cano, and E. Flores Garcia
- 1079 Effect of Intermetallic Phases on the Corrosion of UNS S32050 Super Austenitic Stainless Steel  
J. Shin, M. Cho, and C. Park
- 1080 Comparison of Copper Anodic Behavior under Joint Presence of  $\alpha$ -Alanine or  $\beta$ -Alanine and Chloride Ions  
S. Kaluzhina, E. Skrypnikova, E. Orlova, and L. Volkova
- 1081 Comparison of Electrochemical Behavior of Cast and Sintered CuAg4at.% Alloy  
M. Rajčić-Vujasinović, Z. Stević, V. Grekulović, and S. Simov
- 1082 The Study on Graphite Nano-Fiber as Supporter of Catalysts for PEMFC  
L. Lu and H. Xu
- 1083 Oriented Mesoporous TiO<sub>2</sub> Thin Film as Photoanode for Cathodic Protection of Stainless Steel  
Z. Feng, C. Lei, C. Wang, H. Zhou, S. Li, and B. Xu
- 1084 Photocathodic Protection Effect of a TiO<sub>2</sub> Nanowire Film for 403 Stainless Steel  
R. Du, Y. Zhu, H. Qi, and C. Lin
- 1085 Investigation on the TiO<sub>2</sub> Photoanodes Derived from Liquid Phase Deposition for Cathodic Protection Applications  
C. Lei, Z. Feng, H. Zhou, Y. Zhu, and R. Du
- 1086 Corrosion Resistance of a New Non-Toxic Implant Alloy  
M. Popa, E. Vasilescu, P. Drob, C. Vasilescu, and S. Drob
- 1087 Comparative Study of CoCrMo Alloy in Medium That Simulate the Oral Environment  
K. Souza and S. Agostinho
- 1088 Implications of Sandblasting of 316 LVM Stainless Steel on Its Ion Release, In Vitro Corrosion Behavior and Biocompatibility  
J. Galván, M. Multigner, L. Saldaña, M. Larrea, A. Calzado-Martín, C. Serra, N. Vilaboa, and J. Gonzalez-Carrasco
- 1089 The Effects of SDS and CNT Concentrations on the Rate of Copper Corrosion  
M. Baghalha and M. Kamal-Ahmadi
- 1090 Effect of Organosilicon Nanolayers on Copper Corrosion  
M. Petrunin, L. Maksaeva, T. Yurasova, and E. Terkhova
- 1091 Influence of Electrolyte Additives on Cu-Sb Anode Passivation during Copper Refining Using Electrochemical Noise Analysis  
F. Safizadeh and E. Ghali
- 1092 Evidence of Surface Roughening during the Anodic Response of Alkylthiols with Polycrystalline Au Electrodes  
S. Smith, E. Guerra, and J. Shepherd
- 1093 Characterization of Electrochemical Processes at the Carbon Paste Chalcopyrite Electrode Interface in Sulfuric Acid Solutions  
A. Ghahremaninezhad, E. Asselin, and D. Dixon



- 1094 Hot Corrosion and Electrochemical Behavior of Alloy 625 beneath  $\text{PbSO}_4\text{-Pb}_3\text{O}_5\text{-PbCl-ZnO-5\%CdO}$  Molten Salt Mixture at 800, 700 and 600 °C  
E. Mohammadi Zahrani and A. Alfantazi
- 1095 Dissolution/Deposition of Zinc in the Deionized Water ( $60 < T(^{\circ}\text{C}) < 93.3$ )  
J. Park, R. Choromokos, J. Furman, and P. Mast
- 1096 Corrosion of Materials Used in Solar Panels  
H. Wheat and A. Ghuman
- 1097 Climatic Reliability of Electronic Devices and Electrochemical Migration  
R. Ambat
- 1098 Corrosion Behavior of Extruded Al-Mn Heat Exchanger Alloys  
A. Laferrere, N. Parson, X. Zhou, and G. Thompson
- 1099 Passivation Rates for Small Particulate Aluminum in Contact with Oxide and Nitride Powders  
J. Skrovan, Z. Gasem, and V. Padilla
- 1100 Influence of the Cerium Concentration on Anti-Corrosion Properties of Sol-Gel Coatings Deposited on Aluminum Alloys  
J. Esteban, F. Ansart, J. Bonino, C. Malfatti, T. Menezes, C. Radtke, J. Dupin, and D. Gonbeau
- 1101 The Use of Fluorescent Probes for Monitoring the Water Absorption in Corrosion Protection Sol-Gel Coatings  
A. Jimenez-Morales, D. Carbonell, and J. Galván
- 1102 Electrochemical Characteristics of YSZ-Coated Aluminum Alloys Fabricated By Aerosol-Deposition  
H. Ryu, T. Lim, J. Ryu, D. Park, and S. Hong
- 1103 In situ Optical Emission Spectrometry during the Initiation and Growth of Porous Anodic Alumina  
D. Mercier, Q. Van Overmeere, R. Santoro, and J. Proost
- 1104 Experimental Determination of the Viscosity of Anodic Alumina  
Q. Van Overmeere, D. Mercier, and J. Proost
- 1105 Electrochemical Behavior of Magnesium Grains in Aqueous Solutions  
Z. Xu and G. Song
- 1106 Corrosion Properties of  $\text{CeO}_2$ -Containing MAO Coatings on AZ31 Magnesium Alloy Fabricated by Micro-Arc Oxidation  
T. Lim, H. Ryu, and S. Hong
- 1107 Electrodeposited Al on Mg Alloy from Ionic Liquid as Anti-Corrosion Coating  
X. Yu and W. Zhang
- 1108 Water and Inhibitor Transport in Paint Films  
W. Zhang and M. Jaworowski
- 1109 Electrochemical Performance of Combined Organic and Aluminum Thermal Spray Protective Coatings Immersed in Simulated Marine Environment  
G. Rios
- 1110 Corrosion Behavior of CrSiN/301 Stainless Steel System  
M. Azzi, J. Klemberg-Sapieha, and L. Martinu
- 1111 "Smart" Self-Healing Coatings for Active Corrosion Protection  
M. Zheludkevich and M. Ferreira
- 1112 Electrochemical Heterogeneity of Steel Surface after Pretreatment  
S. Jamali and D. Mills

- 1113 Sol-Gel Routes to Replace Chromate Based Treatments for the Protection against Zinc Corrosion  
V. Meiffren, P. Lenormand, F. Ansart, and S. Manov
- 1114 Effect of Temperature and Thermal Cycling on the Corrosion Performance of Galvanized Steel Relevant to Mechanically Stabilized Earth Walls  
V. Padilla and A. Alfantazi
- 1115 Organic Materials as Corrosion Inhibitors in Aqueous Medium: A Review  
D. Asefi, M. Arami, and M. Niyaz Mohammad
- 1116 Comparing Chain Length Effect of Single Chain and Gemini Surfactants on Corrosion Inhibition of Steel in Acid  
D. Asefi, M. Arami, and N. Mahmoodi
- 1117 Eco-Friendly Compounds as Corrosion Inhibitors: A Review  
D. Asefi, M. Arami, and N. Mahmoodi

## **E1 - Silicon Compatible Materials, Processes, and Technologies for Advanced Integrated Circuits, and Emerging Applications**

*Electronics and Photonics / Dielectric Science and Technology*

- 1118 Nanobonding for Multi-Junction Solar Cells at Room Temperature  
T. Yu, M. Howlader, F. Zhang, and M. Bakr
- 1119 Effects of Externally Applied Uniaxial Tensile Stress on Gate Induced Drain Leakage (GIDL) Current of Metal-Oxide-Semiconductor Transistors  
W. Lau
- 1120 Green Laser Crystallization of GeSi Thin Films and Dopant Activation  
B. Rangarajan, I. Brunets, P. Oesterlin, A. Kovalgin, and J. Schmitz
- 1121 Germanium Fin Structure Optimization for Future MugFET and FinFET Applications  
M. Shayesteh, R. Duffy, B. McCarthy, A. Blake, M. White, J. Scully, R. Yu, V. Djara, and A. Kelleher
- 1122 Catalytic CVD Growth of Nanomaterials for Advanced Interconnects: Si Nanowires and Few Graphene Layers/Carbon-Nanotubes Composites  
V. Jousseau and V. Renard
- 1123 Progress, Opportunities and Challenges for beyond CMOS Information Processing Technologies  
G. Bourianoff and D. Nikonov
- 1124 Single-Digit Nanofabrication Routes for Tailoring and Assembling Graphene into Functional Nanostructures and Devices  
X. Liang, D. Olynick, S. Cabrini, and J. Bokor
- 1125 Block Copolymer Self-Assembly as an Extension of Lithography: Status, Applications, Current Research and Future Directions  
W. Hinsberg
- 1126 3D Integration Technology as an Alternative to "More Moore"  
P. Ramm and A. Klumpp

- 1127 3D MOSCAP Vehicle for Electrical Characterization of Sidewall Dielectrics for 3D Monolithic Integration  
B. Wood, B. McDougall, O. Chan, A. Dent, C. Ni, R. Hung, H. Chen, P. Xu, P. Nguyen, M. Okazaki, D. Mao, X. Xu, R. Ramiraz, M. Cai, M. Jin, W. Lee, A. Noori, M. Shek, and C. Chang
- 1128 3D Integration in Silicon Technology  
M. Farooq
- 1129 Sub-Atmospheric Chemical Vapor Deposition of SiO<sub>2</sub> for Dielectric Layers in High Aspect Ratio TSVs  
M. Lisker, S. Marschmeyer, M. Kaynak, and I. Tekin
- 1130 Comparison of Boron Diffusion in Silicon during the Formation of Shallow p<sup>+</sup>/n Junction with KrF and Green Laser Annealing  
S. Aid, S. Matsumoto, G. Fuse, and S. Sakuragi
- 1131 (Invited) Recent Developments in Ion Implantation  
T. Renau
- 1132 Problems of n-Type Doped Regions in Germanium, their Solutions, and How to Beat the ITRS Roadmap  
R. Duffy, M. Shayesteh, M. White, J. Kearney, and A. Kelleher
- 1133 (Invited) Advances in Si and Ge Millisecond Processing: From SOI to Superconductivity and Carrier-Mediated Ferromagnetism  
W. Skorupa
- 1134 Evaluation of Very High Resolution Multi-Wavelength Raman Spectroscopy for In-Line Characterization of Patterned Epitaxial Si<sub>1-x</sub>Ge<sub>x</sub> Layers on Si(100) Wafers  
V. Vartanian, T. Ueda, T. Ishigaki, K. Kang, and W. Yoo
- 1135 Site Specific and High Spatial Resolution Scanning Spreading Resistance Microscopy and Its Applications in Si Technology  
L. Zhang, M. Koike, and S. Takeno
- 1136 Si CMOS Contacts to III-V Materials for Monolithic Integration of III-V and Si Devices  
N. Pacella, M. Bulsara, and E. Fitzgerald
- 1137 Vanadium Oxide as a Memory Material  
I. Radu, K. Martens, S. Mertens, C. Adelman, X. Shi, H. Tielens, M. Schaekers, G. Pourtois, S. Van Elshocht, S. De Gendt, M. Heyns, and J. Kittl
- 1138 Effect of HfO<sub>2</sub> Crystallinity on Device Characteristics and Reliability for ReRAM  
J. Kim, M. Joo, J. Yoo, T. Youn, S. Kim, W. Kim, J. Kim, J. Roh, and S. Park
- 1139 Material and Electrical Properties of Hole-Trapping Memory Capacitors Composed of nc-ITO Embedded ZrHfO High-k Films  
C. Lin and Y. Kuo
- 1140 Enhanced Data Retention Characteristic on SOHOS-Type Nonvolatile Flash Memory with CF<sub>4</sub>-Plasma-Induced Deep Electron Trap Level  
C. Hsieh, Y. Chen, W. Lin, G. Lin, and J. Lou
- 1141 Impact of Stacked AlON/SiO<sub>2</sub> Gate Dielectrics for SiC Power Devices  
H. Watanabe, T. Kirino, Y. Uenishi, A. Chanthaphan, A. Yoshigoe, Y. Teraoka, S. Mitani, Y. Nakano, T. Nakamura, T. Hosoi, and T. Shimura
- 1142 Pr<sub>3</sub>Si<sub>6</sub>N<sub>11</sub>/Si<sub>3</sub>N<sub>4</sub> Stacked High-k Gate Dielectrics with High Quality Ultrathin Si<sub>3</sub>N<sub>4</sub> Interfacial Layers  
A. Teramoto, A. Teramoto, and T. Ohmi

- 1143 Band-Edge Effective Work Functions by Controlling HfO<sub>2</sub>/TiN Interfacial Composition for Gate-Last CMOS  
C. Hinkle, R. Galatage, R. Chapman, E. Vogel, C. Freeman, E. Wimmer, H. Niimi, A. Li-Fatou, J. Chambers, and J. Shaw
- 1144 Fabrication and Electrical Characterization of High-k LaGdO<sub>3</sub> Based MOSFET Devices  
S. Pavunny, R. Thomas, T. Kalkur, J. Schubert, and R. Katiyar
- 1145 Effects of Metal Layer Insertion on EOT Scaling in TiN/Metal/La<sub>2</sub>O<sub>3</sub>/Si High-k Gate Stacks  
P. Ahmet, D. Kitayama, T. Kaneda, T. Suzuki, T. Koyanagi, M. Kouda, M. Mamatrishat, T. Kawanago, K. Kakushima, K. Tsutsui, A. Nishiyama, N. Sugii, K. Natori, T. Hattori, and H. Iwai
- 1146 High Mobility Thin-Film Transistor for Fast Response LED Display Driving Circuit Device  
M. Kim, H. Cho, B. Shin, and M. Kwak
- 1147 Improvement on Electrical Characteristics of HfO<sub>2</sub> MIS Capacitor with Dual Plasma Treatment  
K. Chang, T. Chang, and H. Chen
- 1148 Formation of Ordered Silicon Nano-Textures Suitable for Field Emission Applications  
H. Malekpour, M. Mehran, and S. Mohajezadeh
- 1149 Investigation of Indium Diffusion into Solution-Processed Oxide TFTs with ZTO Active Layer and IZO Source/Drain Electrodes  
Y. Kim, J. Lee, Y. Lee, S. Cho, and M. Han
- 1150 The Effects of Self Assembled Monolayer(SAM) on the Back Back Interface of a-IGZO TFT  
S. Cho, Y. Lee, J. Lee, K. Jo, D. Kim, B. Kim, and M. Han
- 1151 Micromachining of Si Using Anodized Needle Electrodes in HF Solution  
T. Sugita, K. Hiramatsu, S. Ikeda, and M. Matsumura
- 1152 Stress Characterization of Tungsten-Filled through Silicon via Arrays Using Very High Resolution Multi-Wavelength Raman Spectroscopy  
J. Gambino, D. Vanslette, B. Webb, C. Luce, T. Ueda, T. Ishigaki, K. Kang, and W. Yoo
- 1153 Direct Copper Electrochemical Deposition on Ru-Based Substrates for Advanced Interconnects Target 30 nm and 1/2 Pitch Lines: From Coupon to Full-Wafer Experiments  
S. Armini, S. Demuynck, Z. El-mekki, J. Swerts, M. Nagar, A. Radisic, N. Heylen, G. Beyer, L. Leunissen, and P. Vereecken
- 1154 Room Temperature Copper Seed Layer Deposition by Plasma-Enhanced Atomic Layer Deposition  
J. Mao, E. Eisenbraun, V. Omarjee, A. Korolev, and C. Dussarrat
- 1155 High Rate Copper Isotropic Wet Chemical Etching  
S. Mayer
- 1156 MEMS on LSI  
M. Esashi and S. Tanaka
- 1157 Edge Bonding Free Low Temperature Oxide-Oxide Direct Bonding Process  
A. Castex, M. Broekaart, S. Thieffry, K. Landry, R. Fontanière, and C. Lagahe
- 1158 CMOS - MEMS Integration  
G. Fedder
- 1159 Die/Wafer Sub-Micron Alignment Strategies for Semiconductor Device Integration  
L. Shea-Rohwer, J. Martin, and D. Chu

## **E2 - Bioelectronics, Biointerfaces, and Biomedical Applications 4**

*Dielectric Science and Technology / Electronics and Photonics / Sensor*

- 1160 Building a Biosensor Using Viruses and Nanowires  
R. Penner, D. Taggart, J. Arter, T. McIntire, and G. Weiss
- 1161 Top-Down Processed SOI Nanowire Devices for Biomedical Applications  
S. Ingebrandt, X. Vu, J. Eschermann, R. Stockmann, and A. Offenhausser
- 1162 Improved Model for Nanowire BioFETs on SOI Operating in Electrolyte  
M. Denhoff and D. Landheer
- 1163 Electrodeposited Gold Nanowires and Nanostructures for Biosensing with Plasmonic Optical Diffraction and SPR Phase Imaging  
R. Corn
- 1164 Metal Nanostructures Based Biosensors  
E. Tamiya, M. Saito, Y. Yamaguchi, and H. Yoshikawa
- 1165 Electrochemical Characterization of Regularly-Aligned Nanopore Array Membranes Filled with Electrolyte Solutions and Their Use for Detection of Nucleic Acid Hybridization  
J. Ellis, G. Herzog, B. Glynn, and D. Arrigan
- 1166 Fully Integrated Immunoassays on a Disc  
Y. Cho, T. Kim, J. Park, H. Hwang, V. Sunkara, B. Lee, J. Kim, and H. Kim
- 1167 Microfluidics for Detection of Myoglobin in Blood Samples  
N. Gunda and S. Mitra
- 1168 Suspended Micro- and Nanochannel Resonators for Measuring Physical Properties of Individual Particles  
S. Manalis
- 1169 Graphene-Based Nanostructured Interfaces for High Performance Sensors  
C. Li and C. Guo
- 1170 Corrosion Properties of DLC-Coated Stainless Steel  
D. Kek Merl, S. Srecko Paskvale, P. Panjan, M. Kahn, and W. Waldhauser
- 1171 Growth and Morphology of Eumelanin Thin Films - A Future Bioelectronic Material  
J. Wünsche, F. Rosei, C. Graeff, and C. Santato
- 1172 An Electronic Nose for the Detection of Carbonyl Species  
B. Deore, D. Wayner, D. Stewart, and G. Diaz-Quijada
- 1173 Photonic Crystal Based Biosensor with Inbuilt Nanofluidic Channels  
G. Nagare, S. Mitra, and S. Mukherji
- 1174 Intercellular Network Analysis in Multilayer Muscle Fiber Formation Using Femtoinjection  
M. Saito, M. Kawazoe, H. Funabashi, and H. Matsuoka
- 1175 Electrochemical Studies of Morpholino-DNA Surface Hybridization  
R. Levicky
- 1176 Plasmonics-Based Electrochemical Impedance Microscopy on Cells  
N. Tao, S. Wang, and W. Wang
- 1177 Electrochemically Induced Deposition of Enamel-Like Coating for Tooth Repair  
Z. Feng and Y. Liao
- 1178 Tuning Fructosyl Peptidyl Oxidase into Dehydrogenase and Its Application for the Construction of an Enzyme Electrode  
S. Ferri, E. Nibe, Y. Miyamoto, S. Kim, W. Tsugawa, and K. Sode

- 1179 Glucose Specific GDH-PQQ Based Sensor Strip Application of the Engineered GDH-PQQ Harboring *de novo* Designed Loop Region  
D. Nagae, M. Nakajima, and K. Sode
- 1180 Relation between Effective Charge Numbers and Signals Caused by Protein Adsorption on Field Effect Transistor Detection  
S. Hideshima, T. Nakamura, S. Kuroiwa, and T. Osaka
- 1181 Microsensor Arrays for Determination of Biomarkers of Oxidative Stress  
M. Hepel and M. Stobiecka
- 1182 Probing Oxygen Metabolism in Tumour and Normal Living Cells by Scanning Electrochemical Microscopy  
S. Rapino, R. Marcu, D. Bonazzi, M. Marcaccio, P. Pelicci, M. Giorgio, and F. Paolucci
- 1183 Electrochemically Controlled Separation of DNA Oligomers with High Surface Area Conducting Paper Electrode  
A. Razaq, M. Stromme, L. Nyholm, and A. Mihranyan
- 1184 Exploring Tissue Response to Field Mediated Plasmid DNA Delivery  
R. Gilbert, A. Llewellyn, and A. Hoff
- 1185 Analytical Terahertz Chemical Imaging of Molecular Networks in Bio-Medical Applications  
K. Ajito, Y. Ueno, H. Song, E. Tamechika, and N. Kukutsu
- 1186 Use of Electroporation for Efficacious Gene Delivery to the Lungs  
D. Dean, M. Barravecchia, and X. Lin
- 1187 Surface Charge Density Driven Delivery of Drugs and Plasmid DNA to Skin Using Atmospheric Ion Sources  
A. Hoff, R. Connolly, and M. Jaroszeski

### **E3 - Graphene, Ge/III-V, and Emerging Materials for Post CMOS Applications 3**

#### *Dielectric Science and Technology*

- 1188 (Thomas D. Callinan Award of the Dielectric Science and Technology Division) Ge-Source TFETs for Ultra-Low-Power Electronics  
T. Liu, S. Kim, and Z. Jacobson
- 1189 Post Si CMOS Graphene Nanoelectronics Technologies  
C. Sung
- 2127 CMOS Scaling with III-V Channels for Improved Performance and Low Power  
R. Hill, J. Oh, C. Park, J. Barnett, J. Price, J. Huang, N. Goel, W. Loh, P. Kirsch, P. Majhi, and R. Jammy
- 1191 Reconfigurable Nanowire Electronics  
W. Weber, A. Heinzig, D. Martin, S. Slesazeck, and T. Mikolajick
- 1192 Parametric Study of the Early Stages of Graphene Growth on Copper  
K. Celebi, S. Youn, K. Teo, and H. Park
- 1193 Nano-Scale Strain-Induced Giant Pseudo-Magnetic Fields and Charging Effects in CVD-Grown Graphene  
N. Yeh, M. Teague, R. Wu, S. Yeom, B. Standley, D. Boyd, and M. Bockrath
- 1194 Spectroscopic Ellipsometry of CVD Graphene  
F. Nelson, V. Kamineni, T. Zhang, S. Comfort, J. Lee, and A. Diebold

- 1195 An Investigation of the Geometrical Effects on the Thermal Conductivity of Graphene Antidot Lattices  
H. Karami Taheri, M. Pourfath, R. Faez, and H. Kosina
- 1196 Thermal Properties of Graphene: Applications in Thermal Interface Materials  
A. Balandin
- 1197 Experimental Investigation of Mechanical-Electrical Coupling in Graphene-Based Devices  
J. Greer and M. Huang
- 1198 Molecular-Scale Tailoring of Graphene Surface Chemistry via Organic Functionalization  
M. Hersam
- 1199 Large-Area Synthesis of Graphene by Chemical Vapor Deposition and Transfer-Free Fabrication of Field-Effect Transistors  
S. Sato, K. Yagi, D. Kondo, K. Hayashi, A. Yamada, N. Harada, and N. Yokoyama
- 1200 Transport Properties of Graphene Transistors  
E. Vogel, A. Venugopal, and L. Colombo
- 1201 Transistors from Graphene and Graphene Nanostructures  
X. Duan
- 1202 Graphene Tunneling Barrier Enabled Logic Switch  
B. Yu
- 1203 Klein Tunneling in Graphene p-n-p Junctions  
E. Rossi
- 1204 High-Frequency Characteristics of One-Dimensional Nanostructures  
C. Yang
- 1205 Simulation of Carbon Heterostructures as Barrier Free Tunneling Transistors  
S. Salahuddin
- 1206 Carbon-Based Nanomaterial in Nanoelectronics  
X. Chen, A. Lin, L. Wei, N. Patil, H. Wei, S. Mitra, and H. Wong
- 1207 ZrO<sub>2</sub>-Based InP MOSFETs (EOT  $\approx$  1.2nm) Using Various Interfacial Dielectric Layers  
Y. Chen, H. Zhao, Y. Wang, F. Xue, F. Zhou, and J. Lee
- 1208 Detection of the Tetragonal and Monoclinic Phases and Their Role on the Dielectric Constant of Atomic Layer Deposited La-Doped ZrO<sub>2</sub> Thin Films on Ge (001)  
C. Wiemer, A. Lamperti, L. Lamagna, O. Salicio, A. Molle, and M. Fanciulli
- 1209 Characterization of Ti-Based High-k Gate Dielectrics on GaAs  
T. Das, C. Mahata, C. Maiti, G. Sutradhar, and P. Bose
- 1210 Effect of Rapid Thermal Annealing Treatment to Resistive Switching Characteristics of HfOx RRAM Devices  
K. Chang, W. Tzeng, K. Liu, and H. Chen
- 1211 Modeling and Simulation of High- $\kappa$  Gate GaSb Nanowire Field Effect Transistor for Ultra High Speed and Low Power Applications  
I. Jahangir, S. Jahangir, and Q. Khosru
- 1212 "Graphene-Like" Exfoliation and Characterization of Material Properties of TiTe<sub>2</sub> Quasi-2D Crystals  
J. Khan, D. Teweldebrhan, C. Nolen, and A. Balandin
- 1227 Study of La<sub>2</sub>O<sub>3</sub>/HfO<sub>2</sub> Gate Dielectric for n-InAs Metal-Oxide-Semiconductor Capacitor  
Y. Lin, C. Chang, K. Kakushima, H. Iwai, T. Shie, G. Huang, P. Lu, T. Lin, and E. Chang
- 1213 Prospective and Critical Issues of III-V/Ge CMOS on Si Platform  
S. Takagi and M. Takenaka

- 1214 Heterogeneous Integration and Fabrication of III-V MOS Devices in a 200mm Processing Environment  
N. Waldron, N. Nguyen, D. Lin, G. Brammertz, B. Vincent, A. Firrincieli, G. Winderick, S. Sioncke, B. de Jaeger, G. Wang, J. Mitard, W. Wang, M. Heyns, M. Caymax, M. Meuris, P. Absil, and T. Hoffmann
- 1215 Experimental Demonstration of Modulation Doped  $\text{In}_{0.52}\text{Al}_{0.48}\text{As}/\text{In}_{0.7}\text{Ga}_{0.3}\text{As}/\text{In}_{0.52}\text{Al}_{0.48}\text{As}$  Quantum Well FINFET with Split Wrapped Gates  
L. Liu, V. Saripalli, E. Hwang, V. Narayanan, and S. Datta
- 1216 III-V/Si Electronics  
E. Fitzgerald, L. Yang, and C. Cheng
- 1217 III-V MOSFETs: Surface Passivation, Source/Drain and Channel Strain Engineering, Self-Aligned Contact Metallization  
Y. Yeo, H. Chin, X. Gong, H. Guo, and X. Zhang
- 1218 Band to Band Tunneling Current of Surface Channel Strained InGaAs Double Gate TFET  
S. Siddiqui, O. Shoron, A. Zubair, and Q. Khosru
- 1219 Recent Progress of Ge Technology for a Post-Si CMOS  
A. Toriumi, C. Lee, T. Nishimura, S. Wang, T. Tabata, K. Kita, and K. Nagashio
- 1220 Junctionless Ge MOSFETs Fabricated on 10 nm-Thick GeOI Substrate  
D. Zhao, T. Nishimura, C. Lee, R. Ifuku, K. Nagashio, K. Kita, and A. Toriumi
- 1221 Interface and Border Traps in Ge-Based Gate Stacks  
L. Nyns, D. Lin, G. Brammertz, F. Bellenger, S. Sioncke, S. Van Elshocht, and M. Caymax
- 1222  $\text{Si}_{1-x}\text{Ge}_x$ -Channel PFETs: Scalability, Layout Considerations and Compatibility with Other Stress Techniques  
G. Eneman, G. Hellings, J. Mitard, L. Witters, S. Yamaguchi, C. Ortolland, A. Hikavy, P. Favia, M. Bargallo Gonzalez, E. Simoen, M. Kobayashi, J. Franco, S. Takeoka, R. Krom, H. Bender, R. Loo, C. Claeys, K. De Meyer, and T. Hoffmann
- 1223 Bulk and Interface Engineering of  $\text{GeO}_2/\text{Ge}$  for High- $\kappa$ /Germanium Gate Stack  
Y. Oniki, Y. Iwazaki, and T. Ueno
- 1224 Electrical Properties of SiGe MOS Capacitors with Ultrathin ALD Hafnium Dioxide  
S. Mallik, C. Mahata, M. Hota, G. Dalapati, H. Gao, M. Kumar, D. Chi, C. Sarkar, and C. Maiti
- 1225 Characterization of Nickel Germanide Schottky Contacts for the Fabrication of Ge p-MOSFETs  
D. Gajula, D. McNeill, and M. Armstrong
- 1226 Electron Scattering in Buried InGaAs/High-k MOS Channels  
S. Oktyabrsky, P. Nagaiah, T. Chidambaram, V. Tokranov, M. Yakimov, R. Kambhampati, D. Veksler, G. Bersuker, and N. Goel
- 1190 Characterization Scheme for III-V Junction Development  
P. Hung, C. McDonough, R. Geer, R. Hill, C. Deeb, B. Taylor, and R. Jammy
- 1228 High-k Oxide Growth on III-V Surfaces: Chemical Bonding and MOSFET Performance  
C. Hinkle, B. Brennan, S. McDonnell, M. Milojevic, A. Sonnet, D. Zhernokletov, R. Galatage, E. Vogel, and R. Wallace
- 1229 Improved Capacitance-Voltage Characteristics of MOS Capacitors on GaAs Incorporating a PECVD Deposited  $\text{Si}_3\text{N}_4$  Dielectric Layer  
E. O'Connor, V. Djara, S. Monaghan, P. Hurley, and K. Cherkaoui



- 1230 Atomic Layer Deposition of Al-Doped ZrO<sub>2</sub> Thin Films for Advanced Gate Stack on III-V Substrates  
L. Lamagna, A. Molle, C. Wiemer, S. Spiga, and M. Fanciulli
- 1231 Structural and Electronic Characterization of Metal-Molecule-Silicon Junctions Produced by Flip Chip Lamination  
M. Walsh, M. Coll, C. Richter, and C. Hacker
- 1232 Flexible Memristors Fabricated through Sol-Gel Hydrolysis  
J. Tedesco, N. Gergel-Hackett, L. Stephey, M. Hernández-Mora, A. Herzing, L. Richter, C. Hacker, J. Kopanski, and C. Richter

#### **E4 - Nanocrystal Embedded Dielectrics for Electronic and Photonic Devices**

*Dielectric Science and Technology / Electronics and Photonics*

- 1233 (Invited) Light Emission from Silicon Nanostructures: Past, Present and Future Perspectives  
L. Dal Negro
- 1234 (Invited) Luminescence of Nano-Silicon Related Silicon Nitride Films and Light Emitting Devices  
D. Li, M. Xie, and D. Yang
- 1235 Factors Influencing PL, EL, and Charge Storage Characteristics of Si Nanocrystal Embedded SiO<sub>x</sub>N<sub>y</sub> Thin Films  
P. Joshi, L. Tang, J. Huang, A. Voutsas, and J. Hartzell
- 1236 (Invited) Optical and Structural Properties of Silicon Nanocrystals and Laser-Induced Thermal Effects  
L. Khryashchev (Khriachtchev)
- 1237 (Invited) Recent Advances in Functionalisation of Silicon Nanocrystals and Ultradispersed Nanodiamonds  
L. Siller, P. Coxon, Y. Astuti, Y. Butenko, A. Brieva, L. Alves, N. O'Farrell, B. Horrocks, N. Poolton, M. Newman, and M. Hunt
- 1238 (Invited) Photoluminescence Efficiency of Self-Assembled Germanium Dots  
D. Lockwood, N. Rowell, I. Berbezier, G. Amiard, L. Favre, A. Ronda, M. Faustini, and D. Grosso
- 1239 (Invited) Ultra Low Energy Ion Beam Synthesis as a New Route toward Nanocrystal Memories  
C. Bonafos, G. Assayag, S. Schamm-Chardon, M. Carrada, J. Groenen, F. Gloux, B. Pecassou, P. Dimitrakis, P. Normand, B. Sahu, A. Slaoui, and A. Claverie
- 1240 Silicon and Metallic Nanocrystals Passivation and Integration as Trapping Layer in Non-Volatiles Memories  
J. Colonna, D. Belhachemi, G. Gay, S. Minoret, M. Roure, G. Molas, and E. Jalaguier
- 1241 Silicon and/or Germanium Nanocrystals Embedded into Oxide Host for Non-Volatile Memory Applications  
L. Khomenkova, B. Sahu, A. Slaoui, C. Bonafos, S. Schamm-Chardon, and F. Gourbilleau
- 1242 Growth Process and Morphological Characterization of Silicon Nanodots Integrated in Non-Volatiles Memories  
J. Amouroux, V. Della Marca, P. Boivin, P. Maillot, C. Muller, D. Deleruyelle, E. Jalaguier, and J. Colonna

- 1243 The HfTiO<sub>2</sub> Charge Trapping Layer in Nonvolatile Flash Memory  
C. Chuang, C. Kao, H. Chen, K. Chen, C. Huang, and J. Ou
- 1244 Organic Thin-Film Transistor Memory Devices Based on Charge Trapping in Metallic Nanoparticles Embedded in Gate Dielectric Layer  
J. Song and J. Lee
- 1245 (Invited) Doped Rare Earth - Si Based Nanostructures for Photonic Applications  
F. Gourbilleau, O. Debieu, J. Cardin, C. Liang, and C. Dufour
- 1246 (Invited) Study of Rare Earth Doped Silicon-Based Dielectric Films Using Synchrotron Radiation  
P. Wilson, T. Roschuk, R. Dabkowski, K. Dunn, E. Chelomentsev, J. Wojcik, and P. Mascher
- 1247 Nano-Crystalline SrAl<sub>2</sub>O<sub>4</sub> Persistent Phosphors Doped with Eu<sup>2+</sup> and Dy<sup>3+</sup>  
I. Kinski, S. Meinhard, B. Henke, and S. Schweizer
- 1248 (Invited) Sensitization of Erbium Photoluminescence in Silicon-Rich Silicon Dioxide - Current Status and Future Perspectives  
A. Kenyon, M. Wojdak, I. Ahmad, and M. Shah
- 1249 (Invited) Novel Implantation Processes for Optimising Rare Earth Luminescence from Oxide Films Containing Nanocrystals  
M. Halsall, I. Crowe, H. Li, R. Kashtiban, U. Bangert, A. Knights, and R. Gwilliam
- 1250 (Invited) Silicon Sensitization in Rare-Earth Doped Gain Media: From Si-Related Defect States to Si Nanocrystals  
P. Kik
- 1251 (Invited) Synthesis, Characterization and Manipulation of Embedded Nanostructures  
D. Chrzan, S. Shin, J. Guzman, C. Yuan, C. Liao, C. Boswell-Koller, P. Stone, O. Dubon, A. Minor, M. Watanabe, J. Beeman, K. Yu, J. Ager III, and E. Haller
- 1252 (Invited) Characterization and Metrology of Nanoclusters-Based Nanostructures by Atom Probe Tomography  
P. Pareige, R. Lardé, F. Gourbilleau, and E. Talbot
- 1253 Realization of a Multilayered Nano-Crystalline Silicon Structure by a Novel Low Temperature Process Suitable for Silicon-Based Light Emitting Diodes  
S. Darbari, S. Mohajerzadeh, and M. Robertson
- 1254 (Invited) Photoluminescent Si Nanocrystal Synthesis Using Organic Electrochemistry  
V. Reipa and J. Choi
- 1255 (Invited) Electrochemical Charge Injection in Colloidal Quantum Dots  
P. Guyot-Sionnest
- 1256 Light Emitting Diodes Formed Using Mist Deposition of Colloidal Solution of CdSe Nanocrystalline Quantum Dots  
A. Kshirsagar, S. Pickering, J. Xu, and J. Ruzyllo
- 1257 Effect of Organic/Inorganic Metal Nanocrystals on the Power Conversion Efficiency of Hybrid Solar Cell  
D. Kim, J. Kim, K. Ku, G. Lee, and J. Park
- 1258 Inkjet-Printing Nanocomposite High-K Dielectrics for Pentacene Thin Film Transistor Applications  
C. Liu, W. Lee, T. Shih, and H. Yan
- 1259 The Hysteresis Characteristics of Low Temperature ( $\leq 200$  °C) Silicon Nanocrystals Embedded in Silicon-Rich Silicon Nitride Films  
K. Lee, J. Hwang, K. Keum, K. No, and W. Hong

- 1260 Si/SiO<sub>2</sub> - Based Superlattice Bridged Quantum Cellular Automata  
I. Matyushkin, A. Krasnikov, and S. Yanovich
- 1261 Improvements of Performance and Stability for Gate-All-Around Poly-Si TFTs Using Vacuum Cavity Structures  
H. Liu, S. Chiou, C. Hung, H. Ho, and F. Wang
- 1262 Magnetic and Ferroelectric Properties of Pb(Zr<sub>0.53</sub>Ti<sub>0.47</sub>)<sub>1-x</sub>(Fe<sub>0.5</sub>Nb<sub>0.5</sub>)<sub>x</sub>O<sub>3</sub> Ceramics Systems  
D. Sanchez, A. Kumar, and R. Katiyar
- 1263 Effects of Additive in Cu Solution for Electrodeposition of CuInSe<sub>2</sub> Film  
T. Chang, W. Lee, Y. Su, and C. Fang-I
- 1264 (Invited) Silicon Nanocrystals Coupled to High-Q Optical Microcavities: Theory and Applications  
A. Meldrum, Y. Zhi, K. Manchee, V. Zamora, J. Silverstone, P. Bianucci, and F. Marsiglio
- 1265 (Invited) Self-Organized Nanophotonic Device  
T. Yatsui and M. Ohtsu
- 1266 Realization of Silicon-Nanodots-Based CMOS Backend-Compatible Electrical SPP Source  
I. Brunets, R. Walters, A. Kovalgin, A. Polman, and J. Schmitz
- 1267 (Invited) YAG:Ce Nanoparticles Embedded into TiO<sub>2</sub> Thin Films for White LEDs Elaboration  
G. Dantelle, A. Revaux, D. Decanini, A. Haghiri-Gosnet, T. Gacoin, and J. Boilot
- 1268 On-Nanowire Band-Graded Si: Ge Photodetectors  
C. Kim, H. Lee, Y. Cho, J. Yang, R. Lee, J. Lee, and M. Jo
- 1269 GaN/ GaN Wafer Bonded Structure: Quantum Dot Active Layer as Binding Layer  
Y. Li and E. Stokes
- 1270 Multiscale 3D Patterning of Ag Nanoparticles in Dielectric Layers Using Low-Energy Ion Implantation and Ion- Or Electron-Beam Lithography  
R. Carles, G. BenAssayag, C. Bonafos, J. Groenen, P. Benzo, L. Cattaneo, E. Daran, and F. Gourbilleau
- 1271 Magnetic and Ferroelectric Properties of Pb(Zr<sub>0.53</sub>Ti<sub>0.47</sub>)<sub>1-x</sub>(Fe<sub>0.5</sub>Nb<sub>0.5</sub>)<sub>x</sub>O<sub>3</sub> Ceramic Systems  
D. Sanchez, A. Kumar, and R. Katiyar

### **E5 - Organic Semiconductor Materials, Devices, and Processing 3**

#### *Electronics and Photonics / Dielectric Science and Technology*

- 1272 Highly Conductive PEDOT: PSS as Transparent Electrode of Organic Photovoltaic Cells  
Y. Xia, H. Zhang, and J. Ouyang
- 1273 Organic Transistors and Organic Photovoltaic Solar Cells Using Semiconductor Nanowires  
K. Cho
- 1274 Effect of Degradation in Organic Solar Cells with P3HT:PCBM[70] Blends  
L. Marsal, V. Balderrama, M. Estrada, A. Sanchez, P. Formentin, E. Palomares, J. Pallares, and J. Nolasco
- 1275 Design and Fabrication of Polycarbazole Based High Efficiency Solar Cells  
T. Chu, S. Alem, S. Wakim, P. Verly, J. Lu, and Y. Tao
- 1276 Development of Nanostructures and Organic Dyes for Efficient Dye-Sensitized Solar Cells  
C. Tsai, C. Wu, T. Huang, S. Hsu, Y. Tsai, Y. Jhang, L. Hsieh, S. Liu, H. Lin, L. Lin, C. Chen, S. Chou, K. Wong, S. Chen, and A. Tsai

- 1277 Modeling of Organic Solar Cells  
R. Datars, J. Tajik, and M. Deen
- 1278 Interface Engineering at Anode and Cathode Interface upon Incorporating P3HT as Donor and Modified C<sub>60</sub> as Acceptor (Concentration Graded Bilayer) for High Efficient Organic Solar Cells  
J. Kumar-Baral, V. Truong, and R. Izquierdo
- 1279 Stable AMOLED Displays  
A. Nathan and G. Chaji
- 1280 Highly Efficient Polymer Light-Emitting Diodes Realized by Triplet-Triplet Annihilation  
H. Murata and J. Abe
- 1281 Transparent Low-Voltage Image Pixel with Pentacene/ZnO Photo-Diode and Pentacene Thin-Film Transistor  
S. Im, K. Lee, H. Lee, K. Lee, T. Ha, and J. Kim
- 1282 Novel Light Emitting Electrochemical Cells Based on Iridium (III) Ionic Complexes  
S. Bayatpour, S. Ladouceur, E. Zysman-Colman, F. Cicoira, and C. Santato
- 1283 Enhanced Conductivity and Photocurrent Generation of Carbon Nitride Solids by Doping of Phosphorus  
Y. Zhang
- 1284 Novel Concepts on the Design, Processes and Models for High Performance and Low-Cost Functional Blocks  
M. Raja
- 1285 Contact Effects and Hysteresis in Organic Thin Film Transistors  
J. Jiménez Tejada, K. Awawdeh, P. López Varo, A. Ray, and M. Deen
- 1286 (Electronics and Photonics Division Award) Organic/Polymeric Thin Film Transistors - Fabrication, Characterization and Modeling  
M. Deen
- 1287 Unified Current, Mobility and Capacitance Compact Model for Polymeric TFTs  
M. Estrada, A. Cerdeira, A. Castro, J. Pallares, L. Marsal, and B. Iñiguez
- 1288 Some Issues on Analog Design Using OTFTs  
R. Picos and E. Garcia-Moreno
- 1289 Spin Injection and Transport in Low Molecular Weight Organic Semiconductors  
H. Tada
- 1290 Charge Transport and Recombination in Organic Bulk Heterojunctions  
A. Dodabalapur, C. Lombardo, and E. Danielson
- 1291 Transient Behavior of Variable Range Hopping  
O. Marinov and M. Deen
- 1292 Effects of Microstructural Properties of Organic Semiconductors on Electronic Transport and Aging of Thin Film Transistors and Photovoltaic Devices  
P. Servati, B. Gholamkhash, S. Shambayati, N. Mohseni Kiasari, F. Ko, and S. Holdcroft
- 1293 Molecular Orbital Configuration and Stacking Order of Pentacene/Perfluoropentacene Blend Thin Films  
G. Chang, P. Bazylewski, R. Sasaki, Y. Kawasugi, and H. Tada
- 1294 Plasmonic Composites of Semiconductive Polyelectrolytes with Metal Nanoparticles  
J. Pflieger, S. Kazim, D. Bondarev, and J. Vohlidal
- 1295 Effect of Target Composition on the Surface and Optical Properties of the  $\beta$ -FeSi<sub>2</sub> Film Prepared by Pulsed Laser Deposition  
M. Hossain, H. Katsumata, and S. Uekusa

- 1296 Alkylthio and Arylthio Substituted Pentacenes as Superior Organic Semiconductors for Flexible Electronics  
I. Kaur, E. Cho, and G. Miller
- 1297 Stability of Solution Processed Organic Thin Film Transistor Employing Phase-Segregation of Organic Channel / Polymer Dielectric: Bias Stress and Photo-Electric Characteristic  
J. Park, Y. Chang, K. Lee, K. Lee, and S. Im
- 1298 The Role of Oxygen in Organic Semiconductor Devices  
A. Maliakal
- 1299 Performance Improvement of Pentacene-Based Organic Thin-Film Transistor with HfO<sub>2</sub> Gate Dielectrics Treated by CF<sub>4</sub> Plasma  
K. Chang, S. Huang, and Y. Tseng
- 1300 Synthesis of Polythiophene Copolymers on the Application of Organic Solar Cell  
S. Huang and W. Huang
- 1301 Novel Organic Salts as Electron Injection Layer in High Performance of Polymer Light-Emitting Diodes  
H. Huang, K. Tsai, S. Hsieh, and T. Wen
- 1302 Organic Thin-Film Transistor and Diode with Reverse Offset Printed Ag Electrode  
J. Koo, M. Kim, and I. You
- 1303 Angle Resolved Photoemission Study of Rubrene Single Crystal  
H. Ding, I. Irfan, C. Reese, A. Makinen, Z. Bao, and Y. Gao
- 1304 Processing Semiconducting Macromolecular Architectures  
N. Stingelin
- 1305 Making Contacts to Organic Transistors Using Carbon Nanotube Arrays  
F. Cicoira and R. Martel
- 1306 Electrochemical and Spectroelectrochemical Analysis of Polydiheteropentalenes: A Comparison of O, S and Se Heteroatoms  
D. Navarathne, T. Dey, and G. Sotzing
- 1307 Preparation of Conjugated Polymers from Polyarylsiloxane Precursors  
K. Lee and G. Sotzing
- 1308 High Dose Implant Resist Stripping (HDIS) Using Catalyzed Hydrogen Peroxide (CHP) Systems  
R. Govindarajan, M. Keswani, and S. Raghavan
- 1309 NDR Controlled Multilevel Programming in PoRRAM with All-Organic Active Layer and Inert Electrodes  
M. Charbonneau, J. Buckley, R. Tiron, M. Py, J. Barnes, N. Rochat, C. Licitra, G. Ghibaudo, and B. De Salvo
- 1310 Pentacene TFTs with Flash Evaporated/Plasma Cured Polymeric Dielectric  
G. Abbas and H. Assender
- 1311 Polythiophene Composite Semiconductor for High-Performance Thin-Film Transistors Application  
Y. Wu
- 1312 High-Performance Fully Printed Transistors: Materials, Processes, and Device Characteristics  
V. Subramanian, H. Tseng, R. Kitsomboonloha, and A. de la Fuente Vornbrock
- 1313 Non Conventional Experimental Approaches for the Analysis of Organic Thin Film Transistor Accumulation Mode, Working and Engineering of Device Architecture  
P. D'Angelo

- 1314 Metal-Oxides Hole Injection Layer in Organic Semiconductor Devices  
Y. Gao
- 1315 Organic Semiconductor Devices Modeling for TCAD and ECAD Applications  
S. Mijalkovic

#### **E6 - Processes at the Semiconductor Solution Interface 4**

*Electronics and Photonics / Energy Technology*

- 1316 Anodic Formation of Nanoporosity in n-InP in KOH  
D. Buckley, C. O'Dwyer, R. Lynch, and N. Quill
- 1317 Fundamentals of III-V Semiconductor Electrochemistry and Wet Etching Processes:  
Br<sub>2</sub> Etching Properties onto InP  
I. Gérard, A. Causier, M. Bouttemy, P. Tran-Van, and A. Etcheberry
- 1318 Porous InP as Piezoelectric Component in Magneto-Electric Composite Sensors  
M. Gerngross, M. Leisner, J. Carstensen, and H. Föll
- 1319 Modeling Some "Meta" Aspects of Pore Growth in Semiconductors  
H. Föll, M. Leisner, and J. Carstensen
- 1320 Self-Organizing Electrochemistry: Titania Nanotube- and Mesosponge Layers  
M. Yang, P. Roy, C. Das, K. Lee, and P. Schmuki
- 1321 (European Section Heinz Gerischer Award Presentation) Some Major Electrochemical  
Challenges towards a Sustainable Energy Future  
H. Tributsch
- 1322 Raman Spectroscopy of Metal-Assisted Chemically Etched Si and Li-Si Nanowire Layers  
C. Glynn, W. McSweeney, O. Lotty, J. Holmes, and C. O'Dwyer
- 1323 Formation Process of Silicon Nanowires by Metal-Assisted Etching  
N. Geyer, B. Fuhrmann, H. Leipner, and P. Werner
- 1324 Functionalization of Halogenated Germanium Nanowires  
G. Collins, P. Fleming, C. O'Dwyer, M. Morris, and J. Holmes
- 1325 Functionalization and Behavior in Aqueous Media of Silicon Surfaces for Improved  
Biochemical Sensing  
J. Chazalviel, P. Allongue, A. Gouget-Laemmel, C. Henry de Villeneuve, A. Moraillon, and  
F. Ozanam
- 1326 In situ Contrasted Electrochemical Responses of GaAs and InP regarding a Controlled and  
Promising Process in Liquid Ammonia  
A. Goncalves, C. Mathieu, N. Mezailles, and A. Etcheberry
- 1327 Electroless Oxidation of Diamond Surfaces: Relevance of Concepts Developed for Classical SC  
Electrochemistry  
N. Simon, G. Charrier, J. Vigneron, and A. Etcheberry
- 1328 Electromigration Characteristics for Electron Down-Flow in Copper Interconnects  
Y. Cheng, W. Chung, and Y. Wang
- 1329 (Research Award of the Energy and Technology Division) (Photo)electrochemistry in the  
Service of Solar Energy Conversion  
C. Lévy-Clément
- 1330 Electrochemical and Chemical Behavior of InSb Surfaces  
D. Aureau, P. Tran-Van, R. Chaghi, and A. Etcheberry

- 1331 Electrochemical Passivation of Homoepitaxial InP (100) Thin Films for Light Induced Hydrogen Evolution: A SRPES Study  
A. Muñoz and H. Lewerenz
- 1332 Opto-Electronics of Semiconductor Hetero-Nanocrystals and Hetero-Nanocrystal Solids  
D. Vanmaekelbergh, M. Casavola, F. Pietra, D. Grodzinska, W. Evers, M. Boneschanscher, Z. Sun, C. de Mello Donega, and P. Liljeroth
- 1333 Recent Advances in Electrodeposition of Interfacial Buffer Layers in Chalcopyrite-Based Solar Cells  
E. Chassaing, N. Naghavi, G. Rocha, V. Bockelee, E. Leite, M. Bouttemy, J. Vigneron, A. Etcheberry, and D. Lincot
- 1334 Electrochemical ALD Formation of the Phase Change Material GeSbTe, and Ge Deposition from Aqueous Solutions  
X. Liang and J. Stickney
- 1335 Dye-Sensitized Hole Injection at p-type III-V Electrode Interfaces  
M. Price and S. Maldonado
- 1336 Controlled Formation of ZnO Fine-Pattern Transparent Electrodes by Wet-Chemical Etching  
N. Yamamoto, H. Makino, Y. Sato, and T. Yamamoto
- 1337 Study of Cu Bimetallic Corrosion in CMP Chemical Environments Using Optical Scanning and Micropattern Corrosion Screening  
N. Thomas, K. Yu, T. Hurd, K. Boggs, K. Pillai, and O. Chyan
- 1338 Galvanic Deposition of Nanoporous Si onto 6061 Al Alloy from Aqueous HF  
A. Krishnamurthy, D. Rasmussen, and I. Suni
- 1339 Microwave Electrochemical Characterization of the Si/Isolator Interface  
E. Martinez Moreno and M. Kunst
- 1340 Influence of Residual Ions and Gases at Si/SiO<sub>2</sub> Interface in Ultra-Thin Gate Oxide  
T. Chen, H. Lu, and J. Hwu

## **E7 - Silicon Nitride, Silicon Dioxide, and Emerging Dielectrics 11**

### *Dielectric Science and Technology*

- 1341 Fluctuations in Electronic Properties of MOS Interface in Nanoscale MOSFETs  
T. Tsuchiya, Y. Morimura, and Y. Mori
- 1342 Electron States in MOS Systems  
O. Engstrom
- 1343 Process Engineering and Trap Distribution for Dielectric/Si Interfacial Layer in High-k Gated MOS Devices  
K. Chang-Liao, C. Fu, C. Lu, Y. Chang, Y. Hsu, T. Wang, and D. Heh
- 1344 Current Understanding of the Transport Behavior of Hydrogen Species in MOS Stacks and Their Relation to Reliability Degradation  
Z. Liu, S. Fujieda, H. Ishigaki, M. Wilde, and K. Fukutani
- 1345 Impact of Silicon Nitride Gate Dielectric Composition on the Stability of Low Temperature Nanocrystalline Silicon Thin Film Transistors  
A. Nathan
- 1346 Development of a Fast Technique for Characterizing Interface States  
L. Lin, Z. Ji, J. Zhang, and W. Zhang

- 1347 Detailed Analysis of Si-SiO<sub>2</sub> Interface Traps in State-of-the-Art MOSFETs Using Charge Pumping  
D. Bauza
- 1348 Clear Difference between the Chemical Structure of SiO<sub>2</sub>/Si Interface Formed Using Oxygen Radicals and that Formed Using Oxygen Molecules  
T. Suwa, Y. Kumagai, A. Teramoto, T. Muro, T. Kinoshita, T. Hattori, and T. Ohmi
- 1349 Impact of Two-Fold Coordinated Nitrogen on the Generation of Deep-Level Hole Traps under Negative-Bias Temperature Stressing  
C. Gu and D. Ang
- 1350 Context Dependence Effects in Si/SiON Based Advanced CMOS Devices  
O. Olubuyide
- 1351 Quantitative Discussion on Electron-Hole Universal Tunnel Mass in Ultrathin Dielectric of Oxide and Oxide-Nitride  
H. Watanabe
- 1352 Physics-Based Hot-Carrier Degradation Modeling  
S. Tyaginov, I. Starkov, H. Enichlmair, J. Park, C. Jungemann, and T. Grasser
- 1353 Intrinsic Variability and Reliability in Nano-CMOS  
Y. Cao, J. Velamala, C. Wang, Y. Ye, and R. Zheng
- 1354 Bias Temperature Instabilities and Radiation Effects on SiC MOSFETs  
E. Zhang, C. Zhang, D. Fleetwood, R. Schrimpf, S. Dhar, and S. Ryu
- 1355 Capturing the Four Broad Features of Negative Bias Temperature Instability (NBTI)  
A. Islam, S. Mahapatra, and M. Alam
- 1356 Passivation and Nucleation of InGaAs and Ge by ALD Precursors  
J. Clemens, W. Melitz, J. Lee, T. Kaufman-Osborn, J. Shen, E. Chagarov, R. Droopad, and A. Kummel
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E. Theophile, C. Curran, W. Robl, M. Frank, and T. Kunstmann
- 1502 Plasma Health Care - Aims, Constraints, and Progress  
G. Morfill and J. Zimmerman
- 1503 Plasma Sources for Medical and Health Applications in the Developing World  
D. Graves
- 1504 Fluorine-Free, Low-Temperature Tungsten Deposition by Using Metal-Chloride-Reduction Chemical Vapor Deposition  
F. Hirose, T. Watanabe, A. Shibata, K. Kanomata, T. Suzuki, and H. Miya



- 1505 Characterization of Ultrathin RuCo Films for Diffusion Barrier and Copper Direct-Plate Applications  
D. Greenslit and E. Eisenbraun
- 1506 Evaluation Model of Neutral Particles Behavior Influence upon Contact Profile in C<sub>4</sub>F<sub>8</sub>-Based Dry Etch  
A. Chamov, A. Korovkin, A. Krasnikov, and S. Yanovich
- 1507 General Feature Profile Simulator FPS-3D  
P. Moroz
- 1508 Hydrophobic Properties of PTFE Films Prepared by PVD and CVD Process for Anti-Pollution Coating in Optoelectronics  
D. Kim, K. Bae, S. Seo, S. Sohn, H. Kim, and J. Hong

## **F1 - Electrodeposition for Energy Applications 2**

### *Electrodeposition / Energy Technology*

- 1509 Status and Future of Electrodeposition Technologies in the Field of Photovoltaic Conversion of Solar Energy  
D. Lincot, E. Chassaing, N. Naghavi, and J. Rousset
- 1510 Doped TiO<sub>2</sub> Nanotubes for Direct Water Splitting  
P. Schmuki, M. Yang, C. Das, K. Lee, and P. Schmuki
- 1511 The Supercapacitive Properties of Iridium Oxide in Aqueous Electrolytes  
Y. Chen and D. Scherson
- 1512 Electrodeposition of PV Materials Using Atomic Layer Deposition  
J. Stickney, B. Perdue, and D. Banga
- 1513 Zinc Surface Morphological Variations and Ionic Mass Transfer Rates in Alkaline Solution  
I. Arise, S. Kawai, T. Matsuoka, T. Homma, F. McLarnon, and Y. Fukunaka
- 1514 Electrodeposition of Functional, Thermoelectric Nanowires Composed of PbTe, Bi<sub>2</sub>Te<sub>3</sub>, and PEDOT  
R. Penner, D. Taggart, and Y. Yang
- 1515 Microstructure and Synthesis of Bi<sub>2</sub>Te<sub>3</sub>/Sb<sub>2</sub>Te<sub>3</sub> Superlattice Electrodeposits  
D. Banga, J. Lensch-Falk, D. Robinson, and P. Sharma
- 1516 Bismuth Electrodeposition on Ultrathin Gold Substrates for Sensor Applications  
M. Saini, S. Zheng, W. Wang, C. Chien, and S. Morin
- 1517 Chemical Synthesis of Bismuth Telluride Nanoparticles from Water Soluble Precursors  
V. Stavila, D. Robinson, M. Hekmaty, D. Banga, J. Lensch-Falk, D. Medlin, and P. Sharma
- 1518 Electrochemical Synthesis under Hydrothermal Conditions: A Promising One-Step Synthesis Route for LiCoO<sub>2</sub> Thin Films for Microbatteries Applications  
H. Porthault, F. Le Cras, R. Baddour-Hadjean, and S. Franger
- 1519 Aluminum as Anode Material Electrodeposited from Ionic Liquids for Secondary Rechargeable Batteries  
N. Ingale, J. Gallaway, D. Steingart, S. Khatun, P. Sideris, S. Greenbaum, S. Banerjee, and A. Couzis
- 1520 Effect of Surface Modification of n-TiO<sub>2</sub> and CM-n-TiO<sub>2</sub> by Electrocatalytic Metal Islets on Photosplitting of Water  
M. Frites and S. Khan

- 1521 Cu<sub>2</sub>O and Fe<sub>2</sub>O<sub>3</sub> Modified TiO<sub>2</sub> Nanotubes for Photoelectrochemical Solar Cell Applications  
L. Tsui, L. Wu, N. Swami, and G. Zangari
- 1522 Photo-Assisted Heteroepitaxial Electrodeposition of (0001)-ZnO/(111)-Cu<sub>2</sub>O Heterojunction  
F. Mohamad, J. Sasano, T. Shinagawa, S. Watase, and M. Izaki
- 1523 Deposition of Metal, Alloy and Semiconductor Thin Films Using Bipolar Electrochemistry  
C. Shannon, S. Ramakrishnan, R. Ramaswamy, and S. Ndzesse
- 1524 'Borrowed' SERS Effect for Monitoring Ge Electrodeposition and Surface Chemistry in Real Time  
A. Carim, J. Gu, and S. Maldonado
- 1525 Electrodeposition of Novel Precursor Structures for Efficient Copper Indium Gallium Selenide (CIGS) Films  
S. Aksu, S. Lastella, M. Kunduraci, J. Duimstra, and M. Pinarbasi
- 1526 Preparation of DSSC Photoanode Nanotitania Thin Films by Electrophoretic Deposition in an Aqueous Suspension  
N. Parsi Benekohal and G. P. Demopoulos
- 1527 Uniform Arrays of SiO<sub>2</sub>@Au Core-Shell Particles for In-Situ Surface-Enhanced Raman Spectroscopy: Extension to Pt Group Metals  
J. Zeng, D. Jean, and S. Zou
- 1528 Electrodeposition of CuGaSe<sub>2</sub> from Thiocyanate-Containing Electrolytes  
J. Jebaraj, D. Rasmussen, and I. Suni
- 1529 ZnO 2D Layers and Nanowires Deposition for Photovoltaic Applications  
R. Salazar, S. Sanchez, C. Lévy-Clément, and V. Ivanova
- 1530 Electrodeposition of Iridium onto Glassy Carbon, Gold and Platinum  
S. Le Vot, L. Roue, and D. Bélanger
- 1531 Electrodeposition of Molybdenum from Choline Chloride Based Binary Mixture  
Q. Abbas and L. Binder
- 1532 Electrodeposition of Catalyst Nanowires on Microporous Substrate for PEMFC  
G. Sibiude, N. Guillet, F. Nores Pondal, G. Bidan, and M. Alhoshan
- 1533 Modification of Model Catalysts by Deposition of Ultrathin Layers of Foreign Metals: Ensemble Effects  
J. Xu, A. Abd el Latif, N. Bogolowski, and H. Baltruschat
- 1534 Electrochemical Synthesis and Characterization of Porous Three Dimensionally Ordered Metal Oxides for Energy Related Materials  
T. Gabriel, M. Armstrong, and J. Holmes
- 1535 Multistage Electrodeposition of Supported Platinum-Based Nanostructured Systems for Electrocatalytic Applications  
T. Mkwizu, M. Modibedi, and M. Mathe
- 1536 Non-Line-of-Sight Electrodeposition of Ultrathin, Conformal Polymeric Separators within Ultraporous Carbon Nanofoam Papers  
J. Long, M. Sassin, J. Wallace, and D. Rolison
- 1537 Adsorption and Reduction of Metal Complexes on and within Molecular Layers Formed on Metal and Semiconductor Surfaces  
K. Uosaki, T. Masuda, H. Fukumitsu, and D. Qu
- 1538 Electrodeposition and Characterization of Ni-Co-Sm<sub>2</sub>O<sub>3</sub> Composite Coating as Cathode for Hydrogen Evolution Reaction  
X. Yi, P. He, Y. Chen, W. Wang, L. Du, and T. Zhang

- 1539 Characteristics of Brush Electrodeposited  $\text{ZnS}_x\text{Se}_{1-x}$  Films  
C. Dhanemozhi, R. John, and K. Murali
- 1540 Pulse Plated ZnTe Films and their Properties  
K. Murali, S. Florence, and R. John
- 1541 Electrochemical Preparation and Characterization of Cupric Oxide Thin Films  
V. Dhanasekaran, T. Mahalingam, R. Chandramohan, and J. Chu
- 1542 Properties of Brush Plated  $\text{CdS}_x\text{Te}_{1-x}$  Films  
K. Murali, M. Matheline, and R. John
- 1543 Microstructural and Optical Properties of Electrodeposited CdSnSe Thin Films  
T. Mahalingam, V. Dhanasekaran, J. Chu, T. Taekyu, and Y. Kim
- 1544 Pulse Electrodeposited  $\text{CuInS}_2$  Films  
K. Murali, A. Shanmughavel, and S. Srinivasan
- 1545 Pulse Electrodeposited  $\text{CdIn}_2\text{Se}_4$  Films and their Properties  
K. Murali and T. Elango
- 1546 Pulse Electrodeposited Copper Indium Selenide Films  
K. Murali, V. Chitra, and S. Vasantha
- 1547 The Effect of Heat Treatment on Electrodeposited  $\text{Bi}_2\text{Te}_3$  Thin Films for Thermoelectric Applications  
W. Wang, W. Chang, L. Hsiao, and S. He
- 1548 Optimal Investigation of Electroless Platinum Counter Electrodes for Use in Dye-Sensitized Solar Cells  
Y. Lin and J. Lin
- 1549 Pulse Plated CdSe Films and their Properties  
K. Murali, K. Ananthi, N. Muthukumarasamy, and S. Dhanapandiyan
- 1550 Pulse Plated SnSe Films and their Properties  
K. Murali, K. Ananthi, N. Muthukumarasamy, K. Thilagavathy, and S. Dhanapandiyan
- 1551 Properties of ZnSe Films Deposited by the Pulse Plating Technique  
S. Florence, R. John, and K. Murali
- 1552 Peculiarities of the Initial Stage of Zinc Electrocrystallization on the Copper Electrode from a Zincate Electrolyte  
I. Kryshtop, N. Yurchenko, and V. Trofimenko
- 1553 Study of Hydrogen Evolution Reaction on  $\text{Ni/Co}_3\text{O}_4$  Composite Electrode in Alkaline Solution  
L. Mirkova, V. Pashova, and M. Monev
- 1554 Ni/Re-Co as Electrocatalytic Material for Hydrogen Evolution Reaction in Alkaline Solution  
V. Pashova, L. Mirkova, and M. Monev
- 1555 Characterization of Single Bath Electrodeposited  $\text{Cu}_2\text{ZnSnSe}_4$  Thin Films  
S. Hu, W. Lee, and Y. Su
- 1556 Influence of Electrolyte Composition on the Composition of Ni-Co-Re Alloy Used as Electrocatalytic Material for Hydrogen Production  
V. Pashova, L. Mirkova, and M. Monev
- 1557 Nanoparticle Heterostructure Formation by Electrophoretic Deposition  
J. Dickerson
- 1558 From Au to Pt via Surface Limited Redox Replacement of Pb UPD in One Pot Configuration  
N. Dimitrov, M. Fayette, Y. Liu, J. Nutariya, D. Bertrand, and N. Vasiljevic
- 1559 Electrodeposition of  $\text{Pt}_{100-x}\text{Pb}_x$  Alloys and Intermetallics  
S. Hwang, J. Bonevich, J. Kim, and T. Moffat

- 1560 Pt Nano-Structures Formed through Surface Limited Redox Replacement Reaction with Cu Adlayer on Au(111) Surfaces  
D. Qu, I. Choi, and C. Lee
- 1561 Kinetics of Metal Deposition via Surface Limited Replacement Reaction  
D. Gokcen and S. Brankovic
- 1562 Cu and Pd Deposition onto PtRu<sub>1-x</sub>(111) Electrodes  
L. Kibler
- 1563 Oxygen Reduction Kinetics on Electrodeposited Pt-Ni and Pt-Cu Thin Alloy Film  
Y. Liu and T. Moffat

## **F2 - Surfactant and Additive Effects on Thin Film Deposition and Particle Growth 2**

### *Electrodeposition / Physical and Analytical Electrochemistry*

- 1564 Imaging Morphological Evolution of Electrodeposited Islands  
T. Olson, J. Gray, and C. Orme
- 1565 Controlling Metal Deposition on the Nanoscale by Ordered Molecular Assemblies  
I. Cebula and M. Buck
- 1566 Growth of Metal Multilayer Structures by Surface Limited Redox Replacement and Surfactant Mediation  
N. Dimitrov, C. Mitchell, L. Viyannalage, and S. Bliznakov
- 1567 Function through Structure: An Atomistic View on Additive Ensemble Effects Relevant for the Damascene Process  
N. Hai, A. Flügel, M. Arnold, A. Wagner, D. Mayer, W. Reckien, T. Bredow, H. Keller, and P. Broekmann
- 1568 STM Studies of Self-Assembled 3,3'-Thiobis(1-Propanesulfonic Acid, Sodium Salt) Monolayers on Au(111) and the Effect on Cu Electrodeposition  
K. Krug, P. Lin, Y. Liu, and Y. Lee
- 1569 Accelerator Surface Phase Associated with Superconformal Cu Electrodeposition  
T. Moffat, L. Ou Yang, and C. Lee
- 1570 Surfactant Mediated Growth of Cu and Ag Thin Films  
N. Vasiljevic and J. Nutariya
- 1571 In situ STM Imaging of 3-Mercaptopropanesulfonate Adsorbed on Pt(111) Electrode and Its Effect on the Electrodeposition of Copper  
S. Yau, H. Tu, P. Yen, and W. Dow
- 1572 Surfactant Effects in Cu-Sn Alloy Deposition  
A. Survila
- 1573 Structural Instability of Suppressor Films during Electroplating  
A. Flügel, M. Arnold, C. Emnet, A. Wagner, P. Broekmann, and D. Mayer
- 1574 Copper Deep via Superfilling by Accelerator Distribution Control  
M. Hayase
- 1575 Wet Processes for Filling through Silicon Vias and Butterfly Technology for Filling through Silicon Holes  
S. Shen, W. Dow, C. Lu, Y. Chang, C. Chou, M. Kubo, T. Kamitamari, E. Cheng, J. Lin, and F. Hsu
- 1576 Suppression Characteristics of Surfactants  
E. Shalyt, M. Pavlov, and P. Bratin

- 1577 The Use of Tetraoctyl Ammonium Bromide in the Growth of Vanadium Dioxide Thin Films and Gold Nanoparticle Composites  
M. Saeli, C. Piccirillo, I. Parkin, and R. Binions
- 1578 Simulation of Nickel Tungsten Electrodeposition  
M. Zheng, Z. Liu, and R. Hilty
- 1579 Pt, PtRu, and Pd Deposition Using Electrochemical Atomic Layer Epitaxy (E-ALD), and Adsorbed CO Overpotential Characterization  
N. Jayaraju, L. Sheridan, and J. Stickney
- 1580 Protein Aided Nanomanufacturing of Zinc-Based Semiconductors  
S. Kitayaporn, W. Zhou, S. Abbasi, K. Böhringer, F. Baneyx, and D. Schwartz
- 1581 The Science and Art of Additives for Electrodeposition of 2.4 T CoFe Alloys  
S. Brankovic, B. Kagajwala, J. George, A. Adesanya, and P. Lantonkpode
- 1582 Residual Stress Properties of Nickel Sulfamate and Copper Sulfate Deposits  
C. Arvin, G. Scott, C. Goldsmith, C. Parks, C. Wang, Y. Zhang, J. Abys, and K. Takahashi
- 1583 Study of Electrochemical Deposition of Silver Palladium Alloy as a Contact Material  
Z. Liu, M. Zheng, and R. Hilty
- 1584 Investigation of Additive Effects on Electroless Deposition Process Using DFT Calculation  
T. Homma, M. Kunimoto, and H. Nakai
- 1585 Electroless Deposition of Barrier and Seed Layers for TSV Metallization  
C. Chou, W. Dow, S. Shen, Y. Chang, J. Lin, and F. Hsu
- 1586 Substrate Dosing with  $\text{TiCl}_4$  as a Surface Pretreatment for CVD and ALD of Al for Future IC Interconnects  
R. Phillips and E. Eisenbraun
- 1587 A Facile Methodology for the Development of Mixed and Homogeneous Layers on Si(111)  
K. Koczur, E. Hamed, M. Chahma, and A. Houmam
- 1588 Self-Assembly of Molecular Films on Planar and Nanostructured Surfaces  
R. Salvarezza
- 1589 In situ Surface X-ray Diffraction Study of the Homoepitaxial Electrodeposition on Cu(111) and Cu(001) and the Influence of Additives  
F. Golks, Y. Gruender, K. Krug, A. Druenkler, J. Stettner, G. Wijts, O. Magnussen, and J. Zegenhagen
- 1590 Structure and Dynamics of Self-Assembled Mercaptobenzimidazole Monolayers on Au(111)  
L. Ou Yang and T. Moffat
- 1591 Effect of Additives on Deposition: Electrochemical and Plating Measurements  
A. Gewirth, J. Hatch, and M. Willey
- 1592 Solution Phase Contributions to Cu Thin Film Stress Evolution via In situ Surface Stress Monitoring  
C. Friesen and T. Heaton
- 1593 Effect of Damascene Additives on Microstructural Evolution during Cu Deposition on Textured Cu Seed Layers  
C. Lee, J. Bonevich, and T. Moffat
- 1594 Suppressor Effects on Room Temperature Annealing of Copper Interconnects in Through-Mask Plating  
D. Riemer and P. Ladwig
- 1595 Electrochemical Copper Deposition at MPS-Modified Au(111) Electrodes in the Presence of Chloride  
W. Ho, K. Krug, and Y. Lee

## **G1 - Industrial Electrochemistry and Electrochemical Engineering General Session**

### *Industrial Electrochemistry and Electrochemical Engineering*

- 1596 (IEEE New Electrochemical Technology (NET) Award) Electroosmotic Pulse Technology to Control Water in Varied Construction Media  
V. Hock, O. Marshall, M. McInerney, S. Morefield, C. Weiss, P. Malone, and P. Noyce
- 1597 Study of Mechanically Alloyed Cu-Ni-Fe Based Inert Anodes for Aluminum Production  
S. Helle, B. Davis, D. Guay, and L. Roue
- 1598 Electrodeposition of Rhodium on Nickel Electrodes Used as Urea Oxidation Electrocatalysts  
A. Miller, M. Muthuvel, and G. Botte
- 1599 Anode Processes on Carbon in Chloride-Oxide Melts  
R. Tunold, G. Haarberg, K. Osen, A. Martinez, and E. Sandnes
- 1600 Comments on the Parasitic Copper Deposition during Cathodic Reduction in Copper Chloride Thermo-Chemical Cycle  
M. Reda
- 1601 The Damköhler Number and the Koutecky-Levich Plots as Indicators for the Efficiency of an Electrochemical Process Applied to Copper Chloride ( $C_uC_l$ ) Thermo-Chemical Cycle for Hydrogen Reduction  
M. Reda
- 1602 Effect of Sonication on via Filling Behavior for Copper Metallization in Electronics Packaging  
R. Manu, S. Sobha Jayakrishnan, and S. Boopathi
- 1603 Optimal Design of Electrode Properties for Li-Ion Batteries Using Physics-Based Efficient Reformulated Models  
V. Ramadesigan, R. Braatz, G. Sikha, and V. Subramanian
- 1604 Dissolution Study of Orpiment ( $As_2S_3$ ) in Alkaline Solution  
A. Khodadadi Darban, M. Aazami, A. Meléndez, M. Abdollahy, and I. Gonzalez
- 1605 Nitrate Removal by a Paired Electrolysis Process  
D. Reyter, D. Bélanger, and L. Roue
- 1606 Electrochemical-pH-Switchable Polymer Film for Treatment of Metallic Ion Aqueous Waste: From Fundamental Study to Semi-Pilot Industrial Applications  
X. Le, P. Viel, and S. Palacin
- 1607 Novel Near-Infrared Electrochromic Aramids Based on Electroactive Para-Phenylenediamine-Substituted Triphenylamine and Diphenylamine Derivatives  
L. Huang, H. Yen, and G. Liou
- 1608 Crystallization Paths in  $CaO-Al_2O_3-SiO_2$  System  
V. Lutsyk and A. Zelenaya
- 1609 Adsorption and Desorption Behavior of Organic Molecules on Silicon Wafer Surface  
S. Tlili, S. Gligorovski, B. Temime-Roussel, and H. Wortham
- 1610 Catalytic Activity of Transition Metal Compounds for Oxygen Evolution Reaction in Sulfuric Acid  
K. Matsuzawa, K. Yamauchi, K. Nozawa, R. Koike, M. Aihara, S. Mitsushima, and K. Ota
- 1611 Evaluation and Modeling of a Photo-Electrochemical Reactor for Hydrogen Production Operating under High Photon Flux  
C. Ong, S. Dennison, G. Kelsall, and K. Hellgardt

- 1612 Evaluation of Catalyst Support Materials for Ammonia Electrolysis  
M. Muthuvel and G. Botte
- 1613 Modification and Formation Control of Anodic Aluminum Oxide (AAO) Nano-Templates Synthesized in Oxalic Acid Solution  
M. Soltani, M. Paydar, M. Moradi, F. Behzadi, F. Homayoon-nia, and M. Noormohammadi
- 1614 Fabrication of Doped Tin Oxide Electrode for Electrochemical Generation of Ozone  
B. Wang and K. Chan
- 1615 Increase in Efficiency of Electrolytic Process of Zirconium Production  
V. Bezumov, A. Kabanov, N. Matyushkin, and A. Dunaev
- 1616 Behavior of Soluble and Insoluble Anodes in Cu Electroplating  
Y. Lee, H. Ju, S. Rha, S. Lee, B. Kang, and Y. Lee
- 1617 Pretreatments for Clean Cu Seed Layer in Electroplating  
H. Ju, Y. Lee, Y. Lee, S. Lee, B. Kang, and S. Rha
- 1618 A Spectroscopic Study of 4-Phenyl-3-Buten-2-One Dissolved in an Electroplating Zinc Bath  
S. Gama, C. Fraustro-Reyes, G. Trejo-Cordova, Y. Meas, and G. Orozco
- 1619 A Combined Experimental and Numerical Study on Flow Field Performance  
J. Scarfo, N. Yacovone, J. Powers, I. Alexander, C. Grice, P. Kleszyk, B. Gurau, M. Taslim, and E. Smotkin
- 1620 A Variational Multiscale Model for the Numerical Simulation of Electrochemical Systems  
G. Bauer, V. Gravemeier, and W. Wall
- 1621 A Three-Dimensional Lithium-Ion Battery Model that Includes Thermal, Electrical and Electrochemical Behavior: I. Model Description and Validation  
J. Christensen, P. Albertus, and D. Cook
- 1622 A Three-Dimensional Lithium-Ion Battery Model that Includes Thermal, Electrical and Electrochemical Behavior: II. The Effects of Electric Potential and Thermal Variations on Cell Aging  
J. Christensen, P. Albertus, and D. Cook
- 1623 Global Sensitivity Assessment and Optimization of  $\text{LiMn}_2\text{O}_4$  Electrode Properties in a Surrogate-Based Framework  
W. Du, A. Gupta, X. Zhang, A. Sastry, and W. Shyy
- 1624 Dynamic Optimization for Maximization of Energy Storage and Minimization of Capacity Fade  
V. Ramadesigan, R. Methekar, R. Braatz, and V. Subramanian
- 1625 Hybrid Atomistic Modeling of the Interface between Pt catalysts and Nafion Electrolyte  
X. Zhou, X. Zhou, and H. Liu
- 1626 Electric Field Influence on  $\text{Li}^+$  Ion Transport through Phase-Change  $\text{LiFePO}_4/\text{FePO}_4$  Particles  
E. Kalu, S. Pannala, P. Mukherjee, J. Nanda, S. Martha, N. Dudney, S. Allu, and J. Turner
- 1627 A Multiscale Mechanistic Model for the Transient Analysis of PEM Water Electrolyzers  
A. Franco, L. Lopes Oliveira, C. Jallut, E. Mayousse, and N. Guillet

### **G2 - Characterization of Porous Materials 3**

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

- 1628 Heterogeneous through Plane Porosity Distributions of MPL Treated GDLs  
Z. Fishman and A. Bazylak

- 1629 Lattice Boltzmann Modeling of the Effective Thermal Conductivity of an Anisotropic Gas Diffusion Layer in a Polymer Electrolyte Membrane Fuel Cell  
J. Yablecki and A. Bazylak
- 1630 3D Visualization of PEMFC Electrode Structures Using FIB Nanotomography  
S. Zils, M. Timpel, T. Arlt, A. Wolz, I. Manke, and C. Roth
- 1631 Investigation of PEM Fuel Cell Transport Material Flooding and Microstructure with Synchrotron Radiography  
J. Hinebaugh and A. Bazylak
- 1632 Conductometric Analysis for the Formation of Poly(Vinylidene Fluoride)-Based Ion Track Membranes  
T. Yamaki, N. Nuryanthi, H. Koshikawa, M. Asano, S. Sawada, S. Hasegawa, Y. Maekawa, K. Voss, C. Trautmann, and R. Neumann
- 1633 Testing the Puncture Resistance of Li-Ion Battery Separators through Nanoindentation  
I. Halalay, M. Lukitsch, M. Balogh, and C. Curtis A. Wong
- 1634 A Comparative Study of the Performance of Ultra-Porous Membranes as Separators in Supercapacitor Devices  
A. Laforgue and L. Robitaille
- 1635 In situ Measurements of Potential, Current, and Charging Rate across an Ultracapacitor Electrode  
K. Hess, J. Whitacre, and S. Litster
- 1636 Charging Performance of Carbon Aerogel Electrodes with Hierarchical Porosity for Water Desalination and Energy Storage Applications  
M. Suss, J. Santiago, T. Jaramillo, T. Baumann, M. Stadermann, and K. Rose
- 1637 In situ 3D Imaging and Characterization of Nano-Structures with X-ray Nano-CT Technique  
Y. Wang, Y. Chen, and W. Chiu
- 1638 Lattice Boltzmann Simulation of Supercritical Carbon Dioxide in Brine-Saturated Underground Porous Media  
A. Ebrahimi Khabbazi, J. Ellis, and A. Bazylak
- 1639 Characterization of Supercritical Carbon Dioxide Transport within a Brine-Filled Porous Media Using a Two-Phase Pore Network Model  
J. Ellis, A. Ebrahimi Khabbazi, and A. Bazylak
- 1640 Desalination Shocks and Overlimiting Current in Microstructures  
A. Mani, E. Dydek, D. Deng, B. Zaltzman, I. Rubinstein, and M. Bazant
- 1641 Defects Origin on Epitaxial Silicon Layer on a Double-Porous Silicon Layer  
E. Arbaoui, J. Hartmann, F. Gonzatti, L. Clement, and A. Halimaoui

### **G3 - Electrosynthesis and Electrochemical Processes, in Honor of W. Ves Childs**

*Industrial Electrochemistry and Electrochemical Engineering /  
Physical and Analytical Electrochemistry*

- 1642 Determination of Kinetic and Thermodynamical Parameters of  $\text{Cd}^{+2}$  with  $\text{OC}(\text{NH}_2)_2$ ,  $\text{OS}(\text{CH}_3)_2$  and  $\text{C}_6\text{H}_5\text{NH}_2$  Ligands in Quasi-Reversible Systems  
L. Zare Haghighi, S. Seyed Sadjadi, and S. Milani
- 1643 Role of Deposition Potential on the Optical Properties of SnSSe Thin Films  
T. Mahalingam, V. Dhanasekaran, G. Ravi, R. Chandramohan, A. Kathalingam, and J. Rhee



- 1644 Isothermal Microcalorimetry Applied to Li Battery Electrolyte Stability  
L. Krause and L. Jensen
- 1645 Technological Implications of Active Dissolution Passivation and Electrocatalytic Behavior of Nickel in Fluoride Media  
N. Michael
- 1646 Reversible NAD/NADH Electrocatalysts  
R. Arechederra, P. Addo, and S. Minteer
- 1647 Magnetic Effects on Electron Transfer Kinetics  
H. Lee, S. Minteer, and J. Leddy
- 1648 Electrochemistry within Lyotropic Liquid Crystal Nanostructures  
J. Halls and J. Wadhawan
- 1649 Electron Transfer Relays and Electro-Induced Bond Rupture within Modified Electrodes  
J. Halls and J. Wadhawan
- 1650 The Electrochemical Oxidation of Hydroxylamine on the Low Index Faces of Gold Single Crystals in Aqueous Electrolytes  
A. Jacob Jebaraj and D. Scherson
- 1651 Microbial Electrosynthesis: Converting Carbon Dioxide Directly to Butanol and Other Organic Compounds  
P. Tremblay, K. Nevin, C. Leang, S. Hensley, M. Aklujkar, and D. Lovley
- 1652 Electrochemical Synthesis of Green Rust and Its Modified Form Developed for Wastewater Treatment in Remote Areas  
J. Gomes, M. Haider, G. Irwin, P. Bernazzani, and D. Cocke
- 1653 Electro-Assisted Assembly of Aliphatic Thiol, Dithiol and Dithiocarboxylic Acid Monolayers on Polycrystalline Copper Substrates  
A. Maho, J. Denayer, J. Delhalle, and Z. Mekhalif
- 1654 Ir-Ru Supported Electrocatalysts for Oxygen Evolution Reaction in a PEM Water Electrolyzer  
R. Fuentes, S. Rau, T. Smolinka, and J. Weidner
- 1655 Liquid Fuels Extracted from Coal after the Electrolysis to Produce Hydrogen  
A. Valenzuela-Muñiz and G. Botte
- 1656 Gas-Phase Hybrid Sulfur Electrolyzer Stack  
J. Staser, C. McPheeters, and S. Stone
- 1657 Hydrogen-Bromine Flow Battery for Renewable Energy Storage  
T. Nguyen
- 1658 Development of Gas-phase H<sub>2</sub>-Br<sub>2</sub> Flow Battery  
R. Zhang and J. Weidner
- 1659 Toward On-Chip Processes Using Redox-Magnetohydrodynamic Microfluidics without Channels  
V. Sahore, C. Nash, M. Weston, M. Gerner, and I. Fritsch

## **H1 - Electron Transfer and Applications of Fullerenes and Nanostructured Materials**

### *Fullerenes, Nanotubes, and Carbon Nanostructures*

- 1660 Towards Tunable Graphene / Phthalocyanine-PPV Hybrid Systems  
D. Guldi

- 1661 Synthesis and Photoinduced Electron Transfer Dynamics in Mechanically Linked Porphyrin-[60]Fullerene Systems with Interlocked Topologies  
D. Schuster, J. Megiatto, D. Guldi, S. Wolfrum, and G. de Miguel
- 1662 Electron Tunneling and Hopping in Fullerene-Based Donor-Acceptor Compounds in Solutions and Solid Films  
N. Tkachenko, K. Stranius, H. Saarenpää, A. Efimov, and H. Lemmetyinen
- 1663 Single- and Multi-Walled Carbon Nanotubes Covalently Linked to Perylenebisimides  
A. Sastre-Santos, R. Martin, F. Céspedes-Guirao, M. de Miguel, F. Fernandez-Lázaro, and H. García
- 1664 Long Distance Photoinduced Electron Transfer in Oligomeric Porphyrin-[60]Fullerene Dyads with Triazole-Based Conjugated Linkers  
E. McCord and D. Schuster
- 1665 Photoinduced Processes of the Supramolecularly Functionalized Semi-Conductive SWNTs with Porphyrins  
F. D'Souza, S. Das, N. Subbaiyan, A. Sandanayaka, T. Hasobe, and O. Ito
- 1666 Photo-Physical Properties of Simple and Double Strand Multi-Porphyrinic Polypeptides  
N. Solladie
- 1667 Endohedral Electrochemistry: New Directions in Metal Nitride Cluster Fullerenes  
L. Dunsch, S. Yang, L. Zhang, A. Svitova, and A. Popov
- 1668 Electrochemical Transfer Doping of Carbon Nanotubes, Graphene and Other Semiconductors  
V. Chakrapani, J. Angus, A. Anderson, and G. Sumanasekera
- 1669 Controlling Inter-Fullerene Electronic Interactions in the Solid and Using Them to Store Information  
D. Bassani
- 1670 Fine-Tuning Redox Properties of Perfluoroalkylated Fullerenes: Playing with Perfluoroalkyl Groups and Addition Motifs  
A. Popov, N. Shustova, I. Kuvychko, J. Whitaker, B. Larson, O. Boltalina, S. Strauss, and L. Dunsch
- 1671 Metallofullerenes  $M_nC_{60}$  ( $M = Pt, Pd$ ) as Catalysts for PEM fuel-Cell Electrodes  
G. Krosnicki, N. Guillet, O. Lemaire, L. Guetaz, A. Al-Mayouf, and D. Felder-Flesch
- 1672 Donor- $\pi$ -Acceptor Double-Cable Polythiophenes Bearing Fullerene Pendant with Tunable Donor/Acceptor Ratio: A Facile Postpolymerization  
M. Li, P. Xu, J. Yang, and S. Yang
- 1673 Effect of Purification of Carbon Nanotubes on Their Electrocatalytic Properties for ORR in Acid Solution  
I. Kruusenberg, N. Alexeyeva, J. Kozlova, V. Sammelselg, and K. Tammeveski
- 1674 Effect of Thermally Evaporated Bis (2-methyl-8-quinolinato)-4-Phenylphenolate Cathode Buffer Layer on Performance of Polymer Photovoltaic Cells  
D. Kim, Z. Wang, J. Kim, K. Ku, G. Lee, and J. Park

## **H2 - Molecular and Supramolecular Chemistry of Fullerenes and Carbon Nanotubes** *Fullerenes, Nanotubes, and Carbon Nanostructures*

- 1675 Photoactive Carbon Nanotube-Based Composites  
H. Imahori

- 1676 Fullerenes, Carbon Nanotubes and Graphene: What Was New and What Have We Learned  
R. Haddon
- 1677 Hierarchical Selectivity in Fullerenes: Site, Regio, Diastereo and Enantio Control in the  
1,3-Dipolar Cycloaddition to [70]Fullerene  
E. Maroto, S. Filippone, A. Martín-Domenech, M. Suarez, and N. Martin
- 1678 New Concepts in Receptors for Fullerenes  
N. Martin
- 1679 Customization of Acceptor Materials to Match the Electronic and Physical Properties of Donor  
Polymers in Organic Photovoltaic Systems  
C. Cardona, B. Swain, J. Wall, and S. Joslin
- 1680 Regioselectivity in High-Temperature Additions to Fullerenes  
O. Boltalina, I. Kuvychko, J. Whitaker, B. Larson, T. Folsom, and S. Strauss
- 1681 Selective Derivatization of Perfluoroalkylfullerenes  
S. Strauss, J. Whitaker, B. Larson, I. Kuvychko, and O. Boltalina
- 1682 Nanocarbon Assemblies for Photovoltaics  
Y. Shen and T. Nakanishi
- 1683 Click Chemistry with Fullerene Hexa-adducts  
J. Nierengarten
- 1684 Clicked Fullerene-Porphyrin Conjugates  
M. Vartanian and J. Nierengarten
- 1685 Synthesis of [60]Fullerene-Fused Lactones  
F. Li, B. Zhu, and G. Wang
- 1686 Supramolecular Cross-Linking of C<sub>60</sub>-Grafted Polyphenylacetylene Driven by Molecular  
Recognition  
T. Haino
- 1687 A New CNH-C<sub>60</sub> Hybrid: Synthesis and Properties  
M. Vizuete, M. Gómez-Escalonilla, J. Garcia Fierro, J. Nierengarten, M. Yudasaka, S. Iijima,  
and F. Langa
- 1688 Functionalized Peapods  
N. Tagmatarchis
- 1689 Mild Methods in the Selective Functionalization of Fullerenes  
M. Izquierdo, S. Filippone, and N. Martin
- 1690 Mass Spectrometry Study of Retro-Cycloaddition Reactions in Fullerene Cycloadducts  
R. Martinez, S. Filippone, A. Martín-Domenech, E. Maroto, J. Delgado, and N. Martin
- 1691 Encapsulation of Fullerenes into Non-Covalent Subphthalocyanine Supramolecular Assemblies  
C. Claessens, I. Sánchez-Molina, A. Medina, G. Zango, M. Ince, M. Martínez-Díaz,  
J. Fernandez Ariza, J. Guilleme, D. Guldi, and T. Torres
- 1692 Supramolecular (2,5,7-Trinitrofluorene)-C<sub>60</sub>/Tetrathiafulvalene-Calix[4]Pyrrole Systems  
L. Martin-Gomis, K. Nielsen, F. Fernandez-Lázaro, J. Jeppesen, and A. Sastre-Santos

### **H3 - Carbon Nanotubes and Nanostructures: Fundamental Properties and Processes**

#### *Fullerenes, Nanotubes, and Carbon Nanostructures*

- 1693 (Invited) Compositionally-Tuned Bimetallic Nanocatalysts and Their Influence on the Chirality  
of As-Grown SWCNTs  
R. Sankaran

- 1694 (Invited) Towards Chiral-Control Growth of Single Walled Carbon Nanotubes: Correlation between Catalyst Structure and Chirality of the Tubes  
G. Chen, T. Paronyan, E. Pigos, E. Stach, and A. Harutyunyan
- 1695 (Invited) Design, Synthesis and Properties of Nanostructured Carbon  
C. Nuckolls
- 1696 (Invited) Purification of Single-Chirality Metallic Carbon Nanotubes by DNA  
X. Tu, A. Hight Walker, and M. Zheng
- 1697 Fundamentals and Applications of Monodisperse Carbon Nanomaterials  
M. Hersam
- 1698 (Invited) Advances in Graphene Chemistry  
R. Haddon
- 1699 (Invited) Diameter-Based Separation of Single-Walled Carbon Nanotubes with Dipyrrene Nanotweezers  
N. Komatsu
- 1700 (Invited) Understanding the Selective Retention of Semiconducting SWCNTs onto Agarose  
C. Silvera Batista, S. McLeod, D. Scott, and K. Ziegler
- 1701 (Invited) Semiconducting Zig-Zag Bundles: Preparation and Properties  
M. Kappes
- 1702 (Invited) Performance of Type-Separated Single-Walled Carbon Nanotubes in Photovoltaic Blends  
J. Blackburn, J. Holt, A. Ferguson, N. Kopidakis, and G. Rumbles
- 1703 Diameter and Chiral Selective Purification of SWNT and DWNT Using CO<sub>2</sub>  
P. Gagnon, M. Biron, E. Flahaut, P. Desjardins, and R. Martel
- 1704 (Invited) Characterization of the Chirality Distribution of a Dispersed SWCNT Sample  
J. Fagan
- 1705 (Invited) Measuring SWCNT Length Distributions from Imaged Brownian Motion  
R. Weisman, J. Streit, D. Tsyboulski, and S. Bachilo
- 1706 (Invited) Spectroscopy of Metallic Single-Walled Carbon Nanotubes  
E. Haroz, T. Searles, L. Ren, and J. Kono
- 1707 (Invited) Highly Luminescent Nanotube/Silica Gel Composites: Interfacial Behavior and Optical Properties  
S. Doorn, J. Duque, G. Gupta, A. Dattelbaum, C. Hamilton, and K. Obrey
- 1708 (Invited) Nonlinear Optical Properties of Graphene  
B. Zhao and W. Zhao
- 1709 (Invited) Oxygen Doping Modifies near Infrared Band Gaps in Fluorescent Single-Walled Carbon Nanotubes  
S. Ghosh, S. Bachilo, R. Simonette, K. Beckingham, and R. Weisman
- 1710 A New Look on SWCNT Electronic Levels and Their Modifications  
S. Bachilo, S. Ghosh, and R. Weisman
- 1711 (Invited) Multiple Exciton Generation and Fluorescence Brightening in Single-Walled Carbon Nanotubes  
X. Wang, A. Lee, L. Carlson, J. Smyder, and T. Krauss
- 1712 (Invited) Why Are Fluorescence Quantum Yields of Single-Wall Carbon Nanotubes So Low  
T. Hertel, S. Himmelein, T. Ackermann, D. Stich, and J. Crochet
- 1713 (Invited) Fluorescence from Molecules Encapsulated inside Carbon Nanotubes  
T. Okazaki

- 1714 (Invited) Energy Structures of Excitons and Trions in Single-Walled Carbon Nanotubes  
R. Matsunaga and Y. Kanemitsu
- 1715 (Invited) Optical Imaging and Spectroscopy of Carbon Nanotubes Grown by Chemical Vapor Deposition  
P. Finnie, A. Li-Pook-Than, P. Vinten, P. Marshall, and J. Lefebvre
- 1716 (Invited) Probing Localized Excitons and Band Gap States in Single-Walled Carbon Nanotubes  
J. Lee
- 1717 (Invited) Metal-Nanowires in Carbon Nanotubes  
H. Shinohara
- 1718 Electroreduction of Oxygen on Nitrogen-Doped Carbon Nanotube Modified Electrodes  
N. Alexeyeva, E. Shulga, V. Kisand, I. Kink, and K. Tammeveski
- 1719 Synthesis and Characterization of Carbon Nanotube Electrodes Grown by Thermal CVD  
C. Smart, M. Pearce, S. Oh, R. Hudson, A. Alles, and S. Belli
- 1720 High-Throughput Fabrication of Functionalized Carbon Nanostructures for DNA Detection  
V. Penmatsa, H. Kawarada, and C. Wang
- 1721 Multiwall CVD Carbon Nanotubes as Insulated Nanowires  
S. Belli, S. Oh, S. Kaur, M. Pearce, and C. Smart
- 1722 Polyoxometalates Modified Carbon Nanotubes for Electrochemical Capacitors  
T. Akter, K. Hu, and K. Lian
- 1723 Structural and Electronic Properties of Graphene Supported on Amorphous SiO<sub>2</sub>:  
A First Principles Study  
K. Kweon and G. Hwang
- 1724 Copper Sulfide Nanowires Electrodeposition; Method and Mechanism  
A. Ghahremaninezhad, E. Asselin, and D. Dixon
- 1725 Anchoring Gold Nanoparticles to Gold Surfaces through Nitroxyl Radicals  
R. Bilewicz, O. Swiech, N. Hryniewicz-Sudnik, B. Palys, and A. Kaim
- 1726 Rippling in Vertically Aligned Carbon Nanotube Forests Grown by Chemical Vapor Deposition  
P. Vinten, J. Bond, P. Marshall, J. Lefebvre, and P. Finnie

#### **H4 - Carbon Nanotubes and Nanostructures: Applications and Devices**

*Fullerenes, Nanotubes, and Carbon Nanostructures / Sensor*

- 1727 (Invited) Microfluidic Control over Single-Wall Carbon Nanotube Environments  
T. Hertel, F. Bergler, and F. Schöppler
- 1728 (Invited) Tracking and Imaging of High Brightness Colloidal Carbon Nanotubes for Hydrodynamic Investigations  
J. Crochet, J. Duque, J. Werner, and S. Doorn
- 1729 (Invited) Resonance Raman Spectroscopy of Separated SWCNTs  
J. Simpson, J. Fagan, X. Tu, M. Zheng, and A. Hight Walker
- 1730 (Invited) Imaging and Spectroscopy of Carbon Nanotubes and Polycrystalline Graphene  
J. Park
- 1731 (Invited) Sensing with Excitons in Single Walled Carbon Nanotubes  
J. Lefebvre and P. Finnie
- 1732 Evaluation Model of Emitter Roughness Impact Responsible for Diamond Based Cold Emitter IV Characteristics Aberration  
D. Kartashov, A. Krasnikov, I. Matyushkin, S. Orlov, S. Yanovich, and N. Zaytsev

- 1733 Elastic Characteristics of Nanocomposite Based on Multiwalled Carbon Nanotubes and Polypropylene  
A. Onanko, O. Lyashenko, G. Prodayvoda, S. Vyzhva, and A. Onanko
- 1734 High-Performance N<sub>2</sub>O Plasma Treated Multiwall Carbon Nanotubes by Thermal Chemical Vapor Deposition  
C. Fan, H. Lai, T. Huang, and W. Wu
- 1735 (Invited) Terahertz Response of Carbon Nanotube Transistors  
F. Leonard
- 1736 Force on a Charged Wall Due to the Presence of a Polyelectrolyte Influenced by an Electronically Responsive Cylinder  
O. Malysheva, T. Tang, and P. Schiavone
- 1737 Near-Field 1D Probes with Single-Wall Nanotube Antennas  
S. Rotkin, A. Nemilentsau, G. Slepian, S. Maksimenko, and A. Lakhtakia
- 1738 (Invited) Polymer Wrapped Carbon Nanotubes Doing It All: From Selection to Self-Assembly of Semiconducting Devices  
M. Loi, J. Gao, M. Kwak, and A. Herrmann
- 1739 (Invited) Separation and Optical Characterization of Empty and Water-Filled Single-Wall Carbon Nanotubes  
J. Fagan, J. Huh, J. Simpson, J. Blackburn, J. Holt, and A. Hight Walker
- 1740 (Invited) Floating Catalyst Synthesis and Direct Dry Deposition of SWCNTs for Thin Film Flexible Electronics Applications  
E. Kauppinen
- 1741 (Invited) Shaping Nanotubes and Nanowires with Surfaces  
E. Joselevich
- 1742 (Invited) Nanotube Radio  
S. Perisanu, A. Ayari, P. Vincent, T. Barois, M. Choueib, V. Gouttenoire, and S. Purcell
- 1743 (Invited) Carbon Nanotube Thin-Film-Transistors of Very High Mobility  
H. Shinohara
- 1744 (Invited) Conductance Peak in Carbon Nanotube Field Effect Transistors at Low Temperatures and High Magnetic Fields  
J. Licini and J. Stephens
- 1745 Thermopile Based on Single-Walled Carbon Nanotubes for Broadband Light Detection  
B. St-Antoine, D. Ménard, and R. Martel
- 1746 Solution Processing of Highly Conductive and Transparent Single-Walled Carbon Nanotube Films: Surfactant-Free Dispersions and Non-Acidic Dopants  
B. Larsen, J. Bergeson, M. Reese, T. Barnes, and J. Blackburn
- 1747 Substrate Chemistry Modifies Carbon Nanotubes Field-Effect Transistors Transport Characteristics  
F. Lapointe, C. Aguirre, P. Levesque, P. Desjardins, and R. Martel
- 1748 Covalently Functionalized Double-Walled Carbon Nanotubes for Electronic Devices  
D. Bouilly, J. Cabana, F. Meunier, M. Desjardins-Carrière, F. Lapointe, P. Gagnon, F. L. Larouche, E. Adam, M. Paillet, and R. Martel
- 1749 Highly-Enriched Semiconducting Carbon Nanotubes for the Fabrication of Electronic Devices  
G. Tulevski, B. Chandra, and A. Franklin
- 1750 (Invited) Efficiently Harvesting Excitons from Electronic Type-Controlled Semiconducting Carbon Nanotube Thin Films  
D. Bindl, M. Wu, F. Prehn, and M. Arnold

- 1751 Transparent Conducting Electrodes Made from Networks of Single-Walled Carbon Nanotubes for Organic Photovoltaics  
J. Blackburn, B. Larsen, J. Bergeson, K. Mistry, M. Reese, J. Holt, and T. Barnes
- 1752 High-Performance Dye-Sensitized Solar Cells with Gel-Coated Binder-Free Single-Walled Carbon Nanotube Films as Counter Electrode  
X. Mei, S. Cho, and J. Ouyang
- 1753 Light Emission in Electrically Excited Carbon Nanotubes  
E. Adam, B. Cardin St-Antoine, P. Levesque, M. Paillet, D. Ménard, and R. Martel
- 1754 Single Wall Carbon Nanotubes as Transparent Cathode Electrodes for OLED Applications  
Y. Chien, F. Lefevre, I. Shih, and R. Izquierdo
- 1755 (Invited) Periodic Buckling as Predominant Deformation Mechanism in Carbon Nanotube Foams as Revealed by In situ Uniaxial Compression Experiments and Modeling  
S. Hutchens, A. Needleman, and J. Greer
- 1756 (Invited) Carbon Nanotube Photon Filter for Energetic Particle Detectors  
S. Papadakis, D. Deglau, A. Monica, B. Andrews, and D. Mitchell
- 1757 Single Carbon Nanotube Based Devices for Atto-Liter Studies  
R. Singhal, J. Niu, Z. Orynbayeva, M. Schrlau, G. Friedman, and Y. Gogotsi
- 1758 Directly Grown Vertically Aligned Single-Walled CNTs on Conducting Substrate as Electrode Material for Electrochemical Capacitor  
M. Asyadi Azam, A. Fujiwara, and T. Shimoda
- 1759 Pt Based Nanocomposites for Direct Glucose Determination  
B. Singh, T. McCormac, and E. Dempsey
- 1760 Development of Hybrid Organic-Inorganic Materials for Efficient Charging/Discharging in Electrochemical and Photoelectrochemical Capacitors  
M. Skunik and P. Kulesza
- 1761 Field Ionization Based Gas Sensor Applying a Novel Three Dimensional Carbon Nanostructures  
S. Darbari, Y. Abdi, and S. Mohajerzadeh

## **H5 - Endofullerenes and Carbon Nanocapsules**

### *Fullerenes, Nanotubes, and Carbon Nanostructures*

- 1762 Thermal and Redox Stabilities of Endohedral Metallofullerene Derivatives  
L. Echegoyen, N. Chen, F. Li, A. Balch, M. Olmstead, and B. Mercado
- 1763 New Insights from Quantum Chemical Molecular Dynamics Simulations on the Formation Mechanism of Metallofullerenes  
Y. Nishimoto, B. Finck, Z. Wang, K. Morokuma, and S. Irle
- 1764 Recent Crystallographic Studies of Endohedral Fullerenes  
A. Balch, M. Olmstead, B. Mercado, C. Beavers, and F. Bowles
- 1765 The Role that Internal Metals Play in Endohedral Metallofullerenes  
X. Lu, H. Nikawa, N. Mizorogi, Z. Slanina, T. Akasaka, and S. Nagase
- 1766 A Family of Metallic Oxide Clusters Encapsulated in Fullerene Cages  
S. Stevenson
- 1767 Large Ions in Mixed Metal Nitride Clusters: Gadolinium, Thulium, and Holmium  
A. Svitova, A. Popov, S. Yang, L. Zhang, and L. Dunsch

- 1768 Thermal Properties of Non-IPR Fullerene Solids and their Reactivity with C<sub>2</sub>  
M. Kappes
- 1769 Magnetism of Co<sub>13</sub> Cluster Embedded into Fullerenes of Different Size and Form  
P. Tereshchuk and A. Kuznetsov
- 1770 Electronic Properties of Endohedral Fullerenes M<sub>2</sub>(C<sub>2</sub>)@C<sub>82</sub> :  
Comparison between DFT and DFTB  
Y. Nishimoto and S. Irle
- 1771 Further Exploration in Oxometallic Fullerenes and Metallic Nitride Fullerenes  
M. Mackey and S. Stevenson
- 1772 Taming the Chemistry of Endohedral Fullerenes for Nanoelectronics  
K. Porfyrakis
- 1773 Metal Exchange of a Trimetallic Nitride Templated Endohedral Metallofullerene:  
A Computational Study of a Metathesis Reaction  
T. Fuhrer and H. Dorn
- 1774 STM/STS Studies on the Local Electronic Structure of Metallofullerene-Peapods  
H. Shinohara
- 1775 One-Dimensional Molecular Crystals Produced in Carbon Nanotubes  
T. Okazaki
- 1776 Cluster Dynamics inside Icosahedral C<sub>80</sub> Cages  
H. Dorn
- 1777 Guanidinium Salt as a Selective Organic Solid for the Facile Synthesis of Metal Nitride  
Clusterfullerenes  
S. Yang, L. Zhang, W. Zhang, and L. Dunsch

## **H7 - Carbon Nanotubes and Nanostructures: Medicine and Biology**

*Fullerenes, Nanotubes, and Carbon Nanostructures / Sensor*

- 1779 Optically Pure Fullerodendron Formed by Diastereoselective Diels-Alder Reaction  
Y. Takaguchi, N. Takahashi, N. Tsugawa, and T. Tajima
- 1780 Molecular Interactions of an Anti-Inflammatory Fullerene Derivative in Serum and Immune  
Effector Cells  
A. Dellinger, Z. Zhou, D. MacFarland, and C. Kepley
- 1781 Structure and Properties of IPR and Non-IPR Endohedral Metallofullerenes  
A. Rodríguez-Forteza, N. Alegret, X. Aparicio-Anglès, M. Mulet, and J. Poblet
- 1782 Erbium Photoluminescence in Er<sub>2</sub>C<sub>2</sub>@C<sub>82</sub> and Er<sub>2</sub>@C<sub>82</sub> Elucidated by Density Functional  
Theory  
J. Wang and S. Irle
- 1783 Relative Populations for the Lanthanoid L@C<sub>74</sub> Endohedrals  
Z. Slanina, T. Akasaka, and S. Nagase
- 1784 Molecular and Spin Dynamics of Pristine and Charged Endohedral Metallofullerenes and the  
Impact of Dynamics on the Spectroscopic Properties  
A. Popov and L. Dunsch
- 1785 (Invited) Toxicity Studies on Carbon Nanotubes: State of the Art  
J. Kolosnjaj and F. Moussa



- 1786 (Invited) Biomedical Applications of Covalently Functionalized and Dispersed Single Wall Carbon Nanotubes  
D. Scheinberg, M. McDevitt, C. Villa, R. Bowman, and J. Mulvey
- 1787 (Invited) A Novel Single Wall Carbon Nanotube-Enhanced Biophysical Strategy for Integrated Imaging and Therapy in Bone Tissue Engineering  
B. Sitharaman
- 1788 (Invited) Ultra-Short Single-Walled Carbon Nanotubes (US-Tubes) as "Smart" Delivery Nanocapsules for Chemotherapeutics  
A. Guven, I. Rusakova, and L. Wilson
- 1789 (Invited) Noninvasive Radiofrequency (RF) Field Heating of Metallic and Semiconducting Nanoparticles  
S. Curley
- 1790 Preparation of Fluorescent Diamond Nanoparticles Stably Dispersed under Physiological Environment through Multi-Step Organic Transformations  
N. Komatsu and T. Takimoto
- 1791 (Invited) C<sub>60</sub>O: A Vital Component of Aqueous Fullerene Colloids  
S. Kuriyavar, J. Damron, R. Maples, M. Hilburn, B. Murdianti, and K. Ausman
- 1792 (Invited) Fullero-pyrrolidines as Drug Vectors  
C. Fabbro, A. Montellano Lopez, M. Carini, M. Prato, and T. Da Ros
- 1793 (Invited) Polysaccharides and Glycoproteins Complexes with Nanomaterials  
B. Belgorodsky, E. Drug, L. Fadeev, N. Hendler, E. Mentovich, S. Richter, and M. Gozin

## **H8 - Porphyrins and Supramolecular Assemblies**

### *Fullerenes, Nanotubes, and Carbon Nanostructures*

- 1794 Bis-Porphyrinic Tweezers for the Molecular Recognition of Bidentate Bases of Various Sizes: Towards the Purification of Polluted Effluents  
R. Rein and N. Solladie
- 1795 (Invited) Phthalocyanine-Based Systems for Molecular Photovoltaics  
T. Torres, F. Setaro, J. Suanzes, E. Anaya-Plaza, A. Hassanpour, M. Medel, M. Sanchez-Carballo, C. Ruiz-Ganivet, F. Cardinali, M. Urbani, M. Ragoussi, S. Osati, L. Sánchez-Contreras, O. Trukhina, and D. Guldi
- 1796 (Invited) Porphyrins and Phthalocyanines for Dye-Sensitized Solar Cells  
H. Imahori
- 1797 (Invited) Electroreduction and Protonation or Deprotonation of Dipyrrolylquinoxalines  
K. Kadish, Z. Fu, J. Sessler, E. Karnas, S. Fukuzumi, and K. Ohkubo
- 1798 (Invited) Supramolecular Photoinduced Electron Transfer via Formation of  $\pi$ -Complexes  
S. Fukuzumi
- 1799 (Invited) Azadipyrromethene - Porphyrin - Fullerene Triad: Synthesis and Photoinduced Processes  
F. D'Souza, A. Amin, M. Zandler, M. El-Khouly, and S. Fukuzumi
- 1800 (Invited) Activating Multistep Charge-Transfer Processes in Fullerene-Subphthalocyanine-Ferrocene Molecular Hybrids as a Function of  $\pi$ - $\pi$  Orbital Overlap  
D. Guldi
- 1801 (Invited) A 2-D Interactive Affair between Excited Porphyrin and Graphene Oxide  
P. Kamat and A. Wojcik

- 1802 (Invited) Non-Planar Porphyrin-Dendrimer: Observation of Porphyrin Monocation  
S. Vinogradov, S. Thyagarajan, T. Leiding, S. Peterson-Årsköld, and A. Cheprakov
- 1803 Multicomponent Alkylthiol Self-Assembled Monolayers Formed by Electrochemical  
Co-Adsorption  
L. Lee, B. Pietrobon, and R. Lennox
- 1804 Metalloporphyrin-Conducting Polymer Oxygen Reduction Electrocatalysts with Full  $\pi$ -Electron  
Delocalization  
T. Boinski, W. Tokarz, and P. Piela
- 1805 Cyanide-Treated Fe(III) Porphyrins as an Electrocatalytic Material for Selective H<sub>2</sub>S  
Oxidation  
J. Bennett, M. Neiswonger, J. Pander III, and S. McKinney
- 1806 (Invited) Carbon Nanotubes as Transducers for Metalloporphyrins Based Chemical Sensors  
C. Di Natale, M. Penza, and R. Paolesse
- 1807 (Invited) Application of Chiral Supramolecular Systems and Chiral Materials  
V. Borovkov, T. Kizawa, T. Osawa, S. Ikeda, T. Kitamura, and Y. Inoue
- 1808 (Invited) Binary Ionic Porphyrin Nanomaterials: A New Approach to Artificial Photosynthesis  
J. Shelnut
- 1809 (Invited) Construction of Multi-Porphyrin Arrays via Pd-Catalyzed Coupling Reactions  
N. Aratani, J. Song, H. Shinokubo, and A. Osuka
- 1810 (Invited) Synthesis of Unsymmetrically Meso-Substituted Porphyrins  
M. Senge
- 1811 (Invited) Polypeptides with Functionalized Pendant Porphyrins for Self-Assembling Processes  
and the Elaboration of Novel Type of Glues  
N. Solladie
- 1812 (Invited) Redox Active Metalloporphyrins for Catalytic Decomposition of Cytotoxic Oxygen and  
Nitrogen Species  
A. Mahammed, I. Saltsman, A. Haber, Z. Okun, and Z. Gross
- 1813 (Invited) Synthesis and Spectroscopy of  $\pi$ -Expanded Porphyrins  
D. Gryko, A. Nowak-Król, and J. Lewtak
- 1814 (Invited) Chiral Binaphthyl Porphyrins: Synthesis, Catalysis and NMR Conformational Studies  
E. Rose, E. Gallo, F. Rose-Munch, and O. Lequin
- 1815 (Invited) Supramolecular Assemblies of Functionalized Corroles  
D. Monti, S. Nardis, G. Pomarico, F. Mandoj, M. Stefanelli, C. Di Natale, and R. Paolesse

## **H9 - Nanostructures for Energy Conversion**

### *Fullerenes, Nanotubes, and Carbon Nanostructures / Energy Technology*

- 1816 Photocatalytic Reduction of CO<sub>2</sub>: Probing Structure of Photocatalysts and Mechanism of CO<sub>2</sub>  
Transformation  
N. Dimitrijevic, T. Rajh, B. Vijajan, and K. Gray
- 1817 Dye Sensitized Solar Cells with Enhanced Performance Using TiO<sub>2</sub> Nanotubes via Rational  
Surface Engineering  
Z. Lin, J. Wang, X. Xin, M. Ye, and C. Lin
- 1818 Hybrid Materials Based on TiO<sub>2</sub> and Polyheptazines for Photochemical Solar Energy  
Conversion  
L. Wang, A. Ramakrishnan, M. Bledowski, and R. Beranek

- 1819 Plasmonic Enhancement of Photo-Energy Conversion in Organic Monolayer System  
K. Ikeda and K. Uosaki
- 1820 Ordered Layers of TiO<sub>2</sub> Nanotubes as Anode for Photoelectrochemical Water Splitting  
T. Cottineau, P. Gross, S. Pronkin, N. Keller, V. Keller, and E. Savinova
- 1821 Structure and Catalytic Activity of Dealloyed Pt Bimetallic Surfaces: A Comparative Study of Single-Crystals, Films and Nanoparticles  
P. Strasser, M. Oezaslan, R. Yangb, and M. Toney
- 1822 Bottom-Up Organization of Organic/Inorganic Ternary Composites on Electrode  
H. Hayashi, I. Lightcap, P. Kamat, and H. Imahori
- 1823 Plasmon-Assisted Nano-Processing of an Individual Single-Walled Carbon Nanotube  
M. Takase, M. Nara, S. Yasuda, H. Nabika, K. Ikeda, and K. Murakoshi
- 1824 Hydrogen Evolution at Liquid-Liquid Interfaces  
P. Ge, I. Hatay, and H. Girault
- 1825 Design and Fabrication of Metal Oxide Photocatalysts: Revisiting Principles and Mechanism of Photocatalysts  
B. Ohtani and F. Amano
- 1826 Modeling the Electric Field Effect in Dye-Sensitized Solar Cells Composed of Nanowire Arrays  
J. Hill, N. Banks, and K. Ziegler
- 1827 Oxygen Reduction on Thin-Film Transition Metal Carbides for Fuel Cells  
K. Fahy and G. Burstein
- 1828 High-Quality Inorganic Nanoparticles for Highly Efficient Photoenergy Conversion  
T. Teranishi
- 1829 High Throughput Preparation Processes for Metal and Semiconductor Nanostructures by Using Anodic Porous Alumina  
H. Masuda, T. Yanagishita, T. Kondo, and K. Nishio
- 1830 A Reversible Solid State Thermogalvanic Cell  
B. Cola and S. Rao
- 1831 Picosecond Multiple Exciton Generation from the Excited Singlet State in Rubrene Single Crystal  
A. Furube, R. Katoh, H. Mitsuta, T. Miyadera, and Y. Yoshida
- 1832 Enhancement of Photocatalytic Activities of CdS Nanoparticles by the Immobilization on Au Particles  
T. Torimoto, H. Horibe, K. Okazaki, S. Ikeda, and M. Matsumura
- 1833 Nanostructures to Probe and Accelerate Electrocatalytic Reactions  
I. Yagi, K. Kimijima, H. Notsu, K. Nomura, and N. Ohta
- 1834 Li Diffusion in TiO<sub>2</sub> Substrates: A Dynamical Study  
H. Yildirim, S. Sankaranarayanan, and J. Greeley
- 1835 Interfacial Charge Transfer Dynamics in Quantum Dot Solar Cells  
P. Kamat, K. Tvrdy, and D. Baker
- 1836 In situ Surface-Enhanced Raman Scattering Spectroscopic Study of Sulfur Adsorption on Polycrystalline Platinum Electrode Surface  
B. Xu, I. Park, Y. Li, D. Chen, T. Allison, and Y. Tong
- 1837 Hydrogen Evolution Reaction Catalyzed by 4,4'-Bipyridine Adsorbed on Metal Electrodes: A Combined Infrared and DFT Study  
T. Uchida, A. Yamakata, Y. Sasaki, and M. Osawa

- 1838 Titanium Oxides-Based Multifunctional Nanostructures for Solar Energy Utilization  
V. Subramanian
- 1839 Inorganic Nanowires: A Perspective about Their Role in Energy Conversion and Storage Applications  
M. Sunkara, C. Pendyala, D. Cummins, P. Meduri, J. Jasinski, V. Kumar, H. Russell, E. Clark, and J. Kim
- 1840 Photovoltaic Energy Conversion at the Heterojunctions of  $C_{60}$  and Electrochemical Gradient Copolymers  
B. Pate, B. Williams, J. Lloyd, D. Barofsky, M. Laframboise, and M. Hudspeth
- 1841 Fabrication of Nano Ag Particle with Spin Coating Method for Solar Cell Efficiency Enhancing through Plasmon Effect  
S. Wu, W. Huang, Y. Chen, and J. Shieh
- 1842 Improved Solar Conversion Efficiency under Hole Size of  $TiO_2$  Photoelectrode Surface  
E. Jin, J. Wang, X. Zhao, A. Park, and H. Gu
- 1843 Efficient Dye Adsorption by Using  $ZrO_2$  Nanofiber in Sensitized Nanocrystalline  $TiO_2$  Photoelectrode  
J. Wang, X. Zhao, E. Jin, and H. Gu
- 1844 Photoelectrochemical Properties of  $ZnO$  Nanorod Electrodes Sensitized with  $ZnS-AgInS_2$  Solid Solution Nanoparticles  
T. Sasamura, K. Okazaki, A. Kudo, S. Kuwabata, and T. Torimoto
- 1845 Efficiency Enhancement of Dye-Sensitized Solar Cell by Included Glass Powders  
X. Zhao, A. Park, J. Wang, E. Jin, and H. Gu
- 1846 Synthesis of Sb Doped  $SnO_2$  Nanowires for Application to Dye-Sensitized Solar Cells (DSSCs)  
S. Park, D. Kim, C. Lee, S. Lee, H. Jung, and K. Hong
- 1847 Influence of  $NiO$  Layer as Hole Collector in Reducing Recombination in Dye-sensitized Solar Cells  
A. Park, J. Wang, X. Zhao, E. Jin, and H. Gu
- 1848 Efficiency Enhancing of Dye-Sensitized Solar Cell Influenced by Phosphor Additives  
X. Zhao, J. Wang, A. Park, E. Jin, and H. Gu
- 1849 Preparation and Electrochemical Properties of Several Types of Counter Electrodes for Dye-Sensitized Solar Cells  
M. Le, P. Thi, and T. Pham
- 1850 Synthesis and Electrochemical Properties of Graphene-Based Nanocarbons for Energy Storage Applications  
S. Park, H. Youn, and K. Kim
- 1851 Post-Annealing Effects of  $CuInSe_2$  (CIS) Absorber Layer at Thin Film Solar Cells with Compound Semiconductor Prepared by Co-Sputtering Method  
S. Seo, H. Kim, K. Bae, D. Kim, S. Sohn, H. Kim, and J. Hong

## **H10 - Chemistry and Physics of Graphene and 2D Nanostructures**

*Fullerenes, Nanotubes, and Carbon Nanostructures / Energy Technology*

- 1852 Graphene and Metals: Interactions and Magnetism  
J. Coraux

- 1853 Graphene Oxide Semiconductor Nanocomposites  
P. Kamat and I. Lightcap
- 1854 Anisotropy and Edge Roughness Scattering in the Lattice Thermal Conductivity of Graphene Nanoribbons  
Z. Aksamija and I. Knezevic
- 1855 Controlling Electronic and Ionic Mobility in Coatings and at Interfaces: Novel Materials Concepts for Corrosion Protection  
M. Rohwerder
- 1856 Angles on the Head of a Pin: Moire Physics from Multilayer Graphenes  
E. Mele
- 1857 Terahertz and Infrared Dynamics in Graphene  
L. Ren, Q. Zhang, L. Booshehri, T. Arikawa, and J. Kono
- 1858 Plasmonics with Graphene-Coated Structures  
H. Grebel
- 1859 Probing and Tuning the Properties of Graphene and Graphene Oxide: An Electrochemical Approach  
S. Rapino, G. Valenti, M. Iurlo, A. Catheline, E. Treossi, V. Palermo, M. Marcaccio, A. Penicaud, and F. Paolucci
- 1860 Facile Synthesis of Soluble Graphene Nanosheets and Its Promising Application in Fuel Cell Electrocatalysts  
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- 1861 Sonolytic Design of Graphene -Pt/Au Nanocomposites  
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- 1862 Atomic Layer Deposition of Pt Nanocatalyst on Graphene Nanosheet for PEM Fuel Cell Applications  
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- 1863 Mechanisms of Chemical Reduction of Graphene Oxide to Graphene: A First Principles Study  
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- 1864 Investigation of Spontaneous Pt Deposition on Carbonaceous Materials for Fuel Cell Applications  
C. Kuo, Y. Hsieh, P. Wu, and J. Lee
- 1865 Fabrication and Characterization of Graphene-Chitosan/Prussian Blue Composite Nanosheets and Determination of H<sub>2</sub>O<sub>2</sub>  
J. Yang and H. Hong
- 1866 Synthesis and Characterization of Surface-Graphitized Carbon Black (SGCB) and Nanostructured Platinum for PEMFC  
H. Kim, J. Ahn, H. Choi, and M. Han
- 1867 Graphene-Nanotube Hybrid Transparent Electrodes  
T. Chari, A. Guermoune, Y. Chein, R. Izquierdo, and M. Siaj
- 1868 Probing Electrochemical Charge Transfer at Surfaces Using Graphene Transistors  
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- 1869 Pre-Industrial Strategies for Epitaxial Graphene on 2 Inches 6H-SiC and 8 Inches Ni Substrates  
A. Zenasni, L. Becerra, D. Rouchon, D. Lafond, D. Mariolle, and N. Chevalier

- 1870 Preparation and Characterization of a New CuInS<sub>2</sub>/Graphene Composite Electrode, for Application in Electrochemical Solar Cells  
H. Hayet Cherfouh, T. Chari, A. Guermoune, M. Siaj, and B. Marsan

## **II - Bioelectrocatalysis**

### *Physical and Analytical Electrochemistry / Energy Technology*

- 1871 A Glucose Biofuel Cell to Generate Electricity  
B. Mecheri, A. Geracitano, A. D'Epifanio, C. de Bonis, and S. Licoccia
- 1872 Process Optimization for the Electroenzymatic Hydroxylation of 3-Phenoxytoluene Catalyzed by P450 BM-3 Mutant  
G. Guven
- 1873 Alcohol Dehydrogenase Modification in L-Cysteine Monolayer on Palladium Surface Using Polymer  
I. Feliciano and C. Cabrera
- 1874 Bioelectrocatalytic Generation of Code  
G. Strack, H. Luckarift, E. Katz, and G. Johnson
- 1875 High Current Density Bioanodes Based on Linear Poly(ethylenimine) and Polymethylated Ferrocenes for Use in Biofuel Cells  
D. Hickey, M. Meredith, D. Kao, D. Schmidtke, and D. Glatzhofer
- 1876 Bioelectrocatalysis in Redox Films for Biofuel Cells  
D. Leech
- 1877 Direct Bio-Electrocatalysis of Oxygen Reduction Reaction  
P. Atanassov, D. Ivnitski, C. Lau, H. Luckarift, R. Ramasamy, and G. Johnson
- 1878 Electrochemical Studies on Coupled Dicopper Enzymes for Bioelectrocatalysis  
N. Parimi and R. Ramasamy
- 1879 DET and Bioelectrocatalytic Oxygen Reduction at Electrochemically Functionalized Carbon Nanotubes-Lc and BOx Composites  
M. Moumene, D. Rochefort, and M. Mohamedi
- 1880 Development of Bioelectrocatalytic Multi-Component Films for Reduction of Oxygen and Hydrogen Peroxide  
P. Kulesza, A. Dobrzeniecka, B. Kowalewska, M. Gierwatowska, and K. Miecznikowski
- 1881 Electrocatalytic Cycling of Hydrogen and Biological Cofactors NAD<sup>+</sup>/NADH by Immobilized Enzyme Moieties  
Z. Idris, J. Liu, L. Lauterbach, O. Lenz, and K. Vincent
- 1882 Toluidine Blue O Electrodeposited on Carbon Nanotube Modified Interface for High-Rate Electrocatalysis of NADH Oxidation  
H. Li, H. Wen, and S. Calabrese Barton
- 1883 Carbon Nanotube Modified Microfiber Electrode as Support for Glucose Oxidation Bioanodes  
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- 1884 Developing a Complete Oxidation Direct Electron Transfer Enzymatic Glucose Biofuel Cell  
S. Xu and S. Minteer
- 1885 Scanning Electrochemical Microscopy for Investigation of Multicomponent Bioelectrocatalytic Films  
A. Dobrzeniecka, A. Zeradjjanin, J. Masa, J. Stroka, W. Schuhmann, and P. Kulesza

- 1886 Development of Non-Platinum Conductive Mesoporous Catalyst as Renewable Materials for Alternative Fuel Cells  
K. Sjöholm, M. Cooney, and S. Minteer
- 1887 Fabrication of Pt Nanoparticle Modified 3-D Cu Nanotube Array Electrode and Its Electro-Catalytical Activity towards H<sub>2</sub>O<sub>2</sub>  
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- 1888 Enzyme Immobilized PPS-SWCNTs Composite Electrodes for Electrochemical Sensing and Biofuel Cell Applications  
F. S. Saleh, T. Okajima, L. Mao, and T. Ohsaka

### **I3 - Computational Electrochemistry**

#### *Physical and Analytical Electrochemistry*

- 1889 Multiscale Simulation of Proton Exchange Membranes  
G. Voth
- 1890 A DFT Based Coupled Transport-Reaction Model for H<sub>2</sub> Fueled SOFC Model Anodes  
D. Monder, K. Karan, M. Shishkin, and T. Ziegler
- 1891 Modeling Techniques for Optimization of 3D-Microbattery Architectures  
V. Zadin, H. Kasemägi, A. Aabloo, and D. Brandell
- 1892 Towards an Understanding of Diffusion-Induced-Stresses and Fracture in Lithium Ion Battery Electrodes  
Y. Cheng, M. Verbrugge, and R. Deshpande
- 1893 On the Effect of Functional Groups in Polymer Electrolyte Membranes for Fuel Cell Performance: Insights from Molecular Simulations  
Y. CHOE, E. Tsuchida, T. Ohkubo, Y. Kim, and N. Henson
- 1894 Theoretical Study of Electrochemical Processes on Novel Platinum Group Metal Catalysts  
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- 1895 H<sub>2</sub>S Interactions on CeO<sub>2</sub> (111) Surface from First-Principles  
D. Marrocchelli and B. Yildiz
- 1896 Ab Initio Calculation of Redox Potentials in Transition Metal Complexes  
S. Konezny, M. Doherty, G. Soloveichik, and V. Batista
- 1897 Modelling Solid Oxide Fuel Cell Electrochemistry in Three Dimensions  
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P. Biedermann and K. Flechtner
- 1900 Microsolvation and Proton Transfer in Highly Sulfonated Poly(phenylene sulfone) Ionomers  
C. Wang and S. Paddison
- 1901 Atomistic Simulation of the Cathode-Electrolyte Interface in a Proton Exchange Membrane Fuel Cell  
K. Yeh, M. Glasspool, M. Janik, and J. Maranas
- 1902 Continuum Models of Nafion Morphology  
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- 1903 Steady State Simulation of a One-Layer Oxide Film Linking the Point Defect Model for Oxide Films to the Mass Transfer Model for Electrolyte Solutions  
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- 1904 Continuum Modeling of Fuel-Cell Transport Phenomena  
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- 1905 Physical Multiscale Modeling of Degradation Phenomena in PEM Fuel Cells  
A. Franco
- 1906 On the Role of Electrode Temperature in the ECM Process  
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- 1907 A Pore-Level Model for Water Sorption and Swelling of PEM  
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- 1908 Double Layer Effects in Computational Electrochemistry  
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- 1910 Reaction Mechanisms of  $\text{La}^{3+}$  and  $\text{Zr}^{4+}$  in LiCl-KCl Eutectic Molten Salt - Cyclic and Square Wave Voltammetry Data Simulations  
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- 1911 A Steady-State Model for Anomalous Co-Deposition of Co-Ni Alloys Accounting for Catalytic and Inhibiting Effects  
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- 1912 Kinetic Monte Carlo Approach to the Effects of Additives in Electrodeposition  
Y. Kaneko, Y. Hiwatari, K. Ohara, and F. Asa
- 1913 First Principles Investigations of Electrocatalysis and Corrosion  
J. Greeley
- 1914 The Effects of Nanoscale Confinement on Ion Mobility in Polymer Electrolyte Materials  
B. Habenicht and S. Paddison
- 1915 Tafel Slope Component Analysis of Fuel Cell Cathode Current-Potential Behavior  
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- 1916 Fluid Dynamics Study to Compare Four Different Flow-Field Geometries  
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- 1917 Dynamic Modeling of Aluminum Pitting Corrosion in Chloride Solutions  
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- 1918 Modeling Electrochemical Systems at Different Length Scales  
P. Albertus, J. Christensen, B. Kozinsky, and R. Sanchez-Carrera
- 1919 Development of Simulation Software Package for Nano-Pulsed Electrochemical Micro Machining  
E. Hotoiu, S. Van Damme, D. Deconinck, C. Albu, G. Weyns, and J. Deconinck
- 1920 Modeling of Stability and Dissolution of Pt Nanoparticles in Cathode Catalyst Layers of PEM Fuel Cells  
L. Wang, S. Rinaldo, and M. Eikerling



## I4 - Electrocatalysis 5

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- 1926 Broadband Sum-Frequency Generation at Platinum-Electrolyte Interfaces: From Anion Adsorption to Electrocatalysis  
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- 1927 Electrocatalysis of Pd-Based Nanostructured Materials  
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- 1928 On the Changes of the Electronic Structure of Platinum-Cobalt Nanoparticles by Surface Segregation and Their Correlation to the Oxygen Reduction Reaction  
E. Ciapina and E. Ticianelli
- 1929 Multiscale Computational Study on the Electrocatalytic Activity of Pt(100) Surfaces and Its Implications for Nanoparticles  
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- 1930 Development of Copper-1,2,4-Triazole Complexes as Highly Efficient Electrocatalysts for the Oxygen Reduction Reaction  
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- 1932 Microemulsion Templated Non-Platinum Electrocatalysts for Oxygen Reduction in Alkaline Media  
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- 1935 Oxygen Reduction on Nafion-Coated Thin-Film Palladium Electrodes in Acid and Alkaline Media  
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- 1937 Development of Low-Temperature Non-Precious Metal Catalysts for Oxygen Reduction  
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- 1971 Development of New Method for the Preparation of Pt/C and Pt-Co/C Catalysts  
M. Saha and K. Karan
- 1972 Microstructure Stabilization in Non-Platinum Electrocatalyst through Co-Nitrogen Motifs  
B. Kiefer, K. Artyushkova, P. Atanassov, S. Pylypenko, and R. O'Hayre

- 1973 Effects of Different Carbon Sources and Carbonized Carbon Contents during the Carbon Riveting Process on the Pt Based Catalyst Stability  
Z. Jiang, Z. Wang, D. Gu, and G. Yin
- 1974 Investigation of the Stability of Highly Active Monolayer Pt on Tungsten Carbide Hydrogen Evolution Reaction Catalysts  
D. Esposito, S. Hunt, and J. Chen
- 1975 Synthesis of Nanostructured Mesoporous  $Mn_xCu_{1-x}Co_2O_4$  and Their Bifunctional Electrocatalytic Activities in Alkaline Medium  
D. Tountian, A. Tavares, and B. Marsan
- 1976 Self-Sustained Electrochemical Promotion Catalysts for Heavy Hydrocarbon Reforming  
X. Zhou, H. Liu, Z. Wang, and H. Huang
- 1977 Zirconium Oxide Substrate Effect on Activity of Pt-Based Electrocatalysts during Electrooxidation of Ethanol  
I. Rutkowska, K. Kulakowska, and P. Kulesza
- 1978 Catalytic Carbon Monoxide Oxidation over Size-Controlled Pt Nanoparticles in the Gas Phase and Elevated Temperatures  
E. Baranova, P. Vernoux, L. Lizarraga, E. Obeid, R. Isaifan, and H. Dole
- 1979 Voltammetric Peak Enhancement of Cefpirome in Cetyltrimethylammonium Bromide  
R. Jain, V. Lal, and K. Radhapyari
- 1980 X-ray Photoelectron Spectroscopy of Electrocatalysts - Challenges and Successes  
K. Artyushkova, B. Kiefer, B. Halevi, and P. Atanassov
- 1981 Surface X-ray Scattering Studies of  $Cu_3Pt$  (111) Model Electrocatalysts  
R. Yang, P. Strasser, and M. Toney
- 1982 In situ Coherent X-ray Scattering and STM Studies of Hexagonally Reconstructed Au(001) in Electrolytes  
M. Pierce, V. Komanyk, A. Barbour, D. Hennessy, J. Su, A. Sandy, and H. You
- 1983 Time and Spatially Resolved Study of Fuel Cell Reactions Using In situ X-ray Absorption Spectroscopy  
D. Dixon, J. Melke, S. Kaserer, A. Schoekel, C. Cremers, D. Ramaker, and C. Roth
- 1984 Investigation of Carbon Supported Pt and PtCo Electrocatalysts by Low-Energy Ion Scattering and X-ray Photoelectron Spectroscopy: Influence of the Surface Characteristics on Performance and Degradation  
A. Stassi, I. Gatto, G. Monforte, E. Passalacqua, V. Antonucci, and A. Aricò
- 1985 Impedance and Voltammetric Study of the Role of Polyaniline Supports on the Activities of Pd Particles in Formic Acid Oxidation  
R. Beiramzadeh Moghaddam and P. Pickup
- 1986 Dynamic Electrochemical Impedance of Small Organic Molecule Oxidation on Pd and Pt  
R. Sacci and D. Harrington
- 1987 Impedance Studies of Platinum in Acidic Solutions  
R. Jurczakowski and A. Lasia
- 1988 First-Principles Surface Chemistry under Applied Electrode Voltage  
I. Dabo

**15 - Grahame Award Symposium and Physical and Analytical Electrochemistry**  
**General Session**

*Physical and Analytical Electrochemistry*

- 1989 (David C. Grahame Award of the Physical and Analytical Electrochemistry Division)  
Electrocatalytic Oxidation of Methanol, Formaldehyde, and Formic Acid on Pt as Revealed by Surface-Enhanced Infrared Absorption Spectroscopy (SEIRAS)  
M. Osawa, G. Samjeské, K. Komatsu, T. Uchida, T. Ikeshoji, A. Cuesta, and C. Gutiérrez
- 1990 Structure of Water and other Molecules at the Electrified Solid Liquid Interface Using SFG and Raman Spectroscopy  
A. Gewirth and D. Butcher
- 1991 Use and Abuse of Equivalent Circuits in EIS  
D. Harrington
- 1992 Kinetics and Sensitivity at Nanostructured Electrodes from Different Carbon Fiber Precursor Materials  
A. Brajter-Toth, A. Boateng, and R. Cohen-Shohet
- 1993 Electrical Double Layer Structure at the Room-Temperature Ionic Liquid | Electrode Interface  
E. Lust, L. Siinor, H. Kurig, K. Lust, A. Jänes, and P. Miidla
- 1994 Phase Behavior and Solvation of Lithium Triflate in Ethylene Carbonate and  $\gamma$ -Butyrolactone  
M. Foley, T. Afroz, D. Seo, W. Henderson, H. De Long, and P. Trulove
- 1995 Spectroelectrochemical Studies of Novel Biodegradable Ionic Liquids  
S. Harroun, T. Abraham, P. Scammells, R. Singer, and C. Brosseau
- 1996 X-ray Reflectivity Studies on Electrified Liquid/Liquid Interface  
N. Laanait, J. Yoon, B. Hou, P. Vanysek, C. Zheng, M. Meron, B. Lin, G. Luo, I. Benjamin, and M. Schlossman
- 1997 Application of Common Analytical Voltammetry Waveforms to Biamperometric Electrochemical Cells  
M. Rahimi and S. Mikkelsen
- 1998 On the Impact of Water Management on the Reversible vs. Irreversible Performance Degradation in PEM Fuel Cells: Mitigation of Materials Aging by Sacrificial Materials Aging Mechanisms  
A. Franco
- 1999 Investigation of Carbon Surface Functionalities as a Mechanism of Self-Discharge in Carbon-Based, Aqueous Electrolyte Electrochemical Capacitors  
A. Oickle and H. Andreas
- 2000 Evaluation of Thermodynamic and Kinetic Parameters for Hydrogen Permeation through Palladium-Copper Alloys  
M. Martin, M. Allemand, J. Galipaud, D. Reyter, L. Roue, and D. Guay
- 2001 Mechanism of Copper and Tert-Butyl Alcohol Adsorption on Carbon Materials at Various Open-Circuit Potentials  
M. Goldin, B. Grafov, A. Davydov, M. Goldin, and V. Kolesnikov
- 2002 Modification of Carbon Materials by Indirect Pyrrole Polymerization  
M. Khubutiya, G. Garaeva, A. Stepanov, M. Goldin, and A. Davydov
- 2003 Study of Hydroxyl Free Radical Generation on Doped Tin Oxide Anodes  
B. Wang and K. Chan
- 2004 Voltammetry of Aniline in 9:1 Acetonitrile/Water  
I. Haque and K. Asghar

- 2005 Voltammetric Study of the Interaction of Co(II) Ions with Oxacillin in the Absence and Presence of Lysine  
E. Coşkun and E. Biçer
- 2006 Collagen-Cysteine Interaction - An Electrochemical Study  
S. Cakir
- 2007 Coupled Electron/Proton Transfer Studies of Aminobenzoquinone Modified Monolayers  
W. Zhang and I. Burgess
- 2008 Influence of Antioxidants on DNA Damage Induced by Catechol  
J. Peachey, A. Prance, M. Stobiecka, J. Trybula, and M. Hepel
- 2009 Electrochemical Characteristics of Bi(111) Electrode in Ionic Liquids  
L. Siinor, C. Siimenson, K. Lust, and E. Lust
- 2010 Iron Uptake and Release from Ferritin-Modified Gold Electrodes  
M. Stobiecka and M. Hepel
- 2011 Influence of the Chemical Composition on the Electrochemical Behavior of Binary Mixtures of Carboxylate-Based Ionic Liquids  
R. Ortega-Borges, S. Lopez-Leon, G. Trejo-Cordova, Y. Meas-Vong, and G. Brisard
- 2012 Study of the EC' Mechanism by Scanning Electrochemical Microscopy (SECM)  
R. Calhoun and A. Bard
- 2013 Designed DNA Duplex/Quadruplex Nano-Switches: Biochemical and Electrochemical Studies  
H. Yu
- 2014 Advances in Photosystem I Photoelectrochemistry Using Scanning Electrochemical Microscopy  
D. Cliffel, G. Chen, and G. LeBlanc

## **I6 - Nanostructured and Functionalized Electroactive Polymer Films and Related Materials 2**

*Physical and Analytical Electrochemistry / Sensor / Corrosion*

- 2015 Electrocatalytic Sol-Gel Films with Organized Pore Structures and Silanized Surfaces  
J. Cox, K. Wiaderek, B. Mehdi, and B. Gudorf
- 2016 Electrochemical Modification of Surfaces with Organic Layers  
D. Bélanger
- 2017 Interfacial Processes at the Semiconductor - Biomolecule Phase Boundary  
K. Skorupska, P. Ugarte Berzal, I. Rutkowska, H. Lewerenz, J. Golbeck, and P. Kulesza
- 2018 Hybrid Nanocomposite Structures Formed by Conducting Polymers and Metals or Metal Oxides  
P. Gomez-Romero
- 2019 Towards the Understanding of the Optical Properties of Electronic Conducting Polymers. The Ellipsometry Approach  
J. Correia
- 2020 Electrochemical Investigations of Carbon Nitride Films Deposited on a Conjugated Polymer Substrate  
J. Byers, C. Deslouis, A. Pailleret, and O. Semenikhin
- 2021 Polymer Based Ionic Systems – From Polymeric Electrolytes to Hybrid Networks  
M. Siekierski and W. Wieczorek

- 2022 Electrochemical and Covalent Attachment of Functional Monolayers on Carbon Surfaces  
Y. Leroux, F. Hui, J. Noel, C. Roux, and P. Hapiot
- 2023 On the Redox Capacity and Stability of Polypyrrole and Ways of Increasing Them  
T. Tamm, R. Temmer, M. Marandi, and T. Raudsepp
- 2024 Correlation between Swelling/Shrinking and Ion Exchange Processes in Electronically Conducting Polymers upon Electrochemical Doping/Undoping. EC-AFM and Ac-Electrogravimetry Investigations  
L. Kim, C. Gabrielli, A. Pailleret, and H. Perrot
- 2025 Photoelectrocatalytic Reduction and Sensing of O<sub>2</sub> and H<sub>2</sub>O<sub>2</sub> on Conjugated Polymer Based Magnetic Electrodes  
C. Janáky, B. Endrodi, and C. Visy
- 2026 Metal Functionality in Conducting Polymer Films - Preparation and Electrocatalytic Activity of Polypyrrole Incorporating Gold Nanoparticles  
L. Abrantes, V. Ferreira, and A. Mourato
- 2027 Electrochemical Formation of the Redox-Active Metal-Containing Polymers for Catalytic and Electrocatalytic Applications  
T. Magdesieva, O. Nikitin, A. Yakimansky, M. Goikhman, and I. Podeshvo
- 2028 Functionalized Hybrid Films of Nobel Metal Nanoparticles and Carbon Nanotubes: Applications in Electrocatalysis, Effective Charge Storage and Propagation  
P. Kulesza, S. Zoladek, M. Skunik, I. Rutkowska, B. Dembinska, and K. Miecznikowski
- 2029 Redox Switching of Electroactive Thin Films Investigated by AC Electrogravimetry  
C. Gabrielli, H. Perrot, L. To Thi Kim, J. Garcia-Jareno, and F. Vicente
- 2030 Electrosynthesis and Simultaneously Performed In situ Impedance and UV-Vis-NIR Studies on Poly(3-Thiophene-Butyric-Acid)  
P. Tóth, C. Janáky, E. Peintler-Kriván, and C. Visy
- 2031 Modification of Carbon Electrode with Pyridine  
J. Agullo, M. Morin, and D. Bélanger
- 2032 Morphology Changes of Porous PPy/TFSI Surface during Activation  
J. Wang, H. Naguib, and A. Bazylak
- 2033 Electron Transport in Carbon/Molecule/Metal Molecular Electronic Junctions  
R. McCreery, A. Bergren, and A. Bonifas
- 2034 Conducting Polymers/Nanoparticles Thin Films  
T. Danieli, E. Malel, G. Tanami, M. Sheffer, and D. Mandler
- 2035 Structure, Morphology and Reactivity of Conducting Polymer-Linked Polyoxometallate-Modified Gold Nanoparticles  
S. Zoladek, K. Skorupska, I. Rutkowska, B. Palys, and P. Kulesza
- 2036 Electrochemical Fabrication and Properties of Composite of Polyaniline and Tungsten Oxide  
B. Zou and X. Liu
- 2037 Intensity Modulated Photocurrent Spectroscopy of Organic Solar Cells  
O. Semenikhin
- 2038 Consideration on Electrodeposition of Electroactive o-Alkoxyanilines on Planar and Membrane Electrodes- Determination of Diffusion Coefficients, Oxidation Charge and Film Thickness  
M. Strawski, K. Bienkowski, and M. Szklarczyk
- 2039 Nanostructural Change of Ionic Clusters in Annealed Nafion Membranes Containing Ionic Liquids  
J. Park, M. Shin, Y. Choi, T. Yang, and C. Kim

- 2040 The Effect of Thiols on the Electrochemical Properties of Polythiophenes  
R. Racovita and O. Semenikhin
- 2041 Nanoscale Studies of the Doping Process of Electronically Conducting Polymers  
K. O'Neil and O. Semenikhin
- 2042 Fabrication of Nanostructured Gold Used for Electrochemical Detection  
Y. Tang and P. Chen
- 2043 Corrosion Protection by Conducting Polymers, Examples and Problems  
W. Plieth
- 2044 On the Role of Micro- and Nanostructure of Conducting Polymers in Composite Coatings for Intelligent Corrosion Protection  
M. Rohwerder
- 2045 Polyvinylacetat/Conductive Polymer Blends for Corrosion Protection - The Effect of Pani-MeSA Concentration  
A. Adhikaria, J. Pan, P. Claesson, and C. Leygraf
- 2046 Mussel Adhesive Protein and Ceria Nanoparticle Composite Films for Corrosion Protection  
M. Sababi, F. Zhang, O. Krivosheeva, J. Pan, P. Claesson, and A. Dédinaité
- 2047 Fabrication of Composite Coatings of 4-(pyrrole-1-yl) Benzoate-Modified Poly(3,4-ethylenedioxythiophene) with Phosphomolybdate and Their Application in Corrosion Protection  
L. Adamczyk and P. Kulesza

## **J1 - Sensors, Actuators, and Microsystems General Session**

### *Sensor*

- 2048 Noise Characteristics of GaN Schottky Barrier Photodetectors with Patterned Sapphire Substrate  
Y. Hsu, S. Young, C. Hsiao, T. Chen, S. Wang, C. Chang, and S. Chang
- 2049 Magnetic Force-Based Microarray Chip Used Slide Glass for Medical Care Prepared by Plating Method  
I. Koiwa, H. Takeda, H. Takanashi, and T. Obata
- 2050 Electrolytic Micropump Actuator with Controlled Cyclic Bubble Growth and Recombination  
D. Strickland, J. Ramunas, J. Gonzalez, and J. Santiago
- 2051 The Fabrication and Study of GaN Schottky Barrier Ultraviolet Photodetectors with Nanorod Template  
T. Chen, S. Young, C. Hsiao, S. Wang, Y. Hsu, C. Chang, and S. Chang
- 2052 Investigating the Molecular Origin of the Redox-Induced Actuation of Microcantilevers Modified with Ferrocenylalkanethiolate Self-Assembled Monolayers  
L. Norman, E. Dionne, and A. Badia
- 2053 Characterization of Electrografted Diazonium Salts as Novel Linkers for Surface Plasmon Resonance Sensing  
N. Menegazzo, Q. Zou, and K. Booksh
- 2054 Nano-Link Based Ultra Low Power Micro Electronic Hotplates for Sensors and Actuators  
A. Groenland, R. Wolters, A. Kovalgin, and J. Schmitz
- 2055 Low-Temperature Grown High-Quality Piezoelectric AlN Film for Sensor Applications  
R. Sah, O. Bludau, C. Röhlig, L. Kirste, V. Cimalla, and V. Lebedev



- 2056 Development of High Temperature Smart Sensor Systems  
G. Hunter, G. Beheim, G. Ponchak, M. Scardelletti, R. Meredith, P. Neudeck, J. Jordan,  
L. Chen, J. Xu, A. Biaggi-Labiosa, B. Ward, and D. Makel
- 2057 Polymeric Permanent Magnetic Micro-Actuators  
A. Khosla, J. Herchenroeder, D. Miller, and Z. Chen
- 2058 Low Stress In situ Boron Doped Poly SiGe Layers for MEMS Modular Integration with  
CMOS  
S. Kazmi, T. Aarnink, C. Salm, and J. Schmitz
- 2059 Hybrid Backside Illuminated CMOS Imager for High-End Applications  
J. De Vos, K. De Munck, M. Erismis, K. Minoglou, P. Rao, W. Zhang, D. Sabuncuoglu  
Tezcan, P. De Moor, and P. Soussan
- 2060 Synthesis and Characterization of New Blue Light Emitting Material with High Thermal  
Stability  
H. Wen and M. Chang
- 2061 Field-Structured Chemiresistors  
J. Martin and D. Read
- 2062 Evaluation of Corrosion Behavior in the SAE 1018 Carbon Steel Pipelines that Carry Potable  
Water Applying Acquisition and Data Processing  
H. Lara Ordaz, E. Bolaños Rodriguez, and J. Ramirez Hernandez
- 2063 High Performance Hydrogen Sensor Based on Ternary Pt<sub>1</sub>Pd<sub>3</sub>Ru<sub>1</sub>/C Electrocatalysts  
Y. Weng and J. Wang
- 2064 The Effects of Fabrication Process on the Performance of a CMOS Based Capacitive  
Humidity Sensor  
N. Saeidi, A. Blake, C. Colinge, M. Burke, A. Quinn, A. Demosthenous, and N. Donaldson
- 2065 NO<sub>x</sub> Monitoring with Thin-Film Nano-Composite Metal Oxide Materials  
C. Gonzalez, M. Post, X. Du, and J. Dunford
- 2066 Miniband-Resonant-Tunneling Optoelectronic Device  
D. Guo
- 2067 BaSnO<sub>3</sub> Thick Film Carbon Dioxide Sensors  
L. Cavanagh, P. Smith, and R. Binions
- 2068 Optoelectronic Device with Dual Quantum Wells  
D. Guo
- 2069 Selective Vapor Sensing: Beyond Sensor Arrays  
R. Potyrailo
- 2070 Surface Chemistry Based on Diazonium Salts and on Ionic Liquid Monolayers for Sensing  
Applications  
D. Correia-Ledo, A. Provencher-Girard, M. Ratel, A. Schmitzer, and J. Masson
- 2071 Detection of TATP Using Thermodynamic Based Gas Sensors with Metal Oxide Catalysts  
Y. Chu, K. Waterman, C. Hurley, M. Amani, and O. Gregory
- 2072 Design and Fabrication of a 3D Force Sensor  
S. Nazeer, E. Martincic, J. Gilles, M. Woytasik, J. Nikolovski, H. Youssef, and  
E. Dufour-Gergam
- 2073 Development of a Miniaturized Gas Ionization Sensor for Harsh Environments by Using  
Polyimide Spacer  
T. Walewyns, G. Scheen, E. Tooten, P. Dupuis, and L. Francis

- 2074 Detection of 2,4-Dinitrotoluene with Surface-Modified Three-Dimensionally Ordered Macroporous (3DOM) Carbon  
M. Fierke, E. Olson, P. Buhlmann, and A. Stein
- 2075 Understanding the Mixed Potential Sensor Response through Four Electrode Measurements  
P. Sekhar, E. Brosha, F. Garzon, and R. Mukundan
- 2076 Packaging and Testing of an Electrochemical Hydrogen Safety Sensor Prototype  
P. Sekhar, E. Brosha, M. Rangachary, and F. Garzon
- 2077 Detection and Discrimination of Harmful Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) Vapors Using Electrochemical Gas Sensors  
P. Sekhar, E. Brosha, M. Rangachary, and F. Garzon
- 2078 PPB-Level Detection of Halogenated Hydrocarbons in Drinking Water with an Electrochemical Sensor  
J. Stetter, M. Findlay, V. Patel, D. Ebeling, and M. Carter
- 2079 Direct Detection of Salmonella on Tomatoes and Cantaloupes Using Multiple Magnetoelastic Biosensors  
S. Li, W. Shen, S. Horikawa, and B. Chin
- 2080 Multi-Walled Carbon Nanotube Doped Polydimethylsiloxane Ribbon Cables for Flexible Microsystems  
K. Griffith, C. Ahmadizadeh, C. Huang, M. Pararameswaran, J. Young, C. Lee, T. Yang, C. Tam, Y. Jin, J. Jones, M. Sjoerdsma, B. Gray, and A. Khosla
- 2081 Engineered Nanomaterials for Biosciences  
Z. Aguilar, H. Xu, J. Dixon, B. Jones, D. Chou, Y. Aguilar, and A. Wang
- 2082 Selectivity Issues for Nanostructured Metal Oxide Gas Sensing Elements in Dry and Humid Flare Environments  
M. Rasheed, J. Cheng, and K. Poduska
- 2083 Fabrication and Modeling of a Novel SAW-Like Transducer Device Based on Branched Carbon Nanotubes  
S. Darbari, Y. Abdi, A. Ebrahimi, N. Doostani, and S. Mohajerzadeh
- 2084 Detection of DNA Using AlGaIn/GaN HEMT Biosensor with Amine-Based Chemistry  
R. Thapa, S. Alur, T. Gnaprakasa, Y. Wang, F. Tong, Y. Sharma, X. Wang, C. Ahyi, A. Simonian, J. Williams, A. Son, and M. Park
- 2085 Thin Film Thermocouples Based on Aluminum and Nitrogen Co-Doped Zinc Oxide  
M. Amani and O. Gregory
- 2086 Magnetic Field Transistor Sensors for Biological Analysis Applications  
J. Suh, K. Song, and K. Kim
- 2087 Selective Accumulation and Determination of the Dopamine on the Surface of Gold Electrode Modified by SAMs Method with Cysteamine-SWCN  
R. Shabani, S. Mozaffari, Y. Ghahremani, and M. Saber Tehrani
- 2088 Elastostriction and Electrostriction in PZT Transducers  
M. Wischke, N. Dieterich, D. Haller, M. Kröner, and P. Woias
- 2089 The Difference of Humidity Sensing in CNT-Based Thin Film by Silane Binder  
S. Kim and Y. Won
- 2090 Effect of the Surface Composition on the Redox Actuation of Microcantilevers Functionalized with Ferrocenyl-Alkanethiolates  
E. Dionne, J. Mauzeroll, and A. Badia
- 2091 Electrochemical Characteristics of Ascorbic Acid Oxidation at Cu-ZSM5 Modified Electrodes  
M. Oliver-Tolentino, A. Guzmán-Vargas, E. Arce-Estrada, and A. Manzo-Robledo

- 2092 Effect of the Mixed N<sub>2</sub>/O<sub>2</sub> Oxidation Process on Improvement of the Sensitivity of the SiGe Nano-Wire  
K. Chang, C. Chen, Y. Wang, C. Lai, C. Liu, H. Ting, and C. Wu
- 2093 A Glucose Biosensor Based on Electrodeposited Conductive Polymer Films  
D. Pires Pinto, F. Moro Loureiro, R. Pacheco Pereira, and A. Rocco
- 2094 Critical Analysis of Ion Detection Using Semiconductor Field Effect Devices: Consequences for Chemical and Biomedical Applications  
R. Nascimento and M. Mulato
- 2095 The Effect of Hydrogen-Gas Sensing Properties of Niobium Oxide - Polyaniline Solid Electrolyte Electrodes  
M. Paramasivam, U. Guth, J. Zosel, and M. Berthold
- 2096 Phosphate Sensors Operating on Amperometric and Impedance Alterations on Iron Oxide Thin-Film Electrodes  
R. Moss, J. Jackowski, and M. Anderson
- 2097 Fabrication of PMMA Microfluidic Chips with Integrated Micro Heaters  
M. Parameswaran, D. Gray, J. Zanewich, G. Lu, Z. Wu, A. Wang, J. Jones, M. Sjoerdsma, B. Gray, M. Akbari, M. Pallapa, and A. Khosla
- 2098 Depletion- and Enhancement-Mode Self-Aligned InGaP/GaAs Heterojunction Doped-Channel FET  
S. Lai, S. Tan, W. Lour, and J. Tsai

### **J3 - Sensors for Biomedical Applications**

#### *Sensor / Organic and Biological Electrochemistry*

- 2099 Functional Immuno Magnetic Nanoshells Integrated Voltammetric Sensor for Whole Cell Bacteria Detection  
C. Li
- 2100 Electrochemical Behavior of Nimodipine on Glassy Carbon Electrode  
L. Fang, P. He, Y. Yuan, W. Wang, Y. Chen, L. Du, and T. Zhang
- 2101 Multiplexed Detection of Cancer Biomarkers Using Phase Change Nanoparticles  
C. Wang, L. Ma, and M. Su
- 2102 Spectroscopic and Electrochemical Studies of the Interactions of Fluorone Black with Glutathione  
M. Stobiecka and M. Hepel
- 2103 Planar Microfluxgates Using Electroplated NiFe Cores Aimed for the Monitoring of Cardiac Valves Prosthesis  
T. Heimfarth and M. Mulato
- 2104 The Recognition of Cytochrome c by Immobilized Calixarenes Using Electrochemical Impedance Spectroscopy  
M. Mohsin, F. Banica, T. Oshima, and T. Hianik
- 2105 Direct Electron Transfer of Immobilized Ferritin on the Cobalt Oxide Nanoparticles  
A. Bayandori Moghaddam, S. Hosseini, D. Asheghali, A. Khodadadi, M. Esmaeili, and Z. Ghasemi
- 2106 A USB-Powered, Stand-Alone Electrochemical Biosensor for Point-of-Care Medical Diagnosis  
C. Loncaric, C. Ho, A. Parameswaran, and H. Yu

- 2107 IROSL Emission in UV-Irradiated  $\text{SrAl}_2\text{O}_4:\text{Eu}^{2+}, \text{Dy}^{3+}$   
C. Pereyda-Pierre, R. Meléndrez, R. Gracia-Gutiérrez, M. Pedroza-Montero, and M. Barboza-Flores
- 2108 Thermal Stimulated Processes in  $\text{SrAl}_2\text{O}_4:\text{Eu}^{2+}, \text{Dy}^{3+}$  Exposed to UV-VIS Radiation  
C. Pereyda-Pierre, R. Meléndrez, R. Garcia-Gutierrez, M. Pedroza-Montero, and M. Barboza-Flores
- 2109 Solid-State Nanopores with Integrated Electrodes as New Routes towards Single-Molecule Biosensing  
T. Albrecht, J. Edel, A. Ivanov, E. Instuli, and M. Ayub
- 2110 Lateral Flow Impedance Transducer for Salmonella Detection  
M. Navaei, J. Xu, P. Hesketh, W. Daley, and S. Grullon
- 2111 Nanoengineering of Self-Assembled Monolayers for Sensing Bioinspired Recognition  
J. Yu
- 2112 Fabrication of GMR Structure on Glass Substrates by Direct Electron Beam Lithography  
G. Nagare and S. Mukherji
- 2113 Respiratory Activity and Trans-Epithelial Resistance Measurements on Cultured Human Corneal Epithelia during Growth  
M. Rahimi, Y. Zhou, F. So, D. McCanna, J. Sivak, and S. Mikkelsen
- 2114 Electrochemical Surface Plasmon Resonance Biosensor Using HRP-Gold Nanoparticle (AuNP) Modified Sensor Chip  
V. Mani, D. Wasalathanthri, C. Kumar, and J. Rusling
- 2115 Portable Electrochemical Sensor for Detection of Tricresyl-Phosphate  
X. Yang, R. Overfelt, and A. Simonian
- 2116 Influence of a Redox Marker on the Structure of DNA Probes in Biosensing  
A. De Rache, T. Doneux, and C. Buess-Herman
- 2117  $\text{Ta}_2\text{O}_5$  Nanotube Templates for Amperometric Glucose Biosensors  
C. Horwood, H. El-Sayed, and V. Birss
- 2118 Nucleic Acids Sensing: The New Application by Mesoscopic Oxyhydroxide Thin Films of Transition Metals  
M. Jiang, A. Vo, Y. Li, R. Villagomez, D. Wilson, T. Nguyen, and L. Spears
- 2119 Development of Diagnostic Criteria of Rejection Crises in Liver Transplantation by Redox Potential Measurements  
M. Khubutiya, M. Goldin, A. Zhao, A. Evseev, A. Salienko, and A. Davydov
- 2120 Electrochemical Microfluidic Paper-Based Analytical Devices Using a Glucometer for Point-of-Care Detection of Multiple Analytes  
F. Deiss, Z. Nie, X. Liu, O. Akbulut, and G. Whitesides
- 2121 Electrochemical Biosensors Based on Nanoporous Gold for Glucose and Cholesterol Determination  
A. Ahmadalinezhad and A. Chen
- 2122 Electrochemical Detection of Sequence Specific Genotoxicity from Carcinogenic Benzo[a]pyrene Metabolites  
E. Hvastkovs, J. Satterwhite, A. Pugh, and A. Danell
- 2123 Repeated Exhaustive Coulometric Analysis of Cyanomyoglobin in a Thin-Layer Cell  
S. Kim, J. Burgess, L. Rubino, G. Yankey Jr, and S. Namgung
- 2124 Nanoparticles for Isolation and In Vitro Diagnosis of Circulating Tumor Cell  
Z. Aguilar, H. Xu, D. Chou, J. Dixon, B. Jones, J. Ross, and A. Wang

- 2125 Sensor Application of Carbon-Pt Modified TiO<sub>2</sub> Nanotubes for Detection of Dopamine  
S. Mahshid, S. Mahshid, M. Askari, A. Dolati, S. Luo, L. Yang, and Q. Cai
- 2126 An Amperometric Non-Enzymatic Glucose Biosensor Based on Pt/Ni/ TiO<sub>2</sub> Nanotubes  
Electrode  
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