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Meeting Abstracts —MA2015-01

227th ECS Meeting

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[Yadong Liu, Zhe-Fei Li, Qi Liu, Jian Xie](#)

A03-Stationary and Large-Scale Electrical Energy Storage Systems 5

Energy Technology/Battery/Industrial Electrochemistry and Electrochemical Engineering

[659All Vanadium Redox Flow Battery Development for Stationary Energy Storage Applications](#)

[Vincent Sprenkle, David Reed, Ed Thomsen, Wei Wang, Bin Li, Zimin Nie, Brian J Koepfel, Kurt P Recknagle, Vilayanur Viswanathan, Alasdair Crawford](#)

[660Pathways to Low Cost Electrochemical Energy Storage: A Comparison of Aqueous and Nonaqueous Flow Batteries](#)

[Robert M. Darling, Kevin G. Gallagher, Fikile Brushett, Seungbum Ha, Jeffrey Kowalski](#)

[661Correlating Nafion Membrane Microstructure with Vanadium Redox Flow Battery Performance](#)

[Wei Wang, Murugesan Vijayakumar, Qingtao Luo, Ralph Lloyd, Zimin Nie, Xiaoliang Wei, Bin Li, Vincent Sprenkle, J-David Londono, Murat Unlu](#)

[662Electrochemical Characterization of Porous Carbon Electrodes in Vanadium Redox Flow Batteries](#)

[Zhijiang Tang, Alan Pezeshki, Frank Delnick, Thomas A. Zawodzinski](#)

[663Simulation and Mechanism Analysis of Electrochemistry of the Vanadium Redox Couples By a Rotating Disk Electrode](#)

[Jianxin Pan, Xue Li, Yubin Zhao, Xiaofeng Xie, Vijay K Ramani](#)

[664 Studies on Aqueous Redox Flow Batteries Based on Water-Soluble Quinone Redox Couples](#)

[Bo Yang, Lena Hooper-Burkhardt, Sankarganesh Krishnamoorthy, G. K. Surya Prakash, S. R. Narayan](#)

[665 Acetylacetonate Complexes for Non-Aqueous Vanadium\(III\) Acetylacetonate Redox Flow Batterie Applications](#)

[Jonathan F. Kucharyson, James A. Suttill, Ismailia L. Escalante-Garcia, Levi T Thompson](#)

[666 Tridentate Metal Coordination Complexes As Active Species for Non-Aqueous Redox Flow Batteries](#)

[Sydney Laramie, Rachel Brooner, Melanie Sanford, Levi T Thompson](#)

[667 One Dimensional Mathematical Modelling of the All-Vanadium and Vanadium/Oxygen Redox Flow Batteries](#)

[Barun Kumar Chakrabarti, Ching Liang Chen, Hak Koon Yeoh, Nigel P. Brandon](#)

[668 Modeling and Analysis of All-Vanadium Redox Static Cells](#)

[Seong Beom Lee, Thiagarajan Soundappan, Bharatkumar Suthar, Dayaram Sonawane, Venkat R. Subramanian](#)

[669 Second Generation Aqueous Electrolyte Electrochemical Cells for Scaled Stationary Energy Storage](#)

[Jay Whitacre](#)

[670 Effect of Sulfide Additives on the Cycling Behavior of Iron Electrodes in Alkaline Batteries](#)

[Aswin K Manohar, Chenguang Yang, G. K. Surya Prakash, S. R. Narayanan](#)

[671 Rechargeable Oxide Batteries: Kinetic Study of Iron-Based Storage Materials in Low \$p_{O_2}\$ -\(H₂O-Vapour\)-Atmosphere](#)

[Waldemar Braun, Florian Thaler](#)

[672 Investigation on the Microfluidics in PEM Water Electrolyzers](#)

[Jingke Mo, Stuart M. Steen, William Barnhill, Feng-Yuan Zhang](#)

[673 Performance of Rechargeable Sintered Iron Electrodes for Large-Scale Energy Storage](#)

[Chenguang Yang, Aswin K Manohar, G. K. Surya Prakash, S. R. Narayanan](#)

[674 Modeling Two-Phase Transport on the PEM Water Electrolyzer](#)

[Bo Han, Stuart M. Steen, Jingke Mo, Feng-Yuan Zhang](#)

[675 Probabilistic Analysis for the Safety of Battery Based Energy Storage Systems](#)

[Benjamin Gully, Arun S Agarwal, Davion Hill, Narasi Sridhar](#)

[676 Model-Based Regional Comparison of Autonomy and Battery Utilization of Energy Storage Integration with Solar Power](#)

[Matthew T Lawder, Venkat R. Subramanian](#)

[677 Manufacturing Cost Analysis for Grid Storage: Lithium-Polysulfide Flow Battery](#)

[Seungbum Ha, Kevin G. Gallagher](#)

[678 Numerical Solutions By Method of Lines Approach for Fluid Flow in a Modified Rotating Disk Electrode Apparatus](#)

[Mayandi Ramanathan, Derek Rife, Venkat R. Subramanian](#)

[679 Building a Better Redox Flow Battery - Innovative Diagnostics to Visualise Reactant Transport](#)

Javier Rubio-Garcia, Anthony R. J. Kucernak

680 Towards Long Cycle Life of Soluble Lead-Acid Redox Flow Batteries

Hsun-Yi Chen, Chih-Wei Chang

681 Alkaline Hydrogen-Iodine Fuel Cell

Dhrubajit Konwar, Trung Van Nguyen

682 Development of High Surface Area Carbon Electrodes for the Bromine Reactions in H₂-Br₂ fuel Cells

Venkata Yarlagadda, Trung Van Nguyen, Guangyu Lin, Pau Ying Chong

683 Evaluation of the Performance of an Iron-Chloride Redox Flow Battery for Large Scale Energy Storage

Aswin K Manohar, Kyu Min Kim, Edward J. Plichta, Mary A. Hendrickson, Sabrina Rawlings, G. K. Surya Prakash, S. R. Narayanan

684 Optimization of High-Energy-Density Aqueous Zinc-Polyiodide Redox Flow Battery

Bin Li, Zimin Nie, Vijayakumar Murugesan, Ed Thomsen, David Reed, Jun Liu, Wei Wang, Vincent Sprenkle

685 Towards Sustainable Energy Storage Via Incorporation of Organic Molecules on Carbon Spheres

Muhammad Boota, Kelsey B. Hatzell, Emin Caglan Kumbur, Yury Gogotsi

686 Development of Advanced Hydrogen-Bromine Fuel Cells for Energy Storage

Guangyu Lin, Pau Ying Chong, Trung Van Nguyen, Venkata Yarlagadda, Ryszard Wycisk, Peter N. Pintauro, Michael C Tucker, Adam Z Weber, Michael Bates, Sanjeev Mukerjee

687 Dissecting the Quinone-Bromide Flow Battery

[Qing Chen, Michael R. Gerhardt, Louise Eisenach, Michael P. Marshak, Roy G. Gordon, Michael J. Aziz](#)

688 [Low Cost Aqueous Redox Flow Batteries Employing Sustainable Organic Anolytes](#)

[Tianbiao Liu, Wei Wang, Xiaoliang Wei, Zimin Nie, Murugesan Vijayakumar, Vincent Sprenkle](#)

689 [Development of High Capacity Catholyte Material for Non-Aqueous Redox Flow Batteries](#)

[Jinhua Huang, Liang Su, Magali Ferrandon, Fikile Brushett, Anthony K. Burrell, Lu Zhang](#)

690 [Durability and Performance of the Br₂-H₂ Redox Flow Cell](#)

[Michael C Tucker, Adam Z Weber, Guangyu Lin, Pau Ying Chong, Trung Van Nguyen](#)

691 [Organic Sodium Based Flow Batteries Utilizing Transition Metal and Metal Free Complexes](#)

[Jack S Shamie, Leon Shaw, Caihong Liu, Vincent Sprenkle](#)

692 [Low Temperature Preparation and Electrochemical Properties of LiFeSi₂O₆](#)

[Shiliang Zhou, Graham King, David Scanlon, Moulay-Tahar Sougrati, Brent Melot](#)

693 [Redox Flow Lithium-Ion Batteries for Large-Scale Energy Storage](#)

[Qizhao Huang, Chuankun Jia, Feng Pan, Qing Wang](#)

694 [High Capacity, High Voltage Hybrid Sodium-Based Flow Batteries with Aqueous Catholyte](#)

[Caihong Liu, Leon Shaw, Jack S Shamie, Vincent Sprenkle](#)

695 [Colossal Pseudocapacitance in a High Functionality - High Surface Area Carbon Anode Doubles the Energy of an Asymmetric Supercapacitor](#)

[David Mitlin](#)

[696 Novel Copper-Containing Layered Oxide Cathode for Room-Temperature Stationary Sodium-Ion Batteries](#)

[Yong-Sheng Hu, Linqin Mu, Shuyin Xu, Yunming Li, Liquan Chen](#)

[697 On the Capacity and Cycle Stability of \$\text{Na}_3\text{MnCO}_3\text{PO}_4\$ - a High Capacity, Multi-Electron Transfer Redox Cathode Material for Sodium Ion Batteries](#)

[Chuanlong Wang, Monica Sawicki, Satya Emani, Caihong Liu, Leon Shaw](#)

[698 Two-Point State-of-Charge Determination in Lithium-Ion Battery Packs](#)

[Matthieu Dubarry, Arnaud Devie, Bor Yann Liaw](#)

[699 High Ionic Conductivity of Flexible Polymer-Based Electrolyte with Low Porosity](#)

[Weiyun Zhao, Madhavi Srinivasan](#)

[700 Using Pseudo-Two-Dimensional \(P2D\) Reformulation Model with a Particle Filter to Estimate State of Charge, State of Health, and Remaining Useful Life in Li-Ion Battery Management System \(BMS\)](#)

[Larry Morris, Mark H. Weatherspoon, Ruben Nelson, Jamal Frederon Stephens, Pedro L. Moss](#)

[701 Limits of Li-Ion Batteries for Public Transportation](#)

[Timothy John Patey](#)

[702 Properties of Nickel-Iron Batteries with High-Performance Iron Electrodes](#)

[Chenguang Yang, Aswin K Manohar, G. K. Surya Prakash, S. R. Narayanan](#)

[703 Understanding and Controlling of Solution Chemistry of Lithium Polysulfide to Enable High Energy Li-S Redox Flow Battery](#)

[Huilin Pan, Xiaoliang Wei, Wesley A Henderson, Junzheng Chen, Yuyan Shao, Jie Xiao, Jun Liu](#)

704 [Properties of Redox Couples for Use in Organic Redox Flow Batteries](#)

[Lena Hooper-Burkhardt, Bo Yang, Sankarganesh Krishnamoorthy, G. K. Surya Prakash, S. R. Narayanan](#)

705 [Ionic Liquid Electrolytes for Redox Flow Batteries](#)

[Andinet Ejigu Aynalem, Darren Walsh](#)

706 [The Deep Sea Water and Heat Energy of Thermoelectric Generation Study](#)

[Meng Chu Chen](#)

B01-Carbon Nanostructures for Energy Conversion

Nanocarbons/Battery/Energy Technology/Physical and Analytical Electrochemistry

707 [\(Nanocarbons Division Richard E. Smalley Research Award\) Nanocarbons for Optoelectronic Applications](#)

[Dirk M. Guldi](#)

708 [\(Invited\) New Solar and Chemical Energy Conversion Mechanisms Enabled By Nanocarbon Systems](#)

[Michael S Strano](#)

709 [\(Invited\) Graphene Molecules: Synthesis, Electronic Properties and Applications](#)

[Zhiqiang Ji, Stephen K. Doorn, Milan Sykora](#)

710 [\(Invited\) DAN Assisted Formation of Charge Transfer Complex from Highly Charged Fullerenes and Conjugated Polymer](#)

[Hsing-Lin Wang, Mircea Cotlet, Kuo Chengju, YoungIl Park, Zhongwei Liu, Hsinhan Tsai](#)

[711\(Invited\) Tunable Thermoelectric Power Factor in Semiconducting Single-Walled Carbon Nanotube Networks](#)

[Andrew Ferguson, Azure D. Avery, Kevin S. Mistry, Sarah Guillot, Ben Zhou, Jeffrey L. Blackburn, Barry L. Zink, Yong-Hyun Kim](#)

[712\(Invited\) Single-Walled Carbon Nanotubes and Graphene As Highly Efficient Hole Collecting and Transport Layer for Solar Cells](#)

[Shigeo Maruyama, Kehang Cui, Takaaki Chiba, Il Jeon, Xiao Chen, Rong Xiang, Shohei Chiashi, Yutaka Matsuo](#)

[713\(Invited\) High Performance Nano-Carbon/Silicon Solar Cells Via Strategic Doping Processes](#)

[André D. Taylor](#)

[714\(Invited\) CdTe Photovoltaic Devices Grown Directly on Transparent Carbon Single Wall Nanotube Back Contacts](#)

[Rajendra R. Khanal, Adam B. Phillips, Zhaoning Song, Yao Xie, Hasitha P. Mahabaduge, Michael J. Heben](#)

[715\(Invited\) Improving Charge Transport in TiO₂ nanoparticle Based Hybrid Photoanodes through Spatial Control of Graphene Nanoribbon Assembly](#)

[Vincent Tung, Jaskiranjeet Sodhi, Yen-Chang Chen, Hidetaka Ishihara](#)

[716Origin of Open Circuit Voltage in Solar Cells Based on Polymer Wrapped Carbon Nanotubes and Fullerenes](#)

[Arun Tej Mallajosyula, Gautam Gupta, Stephen K. Doorn, Aditya Mohite](#)

[717Li@SWCNT and Cup-Stacked Carbon Nanotubes for Dye-Sensitized Solar Cells](#)

Elaine Yoshiko Matsubara, Jose Mauricio Rosolen, Bruna Andressa Bregadiolli, Mirko Congiu, Carlos Frederico de Oliveira Graeff

718(Invited) Graphene and 2d Crystals for Energy Devices

Vittorio Pellegrini, Francesco Bonaccorso

719(Invited) Carbonaceous Hybrid Fibers for Solid-State Micro-Supercapacitors with High Volumetric Energy Density

Yuan Chen

720Synthesis of Spherical Graphite Particles Possessing a Definable Size and Their Application in Dual-Graphite Cells

Andreas Heckmann, Paul Meister, Pengfei Gao, Martin Winter, Tobias Placke

721Effect of Gate Electrode in Electrochemical Cells

Tazima Chowdhury, Haim Grebel

722MWCNTS/Nickel Oxide Nanocomposite Supercapacitor Made from Two Electrode Coin Type Cells

Abolanle Saheed Adekunle, B. B. Mamba, B. O. Agboola, O. S. Oluwatobi, Kenneth I. Ozoemena, Eno E Ebenso

723Increasing Energy Storage in Activated Carbon Based Ultra-Capacitors through Plasma Treatment

Marcelis L. Muriel, Rajaram Narayanan, Prabhakar R Bandaru

724Novel 3D Nanocarbon Electrodes for High-Rate Li-Ion Batteries

Huan Wang, Jingyi Xie, Marissa Follette, Placidus B Amama

725Carbon Support Modification for Improving Platinum Performance in PEMFC

[Jue Hu, Chengxu Zhang, Yuedong Meng](#)

[726Energy Transfer Interactions Between Single-Chirality Swcnts and Photoactive Molecules](#)

[Jia Xu, A. Nicholas G. Parra-Vasquez, Navaneetha K Subbaiyan, Stephen K. Doorn, Gabriel Montano, Kirk J Ziegler, Juan G. Duque](#)

[727Preparation of Carbon-Conducting Polymer Composites Using Graphene Oxide Obtained from Carbon Waste By Electrochemical Exfoliation: Application on Supercapacitors](#)

[Gustavo Marciniuk, Alan Ben-Hur Bischof, Rodolfo Thiago Ferreira, Fábio Santana dos Santos, Sérgio Ricardo de Lazaro, Karen Wohnrath, Jarem R. Garcia](#)

[728Fabrication of Multiwalled Carbon Nanotube-Wrapped Ultrathin SnS₂ Nanoplates and Their Superior Li-Ion Intercalation Performance](#)

[Dongsheng Guan](#)

[729\(Invited\) Roll-to-Roll Synthesis of Vertically Aligned Carbon Nanotubes with Embedded Redox Polymers](#)

[Mark E. Roberts, Margarita Rosa Arcila-Velez, Jingyi Zhu, Ramakrishna Podila, Mehmet Karakaya, Apparao M. Rao](#)

[730Nanoporous-Carbon As an Intercalation Host Material to Enable Multivalent Ion Electrochemical Energy Storage](#)

[Michael P. Siegal, W. Graham Yelton, Haiqing Schwarz](#)

[731Three-Dimensional Bi-Continuous Graphene Monolith from Hollow Ni Templates Via Polymer Templates](#)

[Yu Zhu](#)

[732Graphene Nanocomposites Templated from Cage-Containing Metal-Organic Frameworks for Oxygen Reduction in Li-O₂ Batteries](#)

[Gang Wu](#)

[733Influence of Carbon Surface Defects on Double Layer Charge Storage and Ion Dynamics in Electrochemical Capacitors](#)

[Boris Dyatkin, Eugene Mamontov, Yury Gogotsi](#)

[734Biomass Based Carbon Nanospheres As Electrode Materials in Lithium Ion Batteries](#)

[Arenst Andreas Arie, Joong-Kee Lee](#)

[735\(Invited\) Mechanistic Studies of the Oxygen Reduction Reaction Electrocatalyzed By N-Doped Graphitic Carbon Materials](#)

[Liang-shi Li, Qiqi Li, Benjamin Noffke, Krishnan Raghavachari](#)

[736Facile Synthesis and Electrocatalytic Activity of Sulfur Doped Carbon for Oxygen Reduction](#)

[Ruizhi Yang, Yan Sun, Zhenrong Yang, Jiao Wu](#)

[737Facile Synthesis of High-Porous Noble-Metal-Free Catalyst for Highly Efficient Oxygen Reduction Reaction](#)

[Dongmok Whang, Mansu Kim](#)

[738Highly Active Nitrogen-Doped Carbon Metal Oxide Hybrid Composites for Oxygen Reduction Reaction](#)

[Maryam Bayati, Keith Scott](#)

[739Metal-Catalyst-Free Fuel Cells with Carbon As Catalysts](#)

[Wenzhen Li, Ji Qi, Neeva Benipal, Hui Wang, David J Chadderdon, Yibo Jiang, Wei Wei, Xiaotong Han, Yang Qiu, Yun Hang Hu](#)

[740Graphene for Energy: Which Promising Applications and How?](#)

[Etienne Quesnel](#)

[741\(Invited\) Structured Carbon Nanostructures Derived from Graphene Oxide for Catalysis](#)

[Gautam Gupta](#)

[742Combinatorial Search of Hydrogen Catalysts Based on Transition Metal Embedded Graphitic Carbons](#)

[Woon Ih Choi, Brandon Wood, Eric Schwegler, Tadashi Ogitsu](#)

[743Enhancement of Platinum Mass Activity at Polymer-Wrapped Carbon Nanotube-Based Fuel Cell Electrocatalysts](#)

[Naotoshi Nakashima, Inas Hafez, Mohamed Reda Berber, Tsuyohiko Fujigaya](#)

[744Fe and N Functionalized-Ordered Mesoporous Carbon with Different Morphologies: Role of Fe on Surface Properties and Electrocatalytic Activity](#)

[Dea-Soo Yang, Min Young Song, Eunjin Bae, Jong-Sung Yu](#)

[745New Transition Metal-CN ORR Electrocatalysts with a ' Core-Shell '□ Structure](#)

[Vito Di Noto, Enrico Negro, Keti Vezzù, Graeme Nawn, Federico Bertasi, Alexey Serov, Kateryna Artyushkova, Plamen Atanassov](#)

[746Microwave-Assisted Solvothermal Synthesis of Pd-MnO₂ Hybrid at Onion-like Carbons: Electrocatalytic Oxidation of Alcohols in Alkaline Media](#)

[Paul M. Ejikeme, Katlego Makgopa, Kumar Raju, Kenneth I. Ozoemena](#)

[747Gold Decorated Graphene for Energy Conversion in Electrocatalytic Oxidation of Alcohols](#)

[Lakshman K Ventrapragada, Ramakrishna Podilla, Apparao M Rao, Stephen Creager](#)

[748Engineering Carbon Nanotubes As Oxygen Reduction Catalysts for Solid Acid Fuel Cells](#)

[Vanessa Evoen, Hadi Tavassol, Sossina M Haile](#)

[749The Role of Chemistry and Morphology of Carbon in Oxygen Reduction Reaction. Structure-to-Property Studies](#)

[Kateryna Artyushkova, Alexey Serov, Michael J Workman, Plamen Atanasov](#)

B02-Carbon Nanostructures in Medicine and Biology

Nanocarbons/Organic and Biological Electrochemistry/Physical and Analytical Electrochemistry/Sensor

[750Non-Destructive Detection of Metabolites in Live Cells Using Single Walled Carbon Nanotubes](#)

[Thomas Vito Galassi, Prakrit Vaibhav Jena, Daniel Roxbury, Januka Budhathoki-Uprety, Christopher Horoszko, Daniel A Heller](#)

[751Nanomaterial-Based Sensitive Detection for Live Cell Dynamics of Compartmentalized Metabolic Processes](#)

[Christopher Peter Horoszko, Januka Budhathoki-Uprety, Daniel A Heller](#)

[752\(Invited\) Developing Short-Wave Infrared Fluorescent Immunoprobes Based on Single-Walled Carbon Nanotubes](#)

[Kathleen M. Beckingham, Michael Vu, Ching-Wei Lin, Robert C. Bast, R. Bruce Weisman](#)

[753\(Invited\) Corona Phase Molecular Recognition \(CoPhMoRe\) to Enable New Nanosensor Interfaces](#)

[Michael S Strano](#)

[754\(Invited\) Biological Applications of Nanoparticles for Reactive Oxygen Species \(ROS\) Scavenging and Sensing](#)

[Ardemis Anoush Boghossian, Fatih Sen, Brenna Gibbons, Selda Sen, Sean Faltermeier, Juan Pablo Giraldo, Cathy Zhang, Jingqing Zhang, Daniel Heller, Michael S Strano](#)

755 [Spectral Microscopy Resolves Carbon Nanotube Chromatic Diversity in Living Systems](#)

[Daniel Roxbury, Prakrit Vaibhav Jena, Ryan Williams, Daniel Heller](#)

756 [Applications of Single Nanotube Imaging Spectroscopy in Live Cells](#)

[Prakrit Vaibhav Jena, Daniel Roxbury, Thomas Vito Galassi, Christopher Horoszko, Januka Budhathoki-Uprety, Daniel Heller](#)

757 [An Easy Stereo-Specific and Regio-Selective Reaction for the Synthesis of Ester-\[70\]-Fullerene Derivatives](#)

[Edison Castro, Luis Echevoyen](#)

758 [Controllable Synthesis of Heteroatom-Doped Carbon Nanotubes Under Atmospheric Pressure and Their Electrocatalytic Ability to L-Cystein](#)

[Yu-Chen Chang, I-Ting Chen, Guan-Lin Chen, Kuo-Chuan Ho, Wei-Hung Chiang](#)

759 [\(Invited\) Glycofullerenes for Biological Applications](#)

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760 [Stochastic Sensors Based on Diamond Paste for Screening of Biological Fluids for Neurotransmitters](#)

[Raluca-Ioana Stefan-van Staden, Iuliana Moldoveanu, Jacobus Frederick VAN Staden](#)

761 [Porphyrin-Fullerene Based Donor-Acceptor Conjugates for Photocontrol of Cell Membrane Potentials](#)

[Yuta Takano, Tomohiro Numata, Kazuto Fujishima, Tatsuya Murakami, Mineko Kengaku, Yasuo Mori, Hiroshi Imahori](#)

[762Boron-Doped Reduced Graphene Oxide \(B-RGO\) and Its Application to L-Cysteine Sensing](#)

[I-Ting Chen, Hsin-Che Lu, Ting-Hsiang Chang, Li-De Huang, Kuo-Chuan Ho](#)

[763Playing with Fullerene, Carbon Nanotubes, Nanodiamonds and Other Carbon Nanostructures](#)

[Tatiana DaRos, Valentina Armuzza, Jose Miguel Gonzalez Dominguez, Agnieszka Gajewska, Marco Carini](#)

[764Bioconjugated Iron-Filled Carbon Nanotubes As Cancer Theranostics Agents](#)

[Florent Pineux](#)

[765Controlled Layer-By-Layer Polymer/DNA Coating of Carbon Nanotubes for Gene Delivery Applications](#)

[Fatemeh Sadat Majedi, Hamid Keshvari, Mohammad Mahdi Hasani-Sadrabadi, Philippe Renaud, Lobat Tayebi](#)

[766Biomedical Applications of Diamond Nanoparticles](#)

[Vadym N Mochalin, Yury Gogotsi](#)

[767C₆₀-Derivatives: Applications in Electric-Field Cancer Therapy \(EFCT\)](#)

[Stuart Corr, Leoncio Vergara, Yuri Mackeyev, Jason Chak-Shing Ho, Lon J. Wilson, Steven A Curley](#)

B03-Carbon Nanotubes - From Fundamentals to Devices

Nanocarbons/Dielectric Science and Technology/Physical and Analytical Electrochemistry

[768\(Invited\) Vlsi Carbon Nanotube Thin-Film Circuits](#)

[Mark C. Hersam](#)

[769\(Invited\) Scan-Probe Microwave Reflectance of Horizontally Aligned Arrays of Single-Walled Carbon Nanotubes: Nanoscale Imaging of SWNT Electrical Properties in the Quantum Regime](#)

[William L. Wilson, Eric Seabron, Scott Maclaren, Xu Xie, Slava V. Rotkin, John A. Rogers](#)

[770\(Invited\) Single Carbon-Nanotube Photonics and Optoelectronics](#)

[Yuichiro K. Kato](#)

[771\(Invited\) Charge Separation and Recombination at Semiconducting Single-Walled Carbon Nanotube Interfaces](#)

[Jeffrey L. Blackburn, Anne-Marie Dowgiallo, Kevin Mistry, Rachele Ihly, Andrew Ferguson, Nikos Kopidakis](#)

[772\(Invited\) Optoelectronic Properties and Electromechanical Resonance Behavior in Individual Suspended Carbon Nanotube Pn-Junctions and Devices](#)

[Stephen B. Cronin](#)

[773Inkjet Printed Single Walled Carbon Nanotubes As Active Semiconductors in Thin-Film Transistors and Circuits](#)

[Ananth Dodabalapur, Bongjun Kim, Seonpil Jang, Micheal Geier, Mark C. Hersam](#)

[774Toward Carbon Nanotube Based Thermal Interface Materials](#)

[Michael P. Siegal, Caitlin Rochford, W. Graham Yelton, Thomas E. Beechem, Stephen W. Howell, Douglas L. Medlin](#)

[775Multi-Walled Carbon Nanotube Electrode Optimization for Thermocells](#)

[Nick Holubowitch, Cameron Lippert, James Landon, Kunlei Liu](#)

[776Thermal Properties of Chemically Modified Carbon Nanotubes Dispersed in Polymer Matrices](#)

Adam W Januszko, Jerzy Peszke, Agnieszka Pawlicka, Tomasz Czujko

777(Invited) Scalable Assembly and Alignment of Highly Electronic-Type Purified Semiconducting Carbon Nanotubes for High Performance Field Effect Transistors

Michael S. Arnold, Gerald J Brady, Yongho Joo, Meng-Yin Wu, Matthew J Shea, Padma Gopalan

778(Invited) Etching of Surfactant from Solution-Processed, Type-Separated Carbon Nanotubes and Impact on Device Behavior

François Léonard

779Gate Electrodes within Electrochemical Cells

Tazima Chowdhury, Haim Grebel

780Covalent Chemistry on Carbon Nanotubes: From Electronic Fundamentals to Sensor Applications

Delphine Bouilly, Richard Martel, Colin Nuckolls

781(Invited) Carbon Nanotubes: From the Origin of Helicity to Application

Avetik R Harutyunyan

782(Invited) Post-Growth Manipulation of Horizontally Aligned Single-Walled Carbon Nanotubes

Shigeo Maruyama, Taiki Inoue, Keigo Otsuka, Shohei Chiashi

783Thermodynamics of Quasi-Epitaxial Assembly of Fmn Around Various (n,m)-SWNTs

Fotios Papadimitrakopoulos, Roholah Sharifi, Milinda Samaraweera, Jose Gascon

784Preparation of Buckypaper By Surface Modified Multi-Walled Carbon Nanotubesfor Oxygen Reduction Reaction in PEMFC

[Licheng Ye, Junsheng Zheng, Ping Li, Yuan Gao](#)

785[Effects of Growth Substrates on Growth Mode of Carbon Nanofibers](#)

[Meijuan Tian, Qian Zhang, Cuixia Zhang, Lifeng Dong](#)

786[\(Invited\) Carbon Nanotube Separation By Aqueous Two-Phase Extraction: A Progress Report](#)

[Ming Zheng](#)

787[Spectroscopic Investigations into the Aqueous Two-Phase Partitioning of Carbon Nanotubes](#)

[Jason K. Streit, Hui Gui, Geyou Ao, Jeffrey A. Fagan, Angela R. Hight Walker, Chongwu Zhou, Ming Zheng](#)

788[\(Invited\) Aggregation State of Carbon Nanotubes in Solution](#)

[Toshiya Okazaki](#)

789[Swnt-Sorting with a Removable Solubilizer Based on Dynamic Supramolecular Coordination Chemistry](#)

[Naotoshi Nakashima, Fumiyuki Toshimitsu](#)

790[\(Invited\) New Methods to Probe the Surfactant Structure Surrounding Swcnts](#)

[Kirk J Ziegler, Jia Xu, Justin Clar, Jean-Claude J Bonzongo](#)

791[High-Fidelity Single-Column Selective Separation of Swcnts](#)

[Yang Zhao, Justin Clar, Jia Xu, Tianyu Yuan, Jean-Claude J Bonzongo, Kirk J Ziegler](#)

792[\(Invited\) Flexible and Conductive Mxene/Carbon Nanotube Composite Paper for Energy Storage](#)

[Mengqiang Zhao, Chang E. Ren, Zheng Ling, Maria R. Lukatskaya, Olha Mashtalir, Michel W. Barsoum, Yury Gogotsi](#)

[793In Situ Electrochemical Porosimetry of Vertically-Aligned Carbon Nanotube Carpets through Impedance Spectroscopy](#)

[Heena K Mutha, H. Jeremy Cho, Noa Lachman, Matthew E Suss, Carl V. Thompson, Brian L Wardle, Evelyn N Wang](#)

[794Tailoring of Reduction Potential of Carbon Nanotubes Hybrid Compound By Substrate Interaction Probed By Metal Deposition](#)

[Nadia Guerra Macedo, Elaine Yoshiko Matsubara, Jose Mauricio Rosolen](#)

[795Ultracompressible, High Rate Supercapacitors from Graphene-Coated Carbon Nanotube Aerogels](#)

[Evan Wilson, Mohammad F. Islam](#)

[796\(Invited\) Interfacial Functionalization of Carbon Nanotubes: From Effective Charge Propagation and Storage to Enhancement of Electrocatalytic and Bioelectrocatalytic Properties](#)

[Pawel J Kulesza](#)

[797Modifying Carbon Nanotubes with Electroactive Systems](#)

[Nazario Martin](#)

[798\(Invited\) Electronic Scattering in One-Dimensional Carbon Nanotubes](#)

[Philip G. Collins](#)

[799\(Invited\) Tube²: Optical and Electrical Properties of Tube-in-a-Tube](#)

[YuHuang Wang](#)

[800\(Invited\) Progress Towards a Novel Technology for Non-Contact Strain Measurements Based on SWCNT Fluorescence Spectroscopy](#)

[Sergei M. Bachilo, Peng Sun, Jackie Zhao, Satish Nagarajaiah, R. Bruce Weisman](#)

[801\(Invited\) Variance Spectroscopy: A New Bridge Between Ensemble and Single-Particle Studies](#)

[Jason K. Streit, Stephen Sanchez, Sergei M. Bachilo, R. Bruce Weisman](#)

[802\(Invited\) Non-Resonant Absorption in Carbon Nanotubes](#)

[Fabien Vialla, Ermin Malic, Benjamin Langlois, Yannick Chassagneux, Jean-Sébastien Lauret, Christophe Voisin](#)

[803\(Invited\) Photoluminescence Carrier Dynamics and Photon Statistics of Covalent Dopant-Induced Trap States in Single Wall Carbon Nanotubes](#)

[Stephen K. Doorn, Xuedan Ma, Nicolai F. Hartmann, Sibel E. Yalcin, Han Htoon](#)

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871Novel Functionalized Graphene Oxide-Polymer Nanocomposite Anion Exchange Membranes

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872Evaluating the Electrocatalytic Stability of N-Doped Graphene Nanosheets Used As a Counter Electrode for [Co(bpy)₃]^{3+/2+} Based Porphyrin-Sensitized Solar Cells

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873Modulation of the Electrostatic and Quantum Capacitance of Few Layered Graphene through Plasma Processing

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[Weronika Ozimek, Iwona Agnieszka Rutkowska, Pawel J Kulesza](#)

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888 [\(Invited\) Microwave Chemistry Enabled Controlled Fabrication of Graphene with Tailored Structures for Designed Applications](#)

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889 [Chemically-Derived Graphene and Boron Nitride Heterostructures for Optoelectronic Applications](#)

[Sanjay Behura, Rousan Debbarma, Phong Nguyen, Theruvakkattil Sreenivasan Sreeprasad, Vikas Berry](#)

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[Anton V Naumov, Charudatta Galande, Pulickel M Ajayan, R. Bruce Weisman](#)

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[Seonyoung Park, Hyuna Lee, Yura Choi, Woong Choi](#)

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[Soo Young Kim, Chang Yeong Lee, Ji-Hun Bae, Tae-Yoon Kim, Seung-Hwan Chang](#)

B07-Inorganic/Organic Nanohybrids for Energy Conversion

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[905\(Invited\) Photoexcited-State Dynamics in Organic Solar Cells Utilizing Diketopyrrolopyrrole-Based Copolymer Investigated By Transient Optical Spectroscopy](#)

[Hiroyuki Matsuzaki, Akihiro Furube, Ryuzi Katoh, Samarendra Pratap Singh, Prashant](#)

Sonar, Evan Laurence Williams, Chellappan Vijila, Gomathy Sandhya Subramanian, Sergey Gorelik, Jonathan Hobley

906(Invited) Push-Pull π -Extended porphyrins for Solar Energy Conversion

Hong Wang, Raja Gabadage Jinadasa, Alex Matus, Shouzhong Zou, Lei Kerr

907Factors Controlling the Reduction Rate of Dye Cation in Dye-Sensitized Solar Cells

Shogo Mori, Junichi Ogawa, Nagatoshi Koumura, Mutsumi Kimura

908(Invited) Impact of Indium and Gallium Doping on the Photovoltaic Performance of CdSe Quantum Dot Hybrid Solar Cells

Viktor Chikan, Shenqiang Ren, Alec Kirkemide, Randall Scott, Maogang Gong, Jennifer Totleben, Christopher Tuinenga, Christopher Lewis, Hongfu Luo, Daniel Higgins

909(Invited) Optimization of the Thin-Film Making Process for Highly Efficient and Stable Polymer Solar Cells with Zinc Oxide Nanoparticles

Akinobu Hayakawa, Takashi Sagawa

910(Invited) Morphological Control and Kinetics Characterization for Perovskite Solar Cells

Eric Wei-Guang Diao

911(Invited) Uniform Nanostructures for Highly Efficient and Reproducible Perovskite Solar Cells

Liyuan Han, Yongzhen WU, Xudong Yang, Han Chen, Ashraful Islam

912(Invited) Porphyrin and Rylene Based Dyes for Dye-Sensitized Solar Cells

Jishan Wu

913(Invited) Metallated and Metal-Free Molecular Materials for Light/Electrical Energy Conversion

[Wai-Yeung Wong](#)

914([Invited](#)) [Singlet Exciton Fission in Molecular Solids](#)

[Michael R Wasielewski, Samuel W. Eaton, Eric A Margulies](#)

915([Invited](#)) [Photocurrent Enhancement of Quantum Dot Solar Cells By Plasmonic Metal Nanoparticles](#)

[Tetsu Tatsuma, Tokuhisa Kawawaki](#)

916([Invited](#)) [Scalable Fabrication of Moisture Resistant Perovskite Solar Cells](#)

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917([Invited](#)) [Solid-State Z-Scheme Photocatalysts for Overall Water-Splitting Under Visible Light](#)

[Hiroshi Irie](#)

918([Invited](#)) [Energy and Electron Transfer in Plasmonic Metal-Semiconductor Composite Photocatalysts](#)

[Nianqiang \(Nick\) Wu](#)

919([Invited](#)) [Visible to Near-IR Nanoplasmonics in Inorganic Nanoparticles](#)

[Toshiharu Teranishi](#)

920([Invited](#)) [Photocatalytic Conversion of CO₂ By H₂O As an Electron Donor over Ag/ZnGa₂O₄/Ga₂O₃](#)

[Kentaro Teramura, Zheng Wang, Saburo Hosokawa, Tsunehiro Tanaka](#)

921[Photosensitizing Properties of Thiolated Gold Clusters. Exploring Beyond Plasmonics](#)

Yong Siou Chen, Prashant V Kamat

922(Invited) A Visible Light-Active Titania Photocatalyst with Rhodium As a Built-in Redox Mediator

Bunsho Ohtani, Joanna Kunczewicz

923(Invited) Photophysics of Hybrid Semiconductor Nanostructure in Photocatalytic Hydrogen Generation Applications

Masaru Kuno

924(Invited) Tunable Electronic Energy Structure of ZnSe-AgInSe₂ Solid Solution Nanoparticles for Solar Energy Conversion

Tsukasa Torimoto, Yusuke Douke, Hiroko Shibakawa, Susumu Kuwabata, Tatsuya Kameyama

925(Invited) Deprotonation of a Multi-Nuclear Copper Complex for High Oxygen Reduction Reaction Activity Investigated By in Situ X-Ray Absorption Fine Structure Spectroscopy

Masaru Kato, Ken'ichi Kimijima, Mari Shibata, Hideo Notsu, Kazuya Ogino, Kiyoshi Inokuma, Narumi Ohta, Nobuhisa Oyaizu, Hiromitsu Uehara, Tadashi Ohba, Yohei Uemura, Satoru Takakusagi, Kiyotaka Asakura, Ichizo Yagi

926(Invited) Improvement of Electron Transfer Rate at Metal/Organic Interfaces Using Pd Atomic Layers

Katsuyoshi Ikeda

927(Invited) A Novel Diffusion Mechanism of Metal Ions at Ionic Liquid/Electrode Interface Studied By in-Situ Electrochemical XPS

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928Examining Proton Coupled Electron Transfer, Oxygen Reduction, and Anion Diffusion Using a Hybrid Bilayer Membrane

[Andrew A. Gewirth, Edmund C. M. Tse, Christopher J. Barile](#)

[929\(Invited\) In-Situ Raman Observation of Reaction Intermediates at Plasmon-Induced Water Oxidation Processes](#)

[Kentaro Suzuki, Satoshi Yasuda, Kei Murakoshi](#)

[930\(Invited\) Plasmon-Induced Artificial Photosynthesis](#)

[Hiroaki Misawa](#)

[931\(Invited\) A Unique Architecture Based on 1D Semiconductor/ Reduced Graphene Oxide/ Chalcogenide with Multifunctional Properties](#)

[Vaidyanathan Subramanian](#)

[932\(Invited\) Fabrication of Micro- and Nanostructures for High Efficiency Energy Conversion By Using Anodic Porous Alumina](#)

[Hideki Masuda, Toshiaki Kondo, Takashi Yanagishita](#)

[933\(Invited\) Electrochemical CO₂ Reduction By Violarite \(FeNi₂S₄\) As a Prebiotic Core of Carbon Monoxide Dehydrogenase](#)

[Ryuhei Nakamura](#)

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[936Synthesis and Characterization of CdSe Quantum Dots for Photovoltaic Application](#)

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937 [Indium Tin Oxide and Silicon Nanocrystal Nanocomposite Grown By Aerosol Assisted Chemical Vapour Deposition](#)

[S O'Brien, K Linehan, H Doyle, A Kingsley, C Ashfield, B Frank, L Xie, K Leifer, P Thony, S Perraud, M E Pemble, I. M Povey](#)

B08-Porphyrins, Phthalocyanines, and Supramolecular Assemblies

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[Nathalie Solladie](#)

939 [Probing Molecular Chirality Using Metallo-Bisporphyrin Hosts](#)

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940 [Photo-Assisted Chemical Sensors Based on Porphyrins Coated ZnO](#)

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[Janarthanan Jayawickramarajah, Hong Zhang, Gyan H Aryal, Mengyuan Zhu](#)

946 [Application of Octaethylporphyrin Structural Motif for Supramolecular Chirogenesis](#)

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947 [Formation of Hydrogen-Bonded Supramolecular Assemblies Based on Functionalized Saddle-Distorted Porphyrins](#)

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[Hamish Andrew Miller, Francesco Vizza, Manuela Bevilacqua, Alessandro Lavacchi, Marco Bellini, Yanxin Chen, Lianqin Wang](#)

1241 [Influence of Activated Carbon Film Thickness on the Electrode Performance in Capacitive Deionization](#)

[Rafael Linzmeyer Zornitta, Julio Jose Lado, Luis Augusto Martins Ruotolo](#)

1242 [The P2D Model of a Lithium Cell with Vacancy Effect in Solid-State Diffusion](#)

[Chyun-Yaw Lin, Shi-Chern Yen](#)

F04-High Rate Metal Dissolution Processes 2

Industrial Electrochemistry and Electrochemical Engineering/Corrosion/Electrodeposition

1243 [The Importance of Surface OXIDE FILMS in Metal Dissolution Processes - a 20-Year Update](#)

Barry R. MacDougall

1244Microfabrication By High Rate Anodic Dissolution: Fundamentals and Applications

Madhav Datta

1245Through-Mask Electroetching for Industrial Manufacturing

Heather McCrabb, Timothy D Hall, Stephen Snyder, E. J Taylor

1246Achieving Surface Finish Requirements on DMLS Parts with Precision Electrochemical Machining

Donald G Risko

1247Electro-Polishing of Additive Manufactured Porous Titanium for Medical Implants

Lucas Abia Hof, Burnett Johnston, Md. Masiar Rahman, Sajad Arabnejad Khanoki, Damiano Pasini, Rolf Wüthrich

1248Electrochemical Polishing of Nitinol and Other Medical Alloys in Aqueous Electrolytes Using Pulse/Pulse Reverse Electric Fields

Holly Garich, Timothy D Hall, Savidra Lucatero, Stephen Snyder, Maria E. Inman, E. J Taylor, Lawrence Edward Kay

1249Status of Vertical Electroplishing at Cornell University

Fumio Furuta

1250Electropolishing of Nb for Superconducting Radio-Frequency (SRF) Cavities

Hui Tian, Charlie E Reece

1251Environmentally Benign Electrofinishing Process for Selective Material Removal and Reduced Surface Roughness of Materials (like Nb, Ti, Ta, SS and Mo) in Low Viscosity Water Based Electrolytes

[Timothy D Hall, Holly Garich, Stephen Snyder, Savidra Lucatero, Heather McCrabb, E. J Taylor, Maria E. Inman](#)

1252 [20 Years of Corrosion Sensing and Microvisualization of Corrosion Processes](#)

[William H Smyrl](#)

1253 [Electrochemical Micromachining of Bulk Metallic Glasses](#)

[Annett Gebert, Sylvia Horn, Ralph Sueptitz, Petre Flaviu Gostin, Mihai Stoica, Jürgen Eckert, Margitta Uhlemann](#)

1254 [Recycling Electrochemical Machining for Metal Recovery and Elimination of Waste](#)

[Brian Skinn, E. J Taylor, Timothy D Hall, Savidra Lucatero, Stephen Snyder, Heather McCrabb, Holly Garich, Maria E. Inman](#)

1255 [Enhanced Surface Finishing of Tungsten Carbide By Using Organic Additives](#)

[Michael Schneider, Nora Schubert, Lenka Simunkova, Alexander Michaelis](#)

1256 [Aluminum Dissolution in the Aluminum Chloride 1-Ethyl-3-Methylimidazolium Chloride \(AlCl₃-EtMeImCl\) Ionic Liquid](#)

[Chen Wang, Charles L. Hussey](#)

1257 [Surface Structuring of Ti-Al-V and Al-Mg Alloys By Chemical Etching for Advanced Adhesion of Polymers](#)

[Melike Baytekin-Gerngross, Mark-Daniel Gerngross, Jürgen Carstensen, Rainer Adelung](#)

G01-Organic Semiconductor Materials, Devices, and Processing 5

Electronics and Photonics/Dielectric Science and Technology

1258 [\(Invited\) Structure Measurements for Organic Photovoltaics Manufacturing](#)

[Dean M DeLongchamp](#)

[1259\(Invited\) Role of the Metal-Organic Interfaces in the Dark Current-Voltage Characteristics of Organic Solar Cells](#)

[J. a. Jiménez Tejada, P. López Varo, O. Marinov, M. Jamal Deen](#)

[1260\(Invited\) Operating Mechanisms of Organic Bulk-Heterojunction Solar Cells](#)

[Germa Garcia-Belmonte](#)

[1261\(Invited\) Development of Tailor Made Donor-Acceptor Pairs for Fullerene-Free Organic Solar Cells](#)

[Gregory Charles Welch](#)

[1262\(Invited\) Ultrafast Infrared Spectroscopy of Charge Generation in Organic Photovoltaic Materials](#)

[John B. Asbury](#)

[1263\(Invited\) Polymer Nanopatterned Layers for Organic Solar Cell Applications](#)

[Victor Samuel Balderrama, Josep Ferre-Borrull, Josep Pallares, Lluís F Marsal](#)

[1264\(Invited\) Nanomaterials and Device Architecture Engineering for Enhanced Efficiency in Bulk Heterojunction Solar Cells](#)

[Ricardo Izquierdo](#)

[1265\(Invited\) Spray Coating of Organic Semiconductors and Carbon Nanotube Electrodes for Solar Cells](#)

[Barry P. Rand, Jeffrey Tait](#)

[1266\(Invited\) Design of Polymeric Semiconductors for Transistor Applications](#)

[Martin Heeney](#)

[1267\(Invited\) Routes to Stabilization of Linearly-Fused Aromatics](#)

[John Anthony, Thilanga Liyanage](#)

[1268\(Invited\) Unexpected Molecular Interfaces: SAMs on Cobalt](#)

[Sujitra Pookpanratana, Curt A. Richter, Christina A. Hacker](#)

[1269\(Invited\) Thin Films of Eumelanin Pigment: Charge Carrier Transport, Ion Storage, and Interaction with Metal Electrodes](#)

[Prajwal Kumar, Eduardo Di Mauro, Julia Wuensche, Clara Santato](#)

[1270\(Invited\) Importance of Interface Engineering in Organic Spintronics](#)

[Hyuk-Jae Jang, Sujitra Pookpanratana, Jun-Sik Lee, R. Joseph Kline, James I. Basham, David J. Gundlach, Christina A. Hacker, Oleg A. Kirillov, Oana D Jurchescu, Curt A. Richter](#)

[1271\(Invited\) Spectroscopic Investigations of Stable Nitroxyl Radical-Containing Polymers](#)

[Andrew Ferguson, Barbara Katherine Hughes, Wade A. Braunecker, David Bobela, Thomas Gennett](#)

[1272\(Invited\) Development of Printed Flexible Organic Solar Panels, Field Effect Transistors, and Logic Circuits on PET Substrates](#)

[Salima Alem, Ta-Ya Chu, Jianping Lu, Terho Kololuoma, Ye Tao](#)

[1273\(Invited\) Development of High Mobility Polymer Semiconductors for p-Channel, n-Channel, and Ambipolar Thin Film Transistors](#)

[Yuning Li](#)

[1274\(Invited\) Surface-Mediated Molecular Assembly of Organic Semiconductors for High-Performance Organic Electronics](#)

[Kilwon Cho](#)

[1275\(Invited\) Design and Fabrication of Organic Thin Film Transistors Using Solution-Processable Liquid Crystalline Phthalocyanine Derivatives](#)

[Asim Kumar Ray](#)

[1276\(Invited\) Thin-Film Transistors Based on Donor-Acceptor Polymers](#)

[Ananth Dodabalapur, Seohee Kim, Taejun Ha, Prashant Sonar](#)

[1277\(Invited\) Ionic Liquid-Gated PCBM Transistors: Pushing the Limit of the Doping in Organic Transistors](#)

[Jonathan Sayago, Mitesh Patel, Fabio Cicoira, Francesca Soavi, Clara Santato](#)

[1278\(Invited\) Design and Development of an Organic Operational Amplifier for Use in Low-Cost Smart Sensor Systems](#)

[Munira Raja](#)

[1279\(Invited\) Considerations for Materials, Processes, and Characterization of Flexible Electronics](#)

[William S. Wong](#)

[1280\(Invited\) Conducting Polymer Transistors Making Use of Activated Carbon Gate Electrodes](#)

[Hao Tang, Prajwal Kumar, Shiming Zhang, Clara Santato, Francesca Soavi, Fabio Cicoira](#)

[1281Bioinspired Molecular Electrets for Organic Electronics and Energy Applications](#)

[Valentine Ivanov Vullev, Jillian M. Larsen, Eli M. Espinoza](#)

[1282Pvdf Based Gel Polymer Electrolyte for Applications in Flexible Devices](#)

[Andrea Vittorio Oriani, Paula Cojocar, Marco Alberto Spreafico, Marco Apostolo, Francesco Triulzi, Luca Magagnin](#)

[1283\(Invited\) Innovations in Organic Printed Optoelectronics](#)

[Bernard Kippelen](#)

[1284\(Invited\) Plasmonic Composites of Semiconducting Polymers for Optoelectronic Applications](#)

[Jiri Pflieger, Bartosz Paruzel, Klara Halasova](#)

[1285Solution-Processed Light-Emitting Dielectric Films and Their Applications in Multifunctional Devices](#)

[Jing Li, Guifang Dong, Lian Duan, Liduo Wang](#)

[1286Synthesis, Characterization, Electrochemical and Optoelectronic Properties and LED Device Fabrication of Low Band-Gap Donor-Acceptor Organic Semiconducting Small Molecules](#)

[Ragavachari Dhamodharan, Elumalai Ramachandran](#)

[1287\(Invited\) The Effect of Molecular Dynamics on Charge Transport in Organic Semiconductors](#)

[Oana D Jurchescu](#)

[1288\(Invited\) Disentangling the Effects of Gated-Contacts on Transconductance in Organic FETs](#)

[Emily Bittle, James I. Basham, Thomas N. Jackson, Oana D Jurchescu, David J. Gundlach](#)

[1289\(Invited\) Charge-Based Modelling of the Channel Current in Organic Field Effect Transistors Considering Injection Effects](#)

[Franziska Hain, Christian Lammers, Fabian Hosenfeld, H. Klauk, Ute Zschieschang, B. Iniguez, Alexander Kloes](#)

G02-Processes at the Semiconductor Solution Interface 6

Electronics and Photonics/Dielectric Science and Technology/Electrodeposition/Energy Technology/Physical and Analytical Electrochemistry

[1290The Comprehension of the Interfacial Chemistry during Etching Process onto SC: A Way to Understand the Mechanism](#)

[Tommy Vayron, A Causier, Muriel Bouttemy, Isabelle Gérard, Damien Aureau, Jacky Vigneron, Arnaud Etcheberry](#)

[1291Impact of Surface Texturization on Overall Performance of Mono-Crystalline Silicon Solar Cells](#)

[Shrihari Sankarasubramanian, Gaurav Kumar Saud, M Shashikala, Prakash Suratkar, S Saravanan](#)

[1292Prediction of Photovoltaic Cu\(In,Ga\)Se₂ p-n Device Performance by forward Bias Electrochemical Analysis of Only the p-Type Cu\(In,Ga\)Se₂ Films](#)

[Diego Colombara, Tobias Bertram, Valérie Depredurand, Thierry Fouquet, Jérôme Bour, Cédric Broussillou, Pierre-Philippe Grand, Phillip J. Dale](#)

[1293Chemical Nature and Control of High-k Dielectric/III-V Interfaces](#)

[Wilfredo J Cabrera, Mathew D. Halls, Yves J Chabal](#)

[1294\(Invited\) Chemical Stability and Electronic Behavior of Atomic Layer Deposited Metal Oxide Thin Films](#)

[Nicholas C Strandwitz, Bo Bao, Gabriela Calinao Correa](#)

[1295\(Invited\) Stabilizing Semiconductor-Solution Interfaces Via Chemically Stable but Electronically Defective Coatings](#)

[Shu Hu, Matthew Shaner, Michael Frankston Lichterman, Matthias Hermann Richter, Erik Verlage, Thomas Mayer, Bruce Brunschwig, Paul Daniel Dapkus, Nathan S. Lewis](#)

[1296Photoelectrochemical Studies and Capacitance Measurements during the Nitride Passivation of InP in Liquid Ammonia \(-55°C\)](#)

[Christian Njel, Idriss Bakas, Damien Aureau, Anne-Marie Gonçalves, Arnaud Etcheberry](#)

1297 [An Attractive Wet Route for Nitriding III-Vs](#)

[Christian Njel, Damien Aureau, Anne-Marie Gonçalves, Arnaud Etcheberry](#)

1298 [Photoelectrochemical Properties of InGaN Thin Film Grown By Plasma Assisted Molecular Beam Epitaxy](#)

[Yu-Min Shen, Abhijit Ganguly, Li-Chyong Chen, Kuei-Hsien Chen](#)

1299 [\(Invited\) Use of the Doping Dependence of Collection Efficiencies for Dye Sensitized Photocurrents to Demonstrate Physical Models for Charge Transfer at Single Crystal Oxide Semiconductor Surfaces](#)

[Mark T Spitler, Bruce A Parkinson, Kevin Watkins](#)

1300 [\(Invited\) Fabrication and Characterization of Silicon Microwire Anodes by Electrochemical Etching Techniques](#)

[Sandra Nöhren, Enrique Quiroga-González, Jürgen Carstensen, Helmut Föll](#)

1301 [Pseudocapacitive Charge Storage at Nanoscale Silicon Electrodes](#)

[William McSweeney, Hugh Geaney, Colm Glynn, David McNulty, Colm O'Dwyer](#)

1302 [Electroless Ni Layer: Influence of Growth Steps and Annealing Temperature on NiSi Formation](#)

[Elise Delbos, Hanane El Belghiti, Damien Aureau, Jackie Vigneron, Muriel Bouttemy, Arnaud Etcheberry](#)

1303 [Synthesis of Metal Oxides/Graphene Nanocomposites for Applications in Lithium-Ion Battery](#)

[Jiaqi Nan, Hongzhou Dong, Guicun Li, Liyan Yu, Yong Qin, Lifeng Dong](#)

[1304\(Invited\) Investigation of the Si/TiO₂/Electrolyte Interface Using Operando Tender X-ray Photoelectron Spectroscopy](#)

[Michael Frankston Lichterman, Matthias Hermann Richter, Shu Hu, Ethan J Crumlin, S Axnanda, Marco Favaro, Walter Drisdell, Z Hussain, Thomas Mayer, Bruce Brunshwig, Nathan S. Lewis, Hans Joachim Lewerenz, Z Liu](#)

[1305\(Invited\) Integrated Semiconductor/Catalyst Assemblies for Sustained Photoanodic Water Oxidation](#)

[Jinhui Yang, Jason K. Cooper, Francesca M. Toma, Ian D. Sharp](#)

[1306\(Invited\) Measurement of the Energy-Band Relations of Stabilized Si Photoanodes Using Operando Ambient Pressure X-ray Photoelectron Spectroscopy](#)

[Matthias Hermann Richter, Michael Frankston Lichterman, Shu Hu, Ethan J Crumlin, Thomas Mayer, S Axnanda, Marco Favaro, Walter Drisdell, Z Hussain, Bruce Brunshwig, Nathan S. Lewis, Z Liu, Hans Joachim Lewerenz](#)

[1307\(Invited\) P-Type Transparent Conducting Oxide Protection Layers for Sustainable Photoelectrochemical Water Oxidation](#)

[Le Chen, Jinhui Yang, Lyman Lee, Shannon Klaus, Rachel Woods-Robinson, Yanwei Lum, Jason K. Cooper, Ian D. Sharp, Alexis T. Bell, Joel W. Ager](#)

[1308Atomic Layer Deposition of i-Sb₂S₃/p-NiO Thin Layers into Anodic Alumina Membranes for Photoelectrochemical Water Splitting](#)

[Maissa Barr, Loic Assaud, Yanlin Wu, Julien Bachmann, Lionel Santinacci](#)

[1309Enabling Overall Water Splitting By Iron Oxide and Silicon](#)

[Dunwei Wang](#)

[1310A P-GaInP₂ Photoelectrode for Water Reduction Stabilized with TiO₂ and MoS₂ Catalyst](#)

[Jing Gu, James L Young, Nathan Neale, John A Turner](#)

[1311\(Invited\) Electrochemical Reaction Induced Amorphization to Complex Oxide Surface and Its Impact to Catalyst Activity for Oxygen Evolution Reaction](#)

[Hongfei Jia, Li Qin Zhou, Chen Ling](#)

[1312\(Invited\) Exploration of Structure-Function Relationships for Electrocatalytic Water Oxidation By Molecular \[Mn₁₂O₁₂\] Clusters](#)

[Yong Yan](#)

[1313\(Invited\) Investigations into the Formation of Germanene Using Electrochemical Atomic Layer Deposition \(E-ALD\)](#)

[Maria Ledina, Xuehai Liang, Youn-Geun Kim, Jin Jung, Brian Perdue, Chu Tsang, Manuel Soriaga, John Lewellen Stickney](#)

[1314\(Invited\) Direct Electrodeposition of Crystalline III-V Semiconductor Films](#)

[Stephen Maldonado](#)

[1315ZnO Electrodeposition on Boron-Doped Diamond: Effects of Zinc Precursor Concentration](#)

[Pierrick Gautier, Anne Vallée, Arnaud Etcheberry, Nathalie Simon](#)

[1316Investigation of Photoelectrochemical Deposition of Zn\(S,O\) Via Nitrate Ions Reduction in the Presence of Thiourea](#)

[Serena Gallanti, Elisabeth Chassaing, Muriel Bouttemy, Arnaud Etcheberry, Daniel Lincot, Negar Naghavi](#)

[1317Transient Photocurrent in Organic Photocells Assisted By Electric Double Layers in Electrolytes](#)

[Masato Odaka, Michio M Matsushita, Kunio Awaga](#)

[1318A Study on the Seed Step-Coverage Enhancement Process \(SSEP\) of through Silicon Via \(TSV\) Using Electrophoretic Deposition \(EPD\) of Pd/PVP Colloids](#)

[Dongryul Lee, Yujin Lee, Hyungkoun Cho, Min Hyung Lee](#)

[1319 Mechanistic Transition of Electron Transfer Kinetics from Quantum Electron Tunneling to Trap-Facilitated Hopping through TiO₂ Films Grown By Atomic Layer Deposition on SnO₂ Electrodes](#)

[Jason Ryan Avila, Michael Jacob Katz, Omar K. Farha, Joseph T. Hupp](#)

[1320 Cleaning Solution Effect on Electrical and Reliability Properties of Dense and Porous Low Dielectric Constant Materials](#)

[Yi-Lung Cheng, Chi-Jia Huang](#)

H01-Advanced CMOS-Compatible Semiconductor Devices 17

Electronics and Photonics

[1321\(Plenary\) Physical Insights on the Design of UTB Devices, Including FinFETs](#)

[Jerry G. Fossum](#)

[1322\(Plenary\) Substrate Innovation for Extending Moore and More than Moore Law](#)

[Christophe Maleville](#)

[1323\(Invited\) High Performance III-V-on-Insulator MOSFETs on Si Realized by Direct Wafer Bonding Applicable to Large Wafer Size](#)

[Shinichi Takagi, Sang-Hyeon Kim, Yuki Ikku, Masafumi Yokoyama, Ryosho Nakane, Jian Li, Yung-Chung Kao, Mitsuru Takenaka](#)

[1324\(Invited\) 14nm FDSOI Technology for High-Speed and Energy-Efficient CMOS](#)

[Olivier Weber, Emmanuel Josse, Michel Haond](#)

[1325\(Invited\) Ultralow-Voltage Design and Technology of Silicon-on Thin-Buried-Oxide \(SOTB\) CMOS for High Energy Efficient Electronics in IoT Era](#)

Yoshiki Yamamoto, Hideki Makiyama, Tomohiro Yamashita, Hidekazu Oda, Shiro Kamohara, Nobuyuki Sugii, Yasuo Yamaguchi, Tomoko Mizutani, Masaharu Kobayashi, Toshiro Hiramoto

1326(Invited) Advanced Semiconductor Devices for Future CMOS Technologies

Cor Claeys, Danielle Chiappe, Nadine Collaert, Jerome Mitard, Juliana Radu, Rita Rooyackers, Eddy Simoen, Anne Vandooren, Anabela Veloso, Niamh Waldron, Liesbeth Witters, Aaron Thean

1327N-Junctionless Transistor Prototype: Manufacturing Using a Focused Ion Beam System

Lucas Petersen Barbosa Lima, Marcos Vinícius Puydinger dos Santos, Marco Aurélio Keiler, Harold F. W. Dekkers, Stefan De Gendt, José Alexandre Diniz

1328Using the Wave Layout Style to Boost the Digital ICs Electrical Performance in the Radioactive Environment

Rafael Navarenho de Souza, Marcilei Guazzeli da Silveira, Salvador Pinillos Gimenez

1329Germanium Junctionless MOSFET with Steep Subthreshold Swing

Manish Gupta, Abhinav Kranti

1330A Novel U-Shaped Finfet with Vertical Channels

Yunfei Liu, Haizhou Yin, Rui Li, Huilong Zhu, Chao Zhao, Pengfei Wang, Shaoning Mei, Tianchun Ye

1331(Invited) Si-Based Micro-Nanomechanics for Ultimate Sensing

Takahito Ono, Masaya Toda, Yong-Jun Seo, Naoki Inomata

1332(Invited) A Sub-1G MEMS Sensor

Daisuke Yamane, Toshifumi Konishi, Hiroshi Toshiyoshi, Kazuya Masu, Katsuyuki Machida

[1333\(Gordon E. Moore Medal for Outstanding Achievement in Solid State Science and Technology\) Research on Nano and Giga Electronics – Breakthroughs Along the Path](#)

[Yue Kuo](#)

[1334\(Invited\) Comparative Simulation Study of InAs/Si and All-III-V Hetero Tunnel FETs](#)

[Andreas Schenk, Saurabh Sant, Kirsten Moselund, Heike Riel](#)

[1335Compact Model for Nano-Wire Tunnel Field-Effect Transistor](#)

[Shingo Sato, Yasuhisa Omura, Abhijit Mallik](#)

[1336Study of Hysteresis in Vertical Ge-Source Heterojunction Tunnel-FETs at Low Temperature](#)

[Felipe Souza Neves, Paula Ghedini Der Agopian, Joao Antonio Martino, Anne Vandooren, Rita Rooyackers, Eddy Simoen, Aaron Thean, Cor Claeys](#)

[1337Vertical Nanowire TFET Diameter Influence on Intrinsic Voltage Gain for Different Inversion Conditions](#)

[Victor De Bodt Sivieri, Caio Cesar Mendes Bordallo, Paula Ghedini Der Agopian, Joao Antonio Martino, Rita Rooyackers, Anne Vandooren, Eddy Simoen, Aaron Thean, Cor Claeys](#)

[1338Analytically Modeling the Asymmetric Double Gate Tunnel FET](#)

[Hongfei Lv, Shingo Sato, Yasuhisa Omura, Abhijit Mallik](#)

[1339\(Invited\) Special Memory Mechanisms in SOI Devices](#)

[Sorin Cristoloveanu, Maryline Bawedin, Carlos Navarro, Sung-Jae Chang, Jing Wan, François Andrieu, Cyrille Le Royer, Noel Rodriguez, Francisco Gamiz, Alexander Zaslavsky, Yong-Tae Kim](#)

[1340\(Invited\) Challenges to Nano-Scale Device World](#)

[Francis Balestra](#)

1341 [\(Invited\) Spin-Based Silicon and CMOS-Compatible Devices](#)

[Viktor Sverdlov, Siegfried Selberherr](#)

1342 [Variation of Spin Lifetime with Spin Injection Orientation in Strained Thin Silicon Films](#)

[Joydeep Ghosh, Dmitry Osintsev, Viktor Sverdlov, Siegfried Selberherr](#)

1343 [A Steep Subthreshold Swing Technique for Gate-All-Around SOI MOSFETs](#)

[Chun-Yu Chen, Jyi-Tsong Lin, Meng-Hsueh Chiang, Wei-Chou Hsu](#)

1344 [Direct Characterization of Impact Ionization Current in Silicon-on-Insulator Body-Contacted MOSFETs](#)

[Carlos Marquez, Noel Rodriguez, Jose Manuel Montes, Rafael Ruiz, Francisco Gamiz, Carlos Sampedro, Akiko Ohata](#)

1345 [Study of Total Quantum Efficiency of Lateral SOI PIN Photodiodes with Back-Gate Bias, Intrinsic Length and Temperature Variation](#)

[Carla Novo, João Baptista, Marcilei Guazzeli da Silveira, Renato Giacomini, Aryan Afzalian, Denis Flandre](#)

1346 [Threshold Voltage Modeling for Dynamic Threshold UTBB SOI in Different Operation Modes](#)

[Vitor Tatsuo Itocazu, Katia Regina Akemi Sasaki, Matheus Barros Manini, Victor Sonnenberg, Joao Antonio Martino, Eddy Simoen, Cor Claeys](#)

1347 [\(Invited\) Planar Nanoelectronic Devices and Biosensors Using Two-Dimensional Nanomaterials](#)

[Feras Al-Dirini, Mahmood A Mohammed, Md Sharafat Hossain, Faruque M Hossain, Ampalavanapillai Nirmalathas, Efstratios Skafidas](#)

[1348Stress Considerations in Thin Films for CMOS-Integrated Gas Sensors](#)

[Lado Filipovic, Siegfried Selberherr](#)

[1349Geometrical Magnetoresistance in Multi-Gate FDSOI Structures](#)

[Carlos Navarro, Sung-Jae Chang, Maryline Bawedin, François Andrieu, Bruno Sagnes, Sorin Cristoloveanu](#)

[1350Improved Charge-Trapping Performance of Hf-Doped SrTiO₃ for Nonvolatile Memory Applications](#)

[X.D. Huang, P.T. Lai](#)

[1351Crystallinity Improvement of Ferroelectric BiFeO₃ Thin Film by Oxygen Radical Treatment](#)

[Fuminobu Imaizumi, Tetsuya Goto, Akinobu Teramoto, Shigetoshi Sugawa, Tadahiro Ohmi](#)

[1352Influence of Substrate on Hafnium Silicate Metal-Insulator-Metal Capacitors Grown by Atomic Layer Deposition](#)

[B J Hutchinson, V S Teodorescu, R Negrea, B Sheehan, P Carolan, S O'Brien, M Modreanu, M E Pemble, I. M Povey](#)

[1353Ultra-Low Temperature Flattening Technique of Silicon Surface Using Xe/H₂ Plasma](#)

[Tomoyuki Suwa, Akinobu Teramoto, Tetsuya Goto, Masaki Hirayama, Shigetoshi Sugawa, Tadahiro Ohmi](#)

[1354Low Temperature Atomically Flattening of Si Surface of Shallow Trench Isolation Pattern](#)

[Tetsuya Goto, Rihito Kuroda, Tomoyuki Suwa, Akinobu Teramoto, Naoya Akagawa, Daiki Kimoto, Shigetoshi Sugawa, Tadahiro Ohmi, Yutaka Kamata, Yuki Kumagai, Katsuhiko Shibusawa](#)

[1355FDSOI Suitability for Asynchronous Circuits at Sub- \$V_T\$](#)

[Esteve Amat, Jean-Frédéric Christmann, Olivier Billoint, Ivan Miro, Edith Beigne](#)

[1356Proton Radiation Effects on the Analog Performance of Bulk n- and p-FinFETs](#)

[Marcelo Bertoldo, Alberto Vinicius de Oliveira, Paula Ghedini Der Agopian, Eddy Simoen, Cor Claeys, Joao Antonio Martino](#)

[1357Comparison of Current Mirrors Designed with TFET or FinFET Devices for Different Dimensions and Temperatures](#)

[Marcio Dalla Valle Martino, Joao Antonio Martino, Paula Ghedini Der Agopian, Anne Vandooren, Rita Rooyackers, Eddy Simoen, Aaron Thean, Cor Claeys](#)

[1358Impact of Gate Stack Dielectric on Intrinsic Voltage Gain and Low Frequency Noise in Ge pMOSFETs](#)

[Alberto Vinicius de Oliveira, Paula Ghedini Der Agopian, Joao Antonio Martino, Wen Fang, Hiroaki Arimura, Jerome Mitard, Hans Mertens, Eddy Simoen, Anda Mocuta, Nadine Collaert, Aaron Thean, Cor Claeys](#)

H03-Silicon Compatible Materials, Processes, and Technologies for Advanced Integrated Circuits and Emerging Applications 5

Electronics and Photonics/Dielectric Science and Technology

[1359\(Invited\) Heterogeneous Nano- to Wide-Scale Co-Integration of Beyond-Si and Si CMOS Devices to Enhance Future Electronics](#)

[Aaron Thean, Nadine Collaert, Iuliana P. Radu, Niamh Waldron, Clement Merckling, Liesbeth Witters, Roger Loo, Jerome Mitard, Rita Rooyackers, Anne Vandooren, A. Verhulst, Anabela Veloso, D. Yakimets, T. Huynh Bao, Danielle Chiappe, A. Vaysset, O. Zografos, Matty Caymax, C Huyghebaert, Kathy Barla, A. Steegen](#)

[1360\(Invited\) Strained-SiGe Channel FinFETs for High-Performance CMOS: Opportunities and Challenges](#)

[Pouya Hashemi, Karthik Balakrishnan, John A. Ott, Effendi Leobandung, Renee T. Mo, Dae-Gyu Park](#)

1361 [High Mobility Materials on Insulator for Advanced Technology Nodes](#)

[Walter Schwarzenbach, Christophe Figuet, Daniel Delprat, Christelle Veytizou, Isabelle Huyet, Catherine Tempesta, Ludovic Ecartot, Julie Widiez, Virginie Loup, Jean-Michel Hartmann, Pascal Besson, Chrystel Deguet, Frédéric Mazen, Bich-Yen Nguyen, Christophe Maleville](#)

1362 [Evaluation of Anisotropic Biaxial Stress in Si_{1-x}Ge_x/Ge Mesa-Structure by Oil-Immersion Raman Spectroscopy](#)

[Shotaro Yamamoto, Kazuma Takeuchi, Ryo Yokogawa, Motohiro Tomita, Daisuke Kosemura, Koji Usuda, Atsushi Ogura](#)

1363 [A New Method to Induce Tensile Stress in Silicon on Insulator Substrate: From Material Analysis to Device Demonstration](#)

[Sylvain Maitrejean, Nicolas Loubet, Emmanuel Augendre, Pierre Francois Morin, Shay Reboh, Nicolas Bernier, Romain Wacquez, Benoit Lherron, Aurore Bonneville, Qing Liu, Jean-Michel Hartmann, Hong He, Aomar Halimaoui, Juntao Li, Sonia Pilorget, Joel Kanyandekwe, Laurent Grenouillet, Fadoua Chafik, Yves Morand, Cyrille Le Royer, Oliver Faynot, Muhsin Celik, Bruce Doris, Barbara de Salvo](#)

1364 [Mechanical Analyses of Extended and Localized UTBB Stressors Formed with Ge Enrichment Techniques](#)

[Pierre Francois Morin, Laurent Grenouillet, Nicolas Loubet, Alexandre Pofelski, Darsen Lu, Qing Liu, Emmanuel Augendre, Sylvain Maitrejean, Vincent Fiori, Barbara de Salvo, Bruce Doris, Walter Kleemeier](#)

1365 [Fabricating Si Nanowires with Precisely Controlled Diameter and Spacing](#)

[Luping Li, Ying Fang, Cheng Xu, Yang Zhao, Kirk J Ziegler](#)

1366 [\(Invited\) Si Nanowire Tunnel FETs for Energy Efficient Nanoelectronics](#)

[Qing-Tai Zhao, Simon Richter, Lars Knoll, Gia Vinh Luong, Sebastian Blaeser, Christian Schulte-Braucks, Anna Schäfer, Stefan Trellenkamp, Dan Buca, Siegfried Mantl](#)

1367 [Oxide-Based Synaptic Transistors for Neuromorphic Systems](#)

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[1368 Atomic Resolution Study of VO₂ Metal-Insulator Transition As Field-Effect Transistors](#)

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[1497\(Invited\) Performance and Durability of Solid Oxide Cells for Energy Storage](#)

[Scott A Barnett](#)

[1498Steam-Carbon Fuel Cell for Clean Fuel and Energy Production](#)

[Stephen Michael Stewart, Brandon Loong, David U. Johnson, Turgut M Gur, Reginald E. Mitchell](#)

[1499\(Invited\) Electrochemical Upgrading of Bio-Oil](#)

[S Elangovan, Dennis Larsen, Joseph J Hartvigsen, James M Mosby, Jacob Staley, Jessica Elwell, Mukund Karanjikar](#)

[1500The Synthesis of Hydrocarbons for Fuel and Lubricants via Ceramic Membrane Reactor](#)

[James M Mosby, Patrick McGuire, Daniel Taggart, Jacob Staley, S Elangovan](#)

[1501Electrodes for Protonic-Ceramic Membranes Used in Natural Gas-to-Chemicals Processing](#)

[Sandrine Ricote, Anthony Manerbino, Neal P Sullivan, Grover Coors](#)

[1502Co-Synthesis of Hydrogen and Carbon Fuels from Water and Carbon Dioxide](#)

[Fang-Fang Li, Shuzhi Liu, Baochen Cui, Jason Lau, Jessica Stuart, Stuart Licht](#)

[1503\(Invited\) Stabilized Bismuth Oxide As a Component in the Air Electrodes of Reversible Solid Oxide Electrochemical Cells](#)

[Sossina M Haile](#)

[1504\(Invited\) Reversible Solid Oxide Fuel Cell Development at Versa Power Systems](#)

[Anthony Wood, Hongpeng He, Tahir Joia, Casey Cloudless Brown](#)

[1505\(Invited\) Measurement of Electronic Conductivity in 8YSZ Using an Embedded Electrode](#)

[Lei Zhang, Liangzhu Zhu, Anil V. Virkar](#)

[1506\(Invited\) Efficient Electrochemical Biogas Reforming with Enhanced Carbon Deposition Resistance of Ni/YSZ Electrode Coated with Chromium Oxide in a Solid Oxide Electrolyzer](#)

[Wentao Qi, Kui Xie, Shigang Chen, Yucheng Wu](#)

[1507\(Invited\) Enhanced Steam Electrolysis at Exsolution Titanates](#)

[Dragos Neagu, George Tsekouras, Tae-Ho Shin, John Irvine](#)

[1508The Effect of Mixed-Conductivity on Electrolysis Cells Involving BaCe_xZr_{0.9-x}Y_{0.1}O_{3-d} \(x = 0, 0.1 and 0.2\) Protonic Ceramic Membrane](#)

[Sean M Babiniec, Michael Dippon, Sandrine Ricote, Neal P Sullivan](#)

[1509Steam Electrolysis By Proton-Conducting Solid Oxide Electrolysis Cells \(SOECs\)](#)

[Lei Bi, Enrico Traversa](#)

[1510Hydrogen Permeation through Dense BaCe_{0.8}Y_{0.2}O_{3-δ} - Ce_{0.8}Y_{0.2}O_{2-δ} Composite-Ceramic Membranes](#)

[Wade A Rosensteel, Sandrine Ricote, Neal P Sullivan](#)

[1511Fabrication of a Novel BaCe_{0.8}Y_{0.2}O_{3-δ} - Cu Ceramic-Metallic Composite Membrane for Hydrogen Separation](#)

[Wade A Rosensteel, Neal P Sullivan](#)

[1512\(Invited\) Challenges and Limitations of Materials for Membrane-Based Water Electrolysis at Megawatt Scale](#)

[Katherine E Ayers, Nemanja Danilovic, Everett Anderson](#)

[1513Polybenzimidazole Membranes for Hydrogen Production in the Hybrid Sulfur Electrolyzer](#)

[Taylor Reed Garrick, Alexander Gullede, John A Staser, Brian Benicewicz, John W. Weidner](#)

[1514A Novel Anion Exchange Membrane Enabling Generation of Syngas from Water and Carbon Dioxide at Industrially Important Rates](#)

[Zengcai Liu, Richard I Masel, Qingmei Chen, Robert Kutz, Hongzhou Yang, Krzysztof A. Lewinski, Tyler Scott Matthews, Marina Kaplun](#)

[1515Phase Dependent Selectivity of Electrochemical CO₂ Conversion to Fuels on TiO₂ nanoparticles](#)

[Christopher J. Wright, Pranav P. Sharma, Fu-Sheng Ke, Andrew A. Peterson, Xiao-Dong Zhou](#)

1516(Invited) [Optimizing Electrocatalyst Selectivity for CO₂ Reduction over H₂ Evolution](#)

[Andrew A. Peterson](#)

1517(Invited) [Electrosynthesis of Fuels Directly from CO₂](#)

[Anne C. Co, Joshua Billy, Katheriine Muhlenkamp](#)

1518(Invited) [Defect-Rich CO₂ Reduction Catalysts](#)

[Xiaofeng Feng, Matthew Kanan](#)

1519(Invited) [Two-Dimensional Materials for Electrochemical Synthesis of Fuels](#)

[Jingjie Wu, Mingjie Liu, Ken Hackenberg, Yuanyue Liu, Ram Manohar Yadav, Pranav P. Sharma, Xiao-Dong Zhou, Brandon Wood, Boris I. Yakobson, Jun Lou, Pulickel M Ajayan](#)

1520(Invited) [Electrochemical CO₂ Reduction to Formic Acid on Crystalline SnO₂ Nanosphere Catalyst](#)

[Yishu Fu, Yuyu Liu, Yanan Li, Jinli Qiao, Xiao-Dong Zhou](#)

1521 [Electrochemical Reduction of CO₂ Using Bi-Layer Cu₂O Electrodes](#)

[Joel Bugayong, Gregory L Griffin](#)

1522 [Electrochemical Methanation of Carbon Dioxide with Highly Dispersed Copper Nanocatalysts](#)

[Karthish Manthiram, Brandon J. Beberwyck, A. Paul Alivisatos](#)

1523 [CO₂ Electrocatalytic Reduction at Gold and Copper Electrodes: Role of Particle Size and Surface Chemistry](#)

[Evan Michael Andrews, John Flake, Yuxin Fang](#)

[1524Enhancing the Electrochemical Surface Area of Tin Based Porous Electrodes for Carbon Dioxide Reduction to Formate](#)

[Arun S Agarwal, Dushyant Gautam, Edward Rode, Jacek B Jasinski, Tu Quang Nguyen, Mahendra Kumar Sunkara, Narasi Sridhar](#)

[1525Effect of Acid-Leaching on the Electrochemical Performance of Carbon-Supported Copper Phthalocyanine Tetrasulfonic Acid Tetrasodium Salt \(CuTSPc/C\) Catalys](#)

[Jinli Qiao, Xin Qing](#)

[1526Kinetics and Electrocatalytic Activity of Co\(Aminopyrine\)-Derived Nitrogen-Doped Porous Nanocomposite for Oxygen Reduction Reaction in Alkaline Electrolyte](#)

[Sheng Tang, Taishan Zhu, Yishu Fu, Jinli Qiao, Xiao-Dong Zhou](#)

[1527Nitrogen-Doped Hierarchical Mesoporous/Macroporous Carbon \(H-C\) Prepared from the Combined Silica Templates with Different Size for Oxygen Reduction](#)

[Mingjie Wu, Jingjing Shi, Qiang Wang, Jinli Qiao, Yuyu Liu](#)

[1528The Performance of Doped Mesoporous Carbon Electrodes as Electrochemical Capacitors in Optimized Alkaline Electrolyte](#)

[Wenzhao Chen, Jiadong Li, Nengneng Xu, Qiang Wang, Yuyu Liu, Jinli Qiao](#)

[1529The Electrochemical Conversion of Carbon Dioxide to Fuels on a Nanoporous Copper/M Catalyst](#)

[Joshua Billy, Anne C. Co](#)

[1530Electrode Kinetics of the Ni Porous Electrode for Hydrogen Production in the Molten Carbonate Electrolysis Cell \(MCEC\)](#)

[Lan Hu, Göran Lindbergh, Carina Lagergren](#)

[1531 Cross-linked Anion Exchange Membranes Composed of Imidazolium Salt for Alkaline Fuel Cell](#)

[Feifei Song, Shuli Chen, Ying Gao, Yuyu Liu, Jinli Qiao](#)

[1532 Effect of Acid Leaching on the Catalytic Activity of Co-Salen/C Non-Precious Metal Catalysts for Oxygen Reduction Reaction](#)

[Jinli Qiao, Pan Xu](#)

[1533 H₂/O₂ Alkaline Membrane Fuel Cell Performances Using Carbon-Supported Metal Phthalocyanine \(MPc/C, M = Co, Cu, Zn, Ni\) as Cathode Catalysts](#)

[Taishan Zhu, Xin Qing, Pan Xu, Yanxi Song, Jinli Qiao](#)

[1534 Synthesis and Conductive Property of Alkaline Anion-Exchange Membranes Based on Poly\(vinyl alcohol\)/Bis\(2-chloroethyl\) Ether-1,3-bis\[3-\(dimethylamino\)propyl\] Urea Copolymer Composite](#)

[Shuli Chen, Yanxi Song, Feifei Song, Xiaoxiang Zhao, Jinli Qiao, Xiao-Dong Zhou](#)

[1535 Electrode Investigation for the Solid-Oxide Electrolysis of Dry CO₂ for O₂ Production](#)

[Katarzyna Sabolsky, Edward M Sabolsky, John Christian, Jeremy Harp, John Zondlo](#)

[1536 Manganese Doped Lanthanum-Strontium Chromite Fuel Electrode for Solid Oxide Fuel Cell and Oxygen Transport Membrane Systems](#)

[Sapna Gupta, Prabhakar Singh](#)

[1537 Electro-Catalytic and Fuel Cell Studies in an Internal Reforming Iso-Octane Fed SOFC Using Cu/CeO₂ Composites As Anodic Electrodes](#)

[Abdullah Abdulaziz Al-Musa, Mohammed Al-Saleh, Ayman Al-Zahrani, Nikolaos Kakkidis, George Marnellos](#)

[1538 Application of Coordinatively Supported and Activated Metal Nanocenters As Electrocatalytic Systems for Reduction of Carbon Dioxide](#)

[Anna Wadas, Iwona Agnieszka Rutkowska, Pawel J Kulesza](#)

I03-Materials for Low-Temperature Electrochemical Systems 2

Energy Technology/Industrial Electrochemistry and Electrochemical Engineering

1539([Energy Technology Division Research Award](#)) [PEM Fuel Cell Electrode Layer Degradation](#)

[Rod L Borup, Randachary Mukundan, Joseph D. Fairweather, Dusan Spornjak, David A. Langlois, Karren L. More, Gael Maranzana, Adrien Lamibrac, Jérôme Dillet, Sophie Didierjean, Olivier Lottin, Laure Guétaz, Rajesh Ahluwalia, Srikanth Arisetty, Karen Rau](#)

1540([Industrial Electrochemistry & Electrochemical Engineering Division Student Achievement Award](#)) [Anhydrous High-Proton Conductor Based on Ionic Nanopeapods](#)

[Mohammad Mahdi Hasani-Sadrabadi, Erfan Dashtimoghadam, Ghasem Bahlakeh, Karl I Jacob](#)

1541[Heterogeneities of Ageing in a PEMFC Stack: Links Between Membrane Pinholes, Carbon Corrosion and End-of-Life](#)

[Laetitia Dubau, Luis Castanheira, Marian Chatenet, Frederic Maillard, Jérôme Dillet, Gael Maranzana, Sofyane Abbou, Olivier Lottin, Gilles De Moor, Assma El Kaddouri, Corine Bas, Lionel Flandin, Elisabeth Rossinot, Nicolas Caqué](#)

1542[Durability Evaluation of PEFC Catalyst Layers through in-Situ SEM/STEM Techniques](#)

[Akari Hayashi, Masahiko Kitamura, Zhiyun Noda, Kazunari Sasaki](#)

1543[Fabrication and Characterization of Well-Tunable and Titanium Thin-Film Liquid/Gas Diffusion Layers](#)

[Stuart M. Steen, Jingke Mo, Scott Retterer, Alexander Terekhov, Feng-Yuan Zhang](#)

1544[Liquid-Water Distribution in Compressed Gas-Diffusion Layers Using X-Ray Computed Tomography](#)

[Iryna V Zenyuk, Dilworth Y. Parkinson, Adam Z Weber](#)

1545 [Analytical Modeling and Experimental Study of Thermal Conductivity of Catalyst Layer of Polymer Electrolyte Membrane \(PEM\) Fuel Cells](#)

[Mohammad Ahadi, Mehdi Andisheh-Tadbir, Mickey Tam, Jürgen Stumper, Majid Bahrami](#)

1546 [Performance of a High Temperature Polymer Electrolyte Membrane Fuel Cell with Low Catalyst Loading Produced by Reactive Spray Deposition Technology](#)

[Siwon Kim, Timothy D. Myles, Radenka Maric](#)

1547 [Effect of Ionomer Content and Relative Humidity on IT-PEMFC Performances at 120 °c](#)

[Min Kyung Cho, Hee-Young Park, In Young Cha, So Young Lee, Sung Jong Yoo, Hyoung-Juhn Kim, Jonghee Han, Suk Woo Nam, Yung-Eun Sung, Jong Hyun Jang](#)

1548 [Impact of Cationic Impurities on Low-Pt Loading PEFC Cathodes](#)

[Selvarani Ganesan, Md. Aman Uddin, Jaehyung Park, Ugur Pasaogullari, Leonard J. Bonville, Trent Molter](#)

1549 [A Cationic Contamination in PEFC Cathode: A Cause and Effect Study](#)

[Md. Aman Uddin, Jaehyung Park, Selvarani Ganesan, Ugur Pasaogullari, Leonard J. Bonville, Trent Molter](#)

1550 [\(Invited\) Advanced Materials for Electrochemical Systems](#)

[Dongguo Li, Yijin Kang, Dusan Strmcnik, Nenad M Markovic, Vojislav Stamenkovic](#)

1551 [Insights into the Oxygen Reduction Reaction Activity of Pt/C and PtCu/C Catalysts](#)

[Eric J Coleman, Anne C. Co](#)

1552 [High Activity of Ru@CoSe₂/C Electrocatalyst Toward Oxygen Reduction Reaction](#)

[Hengyi Li, Xuan Cheng, Ying Zhang](#)

[1553 Enhancing Activity and Pt Utilization in Pt-C₆H₅PO₄ Composite Electrodes for Solid Acid Fuel Cells](#)

[V. Sara Thoi, Sossina M Haile](#)

[1554 \(Invited\) Engineering the Microstructure and Atomic Arrangement of Pt-Based ORR Catalyst for High Activity and Durability](#)

[Jun Yang, Chunchuan Xu, Kerrie Gath, Patrick Pietrisz, Richard Soltis, Benjamin Pence, Mark Jagnar, Kai Sun, Guangnan Meng, Evan Sohm, Qingying Jia, Sanjeev Mukerjee](#)

[1555 Dealloyed Pt-Ni Polymer Electrolyte Fuel Cell Cathodes: Effects of Catalyst-Ionomer Ink Composition on Structure and Performance](#)

[Deborah J Myers, Nancy Kariuki, Joshua Hammons, Rajesh Ahluwalia, Xiaohua Wang, Jui-Kun Peng, Dharshini Fongalland](#)

[1556 Glad-SAD Pt-Ni Alloy/Ni Nanorods As Highly Active Oxygen Reduction Reaction Electrocatalysts](#)

[Nancy Kariuki, Fatma Yurtsever, Mahbuba Begum, Mesut Yurukcu, Mehmet Cansizoglu, Tansel Karabacak, Deborah J Myers](#)

[1557 Stability Enhancement of the Interaction Between Pt Nanoparticles and Carbon Supports through Carbon Surface Functionalization](#)

[Le Xin, Fan Yang, Zhe-Fei Li, Chengjun Sun, Lia Stanciu, Jian Xie](#)

[1558 High-Performance Pt Catalysts Supported on Polybenzimidazole-Grafted XC72 for Pemfcs](#)

[Zhe-Fei Li, Le Xin, Fan Yang, Jian Xie](#)

[1559 Influence of Temperature on the Oxygen Electroreduction Activity at Nanoporous Carbon Support](#)

[Rutha Jäger, Eneli Härk, Vahur Steinberg, Enn Lust](#)

1560 [\(Invited\) Graphene-Based Anode Material Design and Preparation Process for Lithium Ion Battery](#)

[Zi-Feng Ma, Tao Yuan, Jingjing Ma, Yu-Shi He, Xiao-Zhen Liao](#)

1561 [PEM Water Electrolysis - Durability Under Heavily Reduced Anode Catalyst Loading](#)

[Christoph Rakousky, Marcelo Carmo, Wiebke Maier, Detlef Stolten](#)

1562 [Sensitivity Analysis of a PEM Electrolyser Cathode with Respect to the Platinum and Nafion Loading](#)

[Paul Paciok, Christoph Rakousky, Marcelo Carmo, Wiebke Maier, Detlef Stolten](#)

1563 [Thin Oxide Film Reduction Via the Polyol Method: An Electrochemical Study of a Polyol Reduction Process](#)

[Hany El-Sayed, Vignesh Sureshwaran, Lukas Schuster, Hubert A Gasteiger](#)

1564 [Noble Metal Aerogel Design for Bio-/Fuel Cell Applications](#)

[Dan Wen, Chengzhou Zhu, Alexander Eychmüller](#)

1565 [Synthesis and Electrochemical Properties of IrO₂ Nanosheets](#)

[Wataru Shimizu, Takanobu Ishida, Syu Miyasaka, Yusuke Ayato, Wataru Sugimoto](#)

1566 [Novel Ni-Based Bifunctional Oxygen Catalysts for Metal Air Batteries and Alkaline Fuel Cells](#)

[Asa Logan Roy, Gabriel A. Goenaga, Nelly Margareth Cantillo, Shane Foister, Thomas A. Zawodzinski](#)

1567 [Supportless, Porous, Bismuth-Decorated Palladium Nanotubes with Enhanced Activity and Durability for Formic Acid Oxidation](#)

[Robert W. Atkinson, Alexander B. Papandrew, Thomas A. Zawodzinski](#)

[1568H₂O₂ Electroreduction at Platinum-Rare Earth \(RE = Ce, Sm, Dy, Ho\) Cathodes of Direct Borohydride Fuel Cells](#)

[Diogo M.F. Santos, David Cardoso, Biljana Sljukic, Cesar A.C. Sequeira, Daniele Macciò, Adriana Saccone](#)

[1569Understanding on Electrochemical Structure of Low Temperature Proton Exchange Membrane Fuel Cells](#)

[Shuang Ma Andersen](#)

[1570CO Adsorption/Desorption Studies on Thin Platinum Films By Electrical Resistance Measurements](#)

[Liangzhu Zhu, Lei Zhang, Siddharth Kapoor, Anil V. Virkar](#)

[1571\(Invited\) Fuel Cell Catalyst Development and Prospects of Refining Business in Tkk](#)

[Koichi Matsutani](#)

[1572Dynamic Structures of the Active Sites in Iron-Based Catalysts during ORR](#)

[Qingying Jia, Kara Strickland, Sanjeev Mukerjee, Hasnain Hafiz, Barbiellini-Amidei Bernardo, Urszula Tylus, Nagappan Ramaswamy](#)

[1573Combined Nitrogen Precursor Approach to Develop Cobalt-Based Non-Precious Catalysts for Polymer Electrolyte Fuel Cell Cathodes](#)

[Drew Christopher Higgins, Hoon T Chung, Urszula Tylus, Zhongwei Chen, Piotr Zelenay](#)

[1574Dual-Function Air Cathode for Metal-Air Batteries: Integrating Oxygen Reduction Catalysis with Pulse-Power Capability](#)

[Debra R. Rolison, Jeffrey W. Long, Christopher N. Chervin, Nathan W. Kucko, Eric S. Nelson](#)

[1575Preparations of Highly Stable Ru_xCo/CNTs Electrocatalysts for Oxygen Reduction Reaction](#)

[Dong Gao, Hengyi Li, Xuan Cheng](#)

[1576Different Carbide Derived Nanoporous Carbon Supports and Electroreduction of Oxygen](#)

[Eneli Härk, Margarita Russina, Nikolay Kardjilov, Ingo Manke, André Hilger, Rutha Jäger, Indrek Tallo, Thomas Thomberg, Heisi Kurig, Enn Lust](#)

[1577Synthesis and Characterization of Cu, Fe, Co Based Non-Precious Metal Catalysts for ORR in Alkaline Fuel Cells](#)

[Gabriel A. Goenaga, Asa Logan Roy, Nelly M. Cantillo, Shane Foister, Thomas A. Zawodzinski](#)

[1578Oxygen Reduction on Hafnium/Hafnium Carbide Nanoparticles](#)

[Olga A Baturina, Albert Epshteyn, Andrew Purdy](#)

[1579Pyrolysis Pressure Dependence of MNC Catalysts for Oxygen Reduction](#)

[Cenk Gumeci, Nathaniel Leonard, Barr Halevi, Scott Calabrese Barton](#)

[1580Inhibiting Effects of Nafion on ORR Catalyzed By Precious and Non-Precious Electrocatalysts Supported on Carbon](#)

[Jerzy Chlistunoff, José-María Sansiñena](#)

[1581Surface Confinement of Oxygen in Carbon Supported Oxygen Reduction Catalysts](#)

[Jerzy Chlistunoff, José-María Sansiñena](#)

[1582Nafion-SiO₂ Hybrids Combined with Pt-Sn/C Anodes for DEFC Operating at High Temperature](#)

[Mauro A. Dresch, Fabio C. Fonseca, Elisabete I. Santiago, Denis R.M. Godoi, Hebe M. Villullas](#)

1583 [Electrochemical Reduction of Carbon Dioxide on Single-Crystal Copper Membrane](#)

[Naoki Yoshihara, Mai Arita, Masaru Noda](#)

1584 [Selective Oxidation of Glycerol Using Au, Pd Mono and Bimetallic Nanoparticles Supported on Carbon Nanotube As Anode Catalysts in Anion Exchange Membrane Fuel Cells](#)

[Ji Qi, David J Chadderdon, Neeva Benipal, Yang Qiu, Xiaotong Han, Yibo Jiang, Wenzhen Li](#)

1585 [Catalyst Layer Architectures with Supportless Pt Hollow Spheres for Polymer Electrolyte Fuel Cells \(PEFCs\)](#)

[Didem Cilingir Dogan, Seong Hun Cho, Gu-Gon Park, Tae-Hyun Yang, Sung-Dae Yim](#)

1586 [Platinum-Dysprosium Alloys for Oxygen Reduction in Alkaline Media](#)

[Biljana Sljukic, Diogo M.F. Santos, Marta Martins, Cesar A.C. Sequeira, Daniele Macciò, Adriana Saccone](#)

1587 [Facile Synthesis and Performances of a CoSe₂/C Catalyst for the Oxygen Reduction Reaction](#)

[Dong jiang Zhao, Song yan Ma](#)

1588 [First Principles Investigation on the Phase Change Induced By Delithiation of Li₂Fe_{0.5}Mn_{0.5}SiO₄](#)

[Tiancheng Yi, Yunsong Li, Xuan Cheng, Ying Zhang](#)

1589 [Novel Gas Diffusion Layer for PEMFC Based on in-Situ Synthesized Carbon Nanofibers/Carbon Paper Composites](#)

[Junsheng Zheng, Yuan Gao, Jian-Xin Ma](#)

[1590Preparation and Performance Study of an Unsupported Pt Catalyst for Proton Exchange Membrane Fuel Cell](#)

[Licheng Ye, Junsheng Zheng, Tian Tian, Yuan Gao, Ping Li](#)

[1591Study of Water Retention Elevation on TiO₂ /Nafion Membrane By Using Dynamic AFM](#)

[Osung Kwon, ByungRak Son, Joogon Kim, Sam Park, Dong Ha Lee](#)

[1592Effects on Wetting Agents in Cationic Contamination and Mitigation in PEFCs](#)

[Jaehyung Park, Md. Aman Uddin, Selvarani Ganesan, Ugur Pasaogullari, Leonard J. Bonville](#)

[1593\(Invited\) Separator Requirements for Nonaqueous Flow Batteries](#)

[Robert M. Darling](#)

[1594Gas Permeation Study in Thin and Ultra-Thin Ionomer Films](#)

[Meron Tesfaye, Bryan D McCloskey, Adam Z Weber](#)

[1595Development and Characterization of Membrane and Catalyst Materials for the CuCl\(aq\)/HC\(aq\) Electrolytic Cell](#)

[Derek M. Hall, Roghayeh Lotfi, Soohyun Kim, Serguei N. Lvov](#)

[1596Next Generation Anion Exchange Membranes Based on Perfluorinated Polymer Backbones](#)

[Zachary Page-Belknap, Mei-Chen Kuo, Bryan S Pivovar, Andrew M Herring](#)

[1597Novel Hyperbranched Polymer-Based Anion-Exchange Membranes](#)

[Omar Movil-Cabrera, Logan Frank, John A Staser](#)

[1598Uni-Directional Orientation of Ionic Domains in Block Copolymer Electrolytes for Anisotropic Ion Transport](#)

[Christopher George Arges, Paul F. Nealey](#)

[1599Multiple Advance Diagnostics to Probe the Effect of Balance of Plant Materials on Fuel Cell Performance](#)

[Charles B Staub, Jason M Christ, Guido Bender, Clay S. Macomber, Heli Wang, Huyen N Dinh](#)

[1600Novel Gas Diffusion Layers with Separate Gas and Water Pathways for Pemfcs](#)

[Qianran He, Jie Li, Ling Li, Leon Shaw](#)

[1601Hybrid Inorganic/Organic Membranes for Medium Temperature PEM Fuel Cells](#)

[Miguel E. Córdova-Chávez, Eric M. Kelder, Stephen J. Picken](#)

I05-Solid-Gas Electrochemical Interfaces (SGEI 1)

High Temperature Materials/Energy Technology/Physical and Analytical Electrochemistry

[1602\(Invited\) Dissimilar Interfaces As a Driver to Oxygen Reduction on Perovskite Oxide Surfaces](#)

[Bilge Yildiz](#)

[1603Polarization Induced Changes in LSM Thin Film Electrode Composition Observed by In Operando Raman Spectroscopy and TOF-SIMS](#)

[Melissa D. McIntyre, Marie Lund Traulsen, Kion Norrman, Simone Sanna, Robert A Walker](#)

[1604Surface Segregation in Solid Oxide Electrode Materials Occurring at Intermediate Temperatures](#)

[John Druce, Helena Téllez, Tatsumi Ishihara, John A. Kilner](#)

[1605 Surface Segregation and Inter-Diffusion of Cations and Impurities in Microelectrodes for Solid Oxide Fuel Cells and Electrolyzers](#)

[Helena Téllez, John Druce, Yanuo Shi, Markus Kubicek, Neil J. Simrick, Jennifer L. M. Rupp, Tatsumi Ishihara, John A. Kilner](#)

[1606 Nature and Functionality of Oxygen/Cathode/Electrolyte-Interfaces in SOFCs](#)

[Julian Szász, Florian Wankmüller, Virginia Wilde, Heike Störmer, Dagmar Gerthsen, Norbert H. Menzler, Ellen Ivers-Tiffée](#)

[1607 Surface Composition of Layered Ruddlesden-Popper \$\text{La}_{n+1}\text{Ni}_n\text{O}_{3n+1}\$ \(\$n = 1, 2\$ and \$3\$ \) Epitaxial Films](#)

[Kuan-Ting Wu, Helena Téllez, John Druce, Mónica Burriel, Tatsumi Ishihara, John A. Kilner, Stephen J. Skinner](#)

[1608 \(Invited\) Oxygen Reduction Reaction at Cathodes on Proton Conducting Oxide Electrolytes: Contribution from Three Phase Boundary Compared to Bulk Path](#)

[Rotraut Merkle, Daniel Poetzsch, Joachim Maier](#)

[1609 \(Invited\) Properties of the Electrode-Ammonium Polyphosphate-Composite Interface at Temperatures up to 250°C](#)

[Berthold Benedikt Lothar Reeb, Ulrich Stimming](#)

[1610 Effect of \$\text{Gd}_{0.2}\text{Ce}_{0.8}\text{O}_{2-x}\$ Sintering Temperature on Formation of a \$\text{SrZrO}_3\$ Blocking Layer between \$\text{Y}_{0.16}\text{Zr}_{0.84}\text{O}_2\$, \$\text{Gd}_{0.2}\text{Ce}_{0.8}\text{O}_2\$ and \$\text{La}_{0.58}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_3\$](#)

[Virginia Wilde, Heike Störmer, Julian Szász, Florian Wankmüller, Ellen Ivers-Tiffée, Dagmar Gerthsen](#)

[1611 \(Invited\) Microreactors for Characterization and Benchmarking of Photocatalysts](#)

[Peter C. K. Vesborg, Fabio Dionigi, Daniel Bøndergaard, Thomas Pedersen, Kazunari Domen, Kazuhiko Maeda, Søren Dahl, Ole Hansen, Ib Chorkendorff](#)

[1612 Need for In Operando Characterization of Electrochemical Interface Features](#)

Marie Lund Traulsen, Christodoulos Chatzichristodoulou, Karin Vels Hansen, Luise Theil Kuhn, Peter Holtappels, Mogens Bjerg Mogensen

1613(Invited) Rate-Determining Step for Oxygen Reduction Reaction on Oxide Cathode in SOFC and Its Interpretation Based on Band Energy Diagram

Ayano Takeshita, Satoshi Okada, Shinya Sugiura, Shogo Miyoshi, Yasushi Shibuta, Shu Yamaguchi, Fuyuki Shimojo

1614(Invited) Molecular Understanding of Oxygen Exchange in Solid Oxide Fuel Cell Cathodes

Dane Morgan, Milind Gadre, Anh Ngo, Yueh-Lin Lee, Yang Shao-Horn, Stuart B. Adler

1615 Interfaces and Durability for Different LSCF/CGO/YSZ Systems for IT-SOFC

Cécile Rossignol, Guillaume Constantin, Pascal Briois, Alain Billard, Elisabeth Djurado, Laurent Dessemond

1616(Invited) Structure and Stability of Pt-Y Alloy Particles for Oxygen Reduction Studied by Electron Microscopy

Davide Deiana, Jakob Birkedal Wagner, Thomas Willum Hansen

1617(Invited) Theoretical Approach for Understanding Oxygen Reduction at the Cathode Surface of Solid Oxide Fuel Cell

Michihisa Koyama, Takayoshi Ishimoto

1618 Potential Distributions and the Corresponding Driving Forces for Transport in Cathodes of Solid Oxide Fuel Cells

Xingbo Liu, Wenyuan Li

1619(Invited) Determination of Effective Reaction Area in a Mixed-Conducting SOFC Cathode

Koji Amezawa, Yoshinobu Fujimaki, Takashi Nakamura, Katherine Develos- Bagarinao,

[Katsuhiro Yamaji, Kiyofumi Nitta, Yasuko Terada, Fumitada Iguchi, Keiji Yashiro, Hiroo Yugami, Tatsuya Kawada](#)

[1620\(Invited\) High Temperature CO₂ Electrolysis on La\(Sr\)Fe\(Mn\)O₃ Oxide Cathode by Using LaGaO₃ Based Electrolyte](#)

[Tatsumi Ishihara, Kuan-Ting Wu, Shijing Wang](#)

[1621Phase Field Simulation Coupling Microstructural Evolution and Crack Propagation during Performance Degradation of Solid Oxide Fuel Cells](#)

[Taufiq Abdullah, Lin Liu](#)

[1622Sulfur Tolerance of La_{0.3}M_{0.7}Fe_{0.7}Cr_{0.3}O_{3-δ} \(M= Sr, Ca\) Solid Oxide Fuel Cell Anodes](#)

[Paul Kwesi Addo, Beatriz Molero-Sanchez, Aligul Buyukaksoy, Scott Paulson, Viola Birss](#)

[1623Modeling Water Reduction on 10 Mole% Gadolinia-Doped Ceria \(GDC10\) Porous Electrodes](#)

[Honorio Valdes-Espinosa, Eric M. Stuve, Stuart B. Adler](#)

[1624Anodes Derived from Fluorite-Type and Perovskite-Type Metal Oxides for SOFCs](#)

[Venkataraman Thangadurai, Kalpana Singh, Hala Talaat Handal, Behzad Mirfakhraei](#)

[1625Impregnation Based Electrodes for Solid Oxide Fuel and Electrolysis Cells, the State-of-the-Art and Perspectives](#)

[Samir Boulfrad, Eman Husni Da'as, Lei Bi, Enrico Traversa](#)

[1626Impedance Spectroscopy Analysis of Ni/YSZ Interfaces Prepared by Liquid Precursor Deposition](#)

[Aligul Buyukaksoy, Viola Birss](#)

[1627\(Invited\) How Surface Ionic & Electronic Point Defects Control Oxygen Exchange Reactions](#)

[William C Chueh](#)

[1628\(Invited\) The Role of Solid-Gas Electrochemical Interfaces for Mixed Ionic Electronic Conducting Oxygen Transport Membranes](#)

[Stefan Baumann, Patrick Niehoff, Falk Schulze-Küppers, Madhumidha Ramasamy, Wilhelm A. Meulenber, Olivier Guillon](#)

[1629 Investigation of Infiltration via Multi-Physics Simulation Tool with Realistic Microstructure Properties](#)

[Tao Yang, Ismail Bektas Celik, Hayri Sezer, Shiwoo Lee, Kirk Gerdes](#)

[1630\(Invited\) Capabilities of Analytical Transmission Electron Microscopy for the Analysis of Structural, Chemical and Electronic Properties Exemplified by the Study of Y-Doped \(Ba,Sr\)\(Co,Fe\)O_{3-δ}](#)

[Matthias Meffert, Heike Störmer, Dagmar Gerthsen](#)

[1631 Modification of Oxygen/\(Ba_{0.5}Sr_{0.5}\)\(Co_{0.8}Fe_{0.2}\)O_{3-δ} Interfaces Derived by Metal-Organic Deposition](#)

[Koichi Asano, Christian Niedrig, Wolfgang Menesklou, Stefan F. Wagner, Ellen Ivers-Tiffée](#)

[1632 Optimizing Surface Segregation and Defect Structure of a Perovskite through Strain for Improving Oxygen Reduction and Evolution Catalysis](#)

[Celeste Anna Maria van den Bosch, George Frederick Harrington, Stephen J. Skinner, Ainara Agüero](#)

[1633\(Invited\) Enhancement of Surface Oxygen Exchange Kinetics for Pr_{0.1}Ce_{0.9}O_{2-δ} with Deposition of La or Sm Oxide](#)

[Liang Zhao, Nicola H. Perry, Kazunari Sasaki, Sean R. Bishop](#)

[1634 Surface Modification of \$\text{LaNi}_{0.6}\text{Fe}_{0.4}\text{O}_{3-\delta}\$ Film Electrode by \$\text{Ce}_{0.9}\text{Gd}_{0.1}\text{O}_{1.95}\$ Porous Layer](#)

[Riyan Achmad Budiman, Takamichi Miyazaki, Shin-ichi Hashimoto, Keiji Yashiro, Koji Amezawa, Tatsuya Kawada](#)

[1635 Study of Electrode Performance for Nanosized \$\text{La}_{0.4}\text{Sr}_{0.6}\text{Co}_{0.8}\text{Fe}_{0.2}\text{O}_{3-\delta}\$ IT-SOFC Cathode](#)

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[Nathan J Ray, Eduard G Karpov](#)

[1637 Oxygen Nonstoichiometry and Electrochemical Properties of \$\text{LaNiO}_{3-\delta}\$](#)

[Riyan Achmad Budiman, Shin-ichi Hashimoto, Takashi Nakamura, Keiji Yashiro, Koji Amezawa, Tatsuya Kawada](#)

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[1640 GDC-Infiltrated \$\text{La}_{0.3}\text{Ca}_{0.7}\text{Fe}_{0.7}\text{Cr}_{0.3}\text{O}_{3-\delta}\$ Symmetrical Oxygen Electrodes for Reversible SOFCs](#)

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[Jie Xu, Jiangyu Li, Stuart B. Adler](#)

[1643 Electrochemical Performance of 100cm² Class Direct Carbon-Molten Carbonate Fuel Cell \(DC-MCFC\)](#)

[Sun Hee Choi, Dong-nyeok Park, Hyung Chul Ham, Sung-Pil Yoon, Jonghee Han, Suk Woo Nam](#)

[1644 Anode-Supported Solid Oxide Fuel Cells Fabricated By Single-Step Reduced-Temperature Co-Firing](#)

[Hongqian Wang, Zhan Gao, Adam E Jakus, Ramille N Shah, Scott A Barnett](#)

[1645 Activation of Platinum-Based Centers through Modification with Metal Oxo Species toward Electrocatalytic Oxidation of Dimethyl Ether and Methanol](#)

[Iwona Agnieszka Rutkowska, Jakub P. Sek, Ewelina Marks, Piotr Zelenay, Pawel J Kulesza](#)

I06-State-of-the-Art Tutorial on Diagnostics in Low-Temperature Fuel Cells

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[1646 \(Invited\) Recent Topics on x-Ray Analysis of Fuel-Cell Catalysts](#)

[Hideto Imai](#)

[1647 \(Invited\) Understanding Fuel Cell Materials Degradation Via Advanced Electron Microscopy Techniques](#)

[Karren L. More](#)

[1648\(Invited\) Ionomer Membrane and Thin-Film Diagnostics](#)

[Ahmet Kusoglu, Adam Z Weber](#)

[1649\(Invited\) Water and Proton Dynamics in Perfluorinated Surfactants and Membranes by QENS](#)

[Sandrine Lyonnard, S. Berrod, A. Guillermo, Gerard Gebel, B. Améduri, B. Frick, J. Ollivier](#)

[1650\(Invited\) Imaging and Quantitative Chemical Mapping of PEM-FC Catalyst Layers By Scanning Transmission X-Ray Microscopy](#)

[Adam P Hitchcock](#)

[1651\(Invited\) Diagnostics of Microstructure and Properties of Polymer Electrolyte Fuel Cell Catalyst Layer](#)

[Atsushi Ohma, Tetsuya Mashio, Hiroshi Iden, Kazuyuki Sato, Yoshitaka Ono, Kei Sakai, Ken Akizuki, Yoshihisa Furuya, Kazuhiko Shinohara](#)

[1652\(Invited\) Limiting Current As a Tool to Study Oxygen Transport in PEM Fuel Cells](#)

[Daniel R. Baker, David A. Caulk](#)

[1653\(Invited\) Diagnostics of Fuel-Cell Performance Utilizing Simple Graphical Methods Based on Theoretical Limiting Cases](#)

[Mike L. Perry](#)

[1654\(Invited\) Accurate Measurement of the Water Content of Proton-Exchange Membrane Fuel Cells Using Neutron Radiography](#)

[Daniel S Hussey, David L Jacobson](#)

[1655\(Invited\) Measuring and Modeling Transport Processes in Porous Electrodes](#)

[Jeff T. Gostick](#)

[1656\(Invited\) Modeling of and Novel Approaches to Water Management in Polymer Electrolyte Fuel Cells](#)

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[1657\(Invited\) Segmented Cells: A Tool for Studying Fuel Cell Operation Heterogeneities, MEA Degradation Mechanisms, and Possible Mitigation Strategies](#)

[Gael Maranzana, Jérôme Dillet, Sofyane Abbou, Thomas Gaumont, Adrien Lamibrac, Sophie Didierjean, Jean-Christophe Perrin, Feina Xu, Olivier Lottin](#)

[1658\(Invited\) Diagnostic Methods Utilized in Accelerated Stress Testing of Polymer Electrolyte Membrane Fuel Cells](#)

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[1659\(Invited\) Mass Transport and Electrocatalysis: Experimental Techniques for Determining the Performance of Low Temperature Fuel Cell Electrocatalysts](#)

[Anthony R. J. Kucernak](#)

[1660\(Invited\) Combinatorial Study of Fundamental Electrocatalyst Performance - the Scanning Flow Cell Coupled to Online Analytics](#)

[Serhiy Cherevko, Anna K. Schuppert, Jan-Philip Grote, Simon Geiger, Aleksandar R. Zeradjanin, Gareth Keeley, Karl J.J. Mayrhofer](#)

[1661 Analysis of the Correlation Between Local Temperature and Observed Degradations during Durability PEMFC Tests for Automotive Application](#)

[Fredy Nandjou, Jean-Philippe Poirot-Crouvezier, Marion Chandesris, Jean-François Blachot, Céline Bonnaud, Yann Bultel](#)

[1662 Improvement of the Process Model for the Ohmic Loss of the Proton Exchange Membrane Fuel Cell](#)

[Seyed Mohammad Rezaei Niya, Ryan K. Phillips, Mina Hoorfar](#)

[1663Start up/Shut Down Cycles in a Segmented Polymer-Electrolyte-Membrane Fuel Cell](#)

[Maximilian Schwager, Shankar Raman Dhanushkodi, Walter Mérida](#)

[1664Spatially Resolved Electrochemical Impedance Measurement in a PEM Fuel Cell Using an Array of Reference Electrodes](#)

[Edward Brightman, Chao Lyu, Gareth Hinds](#)

[1665Cost Effective Fabrication and Characterization of in-Membrane Micro-Fuel Cell](#)

[Seyed Reza Mahmoodi, Ronald S. Besser](#)

[1666Mass Transfer Overpotentials in Dispersed Pt/C and De-Alloyed PtNi/C Polymer Electrolyte Fuel Cell Cathodes](#)

[Xiaohua Wang, Jui-Kun Peng, Rajesh Ahluwalia, Deborah J Myers, Zhiwei Yang](#)

[1667Investigating Local Temperature and Related Parameters in Large Area Pemfcs through a Pseudo-3D Physic-Based Model](#)

[Yann Bultel, Fredy Nandjou, Jean-Philippe Poirot-Crouvezier, Marion Chandesris](#)

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[1668Alkene Difunctionalization Via \$\beta\$ -Haloalkoxysulfonium Ions](#)

[Ryutaro Hayashi, Yosuke Ashikari, Toshiki Nokami, Akihiro Shimizu, Jun-ichi Yoshida](#)

[1669Cationic Polymerization Initiated By Electrochemically Generated Dendritic Cations](#)

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[1670Visible Light Responsive \$B_{12}\$ -TiO₂ Hybrid Catalyst Composed of Interfacial Complexation](#)

[Hisashi Shimakoshi, Shunsuke Yonemura, Yoshio Hisaeda](#)

1671 [Electrosynthesis of Heterocyclic Compounds By Radical Cyclization in Environmentally Friendly Media](#)

[J.P. Mendes, J.M. S.S. Esperança, A. P. Esteves, M. M. Silva, M.J. Medeiros](#)

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[Albert Joseph Fry, Elaine Tsui, Evan Baum, Boris Sheludko](#)

1673 [Electrochemical Reduction of Triclocarban at a Silver Cathode](#)

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1675 [Electrochemical Investigation of Benzil/Aluminum Ion Interactions](#)

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1676 [Sustainable Electrochemistry: From Lignin Processing to Paired Electrolysis Reactions](#)

[Bichlien H. Nguyen, Robert J Perkins, Jake A. Smith, Kevin D Moeller](#)

1677 [Nitrogen Containing O- and P-Quinones As Cathode Materials for Lithium Batteries](#)

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1678 [Electrochemical and Spectrophotometric Study of the Hydration of Orthophthalaldehyde and Its Reaction with Amines and Aminoacids](#)

[Kristýna Kantnerová, Joel Donkeng, Jiří Ludvík](#)

1679 [Electrocatalytic Aziridination of Alkenes in an Undivided Cell Mediated By Iodide](#)

[Chengchu Zeng, Jie Chen](#)

1680 [Electrochemical Reduction of 2,2',6,6'-Tetrabromobisphenol A at Silver Cathodes in Dimethylformamide](#)

[Benjamin Gerroll, Dennis G Peters](#)

1681 [The Selective Coupling and Quantification of Peptides on a Polymer-Coated Microelectrode Array](#)

[Matthew D. Graaf, Kevin D Moeller](#)

1682 [Insights into the Distance Dependence of the Electron Transfer Rate through the Monolayer Protecting Au₂₅ Nanoclusters](#)

[Flavio Maran, Sabrina Antonello, Tiziano Dainese, Marco De Nardi, Alfonso Venzo](#)

1683 [Effects of Electrolyte, Current Density and Electricity Consumption on the Anodic Oxidation of Cyclic Amides](#)

[James Y. Becker, Tatiana Golub](#)

1684 [Electrochemical Cyclization of Brominated Allyl Ethers with the Aid of a Chiral Catalyst](#)

[Erick Pasciak, Jonathan Rittichier, M. J. Medeiros, Michael VanNieuwenzhe, Dennis G Peters](#)

1685 [Electrochemical Character and Application of Halide Mediators Using CF₃CH₂OH As Solvent](#)

[Chiu Marco Lam, Chengchu Zeng, R. Daniel Little](#)

[1686](#)[Electrochemically-Induced Radical Cation Diels-Alder Reactions Assisted By "Redox Tag Strategy"](#)

[Yusuke Yamaguchi, Yohei Okada, Kazuhiro Chiba](#)

[1687](#)[Electrochemistry Vs. Photochemistry: A Mechanistic Comparison of the Nucleophilic Trapping of Radical Cations from Electron-Rich Olefin](#)

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[1688](#)[Electrochemical Reduction of Oligo-nitrocalix\[4\]Arenes - Molecules with Multiple Redox Centers, Different Conformations and Variable Shape](#)

[Jiří Ludvík, Alan Liška, Pavel Lhoták](#)

[1689](#)[Electrochemical Reduction of Flavones](#)

[M. J. Medeiros, Erick Pasciak, Muhammad Mubarak, Dennis G Peters](#)

[1690](#)[Electrochemical Explorations of 9,10-Anthraquinone/Hafnium\(IV\) Ion Interactions in Nonaqueous Solvents](#)

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[1691](#)[The Effect of Electron Transfer on a Strongly H-Bonded Ureidopyrimidinone Dimer](#)

[Diane K. Smith, Laurie A. Clare](#)

[1692](#)[Electronic Structure Effects on Electron Transfer Controlled Hydrogen Bonding in Substituted Dinitrobenzene Electrogenated Anions As Receptors for 1,3-Diethylurea](#)

[Eduardo Martinez-Gonzalez, Carlos Frontana](#)

[1693](#)[Electrochemical Behavior of Nitrobenzene in Aqueous CTAB](#)

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[1694\(Invited\) Electrochemical Detection of Collisions of Single Soft Nanoparticles-Emulsions and Viruses](#)

[Allen J. Bard, Byung-Kwon Kim, Aliaksei Boika, Jeffrey E. Dick](#)

[1695\(Invited\) Catalytically Accelerated Hydrogen Gas Detection at Electrodeposited Pd@Pt Nanowires](#)

[R. Penner](#)

[1696\(Invited\) Recent Progress in the Study of Single Molecule Electrochemistry Using Surface-Enhanced and Tip-Enhanced Raman Spectroscopy](#)

[Richard P Van Duyne](#)

[1697\(Invited\) The Use of Redox Nano-Titrations for Elucidating Reactive Heterogeneity on Electrodes for Energy Conversion and Charge Storage](#)

[Burton H Simpson, Jingshu Hui, Timothy Lichtenstein, Xuan Zhou, Joaquín Rodríguez-López](#)

[1698\(Invited\) Bioelectrocatalytic Oxidation of Sucrose with an Enzyme Cascade Assembled on a DNA Scaffold](#)

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[Ryan Jeffrey White](#)

[1700\(Invited\) Fluorescence-Enabled Electrochemistry of Single Molecules and Nanoparticles](#)

[Bo Zhang, Stephen Oja, Jin Lu](#)

[1701\(Invited\) Ultrasensitive Electroanalytical Detection and Study of Single Nanoparticle Catalysts](#)

[Keith J Stevenson](#)

[1702\(Invited\) Dendrite-Free Rechargeable Zinc-Based Batteries: Solving a Chronic Impediment through Architectural Design in 3D](#)

[Debra R. Rolison, Joseph F. Parker, Irina R. Pala, Christopher N. Chervin, Eric S. Nelson, Jeffrey W. Long](#)

[1703\(Invited\) Operando Methods for the Study of Energy Materials](#)

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[1704\(Allen J. Bard Award\) The Electrochemical Nucleation and Physical Behavior of Hydrogen Nanobubbles](#)

[Henry S White, Qianjin Chen, Sean R. German, Hilke Wiedenroth, Long Luo, Stephen W. Feldberg](#)

[1705 Voltammetric and Impedance Investigation of Vanadium Oxidation States in Sulfuric Acid](#)

[Petr Vanýsek, Vitězslav Novák, Ladislav Chladil](#)

[1706 Effect of CO Poisoning of PEM Fuel Cell Anode on Impedance Spectra-Simulations](#)

[Fathima Fasmin, Srinivasan Ramanathan](#)

[1707 Interpreting Impedance Spectra in Time-Constant Domain: Application to the Passive Film on Titanium](#)

[Qing Ni, Steven J. Thorpe, Donald W. Kirk](#)

1708 [Artefacts in Electrochemical Impedance Measurements Due to Stray Capacitances](#)

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1709 [Contact Lens Biofuel Cell Tested in Conditions Similar to Human Eyes](#)

[Russell C Reid, Shelley D. Minteer, Bruce K. Gale](#)

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[Yang Bae Jeon, Fusheng Tang, Jin Wook Lee](#)

1711 [Quantifying Single Human Cancer Cell Redox State By Scanning Electrochemical Microscopy](#)

[Sabine Kuss, Dao Trinh, Janine Mauzeroll](#)

1712 [Redox Triggered Vesicles a Promising Approach for Drug Delivery](#)

[Tomer Noyhouzer, Chloé L'Homme, Sabine Kuss, Heinz-Bernhard Kraatz, Sylvain Canesi, Janine Mauzeroll](#)

1713 [Electrochemical Modification of Carbon Surfaces with Functional Polymers](#)

[Anando Devadoss, Cuihua Xue, Han-Kuan Tsai](#)

1714 [Electrochemical Sensors for Continuous Monitoring of Bacterial Infections](#)

[Edgar D. Goluch, Thaddaeus A. Webster, Hunter J. Sismaet](#)

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[Olga Tkacheva, Andrey Suzdaltsev, Andrey Nikolaev, Yurii Zaikov, Yuriy Shtefanyuk, Vitaliy Pingin, Dmitriy Vinogradov](#)

[1716\(Europe Section Alessandro Volta Medal\) Electrochemical SERS on Nanostructured Surfaces and its Application to DNA Detection and Discrimination](#)

[Philip N. Bartlett](#)

[1717Electrochemical Reduction of CO₂ to CO with High Selectivity Using an All Solid-State Electrolyzer Cell](#)

[Tyler Scott Matthews, Marina Kaplun, Zengcai Liu, Qingmei Chen, Robert Kutz, Sean M. Luopa, Krzysztof A. Lewinski, Richard I Masel](#)

[1718Optimization and Characterization of the Solar Thermal Electrochemical Conversion of Calcium Carbonate into Calcium Oxide for STEP Cement](#)

[Jason Lau, Omar El-Ghazawi, Jiawen Ren, Fang-Fang Li, Stuart Licht](#)

[1719Order and Epitaxy during Electrochemical Layer By Layer Growth of Semiconductor Thin Films](#)

[Francesco Carlà, Roberto Felici, Andrea Magrini](#)

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[Masahiro Kunimoto, Risa Tamura, Takahiro Oyanagi, Nobufumi Matsuo, Yasuhiro Fukunaka, Hiromi Nakai, Takayuki Homma](#)

[1721Analysis of Electrochemical Reactions on Irregular Pores Structures Relevant to Batteries and Fuel Cells Electrodes](#)

[Njideka Helen Okoye, Yung-way Liu, Pedro E Arce](#)

[1722Mixed Ionic / Electronic Conductivity of Electrolyte-Modified Carbon/Zirconia Composites](#)

[Jamie A Shetzline, Stephen Creager](#)

[1723Localized Investigations of the Electrochemical Properties of Lithium Battery Materials Using Micro-Pipets](#)

Michael Edward Snowden, Janine Mauzeroll, Steen Brian Schougaard

1724Monitoring Mechanical Modulation of Reactivity in Electrocatalysis

Qibo Deng, Joerg Weissmueller

1725Determining Microwire Morphology and Current Transient Trends from Single Microwire Electrodeposition

Tim Zhang, Eli Fahrenkrug, Stephen Maldonado

1726Evaluation of Corrosion Mechanisms at the Bone-Metal Interface of Hip Implants

Maria J Runa, Mathew T Mathew, Luis A Rocha

1727Plamonic-Based Electrochemical Imaging of the Crystal Facets of Single Metallic Nanoparticles

Yixian Wang, Xiaonan Shan, Nongjian Tao

1728Understanding of Rate-Limiting Behavior and of Diffusion in Commercial LiCoO₂ Electrodes Via Electrochemical Impedance Spectroscopy

Kazi Rakib Ahmed, Mihri Ozkan, Cengiz Ozkan

1729Photoelectrocatalysis Applied in Water Disinfection Contaminated By C. Parapsilosis using Nanoporous Electrodes of W/WO₃ Prepared By Electrochemical Anodization

Bárbara Araújo Souza, Thais Tasso Guaraldo, Maria Valnice Boldrin Zanoni

1730Synchronization of Current Oscillations in Dual-Anode Dissolution System in the Presence of a Common Cathode Electrode

Michael Joseph Hankins, Mahesh Wickramasinghe, Istvan Z Kiss

1731Determination of Inorganic Arsenic As(III) in Water By Anodic Stripping Linear Sweep Voltammetry Using Gold Ultra-Microelectrode Array

[Quyet Nguyen Duong, Nghiem Van Le, Thuong Dinh Le, Hoang Thai Nguyen, Hien Duy Tong, Thoa Thi Phuong Nguyen](#)

1732 [Visible Light-Induced Photoelectrocatalytic Degradation of 4-Nitrophenol on BiVO₄/Carbon Nanotube Electrode](#)

[Francisco Wirley Paulino Ribeiro, Lucia Helena Mascaro, Suellen Aparecida Alves](#)

1733 [Physical and Electrochemical Properties of Room-Temperature Ionic Liquids Containing Allyl-Based Phosphonium Cations and Bis\(fluorosulfonyl\)Amide Anion](#)

[Katsuhiko Tsunashima, Yuki Sakai, Masahiko Matsumiya](#)

1734 [Synchronization Patterns of Oscillatory Nickel Dissolution in Microfluidic Flow Cell with Branched Channel](#)

[Yifan Liu, Jasmine Coleman, Istvan Z Kiss](#)

1735 [Rotational Waves in an Oscillatory Electrochemical System](#)

[Michael L Sebek, Istvan Z Kiss](#)

1736 [Volammetric and Chronopotentiometric Study of Nonstationary Process on Oxygen-Evolving Anodes in KF-Naf-AlF₃-Al₂O₃](#)

[Andrey Suzdaltsev, Andrey Khramov, Oksana Limanovskaya, Yuriy Zaikov, Valentin Nekrasov](#)

1737 [Non-Precious Metal Catalysts for the Oxygen Reduction Reaction](#)

[Jason A. Varnell, Edmund C. M. Tse, Andrew A. Gewirth](#)

1738 [Accumulation of Naturally-Occurring Radionuclide Polonium-210 By Phytoplankton in Urban Sea Bays](#)

[Daniel Peydus, Galyna Evdokymovna Lazorenko, Vladimir Sergeevich Mychanov](#)

[1739The Electrochemical Properties of Diamond and Tetrahedral Amorphous Carbon Electrodes in Room Temperature Ionic Liquids](#)

[Greg M Swain, Romana Jarosova, Catherine Munson](#)

[1740Electrochemical Properties of Bi\(111\)|1-Ethyl-3-Methylimidazolium Tetracyanoborate and 1-Ethyl-3-Methylimidazolium Iodide Interface](#)

[Carolin Siimenson, Liis Siinor, Enn Lust](#)

[1741In Situ STM Studies of Electrochemically Polished Cd\(0001\) Electrode in 1-Ethyl-3-Methylimidazolium Tetrafluoroborate](#)

[Piret Pikma, Simona Selberg, Liis Siinor, Carolin Siimenson, Enn Lust](#)

[1742Electrochemical Characterization of the Bi\(111\) | 1-Butyl-3-Methylimidazolium Iodide Interface](#)

[Liis Siinor, Laura Läll, Enn Lust](#)

[1743Local Generation of Reactive Oxygen Species at New Polymer-Modified Electrodes](#)

[Gunther Wittstock, Saustin Dongmo, Julia Witt, Carsten Dosche](#)

[1744Composites of Polypyrrole with Micelles Nanospheres](#)

[Piotr Gryczan, Krzysztof Maksymiuk, Anna Kisiel, Agata Michalska](#)

[1745The Impact of the Alkali Cation on the Oscillatory Electro-Oxidation of Ethylene Glycol on Platinum](#)

[Elton Sitta, Raphael Nagao, Istvan Z Kiss, Hamilton Varela](#)

[1746Low-Cost, Fused Filament Fabrication-Prepared, 3D-Printed Microfluidic Devices with Modularly Integrated Electrodes for Electroanalytical Measurements](#)

[Gregory William Bishop, Jennifer E Satterwhite, Snehasis Bhakta, James F Rusling](#)

[1747In-Situ x-Ray Diffraction Study of Pt\(111\) Oxidation during Oxygen Reduction Reaction \(ORR\)](#)

[Jakub Drnec, Martin Ruge, Finn Reikowski, Bjorn Rahn, Francesco Carlà, Roberto Felici, Jochim Stettner, Olaf M. Magnussen, David A. Harrington](#)

[1748Electrochemical Activity of Titanium Dioxide Toward Oxygen Reduction and Evolution Reactions](#)

[Hadi Tavassol, Sossina M Haile](#)

[1749Comparison of Processes for the Degradation of Trans-Cinnamic Acid: Anodic Oxidation, Electro-Fenton and Photoelectro-Fenton](#)

[Nelly Esther Flores, Enric Brillas, Ignasi Sirés](#)

[1750Photoelectrochemical Degradation of 17- \$\beta\$ Estradiol Using a Photoanode Prepared with RuO₂ Nanoparticles Supported over Graphene](#)

[Fernando Cruz Moraes, Bruno Rossi, Ernesto Chaves Pereira](#)

[1751Manipulation of Nanoscale Pattern Formation in Photoelectrochemically Deposited Chalcogenide Films Using Multiple Beam Illumination](#)

[Azhar Carim, Nicholas Batara, Anjali Premkumar, Harry A Atwater, Nathan S. Lewis](#)

[1752Enhancement of Water Oxidation at Tungsten Oxide Photoanodes Doped with Borotungstate-Polyanion Modified-Hematite](#)

[Krzysztof Miecznikowski, Alejandra Ramirez-Caro, Sebastian Fiechter, Pawel J Kulesza](#)

[1753Cobalt Phosphate Group Modified Hematite Nanorod Array As Photoanode for Efficient Solar Water Splitting](#)

[Li Fu, Hongmei Yu, Changkun Zhang, Zhigang Shao, Baolian Yi](#)

[1754Physical-Chemical Properties of the NaF-AlF₃-Sc₂O₃-Al₂O₃ Molten System](#)

[Olga Tkacheva, Alexander Kataev, Alexander Redkin, Yurii Zaikov](#)

1755 [Benchmarking of Heterogeneous CO₂ Reduction Reaction Electrocatalysts](#)

[Ivonne M. Ferrer, Charles C L McCrory, Jonas C Peters, Thomas F Jaramillo](#)

1756 [Exceptionally Fast Hydrogen Absorption and Desorption through Platinum Overlayers](#)

[Piotr Polczynski, Rafal Robert Jurczakowski](#)

1757 [The Electrified Oil/Water Interface in the Presence of Divalent Ions](#)

[Diana Diaz-Romero, Monica Olvera de la Cruz, Guillermo Ivan Guerrero-Garcia](#)

1758 [NaCl Augmented Phase Transformation in Interfacial Water Under Quasistatic-Loading Conditions](#)

[Shah Haidar Khan, Peter Manfred Hoffmann](#)

1759 [Investigation of Quantum Confinement in Lead Sulfide Quantum Dots, through Cyclic Voltammetry](#)

[Santosh K Haram, Yogini D Gujarathi](#)

L03-Computational Electrochemistry

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1760 [Calculating the Proton Transport and Dielectric Properties of Phosphates and Related Materials](#)

[Mark E. Tuckerman](#)

1761 [New Method to Determine Eley-Rideal Barriers for 2e⁻ and 4e⁻ Oxygen Reduction Reactions in Fuel Cells](#)

[Ted H. Yu, Ho-cheng Tsai, Sundararaman Ravishankar, William A Goddard](#)

[1762Molecular Dynamics Study for Lithium Ion Diffusion in Layered \$\text{Li}_x\text{CoO}_2\$ \(\$x=0.5\sim 1.0\$ \)](#)

[Shinnosuke Hattori, Toshiyuki Kunikiyo, Yuichi Tokita](#)

[1763Multiscale Modeling of the Electrode/Electrolyte Interface Using Charge Optimized Many Body \(ECOMB3\) Potentials](#)

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[1877\(Invited\) Making Electrochemical Research Accessible to an Undergraduate Audience](#)

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[1881Electrochemical and UV-Visible Spectroscopic Studies of Self-Organized Gold Nanoparticle~Cytochrome C Superstructures](#)

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L06-Electrochromic and Chromogenic Materials

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2044 [Decoupling Ion and Proton Transport from Structural Relaxation in Polymers and Ionic Liquids](#)

[Alexei Sokolov](#)

2045 [High Transference Number Composite Lithium Electrolytes: From "Soggy Sand" to Electrolytes to Infiltrated Mesoporous Silica](#)

[Jelena Popovic, Joachim Maier](#)

2046 [Interplay Between Vibrational Modes and Relaxations in Electrolytes for Secondary Magnesium Batteries Based on Haloaluminate Ionic Liquids](#)

[Fatemeh Sepehr, Federico Bertasi, Stephen J. Paddison, Vito Di Noto](#)

2047 [The Relationship Between Segmental Motions, Hydration and Overall Mass Transport in Pfsas](#)

[Thomas A. Zawodzinski, Ramez A. Elgammal, Yujia Bai](#)

2048 [Understanding Transport Phenomena in Perfluorosulfonic-Acid Membranes](#)

[Adam Z Weber, Jeff T. Gostick, Ahmet Kusoglu, Andrew Crothers](#)

2049 [Interfacial Structure of Nafion](#)

[Joseph A. Dura, Steven C DeCaluwe, Paul Kienzle](#)

2050 [Hybrid Polymer Electrolytes Based on Linear Siloxane Networks and Crosslinked Polyether Domains: Interplay Between Composition and Properties](#)

[Nicola Boaretto, Christine Brinkmann, Keti Vezzù, Vito Di Noto, Henning Lormann](#)

[2051 Ion-Conduction within the Fibrous Framework of an Electrospun PEO Gel Electrolyte](#)

[Robert B Moore](#)

[2052 First-Principles Molecular Dynamics Studies of Proton Transport in Hydrogen-Bonded Media](#)

[Mark E. Tuckerman](#)

[2053 Charge Transport and Structural Dynamics in Polymerized Ionic Liquids](#)

[Joshua R Sangoro, Stephen J. Paddison](#)

[2054 Understanding Polymer Ion Clustering and Its Implications for Fast Ion Transport in Polymer Electrolyte Membranes](#)

[Andrew M Herring, Vito Di Noto](#)

[2055 Structure and Transport Properties of Ionomer Thin Films in Membrane-Electrode Assemblies](#)

[James A Elliott](#)

[2056 Ionic Conduction and Dielectric Relaxation in Poly\(ethylene carbonate\)-Li Salt Electrolytes](#)

[Yoichi Tominaga](#)

[2057 Toward a Single-Ion Nanocomposite Electrolyte for Lithium Batteries](#)

[Hui Zhao, Gregory Baker, Gao Liu](#)

[2058 Ionic Conductivity of Fe\(II\)-, Co\(II\)- and Ni\(II\)-Based Metallo-Supramolecular Polymers with a One- or Three-Dimensional Structure](#)

[Rakesh Kumar Pandey, Md. Delwar Hossain, Satoshi Moriyama, Takashi Sato, Masayoshi Higuchi](#)

2059 [Study of Morphological Variation on SiO₂/Nafion Composite Membrane Under Different Hydration Condition](#)

[Osung Kwon, ByungRak Son, Joogon Kim, Dong Ha Lee](#)

M01-Nano/Biosensors and Actuators

Sensor/Physical and Analytical Electrochemistry

2060 [Detection of Mercury with a Surface-Enhanced Raman Scattering Biosensor](#)

[Peng Zheng, Nick Wu](#)

2061 [Nanoparticle Imprinted Polymers As Sensing Layers for Size-Selective Recognition of Silver Nanoparticles](#)

[Julia Witt, Daniel Mandler, Gunther Wittstock](#)

2062 [Aptamer-Based Electrochemical Biosensors for Marine Toxins](#)

[Shimaa Eissa, Mohamed Siaj, Mohammed Zourob](#)

2063 [Label-Free Electrochemical Aptasensor for the Sensitive Detection of Cyanotoxin Anatoxin-a](#)

[Reda Elshafey, Mohamed Siaj, Mohammed Zourob](#)

2064 [Fabrication of Electrochemical Biosensor for Cholesterol Using CNT-Gold Nanohybrid Buckypaper](#)

[Jhunu Chatterjee, Hunter Biggs](#)

2065 [What Determines the Detection Limit during Impedance Biosensing?](#)

[Ian Ivar Suni](#)

[2066Enzyme-Based Nitric Oxide \(NO\) Releasing Surfaces: Nitric Oxide Synthase As a Source of Catalytic NO Release in Polymeric Films and in Electrospun Fibers](#)

[Mekki Bayachou, Bhagya Gunsekera, Sarah Wojciechowski](#)

[2067Development of Electrochemical and Optical Based Biosensors](#)

[Vinay Gupta, Gurpreet Kaur, Ayushi Paliwal, Manvi Tak, Anjali Sharma, Monika Tomar](#)

[2068Layer-By-Layer Assembled Enzyme Cascade for Catalyzing Oxidation of Sucrose for Biofuel Cells](#)

[Yuanyuan Zhang, Mary Arugula, Shannon Williams, Aleksandr Simonian](#)

[2069Electrochemical Detection of Four Prominent Tuberculosis Biomarkers Using Functionalized Titania Nanotubular Array Sensing Platform](#)

[Dhiman Bhattacharyya, York R. Smith, Swomitra K. Mohanty, Mano Misra](#)

[2070Application of Polymer-Modified Electrode As Biosensor](#)

[A. A. Shaikh, S. K. Saha, P. K. Bakshi, A. J. Saleh Ahammad](#)

[2071Development of Prognostic Criteria of Kidney Transplantation Complications Based on Open-Circuit Potential Monitoring Using Probit Analysis](#)

[Anatoly K. Evseev, Aleksandr N. Elkov, Michael M Goldin, Alexey V. Pinchuk, Mojtaba Mirzaeian, Mark M Goldin](#)

[2072Pt-Decorated Fluorine-Doped Tin Oxide Nanowire Arrays As Highly Sensitive H₂O₂ sensor Electrodes](#)

[Shih-Yuan Lu, Kuan-Ting Lee, Yu-Chun Lo, Yung-Yung Liang, Nobuhiro Matsushita, Toshiyuki Ikoma](#)

[2073Development of Multi-Parametric/Multimodal Spectroscopy Apparatus for Characterization of Functional Interfaces](#)

[Lang Zhou, Mary Arugula, Aleksandr Simonian, Christopher J Easley, Curtis Shannon](#)

[2074 Facile Hydrothermal Synthesis of \$\text{In}_2\text{O}_3\$ Nanoboxes for Electrochemical Sensing of Paraben](#)

[Jahangir Ahmad Rather, Ahsanulhaq Qureshi](#)

[2075 Glassy Carbon Electrode As a Promising Sensor for Healthcare and Environmental Monitoring](#)

[Sanghamitra Chatterjee, Aicheng Chen](#)

[2076 Mixed Self-Assembled Monolayers of Mercaptoundecanoic Acid and Thiolactic Acid for the Construction of an Enzymatic Biosensor for Hydroquinone Determination](#)

[Christiana Andrade Pessoa, Cleverson Siqueira Santos, Rosana Mossanha](#)

[2077 Nano-Asterisks of Vanadium Dioxide As Electrodes for TNT Detection](#)

[David Cliffler, Matthew Casey, Aaron Daniel](#)

[2078 Improving the the Actuation of Polymeric Artificial Muscles Using Magnetically Aligned Polyelectrolytes](#)

[Mohammad Mahdi Hasani-Sadrabadi, Karl I Jacob](#)

[2079 Simultaneous Detection of Hydrogen Peroxide Production and Oxygen Consumption By Electrochemical Method in THP-1 Cells during Respiratory Burst](#)

[Shigenobu Kasai, Makoto Suzuki, Hiroyuki Kikuchi, Ankush Prasad, Kumi Y. Inoue, Mika Tada, Masaki Kobayashi, Tomokazu Matsue](#)

[2080 Carbon Paste Biosensors Modified with Titanium Dioxide Nanoparticles for the Determination of Acids, Antioxidants and Glucose in Grapes](#)

[Cristina Garcia-Cabazon, Raquel Muñoz, Celia Garcia-Hernandez, Cristina Medina-Plaza, Yolanda Blanco-Val, Jose Antonio de Saja, Fernando Martin-Pedrosa, Maria Luz Rodriguez-Mendez](#)

[2081Preparation of PdCu Decorated Screen Printed Carbon Electrodes for Non-Enzymatic Hydrogen Peroxide Sensors](#)

[Aytekin Uzunoglu, Austin D Scherbarth, Lia Stanciu](#)

[2082Surface Plasmon Resonance \(SPR\) of Reusable DNA LOOP Formation Dynamics](#)

[Fuling Yang, Mary Arugula, Subramaniam Somasundaram, Christopher J Easley, Curtis Shannon, Aleksandr Simonian](#)

[2083Biosensors for Detecting Genetically Modified Organisms in Food and Feed](#)

[Alina Chanysheva, Mary Arugula, Kiril Vaglenov, Aleksandr Simonian](#)

[2084Using of Humic Acid and Platinum Nanoparticle As Surface Modifier for the Construction of a Electrochemical Sensor Using in Detection of Ethinylestradiol](#)

[Karen Wohnrath, Monalisa dos Santos, Vagner dos Santos, Sergio Toshio Fujiwara, Elizabeth Weinhardt Scheffer, Jarem Raul Garcia](#)

[2085Development of Electrochemical Aptamer-Based Biosensors for the Detection of Hormonal Contaminants in Water](#)

[Gaston Contreras Jiménez, Shimaa Eissa, Andy NG, Mohammed Zourob, Mohamed Sij](#)

M02-Nano-Micro Sensors and Systems in Healthcare and Environmental Monitoring

Sensor/Organic and Biological Electrochemistry

[2086\(Plenary\) Paper Amperometric Systems for e-Diagnostics](#)

[Anthony Peter Francis Turner](#)

[2087\(Keynote\) Paper-Based Lateral Flow Strips Toward Point-of-Care Detection of Biomolecules](#)

[Nick Wu, Peng Zheng, Xuefei Gao](#)

[2088A Fully Inkjet-Printed Carbon Nanotube Electrochemical Sensor on Paper](#)

[Tallis H. da Costa, Ryan P. Tortorich, Edward Song, Jin-Woo Choi](#)

[2089Rapid Detection of Fluoride in Potable Water](#)

[Ravi Chavali, Naga Siva Gunda, Selvaraj Naicker, Sushanta Mitra](#)

[2090Electrically Conducting PDMS Nanocomposite Using in-Situ Reduction of Gold Nanostructures and Mechanical Stimulation of Carbon Nanotubes](#)

[Jayan Ozhikandathil, Ajit Khosla, Muthukumaran Packirisamy](#)

[2091Self-Propelled Nanorockets for Water Monitoring and Pollutants Purification](#)

[Tianlong Li, Longqiu Li, Lin Wang, Guangyu Zhang](#)

[2092Visual Nanosensor for the Detection of Heavy Metals in Water](#)

[Corie Horwood, David Cramb, Viola Birss](#)

[2093\(Keynote\) Single Gold Nanowire Electrodes for Electrochemical Based Biosensing Applications](#)

[Alan O' Riordan, Sean Barry, Niamh Creedon, Armelle Montrose, Benjamin O'Sullivan](#)

[2094All Silicon Gas Chromatographic Column for Fast Separation of VOCs Released By Armillaria Fungus](#)

[Milad Navaei, Peter Hesketh, Jie Xu, Alireza Mahdavifar, Jean Marie Dimandja, Gary McMurray](#)

[2095Multimode Microsensors Based on Carbon Matrices for the Screening of Whole Blood for IL-6](#)

[Raluca-Ioana Stefan-van Staden, Livia A Gugoasa](#)

[2096In Vivo Glucose Measurement Using Fine Needle Type Amperometric Glucose Sensor](#)

[Mikito Yasuzawa, Kazuaki Edagawa](#)

[2097\(Plenary\) High Efficiency Coupling of Chemical Sensing to Chemical Treatment in Low-Dimensional Nanofluidic Structures](#)

[Wei Xu, Dane A. Grismer, Lawrence P. Zaino, Chaoxiong Ma, Erick Foster, Paul W. Bohn](#)

[2098\(Keynote\) Dielectrophoresis: Exploring the 2nd Frontier™ of Its Application in the Biomedical Sciences](#)

[Ronald Pethig](#)

[2099New Advances and Opportunities of Magnetohydrodynamic Microfluidics](#)

[Christena K. Nash, Adair Claycomb, Foysal Khan, Benjamin J. Jones, Joshua Hutcheson, Timothy J. Muldoon, Ingrid Fritsch](#)

[2100Fabrication of Polysaccharide-Based Nanoparticles As Drug Delivery Nanocarriers](#)

[Suh Cem Pang, Suk Fun Chin, Ain Nadirah, Soon Hiang Tay, Siti Nur Akmar Mohd Yazid](#)

[2101Artificially Tailored Plasmonic Nanostructures for High-Performance Biosensing Devices](#)

[Aswini K Pradhan](#)

[2102Flexible Micro-Sensor Array for the Non-Invasive Monitoring of 3D Pressure Fields](#)

[Thi Hong Nhung Dinh, Pierre-Yves Joubert, Emile Martincic, Elisabeth Dufour-Gergam](#)

[2103Rapid Prototyping of Electrochemical DNA Detection Sensors](#)

[Stephen Woo, Christine Gabardo, Leyla Soleymani](#)

[2104A Miniature Sensor Integrating Multiple Detection Technologies for Evaluating Water Pollution](#)

[Sujittra Poorahong, Florent Lefèvre, Marie-Claude Perron, Philippe Juneau, Ricardo Izquierdo](#)

[2105\(Plenary\) Wearable Wireless Textile Based Nanosensor System for Early Detection of Concussion and Cardiac Arrest of Football Players](#)

[Vijay K Varadan](#)

[2106\(Keynote\) Near-Zero-Power Electrochemical Sensors for Wearable Wireless Health, Safety, Surveillance and Environmental Electronics](#)

[Joseph R Stetter, Michael T Carter, Edward F Stetter](#)

[2107A Novel Viscometer Based on Self-Propelled Nanomotor](#)

[Longqiu Li, Tianlong Li, Jiyuan Wang, Guangyu Zhang](#)

[2108\(Keynote\) Oxygen Sensing Microfluidic Structures for Biomedical and Environmental Science Research](#)

[Jay W Grate, Ryan Kelly, Norm Anheier, Jonathan Suter, Tom Schmidt, Andreas Vasdekis](#)

[2109 Estimation of Crystalline Structure and Gas Transport Properties of Crystalline Fluorinated Copolymer](#)

[Go Matsuba, Tatsuki Nyuui, Shuichi Sato, Kazukiyo Nagai](#)

[2110 Magnetoelastic Biosensors for Real-Time, Wireless Pathogen Detection on Surfaces](#)

[Yating Chai, Shin Horikawa, JiaJia Hu, Bryan A Chin](#)

[2111 Antibody-Free Electrochemical Detection of Cortisol Using Molecularly Imprinted Polymer](#)

Pandiaraj Manickam, Syed Khalid Pasha, Shekhar Bhansali

2112(Invited) A Brief Overview of Smart Microsystem Technology and Its Application to Fire Detection, Air Quality Monitoring, Health Care, and Emissions Monitoring

Gary W Hunter

2113(Invited) Nanobiosensors for Healthcare and Environmental Monitoring

Zoraida Pascual Aguilar

2114(Invited) Microneedle Array Features in Precise Moulding of Biocompatible Polymers

Hiroshi Ito, Kentaro Taki, Tetsuo Takayama, Kazuyasu Uchiumi, Haruki Yahagi

2115Integrated Micro-Heater Solid State Based NO₂ Gas Sensors with Enhanced Response

Anjali Sharma, Avneet Singh, Reema Gupta, Lokesh Rana, Monika Tomar, Vinay Gupta

2116(Invited) Design and Characterization of a New Low Cost Thick Film Copper Metallization Transfer Process Onto PDMS Enabling Stretchable Electronics

Daniel Hilbich, Gary Yu, Bonnie L. Gray, Lesley Shannon

2117Non-Invasive Sensor for Quantitative Determination of Lactate in Sweat

Rubi Figueroa-Teran, Sofia Babanova, Nia Petseva, Yevgenia Ulyanova, Sameer Singhal, Plamen Atanassov

2118Development of Biofilm-Based Electrocatalytic Materials for Biosensing and Bioenergetics

Pawel J Kulesza

2119Point-of-Care Sensor with Interdigitated Array Electrodes for Lead Determination

[Wenjing Kang, Xing Pei, Adam Bange, Erin Haynes, William R. Heineman, Ian Papautsky](#)

2120 [Improved Anodic Stripping Voltammetric Determination of Arsenic Using Nanoporous Gold Microelectrode](#)

[Junhua Jiang](#)

2121 [Peroxyinitrite Sensing: From Graphene-Based Platforms to Modified Boron-Doped Diamond Electrodes](#)

[Mekki Bayachou, Haitham Kalil](#)

2122 [Pattern Recognition of HER-2 in Whole Blood Samples Using Stochastic Sensors](#)

[Iuliana Moldoveanu, Raluca-Ioana Stefan-van Staden](#)

2123 [\(Invited\) A Chemiresistive Glucose Sensor Based on Polyaniline Nanowire Network](#)

[Edward Song, Jin-Woo Choi](#)

2124 [Nanostructured Sensors for Determination of 3-\(3,4-Dichlorophenyl\)-1,1-Dimethylurea Based in Molecularly Imprinted Polymers \(MIPs\) Deposited in Screen Printed Carbon Nanotubes](#)

[Juan Carlos Morales Gomero, Rey Fernández Cori, Bryan Carlos Huayhuas Chipana, Pilar Taboada Sotomayor](#)

2125 [A New Kind of SERS Active Substrate Using a Film of Densely Packed Gold Nanoparticles](#)

[Gugu Rutherford, Monique Farrell, Bo Xiao, Christian G Carvajal, Kevin Santiago, Aswini K Pradhan](#)

2126 [\(Invited\) Silicon Nanowire and Graphene Field-Effect Transistors for Sensing Applications](#)

[Alexey Tarasov, Mathias Wipf, Ralph L. Stoop, Kristine Bedner, Wangyang Fu, Michel Calame, Christian Schönenberger](#)

2127 [Graphene Based Materials for Arsenic Sensing and Removal from Contaminated Water](#)

[Alessandra Assirelli, Simona Ieffa, Roberto Bernasconi, Luca Nobili, Luca Magagnin](#)

2128 [Electrochemical Characterisation of a Real-Time pH Sensor](#)

[Karen M. Herdman, Fiachra B. Bolger, Niall J. Finnerty, Carmel B. Breslin](#)

2129 [Electrochemical Detection of Volatile Organic Biomarkers Using Next Generation Titania Nanotube Arrays](#)

[York R. Smith, Dhiman Bhattacharyya, Swomitra K. Mohanty, Mano Misra](#)

2130 [Effect of Changed Structure As Well As Composition on the Behaviour of Sn\(Se,Te\) Compound Semiconductor Thin Films and Schottky Diodes for Solar Cell Applications](#)

[Naresh Padha, Narinder Kumar, Anjali Devi, Ramesh Sachdeva, Chetan Panchal](#)

2131 [Effect of the Replacement of Some Indium Atoms with Aluminum Atoms on the Behaviour of p-CuInSe₂ Thin Films and Schottky Diodes](#)

[Naresh Padha, Usha Parihar, Chetan Panchal](#)

2132 [The Effect of Distribution of Uvlight on Elastic Modulus of UV Cured Film in Roll-to-Roll Nanoimprint Process](#)

[Shunsuke Kondo, Kentaro Taki, Hiroshi Ito](#)

2133 [Thiol-Sensitive Electrochemical Sensors for Advance Detection of Neurotoxins in Water and Biomass](#)

[Anna Pilip, Arcadij Eremenko, Ilijya Kurochkin, Iana Russkikh, Taisiya Prokopkina](#)

[2134](#)[A Paper-Based Reagent Storage Approach for Point-of-Care Electrochemical Sensing](#)

[Xiao Wang, Wenjing Kang, Ian Papautsky](#)

[2135](#)[Titanium Dioxide and Tin Oxide Composite for so₂ Gas Sensors](#)

[Suresh Mulmi, Venkataraman Thangadurai](#)

[2136](#)[Highly Sensitive Impedance Sensor for Detection of Acephtament Using Nanostructured Assembly](#)

[Jingming Gong](#)

[2137](#)[\(Keynote\) Progress in the Development of Metal Oxide Gas Sensors to Reduce Carbon Footprint](#)

[Venkataraman Thangadurai, Suresh Mulmi](#)

[2138](#)[\(Invited\) Refractory Ceramic Sensors for Process and Health Monitoring of Slagging Gasifiers](#)

[Edward M Sabolsky, Rajalekshmi Chockalingam, Katarzyna Sabolsky, Gunes A. Yakaboylu, Brian Armour, Aaron Teter, Marc Palmisiano, Timothy Close](#)

[2139](#)[\(Invited\) Quantitative Decoding of Complex Gas Mixtures for Environmental Monitoring Using Mixed-Potential Sensors](#)

[Cortney R Kreller, Aniruddha Nadiga, Shanice C. Brown, Jonathan M. Reynolds, Dusan Spernjak, Fernando H Garzon, Eric L. Brosha, Alexandre V Morozov, Rangachary Mukundan](#)

[2140](#)[Effects of Pt-Based Electrode Compositions on CO Sensing Properties of NASICON-Based Solid Electrolyte Gas Sensors](#)

[Yasuhiro Shimizu, Hirotaka Takeda, Taro Ueda, Kai Kamada, Takeo Hyodo](#)

[2141](#)[Combinatorial Structures of Graphene Oxide and SnO₂ for Sensingvarious VOCs](#)

[Hyejin Park, Yoonsung Chung, Eunji Lee, Soohyun Ahn, Seokhee Lee, Hosang Ahn, Dong-Joo KIM](#)

[2142 Redox Cycling Behavior of Catecholamines and Their Mixtures at Different Diffusion Distances: Steps Toward Quantitative Speciation](#)

[Mengjia Hu, Ingrid Fritsch](#)

[2143 Photochemical Decoration of Metal/Metal-Oxide Nanoparticles on SnO₂ Nanorods for Improved Hybrid Gas Sensors and Photodetectors for Environmental Applications](#)

[Christian G Carvajal, Killani Kadri, Gugu Rutherford, Aswini K Pradhan](#)

[2144 Atomic Layer Deposition of SnO₂ for Selective Room Temperature Low Ppb Level O₃ Sensing](#)

[Steven Christopher Mills, Bongmook Lee, Veena Misra](#)

[2145 Application of AlGa_N/Ga_N Heterostructures for Ultra-Low Power, Low Noise Nitrogen Dioxide Detection](#)

[Michael Lim, Bongmook Lee, Veena Misra](#)

[2146 An Ultra-Low Power Fast Response TCD Sensor for Airborne Measurements Using Unmanned Aerial Vehicles](#)

[Suiqiong Li, Amol Shirke, Lloyd Ploense, Michael T Carter, Melvin W Findlay, Mark Papageorge, Joseph R Stetter](#)

M04-Sensors, Actuators, and Microsystems General Session (Chemical and Biological Sensors)

Sensor

[2147 Non-Invasive Biosensor for Measurement of Blood Urea Level in Human Subjects Using Reverse Iontophoresis](#)

[Eswaramoorthy K Varadharaj, Nagaraju Jampana](#)

[2148 Dielectric Impedance Spectroscopy in Flexible Polymer Microchip: Towards the Non Contact Biosensors](#)

[Mohammed Kechadi, Bernard Tribollet, Jean Gamby](#)

[2149 Early Diagnosis of Small Fiber Neuropathies By Electrochemical Means: Optimization of Sensing Materials](#)

[Amandine Calmet, Hanna Ayoub, Virgine Lair, Sophie Griveau, Philippe Brunswick, Armelle Ringuedé, Fethi Bedioui, Michel Cassir](#)

[2150 Comparison of Magnetoelastic Sensors to Other Acoustic Wave Sensors](#)

[Howard Clyde Wikle, JiaJia Hu, Shin Horikawa, Yating Chai, Bryan A Chin](#)

[2151 Detection of Salmonella on Bird Feces Contaminated Leafy Green Vegetables Using Phage-Based Magnetoelastic Biosensors](#)

[Jing Dai, Yating Chai, JiaJia Hu, Shin Horikawa, Bryan A Chin](#)

[2152 Improved Pathogen Detection Using Magnetoelastic Biosensors Operating Under Multi-Harmonic Resonance Modes](#)

[Songtao Du, Shin Horikawa, Yating Chai, Howard Clyde Wikle, Bryan A Chin](#)

[2153 Magnetoelastic Biosentinels for the Detection of Pathogenic Bacteria in Stagnant Liquids](#)

[Shin Horikawa, Yating Chai, Songtao Du, Howard Clyde Wikle, Bryan A Chin](#)

[2154 Studies on Carbon Mediated Paste Screen Printed Sensors for Blood Glucose Sensing Application](#)

[Eswaramoorthy K Varadharaj, Nagaraju Jampana](#)

[2155 Electrochemical Detection of Antibiotics in Environmental Matrices Using Functionalized Boron-Doped Diamond Electrodes](#)

[Brian P. Chaplin, Pralay Gayen](#)

2156 [Application of PVC Membrane Sensor in Pharmaceutical and Environmental Analysis. One Example: Potentiometric Determination of Moxifloxacin in Some Pharmaceutical Formulation Using PVC Membrane Sensors](#)

[Gamal Abdel-Hafiz Mostafa](#)

2157 [Electrochemical and Electrocatalytic Properties of Platinum Electrode Modified With Gold-CNT Nanocomposite](#)

[Abolanle Saheed Adekunle, J. G. Ayenimo, X. -Y. Fang, W. O. Doherty, A. O. Arotiba, B. B. Mamba, Eno E Ebenso](#)

2158 [\(Invited\) Ionic Fluids Containing Both Strongly and Weakly Interacting Ions of the Same Charge Have Unique Ionic and Thus Chemical Environments As a Function of Ion Concentration](#)

[Robin Don Rogers, Hui Wang](#)

2159 [\(Invited\) Ionic Liquids and Gas Sensor Applications](#)

[Xiangqun Zeng](#)

2160 [Comparison of Electroreduction of Sulfur Dioxide in Ionic Liquid at Gold and Platinum Electrodes](#)

[Min Guo, Xiangqun Zeng](#)

2161 [\(Invited\) Ionic Liquids in Gas Sensors: Recent Progress and Future Prospects](#)

[Michael T Carter, Joseph R Stetter, Melvin W Findlay, Vinay Patel](#)

2162 [An Experimental Study of Adhesion Properties of PB Films for Sensing of H₂O₂ in a PEM-Fuel Cell Environment](#)

[Hamed Akbari Khorami, Nadine Jacobs, Peter Wagner, Alexander Dyck, Peter Wild, Ned Djilali](#)

[2163Control of the Microstructure and the Magnetic and Magnetostrictive Properties of Electrodeposited Fe-Co-B Thin Films for Sensor Applications](#)

[Zhizhi Sheng, Kewei Zhang, Z.-Y. Cheng](#)

[2164Temperature-Controlled Electrochemical Microsensors and Microsensor Arrays](#)

[Nicholas M. Contento, Steve Semancik](#)

[2165The Effect of Carbon Nanotubes Solid Contact Dispersing Agent on the Parameters of Resulting Potentiometric Sensors](#)

[Agata Michalska, Ewa Jaworska, Krzysztof Maksymiuk](#)

[2166Transparent Nanowire Electrodes As a Tool for Electrochemical Detection](#)

[Florent Lefèvre, Sujittra Poorahong, Marie-Claude Perron, Philippe Juneau, Ricardo Izquierdo](#)

[2167Gas Composition Monitoring in Cryogenic Fluid Transfer Lines](#)

[Gary W Hunter, Jeff Williams, Darby B. Makel, Robert G. Johnson, Azlin M. Biaggi-Liabiosa, Chung-Chiun Liu](#)

[2168Electrochemical Characterization of Electrode Materials for Mixed-Potential Sensors](#)

[Jonathan M. Reynolds, Shanice C. Brown, Eric L. Brosha, Rangachary Mukundan, Fernando H Garzon, Cortney R Kreller](#)

[2169Amperometric Oxygen Sensor Based on Bimetallic Pd-V/C/Nafion Electrode](#)

[Hui-Lun Wu, Yu-Ching Weng](#)

[2170Si Doped Metastable Epsilon-WO₃ Nano-Particle Film for Human Breath Acetone Sensing](#)

[Rishabh Jain, Radenka Maric](#)

[2171 Gas Sensing Behaviors of Hierarchically Structured Nickel Oxide Film By Electrophoretic Deposition](#)

[Yoonsung Chung, Hyejin Park, Soohyun Ahn, Eunji Lee, Seokhee Lee, Dong-Joo Kim](#)

[2172 A Pre-Concentrator for Explosive Vapor Detection](#)

[Zachary Caron, Daniel Mallin, Mitchell Champlin, Otto Gregory](#)

[2173 Epitaxially Grown Pt_xIr_{100-x} Alloys with Enhanced Properties for Ammonia Electro-Oxidation](#)

[Nicolas Sacré, Jules Galipaud, Sébastien Garbarino, Lionel Roué, Daniel Guay](#)

[2174 Gas Sensing on Oxidized Bronze](#)

[Sriya Banerjee, Yoon Myung, Parag Banerjee](#)

[2175 Screen-Printed Electrodes Modified with Multi-Walled Carbon Nanotubes for Cisplatin Detection](#)

[Elsa María Materón, Ademar Wong, Stanley Ivair Klein, Maria del Pilar T Sotomayor](#)

[2176 Polypyrrole-Coated Carbon Nanotubes for Low Temperature Gas Sensor](#)

[Anna Kim, Hana Lim, Ho-Nyun Lee, Park Jae-Young, Bongyoung Yoo, Hyun-Jong Kim](#)

[2177 Spray-Coated All-Solid-State Potentiometric Sensors](#)

[Ewa Jaworska, Morten Schmidt, Giuseppe Scarpa, Krzysztof Maksymiuk, Agata Michalska](#)

[2178 Carbon Nanofibers As Transducer Layers in Potentiometric Sensors](#)

[Ewa Jaworska, Joanna Madejak, Anna Kisiel, Krzysztof Maksymiuk, Agata Michalska](#)

[2179a New Bifunctional Electrochemical Sensor for Hydrogen Peroxide and Nitrite Based on Bimetallic Porphyrin MOF](#)

[Bo Zhou, Li-Mei Shi](#)

2180 [Citrus Limon Peel As a Component of Modified Carbon Paste Electrode for Voltammetric Determination of Cd\(II\)](#)

[Deepak Singh Rajawat, Soami Piara Satsangee](#)

2181 [Tailoring Morphology of ZnO Nanostructures on Fabrics By Electrochemical Deposition for Gas Sensors](#)

[Eunji Lee, Hyejin Park, Yoonsung Chung, Seokhee Lee, Dong-Joo Kim](#)

Z01-General Student Poster Session

All Divisions

1865 [Doping Poly\(Acrylonitrile-co-Butadiene-co-Styrene\) with Titanium Dioxide Nanoparticles to Create Novel Chemical Sensors](#)

[Matthew R Skorski, Douglas M Fox, Abigail E Miller](#)

2182 [One-Step Synthesis of Novel Mesoporous Three-Dimensional GeO₂ and Its Lithium Storage Properties](#)

[Haiping Jia, Martin Winter, Tobias Placke](#)

2183 [Enhanced Electrochemical Oxygen Reduction Reaction on Pt-Based Ordered Intermetallic Nanoparticle/Metal Oxide/Carbon Black](#)

[Takao Gunji, Toyokazu Tanabe, Shingo Kaneko, Futoshi Matsumoto](#)

2184 [The Use of Scallop Shell Powder As a Method of Extracting Alkaline-Earth Metals](#)

[Fumihiro Mihara, Ken Takeuchi, Sanae Tamura, Yasushi Idemoto, Yasuo Kogo](#)

2185 [Spherical and Size-Controlled Graphite Particles and Their Physical and Electrochemical Characterization As Active Material in Dual-Graphite Energy Storage Systems](#)

[Andreas Heckmann, Paul Meister, Pengfei Gao, Martin Winter, Tobias Placke](#)

[2186A Graphene-Zinc Nanorods Nano-Composite Film Sensor for Sensitive Determination of Tizanidine in Solubilized System](#)

[Rajeev Jain, Ankita Sinha](#)

[2187The Relationship Between Carbon Nanotube Surface Status and Electrocatalytic Performance Toward Oxygen Reduction Reaction of Cobalt Phthalocyanine /Carbon Nanotube](#)

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Wipula Priya Rasika Liyanage, Jacob Scott Wilson, Edward Kinzel, Manashi Nath

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William E Mustain, Ying Liu, Andrea Kadilak, Leslie Shor

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Bhushan Awate, Robert Mark Worden, Gemma Reguera

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Doris Grumelli, Benjamin Wurster, Diana Hötger, Rico Gutzler, Klaus Kern

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Sofia Babanova, Ivana Matanovic, Albert Thomas Perry, Alexey Serov, Kateryna Artyushkova, Plamen Atanassov

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Wendy Shaw, Arnab Dutta, John Roberts

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