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313 First-Principles Molecular Dynamics Simulation on Glyme-Based Electrolyte

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314 Multivalent Ion Storage Mechanism New Strategy for Storing Enormous Energy at a Fast Rate

Chengjun Xu, Pingping Shi

315 Materials Design Rules for Multi-Valent Ion Mobility in Intercalation Structures

Ziqin Rong, Rahul Malik, Pieremanuele Canepa, Gopalakrishnan Sai Gautam, Miao Liu, Anubhav Jain, Kristin A Persson, Gerbrand Ceder

316 Thianthrene-Functionalized Polymers As High-Voltage Materials for Organic Cathode-Based Dual-Ion Batteries

Martin Kolek, Martin E. Speer, Jean Jacques Jassoy, Jennifer Heine, Martin Winter, Peter Bieker, Birgit Esser


Dominique Guyomard, Elise Deunf, Philippe Moreau, Eric Quarez, Franck Dolhem, Philippe Poizot

318 Progress Towards a Rechargeable Multivalent Battery
Albert L. Lipson, Danielle L. Proffit, Baofei Pan, Saul Lapidus, Chen Liao, Anthony K. Burrell, John T. Vaughey, Brian J. Ingram

319 Tailored Carbon Nanotubes for High-Performance Lithium-Sulfur Batteries

Yo Chan Jeong, Seung Jae Yang, Kunsil Lee, Taehoon Kim, Jae Ho Kim, Haesol Jung, Young Shik Cho, Chong Rae Park

320 Polysulfide Radicals Appearance in Partially Discharged Lithium-Sulfur Battery Analyzed By First-Principles Interpretations of X-Ray Absorption Spectra

Nitash P. Balsara, Kevin Wujcik, Tod Pascal, Chaitanya D. Pemmaraju, Didier Devaux, Wayne C. Stolte, David Prendergast

321 Aniline-Modified Ordered Mesoporous Carbon As an Insoluble Discharge Product Stabilizer for High Performance Li-S Batteries

Jae Ho Kim, Seung Jae Yang, Taehoon Kim, Yo Chan Jeong, Kunsil Lee, Kyung Tae Park, Chong Rae Park

322 Nanostructured Sulfur and Composites for Lithium-Sulfur Batteries

Jianli Cheng, Bin Wang

323 Facile Synthesis of Lithium Sulfide-Graphene Composite As Cathode Material for Lithium Batteries

Zhe Li, Shiguo Zhang, Kazuhide Ueno, Kaoru Dokko, Masayoshi Watanabe

324 High Conductive Carbon Nanofiber-Graphite Paper Electrodes with Ultrahigh Polysulfide-Loading for Advanced Lithium-Sulfur Batteries

Jianhua Yan, Bingsun Li, Xingbo Liu

325 Sulfur Nanoparticles Coated with Polyelectrolyte Nanomembranes for Sulfur Cathode

Naoki Osada, Claudiu B Bucur, John Muldoon
Understanding Li-S Chemistry with First-Principles Analysis

Perla B Balbuena, Juan Carlos Burgos, Yuguang Ma, Luis Eduardo Camacho-Forero, Taylor Smith, Samuel Bertolini Da Silva Oliveira

A Hybrid Dual-Type Sulfur Cathode and a Lithiated Si/SiO\(_x\) Nanosphere Anode for Li-Sulfur Full Cells

Sang-Kyu Lee, Eunjun Park, Bruno Scrosati, Jusef Hassoun, Min-Sik Park, Young-Jun Kim, Hansu Kim, Ilias Belharouak, Yang-Kook Sun

Understanding the Electrochemical Activity of Electrolyte-Insoluble Solid Polysulfide Species in the Lithium-Sulfur Battery System

Michael Klein, Arumugam Manthiram

An Elastic, Conductive, Electroactive Nanocomposite Binder for Lithium-Sulfur Batteries

Craig Milroy, Arumugam Manthiram

Composite of Two-Dimensional Titanium Carbonitride Mxene and Nano-Sulfur As Cathode for Li-S Batteries

Michael Naguib, Hui Wang, Chengdu Liang, Jagjit Nanda

Carbon Wrapped Sulfur Cathode Materials for Rechargeable Batteries

Arun Kumar, moises-Miguel Gallozzo, Maharaj Tomar

Effect of Conductive Substrate Material on Li2S Electrodeposition kinetics in Li-S Batteries

Frank Fan, Menghsuan Pan, Yet-Ming Chiang

Rational Design of Cathode Structure in Li-S Batteries

Liwei Chen
High Areal Capacity Sulfur Cathodes for Lithium-Sulfur Batteries

Xinwei Chen, Jiayan Luo, Yet-Ming Chiang

High Energy Density, Long-Life Li-S Batteries for Aerospace Applications

Ratnakumar V Bugga, Simon C. Jones, Jasmina Pasalic, Dan Addison, Ramanathan Thiallaiyan

A04-Battery Safety

Battery/Industrial Electrochemistry and Electrochemical Engineering

Excellent Thermal Stability of VOPO$_4$ As Cathode for Lithium-Ion Battery

Yiqing Huang, Yuh-Chieh Lin, Youngmin Chung, Natasha Chernova, Fredrick Omenya, Shyue Ping Ong, M. Stanley Whittingham

Liquid Catholyte Investigations for Safer Storage of a Li Primary Battery

Charles J. Patrissi, Christian R. Schumacher

Thermal Stability Studies in Charged Layered Sodium Transition Metal Oxide Cathode Materials for Na-Ion Batteries

Seong-Min Bak, Yongning Zhou, Enyuan Hu, Xiqian Yu, Xiao-Qing Yang

Electroactive Polymer for Reversible Overcharge Protection in Lithium-Ion Batteries

Bin Wang, Jianli Cheng

3D-Nanostructures-Path to High Capacity Lithium Batteries with Ultimate Safety

Jan Prochazka, Radomir Stary, Jiri Pavlik, Marketa Zukalova

Determination of Battery Stability with Advanced Diagnostics

Joshua Lamb, Christopher J Orendorff, Jon Christophersen
In Situ Diagnosis and Control of Li-Ion Batteries for Enhanced Safety

Guangsheng Zhang, Shanhai Ge, Terrence Xu, Chao-Yang Wang

In Operando Li⁺- Activity Measurements in Lithium Ion Batteries - a Method to Develop and Optimize Safe Operating Strategies Even at Unfavourable Conditions

Bjoern-Ingo Hogg, Margret Wohlfahrt-Mehrens

Single-Point Impedance Diagnostic for Internal Temperature Monitoring of Commercial Lithium-Ion Batteries

Neil S Spinner, Corey T Love, Steven G Tuttle, Susan L Rose-Pehrsson

The Importance of Testing and Designing Lithium-Ion Batteries in the Relevant Environment

Judith A Jeevarajan

Quantifying the Impact of Overdischarge on Large Format Lithium Ion Cell Safety

Daphne Fuentevilla, Azzam Mansour, Christopher Hendricks

Development of an on-Demand Internal Short Circuit (NREL/NASA)

Matthew Keyser, Ahmad Pesaran, Eric Darcy

Numerically Characterizing Nail Penetration Testing for Safety Evaluation of Li-Ion Cells

Chuanbo Yang, Gi-Heon Kim, Matthew Keyser, Ahmad Pesaran

Probing Lithium-Ion Battery Safety in Mining Environments

Stephen M Lipka, Fon Rogers, David Tyler Whitlow, Taylor Bramel

Coupled Mechanical-Electrochemical-Thermal Modeling of Li-Ion Batteries
Shriram Santhanagopalan, Chao Zhang, Lei Cao, Ahmad Pesaran

351 Integrated Multiscale Multiphysics Modeling of Dynamic Short Circuit Behavior in Large Lithium-Ion Batteries

Gi-Heon Kim, Chuanbo Yang, Ahmad Pesaran

352 Measurement of Energy Distributed Between Cell Mass and Hot Ejecta during Thermal Runaway of Lithium Ion Cells at Varying State of Charge

Sandeep Yayathi, D. H. Doughty, William Q. Walker

353 Improve Battery Safety for Hybrid Electric Vehicles through Multi-Objective Optimization of Battery Design and Hybridization Level

Changhong Liu, Lin Liu

354 Mechanism of Gas Generation in Lithium Ion Batteries By Overdischarge

Mana Hashimoto, Midori Yamashiro, Toshinari Ichihashi, Akio Toda, Takashi Miyazaki, Shinji Fujieda

355 Failure Mechanism Investigation of Commercial LiFePO₄ Cells in Different Operating Conditions

Yadong Liu, Qi Liu, Zhe-Fei Li, Fan Yang, Yang Ren, Wenquan Lu, Jian Xie

A05 Electrolytes and Electrochemical Interfaces in Energy Storage Systems

Battery/Energy Technology

356 The Carbon-Electrolyte Interface at High Cathodic Voltages

Ann Mari Svensson, Benedicte Eikeland Nilssen, Ahmet Oguz Tezel, Julian Richard Tolchard

357 Electrolyte-Cathode Interactions
Selena M. Russell, Arthur v. Cresce, Kang Xu

358 Effect of Using Fluorinated Phosphate Ester and Fluorinated Ether As Electrolyte Solvents for Lithium Ion Batteries with LiNi_{0.5}Mn_{1.5}Ti_{x}O_{4} Cathode

Takehiro Noguchi, Yukoh Kato, Koji Utsugi

359 Improvement of Electrode/ Electrolyte Interfaces in Graphite/LiNi_{0.5}Mn_{1.5}O_{4} Batteries at High Voltage with Lithium Trimethyl Alkyl Borates As Electrolyte Additives

Brett L Lucht, Mengqing Xu, Liu Zhou, Yingsnan Dong, Usha Totempudi, Arnd Garsuch, Frederick Francois Chesneau

360 (Invited) The Use of Eqcm-D for in-Situ Characterization of Dimensional Changes in Cycled Battery Electrodes

Netanel Shpigel, Sergey Sigalov, Mikhael D. Levi, Doron Aurbach

361 SEI- Component Formation on Nano-Silicon in Rechargeable Lithium-Based Batteries Using Modified Ether-Based Electrolytes

Tony Jaumann, Juan Balach, Markus Klose, Steffen Oswald, Ulrike Langklotz, Holger Althues, Jürgen Eckert, Lars Giebeler

362 A Comparative Study of the Anodic and Cathodic Decomposition of Ethylene Carbonate, Vinylene Carbonate and Fluoroethylene Carbonate

Sophie Solchenbach, Michael Metzger, Hubert A. Gasteiger

363 Effect of Anion Solvation on the Passivation Chemistry of Lithium Ion Electrodes

Arthur v. Cresce, Selena M. Russell, Kang Xu

364 (Invited) Study of SEI on High Performance 3D SiNWs and Sinps Based Anode for Lithium Ion Batteries

Emanuel Peled, Fernando Patolski, Diana Golodnitsky, Kathrin Freedman, Guy Davidi, Dan Schneier, Meital Goor, Keren Goldstein
365 **In-Situ Analysis on Electrode/Electrolyte Interfaces in Li-Ion Batteries By Operando Neutron Reflectometry**

Hiroyuki Kawaura, Masashi Harada, Yasuhito Kondo, Hiroki Kondo, Yoshitake Suganuma, Naoko Takahashi, Jun Sugiyama, Yoshiki Seno, Norifumi Yamada

366 **A New Class of Stable Electrolytes Based on "Hindered Glymes" to Prevent Graphite Exfoliation in Lithium Secondary Batteries**

Devaraj Shanmukaraj, Sylvie Grugeon, Stephane Laruelle, Michel Armand

367 **Capacity Fading Mechanisms of Submicron-Sized Silicon Negative Electrode for Lithium Ion Batteries**

Taeho Yoon, Brett L Lucht, Cao Cuong Nguyen, Daniel Seo

368 **Impact of Libob Additive on Structure and Property of Solid Electrolyte Interphase Formed on Negative Electrodes Surface**

Takashi Sanada, Teruhisa Baba, Masashi Matsumoto, Kazuhiro Kamiguchi, Chihiro Yogi, Yushi Shichi, Hideto Imai

369 **The Effect of CO₂ on Alkyl Carbonate Trans-Esterification during Formation of Graphite Electrodes in Li-Ion Batteries**

Benjamin Strehle, Michael Metzger, Sophie Solchenbach, Stefano Meini, Hubert A. Gasteiger

370 **Degradation Mechanism Analysis of 18650-Type Lithium-Ion Battery: A Hard X-Ray Photoelectron Spectroscopic Investigation**

Teruhisa Baba, Masashi Matsumoto, Chihiro Yogi, Kazuhiro Kamiguchi, Takashi Sanada, Yushi Shichi, Hideto Imai

371 **Salt Effects on SEI Formation in Graphite and LiNi₀.₅Mn₁.₅O₄ Based Half Cells**

Xiao-Guang Sun, Shun Wan, Gabriel M Veith, Raymond R Unocic, Bingkun Guo, Xueguang Jiang, Sheng Dai
Behind the Stability of Graphite Anode in PC-Containing Electrolytes with a New Additive

Hongfa Xiang, Donghai Mei, Sarah D Burton, Arthur v. Cresce, Zihua Zhu, Ruiguo Cao, Xiuliang Sun, Yufan Zhou, Bryant J Polzin, Kang Xu, Ji-Guang Zhang, Wu Xu

(Invited) Ion Transport in Graphite Composite Electrode

Takeshi Abe, Kohei Miyazaki, Tomokazu Fukutsuka, Shohei Maruyama

Electrochemical Charge Transfer Reaction Kinetics at Silicon Electrode Surfaces

Tushar Swamy, Yet-Ming Chiang

In-Situ TEM Observation of Solid Electrolyte Interface Evolution during Li-Ion Battery Operation

Akihiro Kushima, Nariaki Kuriyama, Takanori Maebashi, Yoshiya Fujiwara, Ju Li

Measuring Dynamic Changes in Si SEI Chemistry

Gabriel M Veith, James F Browning, Robert L Sacci, Tyler Fears, Matthieu Doucet

Chemical, Electrochemical and Physical Properties of the Solid Electrolyte Interphase on HOPG Surface: Mechanisms of Formation and Transition Metal Deposition

Byron Konstantinos Antonopoulos, Cansu Kirdar, Filippo Maglia, Felix Schmidt-Stein, Harry Ernst Hoster

(Invited) Insight into Bulk and Interfacial Structure of Electrolytes and SEI Components from Molecular Modeling

Oleg Borodin, Marco Olguin, Wesley A Henderson

Cyclic Carbonate Additives Effect on the Solid Electrolyte Interphase of Li Ion Batteries

Hadi Tavassol, Jennifer Esbenshade, Andrew A. Gewirth
In-Situ Visualization of Solid-Electrolyte Interphase in Lithium-Ion Batteries

Liwei Chen

Contribution of Tof-SIMS Ion Profiling to Understanding the Surface and Bulk Modifications of Si Anode As a Function of Electrolyte Composition and Additives

Jolanta Swiatowska, Catarina Pereira-Nabais, Antoine Seyeux, François Ozanam, Michel Rosso, Michel Cassir, Philippe Marcus

Simultaneous Acquisition of Differential Electrochemical Mass Spectrometric and Infrared Spectroscopic Data for in Situ Characterization of Gassing Processes in Lithium-Ion Batteries

Balázs B. Berkes, Anna Jozwiuk, Heino Sommer, Torsten Brezesinski, Jürgen Janek

Electrochemical Stabilization of Self-Extinguishing Electrolyte Solutions with Trimethyl Phosphate By Adding Potassium Salts

Shigetaka Tsubouchi, Shohei Suzuki, Katsunori Nishimura, Takefumi Okumura

(Invited) Expanding Electrochemical Stability Window of Electrolytes

Kang Xu, Arthur v. Cresce, Selena M. Russell, Chunsheng Wang

Phenyl Carbonates As Low Cost and Competitive Additive for Li-Ion Batteries

Remi Petibon, Lina M. Rotermund, Jeff R Dahn

Controlled Release of Encapsulated Additives for Enhanced Performance of Lithium-Ion Batteries

Taewook Lim, Scott R. White, Nancy R. Sottos

Anodic Stability of New Electrolyte Containing Cyano-Substituted Benzimidazole Derivative Lithium Salt: New Insights By in-Situ Drifts Analysis

Minbale Admas Teshager, Shawn D. Lin, Bing-Joe Hwang, Yaw-Terng Chern, Sunny Hy
Selective Application of Electrolyte Additives on Anode or Cathode Investigated By on-Line Electrochemical Mass Spectrometry

Michael Metzger, Benjamin Strehle, Sophie Solchenbach, Hubert A. Gasteiger

Investigating the Fate of an Electrolyte Additive: A Combined Theoretical and Experimental Study of Prop-1-Ene-1,3-Sultone (PES) in Li-Ion Cells

David Scott Hall, Julian Self, Lenaic Madec, Remi Petibon, Jeff R Dahn

Towards Aging Resistant Lithium Polymer Batteries for Wide Temperature Applications

Jijeesh Ravi Nair, Luca Porcarelli, Federico Bella, Francesca Colo, Giuseppina Meligrana, Claudio Gerbaldi, Rongying Lin

Membranes from Blended Ionomer/PVDF Nanofibers: II. Interplay Between Properties and Electric Response

Graeme Nawn, Keti Vezzù, Enrico Negro, Federico Bertasi, Vito Di Noto, Leslie Dos Santos, Jun-Woo Park, Ryszard Wycisk, Peter N. Pintauro

Lithium-Ion Polymer Batteries Assembled with a Cross-Linked Composite Polymer Electrolyte Using a Vinyl-Functionalized SiO$_2$ Nanoparticles

Won-Kyung Shin, Jinhyun Cho, Ji-Hyun Yoo, Yoon-sung Lee, Dong-Won Kim

Structural Analysis for Lithium Ion Conduction in Li-P-S Solid Electrolyte

Akio Mitsui, Koji Ohara, Masahiro Mori, Yohei Onodera, Yukinori Koyama, Hajime Arai, Yoshiharu Uchimoto, Zempachi Ogumi

Problems at the Electrolyte-Electrode Interfaces in All-Solid-State Li-Ion Batteries: Insight from First-Principles Computation

Yifei Mo

Study of the Interface Layer Between Lithium Metal and a Single Ion Conductor Ceramic, Based on Block Copolymer, for Lithium Air Batteries
Louise Frenck, Renaud Bouchet, Philippe Stevens, Nitash P. Balsara

396 Atomic Structure Modeling of Li-P-S Solid Electrolyte Glass with RMC and DFT Calculations

Masahiro Mori, Koji Ohara, Akio Mitsui, Yukinori Koyama, Hajime Arai, Yoshiharu Uchimoto, Zempachi Ogumi

397 Structure and Li$^+$ Dynamics of the Single-Ion Conducting Polymer Electrolyte P(STFSI)-Ran-PEGMA

Jennifer L Schaefer, Sara V. Orski, Ryan C. Nieuwendaal, Vladimir P. Oleshko, L. Robert Middleton, Christopher L. Soles

398 Sintering Effects on the Resistivity of LiNi$_{1/3}$Mn$_{1/3}$Co$_{1/3}$O$_2$/Ceramic-Solid-Electrolyte Interface in an All-Solid-State Battery

Takehisa Kato, Munekazu Motoyama, Yasutoshi Iriyama

399 Coating Li$_{x}$NbO$_{y}$ on the Surface of Cathode Materials for All Solid State Batteries Using ALD (Atomic Layer Deposition)

Yohei Shindo, Hideyuki Koga, Shinji Nakanishi, Hideki Iba

400 A Novel Class of All Inorganic Solid State Lithium Ion Conductors

Iolanda Santana Klein, Stephen Kyle Davidowski, Charles Austen Angell

401 Optimizing Sintering Conditions of Garnet Electrolytes for Scalable All Solid State Li-Ion Batteries

Dennis W. McOwen, Gregory Hitz, Yang Wen, Yunhui Gong, Tanner Hamann, Eric D. Wachsman

402 Organic Analysis of Electrolyte Reactions Containing Additives

Tsuyoshi Akiyama, Takeshi Aoki, Mami Oda, Yasuhito Aoki, Hirofumi Moriwaki
403 Exceptionally Stable, Non-Aqueous, Sodium-Based Electrolytes for High Energy Electrochemical Capacitors

Che-Nan Sun, Rose Emily Ruther, Frank Delnick, Jagjit Nanda

404 Determining the Transport Properties of Electrolyte Solutions By in-Situ NMR Imaging and Inverse Modeling

Ion C. Halalay, Athinthra K. Sethurajan, Bartosz Protas, Sergey Krachkovskiy, Gillian Goward

405 Structural Transition Behavior of LMO-NMC Composite Used for Cathode of Li Ion Battery at High Voltage Operation


406 Highly Concentrated Electrolytes for 5 V-Class Positive Electrodes in Lithium-Ion Batteries

Rin Masuhara, Michihiro Hashinokuchi, Takayuki Doi, Minoru Inaba, Hidemi Inoue, Hiroe Nakagawa, Tokuo Inamasu, Hiroaki Yoshida

407 Impact of FEC Additive on SEI Structure Formed on a Carbon Negative Electrode Studied By Hard X-Ray Photoelectron Spectroscopy

Masashi Matsumoto, Takashi Sanada, Naoki Takao, Masato Mogi, Tomoyuki Matsuda, Keisuke Ando, Daichi Imamura, Hideto Imai

408 Degradation Behavior in Lithium Iron Phosphate Secondary Cells Under High Rate Pulsed Discharge

David Alan Wetz, Derek Nathan Wong

409 Wetting of Nano-Confined Electrodes By Lithium-Ion Battery Electrolytes Using Multiple Beam Interferometry
Boaz Moeremans, Hsiu-Wei Cheng, Hector Garces, Nitin Padture, An Hardy, Frank Uwe Renner, Markus Valtiner

410 Phosphorus-Containing Electrolytes - Expansion to Include Phosphoramines for Li-Ion Batteries

Eric J. Dufek, John R. Klaehn, Josh S. McNally, Harry W. Rollins

411 Engineered Ionic Diffusion Layers to Increase Rate Capability of NCA Cathode with Larger Particle Sizes in Lithium-Ion Cells

Kevin Dahlberg, Debasis Mohanty, Vishal Mahajan, Myongjai Lee, Lisa Stevenson, Joel Stanley, David M King, David L Wood, Fabio Albano

412 Realization of Stable Cathode-Electrolyte Interfaces in DMSO Based Li-Air Batteries: Experimental and Theoretical Perspectives

Malachi Noked, Marshall A Schroeder, Nitin Kumar, Alexander J Pearse, Kevin Leung, Sang Bok Lee, Gary W Rubloff

413 Elaboration and Characterization of Flexible Li\textsuperscript{+} Conducting Membranes for Aqueous Li-Air Batteries

Gilles Lancel, Damien Bregiroux, Gwenaëlle Toussaint, Philippe Stevens, Christelle Laberty-Robert

414 Magnesium Metal Anode Interfaces and Performance in Chloride-Free Electrolytes

Nathan T Hahn, Kevin R Zavadil

415 Speciation of Haloaluminate Electrolytes in Mg-Ion Batteries: A Combined Study of ab Initio Molecular Dynamics and Simulated X-Ray Absorption Spectroscopy

Liwen Wan, David Prendergast

416 Pd/MWNTs Nanocatalysts Toward Formic Acid Oxidation

Yiran Wang, Qingliang He, Huige Wei, Jiang Guo, Suying Wei, Zhanhu Guo
A Multiphysics Finite-Element Performance Model of a Vanadium Redox Flow Battery

Massimo Guarnieri, Federico Moro, Alberto Bertucco, Valentina Fiorenzato, Monica Giomo

Electrochemical Performance of Three Novel Bromine-Sequestering Agents for Zinc/Bromine Flow Battery Electrolytes

Gobinath Pillai Rajarathnam, Martin Schneider, Max Easton, Anthony Vassallo

A Lattice-Boltzmann Model of Mass Transport in the Diffusion Layers of Vanadium Redox Flow Batteries

Dario Maggiolo, Francesco Picano, Massimo Guarnieri

Soft Solid Crystals of LiCl. N,N-Dimethylformamide: A New Paradigm for Solid Electrolytes Based upon the Pearson Hard-Soft Acid-Base Concept

Parameswara Rao Chinnam, Rebecca N Clymer, Abdel Aziz Jalil, Michael J Zdilla, Stephanie Wunder

Composition Optimization of the Lithium-Rich Li$_3$OCl$_{1-x}$Br$_x$ Anti-Perovskite Superionic Conductors

Zhi Deng, Balachandran Radhakrishnan, Shyue Ping Ong

Enhanced Lithium Ion Conductivity in Lithium Lanthanum Titanate Solid Electrolyte Nanowires Prepared By Electrospinning

Ting Yang, Ying Li, Candace K. Chan

All Solid-State Electrolytes for Lithium Microbatteries: Fabrication of an Ionic Liquid-Based Membrane

Giulia Piana, Hélène Porthault, Sylvain Franger, Jean-Marc Duffault
424 **Relationship Between the Rate Performance of Rechargeable Lithium-Sulfur Batteries and the Local Viscosity Change at the Interface Between the Electrode and Li[N(CF₃SO₂)₂]-Glyme Solvate Ionic Liquid**

Nobuyuki Serizawa, Shiro Seki, Azusa Yamazaki, Naoki Tachikawa, Kazuki Yoshii, Katsuhiro Takei, Kaoru Dokko, Yasushi Katayama, Masayoshi Watanabe

425 **Effect of Cation Structure Modification of Ionic Liquids for Lithium-Ion Batteries**

Xia Cao, Stephan Röser, Babak Rezaeirad, Martin Winter, Isidora Cekic-Laskovic

426 **Nucleation and Growth Behavior of Electrodeposited Lithium in Ionic Liquid**

Hikaru Sano, Hikari Sakaebe, Hiroshi Senoh, Hajime Matsumoto

427 **Complementary Operando Investigations of Graphite Cycled in Ionic Liquids By XPS and Raman Spectroscopy**

Daniel Streich, Petr Novák, Mario El Kazzi

428 **Lithium Coordination in Protic Ionic Liquid-Based Electrolytes**

Thomas Vogl, Sebastian Menne, Andrea Balducci

429 **Elucidating the Interfacial Structure at the Ionic Liquid-Solid Interface Using Atomic Force Microscopy and Molecular Dynamics**

Jennifer Black, Guang Feng, Yu Zhang, M. Baris Okatan, Pengfei Zhang, Sheng Dai, Sergei V. Kalinin, Peter T Cummings, Nina Balke

430 **In Situ XPS and FTIR Studies of Electrochemically Polarized Carbide Derived Carbon and Other Carbon Electrodes in RTILs**

Enn Lust, Arvo Tõnisoo, Tavo Romann, Ove Oll, Vladislav Ivantiev, Rait Kanarbik, Jaanus Kruusma, Rainer Pärna, Arvo Kikas, Ergo Nõmmiste

431 **Thermotropic Ionic Liquid Crystalline Polymers for Lithium-Ion Battery Electrolytes**
Dominic Bresser, Melody Leclere, Patrice Rannou, Hakima Mendil-Jakani, Sandrine Lyonnard, Lionel Picard

A06-High-Energy Li-Ion Intercalation Materials

Battery

432*(Invited) Li Rich FCC Materials As High Capacity Cathodes

Shuhua Ren, Ruiyong Chen, Maximilian Fichtner

433Fluoride-Doped Layered-Spinel Hybrid Lithium-Rich Cathode Material for Lithium Ion Battery

Jin Yi-Chun

434High Capacity Li-Rich Cathode Materials

Kun Luo, Matthew Roberts, Rong Hao, Peter G Bruce

435Re-Entrant Lithium Local Environments and Defect Driven Electrochemistry of Li- and Mn-Rich Li-Ion Battery Cathodes

Baris Key, Fulya Dogan, Brandon R. Long, Jason R. Croy, Kevin G. Gallagher, Hakim Iddir, John Russell, Mahalingam Balasubramanian

436Charging Voltage Limit Effects on the Electro-Chemical Behavior of High Capacity Manganese-Rich Cathode in Lithium Ion Batteries

Wen-feng Mao, Yanbao Fu, Guo Ai, Vince Battaglia

437Origins of the DC-Resistance Increase in HCMR™ Cathodes

Robert Kostecki, Vince Battaglia, Guoying Chen, Wei Chen, Gao Liu, Daniel Membreno, Kristin A Persson, Alpesh Khushalchand Shukla, Lydia Terborg, Tanghong Yi

438*(Invited) Advances in Cathode Materials for High Energy Density Lithium-Ion Batteries
Jagjit Nanda

439 Structural Ambiguity in Li- and Mn-Rich Transition Metal Oxides: Trigonal, Monoclinic, or Both?

Alpesh Khushalchand Shukla, Quentin Ramasse, Colin Ophus, Hugues Duncan, Guoying Chen, Ulrich Dahmen

440 Structural Evolution of High Capacity Li-Rich 0.5Li₂MnO₃*0.5LiMO₂ (M=Mn, Ni and Co) Cathode Materials during Electrochemical Cycling

Jatinkumar Rana, Richard Kloepsch, Jie Li, Gerhard Schumacher, Martin Winter, John Banhart

441 Layered Cathode Materials with Controlled Particle Assembly for High Energy Lithium-Ion Batteries

Feng Lin, Yuyi Li, Dennis Nordlund, Yijin Liu, Tsu-Chien Weng, Huolin Xin, Marca Doeff

442 Degradation Mechanism of Nickel Manganese Cobalt Oxide-Type Commercial Lithium-Ion Cells By Long-Term Cycle Tests

Tomoyuki Matsuda, Keisuke Ando, Masao Myojin, Masashi Matsumoto, Takashi Sanada, Naoki Takao, Hideto Imai, Daichi Imamura

443 (Invited) Surface Modification Effect on the First Charging Process over 4.5 V and the Enhancement of Energy of LiNi¹/₃Co¹/₃Mn¹/₃O₂

Hikari Sakaeb, Akira Yano, Masahiro Shikano, Zempachi Ogumi

444 High-Voltage, Lithium-Ion Research for Transportation Applications

Jason R. Croy, Kevin G. Gallagher, Steven G. Rinaldo, Brandon R. Long, Mahalingam Balasubramanian, Joong Sun Park, Fulya Dogan, Zhenzhen Yang, Eungje Lee, Anthony K. Burrell

445 Composite "Layered-Layered-Spinel" Electrodes for High Energy Lithium-Ion Batteries
Joong Sun Park, Jason R. Croy, Brandon R. Long, Eungje Lee, Michael M. Thackeray

Synthesis of LiCoO$_2$ and LiNi$_{1/3}$Mn$_{1/3}$Co$_{1/3}$O$_2$ 2D Nanosheets By Osmotic Swelling for High Performance Lithium-Ion Batteries

Qian Cheng, Candace K. Chan

Investigating Synthetic Effects on Ni-Based Oxide As a Cathode Material for Li-Ion Batteries

Jing Xu, Wei Tong

(Invited) Understanding Surface and Structural Changes in High Energy Density Electrodes By NMR and Computational Studies

Clare P Grey, Alison Michan, Michal Leskes, Ieuan Seymour

Operando Imaging of Electrochemical Phase Transitions in LiNi$_{0.8}$Co$_{0.15}$Al$_{0.05}$O$_2$ Secondary Particles

Young-Sang Yu, Chunjoong Kim, Yijin Liu, Jordi Cabana

Layered-to-Spinel Phase Transformations Inhibited By ALD Coatings on NMC Cathodes to Mitigate Voltage Fade in Lithium-Ion Cells

Kevin Dahlberg, Debasish Mohanty, Myongjai Lee, Erik Anderson, Vishal Mahajan, Joel Stanley, David M King, David L Wood, Fabio Albano

Diffusion in the Layered Li-Ni-Mn-Co Oxide Based Core-Shell/Gradient Materials during Sintering Simulated with Pellets in Contact

Jing Li, Kiven Plucknett, Jeff R Dahn

Aging Analysis of LiNi$_{1/3}$Mn$_{1/3}$Co$_{1/3}$O$_2$-Graphite Cells Via X-Ray Diffraction

Irmgard Buchberger, Stefan Seidlmayer, Johannes Hattendorff, Aneil Pokharel, Michele Piana, Petra Kudejova, Ralph Gilles, Hubert A. Gasteiger
(Invited) Effects of Crystalline Structure on the Electrochemical Properties of High Voltage Spinel Cathode Materials

She-huang Wu, Shou-Huang Su, Je-Jang Shiu

High Energy X-Ray Used to Investigate the Synthesis of Full Concentration Gradient Cathode

Yan Li, Rui Xu, Yang Ren, Jun Lu, Huiming Wu, Lifen Wang, Dean Miller, Yang-Kook Sun, Khalil Amine, Zonghai Chen

The Effect on Electrochemical Properties By the Content of Mn$^{3+}$ of High-Voltage Spinel LiNi0.5Mn1.5O4 Cathode Material for Highly Stable Lithium-Ion Batteries

Jie Li, Haidong Liu, Jun Wang

Influence of Using Additives in Spray Drying Process on Structural and Electrochemical Properties of LiNi$_{0.5}$Mn$_{1.5}$O$_4$ cathode Material

Tim Risthaus, Jun Wang, Jie Li

Implementation of Stable Surface Structures: A Promising Key to Solve Capacity Fading Issues for the High-Voltage LiNi$_{0.5}$Mn$_{1.5}$O$_4$

Hyojung Yoon, Hyung-Man Cho, Danna Qian, Shirley Meng

Transition Mechanism and Phase Transition Front of Li$_2$Ni$_{0.5}$Mn$_{1.5}$O$_4$

Hideyuki Komatsu, Hajime Arai, Yukinori Koyama, Kenji Sato, Takeharu Kato, Ryuji Yoshida, Haruno Murayama, Ikuma Takahashi, Yuki Orikasa, Katsutoshi Fukuda, Tsukasa Hirayama, Yuichi Ikuhara, Yoshio Ukyo, Yoshiharu Uchimoto, Zempachi Ogumi

Electrochemical Properties of Li$_2$FeP$_2$O$_7$/C Nanocomposites Prepared from LiH$_2$PO$_4$ and Fe(NO$_3$)$_3$·9H$_2$O used As a Precursor

Hee Chan Jang, Hiroaki Nagano, Izumi Taniguchi
Effects of Transition Metal Co-Doping on the Electrochemical Properties of Li$_3$V$_{2-x}$Fe$_x$Mn$_x$(PO$_4$)$_2$/Graphene Cathode Material for Lithium Secondary Battery

Hyun-Soo Kim, Minchan Jeong, Bong-So Jin

Evolution of the Surface and Subsurface Chemical Environment of Li$_{1-x}$Ni$_{0.8}$Co$_{0.15}$Al$_{0.5}$O$_2$ electrodes

Shawn Sallis, Nathalie Pereira, Yiqing Huang, Nicholas F. Quackenbush, M. Stanley Whittingham, Glenn G Amatucci, Louis F.J. Piper

Enhanced Cycleability of LiNi$_{0.5}$Mn$_{1.5}$O$_4$ Cathode with Zn Substitution

Ze Yang, Yan Jiang, Yunhui Huang

Oxygen Activity Promoting the Surface Transformation of High Voltage Layered Oxide Cathodes for Lithium Ion Batteries

Sunny Hy, Haodong Liu, Feng Lin, Marca Doeff, Silas Wolff-Goodrich, Dennis Nordlund, Huolin Xin, Shirley Meng

Advanced Performances of Full Concentration Gradient Li[Ni$_{0.65}$Co$_{0.08}$Mn$_{0.27}$]O$_2$ Cathode Materials for Lithium Ion Batteries

Do-Wook Jun, Kang-Joon Park, Byung-Beom Lim, Chong seung Yoon, Yang-Kook Sun

Capacity Fading Research on Si Anode in Lithium Ion Batteries

Yanbao Fu, Xiangyun Song, Hui Zhao, Wenfeng Mao, Gao Liu, Vince Battaglia

Effect of Crosslinking of Guar Gum As a Bio-Derivative Binder for Negative Electrodes of Lithium-Ion Batteries

In-Yeong Choi, Ji-Eun Lee, Eun-Suok Oh

Performance Enhancement of Li$_4$Ti$_5$O$_{12}$ and Si/C Electrodes Using Graphene/CMC Conductive Composite Binder
Ji-Eun Lee, In-Yeong Choi, Eun-Suok Oh

468 Electrospun Hollow Glassy Carbon-Reduced Graphene Oxide Nanofibers with Encapsulated ZnO Nanoparticles: A Free-Standing Anode for Li-Ion Batteries

Shilpa Shilpa, Basavanakote M Basavaraja, Subhasish B Majumder, Ashutosh Sharma

469 Relaxation Behavior of Magnetization for Electrochemically Lithium Inserted Gamma-Fe$_2$O$_3$

Shigeomi Takai, Hitoshi Kawaji, Akihiro Tamura, Takeshi Yabutsuka, Takeshi Yao

470 (Invited) High Electrochemical Performance of High Voltage LiNi$_{0.5}$Mn$_{1.5}$O$_4$ By Decoupling the Ni/Mn Disordering from the Presence of Mn$^{3+}$ ions

Byoungwoo Kang

471 Low-Temperature Prepared Lithium-Cobalt-Nickel-Oxide Spinels

Eungje Lee, Jason R. Croy, Joong Sun Park, Christopher Johnson, Michael M. Thackeray

472 Intrinsic Electrochemical Properties of LiNi$_{0.5}$Mn$_{1.5}$O$_4$ Synthesized By Flux Method for High Energy Density Li-Ion Batteries

Kei Nishikawa, Nobuyuki Zettsu, Katsuya Teshima, Kiyoshi Kanamura

473 Use of Swncts to Increase the Energy Density of Li-Ion Batteries

Oleg Bobrenok, Andrew Kosolapov, Konstantin Tikhonov, Konstantin Notman

474 Improvement of Electrochemical Properties of Pyroxene-Type LiFeSi$_2$O$_6$

Naoya Ishida, Kazumasa Sakatsume, Naoto Kitamura, Yasushi Idemoto

475 (Invited) Li Intercalation into Multi-Layers Transition Metal Carbides and Carbonitrides "Mxenes" in Li-Ion Batteries
Michael Naguib

Physical and Electrochemical Characterization of Li$_2$FeP$_2$O$_7$/C Nanocomposites Prepared By a Combination of Spray Pyrolysis and Wet Ball Milling Followed By Heat Treatment

Izumi Taniguchi, Hiroaki Nagano

The Mechanisms of Lithium Insertion into Quaternary Lithium Metal Fluorides LiM$^{II}$M$^{III}$F$_6$ (M$^{II}$ = Ca, Ni, Mn and M$^{III}$ = Fe)

Lea de Biasi, Georg Lieser, Jatinkumar Rana, Sylvio Indris, Christoph Dräger, Sven Glatthaar, Reiner Mönig, Helmut Ehrenberg, Joachim R. Binder, Holger Geßwein

Enable High Energy-Density Lithium-Ion Battery Conversion Cathodes Based on Iron Fluorides Using Integrated in Situ Experimental and Computational Approaches

Song Jin

Probing Electrochemically-Induced Structural Changes and Defects Affecting Li-Ion Intercalation and De-Intercalation in High Capacity Orthosilicate Cathodes

Xia Lu, Hsien-Chieh Chiu, Zachary Arthur, Jigang Zhou, Huijing Wei, Ning Chen, Raynald Gauvin, De-Tong Jiang, Karim Zaghib, George P. Demopoulos

(Invited) Side Reactions and Cycling Efficiency with Silicon Electrode Surfaces

John T. Vaughey, Fulya Dogan, Aude A. Hubaud, David J. Schroeder

Li$_2$MeWO$_6$ (Me=Ni, Mn, Co) As Positive Electrode Materials for Li-Ion Batteries

Shinichi Kumakura, Shinichi Komaba, Kei Kubota

Probing the Electrochemical Mechanism of Li$_2$FeO$_4$ (LFO) Cathodes in Li-Ion Cells

Chi-Kai Lin, Xiaoping Wang, Victor A. Maroni, Michael National Krumpelt, Yang Ren, Christopher Johnson
High Performance Pillared Vanadium Oxide Xerogel Cathode for Lithium Ion Batteries
Krista L Hawthorne, Siu on Tung, James Mainero, Yi Ding, Levi T Thompson

Lithium Iron Phosphate Nanosheet Nests As Cathode Material for Li-Ion Batteries
Robert John Wainright, Ramaraja P. Ramasamy

(Invited) Improving Cycle Life of High Capacity Alloy Anodes for Li-Ion and Na-Ion Batteries
Chunsheng Wang, Xiulin Fan, Yujie Zhu, Jing Wang, Jiangfeng Mao

Interrogation of Active Battery Material Intrinsic Properties
Esther S Takeuchi, Amy C Marschilok, Kenneth J Takeuchi

Mixed Metal Phosphorous Oxides: Prospects for Secondary Lithium Based Batteries
Amy C Marschilok, Kenneth J Takeuchi, Esther S Takeuchi

In Situ solvothermalsynthesis of High-Energy Cathodes for Lithium-Ion Batteries
Jianming Bai, Liping Wang, Feng Wang

Influence of Core and Shell Properties in Core-Shell Positive Electrode Materials for Li Ion Batteries
Rajalakshmi Senthil Arumugam, Ramesh Shunmugasundaram, Jeff R Dahn

(Invited) Type I and Type II Silicon Clathrates As Novel Anodes for Lithium Batteries
Candace K. Chan

Interfacial Effects of Electrochemical Lithiation of Epsilon-VOPO$_4$ and Evolution of the Electronic Structure
Nicholas F. Quackenbush, Linda Wangoh, Bohua Wen, Ruibo Zhang, Youngmin Chung, Natasha Chernova, Zehua Chen, Shawn Sallis, Yuh-Chieh Lin, Shyue Ping Ong, M. Stanley Whittingham, Louis F.J. Piper

492 The Use of Reduced Cost and Purity Precursors in the Melt Preparation of LiFePO₄

Majid Talebi-Esfandarani, Steeve Rousselot, Michel Gauthier, Pierre Sauriol, Guoxian Liang, Mickeal Dollé

493 New High-Capacity Electrode Materials for Rechargeable Lithium Batteries: Li₂NbO₄-LiMeO₂ (Me = Mn³⁺, Fe³⁺, and V³⁺) System with Cation Disordered Rocksalt Structure

Naoaki Yabuuchi, Mitsue Takeuchi, Shinichi Komaba, Masanobu Nakayama, Hiromasa Shiiba, Kei Sato, Masahiro Ogawa, Keisuke Yamanaka, Toshiaki Ohta

494 Dilatometric Study of the Electrochemical Intercalation of Bis(trifluoromethanesulfonyl) Imide and Hexafluorophosphate Anions into Carbon-Based Positive Electrodes

Jessica Maria Huesker, Martin Winter, Tobias Placke

495 High Capacity Hybrid Si-SWCNT Anode Structures for Li-Ion Batteries

Oleg Bobrenok, Andrew Kosolapov, Victor Shchukin, Ravel Sharafutdinov, Mikhail Predtechensky, Konstantin Tikhonov, Konstantin Notman

496 Electrochemical Characterization of Li₄Ti₅O₁₂ By Single Particle Measurements Using a Particle - Current Collector Integrated Microelectrode

Yoji Sakurai, Shuhei Kawashiri, Masahiro Utagawa, Takao Tsuda, Tomohiro Tojo, Ryoji Inada

497 Molybdenum Substituted Vanadyl Phosphate Î¼-VOPO₄ with Enhanced Two-Electron Transfer Reversibility and Kinetics for Lithium-Ion Batteries

Bohua Wen, Qi Wang, Yuh-Chieh Lin, Natasha Chernova, Khim Karki, Youngmin Chung, Fredrick Omenya, Shawn Sallis, Louis F.J. Piper, Shyue Ping Ong, M. Stanley Whittingham
Ternary Type I Silicon Clathrates for Lithium-Ion Battery Anodes

Ying Li, Candace K. Chan

Mineral-Inspired, Nanostructured Polyanion Materials for Rechargeable Battery Electrodes

Ran Zhao, Ying Li, Candace K. Chan

Liquid Phase Exfoliation of Two Dimensional Transition Metal Oxides for Electrochemical Applications

Sean O'Brien, Valeria Nicolosi

Graphene-like-Graphite for High Capacity and Fast Chargeable Anode Materials of Lithium Ion Batteries

Qian Cheng, Yasuharu Okamoto, Ryota Yuge, Shigeyuki Miyamoto, Tomoo Murakami, Noriuki Tamura, Yoshiaki Matsuo

Laser Battery with Outstanding Liquid Electrolyte Wetting and Performance

Johannes Pröll, Hans Jürgen Seifert, Wilhelm Pfleging

Operando high-Energy Synchrotron X-Ray Diffraction and Modeling of Alpha-MnO₂ Battery Materials upon Heat Treatment

Zhenzhen Yang, Maria K. Y. Chan, Yang Ren, Christopher Johnson, Michael M. Thackeray

Ti-Substituted Li[Li₀.26Mn₀.6-XTiₓNi₀.07Co₀.07]O₂ Layered Cathode Material with Improved Structural Stability and Suppressed Voltage Fading

Zhaoxin Yu, Shunli Shang, Adnan Mousharraf, Zi-Kui Liu, Donghai Wang

The Thermal and Structural Behavior of Li-Rich Cathode Materials Investigated By Synchrotron-Based X-Ray Techniques
Shoaib Muhammad, Hyunchul Kim, Donghyuk Jang, Yunok Kim, Jaesang Yoon, Mihee Jeong, Gil Hwan Lew, Jaegu Yoon, Jin-Hwan Park, Won-Sub Yoon

506 Domain Modeling of Lithium-Rich Manganese Nickel Oxide By Reverse Monte Carlo Method

Naoto Kitamura, Yusuke Kubo, Naoya Ishida, Yasushi Idemoto

507 (Invited) Mechano-Electro-Chemical Coupling in Lithium Intercalation Compounds

Yue Qi, Christine James

508 Change of Average and Local Crystal Structure and Electronic Structure of Li-Rich Solid Solution Cathode Material 0.4Li$_2$MnO$_3$-0.6LiMn$_{1/3}$Ni$_{1/3}$Co$_{1/3}$O$_2$ during Charge-Discharge Process Using First-Principles Calculations and Neutron Beam and Synchrotron X-Ray Sources

Yasushi Idemoto, Yusuke Sera, Naoya Ishida, Naoto Kitamura

509 Bulk Structure and Surface Properties of Lithium- and Manganese-Rich Layered Oxides and Their Impact on Electrochemical Performance

Guoying Chen, Saravanan Kuppan, Alpesh Khushalchand Shukla

510 Biwedge Octahedron-Shaped Li-Excess Nickel-Manganese Oxide Cathode Showing Remarkably Suppressed Potential Fade

Nae-Lih Wu, Wen-Chin Chen, Hung-Chun Wu

A07-Intermetallic Anodes

Battery

511 Impact of Electrolyte on the Cycling of Si-Based Materials

Vincent L Chevrier, Connor Aiken, Remi Petibon, Xiaohua Ma, Dinh Ba Le, Jeff R Dahn, Kevin W Eberman, Larry J Krause
512 Micron-Sized a-Silicon-Fe-Cu Ternary Composite Anode Material for High Energy Libs

Sujong Chae, Jaephil Cho

513 Failure Mechanisms of Siox- Vs. Sife- Graphite Composite Anodes in Li-Ion Batteries

Soojin Sim, Jaephil Cho

514 Dimensionally Stable and Fast-Charging Graphite-Silicon Planar Composite Anode for Li-Ion Batteries

Nae-Lih Wu, Nai-Hsuan Yang, Yu-Shiang Wu, Jackey Chou

515 Rapid Milling of Alloy Anodes

Timothy Hatchard, Alon Genkin, Mark N Obrovac

516 Study of Molecular Layer Deposition Coating for Silicon-Based Lithium-Ion Anodes

Chunmei Ban, Daniela Molina Piper, Jonathan J. Travis, Younghuee Lee, Seoung-Bum Son, Steven M. George, Sehee Lee

517 Pulsed Laser Deposited Sns-Snse Composite Thin Film As a New Anode Material for Lithium Storage

Xiaojiang Liu, Jiabing Liu, Yanhua Cui

518 Multiwalled Cabon Nanotubes Functionalized Magnetic Fepd Alloy with Enhanced Activity for Ethanol Oxidation Reaction

Yiran Wang, Qingliang He, Huige Wei, Jiang Guo, Suying Wei, Zhanhu Guo

519 Identification of Multiple Failure Mechanisms in Si-Based Electrodes for Li-Ion Batteries

Shane D Beattie, Melanie Loveridge, Bryant J Polzin, Michael J Lain, Irene Rubio
Impact of the Film Storage Conditions on the Performance of Si-Based Anodes for Li-Ion Batteries

Cuauhtemoc Reale Hernandez, Zouina Karkar, Dominique Guyomard, Bernard Lestriez, Lionel Roué

FeSn$_5$@Graphene Anodes for Li-Ion and Na-Ion Batteries

Weiqiang Han, Fengxia Xin, Huajun Tian

Ni$_x$Si$_{1-x}$ Alloy Negative Electrodes for Li-Ion Batteries

Zhijia Du, Richard A Dunlap, Mark N Obrovac

Pre-Lithiated Silicon As the Anode Material for the Next Generation of Lithium Ion Batteries

Yongan Yang, Xuemin Li

Nanoporous Structure Formation in Dealloying of Li Alloys

Qing Chen, Ke Geng, Karl Sieradzki

Electrochemical Insertion Process of Li into n-Si(111)

Toshihiro Kondo, Nana Aoki, Kohei Uosaki

A New Design and Fabrication of Si-C Composite for Lithium-Ion Batteries Anodes

Ken Ogata, Koichi Takei, Byoung-Sun Lee, Kang Hee Lee, Tae-Hwan Yu, Seokgwang Doo

A08-Materials and Cell Designs for Flexible Energy Storage and Conversion Devices

Battery/Energy Technology

Foldable Paper-Based Lithium-Ion Batteries
Candace K. Chan

528 Design, Fabrication and Characterization of Flexible Thin Film Rechargeable Lithium Ion Batteries

Sami Oukassi, Cédric Giroud-Garampon, Séverine Poncet, Raphaël Salot

529 Dually Li Ion/Electron-Conductive Materials for Polymer-Based, Printable Lib Electrodes

Michael Blaine McDonald, Paula T Hammond

530 A Stable Nanostructured Li-Deficient Oxide Thin-Film Electrode for Advanced Lithium-Ion Batteries

Guoqiang Tan, Feng Wu, Jun Lu, Khalil Amine

531 Flexible, Foldable and Multi-Functional Paper-Based Electronics

Jr-Hau He, Po-Kang Yang, Der-Hsien Lien, Chun-Ho Lin

532 Performance of Si-Integrated Li-Ion Microbatteries with Side-By-Side Electrodes: A Geometry Study

Katrin Hoeppner, Marc Ferch, Piotr Mackowiak, Biswajit Mukhopadhyay, Andreas Froebe, Robert Gernhardt, Sebastian Roder, Krystan Marquardt, Robert Hahn

533 Prussian Blue Analog Batteries on Thread Substrates for Wearable Electronic Applications

Andrew Kim, Shaurjo Biswas, Tanya Gupta, Daniel A Steingart

534 Flavin Mediated Electro-Oxidation of 1,4-Dihydronicotinamides Using Photogalvanic Cell

Jun Yano, Akira Kitani
535 Package-Limitation of Cathode Material in Composite Electrode for Lithium-Ion Batteries

Koji Kitada, Haruno Murayama, Katsutoshi Fukuda, Hajime Arai, Yoshiharu Uchimoto, Zempachi Ogumi, Eiichiro Matsubara

536 Pyro-Synthesis of Nanostructured Spinel ZnMn2O4/C As Negative Electrode for Rechargeable Lithium-Ion Batteries

Jeonggeun Jo, Jihyeon Gim, Jinju Song, Sungjin Kim, Muhammad Hilmy Alfaruqi, Sukyeung Nam, Soundhar Rajan, Joseph Paul Baboo, Jaekook Kim

537 3D Paper-Based Lithium-Ion Batteries Using Origami Folding Principles

Qian Cheng, Candace K. Chan

538 Activated Carbon Fiber Treated at Different Temperatures as Supercapacitor Electrodes: Electrochemical Characterization

Dalva Alves Lima Almeida, Andrea Boldarini Couto, Mauricio Ribeiro Baldan, Neidenei Gomes Ferreira

539 Flexible-Stretchable Micro Lithium Ion Batteries for Implantable, Wearable and Embedded Electronics

Muhammad M. Hussain, Arwa T Kutbee

540 Aerospace Applications of Conductive Polymers

Patrick Kinlen, Waynie Schuette

541 Proton-Conducting Polymer Electrolytes for Solid Flexible Supercapacitors

Han Gao, Keryn Lian

542 Synthesis of MoO3 and Nitrogen-Doped Carbon Nanotubes Composite Materials By Electrodeposition As Binder-Free Electrode for Lithium-Ion Batteries
Yanhua Cui, Hui Zhang

A Soft Approach for Energy Storage and Mobile Healthcare

Sheng Xu

Pyro Synthesis of Functional Nanocrystals for Energy Storage Devices

Jihyeon Gim, Jinju Song, Sungjin Kim, Vinod Mathew, Seokhun Kim, Younpyo Oh, Muhammad Hilmy Alfaruqi, Jaekook Kim

Influence of Charge Transportation in Nitroxyl-Radical Polymer Gel on Charging Characteristics for Organic Radical Batteries

Shigeyuki Iwasa, Takanori Nishi, Terumasa Shimoyama

Design and Performances of Three-Dimensional Lithium-Ion Battery

Ho-Jung Yang, Hwi-Yeol Park, Kyung-Hoon Cho, Jin S. Heo, Seunghoon Nam, Huisu Jeong

Bio-Templated and Bio-Tethered Materials for a Flexible Lithium Ion Battery

Mark A Allen, Scott J. Riley, Evgenia Barannikova, Alexander Winton

Improving Lto Performance: Gassing, Impedance and Cycling Study

Carine L Margez, Bing Tan, Saori Tokuoka, Thomas A Greszler

A Low-Losses Topology for Vrfb Stacks

Dario Maggiolo, Davide Fauri, Stefano Da Lio, Alberto Bertucco, Davide Del Col, Massimo Guarnieri

Effect of Glass Transition Temperature on the Energy Storage Properties of Nitroxide Radical Containing Polymers
Wade A. Braunecker, Barbara Katherine Hughes, David C. Bobela, Thomas Gennett

Preparation and Electrochemical Characterization of Polyaniline/Carbon Fiber Binary Composite Film Obtained with Carbon Fiber Treated at Different Temperatures

Dalva Alves Lima Almeida, Carla Polo Fonseca, Neidenei Gomes Ferreira

A Study on the Conductivity and Selectivity of Lithiated Nafion Membranes in Non-Aqueous Electrolytes

Liang Su, Robert M. Darling, Kevin G. Gallagher, Wei Xie, Jacob L. Thelen, Nitash P. Balsara, Fikile R. Brushett

Baseline Si Electrode Fabrication and Performance for the Battery for Advanced Transportation Technologies Program

Zhe Jia

Developing Emulsion-Templated Silicon/Carbon Anodes with Reduced Graphene Oxide for Lithium Ion Batteries

Yuzi Zhang, Yue Pan, Yanjing Chen, Chu Chen, Brett L Lucht, Arijit Bose

A09-Recent Advances in Supercapacitors

Energy Technology/Battery/Dielectric Science and Technology

(Invited) Novel Asymmetric Supercapacitor with Electrochemical Polymerized Conjugated Polymer and Vertically Aligned CNT

Yu Zhu

Pseudocapacitive Carbon Nanofibers Using Sodium Chloride (a.k.a common salt)

Richa Singhal, Vibha Kalra

Electrochemical Properties of Ordered, Two-Dimensional, Double Transition Metals Carbides (MXenes)
Majid Beidaghi, Babak Anasori, Yury Gogotsi, Michel W. Barsoum

558 Enhanced Performance of TiO2 Based Supercapacitor By MnO2 Modification

Yu-Ting Weng, Tzu-Yang Huang, Jyh-Fu Lee, Hwo-Shuenn Sheu, Nae-Lih Wu

559 The Cycling Behaviour of MnO2 as Investigated By Synchrotron XRD, Stepped Potential Electrochemical Spectroscopy (SPECS) and Cycling on the Electrochemical Quartz Crystal Microbalance (EQCM)

Scott W Donne, Andrew J Gibson, Ross Wood, Madeleine F Dupont

560 Porous Titania conformal Coating on Carbon Nanotubes As Energy Storage Materials

Litao Yan, Meng Zhou, Gen Chen, Hongmei Luo

561 FeWO4 As Electrode Material for High Volumetric Capacitance Supercapacitors

Thierry Brousse, Frederic Favier, Nicolas Goubard, Olivier Crosnier, Christophe Payen

562 Effect of Meso- and Micro-Porosity in Carbon Electrodes on Atomic Layer Deposition of Pseudocapacitive V2O5 for High Performance Supercapacitors

James S. Daubert, Hannah N. Gotsch, Neal P. Lewis, J. Zachary Mundy, David N. Monroe, Elizabeth C. Dickey, Mark D. Losego, Gregory N. Parsons

563 Designing Polyoxometalate Thin Films on Carbon Nanomaterials for Pseudocapacitive Electrodes

Matthew Genovese, Yee Wei Foong, Keryn Lian

564 Nitrogen Doped Hydrothermal Carbon for Supercapacitors

Scott W Donne, Kenneth Latham

565 Electrochromic Nanocomposites with Endured Energy Storage Properties
Zhanhu Guo, Huige Wei, Yiran Wang, Jiang Guo, Xingru Yan

566Redox-Active Xerogels As Pseudocapacitive Electrodes with Excellent Cycling Performance

Muhammad Boota, Matthieu Bécuwe, Yury Gogotsi

567An Investigation into the Deposition Mechanism and Capacitive Behaviour of Thin Films of Manganese Oxides Deposited from KMnO₄

Scott W Donne, Andrew J Gibson

568Probing the Mechanical Deformation of 2D Titanium Carbide (MXene) upon Cation Intercalation at the Nanoscale

Jeremy Come, Jennifer Black, Michael Naguib, Maria R. Lukatskaya, Majid Beidaghi, Yury Gogotsi, Sergei V. Kalinin, Nina Balke

569Functionalized Carbon Nanotube Supported By Nickel Nanowire Array with Improved Rate Capability for High Power Electrochemical Capacitors

Hosein Monshat, Shan Hu

570(Invited) Three-Dimensional Freestanding Nanofiber Electrodes for Electric Double Layer and Pseudo-Capacitors

Vibha Kalra

571Active Material Arrangement and Its Effect on Electronic Conductivity in a Suspension Electrode

Kelsey B. Hatzell, Jens Eller, Yury Gogotsi

572Separating the Faradaic and Non-Faradaic Charge Storage Mechanisms in Electrochemical Capacitors Using Step Potential Electrochemical Spectroscopy

Scott W Donne, Madeleine F Dupont
573 Capacitive Deionization Process Via Nano-Titanium Carburizing Electrode

Li Wang, Yun Zhou

574 Supercapacitors Performance Evaluation

Sanliang Zhang

575 Quaternized Graphene Oxide-Based Supercapacitor Electrode

Omar Movil-Cabrera, John A Staser

576 Low-Temperature Chemical Passivation Routes for Integration of Supercapacitors Directly into Silicon Solar Cells

Andrew S Westover, Thomas Metke, Jeremiah Afolabi, Keith Share, Rachel E. Carter, Adam P Cohn, Landon Oakes, Cary L. Pint

577 Increasing the Energy Storage Capability of Porous Silicon Electrochemical Capacitor Devices

Donald S. Gardner, Charles W. Holzwarth, Yang Liu, Scott B. Clendenning, Wei Jin, Bum Ki Moon, Zhaohui Chen, Tomm Aldridge, Eric C Hannah, Chunhui Chen, Chunlei Wang, Ermei Mäkilä, John Gustafson

578 Novel Asymmetric Capacitors Using Intercalated Metal-Organic Framework Negative Electrodes

Nobuhiro Ogihara, Yuka Ozawa, Osamu Hiruta, Chikaaki Okuda, Yoshihiro Kishida, Nobuko Ohba

579 Solid-State Planar Edlc Design Enabled By Hydroxide-Conducting Polymer

Keryn Lian, Han Gao, Jak Li, John R. Miller, Ronald A Outlaw, Sue M. Butler

580 Carbon Dioxide Activated SiC-CDC: Attractive Material for Supercapacitor Electrodes
Alar Jänes, Ester Tee, Indrek Tallo, Thomas Thomberg, Enn Lust

581 (Invited) Dynamic Behaviour of Electric Double Layer Capacitors

Ganesh Madabattula, Sanjeev Kumar

582 Highly Porous Carbon Nanospheres and Carbon Foams for Supercapacitors Using Facile Spray Pyrolysis and One-Pot Reaction

Chengwei Wang, Michael J. O'Connell, Candace K. Chan

583 The Influence of Conductive Salt Ion Selection on the Performance of High Voltage Edls

Andrea Balducci, Sebastian Pohlmann, Claudia Ramirez-Castro, Christoph Schütter

584 Design and Testing of Supercapacitors for High Temperature Operation

Erik J. Brandon, Simon C. Jones, Abhijit V. Shevade, Keith J. Billings, Jasmina Pasalic, Charlie C. Krause, Victoria K. Davis, Keith B. Chin, Bugga V. Ratnakumar

585 Structure-Directed CNT Arrays As Micro-Supercapacitor Electrodes and the Effect of Geometry on Electrolyte Selection

Katherine T Nicol, Justin J Hill

586 Performance Enhancement of Activated Carbon Based Supercapacitors By Incorporation of Fullerene Self-Assemblies

Deepak Sridhar, Kaushik Balakrishnan, Srini Raghavan, Krishna Muralidharan

587 Activated Carbon Derived from Hemp and Its Use in Electrochemical Capacitors

Wei Sun, Stephen M Lipka, Fuqian Yang

588 Freestanding Graphene/Carbide Derived Carbon Films As High-Performance Electrodes for Electrochemical Capacitors
Mohamed Alhabeb, Majid Beidaghi, Katherine L Van Aken, Yury Gogotsi

589 Ionic Liquid Mixtures As Electrolytes for Electrochemical Capacitors

Katherine L Van Aken, Majid Beidaghi, Yury Gogotsi

590 The Effect of Self-Discharge on the Performance of Symmetric Electric Double Layer Capacitors: Insights from Mathematical Modeling and Simulation

Innocent Sunday Ike

591 New Generation High Performance Lithium-Ion Capacitor Laminate Cells

Wanjun Cao, Xujie Chen

592 Environmental Friendly Electrode Preparation for Hybrid Battery-Supercapacitors Based on Li$_3$V$_{1.95}$Ni$_{0.05}$(PO$_4$)$_3$/C and Activated Carbon

Carmen Meuser, Hai-Yen Tran, Marco Secchiaroli, Sonia Dsoke, Margret Wohlfahrt-Mehrens

593 Unveiling the Pseudocapacitance of Ti$_2$C Monolayer for High Performance Electrochemical Capacitor: a First-Principles Study

Xiao Ji, Jianjun Jiang

594 Facile Hydrothermal Synthesis of Feather-like Nickel Phosphite As Cathode Materials for Supercapacitors

Yunjun Ruan, Jianjun Jiang, Houzhao Wan

595 Solvothermal Synthesis of Copper Ferrite-Graphene Nanocomposite As a Supercapacitor Electrode Material

Yuanzhe Piao

B01-Carbon Nanostructures: Fullerenes to Graphene
Fullerene Biomaterials for PDT or MRI: Effects of Derivatization on Activities

Yoko Yamakoshi, Elisha Gabrielle V. Tiu, Safwan Aroua

Graphite-Based Non Precious Metal Catalyst for Oxygen Reduction Reaction

Joseph H Dumont, Ulises Martinez, Aditya Mohite, Geraldine M Purdy, Plamen Atanassov, Piotr Zelenay, Gautam Gupta

Non-Chromatographic Isolation of Mixed-Metal Nitride Clusters in Larger Carbon Cages

Steven Stevenson

Easily Fabricated Carbon Nanotube Electrodes for Low-Ppb-Level Chromium(VI) Detection

Chengwei Wang, Michael J. O'Connell, Candace K. Chan

Preparation and Characterization of Porous CNTs@Fe-C Pellets

Su-ju Hao, Yue-jun Hao, Hua-qiang Hao, Wu-feng Jiang, Yu-zhu Zhang

Resonant Raman Scattering Studies of SWCNT Templated Extreme Nanowires of Hgte and Pbi

David Christopher Smith, Joe Spencer, Jeremy Sloan, Eric Faulques

The Origins and Characteristics of the Threshold Voltage Variability of Quasi-Ballistic Single-Walled Carbon Nanotube Field-Effect Transistors

Qing Cao

Isolation of Adsorbent-Free Long Semiconducting Single-Walled Carbon Nanotubes Using a Hydrogen-Bonding Supramolecular Polymer
Naotoshi Nakashima, Fumiyuki Toshimitsu

604 Engineering Chemical Functionality in Graphene

Sandra Catalina Hernandez, Paul Sheehan, Stanislav Tsoi, Pratibha Dev, Jeremy Robinson, Chad Junkermeier, Keith Whitener, Woo Lee, Thomas Reinecke, Scott Walton

605 Improvement of Surface Enhanced Raman Spectroscopy By Analyte Molecules Covering with Graphene

Ksenya Girel, Hanna Bandarenka, Nikolai Kovalchuk, Ivan Komissarov, Vitaly Bondarenko

606 In Situ Synchrotron X-Ray Diffraction Characterization of the Synthesis of Graphene Oxide and Reduced Graphene Oxide

Mie Møller Storm, Rune E. Johnsen, Poul Norby

607 Nondestructive Production of Magnetic Graphene Towards Energy Applications

Toyoko Imae, Mahmoud Mohamed Mahmoud Ahmed, Masaki Ujihara

608 Graphene Quantum Dots Prepared from Graphene Hydrogels Basing on Hydrothermal Method

Hongyi Qin, Tao Gong, Jingling Liu, Yinhua Jin, Yujin Cho, Cheolmin Shin, Changgu Lee, Taesung Kim

609 Graphene Synthesis on Electrodeposited Substrates and Its Integration in MEMS for Sensor Applications

Lorenzo Pedrazzetti, Roberto Bernasconi, Luca Nobili, Luca Magagnin

610 Graphene-Supported 'Core-Shell' Carbon Nitride Fe- and Sn-Based Electrocatalysts for the Oxygen Reduction Reaction (ORR)

Antoine Bach Delpeuch, Enrico Negro, Keti Vezzù, Graeme Nawn, Federico Bertasi, Gioele Pagot, Vito Di Noto
611 Structure-Dependent Thermal Defunctionalization of Single-Walled Carbon Nanotubes

Saunab Ghosh, Fang Wei, Sergei M. Bachilo, Robert Hauge, W. E. Billups, R. Bruce Weisman

612 Nonvolatile Memory Based on Polymer-Suspended Graphene Nanoplatelets with Fractional and Integer Quantum Conductance at 300K and Zero Magnetic Field

Yuhong Kang, Hang Ruan, Marius K Orlowski

613 Nanostructured Carbon Fibers for the Oxygen Reduction Reaction

Ulises Martinez, Silas Simotwo, Joseph H Dumont, Aditya Mohite, Vibha Kalra, Gautam Gupta

614 Impedance Spectroscopy of a Nanocomposite Fabric Thermistor to Determine Its Dielectric Sensing Structure

Nathaniel J. Blasdel, Chelsea N. Monty

615 Nanostructured Carbon As Electrocatalyst Supports for Solid Acid Fuel Cells

Ramez A. Elgammal, Gabriel M Veith, Beth L Armstrong, Wesley Daniel Tennyson, Ondrej Dyck, Ilia N. Ivanov, Gerd Duscher, Thomas A. Zawodzinski, Alexander B. Papandrew

616 Surface Tailored Acetylene Black for High Voltage Lib Application

Takashi Sonoda, Yuki Nako, Tatsuya Nagai, Akira Yoda, Tetsuya Itoh, Yutaka Takeuchi, Hiroshi Yokota

617 Fabrication and Characterization of Pyrrole/Multi-Walled Carbon Nanotubes Composite Electrodes

Thomas Dushatinski, Tarek M Abdel-Fattah

C01-Corrosion General Poster Session
Non-Destructive Evaluation Method to Measure the Degree of Sensitization

Tomomi Koketsu

Inhibitory and Bactericidal Properties of a Number of Dihydroxyazo Compounds

Vladimir Vigdorovich, Liudmila Tsygankova, Tamara Nazina, Marina Esina, Natalia Shel

Constant-Phase Element Characteristics Caused By Resistivity Distribution in High Performance Anti-Corrosion Organic Coating Applied to Oil Storage Tank

Koya Tokutake, Haruki Nishi, Daisuke Ito, Shinji Okazaki, Yukitaka Serizawa

The Effect of Atomic Hydrogen on the Kinetics of Iron Passivation in Neutral Solutions

Alevtina Rybkina, Andrey Marshakov

Degradation of Anticorrosive Organic Coating Applied to Inner Bottom Plate of Oil Storage Tank By a Large Scale Earthquake

Takashi Konishi, Naoya Kasai, Shinji Okazaki, Tsutomu Kondo

Corrosion Inhibition of Carbon Steel By Some Nonionic Surfactants in 1M H₂SO₄

Florina Branzoi, Viorel Branzoi, Catalina Pacuretu, Angela Stanca

Corrosion Protection of Silicon Micro Systems with Ultra-Thin Barrier Films for Miniaturized Medical Devices

Jorge Mario Herrera Morales, Jean-Charles Souriau, Gilles Simon

Hydrogen Entry into Steel Under an Aqueous NaCl Droplet

Saya Kaneko, Eiji Tada, Atsushi Nishikata
Evaluation of Dezincification Corrosion of Brass By Complex Capacitance

Kozue Tabei, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki

Corrosion Behavior of Casing Steels in Cement Synthetic Pore Solution Exposed to High Pressure CO₂ and H₂S

Ruishu Feng, Justin Beck, Derek M. Hall, Aysel Buyuksagis, Margaret Ziomek-Moroz, Serguei N. Lvov

Anticorrosive and Morphological Properties of Polyaniline/Polyvinyl Chloride Blend on AA7075-T6

Rafael Marinho Bandeira, Fábio Augusto de Souza Ferreira, Ubirajara Pereira Rodrigues Filho, Germano Tremiliosi-Filho

A Novel Coupling Between Atomic Emission Spectroelectrochemistry and Electrochemical Impedance Spectroscopy: Application to Zn, Zn-Cu and Zn-Al-Mg Alloys

Kevin Ogle, Viacheslav Shkirskiy, Polina Volovitch, Peng Zhou, Alina Maltseva

Effect of Tropical Atmosphere on Corrosion of Different Metals: Corrosivity Measurements of Singapore

Sudesh Lakshitha Wijesinghe, Zixi Tan

C₀₂-Coating and Surface Modification for Corrosion Protection

Corrosion

(Keynote) Corrosion Protection of Galvanized Steel Using Smart-Release Inhibitive Pigments Containing Organic Anions

Geraint Williams, Patrick Dodds, Phil Ansell

Intelligent Self-Healing Coatings: Investigating the Role of Self-Healing Kinetics at the Delaminating Interface
Michael Rohwerder

High-Resolution Microscopy of Substrate/Coating Interfacial Regions of a Non-Chromate Organic Coating System on AA2024-T3 after Blister Formation

Kerrie Holguin, Frank Scheltens, Gerald Frankel

A Rapid Assessment of Non-Chromate Primers for Zn/Ni Plated Steel By Electrochemical Techniques

Weilong Zhang, Mike A Kryzman, Mark R Jaworowski, George S Zafiris

Inhibition of Corrosion-Driven Organic Coating Delamination on Zinc By Graphene Nano-Pigments

Hamilton Neil McMurray, Geraint Williams, Carol Frances Glover, Calvin Richards

Inhibition of Corrosion-Driven Organic Coating Delamination on Cold-Rolled Steel By Graphene Nanoplatelets

Carol Frances Glover, Raman Subramanian, Calvin Richards, Geraint Williams, Hamilton Neil McMurray

The Effects Functionalized Graphene Nano-Particles Have on the Corrosion Inhibition of Iron and Galvanised Steel

Calvin Richards, Carol Glover, Hamilton Neil McMurray, Geraint Williams

Micron Scale Cathodically Coated Graphene Impedes Corrosion on Ti, Cube, and Stainless Steel

Patrick Andrew Staley, Joy Metzger, Danielle Griffo, Emily Simmons, Chris Griffo, Mark Bennahmias, Russel Kurtz, Diane K. Smith

A Comparative Study of Mussel Adhesive Proteins As Flash Rust Inhibitors on High Strength Low Alloy Steel

Douglas C. Hansen, William F Nelson
Fabrication and Characterization of Superhydrophobic Poly(vinylidene fluoride-co-hexafluoropropylene)/TiO$_2$ Nanocomposite Coating for Corrosion Protection Applications

Ahmed Bahgat, Aboubakr Moustafa Abdullah, Adel M. A. Mohamed, Mariam Almaadeed

Non-VOC Water-Based Nanocomposite Sol-Gel Thin Films for Corrosion Protection of Commercial Magnesium Alloys

Federico Garcia-Galvan, Antonia Jiménez-Morales, Sebastian Feliu Jr, Juan Carlos Galván

A Study of Anticorrosion Coatings for Surface Modification of Biodegradable Magnesium Alloy

Jing Wang

The Pretreatment of 2000 Series Al Alloy: In Situ Measurement of the Selective Dissolution & Film Formation

Kevin Ogle, Oumaïma Gharbi

Al$_2$O$_3$ Coatings Deposited By ALD on Al Alloys

Philippe Marcus, Jun Tao, Jolanta Swiatowska, Sandrine Zanna, Antoine Seyeux, Emma Harkonen, Mikko Ritala

Atmospheric Corrosion of Zinc Coated Steel- Results from a Worldwide Outdoor Exposure Program

Dominique Thierry, Dan Persson

Corrosion Protection of Low Carbon Steels By Electrodeposited Aluminum Alloys

Andreas Bund, Adriana Ispas, Codruta Aurelia Vlaic, Andrea Foerg, Patrick J. Masset

The Photogenerated Cathodic Protection of Steel Using the Thin Layers of Photoactive Nanocomposite Fabricated By Electrophoretic Deposition
Ji Hoon Park
648 Photocathodic Protection of TiO$_2$ Composite Material on 304 Stainless Steel

Xiutong Wang, Hong Li, Qinyi Wei, Qiaoxia Zhang, Baorong Hou
649 Copper Nanoparticles Effect on the Corrosion Behavior of Different Types of Nickel-Based Super Alloys

Aboubakr Moustafa Abdullah, Adel M. A. Mohamed, Mostafa H Sliem
650 Electrical Resistance-Emission Spectroscopy for Determining the Electrochemical Behavior of Anodized Aluminum in Aqueous Solutions

Khaled Habib
651 The Effects of Hydrophobic Coatings on an Insulative Skirt Layer to Decouple Galvanic Corrosion Between Mechanically-Coupled Aluminum Alloy and Carbon-Fiber Reinforced Polymer-Matrix Composites

Raghu Srinivasan, Lloyd H. Hihara, Jeffrey Nelson
652 Reaction Mechanism of Lanthanide Zirconate Thermal Barrier Materials in Exposure to CMAS

Honglong Wang, Xingxing Zhang, Emily Tarwater, Victor Agubra, Jeff W. Fergus
653 RF Sputtering Thermal Barrier Coating for Enhance Corrosion Efficiency of Aero-Engines Components

Jamnie Yazmin Achem Calahorra, Hilda Esperanza Esparza Ponce, Jose Angel Cabral Miramontes, Facundo Almeraya Calderón, Citzalli Gaona Tiburcio
653 RF Sputtering Thermal Barrier Coating for Enhance Corrosion Efficiency of Aero-Engines Components

C03-Contemporary Aspects of Corrosion and Protection of Magnesium and Its Alloys

Corrosion
654 Gravimetric Measurement of Hydrogen Evolution on Magnesium
Santiago Fajardo, Gerald Frankel

655 Theory for the Enrichment Limit Associated with Noble Metal Impurities on Corroding Mg Anodes

Taylor Cain, Nick Birbilis, John R. Scully

656 Cathodic Activation of Magnesium

Nick Birbilis

657 The Use of EDTA As a Mechanistic Probe of Magnesium Corrosion in Chloride Containing Electrolyte

Geraint Williams, Raman Subramanian, Carol Frances Glover, Sean John, Hamilton Neil McMurray

658 Towards Unravelling the Source of Cathode-Activated Corrosion Filaments Formed on Corroding Mg Alloy Surfaces

Joseph Kish, Zach Cano, Joseph McDermid

659 Interpretation of Inductive Loop in Electrochemical Impedance of Magnesium Dissolving in Sodium Sulfate Solution

Keita Umetsu, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki

660 Hydrogen Evolution Behavior of Dissolving Magnesium Investigated By EIS and Gas Chromatography

Rie Takemiya, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki

661 Dealloying of Magnesium Alloys

Ashlee Wingersky, Allison Handler, Julia Fisher, Anna Weiss, Karl Sieradzki

662 Corrosion Mechanisms of Fusion Welded Magnesium Alloys As a Function of Microstructure
Leslie Gail Bland, James Fitz-Gerald, John R. Scully

663 Corrosion of Galvanically Coupled Magnesium

Dila Ram Banjade, John Harb, Steve Porter

664 Corrosion Behavior of Friction Stir Welded HpdC AM60B Lap Joints

Sarah Zhang, Zach Cano, Brycklin Wilson, Joseph McDermid, Joseph Kish, Carol Frances Glover, Geraint Williams

665 Corrosion Protection of Friction Stir Spot Welds Made in Magnesium Alloys

Yuri Savguira, Sarah Busef, Tom H. North, Steven J. Thorpe

666 Galvanic Corrosion Between Weld Zones As Seen in Fusion Welded AZ31B

Leslie Gail Bland, James Fitz-Gerald, John R. Scully

667 Formation of Calcareous Deposition Layers on AM50 Magnesium Alloy in Presence of Ca²⁺ in De-Icing Salt Solutions: Immersion Vs. Salt Spray Test

Michael Werner Grabowski, Daniel Bengtsson Blücher, Michael Korte, Sannakaisa Virtanen

668 Inhibition Performance Study of Aqueous Vanadate Species on Mg Alloys

Jichao Li, Belinda Hurley, R. Buchheit

669 Effect of Al Content on the Microstructure and Corrosion Resistance of Plasma Electrolytic Oxidation (PEO) Coatings on Mg-Al Alloys

Tao Zhang

670 Mg Corrosion Control By Biopolymer-Polyelectrolyte Membranes
Influence of Proteins and Cells on Corrosion of Mg

Corrosion

Stress Corrosion Cracking of Sensitized 304 Stainless Steel Under MgCl₂ Droplets

Investigation of Pitting on Stainless Steel Using Scanning Electrochemical Microscopy

In-Situ Critical Pitting Temperature on Duplex Stainless Steels

The Effect of Biofilm Formation in Singapore Seawater on Corrosion of Metal and Alloys: New Observations and Concepts

Pit Initiation and Growth on Stainless Alloys in Solutions Containing Sulfate and/or Chloride, and Thiosulfate

Diffusion-Limited 1D Pit Growth of S13Cr in Brine at Elevated Temperature
Experiments Based on One-Dimensional Diffusion Modeling to Determine Critical Factors in Pitting

Jayendran Srinivasan, Robert G. Kelly

Microelectrochemical Investigation of Pit Initiation Site on Austenitic Cast Stainless Steel

Asako Otake, Izumi Muto, Aya Chiba, Yu Sugawara, Nobuyoshi Hara

Effect of Low-Temperature Carburizing Treatment on Improving Pitting Corrosion Resistance at Manganese Sulfide Inclusion in Type 304 Stainless Steel

Aya Chiba, Shuhei Shibukawa, Izumi Muto, Takashi Doi, Kaori Kawano, Yu Sugawara, Nobuyoshi Hara

(Olin Palladium Award) Some Critical Issues in the Breakdown of Passive Films

Digby D. Macdonald

The Influence of Water Radiolysis on Corrosion By Supercritical Water

Subramanian Hariharan, Mojtaba Momeni, Veena Subramanian, James J Noel, Jiju Joseph, Jungsook Clara Wren

Effect of Hydogen Sulfide Ions on a Passivation Behavior of Type-316L Stainless Steel

Jun-Seob Lee, Yuichi Kitagawa, Takayuki Nakanishi, Yasuchika Hasegawa, Koji Fushimi

Dissolution and Repassivation Behaviour of Ti, Ti-6Al-4V, Type316L and Co-27Cr-5.5Mo in Bio-Mechano-Chemical Environment

Kotaro Doi, Sayaka Miyabe, Shinji Fujimoto

Cerium and Lanthanum Salts Used As Individual and Combined Inhibitors for Corrosion Protection of AA7075-T6 in Chloride Solution
Barbara Volaric, Peter Rodic, Ingrid Milosev

686 Study of Single Al Corrosion Pit Growth By Electrochemical Techniques

Weilong Zhang, Mike A Kryzman, Mark R Jaworowski, George S Zafiris

687 Stability Criteria for Intergranular Corrosion of AA5083-H131

Mary Lyn C. Lim, Elissa Trueman, John R. Scully, Robert G. Kelly

688 Coupled Tensile Stress Increases and Topography Evolution during Aluminum Corrosion

Omer Capraz, Shinsuke Ide, Pranav Shrotriya, Kurt Hebert

689 Critical Factors Affecting Intergranular Corrosion of AA5083 Under Atmospheric Exposures

Piyush Khullar, Jose Vargas Badilla, Mary Lyn C. Lim, Stewart C. Hahn, David W. Ellis, Robert G. Kelly

690 Pitting and Hydrogen Evolution on Aluminum in Concentrated HCl Solutions

Brandon Lynch, Santiago Fajardo, Gerald Frankel

691 Intergranular Corrosion in Sensitized AA5083 Under Alternating Wet and Dry Conditions

Mary Lyn C. Lim, Stewart C. Hahn, Robert G. Kelly

692 Potential Dependence of Intergranular Corrosion Propagation in Sensitized Al-Mg Alloys

Mary Lyn C. Lim, David W. Ellis, Stewart C. Hahn, John R. Scully, Robert G. Kelly

693 Susceptibility of 5xxx Aluminum Alloys to Localized Corrosion in Natural Waters
Developing a Framework for Accelerated Test Design By Investigating the Impact of Key Testing Variables on the Exfoliation Corrosion of AA2060

Mary Parker, Srishti Shrivastava, Robert G. Kelly

Role of Confinement in Localized Corrosion

Rohit Puranik, David J Quesnel

Application Of Electrochemistry in the Development of Performance Assessment Models for High Level Nuclear Waste Disposal

Dave Shoesmith

Impact of Salt Deliquescence on the Humidity-Dependence of Atmospheric Corrosion

Eric Schindelholz, B. E. Risteen, Robert G. Kelly

The Effect of the Flow-Regime, Reversal of Polarization, and Oxygen on the Long Term Stability in Capacitive De-Ionization Processes

Izaak Cohen, Eran Avraham, Yaniv Bouhadana, Abraham Soffer, Doron Aurbach

The Dezincification of Brass: In Situ Measurement of Zn and Cu Dissolution with Atomic Emission Spectroelectrochemistry

Kevin Ogle, Peng Zhou

High Resolution in Situ Studies of Localized and Crevice Corrosion with Multiple Beam Interferometry and Atomic Force Microscopy

Buddha Ratna Shrestha, Asif Bashir, Genesis Ngwa Ankah, Frank Renner, Markus Valtiner
On Stress-Corrosion Cracking Initiation: Pitting Susceptibility and Cathodic Activity Near Nonmetallic Steel Inclusions

Kyle Brophy, Faysal Eliyan, Joseph Kish

Heterogeneous Thermal Oxide Film Formed on Polycrystalline Pure Iron

Yu Takabatake, Yuichi Kitagawa, Takayuki Nakanishi, Yasuchika Hasegawa, Koji Fushimi

Localized Corrosion of Carbon Steel in the Presence of Gamma Radiation

Jungsook Clara Wren, Linda Wu, Dan Guo, Alexander Van Belois, James J Noel, Peter Keech

Comparison of Fractographic Behaviors of Electrochemically Hydrogenated and Liquid N₂ Treated 4340 Steel of Various Microstructures

Mobbassar Hassan SK, Ruel Overfelt, Aboubakr Moustafa Abdullah

Factors Affecting Stray Currents Corrosion of Buried Pipeline

Zhu Qingjun, Hou Baorong

Vibrio neocaledonicus Sp., a Novel Marine Bacterium with the High Corrosion Inhibition Efficiency

Masoumeh Moradi, Zhenlun Song, Tao Xiao

Effect of Crevice Length on Potential, Current and pH Distribution in the Crevice Formed in Galvanic Coupling Between AA7050-T7451 and SS316

Chao Liu, Veronica N Rafla, John R. Scully, Robert G. Kelly

Modeling Aircraft Galvanic Stress Controlled By Kinetic Limitations

Jason S Lee
709 3D Corrosion Modeling of Coating Defects

Christopher A. Lueth, John Harb

710 MCB (Mass and Charge Balance) Model Simulation of Corrosion of Co-Cr Alloy Stellite-6

Mojtaba Momeni, Mehran Behazin, Jungsook Clara Wren

711 Multidimensional Modeling of Nickel Alloy Corrosion inside High Temperature Molten Salt Systems


712 Modeling Trapping of Hydrogen Absorbed into Aluminum during Corrosion

Kurt Hebert

713 Effect of Fluctuation of Electrolyte Flow Rate in Hydrogen Entry Cell on Hydrogen Permeation into Steel Sheet

Koji Fushimi, Yudai Yamamoto, Misako Jin, Yuichi Kitagawa, Takayuki Nakanishi, Yasuchika Hasegawa

714 Modeling of Cathode Efficiency of Stainless Steel Under Fully Immersed Conditions

Jayendran Srinivasan, Rebecca Burkley, Chao Liu, Michael T. Weldmedhin, Robert G. Kelly

715 Effects of Temperature on the Corrosion Potential of Stainless Steel Under Gamma-Ray Irradiation

Tomonori Satoh, Chiaki Kato, Fumiyoshi Ueno

716 The Modelling of Pitting Corrosion of Carbon Steel in High Level Nuclear Waste Supercontainer
C06-Pits & Pores 6: Nanomaterials - In Memory of Yukio H. Ogata

Corrosion/Luminescence and Display Materials

717 (Invited) Porous Silicon Studies of Prof. Yukio H. Ogata

Tetsuo Sakka, Kazuhiro Fukami

718 (Invited) Electrodeposition in Microporous Silicon from the Viewpoint of Hydration Property: Effect of Coexisting Ions in Zinc Electrodeposition

Kazuhiro Fukami, Ryo Koda, Akira Koyama, Tetsuo Sakka, Takeshi Abe, Atsushi Kitada, Kuniaki Murase

719 Material Deposition into Porous Silicon Template

Farid A. Harraz, Adel A. Ismail, Saleh A. Al-Sayari, Ali Al-Hajry, Mohammad S. Al-Assiri

720 Effect of Displacement Deposition on Platinum Deposition within Nanoporous Silicon

Akira Koyama, Kazuhiro Fukami, Ryo Koda, Tetsuo Sakka, Takeshi Abe, Atsushi Kitada, Kuniaki Murase

721 (Invited) Silicon Nanowires/Metal Nanoparticles Composites with Specific Properties

Rabah Boukherroub

722 (Invited) Silicon Electrochemical Micromachining Technology: The Good, the Bad and the Future

Giuseppe Barillaro

723 Porosity Control and Transfer in Silicon Nanostructures through Electrochemical & Chemical Etching
Thomas Defforge, Sanahan Vijayakumar, Armando Loni, Arnaud Chaix, Audrey Sauldubois, Caroline Andreazza-Vignolle, Frederique Cunin, Francesco Di Renzo, Leigh T Canham, Gael Gautier

724 Low Doped n-type Localized Porous Silicon Made by Hole Injection from Back-side p+/n Junction for Power Switches Application

Angélique Fèvre, Samuel Menard, Thomas Defforge, Gael Gautier

725 Metal-Assisted Etching of Silicon: Activity of Metal Catalysts and Control of Porous Structure

Shinji Yae, Naoki Fukumuro, Susumu Sakamoto

726 Porous Silicon Nanoneedles By Metal Assisted Chemical Etch for Intracellular Sensing and Delivery

Ciro Chiappini, Enrica De Rosa, Jonathan Otto Martinez, Paola Campagnolo, Carina Almeida, Ennio Tasciotti, Molly Stevens

727 (Invited) Pore Filling of Porous Silicon with Ferromagnetic Nanostructures

Klemens Rumpf, Petra Granitzer, Peter Poelt, Herwig Michor

728 Magnetic Studies of Iron Oxide Nanoparticles Encapsulated within Nanostructured Silicon

Petra Granitzer, Klemens Rumpf, Roberto Gonzalez-Rodriguez, Jeffery Coffer, Peter Poelt, Michael Reissner

729 Morphological and Optical Properties of Stain Etched Silicon in Vanadium Oxide (V₂O₅) / Hydrofluoric Acid (HF) Solution

Maha Ayat, Noureddine Gabouze, Sabrina Sam, Luca Boarino, Rabah Boukherroub

730 (Invited) Bright Light Emitting Silicon/Germanium Nanostructures

David J Lockwood
731 **(Invited) Electronic and Acoustic Applications of Anodized Nano-Crystalline Silicon**

Nobuyoshi Koshida

732 **Plasmonic Mesostructures Prepared by Oriented Mesoporous Materials as a Template**

Shunsuke Murai, Shiguma Uno, Ryosuke Kamakura, Koji Fujita, Katsuhisa Tanaka

733 **Porous Silicon in Microelectronics: From Academic Studies to Industry**

Gael Gautier, Thomas Defforge, Sebastien Desplobain, Jérôme Billoué, Marie Capelle, Patrick Povéda, Kumar Vanga, Bin Lu, Benjamin Bardet, Julie Lascaud, Cheikhou Seck, Angélique Fèvre, Samuel Menard, Laurent Ventura

734 **(Invited) Ultrafine Porous Polyimide Membrane for Rechargeable Lithium Batteries**

Kiyoshi Kanamura, Kazuhei Miyahara, Yohei Aoyama, Kenya Ouchi, Masaki Haibara, Hirokazu Munakata

735 **(Invited) Electrochemical Preparation and Processing of Porous Silicon Nanoparticles for Targeted, Self-Reporting Drug Delivery**

M. J. Sailor

736 **Nanoporous Silicon-Based Platforms for Biological Applications Fabricated by UV Laser Techniques**

Gonzalo Recio-Sanchez, Ramon J Pelaez, Carmen N. Afonso, Fidel Vega, Raul J Martin-Palma

737 **Response Simulation and Extraction of Gas Concentrations for Nanostructure Decorated Nano-/Microporous Silicon Interfaces**

William Laminack, Caitlin Baker, James L. Gole

738 **(Invited) Green Synthesis of Porous Silicon Derived from Accumulator Plants: Associated Morphologies and Stabilization of a Natural Bioactive Extract**
Nguyen T Le, Sabrie Howell, Jhansi Kalluri, Armando Loni, Leigh T Canham, Jeffrey L Coffer

739 (Invited) Organization in Molecular Layers Covalently Attached to Oxide-Free Silicon Surfaces

Catherine Henry de Villeneuve, Thang Long Nguyen Le, Stefan Klaes, Philippe Allongue, François Ozanam

740 Effects of Substrate Composition on Morphology and Growth of Porous Oxide Layers

Hiroaki Tsuchiya, Min-Su Kim, Toshiaki Erami, Yuki Otani, Shinji Fujimoto

741 Porous Layers Composed of Oxide Crystallites Formed by the Combination of Laser Ablation and Anodization of Metal

Abbie S. Ganas, Dmitry A. Znamensky, Nahúm Méndez Alba, José Luis Hernández-Pozos, Kurt W Kolasinski

742 Bias-dependent Photoabsorption Properties of GaN Porous Structures under Backside Illumination

Taketomo Sato, Hirofumi Kida, Yusuke Kumazaki, Zenji Yatabe

743 (Invited) Thermal Carbonization of Porous Silicon: The Current Status and Recent Applications

Jarno Salonen, Martti Kaasalainen, Olli-Pekka Rauhala, Lippo Lassila, Martta Hakamies, Tero Jalkanen, Robert Hahn, P. Schmuki, Ermei Mäkilä

744 Catalytic Activity of Ru for Metal-Assisted Etching of Si

Daisuke Sadakane, Kano Yamakawa, Naoki Fukumuro, Shinji Yae

745 Optical Property of Porous Silicon Produced by Metal-Assisted Etching

Kano Yamakawa, Susumu Sakamoto, Naoki Fukumuro, Shinji Yae
(Invited) Inhomogeneity of Barrier Layer Inducing Irregularity of Porous Anodic Oxide Film on Aluminum

Sachiko Ono, Hidetaka Asoh

Role of Oxide Stress in the Initial Growth of Self-Organized Porous Aluminum Oxide

Kurt Hebert, Omer Ozgur Capraz, Pranav Shrotriya, Peter Skeldon, George Thompson

Semi-Metallic TiO$_2$ Nanotubes: Growth, Properties and Applications

Robert Hahn, Patrik Schmuki

Mechanism Study of Lithium Ion Insertion into Titania Nanotubes

Thierry Djenizian

Ordered and Ultra-High Aspect Ratio Nanocapillary Arrays As a Model System

Mitchell L Solomon, Philip Cox, Nicholas R Schwartz, Gregory E Chester, Justin J Hill

Electrochemical Corrosion Behavior of Nanocrystalline Metal Thin Film Prepared By Magnetron Sputtering -- a Recent Work Report

Li Liu

Pd-Pt Catalyst Layer Formation Based on Porous Si

Masanori Hayase

Dealloying of Few Coating: From Disorder to Order

Yunhan Ling, Jun Zhang, Siqi Yu, Weifeng Liu

Switching from Homogeneous to Localized Corrosion in Stainless-Type Amorphous and Nano-Crystalline Steels
Frank Uwe Renner, Maria Jazmin Duarte

755 Corrosion Product Structures of Steel Samples Exposed to Amine Solutions Used for H₂S Removal.

Mario A Alpuche-Aviles, Scott Waite, Ryan Malkiewich, Suman Parajuli, Maria Muñoz, Pushpa Chhetri

756 (Invited) Formation of Self-Organized Porous Anodic Films on Iron and Stainless Steels

Hiroki Habazaki, Khurram Shahzad, Takuya Hiraga, Etsushi Tsuji, Yoshitaka Aoki

757 Nanoporous α-Alumina Membranes with Pore Diameters Tunable over Wide Range of 30-350 nm

Hidetaka Asoh, Tatsuya Masuda, Sachiko Ono

758 Electrochemical and Thermal Contributions to Ultra-Deep AAO Growth: Aspect Ratio >10⁴

Mitchell L Solomon, Nicholas R Schwartz, Philip Cox, Justin J Hill

759 Functional Optical Devices Based on Highly Ordered Metal Nanostructures Obtained Using Anodic Porous Alumina

Toshiaki Kondo, Takashi Yanagishita, Hideki Masuda

760 Silicon Nanowires Self-Purification By Metal-Assisted Chemical Etching of Metallurgical Silicon

Stefan L. Schweizer, Xiaopeng Li, Junna Wang, Alexander Sprafke, Ralf B. Wehrspohn

D02-Nonvolatile Memories

Dielectric Science and Technology

761 (Keynote) Oxide based Resistive Memories for Low Power Embedded Applications and Neuromorphic Systems
Elisa Vianello, Daniele Garbin, Natalija Jovanovic, Olivier Bichler, Olivier Thomas, Barbara de Salvo, Luca Perniola

762 (Invited) Current Filamentation in Rram As Measured By High Speed Electrical Thermometry

James A. Bain, Abhishek Sharma, Marek Skowronski

763 (Invited) Improving Memory Performance of Cu/HfO$_2$/Pt Conducting-Bridge RAM by Solvent Substitution

Kentaro Kinoshita

764 (Invited) Simulation and Modeling of the Switching Dynamics in Resistive Switching Devices

Stephan Menzel

765 (Invited) Simulating the Behavior of a Bipolar Filamentary ReRAM Cell for Upcoming Memory Devices

Sebastian Wicklein, C Petti, T Minville, A Bandyopadhyay, A Ilkbahar

766 Modulating the Anionic-Electronic Transport Kinetics to Trigger Memristance for Resistive Switching Non-Volatile Memories: New Materials, Structering and Methods

Jennifer L. M. Rupp, Felix Messerschmitt, Sebastian Schweiger, Rafael Schmitt, Markus Kubicek

767 Multilevel Resistive Switching with Oxygen Vacancy Filaments in Pt/TaO$_x$/Cu and Pt/TaO$_x$/Pt Devices

Yuhong Kang, Gargi Ghosh, Marius K Orlowski

768 Multi Level Operation of CuO Based Cbram with Cute Electrode

Dong Won Kim, Kyoung-Cheol Kwon, Myung-JIn Song, Ki-Hyun Kwon, Hye-Jee KiM, Soo-Min Jin, Ye-Ji Son, Jea-Gun Park
(Keynote) Nanoscale Memories: What Does Physics Have to Say?

Victor V. Zhirnov, R Meade, S. C. Pandey, G Sandhu

(Invited) Integration Challenges of Ferroelectric Hafnium Oxide Based Embedded Memory

Johannes Müller, Patrick Polakowski, Jan Paul, Stefan Riedel, Raik Hoffmann, Maximilian Drescher, Stefan Slesazeck, Stefan Müller, Halid Mulaosmanovic, Uwe Schröder, Thomas Mikolajick, Stefan Flachowsky, Elke Erben, Elliot Smith, Robert Binder, Dina Triyoso, Joachim Metzger, Sabine Kolodinski

(Invited) Large Crossbar Arrays for Storage Class Memory and Non-Von Neumann Computing

Kumar Virwani, Geoffrey W. Burr, Robert M. Shelby, Pritish Narayanan

Lead Free Metal-Ferroelectric-Insulator-Semiconductor Devices for Non-Volatile Memory Applications

Rohit Medwal, Surbhi Gupta, Shojan P. Pavunny, Rajesh K. Katiyar, Reji Thomas, Ram S. Katiyar

Characterization of Low-Dielectric Constant Silicon Carbonitride (SiCN) Dielectric Films for Charge Trapping Nonvolatile Memories

Sheikh Rashel AL Ahmed, Shinji Naito, Kiyoteru Kobayashi

Resistance Switching Phenomenon Associated with Anisotropic Magnetoresistance of the ReRAM Device with Ferromagnetic Electrodes

Daisuke Ito, Hayato Yoshida, Tomohiro Shimizu, Shoso Shingubara

(Keynote) Status and Challenges in Spin-Transfer Torque MRAM Technology

Mohamad Krounbi, Vladimir Nikitin, Dmytro Apalkov, Jangeun Lee, Xueti Tang, Robert Beach, Dustin Erickson, Eugene Chen

(Invited) Low Power Stt-Mram and Its Application to Normally-Off Processor
Naoharu Shimomura, Daisuke Saida, Tadaomi Daibou, Yushi Kato, Chikayoshi Kamata, Saori Kashiwada, Yuichi Osawa, Hiroki Noguchi, Junichi Ito, Shinobu Fujita, Hiroaki Yoda

$777\text{Co}_2\text{Fe}_6\text{B}_2/\text{MgO-Based Perpendicular Spin-Transfer-Torque Magnetic-Tunnel-Junction Spin-Valve without [Co/Pt]}_n\text{lower Synthetic-Antiferromagnetic Layer}$

Seung-Eun Lee, Tae-Hun Shim, Jea-Gun Park

$778\text{(Invited) Spin Torque Switching in Magnetic Random Access Memory}$

Tomohiro Taniguchi

$779\text{Critical BEOL Aspects of the Fabrication of a Thermally-Assisted MRAM Device}$


$780\text{Thermal Stability Enhancement of Magnetic Perpendicular-Magnetic Tunnel Junctions Using Double MgO Interface Structure}$

Yasutaka Takemura, Du-Yeong Lee, Seungeun Lee, Jong-Ung Baek, Tae-Hun Shim, Jea-Gun Park

$781\text{Effects of Radio-Frequency Sputtering Power of MgO Tunneling Barrier on Tunneling Magneto-Resistance Ratio for Cofeb/MgO-Based Perpendicular-Magnetic Tunnel Junctions}$

Du-Yeong Lee, Gon-Sub Lee, Hyong-Tak Seo, Jea-Gun Park

$782\text{(Invited) Resistive Random Access Memory for Storage Class Applications}$

Sung Hyun Jo, Tanmay Kumar

$783\text{(Invited) Direct Physical Understanding in Memristive Devices and Corresponding Device Models}$
John Paul Strachan

784*(Invited) Mechanism Study of Reversible Resistivity Change in Oxide Thin Film

Seungbum Hong, Seo Hyoung Chang, Charudatta Phatak, Blanka Magyari-Kope, Yoshio Nishi, Soma Chattopadhyay, Jung Ho Kim

785Set and Reset Voltage Interdependence in Resistive Switching Memory Cells

Gargi Ghosh, Marius K Orlowski

786Analysis of Resistive Switching Characteristics in Surface Anchored Metal Organic Framework (SURMOF) Films

David Malien Nminibapiel, Pragya Shrestha, Zhengbang Wang, K. P. Cheung, Helmut Baumgart, Engelbert Redel, Christof Wöll

D03-Photovoltaics for the 21st Century

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

787*(Invited) CH$_3$NH$_3$PbI$_3$ Perovskite Solar Cells on Inorganic Materials: CuSCN and Crystal Silicon

Seigo Ito

788High Efficiency Millimeter-Scale Crystalline Perovskite Solar Cells

Aditya Mohite, Wanyi Nie, Hsinhan Tsai, Reza Asadpour, Jean-Christophe Blancan, Amanda Neukirch, Gautam Gupta, Jared Crochet, Manish Chhowalla, Muhammad Alam, Hsing-Lin Wang, Sergei Tretiak

789Reduction of Graphene Oxide through Intense Pulsed Light Towards Transparent Conductive Coating Applications

Gabriel Draper, Ruchira Dharamsena, Brandon Lavery, Thad Druffel
Bandgap Engineering in TiO$_2$ By Sulfurization

Woo Jung Shin, Araceli Hernández Granados, Hailin Hu, Meng Tao

Renewable Energy Forecast Using Machine Learning

Ingrid Shao, Siyuan Lu, Hendrik F. Hamann

Metallic Nanoparticles and Nanostructure for Light Trapping

Yongan Tang, Branislav Vlahovic

High Performing Semitransparent Graphene/BiFe$_{0.95}$Si$_{0.05}$O$_3$/ITO Ferroelectric Photovoltaic Device

Surbhi Gupta, Rajesh K. Katiyar, Rohit Medwal, Shojan P. Pavunny, Tej B. Limbu, Monika Tomar, G Morell, Vinay Gupta, Ram S. Katiyar

(Invited) Potential and Activities of III-V/Si Tandem Solar Cells

Masafumi Yamaguchi, K-H Lee, K Araki, N Kojima, Y Ohshita

Low Stress and High Ductility Copper Electroplating Additive Development

Lingyun Wei, Yu Hua Kao, Rebecca Hazebrouck, Robert Corona, Bryan Lieb, Ying Wang, Michael A. Lowe, Mark Lefebvre, Sung-Ho Pyo, Wataru Tachikawa, Jeffrey Calvert

Efficiency Uniformization in Crystalline-Si Solar Cells By Numerical Simulation

Laidong Wang, Meng Tao

Electroplated Cu Grids on Crystalline Silicon Solar Cells and Its Long Term Degradation

Qiang Huang
Flexible Ultra-Thin Silicon Solar-Cell Implemented with Energy-Down-Shift Via Cd$_{0.5}$Zn$_{0.5}$S/ZnS Core/Shell Quantum Dots

Jin-Seong Park, Jae-Hyoung Shim, Yun-Hyuk Ko, Joo-Hyeong Park, Gon-Sub Lee, Jea-Gun Park

Electrochemical Behavior of Silicon in Eutectic Calcium Chloride and Calcium Fluoride Molten Salt

Wen-Hsi Huang, Meng Tao

Comparison of Different TiO$_2$ Phase Structures and Morphologies on Dye-Sensitized Solar Cells

Tsz Cheung Tsui, Wei Han, King Lun Yeung

Intense Pulsed Light Annealing of Perovskite Solar Cells

Brandon Wayne Lavery, Thad Druffel, Gabriel Draper, Mahendra Kumar Sunkara

Concept and Nanostructure Control of Plasmonic Porous Silicon Solar Cells

Kazuki Murakami, Kairi Yamada, Alain Fave, Manabu Ihara

Fabrication and Characterization of Hybrid Solar Cells Based on Perovskite Materials

Tarek M Abdel-Fattah, Shaker Ebrahim, M Soliman, M Anas, E Moustafa

Perovskite Based Solar Cells with Multi-Walled Carbon Nanotubes (MWCNTs)/Carbon Back Contact

Tarek M Abdel-Fattah, Shaker Ebrahim, Wegdan Ramadan, Mohammed Nofal, Moataz Soliman

(Invited) Advance of Dye-Sensitized Solar Cells with Organic Dyes

Takurou N Murakami, Nagatoshi Koumura
806 **PTB7:PC$_{71}$BM Bulk Heterojunction Solar Cells with Multiple Additives**

Masaya Ohzeki, Jiayu Qiu, Shunjiro Fujii, Hiromichi Kataura, Yasushihiro Nishioka

807 **Study of Nano-Filtration and Solvent Effects for Improving Efficacy of Organic Photovoltaic**

Tarek M Abdel-Fattah, Enas m Younes, Gon Namkoong, E M El-Maghraby, Adly Elsayed, A. H. Abo Elazm

808 **Ternary Blend Bulk-Heterojunction Solar Cells Based on Active Layers of PTB7, PC$_{71}$BM, and PC$_{61}$BM**

Jiayu Qiu, Koudai Kiriishi, Kousei Hashiba, Shunjiro Fujii, Hiromichi Kataura, Yasushihiro Nishioka

809 **(Invited) Nanometer-Distance Control in Plasmonic Dye-Sensitized Solar Cells and Applications of Localized Surface Plasmon to Next Generation of Solar Cells**

Manabu Ihara

810 **Solution-Derived NiO Hole Transport Layers on the PTB7:PC$_{71}$BM Organic Solar Cells**

Koudai Kiriishi, Kousei Hashiba, Jiayu Qiu, Shunjiro Fujii, Hiromichi Kataura, Yasushihiro Nishioka

811 **Inverted Organic Solar Cells Based on PTB7:PC$_{71}$BM with PFN Electron Transport Layer on ITO-Free Flexible PEN Substrate**

Kousei Hashiba, Ryo Nagata, Koudai Kiriishi, Hiromichi Kataura, Shunjiro Fujii, Yasushihiro Nishioka

**D04-Semiconductors, Dielectrics, and Metals for Nanoelectronics 13**

Dielectric Science and Technology/Electronics and Photonics

812 **Optimized Novel Indium Antimonide Quantum Well Field Effect Transistor for High-Speed and Low Power Logic Applications**
Rabiul Islam, Md. Mohi Uddin, Mahmud Abdul Matin

$\text{HfO}_2/\text{Al}_2\text{O}_3/\text{InGaAs}$ MOSCAP Structures and InGaAs Plasma Nitridation Elaborated in a 300mm Pilot Line

Mathilde Billaud, Julien Duvernay, Helen Grampeix, Bernard Pelissier, Mickael Martin, Sylvain David, Christophe Vallée, Zdenek Chalupa, Hervé Boutry, Thierry Baron, Mickaël Cassé, Thomas Ernst, Maud Vinet, Gilles Reimbold, Oliver Faynot

*(Invited)* Towards a Vertical and Damage Free Post-Etch InGaAs Fin Profile: Dry Etch Processing, Sidewall Damage Assessment and Mitigation Options

Uthayasankaran Peralagu, Xu Li, Olesya Ignatova, Yen-Chun Fu, David Alan John Millar, Matthew J Steer, Ian M Povey, Khalid Hossain, Manish Jain, Terry G Golding, Ravi Droopad, P. K. Hurley, Iain G Thayne

*(Invited)* MOS Interface Control Technologies for Advanced III-V/Ge Devices

Shinichi Takagi, Chih-Yu Chang, Masafumi Yokoyama, Koichi Nishi, Rui Zhang, Mengnan Ke, Jae-Hoon Han, Mitsuru Takenaka

*(Invited)* Border Trap Density in $\text{Al}_2\text{O}_3$/InGaAs MOS: Dependence on Hydrogen Passivation and Bias Temperature Stress

Kechao Tang, Ravi Droopad, Paul C. McIntyre

*(Invited)* Fabrication of N-Polar (Al,Ga,In)N Heterostructures for Transistor Applications

Stacia Keller, Umesh K Mishra

*(Invited)* Surface Passivation of High-k Dielectric Materials on Diamond Thin Films

Kiran Kumar Kovi, Saman Majdi, Markus Gabrysch, Nattakarn Suntornwipat, Jan Isberg

*(Invited)* Defects and Dopants in Silicon and Germanium Nanowires
Marco Fanciulli, Matteo Belli, Stefano Paleari, Alessio Lamperti, Alessandro Molle, Mauro Sironi, Antonio Pizio

820(Invited) Topological States in Multi-Orbital Honeycomb Lattices of HgTe (CdTe) Quantum Dots

Wouter Beugeling, Efterpi Kalesaki, Christophe Delerue, Yann-Michel Niquet, Daniel Vanmaekelbergh, Cristiane Morais Smith

821(Invited) Factors Impacting Threshold Voltage in Advanced CMOS Integration: Gate Last (FINFET) vs. Gate First (FDSOI)

Dina Triyoso, Rick Carter, Jon Kluth, Scott Luning, Amy Child, Jeremy Wahl, Bob Mulfinger, Kasun Punchihewa, Anil Kumar, Laegu Kang, Ryan Sporer, Xiaobo Chen, Sherry Straub, Girish Bohra, Suraj Patil, Xing Zhang, Alex Chen, Mitsuhiro Togo, Rohit Pal

822Electrical Studies on Parylene-C Columnar Microfibrous Thin Films

Ibrahim H Khawaji, Chandraprakash Chindam, Wasim Orfali, Osama Osman Awadelkarim, Akhlesh Lakhtakia

823Effect of Hydrogen Partial Pressure on in-Situ Steam Generation Oxide Layer

Jin Hyuk Yun, Se Geun Park, Young Ho Lee, Che Young Lee, Jung Su An, In Su Cho

824Highly Robust Advanced Single Precursor Based k 2.4 ILD for Beol Cu Interconnects


825The Effect of CoSi2 Formation Process on the CMOS Transistor Electrical Properties for Sub 100nm Memory Applications

Jeong Hoon Park, Sang Jin Kim, Jung Ho Lee, Chang Jun Yoo, Hyo Jin Kang, Byung Cheol Lee, Jae Goan Jeong
826**Electroless Deposition of Ferromagnetic Co$_x$Fe$_{1-x}$alloys Using Metal Ion Reducing Agent**

Aniruddha Joi, Ernest Chen, Yezdi Dordi

827**(Invited) Variability in FinFET SRAM Cells**

Kazuhiko Endo, Shinichi O'uchi, Takashi Matsukawa, Yongxun Liu, Meishoku Masahara

828**(Invited) Intrinsic Unipolar SiO$_x$-Based Resistive Switching Memory: Characterization, Mechanism and Applications**

Yao-Feng Chang, Burt Fowler, Fei Zhou, Jack C. Lee

829**(Invited) Novel Selector and 3D RRAM Development for High Density Non-Volatile Memory**

Hongxin Yang, Chun Chia Tan, Wei He, Minghua Li, Yu Jiang, Yi Yang

830**(Invited) White-Light-Induced Annihilation of Percolation Paths in SiO$_2$ and High-k Dielectrics - Prospect for Gate Oxide Reliability Rejuvenation and Optical-Enabled Functions in CMOS Integrated Circuits**

Diing Shenp Ang, Tomohito Kawashima, Yu Zhou, Kwang Sing Yew, Milan Kumar Bera, Haizhong Zhang

831**Three-Dimensional Fully-Coupled Electrical and Thermal Transport Model of Dynamic Switching in Oxide Memristors**

Xujiao Gao, Denis Mamaluy, Patrick R Mickel, Matthew Marinella

832**Proximity Gettering Design Via Nano-Cavities Induced By Hydrogen-Ion Implantation for Si CMOS Image-Sensor**

Il-Hwan Kim, Jun-Seong Park, Gon-Sub Lee, Jea-Gun Park

833**(Invited) The Influence of Defects on the Electronic Properties of Hafnia**
834 (Invited) The Assessment of Border Traps in High-Mobility Channel Materials

Eddy Simoen, AliReza Alian, Hiroaki Arimura, D Lin, Hans Mertens, Jerome Mitard, Sonia Sioncke, Wen Fang, Jun Luo, Chao Zhao, Anda Mocuta, Nadine Collaert, Aaron Thean, Cor Claeyts

835 Quantitative Characterization of Near-Interface Oxide Traps in 4H-SiC MOS Capacitors by Transient Capacitance Measurements

Yuki Fujino, Koji Kita

836 Effects of Deuterium Incorporation on Performance and Reliability of Gate-Last High-k/Metal Gate CMOS Devices

Gun Rae Kim, Hyun-chul Sagong, Woo-kyum Lee, June-Kyun Park, Sang-woo Pae, Jong-woo Park, Byoung-deog Choi

837 Negative Gate Transconductance in MIS Tunnel Diode Induced by Peripheral Minority Carrier Control Mechanism

Chien-Shun Liao, Jenn-Gwo Hwu

838 Nanoscale Potential Fluctuation in Non-Stoichiometric Hafnium Suboxides

Oleg M. Orlov, Gennady Ja. Krasnikov, Vladimir A. Gritsenko, Vladimir N. Kruchinin, Timofey V. Perevalov, Vladimir Sh. Aliev, Damir R. Islamov, Igor P. Prosvirin

839 Tunneling Current Induced Frequency Dispersion in the C-V Behavior of Ultra-Thin Oxide MOS Capacitors

Chang-Feng Yang, Jenn-Gwo Hwu

840 Physically Based Analytical Modeling of 2D Electrostatic Potential for Symmetric and Asymmetric Double Gate Junctionless Field Effect Transistors in Subthreshold Region
Imtiaz Ahmed, Quazi D. M. Khosru

841 Non-Uniform Hole Current Induced Negative Capacitance Phenomenon Examined by Photo-Illumination in MOS(n)

Huang-Hsuan Lin, Yen-Kai Lin, Jenn-Gwo Hwu

842 CMOS Compatible Growth of High Quality Ge, SiGe and SiGeSn for Photonic Device Applications

Murtadha A. Alher, Aboozar Mosleh, Larry Cousar, Wei Dou, Perry Grant, Seyed Amir Ghetmiri, Sattar Al-Kabi, Wei Du, Mourad Benamara, Baohua Li, Mansour Mortazavi, Shui-Qing Yu, Hameed A Naseem

843 Enhancement of Material Quality of (Si)GeSn Films Grown by SnCl$_4$ Precursor

Aboozar Mosleh, Murtadha A. Alher, Larry Cousar, Husam Abusafe, Wei Dou, Perry Grant, Sattar Al-Kabi, Seyed Amir Ghetmiri, Bader Alharthi, Huong Tran, Wei Du, Mourad Benamara, Baohua Li, Mansour Mortazavi, Shui-Qing Yu, Hameed A Naseem

844 Influence of Hydrogen Post-Implantation on Threading Dislocation Density in Strain-Relaxed Sige Layer

Jun-Seong Park, Il-Hwan Kim, Gon-Sub Lee, Tae-Hun Shim, Jea-Gun Park

845 (Invited) Effects of Ge Substrate Annealing in H$_2$ on Electron Mobility as well as on Junction Leakage in n-channel Ge MOSFETs

Akira Toriumi, Choonghyun Lee, Tomonori Nishimura

846 Non-Thermal Equilibrium Formation of Ge$_{1-x}$Sn$_x$ (0 ≤ x ≤ 0.2) Crystals on Insulator by Pulsed Laser Annealing

Kenta Moto, Ryo Matsumura, Hironori Chikita, Taizoh Sadoh, Hiroshi Ikenoue, Masanobu Miyao

847 Ultra-Low Temperature (~180°C) Solid-Phase Crystallization of GeSn on Insulator Triggered by Laser-Anneal Seeding
Ryo Matsumura, Kenta Moto, Yuki Kai, Taizoh Sadoh, Hiroshi Ikenoue, Masanobu Miyao

848 (Invited) Fabrication of High-Quality Ge-on-Insulator Structures by Lateral Liquid Phase Epitaxy

Takayoshi Shimura, Yuichiro Suzuki, Masahiro Matsue, Keiko Kajimura, Kohei Tominaga, Takashi Amamoto, Takuji Hosoi, Heiji Watanabe

849 Electrical Characterization of Dry and Wet Processed Interface Layer in Ge/High-K Devices

YI Ming Ding, Durga Misra, Mdnasiruddin Bhuyian, Kandabara Tapily, Robert D. Clark, Steven Consiglio, Cory S. Wajda, Gert J. Leusink

850 (Invited) Excellent Wetting Behavior of Yttria on 2D Materials

Rafik Addou, Matthias Batzill, Robert M Wallace

851 (Invited) Is the Silicene a 2D Dirac Material?

Tetsuroh Shirasawa

852 (Invited) Solution Processing and Device Integration of Two-Dimensional Black Phosphorus

Mark C. Hersam

853 (Invited) Initial State of Graphene Growth on Ge(001) Surfaces

J Dabrowski, G Lippert, G Lupina

854 (Invited) Vertical Field Effect Transistor Based on Graphene/Transition Metal Dichalcogenide Van Der Waals Heterostructure

Rai Moriya, Takehiro Yamaguchi, Yoshihisa Inoue, Yohta Sata, Sei Morikawa, Satoru Masubuchi, Tomoki Machida
855*(Invited) Non-Covalent Functionalization of Epitaxial Graphene for Atomic Layer Deposition of Dielectric Oxides

Jonathan D. Emery, Justice M.P. Alaboson, Hunter J. Karmel, Mark C. Hersam, Michael J. Bedzyk

856*(Invited) Electronic Properties of Self-Assembled Trimesic Acid Monolayer on Graphene Layers

Farzaneh Shayeganfar

857Utilization of a Non-Ionic Surfactant in the Fabrication of Water-Borne Polymeric Semiconductor Nanoparticles for High-Performance, Green Organic Electronics

Jangwhan Cho, Seongwon Yoon, Jaeun Ha, Dae Sung Chung

858Enhanced Charge-Transport Behavior on PbS Nanocrystals Capped with Atomic Ligands

Seongwon Yoon, Jae Un Ha, Jangwhan Cho, Dae Sung Chung

859A Study on Chamber Contamination Control of Rapid Thermal Nitridation Process By Applying Quartz Liner

Jin Hyuk Yun, Se Geun Park, Byung Je Kang, Young Ho Lee, Jung Su An, In Su Cho

860The Improvement Magnet Plate on a Reticle Stage of Lithography Equipment through Analyzing Adhesive and Roughness of Plate

Ik Hwan Yu, Gun Rae Kim, Hag Su Jung, Jae Sung Bae

**D05-Processing Materials of 3D Interconnects, Damascene and Electronics Packaging 7**

Electronics and Photonics/Dielectric Science and Technology

861Plasma Dicing: Current State & Future Trends

Russ Westerman, Gordon Grivna, Ken Mackenzie, Thierry Lazerand, Jason Doub
Miniaturization and Biocompatible Encapsulation for Implantable Biomedical Silicon Devices

Jean-Charles Souriau, Jorge Mario Herrera Morales, Laetitia Castagné, Gilles Simon, Karima Amara, Bertrand Boutaud

Kinetic on Copper Damascene and Cuprous Concentration Computation in With Cl' and SPS

Van Ha Hoang, Masayuki Yokoi, Kazuo Kondo

Microvia Filling in an Acidic Copper Planting Bath with Insoluble Anodes

Chu-Chi Liu, Wei-Ping Dow

Using Copolymers As Suppressors in a Copper Plating Bath for Through-Hole Filling

Shih-I Wen, Wei-Ping Dow

Accelerating Effect of Additives in Damascene Electrodeposition

Toshiya Kitahara, Yutaka Kaneko

Optimizing TSV Fill Phases for Improved Fill Rate, Process Stability and Void Performance

John Ghekiere, Robert Mikkola, Daniel Kebreab, James Burnham, Bridger Hoerner, David Erickson

Impact of Accelerator Decomposition Products to the Stability of TSV Filling Processes

Dirk Rohde, Kinga Haubner, Cornelia Jäger, Andreas Kirbs, Manuel Pölleth, Josef Gaida, Jens Palm

Extreme Bottom-up in Through Silicon Vias by Leveler Pre-adsorption

Takao Ishii, Haruki Egoshi, Masanori Hayase
Reduction of Thermal Expansion Coefficient of Electrodeposited Copper

Kazuo Kondo, Shingo Mukahara, Jin Onuki, Masayuki Yokoi

Scanning Acoustic Microscopy Beyond Conventional Applications

Sebastian Brand, Matthias Petzold

Towards Quantification of Contaminants in Electrodeposited Cu Films

N. T. M. Hai, Valentine Grimaudo, Pavel Moreno-García, Peter Broekmann

The Studies of Spontaneous Potential Oscillation in a Galvanostatic Copper Electrodeposition and the Crystallographic Textures Thereof

Po-Fan Chan, Wei-Ping Dow

Superconformal Filling of High Aspect Ratio through Glass Vias for Interposer Applications Using Tnbt and Ntbc Additives

Nikolay Dimitrov, Paul Ogutu, Edmond Fey

(invited) Copper Electroplating Technology for Packaging

Chien-Hsun Lai, Yu Cheng Yuan, Marco Arnold, Dieter Mayer

Dielectric Spectroscopic Detection of Early Failures in 3-D Integrated Circuits


Combined Surface-Activated Bonding Technique for Low-Temperature Cu/SiO₂ Hybrid Bonding

Ran He, Masahisa Fujino, Akira Yamauchi, Tadatomo Suga

Novel Si Etching and Dielectric Liner Film Processing Technologies for Low-Cost TSV Packaging
Yasuhiro Morikawa

879**Electrografted P4VP as Dielectric in High Aspect Ratio TSV: Surface Preparation and Thermomechanical Consideration**

Thomas Dequivre, Elias Al Alam, Julien Plathier, Andreas Ruediger, Gessie Brisard, Serge Charlebois

880**Effect of Plating Additives on Microstructure and Properties of Electrodeposited Ni-Fe Alloy**

Mao-Chun Hung, Po-Fan Chan, Wei-Ping Dow, Hsiao-Yen Lee, Yi-Sheng Lin, Ping-Feng Yang

881**Highly Adhesive Displacement Plated Cu Seed on Cowb Barrier for All-Wet TSV Fill Process**

Kohei Ohta, Fumihiro Inoue, Tomohiro Shimizu, Shoso Shingubara

882**Thermal Decomposition of Tungsten Nitrido Precursors for Low Temperature MOCVD of WNxCy**

Seo Young Kim, Arijit Koley, Richard Bonsu, Michelle Nolan, Lisa McElwee-White, Tim Anderson

**E01-Current Trends in Electrodeposition - An Invited Symposium**

Electrodeposition

883**(Electrodeposition Division Research Award) The Scanning Bipolar Cell: Design Principles for Patterning of Diverse Metals without Contact to the Substrate**

Trevor M Braun, Daniel T. Schwartz

884**Potential and Adsorbate Effects in Electrodeposition: Lessons Learned from Atomic-Scale in Situ and Operando Studies**

Olaf M. Magnussen
Electrodeposition of Nanowires and Nanostructures from Supercritical Fluids

David Christopher Smith

Electrodeposition from Liquid Metal Salts

Jan Fransaer

E02-Fundamentals of Electrochemical Growth and Surface Limited Deposition

Electrodeposition/Physical and Analytical Electrochemistry

(Keynote) Imaging Electrochemical Growth Using Liquid Cell Transmission Electron Microscopy

Frances M Ross

(Invited) Thermodynamics of Deposition Flux Dependent Intrinsic Film Stress

Marcel J. Rost

(Invited) Self-Terminated Electrodeposition Reactions

Sang Hyun Ahn, Yihua Liu, Rongyue Wang, Dincer Gokcen, Carlos M Hangarter, Ugo Bertocci, Thomas Moffat

(Invited) Semi-Automated System for Electrodeposition of Pt Monolayer Shell on Refractory Metal Core Fuel Cell Electrocatalysts Directly on Gas Diffusion Layer

Stoyan Bliznakov, Miomir Vukmirovic, James Wegrzyn, Radoslav Adzic

Synthesis of II-VI Semiconductors Thin Films By Ecald from Citric Buffer

Remigiusz Kowalik

(Invited) Reaction Kinetics of Metal Deposition Via Slrr of UPD ML Studied By Surface Reflectivity Measurements
Stanko Brankovic, Ela Bulut, Wu Dongjun, Hasan Kilic

893 (Invited) A Coverage Dependent Behavior of Pt on Au Deposited Using Surface Limited Redox Replacement

Natasa Vasiljevic, Zakiya Al Amri

894 Nanostructured, Bimetallic, Noble Metal Powders Prepared By Atomic Layer Electroless Deposition for Applications in Sensing and Catalysis

Patrick J Cappillino, Joshua D Sugar, Farid El Gabaly, Trevor Cai, Zhi Liu, John Lewellen Stickney, David B. Robinson

895 Cu Underpotential Deposition on Ru(0001)

Stanko Brankovic, Dongjun Wu

896 (Invited) In Situ Stress and Nanogravimetric Measurements during Underpotential Deposition

Gery R. Stafford, Matthew Fayette, Ugo Bertocci

897 Towards a Mechanistic Understanding of Platinum Thin Film Deposition on Au(111)

Kathleen Schwarz, Thomas Moffat


Aniruddha Joi, Albina Zieliene, Eugenijus Norkus, Loreta Tamasauskaite-Tamasiunaite, Yezdi Dordi

899 Effects of Cations on Electrochemical Behavior of Ni(II)/Ni in a Hydrophobic Ionic Liquid

Yan-Li Zhu, Yasushi Katayama, Takashi Miura

900 In-Situ Stress Measurements during Cobalt Electrodeposition on (111)-Textured Au
Matthew Fayette, Ugo Bertocci, Gery R. Stafford

901 In Situ Optical Microscopy Studies of Spontaneous Oscillatory Growth of Zinc Dendrites

Dian Yu, Hongyang Li, Jeung Hun Park, Christine Orme, Frances M Ross, Suneel Kodambaka

902 The Effect of Brighteners on the Fabrication of Electroplated High-Bright Aluminum Films Using AlCl3-Emic Ionic Liquids

Futoshi Matsumoto, Shingo Kaneko, Toyokazu Tanabe, Takao Gunji

E03-Novel Design and Electrodeposition Modalities 2

Electrodeposition

903 (Invited) Development of Bimetallic Electrocatalysts and Electrodes for Carbon Dioxide Electrolysis Via Direct Deposition Strategies

Kyler Carroll, Yung Wei Hsiao, Steven Brown, Liang Su, Fikile R. Brushett

904 (Invited) Electrodeposition of Fe-Pt Magnetic Films and Multilayers with Largemagnetic Anisotropy for Magnetic Recording and Microsystems

Siyuan Ge, Defu Liang, Giovanni Zangari

905 Advanced Materials for Integrated on-Chip Power Converter

Hariklia (Lili) Deligianni, Naigang Wang, Oblesh Jinka, Joonah Yoon, E. J. O'Sullivan, Lubomyr Romankiw, W. J. Gallagher

906 (Invited) Controlling Component Distribution in Electrodeposited Multilayer and Alloy Films

Imre Bakonyi, László Péter

907 Modification of Electrodeposited Co-Pd Alloy Catalysts By Superimposed High Magnetic Field
Piotr Zabinski, Krzysztof Mech, Sylwia Banbur-Pawlowska, Remigiusz Kowalik

Direct and Pulse Plating of Metastable Zn-Ni Alloys

Simona Ieffa, Roberto Bernasconi, Luca Nobili, Pietro Luigi Cavallotti, Luca Magagnin

Mediated Electrochemical Deposition of Copper and Silver Thin Films for Improved Resistivity, Grain Size and Intrinsic Stress

Tyler D. Pounds, Stephen L. Farias, Karl Sieradzki, Robert C. Cammarata

(Invited) Pluse Plating for Compound Semiconductor Electrodeposition

John Lewellen Stickney, Justing Czerniawski, Xiaoyue Zhang, Nhi Bui, Sheng Shen

Light Assisted Electrodeposition for the Metallization of Silicon Solar Cells

Qiang Huang, Satyavolu Papa Rao, Kathryn Fisher

Intensity Modulated Photocurrent Spectroscopy (IMPS) Used to Detect Photoactive Intermediates during Ni-W Electrodeposition

Shaopeng Sun, Elizabeth J Podlaha

(Invited) Electropolymerized Polyaniline/Manganese Iron Oxide Hybrids with Enhanced Electrochemical Energy Storage and Color Switching Response

Yiran Wang, Huige Wei, Jiang Guo, Bin Qiu, Suying Wei, Zhanhu Guo

In-Situ Observations of Electrochemical Li Growth and Dissolution on a Lipon Electrolyte By High Resolution Scanning Electron Microscopy

Munekazu Motoyama, Toshio Kimura, Yasutoshi Iriyama

Hybrid Electro-Electroless Deposition (HEED)

Robert Petro, M. Schlesinger
Electrodeposition of Zn Alloys with Cu and Sn from Citrate Electrolytes

Salem Zahmi, Elizabeth J Podlaha

Latest Proofs of Validity of the Phenomenon of Phase Formation through a Stage of Liquid State in Metals Being Electrodeposited

Oleg B Girin

Nanostructured Zinc Electrodeposited from Protic Ionic Liquids: Comparison with Zinc Aqueous Electrodeposition Processes

R. Ortega, Gessie Brisard, Flor Rivas Esquivel

E04-Semiconductors, Metal Oxides, and Composites: Metallization and Electrodeposition of Thin Films and Nanostructures 3

Electrodeposition

Invited) The Electrodeposition of Crystalline Gallium Antimonide Using Electrochemical Liquid-Liquid Solid Deposition (ec-LLS)

Joshua James DeMuth, Luyao Ma, Stephen Maldonado

Electrodeposition of Ordered Copper Germanide from an Alkaline Tartrate-Complexed Electrolyte

Fu Zhao, Marcel Mibus, Lok-kun Tsui, Giovanni Zangari

Electrodeposition of Cu-Zn-Sn Precursors from an Acidic Solution for Cu₂ZnSnS₄ Absorber Layers

Begum Unveroglu, Giovanni Zangari

On the Applications of Newly Architectured CdTe Nanostructures from Ionic Liquid Medium

Khushbu R Chauhan, Dipal B Patel, Indrajit Mukhopadhyay
Dry Electrochemical Etching of MoS$_2$ Thin Films Using Plasma System

Chisung Ahn, Min Hwan Jeon, Hyeong U Kim, Kyong Nam Kim, Hongyi Qin, Yeongseok Kim, Geun Young Yeom, Taesung Kim

Electropolymerization of Poly(phenylene oxide) Films with Variable Thickness

Marina Timmermans, Stella Deheryan, Felix Mattelaer, Christophe Detavernier, Philippe M. Vereecken

Electrodeposition and Characterization of Selective Coatings Based on Black Cobalt for the Conversion of Solar-to-Thermal Energy

Dallely Melissa Herrera Zamora, Francisco Ivan Lizama-Tzec, Oscar Eduardo Arés Muzio, Gerko Oskam

Electrodeposition of Metallic Silicon in P13TFSI Ionic Liquids Containing SiCl$_4$

Akinori Tsuruta, Hisayoshi Matsushima, Mikito Ueda, Takashi Fujii, Hiromitsu Date

Electrodeposition of Cu-Ag Alloy Thin Films Directly on W Diffusion Barrier By Controlling Complexing Agents and Organic Additives

Sunjung Kim, Kang O Kim

Properties of Pulse Electrodeposited CuInGaSe$_2$ Films

Kollegal Ramakrishna Murali, V Chitra

Properties of Pulse Electrodeposited AgGaS$_2$ Films

Kollegal Ramakrishna Murali, S Venkatachalapathy, Ramesh K

Characteristics of Pulse Electrodeposited CuAlSe$_2$ Films

Kollegal Ramakrishna Murali, M Thirumoorthy, K Ramesh
931 Metal Oxide Conductivity and Nanomechanical Properties of ZnO/Mo/ZnO Multilayer Thin Films Deposited By RF Magnetron Sputtering

Shi-Hao Wang, Yu-Jen Hsiao, Te-Hua Fang

932 Study of Aminosilane-Compound Modification Condition on Polished Silicon Wafer and Its Influence on the Adhesion of Electroless Nickel/Phosphorous Film

Wei-Yan Wang, Chin Wei Hsu, Tzu Chien Wei, Chih-Ming Chen, Kuei-Chang Lai

933 Effect of Different Palladium Nanoparticles on the Adhesion Between Electroless-Deposited Nickel-Phosphorus Film and Silane-Compound-Modified Silicon Surface

Chin Wei Hsu, Wei-Yan Wang, Tzu Chien Wei, Kuei-Chang Lai, Chih-Ming Chen

934 Electrochemical Deposition of Hybrid Material Based on Polyindole and CdTe/CdS

Magdalena E Osial

935 Copper Oxide Layers Obtained Via Anodization for Electrowetting on Dielectrics

Roberto Bernasconi, Andrea Bellantone, Francesco Liberale, Luca Magagnin

936 Electrodeposition of Thick MnO$_2$ Films on Restrictive Substrates

Marina Timmermans, Felix Mattelaer, Christophe Detavernier, Philippe M Vereecken

937 Influence of Structural Properties on the Performance of Dye-Sensitized Solar Cells Based on Electrodeposited ZnO

Esdras Josué Canto Aguilar, Juan Antonio Anta, Gerko Oskam

938 Properties of Cabon Fibers with Electrochemically Formed ZnO Nanorods

Kyu Hwan Lee, Dongchan Lim, Sung Mook Choi

939 (Invited) Toward the Formation of Ordered Nanoparticle Films By Electrophoretic Deposition and the Subsequent Assessment of Order Via Voronoi Tessellation Analysis
James H. Dickerson

Development of Silver-Carbon-Nanotube Metal Matrix Composites for Metal Contacts on Space Photovoltaic Cells

Omar Kamal Abudayyeh, Cayla Nelson, Sang Han, Nathan Gapp, David Wilt

Construction of Asymmetric Graphene Sandwiches: Decoration Using Semiconductor and Metal Nanostructures

Peter S Toth, Robert AW Dryfe

(Invited) Electrochemical Processing of Metal-Insulator-Semiconductor (MIS) Photoelectrodes

Daniel Esposito, Natalie Yumiko Labrador

Hydrogen Atom Desorption Induced By Electron Bombardment on Si Surface

Wu Li, Shigeo Sato, Hisanao Akima, Masao Sakuraba

Electrochemical Doping As an Alternative to Ion Implantation in Oxide Semiconductor Thin Films

Takeaki Yajima, Go Oike, Tomonori Nishimura, Akira Toriumi

Formation of Si Nanowires By Electroreduction of Porous Ni/SiO₂ Blocks in Molten CaCl₂

Sheng Fang, Juanyu Yang, Han Wang, Bing Yu, Shigang Lu

The Device-Perimeter Dependency in the Transient Current of a Metal-Insulator-Metal-Insulator-Semiconductor Capacitor with Anodic Oxide Films

Chien-Shun Liao, Jenn-Gwo Hwu

Electrodeposition of Cu on Nickel Seed Layer/p-Si in Buft Cell
Divya Priyadarshani, Prerna Goradia, Aliasgar Contractor, Roman Gouk, Steven Verhaverbeke, Robert Visser

948 Silane-Free Adhesive Electroless Deposition of a Nickel/Phosphorous Layer on Si Wafer

Tzu Chien Wei, Chin Wei Hsu, Wei-Yan Wang, Chih-Ming Chen, Kuei-Chang Lai

949 Bottom-up Filling of Damascene Trenches with Cobalt By Electroplating Process

Chiao-Chien Wei, Eric Chou, Steve Shih, Shih-Ming Lin

F01-Electrochemical Engineering General Session

Industrial Electrochemistry and Electrochemical Engineering

950 Advancements in Copper Interconnect Technology: The Effect of Sulfuric Acid on the Adsorption & Desorption of an Advanced MLI Suppressor

Wyatt Olson, Manning Schmidt, Anna Wetterer, Mark Willey

951 Collaborative Development of a Functional Trivalent Chromium Electroplating Process

Maria E. Inman, E. J Taylor, Timothy D Hall, Stephen Snyder, Savidra Lucatero

952 Transition from Surface Finishing of Stainless Steel Semiconductor Valves to Nickel-Titanium Medical Materials By Analysis of Analogous Patent Art

E. J Taylor, Maria E. Inman

953 Coupling Phenomena Between Micromorphological Evolution and Ionic Mass Transfer Rate during Ag Electrodeposition in AgNO₃ Aqueous Solution

Yasuhiro Fukunaka, Takao Wakatsuki, Takayuki Homma

954 Fabrication of Bumping Mask for Flip-Chip Process on Stainless Steel Using through Mask Electrochemical Micro Machining(TMEMM)
Jae-Bin Ahn, Heon-Yul Ryu, Jin-Goo Park

Characterization of Electric Field Induced Ion Migration in Semiconductor Encapsulation Materials

Stefan Schwab, Jason Jung, Sabine Gruber, Michael Bauer, Michael Nelhiebel, Herbert Hutter

Preparation of Transparent-Type Plasmonic Sensors By the Sol-Gel Process and Electrodeposition

Mikiko Saito, Masahiro Mita, Masahiro Yanagisawa, Takayuki Homma

A New Challenge for Hydrogen Isotope Electrolytic Separation System Combined with Fuel Cell

Hisayoshi Matsushima, Shota Shibuya, Ryota Ogawa, Mikito Ueda

Characterizing Mechanical and Electrochemical Behavior of Mechanically Preloaded Electrodes in Lithium Ion Pouch Cells

Lei Shi, Ulrich Kunz

Effect of ZrO$_2$ Additive for IrO$_2$-Ta$_2$O$_5$/Ti on Activity of Oer in Sulfuric Acid with Toluene Contamination

Kohei Nagai, Kenji Matsumae, Yuji Kohno, Koichi Matsuzawa, Akihiro Kato, Zaenal Awaludin, Yoshinori Nishiki, Shigenori Mitsushima

Nanoparticle Electrocatalysts for the Oxidation of Biomass

Christian Arroyo-Torres, John A Staser, Omar Movil-Cabrera

Electrochemical Enhanced Recovery of Precious Metals from Electronic Waste

Luis A. Diaz, Tedd E. Lister, Gemma Clark, Jacob Parkman

3D Printed Membraneless Water Electrolysis Cells
Glen D O'Neil, Daniel Esposito

963 A Direct Numerical Method of Lines Approach for Predicting Primary and Secondary Current Density Distributions: Linear and Nonlinear Boundary Conditions

Manan Pathak, Kishalay Mitra, Mayandi Ramanathan, Venkat Subramanian

F03-Membrane-based Electrochemical Separations

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

964 (Invited) Membranes of Mixed Ionic and Electronic Conductors for Gas Separation: Effect of Surface and Interfaces

Meilin Liu, Mingfei Liu

965 Electrochemical Oxygen Separation Using Layered Double Hydroxides As Hydroxide Ion Conductor

Kiyoharu Tadanaga, Yuji Arishige, Akitoshi Hayashi, Masahiro Tatsumisago

966 Modifying Electrode Architectures for Solid Acid Electrochemical Hydrogen Separation Devices

David Leon Wilson, Thomas A. Zawodzinski, Alexander B. Papandrew

967 Reaction Dependent Transport of Carbonate and Bicarbonate through Anion Exchange Membranes in Electrolysis and Fuel Cell Operations

William A. Rigdon, Travis J Omasta, Connor A Lewis, William E Mustain

968 (Invited) Applications of Solid Electrolyte Membranes in Heterogeneous Catalysis, Electrochemical Reaction and Separation

Michael Stoukides, Anastasios Vourros, Eirini Vasileiou, Vasileios Kyriakou, Ioannis Garagounis

969 Ion Exchange Membrane Based Ammonia Synthesis
Hui Xu, Tom McCallum, Shyam S Kocha

970 Water Purification in Porous Media Via Shock Electrodialysis

Sven Schlumpberger, Nancy B. Lu, Matthew E Suss, Martin Z. Bazant

971 Removal of Cyanide in Solution Using Electrodeionization

Yun Tian, Yang Yang, Zheng Fan, Xingxing Wu, Zucheng Wu

972 Porous Diamond Membrane Fabricated By Templated Growth for Electrochemical Separation Processes

Fang Gao, Christian Giese, Georgia Lewes-Malandrakis, Christoph E. Nebel

973 Simultaneous Recovery of Potassium, Chloride and Removal of COD from Landfill Leachate Concentrates Using a Combination of Cation-Exchange Membrane Electrolysis

Xinyang Li

974 Recovery Cyanide from Cyanide-Containing Wastewater By Selective Electroconcentration

Yang Yang, Yun Tian, Zheng Fan, Xingxing Wu, Zucheng Wu

975 Hybrid Films Deposition for Nanochannel Membranes with Functional Surfaces

Jeong Hwan Kim, Sung-Woong Lee, Sun-A Jung, Jae-Sung Yoon, Yeong-Eun Yoo

G01-Atomic Layer Deposition Applications 11

Electronics and Photonics/Dielectric Science and Technology

976 (Invited) Atomic Layer Deposition of Core-Shell Nanowires for Solar Energy Conversion Devices

Ashley R. Bielinski, Neil P. Dasgupta
Opportunities of Atomic Layer Deposition for Perovskite Solar Cells

Valerio Zardetto, Francesco Di Giacomo, Mahir Asif Mohammed, Giulia Lucarelli, Stefano Razza, Alessandra D'Epifanio, Silvia Licoccia, W.M.M. Kessels, Aldo Di Carlo, Thomas M. Brown, Mariadriana Creatore

(Invited) A Rational Design for Batteries at Nanoscale by Atomic Layer Deposition


Spatial Atmospheric ALD of Functional Layers for CIGS Solar Cells

A. Illiberi, Corne Frijters, Ellis Balder, Paul Poodt, Fred Roozeboom

(Invited) Atomic Layer Deposition of Nanophase Materials for Electrical Energy Storage

Xiangbo Meng, Jeffrey W Elam

Sensitization of ZnO by Light-Harvesting Antennas Composed of Multiple Stacked Dyes Grown by Liquid-Phase Molecular Layer Deposition

Yusaku Matsumura, Tetsuzo Yoshimura

Understanding Photovoltage in Insulator-Protected Water-Splitting Half-Cells

Andrew G. Scheuermann, Christopher E.D. Chidsey, Paul C. McIntyre

(Invited) Organic-Inorganic Hybrid Materials Formed By ALD Organometallic Infiltration into Polymers

Jesse S Jur, Halil Ibrahim Akyildiz

(Invited) Opportunities in Atomic Layer Deposition for Electronic Textile and Hydrophobic Coating Applications

Han-Bo-Ram Lee
Engineered Combinations of Inorganic ALD/CVD Layers and Monomolecular Organic Films

Silvia Armini

Room Temperate Bonding of Al2O3 Layers by Atomic Layer Deposition on Polyimide Substrates

Takashi Matsumae, Thomas Dushatsinski, Tarek M Abdel-Fattah, Tadatomo Suga, Kai Zhang, Xin Chen, Helmut Baumgart

Raman Spectroscopy of Aluminum-Doped Zinc Oxide Thin Films Synthesized By Atomic Layer Deposition

Pengtao Lin, Xin Chen, Kai Zhang, Helmut Baumgart

Atomic Layer Deposition and in-Situ Characterization of Yttrium Oxide and Yttria-Stabilized Zirconia

Laurent Lecordier

Atomic Layer Deposition of Metals and Oxides on Graphene for Future Nanoelectronics

Ageeth A. Bol, Rene H. J. Vervuurt, Nick F. W. Thissen, Akhil Sharma, W.M.M. Kessels

ALD Materials for the Integration of III-V Based Transistors

Michael Givens, Fu Tang, Qi Xie, Jan Willem Maes

Improving Graphene Conductivity through Selective Atomic Layer Deposition

Chanyuan Liu, Xiaogang Han, Wenzhong Bao, Alexander J Pearse, Liangbing Hu, Gary W Rubloff

Synthesis of Transition Metal Dichalcogenide WSe2-thin Films By Atomic Layer Deposition
Kai Zhang, Xin Chen, Pengtao Lin, Quinton Rice, Mahmoud Abdel-Fattah, Felix J. Seo, Qiliang Li, Helmut Baumgart

(Invited) Vacuum Ultraviolet Photochemical Atomic Layer Deposition of Alumina and Titania Films


New Insights into Sequential Infiltration Synthesis

Jeffrey W Elam, Mahua Biswas, Seth Darling, Angel Yanguas-Gil, Jonathan D. Emery, Alex B. F. Martinson, Paul F. Nealey, Tamar Segal-Peretz, Qing Peng, Jonathan Winterstein, J. Alexander Liddle, Yu-Chih Tseng

(Invited) Ru-Based Binary or Ternary Thin Films By Atomic Layer Deposition for a Seedless Cu Interconnects

Soo-Hyun Kim

ALD TaN Barrier for Enhanced Performance with Low Contact Resistance for 14nm Technology Node Cu Interconnects

Joyeeta Nag, Brian Cohen, Samuel Choi, Atsushi Ogino, Minseok Oh, Yan Yan, Jim Liang, Cathryn Christiansen, Andrew Kim, Baozhen Li, Patrick DeHaven, Anita Madan, Siddarth Krishnan, Andrew H Simon

On the Growth of Silver Thin Films By Atmospheric-Plasma Spatial ALD

Alfredo Mameli, Fieke van den Bruele, W.M.M. Kessels, Fred Roozeboom

(Invited) Metallic Nanocoatings on Optical Fibers as a Sensor Platform

David J. Mandia, Wenjun Zhou, Adam Wells, Jacques Albert, Sean Thomas Barry

Atomic Layer Deposition of Ultrathin TaN and Ternary Ta_{1-x}Al_{x}N_{y} Films for Cu Diffusion Barrier Applications in Advanced Interconnects
Steven Consiglio, Kyle Yu, Sonal Dey, Kandabara Tapily, Robert D. Clark, Toshio Hasegawa, Cory S. Wajda, Gert J. Leusink, Alain C. Diebold

1000 Proposal of Integrated Sensitized Solar Cell Films Based on Sputtered ZnO Thin Films

Alshaalah Jassim, Satoshi Takizawa, Chie Yoshino, Tetsuzo Yoshimura

1001 Synthesis of ALD Tungsten Trioxide Thin Films from W(CO)₆ and H₂O Precursors

Kai Zhang, Christopher McCleese, Pengtao Lin, Xin Chen, Monica Morales, Wei Cao, Felix J. Seo, Clemens Burda, Helmut Baumgart

1002 Synthesis of Noble Metal Nanoparticles By Atomic Layer Deposition Utilizing Self-Assembled Monolayers Templates

Qianqian Zhu, Kun Cao, Bin Shan, Rong Chen

1003 Spectroscopic Ellipsometry Characterization of Pd Thin Film Grown by Atomic Layer Deposition

Yihang Zhang, Xueqi Zhou, Kun Cao, Xiuguo Chen, Shiyuan Liu, Bin Shan, Rong Chen

1004 Sensitization of ZnO in Stacked Structures Containing Multiple Dyes Grown Using Liquid Phase Molecular Layer Deposition

TingTing Liu, Yusaku Matsumura, Tetsuzo Yoshimura

1005 (Invited) An Industry Perspective on Atomic Layer Etching

Satyrath Suri, Colin T. Carver, Robert Turkot, Patricio E Romero, Tristan A Tronic, John Plombon

1006 Selective Removal of Native SiO₂ Using XeF₂

Adam Hinckley, Pablo Mancheno-Posso, C. Steven Lai, Anthony J. Muscat
1007 (Invited) Atomic Layer Etching Using Thermal Reactions: Atomic Layer Deposition in Reverse

Younghee Lee, Jaime W. DuMont, Steven M. George

1008 (Invited) Neutral Beam Technology – Defect-free Nanofabrication for Novel Nanomaterials and Nano-devices

Seiji Samukawa

1009 A Spatial ALD Oxide Passivation Module in an All-Spatial Etch-Passivation Cluster Concept

Fred Roozeboom, Fieke van den Bruele, Yves Creyghton, Paul Poodt, W.M.M. Kessels

1010 (Invited) Divide Et Impera: Towards New Frontiers with Atomic Layer Etching

Thorsten Lill, Keren J. Kanarik, Samantha S.H. Tan, Meihua Shen, Yang Pan, Jeffrey Marks, Vahid Vahedi, Richard A. Gottscho

G02-Semiconductor Cleaning Science and Technology 14 (SCST 14)

Electronics and Photonics

1011 (Invited) Understanding and Controlling Electrochemical Effects in Wet Processing

Srini Raghavan, Chieh-Chun Chiang

1012 (Invited) Ultrapure Water for Advance Semiconductor Manufacturing: Challenges and Opportunities

Slava Libman, Daniel Wilcox, Bernard Zerfas

1013 Oxygen Control Challenge for Advanced Wet Processing

Effects of Diluted-NH$_4$OH as Conductive Rinse Water in Single Wafer Cleaning Processes

Yoshifumi Hayashi, Masayuki Kawakami, Daisaku Yano, Koji Yamanaka

Sulfate Adsorption onto and Desorption from Silicon Dioxide Films

Bing Wu, Srini Raghavan

(Invited) Metallic Contamination Control in Advanced ULSI Processing

Koichiro Saga

Prevention of Metal Contamination in Sub 50 Nm SC1 Cleaning Process

Hyun-Tae Kim, Gun-Ho Park, Byoung-Jun Cho, Jung-Hwan Lee, Min-Su Kim, Jin-Yong Kim, Jin-Goo Park

Behavior of Nickel Deposition on Silicon Wafers from TMAH and Ammonia based SC1 Cleaning Process

Drew Sinha

Contamination Specifications, an Overall Perspective

Paul W Mertens

Submicron Particle Removal during FPD Oxide TFT Process

Jun Lee, Min-Su Kim, Hyun-Tae Kim, In-Chan Choi, Woo-Young Kim, Dae-Seung Lim, Jin-Goo Park

Effect of Particle Contamination on Extreme Ultraviolet (EUV) Mask and Megasonic Cleaning Process for Its Removal

Min-Su Kim, Hye-Rim Ji, In-Chan Choi, Hyun-Tae Kim, Sung-Hae Jang, Jun Lee, In-Seon Kim, Jung-Hwan Kim, Hye-Keun Oh, Jin-Ho Ahn, Jin-Goo Park
Removing Organic Residues Using Backside Brush Scrubber Clean

Kripa Nidhan Chauhan, Vincent Sih, Talapady Bhat, Min Hyo Kang, Eiji Kabutoya, Gordon Cheng

(Invited) Supercritical Drying: A Sustainable Solution to Pattern Collapse of High-Aspect-Ratio and Low-Mechanical-Strength Device Structures

Han-Wen Chen, Steven Verhaverbeke, Roman Gouk, Kurtis Leschkies, Shiyu Sun, Nikos Bekiaris, Robert J. Visser

Effect of Surface Energy Reduction for Nano-Structure Stiction

Tatsuhiko Koide, Shinsuke Kimura, Hiroyasu Iimori, Tomohiko Sugita, Katsuhiro Sato, Yohei Sato, Yoshihiro Ogawa

Dewetting Model Study on a Spinning Substrate - Challenges for Low Chemical Consumption

Ken-ichi Sano, David Mui, Mark Kawaguchi

Effect of Surface Reactivity on Watermark Formation Studied By Sessile Droplet Evaporation Approach

Amir-Hossein Tamaddon, Harold Philipsen, Paul W Mertens, Guy Vereecke, Frank Holsteyns, Marc Heyns, Stefan DeGendt, John Kelly, Dennis H. van Dorp

(Invited) Selective Etch of Si and SiGe for Gate All-Around Device Architecture

Kurt Wostyn, Farid Sebaai, Jens Rip, Hans Mertens, Liesbeth Witters, Roger Loo, Andriy Yakovitch Hikavyy, Alexey Milenin, Naoto Horiguchi, Nadine Collaert, Aaron Thean, Paul W. Mertens, Stefan De Gendt, Frank Holsteyns

Advanced Wet-Etch-Only Process for Complete Tri-Layer Rework

Philipp Steinke, Jesús Calvo, Benjamin Uhlig

Etching of Silicon Nitride in 3D NAND Structures
Derek Bassett, Wallace Printz, Takahiro Furukawa

1030 Selective Silicon Nitride Etch with Hot Diluted HF – an Alternative to Orthophosphoric Acid

Philippe Garnier, Marc Neyens, Thomas Massin, David Thomassin, Carole Maurice

1031 Wet Etchant Diffusion through Photoresist during Gate Oxide Patterning

Marc Neyens, Philippe Garnier, Manon Garach, Nevine Rochat, Christophe Licitra, Raluca Tiron

1032 Acoustic Characterization of Patterning Degradation during Wet Etching

Christophe Virgilio, Philippe Garnier, Mathieu Foucaud, Arnaud Devos, David Pinceau, Julien Carlier, Pierre Campistron, Bertrand Nongaillard, Marc Neyens, Lucile Broussous

1033 Post Salicidation Clean: Removal of Unreacted Pt from High Pt Content NiPt Silicide

Akshey Sehgal, Garo Derderian, Pranesh Muralidhar

1034 (Invited) Nano-Controlled Etching of Polycrystalline Metals - a Key Enabler for Future Technologies

Kanwaljit Singh

1035 Dual-Fluid Spray Process for Particle and Fluorocarbon-Polymer Removal in BEOL Applications

Akihisa Iwasaki, Ayumi Higuchi, Kana Komori, Masanobu Sato, Hajime Shirakawa

1036 Development of a Cu and W Compatible PERR Clean in BEOL Advanced Interconnect Patterning

Els Kesters, Quoc Toan Le, Stefan Decoster, Victor Vega Gonzalez, Frank Holsteyns, Stefan De Gendt
1037 Effect of Dissolved Oxygen on the Removal of BTA from Cu By Tetra Methyl Ammonium Hydroxide

Ramanathan Srinivasan, Srini Raghavan, Amrutha MS

1038 Surface Cleaning of SiGe(100) and Passivation of Ge(100) with Aqueous Ammonium Sulfide

Stacy Lynn Heslop, Philipp Engesser, Harald F. Okorn-Schmidt, Anthony J. Muscat

1039 Evaluation of InGaAs and InP Compatibility with Alkaline Photoresist Stripping Formulations

Glenn Westwood

1040 Optimizing Middle of Line (MoL) Contact Cleaning to Preserve Tungsten (W) Integrity in Advanced Technology Nodes

Sher Jang Singh, Pranesh Muralidhar, Kakoli Das, Silas Scott

1041 Post CMP Cleaning: a Comparison of Contact and Non-Contact Physical Cleaning Methods

Donald Dussault, Mark Beck, Frank Fournel, Christophe Morales

1042 Effect of Pre-Wet Cleaning Conditions on the Pad Oxide Thickness

Dhiman Bhattacharyya, Sathya Priya Sampathkumar, Jagdish Prasad

1043 Real-Time pH Monitoring of Ultra-Diluted Chemistry with a Micro-Sampling pH Monitor

Yoko Nakai, Kazuhiro Miyamura, So Takagi, Yoshihiro Mori

1044 Enhanced Point of Use Filtration for Cleaning without Small Particle Addition

Sasha J Kweskin, Pippen Chen, SunYoung Ham, Thomas Phely-Bobin, Ami Patel
1045(Invited) Reaction Mechanisms on Binary III-V Semiconductor Surfaces during Etching, Passivation, and Deposition

Anthony J. Muscat

1046Surface Chemistry of III-V Semiconductors After Wet Etching with HCl and H₂O₂

Pablo Mancheno-Posso, Anthony J. Muscat

1047Nanoscale Etching: Dissolution of III-As and Ge in HCl/H₂O₂ Solutions

Dennis H. van Dorp, David Weinberger, Simon Van Wonterghem, Sophia Arnauts, Katrien Strubbe, Frank Holsteyns, Stefan De Gendt

1048Chemical Treatments for Native Oxides Removal of GaAs Wafers

Mickaël Rebaud, Marie-Christine Roure, Virginie Loup, Philippe Rodriguez, Eugénie Martinez, Pascal Besson

1049Cleaning of InGaAs and InP Layers for Nanoelectronics and Photonics Contact Technology Applications

Philippe Rodriguez, Laura Toselli, Elodie Ghegin, Mickaël Rebaud, Névine Rochat, Nicolas Chevalier, Eugénie Martinez, Fabrice Nemouchi

1050Chemical Passivation of In₀.₅₃Ga₀.₄₇As(100) Using Ammonium Sulfide and Thiols

Yissel Contreras, Anthony J. Muscat

1051Wet Processing for Post-epi & Pre-furnace Cleans in Silicon Carbide Power MOSFET Fabrication


1052Dissolution of Germanium in Sulfuric Acid Based Solutions
Nobuko Gan, Yuichi Ogawa, Tatsuo Nagai, Toru Masaoka, Kurt Wostyn, Farid Sebaai, Frank Holsteyns, Paul W. Mertens

G03-Thermoelectric and Thermal Interface Materials 2

Electronics and Photonics/High Temperature Materials

1053 (Invited) Advanced Nanostructured Thermoelectric Materials for Energy Conversion

Yue Wu

1054 (Invited) Silicon-Based Nanocomposites for Thermoelectric High Temperature Waste Heat Recovery

Gabi Schierning, Hartmut Wiggers, Roland Schmechel

1055 (Invited) Computation-Driven Materials Search for Thermoelectric Applications

Qing Hao, Hongbo Zhao

1056 (Invited) Optimizations of p and n-Type Bi$_2$Te$_3$-Based Ternary Compounds By Ms-Pulsed Plating and Annealing Under Telluride Atmospheres

Kornelius Nielsch

1057 (Invited) Seebeck Coefficient Measurement of Pbsete / PbTe Nanolaminate Structures

Xin Chen, Pengtao Lin, Kai Zhang, Helmut Baumgart, Brian Geist, Vladimir Kochergin

1058 (Invited) Novel Strategies for the Bottom-up Assembly of Nanowires into Highly Efficient Bulk Thermoelectrics

Sreeram Vaddiraju

1059 (Invited) Thermoelectric Materials and Modules for High Temperature Application
Ryoji Funahashi, Tristan Barbier

1060 (Invited) Recent Advances on the Promising Thermoelectric Oxides Materials

Tristan Barbier, Ryoji Funahashi

1061 (Invited) Optimization of Pulsed Electrodeposited Bi$_2$Te$_3$-Based Thin Films from DMSO Solution: Influence of Deposition Parameters, Electrolytic Bath Composition and Annealing

Devendra Prakash Gautam, Mike O'Neill, Kafil M. Razeeb

1062 (Invited) Colloidal Nanocrystal Composites with High and Low Thermal Conductivity

Robert Wang

1063 (Invited) Thin Film Thermoelectric Metal-Organic Framework with High Seebeck Coefficient and Low Thermal Conductivity

A. Alec Talin, Kristopher Erickson, François Léonard, Vitalie Stavila, Michael E. Foster, Catalin Spataru, Reese Jones, Brian Foley, Patrick Hopkins, Mark D Allendorf

1064 (Invited) Nano-Length-Scale Inorganic/Organic Hybridization for Thermoelectric Materials

Kunihito Koumoto, Chunlei Wan, Ruoming Tian, Ronggui Yang

1065 (Invited) Phonon Transport in Holey Silicon Nanostructures

Jaeho Lee, Peidong Yang

1066 (Invited) The Landauer Approach to Electron and Phonon Transport

Jesse Maassen, Mark Lundstrom

1067 (Invited) Electrodeposited Micro Thermoelectric Module Design for Hybrid Semiconductor Laser Cooling on a Silicon Photonics Platform
Ryan Enright, Shenghui Lei, Ian Mathews, Graeme Cunningham, Ronan Frizzell, Alexandre Shen

1068 (Invited) Thermal Energy Conduction in a Surface Phonon Polariton Crystal

Baratunde Cola

1069 (Invited) Reducing the Thermal Conductivity By Driving PbTe to a Phase Transition Via Strain and/or Alloying

Ivana Savic

1070 (Invited) Phonon Dispersion Engineering and Thermal Transport in Si Membranes

Francesc Alzina, J. Sebastian Reparaz, Bartlomiej Graczykowski, Alexandros El Sachat, Marianna Sledzinska, Emigdio Chávez-Ángel, Markus R Wagner, Andrey Shchepetov, Mika Prunnila, Jouni Ahopelto, Clivia M Sotomayor Torres

1071 (Invited) Tuning of Heat Transport across Thin Films of Polycristalline AlN via Multiscale Structural Defects

Juliana Jaramillo-Fernandez, Jose Ordonez-Miranda, Emmanuel Ollier, Reza Sanatinia, Himanshu Kataria, Emigdio Chávez-Ángel, Sebastian Volz, Clivia M Sotomayor Torres

G04-ULSI Process Integration 9

Electronics and Photonics

1072 (Keynote) Devices Architectures and Technology for Quantum Computing

Tetsuo Kodera, Kosuke Horibe, Shunri Oda

1073 Smartphones: Driving Technology to More than Moore 3-D Stacked Devices/Chips and More Moore FinFET 3-D Doping with High Mobility Channel Materials from 20/22nm Production to 5/7nm Exploratory Research

John O Borland
1074 (Invited) Gold-Induced Low-Temperature (<300°C) Growth of Quasi-Single Crystal SiGe on Insulator for Advanced Flexible Electronics

Taizoh Sadoh, Jong-Hyeok Park, Rikuta Aoki, Masanobu Miyao

1075 (Invited) Temporary Bonding with Polydimethylglutarimide for Residue-Free Layer Transfer and 3-D Integration


1076 (Keynote) Silicon Photonics Technology for Optical Communications with High Bandwidth Density Requirements (1Tbit/s and 1,000 Gbit/s/cm²)

Sylvie Menezo, Gabriel Pares, Stephane Bernabe, Olivier Castany, Corrado Sciancalepore, Karim Hassan, Benjamin Blampey, Benoit Charbonnier, Julie Harduin, Sonia Messaoudene, Saman Saeedi, Azita Emami, Badhise Ben Bakir

1077 (Invited) Si Photonics and Recent Challenges for on-Chip WDM

Kazumi Wada, Z. Zhang, M. Yako, K. Ju, N.J. Kawai

1078 (Invited) Multifunctional Technology with Monolithic Integrated THz-, Photonic- and µ-Fluidic Modules

Andreas Mai, Stefan Lischke, Matthias Wietstruck, Lars Zimmermann, Mehmet Kaynak, Bernd Tillack

1079 (Invited) Electrical Properties of Group 4 Metal-Nitride/Ge Contacts and the Application to Ge Optoelectronic Devices

Hiroshi Nakashima, Keisuke Yamamoto, Dong Wang

1080 Self-Assemble Formation of Ge Dots on Si(100) via C/Ge/C/Si Structure

Yuhki Itoh, Tomoyuki Kawashima, Katsuyoshi Washio

1081 Gate-Bias Dependent Phonon Softening Observed in Ge MOSFETs
Shoichi Kabuyanagi, Tomonori Nishimura, Takeaki Yajima, Akira Toriumi

1082 Biaxial Stress Evaluation in SiGe Epitaxially Grown on Ge Substrate by Oil-Immersion Raman Spectroscopy

Kazuma Takeuchi, Daisuke Kosemura, Shotaro Yamamoto, Motohiro Tomita, Koji Usuda, Naomi Sawamoto, Atsushi Ogura


Shigeaki Zaima, Osamu Nakatsuka, Takashi Yamaha, Takanori Asano, Shinichi Ike, Akihiro Suzuki, Masashi Kurosawa, Wakana Takeuchi, Mitsuo Sakashita

1084 (Invited) Tunneling FET Technologies Using III-V and Ge Materials

Shinichi Takagi, Minsoo Kim, Mitsuhiro Noguchi, Koichi Nishi, Mitsuru Takenaka

1085 (Invited) Vertical Tunnel FETs Using III-V Nanowire/Si Heterojunctions

Katsuhiro Tomioka, Takashi Fukui, Junichi Motohisa

1086 (Invited) On the Electrical Activity of Extended Defects in High-Mobility Channel Materials

Eddy Simoen, Geert Eneman, Andriy Yakovitch Hikavyy, Roger Loo, Somya Gupta, Clement Merckling, AliReza Alian, Andreas Schulze, Matty Caymax, Robert Langer, Kathy Barla, Cor Claeys

1087 (Invited) Material and Device Integration for Hybrid III-V/SiGe CMOS Technology

Veeresh Vidyadhar Deshpande, Vladimir Djara, Daniele Caimi, Eamon O'Connor, Marilyne Sousa, Lukas Czornomaz, Jean Fompeyrine

1088 (Invited) Characterization of Individual Si/SiO₂ Interface Traps: Direct Observation of Single P₅₀₀ Centers by the Charge Pumping (CP) Method and Correction of the Conventional CP Theory
Toshiaki Tsuchiya

1089(Invited) Scavenging Kinetics of Interfacial SiO$_2$ in HfO$_2$/SiO$_2$/Si Gate Stacks

Akira Toriumi, Xiuyan Li

1090(Invited) High-Resolution Photoemission Study of High-k Dielectric Bilayer Stack on Ge(100)

Seiichi Miyazaki, Akio Ohta

1091(Invited) Negative Capacitance Using Ferroelectrics for Future Steep-Slope MOSFETS

Anthony O'Neill

1092Photoemission Study on Chemical Bonding Features and Electronic Defect States of Thermally-Grown SiO$_2$/4H-SiC Structure

Hiromasa Watanabe, Akio Ohta, Katsunori Makihara, Seiichi Miyazaki

1093(Invited) Effect of Individual Dopants in Nano-SOI-MOSFETs and Nano-pn-Diodes

Michiharu Tabe, Daniel Moraru, Arup Samanta, Krzysztof Tyszka, Hoang Nhat Tan, Yuki Takasu, Ryszard Jablonski, Le The Anh, Hiroshi Mizuta, Takeshi Mizuno

1094(Invited) Silicon Field Emitter Array Photocathode

Hidetaka Shimawaki, Masayoshi Nagao, Yoichiro Neo, Hidenori Mimura, Fujio Wakaya, Mikio Takai

1095Hydrogen Plasma Utilization in Advanced Logic Technology

Qiuhua Han, Xiaoying Meng, Haiyang Zhang

1096Process Optimization on Self-Aligned Double Patterned Fin Formation
Haiyang Zhang, Yan Wang, Fangyuan Xiao

1097 Strained p-Channel MOSFET Fabrication Challenge and Perspective for the 28-Nm Technology Node and Beyond

Zhe Zheng, Fangyuan Xiao, Haiyang Zhang

1098 (Invited) Advanced CMOS Device Technologies Discussed Also with Transition-Metal Di-Chalcogenide (TMDC) Channel

Hitoshi Wakabayashi

1099 (Invited) Silicene As a 2D Material Candidate

Patrick Vogt, Guy Le Lay, Paola De Padova

1100 (Invited) Performance of Graphene and Beyond Graphene 2D Semiconductor Devices

Frank Schwierz

1101 (Keynote) Heterogeneous Integration of MEMS by Adhesive Bonding

Masayoshi Esashi, Shuji Tanaka

1102 CMOS and NEMS Hybrid Architectures

Thomas Ernst, Issam Ouerghi, Willy Ludurczak, Julien Arcamone, Laurent Duraffourg, Eric Ollier, Julien Philippe, Sébastien Hentz

1103 (Invited) Observation of Stress Responses of Bacteria Confined in a MEMS Microfluidic Chip

Yusuke Nishimura, Makoto Ishida, Kazuaki Sawada, Hiromu Ishii, Katsuyuki Machida, Kazuya Masu, Changle Wang, Kenichiro Iida, Mitsumasa Saito, Shinichi Yoshida

1104 Innovative Embedded Non-Volatile Memories: Flexibility and Reliability
Gabriele Navarro, Elisa Vianello, Gabriel Molas, Véronique Sousa, Luca Perniola

1105 Increase in Oxide Trap Density Due to the Implementation of High-k and Al₂O₃ Cap Layers in Thick-Oxide Input-Output Transistors for DRAM Applications

Eddy Simoen, Romain Ritzenthaler, Moon Ju Cho, Tom Schram, Naoto Horiguchi, Marc Aoulaiche, Alessio Spessot, Pierre Fazan, Cor Claeys

1106 Resistive Switching Characteristics of Si-Rich Oxides with Embedding Ti Nanodots

Yusuke Kato, Takashi Arai, Akio Ohta, Katsunori Makihara, Seiichi Miyazaki

1107 (Invited) Visualization of Conductive Filament of ReRAM during Resistive Switching by in-situ TEM

Yasuo Takahashi, Masaki Kudo, Masashi Arita

1108 (Invited) An Investigation of the InGaAs MOS System for Future High Mobility Channel Applications

P. K. Hurley, Yuri Gomeniuk, Jun Lin, Scott Monaghan, Ian M Povey, Martyn E Pemble, B J Hutchinson, Brendan Sheehan, Vladimir Djara, Eamon O'Connor, Karim Cherkaoui

1109 Dummy Poly Gate Removal Process Optimization with Pulsing Plasma Application

Shi-Liang Ji, Rui-Xuan Huang, Cheng-Long Zhang

G05-GaN & SiC Power Technologies 5

Electronics and Photonics/Dielectric Science and Technology

1110 (Invited) Wide Bandgap (WBG) Power Switching Devices for Distributed Clean Energy Systems

Krishna Shenai

1111 (Invited) High Power SiC Power Processing Unit Development
Robert Scheidegger

1112 (Invited) Silver Sinter Joining and Stress Migration Bonding for Wbg Die-Attach

Katsuaki Suganuma, Toru Sugahara, Jinting Jiu, Shijo Nagao, Emi Yokoi, Hao Zhang

1113 (Invited) Enabling SiC Yield and Reliability through Epitaxy and Characterization

Hrishikesh Das, Swapna Sunkari, Martin Domeij, Andrei Konstantinov, Fredrik Allerstam, Thomas Neyer

1114 (Invited) Structural Characterization of SiC Crystals Grown By Solvent Laser Heated Floating Zone Method and Hot Wall Chemical Vapor Deposition for the Development of a Low Defect Density Bulk Growth Technique for SiC

Balaji Raghothamachar, Ouloide Yannick Goue, Michael Dudley

1115 Direct Determination of Burgers Vectors of Threading Mixed Dislocations in 4H-SiC c-Plane Wafers Grown by PVT Method

Jianqiu Guo, Yu Yang, Fangzhen Wu, Ouloide Yannick Goue, Balaji Raghothamachar, Michael Dudley

1116 Assessment of Factors Controlling the X-ray Penetration Depth in Studies of 4H-SiC using Monochromatic and White Beam Synchrotron X-ray Topography in Reflection Geometry

Yu Yang, Jianqiu Guo, Ouloide Yannick Goue, Fangzhen Wu, Balaji Raghothamachar, Michael Dudley

1117 (Invited) Role of GaN-Based Devices in Medium and High Power Conversion

Srabanti Chowdhury

1118 (Invited) AlGaN Higher Power Devices

Kenneth A. Jones
1119 (Invited) Ultra-Wide-Bandgap Semiconductors for Power Electronics


1120 Avalanche Energy of High-Voltage Silicon and SiC Power Diodes

Krishna Shenai

1121 (Invited) Threshold Voltage Stability Comparison of Commercial SiC Mosfets and Related Issues

Ron Green, Aivars Lelis, Dan Habersat

1122 (Invited) Baseplate Materials for Securing Reliability of Wide Band Gap Power Semiconductor Module Operating at High Temperatures

Hiroki Takahashi, Takeshi Anzai, Fumiki Kato, Shinji Sato, Hidekazu Tanisawa, Yoshinori Murakami, Kinuyo Watanabe, Hiroshi Sato

1123 (Invited) Epitaxial III-Nitride Film Growth in a Single Wafer Rotating Disk MOCVD Reactor

George D Papasouliotis, Jie Su, Balakrishnan Krishnan, Ronald Arif

1124 (Invited) Quality Improvement and Mapping Analysis of Single Crystal 4H SiC Grown with Purified Beta-SiC Powder Source

Younghee Kim, Eunjin Jung, Myunghun Lee, Jungyu Kim, Doojin Choi

1125 Double Shockley Stacking Fault Formation in Higher Doping Regions of PVT-Grown 4H-SiC Wafers

Yu Yang, Jianqiu Guo, Ouloide Yannick Goue, H Wang, F Wu, Balaji Raghothamachar, Michael Dudley, G Chung, J Quast, E Sanchez, I Manning, Darren Hansen

1126 Study on the Relaxation Process in 4H-SiC Homoepitaxy Growth
Jianqiu Guo, Yu Yang, Fangzhen Wu, Ouloide Yannick Goue, Balaji Raghothamachar, Michael Dudley

1127 (Invited) Vertical GaN Pin Diodes Formed By Mg Ion Implantation

Travis J Anderson, Jordan D Greenlee, Boris Feigelson, Jennifer K Hite, Karl D Hobart, Francis J Kub

1128 (Invited) Ion Implantation into GaN and Implanted GaN Power Transistors

Kazuki Nomoto, Kengo Takahashi, Oikawa Takuya, Hiroki Ogawa, Tomoaki Nishimura, Tomoyoshi Mishima, Tohru Nakamura, Huili Grace Xing

1129 (Invited) Radiation-Induced Defect Mechanisms in GaN Hemts

Andrew D. Koehler, Travis J Anderson, Petra Specht, Brad D Weaver, Jordan D Greenlee, Marko J Tadjer, David I Shahin, Karl D Hobart, Francis J Kub

1130 Vertical Buffer Leakage and Temperature Effects on the Breakdown Performance of GaN/AlGaN HEMTs on Si Substrate

Fouad Benkhelifa, Stefan Müller, Vladimir M. Polyakov, Steffen Breuer, Heiko Czap, Christian Manz, Michael Mikulla, Oliver Ambacher

1131 Leakage Current Mechanisms in Reverse Biased High-Voltage 4H-SiC Power Diodes

Krishna Shenai, Balaji Raghothamachar, Michael Dudley

1132 (Invited) Reliability and Pulsed I-V Analysis of Vertically-Scaled GaN MIS-Hemts

David J. Meyer, Brian P. Downey, Jason A. Roussos, D. Scott Katzer, Mario G. Ancona, Ming Pan, Xiang Gao

1133 4H-SiC JFET Multilayer Integrated Circuit Technologies Tested up to 1000 K

David J Spry, Phil G Neudeck, Liangyu Chen, Carl W Chang, Dorothy Lukco, Glenn M. Beheim
(Invited) Characteristics of a Wire-Bonding-Less SiC Power Module Operating in a Wide Temperature Range

Shinji Sato, Hidekazu Tanisawa, Takeshi Anzai, Hiroki Takahashi, Yoshinori Murakami, Fumiki Kato, Kinuyo Watanabe, Hiroshi Sato

(Invited) Short-Circuit Ruggedness of SiC JFETs

Maxime Berthou, Shiqin Niu, Dominique Tournier, Dominique Planson

H01-Low-Dimensional Nanoscale Electronic and Photonic Devices 8

Electronics and Photonics/Dielectric Science and Technology/Sensor

(Invited) Semiconductor Nanowires and Nanosheets for Extremely Widely Tunable Lasing

Cun-Zheng Ning

(Invited) Lead Halide Perovskite Nanowire and Nanoplate Lasers with Low Lasing Thresholds and High Quality Factors

Song Jin

(Invited) High Performance Deep Ultraviolet Nanowire Light Emitting Diodes and Lasers

Zetian Mi, Songrui Zhao, Xianhe Liu

(Invited) Semiconductor/Oxide Composite Nanowires Supplying White Luminescence

Fumitaro Ishikawa, Naoki Yamamoto

Physical and Electrical Properties of Ag Contacts on MoS₂

Hui Yuan, Minghu Pan, Guangjun Cheng, Curt A. Richter, Qiliang Li
Post Deposition Annealing Atmosphere Effect on SSI-LEDs Made of Zr-Doped HfO₂ High-k Gate Dielectric

Shumao Zhang, Yue Kuo, Stanislav Verkhoturov

Invited) Electronics Based on Monolayers

Lain-Jong Li

Integration of 2-D Materials for Electronic Device Application

Jianyuan Jia, Jaeho Jeon, Jin-Hong Park, Sungjoo Lee

Band Gap Tunable Monolayer WSe₃₋ₓSₓ Synthesis, Characterization and Device Applications

Bin Xiang, Jian Huang, Lei Yang, Qi Fu

Hybrid Two-Dimensional Nanosheet Materials for Energy Storage Devices

Lele Peng, Yue Zhu, Guihua Yu

Functional Nanostructures for Highly Efficient Photoelectrochemical Water Splitting

Yuegang Zhang

Two-Dimensional Layered Materials/Silicon Heterojunctions for Energy and Optoelectronic Applications

Jiansheng Jie

ZnCdSe-Sensitized WO₃ and TiO₂-based Photoelectrodes: A Comparative Study

Ruchi Gakhar, Dev Chidambaram

Enhanced Energy Harvesting Scheme Utilizing Hierarchical Micro/Nanostructures
Yu-Lun Chueh

1150 (Invited) Wearable Electronics Using Low-Dimensional Nanomaterials

Jang-Ung Park

1151 (Invited) Physical, Chemical and Biological Sensors Based on Nanomaterials for Wearable and Smart Electronics

Nae-Eung Lee, Tran Quang Trung, Eun Roh, Byeong-Ung Hwang, Doil Kim, Sajal Shrivastava, Le Thai Duy, Vinh Quang Dang, Yeong-Min Son, Wonil Lee, Il-Yung Sohn, Ju-Hyuck Lee, Bo Young Kim, Saqib Siddiqui, Sang-Woo Kim

1152 (Invited) Printed High Performance Flexible Device Sheet

Kuniharu Takei

1153 (Invited) Flexible Electronic Skins for Wearable Sensors

Hyunhyub Ko

1154 (Invited) Laser Cooling in Semiconductors

Jun Zhang

1155 (Invited) Surfactant-Assisted Chemical Vapor Deposition of High-Performance Small-Diameter Gasb Nanowires

Johnny C Ho

1156 (Invited) Emerging Oxide Nanowires: Creation Concept and Their Promises for Novel Nanoscale Devices

Takeshi Yanagida

1157 (Invited) New Synthesis Approaches to Nanostructured Complex Functional Metal Oxides
Candace K. Chan

1158 (Invited) Operando Measurement of Energy Band Alignment and Built-in Potential in Thin-Film Photovoltaic Devices

Liwei Chen

1159 (Invited) Efficient Perovskite Thin Film Solar Cells on Nanostructure

Zhiyong Fan, Mohammad Mahdi Tavakoli, Siu-Fung Leung, Tsui Kwong-Hoi

1160 Nanopatterned Fiber Based Textile Triboelectric Nanogenerator

Wanchul Seung, Sang-Woo Kim

1161 Highly Flexible and Transferable Supercapacitors with Ordered Three-Dimensional MnO$_2$/Au/MnO$_2$ Nanospikes Arrays

Yuan Gao, Qingfeng Lin, Mohammad Mahdi Tavakoli, Siu-Fung Leung, Zhiyong Fan

1162 (Invited) Strain and Phonon-Carrier Interactions in Ge-Si$_{0.5}$Ge$_{0.5}$ Core-Shell Nanowires Probed Using Tip-Enhanced Raman Spectroscopy

Edward T. Yu, Zhongjian Zhang, David Dillen, Bryan W. Brasile, Emanuel Tutuc

1163 Multiple-Input Multiple-Output Optical Integrator Design by Non-Interacting Control via Dynamic Extension

Stephen Hayden Williams, Xiaojia Xue, Makhin Thitsa

1164 Characterization of InN - In$_{0.25}$Ga$_{0.75}$N Quantum Well Laser Structure for 1330 nm Wavelength

Md. Mobarak Hossain Polash, M. Shah Alam

1165 Optical Gain Optimization of Al$_{0.8}$Ga$_{0.2}$N-Delta-GaN Quantum Well Laser in Ultraviolet Spectra Using Genetic Algorithm
Md. Mobarak Hossain Polash, M. Shah Alam

1166 (Invited) Microscopic Studies of Black Phosphorus and Its Field-Effect Transistors

Minghu Pan, Hui Yuan, Ya-Qiong Xu, Zhixian Zhou, Vincent Meunier

1167 Fast and Patternable Synthesis of Graphene and Transition Metal Dichalcogenide Materials Via Laser Annealing on Insulating Substrates

Henry Medina, Yu-Ze Chen, Chih-Chi Huang, Yu-Lun Chueh

1168 (Invited) Interface and Dielectric Engineering for High-Performance Top-Gated MoS$_2$ Field Effect Transistors

Xuming Zou, Lei Liao

1169 (Invited) Ultrashort Channel Length Black Phosphorus Field-Effect Transistors

Jinshui Miao, Suoming Zhang, Le Cai, Chuan Wang

1170 (Invited) Probing Metal-Graphene Interactions with Raman Spectroscopy

Guangjun Cheng, Irene Calizo, Angela R. Hight Walker

1171 (Invited) A Metal Oxide Antifuse-Diode Device

Yue Kuo

1172 (Invited) Transistors without Semiconductors By Functionalized Boron Nitride Nanotubes

Yoke Khin Yap

1173 (Invited) Oxide Interface Is the Device: Properties of Two-Dimensional Electron Gas

Tao Wu
Growth of InGaAsP Alloy Nanowires for Emission from Visible to Mid-Infrared Wavelengths

Seyed Ebrahim Hashemi Amiri, Sunay Turdogan, Zhicheng Liu, Fan Fan, Cun-Zheng Ning

(Invited) Triboelectric Nanogenerators for Self-Powering Small Electronics

Sang-Woo Kim

(Invited) Low Dimensional Materials Used for Solar Cells

Meicheng Li

Micropatterned P(VDF-TrFE) Film Based Piezoelectric Nanogenerators for Highly Sensitive Self-Powered Pressure Sensing System

Hong-Joon Yoon, Ju-Hyuck Lee, Sang-Woo Kim

(Invited) Electrochemical Nanowire Devices for Energy Storage

Liqiang Mai, Liang Zhou, Xiaocong Tian, Ruimin Sun, Mengyu Yan

(Invited) Imprinted Functional Nano-Structures for Highly Efficient Photonic Devices

Heon Lee

(Invited) Mesoporous Anatase Single Crystals for Efficient Co^{2+/3+} Based Dye-Sensitized Solar Cell

Jung Ho Kim

A Controllable and Widely Applicable Electrochemical Anodization Process to Fabricate Porous Anodic Aluminum Oxide Membrane

Yuanjing Lin, Qingfeng Lin, Xue Liu, Yuan Gao, Zhivong Fan
Lift-Off Patterning of Nano-Crystalline Quantum Dot Films

Ala Sabeeh, Yash Thakur, Jerzy Ruzyllo

H02-Solid-State Electronics and Photonics in Biology and Medicine 2

Electronics and Photonics/Sensor

(Invited) The Next Generation Biochip

Yuh-Shyong Yang

(Invited) Development of Fibronectin-Modified Gold Egfet Sensor for the Detection of S. Epidermidis Biofilm and Staphylococcal 16S rRNA

Chao-Sung Lai

(Invited) Electrical Sensing with a Tube-in-a-Tube Semiconductor

YuHuang Wang, Allen Ng, Yanmei Piao, Chien-Fu Chen, Hyejin Kwon, Cheng Lee

AlGaN/GaN High Electron Mobility Transistors for Cardiovascular Disease (CVD) Marker Detection

Chia-Ho Chu, Indu Sarangadharan, Abiral Regmi, Yi-Ting Chen, Yu-Lin Wang

(Invited) Single Cell Detection Using Magnetic Zigzag Nanowire Biosensor

Hao-Ting Huang, Zung-Hang Wei

Simulation of the pH Sensing Capability of an Open-Gate GaN-Based Transistor

Erin Patrick, Mohua Choudhury, Mark E Law

Aptamer Immobilized Field Effect Transistor for Early Diagnostic of Human Immunodeficiency Virus Type 1 (HIV-1)

Chia-Ho Chu, Indu Sarangadharan, Abiral Regmi, Yi-Ting Chen, Yu-Lin Wang
1190 (Invited) Triboelectric Nanogenerators Harvesting (Bio)Mechanical Energy for Self-Powered Systems

Sihong Wang

1191 (Invited) Piezotronics in 1D/2D Nanomaterials for Active and Adaptive Nano-Electronics/Optoelectronics

Wen Zhuo Wu

1192 (Invited) A Spontaneously Generated Electrical Charge of an Aqueous Droplet by Pipetting and Its Use of a Self-Powered Sensor

Dongwhi Choi, Dong Sung Kim

1193 Development of Fiber-Based Devices as Energy Harvesters and Self-Powered Sensors

Ting-Wei Chang, Yi-Yun Ke, Zong-Hong Lin

1194 (Invited) New Electrochemiluminescent Materials for Bioanalysis

Guobao Xu, Wenjing Qi, Ling Zhang, Xiaqing Liu, Lianzhe Hu

1195 Cultivation of Rat Nerve Cells on Nanoimprinted Microstructures on Polydimethylsiloxane Sheets

Eiki Koshinuma, Hirotaka Maenosono, Daisuke Endo, Yasushiro Nishioka

1196 Nanobionic Architectures of Photosystem I on Î-System Modified Graphene Electrodes

Sven Christian Feifel, Kai Stieger, Heiko Lokstein, Fred Lisdat

1197 Investigation of the Dynamic Relaxation Behavior of Biomolecules Immobilized on Metal Electrode in Time Domain

Chen-Pin Hsu, Yu-Lin Wang
Application of Modified Carbon Nanotube Materials for Enzymatic Biofuels Cells Based on Direct Enzyme-Electrode Contacts

Gero Göbel, Vitali Scherbahn, Marie Putze, Birgit Dietzel, Thorsten Heinlein, Jörg J. Schneider, Fred Lisdat

Bioelectrocatalysis of Fructose Dehydrogenase at Polyaniline-Modified Electrodes

David Sarauli, Burkhard Schulz, Dina Fattakhova-Rohlfing, Fred Lisdat

Electrochemical Synthesis of Magnetic Core-Shell Nanoparticles

Yu-Fen Huang

H03-State-of-the-Art Program on Compound Semiconductors 58 (SOTAPOCS 58)

Electronics and Photonics

Si Dopant Behavior in InGaAs

Kevin Scott Jones, Aaron Lind, Henry Aldridge, Chris Hatem

CMOS Compatible in-Situ N-Type Doping of Ge Using New Generation Doping Agents P(MH3)3 and As(MH3)3 (M=Si, Ge)

Chi Xu, James Dennis Gallagher, Charutha Senaratne, Patrick Sims, John Kouvetakis, Jose Menendez

Thin-Film Vapor-Liquid-Solid Growth of Compound Semiconductors on Heteroepitaxial and Amorphous Substrates

Rehan Kapadia

Propagation of Nanopores and Formation of Nanoporous Domains during Anodization of n-InP in KOH

D. Noel Buckley, Robert P Lynch, Nathan Quill, Colm O'Dwyer
Towards Electrochemical Fabrication of Free-Standing Indium Phosphide Nanofilms

Nathan Quill, Colm O'Dwyer, D. Noel Buckley, Robert P Lynch

Plasma Assisted Low Temperature Synthesis of WSe$_2$

Henry Medina, Yu-Ze Chen, Teng-Yu Su, Jiang-Kuang Li, Yu-Lun Chueh

Advanced Characterization of Materials Electronic Structure with High Energy-Resolution X-Ray Spectroscopy

Dimosthenis Sokaras, Tsu-Chien Weng, Dennis Nordlund

Terahertz Spectroscopy: Studying Carrier Dynamics in Semiconductor Nanostructures

Lyubov V. Titova, Sijia Xu, Jean-Marc Baribeau, David J Lockwood, Frank Hegmann

Characterization of Compound Semiconductors using Aberration-Corrected Electron Microscopy

David Smith

Hybrid Perovskites: A New Class of Compound Semiconductors with Unique Properties

Tao Wu

Recent Developments in Mercury Cadmium Telluride IR Detector Technology

Jarek Antoszewski, Nima Dehdashti Akhavan, Gilberto Umana-Membrreno, Renjie Gu, Wen Lei, Lorenzo Faraone

Bridging the Gap - Rediscovering Black Phosphorus As an Anisotropic Layered Material for Electronics and Optoelectronics

Han Wang
Flexible Graphene Electrode-Based Organic Photovoltaics with Record-High Efficiency

Hyeseung Park, Sehoon Chang, Xiang Zhou, Jing Kong, Tomas Palacios, Silvija Gradecak

Crystalline Tetrahedral Phases Al\(_{1-x}B_xPSi_3\) and Al\(_{1-x}B_xAsT_3\) (T = Si, Ge) Via Reactions of Al(BH\(_4\))\(_3\) and M(TH\(_3\))\(_3\) (M = P, As)

Patrick Sims, Toshihiro Aoki, Jose Menendez, John Kouvetakis

Future Power Electronics with GaN and Diamond

Srabanti Chowdhury

(Invited) From MRTA to SMRTA: Improvements in Activating Implanted Dopants in GaN

Jordan D Greenlee, Boris Feigelson, Travis J Anderson, Jennifer K Hite, Karl D Hobart, Francis J Kub

Study of the Effects of GaN Buffer Layer Quality on the dc Characteristics of AlGaN/GaN High Electron Mobility Transistors

Shihyun Ahn, Weidi Zhu, Chen Dong, Ya-Hsi Hwang, Byung-Jae Kim, Fan Ren, Stephen J. Pearton, Aaron Gregg Lind, Kevin Scott Jones, Ivan Kravchenko

Thermal Engineering of GaN Semiconductor Devices

Samuel Graham

Low Dislocation Density AlGaN Epilayers for UV Laser Diodes and Devices for Power Electronics

Andrew A. Allerman, Michael W Moseley, Mary H Crawford, Jonathan J. Wierer, Andrew M. Armstrong, Albert G. Baca, Robert J. Kaplar, Blythe G. Clark

Inductively Coupled BCl\(_3/Cl_2\)/Ar Plasma Etching of High Al Content AlGaN
Erica Douglas, Carlos Sanchez, Albert G. Baca, Andrew Allerman, Robert J. Kaplar

1221 Effect of Buffer Oxide Etchant (BOE) on Ti/Al/Ni/Au Ohmic Contacts for AlGaN/GaN Based HEMT

Ya-Hsi Hwang, Shihyun Ahn, Chen Dong, Weidi Zhu, Byung-Jae Kim, Fan Ren, Aaron Gregg Lind, Kevin Scott Jones, Stephen J. Pearton, Ivan Kravchenko

1222 Simulating RF Performance of Proton Irradiated AlGaN/GaN High Electron Mobility Transistors (HEMTs)

Shrijit Mukherjee, Erin Patrick, Mark E Law

1223 Study on Effect of Proton Irradiation Energy in AlGaN/GaN Metal-Oxide Semiconductor High Electron Mobility Transistors

Shihyun Ahn, Chen Dong, Weidi Zhu, Byung-Jae Kim, Ya-Hsi Hwang, Fan Ren, Stephen J. Pearton, Gwangseok Yang, Jihyun Kim, Ivan Kravchenko

1224 Cathodoluminescence Studies of Gamma-Irradiation Effects on AlGaN/GaN High Electron Mobility Transistors (HEMTs)

Anupama Yadav, Michael Antia, Elena Flitsiyak, Leonid Chernyak, Igor Lubomirsky, Joseph Salzman

1225 Effects of 340 Kev Proton Irradiation on InGaN/GaN Blue Light-Emitting Diodes

Byung-Jae Kim, Shihyun Ahn, Ya-Hsi Hwang, Fan Ren, Stephen J. Pearton, JiHyun Kim, Ming-lan Zhang

1226 Measurement of Recombination Lifetimes in Gesn Alloys

Emily Erdman, Charutha Senaratne, Jose Menendez, John Kouvetakis, Jay Mathews

1227 Measurement of Optical Emission from Gesn Waveguides

Yun Zhao, James Gallagher, Zairui Li, Imad Agha, Jose Menendez, John Kouvetakis, Jay Mathews
1228 Enhanced Performance Designs of Group-IV Light Emitting Diodes for Mid IR Photonic Applications

James Dennis Gallagher, Charutha Senaratne, Chi Xu, Patrick M Wallace, Jose Menendez, John Kouvetakis

1229 Doping of Direct Gap Ge\textsubscript{1-x}Sn\textsubscript{x} Alloys to Attain Electroluminescence and Enhanced Photoluminescence

Charutha Lasitha Senaratne, James Dennis Gallagher, Chi Xu, Patrick Sims, Jose Menendez, John Kouvetakis

I02-Harnessing Multi-Step Electrochemical Reactions for Energy Conversion and Storage

Energy Technology/Physical and Analytical Electrochemistry

1230 Catalytic Design through Computational Modeling: Exploring the Electrochemical Oxidation of Glycerol By Nitroxy radical

David P Hickey, Ivana Matanovic, David Schiedler, Plamen Atanassov, Matthew S Sigman, Shelley D. Minteer

1231 A Npg-Based Ultra-Thin Anode Catalyst Layer for Spewe

Yachao Zeng, Xiaqian Guo, Xunying Wang, Zhiqiang Wang, Hongmei Yu, Zhigang Shao, Baolian Yi

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Guillaume Ozouf, Gwenn Cognard, Frederic Maillard, Laure Guetaz, Marie Heitzmann, Christian Beauger

1536 Understanding Liquid-Water Management in PEFCs Using X-Ray Computed Tomography and Modeling

Iryna V Zenyuk, Adam Z Weber

1537 Impact of Water Management on Local Potential Evolutions during PEM Fuel Cell Operation with Dead-Ended Anode

Sofyane Abbou, Jérôme Dillet, Gael Maranzana, Sophie Didierjean, Olivier Lottin

1538 Characterization of Liquid Water Invasion in Gdls Using X-Ray Tomographic Microscopy
Adrien Lamibrac, Jörg Roth, Jens Eller, Federica Marone, Felix N Büchi

1539 Influence of Thermal Conductivity and 2-D Temperature Distribution of Liquid Water Saturation

Jacob M LaManna, Daniel S Hussey, David L Jacobson, Matthew M. Mench

1540 Water Management in PEM Fuel Cells with Non-Precious Metal Catalyst Electrodes

Dusan Spernjak, Hoon T Chung, Rangachary Mukundan, Rod L Borup, Daniel S Hussey, David L Jacobson, Gang Wu, Piotr Zelenay

1541 3D Printed Flow Channel Fixture for Visualization of Water Condensation in PEFC By X-Ray Computed Tomography

Robin White, Mohamed El Hannach, Oliver Luo, Frank Orfino, Monica Dutta, Erik Kjeang

1542 Electro-catalysis of Direct Methanol and Ethanol Oxidation in Polymer Electrolyte Fuel Cells

Antonino S. Aricò, David Sebastian, Sabrina Campagna Zignani, Vincenzo Baglio

1543 Nanostructured Transition Metal Nitride (MN) As a Potential Support for Pt(Ru) Anode Electro-Catalyst for Direct Methanol Fuel Cells (DMFCs)

Prasad Prakash Patel, Moni Kanchan Datta, Prashanth Jampani, Prashant N Kumta

1544 Development and Characterization of a Dithionite / Air Fuel Cell

Jens Noack, Jens Tübke, Karsten Pinkwart

1545 Electrochemical Oxidation of Borohydride for Direct Fuel Cells

Christoph Grimmer, Maximilian Grandi, Robert Zacharias, Theo Friedrich, Viktor Hacker
Influence of Structural Effects on Platinum Electrodes in the Preferential Adsorption of CO and Methanol in Acid Media

Marcia Elizangela Paulino, Flavio Colmati, Ernesto Rafael Gonzalez

GDL and MPL Characterization and Their Relevance to Fuel Cell Modelling

Jan Haußmann, Florian Wilhelm, Simon Enz, Merle Klages, Anahid Pournemat, Christian Bergbreiter, Joseph Simon Clark, Keerthi Duraisamy, Katrin Seidenberger, Henning Markötter, Ingo Manke, Joachim Scholta

Novel Gas Diffusion Layers with Patterned Wettability

Antoni Forner-Cuenca, Johannes Biesdorf, Lorenz Gubler, Thomas J. Schmidt, Pierre Boillat

Influence of the Gas Diffusion Layer Compression on the Oxygen Mass Transport in PEM Fuel Cells

Christoph Simon, Frédéric Hasché, David Müller, Hubert A. Gasteiger

Impact of Cell Compression on Resistance, Mass Transport, and Ultimate PEMFC Performance

Megan B. Sassin, Yannick Garsany, Benjamin D. Gould, Karen Swider-Lyons

Influence of Hydrophilic and Hydrophobic Triple MPL Coated GDL on the Oxygen Transport Resistance in a PEFC under High Humidity Conditions

Tatsumi Kitahara, Hironori Nakajima, Kosuke Okamura

Effect of Pore Volume of Hydrophilic Microporous Layer (MPL) on PEFC Performance

Toshihiro Tanuma, Masako Kawamoto

In-Situ Measurement of Oxygen Partial Pressure on the Surface of a Cathode GDL with Automotive Compatible Operating Conditions
Shinichi Hirano, Jixin Chen, Michael Potocki, George Saloka

1554 Influence of MPL Structure Modification on Fuel Cell Oxygen Transport Resistance

Zijie Lu, James Waldecker, Mickey Tam, Max Cimenti

1555 Determination of Permeability of the Gas Diffusion Layer of Proton Exchange Membrane Fuel Cells (PEMFCs)

Sadegh Hasanpour, Mina Hoorfar, Andre Phillion

1556 Characterization Studies of a New MEA Structure for Polymer Electrolyte Fuel Cells

Jaehyung Park, Ugur Pasaogullari, Leonard J. Bonville

1557 Oxide-Supported PEFC Electro catalysts

Kazunari Sasaki, Yohei Nagamatsu, Dai Horiguchi, Masahiro Iwami, Makito Okumura, Zhiyun Noda, Takeshi Daio, Stephen Matthew Lyth, Akari Hayashi

1558 Characterization of Pt Catalysts Supported on Ta-SnO$_2$ with Fused Aggregated Network Structure

Katsuyoshi Kakinuma, Yuichi Senoo, Koji Taniguchi, Masahiro Watanabe, Makoto Uchida

1559 Effect of Added Graphitized Carbon Black on Both Performance and Durability of Pt/Nb-SnO$_2$ Cathodes for PEFCs

Makoto Uchida, Yuji Chino, Koji Taniguchi, Yuichi Senoo, Katsuyoshi Kakinuma, Masanori Hara, Masahiro Watanabe

1560 Mitigation of Cathode Catalyst Degradation during Air/Air Startup Cycling Via the Atmospheric Resistive Switching Mechanism of a Hydrogen Anode with a Pt Catalyst Supported on Ta-Doped TiO$_2$

Haruhiko Shintani, Yuya Kojima, Katsuyoshi Kakinuma, Masahiro Watanabe, Makoto Uchida
Corrosion Resistant Electrospun Niobium Carbide Nanotube Supports for PEMFC Cathodes

Yannick Nabil-Moreau, Sara Cavaliere, Ian Harkness, Graham Hards, Jonathan Sharman, Deborah Jacqueline Jones, Jacques Rozière

Ta-Based Catalyst Support for Proton Exchange Membrane Fuel Cell Applications

Anusha D. Abhayawardhana, Viola Birss

Electrospun Ni nanofibres as Pt supports for PEMFC electrodes

Giorgio Ercolano, Sara Cavaliere, Deborah Jacqueline Jones, Jacques Rozière

Fabrication and Performance of Membrane Electrode Assembly Using a Hydrophilic Pt/[TaOPO₄/VC] Electro catalyst

Yannick Garsany, Megan B. Sassin, Benjamin D. Gould, Karen Swider-Lyons

J01-Physics and Chemistry of Luminescent Materials

Luminescence and Display Materials

RE-Doped Ternary Sulfides A LnS₂ (A = Rb, K, Na; Ln = La, Gd, Lu, Y) - a New Phosphor Family

Vitezslav Jary, Lubomir Havlak, Jan Barta, Eva Mihokova, Maksym Buryi, Martin Rejman, Martin Nikl

Red Emitting Ca₄SiO₄:Eu²⁺ Phosphors for White Light Emitting Diodes

Yasushi Sato, Hiroki Kuwahara, Hideki Kato, Makoto Kobayashi, Masato Kakihana

Design and Luminescent Properties of Ce³⁺-Activated Oxide Phosphor

Sun Woog Kim, Takuya Hasegawa, Masaru Muto, Yukari Kawano, Kazuyoshi Uematsu, Kenji Toda, Hiromitsu Takaba, Tadashi Ishigaki, Mineo Sato
The Pursuit of Novel Phosphor Hosts for the Next Generation of Solid State Lighting

Jakoah Brgoch

Recent Progress in Blue Phosphors: From Non-Thermal Quenching to Highly Efficient Phosphor

Won Bin Im, Yoon Hwa Kim

Luminescent Materials Informatics Based on Confirmatory Factor Analysis

Kee-Sun Sohn, Satendra Singh, Woon Bae Park, Minseuk Kim

Synthesis of Phosphor Materials By New Low-Temperature Solid-State Reaction Method Showing Abnormally High Diffusion

Kenji Toda, Takuya Hasegawa, Tatsuro Kaneko, Ayano Toda, Sun Woog Kim, Kazuyoshi Uematsu, Tadashi Ishigaki, Junko Koide, Masako Toda, Yoshiaki Kudo, Mineo Sato

Thermal & Humidity Stability of Mn$^{4+}$ Doped Complex Fluoride Phosphors

Srinivas P Sista, James Murphy, Florencio Garcia-Santamaria, Anant A Setlur

Engineering of Rare-Earth-Metal Oxysulfate (RE$_2$O$_2$SO$_4$) Hollow Nanospheres for Upconversion

Gen Chen, Litao Yan, Hongmei Luo

Cooperative and White Light Emission from Yb- and Yb,Er-Doped Y$_2$Si$_2$O$_7$ Nanopowders

Baldassare Di Bartolo, Murat Erdem, John Collins, Bryan Sitt, Joseph Ligouri

Influence of the Starting Solution on the Growth and Morphology of Rare Earth-Doped Yttrium Oxide Spherical Particles By the Urea Precipitation Method
Jack Silver, Terry Ireland, George Robert Fern

1576 Controlling Particle Size and Luminescence in Mn$^{4+}$ Activated K$_2$SiF$_6$

Prasanth Kumar Nammalwar, Digamber G Porob, Ravi Hanumantha, Anant A Setlur, James Murphy

1577 Improvement of Luminescence Properties and Particle Growth of AlN Phosphors By Si-Doping

Yujin Cho, Benjamin Dierre, Naoki Fukata, Naoto Hirosaki, Kohsei Takahashi, Takashi Takeda, Takashi Sekiguchi

1578 Tuning the Luminescence Properties of Organometal Halide Perovskites for Light-Emitting Applications

Haizheng Zhong

1579 Luminescence Quenching of [M]NbO$_4$:Pr$^{3+}$ [M=La, Lu, Gd] Under UV Excitation

John Collins, Elena Labovitis, Marco Bettinelli, Asa Sutton, Katrina Dauphinais

1580 Inverse Nephelauxetic Effect in the Pressure Dependence of R-Line Energy of Ruby

Kazuyoshi Ogasawara, Mega Novita

1581 Assessing Spatial Resolution of Cathodo-Luminescence Imaging and Spectroscopy at the Nanoscale for Inorganic Phosphor Powders

George Robert Fern, Paul Gregory Harris, Terry Ireland, Jack Silver

1582 Concentration Dependency of Eu$^{2+}$ Doped La$_{4-x}$Ca$_x$Si$_2$O$_3$:XN$_{18-x}$ Phosphors and the Energy Levels of the Rare-Earth Ions

Otmar Melvin ten Kate, Rong-Jun Xie, Shiro Funahashi, Takashi Takeda, Naoto Hirosaki

1583 Cathodoluminescence Studies of Phosphor Particles
Paul Gregory Harris, Daniel den Engelsen, Jack Silver

Electronic Structures and Optical Properties of Aluminum in Bulk, Thin Film and Nanoparticulate Forms

Kailash C. Mishra, Alan Piquette, Peter C. Schmidt, Keith H Johnson

Inorganic-Organic Hybrid Phosphor Layer for Si Solar Cells

Hiroshi Okura, Ryosuke Sakata, Naoki Doi, Tadashi Ishigaki, Ryohei Komiyama, Hidetoshi Miyashita, Sang-Seok Lee, Koutoku Ohmi

Upconversion Luminescence of HfO$_2$ Phosphors Embedded into Polyester FILMS

S. Carmona, L. Mariscal B., J. M. Hérnandez, Gilberto Alarcón-Flores, H. Murrieta, Ciro Falcony

Luminescent Properties of Al$_2$O$_3$:Tb$^{3+}$ Powders Embedded in Polyethylene Terephthalate Films

L. Mariscal B., Salvador Carmona-Tellez, Ciro Falcony, Héctor Murrieta Sánchez

3d and 4f Ions in Solids: Description and Understanding of Optical Properties

Mikhail G. Brik, Alok M Srivastava, Sam Jospeh Camardello

Thermal Properties of Mn$^{4+}$-Doped Complex Fluoride Phosphors

Anant A Setlur, James Murphy, Florencio Garcia-Santamaria, Srinivas Sista

Thermal Degradation of Nitride Phosphors

Rong-Jun Xie, Chunyun Wang, Takashi Takeda, Yujin Cho, Takayuki Suehiro, Naoto Hirosaki

The Exploration of Rare Earths Based Luminescence for Detection and Sensing in Radiation Security and Enhanced Oil Recovery
Wei Chen, Lun Ma, Sunil Sahi

1592 Amber Full Conversion Ceramics for LED Applications

Yi Zheng, Jason Montaner, Madis Raukas, Chris Tarry, Juliane Kechele, Sonja Tragl, Johanna Strube-Knyrim, Dominik Eisert, Klemens Ferstl, Britta Goeoetz

1593 Chromium Doped Persistent Phosphors for Medical Imaging

Dirk Poelman, Olivier Q De Clercq, Philippe F Smet, Kevin Braeckmans

1594 Zneds: Cu, Al, Cl: A Near Infra-Red Emissive Phosphor for Marking, Coding, and Identification

Paul Jonathan Marsh, Jack Silver, George Robert Fern

1595 Optical and Thermal Management of Phosphor-Converted LEDs

Madis Raukas, John Kelso, Alan Lenef, Alexander Linkov, Maxim Tchoul

L01-Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session

Physical and Analytical Electrochemistry

1596 Real Time Monitoring of Electrostatic Potentials in the Vicinity of Electrodes Delivering Current Pulses Used in Neural Stimulation

Zhange Feng, David Friel, Daniel Scherson

1597 A Versatile Bioanode with Improved Current Density and the Coulombic Efficiency through a Cascade Reaction

Muhammad Nadeem Zafar, Iqra Aslam, Shahzad Murtaza, Roland Ludwig, Lo Gorton

1598 Direct Electrochemical Conversion of Nitrogen to Ammonia from Air and Water on Nitride Electro-Catalysts at Ambient Conditions
Younes Abghoui, Egill Skulason

1599 Electrochemical and Catalytic Properties of Liver Microsomes Adsorbed to Magnetic Nanoparticles

Rajasekhara Nerimetla, Sadagopan Krishnan

1600 Electron Transport in Magnetic Nanomaterials for Sensing and Catalytic Applications

Sadagopan Krishnan, Gayan Premaratne, Trey Sunday, Ryan Matlock, Charuksha Walgama

1601 Bimetallic Iron and Nickel Nanoparticles for the Electrocatalytic Oxidation of Methanol and Ethanol for Fuel Cells

Stephanie L Candelaria, Nicholas Bedford, Lauren F Greenlee

1602 Electrochemical Kinetic Study on the a Yeast-Catalyzed Activity in Microbial Half Cell

Yang Bae Jeon, Fusheng Tang, Jin Wook Lee

1603 The Effect of Intra Vs. Intermolecular Proton Transfer on the Oxidation of Phenylenediamine-Based Ureas

Diane K. Smith, Ran He


Rajendra N Goyal, Rosy Sharma, Pankaj Gupta

1605 Mediator-Less Catalytic Oxidation of NADH Using Oxygen Plasma Treated Screen Printed Carbon Electrodes

Mutyala Sankararao, Jayaraman Mathiyarasu
1606 FEM Modelling of Diffusional Electrochemical Impedance Spectroscopy at a Channel Electrode

Thomas Holm, Mats Ingdal, Frode Seland, David A. Harrington

1607 Reversibility of Ferri-Ferrocyanide Redox during in-Situ Soft X-Ray Spectroscopy

Marcel Risch, Kelsey A. Stoerzinger, Tom Z. Regier, Derek Peak, Sayed Nagy, Yang Shao-Horn

1608 Impedance of Mediated Electrochemical Processes: Fenton Reaction

Piotr Polczynski, Rafal Robert Jurczakowski

1609 Application of the Wedge Scheme to Explain Quinone-Phenol Electrochemical Systems

Patrick Andrew Staley, Diane K. Smith

1610 Thin TiO₂ Overlayers As Catalysts for Oxygen Reduction and Evolution Reactions

Hadi Tavassol, Sossina M Haile

1611 Biomimetic O₂ Reduction at MN4 Catalysts Adsorbed on Carbon Nanotubes and on Pyridine Grafted Carbon Nanotubes

Jose H Zagal, Federico Tasca, Marco Viera, Cesar Zuniga, Ricardo Alberto Venegas, Francisco Javier Recio

1612 Novel Methanol-Tolerant Metal Selenide Based Chalcogenide Electrocatalysts for Oxygen Reduction in Alkaline Solution

Jahangir Masud, Abdurazag Swesi, Manashi Nath

1613 Nickel Selenide As High-Efficiency Catalyst for Oxygen Evolution Reaction

Abdurazag Swesi, Jahangir Masud, Manashi Nath
Combined Experimental and Computational Approach for Rational Design of Bio-Nano Interfaces

Sofia Babanova, Ivana Matanovic, Madelaine Seow Chavez, Plamen Atanassov

Enrichment of Novel Electroactive Bacteria from Equatorial Climate Sediments Via Potentiostatic Growth and Subsequent Characterisation Via Metagenomics, Metatranscriptomics, Voltammetry and Electrochemical Impedance Spectroscopy

Lucinda Elizabeth Doyle, Pui Yi Yung, Stefan Wuertz, Rohan Benjamin Hugh Williams, Enrico Marsili

Selective Patterning on Pyrocarbon Interdigitated Electrodes for Bienzymatic Sensing of Glutamate

Kirstin Claire Morton, Steve Semancik

Naphthoquinone Derivatives As Low-Potential Electron Mediators of Fad-Dependent Glucose Dehydrogenase

David P Hickey, Ross D Milton, Sofiene Abdellaoui, Koun Lim, Boxuan Tan, Shelley D. Minteer

Bioelectrochemical and Spectroscopic Study during Interfacial Biooxidation Process of Chalcopyrite Mediated By Sulfur and Iron Oxidizing Microorganisms

Maria Irene Lopez-Cazares, Jessica Viridiana Garcia-Meza, Erika Roxana Larios Durán, Roel Cruz-Gaona

Enhanced Photo-Bioelectrochemical Energy Conversion By Genetically Engineered Cyanobacteria

Narendran Sekar, Ramaraja P. Ramasamy

Simultaneous Impedance Spectroscopy and Optical Microscopy to Investigate Cells Attachment and Spreading

Maryam Parviz, John Justin Gooding, Katharina Gaus
1621 Light-Harvesting Proteins and Biofilms on Iron Oxide Photoelectrodes

Artur Braun, Debajeet K. Bora, Greta Faccio, Krisztina Schrantz, Elena Rozhkova

1622 Mediator-Less Direct Electron Transfer and Oxygen Reduction By Bilirubin Oxidase Adsorbed on to a Bucky Paper Electrode

Charuksha Walgama, Anuruddha Pathirana, Nick Means, Alan Le Goff, Serge Cosnier, Sadagopan Krishnan

1623 Synchrotron Based Structural Investigations of Mass-Selected PtₓGd Nanoparticles and a Gd/Pt(111) Single Crystal for Electrochemical Oxygen Reduction

Anders Filsøe Pedersen, Amado Andrés Velázquez-Palenzuela, Federico Masini, Maria Escudero-Escribano, Elisabeth Therese Ulrikkeholm, Davide Deiana, Paolo Malacrida, Daniel Friebel, Anders Nilsson, Ifan Erfyl Lester Stephens, Ib Chorkendorff

1624 Synthesis of 3D Cos/CNF Electrode for Efficient Oxygen Evolution

Junfeng Zhang, Rui Chen, Qi Liu, Qingfa Wang

1625 Influence of Temperature on the Shape Evolution of IrO₂-SiO₂ coating and Its Electrochemical Activity for Oxygen Evolution

Qingfa Wang, Xiangwen Zhang, Li Wang, Ruoping Yangzhang

1626 Electrochemical Characterisation of Cobalt-Oxide Catalysts with Different Cobalt Loading for Oxygen Reduction Reaction in Alkaline Media

Lisa Maria Uhlig, Alexander Dyck, Gustav Wilhelm Sievers, Volker Brüser, Gunther Wittstock

1627 Electrochemical Reduction of CO₂ to Useful Fuels on Molybdenum and Molybdenum Oxide Thin-Film Catalysts

Anastasia A. Permyakova, Julien Durst, Juan S. Herranz, Yohan Paratcha, Thomas J. Schmidt

1628 Electroreduction of Oxygen on Carbon Supported Palladium Nanocubes
Heiki Erikson, Ave Sarapuu, Kaido Tammeveski, José Solla-Gullón, Juan Feliu

1629 Electrochemical Investigations of Aromatic Hydrocarbons in Adiponitrile

Graham T. Cheek

1630 Organized Light Harvesting Photosystem I Layers on a Cytochrome C for the Construction of New Photobioelectrodes

Sven Christian Feifel, Kai Stieger, Heiko Lokstein, Fred Lisdat

1631 Square Wave Voltammetric Method for Simultaneous Determination of Bleaching Agents in Skin Cosmetics

Giselle Nathaly Calaça, Silvane Machado, Karen Wohnrath, Christiana Andrade Pessoa, Noemi Nagata

1632 Electron Transfer Studies Between New Fad-Dependent Glucose Dehydrogenase and Different Osmium Polymers (Applications in Biosensors and Biofuel Cells)

Iqra Aslam, Muhammad Nadeem Zafar, Roland Ludwig, Dónal Leech, Lo Gorton

1633 Exploiting the Reaction of Cytochrome C with Fructose Dehydrogenase for a Multilayer Electrode Construction

Fred Lisdat, Christoph Wettstein, Kenji Kano, Ulla Wollenberger

1634 The Study on the Synergistic Effect of Anti-Poisoning Electrocatalyst and Self-Humidifying Proton Exchange Membrane for Hydrogen Fuel Cell

Ran Deng, Viola Sim, Wei Han, King Lun Yeung, Maria Victoria Martínez-Huerta, Xin Ouyang

1635 Modified Electrodes Obtained By Electrochemical Codeposition of Some Conducting Polymers and Carbon Nanotubes with Different Dopants

Florina Branzoi, Viorel Branzoi, Catalina Pacuretu
Extensive Studies of the Electrochemical Behavior of Pt Ni/MWCNT Catalysts in Alkaline Media

Ana Maria Valenzuela-Muñiz, Gabriel Rosado, Ysmael Verde Gomez

Field-Dipole Interactions at p-GaAs (100) Electrode in Sodium Dodecyl Sulfate Acid Solution

Valentina Lazarescu, Mirela Enache, Gianina Dobrescu, Mihai Anastasescu, Catalin Negrila, Mihail Florin Lazarescu


Alnald Javier, Brian Chmielowiec, Jean Sanabria-Chinchilla, Youn-Geun Kim, Jack Hess Baricuatro, Manuel P Soriaga

L03-Electroactive and Redox Active Polymers

Physical and Analytical Electrochemistry/Energy Technology

(Keynote) Biofilm-Supported Redox-Polymer-Type Materials for Electrocatalytic Oxygen Reduction of Importance to Biosensing and Bioenergetics

Pawel J Kulesza

(Keynote) Redox Active Polymers: A Size Selective Solution for Nonaqueous Redox Flow Batteries

Elena C Montoto, Etienne Chenard, Nagarjuna Gavvalapalli, Jingshu Hui, Kevin Cheng, Mark Burgess, Timothy Lichtenstein, Jeffrey S Moore, Joaquín Rodríguez-López

(Invited) Understanding the Role of Organic Alloys in Polymer-Fullerene Solar Cells

Barry C Thompson

(Invited) Tailoring Polymer Structure and Composition for High-Power and High-Charge Capacity Redox Electrodes
Mark E. Roberts

1643 (Invited) Nanostructured Electroactive Polymers for Energy Storage and Biosensors Technologies

Ye Shi, Guihua Yu

1644 (Invited) Intermediate Tunnelling-Hopping Regime in DNA Charge Transport

Limin Xiang, Julio Palma, Christopher Bruot, Vladimiro Mujica, Mark A Ratner, Nongjian Tao

1645 (Invited) Natural Fiber Welded Composites: Electrodes and Capacitors

Luke M. Haverhals, David P. Durkin, Kristy Jost, E. Kathryn Brown, Genevieve Dion, Yury Gogotsi, Hugh C De Long, Brent Tisserat, Paul C Trulove

1646 (Invited) Functional Conductive Polymer Binders for High-Performance Silicon-Based Anodes in Lithium-Ion Batteries

Zhe Jia, Hui Zhao, Gao Liu

1647 (Invited) Impact of Nafion Dispersion Morphology on Fuel Cell Performance and Durability

Yu Seung Kim, Cynthia Welch, Rex Hjelm, Nathan Mack, Christina Johnston, Baeck Choi, David A. Langlois, Kwan-Soo Lee, Edward Bruce Orler, Andrea Labouriau, Karren More, Hui Xu, Jason Willey, Cortney K Mittelsteadt

1648 (Invited) Solid-State Charge Transport in Redox-Active Radical Polymers

Bryan W Boudouris

1649 (Invited) Electrically Switchable Surface Properties Using End-Charged Polymers and pH-Responsive Swelling of Polymer Brushes Via Self-Consistent Field Theory

David Wu, Renfeng Hu
Radical Environments for Fast Charge Transport in the Stable Radical Polymer, Ptma

David C. Bobela, Barbara Katherine Hughes, Wade A. Braunecker, Travis Kemper, Ross E. Larsen, Thomas Gennett

Spectroelectrochemical Studies of Charge Transfer Processes in Stable Nitroxy1 Radical-Containing Polymers

Barbara Katherine Hughes, Wade A. Braunecker, Justin C. Johnson, Thomas Gennett

Conjugated Organophosphorus Materials As Electrodes for Organic Batteries

Christian Reus, Thomas Baumgartner

Characterization of the Time-Dependent Strain Behavior of Electroactive NCC-PEO Composite Polymers

Patrick Bass, Lauchlin Blue, Lin Zhang, Ethan Hofer, Z.-Y. Cheng, Maobing Tu

L04-Electrode Processes 10

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

Modeling Multi-Scale Carbon Fiber Supports for Thin Film Bioelectrodes

Duyen Van Thuy Do, Hao Wen, Cenk Gumeci, Scott Calabrese Barton

Modeling and Optimization of Porous Electrodes for Alkaline Oxygen Evolution

Thomas Kadyk, Michael Eikerling

Insights from the Rigid-Band Model: Tuning Perovskite Electronic Structure for the Oxygen Evolution Reaction

Wesley T Hong, Kelsey A. Stoerzinger, Alexis Grimaud, Yueh-Lin Lee, Wanli Yang, Yang Shao-Horn
DFT-Based Screening for a New Electro-Catalyst to Convert Nitrogen to Ammonia at Room Temperature and Ambient Pressure

Younes Abghoui, Egill Skulason

Development of Screen Printed Electrodes Chemically Modified with Schiff Base Films for Application in Forensic Chemistry

Marcelo Firmino de Oliveira

Using Scanning Electrochemical Microscopy to Control Boundary Layer Chemistry during Nickel Electrodeposition

Nicole L. Ritzert, Rongyue Wang, Thomas P. Moffat

Nano-Structured Pd-Sn Catalysts for Alcohol Electro-Oxidation in Alkaline Medium

Anna Zalineeva, Alexey Serov, Monica Padilla, Ulises Martinez, Kateryna Artyushkova, Stève Baranton, Christophe Coutanceau, Plamen Atanassov

Novel System Based on Divalent Silver for Mediated Electrochemical Oxidation of Persistent Organic Pollutants

Piotr Poiczynski, Rafal Robert Jurczakowski, Wojciech Grochala

Formic Acid Oxidation on Platinum- a Simple Mechanistic Study

Kathleen Schwarz, Ravishankar Sundararaman, Thomas Moffat, Thomas Allison

Electrochemical Oxidation of Dibenzothiophene in Acetonitrile and Acetonitrile-Water Mixtures

Erika Méndez, Miguel Ángel González Fuentes, Andrea Becerra, Felipe J González

Electrochemical Reduction of Carbon Dioxide on Silver Nanostructures and the Role of Oxygen

Michael Shincheon Jee, Byoung Koun Min, Yun Jeong Hwang
1665 Optimizing Gas Diffusion Electrode for Electrochemical Reduction of \( \text{CO}_2 \) to \( \text{CO} \)

Byoungsu Kim, Febrian Hillman, Shigenori Fujikawa, Paul J.A. Kenis

**L05-Nanoscale Electrochemistry**

Physical and Analytical Electrochemistry/Energy Technology

1666 Electrochemical Studies of Thin Films of Side-Chain Ferrocene-Containing Diblock Copolymers

Takashi Ito, Govinda Ghimire, Yi Yi, Maksymilian A Derylo, Lane A Baker

1667 Single-Step Coelectrodeposition of Hybrid Silica Nanocomposite Directs the Fabrication of Free-Standing and Transferal Conducting Polymer Thin Films

Ahmed A. Farghaly, Maryanne M. Collinson

1668 Electrochemical Detection of Colloidal Semiconductor Nanoparticles: From Single Nanoparticles to Aggregates

Mario A Alpuche-Aviles, Pushpa Chhetri, Krishna K. Barakoti, Andrew Recinos

1669 Nano-Impact Electrochemistry for Assessing the Chemical Reactivity of Nanoparticles

Anahita Karimi, Daniel Andreescu, Silvana Andreescu

1670 Nanolayered Supramolecular Protein Clusters on Electrodes: A Switchable Cascadic Reaction Scheme for Dual-Analyte Detection

Sven Christian Feifel, Andreas Kapp, Roland Ludwig, Fred Lisdat

1671 Nickel (III) Salt Dispersed Poly-anilinefilm: Preliminary SECM Examination

Inam ul Haque

1672 Novel Electrocatalysts for Generating Oxygen from Acid Water Electrolysis
Kuntal Chatterjee, Jingjie Wu, Jianfeng Shen, Ken Hackenberg, Robert Vajtai, Jun Lou, Pulickel M Ajayan

1673 In-Situ TEM Study of $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{Co}_{0.8}\text{Fe}_{0.2}\text{O}_3$ for Oxygen Evolution Electrocatalysis

Binghong Han, Kelsey A. Stoerzinger, Vaso Tileli, Andrew Gamalski, Eric A. Stach, Yang Shao-Horn

1674 Low-Temperature Electrochemical Ammonia Synthesis with Nanoscale Fe-Ni Bimetallic Catalysts

Lauren F Greenlee, Nikki S Rentz, Julie N Renner, Katherine E Ayers, Nicholas Bedford

1675 Processing and Properties of Nanocomposite Thin Films for Micro-Solid Oxide Fuel Cell Applications

Michael Rottmayer, Raj Singh, Hong Huang

1676 Origin of Catalytic Activity in MoS2 Nanostructures upon Chemical Transformation

Gautam Gupta, Dustin R. Cummins, Ulises Martinez, Aditya Mohite, Manish Chhowalla, Mahendra Kumar Sunkara

1677 Tuning the Composition and Structure of Metallic Nanotubes for Electrocatalysis

Alexander B. Papandrew, Robert W. Atkinson, Samuel St. John, Raymond R Unocic, Thomas A. Zawodzinski

1678 The Suppression Effect of 830nm Laser Irradiation on Porous Silicon Formation

C. -C. Chiang, Y.-C Huang, P.- C. Juan, F. -S. Lo, T. -H. Lee

1679 Aligning Silicon Nanopillar Formed in Electroless HF/H$_2$O$_2$ Etching through Pre-Forming Porous Layer

C. -C. Chiang, Dawei Xu, Y.-C Huang, P.- C. Juan, F. -S. Lo, Hui-Qin Hu, Cheng-Long He, T. -H. Lee
Platinum-Based Alloy and Ionic Liquid Composites Dispersed on Carbon Black As a Synergistic Catalyst for Oxygen Reduction Reaction

Quoc-Chinh Tran, Ho-Suk Choi

L06-Photocatalysts, Photoelectrochemical Cells, and Solar Fuels 6

Energy Technology/Physical and Analytical Electrochemistry/Sensor

Water Splitting Semiconductor Photoanodes - a Comparative Study

Jan Augustynski

Catalysts, Protection Layers, and Semiconductors: The Challenge of Interfacing

Ib Chorkendorff

Photocatalytic Hydrogen Evolution from Earth Abundant Nickel Oxide Clusters Dispersed on MCM-48 Mesoporous Materials

Rui Peng, Khadga Shrestha, Gautam Mishra, Jonas Baltrusaitis, Chia-Ming Wu, Ranjit T Koodali

Towards Efficient and Acidically Stable Dye-Sensitized Photocathodes for Solar Fuels

Yiving Wu

Efficient and Stable Silicon-Based Solar Water Splitting Devices

Jihun Oh

Plasmon-Mediated Surface Chemistry for Solar Photocatalysis

Wei David Wei

Hot-Carrier Interactions in Semiconductor Nanomaterials Designed for High-Efficiency Solar Energy Conversion
Istvan Robel, Claudiu Cirloganu, Lazaro A. Padilha, Qianglu Lin, Nikolay Makarov, Jeffrey M. Pietryga, Victor I. Klimov

1688 Solar-to-Hydrogen Production on Multi-Band Photoelectrodes: Surpassing the Current Matching Requirements of Conventional Tandem Devices

Zetian Mi, Bandar AlOtaibi, Shizhao Fan

1689 New III-V Semiconductor Alloys for Solar Hydrogen Production

Swathi Sunkara, Mahendra Kumar Sunkara, Alejandro Garcia, Harry Russell, Madhu Menon, Jacek B Jasinski

1690 Solar to Fuels Conversion By a Monolithic and Standalone Photoelectrochemical Device

Hyo Sang Jeon, Yun Jeong Hwang, Byoung Koun Min


Suprem Das, Seth Logsdon, Drew Caneff, Robert Kinser, Shan Hu

1692 Multicomponent Electrocatalytic Systems for Solar Fuels Generators

Frances A Houle, Francesca M. Toma, Daniel Friebel, Joel A. Haber, Ian D. Sharp, Alexis T. Bell

1693 Efficient Solar-to-Hydrogen Production Materials and Devices

Heli Wang, Joel W. Ager, Nicolas Gaillard, Eric Lars Miller

1694 Changes in Photoanodes during Solar Water Oxidation, the Wet Part of Artificial Photosynthesis

Artur Braun

1695 Electronic Band Structure and Charge Transfer in Semiconductors
Nianqiang Wu, Scott Kevin Cushing

1696 Emerging Semiconductor Materials for Direct Photoelectrochemical Water Splitting

Kevin Sivula

1697 Metal Organic Framework Solar Cells: A New Class of Sensitized Light Harvesting Devices

William A Maza, Amanda J Morris

1698 Metal Oxide Nanosurfaces and Hetero-Interfaces for Solar Harvesting Applications

Sanjay Mathur, Yakup Gonullu, Thomas Fischer

1699 Hexavalent Chromium Removal in Industrial Relevant Water Matrices Using Metal Oxide Photocatalysts

Candace K. Chan

1700 Rational Design of Semiconductor for Photoelectrochemical Water Splitting

Su-Huai Wei

1701 Photoelectrochemical Solar Energy Conversion and Electrocatalysis Using Earth-Abundant Nanomaterials

Song Jin

1702 Wide Bandgap Copper Indium Gallium Disulfide Thin Film Materials for Photoelectrochemical Hydrogen Production

Nicolas Gaillard

1703 Extremely Thin Photoelectrode Architectures for Photocatalysis

Isabell Thomann
A Perspective of Photoelectrochemistry: Past Expectations and Present Realities

Adam Heller

Developing Catalysts for the Selective Electrochemical Reduction of Carbon Dioxide to C2 and C3 Products

Boon Siang Yeo

Surface Chemistry of Electrocatalysts for CO₂ Reduction to Fuels

Coleman X. Kronawitter, Zhu Chen, Peng Zhao, Bruce E. Koel

Photocatalytic Conversion of CO₂ By H₂O As an Electron Donor Using Various Solid-State Photocatalysts

Kentaro Teramura

Development of Nanostructured Hybrid Materials for Electrocatalytic and Photoelectrocatalytic Reduction of Carbon Dioxide

Pawel J Kulesza, Anna Wadas, Ewelina Szaniawska, Renata Solarska, Krzysztof Bienkowski, Iwona Agnieszka Rutkowska

Photocatalytic Reduction of CO₂ with H₂O By Engineered TiO₂ Nanocomposites

Ying Li, Lianjun Liu

Fuel Production from the Electroreduction of CO₂

Anne C. Co

Photocatalytic Reduction of CO₂ to CO on TiO₂-Passivated InP at High Underpotentials in Ionic Liquids

Guangtong Zeng, Stephen B. Cronin
Enabling Unassisted Solar Water Splitting By Hematite
Dunwei Wang

Development of New Photocatalysts for Solar-to-Fuel Conversion
Kazuhiko Maeda

Mathematical Modeling of Solar-Fuel Generators
John Stevens, Chengxiang Xiang, Meenesh Singh, Yikai Chen, Adam Z Weber

SnO$_2$ and F:SnO$_2$ Inverse Opal Based Photoelectrochemical Water Splitting
Soon Hyung Kang

Fast Water Oxidation Kinetics in Li-Doped TiO$_2$ Nanotubes
Lok-kun Tsui, Giovanni Zangari

Preparation of Nickel Tungstate (NiWO$_4$) Nanoparticles and Characterization with Electrochemical Methods in Combination with Mott-Schottky Theory
Seyyedamirhossein Hosseini, Hossein Farsi, Shokoufeh Moghiminia, Zhihai Li

Guiding Practical Pathways for Photo-Electrochemical Solar-Hydrogen Generation
Sophia Haussener, Mikael Dumortier

Atomic Layer Deposition of Epitaxial Iron Oxides for Photoelectrochemical Water Oxidation

Silicon-Indium Tin Oxide Schottky Junction with Nickel Oxide Catalyst for Water Oxidation
Sanghwa Yoon, Jae-Hong Lim, Bongyoung Yoo

1721 Benchmarking Nanoparticulate Metal Oxides for the Alkaline Water Oxidation

Suho Jung, Charles C L McCrory, Jonas C Peters, Thomas F Jaramillo

1722 Electrodeposited WO3 Film on Various Metal Substrates and Its Morphological Effect for Photoelectrochemical Water Splitting

Soon Hyung Kang

1723 Photoelectrochemical Characteristics of Pulse Electrodeposited AgIn0.5Ga0.5Se2 Thin FILMS

Ramakrishna Murali

1724 Photoelectrochemical Behaviour of Pulse Plated CuIn0.6Al0.4Se2 Thin FILMS

Kollegal Ramakrishna Murali, Thirumoorthy M, Ramesh K

1725 Photoelectrochemical Cells Studies with Pulse Electrodeposited CuInS2 Films

Kollegal Ramakrishna Murali

1726 Photoelectrochemical Studies on Brush Plated CuInSe2 Films

Kollegal Ramakrishna Murali, Sambandam Murugan

1727 Photoelectrochemical Cells Studies with Brush Electrodeposited AgGaSe2 Films

Kollegal Ramakrishna Murali, J Ashok Kumar, S Perumal

1728 Preparation of Thylakoid/Polyaniline/Reduced Graphene Oxide/Glassy Carbon Integrated System and Photocurrent Enhancement

Jinhwan Lee, Sunghyun Kim
Solar Fuel Generation By 1D ZnO /QDs Heterostructures

Yang He, Jiangtian Li, Deryn Chu, Joeseph Bright, Nianqiang Wu

Enhanced Production of Solar-Fuels By Plasmonic Metal/Semiconductor Photocatalyst Heterostructures

Joeseph Bright, Jiangtian Li, Scott Kevin Cushing, Deryn Chu, Nianqiang Wu

Spray Pyrolyzed TiO$_2$ / Sol Gel Dip Coated NiO Dye Sensitized Solar Cells

Kollegal Ramakrishna Murali

Sol Gel Dip Coated Yb and Tm Doped Indium Oxide Dye Sensitized Solar Cells

Kollegal Ramakrishna Murali

Preparation, Characterization and Photoelectrochemical Investigation of p-Type Nanostructured Cobalt Titanate

Hossein Farsi, Shokufeh Moghiminia, Heidar Raissi

Photoelectrochemical Treatment of Reject Brines from RO Plants

Alan Rasoolkhani, Kevin Nguyen, Austin McKee, Monica Hemingway, Scott Tentinger, Wei Cheng, Syed Mubeen

Photoelectrochemical Characterization of Spin-Coated CuBi$_2$O$_4$ Thin Films for Water Splitting

Ingrid Guadalupe Rodríguez Gutiérrez, Maricarmen Flores Pinto, Manuel Jesús Rodríguez Pérez, Geonel Rodriguez-Gattorno, Gerko Oskam

Low-Cost Synthetic Routes for Fabricating Tandem/Multi-Junction Photoelectrochemical Devices

Wei Cheng, Alan M Rasoolkhani, Syed Mubeen
1737 Graphene Oxides and Their Hybrids for CO₂ Conversion and Solar Fuels

Li-Chyong Chen, Kuei-Hsien Chen

1738 Impact of Catalyst Performance on the Life-Cycle CO₂ Emissions of Methanol Production By Direct Electrocatalytic Reduction of CO₂

Matthew Pellow, Sally Benson

1739 Performance Modeling of Simultaneous CO₂ and Water Electrolysis By Practical Photo-Electrochemical Devices

Ronald R. Gutierrez Perez, Sophia Haussener

1740 Electroreduction of CO₂ to Synthesis Gas and Hydrocarbons on Doped Carbons

Ana Sofia Varela, Peter Strasser

1741 Co-Electrolysis Cell Configurations for CO₂ Electrochemical Reduction

Julien Durst, Juan S. Herranz, Yohan Paratcha, Anastasia A. Permyakova, Thomas J. Schmidt

1742 The Effect of Electrolyte on the Electrochemical Reduction of CO₂ to CO

Sumit Verma, Xun Lu, Sichao Ma, Paul J.A. Kenis

1743 Fully Integrated Stand-Alone Device for Gas-Phase CO₂ Reduction Using Sunlight: Proof of Concept

Mobin Arab, Tamara L. Church, Xiaobo Li, Thomas Maschmeyer, Andrew I. Minett

1744 Magnetic Fields That Enhance the Rates of Multistep Reactions Important in Energy Storage and Conversion

Wayne L. Gellett, Heung Chan Lee, Jessica Jewett Reed, Johna Leddy
1745 Thermal Management in Photo-Electrochemical Hydrogen Generation Devices Using Concentrated Solar Irradiation

Saurabh Tembhumre, Sophia Haussener

1746 Electronic Structure and Optical Properties of Nb$_2$O$_5$ Photo-Catalyst Calculated By Density Functional Method

Pezhman Shirvanian, Michael Hao

1747 Cost Effective Inkjet Printing of Titania Nanoparticles for Photocatalytic Applications

Roberto Bernasconi, Luca Magagnin

1748 Photoelectrochemistry of Nano Zerovalent Fe Based CdFe$_2$O$_4$/Fe$_3$O$_4$ Produced from Cd$^{2+}$ Water Remediation

Keyla Soto, Edwin O. Ortiz-Quiles, Eduardo Larios, Miguel Jose-Yacaman, Carlos R Cabrera

1749 Exfoliated Molybdenum Disulfide for TiO$_2$ Based Dye Sensitized Solar Cells

Edwin O. Ortiz-Quiles, Carlos R Cabrera

1750 Methanol Photooxidation on Colloidal Anatase TiO$_2$: A Mechanistic Study

Mario A Alpuche-Aviles, Krishna K. Barakoti, Andrew Recinos

1751 Wettability Impact of Porous Current Supplier on Current Efficiency in Solid Polymer Water Electrolyzer

Kohei Ito, Yuta Tsuchiya, Takuya Sakaguchi, Akiko Inada, Hironori Nakajima

L07 - Physical and Analytical Electrochemistry in Ionic Liquids 4

Physical and Analytical Electrochemistry/Battery/Industrial Electrochemistry and Electrochemical Engineering/Sensor
1752 Electrochemical Characterisation of Adsorption of Halide Ions at Bi(111) Electrode from Ionic Liquids and Their Mixtures

Carolin Siimenson, Liis Siinor, Enn Lust

1753 Electrochemical Reactions at Ionic Liquid/Gold Interface Probed By Electrochemical Surface Plasmon Resonance

Naoya Nishi, Yoichi Ikeda, Ken-ichi Amano, Tetsuo Sakka

1754 Potential-Dependent Structure of Ionic Liquids and Solvated Lithium Ions on a Gold Electrode: A Surface-Enhanced Infrared Study

Kenta Motobayashi, Ken-ichi Uchida, Kazuya Minami, Naoya Nishi, Tetsuo Sakka, Masatoshi Osawa

1755 Electrochemical Characterization of the Interface Between Pyrolytic Graphite Electrode and 1-Butyl-3-Methylimidazolium Iodide

Liis Siinor, Enn Lust

1756 Mechanistic Study of Energy Efficient Electrochemical Capture and Release of CO₂ in Ionic Liquid Complexes

Poonam Singh, Daniel A Buttry

1757 On the Mechanism of Electrochemical Reduction of Niobium Halides in Ionic Liquids

Adriana Ispas, Andreas Bund

1758 Mg Battery Electrolytes from Aluminate and Borate Complexes in Ionic Liquids

Tylan S Watkins, Daniel A Buttry

1759 Effect of 1-Butyl-1-Methylpyrrolidinium Dicyanamide on the Structure of Pd Electrodeposit
Sujan Shrestha, Elizabeth J Biddinger

1760 Conductivity and Ionicity of Ionic Liquids Made By Ligand Assisted Ionization of Metal Halides

Mohammad Hasani, Charles Austen Angell

1761 Nanocomposite Semi-Solid Ionic-Liquid Electrolytes with Enhanced Charge-Transport and Redox Mediating Capabilities

Pawel J Kulesza, Iwona Agnieszka Rutkowska, Justyna M. Orlowska

1762 Fundamental Characterization of Solvent Effects on Electrochemical Properties of Silylamine-Type Reversible Ionic Liquids

Sungyup Jung, Juan D Jimenez, Elizabeth J Biddinger

1763 Understanding Lithium Solvation in Ionic Liquids from First Principles Molecular Dynamics Simulations

Ali Kachmar, Marcelo A. Carignano

1764 Electrochemical Characterization of 1 Wt% Mixture of 1-Ethyl-3-Methylimidazolium Chloride and 1-Ethyl-3-Methylimidazolium Tetrafluoroborate|Bi(111) Interface

Laura Läll, Liis Siinor, Enn Lust

1765 A Facial Liquid Plasma-Induced Polymerization of a Highly Ion-Conductive Polymeric Membrane

Ho-Suk Choi, Quoc-Chinh Tran

M01-Sensors, Actuators, and Microsystems General Session

Sensor

1766 Effective Design and Fabrication of Harsh Environment and Biomedical Gas Sensors
Prabir Dutta

1767 Field Trials Testing of a Mixed Potential Electrochemical Hydrogen Safety Sensor at a Commercial Hydrogen Filling Station

Eric L. Brosha, Christopher J Romero, Daniel Poppe, Michael Strada, Todd L Williamson, Rangachary Mukundan

1768 Digital Voltage-Current Time Differential Method for Operating Zirconia-Based NOx Gas Sensors

Leta Woo, Frank Bell, Mike Boettcher, James Chee, Joe Fitzpatrick, Brett Henderson, Lee Sorensen, Victor Wang, Robert Novak, Jaco Visser

1769 Zirconia-Based Electrochemical Oxygen Sensor to Infer Fuel Ethanol Content in Flex Fuel Vehicles

Richard E Soltis, Daniel Makled, Michael McQuillen, Gopichandra Surnilla

1770 Performance Evaluation of Mixed-Potential HC, NOx and NH3 Sensors in Diesel and Lean Gasoline Engine Exhaust

Cortney R Kreller, Eric L. Brosha, Rangachary Mukundan, Vitaly Prikhodko, Josh Pihl, Scott Curran, James E Parks

1771 Doped ZnO Nanorod Array for Ultra Low NO2 Sensing

Rishabh Jain, Venkata Manthina, Radenka Maric

1772 CO2 Gas Sensing Response of YPO4 Nanobelts Produced By a Colloidal Method

Carlos R Michel, Alma H Martinez, Cesar D Rivera-Tello

1773 Response Characteristics of a Stable Mixed Potential Ammonia Sensor in Simulated Diesel Exhaust

Eric L. Brosha, Josh Pihl, Cortney R Kreller, Vitaly Prikhodko, Scott Curran, James E Parks, Rangachary Mukundan
1774 Nanomaterials-Based Biosensors for Biomedical and Food Safety Applications

Yang Song, He Li, Chengzhou Zhu, Dan Du, Yuehe Lin

1775 Electrical/ Electrochemical Impedance Measurement for Biological Applications

Liju Yang

1776 Multiplexed DNA Biomarker Detection with Phase Change Nanoparticles

Ming Su

1777 Highly Selective Detection of Glucose, Cholesterol and Urea with Integrated ZnO Nanorods Field-Effect Transistors Array Biosensors

Rafiq Ahmad, Jin-Ho Park, Yoon-Bong Hahn

1778 (Invited) Personalized Breath-Based Health Monitors

Pelagia Gouma

1779 Developing Fully-Integrated Biosensing Systems on the Laboratory Benchtop

Leyla Soleymani, Christine Gabardo, Amin Hosseini, Stephen Woo, Chris Adams-McGavin, Aaron Kwong, Oriana Vanderfleet

1780 Graphene Oxide Based Electrochemical Biosensor

Allen Armando Rodriguez-Silva, Omar Movil-Cabrera, John A Staser

1781 Facile Detection of Troponin I Using Dendritic Platinum Nanoparticles and Glass Capillary Tube Indicators

Sanghee Lee, Donghoon Kwon, Changyong Yim, Sangmin Jeon

1782 Sensor Units to Measure Multi-Direction Seebeck Coefficient of Micro-Scale Film
Yeongseok Kim, Sang-Woo Kang, Hyeong-U Kim, Taesung Kim

1783 A Study on Contamination Control of Oxygen Analyzer By Applying Purifier

Jin Hyuk Yun, Se Geun Park, Young Ho Lee, Che Young Lee, Jung Su An, In Su Cho

1784 In-Situ Characterization of Microfluidic Redox Battery with Dual-Pass Architecture

Omar Ibrahim, Marc-Antoni Goulet, Erik Kjeang

1785 The High Photo-Sensitivity of Low-Temperature Poly-Silicon Lateral p-I-n Diode Utilizing Reflective Layers

Yin-Chang Wei, I-Che Lee, Huang-Chung Cheng

1786 Voltammetric Sensing of Endocrine Disruptor (Bisphenol A) Based on a Reduced Graphene Oxide/Carbon Nanotube/Gold Nanoparticles Nanocomposite Modified Screen-Printed Electrode

Yi-Cheng Wang, Dilek Cokeliler, Sundaram Gunasekaran

1787 Biosensing Application of Electrodeposited Nanoparticles As an Electron Transfer Facilitator for Protein Immobilization

Abdolmajid Bayandori Moghaddam

1788 Fabrication of Low-Invasive Patch Glucose Sensors

Jiang Li, Kentaro Hiura, Mikito Yasuzawa, Yusuke Fuchiwaki

1789 Detection of Salmonella Enterica Typhimurium in Chicken Meat Using Phage Coated Magnetoelastic Sensors

I-Hsuan Chen, Shin Horikawa, Bryan A. Chin, James M Barbaree

1790 Synthesis and Characterization of Nanoporous SnO₂ Thin Film
Wufeng Jiang, Su-ju Hao, Yu-zhu Zhang, Yunhan Ling

1791 Electrochemical Biosensor for Early Diagnosis of Alpha-1-Antitrypsin Deficiency

Bobby Gene Adams, Bryan Evans Materi, Jeffrey Rice, Jonathan Sanders, Cynthia A. Rice

1792 Highly Sensitive Detection of Small Molecule Markers By Surface Plasmon Resonance Imaging

Zainab Hussain Al Mubarak, Gayan Premaratne, Cassandra Rodenbaugh, Sadagopan Krishnan

1793 Rapid Detection of Pathogenic Bacteria with the Naked Eye Using Magnetophoretic Chromatography Technique

Donghoon Kwon, Sanghee Lee, Hyeonjeong Lee, Sangmin Jeon

1794 3D Printing the Way to Truly Remote, Autonomous, Solar Powered Sensor Networks for Environmental Monitoring of Trace Heavy Metals By Calibration-Less Anodic Stripping Coulometry of μl Sized Samples

Mohamed M. Marei, Thomas J Roussel, Richard P Baldwin, Robert S Keynton

1795 Enzyme Functionalized Gold Nanoparticles for the Enhanced Electrochemical Detection of Lactate

Pandiaraj Manickam, Yogeswaran Umasankar, Shekhar Bhansali

1796 Functional PDMS Composite Microbridges for Temperature Sensing Applications

Manu Pallapa, Jacob C. K. Leung, Pouya Rezai

1797 Upconverting Nanoparticles for Sensing

Fiorenzo Vetrone
1798 Integration of Nanostructured Dielectrophoretic Device and Surface-Enhanced Raman Probe for Highly Sensitive and Rapid Pathogen Detection

Foram Madiyar, Saheel Bhana, Luxi Swisher, Xiaohua Huang, Christopher Culbertson, Jun Li

1799 Plasmonic Gold Nanohole Arrays for Surface-Enhanced Raman Scattering Biosensing

Peng Zheng, Xuefei Gao, Nianqiang Wu

1800 Towards Development of a Low-Cost and Sensitive Thermal Sensor for User-Independent Interpretation of Results from Lateral Flow Assay (LFA) Devices

Manu Pallapa, Pouya Rezai

1801 Magnetic Optical Microarray Imager for Diagnosing Type of Diabetes in Clinical Matrices

Vini Singh, Sadagopan Krishnan

1802 Bi-Tapered Optical Fibers: Signal Analysis for Sensing Applications

Daniel J. Jauregui, Amit Ben Harush Negari, Juan M. Sierra Hernandez, Diego Garcia Mina, Branden J. King, Peter E. Powers, Joseph W. Haus, Karolyn M. Hansen

1803 A Comparison of the Sensor Performance of Electrochemical Peptide-Based Sensors Fabricated from 6- or 11-Carbon Self-Assembled Monolayers

Arin L Sutlief, Rebecca Y. Lai

1804 Amplification Strategy of FET Biosensor Signal for Sensitive Detection of Prion Proteins

Shofarul Wustoni, Sho Hideshima, Shigeki Kuroiwa, Takuya Nakanishi, Tetsuya Osaka

1805 Enzyme Biosensor for Detection of Formaldehyde on Carbon Nanotube-Screen Printed Electrodes Modified with Pyrenyl Groups
Gayan Premaratne, Sabrina Farias, Sadagopan Krishnan

1806 Electrochemical Biosensor for Faster Diagnosis of Alpha-1-Antitrypsin Deficiency

Bryan Evans Materi, Bobby Gene Adams, Cynthia A. Rice, Jeffrey Rice, Jonathan Sanders

1807 Preparation of Glucose Oxidase-Immobilized Electrodes Using Cellulose Aqueous Solution

Mikito Yasuzawa, Yuya Omura, Kentaro Hiura, Jiang Li, Yusuke Fuchiwaki, Masato Tanaka

1808 Simple, Inexpensive and Rapid Sensors for Commercial and Household Water Quality Monitoring

Naga Siva Gunda, Ravi Chavali, Sushanta Mitra

1809 Performance Enhancements for Chemiresistive Electronic Noses Based upon Materials, Temperature Modulation and Signal Processing

Kurt D. Benkstein, Nalin Katta, Baranidharan Raman, Steve Semancik

1810 Electrochemical Quantification of Vanadium By Novel Electroanalytical Technique

Moises Israel Salazar-Gastelum, Gerardine G Botte

1811 Electrochemical Sensors to Detect Heavy Metals and Carcinogenic Compounds: Inquiry-Based Modules to Meet Today's Interest

Suzanne Kay Lunsford, Corrie Spradlin, Mary Sullivan, Dolores Dobson, Miyong Hughes

1812 Self Assembled Chemical Field Effect Transistors for Heavy Metal Detection

Hang Ruan, Yuhong Kang, Elizabeth Gladwin, Richard O Claus
1813 **Gas Sensing Properties of Hierarchically Structured Zinc Oxide Films By Electrophoretic Deposition**

Yoonsung Chung, Hyejin Park, Eunji Lee, Seokhee Lee, Dong-Joo Kim

1814 **Activation Free SAM-Assisted Silver Electroless Metallization of Textile for Strain Sensor Application**

Alireza Molazemhosseini, Emanuele Cattarinuzzi, Dario Gastaldi, Pasquale Vena, Luca Magagnin

**M03-Sensors for Agriculture**

Sensor

1815 **Smart(er) Agriculture: Robotics, Sensing, and Autonomy**

Daniel Schmoldt

1816 **Sensor Research and Detection Technology for Efficient Water Usage and Security in Agriculture**

Dong-Joo KIM

1817 **Oligopeptide Probe Coated Magnetoelastic Biosensors for the Rapid Detection of Salmonella Typhimurium**

Sang-Jin Suh

1818 **The Center for Produce Safety - an Industry's Journey to Reduce Foodborne Illness**

Bonnie Fernandez-Fenaroli

1819 **Spectral Imaging Technologies for Food Safety and Quality Evaluations**

Moon Sung Kim

1820 **New Development in Physical, Chemical, and Biological Sensors for Precision Agriculture**
Z.-Y. Cheng

1821 **Biomaterials Research Support at the National Science Foundation**

Aleksandr Simonian

1822 **Phase-Based Electrochemical Biosensors for Detection of Pathogenic Bacteria**

Yan Zhou, Ramaraja P. Ramasamy

1823 **A Biosensor Based on Magnetic Resonance Relaxation**

MariAnne Sullivan, Bart Charles Prorok

1824 **Pulse Excitation Method for Magnetoelastic Biosensors**

Howard Clyde Wikle, Songtao Du, Shin Horikawa, Bryan A Chin

1825 **Exploration of Metal Oxide Catalysts for Direct Urine Fuel Cell and Gas Sensors for Its Condition Monitoring**

Yoonsung Chung, Hyejin Park, Eunji Lee, Seokhee Lee, Sungpil Woo, Youngsoo Yoon, Dong-Joo Kim

1826 **Optimization of Phage and Surface Blocker Loading for the Magnetoelastic Biosensor**

Jiajia Hu, Shin Horikawa, Fengen Wang, Yating Chai, Songtao Du, Yuzhe Liu, Bryan A Chin, Jing Hu

1827 **Layer-By-Layer Assembled Carbon Nanotube Immobilized Enzyme Cascade for Sucrose/O₂ Biofuel Cell Utilization**

Yuanyuan Zhang, Mary Arugula, Shannon Williams, Aleksandr Simonian

1828 **The Dynamic Characterization of Electrochemical Proximity Assay with a Multi-Parametric/Multimodal Spectroscopy Apparatus**
Lang Zhou, Mary Arugula, Christopher J Easley, Curtis Shannon, Aleksandr Simonian

1829 Electrochemical Sensing System for Detection of Tricresyl Phosphate (TCP) in Aqueous Solution and Air

Alina N Chanysheva, Mary A Arugula, Alex L Simonian

1830 Optimization of Nanoporous Anodic Aluminum Sensor-Based Lspr for Methicillin-Resistant Staphylococcus Aureus detection

Mi-Kyung Park, Rubab Momna, Haeng Mi Byeon, Sung Hyeok Park, Joo Hyeon Park, You Jin Kim, In Young Choi, Sae-Wan Kim, Shin-Won Kang

1831 Real-Time Detection of Salmonella on Fresh Apples Using Magnetoelastic Biosensors Operating Under Multi-Harmonic Resonance Modes

Songtao Du, Shin Horikawa, Jiajia Hu, Fengen Wang, Yuzhe Liu, Bryan A Chin

1832 Silica-Coated Magnetostrictive Biosensors for Real-Time Detection of Campylobacter Jejuni in Washing Water

Lin Zhang, Ou Wang, Z.-Y. Cheng, Tung-Shi Huang

1833 Wireless Sensors and Actuators Based on Magnetostrictive Resonators

Kewei Zhang, Lin Zhang, Z.-Y. Cheng

1834 Novel Sensing System for in-Situ Monitoring Soil Water Content

Lin Zhang, Z.-Y. Cheng

1835 Development of on-Site Applicable Immunosensor Combined with Light Microscopic Imaging System for the Detection of Salmonella in Poultry

Jun-Hyun Oh, Mi-Kyung Park

1836 Enhanced Pathogen Detection on Fresh Produce Using Micron-Scale Magnetoelastic Biosensors
Shin Horikawa, Yating Chai, Howard Clyde Wikle, Sang-Jin Suh, James M Barbaree, Bryan A Chin

1837 *Multilayer Scanning Coil Detector for Improved Detection of Surface Pathogen Contamination*

Yuzhe Liu, Songtao Du, Shin Horikawa, Howard Clyde Wikle, Jiajia Hu, Fengen Wang, Bryan A. Chin

1838 *Rapid and Sensitive Detection of Salmonella Typhimurium on Plastic Food Processing Plates By Using Wireless Biosensors*

Yuzhe Liu, Shin Horikawa, Songtao Du, Yating Chai, Jiajia Hu, Fengen Wang, Bryan A Chin

1839 *Detection of Multiple Pathogens on Fresh Produce Using a Surface-Scanning Coil*

Fengen Wang, Shin Horikawa, Yating Chai, Jiajia Hu, Songtao Du, Yuzhe Liu, Howard Clyde Wikle, Bryan A Chin

1840 *Novel Magnetostrictive Fe-Co-B Thin Film Sensors for Food Safety Detection*

Zhizhi Sheng, Z.-Y. Cheng

1841 *VOC Gas Sensors Fabricated with Graphene Oxide Composites for Food Safety and Quality*

Hyejin Park, Eunji Lee, Yoonsung Chung, Seokhee Lee, Dong-Joo KIM

1842 *ZnO Nanostructures with Different Morphologies and Their Combinatorial Optimization with Graphene Oxide for Gas Sensor Properties*

Eunji Lee

1843 *Amperometric Detection of Plant Volatiles Using Metal Oxide Nanoparticles*

Yi Fang, Ramaraja P. Ramasamy
Z01-General Student Poster Session

All Divisions

1844 Theory and Experiments for Generalization of the Scanning Bipolar Cell for Patterning of Diverse Metals

Trevor M Braun, Daniel T. Schwartz

1845 The Studies of Interfacial Property and Water Dynamic Process within Self-Humidifying Confined PFSA-Zeolite Composite Membrane

Viola Sim, Ran Deng, Wei Han, King Lun Yeung

1846 Formation of CuInSe₂ Printable Solar Cell Using Aqueous Phase Synthesized CuIn Alloy Nanoparticles

Hideyuki Takahashi, Shun Yokoyama, Kazuyuki Tohji

1847 Understanding the Electrochemical Induction of Urea to Ammonia on Nickel Based Catalyst in Alkaline Medium

Fei Lu, Gerardine G Botte

1848 Effect of Oxygen Impurity on Nitrogen Radicals in Post-Discharge Flows

Yoshinobu Shiba, Akinobu Teramoto, Tomoyuki Suwa, Kensuke Watanabe, Shinichi Nishimura, Yasuyuki Shirai, Shigetoshi Sugawa

1849 Functionality Supports Synthesis of Tungsten Carbides for Catalytic Applications By Arc Plasma Deposition Process

JI-Won Oh, Hyunwoong Na, Kyou-Hyun Kim, Seong Ho Son, Sahn Nahm, Hanshin Choi

1850 Manipulation of Nanoscale 3 Dimensional Architecture: Graphitic Carbon/Nickel Core-Shell Structured Nanoparticles Dispersed on Carbon Black Support

Hyunwoong Na, JI-Won Oh, Yong Soo Cho, Hanshin Choi
1851 Proton-Coupled Electron Transfer in an Electroactive Three Hydrogen Bond Dda Array Capable of Binding an Aad Guest

Ran He, Diane K. Smith

1852 Photocatalytic Decomposition of Various Organic Compounds over WO$_3$ Supported Ordered Intermetallic Ptpb Co-Catalyst

Takao Gunji, Toyokazu Tanabe, Shingo Kaneko, Futoshi Matsumoto

1853 Development of Micro-Machine Moving with Glucose and Hydrogen Peroxide

Keitaro Yamazaki, Shingo Kaneko, Toyokazu Tanabe, Takao Gunji, Futoshi Matsumoto

1854 Agarose Based Biopolymer Gel Electrolyte for Electrochemical Applications

Rahul Singh

1855 The Role of Pre Hydrogen Flow in Nucleation of Graphene on Silicon Nitride

Segeun Park, Doyeon Kang, Yonghan Roh

1856 Microelectrochemical Property of Precipitates in Al-Mg Alloy

Yuto Sakaizawa, Izumi Muto, Yoshiyuki Oya, Takahiro Kovama, Yu Sugawara, Nobuyoshi Hara

1857 Focused Ion Beam Milling Technique for Plan-View TEM Sampling of DRAM Capacitor

Sungho Lee, Jonghyuk Kang, Cheol-Woong Yang

1858 Synthesis and Characterization of Na$_3$V$_2$(PO$_4$)$_2$F$_3$ Based Cathode Material for Sodium Ion Batteries

Ronald Väli, Alar Jänes, Enn Lust

1859 Chemical Deposition of Vanadium Oxide Electrode for Electrochemical Capacitors
Haoran Wu, Keryn Lian

1860 Formulation of Ionic Liquid Electrolyte to Expand the Voltage Window of Supercapacitors

Katherine L Van Aken, Majid Beidaghi, Yury Gogotsi

1861 Reaction Energies for Electrode Surface Atom Insertion into R-H Bonds and Their Dependence on Electrode Potential: Application to Pt(111)

Meng Zhao, Alfred B. Anderson

1862 Fabrication of Ag-Deposited Silicon Nanoparticles for a Lithium Ion Battery Anode Prepared By Alkaline Immersion Plating

Yu Sugawara, Susumu Arai

1863 Fabrication of Copper / Single-Walled Carbon Nanotube Composite Plating Films By Electrodeposition

Kyohei Kirihata, Susumu Arai, Mitsugu Uejima, Mitsuhito Hirota

1864 Fabrication By Electrodeposition of a New Tin Anode Reinforced with Carbon Nanotubes for Lithium Ion Batteries

Kouki Matsunaga, Susumu Arai

1865 Fabrication of a New Tin Anode for a Lithium-Ion Battery Using a Three-Dimensional Copper Nanostructure

Mendsaikhan Munkhbat, Susumu Arai

1866 Inter-Particle Aggregation and Breakage in Taylor-Reactor Using CFD

Hyeon-Kwon Lee, Dong Hyup Jeon, Jong-Pal Hong, Jung-Hoon Song

1867 Activated Graphene-Derived Porous Carbon with Exceptional Gas Adsorption Properties
Aswathi Ganesan, Manikoth M Shaijumon

1868 Anomalous Mobility Improvement in Ultra-Low-Temperature Polycrystalline-Silicon Thin-Film Transistors on Flexible Substrate after Laser Lift-Off Process

Yin-Chang Wei, I-Che Lee, Huang-Chung Cheng

1869 A New Nasicon-Structure Phosphor As a Blue Component for White LED

Yoon Hwa Kim, Won Bin Im

1870 Anion Conductive Multiblock Copolymers with Long Side Chains for AEM Fuel Cells

Lisha Liu, John M. Ahlfield, Paul A Kohl

1871 In Situ Observation of Electrodeposition of Li on Pt and Ni Substrates in Organic Electrolyte

Naoaki Munemura, Izumi Muto, Yu Sugawara, Nobuyoshi Hara

1872 The Study of Abnormal Degradation in High-Voltage P-Type Mosfets with N+ Polysilicon Gate during AC Stress

Dongjun Lee, Changsub Lee, Sunghoi Hur, Duheon Song, Byoungdeog Choi

1873 A New Silica-Based Anode Using Three-Dimensional Nanostructured Copper As a Current Collector for Lithium Ion Batteries

Ryota Ara, Susumu Arai

1874 Improved Performance and Stability of Ni-Free Anode Materials for Intermediate Temperature-Solid Oxide Fuel Cells

Soo-Yeon Jo, Jun-Young Park

1875 Durability Study of Double Perovskite Cathode Materials for Intermediate Temperature-Solid Oxide Fuel Cells
Ja-Yoon Yang, Jun-Young Park

1876 Electrospun Porous Nanorod Perovskite Oxide/Ionic Conductor Composite As an Electrochemical Catalyst for Water Splitting

In-Seop So, Jun-Young Park

1877 Electrochemical Oscillations during Reduction of Nitrate and Nitrite Ions at High Overpotential

Terumasa Kuge, Yuri Yamada, Shuji Nakanishi, Yoshiharu Mukouyama

1878 Alkali Metal Ions Induced Electrochemical Oscillations in H$_2$O$_2$ - H$_2$SO$_4$ - Pt System

Hirokazu Kawasaki, Daisuke Hara, Mitsunobu Kikuchi, Yuri Yamada, Shuji Nakanishi, Yoshiharu Mukouyama

1879 Chaotic Oscillations in H$_2$O$_2$ - H$_2$SO$_4$ - Pt Electrochemical System

Daisuke Hara, Hirokazu Kawasaki, Mitsunobu Kikuchi, Yuri Yamada, Shuji Nakanishi, Yoshiharu Mukouyama

1880 Specimen Preparation Method to Dual-Axis TEM Analysis Technique

Sang Gul Park, Sungho Lee

1881 Bipolar Membrane Fabrication for Fuel Cells

John M. Ahlfield, Lisha Liu, Paul A Kohl

1882 Surface Functionalized Carbon Nanofiber Supports for Alkaline ORR Catalysts

Wenjiao Huang, John M. Ahlfield, Paul A Kohl, Xinsheng Zhang

1883 Approaches to the Molecular Recognition of Lanthanides Using Azulenyl-, Phenyl-, Beta-Naphthyl- and Vinyl-Malonate Derivatives
Cristina-Andreea Amarandei, Eric Saint-Aman, Liviu Birzan, Eleonora-Mihaela Ungureanu

1884 C-Doped TiO$_2$-B Nanowires Derived from TiC As an Anode Materials for Lithium Ion Batteries with High Rate Performance

Subrahmanyam Goriparti, Remo Proietti Zaccaria, Claudio Capiglia

1885 Synthesis of Lanthanum Telluride Thin Films By Electrodeposition from Ionic Liquids

Yitzhak Snow, Tyler D. Pounds, Stephen L. Farias, Robert C. Cammarata

1886 Effect of Br$_2$ Complexation on a Hydrogen-Bromine Flow Battery Performance

Regis Paul Dowd, Michael Zeets, Trung Van Nguyen

1887 The Effect of Change in Solution Chemistry of Bulk Solution on Crevice Corrosion Propagation of Stainless Steel

Takahito Aoyama, Yu Sugawara, Izumi Muto, Nobuyoshi Hara

1888 Synergistic Effect of Cobalt Nanoparticles Embedded in Nitrogen-Doped Carbon As a Pt Alternative Electrocatalyst for Dye-Sensitized Solar Cells

Sung hee Ahn

1889 Preparation Conditions of Polypyrrole Film on Sulfur-Based Cathode to Prevent Polysulfide Dissolution in Lithium Secondary Batteries

Natsuki Nakamura, Tokihiko Yokoshima, Hiroki Nara, Toshiyuki Momma, Tetsuya Osaka

1890 Oxygen Evolution Reaction on Zirconium Oxide Film in Alkaline Medium

Ayaka Oishi, Koichi Matsuzawa, Yuji Kohno, Akimitsu Ishihara, Shigenori Mitsushima
Effect of Thermal Treatment of Poly(amide imide) Binder on Cycling Performance of Silicon Alloy-Based Anode for Lithium-Ion Battery

Sang-Hyung Kim, Hwi Soo Yang, Seung Hyun Yook, Seon-Kyong Kim, Cheol-Ho Park, Hae Young Choi, Dong-Won Kim

Composite Polymer Electrolyte Containing Core-Shell Structured SiO\(_2\)(Li\(^+\)) Particles for Suppressing Lithium Dendrite Growth and Improving High Temperature Cycling Stability of LiNi\(_{0.5}\)Mn\(_{1.5}\)O\(_4\)

Won-Kyung Shin, Se-Mi Park, Dong-Won Kim

Relaxation Structure Analysis of Li\(_x\)NiO\(_2\) (x=0.09) after Li-Extraction

Akihiro Tamura, Shigeomi Takai, Takeshi Yabutsuka, Takeshi Yao

All-Nanosheet Electrochemical Capacitors Assembled By Laminating Redox-Active Nanosheets and Ion-Conductive Nanosheets

Seiji Uchida, Syota Ito, Shinya Suzuki, Masaru Miyayama

Preparation and Performance Evaluation of Pt/SnO\(_2\)/KB As Cathode Catalyst of PEMFC

Sawaka Kitayama, Taro Kinumoto, Miki Matsuoka, Tomoki Tsumura, Masahiro Toyoda

Preparation of LaMnO\(_3\)-CNF and Activity for Oxygen Electrode Reaction in KOH Aqueous Solution

Kohei Ono, Taro Kinumoto, Tomoki Tsumura, Masahiro Toyoda

Numerical Simulations of Rechargeable Lithium-Ion Batteries with Porous Positive Electrodes: Local Reaction Rate Distribution

Daiki Ito, Munekazu Motoyama, Yasutoshi Iriyama

Carbon Dioxide Absorption Behavior and Carbonate Ion Transport of Lithium Orthosilicate / Potassium Carbonate Coexistence System Prepared By Ball Milling
Kyohei Kanki, Hideshi Maki, Minoru Mizuhata

1899 **Single Particle Measurement Technique Using Tweezers-Type Probe for Insertion Materials**

Yuto Yamada, Tomohiro Ohmura, Hirokazu Munakata, Kiyoshi Kanamura

1900 **Effect of Epitaxial Growth of Gold Nanoparticles on Silicon Substrates on Adhesion of Electrolessly Deposited Metal Films**

Naoki Yamada, Hiroyuki Atsushiba, Susumu Sakamoto, Naoki Fukumuro, Shinji Yae

1901 **Mechanism for Alpha-PbO$_2$ formation on the Cathode of Lead Acid Battery**

Taichi Iwai, Takeshi Yabutsuka, Shigeomi Takai, Takeshi Yao

1902 **Effect of Nickel Content on the Corrosion Behaviour of Stainless Steel at 80 °C**

Dan Guo, Linda Wu, Ahmed Y. Musa, Veena Subramanian, Delin Li, J. C. Wren

1903 **Carbon Nanomaterials Doped with Sulfur for ORR in Alkaline Media**

Elizabeth Montiel-Macias, Perla B Balbuena, Raynald Gauvin, Gabriel Rosado, Ysmael Verde Gomez

1904 **Studies of Electrode/Electrolyte Interfaces**

Daniel Parr, Jacob Chrestenson, Kasim Malik, Luke M. Haverhals

1905 **Studies of Mass Transport in Semiconducting Thin Film Electrodes**


1906 **Novel Potentiometric Sensors Based on Nanostructured TiO$_2$ Electrodes for Selective Determination of Biologically Relevant Transition Metals**

Maryam Hariri, Sylvie Morin
Investigation of Effect of Zinc on Alloy 600 Passive Layers Formed in High Temperature Primary Water

Yifan Jiang, Thomas Devine

Biomolecule Detection Using a Resonant Capacitive Sensor

Danielle Bane, Guru Subramanyam, Karolyn M. Hansen

XPS and FTIR Studies of Dual Target Sputtered Bcn Thin Films

Adithya Prakash, Kalpathy B Sundaram

Irrigation System Using Photovoltaics and Lithium Ion Batteries for Energy Storage

Eugene Newton Moss, Charles Oladimeji, Pedro L. Moss, Mark H Weatherspoon

Carbon Coated MoO2 Deposited through an Economical Polymer-Assited Solution Method on Nickel Foam As Anodes for Lithium-Ion Batteries

Brian Patterson, Hongmei Luo

Nanogaps Fabricated from Electrodeposited Fe-Ni-Co Nanowires

Xiaohua Geng, Elizabeth J Podlaha

Engineering Optical Properties of Nanorods Fabricated By Physical Vapor Deposition

Md Aman Uddin, Ugur Pasaogullari

Cyclic Voltammetric Analysis of 1-Methyl-4-Nitroimidazole Under Biological Conditions

Andrew Doan Nguyen, Ghazwan M Darzi, Diane K. Smith

3D Architected Si-Cu Core-Shell Nanolattices As Mechanically Robust, Binder-Free Li-Ion Battery Electrodes
Xiaoxing Xia, X. Wendy Gu, Julia R Greer

1916 Analysis of a Four H-Bond Array Using Cyclic Voltammetry: Introducing a New Redox Center to Strengthen Dimerization

Bryan T. Tamashiro, Diane K. Smith

1917 Evaluation of Dynamic Hydrophobicity of Nanoporous Silicon Surfaces Prepared By Metal-Assisted Chemical Etching

Kenta Machida, Hidetaka Asoh, Naoya Yoshida, Toshinori Okura, Sachiko Ono

1918 Electrochemical Properties of Transition Metal-Doped LiCoPO$_4$ Synthesized By Hydrothermal Method

Yusaku Noda, Yuto Yamada, Shohei Miyamoto, Hirokazu Munakata, Koji Ohira, Shuhei Yoshida, Daisuke Shibata, Kiyoshi Kanamura

1919 Proton-Coupled Electron Transfer in an Electroactive Three Hydrogen Bond Dda Array Capable of Binding an Aad Guest

Ran He, Diane K. Smith

1920 Effect of Etchant Composition on Surface Morphology of GaAs during Anisotropic Chemical Etching

Hidetaka Asoh, Sachiko Ono, Daiki Ito

1921 Opaque White Anodic Oxide Film Formed on Aluminum

Ayaka Kurihara, Hidetaka Asoh, Sachiko Ono

1922 The Effect of the Angle of Incident of the Light upon the Optical Reflectance on Silicon Nanowires Grown By Electroless Etching

Victor H. Velez, Robert George Mertens, Kalpathy B Sundaram
Studies on the Effects of Angle of Incidence on the Optical Reflectance Properties of Silicon Nanowires Grown By Electroless Etching

Victor H. Velez, Robert George Mertens, Kalpathy B Sundaram

Electrochemical Synthesis of Co-Rh Alloys

Krzysztof Mech, Piotr Zabinski, Remigiusz Kowalik, Marek Wojnicki

Z02-Nanotechnology General Session

All Divisions/Interdisciplinary Science and Technology Subcommittee

Analytical Study of the Band GAP and Optical Characteristics of Copper Sulphide Thin Film: Experiment and Computation

Emmanuel Ifeanyi Ugwu, John Okwo, Daniel Ugadu Onah, John Elom Ekpe

Electroassisted Assembly of Alkylphosphonic Acids Monolayers on Nitinol

Sébastien Devillers, Annelies Vanhooland, Tatiana Issakova, Joseph Delhalle, Zineb Mekhalif

Cellular Toxicity Assessment and Environmental Impact of Pre- and Post-CMP Nanoparticle Slurries

Karshak Kosaraju, Mubin Tarannum, Steven Crawford, Shyam Aravamudhan

Surface-Initiated ATRP of (hydroxyethyl)Methacrylate on Nitinol Modified By in Situ Generated Diazonium from Its Nitro Precursor

Amory Jacques, Joseph Delhalle, Zineb Mekhalif

Fabrication of Large Scale Silver Nanowire Network By Ion Beam Irradiation

Shehla Honey, F.T. Thema, Ishaq Ahmad, Shahzad Naseem, Maaza Malik

Influence of Focused Electron Beam on Electrical Characterization of Advanced Mosfets
Jonghyuk Kang, Sungho Lee, Byoungdeog Choi

1931 Ultrasound Asissted LiFePO$_4$ Nano Plate Synthesis Via Subsequential Aqueous Precipitation Method

Safak Dogu, Mehmet Kadri Aydinol

1932 Electrochemical Separation, Pumping, and Storage of Hydrogen or Oxygen into Nanocapillaries Via High Pressure MEA Seals

Ryan D Reeves, Nicholas R Schwartz, Gregory E Chester, Douglas S Diez, Mitchell L Solomon, Philip Cox, Justin J Hill

1933 High Resolution 3-Dimensional Chemical and Morphological Imaging of Single Li$_x$FePO$_4$ Particles

Young-Sang Yu, David Shapiro, Maryam Farmand, Chunjoong Kim, Yijin Liu, Jordi Cabana

1934 Characterization of Lift Off Resist during Thermal Compression Wafer Bonding Based on Polydimethylglutarimide (PMGI)

Thomas Dushatinski, Takashi Matsumae, Tarek M Abdel-Fattah, Andrew D. Koehler, Jordan D Greenlee, Travis J Anderson, Helmut Baumgart, Karl D Hobart, Francis J Kub

Z03-Impedance Technologies, Diagnostics, and Sensing Applications

Physical and Analytical Electrochemistry/Corrosion/Industrial Electrochemistry and Electrochemical Engineering/Sensor

Ruben Nelson, Mark H Weatherspoon

1935 Development of Equivalent Circuits for Lithium-Air Battery Impedance Using Mixed and Isolated Diffusion Models

Ruben Nelson, Mark H Weatherspoon

1936 Covalently Cross-Linked Cholesterol Oxidase for an Indirect Detection Cholesterol Biosensor

Jarryd Noah Ashby, Ramaraja P. Ramasamy
1937 Analysis of Shunt Currents and Associated Corrosion of Bipolar Plates in PEM Fuel Cells

Vadim Lvovich, William Bennett, Mark Hoberecht

1938 Interpretation of Complex Capacitance Using Equivalent Circuit Involving Constant Phase Element

Yoshinao Hoshi, Kozue Tabei, Isao Shitanda, Masayuki Itagaki

1939 Suitable Position of Reference Electrode in Three-Electrode Cell for Impedance Measurements in Lithium-Ion Rechargeable Battery Investigated By Finite Element Method

Yoshinao Hoshi, Yuki Narita, Keiichiro Honda, Tomomi Ohtaki, Isao Shitanda, Masayuki Itagaki

1940 Time Domain Analysis on Current Response of Equivalent Circuit Involving Constant Phase Element

Masayuki Itagaki, Suguru Suzuki, Yoshinao Hoshi, Isao Shitanda

1941 Influence of Probe Size and Probe Position for Local Electrochemical Impedance Spectroscopy

Vincent Vivier, Molena de Assis Camila, Caio P. Abreu, Isolda Costa, Hercilio G. de Melo, Michel Keddam

1942 Finite Elements Approach to Predicting Impedance Response of Geometrically Convoluted Samples

Petr Vanýsek, Petr Vyroubal, Jiří Haňka, Vítězslav Novák, Jiří Maxa

1943 On the Dielectric Properties of Human Skin

Mark E. Orazem, Annette Bunge

1944 Contribution of Surface Roughness to Constant-Phase Element (CPE) Behavior
Christopher L. Alexander, Bernard Tribollet, Mark E. Orazem

1945 Using Internal Pressure Measurements to Fundamentally Understand the Aging of Lithium-Ion Batteries

David Alan Wetz, Anthony Matasso, Derek Nathan Wong

1946 Development of Simultaneous Measurement Method of Potentiodynamic Polarization Curve and Impedance Spectra Determined By Wavelet Transformation

Seiya Kato, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki

Z04-Electrochemical Energy Summit (E2S)

All Divisions

N/A Electrochemical Energy Summit Plenary Address

Franklin M. Orr

1948 The Joint Center for Energy Storage Research (JCESR): A New Paradigm for Energy Storage Research

George Crabtree

1949 Overcoming Key Challenges for a Viable Lithium-Sulfur Transportation Battery

Kevin R Zavadil

1950 Non-aqueous Redox Flow Batteries for Grid Storage

Fikile R. Brushett

1951 Artificial Photosynthesis- Progress and Prospects

Harry A Atwater
1952 **New Advances in Stabilizing High-Efficiency Semiconductors for Use in Solar Fuels Applications**

Matthew T. McDowell, Ke Sun, Shu Hu, Michael Frankston Lichterman, Xinghao Zhou, Matthew Shaner, Erik Verlage, Bruce Brunschwig, Nathan S. Lewis

1953 **Bringing Components to Solar Fuels Prototypes: Material Discovery, Interface Engineering, and Integration**

Ian D. Sharp


Sunita Satyapal, Chris Ainscough, Adam Z Weber, Sanjiv Malhotra, Dimitrios C Papageorgopoulos, Rick Farmer

1955 **Industry Invited Talks: "The Future of Battery and Fuel Cell Powered Cars: Challenges and Opportunities"**

x TBD

1956 **The Center for Electrochemical Energy Science (CEES): An Overview**

Paul Fenter

1957 **Center for Mesoscale Transport Properties: Probing the Limits of Electron and Ion Transport over Multiple Length Scales**

Amy C Marschilok

1958 **Surface Reaction, Solvent Inhomogeneity, and Ion Transport in Electric Double Layers: Predictions from a Classical Density Functional Theory**

Cheng Lian, Jianzhong Wu

1959 **Advancing Operando Tools to Probe Multiscale Complexity in Chemical Energy Storage**
Karena W Chapman, Clare P Grey, Peter J Chupas, Philip Batson, Frederic Cosandey, Jordi Cabana, Shirley Meng, Guangwen Zhou

1960 A Single Material Battery

Chunsheng Wang, Fudong Han

1961 Structures, Devices, and Architectures for Nanoscale Solutions in Electrical Energy Storage

Gary W Rubloff, Sang Bok Lee

1962 Electrochemical Stiffness in Anodes and Cathodes for Lithium Ion Batteries

Andrew A. Gewirth, Hadi Tavassol, Elizabeth M. C. Jones, Jennifer Esbenshade, Nancy R. Sottos

1963 Atomic Force Microscopy Applications for Energy Storage: Detecting the Structure and Dynamics of Fluid/Electrode Interfaces

Jeremy Come, Jennifer Black, Sergei V. Kalinin, Nina Balke

1964 Understanding the Layered Oxides for High-Voltage Intercalation in Alkaline Ion Batteries

Shirley Meng

1965 Northeast Center for Chemical Energy Storage (NECCES)

M. Stanley Whittingham

1966 The Evolution of a High Capacity Electrode

YuHuang Wang, Chuan-Fu Sun

1967 Ionic Liquid Structure and Dynamics at Charged Graphene Interface
Ahmet Uysal

1968 The Role of Ultrathin Coatings on the Interfacial Reactions at LiMn$_2$O$_4$ Surfaces

Jeffrey W Elam, Khalil Amine, Michael M. Thackeray, Larry Curtiss, Mark C. Hersam, Vinayak Dravid, Chris Wolverton, Andrew A. Gewirth

1969 Center for Mesoscale Transport Properties: Molecular to Mesoscale (m2m)

Esther S Takeuchi

1970 Addressing Fundamental Problems in Capacitive Energy Storage

Majid Beidaghi, Katherine L Van Aken, Boris Dyatkin, Kelsey B. Hatzell, David J Wesolowski, Yury Gogotsi

1971 Computational Studies of Lithium Manganese and Nickel-Manganese Oxide Spinel Surfaces

Hakim Iddir, Kah Chun Lau, Larry Curtiss

1972 Electronic Structure Calculations and Synergistic Experimental Work in the Nanostructures for Electrical Energy Storage (NEES) Energy Frontier Research Center

Kevin Leung


Louis F.J. Piper, Shawn Sallis, Nathalie Pereira, Pinaki Mukherjee, Frederic Cosandey, Yiqing Huang, Nicholas F. Quackenbush, M. Stanley Whittingham, Glenn G Amatucci

1974 The Fluid Interface Reactions, Structures and Transport (FIRST) Energy Frontier Research Center

David J Wesolowski
1975 An Integrated First Principles and Experimental Approach to Enabling Multi-Electron Lithium-Ion Battery Cathodes

Shyue Ping Ong, Yuh-Chieh Lin, Yiqing Huang, Bohua Wen, Nicholas F. Quackenbush, Youngmin Chung, Natasha Chernova, Fredrick Omenya, Louis F.J. Piper, M. Stanley Whittingham

1976 The Challenge of 3D All Solid State Li-Ion Battery

A. Alec Talin, Dmitry Ruzmetov, Paul Haney, Andrei Kolmakov, Alexander C Kozen, Alex Pearse, Keith Gregorczyk, Tom Schmitt, Gary W Rubloff

1977 Hybrid Li-Ion/Li-Oxygen Battery Materials

Maria K. Y. Chan, Alper Kinaci, Zhenzhen Yang, Chun Zhan, Chi-Kai Lin, Victor A. Maroni, Lynn Trahey, Zhenpeng Yao, Jinsong Wu, Fernando Castro, Qianqian Li, Vinayak Dravid, Chris Wolverton, Christopher Johnson, Jun Lu, Khalil Amine, Michael M. Thackeray

Z05-Late Poster Session

All Divisions

1978 Studies on Dielectric Properties of Annealed RF-Sputtered ZrO2 Thin Films

Raul R. Mendoza, Giji Skaria, Adithya Prakash, Victor H. Velez, Kalpathy B Sundaram