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Table of Contents and Index

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## Table of Contents

### A01-Batteries and Energy Technology Joint General Session

1 Evolution of Fe-Antisite Defects in Standard Hydrothermal LiFePO<sub>4</sub> Synthesis and Their Accelerated Removal with Ca<sup>2+</sup>

Andrea Paoella, George P. Demopoulos, Karim Zaghib

2 Layered and Tunneled Manganese Oxides As Battery Cathode Materials - the Role of Electrochemically Active and Inert Metal Cations

Amy C Marschilok, Esther S Takeuchi, Kenneth J Takeuchi

3 Novel Vanadium Based Cation-Disordered Lithium Transition Metal Oxides for Li-Ion Batteries

Musa Ali Cambaz, Maximilian Fichtner

4 Electrochemical Characteristics of Densely-Packed Li(Ni<sub>1/3</sub>Co<sub>1/3</sub>Mn<sub>1/3</sub>)O<sub>2</sub> Single Crystals As an Additive-Free Electrodes for Advanced Lithium-Ion Secondary Battery

Takeshi Kimijima, Nobuyuki Zettsu, Katsuya Teshima

5 Investigation of LiMn<sub>2</sub>O<sub>4</sub> Thin-Film Electrode Using Redox Reaction of Ferrocene

Jun-ichi Inamoto, Kohei Miyazaki, Tomokazu Fukutsuka, Takeshi Abe

6 Nanostructured Organic Positive Electrodes for Sustainable Energy Storage

Tianyuan Liu, Byeongyong Lee, Seung Woo Lee

7 Self-Polymerized Dopamine As an Organic Cathode for Lithium-Ion Batteries

Tianyuan Liu, Byeongyong Lee, Seung Woo Lee

8 New Redox Polymer Hybrids: Bridging the Gap Between Li-Ion Batteries and Supercapacitors

Jean Francois Gohy

9Formation of Percolating Carbon Networks in Battery Processing and Their Effects on Electrode Performance

Samantha Morelly, Maureen Han-Mei Tang, Nicolas J. Alvarez

10Electrochemical Properties of Surface-Treated Hard Carbon Electrode

Wen Ma, Tomokazu Fukutsuka, Kohei Miyazaki, Takeshi Abe

11Electrochemical Lithiation/Delithiation Process of Si

Toshihiro Kondo, Nana Aoki, Asami Omachi, Kohei Uosaki

12In Operando Structural and Acoustic Analysis of Lithium-Ion Batteries

Andrew Hsieh, Greg Davies, Michael Wang, Daniel A Steingart

13Path Dependence in Lithium-Ion Batteries Degradation - a Comparison of Cycle and Calendar Aging

Matthieu Dubarry, Arnaud Devie

14Battery Degradation and Cost Analysis of a Lithium Ion Battery System for a 1 MW Green Energy Hub (GEH)

Larry Morris, Mark H Weatherspoon

15Unscented Kalman Filter-Based Online State-of-Charge Estimation in LiFePO<sub>4</sub> Battery-Powered Electric Vehicles

Boyan Huang, Chenxi Wang, Zheng Zhu, Yegui Xiao

16Reconfigurable Battery Pack for a Lithium Based Battery Charger for BMS Applications

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

[17Development and Implementation of Lithium-Ion Battery Performance and Capacity Fade Models for Resource Planning Tools](#)

[Bharatkumar Suthar, Michael Scioletti, Alexandra Newman, Paul A Kohl](#)

[18Modeling Volume Change and Battery Performance Due to Intercalation in Porous Electrodes](#)

[Taylor Reed Garrick, Yiling Dai, Kenneth Higa, Xinyu Huang, Venkat Srinivasan, John W. Weidner](#)

[19Block Copolymer Sdapp Membranes for Vanadium Redox Flow Batteries-Strategy to Address Transport and Durability](#)

[Zhijiang Tang, Cy Fujimoto, Thomas A. Zawodzinski](#)

[20Disulfonated Copolymer Membranes with Improved Selectivity and Lifetime for Vanadium Redox Flow Batteries](#)

[Kenan Kara, Mehmet Sankir, Nurdan Demirci Sankir, Ertan Agar](#)

[21Effect of Membrane Type of the Performance of a Hydrogen-Vanadium Flow Battery](#)

[Trung Van Nguyen, Regis Paul Dowd, Ryszard Wycisk, Peter N. Pintauro](#)

[22Enhancement of Electrode Reactions in Flow Batteries at Finely Etched and Metal Oxide Loaded Graphitized Carbon Fiber](#)

[Jun Maruyama, Takahiro Hasegawa, Satoshi Iwasaki, Tomoko Fukuhara, Kei Hanafusa](#)

[23Fabrication and Characterization of Electrospun Electrodes for Flow Battery Applications](#)

[Selina Peng Liu, Jeff T. Gostick](#)

[24 Countering Degradation of Carbon Felt Electrodes in All-Vanadium Redox Flow Batteries \(VRFB\)](#)

[Igor Derr, Christina Roth](#)

[25 Performance of Vanadium Redox Flow Battery By Using the Electrode with Porous Carbon Nanofiber](#)

[Hirokazu Ishitobi, Takuya Yoshida, Satoshi Sugawara, Nobuyoshi Nakagawa](#)

[26 Improved Performance of Ti/Mn Redox Flow Battery By Thermally Treated Carbon Paper Electrodes](#)

[Yong-Rong Dong, Hirokazu Kaku, Kei Hanafusa, Kiyooki Moriuchi, Toshio Shigematsu](#)

[27 Activated Carbon Modified Electrodes for Soluble Lead-Acid Flow Batteries](#)

[Hao-Lun Tang, Hsun-Yi Chen](#)

[28 Rde Kinetic Study of V\(IV\)/V\(V\) and V\(II\)/V\(III\) Reactions on Thermally Activated and Non-Activated Carbon Felts](#)

[Yue Li, Javier Parrondo, Vijay K Ramani](#)

[29 Characterization of Carbon Materials for Redox Flow Battery Electrodes By Potential-Step Coulometry](#)

[Yukari Sato, Ayumi Narita, Yuji Kaneko, Akira Negishi, Ken Nozaki, Tohru Kato](#)

[30 Effect of Carbon Substrate Pretreatment on the Ecsa and Activity of  \$Rh\_xS\_y/C\$  Catalyst](#)

[Yuanchao Li, Trung Van Nguyen](#)

[31 A New Process to Synthesize the  \$Rh\_2S\_3\$  Precursor for  \$Rh\_xS\_y\$  Catalyst for HER/HOR in HBr Solution](#)

[Yuanchao Li, Trung Van Nguyen](#)

32Stability of Catholytes in Vanadium Redox Flow Batteries and the Kinetics of Precipitation of V<sup>V</sup>

Daniela Oboroceanu, Nathan Quill, Catherine Lenihan, Deirdre Ní Eidhin, Sergiu Petru Albu, Robert Patrick Lynch, D. Noel Buckley

33Solid Dispersion Flow Battery Particle Synthesis and Electrochemical Characterization

Gary Koenig

34Non-Aqueous Redox Flow Batteries Based on Polyoxometalates

Jee-Jay James Chen, Mark Alan Barteau

35Organic Redox Flow Batteries for Large-Scale Energy Storage

Lena Hooper-Burkhardt, Bo Yang, Sankarganesh Krishnamoorthy, Advaith Murali, G. K. Surya Prakash, S. R. Narayanan

36Copper Bromide Chemistry Analysis for Use in Large Scale Energy Storage and Beyond

Elizabeth A. Stricker, Jesse S. Wainright, Robert F. Savinell

37Low-Cost, Non-Hazardous All-Iron Battery for the Developing World

Michael C Tucker, David Lambelet, Adam Phillips, Mohamed Oueslati, Benjamin Williams, Wu-Chieh Wang, Adam Z Weber

38Understanding Speciation in Ionic-Liquid Electrolytes for Non-Aqueous Redox Flow Batteries

Mallory A. Miller, Jason Gaudet, Levi T Thompson, Jesse S. Wainright, Robert F. Savinell

39Analysis of Ion Crossover in Membranes in All-Vanadium Redox Flow Batteries

Yasser Ashraf Gandomi, Douglas Aaron, Matthew M. Mench

[40The Influence of Flow Field and Electrode Design on Crossover of Ions in All-Vanadium Redox Flow Batteries](#)

[Yasser Ashraf Gandomi, Jacob Houser, Douglas Aaron, Matthew M. Mench](#)

[41A Multi-Dimensional Vanadium Redox Flow Battery Performance Model Accounting for Species Crossover](#)

[Federico Moro, Alberto Bertucco, Monica Giomo, Massimo Guarnieri](#)

[42Development Strategy and Comparison of a Novel Flow Field Design for Redox Flow Battery](#)

[Daouda Fofana, Edward Roberts](#)

[43Parametrization and Validation of a Vanadium-Redox-Flow Cell Model](#)

[Björn Kleinsteinberg, Ayşen Çerçi, Dirk Uwe Sauer](#)

[44Characterization of Fluid Flow Dispersion in Electrodes By Means of Computed Tomography and Lattice-Boltzmann Simulations](#)

[Dario Maggiolo, Andrea Trovo', Francesco Picano, Simone Carmignato, Massimo Guarnieri](#)

[45Redox Flow Battery Cost Modeling: Bridging Techno-Economic Analysis to Materials Selection Criteria](#)

[Jarrod David Milshtein, Rylan Doyle Dmello, Fikile R. Brushett, Kyle Christopher Smith](#)

[46Performance and Cost Characteristics of Multi-Electron Transfer, Common Ion Exchange Non-Aqueous Redox Flow Batteries](#)

[Sydney M Laramie, Jarrod David Milshtein, Tanya Marie Breault, Fikile R. Brushett, Levi T Thompson](#)

[47Co-Laminar Flow Cell with Power Density of 2 Wcm<sup>-2</sup>](#)



Marc-Antoni Goulet, Omar Ibrahim, Erik Kjeang

48 Electrochemical Refrigeration and Energy Harvesting with the Vanadium-Bromide Couples

Ian Salmon McKay, Jay Schwalbe, Matteo Cargnello, Arun Majumdar

49 Energy Storage in Environmentally Stable Nanoscale Magnesium Hybrid Materials

Jeffrey J Urban

50 Influence of Surface Oxygen Non-Stoichiometry on Oxygen Electrochemical Properties of Perovskite-Type Oxides

Yuto Miyahara, Kohei Miyazaki, Tomokazu Fukutsuka, Takeshi Abe

51 Bacterial-Cellulose-Derived Carbon As Air Electrode Material for Lithium Air Secondary Batteries

Masaya Nohara, Yuhki Yui, Shuhei Sakamoto, Masahiko Hayashi, Takeshi Komatsu

52 Understanding Hydrogen Peroxide Decomposition Activity of Transition Metal Oxide Catalysts in Oxygen Reduction Reaction

Phong Trinh, Souradip Malkhandi, Aswin K Manohar, A. Manivannan, G. K. Surya Prakash, S. R. Narayanan

53 Highly-Active, Durable and Inexpensive Iron-Based Electrocatalyst for Oxygen Evolution

Debanjan Mitra, Chenguang Yang, Aswin K Manohar, Phong Trinh, S. R. Narayanan

54 Investigation of Triple-Phase Boundary Region in Partially Immersed Pt Segmented Electrode As a Model Electrode of Air Electrodes for Metal-Air Secondary Batteries

Atsunori Ikezawa, Kohei Miyazaki, Tomokazu Fukutsuka, Takeshi Abe

[55a Highly Efficient and Durable Hybrid Bifunctional Catalyst of Polymer-Wrapped Pristine Multi-Wall Carbon Nanotubes and NiCo<sub>2</sub>O<sub>4</sub> for Rechargeable Zinc-Air Batteries](#)

[Jun Yang, Tsuyohiko Fujigaya, Naotoshi Nakashima](#)

[56 Enhancement of Cycle Stability and Durability in Secondary Zinc-Air Batteries By Optional Ion-Transporting Separator](#)

[Ho Jung Hwang, Oh Chan Kwon, Yong Gun Shul](#)

[57 A New Architecture Design for Observing Lithium Oxide Growth-Evolution Employing Geometric Catalyst Positioning](#)

[Won-Hee Ryu, Forrest S. Gittleson, Jinyang Li, André D. Taylor](#)

[58 Bifunctional MnO<sub>x</sub>@Metal-Oxide Core-Shell Structure As Highly Efficient and Durable Oxygen Catalysts](#)

[Yi Cheng, Shou Dou, Martin Saunders, Jin Zhang, Shuangyin Wang, San Ping Jiang](#)

[59 Development of Aluminum Air Battery Using an Ionic Liquid Electrolyte Solution](#)

[Toshi Oguma, Kazuhisa Azumi](#)

[60 Carbon/Air Thermal Battery: New Materials and Performance](#)

[John F. Cooper](#)

[61 Electrochemical Characterization of Cu<sub>2</sub>S Cathode Prepared By Spray Pyrolysis with Heat Treatment](#)

[Gulnur Kalimuldina, Izumi Taniguchi](#)

[62 Photo-Potential Property of TiO<sub>2</sub> Electrode Prepared By the Screen Printing Method](#)

[Fumi Watanabe, Shinichi Motoda, Motoaki Morita](#)

[63 Anthraquinone Functionalized Reduced Graphene Oxide As Electrode Material for Rechargeable Batteries](#)

[Burak Esat, Sumeyye Bahceci, Anton Angelov Momchilov](#)

[64 Preparation and Performance of Pyrochlore-Type Oxygen Catalyst for Metal Hydride/Air Secondary Battery](#)

[Takahiro Hirai, Kenji Kawaguchi, Masatsugu Morimitsu](#)

[65 A High-Performance Asymmetric ZnO/ \$\alpha\$ -Fe<sub>2</sub>O<sub>3</sub>//ZnO/C Supercapacitor with Core-Shell Nano-Rods](#)

[Debasish Sarkar, Ashok Kumar Shukla, D. D. Sarma](#)

[66 Electrochemical Intercalation of Bis\(trifluoromethanesulfonyl\)Imide \(TFSI\) Anion into Graphitic Carbon from Organic Electrolyte and Application for Dual Carbon Battery](#)

[Takuya Kurihara, Taro Fukuda, Shintaro Ida, Tatsumi Ishihara](#)

[67 Turning Lead into Gold: Systematic Electrocatalytic Water Oxidation Current Enhancement at Nanostructured Fe<sub>2</sub>O<sub>3</sub> Electrode Surface](#)

[Julien Bachmann, Sandra Haschke, Alina Manshina](#)

[68 Toward Active and Durable ORR/O<sub>2</sub> Bifunctional Non-PGM Electrocatalysts: Surfactant-Assisted Electrodeposition of Mn Oxides](#)

[Pooya Hosseini Benhangi, Chun Haow Kung, Akram Alfantazi, Elod L. Gyenge](#)

[69 Electrochemical Properties of Cu<sub>s</sub> Cathode Material for Lithium Rechargeable Batteries Prepared By Spray Pyrolysis](#)

[Gulnur Kalimuldina, Izumi Taniguchi](#)

[70 Ultrasonic Sonochemical Synthesis and Electrochemical Study of Na-Li-Ti-O Quaternary Anode Materials for Secondary Batteries](#)

[Swatilekha Ghosh, Prabeer Barpanda](#)

[71Density Functional Theory Modeling of Boron-Doped Graphene Flakes for Electrochemical Storage Applications](#)

[Yuntong Zhu, Ki Chul Kim, Seung Soon Jang](#)

[72Three-Dimensional Si-Based Composite Nanorods Array Applied in Energy Storage System](#)

[Jing Li, Chuang Yue, Yingjian Yu, Wei Lin, Mingsen Zheng, Junyong Kang](#)

[73Multivalent Zinc Ion, Nickel Ion and Manganese Ion Batteries: Recent Progress and Battery Products](#)

[Chengjun Xu](#)

[74Composite Nafion-Functionalized PDMS Electrospun Fibers for Direct Methanol Fuel Cells](#)

[Yunxi Li, George Mason, Mina Hoorfar](#)

[75Improved Performance of Air Electrode Using  \$\text{Bi}\_2\text{Ir}\_2\text{O}\_{7-z}\$  Catalyst on Graphite for Metal Hydride/Air Secondary Battery](#)

[Kenji Kawaguchi, Shintaro Terui, Masatsugu Morimitsu](#)

[76Characteristics Analysis of  \$\text{NaNiCl}\_2\$  Battery for Applying to Ships](#)

[Jong-Woo Ahn, Gill-Tae Roh, Ki-Do Park, Kyung-Hwa Kim](#)

[77Cycle and Calendar Aging Study of Lithium-Ion Batteries Under Various Vehicle-to-Grid Scenarios](#)

[Arnaud Devie, Matthieu Dubarry](#)

[78Cycle and Calendar Aging Study of Lithium-Ion Batteries in the Context of Grid-Scale Energy Storage Systems](#)

Arnaud Devie, Matthieu Dubarry

79Antimony Sulphide As an Anode Material for Lithium and Sodium Ion Batteries

Hyukjae Lee, Chang-Yong Park

80A Study on the Thermal Behavior of an Ultracapacitor Module Comprising 136 Cells

Sung June Park, Jaeshin Yi, Chee Burm Shin, Jongrak Choi, Ha-Young Lee

81Modeling of a Hollow-in Lithium-Ion Battery for Thermal Design

Boram Koo, Jaeshin Yi, Chee Burm Shin, Yeongjae Lee, YeongJin Hong

82CV Measurement of New Redox Flow Battery Electrolyte Using Single Fiber Electrode

Ayumi Narita, Yukari Sato, Yuji Kaneko, Akira Negishi, Ken Nozaki, Tohru Kato

83Effects of Additives on the Stability of Positive Electrolytes for All-Vanadium Redox Flow Battery

Se-Kook Park, Chang-Soo Jin, Sun-Hwa Yeon, Kyoung-Hee Shin, Bum suk Lee

84Tandem Cell-Based Vanadium Redox Flow Battery Stack

Chang-Soo Jin, Se-Kook Park

85The Characteristics of Non-Aqueous Redox Flow Battery Using Organic Materials

Kyoung-Hee Shin, Se-Kook Park, Chang-Soo Jin, Sun-Hwa Yeon, Bum suk Lee

86Nitrogen-Doped Porous Carbon with High Degree of Graphitization Derived from Silk Cocoon for Lithium-Sulfur Batteries

Ming Wu Xiang, Heng Liu

87 [Podiform Graphene-Sulfur Composite for Lithium Sulfur Battery](#)

[Yi Guo, Yun Zhang](#)

88 [Development of Iron-Based Rechargeable Batteries with Sintered Porous Iron Electrodes](#)

[Kazushi Hayashi, Yasutaka Maeda, Tsubasa Suzuki, Hisatoshi Sakamoto, Toshihiro Kugimiya, Wai Kian Tan, Go Kawamura, Hiroyuki Muto, Atsunori Matsuda](#)

89 [Effect of Chloride Anion on Anodic Dissolution of Aluminum in 4 M NaOH Solution](#)

[Hyeok Jae Lee, In Jun Park, Seok Ryul Choi, Jung Gu Kim](#)

90 [Pre-Treated Carbide-Derived Carbon for Enhanced Electrode Performance](#)

[Sun-Hwa Yeon, Sang-Ho Lee, Dong-Ha Kim, Se-Kook Park, Kyoung-Hee Shin, Chang-Soo Jin](#)

91 [Demonstration of a Large-Scale Energy Storage System for Peak Shaving in the Electric Power System](#)

[Jin Hyeok Choi, Ji-hoon Lim](#)

92 [Carbon Nanotube Film Anodes for Flexible Li-Ion Batteries](#)

[Youngjin Jeong, Hyeonjun Song, Jonghan Jun, Hyunwoong Oh](#)

93 [Indirect Fuel Cell Based on a Redox-Flow Battery Toward the Reduction of Platinum Usage](#)

[Zyun Siroma, Jun Maruyama, Shin-ichi Yamazaki, Tsutomu Ioroi](#)

94 [Corrosion Protection By MOF-5 Coatings for Sustained Zinc-Air Battery Anodes](#)

[Ankit Singh, Raman Vedarajan, Noriyoshi Matsumi](#)

95 [A Flame Spray Process for Cathode Materials Manufacturing for Lithium Ion Batteries](#)

[Jinyun Liao, Jatinkumar Rana, Khaleel Hamad, Taylor Smith, Yangchuan Xing](#)

96 [Electrochemical Study of Nano-Iron/Iron Carbide As Rechargeable Electrodes](#)

[Alagar Raj Paulraj, Yohannes Kiros, Björn Skårman, Hilmar Vidarsson](#)

97 [Electrochemical Charge-Discharge Properties of Co-S/x Wt.% AB5 Composite Materials in Nickel-Based Batteries](#)

[Jijia Li, Xiangyu Zhao](#)

98 [Improvement of Electrochemical Property of Molecular Cluster Ion Cathode Material for Lithium Battery](#)

[Noriyuki Sonoyama, Tetsuya Tsukada, Erfu Ni](#)

99 [Polyimide-Wrapped Carbon Nanotube As High Capacity and Rate Anode for Aqueous Rechargeable Na-Ion Batteries](#)

[Hana Lim, Bo-Young Cho, Ho-Nyun Lee, Min-Hyung Lee, Hansung Kim, Hyun-Jong Kim](#)

100 [Investigation of Solid Electrolyte Interface Formation in  \$\text{Li}\_3\text{S}\$  as Electrode Material in a Solid-State Battery Configuration](#)

[Amaresh Samuthira Pandian, Zachary D. Hood, Hui Wang, Chengdu Liang, Nancy J Dudney](#)

101 [Titanium Dioxide As a High Capacity Anode for High Voltage Aqueous Lithium-Ion Batteries](#)

[Anirudh Ramanujapuram, Daniel Gordon, Keith Coffman, Ramón A. Sosa, Shuchen Zhang, Gleb Yushin](#)

102 [Hybrid Energy Harvester Using Piezoelectric and Pyroelectric Properties of PVDF Nanocomposite Films](#)

[Ashok Batra, Almuatasim Alomari, David Brown](#)

[103 Numerical Modeling of Lithium Ion Battery Capacity Fading on Electric Vehicles](#)

[Chris Yuan](#)

[104 The Materials for Sodium Battery: Synthesis and Electrochemical Characterization](#)

[Van Hoang Nguyen, Tran Van Man, Nguyen Le Thanh Huynh, LE My Loan Phung](#)

[105 Breakthrough in Increasing Li-Ion Battery Energy and Safety, and Reducing Cost. Synergistic Effect of Novel Nanomaterials, Technology, Equipment for Production, and Non-Destructive Method of the Testing](#)

[Elena M Shembel, Vlad I Redko, Nikolai I Klyui, Alexandr V Markevich, Valeriy A Tutyk, Irina M Maksyuta, Olga Kolomoyets](#)

[106 Characteristics of Double Layered TiO<sub>2</sub> Cathode Assembling to Marine Microbial Fuel Cell](#)

[Shinichi Motoda, Motoaki Morita, Sho Tamura](#)

[107 Shape Memory Polymer-Based Self-Healing Triboelectric Nanogenerator](#)

[Jeong Hwan Lee, Ronan Hinchet, Sung Kyun Kim, Sanghyun Kim, Sang-Woo Kim](#)

[108 Evaluation of HEV Batteries for Recycle ~Investigation for Estimating Battery Capacity By Electrochemical Impedance Spectroscopy~](#)

[Hiroki Nishi, Daisuke Koba, Shinichiro Ito, Takeshi Yao, Daikichi Mukoyama, Hiroki Nara, Shingo Tsuda, Toshiyuki Momma, Tetsuya Osaka](#)

[109 Studies of the Electrode/Electrolyte Interface in Magnesium Batteries Using Ambient Pressure X-Ray Photoelectron Spectroscopy](#)

[Yi Yu, Carlos Valero-Vidal, Artem Baskin, Nathan T Hahn, Kevin R Zavadil, Bryan W. Eichhorn, David Prendergast, Ethan J Crumlin](#)

[110 Real-Time Observations of Electrochemical Reactions in Rechargeable Energy Storage Systems](#)



[Reza Shahbazian-Yassar](#)

111 [Honeycomb Ordering to Trigger Stable Oxygen Redox Chemistry in Layered Cathode](#)

[Masashi Okubo, Benoit Mortemard de Boisse, Guandong Liu, Jiangtao Ma, Shinichi Nishimura, Sai-Cheong Chung, Hisao Kiuchi, Yoshihisa Harada, Jun Kikkawa, Atsuo Yamada](#)

112 [Enhancing the Kinetics of Lithium/Sodium Transition Metal Orthosilicate Cathodes through Tuning the Crystallographic Habits](#)

[Zhengping Ding, Douglas G Ivey, Weifeng Wei](#)

113 [Prussian Blue with Different Synthesis Temperature as Cathode for Sodium-Ion Batteries](#)

[Yang Yang, Yan Xiao Min, Wang Hong, Xiao-Zhen Liao, Zi-Feng Ma](#)

114 [Electrochemical Sodium-Ion Intercalation Reaction at Graphite Electrodes](#)

[Yasuyuki Kondo, Tomokazu Fukutsuka, Kohei Miyazaki, Takeshi Abe](#)

115 [Electrochemical Impedance Spectroscopy Study of Alkali-Metal Insertion Processes on Hard Carbon Electrodes](#)

[Ronald Väli, Alar Jänes, Rait Kanarbik, Enn Lust](#)

116 [Natural Polymer Derived Carbon Microsphere Anode for Alkali-Ion Batteries](#)

[Chaoji Chen, Yunhui Huang, Jia Xie](#)

117 [Development of a Lower Temperature Operating Sodium Beta-Alumina Battery \(LT-NBB\): Strategies and Technical Challenges](#)

[Keeyoung Jung, Yoon-Cheol Park, Namung Cho, Sori Son, Younki Lee, Chang-Soo Kim, Goun Kim, Dana Jin, Wooyoung Shim, Guosheng Li, Vincent Sprenkle](#)

[118Advanced Na Batteries Using  \$\beta''\$ -Alumina Solid-State Electrolytes](#)

[Guosheng Li, Hee Jung Chang, Xiaochuan Lu, Vincent Sprenkle](#)

[119A Simple and Low-Cost Method to Fabricate Beta-Alumina Solid Electrolyte \(BASE\) for Na Battery Applications](#)

[Xiaochuan Lu, Guosheng Li, Kerry Meinhardt, Vincent Sprenkle](#)

[120The Re-Discovery of Scandium-Substituted  \$\text{Na}\_3\text{Zr}\_2\(\text{SiO}\_4\)\_2\(\text{PO}\_4\)\$](#)

[Qianli Ma, Marie Guin, Sahir Naqash, Chih Long Tsai, Frank Tietz, Olivier Guillon](#)

[121All-Solid-State Lithium-Ion Battery Assembled By Low-Temperature / High-Pressure Spark Plasma Sintering](#)

[Toyoki Okumura, Tomonari Takeuchi, Hironori Kobayashi](#)

[122First-Principles Study on  \$\text{LiCoO}\_2\$ /Sulfide Interfaces in All-Solid-State Li-Ion Battery: Space-Charge Layer and Interfacial Co Mixing](#)

[Jun Haruyama, Keitaro Sodeyama, Kazunori Takada, Yoshitaka Tateyama](#)

[123Determination of Space-Charge-Layer Width in Li-Ion Solid Electrolyte Under the Application of Voltages](#)

[Issei Sugiyama, Masahiro Saito, Yasuhito Aoki, Yuji Otsuka, Ryota Shimizu, Taro Hitosugi](#)

[124High Capacity All-Solid-State Batteries Based on Metal Sulfides Conversion Electrodes](#)

[Florian Flamary, Brigitte Pecquenard, Frédéric Le Cras](#)

[125All-Solid-State Thin-Film Secondary Battery with Lithium-Free Anode for High-Temperature Tolerance](#)

[Akiyoshi Suzuki, Shunsuke Sasaki, Isao Kimura, Takehito Jimbo](#)

[126ALD Enabled Performance Improvements of Li-Ion Batteries with Solid Electrolyte](#)

[James E Trevey, Kyle Patrick Ingham, David M King](#)

[127Vertically Aligned Hollow TiO<sub>2</sub> Shell Protected SnO<sub>2</sub> Nanorods By Atomic Layer Deposition for Highly Stable Lithium Storage](#)

[Christian G Carvajal, Sangeeta Rout, Rajeh Mundle, Messaoud Bahoura, Aswini K Pradhan](#)

[128Three-Dimensional Amorphous TiO<sub>2</sub> Thin-Film Electrodes Deposited on Micro-Pillars By Spatial Atomic Layer Deposition for Li<sup>+</sup>-Ion Batteries](#)

[Sébastien Moitzheim, Elisabeth Balder, Paul Poodt, Sandeep Unnikrishnan, Philippe M Vereecken](#)

[129Using Bioinspiration to Optimise Battery Electrodes Architecture for High Rate Capability](#)

[Florian Bouville, Juliette Marie Billaud, Tommaso Magrini, Claire Villevieille, André Studart](#)

[130HE3DA](#)

[Jan Prochazka](#)

[131Automated Silver-Zinc Fiber Battery Fabrication](#)

[Abhishek Raj, Andrew Kim, Daniel A Steingart](#)

[132Aqueous Electrolyte Polyionic Batteries for Scaled Stationary Energy Storage](#)

[Jay Whitacre](#)

[133Dissolution of NaTi<sub>2</sub>\(PO<sub>4</sub>\)<sub>3</sub> in Alkaline Solutions and Its Implications for Use As an Aqueous Anode](#)

[Alexander I Mohamed, Jay Whitacre](#)

[134Effect of Concentrated Electrolyte on High Voltage Aqueous Sodium-Ion Battery](#)

[Kosuke Nakamoto, Ayuko Kitajou, Masato Ito, Shigeto Okada](#)

[135Enhancing Cycle Stability of Lithium Iron Phosphate in Aqueous Electrolytes By Increasing Electrolyte Molarity](#)

[Daniel Gordon, Michelle Yu Wu, Anirudh Ramanujapuram, Jim Benson, Jung Tae Lee, Alexandre Magasinski, Naoki Nitta, Cindy Huang, Gleb Yushin](#)

[136Degradation and Stabilization of Lithium Cobalt Oxide in Aqueous Electrolytes](#)

[Anirudh Ramanujapuram, Daniel Gordon, Naoki Nitta, Alexandre Magasinski, Brian Ward, Cindy Huang, Gleb Yushin](#)

[137Electrochemical Performance of Spinel-Type  \$\text{LiNi}\_{0.5}\text{Mn}\_{1.5}\text{O}\_4\$  Thin-Film in Aqueous Electrolytes](#)

[Satomi Ito, Kohei Miyazaki, Tomokazu Fukutsuka, Takeshi Abe](#)

[138Effect of Antifreeze Additives on Low Temperature Performance of Lithium-Ion Aqueous Battery](#)

[Ayaulym Belgibayeva, Almagul Mentbayeva, Nurzhan Umirov, Anara Molkenova, Akylbek Adi, Indira Kurmanbayeva, Zhumabay Bakenov](#)

[139pH-Controlled Electrolysis of Electrolytic Manganese Dioxide \(EMD\) for Improved Rechargeable  \$\text{MnO}\_2/\text{Zn}\$  Batteries](#)

[Farhang Nesvaderani, Arman Bonakdarpour, David P Wilkinson](#)

[140Rechargeability of Manganese Dioxide-Zinc Batteries](#)

[Arman Bonakdarpour, Sean Mehta, Greg Afonso, David P. Wilkinson](#)

[141Simultaneous Analysis of Thin-Film Manganese Dioxide Deposits Using Eqcm, Cyclic Voltammetry, Step Potential Electrochemical Spectroscopy and Electrochemical Impedance Spectroscopy](#)

Scott W Donne, Hayden Cameron

142The Effect of Transition Metal(Al, Co) Ions Doping in  $\alpha$ -MnO<sub>2</sub> Materials As the Rechargeable Zinc Ion Battery

Jae Hyeon Jo, Seung-Taek Myung

143Rapid Processing of Multi-Layered Iron Electrodes for Low-Cost Alkaline Batteries

Alistair David Barnes, Carol Frances Glover, Raman Subramanian, James Sullivan, Jordan Domonic Marinaccio, Geraint Williams, Jonathon Elvins

144A Novel Rapid Processing Route to Sintered Plaque Aqueous Nickel Electrodes for Low Cost Building Scale Energy Storage

Jordan Domonic Marinaccio, Carol Frances Glover, Raman Subramanian, Alistair David Barnes, Geraint Williams, Jonathon Elvins

145Engineering Approaches to Dendrite Prevention in Lithium Anode Based Batteries

Prashanth Jampani Hanumantha, Bharat Gattu, Moni Kanchan Datta, Pavithra Murugavel Shanthi, Prashant N Kumta

146SEM Observation of Lithium Electrodeposition Behavior in Molten Lithium Fluorosulfonyl(trifluorosulfonyl)Amide

Hikaru Sano, Keigo Kubota, Zyun Siroma, Hajime Matsumoto, Susumu Kuwabata

147Nanostructured Li Metal Anode to Inhibit Dendrite Growth in Safe Li-Metal Batteries

Xin-Bing Cheng, Hong-Jie Peng, Jia-Qi Huang, Rui Zhang, Chen-Zi Zhao, Qiang Zhang

148In-Situ Liquid Cell TEM Study of Lithium Electrodeposition: Observation of Root- and Tip-Growth Mode

Akihiro Kushima, Peng Bai, Nariaki Kuriyama, Takanori Maebashi, Yoshiya Fujiwara, Martin Z. Bazant, Ju Li

149 [Electrochemical Modeling, Optimization and Control of Lithium Metal Batteries](#)

[Seong Beom Lee, Suryanarayana Kolluri, Wu Xu, Ji-Guang Zhang, Venkat R. Subramanian](#)

150 [Elevated Temperature Lithium Rechargeable Batteries: Motivation and Challenges](#)

[Dan Addison, Vincent Giordani, Jasim Uddin, Hongjin Tan, Gregory V Chase](#)

151 [Interfaces Promoted Conversion-Type Reactions for Energy Storage](#)

[Yingwen Cheng, Huilin Pan, Junzheng Chen, Yuyan Shao, Jun Liu](#)

152 [Doped Lithium Orthosilicates - Promising High Rate Lithium-Ion Conductors for Li-S Batteries](#)

[Pavithra Murugavel Shanthi, Prashanth Jampani Hanumantha, Bharat Gattu, Oleg I Velikokhatnyi, Prashant N Kumta](#)

153 [Electrochemical Properties of Porous  \$V\_2O\_5\$ /Sulfur/Carbon Composite Electrode Prepared Using a Combination of Aerosol and Powder Technologies](#)

[Izumi Taniguchi, Kong Long](#)

154 [Analyses of Charge/Discharge Mechanism of Fe-Containing  \$Li\_2S\$ -Based Positive Electrode Material Using X-Ray Absorption and Scattering Measurements](#)

[Tomonari Takeuchi, Hiroyuki Kageyama, Koji Nakanishi, Masahiro Ogawa, Tomoya Kawaguchi, Koji Ohara, Katsutoshi Fukuda, Atsushi Sakuda, Toshiaki Ohta, Toshiharu Fukunaga, Hikari Sakaebe, Hironori Kobayashi, Eiichiro Matsubara](#)

## **A02-Challenges in Advanced Analytical Tools and Techniques for Batteries: A Symposium in Honor of Zempachi Ogumi**

155 [\(Invited\) In-Situ Analysis of Lithium Ion Batteries](#)

[Zempachi Ogumi](#)

[156\(Invited\) From Solid State Chemistry to Battery Materials Electrochemistry: A Tool for Solid State Chemistry](#)

[Claude Delmas](#)

[157\(Invited\) Beyond Lithium Ion Batteries](#)

[Khalil Amine, Zonghai Chen, Jun Lu](#)

[158\(Invited\) Tribute to Prof. Zempachi Ogumi : In Operando Studies and in Situ Techniques for Li-Ion and Lithium Metal Polymer Batteries](#)

[Karim Zaghib, H Marceau, P Hovington, Z Wen, C Kim, M Trudeau, R Veillette, D Laul, A Paoletta, M Lagace, M Chaker, A Vijh, A Guerfi, A Mauger, C.M Julien, M Armand](#)

[159in-Operando Imaging Studies on Dynamics of Sulfur/Polysulfides in Li-S Batteries](#)

[Nae-Lih Wu](#)

[160Imaging the Surface of  \$\text{LiMn}\_2\text{O}\_4\$  with Low-Dose STEM](#)

[Charles Dallas Amos, Paulo Jorge Ferreira, John B. Goodenough](#)

[161Examining Electrical Properties of Solid Electrolyte Interface on Silicon Electrodes](#)

[Chunmei Ban, Seoung-Bum Son, Katherine Hurst, Chunsheng Jiang](#)

[162Using Thin Films to Study Capacity Fade Mechanisms Observed in Conventional  \$\text{LiV}\_3\text{O}\_8\$  cathodes](#)

[Andrew Keith Kercher, Varun S.V. Sarbada, Qing Zhang, Kenneth J Takeuchi, Amy C Marschlok, Robert Hull, Nancy J Dudney, Esther S Takeuchi](#)

[163in Situ Transmission Electron Microscopy Studies on Silicon Anodes in Lithium Ion Batteries](#)

[Hyun-Wook Lee, Seok Woo Lee, Yi Cui](#)

[164\(Invited\) In-Situ Spectroscopic Observation of Lithium Sulfur Batteries upon Cycling](#)

[Bing Joe Hwang, Mon-Che Tsai, Felix Lee, Ming-Hsien Lin, Ju-Hsiang Cheng, Wei-Nien Su, Chen-Jui Huang, Pouya Partovi-Azar, Payam Kaghazchi](#)

[165\(Invited\) To Understand Local Structure Evolution and Ion Dynamics of the Electrode/Electrolyte Materials Combined with Different Spectroscopic Techniques](#)

[Yong Yang](#)

[166\(Invited\) Progress in High-Capacity Gradient Cathode Materials for Rechargeable Lithium Batteries](#)

[Y.-K. Sun](#)

[167\(Invited\) In-Situ and Operando Structure Analysis of Lithium Battery Reactions Using Neutron Scattering](#)

[Ryoji Kanno, Sou Taminato, Masao Yonemura, Shinya Shiotani, Takashi Kamiyama, Shuki Torii, Miki Nagao, Yoshihisa Ishikawa, Kazuhiro Mori, Toshiharu Fukunaga, Yohei Onodera, Takahiro Naka, Makoto Morishima, Yoshio Ukyo, Dyah Sulistyanintyas Adipranoto, Hajime Arai, Yoshiharu Uchimoto, Zempachi Ogumi, Kota Suzuki, Masaaki Hirayama](#)

[168Energy Dispersive X-Ray Diffraction \(EDXRD\): An Effective in-Situ Approach for Spatial Resolution of Electrode Reactions](#)

[Esther S Takeuchi, Amy C Marschilok, Kenneth J Takeuchi](#)

[169Change of Average and Local Structures for  \$0.5\text{Li}\_2\text{MnO}\_3\$ - \$0.5\text{LiMn}\_{1/3}\text{Ni}\_{1/3}\text{Co}\_{1/3}\text{O}\_2\$  in First Charge Process of Different Rate](#)

[Yasushi Idemoto, Takuya Sekine, Naoya Ishida, Naoto Kitamura](#)

[170Crystal and Local Structure Analyses for Layered Rock-Salt Type  \$\text{Li}\_x\text{Mn}\_{0.9}\text{Ti}\_{0.1}\text{O}\_2\$  Prepared By Soft Chemical Synthesis](#)

[Naoya Ishida, Kazuki Miyazawa, Naoto Kitamura, Junji Akimoto, Yasushi Idemoto](#)



[171Stabilization of Intermediate Phase in LiFePO<sub>4</sub> Leading to High-Rate Performance](#)

[Takahiro Yoshinari, Yuki Oriksa, Motoaki Nishijima, Koji Ohira, Shogo Esaki, Toshitsugu Sueki, Takuya Ootani, Yuichi Kamimura, Koji Ohara, Katsutoshi Fukuda, Yukinori Koyama, Zempachi Ogumi, Yoshiharu Uchimoto](#)

[172Investigation of Phase Transition Behavior of the Olivine-Type LiFePO<sub>4</sub> at Low Temperature Condition By Operando Time-Resolved X-Ray Diffraction](#)

[Takuya Mori, Yukinori Koyama, Yuki Oriksa, Takeshi Uyama, Takahiro Naka, Hideyuki Komatsu, Keiji Shimoda, Haruno Murayama, Katsutoshi Fukuda, Hajime Arai, Zempachi Ogumi, Yoshiharu Uchimoto](#)

[173New Insight in Understanding the Evolution Mechanism of Li<sub>2</sub>O<sub>2</sub> in Li-O<sub>2</sub> Batteries: An operando Synchrotron X-Ray Diffraction Study](#)

[Chenjuan Liu, William Robert Brant, Reza Younesi, Kristina Edström, Torbjörn Gustafsson, Jiefang Zhu](#)

[174Long Duration Studies of Lithium Battery Materials Using Synchrotron X-Ray Powder Diffraction](#)

[Annabelle Baker, Sarah Day, Chiu C. Tang](#)

[175Electrochemical Performance and Structural Analyses of Amorphous TiS<sub>3</sub> Positive Electrode in All-Solid-State Batteries](#)

[Akitoshi Hayashi, Takuya Matsuyama, Minako Deguchi, Shigeo Mori, Masahiro Tatsumisago](#)

[176Zinc Electrodes in Water-Organics Electrolytes: In Situ Analysis of Suppressed Shape Change](#)

[Hajime Arai, Akiyoshi Nakata, Tadashi Takeya, Masaki Ono, Tomoya Kawaguchi, Katsutoshi Fukuda, Yoshiharu Uchimoto, Zempachi Ogumi](#)

[177In-Situ Neutron Diffraction Study of Lithium-Ion Battery Equalization Effects](#)

[Joern Wilhelm, Veronika Zinth, Simon Vincent Erhard, Irmgard Buchberger, Andreas Jossen](#)

178 [Degradation Analysis of 18650-Type Lithium-Ion Cells By in-Situ and Operando Neutron Diffraction](#)

[Shinya Shiotani, Takahiro Naka, Makoto Morishima, Masao Yonemura, Takashi Kamiyama, Yoshihisa Ishikawa, Yoshio Ukyo, Yoshiharu Uchimoto, Zempachi Ogumi](#)

179 [Lithium Intercalation and Structural Changes at the LiCoO<sub>2</sub> Surface Under High Voltage Battery Operation](#)

[Sou Taminato, Masaaki Hirayama, Kota Suzuki, Kazuhisa Tamura, Taketoshi Minato, Hajime Arai, Yoshiharu Uchimoto, Zempachi Ogumi, Ryoji Kanno](#)

180 [In Situ AFM Observation of Amorphous Si Thin-Film Electrode in Ethylene Carbonate-Based Electrolyte Solutions with Vinylene Carbonate](#)

[ZhengJie Wu, Yuki Kijima, Masakazu Haruta, Takayuki Doi, Minoru Inaba](#)

181 [Inhomogeneous-Lithiation/Homogeneous-Delithiation Occurring in the Composite Electrode at Continuous Cycling](#)

[Koji Kitada, Haruno Murayama, Katsutoshi Fukuda, Hajime Arai, Eiichiro Matsubara, Yoshiharu Uchimoto, Zempachi Ogumi](#)

182 [Distribution Analysis of Electrode Reaction of Lithium Manganese Oxide By Means of Time-Resolved XAFS Technique](#)

[Hirona Yamagishi, Ryota Miyahara, Misaki Katayama, Yasuhiro Inada](#)

183 [Dynamic Properties on NMR Spectroscopy of Non-Aqueous Electrolyte Solution Coexisting with Fumed Silica Dispersion](#)

[Marie Takemoto, Minoru Mizuhata, Hideshi Maki](#)

184 [Raman Imaging for LiCoO<sub>2</sub> Composite Positive Electrodes in All-Solid-State Lithium Batteries to Investigate State-of-Charge Distributions](#)

Misae Otoyama, Yusuke Ito, Akitoshi Hayashi, Masahiro Tatsumisago

185Investigation on Electrochemical Properties and Degradation Mechanism of Silicon Oxide-Containing Negative Electrode for Li-Ion Rechargeable Battery

Hironori Kobayashi, Kentaro Kuratani, Masahiro Shikano, Toyoki Okumura, Yoshiyasu Saito

186X-Ray Spectroscopic Studies on the Electronic Structures of LiNiO<sub>2</sub>-Based Cathode Materials for Lithium-Ion Batteries

Yusaku F Nishimura, Hideaki Oka, Takamasa Nonaka, Tsuyoshi Sasaki, Kazuhiko Dohmae

187The Method of Kramers-Kronig Transform Effective to the Impedance Spectrum of Lithium Battery

Kiyoshi Kobayashi, Yoshio Sakka, Tohru S. Suzuki

188Structural and Dynamical Origin of Ionic Conductivity As Studied By Solid-State NMR

Miwa Murakami, Keiji Shimoda, Hajime Arai, Yoshiharu Uchimoto, Zempachi Ogumi

189Electrochemical Activation of High-Capacity Li<sub>2</sub>MnO<sub>3</sub> Cathode Analyzed By in Situ Neutron Reflectometry

Masaaki Hirayama, Sou Taminato, Norifumi Yamada, Masao Yonemura, Kota Suzuki, Ryoji Kanno

190In Situ Small-Angle Neutron Scattering of Mesoporous Electrode Materials

Craig A Bridges, Xiao-Guang Sun, Lilin He, Sheng Dai

191Inhomogeneous Degradation of Li-Ion Cells: A Post Mortem Study Using Glow Discharge Optical Emission Spectroscopy (GD-OES)

[Niloofer Ghanbari, Thomas Waldmann, Michael Kasper, Peter Axmann, Margret Wohlfahrt-Mehrens](#)

[192Utilization of Hard X-Ray Photoelectron Spectroscopy for Silicon-Based Negative Electrodes Buried within Solid Electrolyte Interphase](#)

[Takuya Masuda, Nana Aoki, Hideo Iwai, Hideki Yoshikawa, Toshihiro Kondo, Kohei Uosaki](#)

[193A Joint Experimental and Theoretical Approach to the Question of Anion Redox in Lithium-Rich Layered Oxides](#)

[William Gent, Yufeng Liang, Yiyang Li, Jongwoo Lim, David Shapiro, David Vine, David Kilcoyne, Tolek Tylliszczak, Wanli Yang, David Prendergast, William C Chueh](#)

[194Origin of Stabilization and Destabilization in Solid-State Redox Reaction of Oxide Ions for Rechargeable Lithium Batteries](#)

[Naoaki Yabuuchi, Kei Sato, Yuki Kobayashi, Masanobu Nakayama, Yu Hashimoto, Takahiro Mukai, Hiromasa Shiiba, Keisuke Yamanaka, Kei Mitsuhashi, Toshiaki Ohta](#)

[195Investigation of Mechanism of Reaction Distribution Formation in Composite Cathodes for Li Ion Batteries By Using Operando 2D-XAS](#)

[Kazuki Chiba, Yuta Kimura, Toshiki Watanabe, Takashi Nakamura, Koji Amezawa, Hajime Tanida, Yoshiharu Uchimoto, Zempachi Ogumi](#)

[196Site-Selective and Element-Selective Analysis of Nickel Substituted Li-Rich Layered Material Using X-Ray Diffraction and Absorption Spectroscopy](#)

[Hideyuki Komatsu, Taketoshi Minato, Toshiyuki Matsunaga, Keiji Shimoda, Tomoya Kawaguchi, Katsutoshi Fukuda, Koji Nakanishi, Hajime Arai, Yoshiharu Uchimoto, Eiichiro Matsubara, Zempachi Ogumi](#)

[197Nanoscale \(PEEM\) Spectroscopy Combined with XPS to Elucidate the Surface Reaction Mechanism of Cycled Battery Electrodes](#)

[Daniela Leanza, Carlos A. F. Vaz, Petr Novák, Mario El Kazzi](#)

198 [Compton Scattering Imaging for Operando Observation of Battery Cell](#)

[Masayoshi Itou, Yoshiharu Sakurai, Kosuke Suzuki, Hiroshi Sakurai, Yuki Orikasa, Yoshiharu Uchimoto](#)

199 [Layer Number Dependence of Li<sup>+</sup> Intercalation on Few-Layer Graphene and Electrochemical Imaging of Its Solid-Electrolyte Interphase Evolution](#)

[Jingshu Hui, Mark Burgess, Jiarui Zhang, Joaquín Rodríguez-López](#)

200 [Focused Ion Beams for Lithiation of High Capacity Host Materials for Negative Electrodes](#)

[Saya Takeuchi, William R. McGehee, Jennifer L. Schaefer, Truman M. Wilson, Kevin A. Twedt, Eddie H. Chang, Christopher L. Soles, Vladimir P. Oleshko, Jabez J. McClelland, Gery R. Stafford, Maureen E. Williams, Oleg A. Kirillov, David J. Gundlach](#)

201 [The Influence of Electric Field on Lithium-Oxygen Battery Cathode Reactions](#)

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

202 [In-Situ Scanning Electron Microscope Observations of Electrochemical Li Deposition and Dissolution at Lipon/Pt, Au Interfaces](#)

[Munekazu Motoyama, Toshio Kimura, Yasutoshi Iriyama](#)

203 [Lithium Detection in the Electron Microscope](#)

[Raynald Gauvin, Nicolas Brodusch, Hendrix Demers, George P. Demopoulos, Karim Zaghbi](#)

204 [Liquid Phase Scanning Electron Microscopy: A New Approach to Investigate Lithium Dendrite Formation in Liquid Electrolytes](#)

[Yuegang Zhang](#)

205 [Microstructure Characteristics of Blend Cathodes Assessed By 3D-Tomography Methods](#)

Janina Costard, Jochen Joos, Ellen Ivers-Tiffée

206Behaviour of Nanostructured Si-Based Anode Materials Studied By Atom Probe Tomography and Hard X-Ray Photoelectron Spectroscopy

Frank Uwe Renner, Konda Gokuldoss Pradeep, Yueming Zheng

207In-Operando Imaging of Electrodeposition and Dendrites Using Nanoscale X-Ray Computed Tomography

Paul Choi, Vinayak Kedlaya, Pratiti Mandal, Sarah Frisco, Jay Whitacre, Shawn Litster

208Towards the In-Operando Observation of Lithium Dendrite Growth Via X-Ray Computed Tomography

Sarah Frisco, Danny X. Liu, Pratiti Mandal, Paul Choi, Vinayak Kedlaya, Shawn Litster, Jay Whitacre, Corey T Love, Karen Swider-Lyons

209Single-Crystal Based Diagnostics for Li-Ion Battery Cathode Development

Guoying Chen, Saravanan Kuppan, Alpesh Khushalchand Shukla

210EIS Analysis of Commercial Lithium-Ion Battery on Accelerated Degradation for Long-Term Charge-Discharge Cycling

Daikichi Mukoyama, Hiroki Nara, Tokihiko Yokoshima, Toshiyuki Momma, Tetsuya Osaka

211A Novel Reference Electrode for Potential and Impedance Measurements of Individual Electrodes in Lithium-Ion Full-Cells

Sophie Solchenbach, Daniel Pritzl, Edmund Jia Yi Kong, Johannes Landesfeind, Hubert A. Gasteiger

212EIS and Structural Analysis of LiCoO<sub>2</sub> Cathode Degradation Behavior in Libs at Initial Stage of Charge-Discharge Cycles

[Hiroki Nara, Tokihiko Yokoshima, Daikichi Mukoyama, Toshiyuki Momma, Tetsuya Osaka](#)

213 [Charge Transfer Parameters \( \$t\_{CT}\$ ,  \$j\_0\$  and  \$k\$ \) Determined By Combining Tomography Analysis with Impedance Modelling](#)

[Janina Costard, Jochen Joos, Michael Weiss, Ellen Ivers-Tiffée](#)

214 [Dependence of Interlayer Distance on the Charge Transfer Reaction of Ni-Al Layered Double Hydroxides](#)

[Hideshi Maki, Masayoshi Inoue, Minoru Mizuhata](#)

215 [Rotating Disk Electrode Measurements of  \$\text{Bi}\_2\text{Ir}\_2\text{O}\_{7-z}\$  on Titanium for Oxygen Reactions in Alkaline Solutions](#)

[Kazuya Takeuchi, Masatsugu Morimitsu](#)

216 [Determining the Mechanism of Self-Discharge in Rechargeable Zn Electrodes Using a Novel but Simple Method](#)

[Patrick Bonnick, Jeff R Dahn](#)

217 [Understanding Why Sodium Intercalated Graphite Is Unstable](#)

[Hiroki Moriwake, Akihide Kuwabara, Craig Andrew James Fisher, Masafumi Nose, Hideki Nakayama, Shinji Nakanishi, Hideki Iba, Yuichi Ikuhara](#)

218 [Determination of Physico-Chemical Parameters for Simulation of Lithium Ion Batteries](#)

[Johannes Landesfeind, Johannes Hattendorff, Andreas Ehrl, Konstantin Weber, Wolfgang A. Wall, Hubert A. Gasteiger](#)

219 [Investigation of Interfacial Phenomena of High-Voltage Li-Ion Battery with Li-Rich Layered Oxide Cathode](#)

[Hieu Quang Pham, Young-Gil Kwon, Eui-Hyung Hwang, Seung-Wan Song](#)

[220](#)[Electromagnetic Non-Destructive Non-Contact Methods & Device for Evaluation Nanostructured Electrode Materials and Electrode Structure of Li-Ion Batteries.](#)

[Vlad I Redko, Elena M Shembel, Volodymyr S Khandetsky, Nely D Zaderey](#)

[221](#)[In Situ Characterization of Gassing Processes in Lithium-Ion Batteries By Dems-Deirs](#)

[Balázs B. Berkes, Alexander Schiele, Barbara Michalak, Heino Sommer, Torsten Brezesinski, Jürgen Janek](#)

[222](#)[Near-Field IR Imaging and Spectroscopy of Interfaces and Interphases in Li-Ion Electrodes](#)

[Maurice Ayache, Simon Franz Lux, Robert Kostecki](#)

[223](#)[Surface Analysis of Magnesium Metal Anode](#)

[Masaki Matsui, Hiroko Kuwata, Takuya Masuda, Nobuyuki Imanishi](#)

[224](#)[Ssnmr Studies of  \$\text{Li}\_3\text{V}\_2\(\text{PO}\_4\)\_3/\text{C}\$  Cathode Reactions: Structural Evolution, Dynamics and LVP-Carbon Interface](#)

[Hua Huo, Jinyu Shao, Guiming Zhong, Di Wu, Luming Peng, Yong Yang, Changsong Dai, Yueping Xiong](#)

[225](#)[Direct Observation of Electrophoretic Flow of Solvent Molecules with Lithium Ions By NMR Imaging](#)

[Junichi Kawamura, Yoshiki Iwai, Shotaro Endo, Naoaki Kuwata, Reiji Takekawa, Masato Ohzu](#)

[226](#)[Real-Time Collection, Visualization, and Processing of Electrochemical-Acoustic Data from Battery Cycling Experiments](#)

[Barry Van Tassell, Andrew Hsieh, Greg Davies, Daniel A Steingart](#)

[227](#)[An Inverse Model of Acoustics in Batteries for Determining Structural Changes, State of Charge and State of Health](#)



[Greg Davies, Andrew Hsieh, Daniel A Steingart](#)

[228 Non-Destructive Analysis of Lithium-Ion Battery Using Isothermal Electrochemical Calorimetry](#)

[Yo Kobayashi, Hisashi Kato, Hajime Miyashiro, Yuichi Mita](#)

[229 Differential Thermal Voltammetry As a Low Cost in-Situ Diagnosis Tool for Lithium-Ion Batteries](#)

[Yu Merla, Billy Wu, Vladimir Yufit, Nigel P. Brandon, Ricardo Martinez-Botas, Gregory James Offer](#)

[4180 \(ECS Charles W. Tobias Young Investigator Award\) Advanced Materials Diagnosis and Characterization for Enabling High Energy Long Life Rechargeable Batteries](#)

[Ying Shirley Meng](#)

### **A03-Li-Ion Batteries**

[230 \(Keynote\) Solid Electrolytes and Metallic Lithium Anodes](#)

[John B. Goodenough](#)

[231 \(Keynote\) The Introduction of Intercalation into Battery Science: 1968-1990](#)

[M. Stanley Whittingham](#)

[232 \(Keynote\) Reflections on the Evolution of Metal Oxide Cathodes for Li-Ion Batteries](#)

[Michael M. Thackeray](#)

[233 \(Keynote\) Reactions in Lithium Ion Batteries - Focusing on Interfacial Li<sup>+</sup> Transfer -](#)

[Zempachi Ogumi](#)

[234 \(Keynote\) 25<sup>th</sup> Anniversary of Lithium Ion Batteries: Carbonaceous Anodes□ and More ?](#)

Martin Winter

235 Exhaust Gas Cleaning in the Recycling of Li-Ion-Batteries

Friederike Maria Stehmann, Stephan Scholl

236 Consumption of Intentionally Added Gas in Lithium-Ion Cells

Leah Ellis, Jeff R Dahn

237 Experiments on Distributions of Cycle Degradations of Li-Ion Batteries

Daisuke Sasaki, Keita Hiyoshi, Shuji Tsukiyama, Mariko Matsunaga, Junichi Miyamoto

238 Development for 300Wh/Kg-Class High Energy Li-Ion Battery for EV

Naoki Kimura, Eiji Seki, Seog-Chul Shin, Shin Takahashi, Shigeki Makino

239 Studies on Alternative Test Methods of Internal Short Circuit Test for Lithium-Ion Batteries in Vehicles

Kiyotaka Maeda, Masashi Takahashi

240 Challenges and Issues Facing Lithium Metal for Solid State Rechargeable Batteries

Karim Zaghbi, A Mauger, C.M Julien, M Armand

241 Toward the Realization of High Energy Density Li-Ion Batteries with Si-Based Anodes and  $\text{LiNi}_{0.5}\text{Mn}_{0.3}\text{Co}_{0.2}\text{O}_2$  Cathodes

Mario Marinaro, Dong-hwan Yoon, Egbert Figgemeier, Petra Stegmeier, Gregory Schmidt, Jerome Chauveau, Paul Spurk, Daniël Nelis, Peter Axmann, Margret Wohlfahrt-Mehrens

242 Bridging the Gap Between Supercapacitors and Batteries By a New Material Based on Renewable Resource

[Maximilian Fichtner, Ping Gao, Zhi Chen, Zhirong Zhao-Karger, Mario Ruben](#)

243 [Controlled Deposition of Li Metal](#)

[Yejing Li, Xuefeng Wang, Zhaoxiang Wang, Liquan Chen](#)

244 [New Organic Electrode Materials As Cathode and Anode for All Organic Li-Ion Greener Batteries](#)

[Alae Eddine Lakraychi, Jean-Pierre Bonnet, Philippe Poizot, Matthieu Becuwe, Franck Dolhem](#)

245 [Li-Rich Layered Oxides As Concentration-Gradients for High Energy Density Lithium-Ion Batteries](#)

[Ségolène Pajot, François Weill, Michel Ménétrier, Adrien Boulineau, Pierre Feydi, Gunay Yildirim, Loic Simonin, Laurence Croguennec](#)

246 [Vanadium and Chromium Molecular Cluster Batteries \(MCB\): Li- Storage in Transition Metal Complexes](#)

[Julia Rinck, Bijoy Das, Maximilian Fichtner](#)

247 [The Origin of the Oxygen Redox Activity in Layered and Cation-Disordered Li-Excess Cathode Materials](#)

[Dong-Hwa Seo, Jinhyuk Lee, Alexander Urban, Gerbrand Ceder](#)

248 [Understanding High Capacity in Li-Rich 3d Cathode Materials](#)

[Kun Luo, Matthew Roberts, Peter G. Bruce](#)

249 [Structural Stability of Nickel-Rich Layered Cathode Materials](#)

[Chixia Tian, Yahong Xu, Dennis Nordlund, Huolin L. Xin, Yijin Liu, Marca Doeff](#)

250 [Surface Modification of Lithium Rich NMC for High Rate Lithium Ion Batteries](#)

Juhyeon Ahn, Sihyoung OH, Jong Hak Kim, Byung Won Cho, Kyung Yun Chung

251 Core-Shell Structure in Li-Battery Application: Phase Control and Electrochemical Property

Linhua Hu, John W Freeland, Jordi Cabana

252 Effect of Lithium Content on Spinel Phase Evolution in Lithium-Rich Layered Oxides  $\text{Li}_x\text{Ni}_{0.25}\text{Co}_{0.10}\text{Mn}_{0.65}\text{O}_{(3.4+x)/2}$  ( $0.8 \leq x \leq 1.6$ ) for Li-Ion Batteries

Byungjin Choi, Kwangjin Park, Jayhyok Song, Dong-Hee Yeon, Jung-Hwa Kim, SeongYoung Park, Hyoun-Ee Kim, Jin-Hwan Park, Seokgwang Doo

253 A High-Voltage and High-Capacity  $\text{Li}_{1+x}\text{Ni}_{0.5}\text{Mn}_{1.5}\text{O}_{4.0}$  ( $0 < x < 1$ ) Cathode Material: From Synthesis to Full Lithium-Ion Cells

Marilena Mancini, Peter Axmann, Giulio Gabrielli, Michael Kiarie Kinyanjui, Ute Kaiser, Margret Wohlfahrt-Mehrens

254 Dimensionally-Stable Lithium Insertion Material of  $\text{LiCoMnO}_4$  for Long-Life Lithium-Ion Batteries

Kingo Ariyoshi, Hiroya Yamamoto

255 Novel Mesoporous Microspheres of Al and Ni Doped LMO Spinel and Their Performance As Cathodes in Secondary Lithium Ion Batteries

Santanu Mukherjee, Nicholas David Schuppert, Alex Bates, Moon Jong Choi, Sungjin Kim, Eunjin Son, Wonjae Ryu, Sam Park

256 Room Temperature Synthesized Hybrid Open Frameworks for Li-Ion Battery Cathodes

Shahul Hameed Abdulrahman, Siham Y. Al-Qaradawi, Erhan Deniz, M.V. Reddy

257 Solid-Solution Vs. Two-Phase Li-Ion Storage in Nanograined Orthosilicate Cathode Materials

[Xia Lu, Hsien-Chieh Chiu, Zachary Arthur, Huijing Wei, Jigang Zhou, De-Tong Jiang, Karim Zaghib, George P. Demopoulos](#)

258 [Cathode Properties of Amorphous  \$\text{XLi}\_x\text{FeSO}\_4\$  \( \$x = 1.0, 1.2\$  and  \$1.5\$ \) Composite for Li-Ion Batteries](#)

[Ayuko Kitajou, Juichi Arai, Shigeto Okada](#)

259 [Morphological and Chemical Control of Oxide Cathode Materials Based on Mn](#)

[Linhua Hu, Jordi Cabana](#)

260 [High-Voltage Lithium Metal Phospho-Olivines for Li-Ion Batteries](#)

[Jan L. Allen, Joshua L. Allen, Samuel A. Delp, Jeff Wolfenstine, T. Richard Jow](#)

261 [Olivine-Based Blends As Positive Electrodes for Lithium Batteries](#)

[Christian M Julien, Alain Mauger, Julie Trottier, Karim Zaghib, Pierre Hovington, Henri Groult](#)

262 [Three-Dimensional Porous  \$\text{LiFePO}\_4\$  Cathode Composite Decorated By Nitrogen-Doped Graphene Aerogel for Ultrafast Lithium Storage](#)

[Bo Wang, Tiefeng Liu, Guijing Liu, Lei Wang, Dianlong Wang, Xiusong Zhao](#)

263 [Electrochemical Characterization of Carbon-Coated  \$\text{LiCoPO}\_4\$  Synthesized By Hydrothermal Method Using Various Carbon Sources](#)

[Yuta Maeyoshi, Shohei Miyamoto, Hirokazu Munakata, Kiyoshi Kanamura](#)

264 [Li Storage in Olivine Structure  \$\text{LiFe}\_x\text{Mn}\_{1-x}\text{PO}\_4\$](#)

[Yong-Yao Xia, Ke Wang](#)

265 [Synergetic Effects of  \$\text{LiFe}\_{0.3}\text{Mn}\_{0.7}\text{PO}\_4\$  - Spinel Blends: From Proof of Concept to Prototype Li-Ion Cells](#)

Andreas Klein, Peter Axmann, Margret Wohlfahrt-Mehrens

266 Near Zero Volt Tolerant Lithium Ion Cells: Benefits for Safe Storage, Shipping, and Medical Implants

Kyle R. Crompton, Brian J. Landi

267 A Techno-Economic Assessment of Cylindrical Spiral-Wound Lithium Ion Batteries: Can the Huge Factories Achieve Their Cost Goals?

Jay Whitacre, Rebecca Ciez

268 Light-Assisted Delithiation of Nano-LiFePO<sub>4</sub> for Photo-Rechargeable Li-Ion Batteries

Andrea Paoella, Cyril Faure, George P. Demopoulos, Karim Zaghib

269 Lithium Ion Batteries Made of Electrodes with 99 Wt% Active Materials and 1 Wt% Carbon Nanotubes without Binder or Metal Foils

Kei Hasegawa, Suguru Noda

270 Li<sub>5</sub>FeO<sub>4</sub> Li Source Additive Fixing Irreversibility in Li-Ion Batteries

Chi-Kai Lin, Xin Su, Wenquan Lu, Xiaoping Wang, Christopher Johnson

271 A Predictive Model of Lithium-Ion Electrode Fabrication, Including Mixing, Coating, Drying, and Calendering

M. Mehdi Forouzan, Anthony Gillespie, Nicholas Lewis, Brian A Mazzeo, Dean R Wheeler

272 (Battery Division Technology Award) Some Directions for Performance Improvement of Li-Ion Batteries out of Usual Paths

Dominique Guyomard, Joël Gaubicher, Pablo Jimenez-Manero, Lucille Quazuguel, Nicolas Dupre, Philippe Moreau, Bernard Lestriez, Philippe Blanchard, Charles

Cougnon, Eric Levillain, Olivier Aleveque, Lionel Roué, Eric De Vito, Maxime Boniface, Arnaud Bordes, Pascale Bayle-Guillemaud

273Reducing Impedance Growth in Li[Ni<sub>0.4</sub>Mn<sub>0.4</sub>Co<sub>0.2</sub>]O<sub>2</sub>/Graphite Pouch Cells Using Optimized Cell Components and Electrolytes

Kathlyne Nelson, Jeff R Dahn

27448V Starting Battery Based on 3D Electrode Concept

Jan Prochazka

275Investigation of the Conductivity Effect on Silicon Anode Performance for Lithium Ion Batteries

Neslihan Yuca, Murat Ferhat Dođdu, Mehmet Emre Cetintasoglu, Omer Suat Taskin, Ipek Avci

276Silicon-Carbon Nanotube Aerogel Core-Shell Nanostructures for Lithium-Ion Batteries with Long-Cycle Life and High Capacity

Hyung Cheoul Shim, Chang-Su Woo, Seungmin Hyun

277Development of High-Energy Lithium-Ion Batteries through the Anode-Side Substitution of Graphite By Si/C-Composite

Sascha Dobrowolny, Falko Mahlendorf, Angelika Heinzl

278Elucidation of Reaction Behavior of Phosphorus-Doped Si Negative Electrode for Lithium-Ion Batteries

Yasuhiro Domi, Hiroyuki Usui, Masahiro Shimizu, Yuta Kakimoto, Hiroki Sakaguchi

279A Silicon Hollow Graphene Nanoshell Li-Ion Anode Composite Material

Nathan A Banek, Kevin Alan Hays, Kevin R. McKenzie, Michael J Wagner

280Silicon-Graphite Composite Electrodes for High Energy Density Li-Ion Battery Applications

Morten Wetjen, Roland Jung, Daniel Pritzl, Hubert A. Gasteiger

281An Efficient and Controllable Prelithiation of Silicon Monoxide for Improving Energy Density of Lithium-Ion Rechargeable Full Cells

Hye Jin Kim, Sunghun Choi, Seung Jong Lee, Myung Won Seo, Jae Goo Lee, Yong Ju Lee, Eun Kyung Kim, Jang Wook Choi

282Influence of Anion Structure of Ionic Liquid on the Electrochemical Performance of Si-Based Negative Electrode for Li-Ion Battery

Kazuki Yamaguchi, Yasuhiro Domi, Hiroyuki Usui, Masahiro Shimizu, Hiroki Sakaguchi

283Comparative Study of Si-Ti Thin Films and Alloys As Lithium Ion Anodes

Yukun Wang, Hui Liu, Min Zhu, Mark N Obrovac

284Consumption of Fluoroethylene Carbonate (FEC) on Si-C Composite Electrodes for Li-Ion Batteries

Roland Jung, Michael Metzger, Dominik Haering, Sophie Solchenbach, Cyril Marino, Nikolaos Tsiouvaras, Christoph Stinner, Hubert A. Gasteiger

285Effects of SEI Formation Additives on Cycle Performance and Surface Morphology in Si-Flake-Powder Anodes

Masakazu Haruta, Takashi Moriyasu, Ryuya Hioki, Shuhei Yoshida, Akira Tomita, Toshio Takenaka, Takayuki Doi, Minoru Inaba

286Electrochemical Degradations Caused By Mechanical Damages in Silicon Negative Electrode

Naoki Yoshida, Tadashi Sakamoto, Naoaki Kuwata, Junichi Kawamura, Kazuhisa Sato, Toshiyuki Hashida

287Cracking the Genetic Code of Nickel on the Performance of the High Energy Layered Cathode Materials



[Wontae Lee, Eunkang Lee, Taewhan Kim, Kyung Lok Lee, Mihee Jeong, Won-Sub Yoon](#)

288 [Investigation of Pristine  \$\text{Li}\_{1.2}\text{Ni}\_{0.13}\text{Mn}\_{0.56}\text{Co}\_{0.13}\text{O}\_2\$  By Advanced TEM](#)

[Christian Wiktor, Hanshuo Liu, Meng Jiang, Yan Wu, Xingyi Yang, Gianluigi A. Botton](#)

289 [Bulk and Interfacial Kinetics of  \$\text{Li}\_{1-x}\text{Ni}\_{0.8}\text{Co}\_{0.15}\text{Al}\_{0.05}\text{O}\_2\$  \(NCA\) Single Particles As a Function of State of Charge](#)

[Ping-chun Tsai, Bohua Wen, Hui-Chia Yu, Min-Ju Choe, Katsuyo Thornton, Yet-Ming Chiang](#)

290 [Strain Effects on Redox Reaction in Li-Rich Layered Oxide Electrode](#)

[Tomoya Kawaguchi, Masashi Sakaida, Masatsugu Oishi, Katsutoshi Fukuda, Satoshi Toyoda, Tetsu Ichitsuho, Eiichiro Matsubara](#)

291 [Understanding the Degradation Mechanism of Lithium Nickel Oxide Cathode for Li-Ion Batteries](#)

[Wei Tong, Jing Xu](#)

292 [Comparative Study of Fluorinated and Non-Fluorinated Electrolytes in  \$\text{Li}\[\text{Ni}\_x\text{Mn}\_y\text{Co}\_z\]\text{O}\_2\$ /Graphite Pouch Cells](#)

[Lin Ma, Jian Xia, Jeff R Dahn](#)

293 [Structure Deformation and Electronic Spin States Modification in the Surfaces of Charged and Discharged Lithium-Ion Battery Cathodes](#)

[Hiroshi Nakano, Raku Shirasawa, Shinnosuke Hattori, Toshiyuki Kunikiyo, Yuichi Tokita](#)

294 [Very-Low Solid-Electrolyte/Electrode Interface Resistance in  \$\text{Li}\(\text{Ni}\_{0.5}\text{Mn}\_{1.5}\)\text{O}\_4\$ -Based Thin-Film Lithium Battery](#)

[Susumu Shiraki, Hideyuki Kawasoko, Tohru Suzuki, Ryota Shimizu, Taro Hitosugi](#)

[295Phase-Field Simulation of Li Intercalation-Induced Stress Evolution in an Elastically Inhomogeneous LiCoO<sub>2</sub> Polycrystals](#)

[Akinori Yamanaka, Yushi Suzuki, Chisa Tsuyuki, Yusuke Asari, Tomio Iwasaki](#)

[296X-Ray Absorption Spectroscopic Analysis of Cobalt-Doped Lithium Oxide Cathode Material for a Lithium-Peroxide Battery during Charge and Discharge](#)

[Yoshiyuki Ogasawara, Hiroaki Kobayashi, Mitsuhiro Hibino, Kazuya Yamaguchi, Tetsuichi Kudo, Daisuke Asakura, Shinichi Okuoka, Hironobu Ono, Koji Yonehara, Yasutaka Sumida, Noritaka Mizuno](#)

[297Inhomogeneous Degradation Phenomena of NMC Cathode in 18650-Type Lithium-Ion Battery: A Soft X-Ray Absorption Spectroscopic Investigation](#)

[Teruhisa Baba, Chihiro Yogi, Yoshitake Honda, Masazumi Arao, Masashi Matsumoto, Hideto Imai](#)

[298Direct Observation of Lattice Aluminum Environments in Li-Ion Cathodes NCA and Al-Doped NMC Via <sup>27</sup>Al MAS NMR Spectroscopy](#)

[Fulya Dogan, John T. Vaughey, Hakim Iddir, Baris Key](#)

[299Mixing and Coating Procedure Development for LiNiCoAlO<sub>2</sub> cathodes at Prototype Production Scale](#)

[Marcus Jahn, Irene Rubio, Daniel Gonzalez, Rohit Bhagat](#)

[300Dissolution of Transition Metals in Lithium Ion Batteries with NMC-Based Electrodes](#)

[Alexander Warnecke, Rita Graff, Dirk Uwe Sauer](#)

[301Investigating the Influence of Transition Metal Composition on High-Voltage Cathodes Performance By Using Magnetic Susceptibility](#)

[Lamuel David, Athena S Sefat, Ercan Cakmak, Yangping Sheng, Jianlin Li, David L Wood, Claus Daniel, Debasish Mohanty](#)

[302 Investigation of the Electronic and Local Structural Changes during Li Uptake and Release of Nanocrystalline NiFe<sub>2</sub>O<sub>4</sub> By X-Ray Absorption Spectroscopy](#)

[Dong Zhou, Stefan Permien, Gerhard Schumacher, Jatinkumar Rana, Wolfgang Bensch, John Banhart](#)

[303 Improvement in the Thermal Safety of Rechargeable Lithium Batteries: Endothermic Behavior of Organic Positive-Electrode Materials](#)

[Masaru Yao, Hisanori Ando, Riki Kataoka, Tetsu Kiyobayashi, Nobuhiko Takeichi](#)

[304 Hysteretic Phenomena Between Charging and Discharging Process in LiNi<sub>0.5</sub>Mn<sub>1.5</sub>O<sub>4</sub>](#)

[Yoshinori Satou, Yuta Shimonishi, Shigeki Komine, Nobuo Yamamoto, Hideo Asai, Shinichi Ito](#)

[305 Enhancing Surface Diffusion in Battery Electrodes Using Solvent Adsorbates](#)

[Yiyang Li, Hungru Chen, Zixuan Guan, Peter Attia, Jongwoo Lim, Martin Z. Bazant, M. Saiful Islam, William C Chueh](#)

[306 What Makes Si Anode Stabilized: Correlation of Electrochemical Performances with Si Local Structural Transformations](#)

[Ken Ogata, Sungsoo Han, Seongho Jeon](#)

[307 A Porous Silicon Anode Material Prepared By Chemical Etching for High-Performance Lithium-Ion Batteries](#)

[Myungbeom Sohn, Hyeong-Il Park, Dong Geun Lee, Hansu Kim](#)

[308 Silicon Anodes Incorporating Few-Layer Graphene \(FLG\) for Improved Cyclability in Li-Ion Batteries](#)

[Qianye Huang, Melanie Loveridge, Chaoying Wan, Richard Dashwood, Rohit Bhagat](#)

[309 Dual-Type Si Nanocrystals Embedded Si/SiO<sub>x</sub> Nanocomposites As a High Capacity Anode Material for Lithium-Ion Battery](#)

Eunjun Park, Hyundong Yoo, Min-Sik Park, Young-Jun Kim, Hansu Kim

310 Micro-Sized Bulk Porous Si from Fe-Si and Al-Si Alloys As High Performance Anodes for Li-Ion Batteries

Weiqliang Han, Huajun Tian, Wei He

311 High Performance and Flexible Si Anodes Enabled By a Facile Electrode Design

Kun Feng, Matthew Li, Zhongwei Chen

312 The ANODE Performance of Highly-FINE Silicon Metal Particles Hybridized with PITCH-Derived Carbon in a Li ION Battery

Hiroyuki Fujimoto

313 Lithium Transport in High-Capacity Encapsulated Silicon-Vacant Electrodes

Juichin Fan, John N. Harb, Robert C. Davis, Richard R. Vanfleet

314 Hierarchical MoS<sub>2</sub>-Carbon Microspheres: A Robust Anode for High Performance Lithium Ion Battery

Gen Chen, Hongmei Luo

315 Synthesis of Layered MoS<sub>2</sub> with Enlarged d-Spacing and Its Carbon Composite By Substrate-Induced-Coagulation Coating Method As Anode Materials for Lithium-Ion Batteries

Joong-Hee Han, Jürgen Kahr, Raad Hamid, Sung-Hwan Han, Do-Young Ahn, Atanaska Trifonova

316 Sulfur Atoms Bridging Few-Layered MoS<sub>2</sub> with S-Doped Graphene Enables Highly Robust Anode for Lithium-Ion Batteries

Xiaolei Wang, Ge Li, Min Ho Seo, Zhongwei Chen

[317 Nanostructured MoS<sub>2</sub>/Graphene Composite As Superior Anode Material for Li-Ion Batteries](#)

[Yongqiang Teng, Hailei Zhao, Zijia Zhang, Zhaolin Li, Qing Xia, Yang Zhang](#)

[318 In Situ Observation of the Electrochemical Dissolution and Deposition of Copper Contaminations in Li-Ion Batteries](#)

[Junji Kuwabara, Kenji Sato](#)

[319 Time and Voltage Resolved Investigation of Lithium Plating on Graphite Anodes By Operando Electron Paramagnetic Resonance \(EPR\) Spectroscopy](#)

[Johannes Wandt, Peter Jakes, Josef Granwehr, Rüdiger-Albrecht Eichel, Hubert A. Gasteiger](#)

[320 Variation of Coulombic Efficiency Versus Upper Cutoff Potential of Li-Ion Cells with Different Electrolyte Solvents](#)

[Jian Xia, Stephen Glazier, Jeff R Dahn](#)

[321 Ferroelectric SEI for Lithium Ion Batteries with Ultrahigh Rate Capability](#)

[Takashi Teranishi, Yumi Yoshikawa, Hidetaka Hayashi, Akira Kishimoto](#)

[322 Anodic Oxidation of Carbon and Electrolyte with Different Conducting Salts in High-Voltage Lithium-Ion Batteries Studied By Online Electrochemical Mass Spectrometry](#)

[Michael Metzger, Patrick Walke, Benjamin Strehle, Sophie Solchenbach, Hubert A. Gasteiger](#)

[323 Improving the High Temperature Performance of Li-Ion Batteries with Transition Metal Ion Trapping Separators - a Brief Review](#)

[Anjan Banerjee, Baruch Ziv, Yuliya A. Shilina, Naomi Sarah Levy, Mikhael D. Levi, Sharon Ruthstein, Shalom Luski, Doron Aurbach, Allen D. Pauric, Gillian R. Goward, Zicheng Li, Timothy J. Fuller, Joseph M. Ziegelbauer, Ion C. Halalay](#)

[324 Electrochemical Impedance Analysis of LiCoO<sub>2</sub>/Graphite Lithium Ion Batteries By Distribution of Relaxation Times Method](#)

[Shinichi Katayama, Hideki Nakai, Akinori Kita](#)

[325 Influence of Decreasing Electrode Thickness on Its Structure and Resistance for Lithium-Ion Batteries](#)

[Chieko Araki, Shigetaka Tsubouchi, Akihiko Noie, Etsuko Nishimura, Shuichi Suzuki, Shigeki Makino](#)

[326 Electrochemical Performance of Lithium-Ion Batteries As a Function of Linked Influences Originating from the Dispersing and Calendering Step](#)

[Henning Dreger, Linus Froböse, Wolfgang Haselrieder, Arno Kwade](#)

[327 Novel Method of Contrast Improvement Applied to Lithium Ion Battery Electrode Materials Enabling Multi Modal and High Resolution 3D Imaging and Advanced Quantification](#)

[Moshiel Biton, Vladimir Yufit, Farid Tariq, Masashi Kishimoto, Nigel P. Brandon](#)

[328 Characterization and Local Structure Analysis of Carbon Coated SiO<sub>x</sub> Using Confocal  \$\mu\$ -Raman Microscope](#)

[Jeonghan Kim, Byoungwoo Kang](#)

[329 An on-Line Electrochemical Parameter Estimation Study on Lithium-Ion Batteries Using Neural Network \(NN\)](#)

[Ali Jokar, Barzin Rajabloo, Martin Desilets, Marcel Lacroix](#)

[330 Derivation and Tuning of a Compact Differential-Algebraic Equations Model for LiFePO<sub>4</sub>-Graphite Li-Ion Batteries](#)

[Cheol W. Lee, Yao Hong, Mushegh Hayrapetyan, Zhimin Xi](#)

[331 Band-Diagram Framework for Materials Development in Cation Intercalation Charge Storage](#)

[Aaron M. Holder, Matthias Young, Steven M. George, Charles Musgrave](#)

[332Understanding Cation-Disordered Cathode Materials Based on Percolation Theory and Ligand Field Theory](#)

[Jinhyuk Lee, Dong-Hwa Seo, Alexander Urban, Gerbrand Ceder](#)

[333Li/Vacancy Configurations in Surface Region of  \$\text{Li}\_{2-x}\text{MnO}\_3\$  Cathode Material: A High-Throughput Computational Investigation](#)

[Truong Vinh Truong Duy, Tsukuru Ohwaki, Hideto Imai](#)

[334Delithiation Mechanisms and the Surface Morphology of Lithium-Excess  \$\text{Li}\_2\text{MnO}\_3\$  Material](#)

[Yongwoo Shin, Kristin A Persson](#)

[335Numerical Analysis for Effects of Cell Formats on Cycle Life of Lithium Ion Batteries with Large Capacities](#)

[Hong-Keun Kim, Charn-Jung Kim, Kyu-Jin Lee](#)

[336Modeling Investigation of Influencing Factors on Li Plating of Li-Ion Battery](#)

[Zhenli Zhang, Zhihong Jin, Perry M Wyatt](#)

[337First Principle Investigation of C606 Molecule Absorption on Graphene As 2D Electrode of Lithium-Ion Battery](#)

[Zicheng Wang, Junxia Meng, Lishuang Xu, Huaizhe Xu](#)

[338Capacity Fade Modeling of a Lithium Ion Cell with a Spinel-Based Cathode and an Artificial Graphite Anode](#)

[Williams Agyei Appiah, Joonam Park, Seoungwoo Byun, Hee Joong Kim, Tae Shin Kim, Myung-Hyun Ryou, Yong Min Lee](#)

[339Development and Validation of a ROM Incorporated By a Semi-Empirical Aging Model for a Large-Format LiFePO<sub>4</sub>/Graphite Cell](#)

[Xinchen Zhao, Song-Yul Choe](#)

[340Quinone Derivatives for Lithium-Ion Batteries: First-Principles Density Functional Theory Modeling](#)

[Seung Soon Jang, Seung Woo Lee](#)

[341Understanding the Heat Signature from Charging and Discharging of Li-Ion Batteries](#)

[Peter Joseph Ralbovsky](#)

[342Advanced Single Particle Measurement Technique for Fundamental Study of First Charging Mechanism of One Silicon Particle](#)

[Kei Nishikawa, Chunyan Li, Kiyoshi Kanamura](#)

[343Investigation of a Porous NiSi<sub>2</sub>/Si Composite Anode Material Used for Lithium-Ion Batteries By X-Ray Absorption Spectroscopy](#)

[Dong Zhou, Haiping Jia, Jatinkumar Rana, Tobias Placke, Martin Winter, John Banhart, Gerhard Schumacher](#)

[344Hybrid Separator Composed of PvdF-HFP/Exfoliated Graphene Oxide Nanosheets for Li-Ion Batteries](#)

[Yunah Choi, Jong Hyeok Park](#)

[345The Effect on the Reaction Rate By the Binder Contact with the Cathode Active Material for 2V Class Water Based Lithium Ion Battery](#)

[Daiki Kurosawa, Tomohiro Ito, Kazuhiro Tachibana, Tatsuo Nishina](#)

[346Paper-Based Ultra-High-Capacity Lithium-Ion Cell for Flexible Electronics](#)

[Yadong Liu, Nojan Aliahmad, Jian Xie, Mangilal Agarwal](#)



[347Plasma - Assisted ALD of Lipo\(N\) for Solid State Batteries](#)

[Brecht Put, Maarten J. Mees, Norah Hornsveld, Philippe M Vereecken, W. M. M. Kessels, Mariadriana Creatore](#)

[348Electrochemical-Acoustic Investigation of Current Density Distribution in Lithium-Ion Batteries](#)

[Andrew Hsieh, Greg Davies, Michael Wang, Daniel A Steingart](#)

[349Analysis on Overvoltage Relaxation of Lithium Secondary Batteries after Current Interruption](#)

[Tomohiro Ito, Kazuhiro Tachibana, Tatsuo Nishina, Takao Kawahira](#)

[350Structural Changes in Copper-Tin Alloy Anodes Observed with X-Ray Microtomography](#)

[Logan Ausderau, Joseph Buckley, Piyush Jibhakate, Xianghui Xiao, George J. Nelson](#)

[351Correlation of Local Conductivity to Microstructure for Li-Ion Battery Electrodes By Use of a Contact Probe and SEM/FIB](#)

[John E Vogel, William Lange, Derek V Clement, Brian A Mazzeo, Dean R Wheeler](#)

[352Improved Electrode Processing and Uniformity with Discrete Carbon Nanotube Aqueous Binder Additives](#)

[Jeremy P Meyers, Sateesh Peddini, Matthew Jungman, Malcolm Finlayson, Vinay Bhat, Jerzy Gazda, Clive Bosnyak](#)

[353High Performance Asymmetric V<sub>2</sub>O<sub>5</sub>-SnO<sub>2</sub> Nanopore Battery By ALD](#)

[Chanyuan Liu, Sang Bok Lee, Gary W Rubloff](#)

[354Performance of Si-Integrated Li-Ion Microbatteries with Side-By-Side Electrodes: A Geometry Study](#)

[Katrin Hoeppe](#)

[355 First Principles Study of the Interfacial Structure Between Spinel  \$\text{LiMn}\_2\text{O}\_4\$  and Protective Thin Films](#)

[Robert Warburton, Hakim Iddir, Larry Curtiss, Xiao Chen, Timothy T Fister, Paul Fenter, Lin Chen, Joseph A. Libera, Jeff Greeley](#)

[356 Investigation of the High-Rate Recharging Mechanism in  \$\text{LiMn}\_2\text{O}\_4\$  By Primary Particle Analysis](#)

[Satoshi Ishikawa, Tomohiro Ito, Kazuhiro Tachibana, Tatsuo Nishina](#)

[357 A Practical Degradation Simulator for Assembled Li-Ion Batteries with Calibration Functions](#)

[Yukinori Hayakawa, Lei Lin, Masahiro Fukui](#)

[358 A Precise FCC Estimation Algorithm Based on Recursive Least-Squares Identification of Li-Ion Batteries with Adaptive Forgetting Factor Tuning](#)

[Hironori Ono, Lei Lin, Masahiro Fukui, Kiyotsugu Takaba](#)

[359 Pitfalls in Simulating the Diffusion Potential of Li-Ion Cells](#)

[Adrien Mathieu Bizeray, David Alastair Howey, Charles W Monroe](#)

[360 Simulation-Supported Analysis of Calendering Impacts on the Performance of Lithium-Ion-Batteries](#)

[Georg Lenze, Fridolin Röder, Ulrike Krewer](#)

[361 First-Principles Study on Li-Ion Desolvation Process in Electrode-Electrolyte Interface](#)

[Tsukuru Ohwaki, Tamio Ikeshoji, Truong Vinh Truong Duy, Taisuke Ozaki, Hideto Imai, Minoru Otani](#)

[362Enhanced Rate Performance in Electrode Materials for Lithium-Ion Batteries](#)

[Juliette Marie Billaud, Florian Bouville, Tommaso Magrini, Claire Villevieille, André Studart](#)

[363Population Balance Model of Formation and Growth of Solid Electrode Interphase in Lithium Ion Batteries](#)

[Amir Abbas Tahmasbi, Thomas Kadyk, Michael Eikerling](#)

[364Towards a Better Understanding of Batteries: Manufacturing and Modeling Using Comsol](#)

[Pedro L. Moss, Seshuteja Chepyala, Mark H. Weatherspoon](#)

[365Simulation of Lithium-Ion Conduction and Deposition with Heterogeneous Porous Structure of Electrode Layers and Separators](#)

[Gen Inoue, Shota Yatabe, Motoaki Kawase](#)

[366Estimating and Identifying Parameters from Charge-Discharge Curves of Lithium-Ion Batteries](#)

[Yanbo Qi, Suryanarayana Kolluri, Venkat R. Subramanian, Daniel T. Schwartz, Shriram Santhanagopalan](#)

[367Multiobjective Optimization of Energy and Power per Unit Mass and Area for LiFePO<sub>4</sub>-Graphite Li-Ion Battery Cells](#)

[Yao Hong, Cheol W. Lee](#)

[368High Capacity and High POWER Ncm/Graphite Lithium ION Battery Using Microgrid® Expanded Metal Current Collectors](#)

[John Hart](#)

[369Environmentally-Friendly Aqueous Li \(or Na\)-Ion Battery with Fast Electrode Kinetics and Super-Long Life](#)

[Xiao-Li Dong, Long Chen, Yong-Gang Wang, Yong-Yao Xia](#)

[370 Ternary Cathode Materials Prepared By Induction Sintering Incorporated with Carbon Coating Technique for High Performance Li-Ion Batteries](#)

[Chien-TE Hsieh](#)

[371 Electrochemical Performance of Carbon-Coated Cauliflower-like WO<sub>3</sub> for Li-Ion Batteries](#)

[Sasidharachari Kammari, Sukeun Yoon](#)

[372 Influence of the Degree of Doping on the Efficiency in a Battery LiFePO<sub>4</sub> - Yttrium Used As Cathode Material](#)

[Francisco Vicente Herrera, Paulina Marquez, Domingo Ruiz, Juan Luis Gautier, Daniela Alburquenque](#)

[373 Impedance Analysis of High Capacity Manganese Rich Cathode in Lithium Ion Batteries](#)

[Wen-feng Mao, Yanbao Fu, Vince Battaglia](#)

[374 A Polymer Surfactant Assisted Method for the Synthesis of Clusters of Mn<sub>3</sub>O<sub>4</sub> Nanoparticles on Few-Layer Exfoliated Graphene Platelet Surface and Its Application As Lithium-Ion Battery Anode](#)

[Debkumar Saha, Lawrence T. Drzal](#)

[375 Influence of LiFePO<sub>4</sub> Electrode Structure on Electrochemical Property](#)

[Hirofumi Yasumiishi, Ryuta Yamaya, Takao Kitagawa, Tetsuya Nakabeppu](#)

[376 Probing the Interfacial Parasitic Reactions Kinetics in Lithium-Ion Battery](#)

[Xiaoqiao Zeng, Zonghai Chen, Khalil Amine](#)

[377Core-Shelled Low-Oxidation State Oxides@Reduced Graphene Oxides Cubes Via Pressurized Reduction for Highly Stable Lithium Ion Storage](#)

[Ping Li, Jong Hyeok Park](#)

[378Layered Si-C Nanocomposites Synthesized from Layered Silicate As High Performance Anodes for Lithium-Ion Batteries](#)

[Chulmin Hwang, Isamu Moriguchi, Koki Urita](#)

[379Synthesis Technology of Nano-Crystalline LVP/C Cathode Materials for Lithium Ion Batteries](#)

[Seung-Woo Choi, Min-Young Kim, Seung-Hoon Yang, Da-Hye Kim, Tae-Hyoung Noh, Moo-Sung Lee, Ho-Sung Kim](#)

[380Realizing 200mAh g<sup>-1</sup> Lithium Manganese Oxide Spinel in Lithium Ion Battery with Prelithiated Anode](#)

[Hyun Kuk Noh, Yu Ju Jeon, Hyun-Kon Song](#)

[381Development of a Novel Quartz \(SiO<sub>2</sub>\) Based Composite Anode Material for Li-Ion Batteries](#)

[Azhar Moldabayeva, Anar Zhexembekova, Meruyert Karim, Moulay-Rachid Babaa, Yongguang Zhang, Anara Molkenova, Izumi Taniguchi, Zhumabay Bakenov](#)

[382Hetero-Nanonet Mediated Paper Batteries with Origami Foldability](#)

[JongTae Yoo, Sung-Ju Cho, Keun-Ho Choi, Sang-Young Lee](#)

[383Accelerating Rate Calorimetry Tests of 18650 Li-Ion Cells before and after Storage Degradation at High Temperature](#)

[Kotaro Konakawa, Omar S. Mendoza-Hernandez, Yoshitsugu Sone, Hiroaki Ishikawa, Minoru Umeda](#)

[384New Lithium-Excess High-Capacity Positive Electrode Materials with Mo<sup>3+</sup>/Mo<sup>6+</sup> three-Electron Redox](#)

[Satoshi Hoshino, Shinnosuke Ichikawa, Tetsuya Ozaki, Tokuo Inamasu, Naoaki Yabuuchi](#)

385 [The Effect of Upper Voltage Limits on Electrochemical Performance of Li-Rich Cathode for Lithium Ion Batteries](#)

[Mehmet Emre Cetintasoglu, Neslihan Yuca, Omer Suat Taskin, Murat Ferhat Dogdu, Ipek Avci](#)

386 [Characterization for Sulfurized Polyethylene Glycol As Electrode Material for Li-S Battery](#)

[Hiroshi Senoh, Hisanori Ando, Toshikatu Kojima, Nobuhiko Takeichi](#)

387 [Molecular Modeling of Energy Barrier of Li Ion Transport from Negative to Positive Electrodes](#)

[Shuhei Saito, Md. Khorshed Alam, Hiromitsu Takaba](#)

388 [Biogenous Iron Oxide\(BIOX\)-As a High-Capacity Anode Material for Lithium Ion Batteries](#)

[Homare Furusawa, Yasuo Takeda, Nobuyuki Imanishi, Jun Takada](#)

389 [Critical Parameters Governing Energy Density of Li-Storage Cathode Materials Unraveled By Confirmatory Factor Analysis](#)

[Su Cheol Han, Jae Hyang Jeong, Chun Guk Park, Myoungho Pyo](#)

390 [Development of the High Heat Resistance CCS Using Waterborne New Binder](#)

[Iwao Fukuchi, Tomoyuki Fukatani](#)

391 [Electrochemical Performance of Graphite-Silicon Alloy Composite Anodes Using Cross-Linked Poly\(vinyl alcohol\) Binder for Lithium-Ion Batteries](#)

[Seung Hyun Yook, Sang-Hyung Kim, Dong-Won Kim, Seon-Kyong Kim, Cheol-Ho Park](#)

[392Enhanced Electrochemical Performance of Ni-Rich Cathode Surface Modified with Double Layer](#)

[Jun Won Lee, Yong Joon Park](#)

[393Electrochemical Property of LiCoMnO<sub>4</sub> Cathode Thin Film Prepared By PLD and Oxygen Post Annealing](#)

[Norikazu Ishigaki, Naoaki Kuwata, Junichi Kawamura](#)

[394Development of the Next Generation Anode Materials for Super-Efficient Lithium-Ion Batteries](#)

[Zhumabay Bakenov, Anara Molkenova, Anar Zhexembekova, Azhar Moldabayeva, Marzhan Moldabayeva, Aidyn Kuanyshev, Medet Tayuekelev, Zhuldyz Beisbayeva](#)

[3953D Hierarchical Anode Configuration Composed of Ultralong N-Doped Graphene Scrolls-Wrapped MnO Nanowires for High-Performance Li-Ion Batteries](#)

[Hao Wu, Penghui Chen, Yun Zhang](#)

[396Integrated Layered YLi<sub>2</sub>MnO<sub>3</sub>-\(1-y\)LiNi<sub>1/2</sub>Mn<sub>1/2</sub>O<sub>2</sub> Materials Applied to Lithium-Ion Batteries](#)

[Ashraf Abdel-Ghany, Alain Mauger, Henri Groult, Karim Zaghbi, Christian M Julien](#)

[397An Optimized Carbon Matrix for Negative Lithium-Ion Battery Electrodes Based on Silicon and Carbon](#)

[Pirmin A. Ulmann, Sergio B. Pacheco, Eddie Mombelli, Antonio Leone](#)

[398Hierarchical Porous Carbon Derived from Low-Cost Sucrose for Advanced Lithium-Sulfur Batteries](#)

[Heng Liu, Ming Wu Xiang](#)

[399Does Ni and/or S Doping of Lithium-Manganese Spinel Enhance Surface Stability of a Cathode?](#)

[Michal Swietoslowski, Monika Bakierska, Krzysztof Mech, Marcin Molenda](#)

400 [Carbon Fiber Coated MnO<sub>2</sub> As Sulfur Carrier for Lithium Sulfur Battery](#)

[Yun Zhang, Yi Guo, Nai Teng Wu](#)

401 [Controlling the Shape of LiMPO<sub>4</sub> and Li<sub>2</sub>MSiO<sub>4</sub> By Supercritical Fluid for High Energy Density Li-Ion Battery](#)

[Quang Duc Truong, Murukanahally Kempaiah Devaraju, Itaru Honma](#)

402 [LiV<sub>x</sub>FeyPO<sub>4</sub>f Nanostructure Cathodes for Lithium Ion Batteries](#)

[V. S. Reddy Channu, Shri Thanedar](#)

403 [Electrochemical Characteristics of Coal Tar Pitch Prepared By Chemical Activation for Lithium Ion Battery](#)

[Jong Dae Lee, Jin Ung Hwang](#)

404 [In-Situ Analysis on BaTiO<sub>3</sub>-LiCoO<sub>2</sub> Composite Cathode for Lithium Ion Batteries](#)

[Yumi Yoshikawa, Takashi Teranishi, Hidetaka Hayashi, Akira Kishimoto](#)

405 [New High-Capacity Positive Electrode Materials on Li-Ni\(II\)-Nb\(V\) System](#)

[Ryutaro Fukuma, Zhen-Ji Han, Sayuri Fukuyama, Naoaki Yabuuchi](#)

406 [MoO<sub>2</sub>/Mo<sub>2</sub>c Hybrid Nanowires As High Performance Anode Materials for Lithium Ion Batteries](#)

[Lichun Yang](#)

407 [Amorphous Silicon Nitride Anodes for Li-Ion Batteries](#)

[Asbjørn Ulvestad, Jan Petter Maehlen, Hanne Flåten Andersen, Oystein Prytz, Trygve Tveiterås Mongstad, Martin Kirkengen](#)



[408Influence of Ni/Mn Ordering and Oxygen Deficiency on Structure, Magnetic and Electrochemical Properties of  \$\text{LiNi}\_{0.5}\text{Mn}\_{1.5}\text{O}\_4\$](#)

[Shogo Shingai, Daisuke Mori, Yoshiyuki Inaguma](#)

[409The Influence of the Grain Size of  \$\text{Li}\_2\text{MnSiO}\_4\$  Cathode Material on Its Stability in Li-Ion Battery Cell](#)

[Michal Swietoslawski, Marta Gajewska, Marcin Molenda](#)

[410Microstructure and Electrochemical Properties of the Si-M\(M : Cr, Ni\) Anode for Lib According to the Si Amount](#)

[SeongHyeun Lee, Sung-soo Kim](#)

[411Si-O-C Composites Prepared By Electrodeposition on CNTs/Cu or Carbon Paper Substrate and Electrochemical Performance for Lithium Ion Battery](#)

[Seongki Ahn, Moongook Jeong, Hiroki Nara, Tokihiko Yokoshima, Toshiyuki Momma, Tetsuya Osaka](#)

[412Preparation of Pre-Lithiated Sulfur Cathode By an in Situ Contacting Reaction](#)

[Yunwen Wu, Tokihiko Yokoshima, Hiroki Nara, Toshiyuki Momma, Tetsuya Osaka](#)

[413The Structure Modification of Substrate for Alloying Materials in Li-Ion Secondary Battery](#)

[Myeongho Kim, Insoo Choi, Myung Jun Kim, Jae Jeong Kim](#)

[414Black  \$\text{Li}\_4\text{Ti}\_5\text{O}\_{12}\$  Anode Materials for High-Rate Li-Ion Batteries](#)

[Ji-Yong Eom, Dongwook Han, Seung-Eul Yoo](#)

[415Preparation of High Surface Area-Activated Graphene Via Chemical Activation and Thermal Synthesis for Possible Applications on Lithium-Ion Batteries](#)

[Cheng-Che Hsieh, Wei-Ren Liu](#)

[416 Three-Dimensional Phase-Field Simulation of Li Diffusion and Stress Evolution in a Polycrystalline LiCoO<sub>2</sub> Cathode](#)

[Chisa Tsuyuki, Akinori Yamanaka, Yushi Suzuki, Yusuke Asari, Tomio Iwasaki](#)

[417 Optimal Control of Li-Ion Battery Energy Storage System for Frequency Regulation](#)

[Jihun LIM, Jin Hyeok Choi, Geon-pyo Lim, Woonjae Jeon](#)

[418 Understand the Voltage Fade Mechanism of Li-Rich Layered Oxide Cathodes during Extended Cycling](#)

[Quanxin Ma, Changsong Dai](#)

[419 Effect of Solid Electrolyte Interphase of Amorphous Si Flake Anode on Cycle Performance in Solvate Ionic Liquid Electrolytes](#)

[Takashi Moriyasu, Masakazu Haruta, Akira Tomita, Toshio Takenaka, Takayuki Doi, Minoru Inaba](#)

[420 Li<sub>3</sub>V<sub>2</sub>\(PO<sub>4</sub>\)<sub>3</sub> Particles Anchored in Carbon Nanofiber As a Cathode Material for High-Power Lithium Rechargeable Battery](#)

[Jeongyim Shin, Junghoon Yang, Yong-Mook Kang](#)

[421 Cobalt Ferrite Nanoparticles Anchored on Functionalized Graphene Oxide for High Performance Lithium Ion Battery](#)

[Xianmin Zhao, Qiaofeng Han, Yongsheng Fu](#)

[422 Decomposition of Non-Aqueous Electrolytes on High-Voltage Cathodes of Lithium-Ion Batteries](#)

[Chisaki Fujitomo, Haruno Murayama, Eiji Yamamoto, Makoto Tokunaga](#)

[423 Electrochemical Performance of Ti- and Zr-Doped LiCoO<sub>2</sub> Film Cathodes Prepared By Rf-Magnetron Sputtering for Lithium Microbatteries](#)

Kapu Sivajee-Ganesh, Bommireddy Purusottam-Reddy, Obili M Hussain, Alain Mauger, Karim Zaghbi, Christian M Julien

424Development on High Energy Laminated Type Li Secondary Batteries Using Si-O-C Composite Anode and S/KB Composite Cathode with Glyme-Li Salt Solvate Ionic Liquid

Moongook Jeong, Tokihiko Yokoshima, Atsushi Sugiyama, Hiroki Nara, Hitoshi Mikuriya, Toshiyuki Momma, Tetsuya Osaka

425Electrochemical Properties of  $\text{LiNi}_{0.85}\text{Co}_{0.10}\text{Al}_{0.05}\text{O}_2$  synthesized By Using AAO(Anodic Aluminum Oxide) Template

Mi-Ra Shin

426Formation of a Lithium-Plated Reference Electrode in Lithium-Ion Batteries: Characterization Using Dynamic Impedance and Simulation Using an Electrochemical Model

Ziheng Wang, Jun Huang, Zhe Li, Jianbo Zhang

427Synthesis and Characterization of Lithium Cobalt Manganese Oxides ( $\text{LiCoO}_2\text{-Li}_2\text{MnO}_3$ ) As Positive Electrode Material for Lithium-Ion Batteries

Takayuki Inoue, Yusuke Yamada, Kingo Ariyoshi

428Facile Preparation of Nanoflake Covered-Hollow  $\text{NiCo}_2\text{O}_4$  and the Study of Electrochemical and Structural Properties As an Anode Material in Lithium Ion Batteries

Jaeseung Yoo, Nulu Venugopal, Suhan Son, Woong Oh, Gil Hwan Lew, Kowsalya Palanisamy, Won-Sub Yoon

429Surface Morphology Treatment of Lithium Metal Anode for Dendrite Suppression

Joonam Park, Seungwoo Byun, Williams Agyei Appiah, Jiseon Jeong, Yunju Lee, Kuk Young Cho, Young-Gi Lee, Myung-Hyun Ryou, Yong Min Lee

430Electrode Designs of Lithium Ion Batteries Utilizing the Simulation of Porous Structures

[Kazuki Ikeshita, Gen Inoue, Motoaki Kawase](#)

[431 Effect of Local Structural Changes on Rate Capability of  \$\text{LiNi}\_{0.5}\text{Mn}\_{1.5}\text{O}\_4\$  Cathode Material for Lithium Ion Batteries](#)

[Jaesang Yoon, Donghwi Kim, Ji Hyun Um, Mihee Jeong, Suhan Son, Won-Sub Yoon](#)

[432 Effects of Environmental Humidity on Self-Discharging Behaviour and Electrochemical Performance of Lithium-Ion Batteries](#)

[Seungwoo Byun, Joonam Park, Williams Agyei Appiah, Jinkyu Park, Myung-Hyun Ryou, Yong Min Lee](#)

[433 Li Distribution in a  \$\text{LiNi}\_{1/3}\text{Mn}\_{1/3}\text{Co}\_{1/3}\text{O}\_2\$  Positive Electrode Analyzed Using Reflection Electron Energy-Loss Spectroscopy](#)

[Noboru Taguchi, Hikari Sakaebe, Yasushi Maeda, Tomoki Akita](#)

[434  \$\text{Si-SiO}\_x\$  nanoparticles Synthesis for Lithium-Ion Battery Anode Material By Atmospheric Pressure Microwave Plasma](#)

[Joon-soo KIM, Bo-yun Jang](#)

[435 Preparation of Highly Porous Silicon As an Anode for Lithium Ion Batteries](#)

[Duc Tung Ngo, Young-Jae Kim, Chan-Jin Park](#)

[436 Relaxation Analysis of Electrochemically Lithium Inserted  \$\gamma\text{-Fe}\_2\text{O}\_3\$  By Using a Solid-State Li NMR](#)

[Masashi Yamamoto, Hiroshi Okano, Keisuke Yamada, Shigeomi Takai, Takeshi Yabutsuka, Takeshi Yao](#)

[437 Investigating Structural Evolution and Reaction Kinetics of  \$\text{Li}\_x\text{Ni}\_{0.8}\text{Co}\_{0.15}\text{Al}\_{0.05}\text{O}\_2\$  Cathode Materials during Initial Charge/Discharge Using TEM Coupled with Electron Energy Loss Spectroscopy](#)

[Eunmi Jo, Sooyeon Hwang, Kyung Yoon Chung, Eric A. Stach, Seung Min Kim, Wonyoung Chang](#)

438 [Lattice Energy Calculation for Li Inserted Graphite at Relaxation Process](#)

[Tomoki Endo, Hiroshi Okano, Takashi Kitamura, Shigeomi Takai, Takeshi Yabutsuka, Takeshi Yao](#)

439 [Improvement of the Electrochemical Performance of Si Anodes By Use of Ultrathin Polydopamine Coating upon Conductive Carbon Particles](#)

[Danoh Song, Dae Soo Jung, Inseong Cho, Yong Min Lee, Myung-Hyun Ryou](#)

440 [Development of Cathode Materials of Lithium-Ion Secondary Batteries for High Energy and Safety](#)

[Byung-Beom Lim, Chong seung Yoon, Sung-Jin Kim, Juhyon J. Lee, Yang-Kook Sun](#)

441 [A Cost Efficient Silicon-Carbon Based Anode Material for Lithium-Ion Batteries](#)

[Hanne Flåten Andersen, Jan Petter Mæhlen, Per Erik Vullum, Tommy Møkkelbost, Jorunn Voje, Bjørn Sandberg, Preben J. S. Vie, Martin Kirkengen](#)

442 [Lithium-Rich Layered Cathode Materials Containing 3d and 4d Transition Metals for Lithium Ion Battery](#)

[Aruto Watanabe, Yuki Orikasa, Koji Nakanishi, Takuya Mori, Kentaro Yamamoto, Motoaki Nishijima, Kenji Hashimoto, Hajime Kinoshita, Yoshiharu Uchimoto](#)

443 [Rice Husk-Derived Porous Silicon with High Purity As Anode for Lithium Ion Batteries](#)

[Dae Soo Jung](#)

444 [High-Energy Laminated-Type Li-S Batteries Using High-Sulfur Loading Positive Electrode on Aluminum Foam](#)

[Hitoshi Mikuriya, Tokihiko Yokoshima, Moongook Jeong, Hiroki Nara, Toshiyuki Momma, Tetsuya Osaka](#)

[445 Synthesis and Electrode Performance of  \$\text{Li}\_3\text{NbO}\_4\$  -  \$\text{LiVO}\_2\$  Binary System for Li Batteries](#)

[Naoaki Yabuuchi, Mizuki Nakajima](#)

[446 A Novel Adhesion Map Correlating Adhesion Properties to the Electrode Design Parameters in Lithium-Ion Battery Electrode](#)

[Kyuman Kim, Seungwoo Byun, Inseong Cho, Myung-Hyun Ryou, Yong Min Lee](#)

[447 Advanced Performance of Concentration Gradient Core-Shell  \$\text{Li}\[\text{Ni}\_{0.95}\text{Co}\_{0.025}\text{Mn}\_{0.025}\]\text{O}\_2\$  Cathode Materials for Lithium Ion Batteries](#)

[Do-Wook Jun, Yang-Kook Sun](#)

[448 Investigation of Various Factors for Capacity Fading of Li-Rich Solid Solution Cathode](#)

[Ken Sasaki, Hirokazu Munakata, Kiyoshi Kanamura](#)

[449 Cycle Performance of Metal-Substituted  \$\text{LiCoPO}\_4\$  of Coarse Particles](#)

[Shohei Miyamoto, Yusaku Noda, Hirokazu Munakata, Koji Ohira, Shuhei Yoshida, Daisuke Shibata, Kiyoshi Kanamura](#)

[450 Comparative Study on Evaluation Methods of Entropy Change of Electrochemical Reaction in Lithium-Ion Batteries](#)

[Yoshiyasu Saito, Hironori Kobayashi](#)

[451 Heat-Resisting and Flame-Retarding Difunctional Separators for Safe Lithium-Ion Battery](#)

[Suyeon Hwang, Hyunkyu Jeon, Taejoo Lee, Myung-Hyun Ryou, Yong Min Lee](#)

[452 Electrochemical Properties of Nb-Based Oxides As Active Materials for the Negative Electrode of Lithium Secondary Batteries](#)

[Soon-Ki Jeong, Yang Soo Kim](#)

[453 Nickel Oxalate Dihydrate Nanorods Attached to Reduced Graphene Oxide Sheets As a High Capacity Anode for Rechargeable Lithium Batteries](#)

[Seung-Taek Myung, Chang Heum Jo, Chong seung Yoon, Hitoshi Yashiro, Yang-Kook Sun](#)

[454 The Complete Water-Based Ceramic Coating Process for Lithium Secondary Batteries By Plasma Treatment](#)

[Hyunkyung Jeon, Hongkyung Lee, Hee-Tak Kim, Yong Min Lee, Myung-Hyun Ryou](#)

[455 N-Doped Carbon submicron Spheres Containing Sn Nanoparticles with Homogeneous Distribution As High Performance Anodes for Lithium and Sodium Ion Batteries](#)

[Seong Jin Park](#)

[456 The Effects of Surface Polyanions on the Lithium-Excess Layered Cathode](#)

[Guofeng Xu, Jianling Li, Xindong Wang](#)

[457 Evaluation of Fe Substitution Effect on the Electrochemical Properties of LiMnPO<sub>4</sub> By Single Particle Measurement](#)

[Tomohiro Omura, Yuto Yamada, Yusaku Noda, Shohei Miyamoto, Hirokazu Munakata, Koji Ohira, Shuhei Yoshida, Daisuke Shibata, Kiyoshi Kanamura](#)

[458 Difference of Relaxation Behavior Between LiNiO<sub>2</sub> and Li\(Ni, Co, Al\)O<sub>2</sub> after Lithium Extraction](#)

[Shigeomi Takai, Akihiro Tamura, Souki Kaji, Takeshi Yabutsuka, Takeshi Yao](#)

[459 Interconnected Ni Nanowire Scaffolds for Fast-Charging 3D Thin-Film Lithium-Ion Batteries](#)

[Stanislaw Piotr Zankowski, Johannes Vanpaemel, Philippe M Vereecken](#)

[460 Oxygen Generation from  \$^{18}\text{O}\$ -Doped  \$\text{Li}\_2\text{CuO}\_2\$  Caused By Electrochemical Oxidation](#)

[Tomoyuki Ozaki, Yu Taura, Kazuko Yamashita, Ryuichi Arakawa, Hideya Kawasaki, Yoshinori Arachi](#)

[461 Synthesis and Electrochemical Properties of  \$\text{Li}\_2\text{MnO}\_3\$  /  \$\text{Li}\_4\text{Mn}\_5\text{O}\_{12}\$  Binary System As Positive Electrode Materials for Lithium Ion Battery](#)

[Masaki Okada](#)

[462 Synthesis of  \$\text{LiCoO}\_2\$  Thin Film on the Solid Electrolyte By Electro-Deposition Method -for the Fabrication of All-Solid Lithium Ion Battery-](#)

[Noriyuki Sonoyama, Yuki Yoshida](#)

[463 Role of Water Molecules on the Electrochemical Properties of  \$\alpha\$ - \$\text{MnO}\_2\$  Hydrate: A Combined Computational and Experimental Study](#)

[Huan Duan, Baozheng Jiang, Jia Li, Chengjun Xu, Lin Gan, Hongda Du](#)

[464 Investigation of Coated Lithium Powder for Lithium Metal Batteries By Using Couette-Taylor Flow](#)

[Changbum Lee, Jiwoong Kim, Woo Young Yoon](#)

[465 Graphene Coated  \$\text{LiNi}\_{0.5}\text{Mn}\_{1.5}\text{O}\_4\$  for High Power Positive Electrode Material of Lithium Batteries](#)

[Chang-Woo Lee, Jun-Ho Kim, Hyun-Ju Lee, Jeom-Soo Kim](#)

[466 The Examination of the Composition of  \$x\text{Li}\_2\text{MnO}\_3\$ - \$y\text{LiNi}\_{0.5}\text{Mn}\_{0.5}\text{O}\_2\$ - \$z\text{LiNi}\_{1/3}\text{Co}\_{1/3}\text{Mn}\_{1/3}\text{O}\_2\$  Solid-Solution Cathode Materials Exhibiting High Capacity, Discharge Voltage and Rate Performance](#)



Koki Miyamoto, Takao Gunji, Yasumasa Mochizuki, Shingo Kaneko, Toyokazu Tanabe, Takeo Ohsaka, Futoshi Matsumoto

467A Novel Technique to Evaluate the Adhesion Property Between Ceramic Coated Layer and Separator Using Saicas

Seokhyeon Gong, Yunju Lee, Daeyong Yeon, YongMin Lee, Myung-Hyun Ryou

468Morphology-Tuned NiCo<sub>2</sub>O<sub>4</sub>-Coated 3D Graphene Rrchitectures As Binder-Free Electrode for Lithium Ion Battery

Chunfei Zhang, Jong-Sung Yu

469Lithium Hydroxide Based Performance Improvements for Nickel Rich Ncm Layered Cathode Material

Brian Fitch, Marina Yakovleva, Scott Meiere

470Enhanced Performance of Li-Ion Battery Cathodes By Polymeric Artificial Solid Electrolyte Interphases

Nae-Lih Wu

471Interface Design with Conducting Polypyrrole Thin Film for Improving the Storage Property of Ni-Rich Materials

Jingchao Cao, Kesong Xiao

472Bezoquinone Dimer Fused By the Tetrathiafulvalene Unit As an Organic Positive Electlode Material for Rechargeable Batteries

Minami Kato, Masaru Yao, Tetsu Kiyobayashi, Nobuhiko Takeichi, Yohji Misaki

473Mesoporous Spinel Metal Oxides As High Performance Cathode in Aqueous Rechargeable Lithium Ion Battery

Nicholas David Schuppert, Santanu Mukherjee, Alex Bates, Moon Jong Choi, Taehee Park, Sam Park

[474 Study of the Structural and Thermal Stabilities of Chemically Deintercalated Phases of NMC Type Positive Electrode Materials for Lithium Ion Batteries](#)

[Wassima El Mofid, Svetlozar Ivanov, Andreas Bund](#)

[475 Initial Coulombic Efficiency Improvement of the Li-Rich Layered Oxide Cathodes Via Tellurium Doping](#)

[Junxia Meng, Zicheng Wang, Lishuang Xu, Huaizhe Xu](#)

[476 Gradient Surface Modification of Li-Excess Layered Oxide Cathodes Using Polyanions](#)

[Weifeng Wei, Jiayu Liu, Ying Zhao, Douglas G Ivey](#)

[477 The Charge/Discharge Properties of Vinylene Carbonate-Treated Cobalt-Doped Lithium Oxide Cathode for Lithium Peroxide Batteries](#)

[Hiroaki Kobayashi, Mitsuhiro Hibino, Yoshiyuki Ogasawara, Kazuya Yamaguchi, Tetsuichi Kudo, Shinichi Okuoka, Koji Yonehara, Hironobu Ono, Yasutaka Sumida, Noritaka Mizuno](#)

[478 New Generation Cathode Materials Realizing Both Safety and High Energy Density](#)

[Yoshinori Satou, Shigeki Komine, Nobuo Yamamoto, Yuta Shimonishi](#)

[479 Improved Electrochemical Performance of  \$\text{Li}\_{1.2}\text{Ni}\_{0.2}\text{Mn}\_{0.6}\text{O}\_2\$  By  \$\text{AlF}\_3\$  Coating](#)

[Ashraf Abdel-Ghany, Rasha S El-Tawil, Ahmed M Hashem, Alain Mauger, Karim Zaghib, Christian M Julien](#)

[481 \(Battery Division Research Award\) Aqueous Lithium-Air Batteries with Protected Lithium Electrode](#)

[Nobuyuki Imanishi](#)

[482 \(Battery Division Research Award\) Activating Oxygen Chemistry for Energy Storage](#)

Yang Shao-Horn

483 (Battery Division Student Research Award) Production and Characterization of Si Based Thin Films as Negative Electrodes For Secondary Lithium Ion Batteries

Billur Deniz Polat Karahan

484 PEDOT:PSS Conducting Polymer As Binder and Conductive Additive for Silicon Nanoparticle-Based Lithium-Ion Battery Anodes

Sang-Hoon Park, Thomas Higgins, Paul J King, Chuanfang Zhang, Jonathan N Coleman, Valeria Nicolosi

485 An Self-Healing Effective Binder for Silicon Anodes in Lithium Ion Batteries

Bing Yu, Zhaohui Wu, Juanyu Yang, Han Wang, Bimeng Shi

486 Coronene-Based Conductive and Ductile Polymer Binder for Lithium-Ion Batteries

Omer Suat Taskin, Neslihan Yuca, Mehmet Emre Cetintasoglu, Murat Ferhat Dogdu, Ipek Avci

487 Poly(fluorene phenylene) Graft Copolymer As a Novel Binder with Polyvinylpyrrolidone for High-Capacity Silicon Anode in Lithium-Ion Batteries

Ipek Avci, Omer Suat Taskin, Neslihan Yuca, Mehmet Emre Cetintasoglu, Murat Ferhat Doğdu

488 Understanding of the Polyacrylic Acid Role As Efficient Binder in Silicon Based Electrode for Li-Ion Battery

Willy Porcher, Sophie Chazelle, Nicolas Mariage, Adrien Boulineau, Cédric Haon, Jean-Sébastien Bridel, Tim Van Rompaey

489 Kraft Lignin - an Alternative Sustainable Binder Material for Green Li-Ion Batteries

Huiran Lu, Ann Cornell, Fernando Alvarado, Mårten Behm, Simon Leijonmarck, Jiebing Li, Per Tomani, Göran Lindbergh

[490The Role of Polymer Binders in Alloy Anodes](#)

[Timothy Hatchard, Paul Bissonnette, Mark N Obrovac](#)

[491Guar Gum: A Promising Aqueous Binder for Electrode Material with High Energy Density](#)

[Jun-Tao Li, Zhan-Yu Wu, Jie Liu, Tao Zhang, Ling Huang, Shi-Gang Sun](#)

[492Localized Electrochemical Analysis of Polyacrylate Binders on Graphite-Silicon Negative Electrodes in Lithium-Ion Batteries](#)

[Akichika Kumatani, Tetsuya Watanabe, Takahashi Yasufumi, Kei Kubota, Hiroki Ida, Hitoshi Shiku, Shinichi Komaba, Tomokazu Matsue](#)

[493Bian Based Copolymer As Binder Material for Graphite Anode in Lithium Ion Batteries](#)

[Sai Gourang Patnaik, Raman Vedarajan, Noriyoshi Matsumi](#)

[494The Effect of Polymer Binder on the Electrochemical Performance of Si/C Anodes](#)

[Lydia Terborg, Min Ling, Kaiqi Nie, Antoine Dahi, Chenghao Wu, Jinghua Guo, Philip N Ross, Gao Liu, Robert Kostecki](#)

[495Preparation and Electrochemical Evaluation of LiCoO<sub>2</sub> Film Prepared with Cold Spraying for Development of Lithium-Ion Battery](#)

[Kohei Okuyama, Naoki Yoshida, Kazuhisa Sato, Toshiyuki Hashida](#)

[496Graphene Modified Feof Nano-Structured Hybrid As Cathode Materials for Li-Ion Battery](#)

[Yadong Liu, Fan Yang, Le Xin, Yang Ren, Chengjun Sun, Yuzi Liu, Jian Xie](#)

[497Development of a Water Based Process for Stable Conversion Cathodes on the Basis of FeF<sub>3</sub>](#)

[Alexander Herald Pohl, Mohammadkazem Faraz, Andreas Schröder, Michael Baunach, Wilhelm Schabel, Alexander Guda, Viktor Shapovalov, Alexander Soldatov, Venkata Sai Kiran Chakravadhanula, Christian Kübel, Ralf Witte, Horst Hahn, Thomas Diemant, Rolf Jürgen Behm, Hermann Emerich, Maximilian Fichtner](#)

498 [Fluorolytic Sol-Gel Preparation of a Composite of Lithium Fluoride and Iron Difluoride As a Positive Electrode Material for Lithium Secondary Batteries](#)

[Shinya Tawa, Kazuhiko Matsumoto, Rika Hagiwara](#)

499 [Sulfurized Polyethylene Glycol As Electrode Material for Li-S Battery](#)

[Toshikatu Kojima, Hisanori Ando, Nobuhiko Takeichi, Hiroshi Senoh](#)

500 [Polyanion Glass Cathodes -- a Clearer Picture](#)

[Andrew Keith Kercher, James A. Kolopus, Robert L Sacci, Rose Emily Ruther, Kyler J. Carroll, Lynn A. Boatner, Nancy J Dudney](#)

501 [Lithium Titanium Sulfide Thin Film Cathodes for All-Solid-State Lithium-Ion Batteries: Taking Advantage of a Dual Cation and Anion-Based Redox Process](#)

[Frédéric Le Cras, Vincent Flamary, Vincent Dubois, Hervé Martinez, Brigitte Pecquenard](#)

502 [Sonication-Induced Colloidal Nanocrystals of High-Capacity Cathode Material for Advanced Lithium-Ion Batteries](#)

[Jianqing Zhao, Ruiming Huang, Lijun Gao, Huixin He, Ying Wang](#)

503 [Melt Synthesis of LiFePO<sub>4</sub>: Fundamentals, Versatility and Application](#)

[Majid Talebi-Esfandarani, Steeve Rousselot, Liling Jin, Thomas Bibienne, Michel Gauthier, Patrice Chartrand, Pierre Sauriol, Ali Seifitokaldani, Guoxian Liang, Mickael Dollé](#)

504 [Role of Cathode-Electrolyte-Ferroelectric Interface for High Performance Lithium Ion Battery](#)

[Sou Yasuhara, Keisuke Chajima, Takashi Teranishi, Shintaro Yasui, Tomoyasu Taniyama, Mitsuru Itoh](#)

[505Ca-doped  \$\text{Li}\_4\text{Ti}\_5\text{O}\_{12}\$  Nanosphere as a Superior Anode Material for Lithium-ion Batteries](#)

[Qianyu Zhang](#)

[506Approaches to Develop High Capacity and Long-Cycle Life Anodes for Lithium Ion Battery](#)

[Xiao-Dong Zhou, Kuber Mishra](#)

[507Surface Modification Strategies of High Capacity Anodes Towards Exceptional Robust Cycling](#)

[Yue Ma](#)

[508 \$\text{Co}\_3\text{O}\_4\$  quantum Dots Uniformly Confined into Sheet-like SWCNT Matrix for Highly Reversible Lithium Storage](#)

[Zhiqiang Xie, Chengmin Jiang, Angel A Martí, Ying Wang](#)

[509Structurally Defined Nanographene Assemblies for Highly Efficient Lithium Storage](#)

[Hung-Ju Yen, Hsinhan Tsai, Ming Zhou, Aiping Chen, Edward F. Holby, Samrat Choudhury, Xianliang Wang, Linxiang Zhu, Haiqing Lin, Liming Dai, Lyudmyla Adamska, Sergei Tretiak, Gang Wu, Hsing-Lin Wang](#)

[510Laser Pyrolysed N-Doped  \$\text{SnO}\_x\$  Nanoparticles with Enhanced Conductivity and Stability As Anode in Li-Ion Batteries](#)

[Luyuan Paul Wang, Yi Zhao, Chao Wei, Yann Leconte, Madhavi Srinivasan, ZhiChuan, Jason Xu](#)

[511Influence of Cobalt and Sodium Doping on  \$\text{MnO}/\text{CNT}\$  Composite Anode Materials for Li-Ion Batteries](#)

Alessandro Palmieri, Raana Kashfi-Sadabad, Sajad Yazdani, Michael Pettes, William E Mustain

512C and N Co-Doped CuO Hollow Microspheres Derived from Cu/Cu<sub>2</sub>O Assembles As High Performance Anode Materials for Lithium Ion Batteries

Sicen Yu, Zhouguang Lu, Fucong Lyu, Shaofei Wu, Bo Nan, Zhenyu Wang, Lujie Cao, Zhifang Sun, Mingchan Li, Mingyang Yang, Wenxi Wang, Chaoqun Shang

513Electrochemical Characterization of Phosphorus Encapsulated in Drilled Carbon Nanotubes as Anode Material for Lithium Ion Batteries

Tomohiro Tojo, Shinpei Yamaguchi, Ryoji Inada, Yoji Sakurai

514Double-Sided Carbon Covered Hierarchical Tin Oxide Anode for High Capacity Lithium-Ion Batteries

A-Young Kim, Dongjin Byun, Joong Kee Lee

515Solution Combustion Synthesis of Transition Metal Oxide-Carbon Composite for Li Ion Battery Anode

Chunyu Zhu, Yoshitaka Aoki, Hiroki Habazaki

516Factors Affecting the Electrochemical Performance of Graphene like Graphite

Junichi Taninaka, Shunya Maruyama, Katsuki Hashiguchi, Yoshiaki Matsuo, Yasuji Muramatsu, Qian Cheng, Yasuharu Okamoto, Noriyuki Tamura, Tomoo Murakami

517Oxygen Containing Carbon Materials for High Capacity and Fast Chargeable Anode Materials of Lithium Ion Batteries

Qian Cheng, Yasuharu Okamoto, Tomoo Murakami, Masayoshi Tsuji, Yoshiaki Matsuo

518Exfoliated Graphite and Copper Oxide Hybrid Anode for High Capacity and Stable Li Ion Battery

[Sanghun Cho, Jeeyoung Yoo, Yong-keon Ahn, Duck-Jae You, Sung Yun Chung, Youn Sang Kim](#)

519 [Development of a Core Void Shell Silicon Nanoparticle for Use in High Capacity Anodes](#)

[Maarten Verheijen, Boaz Moeremans, Thomas Vranken, An Hardy, Marlies K Van Bael](#)

520 [Superior Li-Storage Performances of Liquid-Phase Exfoliated Two-Dimensional Gallium Sulfide Nanosheets/Single-Walled Carbon Nanotubes Flexible Composite](#)

[Chuanfang Zhang, Sang Hoon Park, Oskar Ronan, Andrew Harvey, Jonathan N Coleman, Valeria Nicolosi](#)

521 [Reduced Graphene Oxide Sheets Attached Tin Oxalate Dihydrate As a High Capacity Anode for Lithium Ion Rechargeable Batteries](#)

[Jae sang Park, Seung-Taek Myung](#)

522 [Electrochemical Properties of Nickel Oxide Nanostructures Grown Using a Low Pressure Chemical Vapor Deposition Process As Anode in Lithium Ion Batteries](#)

[Venkata Sreenivas Puli, Joshua Adkins, Corey L Arnold, Lamartine Meda](#)

523 [Flexible, Three-Dimensional Ordered Macroporous TiO<sub>2</sub> Electrode with Enhanced Electrode-Electrolyte Interaction in High-Power Li-Ionbatteries](#)

[Gregory Lui, Ge Li, Xiaolei Wang, Gaopeng Jiang, Edric Lin, Michael Fowler, Aiping Yu, Zhongwei Chen](#)

524 [Synthesis, Characterization and Electrochemical Properties of Germanium@Multiwalled Carbon Nanotubes Composite As Anode in Lithium Ion Batteries](#)

[Subrahmanyam Goriparti, Remo Proietti Zaccaria, Claudio Capiglia](#)

525 [Bismuth Thin Films As Anodes for Low Voltage All-Solid-State Li-Ion Batteries](#)



[Brigitte Pecquenard, Jules Galipaud, Stéphane Cotte, Frédéric Le Cras](#)

[526Effect of Iodination Temperature on the Polyvinyl Alcohol Based Carbon Nanofiber for Lithium Ion Battery Anodes](#)

[Esra Serife Pampal, Elena Stojanovska, Serra Kucukkalfa, Davut Uzun, Safak Yilmaz, Ali Kilic](#)

[527Improving High-Rate Performance of Graphene Anode By Anchoring Titanium Nitride Nanoparticles in Lithium Ion Batteries](#)

[Elahe Yousefi, Mohammad Ghorbani, Abolghasem Dolati, Hitoshi Yashiro](#)

[528Activation of Al<sup>3+</sup> Ion Redox in the Conversion Type Anode Material for Lithium Ion Battery](#)

[Noriyuki Sonoyama, Yoshitaka Ogasawara, Tomokatsu Aoi, Satoshi Yoshida](#)

#### **A04-Advances in Electrolytes for Lithium Batteries**

[529Electrolyte Systems for High Energy Cells](#)

[Daniel P Abraham](#)

[530Low Temperature Electrolytes in High Specific Energy 18650 Li-Ion Cells for Future NASA Missions](#)

[Marshall C. Smart, Frederick C. Krause, John-Paul Jones, Larry D. Whitcanack, Bugga V. Ratnakumar, Erik J. Brandon, Mark Shoesmith](#)

[531\(Invited\) CsPF<sub>6</sub> and Propylene Carbonate in Conventional LiPF<sub>6</sub>/Carbonate Electrolytes for Enhanced Lithium-Ion Battery Performances in Wide Temperature Range](#)

[Wu Xu, Hongfa Xiang, Jianming Zheng, Qiuyan Li, Donghai Mei, Pengfei Yan, Ruiguo Cao, Mark H Engelhard, Shuhong Jiao, Samuel Cartmell, Bryant J. Polzin, Chongmin Wang, Ji-Guang Zhang](#)

[532\(Invited\) Structure and Properties of Electrolyte Solutions Based on Fluorinated Alkylphosphates As Nonflammable Solvents for Lithium-Ion Batteries](#)

[Yanko Todorov, Kenta Fujii, Masahiro Aoki, Hideyuki Mimura, Nobuko Yoshimoto, Masayuki Morita](#)

[533Advanced Design of Lifs-Based Electrolyte for High Performance Li-Ion Battery](#)

[Satoshi Uchida, Masaki Yamagata, Masashi Ishikawa](#)

[534MCMB-LiNiCoAlO<sub>2</sub>-Based Li-Ion Cells with Methyl Propionate-Based Electrolytes for Very Low Temperature Applications](#)

[Marshall C. Smart, Christine L. Fuller, Frederick C. Krause, John-Paul Jones, Larry D. Whitcanack, Bugga V. Ratnakumar, Michael R. Tomcsi, Vince Visco](#)

[535The Effect of Electrolyte Composition and Additives on Lithium Plating during Low Temperature Charging](#)

[John-Paul Jones, Marshall C. Smart, Frederick C. Krause, Bugga V. Ratnakumar, Erik J. Brandon](#)

[536\(Invited\) Electrochemical Properties of Graphite Electrode in Propylene Carbonate-Based Electrolyte Solution Containing Mg Salt](#)

[Takeshi Abe, Saya Takeuchi, Heeyoub Song, Ryohei Kokumai, Kohei Miyazaki, Tomokazu Fukutsuka](#)

[537Practical Sulfolane-Based Electrolytes: Choice of Li Salt for Graphite Anode Operation](#)

[Tong Zhang, Serife Kaymaksiz, Iratxe De Meatza, Elie Paillard](#)

[538\(Invited\) Fluorinated Electrolytes for 5-V Li-Ion Chemistry](#)

[Zhengcheng Zhang, Libo Hu, Meinan He, Chi-Cheung Su, Adam Tornheim](#)

[539Development of Novel Electrolyte Additives for Designed Surface Modification](#)

[Brett L Lucht](#)

[540Decomposition of Electrolyte and Composite Cathode Materials in High-Voltage Lithium Batteries](#)

[Yoshiharu Matsumae, Daiki Watanabe, Shoshi Terada, Ryoichi Tatara, Kaoru Dokko, Masayoshi Watanabe](#)

[541A New Anion Receptor for Improved Interface Between the Lithium- and Manganese-Rich Layered Oxide Cathode and the Electrolyte](#)

[Yulin Ma, Yan Zhou, Geping Yin, Feng Lin, Guoying Chen](#)

[542\(Invited\) Electrolyte Additives for High-Voltage Lithium-Ion Battery Cathodes](#)

[Stefano Passerini, Agnese Birrozzì](#)

[543High Voltage Compatible Bi-Functional Electrolyte for Li Metal Batteries](#)

[Won-seok Chang, Toshinori Sugimoto, Tomonobu Mizumo, Yong-Gun Lee, Hong Soo Choi, Hyorang Kang, Taehwan Yu, Seokgwang Doo](#)

[544Temperature Responsive Composite Gel-Polymer Electrolytes for Lithium-Sulfur Batteries](#)

[Almagul Mentbayeva, Bakdaulet Isakhov, Asylzat Aishova, Dauren Batyrbekuly, Yongguang Zhang, Zhumabay Bakenov](#)

[545Highly-Ordered Structural Deposition of  \$\text{Li}\_2\text{O}\_2\$  in Li- \$\text{O}\_2\$  Battery](#)

[Yoko Hase, Juntaro Seki, Tohru Shiga, Hidetaka Nishikoori, Hideki Iba, Kensuke Takechi](#)

[546Optimization of Dual-Salt Electrolytes for Rechargeable Lithium Metal Batteries](#)

[Shuhong Jiao, Jianming Zheng, Samuel Cartmell, Ji-Guang Zhang, Wu Xu](#)

[547\(Invited\) Advanced Electrolytes for Lithium Metal Electrode](#)

Hoogil Lee, Hyunkyu Jeon, Myung-Hyun Ryou, Yong Min Lee

548A Reversible Dendrite-Free High-Areal-Capacity Metallic Lithium Electrode

Hui Wang, Masaki Matsui, Hiroko Kuwata, Yasuaki Matsuda, Xuefu Shang, Yasuo Takeda, Osamu Yamamoto, Nobuyuki Imanishi

549Li<sub>7</sub>La<sub>3</sub>Zr<sub>2</sub>O<sub>12</sub> Interface Modification for Li Dendrite Prevention

Martin Finsterbusch, Chih Long Tsai, Vladimir Roddatis, Vinod Chandra Nair, Qianli Ma, Sven Uhlenbruck, Paul Heitjans, Olivier Guillon

550Oxygen Electrode Reactions in Dilakylacetamide-Based Electrolytes for Lithium-Air Batteries

Amell Musaid Alsudairi, Sanjeev Mukerjee, K.M. Abraham

551Probing the Role of Solvent and Salt in Lithium Sulfur Redox Reactions

Qingli Zou, Yi-Chun Lu

552Theoretical Investigation on the Behavior of Tetrathiafulvalene (TTF) As a Red-Ox Mediator for Charge Process of Li-Air Battery

Sunho Jung, Kazuto Akagi

553(Invited) Solvate Ionic Liquids for Advanced Lithium Batteries

Masayoshi Watanabe

554(Invited) Concentrated Liquid Electrolytes

Atsuo Yamada, Yuki Yamada

555(Invited) Highly Concentrated LiBF<sub>4</sub>-Based Electrolyte Solutions for LiNi<sub>0.5</sub>Mn<sub>1.5</sub>O<sub>4</sub> Positive Electrodes in Lithium Ion Batteries

Takayuki Doi, Yusuke Shimizu, Michihiro Hashinokuchi, Minoru Inaba, Katsuyuki Takahashi, Hidemi Inoue, Hiroe Nakagawa, Tokuo Inamasu

556(Invited) Fsi-Based Ionic Liquid Electrolyte and Lifsi-Based Solvent Electrolyte for Excellent Lib Performance

Masashi Ishikawa, Masaki Yamagata, Satoshi Uchida, Yukiko Matsui

557Monte-Carlo Simulation of the Ionic Transport of Electrolyte Solutions at High Concentrations Based on the Pseudo-Lattice Model

Tetsu Kiyobayashi, Kentaro Kuratani, Hiroyuki Ozaki

558In Situ Electrochemical Measurements of Deposition and Dissolution of Lithium in Li[N(CF<sub>3</sub>SO<sub>2</sub>)<sub>2</sub>]-Glyme Solvate Ionic Liquids

Naoki Tachikawa, Shin Hosoda, Takuya Ishida, Kazuki Yoshii, Masayoshi Watanabe, Yasushi Katayama

559Functionalized Cyclic Phosphonium (CylP<sup>+</sup><sub>n</sub>A<sup>-</sup>) Ionic Liquids As Candidate Materials for Li-Ion Battery Electrolytes

Gopi Krishna Phani Dathar, Shanthi Pandian, Krishnan S Hariharan, Dahye Park, Hyorang Kang

560Metal Organic Frameworks/Ionic Liquid Composites As Electrolytes for Li-Ion Batteries

Ankit Singh, Raman Vedarajan, Noriyoshi Matsumi

561Ionic Liquid/Borane Binary Electrolyte with Remarkably High Lithium Transference Number

Noriyoshi Matsumi, Kento Matsui, Emari Tamaru, Raman Vedarajan

562Transport Phenomena of Nonaqueous Electrolyte Solutions at High Concentrations: A Comparison Between the Li- and Na-Systems

[Kentaro Kuratani, Iori Kishimoto, Yasuhiro Nishida, Ryota Kondo, Hiroyuki T Takeshita, Hiroshi Senoh, Tetsu Kiyobayashi](#)

[563 Electroactive Ionic Liquids Based on Anions Modified with 1,4-Dimethoxybenzene As Redox Shuttle for Overcharge of Lithium-Ion Batteries](#)

[Bruno Gelinas, Thomas Bibienne, Mickael Dollé, Dominic Rochefort](#)

[564 A New Technique for Measuring the Diffusion Coefficient of Electrolytes for Lithium-Ion Batteries](#)

[Michael Schoenleber, André Weber, Ellen Ivers-Tiffée](#)

[565 Reconstruction of the LiCoO<sub>2</sub> Near-Surface Region upon Overgrowth of Lipon](#)

[Yuta Sugimoto, Satoru Ohuchi, Tetsuya Asano, Toshiro Kume](#)

[566 \(Invited\) Impact of Electrolytes on Li<sup>+</sup> Charge Transfer Kinetics at the Electrolyte and Electrode Interface and Rate Performance in Li-Ion Batteries](#)

[Taiguang Richard Jow, Samuel A. Delp, Joshua L. Allen, Oleg Borodin, Jan L. Allen](#)

[567 Analysis of the Reduction and Oxidation of Vinylene Carbonate \(VC\) and Fluoroethylene Carbonate \(FEC\) in Graphite/LiNi<sub>0.5</sub>Mn<sub>1.5</sub>O<sub>4</sub> Cells By Electrochemical Impedance Spectroscopy](#)

[Daniel Pritzl, Sophie Solchenbach, Hubert A. Gasteiger](#)

[568 Advanced Characterization of a Stabilized Solid Electrolyte Interphase on Silicon Anodes for Lithium-Ion Batteries By in-Situ Electrochemical Surfaces Forces Apparatus](#)

[Boaz Moeremans, Hsiu-Wei Cheng, Claudia Merola, Markus Valtiner, Yueming Zheng, Marlies K Van Bael, An Hardy, Frank Uwe Renner](#)

[569 Electrochemical Characterization and Interfacial Chemistry of Tin-Based Anode Materials for Mg-Ion Batteries](#)

[Dan Thien Nguyen, Xuan Minh Tran, Seung-Wan Song](#)

[570SEI Film Formation Mechanism Based on Aggregation Configurations of Electrolyte Decomposed Products: DFT-MD Study](#)

[Keitaro Sodeyama, Keisuke Ushirogata, Yukihiro Okuno, Yoshitaka Tateyama](#)

[571DFT-MD Study of Interface Between Carbon Anode and Amorphous Lithium Carbonate](#)

[Yoshiumi Kawamura, Takeshi Baba, Nobuaki Takahashi, Keitaro Sodeyama, Yoshitaka Tateyama](#)

[572Atomistic Simulation of Solid Electrolyte Interphase \(SEI\) Using Reactive Force Field](#)

[Woon Ih Choi, Min Sik Park, Youngseon Shim, Hyo Sug Lee, Jaykwang Shin](#)

[573Charge Transfer Resistance Between Garnet-Type Solid Electrolyte and Lithium Metal Anode](#)

[Rajendra Hongahally Basappa, Tomoko Ito, Hirotochi Yamada](#)

[574Preferentially Ordered Solid Electrolytes for Fuel Cell and Lithium Battery](#)

[Yu-shin Fang, Robin Chih-Hsing Wang, Alice Yi-han Chang, Peter Po-Jen Chu](#)

[575Interfacial Lithium-Ion Transfer Between Graphite Negative Electrode and Sulfide Solid Electrolyte](#)

[Meiqi Huang, Tomokazu Fukutsuka, Kohei Miyazaki, Akitoshi Hayashi, Masahiro Tatsumisago, Takeshi Abe](#)

[576Nanohybrid Polymer Electrolytes with Enhanced Safety and Electrochemical Performance](#)

[Weifeng Wei, Jinfang Zhang, Cheng Ma](#)

[577Growth of  \$\text{Li}\_{6.75}\text{La}\_3\text{Zr}\_{1.75}\text{Nb}\_{0.25}\text{O}\_{12}\$  Crystals in Molten  \$\text{Li}\_3\text{BO}\_3\$  Glass and Their Electrochemical Characteristics As a Hybrid Solid Electrolyte By Using Electrochemical Impedance Spectroscopy](#)

Sakina Kaneko, Miho Yamashita, Nobuyuki Zetsu, Katsuya Teshima

578 Chemical and Structural Changes of  $\text{Li}_2\text{S-P}_2\text{S}_5$  Solid Electrolyte during Heat Treatment

Yasuhito Aoki, Kengo Ogawa, Takeshi Nakagawa, Yuichi Hasegawa, Yoko Sakiyama, Toshikatu Kojima, Mitsuharu Tabuchi

579 Solid Polymer Electrolyte Embedded with Ionic Liquid for Lithium-Ion Battery Operating at Ambient Temperature

Duck-Jae You, Jeeyoung Yoo, Yong-keon Ahn, Sanghun Cho, Sung Yun Chung, Youn Sang Kim

580 Lithium Diffusion Coefficient of Amorphous Lithium Phosphate Thin Films Measured By Secondary Ion Mass Spectroscopy

Xiaoli Lu, Naoaki Kuwata, Takamichi Miyazaki, Junichi Kawamura

581 Impact of Proton Contamination on the Solid Electrolyte  $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$  (LLZO)

Seungho Yu, Donald J Siegel

582 Ab Initio Calculations of Ionic Conductivity in Lithium and Sodium Polyborate Solid Electrolytes

Brandon C. Wood, Joel Varley, Kyoung Kweon, Vitalie Stavila, Terrence John Udovic

583 Thermoplastic Polyurethane (TPU) Based All-Solid-State Lithium-Ion Batteries

Yadong Liu, Nojan Aliahmad, Jian Xie, Mangilal Agarwal

584 Stable Cyclability of Novel Triblock Polyelectrolyte Separators for Lithium Metal Battery

Kun Lin Liu, Chi Yang Chao



[585 Electrochemical Properties of Amorphous  \$\text{Li}\_3\text{PS}\_4\$  Films Synthesized by Pulsed Laser Deposition using  \$\text{Li}\_2\text{S}\$ -Excess Targets](#)

[Zhen Quan, Masaaki Hirayama, Daichi Sato, Yueming Zheng, Taka-aki Yano, Kosuke Hara, Kota Suzuki, Masahiko Hara, Ryoji Kanno](#)

[586 Effects of an Organic Chemical Additive in Electrolyte on the Suppression of Lithium Dendrite in Lithium Metal Based Batteries](#)

[Van-Chuong Ho, Duc Tung Ngo, Hang T.T. Le, Su-Won Kim, Chan-Jin Park](#)

[587 Local Structure and Composition Variation at Surface of Lithium-Ion Conducting Solid Electrolyte](#)

[Hirotooshi Yamada](#)

[588 Concentrated  \$\text{LiBF}\_4/\text{PC}\$  Electrolyte Solutions for 5 V  \$\text{LiNi}\_{0.5}\text{Mn}\_{1.5}\text{O}\_4\$  Positive Electrode in Lithium-Ion Batteries](#)

[Yusuke Shimizu, Michihiro Hashinokuchi, Takayuki Doi, Minoru Inaba, Katsuyuku Takahashi, Hidemi Inoue, Hiroe Nakagawa, Tokuo Inamasu](#)

[589  \$\text{Na}\_{10}\text{TiP}\_2\text{Se}\_{12}\$  As Novel Electrolyte for All-Solid-State Na-Battery](#)

[Dehui Zhang, Liqing He, Dong Wu, Zhouguang Lu](#)

[590 The Effect of Heating Rate on Li Losses from Al Stabilized  \$\text{Li}\_7\text{La}\_3\text{Zr}\_2\text{O}\_{12}\$](#)

[Kamil Burak Dermenci, Servet Turan](#)

[591 Li Insertion and Removal Potentials of  \$\text{Li}\_7\text{P}\_3\text{S}\_{11}\$  Using VASP Calculation](#)

[Chil-Hoon Doh, Yoon-Cheol Ha, You-Jin Lee, Jun-Woo Park](#)

[592 Preparation of Amorphous Lipon Electrolyte Particles Using the Polygonal-Barrel Plasma Treatment System](#)

[Hideki Nishizawa, Hiroaki Iwane, Yuzo Tasaki, Hideshi Kikuyama, Yuji Honda, Takayuki Abe](#)

[593A Novel Solid Electrolyte Material \( \$\text{Li}\_{17}\text{Ge}\_2\text{P}\_3\text{S}\_{20}\$ \) with High Ionic Conductivity](#)

[Dong Wu, Liqing He, Dehui Zhang, Zhouguang Lu](#)

[594Effect of Lithium Nitrate \( \$\text{LiNO}\_3\$ \) on Lithium Metal Secondary Batteries As a Lithium Metal Stabilizing Electrolyte Additive](#)

[Dahee Jin, Hoogil Lee, Taeyeong Han, Seokwoo Kim, Myung-Hyun Ryou, YongMin Lee](#)

[595Gel Electrolytes Incorporated with Graphene-Oxide Quantum Dots for High Performance in Lithium Ion Batteries](#)

[Yen-Ming Chen, Hsisheng Teng](#)

[596DFT Molecular Dynamics Simulations of  \$\text{Li}^+\$](#)

[Nima Leclerc, Nicole Adelstein](#)

[597Mixed Lithium Indium Halides As Solid-Electrolytes: Computational Experiments on Drivers of  \$\text{Li}^+\$  Diffusion](#)

[Thomaz Coelho Alves, Alysia Zevgolits, Nicole Adelstein](#)

[598First-Principles Molecular Dynamics of Non-Arrhenius  \$\text{Li}^+\$  Diffusion in Solid Electrolytes for Batteries](#)

[Alysia Zevgolits, Thomaz Coelho Alves, Nicole Adelstein](#)

[599High Ionic Conductivity and Moduli Ionogels Made with Tetraglyme/Litfsi /Methyl Cellulose for Lithium Batteries](#)

[Parameswara Rao Chinnam, Sumanth Chereddy, Stephanie Wunder](#)

[600Lithium Dendrite Suppressing Effect of Fluoroethylene Carbonate Additive on Surface Patterned Lithium Metal](#)

[Hoogil Lee, Taeyeong Han, Dahee Jin, Yong Min Lee, Myung-Hyun Ryou](#)

[601Applications of Solution Process for  \$\text{Li}\_4\text{SnS}\_4\$ -Based Solid Electrolytes to All-Solid-State Lithium-Ion Batteries](#)

[Dong Hyeon Kim, Kern Ho Park, Young Eun Choi, Dae Yang Oh, Sung Hoo Jung, Yoon Seok Jung](#)

[602A Piperidinium-Based Ester-Functionalized Task-Specific Ionic Liquid As Electrolytes in Li/LiFePO<sub>4</sub> Batteries](#)

[Peixia Yang, Xiaona Pan, Jinqiu Zhang, Maozhong An](#)

[603In-Situ AFM Observation of Highly Oriented Pyrolytic Graphite in PC-Based Electrolyte Solution Containing Magnesium Ion](#)

[Ryohei Kokumai, Hee-Youb Song, Tomokazu Fukutsuka, Kohei Miyazaki, Takeshi Abe](#)

[604Enhanced High-Voltage Stability of  \$\text{LiNi}\_{0.6}\text{Co}\_{0.2}\text{Mn}\_{0.2}\text{O}\_2\$  Cathode By Using Electrolyte Additive](#)

[Jae-Hee Kim, Hieu Quang Pham, Eui-Hyung Hwang, Young-Gil Kwon, Jung-Gyu Lee, Seung-Wan Song](#)

[605All Solid-State Lithium Cells Employing Hybrid Solid Electrolytes Containing  \$\text{Li}^+\$ -Conducting Inorganic Electrolyte](#)

[Myungsoo Park, Yun-Chae Jung, Dong-Won Kim](#)

[606Determination of Mass Transfer Properties and Ionic Association in  \$\text{LiPF}\_6\$  - Organic Carbonates Solutions from PFG-NMR and Specific Conductivity Data](#)

[Sergey A Krachkovskiy, J David Bazak, Sean Fraser, Gillian R. Goward, Ion C. Halalay](#)

[607Novel Carbonate-Based Polymer Electrolytes for All-Solid-State Li Batteries](#)

Yoichi Tominaga

608 High Performance Cross-Linked Composite Gel Polymer Electrolyte Using Mesoporous and Reactive SiO<sub>2</sub> Nanoparticles for Lithium-Ion Polymer Cells

Won-Kyung Shin, Myunsoo Park, Dong-Won Kim, Young Rae Kim

609 Polymeric Gel Electrolyte Consisting of Network Polymer Using Tri-Functional Glycerol Ester for Li-Ion Batteries

Seiya Tanji, Kazuhiro Yamabuki, Kenta Fujii, Masayuki Morita, Nobuko Yoshimoto

610 Measurement of Ionic Conductivity and Mechanical Property of Slide-Ring Gel Swollen with Propylene Carbonate Including Lithium Ions

Naoki Sugihara, Shinji Kanehashi, Koichi Mayumi, Yoichi Tominaga, Takeshi Shimomura, Kohzo Ito

611 High Lithium-Ion Conducting Nasicon-Type Li<sub>1+x-y</sub>Al<sub>x</sub>Nb<sub>y</sub>Ti<sub>2-x-y</sub>(PO<sub>4</sub>)<sub>3</sub> Solid Electrolyte

Xuefu Shang, Hiroyoshi Nemori, Shigehi Mitsuoka, Yasuo Takeda, Osamu Yamamoto, Nobuyuki Imanishi

612 Synthesis Characteristics of Garnet-Llzo Materials By Modified Co-Precipitation

Seung-Hoon Yang, Min-Young Kim, Da-Hye Kim, Kyeong-Joon Kim, Seung-Woo Choi, Tae-Hyoung Noh, Moo-Sung Lee, Ho-Sung Kim

613 Influence of Solid Electrolyte Interphase Stabilization on Cycling Performance of Silicon-Graphite Composite Battery Anodes

Jaeram Kim, Hyuntak Jo, Dan Thien Nguyen, Do-Man Jeon, A-Reum Yang, Seung-Wan Song

614 Improved Low-Temperature Performance of Li-Ion Battery of LiCoO<sub>2</sub>//Graphite By Electrolyte Control

Hieu Quang Pham, Jae-Hee Kim, Young-Gil Kwon, Eui-Hyung Hwang, Jung-Gyu Lee, Seung-Wan Song

615 Local Structure and Electrochemical Performances of Garnet-like Solid Electrolyte Densified By Spark Plasma Sintering

Hirotooshi Yamada, Tomoko Ito, Rajendra Hongahally Basappa

616 Optimizing Alkali Ionic Conductivity in Superionic Conductor Solid Electrolytes

Shyue Ping Ong, Ying Shirley Meng, Iek-Heng Chu, Han Nguyen, Sunny Hy, Zhuoying Zhu, Yuh-Chieh Lin, Zhi Deng, Zihan Xu, Zhenbin Wang, Christopher Kompella

617 Composite Polymer-Ceramic Electrolyte for High-Energy Lithium Secondary Batteries

Amaresh Samuthira Pandian, Frank Delnick, Nancy J Dudney

618 (Invited) Solution-Processable Li and Na Superionic Conductors for All-Solid-State Batteries

Kern Ho Park, Abhik Banerjee, Dong Hyeon Kim, Seung-Tae Hong, Seung Mo Oh, Yoon Seok Jung

619 (Invited) in Situ Functional Imaging of Electrodes for All-Solid-State Batteries

Marina S. Leite

620 Ion-Conductive Properties of Novel Polymer Electrolytes Based on Ethylene Oxide/Ethylene Carbonate Copolymers

Takashi Morioka, Koji Nakano, Yoichi Tominaga

621 Chemically Anchored Liquid-PEO Based Block Copolymer Electrolytes for Solid-State Lithium-Ion Batteries

Jean Francois Gohy

622 Quasi-Solid State Electrolytes for Li-Ion Battery Applications

Itaru Honma, Takahiro Matsuo, Atsushi Unemoto, Yoshiyuki Gambe

623 Thin Film Processing of Amorphous Lithium Lanthanum Titanate Based Solid-State Microbatteries

Jungwoo Zema Lee, Ziyang Wang, Cyrus Sam Rustomji, Thomas Andrew Wynn, Ying Shirley Meng

624 Synthesis, Structure and Electrochemical Properties of Garnet-like Lithium Conductor  $\text{Li}_{7-x-3y}\text{Al}_y\text{La}_3\text{Zr}_{2-x}\text{Ta}_x\text{O}_{12}$

Yasuaki Matsuda, Yuya Itami, Kikuko Hayamizu, Toru Ishigaki, Masaki Matsui, Yasuo Takeda, Osamu Yamamoto, Nobuyuki Imanishi

625 Functional Design of Nitrile-Based Electrolyte Components

Mariano Grünebaum, Alexander Pelz, Babak R. Rad, Annika Buchheit, Daniel Krause, Benjamin Pohl, Martin Winter, Hans-Dieter Wiemhöfer

626 Electrochemical Behavior of  $\text{Li}_4\text{Ti}_5\text{O}_{12}$  in Ionic Liquid/Water Bilayer Electrolyte

Hiroshi Miwa, Tomokazu Fukutsuka, Kohei Miyazaki, Takeshi Abe

627 Physicochemical Properties and Electrochemical Stabilities of Highly Concentrated Electrolytes

Daiki Watanabe, Shoshi Terada, Yoshiharu Matsumae, Ryoichi Tatara, Kaoru Dokko, Masayoshi Watanabe

628 Study of the Effect of Electrolyte Concentration on Li-Air Battery Performance

Ryoichi Tatara, David Kwabi, Michal Tulodziecki, Thomas Batcho, Hoi-Min Kwon, Morgan L. Thomas, Carl V. Thompson, Kaoru Dokko, Yang Shao-Horn, Masayoshi Watanabe

629 Transport Properties of Highly Concentrated Li Salt Solutions

[Kenta Watanabe, Ryoichi Tatara, Kaoru Dokko, Masayoshi Watanabe](#)

630 [Investigation of Potential Window of Aqueous Electrolyte Solution in Aqueous Rechargeable Lithium Batteries](#)

[Yuko Yokoyama, Kohei Miyazaki, Tomokazu Fukutsuka, Takeshi Abe](#)

631 [Novel Carbonate-Based Electrolyte Additive for High Voltage Lithium-Ion Batteries](#)

[Marshall A Schroeder, Arthur v. Cresce, Selena M Russell, Kang Xu](#)

### **A05-Beyond Li-ion Batteries**

632 [Exploring High Power Nonaqueous Flow Cell Design](#)

[Jarrod David Milshtein, John Leonard Barton, Robert M. Darling, Fikile R. Brushett](#)

633 [Recent Progress in Aqueous Organic Flow Batteries](#)

[Kaixiang Lin, Qing Chen, Eugene S. Beh, Michael R. Gerhardt, Andrew A. Wong, Liuchuan Tong, Rafa Gómez Bombarelli, Michael P. Marshak, Roy G. Gordon, Alan Aspuru-Guzik, Michael J. Aziz](#)

634 [High Capacity Catholytes for All-Organic Non-Aqueous Redox Flow Batteries](#)

[Susan A Odom, Fikile R. Brushett, Matthew D Casselman, Aman Preet Kaur, Jarrod David Milshtein, Jeffrey Kowalski, Subramanyam Modekrutti, Corrine F Elliott](#)

635 [Electrochemical Stability of Bipyridylimino Isoindoline Metal Complexes As Multi-Electron Anolyte Materials for Non-Aqueous Redox Flow Batteries](#)

[Sydney M Laramie, Christo S Sevov, Melanie S Sanford, Levi T Thompson](#)

636 [Highly Stable Catholyte Based on Vanadyl Acetylacetonate for Non-Aqueous Redox Flow Batteries](#)

[Siu on Tung, Levi T Thompson, Jonathan F. Kucharyson](#)

[637 Quinone Based Conducting Redox Polymers for Electric Energy Storage](#)

[Hao Huang, Christoffer Karlsson, Adolf Gogoll, Maria Strømme, Martin Sjödin](#)

[638 Evaluation of High-Concentration TEMPO-Based Electrolytes for Use in Nonaqueous Redox Flow Batteries](#)

[John Leonard Barton, Thomas Carney, Fikile R. Brushett](#)

[639 Building Stable Radical Cations for Non-Aqueous Redox Flow Batteries](#)

[Lu Zhang, Ilya A Shkrob, Wes Brogden, Wentao Duan, Xiaoliang Wei, Rajeev Assary, Lei Cheng, Larry Curtiss, Fikile R. Brushett, Levi T Thompson](#)

[640 Charge Transport in TEMPO/Ionic Liquid Redox Polymers](#)

[Christoffer Karlsson, Takeo Suga, Hiroyuki Nishide](#)

[641 A Biomimetic Redox Flow Battery Based on a Flavin Mononucleotide](#)

[Akihiro Orita, Michael Verde, Masanori Sakai, Shirley Meng](#)

[642 Room Temperature, Hybrid Na-Based Flow Batteries with Organic Catholytes and Multi-Electron Transfer Redox Reactions](#)

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

[643 Recent Progress in Aqueous Organic or Inorganic-Based Redox Flow Batteries at Pnnl](#)

[Bin Li, Zimin Nie, James Kizewski, Wentao Duan, Xiaoliang Wei, Wei Wang, Jun Liu, David Reed, Vincent Sprenkle](#)

[644 Preparation of the Sulfonated Poly\(ether ether ketone\)/Functionalized Graphene Oxide Composite Membrane for Vanadium Redox Flow Battery](#)

[Sanaki Park, Hansung Kim](#)



[645 Polymer Electrolyte Membrane Based on Sulfonated Poly\(phenylene oxide\) for Vanadium Redox Flow Battery \(VRFB\)](#)

[Sung-Hee Roh, Ho-Young Jung](#)

[646 Low Cost Membrane-Free Single Chamber Zinc Bromine Battery for Grid-Scale Electrochemical Energy Storage Applications](#)

[Shaurjo Biswas, Aoi Senju, Thomas Hodson, Daniel A Steingart](#)

[647 Design and Optimization of Carbon Foam Electrode for Local Confinement of Bromine in Non-Flowing Single-Chamber Zinc Bromine Batteries](#)

[Shaurjo Biswas, Aoi Senju, Thomas Hodson, Xiaofang Yang, Bruce E. Koel, Daniel A Steingart](#)

[648 Studies of Earth Abundant Metal Complexes for Near Neutral Aqueous Redox Flow Battery \(RFB\) for Grid Storage](#)

[Ganesan Nagasubramanian, Eric Allcorn, David Ingersoll](#)

[649 Tailoring Electrolytes for Redox-Active Polymer Flow Batteries with Low-Cost Reactors](#)

[Vinay Arvind Iyer, Elena C. Montoto Blanco, Nagarjuna Gavvalapalli, Jeffrey S Moore, Joaquín Rodríguez-López, Kyle Christopher Smith](#)

[650 The Gamma-V<sub>2</sub>O<sub>5</sub> phase: A High Voltage Cathode Material for Sodium-Ion Batteries](#)

[Marianne Safrany-Renard, Rita Baddour-Hadjean, Diane Muller-Bouvet, Jean-Pierre Pereira-Ramos](#)

[651 Tuning V Redox Couple By Metal-Ion Substitution in Na<sub>3</sub>V<sub>2</sub>\(PO<sub>4</sub>\)<sub>3</sub> Cathode Material for High Energy Density Na-Ion Batteries](#)

[DongRak Sohn, Sung-Jin Lim, Do-Hwan Nam, Kyung-Sik Hong, Tae-Hee Kim, HyukSang Kwon](#)

[652 Sodium Insertion/Extraction in Carbon-Coated Nanoscale Anatase TiO<sub>2</sub>](#)

[Changsheng Ding, Toshiyuki Nohira, Rika Hagiwara](#)

[653 Electrochemically Synthesized Sn Nanodendrites As High-Performance Na-Ion Batteries Anodes](#)

[Tae-Hee Kim, Do-Hwan Nam, Kyung-Sik Hong, DongRak Sohn, EunAe Cho, HyukSang Kwon](#)

[654 Novel Potassium Titanate As Potential Anodes for Sodium Ion Battery](#)

[Qing Zhang, Huiqiao Li](#)

[655 Ultrafine Nb<sub>2</sub>O<sub>5</sub> Nanocrystal Coating on Reduced Graphene Oxide As Anode Materials for Sodium Ion Battery](#)

[Litao Yan, Gen Chen, Hongmei Luo](#)

[656 Synthesis of Porous Sn<sub>4</sub>P<sub>3</sub>-C Nanospheres As an Ultra- Stable and High Capacity Anode Material for Sodium-Ion Battery](#)

[Jonghyun Choi, Won-Sik Kim, Seong-Hyeon Hong](#)

[657 Charge-Discharge Properties of HC/NaCrO<sub>2</sub> Full-Cells Using Na\[FSA\]-\[C<sub>3</sub>C<sub>1</sub>pyrr\]\[FSA\] Ionic Liquid Electrolytes](#)

[Takayuki Yamamoto, Kazushi Mitsuhashi, Kazuhiko Matsumoto, Toshiyuki Nohira, Rika Hagiwara, Atsushi Fukunaga, Shoichiro Sakai, Koji Nitta](#)

[658 in-Operando EC-STM, XRD and Eqcm Studies on the Formation of Ternary Na Graphite-Intercalation-Compounds](#)

[Lukas Seidl, Nicolas Bucher, Steffen Hartung, Sladjana Martens, Oliver Schneider, Ulrich Stimming](#)

[659 Investigation on Improved Electrochemical Performance of Layered Sodium Manganese Oxide By Partial Transformation of P2-Phase to O3-Phase for Sodium Ion Battery](#)

[Junghoon Yang, Yong-Mook Kang](#)

[660 Substituent Effects on Redox Potential of Organic Electrode Materials in Li/Na Rechargeable Batteries: Electronic Effects Vs. Cation-Substituents Interaction](#)

[Sechan Lee, Jihyun Hong, Ji Eon Kwon, Soo Young Park, Kisuk Kang](#)

[661 Synthesis and Electrochemical Performance of  \$Cu\_xS\_y\$  Micro-Sphere As an Anode Material for Sodium Ion Battery](#)

[Donghyeok Shin, Hyunjung Park, Taeseup Song, Youngsik Kim, Ungyu Paik](#)

[662 Divalent Tin Oxide \(SnO\) Carbon Composite As Superior Anode in Sodium-Ion Batteries](#)

[Dehua Zhou, Christopher Johnson](#)

[663 Electrochemical Properties of Composites of Sodium Peroxide \( \$Na\_2O\_2\$ \) and Transition Metal Oxide \( \$MnO\_x\$ \) As a Positive Electrode Material for the Sodium Ion Battery](#)

[Riki Kataoka, Tetsu Kiyobayashi, Nobuhiko Takeichi](#)

[664  \$NaCrO\_2\$  Cathode for High-Rate Sodium-Ion Batteries](#)

[Seung-Taek Myung, Jae sang Park, Hun-Gi Jung, Kyung Yoon Chung, Doron Aurbach, Chan-yeop Yu, Yang-Kook Sun](#)

[665 Crystal Structure of  \$Na\_2Fe\_2\(MoO\_4\)\_3\$  As a Positive Material for Sodium-Ion Batteries: Determination of the Inserted Sodium-Ion Positions from Powder X-Ray Diffraction Data](#)

[Jongwook W Heo, Seung-Tae Hong](#)

[666 Prussian Blue Analogue Materials for Sodium-Ion Batteries](#)

[Hyun-Wook Lee, Yi Cui](#)

[667 In Searching for Electrolyte Compatible with  \$NaMnO\_2\$  Cathode Material in Sodium Ion Battery](#)

Tianyuan Ma, Gui-Liang Xu, Yan Li, Boao Song, Xiaoqiao Zeng, Chengjun Sun, Yang Ren, Steve M. Heald, Jacob Jorne, Reza Shahbazian-Yassar, Khalil Amine, Zonghai Chen

668 New Carbon Materials with Large Closed Pore Volume for the Anode of High Energy Na-Ion Batteries

Akira Kano, Tetsuyuki Okano, Nobuhiko Hojo, Shuji Ito, Masahisa Fujimoto, Kensuke Nakura

669 (Invited) 3D-Catenated EMImCl/(TiCl<sub>4</sub>)<sub>1.4</sub>/( $\delta$ -MgCl<sub>2</sub>)<sub>x</sub> Ionic Liquid Electrolyte for Mg Secondary Batteries

Gioele Pagot, Federico Bertasi, Enrico Negro, Fatemeh Sepehr, Stephen J. Paddison, Vito Di Noto

670 High Performance Magnesium Ion Electrolytes

Jake Tompkins Herb, Carl Nist-Lund, Craig B. Arnold

671 Diffusion Measurements of Mg in High Capacity Thiospinel Mg<sub>x</sub>Ti<sub>2</sub>S<sub>4</sub>

Patrick Bonnick, Xiaoqi Sun, Linda F Nazar

672 Magnesium Insertion into the Chevrel Phase Mo<sub>6</sub>S<sub>8</sub>: XPS Analysis

Julien Richard, Jean François Colin, Anass Benayad, Sebastien Martinet

673 Impact of Solvent Co-Intercalation in Cathodes: A Study on Mg-Xerogel V<sub>2</sub>O<sub>5</sub>

Gopalakrishnan Sai Gautam, Pieremanuele Canepa, Will Richards, Rahul Malik, Gerbrand Ceder

674 Feasibility of Metal-Anode Rechargeable Battery: Toward "Rocking-Chair" Type Mg-Li Dual-Salt Batteries

Hongyi Li, Shunsuke Yagi, Yu Kumagai, Fumiyasu Oba, Eiichiro Matsubara, Tetsu Ichitsubo

[675Fluorophosphate-Based Polyanion Cathode Materials for Rechargeable Magnesium Batteries](#)

[Titus Masese, Zhen-Dong Huang, Hiroshi Senoh, Hikaru Sano, Masahiro Shikano, Yoshiharu Uchimoto](#)

[676Magnesium Phosphorus Oxynitride with High Mg<sup>2+</sup> Ionic Conductivity as a Novel Thin-film Magnesium Electrolyte](#)

[Yu Nishitani, Satoshi Shibata, Takuji Tsujita, Okano Tetsuyuki, Atsushi Omote](#)

[677Understanding Magnesiumation Mechanism and Cation Dynamics in Transition Metal Oxides for Magnesium-Ion Batteries](#)

[Baris Key, John T. Vaughey, Hao Wang, Niya Sa, Jared T Incorvati, Ryan D Bayliss, Jordi Cabana, Kenneth Poepelmeier, Anthony K. Burrell](#)

[678First-Principles Screening and Evaluation of Sulfide Compounds for Multivalent Battery Cathode Applications](#)

[Miao Liu, Ziqin Rong, Pieremanuele Canepa, Rahul Malik, Anubhav Jain, Gerbrand Ceder, Kristin A Persson](#)

[679Modeling Electrode/Electrolyte Interactions in Magnesium Batteries](#)

[Jeffrey S Lowe, Donald J Siegel](#)

[680\(Invited\) Key Challenges Facing Rechargeable Magnesium Batteries: A Peek Outside the Box](#)

[Thomas D Gregory](#)

[681A New Pyrrolidinium-Based Electrolyte for Secondary Magnesium Batteries](#)

[Federico Bertasi, Ketì Vezzù, Enrico Negro, Giuseppe Pace, Gioele Pagot, Graeme Nawn, Antoine Bach Delpeuch, Vito Di Noto](#)

[682Design Strategies for Multivalent Energy Dense Cathode Materials](#)

[Gerbrand Ceder, Ziqin Rong, Miao Liu, Daniel C. Hannah, Gopalakrishnan Sai Gautam, Pieremanuele Canepa, Kristin A Persson](#)

683[High Throughput Approach to Accelerate Electrolyte Discovery for Post Li-Ion Batteries](#)

[Kristin A Persson, Nav Nidhi Rajput, Xiaohui Qu](#)

684[Organic Cathodes for Energy Storage Systems](#)

[Chen Liao, Baofei Pan, John T. Vaughey, Zhengcheng Zhang, Anthony Burrell](#)

685[Studies of New Rechargeable Mg-Ion Battery Using Boron-Hydrogen Based Electrolytes](#)

[Hikaru Aso, Oscar Tutusaus, Timothy S. Arthur, Rana Mohtadi](#)

686[Surface Analysis of Magnesium-Based Intermetallic Compounds](#)

[Hiroko Kuwata, Masaki Matsui, Nobuyuki Imanishi](#)

687[Facile Chemical Routes to Assess the Feasibility of Electrode Hosts for Multi-Valent-Ion Insertion/Extraction](#)

[Arumugam Manthiram, Watchareeya Kaveevivitchai](#)

688[Spinel-to-Rocksalt Transition on Mg Insertion into Spinel-Oxide Cathodes in Magnesium Rechargeable Batteries](#)

[Kohei Shimokawa, Shinya Okamoto, Tomoya Kawaguchi, Yu Kumagai, Fumiyasu Oba, Shunsuke Yagi, Eiichiro Matsubara, Tetsu Ichitsubo](#)

689[Magnesocene-Based Electrolytes - a New Electrolyte Class for Magnesium Batteries](#)

[Rainer Martin Schwarz, Philipp Fischer, Marijana Pejic, Mario Marinaro, Ludwig Jörissen, Mario Wachtler](#)

[690\(Invited\) Li-S Battery and Beyond Systems: Composite Cathodes, Li Anodes and Prospects](#)

[Yu-Guo Guo](#)

[691\(Invited\) High-Capacity Lithium-Sulfur Batteries at Low Electrolyte/Sulfur Ratios](#)

[Donghai Wang, Shuru Chen](#)

[692Development of High Area Loading and Stable Sulfur Electrode through Interface Functionality and Electrode Design for Lithium Sulfur Battery](#)

[Gao Liu, Min Ling, Changan Yang, Guo Ai](#)

[693High Energy Density Lithium-Sulfur Batteries for NASA and DoD Applications](#)

[Ratnakumar V Bugga, Simon C. Jones, John-Paul Jones, Jasmina Pasalic, Frederick C. Krause, Loraine Torres](#)

[694Nmr's Perspective of Speciation Process in Lithium Sulfur Batteries](#)

[Hao Wang, Baris Key, Niya Sa, Meinan He, John T. Vaughey, Linda F Nazar, Mahalingam Balasubramanian, Kevin G. Gallagher](#)

[695Enhancement of Lithium-Sulfur Batteries By Introducing Metal-Organic-Framework \(MOF\) Coated Separators](#)

[Seho Sun, Junghyun Choi, Joo Hyun Kim, Youngsik Kim, Ungyu Paik](#)

[696Structural and Chemical Synergistic Encapsulation of Polysulfides Enables Ultralong-Life Lithium-Sulfur Batteries](#)

[Xiaolei Wang, Ge Li, Jingde Li, Zhongwei Chen](#)

[697Rapid Sulfur-Melt Integration into Electrospun Carbon Nanofibers As Free-Standing, Binder-Free Cathodes in Lithium Sulfur Batteries](#)

[Caitlin Dillard, Vibha Kalra](#)

[698A New Concept of Flexible Electrodes for Lithium/Sulfur Batteries](#)

[Jin-Woo Park, Sun-Hwa Choi, Hui-Hun Kim, Ki-Won Kim, Jou-Hyeon Ahn, Gyu-bong Cho, Hyo-Jun Ahn](#)

[699Compatibility of Polymer Binders with Solvate Ionic Liquid Electrolytes in Lithium-Sulfur Batteries](#)

[Kaoru Dokko, Toshitada Nakazawa, Ai Ikoma, Ryosuke Kido, Yuzo Kitazawa, Kazuhide Ueno, Masayoshi Watanabe](#)

[700Electrospun Hollow Carbon/Sulfur Nanofiber for Lithium-Sulfur Battery](#)

[Jong Hyuk Yun, Joo-Hyung Kim, Do Kyung Kim](#)

[701\(Invited\) Sion Power](#)

[Yuriy Mikhaylik, Igor Kovalev, Charlie Scordilis-Kelley, Michael Laramie, Tracy Kelley](#)

[702The Composite of Aluminum Oxide/Pvdf-HFP Membrane for Advanced Li-S Batteries](#)

[Yong-keon Ahn, Ji-Sang Yu, Sang-Gil Woo, Jeeyoung Yoo, Sanghun Cho, Duck-Jae You, Youn Sang Kim, Ki Jae Kim](#)

[703Catecholamine Functionalized Reduced Graphene Oxide-Sulfur Composite As a Cathode Material for Lithium-Sulfur Batteries](#)

[Syed Abdul Ahad, Joo-Hyung Kim, Do Kyung Kim](#)

[704Integrated Anion and Cation Capture Agent for Use in Lithium Sulfur Batteries](#)

[Brian Robert Perdue, David R. Wheeler, Christopher A. Apblett](#)

[705The Role of Protective Layers in Preventing Dendrite Growth in Lithium Metal Anodes](#)

[Pallab Barai, Kenneth Higa, Yiling Dai, Venkat Srinivasan](#)



[706 Extending Cycle Life of Lithium-Sulfur Cells Using a Flexible and Selective Lithium-Ion Conducting Membrane](#)

[Derek Moy, S. R. Narayanan](#)

[707 Development of Multilayered Inorganic Protections on Li Electrode to Improve Performance and Safety of Li-S Battery](#)

[Brigitte Pecquenard, Fabrice Mauvy, Frédéric Le Cras, Céline Barchasz, Anass Benayad](#)

[708 Effects of Pore Volume and Pore Size Distribution of Carbon Supports of Sulfur on Performance of Li-S Batteries with Solvate Ionic Liquid Electrolyte.](#)

[Ayumi Ando, Ai Ikoma, Kenzo Obata, Yutaro Kamei, Kaoru Dokko, Masayoshi Watanabe](#)

[709 Sulfur-Embedded Polymers for High Performance Li-S Batteries](#)

[Jang Wook Choi](#)

[710 Investigating Lithium-Sulfur-Metal Interactions in the Host Materials of Li-S Batteries](#)

[Zhejun Li, Yi-Chun Lu](#)

[711 Investigation of the Electrochemical Oxygen Reduction Reaction in Non-Aqueous, Magnesium-Ion-Containing Electrolytes for Magnesium Air Batteries](#)

[Philipp Fischer, Rainer Martin Schwarz, Marijana Pejic, Mario Marinaro, Mario Wachtler, Ludwig Jörissen](#)

[712 Novel High Energy Density Sodium Layered Oxide Cathode Materials - from Material to Cells](#)

[Katherine Smith, Joshua Treacher, Daniela Ledwoch, Paul Adamson, Emma Kendrick](#)

[713 Computational Modelling Studies on Stability of Li-S-Se System](#)

[Phuti Esrom Ngoepe, Clifton Masedi, Happy Sithole](#)

714 [Revisiting the Criterion for Mechanical Suppression of Dendrites at the Li/Electrolyte Interface](#)

[Zeeshan Ahmad, Venkatasubramanian Viswanathan](#)

715 [Case Studies on Non-Aqueous Zn Ion Systems to Develop Multivalent Ion Batteries](#)

[Sang-Don Han, Premkumar Senguttuvan, Soojeong Kim, Albert L. Lipson, Sanja Tepavcevic, Brian J. Ingram, Timothy T Fister, Christopher Johnson, John T. Vaughey](#)

716 [Synthesis, Crystal Structure, and Electrochemical Properties of the New Alluaudite-Type Compounds  \$Ag\_{2-y}Na\_yM\_3\(XO\_4\)\_3\$  \(M= Mn, Fe; X= V, P\)](#)

[Hamdi Ben Yahia, Rachid Essehli, Ilias Belharouak, Masahiro Shikano](#)

717 [Mg Secondary Batteries Using Nano-Crystalline  \$V\_2O\_5\$](#)

[Ryosuke Taniki, Itaru Honma](#)

718 [Voltage Delay Action of Na Metal in Na/MnO<sub>2</sub> Non-Aqueous Cells](#)

[Brij Kishore, N Munichandraiah](#)

719 [Developing Li-Metal Alloy Batteries with High Cyclability and Rate Capability](#)

[Junjie Niu](#)

720 [Investigation of  \$NaFe\(PO\_3\)\_3\$  and  \$Na\_3Fe\_3\(PO\_4\)\_4\$  Orthophosphates for Sodium-Ion Batteries: Structural and Electrochemical Insight](#)

[Ritambhara Gond, Ganesh Shinde, Prabeer Barpanda](#)

721 [Phthalocyanines Based Two-Phase Catalysts for Lithium Oxygen Batteries](#)

[Anupriya Arul, Maria Christy, Kwang Uk Moon, Hyoseok Park, Mi Young Oh, Kee Suk Nahm](#)

722 [Electrochemical Behavior of Calcium Ions on Prussian Blue Analogue Electrodes](#)

[Tomohiro Tojo, Yosuke Sugiura, Noriyuki Oshida, Hayato Tawa, Ryoji Inada, Yoji Sakurai](#)

723 [Growth and Electrochemical Characterization of Sea Urchin Shaped  \$\alpha\$ - \$\text{MnO}\_2\$ / \$\text{RuO}\_2\$  Mixed Oxides for Cathode Catalyst Application in Lithium-Oxygen Battery](#)

[Kwang Uk Moon, Hyoseok Park, HoSaeng Jang, Anupriya Arul, Maria Christy, Mi Young Oh, Kee Suk Nahm](#)

724 [Structural-Ordered Flexible Polypyrrole Films Derived from Vapor Phase Polymerization Process As Ultrahigh-Rate Anodes for Li-Ion and Na-Ion Batteries](#)

[Tao Yuan, Shiyong Zheng, Zi-Feng Ma](#)

725 [Surface Modifications of  \$\text{LiMn}\_2\text{O}\_4\$  electrode for Aqueous Lithium Ion Batteries](#)

[Junyoung Mun, Artur V. Tron, Jaemin Kim, Nakgyu Go, Yong Nam Jo, Wonchang Choi](#)

726 [Investigation of Reaction Mechanism in All-Solid-State Li-Air and Li- \$\text{O}\_2\$  Batteries](#)

[Hirokazu Kitaura, Haoshen Zhou](#)

727 [Calcium-Ion Intercalation Chemistry of the Hewettite for Rechargeable Calcium-Ion Batteries](#)

[Hunho H Kwak, Seung-Tae Hong](#)

728 [Honeycomb-Layer Structured  \$\text{Na}\_3\text{M\(II\)}\_2\text{M\(V\)}\text{O}\_6\$  Cathode for Sodium-Ion Batteries](#)

[Kyung-Wan Nam](#)

729 [The Lithium and Oxygen Concentration Dependence in Li- \$\text{O}\_2\$  Batteries Studied with Electrochemical Quartz Crystal Microbalance and Cylindrical Microelectrodes](#)

[Jonas Lindberg, Björn Wickman, Mårten Behm, Göran Lindbergh](#)

[730 Exploring the Electrochemical Reaction Mechanism of Carbonate Oxidation in Li-Air/CO<sub>2</sub> Battery through Tracing Missing Oxygen](#)

[Ping He](#)

[731 Modeling the Thermodynamic and Kinetic Effects on the Electrochemical Performance of Planar Na-NiCl<sub>2</sub> Batteries](#)

[Chang-Soo Kim, Yihan Xu, Guosheng Li, Yoon-Cheol Park, Keeyoung Jung](#)

[732 Importance and Possibility of the First Discharge for High Energy Lithium Metal Anode Rechargeable Battery](#)

[Hidetoshi Abe, Miyu Nemoto, Masaaki Kubota, Kazuhiro Imazawa, Hirokazu Munakata, Kiyoshi Kanamura](#)

[733 Oxygen Selective Membrane for Lithium Air Batteries](#)

[Lujie Cao, Fucong Lv, Ying Liu, Wenxi Wang, Yifeng Huo, Zhouguang Lu](#)

[734 Electrochemical and Structural Characterizations of a Zinc-Ion Battery System Consisting of Zn<sub>2</sub>Mo<sub>6</sub>S<sub>8</sub> As the Negative and Zn<sub>3</sub>\[Fe\(CN\)<sub>6</sub>\]<sub>2</sub> As the Positive Material](#)

[Munseok S Chae, Seung-Tae Hong](#)

[735 Metal Sulfide Nanofiber Anodes for High Capacity Sodium Rechargeable Batteries](#)

[Won-Hee Ryu, André D. Taylor](#)

[736 Tailored Transition Metal Oxide Spheres Using Versatile Polymer-Template for Sodium-Ion Battery Cathodes](#)

[EunHee Song](#)

[737 Synthesis and Characterization of Distorted Orthorhombic Type Na<sub>0.7</sub>MnO<sub>2</sub> Cathode Material By Spray Pyrolysis](#)

[Ji Ung Choi, Seung-Taek Myung](#)

738 [Statistical Analysis of Li-Oxygen Batteries](#)

[Petru Andrei, Chen Zhu](#)

739 [Thermal Stability of C<sub>6</sub>O<sub>6</sub><sup>2-</sup>-Based Organic Cathodes in Li-Ion and Na-Ion Batteries](#)

[Liwei Zhao, Kuniko Chihara, Ayuko Kitajou, Eiji Kobayashi, Shigeto Okada](#)

740 [Tuning Polysulfide Adsorption in Li-S Positive Electrodes with Metal Organic Frameworks.](#)

[Haesun Park, Donald J Siegel](#)

741 [Compatibility Studies with New F-Free Electrolyte for Sodium Ion Batteries](#)

[Anna Bitner-Michalska, Tomasz Trzeciak, Marcin Poterala, Grazyna Zofia Zukowska, Leszek Niedzicki, Wladyslaw Wieczorek, Marek Marcinek](#)

742 [Gas Analysis Formed in Dual Carbon Battery Using LiPF<sub>6</sub> in EC-Dmc](#)

[Keisuke Ina, Tatsumi Ishihara, Shintaro Ida, Takuya Kurihara](#)

743 [Improved Performance and Fabrication of Interlayer for Advanced Lithium-Sulfur Batteries](#)

[Hee Min Kim, Arumugam Manthiram, Y.-K. Sun](#)

744 [Synthesis and Electrochemical Activity of Sodium Titanium Phosphate for Sodium Ion Battery](#)

[Doyoub Kim, Heetaek Park, Byoungwoo Kang](#)

745 [Investigating the Role of Redox Mediator on the Reaction Stability of Nonaqueous Lithium-Oxygen Batteries](#)

[Zhuojian Liang, Yi-Chun Lu](#)

[746 Low-Cost Modular Battery Fabrication System Based on 3D-Printed Parts and Microcontrollers](#)

[Andrew Kim, Abhishek Raj, Lindsay Epstein, Shaurjo Biswas, Daniel A Steingart](#)

[747 Theoretical Overpotentials for Metal Anodes](#)

[Kyle Steven Nagy, Saeed Kazemiabnavi, Donald J Siegel](#)

[748 Effects of O<sub>2</sub> Concentration and Precipitates on the Lithium Air Battery](#)

[Suguru Uemura, Shuichiro Hirai, Takashi Sasabe, Nobuyuki Imanishi, Kosuke Torikai, Tomoaki Furuyama](#)

[749 Enhanced  \$\beta\$ "-Alumina Solid Electrolytes for Lower Temperature Operating Planar Sodium Beta-Alumina Batteries \(LT-NBBs\)](#)

[Younki Lee, Yoon-Cheol Park, Sori Son, Keeyoung Jung](#)

[750 A Study on Long-Term Cycle Performance of Conventional Tin Anode for Sodium-Ion Batteries](#)

[Changhyeon Kim, Huihun Kim, Milan K Sadan, Gyubong Cho, Ki-Won Kim, Jou-Hyeon Ahn, Hyo-Jun Ahn](#)

[751 Charge/Discharge Properties of Li Pre-Doped Si Anodes in Glyme-Based Electrolytes for Li-Air Batteries](#)

[Masamichi Matsudaira, Shinpei Kosaka, Morihiro Saito](#)

[752 Analysis of Ion Transport in Glyme-Based Electrolyte Solutions for Li-Air Batteries](#)

[Morihiro Saito, Shinya Yamada, Yusuke Tachikawa, Kimihiko Ito, Yoshimi Kubo](#)

[753 Synthesis, Electrochemical Properties of 3D Structured Red P-Carbon As an Anode Material for Na-Ion Battery](#)

Joo-Hyung Kim, Hyun-Wook Lee, Jong Hyuk Yun, Do Kyung Kim

754 Nanorod Assembly in a Spherical Secondary Particle for High-Energy Sodium Ion Batteries

Jang-Yeon Hwang, Y.-K. Sun

755 Charge-Discharge Properties of a Phosphoric Acid Material System for Application in Sodium Ion Batteries

Keisuke Nagao, Hiroo Takahashi

756 Tin Oxide Anchored on Reduced Graphene Oxide Sheet to Provide Improved Electrochemical and Structural Properties for Alkali Ion (Li, Na) As an Anode Material for Rechargeable Battery

Chang Heum Jo, Jae Hyeon Jo, Seung-Taek Myung

757 Unusual Na Storage Behavior of Ordered Mesoporous Carbon on Ether-Based Electrolyte System

Yunok Kim, Gil Hwan Lew, Woong Oh, Mihee Jeong, Xing Jin, Ji Man Kim, Won-Sub Yoon

758 Understanding the Critical Role of Carbon Nanotube Surface Chemistry Towards the Electrochemical Behavior in Li-O<sub>2</sub> Cells

Raymond A Wong, Keiko Waki, Hye Ryung Byon

759 All-Solid-State Li Battery with Sulfur Composite Cathode

Han Ul Choi, Hyung-Tae Lim

760 Novel Sodium-Rich Anti-Perovskites Via Conventional Sintering and Spark Plasma Sintering

Han Nguyen, Sunny Hy, Erik Wu, Zhi Deng, Thomas A. Yersak, Shyue Ping Ong, Ying Shirley Meng

[761Revealing the Impact of Anions in Lithium Oxygen Batteries](#)

[Merve Ilikso, Shuo Yang, Dirk Uwe Sauer](#)

[762Cobalt-Based Nanoparticles Decorating Carbon Nanofibers Films As Highly Efficient Electrocatalysts for Oxygen Reduction](#)

[Il To Kim, Myeong Jun Song, Moo Whan Shin](#)

[763Molecular Simulation of Decomposition of  \$\text{Li}\_2\text{O}\_2\$  and  \$\text{Li}\_2\text{CO}\_3\$  during Charging Process of Li-O<sub>2</sub> Battery](#)

[Hiromitsu Takaba, Masahiro Soeno, Syoujiro Iso, Md. Khorshed Alam](#)

[764Hierarchically Porous and Heteroatom Doped Carbon Host Matrix for Long Life Li/S Battery: A Mechanistic Investigation By in-Situ Raman Spectroscopy and Ex-Situ XPS](#)

[Bhaghavathi Parambath Vinayan, Maximilian Fichtner](#)

[765Na-Ion Batteries As a Pathway for Seawater Desalination](#)

[Kyle Christopher Smith](#)

[766Probing the Enhancement Mechanism of Catalyst-Assisted Nonaqueous Oxygen Evolution Reaction in Lithium-Oxygen Batteries](#)

[Yu Wang, Yi-Chun Lu](#)

[767Investigation of Self Supporting Paper-like Structures and Metallic Current Collector Backed Structures with Exfoliated Graphene Platelets As Cathodes for Lithium-Air Battery](#)

[Debkumar Saha, Lawrence T. Drzal](#)

[768P2- and P3-Type  \$\text{Na}\_x\text{Cr}\_x\text{Ti}\_{1-x}\text{O}\_2\$  Layered Oxides As Bi-Functional Electrode Materials for Rechargeable Sodium Batteries](#)

[Yuka Tsuchiya, Naoaki Yabuuchi](#)



[769](#)[Enhancing Electrochemical Performance By Coating Al<sub>2</sub>O<sub>3</sub> on Na<sub>0.6</sub>Mn<sub>0.66</sub>Ni<sub>0.22</sub>Co<sub>0.11</sub>O<sub>2</sub> cathode in Sodium-Ion Batteries](#)

[Ngoc Anh Nguyen, Kyuman Kim, Inseong Cho, Myung-Hyun Ryou, Yong Min Lee](#)

[770](#)[Charge Transport Mechanism in Solid-State Redox-End Members in Lithium-Sulfur\(Li-S\) Batteries](#)

[Haesun Park, Nitin Kumar, Donald J Siegel](#)

[771](#)[Synthesis and Characterization of Mg-Doped Na<sub>0.6</sub>Ni<sub>0.3-x</sub>Mg<sub>x</sub>Ti<sub>0.7</sub>O<sub>2</sub> as Anode Material for Sodium Ion Battery](#)

[Ji Eun Wang, Joo-Hyung Kim, Han-gil Choi, Hyung-shin Kwon, Sung-hwan Kim, Do Kyung Kim](#)

[772](#)[A Simple, One-Dimensional Electrochemical Model for the Lithium-Sulfur Battery](#)

[Sevgi Can Erensoy, Damla Eroglu](#)

[773](#)[Performance Enhancement in Redox Flow Batteries Using Bismuth Based Catalyst](#)

[Yongchai Kwon, Yustian Suharto, Seungwon Yang, Ki Jae Kim](#)

[774](#)[Design Principles for Electrolytes in Li-O<sub>2</sub> Batteries](#)

[Vikram Pande, Venkatasubramanian Viswanathan](#)

[775](#)[Study on Lithium-Sulfur Batteries](#)

[Yong-Gang Wang, Lina Wang, Shouyi Yuan, Yong-Yao Xia](#)

[776](#)[One-Step Fabrication of Sulfur Composite Electrode for All-Solid-State Lithium-Sulfur Battery Using High-Temperature Mechanical Milling Method](#)

[Kota Suzuki, Dai Kato, Naohiro Mashimo, Masaaki Hirayama, Ryoji Kanno](#)

[777](#)[Lithium Sulfur Battery Modeling with Microscopic Kinetics Formulation](#)

[Jui-Hui Chung, Hsun-Yi Chen](#)

[778A High Performance Hybrid Battery Based on Aluminum Anode and LiFePO<sub>4</sub> Cathode](#)

[Xiao-Guang Sun, Craig Bridges, Mariappan P Paranthaman, Sheng Dai, Gilbert Brown](#)

[779Sn Negative Electrode Consists of Flexible 3D Structures for Sodium Ion Secondary Batteries](#)

[Naoki Okamoto, Koki Morita, Takeyasu Saito](#)

[780First Principles Studies of Fe, Co, Mn, and Ir-Based Hybrid Li-Ion/Li-Oxygen Battery Materials](#)

[Liang Li, Alper Kinaci, Denise Ford, Kendra Letchworth-Weaver, Maria K. Y. Chan](#)

[781Electrochemical Properties of Birnessite As a Positive Material for Aqueous Calcium-Ion Batteries](#)

[June E Hyoung, Seung-Tae Hong](#)

[782Catalytic Activity of Bi<sub>2</sub>Ru<sub>2</sub>O<sub>7-z</sub> on Titanium for Oxygen Reactions in Alkaline Solutions Using Rotating Disk Electrode](#)

[Yuki Sakurai, Masatsugu Morimitsu](#)

[783The Development of Ester-Based Electrolyte Solutions for Magnesium Rechargeable Batteries](#)

[Miki Sugita, Takayuki Doi, Minoru Inaba](#)

[784Single Wall Carbon Nanotube Modified with Nano Size Metal Oxides for High-Performance Cathode in Li-O<sub>2</sub> Rechargeable Batteries](#)

[Il-Chan Jang, Tatsumi Ishihara](#)

[785 Synthesis of Graphitic Ordered Mesoporous Carbon for High-Performance of Lithium-Sulfur Battery](#)

[Min-Seop Kim, Woong Kim, Won Il Cho](#)

[786 Influence of Surface Area of Mesopore Volume on Discharge Characteristics for Lithium-Air Secondary Battery](#)

[Shun Sakamoto, Tatsuya Takeguchi, Miyuki Kojima, Koichi Ui](#)

[787 Preparation of Nickel-Based Thin Film Co-Deposited with  \$\text{Bi}\_2\text{Ru}\_2\text{O}\_{7-z}\$  Nano-Particles on Resin for Air Secondary Batteries](#)

[Yuichiro Tamura, Masatsugu Morimitsu](#)

[788 Perovskite-Type  \$\text{La}\_{0.8}\text{Sr}\_{0.2}\text{Co}\_{0.8}\text{Fe}\_{0.2}\text{O}\_3\$  with Uniform Dispersion on Graphene As an Efficient Bi-Functional Li- \$\text{O}\_2\$  Battery Cathode](#)

[Junfang Cheng, Bo Chi, Guozhu Zhang, Jun Li, Yuexing Jiang, Lu Zou, Yinghang Zhang, Ziling Wang, Yizhen Huang](#)

[789 Potassium Ion Cells Using Graphite Electrodes](#)

[Park Chun Guk](#)

[790 Sulfur-Infiltrated Hierarchical Porous Carbon \(HPC\) Cathodes for Lithium-Sulfur Batteries](#)

[Dae Soo Jung, Kwang Chul Roh, Jang Wook Choi](#)

[791 Understanding the Mechanism of Two-Step Discharge Behavior in Lithium Air Batteries with Extremely High Capacity](#)

[Won Keun Kim, Jin Soo Kim, Dae Gun Jin, Ji Na Kim, Kyoung Han Ryu, Ho-Teak Lee](#)

[792 Analytical Study of SEI Formation Process on Lithium Metal](#)

[Hidetoshi Sonoki, Hiroko Kuwata, Masaki Matsui, Nobuyuki Imanishi](#)

[793In Operando X-Ray Imaging and Tracking of Degradation and Failure Phenomena inside Zinc-Air Systems](#)

[Vladimir Yufit, Farid Tariq, David S Eastwood, Moshiel Biton, Billy Wu, Peter D Lee, Nigel P. Brandon](#)

[794Systematic Investigation on Ion Transport Mechanism in Glyme-Based Electrolytes for Li-Air Batteries](#)

[Shinya Yamada, Yusuke Tachikawa, Kimihiko Ito, Yoshimi Kubo, Morihiro Saito](#)

[795MnO<sub>2</sub> Coated with Polyaniline As Active Air Electrode for Li-O<sub>2</sub> Reversible Battery](#)

[Masato Eguchi, Il-Chan Jang, Shintaro Ida, Tatsumi Ishihara](#)

[796Decomposition Mechanism of Discharged Product in Lithium Air Battery Optimized By Dandelion-like NiCo<sub>2</sub>O<sub>4</sub> Hollow Sphere](#)

[Bo Chi, Lu Zou, Yuexing Jiang, Junfang Cheng, Jin Li, Jun Li](#)

[797Operando soft X-Ray Absorption and Raman Spectroscopic Study on Magnesium Deposition By Using Ether-Based Electrolyte](#)

[Masashi Hattori, Kentaro Yamamoto, Takuya Mori, Yuki Orikasa, Koji Nakanishi, Hajime Tanida, Yusuke Tamenori, Keiji Shimoda, Masahiro Mori, Yukinori Koyama, Yoshiharu Uchimoto](#)

[798V<sub>2</sub>O<sub>5</sub>-SiO<sub>2</sub> and V<sub>2</sub>O<sub>5</sub>-B<sub>2</sub>O<sub>3</sub> As Cathode Materials for Rechargeable Mg-Ion Batteries](#)

[Kaushik Jayasayee, Sidsel Meli Hanetho, Paul Inge Dahl, Ove Paulsen, Jannicke Kvello, Lu Wang, Julian Richard Tolchard, Fride Vullum-Bruer, Anne Fiksdahl](#)

[799The Effects of Electrolyte Variations on the Oxygen Efficiency in Lithium Air Batteries](#)

[Kyoung Han Ryu, Won Keun Kim, Samuel Seo, Ho-Teak Lee](#)

[800Octahedron like Antimony Oxide: An Efficient Anode for Rechargeable Sodium Ion Batteries](#)

Ramchandra S Kalubarme, Chan-Jin Park, Suresh W Gosavi

801 Effects of Carbon Supports on Air Electrode Properties of Lanthanum Manganite-Based Catalysts for Li-Air Batteries

Yusuke Tachikawa, Hiroshi Suzuki, Shinpei Kosaka, Hidenobu Shiroishi, Yumi Tanaka, Shiro Seki, Morihiro Saito

802 Investigation of Discharge Products of Mg-Air Battery with Non-Aqueous Ether-Based Electrolytes

Hiroki Inoue, Yasuhiro Akita, Hirokazu Munakata, Kiyoshi Kanamura

803 Vanadium Dioxide Reduced Graphene Oxide Composite As Cathode Materials for Rechargeable Li and Na Batteries

Seung-Taek Myung, Nurul Huda Mahadi, Jae sang Park, Yang-Kook Sun

804 the Role of Ceramic Filler in Microporous Gel Electrolytes for Sodium Ion Batteries

Seokwoo Kim, Ngoc Anh Nguyen, Kyuman Kim, Myung-Hyun Ryou, YongMin Lee

805 Thermally Reduced Graphite Oxide for Potassium Ion Battery Anodes

Jae Hyang Jeong, MyoungHo Pyo

806 Short and Intermediate Range Ordering in Fast Cation Glasses for Battery Applications

Mohammad Kassem, Takeshi Usuki, Eugene Bychkov

807 Phosphide-Based Nanocomposites As High-Performance Anode Materials for Na-Ion Batteries

Kyung-Sik Hong, Do-Hwan Nam, Sung-Jin Lim, DongRak Sohn, Tae-Hee Kim, HyukSang Kwon

[808Improvement of Charge-Discharge Cycling Performances of Zinc Electrode By Using Porous-TiO<sub>2</sub>-Coated Zinc As a Negative Electrode Active Material](#)

[Masaki Ono, Akiyoshi Nakata, Hajime Arai, Zempachi Ogumi](#)

[809Carbon Coated Mesoporous CeO<sub>2</sub> on Graphene Foam As Flexible Cathode in Lithium-Air Batteries](#)

[Yuexing Jiang, Junfang Cheng, Lu Zou, Bo Chi](#)

[810RuO<sub>2</sub>/MnO<sub>2</sub> Nanorods As High Efficient Electrocatalyst of Lithium-Oxygen Battery](#)

[Yue-Feng Xu, Gui-Liang Xu, Xiao-Ru Zhang, Yuan Chen, Zonghai Chen, Ling Huang, Jun-Tao Li, Khalil Amine, Shi-Gang Sun](#)

[811Metal-Organic Frameworks \(MOFs\) Derived Porous Co<sub>3</sub>O<sub>4</sub>/Carbon Composites for Lithium-Air Batteries](#)

[Myeong Jun Song, Il To Kim, Moo Whan Shin](#)

[812Electro Chemical Properties of Hard Carbon Single Particles for Anode in Sodium Ion Batteries](#)

[SeongHyeon Lim, Yuto Yamada, Sung-soo Kim, Kiyoshi Kanamura](#)

[813Mesoporous Sodium Vanadium Phosphate/Carbon As Efficient Cathode Materials for Rechargeable Sodium-Ion Batteries](#)

[Tai-Feng Hung, Wei-Jen Cheng, Wen-Sheng Chang, Chang-Chung Yang, Yu-Lin Kuo](#)

[814Air Electrode Study for Rechargeable and Long-Life Zinc-Air Batteries](#)

[Yi-Cheng Lee, Wei-Jen Cheng, Wen-Sheng Chang, Chang-Chung Yang](#)

[815Electrochemical Performance of NaNiCoMnO<sub>2</sub> for Cathode Material in Sodium Ion Batteries](#)

[Gyuhoo Shin, Sung-soo Kim](#)

[816A Simple Approach of Electrolyte Development for Magnesium Ion Battery](#)

[Niya Sa, Hao Wang, Baris Key, Scott M Brombosz, Anthony Burrell, John T. Vaughey](#)

[817Catalytic Activity Variation with the Crystal Structure Change of PdCu Nanocatalysts for Rechargeable Lithium-Oxygen Batteries](#)

[Mihui Park, Kyeongse Song, Yong-Mook Kang](#)

[818Electrochemical Deposition and Dissolution Behavior of Magnesium Metal in Organosilicon-Containing Electrolyte Solutions](#)

[Masanobu Ouchi, Tomokazu Fukutsuka, Kohei Miyazaki, Takeshi Abe](#)

[819Cycling Performance and Interfacial Phenomena of High-Energy Li-Ion Battery with Sulfur-Based Cathode and Silicon-Based Anode](#)

[Dan Thien Nguyen, Alexander Hoefling, Sergej Diez, Werner Pauer, Hans-Ulrich Moritz, Patrick Theato, Young Joo Lee, Seung-Wan Song](#)

[820The Effect of the V<sub>2</sub>O<sub>5</sub> Morphology on the Intercalation Behavior of Na<sup>+</sup>-Ions](#)

[Lukas Seidl, Sladjana Martens, Ulrich Stimming, Oliver Schneider](#)

[821Hierarchical Ru and RuO<sub>2</sub> Foams with Superior Performance for Rechargeable Lithium Oxygen Battery Cathodes](#)

[Jungdon Suk, Kyoung Hwan Kwak, Yongku Kang](#)

[822Local Structure and Li Ion Dynamics in Garnet Li<sub>7-2x</sub>Ga<sub>x</sub>La<sub>3</sub>Zr<sub>2</sub>O<sub>12</sub> Solid Electrolytes](#)

[Randy Jalem, Masanobu Nakayama](#)

[8231D Structured Fe-Doped Tunnel Na<sub>0.44</sub>MnO<sub>2</sub> Cathode Material with Excellent High Rate and Long Cycle Life Performance for Sodium Ion Battery Application](#)

[Mawuse Amedzo-Adore, Dong-Wook Han, Junghoon Yang, Yong-Mook Kang](#)

[824 Mesoporous RuO<sub>2</sub>/Fe<sub>2</sub>O<sub>3</sub> Nanofiber As Efficient Electrocatalyst for Lithium Oxygen Batteries](#)

[Zhimei Huang, Yue Shen, Yunhui Huang](#)

[825 High-Capacity Na-Excess Positive Electrode Materials; Na<sub>3</sub>NbO<sub>4</sub>-NaMnO<sub>2</sub> Binary System](#)

[Kei Sato, Naoaki Yabuuchi](#)

[826 A Renewable Anthraquinone Derivative As Organic Anode Materials for Sodium-Ion Batteries](#)

[Dabei Wu, Yunhui Huang, Xianluo Hu](#)

[827 Insight into the Na-Storage Mechanism of Bismuth Oxyiodide Anode Materials](#)

[Xiaoxiao Liu, Yunhui Huang, Xianluo Hu](#)

[828 Honeycomb Compound Na<sub>3</sub>Ni<sub>2</sub>BiO<sub>6</sub> As Positive Electrode Material for Na-Ion Battery](#)

[Lituo Zheng, Mark N Obrovac](#)

[829 {001} Facets Exposed Anatase TiO<sub>2</sub> Nanosheets and Reduced Graphene Oxide Composite Anodes for High Performance Na-Ion Batteries](#)

[Yueni Mei, Yunhui Huang, Xianluo Hu](#)

[830 Exploration of Side Reactions Based on Graphite-Li<sub>2</sub>O<sub>2</sub> Redox Couple for Lithium Oxygen Battery](#)

[Wang Zhang, Yue Shen, Yunhui Huang](#)

[831 Electrospun Mns/Porous Carbon Fibers: A Novel Anode Materials for Sodium-Ion Batteries](#)

[Kongyao Chen, Wuxing Zhang, Yunhui Huang](#)



[832Suppression of Shuttle Phenomenon of Li-S Batteries Using Cation Exchange Membrane Separator with Polysulfide-Containing Solution](#)

[Kaname Nakajima, Heisuke Nishikawa, Shuji Hitomi, Tokuo Inamasu, Hiroaki Yoshida](#)

[833Cycling Performance of Lithium-Oxygen Batteries Assembled with Hybrid Electrolytes](#)

[Hyun-Sik Woo, Jae-Hong Kim, Dong-Won Kim](#)

[834The Catalytic Activity and Electrochemical Performance of Flower-like PEDOT for Enhanced Air Electrode of Li-Air Batteries](#)

[Seon Hye Yoon, Yong Joon Park](#)

[835Spinel NiCo<sub>2</sub>O<sub>4</sub>-Deposited CNT Bucky Paper As a Cathode for Rechargeable Li-O<sub>2</sub> Battery](#)

[Kyu-Nam Jung, Jong-Won Lee](#)

[836CNT/Co<sub>3</sub>O<sub>4</sub> Based Air Electrode Selectively Wrapped By Polyaniline for High Performance Air Electrode](#)

[Jin Young Kim, Yong Joon Park](#)

[837Bi<sub>2</sub>O<sub>3</sub>-Added Li<sub>1.4</sub>Al<sub>0.4</sub>Ti<sub>1.6</sub>\(PO<sub>4</sub>\)<sub>3</sub> with Enhanced Li-Ion Conductivity As a Solid Electrolyte for All-Solid-State Battery](#)

[Jong-Won Lee, Kyu-Nam Jung](#)

[838Effect of Humidification of Oxygen Gas on All Solid State Lithium-Air Batteries](#)

[Shoma Sakuma, Yosuke Suzuki, Nobuyuki Imanishi](#)

[839Degradation Mechanisms of NaTi<sub>2</sub>\(PO<sub>4</sub>\)<sub>3</sub> Aqueous Anodes and Mitigation Techniques](#)

[Alexander I Mohamed, Jay Whitacre](#)

840a [Noble Aqueous Lithium-Metal Chloride Rechargeable Battery](#) □

[Yoshinori Morita, Peng Zhang, Hui Wang, Yasuo Takeda, Osamu Yamamoto, Nobuyuki Imanishi](#)

841 [A Simple Efficient Polysulfide Anchor for Li-S Batteries](#)

[Zhangxiang Hao, Lixia Yuan, Yunhui Huang](#)

842 [Rechargeable Aqueous Lithium-Air Batteries](#)

[Hiroyoshi Nemori, Khalilur Rahman, Hiroaki Izumi, Shigehi Mitsuoka, Xuefu Shang, Osamu Yamamoto, Nobuyuki Imanishi, Masaya Nomura](#)

843 [A Rotating Ring Disk Electrode Study of the Stability in Different Electrolytes for Lithium-Oxygen Batteries](#)

[Jenn-Shing Chen, Meng-Huan Cheng](#)

844 [Improvement of a Capacity Utilization By Introducing an Asymmetric Anolyte/Catholyte Volume in Vanadium Redox Flow Battery](#)

[Jong Ho Park, Jung Hoon Yang](#)

845 [Accommodating Lithium into a Three-Dimensional Carbon Framework As the Anode for Rechargeable Lithium Batteries](#)

[Jingwei Xiang, Lixia Yuan, Yunhui Huang](#)

846 [\(Invited\) Development of a Superionic Conductor for High Power All-Solid-State Battery](#)

[Yuki Kato](#)

847 [Sulfides Electrolytes for All Solid State Metal Ion Batteries](#)

[Hailong Chen, Malte McDaniel, Shan Xiong, Hai Wang](#)

[848 Towards All Solid State Batteries Using Perovskite Solid Electrolytes](#)

[Thomas Bibienne, Pauline Alvares, Laurent Castro, Fanny Bardé, Fabio Rosciano, Mickael Dollé](#)

[849 All-Solid-State Lithium Battery Using Transparent Garnet-Type Al-Doped  \$\text{Li}\_7\text{La}\_3\text{Zr}\_2\text{O}\_{12}\$](#)

[Shoichi Sugata, Noriko Saito, Ken Watanabe, Tsuyoshi Ohnishi, Je-Deok Kim, Itaru Honma](#)

[850 Tuning Dopant Chemistry in the  \$\text{Na}\_3\text{PS}\_4\$  Glass-Ceramic Electrolyte](#)

[Iek-Heng Chu, Zhuoying Zhu, Christopher Kompella, Han Nguyen, Zhi Deng, Sunny Hy, Ying Shirley Meng, Shyue Ping Ong](#)

[851 Formation of an Intermediate Layer Between Lithium Metal and  \$\text{Li}\_7\text{La}\_3\text{Zr}\_2\text{O}\_{12}\$  to Reduce Its Interfacial Resistance](#)

[Jungo Wakasugi, Hirokazu Munakata, Kiyoshi Kanamura](#)

[852 Performance and Interface Properties of Vapor-Phase Deposited Electrode and Electrolyte Materials for Conformal Solid State Batteries](#)

[Alexander J Pearse, Keith Gregorczyk, Tom Schmitt, Chanyuan Liu, Alexander C Kozen, Konstantinos Gerasopoulos, A. Alec Talin, Farid El Gabaly, Gary W Rubloff](#)

[853 3D Structuring of Thin Film Solid State Li-Ion Cells for Fast Charging Micro-Batteries](#)

[Philippe M. Vereecken](#)

[854 \(Invited\) Predicting the Interfacial Reactions Between Cathodes and Liquid and Solid Electrolytes](#)

[Gerbrand Ceder, Will Richards, Yan Eric Wang](#)

[855 Failure Mechanism from Direct Contact Between Lithium Metal and Solid Electrolytes](#)

[Habin Chung, Byoungwoo Kang](#)

[856 Sheet-Type All-Solid-State Batteries Using Electrode Sheets with Effective Electrode-Electrolyte Interface](#)

[Atsushi Sakuda, Kentaro Kuratani, Mari Yamamoto, Masanari Takahashi, Tomonari Takeuchi, Hironori Kobayashi](#)

[857  \$\text{Li}\_2\text{S}\$  Oxide and LPS Sulfide Composite Solid Electrolyte for Lithium Ion Battery](#)

[Shingo Ohta, Chihiro Yada, Toshiya Saito, Hideki Iba](#)

[858 Electrochemical Characteristics of the Composite Electrodes of  \$\text{Li}\_4\text{Ti}\_5\text{O}\_{12}\$  Crystals/ \$\text{Li}\_3\text{BO}\_3\$  Glass and  \$\text{Li}\_4\text{Ti}\_5\text{O}\_{12}\$  Crystals/ \$\text{Li}\_3\text{BO}\_3\$ - \$\text{Li}\_{6.75}\text{La}\_3\text{Zr}\_{1.75}\text{Nb}\_{0.25}\text{O}\_{12}\$  Hybrid Solid Electrolyte System for All-Solid-State Lithium-Ion Secondary Battery](#)

[Nobuyuki Zettsu, Taisuke Horikawa, Takeshi Kimijima, Shuhei Uchida, Sho Makino, Wataru Sugimoto, Katsuya Teshima](#)

[859 Developing Solid-State Lithium Ion Battery with Oxide-Based Electrolytes](#)

[Byoungwoo Kang](#)

[860 Li Ion Transport and Electrochemical Decomposition of Garnet  \$\text{Li}\_{7-x}\text{La}\_3\text{Zr}\_{2-x}\text{Ta}\_x\text{O}\_{12}\$  Solid Electrolytes](#)

[Randy Jalem, Yasuyuki Morishita, Takashi Okajima, Masanobu Nakayama, Toshihiro Kasuga](#)

[861 Porous Carbon Nanofibers Decorated with Cobalt Nanoparticles As Binder-Free Efficient Cathode for Lithium-Oxygen Batteries](#)

[Richa Singhal, Vibha Kalra](#)

[862 Preparation of Polyimide Separator with 3-Dimensionally Ordered Macroporous Structure Using Polystyrene Sphere Template for Lithium Metal Secondary Battery](#)

[Masaki Haibara, Kenya Ouchi, Hirokazu Munakata, Kiyoshi Kanamura](#)

[863 Singlet Oxygen Formation during the Charging Process of an Aprotic Lithium-Oxygen Battery](#)

[Johannes Wandt, Peter Jakes, Josef Granwehr, Hubert A. Gasteiger, Rüdiger-Albrecht Eichel](#)

[864 Relationship Between Discharge Profile and Pore Structure for Lithium-Air Secondary Battery](#)

[Nozomi Matsuhashi, Tatsuya Takeguchi, Miyuki Kojima, Koichi Ui](#)

[865 A Porous Air Electrode for Li-O<sub>2</sub> Batteries Based on a Green Method](#)

[Guofeng Xia, Shuiyun Shen, Fengjuan Zhu, Aiming Wu, Ruofei Wu, Junliang Zhang](#)

[866 Enhancement of Li-O<sub>2</sub> Battery Performance with Novel Bubble-like-Carbon-Based Oxygen Electrode](#)

[Katie Heeyum Lim, Sunhee Kim, Jinhyeok Lim, Chang-Ha Lee, Hansung Kim](#)

[867 Non-Aqueous Li-Air Flow Battery: Improving Capacity and Current Density through Cathode Optimization](#)

[Byoungsu Kim, Kensuke Takechi, Sichao Ma, Sumit Verma, Ashtamurthy S Pawate, Fuminori Mizuno, Paul J.A. Kenis](#)

[868 Correctly Evaluating the Performance of Lithium-Oxygen Battery](#)

[Yue Shen](#)

[869 Effect of Polymer Wrapping on Carbon Nanotubes in Li-O<sub>2</sub> Battery Cathode](#)

[Tsuyohiko Fujigaya, Il-Chan Jang, Ryota Kanamori, Tatsumi Ishihara, Naotoshi Nakashima](#)

[870 Low-Overpotential Li-O<sub>2</sub> Battery: An Application of Nanostructured Cathode Architecture By Atomic Layer Deposition](#)

[Xiangyi Luo, Lu Ma, Mar Piernavieja-Hermida, Jianguo Wen, Yang Ren, Tianpin Wu, Yu Lei, Jun Lu, Khalil Amine](#)

871 [Cathode Design for High Energy Molten Salt Lithium-Oxygen Batteries](#)

[Dylan Tozier, Vincent Giordani, Jasim Uddin, Hongjin Tan, Bryan D McCloskey, Julia R Greer, Gregory V Chase, Dan Addison](#)

872 [\(Invited\) A Three-Dimensional Li-Air Cell](#)

[Dongmin Im, Jung Ock Park, Joon-Hee Kim, Kyoung Hwan Choi, Heung Chan Lee, Min-Sik Park, Mokwon Kim, Wonsung Choi](#)

873 [The Effects of Water Concentration on Lithium Deposition/Dissolution Toward Practical Operation of Lithium-Air Batteries](#)

[Hiroyuki Koshikawa, Shoichi Matsuda, Kazuhide Kamiya, Yoshimi Kubo, Kohei Uosaki, Kazuhito Hashimoto, Shuji Nakanishi](#)

874 [Contribution of  \$I^-/I\_3^-\$  and  \$I\_3^-/I\_2\$  Redox Couples to Charge and Discharge Reactions of Li-Oxygen Battery with Solvate Ionic Liquid Electrolytes](#)

[Azusa Nakanishi, Yuki Kobayashi, Ryoichi Tatara, Hoi-Min Kwon, Morgan L. Thomas, Kaoru Dokko, Masayoshi Watanabe](#)

875 [Lithium Halides As Redox Mediators in Lithium Oxygen Battery](#)

[Won-Jin Kwak, Daniel Hirshberg, Daniel Sharon, Michal Afri, Aryeh A Frimer, Doron Aurbach, Yang-Kook Sun](#)

876 [Cell and System Design of Lithium Air Batteries for Electric Vehicles](#)

[Hee-Yeon Ryu, Junki Rhee, Kyoung Han Ryu, Ho-Teak Lee](#)

877 [\(Invited\) Electrolyte Developments for Rechargeable K-O<sub>2</sub> Batteries](#)

[Yiyang Wu](#)

[878Improvement of Discharge Characteristic of Primary Al-Air Battery Anode By Sodium Thiocyanate Electrolyte Additive](#)

[Hiroshi Suyama, Yutaka Hirose, Hideki Nakayama, Hidetaka Nishikoori, Shinji Nakanishi, Yasutoshi Jagawa, Hideki Iba](#)

879[Promoting Solution Phase Discharge in Li-O<sub>2</sub> Batteries](#)

[Lee Johnson, Yuhui Chen, Xiangwen Gao, Peter G. Bruce](#)

880[An Electrochemical Impedance Study of the Capacity Limitations in Na-O<sub>2</sub> Cells](#)

[Kristian Bastholm Knudsen, Jessica E. Nichols, Tejs Vegge, Alan C. Luntz, Bryan D McCloskey, Johan Hjelm](#)

881[An Electrically Rechargeable Al-Air Battery with Aprotic Ionic Liquid Electrolyte](#)

[Nicky Bogolowski, Olivia Ngaleu, Jean-Francois Drillet](#)

## **A06-Failure Mode and Mechanism Analyses**

882[\(Invited\) Study of Lithium-Ion Cell Degradation Behavior Under Multiple Stresses](#)

[Jianbo Zhang, Laisuo Su, Yakun Zhang, Jianyu Zhang, Xinyu Li, Zhe Li, Bor Yann Liaw](#)

883[Battery Reliability, Safety, and Failure Modes and Effects Analysis](#)

[Bor Yann Liaw](#)

884[Fundamental Aspects of Large-Scale Energy Storage System Safety](#)

[John Hewson, Summer Ferreira, Joshua Lamb, Christopher J Orendorff, Babu Chalamala](#)

885[Impact of Next Generation Electrode Materials on Abuse Response](#)

[Kyle R Fenton, Christopher J Orendorff, Ganesan Nagasubramanian, Joshua Lamb, Eric Allcorn](#)

[886Impact of Battery Size and Charge on the Thermal Runaway of Lithium Ion Batteries](#)

[Joshua Lamb, Leigh Anna M Steele, Christopher J Orendorff](#)

[887Materials Safety Study of Practical Nano-Silicon + Graphite Anodes for Lithium-Ion Batteries](#)

[Eric Allcorn, Ganesan Nagasubramanian, Kyle R Fenton](#)

[888Non-Isothermal Aging of Lithium-Ion Cells](#)

[Ira Bloom, Edward V Thomas, Jon P Christophersen, David C Robertson, Lee K Walker, Chinh Ho, Vince Battaglia](#)

[889Achieving Long Life Time Batteries: Understanding and Controlling Non-Faradaic Reactions](#)

[Esther S Takeuchi, Amy C Marschilok, Kenneth J Takeuchi](#)

[890Quantifying the Effect of Lithium-Ion Electrode Manufacturing Defects on Electrochemical Performance](#)

[Lamuel David, Sergiy Kalnaus, Debasish Mohanty, Yangping Sheng, Jianlin Li, Claus Daniel, David L Wood](#)

[891A Computational Analysis of Battery Response during Onset of Internal Short Under Mechanical Abuse Conditions](#)

[Srikanth Allu, Sergiy Kalnaus, Abhishek Kumar, Sreekanth Pannala, Srdjan Simunovic, Hsin Wang, John A Turner](#)

[892Determining Factors for Charge-Discharge Performances of Composite Electrode in Lithium-Ion Battery](#)

[Yuki Oriksa, Hisao Yamashige, Hajime Tanida, Misaki Katayama, Koji Kitada, Ke Zheng Chen, Yasuhiro Inada, Toshiaki Ohta, Zyun Siroma, Shiro Kato, Hajime Kinoshita, Hajime Arai, Zempachi Ogumi, Yoshiharu Uchimoto](#)

[893Mechanistic Study of Parasitic Reactions on Cathodes of Lithium-Ion Batteries](#)



Zonghai Chen, Xiaoqiao Zeng, Tianyuan Ma, Khalil Amine

894 Understanding the Abnormal Capacity of Metal Hydroxide Anode Material for Next Generation Lithium Rechargeable Batteries

Hyunchul Kim, Mahalingam Balasubramanian, Jaeseung Yoo, Wontae Lee, Jaesang Yoon, Ji Man Kim, Won-Sub Yoon

895 Healing of Micro-Cracks in Silicon-Aluminum Anodes for Lithium-Ion Cells: Role of Silicon Particle Size and Electrolyte Composition

Sandeep Bhattacharya, Ahmet T. Alpas

896 Effect of Zero Volt Storage on Commercial Lithium Titanate Cells

Michael Brunell, Brad Hanauer, Melanie Loveridge, Richard Dashwood, Rohit Bhagat

897 Effects of Cell Reversal on Li-Ion Batteries

E. Joseph Nemanick, David Wang, James Matsumoto, Neil Ives

898 The Mechanism of Decreasing Resistance by SDX™ in Lithium Ion Battery

Akifumi Takeda, Takeshi Nakamura, Hitoshi Yokouchi, Hideki Tomozawa

899 The Effect of Contact Resistance during Nail Penetration of Commercial Automotive Lithium-Ion Cells

Ahmed Abaza

900 Li Plating Quantification in Commercial Graphite□LiFePO<sub>4</sub> cells

David Anseán, Matthieu Dubarry, Arnaud Devie, Bor Yann Liaw, Víctor M. García, Juan C. Viera, Manuela González

901 Impedance Spectra Associated with Metal Deposition at the Negative Electrode from Contaminated Metal Particles at the Positive Electrode in a Lithium Ion Battery

Hironori Nakajima, Akiko Inada, Tatsumi Kitahara, Yusaku Nagata

902Investigation into Estimation of Battery Core Temperature Using Electrochemical Impedance Spectroscopy on a 4P1S Array of 26650 Cells

Brett Huhman, Corey T Love, John M Heinzl

903In-Situ Diagnostics of Ageing Mechanisms in Li-Ion Batteries Using Entropy Spectroscopy and Incremental Capacity Analysis

Preben J. S. Vie, Jan Petter Maehlen, Hanne Flåten Andersen, Martin Kirkengen

904Exploiting Zinc Dendrite Formation and Bromine Transport Properties to Build a Safer, More Reliable Zn-Br<sub>2</sub> Battery

Thomas Hodson

905Investigation of Anode/Cathode Electrolyte Interfaces at High Cell Voltages with and without Additives

Dongqing Liu

906Lifetime Prediction of Massively Parallelized Lithium-Ion Batteries

Friedrich Emanuel Hust, Jan Kabzinski, Markus Niessen, Heiko Witzenhausen, Dirk Uwe Sauer

907Title: Mechanical Behaviour of Lithium Ion Pouch Cells Under the Influences of Electrochemical Aging or Mechanical Injury

Lei Shi, Ulrich Kunz

908Investigation on Electrochemical Properties and Degradation Mechanism of Cylindrical-Type Li-Ion Rechargeable Battery without Deconstruction

Hironori Kobayashi, Kentaro Kuratani, Shinji Koike, Yoshiyasu Saito

[909High-Precision Measurement of Side Reaction Current on Lithium Insertion Electrodes in Lithium-Ion Cells](#)

[Yuki Fukunishi, Yusuke Yamada, Kingo Ariyoshi](#)

[910Diagnosis of the Storage Aging of a Commercial Cell with Neutron Powder Diffraction](#)

[She-huang Wu, Po-Han Lee](#)

[911Lithium Plating Identification and Quantification in Li-Ion Cell from Degradation Behaviors](#)

[Yakun Zhang, Xinyu Li, Laisuo Su, Zhe Li, Bor Yann Liaw, Jianbo Zhang](#)

[912\(Invited\) Analyzing and Minimizing Capacity Fade through Model Predictive Control - Theory and Experimental Validation](#)

[Manan Pathak, Dayaram Sonawane, Shriram Santhanagopalan, Venkat R. Subramanian](#)

[913Coupled Electrochemical, Electrical and Thermal Modeling of Li-Ion Battery Modules](#)

[Sergiy Kalnaus, Srikanth Allu, Sreekanth Pannala, Srdjan Simunovic, Wael Elwasif, John A Turner](#)

[914Calendar and Cycle Aging of Commercial NCA Lithium-Ion Cells](#)

[Peter Keil, Andreas Jossen](#)

[915Novel Diagnostic Methods Via Instrumented Lithium Batteries](#)

[Rohit Bhagat, Joe Fleming, Euan McTurk, Sampan Seth, Richard Dashwood, David Greenwood, Stefania Ferrari](#)

[916Electrochemical-Thermal Characterization and Modeling of Large Format Prismatic Lithium Ion Batteries](#)

Howie N Chu, Charles W Monroe

917 Non-Isothermal Electrochemical Model for Low Temperature Operation of Linca Battery

Suman Basu, Krishnan S Hariharan, Subramanyya Mayya Kolake, Taewon Song

918A Semi-Empirical Capacity Fade Model for Li-NCA Cathode

Suman Basu, Krishnan S Hariharan, Subramanyya Mayya Kolake, Taewon Song

919 (Invited) Lithium Rich Layered Materials – Electrochemical Properties of Epitaxial Film Electrodes

Ryoji Kanno, Sou Taminato, Kazuhiro Hikima, Yoshifumi Mizuno, Kota Suzuki, Masaaki Hirayama

920 Diagnostic Examination of NCM523//Graphite Cells Cycled at High Voltages

Daniel P Abraham, James A Gilbert

921 (Invited) Investigation of the Reaction & Degradation Mechanism of Iron Based Cathodes for Sodium-Ion Batteries Using X-Ray Absorption and Time-Resolved X-Ray Diffraction Techniques

Ghulam Ali, Dong-Hyun Kim, Ji-Hoon Lee, Kyung Yoon Chung

922 Calendar Degradation Mechanism of Lithium Ion Batteries with a  $\text{LiMn}_2\text{O}_4$  and  $\text{LiNi}_{0.5}\text{Co}_{0.2}\text{Mn}_{0.3}\text{O}_2$  Blended Cathode

Keisuke Ando, Tomoyuki Matsuda, Masao Myojin, Daichi Imamura

923 In Situ Stress Measurements during Electrochemical Cycling of Lithium-Rich Cathodes

Leah Nation, Juchuan Li, Christine James, Yue Qi, Nancy J Dudney, Brian W. Sheldon

[924Mechanical Testing of Battery Electrodes for Applications in Flexible Lithium Ion Batteries](#)

[Abhinav Machhindra Gaikwad, Ana Claudia Arias](#)

[925Coupling Surface Imaging, FIB, and Spectroscopies to Understand Silicon Anodes Lithiation and Ageing Mechanisms](#)

[Arnaud Bordes, Eric De Vito, Cédric Haon, Alexandre Montani, Adrien Boulineau, Philippe Marcus](#)

[926Surface Films on LIB \(Lithium-ion Battery\) Electrodes](#)

[Seung M. Oh, Tae Jin Lee, Jiwon Jung, Hosang Park, Ji Heon Ryu](#)

[927Contribution of a Reference Electrode Inserted in a Commercial Cell in the Understanding of the Ageing Mechanisms of C/NMC Li-Ion Batteries at Low Temperatures](#)

[Bramy Pilipili Matadi, Sylvie Geniès, Arnaud Delaille, Yann Bultel](#)

[928Dynamic Transformations of Layered Compounds at Full Delithiation Due to Surface Triggered Reactions](#)

[Nicholas Faenza, Pinaki Mukherjee, Shawn Sallis, Nathalie Pereira, Hena Das, Gerbrand Ceder, Louis F.J. Piper, Frederic Cosandey, Glenn G Amatucci](#)

[929Elucidation of Reaction Mechanism at the Cathode/Electrolyte Interface in All-Solid-State Battery By Using Depth-Resolved X-Ray Absorption Spectroscopy](#)

[Ke Zheng Chen, Takuya Mori, Yuki Orihara, Yusuke Ito, So Yubuchi, Takuya Matsuyama, Akitoshi Hayashi, Masahiro Tatsumisago, Kiyofumi Nitta, Tomoya Uruga, Yoshiharu Uchimoto](#)

[9303D Imaging and in-Operando X-Ray Tomography Study of Lithiation Induced Delamination and Cracking of Si Based Anodes for Lithium Ion Batteries](#)

[Farid Tariq, Vladimir Yufit, Kristina Kareh, Pui-kit Lee, Dennis Y.W. Yu, David S](#)

[Eastwood, Peter D Lee, Moshiel Biton, Yu Merla, Emanuel Peled, Diana Golodnitsky, Nigel P. Brandon](#)

## **A07-Electrochemical Capacitors and Related Devices: Fundamentals to Applications**

931 [\(Invited\) The Development of Pseudocapacitance in Oxide Materials](#)

[Bruce Dunn](#)

932 [Vanadium Nitride Electrodes: Limitations and Practical Use in Electrochemical Capacitors](#)

[Thierry Brousse, Alban Morel, Daniel Bélanger, Yann Borjon-Piron](#)

933 [High-Performance Hybrid Supercapacitor with 3D Hierarchical Porous Flower-like Layered Double Hydroxide Grown on Nickel Foam As Binder-Free Electrode](#)

[Luojiang Zhang, Kwan San Hui, Kwun Nam Hui, Haiwon Lee](#)

934 [New Colloidal Techniques for the Fabrication of Manganese Dioxide-Carbon Nanotube Electrodes of Supercapacitors](#)

[Igor Zhitomirsky](#)

935 [Ba<sub>0.5</sub>Sr<sub>0.5</sub>Co<sub>x</sub>Fe<sub>1-x</sub>O<sub>3-d</sub> As High Volumetric Capacitance Pseudocapacitive Electrode Materials](#)

[Pierre Lannelongue, Thierry Brousse, Olivier Crosnier, Frederic Favier](#)

936 [Thin-Film Supercapacitor Electrodes Based on Nanomaterials Processed By Ultrasound Irradiation](#)

[João Coelho, Sean O'Brien, Andrés Seral-Ascaso, Sang-Hoon Park, Valeria Nicolosi](#)

937 [Pseudocapacitive FeWO<sub>4</sub> Electrode: From Charge Storage Mechanism to Practical Use in Asymmetric Cell](#)

[Olivier Crosnier, Nicolas Goubard-Bretesché, Gaëtan Buvat, Camille Douard, Antonella](#)

[Iadecola, Stéphanie Belin, Richard Retoux, Christophe Payen, Frederic Favier, Kazuaki Kisu, Etsuro Iwama, Katsuhiko Naoi, Marie-Liesse Doublet, Thierry Brousse](#)

938 [Manganese Dioxide Electrode: Attempts to Increase the Electrochemical Utilization](#)

[Axel Gambou-Bosca, Daniel Bélanger](#)

939 [Pseudocapacitance and Excellent Cyclability of Quinones on 2D Graphene](#)

[Muhammad Boota, Chi Chen, Matthieu Bécuwe, Ling Miao, Yury Gogotsi](#)

940 [Understanding Pseudocapacitive Charge Storage in Transition Metal Oxides from Fundamental Interfacial Processes to 3D Electrode Design](#)

[Jeffrey W. Long, Megan B. Sassin, Christopher N. Chervin, Joseph F. Parker, Jean Marie Wallace, Debra R. Rolison](#)

941 [\(Invited\) Wafer Level Fabrication Process of High Performance Micro-Supercapacitors](#)

[Kevin Robert, Etienne Eustache, Kevin Brousse, Peihua Huang, Camille Douard, Mylène Brachet, Jean Le Bideau, Barbara Daffos, Pierre-Louis Taberna, Patrice Simon, Thierry Brousse, Christophe Lethien](#)

942 [Printable Micro-Supercapacitor with Ni@ MnO<sub>2</sub> Dendritical Core-Shell Nanostructure and Pattern Design for Flexible Electronic Applications](#)

[Yuanjing Lin, Yuan Gao, Zhiyong Fan](#)

943 [3D Printed Structural Pseudocapacitors - a Multi-Scale X-Ray Tomography Study](#)

[Xinhua Liu, Rhodri Jervis, Robert C. Maher, Ignacio Villar-Garcia, Max Naylor-Marlow, Paul R. Shearing, Mengzheng Ouyang, Lesley F. Cohen, Nigel P. Brandon, Billy Wu](#)

944 [Simple and Versatile Fabrication of 3D Micro-Supercapacitors Using Pneumatic Printing Combined with Intense Pulsed White Light](#)

[Chiho Song, Hak-Sung Kim, Heejoon Ahn](#)

[945Mechanically Stable Carbide Derived Carbon Nanoporous Films for Micro-Supercapacitors](#)

[Pierre-Louis Taberna, Patrice Simon, Christophe Lethien, Peihua Huang, Sebastien Pinaud, Kevin Brousse, Raphael Laloo, Viviane Turq, Marc Respaud, Arnaud Demortiere, Barbara Daffos, Bruno Chaudret, Yury Gogotsi](#)

[946\(Invited\) Ferrocene-Modified Electroactive Ionic Liquids to Prevent Self-Discharge of Redox-Active Electrolyte Capacitors](#)

[Dominic Rochefort, Han Jin Xie, Bruno Gélinas](#)

[947Significant Performance Enhancement in Asymmetric Supercapacitors with Redox Additive Aqueous Electrolyte and Trade-Off Between Capacitance/Cycling at Elevated Temperatures](#)

[Arvinder Singh, Amreesh Chandra](#)

[948Pseudohalide-Based Electrolytes for High-Energy Electrochemical Capacitors](#)

[Krzysztof Fic, Barbara Gorska, Paulina Bujewska, François Béguin, Elzbieta Frackowiak](#)

[949Characterization of Different Conductive Salts in Acn-Based Electrolytes for Electrochemical Double Layer Capacitors](#)

[Jakob Krummacher, Christoph Schütter, Andrea Balducci](#)

[950Ionic Liquid Mxene-Based Pseudocapacitors](#)

[Mohamed Alhabeb, Katherine L Van Aken, Babak Anasori, Yury Gogotsi](#)

[951From Computational Screening to Real Devices: The Case of Cyano Esters Based Electrolytes for Electrochemical Double Layer Capacitors](#)

[Andrea Balducci, Christoph Schütter, Jakob Krummacher, Martin Korth](#)

[952Silica-Based Ionogel Electrolyte for Electrical Double Layer Capacitors](#)



Léo Negre, Barbara Daffos, Pierre-Louis Taberna, Patrice Simon

953 Aqueous-Based Polymer Electrolytes for Solid Energy Storage Systems

Keryn Lian, Jak Li, Alvin Virya, Yee Wei Foong, Haoran Wu, Han Gao

954 Solid-State Microsupercapacitors Assembled Using Ionic Liquids for Wide Temperature-Range Applications

Hsisheng Teng, Pei Yi Chang, Hsin-Chieh Huang

955 High Voltage Lithium Ion Capacitor for Elevated Temperature Applications; Built on Activated Carbon and Litfsi Dissolved in Alkylcarbonates Compound

Maryam Salari, Mark W Grinstaff

956 (Invited) In-Situ Study of Electric Double Layer and Ionic Transport at the Solid/Liquid Interface Using Scanning Probe Microscopy

Jeremy Come, Jennifer Black, Sergei V. Kalinin, Yury Gogotsi, Nina Balke

957 (Invited) Bottom-up Silicon Nanostructures: A Toolbox for Integrated on-Chip Edlcs

Dorian Gaboriau, Mylène Brachet, Maxime Boniface, David Aradilla, Dmitry Aldakov, Gerard Bidan, Jean Le Bideau, Thierry Brousse, Pascal Gentile, Said Sadki

958 (Invited) Understanding the Different Steps Occurring during the Charging of Supercapacitors

Clarisse Pean, Mathieu Salanne, Patrice Simon

959 (Invited) Aqueous Hybrid Supercapacitor Using Water-Stable Multilayered Li<sup>+</sup>-Doped Carbon Negative Electrode with Alginate Gel As a Buffer Layer

Sho Makino, Shigeyuki Sugimoto, Wataru Sugimoto

[960\(Invited\) Binary Mixtures of 1-Butyl-1-Methylpyrrolidinium Bis{\(trifluoromethyl\)Sulfonyl}Imide and Aliphatic Nitrile Solvents As Electrolyte for Electrochemical Double Layer Capacitors](#)

[Christoph Schütter, Alex R Neale, Patrick Wilde, Peter Goodrich, Christopher Hardacre, Stefano Passerini, Johan Jacquemin, Andrea Balducci](#)

[961\(Invited\) Novel  \$Ti\_4O\_7/MnO\_2\$  Pseudocapacitive Composite for High Energy Density and Stability Supercapacitor](#)

[Yu-Ting Weng, Sheng-Siang Huang, Chung-Hsien Chuang, Nae-Lih Wu](#)

[962\(Invited\) Structural Aspect on Ion Solvation in Ionic Liquid-Based Electrolyte Solutions for Electrochemical Devices](#)

[Kenta Fujii, Nobuko Yoshimoto, Masayuki Morita](#)

[963\(Invited\) Nanostructured Graphene Electrodes for High Performance and Stretchability](#)

[Jeong Gon Son](#)

[964\(Invited\) Ionic Liquid Mixture Electrolytes to Increase the Performance of Electrochemical Capacitors](#)

[Katherine L Van Aken, Yury Gogotsi](#)

[965Electrochemical Characteristics of Graphite Felt Electrode By Surface Modification for Vrfbs](#)

[Tae-Hyoung Noh, Min-Young Kim, Moo-Sung Lee, Hong-Sik Park, Ho-Sung Kim](#)

[966Interconnected Carbon Nanostructures for High Performance Supercapacitor Applications](#)

[Hyun-Kyung Kim, Ali Reza Kamali, R Vasant Kumar, Derek John Fray](#)

[967Lithium Titanate Confined in Carbon Nanopores for Asymmetric Supercapacitors](#)

[Enbo Zhao, Chuanli Qin, Hong-Ryun Jung, Gene Berdichevsky, Alper Nese, Seth Marder, Gleb Yushin](#)

[968 Investigation of Self Supporting Paper-like Structures Fabricated with Few-Layer Exfoliated Graphene Platelets and Composites with Birnessite-MnO<sub>2</sub> As Electrode Materials for Electric Double-Layer Capacitor and Redox Capacitor](#)

[Debkumar Saha, Lawrence T. Drzal](#)

[969 The High-Performance Asymmetric Capacitors with Lithium-Intercalated Metal-Organic Framework Electrodes](#)

[Yuka Ozawa, Nobuhiro Ogihara, Osamu Hiruta, Nobuko Ohba](#)

[970 Advanced in-Situ Characterization of Carbon-Based Supercapacitors](#)

[Krzysztof Fic, Elzbieta Frackowiak](#)

[971 Preparation and Electrochemical Properties of the Pouch-Type Edlc](#)

[Ick-Jun Kim, Sunhye Yang, Sang-Min Lim, Bo-Kun Koo](#)

[972 New Hybrid Supercapacitor Based on Li-Predoped TiO<sub>2</sub>\(B\) Prepared By Means of Ultracentrifugation](#)

[Shintaro Aoyagi, Keita Okazaki, Yoshihiko Egawa, Junichi Miyamoto, Etsuro Iwama, Wako Naoi, Katsuhiko Naoi](#)

[973 Activation of Petroleum Pitch for Production of Porous Carbons with High Electric Double Layer Capacitance](#)

[Pin-i Wu, Hsisheng Teng](#)

[974 Fabrication and Enhanced Electrochemical Properties of Bi<sub>3.64</sub>Mo<sub>0.36</sub>O<sub>6.55</sub> Nanoparticles with a High Bi Content for Pseudocapacitor Electrodes](#)

[Xiaoheng Liu, Dan Zhu, Weiwei Wang](#)

[975 Facile Synthesis of Nickel Cobalt Layered Double Hydroxides Microspheres with High Pseudocapacitive Performance](#)

[Daosong Zha, Qiaofeng Han, Xin Wang](#)

[976 Facile Synthesis of Nanostructured  \$\text{Co}\_3\text{O}\_4\$  thin Films at Low Temperature for High-Performance Pseudocapacitors](#)

[Kuan Tian, Lu Wei, Xin Guo](#)

[977 Activated Carbons By Nitrogen Doped Chemical Activation and Their Performance for Electrical Double Layer Capacitors](#)

[Masaaki Yoshikawa, Hiroyuki Fujimoto](#)

[978 Cycling Performance of Ppy Derived Carbon Based Symmetric Supercapacitors in Aqueous Electrolyte](#)

[Abdulhakeem Bello, Farshad Barzegar, Moshawe Jack Madito, Damilola Yusuf Momodu, Abubakar Abubakar Khaleed, Tshifhiwa Moureen Masikhwa, Julien Koudio Dangbegnon, Ncholu Manyala](#)

[979 Vertically Stacked Bilayer  \$\text{CuCo}\_2\text{O}\_4/\text{MnCo}\_2\text{O}\_4\$  heterostructures on Functionalized Graphite Paper for High-Performance Electrochemical Capacitors](#)

[Shude Liu, Kwan San Hui, Kwun Nam Hui](#)

[980 In-Situ TEM Analysis of Ink-Jet Printed  \$\text{MnO}\_2\$ -Graphene for Supercapacitor Electrodes](#)

[Lorcan McKeon, Edmund Long, João Coelho, Chuanfang Zhang, Sang Hoon Park, Richard Coull, Aleksey Shmelov, Valeria Nicolosi](#)

[981 A Combined Theoretical-Experimental Study of Energy Storage Behavior of Reduced Graphene Oxide/Manganese Oxide Supercapacitor](#)

[Chan-Woo Lee, Segi Byun, Jung-Joon Yoo](#)

[982 Electrochemical Properties of CO<sub>2</sub> Laser Radiated Carbon-Based Electrodes for Supercapacitors](#)

[Hye-Ryeon Yu, Yu-Song Choi, Hae-Won Cheong](#)

[983 Electrochemical Characteristics of Large Area Thin Film Supercapacitors for Flexible Electronic Applications](#)

[Jung-Joon Yoo, Young Il Kim, Jong-Huy Kim](#)

[984 Activated Carbon Derived from Tree Bark Biomass for High Performance Electrochemical Capacitors](#)

[Damilola Yusuf Momodu, Moshawe Jack Madito, Farshad Barzegar, Tshifhiwa Moureen Masikhwa, Faith Ugbo, Abubakar Abubakar Khaleed, Abdulhakeem Bello, Julien Koudio Dangbegnon, Ncholu Manyala](#)

[985 Three-Dimensional Graphene Sponge with Hierarchically Porous Structure for Electrochemical Supercapacitors](#)

[Changsheng Shan, Hsing-Lin Wang](#)

[986 Synthesized the Nano-Rod Structured Metal Oxide By AAO Template Method Application to Electrochemical Capacitors](#)

[Cheong Kim, Hiroki Habazaki, Soo-gil Park](#)

[987 Investigating the Electrochemical Behaviour of Different Carbons in Non-Aqueous Solvents Using Step Potential Electrochemical Spectroscopy](#)

[Scott W Donne, Madeleine F Dupont, Aude Roland](#)

[988 The Effects of Duty Cycle on the Step Potential Electrochemical Spectroscopy \(SPECS\) and Electrochemical Impedance Spectroscopy \(EIS\) Analysis of Manganese Oxides for Electrochemical Capacitors](#)

[Scott W Donne, Marveh Forghiani](#)

[989Graphene Oxide Self-Assembled with a Cationic Fullerene for High Performance Supercapacitor Applications](#)

[Krishnan Senthilkumar](#)

[990High Performance Supercapacitors Electrode Based on N-Doped Carbon Nanofibers](#)

[Rong Liu, Fangping Zhang, Enyuan Li, Jun Xu, Guohui Yuan](#)

[991High Performance Supercapacitor with the Activated Carbon Particle/Polymer Composite](#)

[Yunseok Jang, Kwang-Young Kim](#)

[992High Energy-Density Hybrid Supercapacitors: Combining High-Voltage Window Ionic Liquids with MnO<sub>2</sub>-Nanomaterials](#)

[Simon Lindberg, Florian Nitze, Aleksandar Matic](#)

[993Comparative Study with Phenol and Furfural Resin-Based Active Carbon for High Density Electric Double Layer Capacitor](#)

[Takafumi Nakazawa, Kouhei Nishimura, Takeyasu Saito, Naoki Okamoto, Isamu Ide, Yoshikazu Onishi, Masanobu Nishikawa](#)

[994MnO<sub>2</sub> for Supercapacitors](#)

[Ingrid Roten Mattson, Svein Sunde, Sidsel Meli Hanetho, Ann Mari Svensson](#)

[995A High Energy Density Lithium Ion Capacitor with CNT Anchored on Carbon Nano Plate As a New Anode Material](#)

[Youngkwon Kim, Sang Cheol Woo, Jun Ho Song, Churl Seung Lee, Ji Sun Park, Young-Jun Kim](#)

[996Flexible Supercapacitor for High Temperature Applications](#)

[Elof Köhler, Henrik Staaf, Volodymyr Kuzmenko, Qi Li, Peter Enoksson](#)

997Preparation of Sioc Li-Ion Capacitor By TEOS Based Sol-Gel Method with Different Silicones Precursors

Bochen Li, Chikara Funahashi, Takeyasu Saito, Naoki Okamoto, Isamu Ide, Yoshikazu Onishi, Masanobu Nishikawa

998Supercapacitive Properties of the Electrodeposited Layered Electrodes of Ruthenium Oxide and Polyaniline

Kwang Man Kim, Young-Gi Lee, Jumi Kim, Ju Young Kim, Jang Myoun Ko

999Hybrid Composite Electrodes for Supercapacitors Prepared By Simple Routes

Tommy Mokkelbost, Sidsel Meli Hanetho, Alejandro Oyarce Barnett, Julian Richard Tolchard, Ann Mari Svensson, Fatima Montemor

1000Optoelectronics and Electrochemical Properties of RuO<sub>2</sub>/PEDOT:PSS Transparent, Conductive Ultrathin Films

Chuanfang Zhang, Thomas Higgins, Sang Hoon Park, Jonathan N Coleman, Valeria Nicolosi

1001Porous Silicon Electrochemical Capacitors Using Double Sided Porous Silicon and ALD Coatings

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

1002Polyoxometalate Modified Biomass Carbon Composites for Supercapacitor Electrodes

Matthew Genovese, Keryn Lian

1003Study of the Aluminum Anode Oxide Film and Cathode Material Interface of Conductive Polymer Aluminum Solid Electrolytic Capacitor

Masaki Sekiguchi, Tomohiro Ito, Kazuhiro Tachibana, Tatsuo Nishina

[1004Synthesis and Integration of Ultrathin Polyaniline Films into Carbide Derived Carbon Supercapacitors](#)

[Yuriy Y. Smolin, Katherine L Van Aken, Muhammad Boota, Masoud Soroush, Yury Gogotsi, Kenneth K.S. Lau](#)

[1005Polyaniline / Nickel Ferrite / Nitrogen Doped Graphene Ternary Composite for Supercapacitors](#)

[Xifeng Xia, Luyou Tong, Wu Lei, Qingli Hao](#)

[1006Wearable Fiber-Shaped Solid-State Supercapacitors Based on Hierarchical MoS<sub>2</sub> for a Self-Powered Photodetecting System](#)

[Bin Wang, Jianli Cheng](#)

[1007Supercapacitors Using Binder-Free & Surfactant-Free CNT Electrodes](#)

[Sean Brahim, Erik Indra, Ramon Sy, Paul Bonzato, Stefan Maat](#)

[1008\(Invited\) Ultracapacitive Energy Storage Using 2D Nanomaterials Under Extreme Conditions](#)

[Ho Seok Park](#)

[1009Double Reinforced Energy Storage of Graphene By KOH Activation and Nitrogen Doping](#)

[Yiran Wang, Jiang Guo, Hailong Lyu, Suying Wei, Zhanhu Guo](#)

[1010Flexible Wire-Shaped Supercapacitors in Parallel Double Helix Configuration with Stable Electrochemical Properties Under Static/Dynamic Bending](#)

[Kai Guo, Huiqiao Li](#)

[1011Surface Functionalization and Capacitance Enhancement of Activated Carbon through Mechanical Activation](#)



Ling Li, Caihong Liu, Leon Shaw

1012 Electrochemical Processing and Chemical Modification of Carbon Cloth for Capacitive Applications

Masaharu Nakayama, Kyohei Komine, Sohei Iguchi

1013 Hemp-Derived Activated Carbons for Electrochemical Energy Storage

Stephen M Lipka, Christopher R Swartz, Joanna E. Mroczkowska, Wei Sun

1014 Electric Double Layer Capacitor Properties of Pillared Carbons

Yoshiaki Matsuo, Takuya Fukuda, Osamu Kimizuka, Motoaki Nishijima, Hajime Kinoshita

1015 Investigating the Effects of Slurry Preparation Protocol on Electrochemical Performance of Carbon Based Flowable Electrodes

Bilen Akuzum, Lutfi Agartan, Yury Gogotsi, E. Caglan Kumbur

1016 Resolving the Effects of Surface Area and Porosity on the Capacitance of Activated Carbon

Jocelyn Ellen Zuliani, Donald W. Kirk, Charles Q. Jia

1017 Simultaneous Production of High-Performance Flexible Textile Electrodes and Fiber Electrodes for Wearable Energy Storage

Chengjun Xu, Liubing Dong

1018 (Invited) In Situ Gas Analysis of Carbon Based Supercapacitor Operating in Aqueous Electrolyte

Minlong He, Krzysztof Fic, Petr Novák, Erik J. Berg, Elzbieta Frackowiak

1019 Directly-Grown Hierarchical Carbon Nanotube@Polypyrrole Core-Shell Hybrid on Carbon Cloth As a High-Performance Flexible Supercapacitor with High Cycle Stability

[Indrajit Shown, Yesi Yesi, Li-Chyong Chen, Kuei-Hsien Chen](#)

1020 [Metal-Free Nanocomposite Materials Based on Carbon Nitride Nanofibers and Graphene Oxide for Electrochemical Applications: Supercapacitors & Catalysts for Oxygen Reduction Reaction \(ORR\)](#)

[Omar Movil-Cabrera, John A Staser, Allen Armando Rodriguez-Silva](#)

1021 [Electrochemical Capacitor Electrodes Based on High-Purity Electrospun Polyaniline and Polyaniline-Carbon Nanotube Nanofibers](#)

[Silas Simotwo, Chris Delre, Vibha Kalra](#)

1022 [\(Invited\) Hybrid Supercapacitors: Their Evolution to Second and Third Generations](#)

[Katsuhiko Naoi, Wako Naoi](#)

1023 [Simplified Lithium-Ion Capacitors with Irreversible Lithiated Materials in the Positive Electrode](#)

[Pawel Jezowski, Olivier Crosnier, Philippe Poizot, Thierry Brousse, François Béguin](#)

1024 [High Performance Pseudocapacitors Based on Multicomponent Transition Metal Oxides By Local Distortion of Oxygen Octahedra](#)

[Hyeon Jeong Lee, Ji Hoon Lee, Jang Wook Choi](#)

1025 [High-Power Lithium Vanadate / Carbon Composite for Hybrid Supercapacitors](#)

[Etsuro Iwama, Nozomi Kawabata, Nagare Nishio, Kazuhisa Baba, Wako Naoi, Patrick Rozier, Patrice Simon, Katsuhiko Naoi](#)

1026 [High Energy Hybrid Capacitor with Quinone-Grafted Negative Electrode in Neutral Aqueous Electrolyte](#)

[Paulina Babuchowska, François Béguin](#)

[1027Metal Free Hybrid Capacitor Using Intercalation of 1-Butyl-3-Methylimidazolium Cation to Acetylene Black, Ketjen Black and Graphite](#)

[Masanobu Chiku, Yuuya Tanimoto, Eiji Higuchi, Hiroshi Inoue](#)

[1028Electrochemical Kinetics of Carbon-Nested Ultrafast Nano-LiFePO<sub>4</sub> for Hybrid Ees](#)

[Kazuaki Kisu, Etsuro Iwama, Shota Nakashima, Yuki Sakai, Yuki Orikasa, Philippe Leone, Nicolas Dupré, Wako Naoi, Thierry Brousse, Patrick Rozier, Patrice Simon, Katsuhiko Naoi](#)

[1029Supercapacitors: From Coin Cell to 800 F Pouch Cell](#)

[Alexander John Roberts, Irene Rubio, Daniel Gonzalez, Rohit Bhagat](#)

[1030Important Technical Elements to Enhance Electrochemical Capacitor Performance](#)

[Masashi Ishikawa, Masaki Yamagata, Kazunari Soeda, Satoshi Uchida](#)

[1031Flexible and Weaveable Wire-Shaped Capacitor with Ultra-High Energy Density](#)

[Jianli Cheng, Bin Wang](#)

[1032\(Invited\) Differentiating the Behaviour of Electrochemical Capacitor Materials](#)

[Scott W Donne, Madeleine F Dupont](#)

[1033Chemically Deposited NiCo<sub>2</sub>O<sub>4</sub> Thin Films for High-Performance Supercapacitors](#)

[Ramesh J. Deokate, Ramchandra S. Kalubrame, Chandrakant D Lokhande](#)

[1034Effect of Porous Structure of Electrodes on the Properties of AC/AC Edlc with Organic Electrolyte](#)

[Kadir Özgün Köse, Mehmet Kadri Aydinol](#)

[1035Mechanism Study on the Asymmetric Behaviors of Carbon/Carbon Supercapacitors](#)

[Lintong Hu, Huiqiao Li](#)

1036 [Lithium Ion Capacitor with Massive Power Density Using Electrodes from Silicon Oxycarbide and Activated Carbon Derived from Zalacca Salacca Peels](#)

[Martin Halim, Joong Kee Lee](#)

1037 [Carbonized Nanocellulose Sustainably Boosts the Performance of Activated Carbon in Ionic Liquid Supercapacitors](#)

[Zhi Li, Jun Liu, Thomas George Thundat](#)

1038 [Characterising the Charge Storage Mechanisms in Electrochemical Capacitors Using a Combination of Electrochemical Impedance Spectroscopy \(EIS\) and Step Potential Electrochemical Spectroscopy \(SPECS\)](#)

[Scott W Donne, Madeleine F Dupont, Amanda Cameron, Gareth Elliott](#)

## **B01-Carbon Nanostructures: From Fundamental Studies to Applications and Devices**

1039 [Thermal Energy Harvesting Using Carbon Nanotube and Polymer Aqueous Electrolyte Composite](#)

[Ali Hussain Kazim, Baratunde Cola](#)

1040 [Tuning Work Function of Multi-Walled Carbon Nanotubes By Defects Creation](#)

[Bo Gong, Jie Chen, Akitoshi Ikematsu, Keiko Waki](#)

1041 [Structural and Electrode Properties of Iodine Molecules Encapsulated in Single-Walled Carbon Nanotubes](#)

[Yukihiro Yoshida, Nao Kato, Yosuke Ishii, Shinji Kawasaki](#)

1042 [Alkali Metal Ion Storage Properties of Single-Walled Carbon Nanotube Encapsulation Systems](#)

[Yuki Sakamoto, Li Canghao, Yosuke Ishii, Shinji Kawasaki](#)

1043 [Nanotubes Via Vacuum-Supported Suction-System](#)

[Maren Rastedt, Dirk Hoogestraat](#)

1044 [Reactor R&D: Effect of Plasma Additives on Endohedral Metallofullerene and Empty-Cage Fullerenes](#)

[Steven Stevenson, Sarah K Budd, Brittany L Kime](#)

1045 [SWCNT-TiO<sub>2</sub> Nanocomposite Photo-Anode for Improved Thermal Performances of Dye-Sensitized Solar Cells](#)

[Radhe Agarwal, Satyaprakash Sahoo, Chitturi venkateswara Rao, Ram S. Katiyar](#)

1046 [Control Synthesis of Nitrogen Doped Carbon Nanotubes and Their Application in Energy Storage](#)

[Hao Liu, Jun Mei](#)

1047 [CVD Grown Mwcnts and Graphene for Pemfcs Application](#)

[Daniela Ion-Ebrasu, Stanica Enache, Constantin Bubulinca, Elena Carcadea, Mihai Varlam, Ioan Stefanescu, Gunther Wittstock](#)

1048 [Functionalization of Graphene Sheets By the Diazonium Chemistry during the Electrochemical Exfoliation of Graphite](#)

[Benjamin Diby Ossoonon, Daniel Bélanger](#)

1049 [Controllable Growth and Ultrasensitive Molecule Detection of Large-Area Doped Graphene](#)

[Ruitao Lyu](#)

1050 [Gallium Catalysed Direct Growth of Graphene Epitaxial Layer on SiC Substrates By Chemical Vapor Deposition](#)

[Kulandaivel Jeganathan, Periyagounder Dharmaraj](#)

1051 [Graphene Chemical Modification](#)

[Sandra Catalina Hernandez, Chad Junkermeier, Pratibha Dev, Woo Lee, Jeremy Robinson, Paul Sheehan, Thomas Reinecke, Scott Walton](#)

1052 [Optical Properties of Transferred Graphene Nanostructures](#)

[Slava V. Rotkin](#)

1053 [Towards the Manipulation of Defects and Dopants to Functionalise Graphene - a DFT Based Study and Development of New Theoretical Methods](#)

[Mariana Hildebrand, Toby Sainsbury, Ivan Rungger, Nicholas Harrison](#)

1054 [The Effect of pH on the Reduction of Graphene Oxide in Regards to the Structure and ORR Capabilities in Alkaline Media](#)

[Dean Glass, G. K. Surya Prakash, George A. Olah](#)

1055 [High-Energy Electrochemical Capacitors Utilizing Chemically Reduced Graphite Oxide As Negative Electrode Material](#)

[Ilona Acznik, Katarzyna Lota, Agnieszka Sierczyńska](#)

1056 [Oxygen Reduction on Graphene-Based Materials of Different Origin](#)

[Elo Kibena-Põldsepp, Jaana Lilloja, Mairo Merisalu, Protima Rauwel, Leonard Matisen, Ahti Nüüsk, Eduardo S.F. Cardoso, Gilberto Maia, Mati Kook, Urmas Joost, Väino Sammelseg, Kaido Tammeveski](#)

1057 [CVD Assembly of 3D Graphene and Their Contribution for Lithium-Sulfur Batteries with High Energy Density and Long Lifespan](#)

[Qiang Zhang, Jia-Qi Huang, Hong-Jie Peng, Xin-Bing Cheng](#)

1058 [Strain Sensing Polymer Nanocomposites at Ultralow Graphene Loading Level](#)

[Hu Liu, Jiang Guo, Qingliang He, Kun Dai, Guoqiang Zheng, Chuntai Liu, Zhanhu Guo](#)

[1059 Macroscopic Superlubricity Enabled By Ensembles of Graphene on Diamond Nanoscrolls](#)

[Subramanian K. R. S. Sankaranarayanan](#)

[1060 Thermal Conductivity of Ultrananocrystalline Diamond/Nonhydrogenated Amorphous Carbon Composite Films Prepared By Coaxial Arc Plasma Deposition](#)

[Satoshi Takeichi, Takashi Nishiyama, Masamichi Kohno, Koji Takahashi, Yuki Katamune, Tsuyoshi Yoshitake](#)

[1061 Carbon Nanotube Capacitor Using Redox Reaction of Iodide Ions in Electrolyte](#)

[Yukihiro Yoshida, Yoshimitsu Taniguchi, Yosuke Ishii, Shinji Kawasaki](#)

[1062 Field Emission from Titanium-Coated Carbon Nanotubes Grown on Micron-Sized Silicon Pillar Arrays](#)

[Hyung Soo Uh, Sangsik Park](#)

[1063 Catalytic Activity of Gold Nanoparticle Functionalized Carbon Nanotubes for a Hydrogen Evolution Reaction](#)

[Tarek M Abdel-Fattah, Clay Huff, Thomas Dushatinski](#)

[1064 Improving Gas Barrier Performance of Polymer Nanocomposites with Carbon Nanotube Nanofillers](#)

[Yanbin Cui, S Kumar](#)

[1065 RCC Inspired Synthesis of Graphene - Carbon Nanotube Hybrid for Use in Flexible Electronics](#)

[Brahma Teja M S, Siva Kumar B](#)

[1066Improved Performance in Flexible Organic Solarcells Via Optimization of Highly Transparent Silvergrid/Graphene Electrodes](#)

[Jung Hwa Seo, Bright Walker](#)

[1067Observation of Ferromagnetic Semiconductor Behaviors from Graphene Doped with Manganese-Oxide By Electrochemical Method](#)

[Chang-Soo Park, Dongri Qiu, Yoon Shon, Eun Kyu Kim](#)

[1068Chemical Etching and Transfer for Fabrication of Transparent Graphene Electrodes](#)

[Masatou Ishihara, Yuki Okigawa, Takatoshi Yamada, Masataka Hasegawa](#)

[1069Scalable Conversion of Carbon Dioxide into Graphene for Electrochemical Energy Storage](#)

[Chen Li, Xiong Zhang, Yanwei Ma](#)

[1070Improvement of Contact Resistance of Graphene Devices Via AuCl<sub>3</sub> Doping](#)

[Dong-Chul Choi, Jongwan Jung](#)

[1071Graphene Oxide Layers for a Long-Term Stable Electrochromism](#)

[Tae-Ho Kim, Ki In Choi, Hyeri Kim, Seong Hyeon Oh, Jaseung Koo, Yoon-Chae Nah](#)

[1072Spectroscopic Analysis of Nitrogen-Doped Ultrananocrystalline Diamond/Hydrogenated Amorphous Carbon Composite Films Prepared By Coaxial Arc Plasma Deposition](#)

[Hiroki Gima, Abdelrahman Zkria, Tsuyoshi Yoshitake](#)

[1073Defect Structures of Ultrananocrystalline Diamond/Hydrogenated Amorphous Carbon Composite Films Prepared By Physical Vapor Deposition](#)

[Yuki Katamune, Satoshi Takeichi, Sausan Al Riyami, Tsuyoshi Yoshitake](#)



[1074 Heterojunction Diodes Comprising Nitrogen-Doped Ultrananocrystalline Diamond/Hydrogenated Amorphous Carbon and p-Type Silicon](#)

[Abdelrahman Zkria, Tsuyoshi Yoshitake](#)

[1075 Enhanced Formation of Carbon Microcoils Having Different-Sized Ni Catalyst By Different Injection Gas Sequence](#)

[Gi-Hwan Kang, Sung-Hoon Kim, Sangmoon Park](#)

[1076 Study of the Active Centers and Reaction Mechanism of Fe/IRMOF-3 Derived Porous Carbons As Fe-N-C Electrocatalysts in Oxygen Reduction Reaction](#)

[Hui Sun, Haixia Su, Xingyu Ma, Xin Zhang](#)

[1077 Dominant Formation of Carbon Nano or Microcoils By the Manipulation of SF<sub>6</sub> Injection Flow](#)

[Dongchul Kim, Sung-Hoon Kim, Jae-Kyung Lee](#)

[1078 Hybrid Structure of Atomically Thin Carbon Nanosheet/Au Particles and Its Application As Organic Solar Cells](#)

[Sungho Lee, Seung Mu Jo, Han-Ik Joh](#)

[1079 Mixing Vs Layering: Importance of Controlled Architecture in Bimetallic Multilayer Electrode Toward Efficient Electrocatalyst](#)

[Minsu Gu, Byeong-Su Kim](#)

[1080 Effect of Anode Microporous Layer on the Performance of Direct Methanol Fuel Cell Using Carbon Nanocoil-Supported PtRu Catalyst](#)

[Yoshiyuki Suda, Yoshiaki Shimizu, Tatsuo Ohiro, Kohei Mizui, Toru Harigai, Hirofumi Takikawa, Hitoshi Ue](#)

[1081 Enhancing the Electrochemical Performance of Electric Double-Layer Capacitors by Applying Mesoporous Carbon Gel RFCX to the Electrode](#)

[Zairan Cheng, Hirokazu Oda, Kiyoharu Nakagawa](#)

1082 [Application of Carbon Nanomaterials to an Active Electrode Material in Electric Double Layer Capacitors](#)

[Yoshiyuki Suda, Akitaka Mizutani, Tatsuo Ohiro, Kohei Mizui, Toru Harigai, Hirofumi Takikawa, Hitoshi Ue](#)

1083 [Development of Low-Temperature Methane Gas Sensors By Using Cup-Stacked Carbon Nanofilament-Supported Pd Catalyst](#)

[Kenta Koyama, Hirokazu Oda, Kiyoharu Nakagawa, Toshihiro Ando](#)

1084 [Development of the Negative Electrode Using Coin-Stacked CNF for Li Ion Battery](#)

[Akihiro Shimizu, Hirokazu Oda, Kiyoharu Nakagawa](#)

1085 [3D Porous Hollow Microspheres of Activated Carbon from Nature through Nanotechnology for Electrochemical Double-Layer Capacitors](#)

[Lu Wei, Kuan Tian, Xingyan Zhang, Yiyi Jin, Xin Guo](#)

1086 [Wood for Photonics, Batteries and Structural Materials](#)

[Amy ShinHwei Gong, Mingwei Zhu, Tian Li, Fei Shen, Wei Luo, Jianwei Song, Liangbing Hu](#)

1087 [Graphene Conductivity Control By Friction Induced Charge Trapping](#)

[Seongsu Kim, Tae Yun Kim, Kang Hyuck Lee, Christian Falconi, Sang-Woo Kim](#)

1088 [The Role of Superficial Graphene in Electroforming Process](#)

[Hokyun Ryo, Sukang Bae, Tae-Wook Kim, Jun-Seok Ha, Sang Hyun Lee](#)

1089 [Graphene Based Electronic Textiles Fabricated with Natural Materials](#)

[Jun Woo Jeon, Songlee Han, Dong Seok Shin, Byung Hoon Kim](#)

[1090 Tunable Giant Magnetoresistance Behavior and Electron Conductivity of Conjugated Naopolyaniline](#)

[Zhanhu Guo, Jiang Guo, Qingliang He, Yiran Wang, Xingru Yan](#)

[1091 The Redox Reaction of Triiodide Ions/Iodide at Various Carbon Nanohorn Films-Modified Electrodes Prepared By the Electrophoretic Deposition Will be Discussed](#)

[Mariko Matsunaga, Kento Suda](#)

[1092 Role of Carbon Nanostructured Platform in Electron Transfer of Flavin-Dependent Oxidases](#)

[Barbara Kowalewska, Katarzyna Jakubow](#)

[1093 Hierarchical Porous Carbon Scaffolds As a Materials Scaffold for the Attachment of Silicon in Lithium Ion Battery Anodes](#)

[Luis Estevez, Sookyung Jeong, Ruiguo Cao, Jianming Zheng, Xiaolin Li, Wu Xu, Ji-Guang Zhang](#)

[1094 The Role of Graphene Nanostructures on Colloidal Quantum Dot Photovoltaic Devices](#)

[Mohammadmahdi Tavakoli, Razieh Tavakoli, Abdolreza Simchi, Zhiyong Fan](#)

[1095 Carbon Nanocomposite for Photo-Energy Conversion](#)

[Yanfei Shen](#)

[1096 Theoretical Study of Sp<sup>2</sup>-sp<sup>3</sup> Hybrid Carbon Networks for Energy Storage](#)

[Yanwei Wen, Xiao Liu, Bin Shan, Rong Chen](#)

[1097 Preparation of Hydrophilic Carbon Nano-Particles and Its Application to the Counter Electrodes of DSSCs](#)

[Shoichiro Ikeda, Akinari Nobumoto, Hideo ONO, Shinji ONO, Mojgan Kouhnavard, Norasikin Ahmad Ludin, Kamaruzzaman Sopian, Mikio Miyake](#)

[1098 Nitrogen-Doped Carbon Nanofibers for the Oxygen Reduction: The Role of Iron As Growth Catalyst](#)

[Marthe Emelie Melandsø Buan, Navaneethan Muthuswamy, Andrea Cognigni, John Charles Walmsley, De Chen, Magnus Rønning](#)

[1099 Assessment of Nanostructured Carbons As Electrocatalyst Supports for Solid Acid Fuel Cells](#)

[Ramez Ahmed Elgammal, Alexander Blair Papandrew, Mengkun Tian, Gabriel M Veith, Thomas Anthony Zawodzinski](#)

[1100 Effects of Deposition Temperature on Synthesis of Ultrananocrystalline Diamond/Amorphous Carbon Composite Films on Cemented Carbide Substrate By Coaxial Arc Plasma Deposition](#)

[Mohamed Egiza, Hiroshi Naragino, Aki Tominaga, Kouki Murasawa, Hidenobu Gonda, Masatoshi Sakurai, Tsuyoshi Yoshitake](#)

[1101 A Systematic Study of Modified Carbon Electrodes for the All-Vanadium Redox Flow Cell □ from Model Electrodes to Application](#)

[Susan Margaret Taylor, Alexandra Patru, Olga Nibel, Mario El Kazzi, Lorenz Gubler, Thomas J. Schmidt](#)

[1102 Tailoring the Nanostructure of Colloidal Imprinted Carbons for Their Application in Electrochemical Devices](#)

[Marwa Atwa, David O'Connell, Xiaoan Li, Kunal Karan, Viola Birss](#)

## **C01-Corrosion General Poster Session**

[1103 Simultaneous Interferometry and Microscopy Reveal Unexpected Nickel Corrosion Dynamics in Confined Geometry](#)

[Claudia Merola, Hsiu-Wei Cheng, Kai Kristiansen, Ying-Ju Chen, Jacob Israelachvili, Markus Valtiner](#)

1104 [In Situ Visualization of Corrosion Processes of Metal Thin Films in Aqueous Solutions](#)

[Jeung Hun Park, Daniel A Steingart, Frances M Ross](#)

1105 [Development of Estimation Model for Corrosion Rate of Silver in Hydrogen Sulfide Gas](#)

[Satoko Takahashi, Hisakatsu Kawai](#)

1106 [Hydrogen Entry Behavior into Pre-Rusted Steel in an Atmospheric Corrosion Environment](#)

[Saya Kaneko, Eiji Tada, Atsushi Nishikata](#)

1107 [Corrosion Behavior of Aluminium Bronze with Addition of Silicon Prepared By Powder Metallurgy](#)

[Abdul Halim Zamri, Nur Amirah Mohd Zahri, Nazatul Liana Sukiman](#)

1108 [Electrochemical Corrosion Behaviors of 304 Stainless Steel with the Bimodal Grain Size Distribution](#)

[Yan Gao](#)

1109 [Effect of Zn Existence on Mg Corrosion Due to Cu](#)

[Hiroaki Ishimaru, Taiki Morishige, Toshihide Takenaka](#)

1110 [Galvanic Corrosion Studies of Aluminum Coupled to Non-Passivating and Passivating Alloys](#)

[Kathleen Quiambao](#)

[1111 Electrochemical Properties of Fe-Based Amorphous Metallic Coatings in Aqueous Media](#)

[Seunghyun Kim, Jeong Won Kim, Ji Hyun Kim](#)

[1112 Control of Galvanic Corrosion Behavior Between Tungsten and Titanium Nitride in CMP Application](#)

[Kangchun Lee, Jihoon Seo, Jinok Moon, Yeongil Jung, Ungyu Paik](#)

[1113 Corrosion Behavior of Sn-1Ag-0.5Cu Solder Alloy with the Addition of Fe and Bi](#)

[Nor Wahida Subri, Bakhtiar Ali, Mohd Faizul Mohd Subri, Nazatul Liana Sukiman](#)

[1114 Corrosion Fatigue Behavior of Low-Carbon Structural Steel in NaCl Solution](#)

[Misaki Otsuka, Eiji Tada, Atsushi Nishikata](#)

[1115 Tribocorrosion of Type 316L Stainless Steel with Nanopore Arrays in Stimulated Body Fluid](#)

[Chisato Toji, Sayaka Miyabe, Hiroaki Tsuchiya, Shinji Fujimoto](#)

[1116 Investigation of Electrochemical Properties Between Titanium Scraps and Recycled Titanium](#)

[Yun Ho Jin, Jae-Kyo Yang](#)

[1117 Local Electrochemical Study of Friction Stitch Welded X65 Steel Using Scanning Vibrating Electrode Technique](#)

[Yanhong Gu, Huijuan Ma, Hui Gao](#)

[1118 Ni-Ta-Si Brazes for Planar Solid Oxide Fuel Cell Applications](#)

[Quan Zhou, Tridip Das, Yuxi Ma, Yue Qi, Jason D. Nicholas, Thomas Bieler](#)

[1119Galvanic Corrosion of AA5052 Aluminum-Magnesium Alloy and Carbon Steel in NaCl Solutions](#)

[Gaku Urase, Eiji Tada, Atsushi Nishikata](#)

[1120Corrosion Resistance of Laser Powder Bed Fusion Built Fe-Cr-Mn-Si-W-Mo-B-C Alloy](#)

[Ji-Won Oh, Hyunwoong Na, Hanshin Choi](#)

[1121Evaluation of Ant-Nest Corrosion Rate of Copper in Formic Acid Vapor](#)

[Sayoko Kumakura, Michitaka Hayashi, Eiji Tada, Atsushi Nishikata](#)

[1122Study of Measuring Method for Corrosion Behavior Analysis in Low Concentration Solution](#)

[Yuta Yagi, Ryoji Suzuki, Kazuhiko Noda](#)

[1123Corrosion Morphologies in Different Welding Zones of Friction-Stir Welded \(FSW\) Aluminum Alloy AA5086AA5086, AA6061AA6061, and Dissimilar AA5086AA6061 Joints Exposed in Various Atmospheric Environments](#)

[Natalie Wohner, Lloyd H. Hihara](#)

[1124Influences of Inert Particles on Corrosion Behavior of Carbon Steel Under Sodium Chloride Droplet](#)

[Yanhua Wang, Lian Zhong](#)

[1125Effect of Sulfate on Corrosion Behavior of Reinforcing Steel in Simulated Concrete Pore Solutions](#)

[Rong-Gui Du, Shi-Gang Dong, Ying-Bo Gao, Yan Liang, Zi-Chao Guan](#)

[1126Numerical Models of Cathodic Protection for Buried Steel Pipes Under Insulator Coating Layer](#)

Masashi Odahara, Hiroaki Tsuchiya, Shinji Fujimoto

1127Effects of Crystallinity of Spark Plasma Sintered Fe Base Nano-Composite Alloy

Hyunwoong Na, Ji-Won Oh, Hanshin Choi

1128Corrosion of Aluminum Alloy-Polymer Matrix Composite Interfaces in Diverse Natural Atmospheric Environments

Brent Ernest Howard, Lloyd H. Hihara

1129Effect of Green Corrosion Inhibitors on the Corrosion Behaviour of Nanocrystalline W-42Cr-5Ni Alloy in 0.5 M NaCl Solution

Dhruba Babu Subedi

1130Surface Analysis of 4-Methyl-2-Phenyl-Imidazole on the Cu Surface

Matjaz Finsgar

1131The Synthesis and Anticorrosion Performance of Polyaniline/SiO<sub>2</sub> Nanocomposites with Different Wettability

Lian Zhong

1132Oxide Scale Analysis of the Carbon Steel Exposed to Bentonite after Electrochemical Test

Masao Uyama, Takashi Hitomi, Hiroyuki Saito, Kazuki Aoshima, Motoaki Osawa

1133Microstructure and Electrochemical Characterizations of Mn-Ce Conversion Coating on LZ91 Magnesium Alloy

Ko-Lun Chang, Shun-Yi Jian, M.D. Ger, Hung-Hua Sheu

1134Semiconductive Behavior of Anodic Titanium Oxide Films with Different Thicknesses



Eri Fujimura, Yuhei Fujioka, Hiroaki Tsuchiya, Shinji Fujimoto

1135 Formation of Nanotubular Oxide Layers on Ti Alloys Containing Noble Metal

Yuki Otani, Hiroaki Tsuchiya, Shinji Fujimoto

1136 Investigation of Anticorrosion Coatings for Iron Using Polyaniline By Electrochemical Impedance Method

Ai Fujimatsu, Atsushi Aoki

1137 Electrochemical Conversion of CoSb<sub>3</sub> in Various Acidic Electrolytes

Delphine Veys-Renaux, Richard Drevet, Carine Petitjean, Lionel Aranda, Nicolas David, Patrice Berthod

1138 The Adsorption and Corrosion Inhibition of Some Nonionic Surfactants on Carbon Steel and Brass in Aggressive Media

Florina Branzoi, Catalina Pacuretu, Roxana Branzoi

1139 The Contribution of Hydrogen to the Loss of Mechanical Properties of a 7046 Aluminium Alloy Pre-Exposed in a Chloride Media

Loïc Oger, Christine Blanc, Lionel Peguet, Gregory Odemer, Eric Andrieu

1140 Hydration Structures and Water Chemistry at Zirconia-Water Interface

Binyang Hou, Changyong Park, Seunghyun Kim, Taeho Kim, Ji Hyun Kim, Jongjin Kim, Seungbum Hong, Chibum Bahn

1141 Layer-By-Layer Assembly of Graphene Oxide/Polymer Coating Film to Improve Corrosion Resistance

Young-Seok Kim, Woohyung Choi, Hyunjung Lee, Seungtaek Oh

1142 Study of Micro-Scale Experimental Teaching Materials of Corrosion and Corrosion Protection for Maintenance Engineers

[Daisuke Ito, Takashi Yokoyama, Shinji Okazaki](#)

## **C02-Oxide Films: A Symposium in Honor of Masahiro Seo**

1143([Keynote](#)) [Recent Progress in Nanoscale Understanding of Surface Oxide Film Formation, Properties and Breakdown on Metals and Alloys Using in Situ and Ex Situ Characterization Methods](#)

[Philippe Marcus](#)

1144[Connection Between Atomic Scale Characterization and Electrochemical Behavior during Passivation of Single Crystals on Ni-Cr and Ni-Cr-Mo Alloys](#)

[Kateryna Gusieva, Katie Lutton, Gopalakrishnan Ramalingam, Petra Reinke, Xiao-Xiang Yu, Ahmet Gulec, Laurence Marks, Evan Zeitchick, John Preezko, John Scully](#)

11453D [Impedance Spectroscopy: Analysis of Formation of Chromate Film](#)

[Yoshinao Hoshi, Yuta Endo, Isao Shitanda, Masayuki Itagaki](#)

1146([Invited](#)) [STEM / EELS Characterization of Passive Films Formed on Stainless Steels](#)

[Shinji Fujimoto, Akihiko Kawano, Hiroaki Tsuchiya, Minoru Saito](#)

1147([Invited](#)) [Passivity and Localized Corrosion of Stainless Steels in Energy-Related Applications](#)

[Sannakaisa Virtanen](#)

1148([Invited](#)) [Liquid Phase Ion-Gun Technique for Degradation and Evaluation of Oxide Films](#)

[Koji Fushimi](#)

1149[Effect of Cr Content on Pit Initiation Behavior at MnS Inclusions in Fe-Cr Steels](#)

[Shinpei Asano, Izumi Muto, Yu Sugawara, Nobuyoshi Hara](#)

[1150Effects of Applied Strain and Sensitization on SCC Behavior of 304 Stainless Steel in Atmospheric Corrosion Environments](#)

[Eiji Tada, Kazuki Nakao, Shinji Yamada, Atsushi Nishikata](#)

[1151Microelectrochemical Investigation of Atmospheric Aging Effect on Pitting Corrosion Resistance at Manganese Sulfide Inclusion in Type 304 Stainless Steel](#)

[Aya Chiba, Izumi Muto, Yu Sugawara, Nobuyoshi Hara](#)

[1152Recovery of the Pitting Corrosion Resistance for a Sensitized Duplex Stainless Steel Using Interstitial Hardening](#)

[Nicole R Tailleart, Farrel J Martin, Roy Rayne, Robert Bayles, Aron Rubinoff, Leroy Levenberry, Paul M. Natishan](#)

[1153Grain-Dependent Reduction of Thermally-Oxidized Iron Surface Observed By In Situ 2D Ellipsometry](#)

[Yu Takabatake, Yuichi Kitagawa, Takayuki Nakanishi, Yasuchika Hasegawa, Koji Fushimi](#)

[1154\(Keynote\) Optical in-Situ Detection of Passive Oxides on Metals](#)

[Toshiaki Ohtsuka](#)

[1155Investigation of Structural Change of Rust Layer of Steels during Wet and Dry Cycles By Synchrotron Radiation and Neutron Beams](#)

[Takenori Nakayama](#)

[1156The Kinetics of the Metastable Pit Nucleation on Metal Surfaces](#)

[Pin Lu, George Engelhardt, Digby D. Macdonald](#)

[1157Analysis of the Passivation and Local Dissolution of Ni-Cr-Based Alloys Using the Cabrera-Mott and Point Defect Models](#)

[Katie Lutton, Kateryna Gusieva, John Scully](#)

1158 [Opto-Electrochemical Spectroscopy](#)

[Khaled Habib](#)

1159 [Thin Metal Oxide Coatings for Lightweight Alloys](#)

[Väino Sammelselg, Mairo Merisalu, Lauri Aarik](#)

1160 [Specific Formation Behavior of Crystalline TiO<sub>2</sub> Mesoporous Films during Anodizing in Hot Alkaline Glycerol Electrolytes](#)

[Etsushi Tsuji, Shiki Matsuura, Yuto Okazaki, Yoshitaka Aoki, Hiroki Habazaki](#)

1161 [\(Invited\) Effect of Heat Treatment Conditions on Crystallization of Anodic Alumina Membrane Formed in Phosphoric Acid](#)

[Hidetaka Asoh, Yoshihito Shigehara, Hideki Hashimoto, Sachiko Ono](#)

1162 [\(Invited\) Understanding the Role of Al<sup>3+</sup> in Accelerated Testing and Its Impact on the Protective Oxide Film of AA2060](#)

[Robert G. Kelly, Mary Elizabeth Parker](#)

1163 [Anodizing of MgZn<sub>2</sub> Phase in Sulfuric Acid: Mechanism of O<sup>2-</sup> Diffusion in Mixed \(Mg,Zn\)O at High Voltage](#)

[Emmanuel Rocca, Joffrey Tardelli](#)

1164 [\(Keynote\) Anodic Oxide Films As Electron Spectrometer](#)

[Detlef Diesing, Jan Philipp Meyburg](#)

1165 [Effect of Electric Field Strength on Cell Morphology and Anion Incorporation of Anodic Porous Alumina](#)

Sachiko Ono, Hideki Hashimoto, Hidetaka Asoh

1166(Invited) Anodic Oxide Formation and Oxygen Evolution on Metals Such As Al and Ta - Experiment and Simulation

Manuel M. Lohrengel

1167Model for Stress Generation and Flow in Anodic Oxides

Kurt Hebert, Omer Capraz, Shinsuke Ide, Pranav Shrotriya

1168(Invited) Photocurrent Spectroscopy in Corrosion and Passivity Studies: A Critical Assessment

Francesco Di Quarto, Francesco Di Franco, Andrea Zaffora, Monica Santamaria

1169Direct Measurement of the Dissolution of Valve Metals Under High Field Anodisation Conditions

Achim Walter Hassel, Jan Philipp Kollender

1170(Corrosion Division H. H. Uhlig Award) Electrochemical Modeling of Intergranular Corrosion and Stress-Corrosion Cracking in AA5083-H131

Robert G. Kelly

1171(Corrosion Division Morris Cohen Graduate Student Award) In-situ Monitoring of Ultra-slow Oxide Growth on Copper

Saman Hosseinpour, Markus Schwind, Christoph Langhammer, Bengt Herbert Kasemo, Magnus C Johnson, Christofer Leygraf

1172(Keynote) Radiation Induced Corrosion of Copper for Spent Nuclear Fuel

Christofer Leygraf, Åsa Björkbacka, Magnus C Johnson, Mats Jonsson

1173Corrosion Monitoring of Steels Embedded in Swelled Bentonite Clay

Kazuhiisa Azumi, Masatoshi Sakairi, Koji Fushimi, Hiroki Ito, Yoshikatsu Tochigi, Gen Nakayama, Masato Kobayashi

1174 Deposition of Uranium Oxide Following the Reduction in Weak Acid Solution Using Electrochemical Quartz Crystal Microbalance (EQCM)

Kazuki Ouchi, Haruyoshi Otake, Yoshihiro Kitatsuji, Masahiro Yamamoto

1175 Effect of Re-Oxidation Rate of Additive Cation on Corrosion Rate of Stainless Steel in Boiling Nitric Acid Solution.

Masahiro Yamamoto, Chiaki Kato, Takafumi Motooka, Yasutoshi Ban, Fumiyoshi Ueno

1176 An Investigation into the Stability of Passive Layers on Zinc Under Alkaline Conditions

Ivan Stuart Cole, Angathevar Veluchamy, Emmanuel Bosco

1177 Effect of Metal Cations in Fresh Water on Surface Film Structure and Initial Corrosion of Mild Steel

Kyohei Otani, Masatoshi Sakairi

1178 Solution Processing and Conversion of Transparent Metal Oxide Optical Coatings By Solid State Diffusion

Colm Glynn, Damien Aureau, Gillian Collins, Sally O'Hanlon, Arnaud Etcheberry, Colm O'Dwyer

1179 Formation of Nanoporous NiFe<sub>2</sub>O<sub>4</sub> Oxide Films By Anodizing of Fe-Ni Alloy

Ryosuke Tomizawa, Chunyu Zhu, Etsushi Tsuji, Yoshitaka Aoki, Hiroki Habazaki

1180 A New Method for Analyzing Transient Response of Hydrogen Permeation in Carbon Steel Sheet

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

[1181Localized Corrosion Behavior of Stainless Steels Under Loading Stress Environment](#)

[Tomoe Izuhara, Yuta Yagi, Ryoji Suzuki, Kazuhiko Noda](#)

[1182Composite Cu-LaFeO<sub>3</sub> Coating on High Cr Ferritic Stainless Steels for IT-SOFC Interconnects](#)

[Andrea Masi, Stefano Frangini, Livia Della Seta, Stephen J. McPhail, Davide Pumiglia, Maurizio Carlini](#)

[1183Impedance Analysis for Steel Material in Low Electrolyte Solution Environment](#)

[Koyo Sawanobori, Yuta Yagi, Ryoji Suzuki, Kazuhiko Noda](#)

[1184pH Sensing Electrochemical Cell to Investigate Anodic Dissolution of Magnesium](#)

[Kei Miyazawa, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki](#)

[1185Electrochemical Properties of Oxide Films on Ti](#)

[Keisuke Ooniwa, Yuta Yagi, Ryoji Suzuki, Kazuhiko Noda](#)

[1186Self-Healing Superhydrophobic CeO<sub>2</sub> Coating Prepared By Anodic Deposition](#)

[Katsutoshi Nakayama, Takuya Hiraga, Chunyu Zhu, Etsushi Tsuji, Yoshitaka Aoki, Hiroki Habazaki](#)

[1187Development of Electrochemical Cell Combined with Gas Chromatograph for in-Situ Detection of Hydrogen Evolution on Mg](#)

[Rie Takemiya, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki](#)

[1188Growth Behavior of Anodic Alumina Nanofibers Fabricated By Pyrophosphoric Acid Anodizing and Their Hydrophilicity](#)

[Daiki Nakajima, Tatsuya Kikuchi, Shungo Natsui, Ryosuke O. Suzuki](#)

[1189Preparation of Niobium Pentoxide Nanotube Powders By a Facile Electrochemical Anodization](#)

[Xiaolin Liu, Jia Lin](#)

[1190Nanostructured Iridium Oxide Micro Electrode Array for Neurostimulation Application](#)

[Tsai-Wei Chung, Yi-Cheng Chen, Kuang-Chih Tso, Chien-Chon Chen, Shih-Fan Chen, Pu-Wei Wu, Po-Chun Chen](#)

[1191Development of Self-Healing Coat Using a Micro-Capsules for Corrosion Protection of Metal](#)

[Makoto Chiba, Kazuki Anetai, Chinami Yamada, Sven Pletincx, Hilke Verbruggen, Atsushi Hyono, Iris De Graeve, Terryn Herman, Hideaki Takahashi](#)

[1192Design of High Performance Intermediate Temperature Fuel Cells Based on BaCe<sub>0.8</sub>Y<sub>0.2</sub>O<sub>3</sub>/Pd Heterointerfaces](#)

[Yoshitaka Aoki, Toyuki Yamaguchi, Etsushi Tsuji, Hiroki Habazaki](#)

[1193Durability of Electrodeposited Ni-Fe-Co-C Anodes for Alkaline Water Electrolysis](#)

[Hiroyuki Sato, Yuto Kanai, Zenta Kato, Koichi Izumiya, Naokazu Kumagai, Koji Hashimoto](#)

[1194Suppression of Oxide Growth on Ti Substrate of Ir<sub>1-x</sub>Sn<sub>x</sub>O<sub>2</sub>/Ti Anodes in Electrolytic Oxygen Evolution](#)

[Zenta Kato, Ryo Kashima, Kohei Tatsumi, Shinnosuke Fukuyama, Koichi Izumiya, Naokazu Kumagai, Koji Hashimoto](#)

[1195\(Invited\) Fabrication of Highly Ordered Anodic Porous Alumina and Its Applications to Functional Nanodevices](#)

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

[1196Anodizing of Aluminum in Etidronic Acid Solution](#)



[Tatsuya Kikuchi, Akimasa Takenaga, Osamu Nishinaga, Shungo Natsui, Ryosuke O. Suzuki](#)

[1197 Anodic Oxides Layers: Synthesis and Formation of Composites for Energy Storage Devices](#)

[Damian Kowalski](#)

[1198 Development of Empirical Charge Transfer Interatomic Potential for Tantalum Oxide Nanostructures from First Principle Calculations](#)

[Kiran Sasikumar, Badri Narayanan, Subramanian K. R. S. Sankaranarayanan](#)

[1199 Passivation and Potential Fluctuation of Mg-Alloy AZ31B in Alkaline Environments](#)

[Hongbo Cong, Shengxi Li, Nick Birbilis](#)

[1200 Revisiting the Effect of Crystallographic Orientation on the Corrosion of Commercially Pure Magnesium](#)

[Leslie Gail Bland, John Scully](#)

[1201 The Effect of Thermal Hydrogenation Processing on the Nano-Size Grain Refinement and Oxide Layer Formation of Ti-6Al-4V Alloy](#)

[Le-Min Wang, Chih-Jen Tsai](#)

[1202 Corrosion Behaviors and Metal Ion Releases of Metallic Biomaterials in Simulated Body Fluid](#)

[Yusuke Tsutsumi, Maki Ashida, Peng Chen, Hisashi Doi, Takao Hanawa](#)

[1203 Electrochemical Characterization of the Titanium/Pbs Interface By Ambient Pressure X-Ray Photoelectron Spectroscopy](#)

[Carlos Valero-Vidal, Marco Favaro, Yi Yu, Ethan J Crumlin](#)

[1204 Electrochemical Corrosion Study of Weld Joint of Nb and Ti6Al4V in Saline and Water](#)

[Mingzhang Wang, Kenneth LeVert, Puqiang Zhang, Tom Gorka](#)

[1205 Quantifying the Role of Transition Metal \(Re\)Plating in the Cathodic Activation of Corroding Magnesium](#)

[Emmanouela Michailidou, Hamilton Neil McMurray, Geraint Williams](#)

[1206 \(Invited\) Surface Modification and Coating of Biodegradable Magnesium](#)

[Sannakaisa Virtanen](#)

[1207 Corrosion Behavior of Calcium Phosphate-Coated Biomedical Magnesium Alloy Under in Vitro and In Vivo Environments](#)

[Sachiko Hiromoto, Motoki Inoue, Tetsushi Taguchi](#)

[1208 Evaluation of Zn Doped Hydroxyapatite Plasma Spray Biocompatible Coatings on Metallic Substrates](#)

[Seisho Take, Masataka Kato, Tomoya Asami, Yuto Aihara, Satoru Izawa, Taro Atsumi](#)

[1209 Multifunctional Titanium Dioxide Nanotubes for Biomedical Applications](#)

[Tolou Shokuhfar](#)

[1210 Electrochemical Behavior of NiTi Alloys during Rapid Straining](#)

[Hiroaki Tsuchiya, Hiroyuki Yamamoto, Shinji Fujimoto](#)

[1211 Crack Initiation of Type 316L Stainless Steel Under Cyclic Deformation in Simulated Body Fluid](#)

[Kotaro Doi, Sayaka Miyabe, Hiroaki Tsuchiya, Shinji Fujimoto](#)

**C03-High Temperature Corrosion and Materials Chemistry 12**

[1212Exploration of Novel Oxide Cathode Materials for Proton-Conducting Solid Oxide Fuel Cell: Phase Relation in the Ba\(Zr, Y\)O<sub>3</sub>-Ba\(Co, Y\)O<sub>3</sub>-Ba\(Fe, Y\)O<sub>3</sub> System](#)

[Hiroki Uehara, Shu Yamaguchi](#)

[1213Origin of Compositional Instability for a-Site/B-Site Rich La<sub>0.6</sub>Sr<sub>0.4</sub>Co<sub>0.2</sub>Fe<sub>0.8</sub>O<sub>3-D</sub> \(LSCF6428\) Under Oxygen Potential Gradient](#)

[Xingwei WANG, Takamichi Miyazaki, Keiji Yashiro, Shin-ichi Hashimoto, Tatsuya Kawada](#)

[1214Dissociation Oxygen Partial Pressure of CaPd<sub>3</sub>O<sub>4</sub> from 1023 to 1328 K](#)

[Kenichi Kawamura, Yasunori Yuasa](#)

[1215Thermochemical Investigations on Functional Energy Storage Materials](#)

[Torsten Markus](#)

[1216Experimentally Determined Ti-Al-Cl Phase Diagram at T = 150 to 400](#)

[Evan Copland, Nathan Webster](#)

[1217Chlorosilane Interactions with Iron at High Temperatures](#)

[Joshua L. Aller, Ryan Mason, Michael Baber, Greg Tatar, Kevin Ellingwood, Nathan S. Jacobson, Paul E. Gannon](#)

[1218CMAS Corrosion of Gadolinium and Samarium Zirconate Pyrochlore Thermal Barrier Coating Materials](#)

[Jeffrey Fergus, Honglong Wang, Ahmet Bakal, Wenzhou Deng, Kai Roebbecke](#)

[1219Influence of Alkali Metal Oxide on CMAS Damage Progression in Air Plasma Sprayed Thermal Barrier Coatings](#)

[Yuki Hayashi, Siddharth Lokachari, Satoshi Yamagishi, Masakazu Okazaki](#)

[1220\(Invited\) Role of Transient Oxide Scale for Development and Growth of Al<sub>2</sub>O<sub>3</sub>](#)

[Shigenari Hayashi, Suzue Yoneda](#)

[1221 Nitridation of a FeCrAl Alloy in H<sub>2</sub>+N<sub>2</sub> Environment at 900°C: A Microstructural Study](#)

[Nooshin Mortazavi, Christine Geers, Bo Jönsson, Jan-Erik Svensson, Gustav Sundell, Lars-Gunnar Johansson, Mats Halvarsson](#)

[1222 Evaluation of Corrosion Resistance of Materials for Supercritical Carbon Dioxide Power Plant](#)

[Soo Yeol Lee, Hobyung Chae, Sukho Seo, Yongchan Jung](#)

[1223 Effect of Temperature on Oxidation Behaviour of Ni-Cr Alloys in CO<sub>2</sub> Atmosphere](#)

[Yun Xie, Jianqiang Zhang, David John Young](#)

[1224 Improvement of Oxidation Behavior in Cr\(N,O\) By Increasing the Oxygen Content](#)

[Hisayuki Suematsu, Kazuma Suzuki, Tsuneo Suzuki, Tadachika Nakayama, Koichi Niihara](#)

[1225 Kinetics and Microstructure of Sulfonitriding of Die-Steels](#)

[Makoto Nanko, Kazuya Horie, Ryosuke Nakagane, Satoru Kadowaki, Yoshihiro Kuwabara](#)

[1226 In Situ Optical Investigation of H<sub>2</sub>S Impact on Carbon Oxidation in Operating Solid Oxide Fuel Cells](#)

[John D Kirtley, Syed Noorullah Qadri, Daniel A Steinhurst, Jeffrey C Owrutsky](#)

[1227\(Invited\) In-Situ Detection of Breakaway of Fe-17% Stainless Steel in Water Vapor Containing Air By Synchrotron Radiation X-Ray Diffraction](#)

[Isao Saeki](#)

[1228 Water Vapour Effects on Wustite Scale Growth at High Temperatures](#)

[Huaying Yin, David John Young](#)

[1229 Does Hydrogen Affect Oxygen Permeability in Alloys?](#)

[Vladimir Shemet](#)

[1230 High Temperature Corrosion of High Strength Materials for Boiler Applications in the Temperature Range from 550 C to 750 C](#)

[Lorenz Singheiser, Joanna Zurek, Pawel Huczowski, Michael Müller, Joe Quadackers](#)

[1231 Measurement of Cr Evaporation in Several Nickel Based Alloys at Moderate Velocities](#)

[Joseph H Tylczak, Gordon R Holcomb](#)

[1232 Mitigation of Chromium Assisted Degradation of LSM Cathode in SOFC](#)

[Chiying Liang, Boxun Hu, Ashish Aphale, Weyshla Rodriguez, Md. Aman Uddin, Prabhakar Singh](#)

[1233 Nano-Structured Coatings for Supercritical Steam Turbines Application: High Temperature Corrosion Studies By TG-Mass Spectrometry](#)

[Francisco Javier Perez Trujillo, Maria Sonia Mato, Andrea Illana, Isabel Lasanta, Saul Castañeda, German Alcalá, Teresa De Miguel](#)

[1234 Environmental Degradation of Au-Nanoparticle Incorporated Oxides By Reactive Evaporation of AuH\(g\)](#)

[Gordon R Holcomb, Joseph Tylczak, John P Baltrus, Paul R Ohodnicki](#)

[1235 A Study of High Temperature Stability of Zirconia Surface in Pressurized Water with High Resolution X-Ray Reflectivity](#)

[Binyang Hou, Changyong Park, Seunghyun Kim, Taeho Kim, Ji Hyun Kim, Jongjin Kim, Seungbum Hong, Chibum Bahn](#)

[1236 Investigation of Passive Layers Formed on Alloy 600 in Zinc Containing High Temperature Primary Water](#)

[Yifan Jiang, Thomas Devine](#)

[1237 \(Invited\) Plasma Facing Materials for Future Fusion Reactors Under Extreme Loading Conditions](#)

[Jochen Linke, Juan Du, Andrey Litnovsky, Thorsten Loewenhoff, Gerald Pintsuk, Marius Wirtz, Lorenz Singheiser](#)

[1238 Synthesis, Processing, and Properties of Multi-Phase Metal-Ceramics in the Ta-Hf-C System](#)

[Mark Matthew Opeka, James A. Zaykoski](#)

[1239 Modeling the Effect of High-Temperature Alloys on Corrosion inside Molten Salt Systems](#)

[Bahareh Alsadat Tavakoli, Sirivatch Shimpalee, John W. Weidner, Brenda L. Garcia-Diaz, Michael J. Martinez-Rodriguez, Luke Christopher Olson](#)

[1240 High Temperature Corrosion in Molten Salts in Solar Power Concentration Plants: Dynamic and Static Corrosion Test](#)

[Francisco Javier Perez Trujillo, Maria Isabel Lasanta, Gustavo Garcia Martin, Maria Teresa de Miguel, Víctor Encinas Sánchez](#)

[1241 High-Temperature Reactions of Cesium Molybdate on 304 Stainless Steel](#)

[Thi-Mai-Dung Do, Supamard Sujatanond, Toru Ogawa](#)

[1242 Effect of H<sub>2</sub>O on Corrosion of Ni in Molten Eutectic LiCl-KCl](#)

[David Horvath, Michael Forrest Simpson](#)

[1243Corrosion of Stainless Steel 316L in Molten LiCl-Li<sub>2</sub>O-Li](#)

[Augustus Merwin, Dev Chidambaram](#)

[1244Accelerated Degradation of Ag-Cu-Ti Alloy in Molten Sodium Via Dissolution of Silver](#)

[Keeyoung Jung, Yoon-Cheol Park, Hoe-Jun Heo, Chung-Yun Kang](#)

[1245Molten Salt Corrosion of SiC Fibers](#)

[Elizabeth J. Opila, Lucas Herweyer](#)

[1246Synthesis of Carbide Derived Carbon \(CDC\) By Electrolysis of Molten Chloride Salts](#)

[Michael McNallan, Mariusz Mika, Kai-yuan Cheng](#)

[1247Corrosion Investigation of Ni-Free Nitrided Stainless Steel Material As Bipolar Plate for Polymer Electrolyte Fuel Cell](#)

[Sayoko Shironita, Yang Yu, Kunio Nakatsuyama, Kenichi Souma, Minoru Umeda](#)

[1248Solubility of Metal Oxides in Na<sub>2</sub>O-B<sub>2</sub>O<sub>3</sub> Melts Associated with Basicity](#)

[Ryutaro Toki, Takashi Doi](#)

[1249Soaking Experiments for Understanding Corrosion Behavior of Zircaloy with Molten Stainless Steel-B<sub>4</sub>C at Elevated Temperatures](#)

[Suguru Matsuura, Makoto Nanko, Masaki Kurata](#)

[1250"Drop-n-Catch" Approach to Calorimetry of Laser Heated Levitated Alumina and Ytria Above 2000 °C](#)

[Denys Kapush, Sergey V. Ushakov, Alexandra Navrotsky](#)

## **C04-Pits & Pores 7: Nanomaterials – Fabrication Processes, Properties, and Applications**

1251([Invited](#)) [The Effects of Laser Ablation Texturing and Nanoparticles on Anodic Nanotube and Porous Film Formation](#)

[Kurt W Kolasinski, Dmitry A. Znamensky, Abbie S Ganas, Harrison M. Snodgrass, Grant J. Sturgeon, José Luis Hernández-Pozos](#)

1252[Maskless Direct-Write Etching of Nanopit Arrays in Si Using Focused Electron Beam Induced Etching](#)

[Heinz Wanzenboeck, Emmerich Bertagnolli](#)

1253[Precise Structural Tuning of Porous GaN Using Two-Step Anisotropic Etching for Optical and Photo-Electric Applications](#)

[Yusuke Kumazaki, Satoru Matsumoto, Taketomo Sato](#)

1254[Crystallographically-Oriented Macropores in Multi-Crystalline Zn](#)

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

1255([Invited](#)) [Thin Porous Silicon Produced By Metal-Assisted Etching](#)

[Shinji Yae](#)

1256([Invited](#)) [Preparation of Ordered Anodic Porous Alumina Through-Hole Membrane and Its Applications](#)

[Takashi Yanagishita, Hideki Masuda](#)

1257[Fabrication of Commercially Viable AAO/Al Composite Membranes By Using Pre-Patterned Al Substrates](#)

[Dae-Yeong Jeong, Balasankar Athinarayanan](#)

1258[Anodization of Al Alloyed with in, Sn and Ag](#)



[Keaton Ramsey, William Sides, Qiang Huang](#)

1259[High Resolution Studies of Dealloyed Layers](#)

[Ayman A. El-Zoka, Doug D. Perovic, Roger C. Newman, Brian Langelier](#)

1260[Variance-Based Sensitivity of Localized Sulphation to Microporous Separator Properties Using a Distributed Parameter Model of a Valve-Regulated Lead-Acid Battery](#)

[Angelique Janse van Rensburg, George van Schoor, Pieter Andries van Vuuren](#)

1261(Invited) [Systematic Engineering of Structured Magnetic Nanowire Arrays for Three-Dimensional Data Storage](#)

[Julien Bachmann, Sebastian Bochmann, Jihyun Lee, Amalio Fernandez-Pacheco, Alexis Wartelle, Beatrix Trapp, Russell Cowburn, Olivier Fruchart](#)

1262[Control of the Magnetic Properties of a Magnetic Field Guidable Biocompatible Nanovehicle](#)

[Petra Granitzer, Klemens Rumpf, Michael Reissner, Peter Poelt](#)

1263[Synthesis and Magnetic Characterization of \(Porous Silicon/"Hard-Soft" Magnetic\) Nanocomposites](#)

[Klemens Rumpf, Petra Granitzer, Herwig Michor, Peter Poelt](#)

1264[Optical Diagnostics of Porous Silicon Nanoparticles Biodegradation](#)

[Maxim Bronislavovich Gongalsky, Liubov Osminkina, Elena Tolstik, Yulia Bezsudnova, Vladimir Sivakov, Victor Timoshenko](#)

1265(Invited) [Porous Silicon Dissolution Monitoring and Optical Constants Measurement Using in Situ Photoconduction in HF](#)

[Bernard Gelloz, Kazuki Ichimura, Hiroki Fuwa, Eiichi Kondoh, Lianhua Jin](#)

[1266Si/SiGe Heterointerfaces in One-, Two-, and Three-Dimensional Nanostructures: Their Effect on SiGe Light Emission](#)

[David J Lockwood, Xiaohua Wu, Jean-Marc Baribeau, Selina A. Mala, Xiaolu Wang, Leonid Tsybeskov](#)

[1267Enhanced Electrochemical Performance of Porous Electrodes for All-Solid-State Li-Ion Microbatteries](#)

[Thierry Djenizian](#)

[1268Fully Monolithically Fabricated Si One-Chip Miniature Fuel Cell -Electrolyte Polymerization in Porous Si Layer](#)

[Tsuyoshi Koriyama, Takeo Yamaguchi, Masanori Hayase](#)

[1269\(Invited\) Porous Silicon for Energy Storage at Microscale: Supercapacitors](#)

[Kestutis Grigoras, Jari Keskinen, Leif Grönberg, Jouni Ahopelto, Mika Prunnila](#)

[1270\(Invited\) Electrolyte Solutions Confined in Porous Silicon Electrodes](#)

[Kazuhiro Fukami, Akira Koyama, Atsushi Kitada, Takeshi Abe, Kuniaki Murase](#)

[1271Self-Organized TiO<sub>2</sub> Nanotube Arrays: Latest Features and Applications](#)

[Patrik Schmuki](#)

[1272Self-Organized TiO<sub>2</sub> Nanotube Arrays: Towards Improved Ordering](#)

[Jan M. Macak, Hanna Sopa, Ludek Hromadko, Milos Krbal](#)

[1273Dictating Organolead Perovskite Nanostructure Size Using Silicon Nanotube Templates](#)

[Jeffery L Coffey, Roberto Gonzalez-Rodriguez, Neta Arad-Vosk, Naama Rozenfeld, Amir Sa'ar](#)

[1274\(Invited\) Stress-Assisted Formation of Self-Organized Porous Anodic Oxides](#)

[Kurt Hebert, Pratyush Mishra, Omer Capraz, Pranav Shrotriya](#)

[1275\(Invited\) Self-Organized Formation of Porous Anodic Films on Iron and Their Application](#)

[Hiroki Habazaki](#)

[1276Formation of Self-Organized Nanohole Arrays on Stainless Steels](#)

[Hiroaki Tsuchiya, Shoken Hamada, Natsuko Yamada, Shinji Fujimoto](#)

[1277Pit Formation, Patterning and Flattening of Ge Surfaces in O<sub>2</sub>-Containing Water by Metal-Assisted Chemical Etching](#)

[Tatsuya Kawase, Atsushi Mura, Yusuke Saito, Takeshi Okamoto, Kentaro Kawai, Yasuhisa Sano, Kazuto Yamauchi, Mizuho Morita, Kenta Arima](#)

[1278Viable Approach for Forming Uniform Polymer Nanocomposites with Ultrahigh Filler Loading](#)

[Chia-Yun Hsieh, Kenneth K.S. Lau](#)

[1279Chemical Sculpturing of Al Micro-Particles for Polymer Composites and Universal Polymer-Polymer Joints](#)

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

[1280PbS Quantum Dots and Au Nanoparticle Co-Sensitized Black TiO<sub>2</sub> Nanotubes for Photocurrent Enhancement](#)

[Kang Du, Guohua Liu, Haisheng San, Xuyuan Chen, Kaiying Wang](#)

[1281Modeling of Porous Metal Oxide Layer Growth in the Anodization Process](#)

[Michal Habera](#)

1282 [Wireless Corrosion Sensors: Review and Status](#)

[William H Smyrl](#)

1283 [Oil-Impregnated Aluminum Anodic Oxide Layer with Bottle-Shaped Pores for Enhanced Anti-Corrosion and Self-Healing Properties](#)

[Junghoon Lee, Chang-Hwan Choi](#)

1284 [Oil-Impregnated Nanoporous Oxide Layer of Anodized Stainless Steel for Omniphobic and Anti-Corrosive Surfaces](#)

[Junghoon Lee, Youhua Jiang, Chang-Hwan Choi](#)

1285 [In-Situ Critical Pitting Temperature of Steels Using EC Noise](#)

[Luis Francisco Garfias-Mesias](#)

1286 [Pitting Corrosion of Copper Tubes for Drinking Water Applications Due to Silicate Films](#)

[Ralf Feser, Sven Schewe](#)

1287 [\(Invited\) Complementary Experimental and Modeling Approaches to Elucidate Critical Conditions for Pit Stability and Repassivation](#)

[Robert G. Kelly, Jayendran Srinivasan](#)

1288 [Dealloying Mechanism of Bulk-AlCu Intermetallic Phases \( \$Al\_2Cu\$ ,  \$Al\_7Cu\_2Fe\$ ,  \$Al\_2CuMg\$ \) : Effect of Crystallographic Structure and Electrolyte](#)

[Emmanuel Rocca, Joffrey Tardelli](#)

1289 [Enhanced Electrocatalytic Activity on Water Splitting with NiOx Nanoflakes Electrode Fabricated Via Selective Etching and Reconstruction of Niw Amorphous Films](#)

[Yunhan Ling, Fei Qin, Siqu Yu, Yanhong Gu](#)

[1290Liquid-Cell Transmission Electron Microscopy of Localized Corrosion of Aluminum](#)

[Ainsley Pinkowitz, Sarah Straub, Robert Hull, David Duquette](#)

## **C05-Atmospheric –and– Marine Corrosion**

[1291Surface Potential Distribution in Corrosion Degradation Process of Organic Coated Steel](#)

[Sayaka Itou, Hideki Katayama, Takaya Akashi](#)

[1292Detection of Hydrogen Permeated Under Atmospheric Corrosive Environment By Surface Potential Measurement](#)

[Toshiki Katsumura, Hideki Katayama, Takaya Akashi](#)

[1293Influence of Corrosion Product on Corrosion Behavior of Carbon Steel in Atmospheric Environment](#)

[Honami Shinoda, Hideki Katayama, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki](#)

[1294Evaluation of SD345 Corrosion Resistance in Simulated Concrete Pore Solution](#)

[Maya Yamada, Hideki Katayama, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki](#)

[1295The Effect of Carbon Dioxide Pressure in Carbon Steel Corrosion in 5 Wt.% NaCl Solution Using Flow Loop](#)

[Hyoung Chan Kim, Sang Joon Lee, Seong Jun Cho, Ju Dong Lee, Young Cheol Lee, Hyeong Soon Moon, Kyung Tae Park](#)

[1296In-Situ Corrosion Monitoring of Iron and Zinc in Atmospheric Environments](#)

[Masataka Omoda, Daisuke Mizuno, Nobuyuki Ishikawa](#)

[1297Atmospheric Corrosion Monitoring of Carbon Steel in Snowy Cold Region](#)

[Hideki Katayama](#)

1298 [Quantification and Prediction Tools for Atmospheric Corrosion and Electrochemistry in Non-Conventional \(Micro-\)Setups](#)

[Hans Simillion, Nils Van den Steen, Herman Terryn, Johan Deconinck](#)

1299 [Experimental Investigation on the Corrosivity of Atmosphere through the Atmospheric Corrosion Monitoring \(ACM\) Sensors](#)

[Tadashi Shinohara, To Dara, Osamu Umezawa](#)

1300 [Microelectrode Test Configurations for Measurement of Galvanic Current Under Saline Drops in Simulated Atmospheric Conditions](#)

[Carlos Hangarter, Steven Policastro](#)

1301 [\(Henry B. Linford Award for Distinguished Teaching\) Determination of Local Hydrogen Concentrations in High Performance Alloys Using Local Probe Methods](#)

[John Scully, Rebecca Filardo Schaller, Brendy C Rincon Troconis](#)

1302 [Electrochemical Hydrogen Permeation Tests Under Potentiostatic Hydrogen Charging Conditions Conventionally Used for Hydrogen Embrittlement Study](#)

[Eiji Akiyama, Songjie Li](#)

1303 [Hydrogen Entry into an AISI 4135 High Strength Steel in Tribocorrosion Environment](#)

[Kotaro Doi, Eiji Akiyama, Masao Hayakawa](#)

1304 [Hydrogen Entry into Pure Iron Treated By Plasma Nitriding](#)

[Yu Sugawara, Izumi Muto, Nobuyoshi Hara](#)

1305 [AE Monitoring of Hydrogen Embrittlement Crack in Maraging Steel](#)

[Ippei Shinozaki, Gen Nakayama, Yohei Sakakibara](#)

[1306Contribution of Hydrogen to the Intergranular Corrosion Damage in a 2024 T351 Aluminum Alloy](#)

[Marie-Laetitia de Bonfils-Lahovary, Manon Lafouresse, Lydia Laffont, Christine Blanc](#)

[1307A Comparative Study of Two Coating Systems Exposed for 2 Years in the Field and in Accelerated Atmospheric Corrosion Chamber Environments](#)

[Douglas C. Hansen, Leanne Petry](#)

[1308Evaluating Coating Degradation of Ballast Tank By Electrochemical Impedance Spectroscopy](#)

[Hitoshi Hayashibara, Eiji Tada, Atsushi Nishikata](#)

[1309A Predictive Model for Zinc Runoff Rates from Zinc Sheet and Galvanized Steel in Outdoor Constructions](#)

[Christofer Leygraf, Inger Odnevall Wallinder](#)

[1310Effect of Mg<sup>2+</sup> on the Corrosion Behavior of Zinc](#)

[Eiji Tada, Yumiko Tsurumaki, Atsushi Nishikata](#)

[1311Electrochemical Evaluation of Degradation of Zn-Coated Steel Exposed to Cyclic Wet-Dry Condition](#)

[Atsushi Nishikata, Takafumi Okazaki, Eiji Tada](#)

[1312Inhibition of Flash Rusting of HY80 By a Mussel Adhesive Protein: Characterizing the Interaction of MAP-5 with a High Strength Low Alloy Steel](#)

[Douglas C Hansen, Brooke N Bennett](#)

[1313Effect of Cations on the Growth of Atmospheric Rusts on Carbon Steel in Wet/Dry Environments](#)

[Kyung-Tae Kim, Kouki Hayano, Koushu Hanaki, Masato Yamashita, Shinji Fujimoto](#)

1314 [Corrosion Protection Mechanism of Novel Copper Alloy Resistant to Formicary Corrosion](#)

[Yoshihiko Kyo, Kozo Kawano, Shinobu Suzuki, Koji Kanamori, Hirokazu Tamagawa, Yoshiyuki Oya](#)

1315 [Strong Correlations Between Structural Order and Passive State at Water-Copper Oxide Interfaces](#)

[Badri Narayanan, Mathew Cherukara, Sanket Deshmukh, Ross Harder, Shriram Ramanathan, Subramanian K. R. S. Sankaranarayanan](#)

1316 [Micro-Biologically Induced Steel Corrosion and Corrosion Control in Simulated Marine Environment: Steel Electrochemical Response and Micro-Organisms Viability within Cathodic Protection Application](#)

[D. a. Koleva, Y Gonzalez-Garcia, H.M. Jonkers, L Polerecky](#)

1317 [Virtual Design of Green Primers](#)

[Ivan Stuart Cole, Erik Sapper, Michael Breedon, Clement Chu, Fiona Chen](#)

1318 [Detection of Micro/Nano Droplet By Galvanic-Coupled Arrays](#)

[Jin Kawakita, Toyohiro Chikyow](#)

1319 [Modeling Film Thicknesses and Estimating Corrosion Depths Under Climate Control](#)

[Nils Van den Steen, Hans Simillion, Dominique Thierry, Johan Deconinck](#)

1320 [Role of Electrolyte Evolution on Damage Distributions and Rates during Atmospheric Corrosion Under Sodium Chloride Droplets](#)

[Eric John Schindelholz, Harry K Moffat, Neil Rob Sorensen](#)



[1321Effect of Temperature on Behavior of Oxygen Transport through Solution Layer Formed on Metals](#)

[Masatoshi Sakairi, Ryota Sakaki](#)

[1322The Influence of Salt Loading Density on the Atmospheric Corrosion of Aluminum](#)

[Rebecca Filardo Schaller, Jason Mark Taylor, Eric John Schindelholz](#)

[1323Corrosion Behavior of Al 6063 in Qatar's Desert and Marine Environments](#)

[Aboubakr Moustafa Abdullah, Mostafa H Sliem, Adel M Mohamed](#)

[1324Role of the Size of Iron- and Silicon-Rich Particles in the Atmospheric Corrosion Performance of Al-Mg-Si Alloys](#)

[Mohsen Esmaily, Jan-Erik Svensson, Lars-Gunnar Johansson](#)

[1325A Comparison of Potentiodynamic and Potentiostatic Electrochemical Test Methods for Resolving the Localized Corrosion Response of Heat Treated Al-Li-Cu Alloy 2099](#)

[Benjamin Hanna, Rudolph Buchheit, Fan Yang](#)

[1326Improving the Corrosion Resistance of Magnesium-Aluminum Alloys Using Microstructural Design](#)

[Mohsen Esmaily, Jan-Erik Svensson, Lars-Gunnar Johansson](#)

[1327Effect of Intermetallic Particle Size and Distribution on the Corrosion of an Mg-Al Alloy](#)

[Leslie Gail Bland, Jishnu Bhattacharyya, Sean Agnew, John Scully](#)

[1328The NaCl-Induced Atmospheric Corrosion Performance of Magnesium-Based Metal Matrix Composites](#)

[Mohsen Esmaily, Jan-Erik Svensson, Lars-Gunnar Johansson](#)

[1329Corrosion Properties of Powder Bed Fusion Additively Manufactured Stainless Steels](#)

[Rebecca Filardo Schaller, Jason Mark Taylor, Eric John Schindelholz, Jeffrey Rodelas](#)

[1330Crevice Corrosion of Nickel Alloy 625 in an Ocean Water Environment: New Insight into the Crevice Environment](#)

[Diana M. Salgado, Scott Lillard](#)

[1331Effect of Sulfate Ions on Repassivation Behavior of Crevice Corrosion on Type 316L Stainless Steel](#)

[Takahito Aoyama, Yu Sugawara, Izumi Muto, Nobuyoshi Hara](#)

[1332Influence of Surface Nanoporus Structure on the Corrosion Fatigue of Type 316L Stainless Steel in Sodium Chloride Solution](#)

[Natsuko Yamada, Hiroaki Tsuchiya, Shinji Fujimoto](#)

[1333Effect of Ferritic Phase Content on Pitting Corrosion Behavior of Cast Duplex Stainless Steel](#)

[Ryotaro Yamamoto, Hiroshi Yakuwa, Matsuho Miyasaka, Nobuyoshi Hara](#)

[1334Uncoupling the Mechanisms behind Tribocorrosion in Chloride Containing Media Using Spatially Resolved Friction and Electrochemical Measurements](#)

[J. Michael Shockley, Derek John Horton, Steven Policastro, Kathryn J. Wahl](#)

[1335Combined Numerical and Experimental Approach to Study the Effect of External SS316 Cathode on the Localized Corrosion in AA7050-T7451 Galvanically Coupled with SS316 Under Atmospheric Conditions](#)

[Chao Liu, Robert G. Kelly](#)

[1336Galvanic Corrosion of AA7050-T7451 and 316L Stainless Steel in a Simulated Fastener](#)

[Veronica N Rafla, Sarah Glanvill, Aaron Parsons, Alison J Davenport, John Scully](#)

1337[The Influence of Non-Passivating and Passivating Alloys on the Galvanic and Local Corrosion Rates of 6061-T6 Al](#)

[Kathleen Quiambao, Lloyd H. Hihara](#)

1338[Galvanic Corrosion Evaluation of Discarded Military Munition Steel Casing and Copper Driving Bands in Seawater](#)

[Raghu Srinivasan, Lloyd H. Hihara](#)

### **C06-Metallic, Organic and Composite Coatings for Corrosion Protection**

1339(Invited) [The Mechanisms By Which Graphene Nano-Pigments Inhibit Corrosion-Driven Organic Coating Delamination](#)

[Hamilton Neil McMurray, Geraint Williams, Carol Frances Glover, Calvin Richards](#)

1340[Novel Approaches for Characterizing the Delamination Resistance of Organic Coatings](#)

[Michael Rohwerder, Vijayshankar Dandapani](#)

1341[Predictive Engineering of Coating Adhesion on a Molecular Basis](#)

[Thomas Utzig, Philipp Stock, Markus Valtiner](#)

1342[Microstructure and EIS Characterization of Multi-Layered Coatings on Metals](#)

[Shawei Tang, Jin Hu](#)

1343[Fundamental Investigation of E-Coat Systems for Next Generation Corrosion Control](#)

[Fardin Padash, John N. Harb](#)

[1344Corrosion Resistant and UV Durable PVDF-Co-HFP /Al<sub>2</sub>O<sub>3</sub> Superhydrophobic Nanocomposite Coating for Aluminum](#)

[Ahmed Bahgat, Aboubakr Moustafa Abdullah, Adel M Mohamed, Mariam Almaadeed](#)

[1345The Effect of Environmental Stress Cracking on the Corrosion Performance of PET Coated Packaging Steel](#)

[David Warren, Arnoud C.A. de Vooy, Hamilton Neil McMurray](#)

[1346Extending the Life-Time of Low Cost Fuel Cells](#)

[Max Bedouet](#)

[1347Corrosion Protection of Galvanized Steel Using Smart-Release Hydrotalcite Pigments Containing Benzotriazole Derivatives](#)

[Geraint Williams, Patrick Charles Dodds, Phil Ansell, Hamilton Neil McMurray](#)

[1348An Investigation of Zinc Based Polyphosphates As Corrosion Inhibitors for Use in Organically Coated Steel](#)

[Christian Griffiths, Hamilton Neil McMurray, Geraint Williams](#)

[1349Corrosion Protection of Zinc Alloy Coated Steel By Organic Coatings Pigmented with Strontium Aluminium Polyphosphate](#)

[Yanwen Liu, Xiaorong Zhou, Stuart B Lyon, Reza Emad, Teruo Hashimoto, Ali Gholinia, Derek Graham, Simon R Gibbon, David Francis](#)

[1350A Smart-Release Corrosion Inhibitor Pigment for Galvanised Steel Based on Salicylaldehyde-Loaded Hydrotalcite](#)

[Phil Ansell, Geraint Williams, Patrick Charles Dodds, Carol Frances Glover, Hamilton Neil McMurray](#)

[1351A Novel, Highly Effective, Chrome-Free, Smart-Release, Economically Viable Corrosion Inhibitor- from Lab Kinetics through to Industrial Coating Incorporation](#)

[Patrick Charles Dodds, Geraint Williams, Phil Ansell, Carol Frances Glover](#)

1352 [An Svet Study of the Throwing Power of Smart-Release Corrosion Inhibitor Pigments in Organic Coatings](#)

[Carol Frances Glover, Geraint Williams, Phil Ansell, Patrick Charles Dodds](#)

1353 [Corrosion Resistance of Zinc-Rich Metallic Coatings on Aluminum](#)

[Mariia Stepanova, Otto Lunder, Jan Halvor Nordlien, Kemal Nisancioglu](#)

1354 [Zinc Diffusion Coatings on Aluminium for Improved Pitting Resistance](#)

[Otto Lunder, Jan Halvor Nordlien, John Erik Lein](#)

1355 [The Influence of Copper Coatings on the Corrosion of Carbon Steel Substrates](#)

[Thalia E. Standish, Dmitrij Zagidulin, Sridhar Ramamurthy, Andrew Nelson, Peter Keech, Dave Shoosmith](#)

1356 [Enhancement of Corrosion Resistance in Carbon Steels Using Fe-Based Amorphous Metallic Coatings Under High-Temperature Flowing Water](#)

[Seunghyun Kim, Jeong Won Kim, Ji Hyun Kim](#)

1357 [The New Examples of Tungsten Induced Codeposition Cu-W and Cu-Ni-W Alloys](#)

[Pawel Bacal, Mikolaj Donten, Zbigniew Jan Stojek](#)

1358 [\(Invited\) Atmospheric Corrosion of Zinc Magnesium Aluminum Coated Steel](#)

[Dominique Thierry, Dan Persson, Gerald Luckeneder, Karl-Heinz Stellnberger](#)

1359 [Investigation into the Corrosion Mechanisms and Effective Inhibitor Additions for Zinc-Magnesium-Aluminium \(ZMA\) Alloys](#)

Thomas Lewis, James Sullivan, Nathan Cooze, Callum Gallagher, Jonathon Elvins, Tomas Prosek, Dominique Thierry

1360 Increased Corrosion Resistance of Zinc Magnesium Aluminum Galvanized Coating through Germanium Additions

Shahin Mehraban

1361 Evaluation of Corrosion Protection Performance of Zinc Coatings and Failure Mechanisms

Sudesh Lakshitha Wijesinghe, Yong Teck Tan, Chan Wai Koh, Fern Lan Ng, Goh Min Hao

1362 Corrosion Properties of High-Corrosion-Resistance Galvanized Steel Sheet, Posmac(R)

Changhoon Choi, Soo Hyoun Cho, Min-Suk Oh

1363 Preparation, Characterization and Electrochemical Study of Lanthanum-Silica Sol-Gel Thin Films

Federico R. García-Galván, Noemi Carmona, Antonia Jiménez-Morales, Manuel García-Heras, Juan Carlos Galván, María Angeles Villegas

1364 Sol-Gel TiO<sub>2</sub> and ZrO<sub>2</sub>-Nanocomposite Thin Films for Enhancing in Vitro Biocompatibility and Bio-Corrosion Resistance of Ti6Al4V Orthopaedic Implants

Federico R. García-Galván, Amir A. El hadad, Antonia Jiménez-Morales, Graham J. Hickman, Carole C. Perry, Juan Carlos Galván

1365 Study of the Biocompatibility and Corrosion Resistance of Hydroxyapatite Sol-Gel Thin Coatings on Ti6Al4V Alloy

Antonia Jiménez-Morales, Amir A. El hadad, Eduardo Peón, Federico R. García-Galván, Violeta Barranco, Juan Carlos Galván

1366 Corrosion Protective Graphene-Oxide Composite Coating for Metal Alloys

Väino Sammelselg, Jay Mondal, Andreia Marques, Lauri Aarik, Martin Neitsov, Jekaterina Kozlova, Mairo Merisalu, Mihkel Rähn, Alda Simões

1367 Effectiveness of a TCP Conversion Coating at Inhibiting Corrosion on AA2024-T3 during SO<sub>2</sub> Atmospheric Testing

Greg M Swain, Brandon Whitman

1368 Effects of Flow on Protective Scales Formation in a CO<sub>2</sub> Saturated Brine Environment

Mobbassar Hassan SK, Aboubakr Moustafa Abdullah, Nicholas Laycock, David E Williams, Bridget Ingham

1369 MAX Phase Thin Films As Electrical-Conductive Corrosion-Protective Coatings with Self-Healing Abilities

Rolf Grieseler, Magali Karina Camargo, Marcus Hopfeld, Isabel Diaz Tang, Andreas Bund, Peter Schaaf

1370 Steel Surface Conversion By Flavonoid Model Molecules

Delphine Veys-Renaux, Emmanuel Rocca, Solenn Reguer, Francois Mirambet

1371 Characterization of Ti-Based Foams for Biomaterials Applications

Mamié Sancy, Claudio Aguilar, Sheila Lascano, Carolina Guerra, Nelson Vejar

1372 Evaluation of Titanium Carbide Thin Film Coatings on Surface Microstructure Controlled WC-Co

Chihiro Tanaka, Takeyasu Saito, Naoki Okamoto, Soichiro Suzuki, Akira Kitajima, Koji Higuchi

1373 Effects of CNT-Zinc Hybrid Structure on Corrosion, Scratch and Adhesion Strength of Epoxy Composite Coating

Farhad Daneshvar Fatah, Hung-Jue Sue, Homero Castaneda

1374 [Adhesion and Interface Study of Cu/Ni/Polyimide Film](#)

[Seung Min Kim, Jeong Gil Lee, Joong Kyu An, Shan hua Jin, Sang Hyun Jun, Young Tae Kim, Joon Woo Park](#)

1375 [Novel Silane-Polymer Composite Coating for Corrosion Protection of Mg-Zn-Al Alloy Against Corrosion in NaCl Solution](#)

[Mohammad BinSabt, Faizah M Al-Kharafi, Maryam Abditon, Ahmed Galal](#)

1376 [Study of Anti-Corrosion Coating Effects with the Pre ceramic Materials and Active Fillers](#)

[Jung Won Bang, Minh Dat Nguyen, Younghee Kim, Soo-Ryong Kim, Byung-Ik Kim, Woo-Teck Kwon](#)

1377 [Bulk Crystallization of Supercooled Metal Films](#)

[Andrey A. Chernov, Andrey A. Pil'nik, Damir R. Islamov](#)

## **D01-Photovoltaics for the 21st Century 12**

1378 [\(Invited\) Industrial High Efficiency Perc Solar Cells](#)

[Guoqiang Xing](#)

1379 [Flexible Carbon Nanotube/Silicon Thin Solar Cells Using Scalable Fabrication Techniques](#)

[Marina Mariano, Lyndsey McMillon-Brown, Xiaokai Li, Yeonwoong Jung, Mark Reed, André D. Taylor](#)

1380 [Enhanced Power-Conversion-Efficiency of Silicon Solar Cells Via Energy-Down-Shift Using Energy Tuning Effect for Mn Doped Cd<sub>0.5</sub>Zn<sub>0.5</sub>S/ZnS Core/Shell Quantum Dots](#)

[Seung-Jae Lee, Yun-Hyuk Ko, Mohammed Jalalah, Tae-Hun Shim, Jea-Gun Park](#)

1381 [Flexible Crystalline Silicon Solar Cell with Vertically Aligned Microwire Arrays](#)



[Inchan Hwang, Han-Don Um, Kwanyong Seo](#)

1382([Invited](#)) [Terawatt Solar Photovoltaics: Roadblocks and Our Approaches](#)

[Meng Tao, Wen-Cheng Sun, Wen-Hsi Huang, Laidong Wang, Joseph A Azzolini, Clarence J Tracy](#)

1383 [Substitutionally-Doped Intermediate Band Absorbers of Readily Tunable Composition](#)

[Robert McCarthy, Matthew S. Weimer, Richard Haasch, Richard D Schaller, Hock S. Adam, Alex B. F. Martinson](#)

1384 [Improving Open-Circuit Voltage in  \$\text{Cu}\_2\text{ZnSnSe}\_4\$  Thin Film Solar Cells Via Interface Passivation](#)

[Jekyung Kim, Sanghyun Park, Jihun Oh, Byungha Shin](#)

1385 [Efficiency Potential of Future Generation Solar Cells](#)

[Masafumi Yamaguchi, Kan-Hua Lee, Kenji Araki, Kyotaro Nakamura, Nobuaki Kojima, Yoshio Ohshita](#)

1386 [Low Temperature Growth of  \$\text{Cu}\_2\text{ZnSnS}\_4\$  Thin Films By Solution-Based Mist Chemical Vapor Deposition Method](#)

[Takumi Ikenoue, Yuichiro Watanabe, Masao Miyake, Tetsuji Hirato](#)

1387([Invited](#)) [Inorganic Charge Transport Materials Grown By Atomic Layer Deposition for Highly Efficient and Long-Term Stable Perovskite Solar Cells](#)

[Seongrok Seo, Changdeuck Bae, Seonghwa Jeong, Yongjae In, Hyunjung Shin](#)

1388 [Model-Guided Design and Optimization of Polymer-Electrolyte Dye Sensitized Solar Cells](#)

[Yuriy Y. Smolin, Austin G. Kuba, Kenneth K.S. Lau, Masoud Soroush](#)

[1389Improvement of the DSSC Performance By Using a Phosphonium-Type Ionic Liquid Modified TiO<sub>2</sub> Electrode](#)

[Ayaka Matsunaga, Tomohiko Inomata, Tomohiro Ozawa, Hideki Masuda](#)

[1390High-Efficiency Dye-Sensitized Solar Cells with Molecular Copper Phenanthroline As Solid Hole Conductor](#)

[Marina Freitag, Meysam Pazoki, Kári Sveinbjörnsson, Jinbao Zhang, Quentin Daniel, Licheng Sun, Gerrit Boschloo, Anders Hagfeldt](#)

[1391\(Invited\) Inverted Planar Heterojunction Perovskite Solar Cells Based on Lead Acetate Precursor with Efficiency Exceeding 18%](#)

[Rui Zhu](#)

[1392Performance Improvement of Organic Solar Cells By the Integrated Antireflection System with Moth Eye Surface and High-Refractive-Index Glass](#)

[Shigeru Kubota, Yoshiki Harada, Takenari Sudo, Kensaku Kanomata, Bashir Ahmmad, Jun Mizuno, Fumihiko Hirose](#)

[1393Hybrid Silver Mesh Electrode for ITO-Free Flexible Polymer Solar Cells](#)

[Wanjung Kim, Jong Hyeok Park](#)

[1394Mechanistic Investigation into the Light-Soaking Effect Observed in Inverted Polymer Solar Cells Using Indium Tin Oxide Electrodes Modified By Piperazine Derivatives](#)

[Takuji Kusumi, Kyosuke Fujimori, Takayujki Kuwabara, Takahiro Yamagucji, Tetsuya Taima, Kohshin Takahashi, Vanadian Astari Suci Atina, Kazuhiro Marumoto](#)

[1395\(Invited\) Controlling Perovskite Structure and Grain Morphology for High-Performance Perovskite Solar Cells](#)

[Kai Zhu](#)

[1396Charge Accumulation Mechanisms Under Dark in Perovskite Solar Cells](#)

[Teresa S. Ripolles, Ajay K. Baranwal, Germà García-Belmonte, Shuzi Hayase](#)

1397 [Opto-Electronic Properties of Hybrid Perovskites](#)

[Aditya Mohite, Wanyi Nie, Hsinhan Tsai, Jean-Christophe Blancon, Sergei Tretiak, Gautam Gupta](#)

1398 [Degradation Mechanism of Planar Heterojunction Perovskite Solar Cells for High Stability](#)

[Kohei Yamamoto, Md Shahiduzzaman, Yoshikazu Furumoto, Kyosuke Yonezawa, Takayuki Kuwabara, Kohshin Takahashi, Tetsuya Taima](#)

1399 [\(Invited\) Recent Progresses in Solution-Processed Hybrid Perovskite Devices in Photovoltaics and Optoelectronics](#)

[Tsutomu Miyasaka](#)

1400 [Feasible Strategy Towards Low Temperature Fabrication of Flexible Perovskite Solar Cells](#)

[Tingli MA, Kai Wang](#)

1401 [Enabling Continuous Processing of Perovskite Solar Cells](#)

[Thad Druffel](#)

1402 [Stabilizing Hybrid Perovskites Via Non-Hydrolytic Atomic Layer Deposited Overlayers](#)

[In Soo Kim, Alex B. F. Martinson](#)

1403 [Vapor-Assisted Efficient Perovskite Solar Cells Fully Fabricated in Open Air](#)

[Jun Yin, Jing Li, Nanfeng Zheng](#)

1404 [\(Invited\) X-Ray Crystallographical Studies on the Intermediates in the Solution Fabrication Process for Highly Efficient Perovskite Solar Cells](#)

[Atsushi Wakamiya](#)

[1405 Investigation of Dynamics of Perovskites using Chemically, Spatially and Temporally Resolved 2D Mapping](#)

[Gon Namkoong, Hyeon Jun Jeong, M A Mamun, Hyeryung Byun, Derek Demuth, Mun Seok Jeong, Helmut Baumgart](#)

[1406 Direct Observation of Ferroelectricity and Charge Separation Process in CH<sub>3</sub>NH<sub>3</sub>PbI<sub>3</sub> Perovskite Solar Cell](#)

[Peiqi Wang](#)

[1407 Modeling and Mechanistic Analyses of Electrochemical Impedance Spectroscopy of Ion Transport in Photovoltaic Devices Containing Perovskite Active Layers](#)

[Mark T Tuominen, Ramesh Y Adhikari, Zhou Xu, Monojit Bag, Lawrence A Renna, Christie L Cutting, Dhandapani Venkataraman](#)

[1408 \(Invited\) Real Time Analysis of the Crystallization Dynamics of Organilead Halide Perovskite](#)

[Tetsuhiko Miyadera](#)

[1409 TiO<sub>2</sub> Coated Graphene/ Mesoporous TiO<sub>2</sub> Composite Layer for Perovskite Solar Cells Produced By Supramolecular Protein](#)

[Yuki Hashima, Itaru Raifuku, Yasuaki Ishikawa, Naofumi Okamoto, Mutsunori Uenuma, Ichiro Yamashita, Yukiharu Uraoka](#)

[1410 In Situ Growth and Degradation Mechanisms in Hybrid Lead Halide Perovskite/Graphene Solar Cells](#)

[Muge Acik, Seth B. Darling](#)

[1411 Temperature-Dependent Device Characterization of Perovskite Solar Cells Prepared By Different Synthesis Methods](#)

[Daehan Kim, Seongryul Pae, YunSeog Lee, Oki Gunawan, Byungha Shin](#)

1412 [Stability Factors in Graphene-Based Perovskite Solar Cells Studied By in Situ Spectroscopy](#)

[Muge Acik, Seth B. Darling](#)

1413 [Photovoltaic Effect in ITO/Rgo/BFO/Au Heterostructures](#)

[Radhe Agarwal, Yogesh Sharma, Frank Mendoza, Gerardo Morell, Ram S. Katiyar](#)

1414 [Characterization of Cu-Based I-V-VI Thin Films Using Hybrid Inks](#)

[Ara Cho](#)

1415 [Fabrication of Non-Vacuum Sns Thin Film for Solar Cell Application](#)

[Young Joo Eo](#)

1416 [A Novel Poly\(acrylonitrile\)-Based Quasi-Solid-State Electrolyte for Dye-Sensitized Solar Cells](#)

[Yi-Han Su, Hsisheng Teng](#)

1417 [First-Principles Study of Ion Diffusions in  \$\text{CH}\_3\text{NH}\_3\text{PbI}\_3\$  and  \$\(\text{NH}\_2\)\_2\text{CHPbI}\_3\$  for Perovskite Solar Cells](#)

[Jun Haruyama, Keitaro Sodeyama, Liyuan Han, Yoshitaka Tateyama](#)

1418 [Designing Three-Dimensional Nanowire Arrays As Efficient Counter Electrodes for Quantum-Dot-Sensitized Solar Cells](#)

[Jin-Song Hu](#)

1419 [Enhancement in Efficiency of Hybrid Polymer Solar Cells By CdSe Quantum Dot Doping](#)

[Kusum Kumari, Suresh Chand](#)

1420 [Heterojunction Solar Cells Fabricated with a Cu<sub>2</sub>O:Mn Thin Film Grown Epitaxially on p-Type Cu<sub>2</sub>O:Na Sheets By Electrochemical Deposition](#)

[Kyosuke Watanabe, Ryousuke Uozaki, Jouji Yamazaki, Toshihiro Miyata, Tadatsugu Minami](#)

1421 [Transparent Conducting Oxide Layer By Thermal Evaporation for Cu\(In,Ga\)Se<sub>2</sub> Solar Cell with Chemical Bath Deposited-ZnS Buffer Layer](#)

[Woo-Jung Lee, Dae-Hyung Cho, Jae-Hyung Wi, Won Seok Han, Yong-Duck Chung, Yi Do Kim, Myung-Woon Choi, Jin Chul Choi](#)

1422 [Thermal Stability of CuInSe<sub>2</sub> solar Cell with Sputter-Zn\(O,S\) Buffer Layer As a Bottom Cell](#)

[Hye-Jung Yu, Jae-Hyung Wi, Woo-Jung Lee, Dae-Hyung Cho, Won Seok Han, Seong-Yeon Kim, Jun-Ho Kim, Yong-Duck Chung](#)

1423 [Edge-Fluorinated Graphene Nanoplatelets As Electrocatalysts for Solar Cells and Lithium Ion Batteries](#)

[Myung Jong Ju, In-Yup Jeon, Jae-Joon Lee, Jong-Beom Baek](#)

1424 [Enhanced Photovoltaic Effect in Single-Wall Carbon Nanotube/BiFeO<sub>3</sub> Heterostructure](#)

[Ho Jin Lee, Hyo-Sun Kim, Young-soo Seo, Taekjib Choi](#)

1425 [Synthesis and Characterization of Fullerene Derivatives with Alkyl Spacers and Alkyl Chains in Organic Photovoltaic Devices](#)

[Hiroshi Moriyama, Mizuki Igawa, Yuki Kuda](#)

1426 [Nano-Scale Smoothing of Double Layer Porous Si Substrates for Detaching and Fabricating Low Cost, High Efficiency Monocrystalline Thin Film Si Solar Cell By Zone Scanning Annealing](#)

[Chiaki Takazawa, Kei Hasegawa, Anatolii Lukianov, Xiaomei Zhang, Manabu Ihara](#)

1427 [Effects of Naf Post-Deposition Treatment on Defect Chemistry and Surface Properties in CIGS Thin Film Solar Cells](#)

[Suncheul Kim, Seungtae Kim, Byungtae Ahn, Joongkeun Park](#)

1428 [Eco-Friendly Orgnaic-Inorganic Hybrid Perovskite Solar Cells](#)

[Sang Hyuk Im, Jin Hyuck Heo](#)

1429 (Invited) [Parallelized Nano-Pillar Perovskites for Semitransparent Solar Cells Using Anodized Aluminum Oxide Scaffold](#)

[Hyeok-Chan Kwon, Hongseuk Lee, Eunsong Lee, Sunihl Ma Ma, Joocho Moon](#)

1430 (Invited) [Intramolecular Exchanging Crystallization for Formamidinium Lead Iodide Perovskite Solar Cells](#)

[Jun Hong Noh](#)

1431 [Highly Efficient and Stable Perovskite Solar Cells with a p-I-n Type Planar Geometry](#)

[Ik Jae Park, Jin Young Kim](#)

1432 [Two-Dimensional Layered Perovskite Solar Cells with 12.5 % Efficiency and 2000 Hours Stability in Light and Humidity](#)

[Gautam Gupta, Hsinhan Tsai, Wanyi Nie, Jean-Christophe Blancon, Constantinos Stoumpos, Mercuri Kanatzidis, Aditya Mohite, Pulickel M Ajayan](#)

1433 (Invited) [Green Solutions for Next Generation Photovoltaics: Using Wood, Glass, and Aluminum](#)

[Jeremy Munday](#)

[1434 Nanostructure Provides a Major Breakthrough in Properties of Transparent Polymer, and Solar Cells, Which Are Encapsulated By Nanopolymer](#)

[Elena M Shembel, Vlad I Redko, Nikolai I Klyui, Larisa Yashchenko, Nataly Yarova](#)

[1435 Theoretical Investigation of Unique Properties in Perovskite Solar Cell Materials](#)

[Wan-Jian Yin, Yanfa Yan, Su-Huai Wei](#)

[1436 High Efficiency and Durable Flexible Photovoltaics: Dye-Sensitized and Perovskite Solar Cells](#)

[Min Jae Ko](#)

[1437 Surface Passivation of Lead Sulfide Nanocrystals with Low Electron Affinity Metals: Photoluminescence and Photovoltaic Performance](#)

[Mohammad Mahdi Tavakoli, Rouhollah Tavakoli, Zhiyong Fan, Abdolreza Simchi](#)

[1439 \(Invited\) Innovation and Challenges of 3-D NAND Flash Technology](#)

[Ki-Seog Kim, Jin Woong Kim, Kyo-Won Jin](#)

## **D02-Nonvolatile Memories 5**

[1438 \(Keynote\) Development of Magnetic Tunnel Junctions for Stt-Mram Application](#)

[Kay Yakushiji, Hitoshi Kubota, Akio Fukushima, Shinji Yuasa](#)

[1440 \(Invited\) Resistive Switching in Mott Insulators: From Fundamentals to Mott Memories](#)

[Julien Tranchant, Etienne Janod, Benoit Corraze, Madec Querré, Marie-Paule Besland, Laurent Cario](#)

[1441 \(Invited\) Material and Device Design for Practical Application of Highly-Reliable and High-Density ReRAM](#)



Ryutaro Yasuhara

1442Resistive Switching Comparison Between Cu/TaO<sub>x</sub>/Ru and Cu/TaO<sub>x</sub>/Pt

Marius K Orlowski, Ye Fan, Mohammad Al-Mamun, Ben Colon, Sean W. King

1443Thermodynamically Introduced Oxygen Vacancies in Epitaxial Pt-CeO<sub>2</sub> System and Their Influence on Resistive Switching

Mykhailo Chundak, Michiko Yoshitake, Michal Vaclavu, Vladimir Matolin, Toyohiro Chikyow

1444Multi-Level CuO-Based Conductive-Bridging-Random-Access-Memory Cell Embedded with Au Ncs

Myung-Jin Song, Ki-Hyun Kwon, Dong-Won Kim, Hye-Jee Kim, Soo-Min Jin, Jea-Gun Park

1445Double Layers-Stacked 3D 1D1R Crossbar Rram Integrating a Diode Selector with Rectification Ratio of  $\sim 10^9$

Kyung Jean Yoon, Si Jung Yoo, Tae Hyung Park, Yeong Jae Kwon, Dae Eun Kwon, C. S. Hwang

1446(Invited) New Design of Double MgO-Based p-Mtj Spin-Valves with Top Co<sub>2</sub>Fe<sub>6</sub>B<sub>2</sub> Free Layer Performain Highly Increased TMR Ratio and Thermal Stability

Jea-Gun Park

1447(Invited) Scaled Magnetic Tunnel Junctions for High-Density Nonvolatile Memories

Toshihiro Sugii, Chikako Yoshida, Hideyuki Noshiro, Youichi Yamazaki, Yoshihisa Iba

1448Perpendicular Stt-Mram Scaling Challenges and Potential Solutions

Tom Zhong, Luc Thomas, Guenole Jan, Jian Zhu, Huanlong Liu, Yuan-jen Lee, Son Le, Yu-Ring Tong, Dongna Shen, Renren He, Jesmin Haq, Jeffrey Teng, Santiago Serrano

[Guisan, Jodi Iwata-Harms, Sahil Patel, Vinh Lam, Yu-jen Wang, Terry Torng, Pokang Wang](#)

1449[Highly Enhanced TMR Ratio and  \$\Delta\$  for Double MgO-Based p-Mtj Spin-Valves with Top  \$\text{Co}\_2\text{Fe}\_6\text{B}\_2\$  Free Layer By Nanoscale-Thick Iron Diffusion-Barrier](#)

[Seung-Eun Lee, Jong-Ung Baek, Tae-Hun Shim, Jin-Pyo Hong, Jea-Gun Park](#)

1450[Thermally Stable Perpendicular-Magnetic Tunneling Junction Spin-Valve Implementing W Bridge, Space and Cap-Layer](#)

[Jin-Young Choi, Du-Yeong Lee, Seung-Eun Lee, Jin-Pyo Hong, Jea-Gun Park](#)

1451[Thermally Assisted Spin Torque Switching in Magnetic Random Access Memory](#)

[Tomohiro Taniguchi, Akio Fukushima, Kay Yakushiji, Hitoshi Kubota](#)

1452[Arrays of Single-Domain Nanomagnets As Memory- Logic-Hybrid Device - a Nonvolatile Magnetic Memory That Can Perform Logical Operations](#)

[Heinz Wanzenboeck, Emmerich Bertagnolli](#)

1453[\(Invited\) Analysis of Traps in 3-D NAND Flash Memory Cells](#)

[Jong-Ho Lee](#)

1454[3-Nm-Thick ZnO Nanoislands Charge Trapping Layer for Memory Devices Grown By Single ALD Step](#)

[Nazek El-Atab, Farsad Imtiaz Chowdhury, Turkan Gamze Ulusoy, Ali Okyay, Ammar Nayfeh](#)

1455[Experimental Extraction of the Charge Centroid in SiCN-Based Charge Trapping Memories Using the Constant-Current Carrier Injection Method](#)

[Sheikh Rashel Al Ahmed, Kaihei Kato, Kiyoteru Kobayashi](#)

1456[The Origin of Traps Responsible for Localization and Charge Transport in Memory Devices](#)

Vladimir A. Gritsenko

1457 Multi-Functional Bipolar Resistive Switching Originated from Self-Compliance Electroforming in Pt/WO<sub>3</sub>/Pt Memristive Devices

Zheng-Hua Tan, Rui Yang, Xue-Bing Yin, Xin Guo

1458 Magnetic Conductive Filament Formed in the Reram Device with Ferromagnetic Electrode

Hayato Yoshida, Tomohiro Shimizu, Takeshi Ito, Shoso Shingubara

1459 Resistive Switching Effect in BiFeO<sub>3</sub> Nano-Islands

Taekjib Choi

1460 Reversible Phase Transition in GeTe through Resonance Bond Switching

Mannho Cho, Wonjun Yang, Dasol Kim, Seungjong Park, Min Ahn, JeongHwa Han, Hoon Jung

1461 Control of Tetragonal Distortion and Ferroelectricity in Bi(Zn<sub>1/2</sub>Ti<sub>1/2</sub>)O<sub>3</sub>-Based Lead-Free Ferroelectric Thin Films

Shintaro Yasui, Hiroshi Uchida, Hiroshi Funakubo

1462 Hopping Conduction in Intermediate Resistance State of Tantalum Oxide Resistive Switching Memory

Jiu-Xing Huang, Jen-Sue Chen

1463 Selector Requirements for 3D Resistive Switching Crossbar Array Based on Writing Margin Evaluation

Kyung Jean Yoon, Woorham Bae, Deok-Kyoon Jeong, C. S. Hwang

1464 Evaluation of Hole Trapping Characteristics in MONOS-Type Memories Using the Constant Current Carrier Injection Method

[Kaihei Kato, Sheikh Rashel Al Ahmed, Kiyoteru Kobayashi](#)

1465 [Charge Trap Memory Based on Few-Layer Black Phosphorus and High-K Materials](#)

[Kaiyou Wang](#)

1466 [Resistive Switching Nanodevices Based on Sulfides](#)

[Engelbert Redel, Helmut Baumgart, Christof Wöll, Zhengbang Wang, David Malien Nminibapiel, Pragya Shrestha](#)

1467 [Electrical Contact Property of GeCu<sub>2</sub>Te<sub>3</sub> Phase Change Material to Electrode](#)

[Satoshi Shindo, Yuji Sutou, Daisuke Ando, Junichi Koike, Yuta Saito, Yun-Heub Song](#)

1468 [Acquisition and Extinction of Associative Memory Realized in Memristive Devices with Intrinsic Forgetting Effect](#)

[Xue-Bing Yin, Zheng-Hua Tan, Rui Yang, Xin Guo](#)

1469 [\(Invited\) Resistive RAM Memories from a Material Perspective: Exploration of the Switching for Several Oxides Using Ab Initio Simulations](#)

[Philippe Blaise, Benoit Sklenard, Boubacar Traore, Cecile Nail, Elisa Vianello, Gabriel Molas](#)

1470 [TiO<sub>2</sub> Based Conductive-Bridge-Random-Access-Memory](#)

[Dong-Won Kim, Myung-Jin Song, Ki-Hyun Kwon, Hye-Jee Kim, Soo-Min Jin, Do-joon Kim, Jea-Gun Park](#)

1471 [Tantalum Oxide Resistive Memory Devices By Ion Assisted Deposition](#)

[Ronald S. Goeke, David R. Hughart, Robin Bay Jacobs-Gedrim, Carl L. Smith, Conrad D. James, Matthew J. Marinella](#)

1472 [Doping Trends in HfO<sub>x</sub> Rram](#)

Dan Duncan, Keumdong Jung, Blanka Magyari-Kope, Yoshio Nishi

1473(Invited) Analog Hfox-Rram Switches for Neural Networks

Sabina Spiga, Brivio Stefano, Erika Covi, Marco Fanciulli, Alexander Serb, Themis Prodromakis, Hesham Mostafa, Giacomo Indiveri

1474(Invited) Understanding the Structure and Electrical Response of Combined Threshold and Memristive Switching Devices Obtained from Amorphous Nb<sub>2</sub>O<sub>5</sub> Layers

Susanne Hoffmann-Eifert, Carsten Funck, Stephan Menzel, Nabeel Aslam, Timothee Blanquart, Jaakko Niinistö, Mikko Ritala, Markku Leskelä, Hongchu Du, Manuel Bornhöfft, Joachim Mayer, Rainer Waser

1475Three-Dimensional Non-Linear Complex Model of Dynamic Memristor Switching

Andrey A. Chernov, Damir R. Islamov, Andrey A. Pil'nik, Timofey V. Perevalov, Vladimir A. Gritsenko

1476(Invited) Two-Terminal Selectors Enables Non-Volatile Memory and Neuromorphic Computing Applications

J. Joshua Yang, Zhongrui Wang, Saumil Joshi

1477Evaluating Resistive Memory Devices for Neuromorphic Computing Using Ultrashort Voltage Pulses

Robin Bay Jacobs-Gedrim, David R. Hughart, Sapan Agarwal, Patrick Sean Finnegan, Ronald S. Goeke, Michael Van Heukelom, Joshua Nowlin, Jamison Wagner, Conrad D. James, Matthew J. Marinella

1478Nanosecond Programming of SiO<sub>x</sub> Based Resistive RAM: Simplified Digital Programmings and Analog Neuromorphic Type Behavior

Luca Montesi, Mark Buckwell, Konstantin Zarudnyi, Leon Garnett, Steven Hudziak, Adnan Mehonic, Anthony Joseph Kenyon

1479(Invited) Ge-Cu-Te Phase Change Material for Pcam Application

Yuji Sutou, Yuta Saito, Satoshi Shindo, Junichi Koike

1480(Invited) Bipolar Switching of Phase Change Memory for Enhanced High-Temperature Stability

Daniele Ielmini

1481Ferroelectric Switching Pathways and Energetics in (Hf,Zr)O<sub>2</sub>

Sergey V. Barabash, Dipankar Pramanik, Yoshio Nishi, Blanka Magyari-Kope, Yahong Zhai

1482Engineering Ferroelectricity in Hf<sub>x</sub>Zr<sub>1-x</sub>O<sub>2</sub>

Stephen Weeks, Ashish Pal, Vijay Narasimhan, Karl Littau, Dipankar Pramanik, Tony Chiang

1483Leakage Currents Mechanism in Thin Films of Ferroelectric Hf<sub>0.5</sub>Zr<sub>0.5</sub>O<sub>2</sub>

Damir R. Islamov, Anna G. Chernikova, Maxim G. Kozodaev, Timofey V. Perevalov, Vladimir A. Gritsenko, Oleg M. Orlov, Andrey M. Markeev

1484(Invited) Hard X-Ray Photoelectron Spectroscopic Study on High-k Dielectrics Based Resistive Random Access Memor

Takahiro Nagata, Yoshiyuki Yamashita, Hideki Yoshikawa, Toyohiro Chikyow

1485Compliance-Free Picosecond Smart Pulse Programming for Rram

David Malien Nminibapiel, Pragya Shrestha, J. H. Kim, J P Campbell, Helmut Baumgart, K. P. Cheung

1486Multi-Bit Non-Volatile Organic Transistor-Based Memory Using Lithium-Ion-Encapsulated Fullerene As a Charge Trapping Layer

Cuong Manh Tran, Heisuke Sakai, Yuki Kawashima, Kei Ohkubo, Shunichi Fukuzumi, Hideyuki Murata

[1487Tomography of Intrinsic Filamentation in Silica and Hsq Based Reram Devices with Conductive Atomic Force Microscopy](#)

[Mark Buckwell, Konstantin Zarudnyi, Luca Montesi, Wing Hung Ng, Stephen Hudziak, Adnan Mehonic, Anthony Joseph Kenyon](#)

[1488Joule Heating Effect in the Electroforming Process of Pt/WO<sub>3-x</sub>/Pt Nanoionics-Based Memristive Devices](#)

[Rui Yang, Kazuya Terabe, Xin Guo](#)

[1489Silicon Oxide Reram Device](#)

[Adnan Mehonic, Mark Buckwell, Luca Montesi, Manveer Munde, Richard John Chater, David S McPhail, Michel Bosman, Anthony Joseph Kenyon](#)

[1490Silicon Oxide-Based Memory and Three-Dimensional Nanoporous System for Ultrahigh Density Storage](#)

[Gunuk Wang](#)

[1491Resistance Switching Structures Based on Hydrogen Silsesquioxane \(HSQ\) Thin Films](#)

[Wing Hung Ng, Adnan Mehonic, Luca Montesi, Mark Buckwell, Anthony Joseph Kenyon](#)

[1492The Interaction of SiO<sub>x</sub>-Based Resistive RAM Devices with Oxygen: Observations on Release and Absorption](#)

[Luca Montesi, Mark Buckwell, Celeste Anna Maria van den Bosch, Richard John Chater, Sarah Fearn, Adnan Mehonic, Ainara Aguadero, Anthony Joseph Kenyon](#)

[1493Characteristic of Resistive Switching Device Using Mesoporous Carbon-Silica-Titania Nanocomposite](#)

[Hunsang Jung, Yo-Han Kim, Hyun Ho Lee](#)

[1494Graphene Oxide and ZnO/Al:ZnO Based Transparent Resistive Switching Devices for Memristor Applications](#)

[Aswini K Pradhan, Sangram Pradhan, Rajeh Mundle, Bo Xiao](#)

### **D03-Plasma Nano Science and Technology**

[1495\(Invited\) Challenges in Ultra-Small Device Manufacture](#)

[Michael anthony Morris](#)

[1496\(Invited\) The Challenges and Opportunities in Plasma Etching of Functionally Enhanced Complex Material Systems](#)

[Jack Kun-Chieh Chen, Taeseung Kim, Jane P. Chang](#)

[1497\(Invited\) Multifunctional Materials for Electronics and Photonics](#)

[Federico Rosei](#)

[1498Self-Aligned Contact Etch Process Optimization with Pulsing Plasma Technology](#)

[Er-Hu Zheng, Yi-Ying Zhang, Hai-Yang Zhang](#)

[1499The Application of Advanced Pulsed Plasma in Fin Etch Loading Improvement](#)

[Haiyang Zhang, Fangyuan Xiao, Qiuhua Han](#)

[1500Initial Transient Phenomena Impact on Plasma CVD of Ultrathin Silicon Nitride and Silicon Carbon Nitride Dielectrics for Nano Devices Cu-Low k Interconnects](#)

[Son van Nguyen, Thomas J Haigh, Hosadurga k Shobha, Deepika Priyadarshini, Donald F Canaperi](#)

[1501Dummy Poly Gate Removal Scheme at Finfet](#)

[Shi-liang Ji, Qiu-Hua Han, Hai-Yang Zhang](#)



[1502\(Invited\) Radical-Controlled Plasma Nano Processing for Green and Life Innovations](#)

[Masaru Hori](#)

[1503\(Invited\) Silicon Oxide Films: Plasma Assisted Formation of Nanostructures from Glass to Organic Polymers](#)

[Ruediger Foest, Jan Schäfer, Jaroslav Hnilica, Jens Harhausen](#)

[1504\(Invited\) Atmospheric Pressure Microplasma Jet: Properties and Applications in Synthesis of Nanoparticles](#)

[Xiao-Xia Zhong](#)

[1505\(Invited\) Microplasmas Technologies for Third Generation Solar Cells Based on Colloidal Nanocrystals with Quantum Confinement Effects](#)

[Vladimir Svrcek](#)

[1506In-Situ Rare Earth Doping of Silicon-Based Nanostructures By Plasma Enhanced Chemical Vapour Deposition](#)

[Peter Mascher, Jacek Wojcik, Zahra Khatami, Jeremy William Miller, Austin Brown](#)

[1507\(Invited\) Plasma Deposition of Functional Nanocomposites](#)

[Franz Faupel, Thomas Strunskus, Oleksandr Polonskyi, Mady Elbahri, Michael Bonitz, Holger Kersten](#)

[1508\(Invited\) A Rapid and Scalable Method for the Synthesis of Carbon Nanowalls](#)

[Miran Mozetič, Rok Zaplotnik, Gregor Primc, Alenka Vesel](#)

[1509\(Invited\) Role of Charges in Non-Classical Crystallization of Thin Films and Nanostructures in the Plasma CVD Process](#)

[Nong-Moon Hwang](#)

[1510\(Invited\) Microplasma Jet Deposition of Nanostructured Materials](#)

[Michael Gordon](#)

[1511Atmospheric Pressure Nonequilibrium Plasma Jets for Synthesis, Deposition, and Modification of Various Oxides](#)

[William F Paxton, Srikanth Ravipati, Babajide Ajayi, Mahendra Kumar Sunkara](#)

[1512\(Invited\) Plasma Treatment on 2D Mxene  \$Ti\_3C\_2\$  Nanosheets for Water Desalination](#)

[Hui Ying Yang](#)

[1513\(Invited\) Electrostatic Field and Non-Thermal Plasma for Handling and Processing Bio-Molecules and Cells](#)

[Akira Mizuno](#)

[1514\(Invited\) Plasma Assisted Preparation of Low Pt Content Proton Exchange Membrane Fuel Cell Anode Catalysts](#)

[Vladimir Matolin, Martin Dubau, Anna Ostroverkh, Jaroslava Lavkova, Iva Matolinova](#)

[1515The Synergetic Catalytic Effect of Molten Gallium in the Presence of Hydrogen and Nitrogen Plasmas: Study and Applications](#)

[Daniel Felipe Jaramillo-Cabanzo, Maria Carreon, Indira Chaudhuri, Madhu Menon, Mahendra Kumar Sunkara](#)

[1516Plasma-Assisted Deposition of Carbon Nanowalls for Detection of Organic Vapours](#)

[Uros Cvelbar, Petr Slobodian, Hiroki Kondo, Makoto Sekine, Masaru Hori](#)

[1517Potential CCP Pulsed Plasma Application at Beol AIO Etch Process](#)

[Cheng-Long Zhang, Qi-Yang He, Hai-Yang Zhang](#)

[1518 Atmospheric Plasma Jet Oxidation of Solution Based Precursors for Enabling Material Discovery](#)

[Babajide Ajayi, Daniel Felipe Jaramillo-Cabanzo, Sudesh Kumari, Joshua M Spurgeon, Jacek B Jasinski, Mahendra Kumar Sunkara](#)

[1519 Role of Low-Energy Ion Impact in Plasma Deposition of Cubic Boron Nitride Films](#)

[Kazuma Murata, Masataka Torigoe, Kungen Teii, Seiichiro Matsumoto](#)

[1520 IR Laser Modifications of Anodic Tantalum Pentoxide for Photonic Applications](#)

[Alina Kulpa](#)

[1521 Plasma Synthesis of Platinum-Palladium Alloy Nanoparticles and Their Application to the Counter Electrode of Dye-Sensitized Solar Cells](#)

[Woo-Yeol Lee, Van-Duong Dao, Ho-Suk Choi](#)

[1522 Electromagnetic Interference Shielding Effectiveness of Silver Thin Films Fabricated By Dry Plasma Reduction](#)

[Hyo-Jun Oh, Van-Duong Dao, Ho-Suk Choi](#)

## **E01-Electroless Deposition: Principles and Applications 4: In Honor of Milan Paunovic and Mordechai Schlesinger**

[1523 In Situ-Raman Spectroscopy and Electrochemical Characterization on the Enig Process](#)

[Alessandra Accogli, Andrea Lucotti, Luca Magagnin](#)

[1524 The Spontaneous Deposition of Au on Pt \(111\) and Polycrystalline Pt](#)

[Stephen Ambrozik, Corey Mitchell, Nikolay Dimitrov](#)

[1525 Galvanic Displaced Nickel-Silicon and Copper-Silicon Interfaces: A DFT Investigation](#)

[Lorenzo Pedrazzetti, Peiman Soltani, Alessio Mezzi, Saulius Kaciulis, Luca Nobili, Luca Magagnin, Matteo Maria Saverio Tommasini](#)

[1526A XAFS Investigation of Pt Monolayer on Au\(111\) Obtained from Displacement Reaction](#)

[Qiuyi Yuan, Satoru Takakusagi, Yohei Uemura, Takahiro Wada, Kiyotaka Asakura](#)

[1527Galvanic Deposition of Copper, Silver and Gold on Silicon Surfaces from Fluoride Free Aqueous Solutions](#)

[Stojan S Djokić](#)

[1528Electroless Metallization of Dielectric Surfaces](#)

[Val M Dubin, Andrei L Gindilis, Barbara L Walton, Sage R Bauers, Amy Albrecht, Kevin Norelli, David C Johnson](#)

[1529Curcbit Formation on Glass Substrate Using a Titanium-Copper Oxide Catalytic Adhesion Layer for Copper Plating](#)

[Kyohei Okabe, Christopher Ernest John Cordonier, Joohyong Noh, Hideo Honma, Osamu Takai](#)

[1530Preparation of High-Speed Signal Transmission Line on Thin Polyimide Layer By All-Wet Process](#)

[Tokihiko Yokoshima, Hiroki Kagawa, Takuma Hachisu, Atsushi Sugiyama, Tetsuya Osaka, Lei Xu, Shigeru Watariguchi, Kazutaka Tajima, Katsuya Kikuchi, Masahiro Aoyagi](#)

[1531An Alternative Pre-Treatment for Metallization of Polymeric Materials and Its Applications](#)

[Andrea Vittorio Oriani, Paula Cojocaru, Luca Magagnin](#)

[1532Formation of a Hermetic Copper-Glass Joint By Copper Plating for Direct Metallization of Glass](#)

[Christopher Ernest John Cordonier, Kyohei Okabe, Joohyong Noh, Hideo Honma](#)

1533 [Co-Ni Electroless Composite Plating of Nanometer-Levelled Diamond Particles on Micrometer-Levelled Plastic Balls and the Application of Thus Prepared Devices to Various Electronics Processes](#)

[Sachio Yoshihara](#)

1534 [Environmentally Conscious Pretreatment Process for Plating on PPS Resins](#)

[Taro Nomura, Katsuhiko Tashiro, Yasushi Umeda, Hideo Honma, Osamu Takai](#)

1535 [Electro-Less Deposition Using Metal Ion Based Reducing Agents: Potential Benefits and Applications in Semiconductor Manufacturing](#)

[Aniruddha Joi, Yezdi Dordi](#)

1536 [Low Temperature Electroless Deposition of Hard Magnetic Alloys for the Metallization of Additive Manufactured Functional Microstructures](#)

[Roberto Bernasconi, Caterina Credi, Marinella Levi, Luca Magagnin](#)

1537 [Effects of Additives on Ag Nanoparticles Catalyzed Electroless Copper Deposition Using Glyoxylic Acid As a Reducing Agent](#)

[Yu-Chen Chang, Shih-Cheng Chou, Pu-Wei Wu, Po-Chun Chen, Meng-Chi Huang, Yu-Ming Wang, Chang-Jung Hsueh](#)

1538 [In Situ-Raman Spectroscopy and Comparison with DFT Computational and Experimental Study of Electroless Nickel Deposition](#)

[Alessandra Accogli, Andrea Lucotti, Carlo Cavallotti, Pietro Luigi Cavallotti, Luca Magagnin](#)

1539 [Developments in Hybrid Electro-Electroless Deposition \(HEED\)](#)

[Robert Petro](#)

[1540 Electroless Deposition of Aluminum from a Room Temperature Ionic Liquid Electrolyte](#)

[Setsuko Koura, Sota Ooshima, Daiki Kudo, Nobuyuki Koura](#)

[1541 Comparative Study of Electroless Platinum Deposition Using Multivalent Metal Ions or Hydrazine As Reducing Agents](#)

[Eugenijus Norkus, Ina Stankeviciene, Aldona Jagminiene, Loreta Tamasauskaite-Tamasiunaite, Arnas Naujokaitis, Vytenis Buzas, Laurynas Maciulis, Liudas Tumonis](#)

[1542 Electroless Deposition of High Quality Co Films on Cu Polycrystalline Substrate Assisted By Pb UPD Monolayer](#)

[Dongjun Wu, Aniruddha Joi, Yezdi Dordi, Stanko Brankovic](#)

[1543 Electroless Copper Plating Process By Applying Alternating One-Side Air Stirring Method for High-Aspect-Ratio through-Holes](#)

[Hiroshi Kanemoto, Toshinori Kawamura, Hitoshi Suzuki, Tomoyuki Miyazaki, Hironori Mozumi, Yoshihisa Kaneko](#)

[1544 Thin and Flexible Nickel Based Current Collectors Developed By Electroless Deposition for Energy Storage Devices](#)

[Haoran Wu, Amelia Susanto, Keryn Lian](#)

[1545 Chemical Bath Deposition of Iridium Oxide Film for Implantable Neurostimulation Electrode Applications](#)

[Kuang-Chih Tso, Tsai-Wei Chung, Yi-Cheng Chen, Pu-Wei Wu, Po-Chun Chen](#)

[1546 Metallization on Silk Utilizing Supercritical Carbon Dioxide Assisted Electroless Plating for Wearable Device](#)

[Wan-Ting Chiu, Chun-Yi Chen, Tso-Fu Mark Chang, Tomoko Hashimoto, Hiromichi Kurosu, Masato Sone](#)

[1547 Surface Metallization of Silicon Carbide By Electroless Deposition](#)

[Naoki Yamada, Daisuke Sadakane, Kenji Fukuda, Susumu Sakamoto, Naoki Fukumuro, Shinji Yae](#)

1548[Electroless Deposition of Co-Mo-P \(or B\) Alloys for Ulsi Applications](#)

[Yelena Sverdlov, Yosi Shacham-Diamand, Jenny Shklovsky](#)

1549[Electroless Plating of Copper on Graphite Powders for Homogeneous Copper-Carbon Composite](#)

[Hyukjae Lee, Tai-Joo Chung, Hyun-Uk Pyo](#)

1550[Electroless Deposition of Fe-Ni Alloy Thin Films for Power Semiconductor Package](#)

[Takayo Yamamoto, Tomio Nagayama, Yoshiki Konno, Toshihiro Nakamura](#)

1551[Composition, Structure and Properties of Electroless Deposited Rhenium-Rich Re-Co Thin Films](#)

[Alla Duhin, Alexandra Inberg, Noam Eliaz, Eliezer Gileadi](#)

1552[Metallization of Three Dimensional Microstructure Using Electroless Plating](#)

[Ying-Chih Liao, Kuan-Ming Huang, Yung-Jian Chen, Tien-Tung Chung](#)

1553[Deposition of Ni-Based Carbon Nanotube Composite Coatings By Using Laser Enhanced Electroless Plating](#)

[Tsunehisa Suzuki](#)

## **E02-Magnetic Materials Processes and Devices 14**

1554[Influence of Cooling Rate on Coercivity and Microstructures in Hot-Deformed Nd-Fe-B Magnets By Nd-Cu Electrochemical/Electroless Deposition](#)

[Jeehye Kwon, Dayoung Yoo, Jieun Park, Dongyun Lee](#)

1555(Invited) [The Interaction of Organic Additive in Magnetic Alloy Plating](#)

[Ming Sun, Ming Jiang](#)

1556 [Shape Transition and Growth of  \$\text{Co}\_x\text{Fe}\_{\(1-x\)}\$  Alloy Nanocrystals By Electrochemical Deposition](#)

[Kimoon Park, Sanghwa Yoon, Bongyoung Yoo](#)

1557 [\(Invited\) Electrodeposition of Thermally Stable Soft Magnetic Materials](#)

[Jie Gong, Steve Riemer, Ibro Tabakovic, Michael Kautzky](#)

1558 [Fe-Based Magnetic Alloy Electrodeposition for Thin Films and Template Based Nanostructures](#)

[Veronika Haehnel, Xiao Ma, Christoph Konczak, Diana Pohl, Margitta Uhlemann, Heike Schlörb](#)

1559 [Engineering the Magnetic Anisotropy of Electrodeposited Multilayers](#)

[James Shirtcliffe, Walther Schwarzacher](#)

1560 [Superconformal Bottom-up Nickel Deposition in High Aspect Ratio through Silicon Vias](#)

[Daniel Josell, Thomas P. Moffat](#)

1561 [Superconformal Bottom-up Cobalt Deposition in High Aspect Ratio through Silicon Vias](#)

[Daniel Josell, Manoj Silva, Thomas P. Moffat](#)

1562 [Electrodeposition of Magnetic SmCo Films from Deep Eutectic Solvents](#)

[Gabriele Panzeri, Luca Magagnin](#)

1563 [Lifecycle Characterization of a High Magnetostriction Cobalt Iron Electroplating Chemistry](#)



[Christopher R. St. John, Jamin Ryan Pillars, Andrew E Hollowell, Patrick Finnegan, Eric Donald Langlois, Christian L. Arrington](#)

1564([Invited](#)) [Structural Control of Electrodeposited L1<sub>0</sub>-FePt Nanodot Arrays Towards Reduction of Ordering Temperature](#)

[Siggi Wodarz, Shougo Hashimoto, Manabu Saitou, Giovanni Zangari, Takayuki Homma](#)

1565[Electrochemical Synthesis and Characterization of Fe-Ni-Pt Alloy Films](#)

[Siyuan Ge, Siggi Wodarz, Shougo Hashimoto, Manabu Saitou, Takayuki Homma, Giovanni Zangari](#)

1566[Electrodeposition of Ag-Ni-W Alloys](#)

[Avinash R. Kola, Elizabeth J Podlaha](#)

1567([Invited](#)) [Biological Applications of Magnetic Nanoparticles for Magnetic Immunoassay and Magnetic Particle Imaging](#)

[Takashi Yoshida, Teruyoshi Sasayama, Keiji Enpuku](#)

1568([Invited](#)) [Application of Ferrite Nanoparticles to Magnetic Hyperthermia](#)

[Tetsuya Osaka, Shofu Matsuda, Sho Hideshima, Takuya Nakanishi, Eri Nakajima, Maho Kanazu](#)

1569[Synthesis and in Vitro Evaluation of Magnesium Ferrite Nanoparticles for Application to Magnetic Hyperthermia](#)

[Shofu Matsuda, Maho Kanazu, Takuya Nakanishi, Tetsuya Osaka](#)

1570([Invited](#)) [Magneto-Optical and Plasmonic Composite Particles Synthesized By Deposition of Au Nanoparticles on Bismuth-Substituted Yttrium-Iron Garnet Core](#)

[Yoshitaka Kitamoto, Yusuke Ishii](#)

1571([Invited](#)) [Magnetic MEMS for Industry 4.0](#)

[Marc Christopher Wurz](#)

[1572 Unleashing the Magic of Nanomagnet Assemblies - Direct-Write Deposition of Nanomagnet Logic Circuitry](#)

[Heinz Wanzenboeck, Marco Gavagnin, Emmerich Bertagnoli](#)

[1573 \(Invited\) A Single-Molecule Spin-Based Transistor](#)

[W. Schwarzacher, Richard Brooke, Doug Szumski, Richard Nichols, Bing-Wei Mao, Chengjun Jin, Kristian Thygesen](#)

[1574 \(Invited\) New Developments in Magnetic Inductors for On-Chip Power Conversion, Including Fabrication](#)

[E. J. O'Sullivan, Naigang Wang, Hariklia \(Lili\) Deligianni, Bruce Doris, Andrea Bahgat Shehata, Bucknell C. Webb, Lubomyr Romankiw, William J. Gallagher](#)

[1575 Development and Optimization of Thin-Film Technology Based Micro Inductors and Transformers](#)

[Sebastian Beringer, Dragan Dinulovic, Martin Haug, Lutz Rissing, Marc Christopher Wurz](#)

[1576 \(Invited\) On-Wafer Microwave Devices Based on Magnetic Materials](#)

[Zbigniew Celinski, Robert Camley, Ian Harward, Sara Goldman](#)

[1577 Optimized Cofeb Alloy Films for Electroformed Resonators](#)

[Jamin Ryan Pillars, Eric Donald Langlois, Christian L. Arrington, Todd Monson, Margo Staruch, Peter Finkel](#)

[1578 Effect of Annealing Temperature on the Coercivity and the Electrical Resistivity of the Electroplated Ni-Fe-W Alloy Film](#)

[Brij Mohan Mundotiya, Lutz Rissing, Marc Christopher Wurz](#)

1579 [Structuring Methods of Plastic Substrates for Electroplating Applications](#)

[Sebastian Bengsch, Mathias Rechel, Esmail Asadi, Marc Christopher Wurz](#)

### **E03-Molecular Structure of the Solid-Liquid Interface and Its Relationship to Electrodeposition 8**

1580 [Self-Assembled Monolayers on Ferromagnetic Metals Prepared By an Electrochemical Method](#)

[Rashida Parveen, Walther Schwarzacher, Svetlana Ovchinnikova, Alexander Masliy](#)

1581 [Electrocatalytic Reduction of Selenate on Gold Electrodes Alongside Copper Deposition](#)

[Jonathan Strobl, Daniel Scherson](#)

1582 [Exploring Different Concepts for 2D Cu Growth on Ru\(0001\) Assisted By Pb UPD Monolayer](#)

[Dongjun Wu, Stanko R Brankovic](#)

1583 [Electrochemical Silver Deposition Onto Pt\(111\) Surfaces](#)

[Ludwig A. Kibler, Khaled A. Soliman, Alan Plumer, Eric Bringley, Christopher S. Wildi, Jonathan E. Mueller, Timo Jacob](#)

1584 [Superconformal Film Growth: Challenges and Opportunities](#)

[Thomas P. Moffat, Guokun Liu, Shouzhong Zou, Liang Yueh Ou Yang, Chang Hwa Lee, Daniel Josell](#)

1585 [The Electrodeposition of Germanene](#)

[John Lewellen Stickney, Maria Ledina, Jin Jung, Nhi Bui](#)

1586 [Induced Co-Deposition of Cu-Ge Alloys](#)

[Giovanni Zangari, Fu Zhao, Marcel Mibus](#)

1587 [Growth-Inhibited Nucleation Enhancement: from High Density Nanoparticle Deposits to Nanometer Thin Continuous Films](#)

[Philippe M. Vereecken, Johannes Vanpaemel, Magi Nagar, Katrien Strubbe, Aleksandar Radisic](#)

1588 [The Effect of Bath Condition on the Composition of Si Thin Films Electrodeposited in Non-Aqueous Solvents](#)

[Yasuhiro Tsuyuki, Minami Tsuzuki, Yasuhiro Fukunaka, Takayuki Homma](#)

1589 [Preparation of Composite Film from Non-Suspended Solution By Electrochemical Technique](#)

[Ichiro Koiwa, Kenta Chokki, Nobuaki Watanabe, Kazuhiro Yabe](#)

1590 [\(Electrodeposition Division Research Award\) Using Liquid Metals for Advanced Electrodepositions](#)

[Stephen Maldonado](#)

1591 [Self-Terminated Electrodeposition Reactions for Electrocatalysis](#)

[Thomas P. Moffat, Yihua Liu, Sang Hyun Ahn, Rongyue Wang, Nicole L. Ritzert, Dincer Gokcen, Carlos Hangarter, Ugo Bertocci](#)

1592 [High Activity Oxygen Evolution Reaction Catalysts from Additive-Controlled Electrodeposited Ni and NiFe Films](#)

[Andrew A. Gewirth, Thao Thi Huong Hoang, Kevin Gary Schmitt](#)

1593 [First Principles Studies of the Structural and Electrocatalytic Properties of Ultrathin \(OXY\)Hydroxide FILMS on Precious Metal Substrates](#)

[Zhenhua Zeng, Joseph J. Kubal, Hee-Joon Chun, Jeff Greeley](#)

1594 Theoretical Investigation of Atomic-Scale Structure and Energetics of the Metal-Electrolyte Interface

Kendra Letchworth-Weaver, Christine K. Umbright, Maria K. Y. Chan, T. A. Arias

1595 In-Situ Microfluidic Study with Kinetic-Monte Carlo Simulations to Investigate Zn Electroplating Morphology at High Overpotentials

Tanya Gupta, Greg Davies, Jeung Hun Park, Daniel A Steingart

1596 In-Situ Raman Spectroscopy Study on the Preferential Adsorption of Electrolyte Species on Electrode Surface of Lithium Ion Battery

Yingying Sun, Masahiro Yanagisawa, Takayuki Homma

1597 In-Situ Measurements of Stress during Electrodeposition of Copper Nanofilms: Surface and Grain-Boundary Migration of Atoms and the Effect of Chloride Ions

Joseph A Murphy, Catherine Lenihan, Robert Patrick Lynch, D. Noel Buckley

1598 In-Situ Stress Measurements during Cobalt Electrodeposition

Gery R. Stafford, Ugo Bertocci

1599 Self-Organized Porous Anodic Oxide Formation: Role of Oxide Flow Driven By Surface Stress

Kurt Hebert, Omer Capraz, Pratyush Mishra, Shinsuke Ide, Pranav Shrotriya

1600 Control of Accumulation of Cu(I) in Copper Sulfate Electroplating Plating Solution

Toshiaki Koga, Chieko Hirakawa, Yoshitaro Sakata, Hiroaki Noma, Kazuhiro Nonaka, Nao Terasaki

1601 Spectroscopic and Electrochemical Analysis of Cu(I) Complex of Copper Sulfate Electroplating Solution and Evaluation of Plated Films

[Toshiaki Koga, Chieko Hirakawa, Yoshitaro Sakata, Hiroaki Noma, Kazuhiro Nonaka, Nao Terasaki](#)

1602[Electrodeposition of Cobalt Selenide Thin Films Using Combined Voltammetry and Electrochemical Quartz Crystal Microgravimetry](#)

[ki-Jung Paeng, hyung Woo Jee](#)

1603[Effect of Amine Additive on Properties of Electrodeposited Nickel](#)

[Hyoung Chan Kim, Wook Jin Lee, Sang Joon Lee, Yang Do Kim](#)

### **E04-Electrodeposition for Energy Applications**

1604[\(Electrodeposition Division Early Career Investigator Award\) Self-terminated Electrodeposition – A New Way for Growing Metal Thin Films](#)

[Yihua Liu](#)

1605[\(Invited\) Novel Method for Conformal  \$\text{LiMn}\_2\text{O}\_4\$  thin Films Fabrication on Planar and 3D Microstructured Substrates](#)

[Nouha Labyedh, Marina Timmermans, Felix Mattelaer, Maarten J. Mees, Christophe Detavernier, Philippe M. Vereecken](#)

1606[\(Invited\) Photoelectrochemical Water Splitting with Doped  \$\text{TiO}\_2\$  Nanotube Arrays: Limits and Water Oxidation Efficiency](#)

[Lok-kun Tsui, Giovanni Zangari](#)

1607[\(Invited\) The Effect of Size and Thickness of Pt Nanostructures on Au on Formic Acid Oxidation](#)

[Natasa Vasiljevic, Michael Peter Mercer, Zakiya Al Amri](#)

1608[\(Invited\) De-Alloying of  \$\text{Cu}\_x\text{Au}\_{\(1-x\)}\$  Alloys at Different Length Scales for the Development of Active Nanoporous Au Catalysts](#)

[Nikolay Dimitrov, Jiaxin Xia, Stephen Ambrozik, Innocent Achari](#)

1609 [Electrodeposition and Characterization of Pt\(100\) Nanostructures](#)

[Erwan Bertin, Sebastien Garbarino, Magali Brunet, David Pech, Daniel Guay](#)

1610 [Cobalt-Palladium Alloys for Hydrogen Generation Via Water Electrolysis](#)

[Dawid Kutyla, Karolina Kolczyk, Remigiusz Kowalik, Krzysztof Mech, Piotr Zabinski](#)

1611 [Electrodeposition of Ni-Ga Alloy Catalyst from BMIM-Otf Ionic Liquid Electrolyte for Electroreduction of Carbon Dioxide](#)

[Jinqiu Zhang, Xing Gu, Peixia Yang, Maozhong An](#)

1612 (Invited) [Pt Monolayers and Submonolayers on Nobel Metal Nanoparticles: Substrate- and Coverage-Dependent Atomic Structures and Electrocatalytic Activities](#)

[Lingyi Peng, Hongda Du, Lin Gan](#)

1613 [Electrochemical Codeposition of Cobalt and Ruthenium from Acidic Chloride Electrolytes](#)

[Krzysztof Mech, Justyna Mech, Piotr Zabinski, Remigiusz Kowalik, Marek Wojnicki](#)

1614 [High Mass Activity and Stability of Core-Shell Pd-Ni Nanoparticles Electrodeposited on Diamond Electrodes for Direct Alcohol Fuel Cell Applications](#)

[Christos K. Mavrokefalos, Maksudul Hasan, James F. Rohan, John S. Foord](#)

1615 [Miniature Fuel Cell with Monolithically Fabricated Si Electrodes -Fabrication of Pd-Pt Catalyst By H-UPD-Slrr-](#)

[Toshimitsu Miyauchi, Natasa Vasiljevic, Masanori Hayase](#)

1616 [Redox Deposition of Hydrous Ruthenium Dioxide Onto Porous Vanadium Oxide Nanowires Prepared By Electroless Deposition](#)

Jing-Mei Li, Chi-Chang Hu, Yung Jung Hsu

1617 Electrochemical Decoration of Core Shell Metal Nano Particles over TiO<sub>2</sub> Nanotubes for Oxygen Reduction Reaction

Bukka Santhosh, Yuhei Umehara, Koichi Higashimine, Raman Vedarajan, Noriyoshi Matsumi

1618 (Invited) Electrochemical Deposition of Thick and Adherent MnO<sub>2</sub> Films for Thin-Film Batteries

Nouha Labyedh, Meryem Ozge Arman, Marina Timmermans, Stella Deheryan, Philippe M. Vereecken

1619 Electrodeposited and Oxidized Mn/Co-Fe As Bi-Functional Electrocatalysts for Rechargeable Zinc-Air Batteries

Ming Xiong, Douglas G Ivey

1620 Highly Glossy Copper Foil Electrodeposition Used As a Negative Electrode of Lithium Batteries

Chih-Han Yen, Chia-Fu Hsu, Wei-Ping Dow, Kuen-Yuen Hwang, Jui-Chang Chou, Kuei-Sen Cheng, Huei-Fang Hwang

1621 Electrodeposition As an Approach for Fabricating High Performance Battery Electrodes

Amy C Marschilok, Kenneth J Takeuchi, Esther S Takeuchi

1622 Mechanical Properties of Electrodeposited Al-W Alloy Films and the Effects of Subsequent Heat Treatment

Shota Higashino, Ayumu Takahashi, Ryuta Kasada, Masao Miyake, Tetsuji Hirato

1623 (Invited) Pulsed Electrodeposition of Metallic Nanoparticles for Energy Conversion and Storage Applications



[Shahram Karimi](#)

1624 [Gradient Morphologies in Electrodeposited Manganese Dioxide and Their Effect on Electrochemical Performance](#)

[Scott W Donne, Hannah Fellows, Yaser Beyad](#)

1625 [Polymeric-Metal Oxide Nanostructures As Future Materials for Energy Applications](#)

[Agnieszka Brzózka, Krzysztof Fic, Grzegorz Dariusz Sulka](#)

1626 [Microstructural Analysis of Initial Scale Formed on Stainless Steel Sheet Immersed in Hot Spring Water](#)

[Motoaki Morita, Wataru Shinohara, Ryohei Hashimoto, Shinichi Motoda](#)

1627 [\(Invited\) Electrodeposition of PbTe Thick Films for Micro Thermoelectric Devices](#)

[Tingjun Wu, Nosang Vincent Myung](#)

1628 [Copper\(II\) Complexes in Aqueous Alkaline Copper\(II\)-Lactate Solutions for Electrodeposition of Copper\(I\) Oxide](#)

[Tianyu Chen, Atsushi Kitada, Kazuhiro Fukami, Dilshadbek T. Usmanov, Lee Chuin Chen, Kenzo Hiraoka, Kuniaki Murase](#)

1629 [Electrodeposited ZnO Nanostructures Onto Transparent Metallic Web Electrodes for Photocatalytic Applications](#)

[Elena Matei, Lucian Diamandescu, Monica Enculescu, Irina Zgura, Ionut Enculescu](#)

1630 [Electrodeposition of Tellurium Thin Films from Citric Acid Bath](#)

[Remigiusz Kowalik, Dawid Kutyla, Karolina Kolczyk, Krzysztof Mech, Tomasz Tokarski, Piotr Zabinski](#)

1631 [Silver Electrodeposition Based Multicolor Electrochromic Cell Toward Energy Saving Applications](#)

Norihisa Kobayashi, Kazuki Nakamura, Jineui Hong, Riho Tejima

1632Enhanced Photoelectrochemical Behavior of Undoped and Doped BiVO<sub>4</sub> inverse Opal Photoelectrode for Photoelectrochemical Water Splitting

Balamurugan Maheswari, soon Hyung Kang

1633Anodized Porous Oxide Thin Films for Energy Application

Hua Cheng, Dehui Zhang, Dong Wu, Zhouguang Lu

1634Cascading Alignment of Multilayered SnO<sub>2</sub>/WO<sub>3</sub>/BiVO<sub>4</sub> Inverse Opal Skeletons in Photoelectrochemical Water Splitting

Gun Yun, Soon Hyung Kang

1635Pulse Electrodeposited AgGaS<sub>2</sub> Films and Their Optical Properties K.R.Murali

Kollegal Ramakrishna Murali

1636Effect of Oxide Intermediate Layers on Pyramidally Textured Cu<sub>2</sub>O/ZnO Solar Cells Prepared By Electrodeposition

Tsutomu Shinagawa, Masaya Chigane, Junichi Tani, Masanobu Izaki

1637Ionic Liquid-Assisted Electron Transfer in Micelles for Simultaneous Deposition of Uniform Ag Nanoparticles at Electrode Surface and in Bulk Microemulsions

Zenglin Wang, Yuhan Li, Chuan Zhao

1638Improving the Electrolytic Hydrogen Production Using Co-Cu-Mo Based Ionic Activator

Milica P Marceta Kaninski, Sladjana Lj Maslovara, Petar Z Lausevic, Djordje P Saponjic, Zeljka M Nikolic, Gvozden S Tasic, Vladimir M Nikolic

1639Direct Growth of Birnessite-Type MnO<sub>2</sub> on Activated Carbon Cloth for a Flexible Supercapacitor

[Masaharu Nakayama, Koki Kaneshige, Kyohei Komine](#)

1640 [Fine Grained Au Films with Controllable Mechanical Strength By Pulse Plating for Micro-Electrical-Mechanical System Accelerometer](#)

[Chun-Yi Chen, Masaharu Yoshida, Tso-Fu Mark Chang, Daisuke Yamane, Katsuyuki Machida, Kazuya Masu, Masato Sone](#)

1641 [CuIn\(Ga\)Se<sub>2</sub> Solar Cell Fabricated By All Wet-Processes](#)

[Kangju Park, Sungkyu Park, Dajeong Lee, Hyunsoo Jin, Jihye Gwak, Yang Do Kim, Dongyun Lee](#)

1642 [Sn-Cu Alloy Microtubes for Li-Ion Battery Anode Prepared By Electroless Plating](#)

[Yutaka Fujiwara, Shingo Ikeda, Masanari Takahashi, Yasuyuki Kobayashi](#)

1643 [Effects of Additives on Performance of Zinc Air Battery](#)

[Ching-Chen Wu, Shih-Hsuan Huang, Kan-Lin Hsueh, Wen-Sheng Chang, Chang-Chung Yang](#)

1644 [Effect of Supporting Electrolytes on AlCl<sub>3</sub>/Diglyme Aluminum Electrodeposition Bath](#)

[Yukiya Kato, Atsushi Kitada, Kazuhiro Fukami, Kuniaki Murase](#)

1645 [Flexible CIGS Thin Film Solar Cell from Electrodeposited Precursors](#)

[Youngho Kim, Daejung Kim, Hyunpil Oh](#)

## **F01-Industrial Electrochemistry and Electrochemical Engineering General Session**

1646 [Ni/SiC Composite Coating on Graphite– Geometry Effect on the Coatings](#)

[S Harinipriya, Belal Usmani](#)

[1647On the Dynamics of Solid Oxide Fuel Cell Stacks: Preliminary Model-Driven Design and Control](#)

[Carlos Boigues Muñoz, Lorenzo Abate, Stephen J. McPhail](#)

[1648Experimental and Numerical Study of Small Lead Acid Batteries Regeneration](#)

[Francois Astier, Philippe Mandin, Jeremy Boyer, Odile Merdrignac, Nicolas Noiret](#)

[1649Improvement of Current Efficiency for a Hydrogenation Electrolyzer with Low Concentration of Toluene](#)

[Yuki Sawaguchi, Naoto Morita, Kensaku Nagasawa, Koichi Matsuzawa, Akihiro Kato, Yoshinori Nishiki, Shigenori Mitsushima](#)

[1650Systematic Characterization of a SOFC Short Stack in Multiple Operation Modes](#)

[Stephen J. McPhail, Bruno Conti, Marco Graziadio](#)

[1651A Study on Workability and Durability of Different Plating Thickness of Silver on Monel As a Cathode Material for Oxygen Reduction](#)

[Utsav Raj DoteI](#)

[1652Influence of Different Operating Parameters on the Partial Reduction of Oxygen for Hydrogen Peroxide Production](#)

[Carsten Cremers, Birgit Kintzel, Keerthi Priya Duraisamy, Karsten Pinkwart, Jens Tübke](#)

[1653Electrochemical Behaviour of Industrial IrO<sub>2</sub>-Ta<sub>2</sub>O<sub>5</sub> Anodes for Copper Electrowinning](#)

[Wenting Xu, Geir Martin Haarberg, Svein Sunde, Frode Seland, Arne petter Ratvik, Erik Zimmerman, Torjus Åkre](#)

[1654Synthesis of Novel Graphene Composite Adsorbent for Water Treatment By Adsorption and Electrochemical Regeneration](#)

[Farbod Sharif, E.P.L. Roberts](#)

1655 [Nanoscale Size Effects in Catalytic Activity of RuO<sub>2</sub> for Oxygen Evolution](#)

[Shuhei Kimura, Kenji Kawaguchi, Masatsugu Morimitsu](#)

1656 [Gas Anodes for Electrowinning of Aluminium](#)

[Tommy Mokkelbost, Babak Khalaghi, Karen Sende Osen, Wei Bai, Ole Sigmund Kjos, Geir Martin Haarberg](#)

1657 [Highly Stable Mixed Metal Oxide Anodes for Industrial Electrochemical Processes](#)

[Satyananda Kishore Pilli, Bryan K Boggs](#)

1658 [A Generalized Numerical Method for Approximating Equilibrium Reactions for Electrochemistry Simulations](#)

[Kyle Lange, Graham Goldin, Chris Lueth, Christian Walchshofer, Alexandros Makridis](#)

1659 [Investigation of the Optimum Operative Conditions for a Parallel Plate Electrochemical Reactor](#)

[Giuliana Litrico, Pierre Proulx](#)

1660 [An Electrochemical Study of Sb and Ni Doped SnO<sub>2</sub> Electrodes for Ozone Electrolysis](#)

[Staffan Sandin, Joakim Bäckström, Ann Cornell](#)

1661 [Electrochemical Kinetics during Production of Liquid Iron at 1550 C Via Molten Oxide Electrolysis](#)

[Jan-Christian Wiencke, Hervé Lavelaine, Christophe Rapin, Pierre-Jean Panteix, Carine Petitjean](#)

1662 [Electrochemical Oxidation of Lignin for Production of Value Added Chemicals](#)

[Raziyeh Ghahremani, John A Staser](#)

1663 [A Novel Approach to Coal Processing - Electrochemical Solutions to Pollution Reduction and Material Synthesis](#)

[Aliakbar Yazdani, Gerardine G Botte, Santosh H. Vijapur, Dan Wang, Yuxuan Wang, Ben Sheets](#)

1664 [Facile Fabrication of Large-Area and Free-Standing Ni Inverse Opals](#)

[Pei-Sung Hung, Chen-Hong Liao, Bo-Han Huang, Wei-Shen Chiang, Tsung-Lin Hsieh, Pu-Wei Wu](#)

1665 [Bimetallic Pt-Based Electrocatalysts Supported on Carbon Fiber for Coal Electrooxidation to Produce Hydrogen](#)

[Ping Yu](#)

1666 [Present Status of Electrolytic Technologies in the Field of Functional Water Treatment](#)

[Yoshinori Nishiki](#)

1667 [The Characteristics of the Bismuth Telluride Based Materials Via Gas Phase Reaction Method](#)

[Hye Young Koo, Gook Hyun Ha](#)

1668 [Corrosion Resistance Properties of Cu-Sn Electrodeposits from Cyanide-Free Bath](#)

[Toshihiro Nakamura, Yoshiki Konno, Takayo Yamamoto, Tomio Nagayama](#)

1669 [Electrodeposition of Nickel from Aqueous Chloride Electrolytes](#)

[Mats Jensen, Geir Martin Haarberg, Frode Seland, Svein Sunde, Arne Petter Ratvik, Torjus Åkre](#)

1670 [Electrodeposition of Invar Fe-Ni Alloy/SiC Particle Composite](#)

[Tomio Nagayama, Takayo Yamamoto, Toshihiro Nakamura](#)

[1671 Electrochemical Reactor Design and Operation for the Simons Fluorination of Methyl Sulfonyl Fluoride](#)

[Dawei WANG, Yaqiong WANG, Wenlin Xu](#)

[1672 Paired Electro-Synthesis of PbO<sub>2</sub> and Pb As Lead Storage Battery Active Materials Using Pb\(NO<sub>3</sub>\)<sub>2</sub> as a Precursor](#)

[Yaqiong WANG, Baotong LI, Wenlin Xu](#)

[1673 Paired Electro-Synthesis of PbO<sub>2</sub> and Pb As Lead Storage Battery Active Materials Using PbSO<sub>4</sub> As a Precursor](#)

[Yaqiong WANG, Xuan Zhao, Wenlin Xu](#)

[1674 Preparation of Multi-Walled Carbon Nano-Tube Composite Copper Plating from Acidic Solution](#)

[Yota Kamebuchi, Yuki Kamimoto, Ryoichi Ichino, Takeshi Bessho](#)

[1675 Evaluation of Leak and Reverse Current in a Bipolar Electrolyzer](#)

[Takayuki Kobayashi, Yousuke Uchino, Shinji Hasegawa, Ikuo Nagashima, Yoshio Sunada, Akiyoshi Manabe, Koichi Matsuzawa, Shigenori Mitsushima](#)

## **F02-Electrochemical Impedance Spectroscopy: In Honor of Bernard Tribollet**

[1676 \(Keynote\) Interrogation of the Interfacial Capacitance By a Double Modulation Technique](#)

[Rene Antaño López, Michel Keddad, Hisasi Takenouti, Mireille Turmine, Vincent Vivier](#)

[1677 \(Invited\) Synergistic Use of Electrochemical Impedance Spectroscopy and Photoelectrochemical Measurements for Studying Solid State Properties of Anodic HfO<sub>2</sub>](#)

Monica Santamaria, Giada Tranchida, Andrea Zaffora, Francesco Di Franco, Hiroki Habazaki, Francesco Di Quarto

1678(Invited) Phenomena in Mass-Transport Electrochemical Impedance Spectroscopy at Channel Electrodes

Thomas Holm, Mats Ingdal, Espen Vinge Fanavoll, Svein Sunde, Frode Seland, David A. Harrington

1679(Invited) Secondary Modulation in Electrochemical Impedance Spectroscopy Instrumentation

Xueyuan Zhang, Dominik Moosbauer

1680(Invited) Transmission Line Modelling of Thin Film Graphene Electrodes: Capacitance of Chemically-Derived Graphene in Monolayer State

Wataru Sugimoto, Zhongwei Lei, Takahiro Mitsui, Masayuki Itagaki

1681(Invited) Theory of Impedance Response of Porous Electrodes: Simplifications, Inhomogeneities, Non-Stationarities and Applications

Jun Huang, Jianbo Zhang

1682The Influence of Homogeneous Reactions on the Impedance Response of a Rotating Disk Electrode

Morgan Harding, Bernard Tribollet, Mark E. Orazem

1683The Ohmic Impedance Contribution to the Indirect Impedance Measurement

Christopher L. Alexander, Mark E. Orazem

1684(Invited) Modeling Current-Distribution Effects on the Impedance of Electrodes Covered with Films

Svein Sunde, Morten Tjelta



1685(Invited) Characterization of Thin Passive Film-Electrolyte Junctions. Amorphous Semiconductor (a-SC) Schottky Barrier Approach

Francesco Di Quarto, Francesco Di Franco, Shahab Miraghaei, Monica Santamaria, Fabio La Mantia

1686(Keynote) Electrochemical Impedance Spectroscopy Characterization of Advanced Materials for Energy

Thomas Collet, Dries Van Laethem, Xinhua Zhu, Nils Van den Steen, Rodrigo Montoya, Lucia Fernandez Macia, Johan Deconinck, Annick Hubin

1687Approximability of Impedance Spectra By RC Elements and Implications for Impedance Analysis

Michael Schoenleber, Ellen Ivers-Tiffée

1688(Invited) Linear and Nonlinear Electrochemical Impedance Spectroscopy: A Data Science Perspective

Matthew D Murbach, Daniel T. Schwartz

1689(Invited) Thermoelectrochemical Impedance Method Fundamental Aspect and Applications

OMAR Aaboubi

1690Using of Finite Elements Modeling Computer Simulation in Impedance Prediction and Data Evaluation

Petr Vanýsek, Petr Vyroubal, Vitězslav Novák

1691(Keynote) The Electrochemical Behavior of an Inhibitor Containing Ce<sup>3+</sup> for a Low-Alloy Steel in a 3.5% NaCl Solution

Xingyue Yong, Ranran Du, Yong Fu, Ying Wnag, Zhenglin Chen, Ning Xiao

1692(Invited) Mechanisms of Inhibition of Corrosion of Metal Reinforcements for Eco Friendly Concrete Containing a Biological Admixture

[Françoise Feugeas, Sara Chakri, Essia Belhaj, Eliane Sutter, Vincent Vivier, Thierry Meylheuc, Bernard Tribollet](#)

[1693\(Invited\) An Impedance Study of the Factors Affecting the Passivity of Steel in Concrete](#)

[J.M. Deus, B. Díaz, X.R. Nóvoa, M. C. Pérez](#)

[1694\(Invited\) Improved the Impedance Spectroscopy Measurements with Non-Contact Microelectrodes Embedded into a Flexible Polymer Comprising a Microfluidic Network](#)

[Mohammed Kechadi, Bernard Tribollet, Jean Gamby](#)

[1695\(Invited\) Localized Electrochemical Techniques for Characterizing Welded Areas of Dissimilar Al Alloys Joined By FSW](#)

[Caio Palumbo Abreu, Hercilio G. de Melo, Mireille Turmine, Nadine Pebere, Isolda Costa, Vincent Vivier](#)

[1696\(Invited\) Electrochemical Impedance Study on Anodic Dissolution of Magnesium in Sodium Sulfate Solution](#)

[Keita Umetsu, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki](#)

[1697Magnesium Alloy Corrosion Under Thin Electrolyte Layer Using Electrochemical Impedance Spectroscopy and Polarization Curve](#)

[Fahe Cao, Zejie Zhu, Xiaoyan Liu, Jianqing Zhang](#)

[1698\(Invited\) Impedance Analysis of the Aluminum Oxide Formation](#)

[Mamié Sancy, Fabiola Pineda](#)

[1699\(Invited\) Study of Barrier Oxide Growth on Impure Aluminum in Aqueous Solution By Chronoamperometry and Electrochemical Impedance Spectroscopy](#)

[Nils-Håvard Giskeødegård, Kemal Nisancioglu](#)

[1700 On Interpretation of Constant-Phase Elements](#)

[Mark E. Orazem, Bernard Tribollet, Vincent Vivier, Marco Musiani, Nadine Pebere](#)

[1701 \(Keynote\) Local Electrochemical Impedance Spectroscopy: A Powerful Tool for Studying Corrosion Inhibition Mechanisms on 2024 Aluminum Alloy](#)

[Nadine Pebere, Emilie Lebon](#)

[1702 \(Invited\) EIS Analysis of the Water Uptake Process in Model Epoxy Coatings and Free Films](#)

[Coralie Vosgien Lacombe, Geoffrey Bouvet, Dao Trinh, Stéphanie Mallarino, Sébastien Touzain](#)

[1703 \(Invited\) Relating Paint Structure to Electrochemical Impedance Spectroscopy](#)

[Anthony ewart Hughes, Shyama Deepak Ranade, Mike yongjun Tan, Y Sam Yang, Maria Forsyth](#)

[1704 \(Invited\) New Benzoxazine Resins Coated on Anodized Aluminium Alloys: Electrochemical Behaviour of Efficient Corrosion Protection Systems](#)

[Marjorie Olivier, Alexis Renaud, Ludovic Dumas, Adrien Delangre, Yoann Paint, Leila Bonnaud, Marc Poorteman, Philippe Dubois](#)

[1705 \(Invited\) Discussion on the Way\(s\) to Analyze the Electrochemical Impedance Spectroscopy Spectra for the Reduction of Nitric Acid on Passive Metals](#)

[Marie Benoit, Christian Bataillon, Benoit Gwinner, Frédéric Miserque, Carlos Sanchez-Sanchez, Bernard Tribollet, Vincent Vivier](#)

[1706 \(Invited\) EIS for the Early Detection of Unexpected Corrosion Phenomena in Highly Resistive Organic Solutions: Multiple Electrical Equivalent Circuit Fitting Validated By Parametric Continuity Conditions](#)

[Ricardo P. Nogueira, Clément Boissy, Aurélien Percheron, Virginie Roche, Lionel Renaud, Pierre Mékarbané, Denis Siguret](#)

[1707\(Invited\) Parameter Identification in Electrochemical Impedance Spectroscopy Applications: Analysis of Sensitivity](#)

[Mickael Boinet, Cyril Condolf, Remi Goulet, Bernard Tribollet, Vincent Vivier](#)

[1708 Impedance Spectroscopy and Differential Electrochemical Mass Spectrometry As Tools for Characterization of Mediated Oxidation of Organic Pollutants](#)

[Piotr Polczynski, Rafal Robert Jurczakowski, Wojciech Grochala](#)

[1709\(Invited\) Electrochemical Impedance Study of Lithium Cobalt Oxide Thin Film in Some Ionic Liquids](#)

[Yasushi Katayama, Shin-ichiro Fujimoto, Naoki Tachikawa, Kazuki Yoshii, Tetsuo Nishida, Hideto Imai, Toshihiro Takekawa](#)

[1710\(Invited\) Synergy of Nyquist and Bode Electrochemical Impedance Spectroscopy Studies to Stoba in Lithium Ion Battery](#)

[Fu-Ming Wang, Lyu-Ye Yang](#)

[1711\(Keynote\) Non-Destructive Analysis of Electrochemical Systems By Electrochemical Impedance Spectroscopy](#)

[Tetsuya Osaka, Daikichi Mukoyama, Hiroki Nara, Tokihiko Yokoshima, Toshiyuki Momma](#)

[1712\(Invited\) in-Situ Impedance of Lithium-Ion Rechargeable Batteries during Charge and Discharge](#)

[Masayuki Itagaki, Yoshinao Hoshi, Isao Shitanda](#)

[1713 Interfacial Impedance Characterization and Equivalent Circuit Modeling Analysis of a Li-O<sub>2</sub> Battery](#)

[Ruben Nelson, Mark H Weatherspoon](#)

[1714\(Invited\) Effect of Position of Reference Electrode on Electrochemical Impedance in Laminated Lithium-Ion Rechargeable Batteries](#)

[Yoshinao Hoshi, Yuki Narita, Isao Shitanda, Masayuki Itagaki](#)

[1715\(Invited\) Analysis of Li-Ion Battery By EIS Response By Equivalent Circuit and Verification of Estimated Parameters](#)

[Toshiyuki Momma, Daikichi Mukoyama, Hiroki Nara, Tokihiko Yokoshima, Tetsuya Osaka](#)

[1716\(Invited\) Impedance Analysis Using Equivalent Circuits with Transmission Line Model for Reaction Distribution in Polymer Electrolyte Fuel Cell and Li-Ion Battery](#)

[Hiroki Nara, Daikichi Mukoyama, Tokihiko Yokoshima, Toshiyuki Momma, Tetsuya Osaka](#)

[1717Quantitative Reconstruction of Half-Cell Impedances of Commercial Lithium-Ion Cells By Three Electrode Measurements and Impedance Modeling](#)

[Stefan Schindler, Michael A. Danzer](#)

[1718Quantitative Analysis of Time-Domain Supported Electrochemical Impedance Spectroscopy Data of Li-Ion Batteries: Reliable Activation Energy Determination at Low Frequencies](#)

[Andreas Mertens, Izaak C. Vinke, Hermann Tempel, Hans Kungl, L.G.J. de Haart, Rüdiger-Albrecht Eichel, Josef Granwehr](#)

[1719\(Invited\) AC Impedance Studies on Electrode/Electrolyte Interface in Lithium-Ion Batteries](#)

[Takeshi Abe](#)

[1720\(Invited\) Electrochemical Impedance Spectroscopy for Polymer Electrolyte Membrane Fuel Cells: Understanding the Relationship Between Liquid Water and Performance](#)

[Aimy Bazylak](#)

[1721\(Keynote\) Electrochemical Impedance Spectroscopy for Sensor and Biosensor Characterization and for Impedimetric Sensing](#)

Christopher Brett, Madalina Barsan, Mariana Ghica

1722(Invited) The Impedance of Bioelectrochemical Interfaces

Manuela Rueda, Francisco Prieto, Julia Alvarez-Malmagro

1723(Invited) Evaluating Corrosion Processes in an Aluminum Alloy, AA2024, Assisted By a Consortium of Microorganisms

Maritza Angelica Paez, Claudia Alvarado, Miguel Gulppi, Grace Gomez, Mamie Sancy, Manuel Ignacio Azocar, Nelson Vejar, Jenny Blamey, Paulo Molina, Jose H Zagal

1724Gentle, Nondestructive Monitoring of Wound Healing in Cell-Based Assays Using Electrochemical Impedance Spectroscopy

Heinz Wanzenboeck, Emmerich Bertagnolli

1725(Invited) Correlation of Electrochemical Dissolution and Impedance of Active Implant Electrodes from Platinum and Iridium

Achim Walter Hassel, Jan Philipp Kollender, Georg Sprinzl, Theo Doll

1726(Invited) Corrosion Inhibitor (Decanethiol) for Carbon Steels Exposed to Aqueous CO<sub>2</sub>

Zineb Belarbi, Fernando Farelas, Marc Singer, David Young, Srdjan Nesic

1727(Invited) Using High Frequency Impedance Measurements for Phase Wetting Detection and Water Layer Thickness Characterization in Two-Phase Oil-Water Flow

Luciano Paolinelli, Srdjan Nesic, Yao Juncheng, Ahmadreza Rashedi

1728Dynamic Stress Analysis at Solid Electrodes

Gery R. Stafford, Ugo Bertocci

1729(Invited) Effect of Mechanical Stress on the Passivity of Steel

[Dominique Thierry, Andrej Nazarov, Vincent Vivier](#)

[1730\(Invited\) Electrochemical Impedance Analysis of Printable Porous Carbon Electrode for Realization of High-Power Biofuel Cell and Wearable Self-Powered Biosensor](#)

[Isao Shitanda, Yoshinao Hoshi, Masayuki Itagaki](#)

[1731 Impedance Spectroscopy of Direct Ethanol Fuel Cells with Anodes Containing Pt Group Metals](#)

[Piotr Polczynski, Aleksandra Mikolajczak, Adam Lewera, Rafal Robert Jurczakowski](#)

[1732 Monitoring of Corrosion Resistance of Steel in Simulated Concrete Pore Solution By EIS](#)

[Tatsuki Okamoto, Hiroyuki Tokieda, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki](#)

[1733 Detection Method of Corrosion Site of Reinforcing Steel in Concrete By Two Electrode System](#)

[Taisuke Koike, Hiroyuki Tokieda, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki](#)

[1734 Influence of C-Rate on Impedance Spectra in Lithium-Ion Rechargeable Batteries By in-Situ EIS](#)

[Hirotaka Kato, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki](#)

[1735 EIS Study on Solid Electrolyte Deposition of Copper Film](#)

[Yuka Narui, Kenta Kojima, Toru Iwabuchi, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki, Hiroshi Yanagimoto, Motoki Hiraoka, Hirofumi Iisaka](#)

[1736 Analysis of Warburg Impedance of Lithium-Ion Rechargeable Batteries By Wavelet Transformation](#)

[Yusuke Gamano, Yoshinao Hoshi, Isao Shitanda, Masayuki Itagaki](#)

[1737Evaluation of Photoelectrochemical Glutathione Sensors Using of Electrochemical Impedance Spectroscopy](#)

[Kensuke Katagishi, Asako Kuragano, Chiaki Terashima, Norihiro Suzuki, Kazuya Nakata, K. Katsumata, Yoshinao Hoshi, Isao Shitanda, T. Kondo, M. Yuasa, Masayuki Itagaki, Akira Fujishima](#)

## **F03-Contemporary Issues and Case Studies in Electrochemical Innovation 2**

[1738\(Invited\) Using Industry to Inspire Academic Research](#)

[Esther S Takeuchi, Amy C Marschilok, Kenneth J Takeuchi](#)

[1739\(Invited\) Vionx Energy: A Small Company Leveraging Large-Company Innovations](#)

[Mike L. Perry, Robert M. Darling](#)

[1740The Joint Center for Energy Storage Research: Integration of Research, Development, and Demonstration](#)

[Fikile R. Brushett, Lynn Trahey, Devin Hodge](#)

[1741Lithium Battery Start-Ups](#)

[Nitash P Balsara](#)

[1742Model Based Battery Management Systems \(BMS\) - from Theory to Commercialization](#)

[Manan Pathak, Neil-Dawson Elli, Tae-Jin Jang, Chintan Pathak, Venkat R. Subramanian](#)

[1743Leveraging Available Resources: A Small Business Perspective on Collaboration and Commercialization](#)

[Katherine E Ayers](#)

[1744Center Approach to Accelerate Technology Commercialization](#)



[Gerardine G Botte](#)

1745([Invited](#)) [Industrialization Trial of a Biosensor Technology](#)

[Keishi Ohashi, Tetsuya Osaka](#)

1746[Electrochemical Innovation in Electronics: Is Success Sustainable?](#)

[Hariklia \(Lili\) Deligianni](#)

1747[Trials, Tribulations, and Some Success in Developing Modeling Tools for the Electrochemical Industry](#)

[Uziel Landau](#)

1748([Invited](#)) [Stable Nanocrystalline Electrodeposits: Case Studies Spanning from Theory to Products](#)

[Christopher Allan Schuh](#)

1749[Electrolyte Maintenance Technology Platform: Applying Learning Across Electrochemical Machining and Stripping Processes](#)

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

1750[Development of Magnetic Films for Encoding of Information on Heavy Equipment Parts](#)

[Fu Zhao, Tom Pechan, Steve Wilmeth, Paolo Sechi, Don Arns, Giovanni Zangari](#)

1751[Development of a Functional Trivalent Chromium Electroplating Process: An Innovation Is Not Equivalent to an Invention](#)

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

1752([Invited](#)) [Electrokinetic Separations to Increase the Percent Solids of the Effluent from a Phosphate Mine](#)

[Mark E. Orazem, Rui Kong, Yuelong Huang, Arthur Dizon, Saeed Moghaddam, David Bloomquist](#)

1753[Playing with Fire: Commercialization of a Metal-Supported SOFC Product for Use in Charcoal Cookstoves](#)

[Michael C Tucker, Craig P Jacobson, Bernard Carreon, Jeffrey Charyasatit, Kenny Langston, Cindy Taylor, Jose Manjarrez, Nicholas Burton, Mark LaBarbera](#)

1754[Analyzing the Prospects of Electroreduction of Carbon Dioxide to Value-Added Chemicals](#)

[Paul J.A. Kenis](#)

1755[Monitoring of Diaphragm Cell Chlor-Alkali Plants for Improved Safety and Performance](#)

[Peter C. Foller, Jason Gu](#)

## **F04-Membrane-based Electrochemical Separations 2**

1756[\(Invited\) Membrane Development for Energy Technologies](#)

[Grigorii L. Soloveichik](#)

1757[\(Invited\) Capturing and Converting CO<sub>2</sub> with High Temperature Electrochemical Methods](#)

[Kevin Huang](#)

1758[\(Invited\) Ceramic Membranes for Gas Separation and Electro-Synthesis: Effect of Surface and Interfaces](#)

[Yu Chen, Meilin Liu](#)

1759[\(Invited\) Electrochemical Membrane Technology for Carbon Dioxide Capture from Flue Gas](#)

[Hossein Ghezal-Ayagh, Stephen Jolly, Frank Dobek, Frank Chimbole, Carl Willman](#)

1760 [PBI-HFA Hollow Fiber Membrane for Selective Hydrogen Separation](#)

[Sun Hee Choi, Do Young Kim, Chang Won Yoon, Jonghee Han](#)

1761 [\(Invited\) Versatile Hydrogen Separations at Intermediate Temperatures with Solid Acid Membranes](#)

[Alexander B. Papandrew, David L. Wilson, Thomas A. Zawodzinski](#)

1762 [\(Invited\) Electrically Conductive Diamond Membrane for Electrochemical Separation Processes](#)

[Fang Gao, Christoph E. Nebel](#)

1763 [Ion Conducting Conduits with a Tortuosity of One from One Electrode to Another: The Role of Domain Connectivity and Tortuosity on Ion Conductivity in Block Copolymer Electrolyte Thin Films](#)

[Yu Kambe, Christopher George Arges, David A. Czaplewski, Paul F. Nealey](#)

1764 [Selective Separation of Organics and Inorganics with Ion-Exchange Membranes: Influence of Solution Matrix and Organics Properties](#)

[Marjolein Vanoppen, Griet Stoffels, Lingshan Ma, Evelyn De Meyer, Klaas V.K.M. Schoutteten, Julie Vanden Bussche, Lynn Vanhaecke, Arne R.D. Verliefde](#)

1765 [\(Invited\) Electrospun Nanofiber Composite Bipolar Membranes](#)

[Peter N. Pintauro, Ryszard Wycisk, Marc Cunningham, Chunhui Shen](#)

1766 [Lithium Conducting Solid Electrolytes for Electrolysis of Lithium Tritide and Enrichment of Lithium-6](#)

[Luke Christopher Olson, Brenda L. Garcia-Diaz, Hector Colon-Mercado, Joseph Teprovich](#)

1767 [Electrochemical Synthesis of Ammonia: Status, Challenges and Opportunities](#)

[Hui Xu, Tom McCallum](#)

1768 [Highly Stable Dual-Phase  \$Y\_{0.8}Ca\_{0.2}Cr\_{0.8}Co\_{0.2}O\_3 - Sm\_{0.2}Ce\_{0.8}O\_{1.9}\$  ceramic Composite Membrane for Oxygen Separation](#)

[Kyung Joong Yoon, Olga A Marina](#)

1769 [Electrochemical CO<sub>2</sub> Reduction in Ionic Liquid Using Two Compartment Cell Separated with Proton-Conducting Membrane](#)

[Hayato Yoshikawa, Kazuhisa Azumi](#)

## **G01-High Purity and High Mobility Semiconductors 14**

1770 [\(Keynote\) Metrology for Nanoscale Complex Semiconductor Systems](#)

[Wilfried Vandervorst](#)

1771 [\(Invited\) Characterization of Semiconductor Materials Using Synchrotron Radiation, XAFS and X-Ray CTR Scattering](#)

[Masao Tabuchi](#)

1772 [\(Invited\) Non-Visual Defect Monitoring with Surface Photovoltage Mapping](#)

[Andrew David Findlay, Dmitriy Marinskiy, Piotr Edelman, Marshall Wilson, Alexandre Savtchouk, Carlos Almeida, Jacek Lagowski](#)

1773 [\(Invited\) Characterization of Interface Defects by the Charge Pumping Technique](#)

[Toshiaki Tsuchiya](#)

1774 [\(Invited\) DLTS Studies of Defects in n-GaN](#)

[Yutaka Tokuda](#)

[1775Substitutional Carbon Loss in Si:C Stressor Layers Probed by Deep-Level Transient Spectroscopy](#)

[Eddy Simoen, Sathish Kumar Dhayalan, Andriy Yakovitch Hikavyi, Roger Loo, Erik Rosseel, Henk Vrielinck, Johan Lauwaert](#)

[1776\(Invited\) Current Stage of the Investigation of the Composition of Oxygen Precipitates in Czochralski Silicon Wafers](#)

[Dawid Kot, Gudrun Kissinger, Markus Andreas Schubert, Andreas Sattler](#)

[1777Practical Evaluation Method of Oxygen Precipitation in the Czochralski Silicon](#)

[Anselmo Jaehyeong Lee, Sejun Hong, Ja-Young Kim, Hee-Bog Kang, Sung-Wook Lee](#)

[1778Combined Effect of Rapid Thermal Annealing and Crystal Nature on the Gate Oxide Reliability of Czochralski Silicon](#)

[Jung-Won Shin, Woo-Sung Lee, Ja-Young Kim, Anselmo Jaehyeong Lee, Hee-Bog Kang, Sung-Wook Lee](#)

[1779Investigation of the Composition of the Si/SiO<sub>2</sub> Interface in Oxide Precipitates and Oxide Layers on Silicon by STEM/EELS](#)

[Gudrun Kissinger, Markus Andreas Schubert, Dawid Kot, Thomas Grabolla](#)

[1780Depth Profile Analysis of Metals Gettered By Bulk Micro-Defects \(BMDs\) in Silicon Substrates](#)

[Koichiro Saga, Rikiichi Ohno](#)

[1781Development of Silicon Substrate for Advanced Multi-Chip Packaging Process with the Enhanced Gettering Ability](#)

[Jeong-Hoon An, Jang-Seop Kim, Anselmo Jaehyeong Lee, Hyung-Kook Park, Hyeung-il Park, Byeong-Sam Moon, Sang-Hyun Lee, Jea-Gun Park](#)

[1782\(Invited\) Application of DFT Calculation for the Development of High Quality Si and Ge Substrates: From Ultra Large Diameter Crystal Pulling to Metal Gettering](#)

[Koji Sueoka](#)

[1783\(Invited\) Multiscale Modeling of Stress-Mediated Compositional Patterning in SiGe Substrates](#)

[Daniel Kaiser, Swapnadip Ghosh, Sang Han, Talid Sinno](#)

[1784\(Invited\) Modeling Extended Defects in Semiconductor Devices](#)

[Victor Moroz, Hiu Yung Wong, Munkang Choi](#)

[1785\(Invited\) Defect Evolution during Silicon Smartcut™](#)

[François Rieutord, Samuel Tardif, Frédéric Mazen, Didier Landru, Oleg Kononchuk](#)

[1786 Nano Crystals to Micro Crystals: Organolead Triiodide Perovskite Crystal Growth from Isopropanol Solution](#)

[Malin Birgitta Johansson, Tomas Edvinsson, Stefan Bitter, Anna I. K. Eriksson, Erik M. J. Johansson, Mats Göthelid, Gerrit Boschloo](#)

[1787\(Invited\) Silicon Nanowires: Donors, Surfaces and Interface Defects](#)

[Marco Fanciulli, Stefano Paleari, Matteo Belli, Alessio Lamperti](#)

[1788\(Invited\) Characterization of Group IV Based Nanowires Manufactured on Advanced Engineered Substrates](#)

[Henry H. Radamson, Mohammad Noroozi, Muhammet Toprak, Jun Luo, Guilei Wang, Chao Zhao](#)

[1789\(Invited\) Straining of Group IV Semiconductor Materials for Bandgap and Mobility Engineering](#)

[Kentarou Sawano, Xuejun Xu, Shiori Konoshima, Nayuta Shitara, Takeshi Ohno, Takuya Maruizumi](#)

[1790 High Electron and Hole Mobility by Localized Tensile & Compressive Strain Formation Using Ion Implantation and Advanced Annealing of Group IV Materials \(Si+C, Si+Ge & Ge+Sn\)](#)

[John O Borland](#)

[1791 Low Temperature Effect on Strained and Relaxed Ge pFinFETs STI Last Processes](#)

[Alberto Vinícius de Oliveira, Eddy Simoen, Paula Ghedini Der Agopian, Joao Antonio Martino, Jerome Mitard, Liesbeth Witters, Robert Langer, Nadine Collaert, Aaron Thean, Cor Claeys](#)

[1792 \(Invited\) On the Manipulation of Phosphorus Diffusion as Well as the Reduction of Specific Contact Resistivity in Ge by Carbon Co-Doping](#)

[Jun Luo, Jinbiao Liu, Eddy Simoen, Guilei Wang, Shujuan Mao, Henry H Radamson, Ningyuan Duan, Junfeng Li, Wenwu Wang, Dapeng Chen, Chao Zhao, Tianchun Ye](#)

[1793 \(Invited\) Significant Reduction of Leakage Currents in Reverse-Biased Ge n<sup>+</sup>/p Junctions by Taking Care of Peripheral Passivation Layer](#)

[Chi Liu, Hiroki Ikegaya, Tomonori Nishimura, Akira Toriumi](#)

[1794 Chemical Bath Deposited ZnO:Al Thin Films and Their Application to CuInGaSe<sub>2</sub> Thin Film Solar Cells](#)

[Yesol Choi, Hyun Jun Jang, Ki-Ha Hong, Choong-Heui Chung](#)

[1795 Building III-V Devices onto Large Si Wafers](#)

[Xin-Yu Bao, Zhiyuan Ye, David Carlson, Errol Sanchez](#)

[1796 Density Functional Theory Study on Frenkel Pair Formation from Oxygen Clusters in Si Crystal](#)

[Hiroaki Fukuda, Koji Sueoka](#)

[1797 High Purity Analysis of Low Melting Point Such As Gallium By Glow Discharge Mass Spectrometry](#)

[Jaesik Yoon](#)

1798 [Ab-Initio Studies of Acceptor Impurities and Stability of Complexes in Ge](#)

[Igumbor Emmanuel, Edwin R Mapasha, Andrew C Richard, Walter E Meyer](#)

1799 [Electrical Characterization of Defects Introduced By Electron Beam Deposition in n-GaAs](#)

[Shandirai Tunhuma, Mmantsae Diale, Matshisa Legodi, Danie Auret](#)

## **G02-Semiconductors, Dielectrics, and Metals for Nanoelectronics 14**

1800 [Conductive AFM Topography of Intrinsic Conductivity Variations in Silica Based Dielectrics for Memory Applications](#)

[Mark Buckwell, Konstantin Zarudnyi, Luca Montesi, Wing Hung Ng, Stephen Hudziak, Adnan Mehonic, Anthony Joseph Kenyon](#)

1801 [Nonvolatile Memory Characteristics of CdS Embedded Zr-Doped HfO<sub>2</sub> High-k Dielectric MOS Capacitors](#)

[Shumao Zhang, Yue Kuo](#)

1802 [\(Invited\) Memcomputing \(Memristor + Computing\) in Intrinsic SiO<sub>x</sub>-Based Resistive Switching Memory](#)

[Ying-Chen Chen, Xiaohan Wu, Meiqi Guo, Fei Zhou, Yao-Feng Chang, Burt Fowler, Chih-Hung Pan, Ting-Chang Chang, Jack C. Lee](#)

1803 [\(Invited\) Physical Models of Program and Read Fluctuations in Metal Oxide Resistive RAM](#)

[Daniele Ielmini](#)

1804 [\(Invited\) Mobile Ions, Transport and Redox Processes in Memristive Devices](#)

[Iliia Valov, Michael Luebben, Anja Wedig, Rainer Waser](#)



1805(Invited) Environmental Resistance of Resistive Random Access Memory

Kentaro Kinoshita

1806(Invited) Conductive Bridging RAM (CBRAM): Then, Now, and Tomorrow

John R. Jameson, Philippe Blanchard, John Dinh, Nathan Gonzales, Vasudevan Gopalakrishnan, Berenice Guichet, Shane Hollmer, Sue Hsu, Gideon Intrater, Deepak Kamalanathan, David Kim, Foroozan Koushan, Ming Kwan, Derric Lewis, Bård Pedersen, Mark Ramsbey, Ed Runnion, Jeffrey Shields, Kevin Tsai, Aaron Tysdal, Daniel Wang, Venkatesh Gopinath

1807Charge Transport Mechanism of Stress Induced Leakage Current in Thermal Silicon Oxide

Damir R. Islamov, Vladimir A. Gritsenko, Timofey V. Perevalov, Oleg M. Orlov, Gennady Ja. Krasnikov

1808Local Thinning Induced Less Oxide Breakdown in MOS Structures Due to Lateral Non-Uniformity Effect

Huang-Hsuan Lin, Jenn-Gwo Hwu

1809A Method for Effective Work Function Monitoring

Dmitriy Marinskiy, Thy Chong Loy, Piotr Edelman, Jacek Lagowski

1810Current Coupling Effect in MIS Tunnel Diode with Coupled Open-Gated MIS Structure

Chien-Shun Liao, Jenn-Gwo Hwu

1811Mechanical/Structural Properties of the Key Thin Film Materials Ag, Cu, & Ni for Electronics Applications

Yousuf Mohammed, Daniel Josell, Helmut Baumgart, A A Elmustafa

1812(Invited) Large Mobility Modulation Due to Discrete Impurities in Nanowires

[Nobuyuki Sano](#)

[1813\(Invited\) Electrochemical Gating-Induced Hydrogenation in VO<sub>2</sub> Nanowires at Room Temperature](#)

[Teruo Kanki, Tusbasa Sasaki, Hidekazu Tanaka](#)

[1814\(Invited\) Generation-Recombination Noise in Advanced CMOS Devices](#)

[Eddy Simoen, Alberto Vinícius de Oliveira, Dimitri Boudier, Jerome Mitard, Liesbeth Witters, Anabela Veloso, Paula Ghedini Der Agopian, Joao Antonio Martino, Regis Carin, Bogdan Cretu, Robert Langer, Nadine Collaert, Aaron Thean, Cor Claeys](#)

[1815\(Invited\) Gate Stack Technology for Advanced AlGa<sub>N</sub>/Ga<sub>N</sub> Mos-Hemt Power Devices](#)

[Heiji Watanabe, Ryohei Asahara, Joyo Ito, Kenta Watanabe, Mikito Nozaki, Takahiro Yamada, Satoshi Nakazawa, Yoshiharu Anda, Masahiro Ishida, Tetsuzo Ueda, Akitaka Yoshigoe, Takuji Hosoi, Takayoshi Shimura](#)

[1816\(Invited\) First-Principles Study on Electron Conduction at 4H-SiC\(0001\)/SiO<sub>2</sub> Interface](#)

[Tomoya Ono, Christopher Kirkham, Shigeru Iwase](#)

[1817\(Invited\) Recent Progress in Vertical Si/III-V Tunnel FETs: From Fundamentals to Current-Boosting Technology](#)

[Katsuhiro Tomioka, Junichi Motohisa, Takashi Fukui](#)

[1818Electrically Scaled Hafnium Oxide Based Ge Devices](#)

[Kandabara Tapily, Sonal Dey, Steven Consiglio, Robert D. Clark, Cory S. Wajda, Gert J. Leusink, Alain C. Diebold](#)

[1819\(Invited\) Mechanism of Low Temperature ALD of Al<sub>2</sub>O<sub>3</sub> on Graphene Terraces](#)

[Iljo Kwak, Jun Hong Park, Larry Grissom, Bernd Fruhberger, Andrew Kummel](#)

[1820High-Performance Thin-Film Transistors Based on Highly Crystalline CVD-Grown Multilayer MoSe<sub>2</sub> Films](#)

[Na Liu, Chulseung Jung, Hyunseong Moon, Seongin Hong, Young Ki Hong, Inturu Omkaram, Sunkook Kim](#)

[1821\(Invited\) Evaluation of Few-Layer MoS<sub>2</sub> Transistors with a Top Gate and HfO<sub>2</sub> Dielectric](#)

[Chadwin D Young, Peng Zhao, Pavel Bolshakov-Barrett, Angelica Azcatl, P. K. Hurley, Y. Y. Gomeniuk, Michael Schmidt, Christopher L Hinkle, Robert M Wallace](#)

[1822\(Invited\) Xenex: A New Emerging Two-Dimensional Materials Platform for Nanoelectronics](#)

[Alessandro Molle](#)

[1823\(Invited\) Reliability Study on Layered 2D Insulator](#)

[Kosuke Nagashio](#)

[1824Silicene Nanoribbon Tunnel Field Effect Transistor](#)

[Md S Fahad, Ashok Srivastava, Ashwani K Sharma, Clay Mayberry, K M Mohsin](#)

[1825Multiple Magnetic Resonance of Nuclei in a Two-Dimensional Electron System](#)

[Xuan Qian, Yang Ji, Vladimir Umansky](#)

[1826CMP Development for New Generation Materials through Metal Oxide Thin Film Characterization](#)

[G. Bahar Basim](#)

[1827Particle Removal in Wet Wafer Cleaning Processes](#)

[Ji Zhu, Man Xia, David Mui, Mark Kawaguchi](#)

1828 [Advanced Wet Clean Technology at Lightly Doped Drain Layers in FinFET](#)

[Jian Li, Vincent Sih, Hui Zhan](#)

1829 [An Insightful Review of Galvanic Formations and Dynamic Interactions in Selectively Corroding Silicon Surfaces during Wafer Manufacturing](#)

[Lieyi Sheng](#)

1830 [Microstructural Dependence of Performance in Potentiostatically Electrodeposited Soft Gold Coatings](#)

[Dhego Banga](#)

1831 [Preventing TSV Protrusion Via Controlling Impurity Content in Copper Electrodeposits](#)

[Ui-Hyoung Lee, Chae-Min Park, Hyo-Jong Lee, Kihyeob Lee, Kangsoo Kim](#)

1832 [\(Invited\) Ferroelectric \(Hf,Zr\)O<sub>2</sub> Films](#)

[C. S. Hwang](#)

1833 [Broadband Spectroscopic Characterization of Hybrid Low-k Dielectric Thin Films for Micro- and Nanoelectronic Applications](#)

[Yaw S. Obeng, Chukwudi A. Okoro, Karl R. Montgomery, Papa K. Amoah, Lin You, Joseph J. Kopanski, Jan Obrzut](#)

1834 [Self-Assembled Monolayer-Based Gate Dielectrics for MoS<sub>2</sub> FETs](#)

[Takamasa Kawanago, Shunri Oda](#)

1835 [UV Cure Enabled Robust STI Oxide Gap Fill Solution for Thermally Limited Flow in Advanced Logic Devices](#)

[Sanjay C Mehta, Richard Conti, Thamarai Devarajan, Matthew P Wright, Yiping Yao, Stephan A Cohen, Todd Ryan, Thomas J Haigh, Paul Hall, Donald F Canaperi, Leo Tai](#)

[1836Oxidizing Species Dependence of the Interface Reaction during Atomic-Layer-Deposition Process and Post-Deposition-Anneal](#)

[Tomoyuki Suwa, Akinobu Teramoto, Yasumasa Koda, Masaya Saito, Hisaya Sugita, Marie Hayashi, Junichi Tsuchimoto, Hidekazu Ishii, Yoshinobu Shiba, Yasuyuki Shirai, Shigetoshi Sugawa](#)

[1837Impact of Sacrificial Consumption of Substrate By Thermal Oxidation on Electron Mobility of 4H-SiC Mosfets](#)

[Koji Kita, Hirohisa Hirai](#)

[1838\(Invited\) Silicon Emission Mechanism for Oxidation Process of Non-Planar Silicon](#)

[Hiroyuki Kageshima, Kenji Shiraishi, Tetsuo Endoh](#)

[1839Electronic Structure of Oxygen Deficient Noncentrosymmetric Orthorhombic  \$\text{Hf}\_{0.5}\text{Zr}\_{0.5}\text{O}\_2\$](#)

[Timofey V. Perevalov, Damir R. Islamov, Vladimir A. Gritsenko, Andrey A. Saraev](#)

[1840Studies of Parylene C Microfibrous Thin Films Electrical Properties](#)

[Ibrahim H Khawaji, Osama O. Awadelkarim, Akhlesh Lakhtakia](#)

[1841Selected Success Stories from Twenty Years of High-k Gate Dielectric Research](#)

[Samares Kar](#)

[1842Development of High Performance p-Type Bisbte Based Alloys By Powder Metallurgy](#)

[Babu Madavali, Chul-Hee Lee, Dong-Won Shin, Femi Olu Emmanuel, Soon Jik Hong](#)

[1843Selective-Area Growth of Vertical InGaAs Nanowires on Ge for Transistor Applications](#)

[Akinobu Yoshida, Katsuhiro Tomioka, Fumiya Ishizaka, Kohei Chiba, Junichi Motohisa](#)

[1844Temperature-Dependent and Dielectric Relaxation of Porous Silicon Prepared by Electrochemical Etching](#)

[Faruk Fonthal Rico, Edward Steven Oliveros, Mario Chavarria](#)

[1845Deposition and Electrical Characterization of CaCu<sub>3</sub>Ti<sub>3</sub>FeO<sub>12</sub> Thin Films](#)

[Giji Skaria, Shraddha Nehate](#)

[1846Electrical Properties of Al<sub>2</sub>O<sub>3</sub> Incorporated CeO<sub>2</sub> Thin Films Deposited by RF Magnetron Sputtering](#)

[Junya Konishi, Takashi Ohsawa, Setsu Suzuki, Keiji Ishibashi, Sung-Gi Ri, Kenichiro Takahashi, Yasuhiro Yamamoto](#)

[1847Unidirectional Oxide Hetero-Interface Thin-Film Diode with Improved Electrical Current](#)

[Buil Nam, Sung Yun Chung, Duck-Jae You, Youn Sang Kim](#)

[1848First Principles Study on the Strain Dependence of Thermal Oxidation and Hydrogen Annealing Effect at Si/SiO<sub>2</sub> Interface in V-MOSFET](#)

[Kawachi Shingo, Hiroki Shirakawa, Masaaki Araidai, Hiroyuki Kageshima, Tetsuo Endoh, Kenji Shiraishi](#)

[1849Structure of Pr Oxide Films on Si Deposited by Reactive Sputtering](#)

[Kenta Kumagai, Kouta Yamaguchi, Kenta Hara, Setsu Suzuki, Keiji Ishibashi, Yasuhiro Yamamoto](#)

[1850Vertically Integrated ZRAM toward Extremely Scaled Memory](#)

[Byung-Hyun Lee, Dae-Chul Ahn, Min-Ho Kang, Seung-Bae Jeon, Tewook Bang, Hagyoul Bae, Jun-Young Park, Dae-Won Hong, Nam-Soo Park, Yang-Kyu Choi](#)

[1851Comparison of Various Low Dielectric Constant Materials](#)

[Wei-jie Hung, Yi-Lung Cheng](#)

### **G03-Atomic Layer Deposition Applications 12**

1852([Invited](#)) [Plasma-Enhanced Quasi-ALE and ALD Processing for Leading-Edge Microfabrication](#)

[Masanobu Honda, Takayuki Katsunuma, Masahiro Tabata, Akihiro Tsuji, Tomoyuki Oishi, Toru Hisamatsu, Shuhei Ogawa, Yoshihide Kihara](#)

1853[Plasma-Enhanced Atmospheric-Pressure Spatial ALD of Al<sub>2</sub>O<sub>3</sub> and ZrO<sub>2</sub>](#)

[Yves Creyghton, A. Illiberi, A. Mione, W. van Boekel, N. Debernardi, M Seitz, Fieke van den Bruele, P. Poodt, Fred Roozeboom](#)

1854([Invited](#)) [Control of Internal Plasma Parameters Toward Atomic Level Processing](#)

[Makoto Sekine, T Tsutsumi, Y Fukunaga, K Takeda, H Kondo, K Ishikawa, M Hori](#)

1855([Invited](#)) [Advanced ALD Reactor Designs](#)

[Steven Darrell Marcus, Jerry Mack, Vinayak Vats, Yoshi Okuyama, Ben Nie, Lin Yang, Kay Song, Gi Kim, Somnath Nag, Eungsoo Kim, Zia Karim](#)

1856([Invited](#)) [Control of Atomic Layer Reactions in Plasma Processing](#)

[Peter Ventzek, S D Sherpa, M Wang, V Rastogi, Alok Ranjan](#)

1857[Novel Anhydrous Hydrazine Delivery for Low Temperature Silicon Nitride Passivation of SiGe\(110\)](#)

[Daniel Alvarez, Jeffrey Spiegelman, Russell Holmes, Chris Ramos, Andrew Kummel, Mary Edmonds, Kasra Sardashti, Steven Wolf](#)

1858([Invited](#)) [Atomic Layer Deposition: Eye on the Future of Batteries](#)

[Alexander C Kozen, Malachi Noked, Chuan-Fu Lin, Alexander J Pearse, Keith Gregorczyk, Sang Bok Lee, Gary W Rubloff](#)

[1859ALD Coatings on Lithium Metal for High Energy Lithium Batteries](#)

[Lin Chen, Jeffrey W Elam](#)

[1860Plasma-Enhanced Atomic Layer Deposition of Iron and Titanium Phosphates as Electrode Materials for 3D-Structured Lithium-Ion Microbatteries](#)

[Thomas Dobbelaere, Felix Mattelaer, Jolien Dendooven, Philippe M. Vereecken, Christophe Detavernier](#)

[1861Plasma-Assisted Atomic Layer Deposition of Thin Film Li<sub>2</sub>CO<sub>3</sub> for All-Solid-State Li-Ion Batteries](#)

[Norah Hornsveld, Brecht Put, W. M. M. Kessels, Philippe M Vereecken, Mariadriana Creatore](#)

[1862\(Invited\) Template Assisted Synthesis of Porous Metal Oxide and Metal Nanostructures by ALD](#)

[Shaoren Deng, Mert Kurttepli, Sara Bals, Daire J. Cott, Christophe Detavernier](#)

[1863A Rotation Fluidization Coupled Atomic Layer Deposition Reactor for Nanoparticle Coating](#)

[Chen-Long Duan, Rong Chen](#)

[1864\(Invited\) Nanostructured Photocatalysts Prepared By Atomic Layer Deposition](#)

[Imre Miklos Szilagy](#)

[1865ALD for Functional Devices Based on TiO<sub>2</sub> Nanotube Arrays](#)

[Raul Zazpe, Jan Prikryl, Hanna Sopha, Jan M. Macak](#)

[1866\(Invited\) Using Inherent Substrate-Dependent Nucleation to Promote Metal and Metal Oxide Selective-Area Atomic Layer Deposition](#)

[Gregory N. Parsons, Berç Kalanyan, Sarah E. Atanasov, Paul Lemaire, Chris Oldham](#)



[1867\(Invited\) Atomic Layer Deposition for Catalyst “Bottom-up” Synthesis](#)

[Junling Lu](#)

[1868A Precise and Scalable Post-Modification of Mesoporous Metal-Organic Framework NU-1000 Via Atomic Layer Deposition](#)

[In Soo Kim, Omar K. Farha, Joseph T. Hupp, Laura Gagliardi, Karena W Chapman, Chris Cramer, Alex B. F. Martinson](#)

[1869Fabrication of p-Type La: Fe<sub>2</sub>O<sub>3</sub> as Photocathode Via Atomic Layer Deposition](#)

[Qi Peng, Chun Du, Yanwei Wen, Bin Shan, Rong Chen](#)

[1870Refractory Solar Selective Coatings Synthesized By Atomic Layer Deposition](#)

[Anil U. Mane, Joseph A. Libera, Angel Yanguas-Gil, Jason R Avila, Jeffrey W Elam](#)

[1871Low Temperature Atomic Layer Deposited TiO<sub>2</sub> Compact Layers for Planar Perovskite Solar Cells](#)

[In Soo Kim, Richard Haasch, Duyen Cao, Omar K. Farha, Joseph T. Hupp, Mercuri Kanatzidis, Alex B. F. Martinson](#)

[1872Effects of SiO<sub>2</sub> and TiO<sub>2</sub> Combination Coating on TiO<sub>2</sub> Nanoparticle Electrodes in Dye Sensitized Solar Cells](#)

[Kensaku Kanomata, Yuki Kato, Takahiro Imai, Masanori Miura, Bashir Ahmmad, Shigeru Kubota, Fumihiko Hirose](#)

[1873Effect of Thickness on Flexible, Electrical and Optical Properties of Ti- ZnO Films on Flexible Glass By Atomic Layer Deposition](#)

[Woo-Jae Lee, Jung-Dae Kwon, Se-Hun Kwon](#)

[1874\(Invited\) Atomic Layer Deposition of Multiferroic Materials](#)

[Jeffery Chang, Calvin D Pham, Jane P. Chang](#)

[1875 Infrared Study of Room Temperature Atomic Layer Deposition of SnO<sub>2</sub> Using Sn\(CH<sub>3</sub>\)<sub>4</sub> and Plasma Excited Humidified Argon](#)

[Fumihiko Hirose, Kentaro Tokoro, Kensaku Kanomata, Masanori Miura, Bashir Ahmmad, Shigeru Kubota](#)

[1876 Plasma-Enhanced Atomic Layer Deposition of Silicon Nitride Thin Film at 100°C Using Novel Silicon Precursors](#)

[Se-Jin Jang, Joong-Jin Park, Sung-Gi Kim, Sang-Do Lee, Byeong-il Yang, Jung-Ju Park, Gun-Ju Park, Jang-Hyeon Seok, Sang-Ick Lee, Myoung-Woon Kim, Jae-Min Park, June Hwang, Won-Jun Lee](#)

[1877 In-situ Monitoring System Equipped with FT-IR and QMS and Thermal Decomposition of Zr\(NCH<sub>3</sub>C<sub>2</sub>H<sub>5</sub>\)<sub>4</sub> Precursor](#)

[In-Sung Park, Sejong Seong, Yongchan Jung, Taehoon Lee, Jin-Ho Ahn, Jong-Ki An, Juyoung Yun](#)

[1878 Preparation of High-Quality Metallic Films By Hot-Wire Assisted Atomic Layer Deposition](#)

[Yukihiro Shimogaki, Kohei Shima, Guangjie Yuan, Takeshi Momose, Hideharu Shimizu](#)

[1879 On the Growth, Percolation and Wetting of Silver Thin Films Grown by Atmospheric-Plasma Enhanced Spatial Atomic Layer Deposition](#)

[Alfredo Mameli, Fieke van den Bruele, Chaitanya Krishna Ande, Marcel A. Verheijen, W.M.M. Kessels, Fred Roozeboom](#)

[1880 Depicting the Electronic Structure of HfO<sub>2</sub> Films by Spectroscopic Techniques](#)

[Silma Alberton Corrêa, Simone Brizzi, Dieter Schmeisser](#)

[1881 Determination of Atomic-Layer-Deposited Multilayer Antireflection Coating Parameters Using a Novel X-Ray Reflectivity Approach](#)

[Chao Li, Firouz Shahriarian, Mark S. Goorsky](#)

[1882\(Invited\) ALD to Prevent Metal Transfer from Implants](#)

[Laura Borgese, Fabjola Bilo, Annalisa Zacco, Elza Bontempi, Michela Pasquali, Stefania Federici, Josef Prost, Mirjam Rauwolf, Anna Turyanskaya, Christina Streli, Peter Kregsamer, Peter Wobrauschek, Laura Eleonora Depero](#)

[1883Nested ZnO Nanorod Gas Sensors Grown on ALD Seed Layers Synthesized on Si Substrates and Glass Fibers](#)

[Pengtao Lin, Xin Chen, Kai Zhang, Helmut Baumgart](#)

[1884Thermoelectrical Properties Enhancement By ALD Synthesis of Lead Chalcogenide on Stripe Patterned Silicon Substrates](#)

[Xin Chen, Pengtao Lin, Kai Zhang, Helmut Baumgart](#)

[1885Tuning the Performance of Pt/HfO<sub>2</sub>/Ti/Pt ReRAM Devices Obtained from Plasma-Enhanced Atomic Layer Deposition for HfO<sub>2</sub> Thin Films](#)

[Alexander Hardtdegen, Hehe Zhang, Susanne Hoffmann-Eifert](#)

[1886Electrochemical Atomic Layer Deposition of Copper Mediated By Underpotentially Deposited Zinc](#)

[Kailash Venkatraman, Ryan Gusley, Lu Yu, Yezdi Dordi, Rohan Akolkar](#)

[1887Synthesis of Cerium-Oxide Coated Platinum Core-Shell Structure Catalysts with Enhanced Stability and Activity via Atomic Layer Deposition](#)

[Kun Cao, Lu Shi, Jiaming Cai, Bin Shan, Rong Chen](#)

[1888Atomic Layer Deposition of Zn\(O, S\) Buffer Layer on CIGS Solar Cell](#)

[Yu-Hsuan Yu, Chi-Chung Kei, Wen-Chieh Li, Cheng-Han Wu, Shih-Chang Liang, Cuo-Yo Ni, Ming-Hua Shiao](#)

[1889Improved Activity and Stability of TiO<sub>2</sub>-Coated Co/C Catalysts for Electrochemical Application](#)

[Hyung Ju Kim, David H. K. Jackson, Thomas F. Kuech, George W. Huber](#)

[1890A High Mobility of p-Type SnO Thin Films Grown By Atomic Layer Deposition for Thin Film Transistors](#)

[Soo Hyun Kim, Jung Joon Pyeon, Seong Keun Kim](#)

[1891Behavior of  \$\text{La}\_{0.6}\text{Sr}\_{0.4}\text{Co}\_{0.2}\text{Fe}\_{0.2}\text{O}\_{3-\delta}\$  Cathode Powders Surface Modified by Atomic Layer Deposition for Solid Oxide Fuel Cells](#)

[Jeffrey F. Roeder, Anthony F Zeberoff, Peter C Van Buskirk, Alireza Torabi, Joseph Barton, Carl Willman, Hossein Ghezeli-Ayagh, Kevin Huang](#)

[1892ALD Coating of Selective Laser Melted 3-D Printed Stainless Steels](#)

[Kai Zhang, Pengtao Lin, Xin Chen, Helmut Baumgart, James Bradas](#)

[1893Atomic Layer Deposition of Iridium Oxide Thin Films on Tungsten and Si Substrates](#)

[Kai Zhang, Pengtao Lin, Xin Chen, Helmut Baumgart, James Bradas](#)

[1894Atomic Layer Deposited Metal Oxides Films for Solar Cells](#)

[Do-Heyoung Kim](#)

## **G04-Processing Materials of 3D Interconnects, Damascene and Electronics Packaging 8**

[1895\(Invited\) Ultra Fine Pitch 3D Interconnects](#)

[S everine Cheramy, Franck Bana, Nicolas Bresson, Arnaud Garnier, Lucile Arnaud, Amandine Jouve, Didier Lattard](#)

[1896\(Invited\) Semiconductor Packaging Technology to Progress the IoT Era](#)

[Yasuhiko Takeno](#)

[1897\(Invited\) Chloride and SPS Reaction](#)

[Ha Van Hoang, Kazuo Kondo](#)

[1898\(Invited\) Nano-Structure Controlled Very Low Resistivity Cu Wires By High Purity Plating and Realization of High Performance Lsis](#)

[Jin Onuki](#)

[1899a Study on Via Filling Performance in a High-Aspect-Ratio Through-Silicon Via with Various Conditions of Leveler](#)

[SangHoon Jin, Woon-Young Lee, Dong-Ryul Lee, Yu-Jin Lee, SangYul Lee, Min-Hyung Lee](#)

[1900Effect of Degraded Additives on Under-Fill TSV](#)

[Shafaat Ahmed, Paul Findeis, Connie Nga Troung, Tien Jen Cheng, Stephan Grunow, Ronald Rothkranz, Jennifer Oakley, Troy Graves-Abe](#)

[1901Bottom-up Cu Filling of through-Silicon-Via\(TSV\) with Single Additive](#)

[Sanghyun Jin, Sungho Seo, Sangwoo Park, Bongyoung Yoo](#)

[1902Electrochemical Behavior and Analysis of Organic Additives in Cobalt Damascene Baths](#)

[Michael Pavlov, Danni Lin, Eugene Shalyt, Xiaodong Yan](#)

[1903Using a Peg with a Small Molecule Weight to Enhance Copper Bottom-up Filling Performance of through Silicon Via with a Deep and Wide Dimensions](#)

[Po Ting Chen, Wei-Ping Dow, Ping-Feng Yang](#)

[1904Effects of Brighteners on Throwing Power and Thermal Reliability of Plating through Holes in a Copper Plating Bath](#)

[Tsu-Chi Chen, Yao-Lin Tsai, Chia-Fu Hsu, Wei-Ping Dow](#)

[1905](#)[Detection of Cuprous Ions By Micro Ring Electrodes on a TSV Side Wall](#)

[Ha Van Hoang, Kazuo Kondo](#)

[1906](#)[A Novel Bottom up Fill Mechanism for the Metallization of Advanced Node Copper Interconnects](#)

[Vincent Mevellec, Mikailou Thiam, Dominique Suhr, Laurianne Religieux, Paul Blondeau, Jean-Baptiste Chaumont, Frederic Raynal](#)

[1907](#)[The Suppression Induced S-NDR Mechanism for Defect-Free Filling of High Aspect Ratio Features](#)

[Daniel Josell, Thomas P. Moffat](#)

[1908](#)[\(Invited\) All-Wet TSV Fabrication Using Electroless Plated Barrier and Cu Seed Layers with Pd Nanoparticle Catalyst](#)

[Fumihiko Inoue, Shoso Shingubara](#)

[1909](#)[Damascene Copper Plating Recipe Engineering for Defectivity, Health of Line \(HOL\) and Reliability Improvement](#)

[Shafaat Ahmed, Qiang Huang, Tien Jen Cheng, Paul Findeis, Dinesh R Koli, Connie Nga Troung, Stephan Grunow](#)

[1910](#)[Using Graphene As a Conducting and Barrier Layer for Filling through Silicon Vias with Co-W Alloy](#)

[Yi-Yong Chen, Wei-Ping Dow, Ping-He Chang, Hong-Qing Li, Jing-Yuan Lin](#)

[1911](#)[A Synthesis Approach of Cu Nanoparticles Using Polyimide As a Template and Their Application on a Printed Circuit Board](#)

[Yao-Lin Tsai, Yi-Chun Chung, Wei-Ping Dow, Yasuo Hashimoto](#)

[1912](#)[High Aspect Ratio through Silicon Via Filling By Nickel-Tungsten Alloy Using Graphene As a Conducting and Barrier Layer](#)

Yen-Cheng Huang, Wei-Yang Zeng, Shih-Cheng Chang, Wei-Ping Dow

1913 Using Reduced Graphene Oxide (rGO) As a Conducting Layer on a Polyimide Film for Cu Metallization

Yu- Zhen Zhang, Wei-Ping Dow

1914 Electroplating through Fluidic Channels as Production Technology for 3D Interconnect Devices and Sensing Structures

Mathias Rechel, Sebastian Bengsch, Marc Christopher Wurz

1915 Processing Hundreds of Nanometres Thick Electrografted P4VP for High Aspect Ratio TSV Insulation

Thomas Dequivre, Michael Bérubé, Gessie M Brisard, Serge A Charlebois

1916 Using Reduced Graphene Oxide As Conducting Layer of Plating through Holes of a Printed Circuit Board

Shuo-Wen Chang, Wei-Yang Zeng, Wei-Ping Dow

1917 Oxidation Extent of Graphene Oxide on Copper Electroplating for Fabricating Printed Circuit Boards

Chun Hsieh, Wei-Yang Zeng, Wei-Ping Dow

1918 (Invited) Copper Plating and Its Application in Advanced Packaging

Lingyun Wei, Matthew Thorseth, Mark Scalisi, Jonathan P Prange, Inho Lee, Yil-Hak Lee, yoon Joo Kim, Mark Lefebvre, Jeffrey Calvert, Wataru Tachikawa

1919 Invar Electroplating for Controlled Expansion Interconnects

Val M Dubin, Milana O Lisunova, Igor O Kovalenko, Barbara L Walton, Gillian Downey, Jonathan Su, Kevin Witt

[1920A Copper Plating Formula Development for through-Hole Filling without a Dimple on Top of the Hole Opening](#)

[Hong-Jyun Geng, Shih-I Wen, Wei-Ping Dow](#)

[1921A Cocoon-Shaped Copper Plating Filling Technique for through Hole Metallization](#)

[Jhih-Jyun Mai, Shih-I Wen, Wei-Ping Dow](#)

[1922Electromigration Effects upon Cu/Ni/Sn-Ag and Cu/Ni/Sn-Ag-Cu Interfacial Reactions](#)

[Sinn-wen Chen, Jing-wei Chen, Yi-cheng Lin, Tao-chih Chang](#)

[1923\(Invited\) Interconnect Metals for Future Integrated Circuits](#)

[Paul Besser, Hui-Jung Wu, Yu Jiang, Kaushik Chattopadhyay, Lee Brogan, Larry Zhao, Natalia Doubina, Praveen Nalla, Artur Kolics](#)

[1924a Unique 3D Integration Approach for SOI Substrates - Mating Device Layer CVD W Filled Tsvs with Handle Layer ECD Cu Filled Tsvs](#)

[Andrew E Hollowell, Christian L. Arrington, Todd Bauer, Matthew Blain, Jason Dominguez, Ronald S. Goeke, Edwin Heller, Robert Jarecki, Rebecca Loviza, Jaime McClain, Lyle Alexander Menk, Jamin Ryan Pillars, Paul Resnick, Robert Timon](#)

[1925Copper Oxide Direct Bonding of 200mm CMOS Wafers with Five Metal Levels and TSVs: Morphological and Electrical Characterization](#)

[Celso Cavaco, Lan Peng, Simone Lavizzari, Jesse Claes, Nele V. Hoovels, Stefano Guerrieri, Deniz Sabuncuoglu Tezcan, Haris Osman](#)

[1926Electroless Plating of Diffusion Barrier Films on SiO<sub>2</sub> and Evaluation of Film Characteristics](#)

[Atsushi Hirate, Kohei Ohta, Yuto Miyachi, Tomohiro Shimizu, Takeshi Ito, Shoso Shingubara](#)



[1927ALD Platinum Substrate Preparation and Electrodeposition of Copper into Extremely Deep through-Silicon-Vias](#)

[Lyle Alexander Menk, Christian L. Arrington, Todd Bauer, Matthew Blain, Jason Dominguez, Ronald S. Goeke, Edwin Heller, Andrew E Hollowell, Robert Jarecki, Rebecca Loviza, Jaime McClain, Jamin Ryan Pillars, Paul Resnick, Robert Timon](#)

[1928Effect of Cu Diffusion on Electrical and Reliability Characteristics of Low Dielectric Constant Dielectrics](#)

[Yi-Lung Cheng, Yao-Jia Zhuang](#)

[1929Investigation of Mechanical Stress Distribution in Flexible Microelectronic System Under Bending Force By Finite Element Analysis](#)

[Seung-ho Seo, Jea-Hak Lee, Jun-Yeob Song, Won-Jun Lee](#)

[19303D Printed Porous Dielectric Layers for Low Dielectric Applications](#)

[Ji Young Oh, Kyu-Sung Lee, Kyung-Hyun Kim, Yong Suk Yang, Chang-Woo Lee](#)

[1931UV Laser Annealing Effect on Mechanical Properties of Boron Doped Amorphous Carbon Films As Hardmasks](#)

[Chulmin Youn, Jaeyoung Yang, Sungwoo Lee, Ginyung Hur, Taekjib Choi](#)

## **G05-SiGe, Ge, and Related Materials: Materials, Processing, and Devices 7**

[1932\(Invited\) Toward GeSn Lasers: Light Amplification and Stimulated Emission in GeSn Waveguides at Room Temperature](#)

[Jay Mathews, Zairui Li, Yun Zhao, James Gallagher, Imad Agha, Jose Menendez, John Kouvetakis](#)

[1933\(Invited\) Direct Band Gap Germanium](#)

[Anas Elbaz, Moustafa El Kurdi, Mathias Prost, Abdelhamid Ghrib, Sébastien Sauvage, Xavier Checoury, Frederic Aniel, Nicolas Zerounian, Gennaro Picardi, Razvigor Ossikovski, Gregoire Beaudoin, Isabelle Sagnes, Frédéric Boeuf, Philippe Boucaud](#)

1934 [Germanium/Silicon-Germanium Heterostructure Avalanche Photodiodes on Silicon](#)

[Yuji Miyasaka, Tatsuro Hiraki, Tai Tsuchizawa, Kazumi Wada, Yasuhiko Ishikawa](#)

1935 [Low Threshold Light Emission from Reverse-Rib  \$n^+\$  Ge Cavity Made by P Diffusion](#)

[M. Yako, ChanHyuck Park, Donghwan Ahn, Yasuhiko Ishikawa, Kazumi Wada](#)

1936 (Invited) [Fabrication of Ge Waveguides by Epitaxial Lateral Overgrowth toward Monolithic Integration of Light Sources](#)

[Katsuya Oda, Tadashi Okumura, Junichi Kasai, Satoshi Kako, Satomi Ishida, Satoshi Iwamoto, Yasuhiko Arakawa](#)

1937 [Doping Effects in Direct Bandgap GeSn Light Emitter](#)

[Daniela Stange, Nils von den Driesch, Esteban Marin, Søren Roesgaard, Zoran Ikonic, Jean-Michel Hartmann, Siegfried Mantl, Hans Sigg, Detlev Grützmacher, Dan Buca](#)

1938 (Invited)  [\$\text{SiO}\_x\text{N}\_y\$  Back-End Integration Technologies for Heterogeneously Integrated Si Platform](#)

[Hidetaka Nishi, Tai Tsuchizawa, Takaaki Kakitsuka, Koichi Hasebe, Koji Takeda, Tatsuro Hiraki, Takuro Fujii, Tsuyoshi Yamamoto, Shinji Matsuo](#)

1939 [Power-Dependent Transient Gain Study on Direct Gap GeSn Crystallized on Amorphous Layers](#)

[Xiaoxin Wang, Haofeng Li, Jifeng Liu](#)

1940 (Invited) [Development of SiGeSn Technique Towards Mid-Infrared Devices in Silicon Photonics](#)

[Wei Du, S. Al-Kabi, Seyed Ghetmiri, Huong Tran, Thach Pham, Bader Alharthi, Aboozar Mosleh, Joe Margetis, John Tolle, Hameed A Naseem, Mansour Mortazavi, Greg Sun, Richard Soref, B Li, Shui-Qing Yu](#)

1941 (Invited) [GeSn Short-Wave Infrared Photodetectors](#)

[Buwen Cheng, Zhi Liu, Jun Zheng, Shaojian Su, Dongliang Zhang, Wenzhou Wu, Chunlai Xue, Qiming Wang](#)

1942 [Mid-Infrared Sensing Using Heavily Doped Germanium Plasmonics on Silicon Substrates](#)

[Leonetta Baldassarre, Emilie Sakat, Jacopo Frigerio, J. B. J. Frigerio, Antonio Samarelli, Valeria Giliberti, Giovanni Pellegrini, Kevin Gallacher, Marco Fischer, Daniele Brida, Giovanni Isella, Paolo Biagioni, Douglas J Paul, Michele Ortolani](#)

1943 [Mid-Infrared Intersubband Absorption from p-Ge Quantum Wells Grown on Si Substrates](#)

[Kevin Gallacher, Andrea Ballabio, Ross Millar, Jacopo Frigerio, Aneeqa Bashir, Ian MacLaren, Giovanni Isella, Michele Ortolani, Douglas J Paul](#)

1944 [Sb Doped GeSn Growth by MOCVD with Newly Employed Source Gases](#)

[Kohei Suda, Naomi Sawamoto, Hideaki Machida, Masato Ishikawa, Hiroshi Sudoh, Yoshio Ohshita, Koji Usuda, Ichiro Hirosawa, Atsushi Ogura](#)

1945 [Si-Based Ge and GeSn Material Epitaxy and Thermal Stability Characterization](#)

[Chunlai Xue, Xu Zhang, Hui Cong, Buwen Cheng, Qiming Wang](#)

1946 [Lateral Growth of High Quality GeSn Layers on Si Using Tin As Catalysts](#)

[Chuanbo Li, Kai Yu, Buwen Cheng](#)

1947 [High Sn-Content GeSn on Insulator Grown By Rapid Melting Growth](#)

[Zhi Liu, Chuanbo Li, Chunlai Xue, Buwen Cheng](#)

1948 [\(Invited\) Challenges and Solutions in Metrology for Complex, Confined Systems](#)

[Wilfried Vandervorst](#)

1949 [Impurity and Defect Monitoring in Hexagonal Si and SiGe Nanocrystals](#)

[Sebastian Koelling, Rianne C. Plantenga, Hakon I.T. Hauge, Yizhen Ren, Ang Li, Marcel A. Verheijen, Sonia Conesa Boj, Simone Assali, Paul M. Koenraad, Erik P.A.M. Bakkers](#)

1950[In-Line Critical Dimension and Sidewall Roughness Metrology Study for Compound Nanostructure Process Control by in-Line 3D Atomic Force Microscope](#)

[Tae-Gon Kim, Heon-Yul Ryu, Ah-jin Jo, Sang-Joon Cho, Sang-il Park, Tom Vandeweyer](#)

1951[\(Invited\) Electron Channeling Contrast Imaging: Potential for Future Metrology in Semiconductor Industry](#)

[Tomas Vystavel, Anna Prokhodtseva, Andreas Schulze, Matty Caymax](#)

1952[\(Keynote\) FD-SOI: The History from Early Transistors to Today](#)

[Carlos Mazure, Sorin Cristoloveanu](#)

1953[\(Keynote\) FDSOI Past, Present and Future](#)

[Bruce Doris](#)

1954[\(Invited\) UTBB FDSOI PMOSFETs Including Strained SiGe Channels at the 14nm Technology Node and Beyond](#)

[François Andrieu, Remy Berthelon, Simeon Morvan, Olivier Gourhant, Elise Baylac, Cyrille Le Royer, Didier Dutartre, Emmanuel Josse, Michel Haond](#)

1955[\(Invited\) Variability and Performance on FDSOI Technology with Strained SSOI Substrate and SiGe Channel](#)

[Jérôme Mazurier](#)

1956[Low Power FDSOI Technology and Devices for RF Applications](#)

[Christoph Schwan, Kok Wai Chew, Thomas Feudel, Thorsten Kammler, Juergen Faul, Laegu Kang, Richard Taylor, Andreas Huschka, Jon Kluth, Rick Carter, Thomas McKay, Edward Nowak, Josef Watts, David L. Haramel](#)

[1957Improvement of Boron Doping in SiGe Raised Sources and Drains for FD-SOI Technology by Carbon Incorporation](#)

[Maxime Labrot, Fabien Cheynis, David Barge, Marc Juhel, Pierre Müller](#)

1958[\(Invited\) Negative Capacitance Transistors](#)

[Sayeef Salahuddin](#)

1959[A Computational Study of Tunneling Field-Effect Transistors: Challenges and Design Optimizations](#)

[Gengchiao Liang, Kain Lu Low](#)

1960[\(Invited\) Beyond CMOS Spintronics](#)

[Iuliana Radu](#)

1961[Prospects of High-Ge-Content Strained SiGe for Advanced FinFET Generations](#)

[Pouya Hashemi, Karthik Balakrishnan, Takashi Ando, John Bruley, John A. Ott, Sebastian Engelmann, Kevin Chan, Kam-Leung Lee, Dae-Gyu Park, Renee T. Mo, Effendi Leobandung](#)

1962[Integration of Low Temperature SiGe:B Raised Sources and Drains in p-Type FDSOI Field Effect Transistors](#)

[Cao-Minh Vincent Lu, Claire Fenouillet-Beranger, Jean-Michel Hartmann, Philippe Rodriguez, Véronique Benevent, Marie-Pierre Samson, Bernard Previtali, Claude Tabone, Mikael Cassé, Fabienne Allain, Giovanni Romano, Laurent Brunet, Perrine Batude, Thomas Skotnicki, Maud Vinet](#)

1963 [\$\Omega\$ -Gate Nanowire P-FET with cSiGe Channel Epitaxied on Strained-SOI Substrates](#)

[Phuong Nguyen, Sylvain Barraud, Mikael Cassé, Johan Pelloux-Prayer, Claude Tabone, Jean-Michel Hartmann, Christian Arvet, Nicolas Bernier, Louis Hutin, Ludovic Ecarnot, Christophe Maleville, Bich-Yen Nguyen, Carlos Mazure, Oliver Faynot, Maud Vinet](#)

[1964 Comparative Analysis of Growth Rate Enhancement and Ge Redistribution during Silicon-Germanium Oxidation by Rapid Thermal Oxidation](#)

[Fabien Rozé, Olivier Gourhant, Elisabeth Blanquet, François Bertin, Marc Juhel, Francesco Abbate, Clement Pribat, Romain Duru](#)

[1965 300 mm SiGe-On-Insulator Substrates with High Ge Content \(70%\) Fabricated Using the Smart Cut™ Technology](#)

[Julie Widiez, Christelle Veytizou, Jean-Michel Hartmann, Virginie Loup, Pascal Besson, Nicolas Baumel, Christophe Figuet, Isabelle Huyet, Frédéric Mazen, Walter Schwarzenbach, Catherine Tempesta, Ludovic Ecarnot](#)

[1966 \(Invited\) Enabling Hetero-Integration of III-V and Ge-Based Transistors on Silicon with Ultra-Thin Buffers Formed by Interfacial Misfit Technique](#)

[Xiao Gong, Sachin Yadav, Kian Hui Goh, Kian Hua Tan, Annie Kumar, Kian Lu Low, Bowen Jia, Soon-Fatt Yoon, Gengchiao Liang, Yee-Chia Yeo](#)

[1967 \(Invited\) SiGe and III-V Materials and Devices: New HEMT and LED Elements in 0.18-Micron CMOS Process and Design](#)

[Eugene A Fitzgerald, K.E. Lee, Soon-Fatt Yoon, S.J. Chua, Chuan Seng Tan, G.I. Ng, X. Zhou, Xiao Gong, J.S. Chang, L.S. Peh, C.C. Boon, D.a. Antoniadis, Sachin Yadav, X.S. Nguyen, D.a. Kohen, Annie Kumar, Li Zhang, Kwang Hong Lee, Z.H. Liu, S.B. Chain, T Ge, P. Choi](#)

[1968 Challenges and Opportunities of Near and Mid-Infrared Photonics Based on SiGe and Ge](#)

[Mitsuru Takenaka, Younghyun Kim, Jae-Hoon Han, Jian Kang, Shinichi Takagi](#)

[1969 Modeling and Simulation of Negative Capacitance Gate on Ge FETs](#)

[Yu-Hung Liao, Sheng-Ting Fan, C. W. Liu](#)

[1970 \(Invited\) Anisotropic Strain Introduction into Si/Ge Hetero Structures](#)

[Kentarou Sawano, Shiori Konoshima, Junji Yamanaka, Keisuke Arimoto, Kiyokazu Nakagawa](#)

1971 [Investigation of the Low Temperature / High Temperature Approach to Produce Si<sub>0.5</sub>Ge<sub>0.5</sub> and Pure Ge Strain Relaxed Buffers](#)

[Jean-Michel Hartmann, Joris Aubin, Yann Bogumilowicz, Vincent Delaye, Anne-Marie Papon](#)

1972 [Strain Relaxed Silicon Germanium Buffer Layers: From Growth to Integration Challenges](#)

[Abhishek Dube, Yi-Chiau Huang, Benjamin Cherian, Kouros Nafisi, Hua Chung, Schubert Chu](#)

1973 [Epitaxial Growth of Ge Strain Relaxed Buffer on Si with Low Threading Dislocation Density](#)

[Ahmad Abedin, Ali Asadollahi, Konstantinos Garidis, Per-Erik Hellström, Mikael Ostling](#)

1974 (Invited) [Silicene: Silicon at the Two Dimensional Limit and Its Applications to Nanoelectronics](#)

[Alessandro Molle, Carlo Grazianetti, Eugenio Cinquanta](#)

1975 (Invited) [Strain Engineered Crack-Free GaN on Si for Integrated Vertical High Power GaN Devices with Si CMOS](#)

[Shadi Dayeh, Atsunori Tanaka, Woojin Choi, Renjie Chen](#)

1976 (Invited) [Realizing 2D Materials Via MOCVD](#)

[Natalie Briggs, Shruti Subramanian, Yu-Chuan Lin, Sarah Eichfeld, Bhakti Jariwala, Ganesh Bhimanapati, Kehao Zhang, Joshua A Robinson](#)

1977 (Invited) [The Structure-Dependent Properties of InAs Nanowires and Their Devices](#)

Mengqi Fu, Tuanwei Shi, Xing Li, Qing Chen

1978Rapid Synthesis of Nonepitaxial Multilayer Silicene and Germanene Assisted By Plasma/Ion Implantation

Hsu-Sheng Tsai, Jenq-Horng Liang

1979RAMAN Characterization of  $Ge_{1-x}Sn_x$  Allows By Using a SPACE Correlation MODEL

Héctor Pérez Ladrón de Guevara, Miguel Angel Vidal Borbolla, Angel Gabriel Rodriguez Vazquez, Hugo Ricardo Navarro Contreras

1980Development of Interatomic Potential of Group IV Alloy Semiconductors for Lattice Dynamics Simulation

Motohiro Tomita, Atsushi Ogura, Takanobu Watanabe

1981Fabrication and Characterization of SiGe on Insulator through Condensation and Wafer Bonding Techniques

Mohammad Noroozi, Bejan Hamawandi, Muhammet Toprak, Henry H. Radamson

1982(Invited) Processing Technologies for Advanced Ge Devices

Roger Loo, Andriy Yakovitch Hikavy, Liesbeth Witters, Andreas Schulze, Hiroaki Arimura, Daire Cott, Jerome Mitard, Clement Porret, Hans Mertens, Paul Ryan, John Wall, Kevin Matney, Matthew Wormington, Paola Favia, Olivier Richard, Hugo Bender, Naoto Horiguchi, Nadine Collaert, Aaron Thean

1983(Invited) Germanium Enrichment for Planar-, Fin- and Nanowire-Channel MOSFETs Made on SOI

Emmanuel Augendre, Nicolas Loubet, Pierre Francois Morin, Qing Liu, Joël Schmitt, Benoît L'Herron, Phuong Nguyen, Sylvain Barraud, Louis Hutin, Sylvain Maitrejean, Barbara De Salvo, Rémi Coquand, Shay Reboh, Rajasekhar Venigalla, Bruce Doris, Tenko Yamashita, Olivier Faynot, Maud Vinet

1984(Invited) Low Resistance Contacts to Nanoscale Semiconductor Devices



Krishna C. Saraswat, Gautam Shine

1985Investigation on Passivation Mechanism of Ge Surface By GeO<sub>x</sub>

Jie Zhang, Xiaolei Wang, Jing Zhang, Shuhua Wei, Wenwu Wang

1986The Effect of H-Implantation Energy on the Annealing Kinetics of Germanium Surface Blistering

Fan Yang, Xuan Xiong Zhang, Yuming Shen, Yi Ou, Jiwei Jiao, Hua Meng

1987(Invited) SiGe Applications in Automotive Radars

Wolfgang Liebl, Josef Boeck, Klaus Aufinger, Dirk Manger, Walter Hartner, Bernd Heinemann, Rudolf Lachner

1988On the Challenges of SiGe HBTs in Advanced BiCMOS Technology Toward Half THz  $f_{MAX}$

Qizhi Liu, Vibhor Jain, Renata A Camillo-Castillo, John J Pekarik, James W. Adkisson, Alvin Joseph, David L. Harame

1989TCAD Calibration of High-Speed Si/SiGe HBTs in 55-nm BiCMOS

Van-Tuan VU, Didier Celi, Thomas Zimmer, Sebastien Fregonese, Pascal Chevalier

1990(Invited) SiGe BiCMOS for Optoelectronics

Dieter Knoll, Stefan Lischke, Ahmed Awny, Lars Zimmermann

1991(Invited) A Brief History of Selective Epitaxy (at IBM SRDC)

Judson Robert Holt, Matthew Wahlquist Stoker, Timothy J Mcardle, Annie Levesque

1992In-Situ Boron Doped SiGe Epitaxy Optimization for FinFET Source/Drain

Yi Qi, Jianwei Peng, Hsien-Ching Lo, Judson Robert Holt, Michael Willemann, Churamani Gaire, Sarah Evans, Patrick Flanagan, Hong Yu, Owen Hu, Michael Kennett

1993 Integration of Selective Epitaxial Growth of SiGe/Ge Layers in 14nm Node FinFETs

Guilei Wang, Jun Luo, Changliang Qin, Hushan Cui, Jinbiao Liu, Kunpeng Jia, Junjie Li, Tao Yang, Junfeng Li, Huaxiang Yin, Chao Zhao, Tianchun Ye, Ping Yang, Ganesh Jayakumar, Henry H Radamson

1994 A Benchmark of Germane and Digermane for the Low Temperature Growth of Intrinsic and Heavily in-situ Boron-Doped SiGe

Jean-Michel Hartmann, Joris Aubin, Jean-Paul Barnes

1995 (Invited) Group IV Epitaxy Applications for Enabling Advanced Device Scaling

Benjamin P Colombeau, Matthias Bauer, Bingxi Sun Wood, Hua Chung, Jeffrey Hebb, Yi-Chiau Huang, Xianzhi Tao, Saurabh Chopra, Abhishek Dube, Michael Chudzik, Schubert Chu

1996 (Invited) Graphene Synthesis and Processing on Ge Substrates

Mindaugas Lukosius, Gunther Lippert, J Dabrowski, Julia Kitzmann, Marco Lisker, P Kulse, Andreas Krüger, Oksana Fursenko, Ioan Costina, Andreas Trusch, Yuji Yamamoto, Andre Wolff, Andreas Mai, Thomas Schroeder, Grzegorz Lupina

1997 Effects of Etching Variation on Ge/Si Channel Formation and Resulted Device Behavior

Chun-Lin Chu, Bo-Yuan Chen Chen, Guang-Li Luo, Mei-Yi Li

1998 Investigation of Disilane-Based SiGe-HBT Layers for Low External Base Resistances

Andreas Mai, Ioan Costina, Thomas Lenke, Yuji Yamamoto

1999 Growth Rate and Temperature Dependence of Oxygen Incorporation in  $\text{Si}_{1-x}\text{Ge}_x$  Thin Films

Clayton Adam Jackson, Adam J Williams, Peter W Deelman

2000(Invited) Industrial Applications of Si-Based Epitaxy in Nanoelectronics

Didier Dutartre

2001Thermal Rounding Kinetics and Demonstration of Steep and Flat Facets Succession in Selective Si-Based Epitaxy

Victorien Paredes-Saez, Didier Dutartre, Georges Bremond

2002Abrupt SiGe and Si Profile Fabrication by Introducing C Delta Layer

Yuji Yamamoto, Anne Hesse, Peter Zaumseil, Junichi Murota, Bernd Tillack

2003(Invited) Selective Epitaxial Growth of High-P Si:P for Source/Drain Formation in Advanced Si nFETs

Erik Rosseel, Sathish Kumar Dhayalan, Andriy Yakovitch Hikavyy, Roger Loo, Harald Benjamin Profijt, David Kohen, Stefan Kubicek, Thomas Chiarella, Hao Yu, Naoto Horiguchi, Dan Mocuta, Kathy Barla, Aaron Thean, Gregory Bartlett, Joe Margetis, Nupur Bhargava, John Tolle

2004Atmospheric Pressure Selective Epitaxial Growth of Heavily in-situ Phosphorous-Doped Si(:C) Raised Sources and Drains

Jean-Michel Hartmann, Joris Aubin, Sylvain Barraud, Marie-Pierre Samson

2005(Invited) Transistor Strain Measurement Using Electron Beam Techniques

Jian Min Zuo, Honggyu Kim, Jiong Zhang, Jean-Ruc Rouviere

2006Analysis of Microscopic Strain and Crystalline Structure in Ge/Ge<sub>1-x</sub>Sn<sub>x</sub> Fine Structures by Using Synchrotron X-ray Microdiffraction

Shinichi Ike, Osamu Nakatsuka, Yuki Inuzuka, Tomoya Washizu, Wakana Takeuchi, Yasuhiko Imai, Shigeru Kimura, Shigeaki Zaima

[2007Very High-Resolution Mobility, Resistivity and Activation for High-Mobility Materials](#)

[Abhijeet Joshi](#)

[2008In-Line Resistance Measurement of Single Nanometer-Wide Trenches and Fins](#)

[Janusz Bogdanowicz, Brigitte Parmentier, Andreas Schulze, Alain Moussa, Clement Merckling, Bernardette Kunert, Weiming Guo, Yves Mols, Clement Porret, Erik Rosseel, Andriy Yakovitch Hikavyy, Ole Hansen, Dirch H. Petersen, Henrik H. Henrichsen, Peter F. Nielsen, Wilfried Vandervorst](#)

[2009Evaluation of Dielectric Function of Thermally-grown SiO<sub>2</sub> and GeO<sub>2</sub> from Energy Loss Signals for XPS Core-line Photoelectrons](#)

[Taishi Yamamoto, Akio Ohta, Mitsuhsa Ikeda, Katsunori Makihara, Seiichi Miyazaki](#)

[2010\(Invited\) The Application of Advanced Sigma Complementary Bipolar Technologies to High Speed and High-Precision Applications](#)

[Marco Corsi, Robert Payne, Kenneth G MacLean, Jeff A Babcock, Steve Brantley, Berthold Staufer, Greg Cestra, Paul Damitio, Jerry Doorenbos, Joel Halbert](#)

[2011An Analytical Model of Avalanche Multiplication Factor for Wide Temperature Range Compact Modeling of Silicon-Germanium Heterojunction Bipolar Transistors](#)

[Huaiyuan Zhang, G. Niu](#)

[2012A Multimode SiGe BiCMOS 5–6 GHz Front-End IC that Enables 802.11ac Wave 2 and 802.11ax Wireless LAN Front-End Designs](#)

[Chun-Wen Paul Huang, Kenny Christensen, Justin Allum, Lui Lam, Andrew Chen, Mark Doherty, Mike McPartlin, Bill Vaillancourt](#)

[2013Impact of Lateral Scaling on Silicon Germanium High Breakdown Power Amplifier Device Performance](#)

[Renata A Camillo-Castillo, Vibhor Jain, Qizhi Liu, Ramana Malladi, James W. Adkisson, Alvin Joseph](#)

[2014Hole Effective Mass of Strained Ge<sub>1-x</sub>Sn<sub>x</sub> Alloys P-Channel Quantum-Well MOSFETs on \(001\), \(110\), and \(111\) Ge Substrates](#)

[Huang-Siang Lan, C. W. Liu](#)

[2015In-Plane Biaxial Strain Evaluation Induced in Ge<sub>1-x</sub>Sn<sub>x</sub> Films Using Oil-Immersion Raman Spectroscopy](#)

[Kazuma Takeuchi, Kohei Suda, Ryota Suzuki, Ryo Yokogawa, Naomi Sawamoto, Koji Usuda, Atsushi Ogura](#)

[2016Micro-Raman Characterization of Cluster Carbon Implanted Si before and after Rapid Thermal Annealing](#)

[Woo Sik Yoo, Kitaek Kang, Hiroshi Nishigaki, Noriyuki Hasuike, Hiroshi Harima, Masahiro Yoshimoto, Karuppanan Sekar](#)

[2017\(Invited\) Surface Chemical Choreography of Si/Ge Nanowire Hetero- and Quantum-Structures](#)

[Saujan Sivaram, Ho Yee Hui, Maria de la Mata, Jordi Arbiol, Michael A Filler](#)

[2018Physics of Metal/Ge Interfaces; Interface Defects and Fermi-Level Depinning](#)

[Takashi Nakayama, Shogo Sasaki, Yoshihiro Asayama](#)

[2019\(Invited\) Finely Controlled Heterointerfaces between Ge\(111\) and Metallic Alloys or Insulators for Next Generation Ge-Based Devices](#)

[Kohei Hamaya, Shinya Yamada, Kenji Kasahara, Takeshi Kanashima](#)

[2020Remote Coulomb Scattering in Ge MOSFET with GeO<sub>x</sub>/Al<sub>2</sub>O<sub>3</sub> Gate Dielectrics](#)

[Haoyu Xu, Xiaolei Wang, Jing Zhang, Shuhua Wei, Wenwu Wang](#)

[2021Impact of N<sub>2</sub>O/NH<sub>3</sub>/N<sub>2</sub> Gas Mixture on the Interface Quality of Germanium MOS Capacitors](#)

[Ghada Dushaq, Mahmoud Rasras, Ammar Nayfeh](#)

2022 [Role of High-k Interlayer in ZrO<sub>2</sub>/High-k/ZrO<sub>2</sub> Insulating Multilayer on Electrical Properties for DRAM Capacitor](#)

[Takashi Onaya, Toshihide Nabatame, Tomomi Sawada, Kazunori Kurishima, Naomi Sawamoto, Akihiko Ohi, Toyohiro Chikyow, Atsushi Ogura](#)

2023 [\(Invited\) Optimal Target Functions for Epitaxy in New Channel Applications Such As Horizontal Gate-All-Around \(h-GAA\) Device Architectures Using Nano-Sheets or Nanowires](#)

[Matthias Bauer](#)

2024 [Annihilation of Threading Dislocations in Strain-Relaxed Si<sub>1-x</sub>Ge<sub>x</sub> Layer By Hydrogen Ion Implantation](#)

[Jun-Seong Park, Il-Hwan Kim, Hyeon-Ju Shin, Tae-Hun Shim, Gon-Sub Lee, Jea-Gun Park](#)

2025 [High Thermal Stability of Tensile Strained Direct Gap GeSn Crystallized on Amorphous Layers](#)

[Haofeng Li, Alejandra Cuervo Covian, Xiaoxin Wang, Jifeng Liu](#)

2026 [Engineering Large In-Plane Tensile Strains in Ge Microdisks, Microrings and Racetrack Optical Cavities](#)

[Ross Millar, Kevin Gallacher, Jacopo Frigerio, Andrea Ballabio, Aneeqa Bashir, Ian MacLaren, Giovanni Isella, Douglas J Paul](#)

2027 [\(Invited\) Future Applications of SiGeSn and GeSn](#)

[Detlev Grützmacher](#)

2028 [\(Invited\) The Use of Silicon-Germanium Superlattices in Thermoelectric Devices and Microfabricated Generators](#)

[Lourdes Ferre Llin, Francesco Mirando, Antonio Samarelli, Ameze Odia, Stefano Cecchi, Tanja Etzelstorfer, Elisabeth Müller Gubler, Daniel Chrastina, Giovanni Isella, Julian Stangl, John M R Weaver, Phil Dobson, Douglas J Paul](#)

2029 [\(Invited\) Graphene for Biosensor Applications](#)

[Kazuhiko Matsumoto](#)

2030 [Thermoelectric Properties of Ge-Rich GeSn Films Grown on Insulators](#)

[Masashi Kurosawa, Kun Liu, Momoka Izawa, Isao Tsunoda, Shigeaki Zaima](#)

2031 [\(Invited\) In-Situ Doped Epitaxial Growth of Highly Dopant-Activated n<sup>+</sup>-Ge Layers for Reduction of Parasitic Resistance of Ge-nMISFETs](#)

[Yoshihiko Moriyama, Yuuichi Kamimuta, Keiji Ikeda, Akira Sakai, Tsutomu Tezuka](#)

2032 [Very Low Temperature Epitaxy of Heavily In-situ Phosphorous Doped Ge Layers and High Sn Content GeSn Layers](#)

[Joris Aubin, Jean-Michel Hartmann, Jean-Paul Barnes, Jean-Baptiste Pin, Matthias Bauer](#)

2033 [Growth and Etch Forms of Germanium Microcrystals on a Silicon Oxide Substrate](#)

[Yi-Chiau Huang, Man-Ping Cai, Hongwen Zhou, Hua Chung](#)

2034 [\(Invited\) Integration of III/V Hetero-Structures By Selective Area Growth on Si for Nano- and Optoelectronics](#)

[Bernardette Kunert, Weiming Guo, Yves Mols, Robert Langer, Kathy Barla](#)

2035 [Integration of High Quality III-V Materials on Si Using the Aspect-Ratio-Trapping Technique](#)

[Xuliang Zhou, Shiyang Li, Jiaoqing Pan](#)

[2036\(Invited\) Silicon Nano-Tip Pattern Approach for Surface and Interface Engineering of Fully Coherent, High Ge Content Nanostructure Arrays for High Performance Photodetection](#)

[Gang Niu, Giovanni Capellini, Grzegorz Lupina, Tore Niermann, Marco Salvalaglio, Anna Marzegalli, Markus Andreas Schubert, Peter Zaumseil, Hans-Michael Krause, Oliver Skibitzki, Michael Lehmann, Francesco Montalenti, Ya-Hong Xie, Thomas Schroeder](#)

[2037\(Invited\) The Effect of Germanium/Silicon Interface on Germanium Photonics](#)

[Daeik Kim, Shuyu Bao, Chuan Seng Tan, Ju Hyung Nam, K. C. Saraswat, Donguk Nam](#)

[2038Enhanced Light Emission from N-Doped Ge Microdisks by Thermal Oxidation](#)

[Hideaki Hashimoto, Xuejun Xu, Kentarou Sawano, Takuya Maruizumi](#)

[2039Effect of Ge Core Size on Photoluminescence from Si Quantum Dots with Ge Core](#)

[Kentaro Yamada, Keigo Kondo, Katsunori Makihara, Mitsuhsa Ikeda, Akio Ohta, Seiichi Miyazaki](#)

[2040The Improvement of GeO<sub>2</sub> Film Characteristics on Ge Substrates Using Ultrathin Hf Metal Deposition Followed by Annealing](#)

[Tomo Ueno, Jun-pei Niida, Marina Yamaguchi, Yoshitaka Iwazaki](#)

## **H01-State-of-the-Art Program on Compound Semiconductors 59 (SOTAPOCS 59)**

[2041\(Electronics and Photonics Division Award\) Physics of Wide Band Gap Semiconductor Devices](#)

[Michael Shur](#)

[2042\(Invited\) InGaN/GaN Nanowire LEDs and Lasers on Nonconventional Substrates](#)

[Boon S Ooi, Chao Zhao, Tien Khee Ng](#)



[2043\(Invited\) Periodically Oriented Gallium Nitride for Frequency Conversion](#)

[Jennifer K Hite, Jaime A. Freitas, Michael A Mastro, Igor Vurgaftman, Jerry R. Meyer, Christopher G. Brown, Jacob Leach, Kevin Udvary, Steven R. Bowman, Charles R. Eddy, Francis J Kub](#)

[2044\(Invited\) Epitaxial Transition Metal Nitrides for III-Nitride Devices: Application for Epitaxial Lift-Off and Transfer](#)

[Brian P. Downey, David J. Meyer, D. Scott Katzer, Neeraj Nepal, Virginia D. Wheeler, David F. Storm, Travis J Anderson, Matthew T Hardy](#)

[2045\(Invited\) Ultra-Wide-Bandgap AlGaN Power Diodes and Transistors](#)

[Robert J. Kaplar, Andrew A. Allerman, Andrew M. Armstrong, Mary H. Crawford, Jeramy R. Dickerson, Arthur J. Fischer, Michael P. King, Albert G. Baca, Erica A. Douglas](#)

[2046\(Invited\) GaN/Si Buffer Development for RF and Power Applications](#)

[Chien-Fong Lo, O. Laboutin, C.-K. Kao, Hugues Marchand, Rytis Dargis, Andrew Clark, Rodney Pelzel, W. Johnson](#)

[2047AlGaIn/GaN High Electron Mobility Transistor Grown and Fabricated on Lattice Matched Metallic Layers](#)

[Fan Ren, Stephen J. Pearton, Shihyun Ahn, Yi-Hsuan Lin, Francisco Machuca, Robert Weiss, Alex Welsh, David Smith, Ivan Kravchenko](#)

[2048\(Invited\) Toward an Understanding of Defects and Device Reliability in GaN Hemts](#)

[Aaron R Arehart](#)

[2049Rectification Properties of Boron Nitride/Silicon Heterostructure Diodes](#)

[Kungen Teii, Hiroyuki Ito, Naoki Katayama, Seiichiro Matsumoto](#)

[2050GaIn Based Ethanol Sensor](#)

Sunwoo Jung, Kwang Hyeon Baik, Seoung Jai Bai, Soohwan Jang

2051(Invited) Displacement Damage and Single Event Effects in AlGa<sub>N</sub>/Ga<sub>N</sub> HEMTs

Andrew D. Koehler, Travis J Anderson, Ani Khachatryan, Nicolas J.-H. Roche, Stephen Buchner, Brad D Weaver, Karl D Hobart, Francis J Kub

2052(Invited) Chemical Sensors Based on AlGa<sub>N</sub>/Ga<sub>N</sub> Transistors

Giacinta Parish

2053 Direct Detection of Low Concentration DNA in High Ionic Strength Solution with AlGa<sub>N</sub>/Ga<sub>N</sub> High Electron Mobility Transistors

Yen Wen Chen, Yu-Lin Wang

2054(Invited) Development of Nitride Photocatalysts for Artificial Photosynthesis

Kazuhiro Ohkawa

2055(Invited) Expectations for High-Power Semiconductors in Microwave-Assisted Chemistry

Tomohiko Mitani, Naoki Shinohara

2056(Invited) Advanced Photonic Circuits Using III-V Semiconductors

Anna Tauke-Pedretti, G. Allen Vawter, Erik Skogen, Gregory Peake, M. E. Overberg, Charles Alford, Florante Cajas

2057(Invited) Photonic Chip for Laser Stabilization to a Rubidium Atomic Vapor

Matthew Taylor Hummon, Argyris Dellis, Songbai Kang, John E Kitching, Vladimir A Aksyuk, Kartik Srinivasan, Daron A Westly, Qing Li, Brian J Roxworthy

2058(Invited) Towards Topological Antiferromagnetic Spintronics

[Qinglin He, Lei Pan, Koichi Murata, Kang L. Wang](#)

[2059\(Invited\) Monolithic Integration of n-In<sub>0.53</sub>Ga<sub>0.47</sub>As and p-Ge FinFETs on Si](#)

[Shih-Pang Chang, Kun-Lin Lin, Chien-Ting Wu, Cheng-Yu Chen, Mon-Yang Chen, Rong-Ren Lee, Wen-Da Hsu, Shih-Hong Chen, Chun-Jung Su, Guang-Li Luo, Shih-Chang Lee, Ta-Cheng Hsu, Wen-Kuan Yeh, Jen-Inn Chyi](#)

[2060 Electrochemical Pore Formation in InP: Understanding and Controlling Pore Morphology](#)

[Nathan Quill, Laura Green, Colm O'Dwyer, D. Noel Buckley, Robert Patrick Lynch](#)

[2061 Behaviors of GaSb and InSb III-V Semiconductor Surfaces in the Wet Chemical Solutions](#)

[Sangwoo Lim, Dongwan Seo, Jihoon Na, Eunseok Oh](#)

[2062 Characterization of Aggregated Carbon Compounds at SiO<sub>2</sub>/SiC Interface after Plasma Oxidation at Near Room Temperature](#)

[Kenta Arima, Kohei Hosoo, Ryota Ito, Naoki Saito, Kentaro Kawai, Yasuhisa Sano, Mizuho Morita](#)

[2063 Fabrication of  \$\alpha\$ -Ga<sub>2</sub>O<sub>3</sub> Thin Films Using  \$\alpha\$ -\(Al<sub>x</sub>Ga<sub>1-x</sub>\)<sub>2</sub>O<sub>3</sub> Multi Buffer Layers and Its Crystal Structure Properties](#)

[Riena Jinno, Takayuki Uchida, Kentaro Kaneko, Shizuo Fujita](#)

[2064 Band Gap Engineering of Wurtzite-Type Narrow Band Gap Oxide Semiconductor  \$\beta\$ -CuGaO<sub>2</sub>](#)

[Takahisa Omata, Yuki Mizuno, Hiraku Nagatani, Issei Suzuki, Masao Kita](#)

## **H02-Semiconductor Wafer Bonding: Science, Technology and Applications 14**

[2065\(Invited\) Surface Activated Wafer Bonding; Principle and Current Status](#)

Hideki Takagi, Yuichi Kurashima, Tadatomo Suga

2066Surface Activation and Planarization with Gas Cluster Ion Beam for Wafer Bonding

Noriaki Toyoda, Tomoya Sasaki, Isao Yamada, Tadatomo Suga

2067Low-Temperature Aluminum-Aluminum Wafer Bonding

Bernhard Rebhan, Andreas Hinterreiter, Nishant Malik, Kari Schjøberg-Henriksen, Viorel Dragoi, Kurt Hingerl

2068Ultra-Thick Metal Ohmic Contact Fabrication Using Surface Activated Bonding

Jianbo Liang, Katuya Furuna, Moeko Matsubara, Marwan Dhamrin, Yositaka Nishio, Naoteru Shigekawa

2069(Invited) Analysis of Defect Levels at GaAs/GaAs Surface-Activated Bonding Interface for Multi-Junction Solar Cells

Masakazu Sugiyama, Daiji Yamashita, Kentaroh Watanabe, Masahisa Fujino, Tadatomo Suga, Yoshiaki Nakano

2070The Roles of Band Bending, Surface Misorientation, and Passivation on Electrical Transport Across III-V Bonded Structures

Matthew Yee, Michael Liao, Mark Seal, Mark S. Goorsky

2071Conductive Semiconductor Interfaces Fabricated by Room Temperature Covalent Wafer Bonding

Christoph Flötgen, Nasser Razek, Viorel Dragoi, Markus Wimplinger

2072(Invited) High Output Power Deep Ultraviolet Light-Emitting Diodes with Hemispherical Lenses Fabricated Using Room Temperature Bonding

Masatsugu Ichikawa, Shinya Endo, Harunobu Sagawa, Akira Fujioka, Takao Kosugi, Takashi Mukai, Miyuki Uomoto, Takehito Shimatsu

[2073 Necessary Thickness of Au Capping Layers for Room Temperature Bonding of Wafers in Air Using Thin Metal Films with Au Capping Layers](#)

[Miyuki Uomoto, Takehito Shimatsu](#)

[2074 Direct Wafer Bonding of SiC-SiC at Room Temperature by SAB Method](#)

[Fengwen Mu, Kenichi Iguchi, Haruo Nakazawa, Yoshikazu Takahashi, Masahisa Fujino, Tadatomo Suga](#)

[2075 \(Invited\) Diverse Accessible Heterogeneous Integration \(DAHI\) Foundry at Northrop Grumman Aerospace Systems \(NGAS\)](#)

[Augusto Gutierrez-Aitken, Dennis Scott, Ken Sato, Ben Poust, Eric Nakamura, Khanh Thai, Wes Chan, Eric Kaneshiro, Cedric Monier, Ioulia Smorchkova, Nancy Lin, Dino Ferizovic, Xiang Zeng, Aaron Oki, Reynold Kagiwada](#)

[2076 Suppressed Self-Heating in Multi-Finger InP-Based DHBTs with Au Subcollector Fabricated on SiC Substrate by Surface-Activated Bonding](#)

[Yuta Shiratori, Takuya Hoshi, Norihide Kashio, Kenji Kurishima, Eiji Higurashi, Hideaki Matsuzaki](#)

[2077 Au / SiO<sub>2</sub> Hybrid Bonding with 6- \$\mu\$ m-Pitch Au Electrodes for 3D Structured Image Sensors](#)

[Yuki Honda, Kei Hagiwara, Masahide Goto, Toshihisa Watabe, Masakazu Nanba, Yoshinori Iguchi, Takuya Saraya, Masaharu Kobayashi, Hiroshi Toshiyoshi, Eiji Higurashi, Toshiro Hiramoto](#)

[2078 Novell Plating Processes for Silicon Based Pixel Detectors](#)

[Mathias Fritz, Sabine Nieland, Tobias Wittig, Andreas Bund](#)

[2079 III-V/Si Hybrid Laser Array with Dbr on Si Waveguide](#)

[Ran Guang Zhao, Tao Li, Li Yanping, Weixi Chen, Jiaoqing Pan, Lijun Yuan](#)

[2080\(Invited\) Thermomechanical Finite Element Modeling of Cu-SiO<sub>2</sub> Direct Hybrid Bonding with a Dishing Effect on Cu Surfaces](#)

[Rafael Estevez, Y. Beilliard, G. Parr, P. McGarry, P. Coudrain, L. Di Cioccio](#)

[2081Cu-Cu Die to Die Surface Activated Bonding in Atmospheric Environment Using Ar and Ar/N<sub>2</sub> Plasma](#)

[Shen Lin Chua, Chuan Seng Tan](#)

[2082Combined Surface Activated Bonding Technique for Hydrophilic SiO<sub>2</sub>-SiO<sub>2</sub> and Cu-Cu Bonding](#)

[Ran He, Masahisa Fujino, Akira Yamauchi, Tadatomo Suga](#)

[2083Impact of Water Edge Absorption on Silicon Oxide Direct Bonding Energy](#)

[Frank Fournel, Marwan Tedjini, Vincent Larrey, François Rieutord, Christophe Morales, Claudine Bridoux, Hubert Moriceau](#)

[2084Control of Direct Bonding Behavior by Interlayers](#)

[Marko Eichler, Helena Dillmann, Krees Nagel, Claus-Peter Klages](#)

[2085Adhesion Energy and Bonding Wave Velocity Measurements](#)

[Vincent Larrey, Gaelle Manguen, Frank Fournel, Damien Radisson, François Rieutord, Christophe Morales, Claudine Bridoux, Hubert Moriceau](#)

[2086A Study of Void Formation in Fluorine Containing Plasma Activated Wafer Bonding](#)

[Chenxi Wang, Yannan Liu, Tadatomo Suga](#)

[2087Edge Water Penetration in Direct Bonding Interface](#)

[François Rieutord, Samuel Tardif, Didier Landru, Oleg Kononchuk, Vincent Larrey, Hubert Moriceau, Marwan Tedjini, Frank Fournel](#)

[2088\(Invited\) Locally Measuring the Adhesion of InP Membranes Directly Bonded on Silicon](#)

[Gilles Patriarche, Konstantinos Pantzas, Eric Le Bourhis, Gregoire Beaudoin, Anne Talneau](#)

[2089\(Invited\) Heterogeneous Photonic Integration by Direct Wafer Bonding](#)

[Michael L Davenport, Lin Chang, Duanni Huang, Nicolas Volet, John E Bowers](#)

[2090Modified Surface Activated Bonding Using Si Intermediate Layer for Bonding and Debonding of Glass Substrates](#)

[Kai Takeuchi, Masahisa Fujino, Tadatomo Suga](#)

[2091Nanomechanical Analysis of Polydimethylglutarimide Based Lift Off Resist Used for Temporary Bonding and Film Transfers](#)

[Yousuf Mohammed, Takashi Matsumae, Andrew D. Koehler, Tadatomo Suga, Helmut Baumgart, Karl D Hobart, A A Elmustafa](#)

[2092Room Temperature Bonding with Lift-Off Resist Using the Surface Activated Bonding Method for a Layer Transfer Platform](#)

[Takashi Matsumae, Tadatomo Suga](#)

[2093Thin Layer Transfer Using Room Temperature Wafer-Level Bonding Process](#)

[Karine Abadie, Frank Fournel, Christophe Morales, Hubert Moriceau, Markus Wimplinger](#)

[2094Optical Isolator with Si Guiding Layer Fabricated by Photosensitive Adhesive Bonding](#)

[Hideki Yokoi, Salinee Choowitsakunlert, Kouya Kobayashi, Kenji Takagiwa](#)

[2095Determination of Band Structure at GaAs/4H-SiC Heterojunctions](#)

[Jianbo Liang, Sae Shimizu, Manabu Arai, Naoteru Shigekawa](#)

2096 [Direct Wafer Bonding and Layer Exfoliation of Sapphire](#)

[Christine Wong, Melissa Forstell, Mark S. Goorsky](#)

2097 [Surface Preparation and Eutectic Wafer Bonding](#)

[Martin Heller, Margarete Zoberbier, Toma Fujita, Marko Eichler](#)

2098 [Decreased Surface Porosity and Roughness of InP for Epitaxially Grown Thin-Film Devices: A Path to Integration of High Performance Electronics](#)

[Michael Gervasoni, Ariella Machness, Mark Goorsky](#)

2099 [Transfer of Ultra-Thin Semi-Conductor Films onto Flexible Substrates](#)

[Pierre Montméat, Isadora De Nigris Brandolisi, Samuel Tardif, Thierry Enot, Gregory Enyedi, Riadh Kachtouli, Pascal Besson, François Rieutord, Frank Fournel](#)

2100 [\(Invited\) MEMS Capping By Anodic Bonding of Evaporated Glass Thin Films](#)

[Ulli Hansen, Simon Maus, Oliver Gyenge, Xiaodong Hu](#)

2101 [Glass Frit Wafer Bonding - Sealed Cavity Pressure in Relation to Bonding Process Parameters](#)

[Roy Knechtel, Sophia Dempwolf, Holger Klingner](#)

2102 [Wafer-Level Hermetic Seal Bonding at Low-Temperature with Sub-Micron Gold Particle Using Stencil Printing](#)

[Hiroyuki Ishida, Toshinori Ogashiwa](#)

2103 [Aluminum-Germanium Eutectic Bonding for MEMS: Behaviour and Solidification of Liquid Al-Ge on Different Substrates](#)



[Victor Lumineau, Frank Fournel, Bruno Imbert, Fiqiri Hodaj](#)

2104 [\(Invited\) Self-Assembly Based Multichip-to-Wafer Bonding Technologies for 3D/Hetero Integration](#)

[Takafumi Fukushima, Kangwook Lee, Tetsu Tanaka, Mitsumasa Koyanagi](#)

2105 [Wafer-Level Vacuum Packaging by Thermocompression Bonding Using Silver after Fly-Cut Planarization](#)

[Cong Liu, Hideki Hirano, Joerg Froemel, Shuji Tanaka](#)

2106 [Low Temperature Thermo Compression Bonding with Printed Intermediate Bonding Layers](#)

[Maik Wiemer, Frank Roscher, Tobias Seifert, Klaus Vogel, Toshinori Ogashiwa, Thomas Gessner](#)

2107 [Plastic Deformation of Thin Si Membranes in Si-Si Direct Bonding](#)

[Erik Poppe, Geir Uri Jensen, Sigurd Teodor Moe, Dag Wang](#)

2108 [Surface Protection for Semiconductor Direct Bonding](#)

[Roy Knechtel, Holger Klingner](#)

2109 [Direct Bonding of Multiple Curved, Wedged and Structured Silicon Wafers as X-Ray Mirrors](#)

[Boris Landgraf, Ramses Gunther, Giuseppe Vacanti, Nicolas Barriere, Mark Vervest, David Girou, Alex Yanson, Max Collon](#)

2110 [Bond Strength of 3D-stacked Monocrystalline Silicon X-ray Mirrors](#)

[David Girou, Boris Landgraf, Ramses Gunther, Max Collon](#)

2111 [High Efficiency Cleaning Processes for Direct Wafer Bonding](#)

[Donald Dussault, Jan Rothballer, Florian Kurz, Make Reichardt, Viorel Dragoi](#)

2112 [High Precision Low Temperature Direct Wafer Bonding Technology for Wafer-Level 3D ICs Manufacturing](#)

[Florian Kurz, Thomas Plach, Jürgen Süss, Thomas Wagenleitner, Dominik Zinner, Bernhard Rebhan, Viorel Dragoi](#)

2113 [Bonding of SiO<sub>2</sub> and SiO<sub>2</sub> at Room Temperature Using Si Ultrathin Film](#)

[Jun Utsumi, Kensuke Ide, Yuko Ichiyanagi](#)

### **H03-Thin Film Transistors 13 (TFT 13)**

2114 [\(Invited\) Present and Future of LTPS Technology](#)

[Toshiki Kaneko, Takashi Nakamura, Hiroyuki Kimura](#)

2115 [\(Invited\) Self-Aligned Four-Terminal Low-Temperature Polycrystalline-Silicon Thin-Film Transistors on Glass Substrate Using Continuous-Wave Laser Lateral Crystallization](#)

[Akito Hara, Hiroki Ohsawa](#)

2116 [Microsecond Crystallization of Amorphous Silicon Films on Glass Substrates by Joule Heating](#)

[Won-Eui Hong, Jae-Sang Ro](#)

2117 [Charge-Trap Inactivation of Multi-Line-Beam Clc Poly-Si Tfts Using Channel Impurity Doping](#)

[Mitsuhisa Hiraiwa, Thuy Thi Nguyen, Shin-Ichiro Kuroki](#)

2118 [Characterization of \(100\)-Dominantly Oriented Poly-Si Thin Film Transistors Using Multi-Line Beam Continuous-Wave Laser Lateral Crystallization](#)

[Thuy Thi Nguyen, Mitsuhisa Hiraiwa, Tatsuaki Hirata, Shin-Ichiro Kuroki](#)

[2119\(Invited\) Microcrystalline Silicon Based TFTs and Resistors for Reliable Flexible Electronics](#)

[Yannick Kervran, Khalid Kandoussi, Hanpeng Dong, Sabri Janfaoui, Nathalie Coulon, Claude Simon, Emmanuel Jacques, Tayeb Mohammed-Brahim](#)

[2120\(Invited\) A New Materials Concept for High Performance Organic Thin Film Transistors](#)

[Hiroaki Iino, Masafumi Kunii, Jun-ichi Hanna](#)

[2121Controllably Aligned Ultra-Flexible and High-Performance Organic Single-Crystal Arrays Via Solvent Vapor Annealing for Large Area Soft Electronics](#)

[Jingu Kang, Jaehyun Kim, Jeong-Wan Jo, Myung-Gil Kim, Jaekyun Kim, Sung Kyu Park](#)

[2122Ultra-Thin Flexible Electronics with the Enhancement Inverter Based-on Pentacene Thin Film Transistor](#)

[Dong-Hoon Lee, Hyeong Jun Cho, Min Su Kim, JongSu Oh, Eng-kyu Park, Sihan Wang, Yong-Sang Kim](#)

[2123Investigation of High Current Tetracene-TFT Using Surface Nitrided SiO<sub>2</sub> Gate Insulator Film](#)

[Hiroki Nakao, Kabuto Hori, Yoshitaka Iwazaki, Tomo Ueno](#)

[2124\(Invited\) Ambipolar Organic-Inorganic Hybrid Perovskite Tfts](#)

[Juan Li, Yuxiang Wu, Jian Xu, Jianjun Zhang](#)

[2125High Performance OTFTs with CNT/Metal Hybrid Electrodes and Their Application to Amoled Panel](#)

[Chung Kun Song, Jae Sun Kim](#)

[2126\(Invited\) High Performance of Nonvolatile Memory with Van Der Waals Heterostructures of WS<sub>2</sub> and Multi-Layered Graphene](#)

Eun Kyu Kim, Dongri Qiu

2127(Invited) Low-Temperature Growth of Orientation-Controlled Large-Grain Ge-Rich SiGe on Insulator at Controlled-Position for Flexible Electronics

Taizoh Sadoh, Rikuta Aoki, Takahiro Tanaka, Jong-Hyeok Park, Masanobu Miyao

2128(Invited) Unseeded Growth of Poly-Crystalline Ge with (111) Surface Orientation on Insulator by Pulsed Green Laser Annealing

Masahiro Horita, Toru Takao, Yoshiaki Nieda, Yasuaki Ishikawa, Nobuo Sasaki, Yukiharu Uraoka

2129Cooling Rate Dependent High Substitutional Sn Concentration (>10%) in GeSn Crystals on Insulator by Pulsed Laser-Annealing

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

2130Low-Temperature Formation of Sn-Doped Ge on Insulating Substrates by Metal-Induced Crystallization

Takatsugu Sakai, Ryo Matsumura, Taizoh Sadoh, Masanobu Miyao

2131(Invited) Low-Temperature Processed and Self-Aligned InGaZnO Thin-Film Transistor with an Organic Gate Insulator for Flexible Device Applications

Mamoru Furuta, Tatsuya Toda, Gengo Tatsuoka, Yusaku Magari

2132Highly Stable Zinc Oxynitride Thin-Film Transistors with Field-Effect Mobility Exceeding 100 cm<sup>2</sup>/Vs

Yang Soo Kim, Hyun-Suk Kim

2133Light Gated Zinc Tin Oxide Thin Film Transistor Fabricated Via Solution Process

I-Wen Wang, Jeng-Ting Li, Jen-Sue Chen

2134Improvement of TFT Characteristics for Low-Temperature Solution-Processed Oxide Semiconductors with Hydrogen Injection and Oxidation Process

Masashi Miyakawa, Mitsuru Nakata, Hiroshi Tsuji, Yoshihide Fujisaki, Toshihiro Yamamoto

2135(Invited) Low-Temperature Sol-Gel Derived Ultra-Flexible Metal-Oxide Thin-Film-Transistors and Their Applications

Jeong-Wan Jo, Jae Sang Heo, Kyung-Tae Kim, Jaehyun Kim, Myung-Gil Kim, Sung Kyu Park

2136Low-Temperature Processed Metal-Semiconductor Field-Effect Transistor with In-Ga-Zn-O/AgO<sub>x</sub> Schottky Gate

Yusaku Magari, Shinsuke Hashimoto, Kenichiro Hamada, Mamoru Furuta

2137(Invited) The Compact Models and Parameter Extraction for Thin Film Transistors

Michael Shur

2138(Invited) Stability under Gate Bias Stressing of Amorphous Oxide Thin Film Transistors

Kham Man Niang, Andrew J. Flewitt

2139Influence of Carrier Concentration at Front- and Back-Channel on Transfer Characteristics of Bottom-Gate In-Ga-Zn-O Thin-Film Transistors

Daichi Koretomo, Tokiyoshi Matsuda, Mutsumi Kimura, Mamoru Furuta

2140(Invited) Selection of Channel Layer for the Vertical Oxide TFT

Sang-Hee Ko Park, Hye-In Yeom, Chi-Sun Hwang, Geumbi Moon, Jong-Beom Ko, Yunyong Nam

2141(Invited) Vertical Channel Amorphous Indium Gallium Zinc Oxide Thin Film Transistors

Han-Ping D. Shieh, Ram Narayan Chauhan, Kang-Ju Chuang, Nidhi Tiwari

2142Stretched-Exponential Trends in a-IGZO Tfts

Fan Zhou, Tsung Han Chiang, John F Wager

2143Investigation on the Gate Electrode Configuration of IGZO TFTs for Improved Channel Control and Suppression of Bias-Stress Induced Instability

Tarun Mudgal, Nicholas Edwards, Prashant Ganesh, Anish Bharadwaj, Eli Powell, Michael S Pierce, Robert G. Manley, Karl D Hirschman

2144Comprehensive Depletion-Mode Model for TFT Assessment

Fan Zhou, Tsung Han Chiang, John F Wager

2145Prospectively of Carbon-Doped Indium-Tungsten-Oxide Channel TFT for Bias Stress Instability

Kazunori Kurishima, Toshihide Nabatame, Takio Kizu, Nobuhiko Mitoma, Kazuhito Tsukagoshi, Tomomi Sawada, Akihiko Ohi, Ippei Yamamoto, Tomoji Ohishi, Toyohiro Chikyow, Atsushi Ogura

2146(Invited) Highly Robust a-IGZO TFT for Foldable Displays

Suhui Lee, Mohammad Masum Billah, Mallory Mativenga, Jin Jang

2147Thin-Film Technology for Large-Area / CMOS Hybrid Systems

Sigurd Wagner, Tiffany Moy, Josue Sanz-Robinson, Warren Rieutort-Louis, Yasmin Afsar, Yingzhe Hu, Liechao Huang, James Sturm, Naveen Verma

2148NMOS Logic Inverters Based on Threshold Voltage-Tunable IGZO Transistors

Lingyan Liang, Jingjing Yu, Mei Wang, Hongtao Cao

[2149\(Invited\) Transparent Top Gate Oxide TFT with ITO/Ag/ITO Low Resistance Electrode for the Application to the High Speed Operation Fingerprint Sensor Array in the Touch Panel](#)

[Yujin Kim, Guk-Jin Jeon, Myung Keun Lee, Seung Hee Lee, Sang-Hee Ko Park](#)

[2150\(Invited\) Strain Sensing Inverter and Photovoltaic Circuits Based on Novel Heptazole Organic Thin Film](#)

[Seongil Im](#)

[2151\(Invited\) Intrinsically-Stretchable, Transparent Thin Film Transistors](#)

[Kwing Tong, Jiajie Liang, Qibing Pei](#)

[2152Improvements in Sensing Responses to Ammonia Gas for the In-Ga-Zn-O Thin-Film Transistor Using Atomic-Layer-Deposited ZnO Nanoparticles as Gas Sensitizers](#)

[Da-Jeong Yun, Gi-ho Seo, Won-ho Lee, Sung-Min Yoon](#)

[2153\(Invited\) Flexible Memory Applications Using Oxide Semiconductor Thin-Film Transistors](#)

[Sung-Min Yoon, So-Jung Kim, Min-Ji Park, Da-Jeong Yun](#)

[2154Extended-Gate pH Sensors Using Self-Aligned Four-Terminal Metal Double-Gate Low-Temperature Polycrystalline-Silicon Thin-Film Transistors on Glass Substrate](#)

[Hiroki Ohsawa, Akito Hara](#)

[2155Thermoelectric Devices Fabricated Using Amorphous Indium Gallium Zinc Oxide](#)

[Yuta Fujimoto, Mutsunori Uenuma, Yasuaki Ishikawa, Yukiharu Uraoka](#)

[2156High-Performance Flexible Hybrid Photosensor Circuits Made by Low-Temperature Solution Processed Metal-Oxide and Organic TFTs](#)

Jaehyun Kim, Jaekyun Kim, Jingu Kang, Myung-Gil Kim, Yong-Hoon Kim, Sung Kyu Park

2157 A Current Supply with Single Organic Thin-Film Transistor for Charging Supercapacitors

Vahid Keshmiri, Christian Larsen, Ludvig Edman, Robert Forchheimer, Deyu Tu

2158 High-Performance Biosensors Based on Solution-Gated Organic Thin Film Transistors

Caizhi Liao, Feng Yan

2159 Formation of ZnO Nanoparticles by Atomic Layer Deposition for the Nonvolatile Memory Thin-Film Transistor Applications

Gi-Ho Seo, Da-Jeong Yun, Won-Ho Lee, So-Jung Kim, Sung-Min Yoon

2160 Heterostructure Source-Gated Transistors: Challenges in Design and Fabrication

Radu Alexandru Sporea, K. D. G. Imalka Jayawardena, Marios Constantinou, Munroe Ritchie, Alistair Brewin, William Wright, S. Ravi P. Silva

2161 Oxide TFT with Sog Gate Insulator

Sang Ho Hwang, Min-Taek Hong, Jong Mo Lee, Hee jin Jang, Eui Jung Yun, Byung Seong Bae, Myeong Seok Kim, Hyun Sue Huh

2162 Amplifier Circuit with Oxide TFT

Ye Lin Han, In Hye Kang, Young Eun Jeon, Young Jin Lee, Byung Seong Bae

2163 Influence of Passivation Layers on Characteristics of High Mobility Amorphous Indium-Zinc-Tin-Oxide Thin-Film Transistors

Po-Tsun Liu, Chih-Hsiang Chang, Guang-Ting Zheng, Che-Chia Chang

2164 The Oxide TFT with Solution Based Gate Insulator



Min-Taek Hong, Seong Min Shin, Jong mo Lee, Emmanuel Jacques, Tayeb Mohammed-Brahim, Byung Seong Bae

2165The Oxide TFT By Anodic Oxidation

Seong Min Shin, Min-Taek Hong, Jongmo Lee, Eui Jung Yun, Byung Seong Bae

2166Operational Amplifier Circuits with Oxide Thin Film Transistors

In Hye Kang, Jun Young Hwang, Min-Taek Hong, Jong Mo Lee, Byung Seong Bae

2167Improvement of Stress Stability in Back Channel Etch-Type Thin Film Transistors with Post Process Annealing

Mototaka Ochi, Aya Hino, Hiroshi Goto, Kazushi Hayashi, Toshihiro Kugimiya

2168Improved Properties of Oxide Thin-Film Transistor By Electrohydrodynamic-Jet Printing

Young-Jin Kwack, Woon-Seop Choi

2169Organic Electrochemical Transistors for Bio-Sensing Applications

Naixiang Wang, Feng Yan

2170Inkjet-Printed Oxide TFTs with Solution-Processed Dual Semiconductors

Seung-Hyun Lee, Young-Jin Kwack, Jun Seok Lee, Woon-Seop Choi

2171Optimization of Poly(3,4-ethylenedioxythiophene):Poly(4-styrenesulfonate) Electrodes Using Electrohydrodynamic Printing Process

Eun Mi Jung, Seung Woo Lee, Se Hyun Kim, So Hyun Park

2172Low Temperature Processed Organic Tfts with Solution-Processable Al<sub>2</sub>O<sub>3</sub> Gate Insulator Using Hydrogen Peroxide

[Eung-Kyu Park, Sihan Wang, Hyeong Jun Cho, So Young Lee, Dong-Hoon Lee, Yong-Sang Kim](#)

2173 [Enhancement of Field-Effect Mobility By Controlling the Surface Potential of PVP Insulator in Pentacene-Based Thin Film Transistors](#)

[Yunseok Jang, Kwang-Young Kim](#)

2174 [Fabrication of Thin Film Devices on Curved Surfaces Using Polymeric Perforated Films](#)

[Seokwon Joo, Peng Xiao, Soonmin Seo](#)

2175 [Solution-Processed Nanoscale Carbon Nanotube Thin-Film Transistors Fabricated By Electromigration](#)

[Jun-Young Jeon, Tae-Jun Ha](#)

2176 [Design of Bi-Directional Transmission Gate Driver in Amorphous Silicon Technology for TFT-LCD Application](#)

[Guang-Ting Zheng, Po-Tsun Liu, Meng-Chyi Wu, i-Hsiang Lu](#)

#### **H04-Low-Dimensional Nanoscale Electronic and Photonic Devices 9**

2177 [\(Invited\) Growth of Transfer-Free 2D Materials: From Controllable Growth to Material Characterizations and Device Applications](#)

[Yu-Lun Chueh](#)

2178 [Synthesis of MoS<sub>2</sub> on Homogeneous Single Layer Epitaxial Graphene on 6H-SiC\(0001\)](#)

[Luke O. Nyakiti, Zachary Robinson, Rachael L. Myers-Ward, Marc Currie, Jennifer K Hite, Karthik Sridhara, Edward Clancy, Charles R. Eddy, D. Kurt Gaskill](#)

2179 [Molecular Dynamics Simulations of Silicene Monolayer Growth](#)

[Mathew Joseph Cherukara, Badri Narayanan, Ross Harder, Subramanian K. R. S. Sankaranarayanan](#)

2180([invited](#)) [Metal-Catalyzed Etching of Graphene Layers](#)

[Guangjun Cheng, Irene Calizo, Angela R. Hight Walker](#)

2181([Invited](#)) [Interfacial Engineering of Two-Dimensional Nanomaterials: Chemical Functionalization and Scanning Probe Characterization](#)

[Qing Hua Wang](#)

2182([Invited](#)) [2D Material-like Ultrathin Single-Crystal Si Nanomebranes](#)

[Jong-Hyun Ahn](#)

2183([Invited](#)) [Physical Properties of Novel 2D Semimetal WTe<sub>2</sub>: From Microscopic Study to Devices](#)

[Minghu Pan, Hui Yuan](#)

2184[Low Temperature Synthesis of High Quality a Few PtSe<sub>2</sub> Monolayers By Plasma Assisted Selenization Process](#)

[Teng-Yu Su, Henry Medina, Chia-Wei Chen, Bo-Wei Wu, Yu-Lun Chueh](#)

2185([Invited](#)) [Synthesis and Applications of Novel Two-Dimensional Nanomaterials](#)

[Hua Zhang](#)

2186([Invited](#)) [Performance Limit and Potential of Layered MoTe<sub>2</sub> Transistors](#)

[Yen-Fu Lin](#)

2187([Invited](#)) [Multi-Bit Transistor Memories Made from Mechanically Exfoliated WSe<sub>2</sub> and Plasma-Doped MoS<sub>2</sub>](#)

[Xiaogan Liang, Mikai Chen](#)

[2188\(Invited\) Diluted Magnetic Monolayer MoS<sub>2</sub> Synthesis, Characterization and Device Applications](#)

[Bin Xiang, Benliang Zhao, Yaohui Fan, Wenhui Wang, Lei Yang](#)

[2189\(Invited\) Nitride Semiconductor Quantum Structures for Novel Nanophotonic Devices](#)

[Yong-Hoon Cho](#)

[2190Low Threshold Single Mode ZnO Nanowire Nanolasers](#)

[Giuseppe Visimberga, Markus Boese, Colm O'Dwyer](#)

[2191\(Invited\) Engineering of Optical Activity of Plasmonic Nanospirals](#)

[Zhifeng Huang](#)

[2192\(Invited\) Flexible Transparent Conductors Based on Metallic Nanomesh](#)

[Zhifeng Ren](#)

[2193Low Temperature Grown Graphene on Ultra-Long Copper Nanowire By Carbon-Enclosed Chemical Vapor Deposition As Stable Transparent Conducting Electrodes in Harsh Environments](#)

[Arumugam Manikandan, Henry Medina, Yu-Ze Chen, Yu-Lun Chueh](#)

[2194\(Invited\) Fully-Printed Stretchable Electronic Devices and Circuits](#)

[Le Cai, Suoming Zhang, Jinshui Miao, Zhibin Yu, Chuan Wang](#)

[2195\(Invited\) Low-Voltage Complementary Electronics from Ion Gel-Gated Vertical Van Der Waals Heterostructures](#)

Jeong Ho Cho

2196 Direct Current-Induced Oxidization of Metallic Nanowires and Their Resistive Switching Properties

Yu-Chuan Shih, Kai-De Liang, Yu-Ze Chen, Hung-Wei Tsai, Yu-Lun Chueh

2197 (Invited) Nanowire Electrodes for Electrochemical Capacitors and Nanoparticles for Current Conduction

Hideyuki Nakanishi, Ikuo Kikuta, Yuto Kawabata, Ikuko Matsumoto, Yasuaki Naitoh, Hiroyo Segawa, Tomohisa Norisuye, Qui Tran-Cong-Miyata

2198 (Invited) Nanoscale III-Vs on Oxides and Metals - a Route Towards Low-Cost, High-Performance Electronic and Photonic Devices on Non-Traditional Substrates

Rehan Kapadia

2199 (Invited) Wearable Electronics Using 1D-2D Hybrid Nanostructures

Jang-Ung Park

2200 Electron Transport Behavior Analysis of Bis(terpyridine) Metal Complex Wires on Electrodes

Hiroaki Maeda, Ryota Sakamoto, Hiroshi Nishihara

2201 Fabrication of Self-Assembly Metal /Semiconductor Heterostructured Nanowires By Using Anodic Aluminum Oxide (AAO)-Assisted Molding Injection Process

Shih-Hsun Chen, Chiu-yen Wang, Yu Chen Hung, Chien-Chon Chen, Jin Shyong Lin

2202 High Aspect Ratio Single Crystal of Cesium Iodide Column

Chien Chon Chen, Shih Hsun Chen, Jheng En Yang, Ker Jer Huang, Wern Dare Jheng

2203 Self Assembled ZnO Nanowire Field Effect Transistors

[Elena Matei, Camelia Florica, Andrea Costas, Monica Enculescu, Ionut Enculescu](#)

2204([Invited](#)) [Multi-Functional Flexible Healthcare Sensors and Integrated Circuits](#)

[Kuniharu Takei](#)

2205([Invited](#)) [Gold Nanobridge Enhanced Fiber Optic Sensor](#)

[Adam Floyd, Brian Scott, Yunbin Song, Michael Fraser, Zhihao Yu, Anbo Wang, Gary Pickrell](#)

2206([Invited](#)) [Thermal Management of Metal Oxide Nanowire Sensor](#)

[Takeshi Yanagida](#)

2207[Fluorescence Microscopy Characterization of Patterned Nano-Crystalline Quantum Dot Films](#)

[Ala Sabeeh, Jared Price, Jerzy Ruzyllo](#)

2208([Invited](#)) [Towards High-Power All-Solid-State Batteries](#)

[Ruben-Simon Kühnel, Léo Duchêne, Elsa Roedern, Arndt Remhof, Corsin Battaglia](#)

2209[Individual-Particle Electron Tomography: A Method for Monitoring the 3D Structure of Low-Dimensional DNA-Based Nanodevice](#)

[Gang \(Gary\) Ren](#)

2210([Invited](#)) [High Density Individually Addressable Nanowire Arrays for Intracellular Mapping of Neuronal Activity](#)

[Shadi Dayeh](#)

2211([Invited](#)) [High-Performance Wearable Supercapacitor Textiles](#)

[Zijian Zheng](#)

[2212\(Invited\) Layered \(III-Se\) Photodetectors](#)

[Kaiyou Wang](#)

[2213\(Invited\) Facile Horizontal GaAs Nanowire Schottky Solar Cells with Record High Efficiency](#)

[Ning Han, Johnny C Ho](#)

[2214A Novel Core-Shell Structure of Anti-Reflection Layer for Cu\(In,Ga\)Se<sub>2</sub> Solar Cell Application](#)

[Chia-Wei Chen, Hung-Wei Tsai, Teng-Yu Su, Wei-Sheng Lin, Stuart Richard Thomas, Yu-Lun Chueh](#)

[2215Three-Dimensional Arrays of Lead Halide Perovskite Nanowire Based Image Sensors](#)

[Zhiyong Fan, Leilei Gu, Mohammadmahdi Tavakoli, Daquan Zhang](#)

[2216\(Invited\) Bottom-up Growth of Fully Transparent Indium Tin Oxide Nanowire Layers for Enhanced Light Output for Light Emitting Devices](#)

[Colm O'Dwyer](#)

[2217Efficient and Flexible Perovskite Solar Cell Based on Inverted-Nanocone Structure with Enhanced Mechanical Properties](#)

[Xizi Chen, Mohammad Mahdi Tavakoli, Qingfeng Lin, Siu-Fung Leung, Zhiyong Fan](#)

[2218Chemical Vapor Deposition Growth of High Density Perovskite Nanowire Arrays and Their Applications in Optoelectronic Devices](#)

[Daquan Zhang, Leilei Gu, Mohammad Mahdi Tavakoli, Zhiyong Fan](#)

[2219\(Invited\) Understanding the Energy Band Alignment in Inverted Organic Thin-Film Photovoltaic Devices](#)

Liwei Chen

2220 Flexible High Performance Hybrid Azo/Ag-Nanowire/Azo Sandwich Structured Transparent Conductors for Flexible Cu(In,Ga)Se<sub>2</sub> Solar Cell Applications

Stuart Richard Thomas, Yu-Lun Chueh, Wen-Chi Tsai, Zhiming Wang

2221 (Invited) Nanoscale Morphology Control in Halide Perovskite/Polymer Composites for Printed LEDs and Beyond

Zhibin Yu

2222 ZnO Nanowires Electrodeposited for UV Detector Applications

Cristina V. Manzano, Laszlo Pethö, Johann Michler, Laetitia Philippe

2223 Photovoltaic Cell Using p-WSe<sub>2</sub>/n-MoS<sub>2</sub> Heterojunction for Optical Switching

Jongtae Ahn, Jin Sung Kim, June Yeong Lim, Sanghyuck Yu, Seongil Im

2224 Enhancement of Light Extraction Efficiency in Organic Light Emitting Diode with Nano-Scaled Random Patterns

Heon Lee, Yangdoo Kim

2225 OLED Operating Active Matrix Pixel Device Using Two Dimensional Transition Metal Dichalcogenides Channel FET

Sanghyuck Yu, Jin Sung Kim, Jongtae Ahn, June Yeong Lim, Seongil Im

2226 Photodetection of CVD-Grown MoSe<sub>2</sub> Monolayer Devices in Infrared Range

Min-Wei Chang, Ming-Yen Lu, Hsiang-Chen Wang

2227 (Invited) Insight into the Electrochemical Activation of Carbon-Based Cathodes for Hydrogen Evolution Reaction



[Johnny C Ho](#)

[2228\(Invited\) Contributions of Phase, Sulfur Vacancies, and Edges to the Hydrogen Evolution Reaction Catalytic Activity of Porous Molybdenum Disulfide Nanosheets](#)

[Yin Ying, Jiecai Han, Bo Song](#)

[2229Amorphous Cobalt-Iron Hydroxide Nanosheet Array Electrocatalyst for Efficient Electrochemical and Photoelectrochemical Oxygen Evolution](#)

[Xingwang Zhang, Wei Liu, Hu Liu](#)

[2230\(Invited\) Thermally-Enhanced Photo-Electrochemical Water Splitting](#)

[William C Chueh](#)

[2231\(Invited\) Texturization of MoS<sub>2</sub> Surface to Enhance Catalytic Property of Hydrogen Evolution Reaction](#)

[Daisuke Kiriya, Peter Lobaccaro, Hnin Yin Yin Nyein, Ali Javey](#)

[2232\(Invited\) Active Fe-Oxide on Iron Phosphorus Trichalcogenides \(FePS<sub>3</sub>\) Nanosheets Surface for Highly Efficient Electrocatalytic Oxygen Evolution](#)

[Bo Song](#)

[2233\(Invited\) Si/NiCoSe<sub>x</sub> Nanorods Photocathode for Enhanced Photoelectrochemical Hydrogen Production](#)

[Xingwang Zhang, Hongxiu Zhang, Denghong He](#)

[2234GaN MISIM Diode with High-k Dielectrics of ZrO<sub>2</sub> and Al<sub>2</sub>O<sub>3</sub> for UV Sensing](#)

[Gil-Ho Lee, Jeong-Hoon Seol, Jong-Ki An, Ju-Young Yun, Sung-Ho Hahm](#)

[2235Heterogeneous Integration of InGaAs Nanowires on Si\(111\) for Si Photonics](#)

[Kohei Chiba, Katsuhiro Tomioka, Fumiya Ishizaka, Akinobu Yoshida, Junichi Motohisa](#)

[2236 Synthesis of Alternate Layered Structure of Ruthenate Nanosheet-Graphene Oxide for Electrochemical Applications](#)

[Dai Mochizuki, Keita Ishimoto, Yusuke Ayato, Wataru Sugimoto](#)

[2237 Effects of Asymmetric Local Joule Heating on Silicon Nanowire-Based Devices and Their Applications](#)

[Hsiang-Hsi Ho, Wei-Che Tsai, Liang-Zheng Hong, Cheng-Han Lyu, Wen-Ching Chien, Hsun-Feng Hsu](#)

[2238 Controlling the Temporal Pulse Shape of the Passively Q-Switched Laser by Nonlinear Feedback Control](#)

[Makhin Thitsa, Zechariah Rice, Marcos Nve-Nsi, Xiaojie Xue](#)

[2239 ZnO Nanowire Device Fabricated By Hydrothermal Synthesis and Dielectrophoresis Method for Gas Sensor Applications](#)

[Cheng-Han Lyu, Kai-Heng Sun, Yu-Hung Wang, Hsun-Feng Hsu](#)

[2240 Vertically Stackable One-Dimensional p-n ZnO Homojunction Architectures for UV Sensing/Energy Harvesting Applications](#)

[WonBae Ko, SeungMo Yang, JungYup Yang, KapSoo Yoon, Jea-Gun Park, Jin-Pyo Hong](#)

[2241 Dielectrophoretic Alignment of Functional Nanowires for Chemical Sensing Application](#)

[Jaekyun Kim](#)

## **H05-Gallium Nitride and Silicon Carbide Power Technologies 6**

[2242 \(Invited\) Current Topics in Electronic Devices Based on Wide Band-Gap Semiconductors for Power Applications and Energy Efficiency](#)

[Eric P Carlson, Isik C. Kizilyalli, Timothy D Heidel, Daniel W Cunningham](#)

[2243 Ultra Large Scale Manufacturing Challenges of Silicon Carbide and Gallium Nitride Based Power Devices and Systems](#)

[Rajendra Singh, Amir A Asif](#)

[2244 \(Invited\) Vertical GaN High Voltage Transistors: Comparison with SiC Switches](#)

[Aristos Christou, David Shahin](#)

[2245 \(Invited\) Methods for Dynamic Analysis and Stability Assurance of Power Modules with Wide Bandgap Devices](#)

[Michael S. Mazzola, Maryam Rahmani](#)

[2246 \(Invited\) Wide Band-Gap on Its Hard Way up - The Trouble Starts Just Outside the Chip](#)

[Nando Kaminski](#)

[2247 \(Invited\) Novel Integrated Circuit Platforms Employing Monolithic Silicon CMOS + GaN Devices](#)

[Eugene A Fitzgerald, K.E. Lee, Li Zhang, C.C. Huang, A. Kadir, Shuyu Bao, Z. Ren, C. Wang, Y. Wang, Kwang Hong Lee, Z.H. Liu, Tomas Palacios, Chuan Seng Tan, G.I. Ng, S.J. Chua](#)

[2248 \(Invited\) Silicon Carbide as a Robust Neural Interface](#)

[Christopher L. Frewin, Evans E. Bernardin, Felix Deku, Richard Everly, Jawad Hassan, Joseph J. Pancrazio, Stephen E. Saddow](#)

[2249 \(Invited\) Probability of Low Off Angled 4H-SiC Epitaxial Wafers on Power Device Applications](#)

[Kazutoshi Kojima, Keiko Masumoto, Hirokuni Asamizu, Shinsuke Harada, Hajime Okumura](#)

[2250\(Invited\) Practical Considerations of Si Vs SiC Technology in High POWER, High Frequency Inverters for Industrial Induction Heating Applications](#)

[Enrique J. Dede, Jose Jordan, Vicente Esteve](#)

[2251\(Invited\) Reliability Study of RF Power Amplifiers with GaN-on-SiC HEMTs](#)

[Jenny Lang, Jang-Kwon Lim, Johan Hellen, Torbjörn M.J. Nilsson, Bo Schodt, Ralf Poder, Ilja Belov, Mietek Bakowski, Peter Leisner](#)

[2252Carbon-Doped GaN on SiC Materials for Low-Memory-Effect Devices](#)

[Jr-Tai Chen, Erik Janzén, Niklas Rorsman, Mattias Thorsell, Mats Andersson, Olof Kordina](#)

[2253\(Invited\) Physics of GaN High Electron Mobility Transistors](#)

[Michael Shur](#)

[2254\(Invited\) Electric Field Control in AlGaIn/GaN HEMTs Operating in the Kilovolt Regime](#)

[Brian D. Tierney, Sandeepan DasGupta, Sukwon Choi, Jeramy R. Dickerson, Shahed Reza, Sapan Agarwal, Albert G. Baca, Robert J. Kaplar, Matthew J. Marinella](#)

[2255\(Invited\) Manufacturing Microwave AlGaIn/GaN High Electron Mobility Transistors \(HEMTs\) on Truly Bulk Semi-Insulating GaN Substrates](#)

[Anna Barbara Piotrowska, Eliana Anetka Kaminska, Wojciech Wojtasiak, Wojciech Gwarek, Robert Kucharski, Marcin Zajac, Pawel Prystawko, Piotr Kruszewski, Marek Ekielski, Jakub Kaczmarek, Maciej Kozubal, Artur Trajnerowicz, Andrzej Taube](#)

[2256\(Invited\) RF Power Performance of Nanocrystalline Diamond Coated InAlN/AlN/GaN HEMTs](#)

[Brian P. Downey, David J. Meyer, Mario G. Ancona, Tatyana I Feygelson, Bradford B Pate, Jason A. Roussos, Marko J. Tadjer, Travis J Anderson, Matthew T Hardy, Neeraj Nepal, Charles R. Eddy](#)

[2257\(Invited\) Improved Vertical GaN Diodes with Mg Ion Implanted Junction Termination Extension](#)

[Travis J Anderson, Andrew D. Koehler, Boris Feigelson, Karl D Hobart, Francis J Kub](#)

2258 [Advances in AlGaIn/GaN HEMT Surface Passivation](#)

[Andrew D. Koehler, Marko J. Tadjer, Travis J Anderson, P. Chojecki, Karl D Hobart, Francis J Kub](#)

2259 [\(Invited\) Simulation of the Effects of As-Grown Defects on GaN-Based Power HEMTs](#)

[Shrijit Mukherjee, Erin Patrick, Mark E Law, Fan Ren, Stephen J. Pearton](#)

2260 [Non-Pressure Joining Method for Zn-Al Solder by Pre-Ultrasonic Bonding](#)

[Hidekazu Tanisawa, Hiroki Takahashi, Fumiki Kato, Kenichi Kouji, Shinji Sato, Yoshinori Murakami, Hiroshi Sato](#)

2261 [Interfacial Transitional Layer in SiO<sub>2</sub> Film Thermally Grown on SiC\(000-1\)](#)

[Ryu Nagai, Nozomu Iitsuka, Kodai Ozawa, Ryu Hasunuma, Kikuo Yamabe](#)

2262 [Deep Trap Levels Responsible for Current Collapse in AlGaIn/GaN MISFET](#)

[Jeong-hoon Seol, Hee-Sung Kang, Gil-Ho Lee, Jung-Hee Lee, Sung-Ho Hahm](#)

2263 [The Novel Way to Inspection Technique for SiC Substrate by Applying Stress Effects](#)

[Yoshitaro Sakata, Nao Terasaki, Kazuhiro Nonaka](#)

2264 [Characterization and Comparison of Planar and Trench Silicon Carbide \(SiC\) Power MOSFETs](#)

[Zhiqiang Wang, Madhu Chinthavali, Steven Campbell](#)

2265(Invited) SiC Growth Parameter Evolution Utilizing Infrared Thermal Imaging Towards Realization of Extremely Low Dislocation Bulk SiC

Andrew Joseph Trunek

2266(Invited) Investigation on the Carbon Supply in the Top Seeded Solution Growth of SiC Bulk Crystal

Seong Min Jeong, Minh-Tan Ha, Ji-Young Yoon, Ji Eun Lee, Byeong-Guen KIM, Myung Hyun Lee, Younghee Kim

2267(Invited) Sublimation Growth of 3C-SiC: Status and Prospects

Valdas Jokubavicius, Mikael Syväjärvi, Rositsa Yakimova

2268(Invited) Schematic Description of the Internal Stress Distribution Responsible for Defect Generation in Larger-Diameter PVT-Grown 4H-SiC Single Crystals

Tatsuo Fujimoto, Masashi Nakabayashi, Shohji Ushio, Komomo Tani, Masakazu Katsuno, Shinya Sato, Hiroshi Tsuge

2269(Invited) Study on the Role of Thermal Stress on Prismatic Slip of Dislocations in 4H-SiC Crystals Grown by PVT Method

Jianqiu Guo, Yu Yang, Ouloide Yannick Goue, Balaji Raghothamachar, Michael Dudley

2270(Invited) 4H-SiC Ion Implanted Bipolar Junctions: Relevance of the 1950°C Temperature for Post Implantation Annealing

Roberta Nipoti, Antonella Parisini, Giovanna Sozzi, Maurizio Puzanghera, Andrea Parisini, Alberto Carnera

2271(Invited) Progress in Buried Grid Technology for Improvements in on-Resistance of High Voltage SiC Devices

Adolf Schöner, Hossein Elahipanah, Nicolas Thierry-Jebali, Sergey A. Reshanov, Wlodek Kaplan, Andy Zhang, Jang-Kwon Lim, Mietek Bakowski

[22724H-SiC V-Groove Trench MOSFETs with Low Specific On-State Resistance and High Reliability](#)

[Yasuki Mikamura, Kosuke Uchida, Yu Saitoh, Toru Hiyoshi, Takeyoshi Masuda, Takashi Tsuno](#)

[2273\(Invited\) Threshold Voltage Modulation By Interface Charge Engineering for High Performance Enhancement-Mode Al<sub>2</sub>O<sub>3</sub>/GaN Power Mosfets](#)

[Qi Zhou, Anbang Zhang, Yuanyuan Shi, Zeheng Wang, Li Liu, Wanjun Chen, Bo Zhang](#)

[2274Characterization of Interface State Density of SiO<sub>2</sub>/SiC \(000-1\) Based on Oxygen Concentration at the Interface during Thermal Oxidation](#)

[Ryu Hasunuma, Kohei Hanasato, Kikuo Yamabe](#)

[2275Direct Observation of Energy Distribution of Interface States at SiO<sub>2</sub>/4H-SiC Interface](#)

[Yoshiyuki Yamashita, Ryu Hasunuma, Takahiro Nagata, Toyohiro Chikyow](#)

[2276\(Invited\) Study of Minority Carrier Lifetime Killer by Synchrotron X-Ray Topography](#)

[Ouloide Yannick Goue, Jianqiu Guo, Yu Yang, Balaji Raghothamachar, Michael Dudley](#)

[2277Characterization of Leakage Causing Visible Epitaxial Defects Nucleating from Crystal Defects in the Substrate](#)

[Hrishikesh Das, Swapna Sunkari, Hans Naas](#)

[2278TEM Study on Microstructure of Stacking Fault Nucleation Sites in 4H-SiC P-I-N Diodes](#)

[Yu Nakamura, Tomoaki Frushou, Shigehisa Yamamoto](#)

[2279Investigation of Penetration Depth and Defect Image Contrast Formation in Grazing Incidence X-ray Topography of 4H-SiC Wafers](#)

[Yu Yang, Jianqiu Guo, Ouloide Yannick Goue, Balaji Raghothamachar, Michael Dudley, G Chung, E Sanchez, I Maning](#)

### **H06-Fundamentals and Applications of Microfluidic and Nanofluidic Devices 3**

2280([Invited](#)) [Ultrasensitive Sensors Based on Solid State Nanopores](#)

[Yun Fei Chen, Wei Si, Hong Tan, Jingwen Yu](#)

2281([Invited](#)) [Analytical Models for Field Effect Control of Electrokinetic Transport Phenomena in Nanofluidics](#)

[Yu Ma, Shizhi Qian, Li-Hsien Yeh](#)

2282 [Noise and Sensitivity Characteristics of Solid-State Nanopores with 2-D Membranes](#)

[Kyeong-Beom Park, Hyung-Jun Kim, Hyun-Mi Kim, Ki-Bum Kim](#)

2283 [Towards Understanding the Ion Transport in Polyelectrolyte-Modified Nanopores with Bipolar Charges](#)

[Chih-Yuan Lin, Li-Hsien Yeh, J.P. Hsu](#)

2284 [Photo-Induced Ionic Noise in Si and Quartz Based Solid-State Nanopore Device](#)

[Hyung-Jun Kim, William H Pitchford, Kyeong-Beom Park, Hyun-Mi Kim, Joshua B Edel, Ki-Bum Kim](#)

2285 [Temperature Sensitive of Ionic Conductance in Alumina Nanochannels](#)

[Yen-Shao Su, Li-Hsien Yeh](#)

2286([Invited](#)) [Microfluidic Synthesis of Functional Nanomaterials](#)

[Jiashu Sun](#)



[2287Design and Fabrication of Ag / AgCl Composite Reference Electrode Based on Microfluidic Chip](#)

[Li Chen, Xiaolin Zheng, Ning Hu, Yanjian Liao](#)

[2288Comparison of Six Different Printed Ag Inks for Coulometric Removal of Chloride Ions from Seawater: Towards an Integrated Microfluidic Platform for Desalination](#)

[Marianna Figuera, Peter D. Van der wal, Herbert Shea](#)

[2289Deformation Measurement of the Hybrid Cells Using a Microfluidic Array Device](#)

[Xiaoling Zhang, Jun Yang, Ning Hu, Xiaolin Zheng](#)

[2290How Microfluidics Can Help to Understand and Promote Nerve Healing after Injury: A Neurobiological Microfluidic Device with Electrophysiological Functionality](#)

[Heinz Wanzenboeck, Patrick Schuller, Emmerich Bertagnolli](#)

[2291\(Invited\) Automatic Particle and Cell Detection and Manipulation in a Microfluidic Chip](#)

[Yongxin Song](#)

[2292\(Invited\) Electroosmotic Flow-Driven Ion Current Rectification and Negative Differential Electrolyte Resistance in Nanofluidics](#)

[Li-Hsien Yeh](#)

[2293Heat Transfer Enhancement By Elastic Turbulence in a Micro Curvilinear Channel](#)

[Hong Na Zhang, Dong Yang Li, Xiao Bin Li, Feng Chen Li](#)

[2294A Microfluidic Electrochemical Cell with Integrated Palladium Hydride Reference Electrode](#)

[Espen Vinge Fanavoll, David A. Harrington, Svein Sunde, Frode Seland](#)

[2295 Direct Numerical Simulation of Particle Segregation and Dynamics in Inertial Microfluidics By Discrete External Boundary Force-Lattice Boltzmann Method](#)

[Yi Huang, Zhaohui Liu, Chuguang Zheng, Shizhi Qian](#)

[2296 \(Invited\) Engineering Nonlinear Electrokinetic Flows at Polarizable Interfaces](#)

[Zachary Gagnon](#)

[2297 Dynamics of High Weber Number Droplets Impacting on Hydrophobic Surfaces with Closed Micro-Cells](#)

[Rui Zhang, Feng He, Pengfei Hao](#)

[2298 Numerical Study on the Heat Transfer Performance of Non-Newtonian Fluid Flow in a Manifold Microchannel Heat Sink](#)

[Si Ning Li, Hong Na Zhang, Qian Li, Meng Zhang, Xiao Bin Li, Feng Chen Li](#)

[2299 Dynamic Characteristics of Air-Water Interface in a Patterned Microchannel](#)

[Jingxian Zhang, Yucheng Jie, Zhaohui Yao](#)

[2300 A Computational Model for Natural Convection and Forced Convection in Redox MHD Systems Based on Electroneutrality and Migration](#)

[KM Isaac, Fangping Yuan](#)

[2301 Numerical Simulation of Thermal Diffusion and Convection in Electrokinetic Microchannel Flow](#)

[Kai Zhang, XiaoFei Lv](#)

[2302 Miniaturized Redox Flow Batteries for Electronic Applications: CFD Modeling](#)

[Brijesh Kumar, Atul Bhargav, Patrick Ruch](#)

[2303 Viscoelastic Slip Velocity for Microscale Electrokinetic Flows](#)

[Sang W. Joo, Amir Saadat, Bamin Khomami](#)

2304[Micro Printing Using Microfluidics for Printed Biodegradable Devices in Trillion Sensing](#)

[Nao Terasaki, Kristen Dorsey, Mitsutoshi Makihata, Albert P Pisano](#)

2305[Electric Field-Driven Particle Separation in a Bifurcating Microchannel](#)

[Di Li, Xinyu Lu, Yongxin Song, Junsheng Wang, Dongqing Li, Xiangchun Xuan](#)

2306[Electroosmotic Flow through a Tubular Channel](#)

[Bo-Tau Liu, Ci-Da Li](#)

## **H07-Emerging Nanomaterials and Devices**

2307[\(Invited\) Highly Functional Graphene Nano-Electromechanical \(GNEM\) Devices for Advanced Switch and Sensor Applications](#)

[Hiroshi Mizuta, Jian Sun, Marek E. Schmidt, Manoharan Muruganathan](#)

2308[Enhancement of the Extent of In Situ Transfer-Free Few-Layer Graphene by Solid Carbon Source for Use in Gas Sensor Applications](#)

[Dennis Noll, Udo Schwalke](#)

2309[Electrical Measurement of the Band Gap of Molybdenum Ditelluride and Black Phosphorus in Ambipolar Transistors with Graphene Source/Drain Contact](#)

[June Yeong Lim, Jin Sung Kim, Jongtae Ahn, Sanghyuck Yu, Seongil Im](#)

2310[\(Invited\) Emerging Graphene Device Technologies](#)

[Mikael Östling, Anderson D Smith, Sam Vaziri, Szymon Sollami Delekta, Jiantong Li, Max Christian Lemme](#)

2311[Titanium Carbide MXene Flakes as Novel 2D Metallic Solution-Processed Films](#)

Marina Mariano, Olha Mashtalir, Francisco Antonio, Won-Hee Ryu, Bingchen Deng, Fengnian Xia, Yuri Gogotsi, André D. Taylor

2312 Single and Few Layered WS<sub>2</sub> Nanoflowers: Synthesis, Characterization and Their Piezoresponce

Jyh Ming Wu, Masimukku Srinivaas

2313 Theoretical Analysis and Experimental Optimization of Graphene/TMD Heterojunction Barristors

Jaewoo Shim, Yong-Hoon Kim, Jin-Hong Park

2314 Current Transport in Graphene/Copper Hybrid Nano Ribbon Interconnect: A First Principle Study

K M Mohsin, Ashok Srivastava, Ashwani K Sharma, Clay Mayberry, Md S Fahad

2315 (Invited) High-Yield Reconfigurable Silicon and Germanium Nanowire Transistors and Compact Logic Circuits

Walter M. Weber, André Heinzig, Jens Trommer, Tim Baldauf, Michael Raitza, Matthias Grube, Sebastian Pregl, D.-Y. Jeon, S.-J. Park, Violetta Sessi, Thomas Mikolajick

2316 Dual Gate Black Phosphorous Field Effect Transistors on Glass for NOR Logic and OLED Switching

Jin Sung Kim, June Yeong Lim, Sanghyuck Yu, Jongtae Ahn, Seongil Im

2317 Favorable Combination of Schottky Barrier and Junctionless Properties in Field-Effect Transistors for High Temperature Applications

Tillmann Adrian Krauss, Frank Wessely, Udo Schwalke

2318 High Photoresponsivity Multilayer MoS<sub>2</sub> Thin-Film Transistors with Local Bottom Gate Structure

[Seongin Hong, Ok Jin Kim, Gyuchull Han, Junyeon Kwon, Na Liu, Young Ki Hong, Dong Hak Kim, Inturu Omkaram, Youngki Yoon, Sunkook Kim](#)

2319 [Turning the n-Type CdS to p-Type CdS Nanowires By Surface Charge Transfer Doping](#)

[Hsin-Ju Chen, Hsiang-Chen Wang, Ming-Pei Lu, Ming-Yen Lu](#)

2320 [\(Invited\) Electrical and Structural Origin of Self-Healing Phenomena in Pentacene Thin Film Transistors](#)

[Evan S. H. Kang, Hongbin Zhang, Wolfgang Donner, Heinz von Seggern](#)

2321 [High Performance Organic Photovoltaics with Transparent Oxide Interlayer](#)

[Hyeok Kim](#)

2322 [Yolk-Shell Nanocrystals for Efficient Photoelectrochemical Water Splitting](#)

[Ting-Hsuan Lai](#)

2323 [Surmofs and Cncs As Novel Tuneable Materials for Optical, Photonic and Solar Energy Materials](#)

[Engelbert Redel](#)

2324 [\(Invited\) Compliance-Free Pulse Forming of Filamentary RRAM](#)

[Pragya Shrestha, David Malien Nminibapiel, J. H. Kim, Helmut Baumgart, K. P. Cheung, J P Campbell](#)

2325 [Impact of Etch Process on Hafnium Dioxide Based Nanoscale RRAM Devices](#)

[Karsten Beckmann, Josh Holt, Wilkie Olin-Ammentorp, Joseph Van Nostrand, Nathaniel Cady](#)

2326 [One Step Synthesis of Au Nanoparticle-Cyclized Polyacrylonitrile Composite Films and Their Use in Organic Nano-Floating Gate Memory Applications](#)

[Se-Phin Cho, Sukjae Jang, Hae-Na Jo, Sang-A Lee, Sukang Bae, Sang Hyun Lee, Junyeon Hwang, Han-Ik Joh, Gunuk Wang, Tae-Wook Kim](#)

2327 [Resistance Switching in Individual Hydrogen Silsesquioxane \(HSQ\) Nanopillars](#)

[Wing Hung Ng, Mark Buckwell, Adnan Mehonic, Anthony Joseph Kenyon](#)

2328 [\(Invited\) Epitaxial Oxides on Silicon for CMOS and Beyond](#)

[H. Joerg Osten](#)

2329 [Effect of MoO<sub>3</sub> Vapor Flow to Large Area MoS<sub>2</sub> Few-Layered Films Growth](#)

[Hung-Yi Chen, Hsiang-Chen Wang, Wen-Wei Wu, Ming-Pei Lu, Ming-Yen Lu](#)

2330 [Probing the Growth Mechanisms of Vertical-Stacked and Lateral-Grown MoS<sub>2</sub> Few Layers](#)

[Ya-Ting Chung, Ming-Yen Lu, Hsiang-Chen Wang](#)

2331 [Mechanical Transfer of Large-Scale Two-Dimensional Materials Onto Arbitrary Substrates Via Water-Penetration-Assisted Method](#)

[Shen Lai, Sungjoo Lee](#)

2332 [Fabrication of MoS<sub>2</sub> Thin Film at Low Temperature By Atmospheric-Pressure Solution Based Mist CVD](#)

[Shota Sato, Toshiyuki Kawaharamura](#)

2333 [\(Invited\) All-Carbon Integrated Circuits for Flexible/Stretchable Electronics](#)

[Yutaka Ohno](#)

2334 [Evaluation of Different High K Materials for In situ Growth of Carbon Nanotubes](#)

[Martin Keyn, Tillmann Adrian Krauss, Andreas Kramer, Udo Schwalke](#)

[2335 High-Performance Photodetectors Using Transition Metal Dichalcogenide \(TMD\)-based Hybrid Structures](#)

[Seo-Hyeon Jo, Jin-Hong Park](#)

[2336 Multiphysics Simulations of Photoelectron Generation and Transport in Dye Sensitized TiO<sub>2</sub> Nanorod-Based Solar Cells](#)

[Dailin Li, Chuanfa Zhang, Samuel J. Peterson, Lifeng Dong](#)

[2337 Thermoelectric Properties of Highly Ordered Metal-Organic Framework Films](#)

[Xin Chen, Zhengbang Wang, Pengtao Lin, Kai Zhang, Helmut Baumgart, Engelbert Redel, Christof Wöll](#)

[2338 Direct Determination of the Barrier Height of Au Contact on p-Type Ultrananocrystalline Diamond/Hydrogenated Amorphous Carbon Composite Films](#)

[Takanori Hanada, Shinya Ohmagari, Abdelrahman Zkria, Tsuyoshi Yoshitake](#)

[2339 Oxidation of CuSn Alloy Nano-Tree and Application for Gas Sensors](#)

[Naoto Kaneko, Tomohiro Shimizu, Takeshi Ito, Yoshihiro Tada, Shoso Shingubara](#)

[2340 Photoconduction of p-type Ultrananocrystalline Diamond/Hydrogenated Amorphous Carbon Composite Films in Metal-Semiconductor-Metal Geometry](#)

[Takanori Hanada, Shinya Ohmagari, Abdelrahman Zkria, Tsuyoshi Yoshitake](#)

[2341 Enhanced Photocurrents in the Vertically Aligned Hybrid CdTe-Si One-Dimensional Nanostructures with High Surface Area](#)

[Jinho Lim, Sung-Hwan Hwang, Hyunsung Jung](#)

[2342 An Organic Metal Halide Tandem Solar Cell Embracing Non-Toxic Tin Perovskite](#)

[Hoang Minh Tam, Oh Ilhwan](#)

2343 Wafer-Level Fabrication and Characterization of Amorphous Thin Films MoS<sub>2</sub> Prepared by RF Magnetron Sputtering Technique

Kim R Gustavsen, Ken A Nygård, Preben Honerød-Bentsen, Kang Du, Guohua Liu, Muhammad Tayyib, Dag W Breiby, Kristian Weibye, Ola Nilsen, Knut E Aasmundevit, Kaiying Wang

2344 Nizo/Ag/Nizo Multilayer Films for Transparent Conducting Electrodes of Polymer Dispersed Liquid Crystal-Based Smart Windows

Eun Mi Kim, Nam Ho Kim, Young Baek Kim, Gi-Seok Heo

2345 Medical Implants from a Unique Technology Combining a Highly Flexible Integration of Passives with Outstanding Performances

Catherine Bunel

2346 Fabrication of a-C Semiconductor Nanoparticles for Quantum Dots Surface Emitting Laser Using High-Density Plasma in Localized Area

Ryutaro Kobayashi, Yoshiya Nagata, Keigo Okafuji, Shinpei Ohtomo, Hiroshi Naragino, Kensuke Honda

2347 Development of Silicon and Carbon Based p-Type Amorphous Semiconductor Films with Optical Gap Variable for High-Efficiency Multi-Junction Solar Cells

Hiroshi Naragino, Yoshiya Nagata, Keigo Okafuji, Shinpei Ohtomo, Yuta Shimizu, Kensuke Honda

2348 Roll-to-Roll Sputtered ITO/Ag/ITO Multilayers for Highly Transparent and Flexible Electrochromic Applications

Tae-Ho Kim, Sung-Hyun Park, Doo-Hee Kim, Yoon-Chae Nah, Han-Ki Kim

2349 Template-Free Electrochemical Synthesis of Selenium Nanowires

Saba Seyedmahmoudbaraghani, Nosang Vincent Myung

**I01-Polymer Electrolyte Fuel Cells 16 (PEFC 16)**



2350Operando Resonant Soft X-Ray Scattering As a Spatio-Chemical Characterization Technique for Electrochemistry

Isvar A. Cordova, Cheng Wang, Adam Z Weber, Rachel A. Segalman, Michael A. Brady, Gregory M. Su

2351Effect of Flow Field Configuration on Oxygen Transport Resistances in Proton Exchange Membrane Fuel Cell Cathode

Jash Karani, Udit N Shrivastava, Kazuya Tajiri

2352Relation Between Current Density Distribution in Land-Channel Direction and Presence of Liquid Water in Proton Exchange Membrane Fuel Cell Flow Channel

Jash Karani, Udit N Shrivastava, Kazuya Tajiri

2353Identification of Polarization Losses in High-Temperature PEM Fuel Cells by Distribution of Relaxation Times Analysis

Stefan Schindler, Alexandra Weiß, Samuele Galbiati, Florian Mack, Michael A. Danzer, Roswitha Zeis

2354A New Membrane Electrode Assembly Structure with Novel Flow Fields for Polymer Electrolyte Fuel Cells

Jaehyung Park, Ugur Pasaogullari, Leonard J. Bonville

2355Optimization of Polymer Electrolyte Membrane Fuel Cells with a Large Number of Degrees of Freedom

Petru Andrei, James Lamb, Grayson Mixon

2356PEMFC Reactant Mass Transfer Coefficient Measurement and Separation – Method Extension to the Mixed Kinetic and Mass Transfer Control Regime

Jean St-Pierre, Tatyana V. Reshetenko

2357Investigation of MPL Effect on PEFC Cold Start

[Jiaxun Zhou, Xu Xie, Kui Jiao](#)

[2358 Failure Point Analysis of Membrane Electrode Assemblies with Coating Irregularities](#)

[Adam Phillips, Guido Bender, Jocelyn Mackay, Jason Morgan Porter, Michael Ulsh](#)

[2359 Accelerated Degradation of Polymer Electrolyte Membrane Fuel Cell Gas Diffusion Layers: Mass Transport Resistance and Liquid Water Accumulation at Limiting Current Density with in operando Synchrotron X-ray Radiography](#)

[Michael G George, Hang Liu, Rupak Banerjee, Nan Ge, Pranay Shrestha, Daniel Muirhead, Jongmin Lee, Stéphane Chevalier, James Hinebaugh, Matthias Messerschmidt, Roswitha Zeis, Joachim Scholta, Aimy Bazylak](#)

[2360 The Effect of Nitrogen Cross-Over on Water Balance Measurements in Proton Exchange Membrane Fuel Cell Using Constant Temperature Anemometry](#)

[Saher Al Shakhshir, Torsten Berning, Søren Knudsen Kær](#)

[2361 Advanced Characterization of Electrocatalyst Interfaces](#)

[Yuyan Shao, Langli Luo, Yingwen Cheng, Mark H Engelhard, Jun Liu, Chongmin Wang](#)

[2362 Cobalt Phosphide Based Nanostructures as Bifunctional Electrocatalysts for Low Temperature Alkaline Water Splitting](#)

[Timothy N. Lambert, Julian A. Vigil, Ben Christensen](#)

[2363 A Hydrogen Evolution Reaction Catalyst Using Nickel Phosphides with Mixed Crystalline Structure](#)

[Gaoyang Liu, Juyuan Xu, Xindong Wang, Hui Li, Haijiang Wang](#)

[2364 Monocrystalline Ni<sub>12</sub>P<sub>5</sub> Hollow Spheres with Ultrahigh Specific Surface Area As Advanced Electrocatalysts for the Hydrogen Evolution Reaction](#)

[Jinfa Chang, Songtao Li, Guoqiang Li, Liang Liang, Junjie Ge, Changpeng Liu, Wei Xing](#)

2365 [Deposition of Nickel Hydroxide on Pt/C to Improve the Efficiency of the Hydrogen Evolution Reaction in Solid-State Alkaline Water Electrolyzers](#)

[Guanxiong Wang, Javier Parrondo, Cheng He, Yanxin Li, Vijay K Ramani](#)

2366 [Hydrogen Evolution Reaction on Pt/RuO<sub>2</sub>-TiO<sub>2</sub> Electrocatalyst in Alkaline Media](#)

[Cheng He, Guanxiong Wang, Javier Parrondo, Vijay K Ramani](#)

2367 [Novel PGM-Free Electrocatalysts for Alkaline Electrolyzers](#)

[Alexey Serov, Nalin Andersen, Morgan George, Chris Capuano, Katherine E Ayers, Plamen Atanassov](#)

2368 [\(Invited\) Alkaline Water Electrolysis: Achieving High Current Densities](#)

[Marcelo Carmo, Fabian Tigges, Paul Paciok, Wiebke Lüke, Detlef Stolten](#)

2369 [Anion Exchange Membrane Electrolyzers Showing 1 A/cm<sup>2</sup> at Less Than 2 V](#)

[Richard I Masel, Zengcai Liu, Syed Sajjad](#)

2370 [Steps Towards Reactive Hydrogen Pumping](#)

[Brian Fane, Gabriel A. Goenaga, Thomas A. Zawodzinski](#)

2371 [Separation and Characterization of Overpotentials in Electrochemical Hydrogen Pump with a Reference Electrode](#)

[Yan Ming Hao, Hironori Nakajima, Akiko Inada, Kazunari Sasaki, Kohei Ito](#)

2372 [Gas Crossover Mitigation in PEM Water Electrolysis: Hydrogen Cross-over Benchmark Study of 3M's Ir-NSTF Based Electrolysis Catalyst-Coated Membranes](#)

[Dmitri Bessarabov, Andries Kruger, Sean M. Luopa, Jiyoung Park, Attila A. Molnar, Krzysztof A. Lewinski](#)

2373 [Gas Evolution at Porous Electrodes](#)

[Thomas Kadyk, Michael Eikerling](#)

2374 [Evaluating Operation Procedures of the Sulfur Depolarized Electrolyser for Hydrogen Production from Water](#)

[Andries Kruger, Jochen A. Kerres, Dmitri Bessarabov, Henning Krieg](#)

2375 [The Non-Monotonic Surface Charging Behavior of Platinum: Implications for Electrocatalysis in PEFC](#)

[Jun Huang, Jianbo Zhang, Michael Eikerling](#)

2376 [Toward Beyond-Volcano-Top Performance in Oxygen Reduction Reaction on Pt from First-Principles and Kinetic Calculations](#)

[Tamio Ikeshoji, Minoru Otani](#)

2377 [New Insights into Mechanistic Aspects of Oxygen and Hydrogen Peroxide Reduction in Aqueous Electrolytes](#)

[Nicholas Stefan Georgescu, Zhange Feng, Jing Xu, Daniel Scherson](#)

2378 [Considerations of Oxide Species Coverage on the Kinetic Parameters of Pt-Based Catalysts](#)

[Jason M Christ, Anusorn Kongkanand, Wenbin Gu, Swami Kumaraguru, Shyam S. Kocha, KC Neyerlin](#)

2379 [Carbon-Supported Pt Hollow Nanospheres As a Highly Efficient Electrocatalyst for the Oxygen Reduction Reaction](#)

[Baizeng Fang, Blaise A Pinaud, David P Wilkinson](#)

[2380 Investigation of a Correlation Between PEFC Operation Conditions and Electrocatalysts Degradation](#)

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

[2381 Effect of Temperature on Platinum Dissolution from PEFC Catalysts](#)

[Zhongqi Wang, Eiji Tada, Atsushi Nishikata](#)

[2382 Study on Dissolution Behavior of Pt-M Binary Alloys Under Potential Cycling By Channel Flow Multi Electrodes](#)

[Azusa Ooi, Eiji Tada, Atsushi Nishikata](#)

[2383 Structural Effects on Oxygen Reduction Activity of Carbon-Free Connected Platinum-Iron Nanoparticle Catalysts](#)

[Hidenori Kuroki, Takanori Tamaki, Shiho Nakanishi, Masashi Matsumoto, Kei Kubobuchi, Masazumi Arao, Hideto Imai, Yoshitaka Kitamoto, Takeo Yamaguchi](#)

[2384 Oxygen Reduction Reaction Mechanism of Connected Platinum-Iron Nanoparticle Catalysts Probed By EC-XPS](#)

[Masashi Matsumoto, Chihiro Yogi, Masazumi Arao, Hidenori Kuroki, Takanori Tamaki, Takeo Yamaguchi, Hideto Imai](#)

[2385 Modeling of Oxygen Diffusion Resistance in PEFCs in the Intermediate Potential Region](#)

[Takahisa Suzuki, Haruhiko Yamada, Yu Morimoto](#)

[2386 Molecular Dynamics Simulation of Oxygen Diffusivity, Solubility, and Permeability in Ionomer on Pt Surface](#)

[Yuya Kurihara, Takuya Mabuchi, Takashi Tokumasu](#)

[2387 Multi-Scale Modeling of Transports inside PEMFC By Combining Multi-Phase CFD Fuel Cell Model with Lattice Boltzmann Method](#)

[Sirivatch Shimpalee, Shinichi Hirano, Zijie Lu, Pongsarun Satjaritanun, Shohei Ogawa, Shawn Litster, Yottana Khunatorn, John W. Weidner](#)

2388 [Direct Simulations of Coupled Transport and Reaction on Nano-Scale X-Ray Computed Tomography Images of Platinum Group Metal-Free Catalyst Cathodes](#)

[Shohei Ogawa, Siddharth Komini Babu, Hoon T Chung, Piotr Zelenay, Shawn Litster](#)

2389 [Dimensionless Model Analysis of PEFC Cathode](#)

[Motoaki Kawase, Kazuhiro Yamaguchi, Miho Kageyama, Kazuyuki Sato, Gen Inoue](#)

2390 [The Optimization of PEM Fuel Cell Performance Using the CFD Method Combined with Experimental Validation](#)

[Guanghua Wei, Jiabin Lu, Fengjuan Zhu, Qinglei Zhang, Junliang Zhang](#)

2391 [A Multi-Scale Modeling Approach to Study and Design PEM Fuel Cells Catalyst Layers with Non-Precious Metals](#)

[Diana Constanza Orozco-Gallo, Thomas A. Zawodzinski](#)

2392 [A Monte Carlo Study on the Effect of Structural and Operating Parameters on the Water Distribution within the Microporous Layer and the Catalyst Layer of PEM Fuel Cells](#)

[Anahid Pournemat, Florian Wilhelm, Jan Haußmann, Severin Vierrath, Simon Thiele, Joachim Scholta](#)

2393 [Effect of Catalyst Distribution on Macroscopic MASS Transport Properties of a FUEL CELL Catalyst Electrode: Pore-Scale Modeling Approach](#)

[Uktam Salomov, Pietro Asinari](#)

2394 [Platinum Group Metal-Free Direct Hydrazine Alkaline Membrane Fuel Cells for Automotive Applications](#)

Plamen Atanassov, Alexey Serov, Kateryna Artyushkova, Ivana Matanovic, Tomokazu Sakamoto, Hirofumi Kishi, Koichiro Asazawa, Hirohisa Tanaka, Susumu Yamaguchi

2395 Identifying Performance-Limiting Mechanisms in Alkaline-Exchange-Membrane Fuel Cells Using Modeling: Strategy for Internally-Humidified Fuel Cells

Huai-Suen Shiau, Adam Z Weber

2396 Facilitated Direct Dimethyl Ether Fuel Cells through High Temperature Membrane Electrode Assemblies

Emory Sayre De Castro, Andrew Van Dyke, Xi Yin, Hoon T Chung, Piotr Zelenay

2397 Ionomer Layer Design of the Electrode Using PGM-Free Electrocatalysts for Anion Exchange Membrane Fuel Cells

Koichiro Asazawa, Aoi Takano, Eriko Nishino, Susumu Yamaguchi, Junpei Miyake, Makoto Uchida, Kenji Miyatake

2398 Improving Performance in Alkaline Membrane Fuel Cells through Enhanced Water Management

Travis J Omasta, Xiong Peng, Connor A Lewis, John Varcoe, William E Mustain

2399 First-Principles Study on Alloy Nanoparticles for Polymer Electrolyte Fuel Cell Catalyst

Yusuke Nanba, David Samuel Rivera Rocabado, Takayoshi Ishimoto, Michihisa Koyama

2400 (Invited) Genetic Algorithms and DFT for Accelerated Design of Nanoalloys

Paul C. Jennings, Steen Lysgaard, Vladimir Tripkovic, Heine A. Hansen, Tejs Vegge

2401 Performance and Durability of Pt-Ti Catalyst for Oxygen Electroreduction

Ting He

2402 Electrochemical Performance of Thin-Film Pt<sub>3</sub>y Electrodes in PEMFC

[Björn Eriksson, Niklas Lindahl, Björn Wickman, Rakel Wreland Lindstrom, Göran Lindbergh, Carina Lagergren](#)

2403[Exploring the Lanthanide Contraction to Tune the Activity and Stability of Pt](#)

[María Escudero-Escribano, Paolo Malacrida, Martin Hangaard Hansen, Ulrik Grønbjerg Vej-Hansen, Amado Andrés Velázquez-Palenzuela, Vladimir Tripkovic, Jakob Schiøtz, Jan Rossmeisl, Ifan E. L. Stephens, Ib Chorkendorff](#)

2404[\(Invited\) Engineering Modeling of PEM Water Electrolysis: A Survey](#)

[Boris Bensmann, Richard Hanke-Rauschenbach](#)

2405[Benchmarking MEA Performance and Durability for PEM Water Electrolysis](#)

[Brian Rasimick, Shuai Zhao, Karren More, Bryan S Pivovar, Hui Xu](#)

2406[Impact of Pressure and Temperature on Hydrogen Permeation in PEM Water Electrolyzers Operated at Asymmetric Pressure Conditions](#)

[Patrick Trinke, Boris Bensmann, Sven Reichstein, Richard Hanke-Rauschenbach, Kai Sundmacher](#)

2407[Overpotential Analysis in High Pressure Water Electrolysis](#)

[Michel Suermann, Thomas J. Schmidt, Felix N Büchi](#)

2408[Electrochemical Characterization of PEMECs Operating at Various Current Densities](#)

[Katrine Elsoe, Laila G.- Madsen, Guenther G. Scherer, Johan Hjelm, Mogens Bjerg Mogensen](#)

2409[\(Invited Plenary\) Honda Fuelcell Vehicle Development and Toward the Hydrogen Society](#)

[Takashi Moriya](#)



[2410\(Plenary\) Challenges in Going from Laboratory to Megawatt Scale PEM Electrolysis](#)

[Nemanja Danilovic, Katherine E Ayers, Christopher Capuano, Julie N Renner, Luke Wiles, Morgan Pertoso](#)

[2411\(Invited Plenary\) Oxygen Electrocatalysis over Transition Metal Oxides: Combining Electrochemistry with Modeling and in Situ Spectroscopy](#)

[Elena R. Savinova](#)

[2412\(Invited Plenary\) Improving the Catalytic Properties of Non-Precious Metal Catalysts - Milestones in the Development of Me-N-C Catalysts](#)

[Ulrike Ingrid Kramm](#)

[2413\(Invited Plenary\) Correlating Structure and Chemistry of PEM Fuel Cell Materials with Durability and Performance Using Advanced Microscopy Methods](#)

[Karren L. More, David A. Cullen, Brian Sneed, Deborah J Myers, Rod L. Borup, Rangachary Mukundan](#)

[2414\(Plenary\) Development of PFSA Ionomers and Their Use in Fuel Cells](#)

[Shinji Kinoshita, Tetsuji Shimohira, Atsushi Watakabe, Satoru Hommura, Susumu Saito, Toshihiro Tanuma, Kohta Yamada](#)

[2415\(Invited Plenary\) Aromatic Ionomers As Alternative Fuel Cell Membranes: Issues and Possibilities](#)

[Kenji Miyatake](#)

[2416\(Plenary\) Doing More with Less: Challenges for Catalyst Layer Design](#)

[Andreas Michael Vincent Putz, Darija Susac, Viatcheslav Berejnov, Juan Wu, Adam P Hitchcock, Jürgen Stumper](#)

[2417\(Plenary\) Electrochemical Diagnostics and Modeling in Developing the PEMFC Cathode](#)

[Anusorn Kongkanand, Venkata Yarlagadda, Taylor Reed Garrick, Thomas E Moylan, Wenbin Gu](#)

2418 [\(Invited\) The Role of Electrolysis in a Renewable Energy Economy](#)

[Christopher Hebling, Tom Smolinka](#)

2419 [Iridium Nanoparticles Supported on Magneli Phase  \$Ti\_4O\_7\$  for PEM Water Electrolyzers](#)

[Tsutomu Ioroi, Kazuaki Yasuda](#)

2420 [Optimization of Annealing Catalyst Powder for High Temperature PEMWE](#)

[Hua Li, Hironori Nakajima, Kohei Ito](#)

2421 [Nanoporous  \$IrO\_2\$  catalyst with Ultrahigh Specific Surface Area Synthesized through an Ammoniating Method for Acidic Oxygen Evolution](#)

[Guoqiang Li, Songtao Li, Changpeng Liu, Wei Xing, Junjie Ge](#)

2422 [Bifunctional Platinum-Cobal Oxide Catalysts for the Oxygen Reduction and Evolution Reactions](#)

[Lei Wang, Chao Wang](#)

2423 [\(Invited\) Conventional and Innovative Electrocatalysts for PEM Water Electrolysis](#)

[Pierre Millet](#)

2424 [The Effect of Alloying with Non-PGM Transition Metals on the Activity of Ir-Nstf Electrolyzer Catalysts](#)

[Krzysztof A. Lewinski, Sean M. Luopa, Dennis Franciscus van der Vliet](#)

2425 [Influence of Crystallinity, Particle Size, and Microstructure on the Oxygen Evolution Activity of  \$IrO\_2\$](#)

[Daniel F. Abbott, Dmitry Lebedev, Kay Waltar, Mauro Povia, Emiliana Fabbri, Maarten Nachtegaal, Christophe Coperet, Thomas J. Schmidt](#)

2426 [Mercury Underpotential Deposition to Determine the Electrochemical Surface Areas of Iridium and Iridium Oxide](#)

[Shaun M Alia, Shyam S. Kocha, Bryan S Pivovar](#)

2427 [Stability and Oer Activity of IrO<sub>x</sub> in PEM Water Electrolysis](#)

[Philipp J. Rheinländer, Maximilian Bernt, Yasin Incedag, Hubert A. Gasteiger](#)

2428 [Iridium Oxide Nanoparticles Supported on Polybenzimidazole-Wrapped Multi-Wall Carbon Nanotube As Efficient and Durable Electrocatalysts for Proton Exchange Membrane Water Electrolyzers](#)

[Tsuyohiko Fujigaya, Jun Yang, Kohei Ito, Yilei Shi, Naotoshi Nakashima](#)

2429 [\(Invited\) Effect of Cationic Group Chemisorption on Hydrogen Oxidation Reaction](#)

[Yu Seung Kim, Hoon T Chung, Ivana Matanovic](#)

2430 [Determining Kinetic Barriers to Alkaline Hydrogen Oxidation and Evolution Via Oxide Supports](#)

[Maureen Han-Mei Tang, Joshua David Snyder, Jennifer Gallup, Kiran Vasudevan](#)

2431 [Novel Electrocatalyst for Hydrogen Oxidation in Alkaline Media](#)

[Alexey Serov, Yu Seung Kim, Madeleine Odgaard, Barr Halevi, Plamen Atanassov](#)

2432 [A Durable CO-Tolerant Polymer-Coated Electrocatalyst Supported on a Nanoporous Carbon](#)

[Naotoshi Nakashima, Zehui Yang, Isamu Moriguchi](#)

2433 [\(Invited\) Efficient Electrocatalysts for Alcohol Oxidation and Oxygen Reduction in Alkaline Solutions](#)

[Kohei Miyazaki, Tomokazu Fukutsuka, Takeshi Abe](#)

2434 [Mechanistic Insights into Electrochemical Oxidation of Small Alcohol Molecules](#)

[Shalaka Dewan, David Raciti, Chao Wang](#)

2435 [Synthesis and Characterization of High Performance Pd-Metal Oxides \( \$\text{Fe}\_3\text{O}\_4\$ ,  \$\text{Fe}\_2\text{O}\_3\$  and  \$\text{CeO}\_2\$  nanorods\) for the Oxidation of Organic Molecules in Alkaline Media](#)

[J.E. Solis-Tobías, J.a. Díaz-Guillén, P.C. Meléndez-González, N. M. Sanchez-Padilla, R. Pérez-Hernández, I.L. Alonso-Lemus, F.J. Rodriguez-Varela](#)

2436 [Experimental Elucidation of the Oxygen Reduction Volcano in Base on a Pt Alloy Single Crystal](#)

[Kim Degn Jensen, Jakub Tymoczko, Aliaksandr S Bandarenka, Ib Chorkendorff, María Escudero-Escribano, Ifan E. L. Stephens](#)

2437 [Highly Efficient Nitrogen and Sulfur Co-Doped Three-Dimensional Graphene-Based Nanocatalysts for the ORR](#)

[Jie Wang, Min Wu, Zexing Wu, Huolin L. Xin, Deli Wang](#)

2438 [Spectrometric Quantification of the Rate of Carbon Corrosion on Oxygen Evolving Electrodes in Alkaline Media](#)

[Jasim Uddin, Hongjin Tan, Vincent Giordani, Gregory V Chase, Dan Addison](#)

2439 [Design of Organic-Inorganic Hybrid Nanocatalysts to Enhance Catalytic Activity and Durability for Oxygen Reduction Reaction](#)

[Namgee Jung, Sung Jong Yoo, Sung-Soo Kim, Jong-Ryul Jeong](#)

2440 [\(Invited\) Durable Nanoparticle for Fuel Cell Electrocatalyst](#)

[Yung-Eun Sung, Dong Young Chung](#)

2441 [Fine Tuning of the ORR Performance-Durability for Pt-Based Electrocatalysts](#)

[Pietro Papa Lopes, Dongguo Li, Haifeng Lv, Dusan Strmcnik, Paul Arvydas Paulikas, Nenad M Markovic, Vojislav Stamenkovic](#)

2442 [Mo-doped Shaped Nanoparticles based on PtNi-alloys – A Promising ORR catalyst?](#)

[Stefanie Kühn, Henner Heyen, Peter Strasser](#)

2443 [Mimicking Active Pt<sub>3</sub>ni \(111\) Surface on Pt<sub>3</sub>ni Icosahedron for Oxygen Reduction](#)

[Wei Xing, Jianbing Zhu, Meiling Xiao, Songtao Li, Junjie Ge, Changpeng Liu](#)

2444 [Oxygen Reduction Reaction at Binary and Ternary Nanocatalysts Based on Pt, Ni and Au](#)

[Styven Lankiang, Johannes Berndt, Stève Baranton, Amaël Caillard, Pascal Brault, Christophe Coutanceau](#)

2445 [Highly Active and Durable Extended Surface Oxygen Reduction Electrocatalysts](#)

[Shaun M Alia, Chilan Ngo, Sarah Shulda, Katherine Hurst, K.C. Neyerlin, Shyam S. Kocha, Svitlana Pylypenko, Bryan S Pivovar](#)

2446 [Unsupported Pt-Ni Aerogels As O<sub>2</sub>-Reduction Catalysts for PEMFCs](#)

[Sebastian Henning, Juan Herranz, Laura Kühn, Wei Liu, Alexander Eychmüller, Thomas J. Schmidt](#)

2447 [Performance of Platinum-Nickel Nanowires in a PEMFC](#)

[Scott A Mauger, K.C. Neyerlin, Shaun M Alia, Katherine Hurst, Sarah Shulda, Chilan Ngo, Johanna Nelson Weker, Svitlana Pylypenko, Bryan S Pivovar](#)

2448 [Up-Scaling the Pt Hollow Nanoparticle Materials: From the Laboratory Synthesis up to Large PEMFC Cell Integration](#)

[Fabrice Micoud, Marie Heitzmann, Christine Nayoze-Coyne, Thibaut Gutel, Raphaël Chattot, Tristan Asset, Laetitia Dubau, Laure Guetaz, Frédéric Maillard](#)

[2449A Controllable Synthesis of Pt-Based Electrocatalyst for the Oxygen Reduction Reaction of PEMFC with High Pt Utilization](#)

[Fengjuan Zhu, Liuxuan Luo, Shuiyun Shen, Guofeng Xia, Junliang Zhang](#)

[2450Development of Low Cost High-Temperature Polymer Electrolyte Fuel Cell Membrane-Electrode-Assemblies for Combined Heat and Power Plants in Single Family Homes](#)

[Alexander Schenk, Stefan Gamper, Christoph Grimmer, Birgit Elvira Pichler, Merit Bodner, Stephan Weinberger, Viktor Hacker](#)

[2451Effect of Flow-Field Structure on the Performance of Hydrogen/Bromine Redox Flow Batteries](#)

[Kyeongmin Oh, Hyunchul Ju](#)

[2452Effect of Operation Strategies on Phosphoric Acid Loss in HT-PEM Fuel Cells](#)

[Maren Rastedt, Francisco Javier Pinar, Nadine Pilinski, Alexander Dyck, Peter Wagner](#)

[2453Enduring Anion-Exchange Membrane Fuel Cells](#)

[Steven Holdcroft, Benjamin Britton, Andrew G. Wright, Thomas Weissbach](#)

[2454Combined Modeling and Experimental Analysis of Direct Methanol Microscale Fuel Cells](#)

[Adam S Hollinger, Daniel G Doleiden, Nazlihan O Argun, Kelly L Miller](#)

[2455\(Invited\) Modelling and Experimental Results for the Hydrogen Oxidation/Hydrogen Evolution Reactions: New Insights into the Performance of Polymer Electrolyte Fuel Cells and Electrolyzers](#)

[Anthony R. J. Kucernak, Kieran F. Fahy, Christopher Zalitis](#)

[2456Shorting in Polymer Electrolyte Fuel Cells: Aspects of Material Testing and Operating Conditions](#)

[Yeh-Hung Lai](#)

2457 [Investigations of Performance and Durability of PtNi-Alloy Based MEAs Utilizing In-Cell Diagnostics](#)

[Zhiwei Yang, Robert M. Darling, Mike L. Perry](#)

2458 [Investigating the Equilibration Time of Catalyst Coated Membranes Using AC and DC Methods](#)

[Philippe J. Côté, Caroline R. Cloutier, Dzmitry Malevich, Jon G. Pharoah](#)

2459 [Differential Cell Study on Impact of in-plane O<sub>2</sub> Diffusivity Under Load on O<sub>2</sub> Transport Loss](#)

[Swami Kumaraguru, Srikanth Arisetty, Wenbin Gu](#)

2460 [Development of Measurement Method and Simulation of Water Content Distribution of CCM of Fuel Cell](#)

[Kenji Nagumo, Hiroto Chiba](#)

2461 [Effect of Properties of Hydrophilic Microporous Layer \(MPL\) on PEFC Performance](#)

[Toshihiro Tanuma, Masako Kawamoto](#)

2462 [Indirect and Direct Observation of Ionomer Colloidal Systems with Applications to Fuel-Cell Catalyst Layers](#)

[Kelsey B. Hatzell, Ahmet Kusoglu, Peter Dudenas, Nancy Kariuki, Deborah J Myers, Adam Z Weber](#)

2463 [Air Breathing PEM Fuel Cells in Aviation](#)

[Steffen Flade, Thomas Stephan, Oliver Thalau, Torben Burberg, Johannes Schirmer, Josef Kallo](#)

2464 [Hydrogen Fuel Cells for Unmanned Undersea Vehicle Propulsion](#)

[Karen Swider-Lyons, Daniel Deitz](#)

2465 [Development Study of an Air Independent Fuel Cell System for an Autonomous Underwater Vehicle \(AUV\)](#)

[Manuel Hitscherich, Carsten Cremers, Detlef Stolten, Karsten Pinkwart, Jens Tübke](#)

2466 [Effect of Sulfate Contaminant on ORR Activity and PEMFC Performanc](#)

[Huyen N Dinh, Guido Bender, Jason M Christ, Jason W. Zack, Leah McGovern, Jacob Przywara, Christian Carey](#)

2467 [The Impact of Fuel Impurities on Pemfcs Using a Hydrogen Fuel Re-Circulation System](#)

[Tommy Rockward, Jacob Valdez, Rangachary Mukundan](#)

2468 [\(Invited\) Development of a Hydrogen Energy System as a Grid Frequency Management Tool](#)

[Mitch Ewan, Richard Rocheleau, Karen Swider-Lyons, Peter Devlin, Maheboob B.V. Virji, Guenter Randolph](#)

2469 [Advances in Electrochemical Hydrogen Compression and Purification](#)

[Peter Jaime Bouwman](#)

2470 [On-Board Hydrogen Powered Proton Exchange Membrane Fuel Cells](#)

[Tunc Eren Akay, Nazrin Abdullayeva, Mehmet Sankir, Nurdan Demirci Sankir](#)

2471 [\(Invited\) Core-Shell Hydride Nanoarchitectures for Reversible Hydrogen Storage](#)

[Francois Aguey-Zinsou](#)



[2472 Evaluation of Acid Accelerators for an Off-Grid PEM Fuel Cell Power Station Utilizing Solid Sodium Borohydride for Hydrogen Storage](#)

[Lewis Hsu, Mindy Huang, Greg Anderson, Arthur Rubio, Maxwell Kerber, Michael Putnam, Alex Phipps](#)

[2473 Carbon-Supported Gold and Silver Nanoparticles As Catalysts for Electroreduction of Oxygen in Alkaline Media](#)

[Pawel J Kulesza, Sylwia Zoladek, Beata Dembinska, Krzysztof Miecznikowski, Iwona Agnieszka Rutkowska](#)

[2474 Investigating Catalyst-Electrolyte Interface By Microelectrode, Infrared Reflection Adsorption Spectroscopy and Neutron Reflectometry](#)

[Joseph H Dumont, Rex Hjelm, Erik Watkins, Hoon T Chung, Ulises Martinez, Plamen Atanassov, Yu Seung Kim](#)

[2475 Optimization of Perovskite Oxide/Carbon Composites for Oxygen Reduction Reaction in Alkaline Media](#)

[Michael J. Dzara, Prabhuram Joghee, Jason M Christ, Chilan Ngo, Christopher A. Cadigan, Tim Batson, Ryan M. Richards, Ryan O'Hayre, Svitlana Pylypenko](#)

[2476 Oxygen Reduction Reaction of Tetraaza\[14\]Annulene Iron Complexes](#)

[Masafumi Asahi, Shin-ichi Yamazaki, Tsutomu Ioroi](#)

[2477 Effect of Silver Modification on Glycerol Oxidation Reaction Activity of Palladium Electrode in Alkaline Medium](#)

[Hiroshi Inoue, Yuki Teraoka, Masanobu Chiku, Eiji Higuchi](#)

[2478 Highly Active Nanocatalysts for Oxygen Reduction Reaction](#)

[Jin-Song Hu, Zidong Wei, Li-Jun Wan](#)

[2479 Carbon Supported Pt Nanocatalysts Decorated with Titanium Oxide By Coaxial Pulse Arc Plasma Deposition](#)

[Satoshi Tominaka, Bo Jiang, Cuiling Li, Victor Malgras, Yoshiaki Agawa, Hiroyuki Tanaka, Yusuke Ide, Yusuke Yamuchi](#)

2480 [Hydrothermal Synthesis of Co-N-C Nanocomposites As High Performance Electrocatalysts for Oxygen Reduction Reaction](#)

[Bo Nan, Zhouguang Lu, Fucong Lyu, Yang Shi, Haohong Shi, Sicen Yu](#)

2481 [Developing Cobalt Doped  \$\text{Pr}\_{0.5}\text{Ba}\_{0.5}\text{MnO}\_{3-\delta}\$  Electrospun Nanofiber Bifunctional Catalyst for Oxygen Reduction Reaction and Oxygen Evolution Reaction](#)

[Yaqian Zhang, Yi-Fei Sun, Jing-Li Luo](#)

2482 [Manganese Oxide/Poly\(3,4-ethylenedioxythiophene\) Hybrid Electrocatalysts for the Oxygen Reduction Reaction in Alkaline Fuel Cells](#)

[Timothy N. Lambert, Julian A. Vigil](#)

2483 [Synthesis and Evaluation of Core-Shell Electrocatalysts for Oxygen Reduction Reaction](#)

[Shangqian Zhu, Jeffrey Yue, Xueping Qin, Minhua Shao](#)

2484 [Development of Highly Active and Durable Pt-Pd System Catalysts for PEFCs](#)

[Hideo Daimon, Shunya Higuchi, Yuuki Matsui, Hisashi Kawasaki, Yui Noguchi, Naoya Aoki, Hideo Inoue, Takayuki Doi, Minoru Inaba](#)

2485 [Surface Structures and Electrochemical Stabilities for Pt/Pd\(111\) Model Electrocatalysts](#)

[Naoto Todoroki, Yohe Bando, Yuki Tani, Soma Kaneko, Hirofumi Watanabe, Toshimasa Wadayama](#)

2486 [\(Invited\) A General Strategy to Synthesize High-Performance Open Nanoframe Structured Catalysts](#)

[Pei Kang Shen](#)

[2487 Iridium-Platinum Core-Shell Nanoparticles As Catalysts for the Oxygen Reduction Reaction](#)

[Alaina Leigh Strickler, Ariel Jackson, Thomas F Jaramillo](#)

[2488 Investigation of the Performance of PtCo/C Cathode Catalyst Layers for ORR Activity and Rated Power for Automotive Pemfcs](#)

[K.C. Neyerlin, Jason W. Zack, Natalia Macauley, Rangachary Mukundan, Rod L. Borup, Karren L. More, Shyam S. Kocha](#)

[2489 Impact of Catalyst Ink Stirring Condition on Oxygen Transport within PEFC](#)

[Takashi Sasabe, Ting-Chu Jao, Suguru Uemura, Toshihiko Yoshida, Shuichiro Hirai](#)

[2490 Performance of Stratified Fuel Cell Catalyst Layer](#)

[Natalia Macauley, Rod L. Borup, Rangachary Mukundan, Mahlon S. Wilson, Dusan Spornjak, K.C. Neyerlin, Shyam S. Kocha, Stephen Grot](#)

[2491 Electrochemical Characterization of Free-Standing Platinum Nanoelectrode Array Using Atomic Layer Deposition for Polymer Electrolyte Fuel Cells](#)

[Dinesh C Sabarirajan, James Vlahakis, Robert D White, Iryna V Zenyuk](#)

[2492 New Insights from Electrochemical Diagnostics Pertaining to the High Current Density Performance of Pt-Based Catalysts](#)

[K.C. Neyerlin, Jason M Christ, Jason W. Zack, Wenbin Gu, Swami Kumaraguru, Anusorn Kongkanand, Shyam S. Kocha](#)

[2493 \(Invited\) Imaging Fuel Cell Components: From Flow Field Channels to Catalyst Layers](#)

[Dusan Spornjak, Rod L. Borup, Daniel S Hussey, Piotr Zelenay, Rangachary Mukundan](#)

[2494 Characterization of Water Cluster Connectivity and Fluid Transport in PEFC Gas Diffusion Layers](#)

[Jens Eller, Felix N Büchi](#)

2495 [Neutron Imaging Detector with Scintillation Light Magnification and Amplification](#)

[Daniel S Hussey, Jacob M LaManna, Elias Baltic, David L Jacobson](#)

2496 [Determining the Impact of Dynamic Load Conditions on Interfacial Liquid Water Accumulation in Polymer Electrolyte Membrane Fuel Cell Gas Diffusion Layers Using Synchrotron X-Ray Radiography](#)

[Rupak Banerjee, Nan Ge, Jongmin Lee, Michael Gerald George, Hang Liu, Daniel Muirhead, Pranay Shrestha, Stéphane Chevalier, James Hinebaugh, Aimy Bazylak](#)

2497 [Imaging Phosphoric Acid in HT-PEFC: What Has Been Learnt so Far?](#)

[Felix N Büchi, Sebastian H. Eberhardt, Jonathan Halter, Thomas J. Schmidt](#)

2498 [Combined Neutron and x-Ray Imaging Techniques for Enhanced Water Management Diagnostics](#)

[Jacob M LaManna, Daniel S Hussey, Elias Baltic, David L Jacobson](#)

2499 [Roles of Photon Scattering in Synchrotron X-ray Radiography of In Operando Visualizations of the Polymer Electrolyte Membrane Fuel Cell](#)

[Nan Ge, Stéphane Chevalier, James Hinebaugh, Michael Gerald George, Jongmin Lee, Rupak Banerjee, Hang Liu, Daniel Muirhead, Pranay Shrestha, Aimy Bazylak](#)

2500 [MRI Investigation of Local Diffusion Phenomena in PEFC Catalyst Ink](#)

[Yuki Kameya, Norio Iriguchi, Suguru Uemura, Takashi Sasabe, Toshihiko Yoshida, Shuichiro Hirai](#)

2501 [Nanoscale Imaging of Voltage Cycled Cathode Catalyst Layers in Polymer Electrolyte Fuel Cells](#)

[Senthil velan Venkatesan, Erik Kjeang](#)

[2502 Transmission X-Ray Microscopy 3-D Characterization of Pt-Ni Extended Surface Catalyst Electrodes](#)

[Sarah M Shulda, Johanna Nelson Weker, Chilan Ngo, Scott A Mauger, Shaun M Alia, K.C. Neyerlin, Bryan S Pivovar, Svitlana Pylypenko](#)

[2503 Fe-Ni Core-Shell Hydroxide Nanoparticles As an Active Oxygen Evolution Reaction \(OER\) Catalyst](#)

[Lauren F Greenlee, Stephanie L Candelaria](#)

[2504 Cobalt Alloyed Catalyst Combined with Carbide and Carbon As Efficient Oxygen Evolution Reaction Catalysts for Alkaline Water Electrolysis](#)

[MinJoong Kim, DongHoon Song, SeKwon Oh, EunAe Cho](#)

[2505 Investigation of Pt/C Catalysts Using Identical Location Transmission Electron Microscopy Under PEM Electrolysis Conditions](#)

[Paul Paciok, Marcelo Carmo, Wiebke Lüke, Marc Heggen, Detlef Stolten](#)

[2506 Gold-Supported Cerium-Doped NiO<sub>x</sub> Catalysts for Water Oxidation](#)

[Desmond Ng, Max Garcia-Melchor, Michal Bajdich, Pongkarn Chakthranont, Charlotte S Kirk, Aleksandra Vojvodic, Thomas F Jaramillo](#)

[2507 Electron-Conducting Perovskites As Oer Electrocatalysts in Alkaline Medium](#)

[Anchal Jain, Vijay K Ramani](#)

[2508 Mixed Oxide Electrocatalysts in Acidic Water Electrolysis: Activity and Stability Challenges](#)

[Olga Kasian, Simon Geiger, Alan Savan, Alfred Ludwig, Serhiy Cherevko, Karl J.J. Mayrhofer](#)

[2509 Gas Crossover Suppression by Controlling Wettability of Cathode Current Collector](#)

Kohei Ito, Takuya Sakaguchi, Yuta Tsuchiya, Akiko Inada, Hironori Nakajima, Ryo Saito

2510 Simplified Microwave Assisted Solvothermal One Pot Synthesis of Highly Active Nickel-Iron Layered Double Hydroxide as Oxygen Evolution Reaction Catalyst

Sören Dresp, Peter Strasser

2511 Improvement of Current Efficiency of a Membrane Electrolyzer for Electrohydrogenation of Toluene As Hydrogen Carrier Synthesis

Shigenori Mitsushima, Kensaku Nagasawa, Yuki Sawaguchi, Koichi Matsuzawa, Akihiro Kato, Yoshinori Nishiki

2512 Iron-Based Spinel Oxide Nanoparticles for Electrocatalysis of Oxygen Evolution Reaction

Weiyan Liu, Shaoxun Fan, Jia Li, Lin Gan

2513 Flexible Paper Based N-, P- Doped 3-D Graphene Framework Hosting Metal Oxides for Efficient Oxygen Evolution Reactions

Le Xin, Nojan Aliahmad, Jian Xie, Mangilal Agarwal

2514 (Invited) Polymer Electrolyte Fuel Cells Lifetime Prediction By a Full Multi-Scale Modeling Approach

Mathias Gerard, Christophe Robin, Marion Chandesris, Pascal Schott

2515 Recoverable Degradation Losses in PEM Fuel Cells

Rod L. Borup, Rangachary Mukundan, Dusan Spornjak, David A. Langlois, Natalia Macauley, Yu Seung Kim

2516 Durability of PtCo/C Cathode Catalyst Layers Subjected to Accelerated Stress Testing

Natalia Macauley, Rangachary Mukundan, David A. Langlois, K.C. Neyerlin, Shyam S. Kocha, Karren L. More, Madeleine Odgaard, Rod L. Borup

2517 Accelerated Degradation of Polymer Electrolyte Membrane Fuel Cell Gas Diffusion Layers: Performance Degradation and Steady State Liquid Water Distributions with in Operando Synchrotron X-ray Radiography

Hang Liu, Michael Gerald George, Nan Ge, Rupak Banerjee, Stéphane Chevalier, Jongmin Lee, Pranay Shrestha, Daniel Muirhead, James Hinebaugh, Roswitha Zeis, Matthias Messerschmidt, Joachim Scholta, Aimy Bazylak

2518 Measurement of Local Electrode Potentials in an Operating PEMFC Exposed to Contaminants

Jacob S Spendelow, Luis Castanheira, Gareth Hinds, Tommy Rockward, David A. Langlois, Rangachary Mukundan, Rod L. Borup

2519 In Situ Visualization of Cathode Catalyst Layer Degradation in Fuel Cells Using X-Ray Computed Tomography

Robin White, Alex Wu, Frank Orfino, Monica Dutta, Erik Kjeang

2520 The Effect of Airborne Bromomethane Contamination on PEMFC Performance

Yunfeng Zhai, Olga A Baturina, David E. Ramaker, Jean St-Pierre, Karen Swider-Lyons

2521 Look Insight Advances in Nano X-Ray Computed Tomography for Fuel Cells

Tom Engl, Erik Kjeang

2522 Ultralow Degradation Rates in HT-PEM Fuel Cells

Maren Rastedt, Francisco Javier Pinar, Peter Wagner, Héctor R. García, Thomas Steenberg, Hans A. Hjuler, Martin Paidar, Karel Bouzek

2523 RRDE Analysis of Ethylene Glycol and Caprolactam Effects on the ORR

Jing Qi, Yunfeng Zhai, Jean St-Pierre

[2524The Implications of Cation Clustering in Anion Exchange Membranes on Conductivity and Mechanical Properties](#)

[Andrew M Herring, E. Bryan Coughlin, Mathew W. Liberatore, Tara P Pandey, Himanshu N Sarode, Ye Liu, Vito Di Noto, Ketì Vezzù](#)

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[Kimio Yoshimura, Shun Watanabe, Hideyuki Shishitani, Susumu Yamaguchi, Hirohisa Tanaka, Yasunari Maekawa](#)

[2526Alkaline Stability of Poly\(phenylene oxide\) Based Anion Exchange Membranes Containing Imidazolium Cations](#)

[Zhongyang Wang, Javier Parrondo, Vijay K Ramani](#)

[2527Alkali-Resistant Anion-Exchange Membranes for Electrochemical Hydrogen Conversions](#)

[Julia Ponce-Gonzalez, Daniel Whelligan, Lianqin Wang, Rachida Bance-Soualhi, John Varcoe](#)

[2528Bipolar Membrane Design for Hybrid PEM/AEM Fuel Cells](#)

[John M. Ahlfield, Lisha Liu, Deryn Chu, Paul A Kohl](#)

[2529NMR As a Tool for the Study and Rational Design of Aems](#)

[Ramez Ahmed Elgammal, Asa Logan Roy, Thomas Anthony Zawodzinski](#)

[2530Realizing the Potential of Micro-Phase Separated Block Copolymer Electrolytes: Ion Domain Connectivity Plays a Prominent Role in Ion Conduction](#)

[Christopher George Arges, Yu Kambe, Moshe Dolejsi, Guangpeng Wu, Tamar Segal-Peretz, Jiaxing Ren, Paul F. Nealey](#)

[2531Anion Exchange Membrane for Fuel Cell: Multi-Scale Modeling Approach](#)



Seung Soon Jang

2532N-Functionalised Polyketone Ion Exchange Membranes for Aemfcs

Graeme Nawn, Gianni Cavinato, Giuseppe Pace, Keti Vezzù, Federico Bertasi, Enrico Negro, Antoine Bach Delpauch, Vito Di Noto

2533Anion Conducting Multiblock Copolymers with Partial Fluorination and Long Side Chains

Lisha Liu, John M. Ahlfield, Deryn Chu, Paul A Kohl

2534Elucidation of the Morphology of Imidazolium-Based Anion Exchange Membranes for Alkaline Anion Fuel Cells

Yue Zhao, Kimio Yoshimura, Hideyuki Shishitani, Susumu Yamaguchi, Hirohisa Tanaka, Yasunari Maekawa

2535Electrochemical Degradation of Nafion Ionomer to Functionalize Graphene as a Support for Core-Shell Palladium-Ruthenium Alloy @ Platinum Electrocatalysts

Chih-Chia Kuo, Yu-Chen Chang, Chao-Lin Chou, Shih-Cheng Chou, Pu-Wei Wu

2536Model-Based Analysis of Carbon Corrosion in Start-up/Shutdown, Fuel Starvation, and Voltage Reversal of a Polymer Electrolyte Fuel Cell

Jixin Chen, Jingwei Hu, James Waldecker

2537Air Starvation Accelerated Stress Tests in Polymer Electrolyte Fuel Cells

Merit Bodner, Alexander Schenk, Bernhard Marius, Mija Rami, Viktor Hacker

2538(Invited) Pt Based Fuel Cell Catalysis

Daniel Herein

2539Development of Novel Hierarchically Microporous-Mesoporous Carbon and Carbon Nanospheres Based Materials and PEMFC Single Cells

[Enn Lust, Silver Sepp, Jaak Nerut, Kersti Vaarmets, Rait Kanarbik, Indrek Tallo, Rutha Jäger, Eneli Härk, Piia Ereth Kasatkin, Masoud Taleb](#)

2540 [MgO-Templated Mesoporous Carbon As a Catalyst Support for Polymer Electrolyte Fuel Cells](#)

[Yuji Kamitaka, Tomohiro Takeshita, Noritomo Suzuki, Ryosuke Jinnouchi, Hajime Murata, Yu Morimoto](#)

2541 [Engineered Carbon Supports for Low Precious-Metal-Content Catalysts](#)

[Thomas Stephenson, Alia Lubers, Geoff McCool, Henry Romero, Samuel McKinney, Barr Halevi](#)

2542 [Electrochemical Behaviors of Directly Deposited Pt on Specific CNT As an Electrocatalyst for ORR](#)

[Masaru Yoshitake, Yumi Tanaka](#)

2543 [New Electrocatalyst for PEM Fuel Cell Application Based on Platinum Supported on Mwcnts and Few Graphene Layers](#)

[Marie Heitzmann, Emeline Remy, Stéphane Louisia, Pierre-André Jacques, Laure Guetaz, Philippe Serp, Rosa Axet](#)

2544 [CNTs Grown on Al<sub>2</sub>O<sub>3</sub> Spheres As an Efficient Catalyst Support for High Performance MEA in PEM Fuel Cells](#)

[Eun Ja Lim, Kwang Hyun Chang, Seonghun Cho, Seok-Hee Park, Gu-Gon PARK, Sung-Dae Yim](#)

2545 [Nanofibrous Electrodes with Tunable Electrodeposited Pt Morphologies with High ORR Activity and Durability](#)

[Giorgio Ercolano, Filippo Farina, Sara Cavaliere, Deborah J. Jones, Jacques Rozière](#)

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[Joannis K. Kallitsis](#)

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[Michael Yandrasits, Matthew Lindell, Michael Kurkowski, Mark S Schaberg](#)

2548 [Amino-Functionalized Mesoporous Silica Based Polyethersulfone-Polyvinylpyrrolidone Composite Membrane for Elevated Temperature Fuel Cells](#)

[Jin Zhang, Shanfu Lu, Haijin Zhu, Kongfa Chen, Jian Liu, Yan Xiang, Maria Forsyth, San Ping Jiang](#)

2549 [Graphene Oxide-Nafion Multilayer Membrane: Influence of Preparation Method](#)

[Carolina Musse Branco, Surbhi Sharma, Robert Steinberger-Wilckens](#)

2550 [Graphene Oxide for Proton Exchange Membrane and Anion Exchange Membrane Fuel Cells](#)

[Stephen Matthew Lyth, Thomas Bayer, Roman Selyanchyn, Benjamin Vaughan Cuning, Masamichi Nishihara, Shigenori Fujikawa, Kazunari Sasaki](#)

2551 [Electrospinning Strategies for PFSA/PVDF Nanofiber Composite Membrane Fabrication](#)

[Peter N. Pintauro, Jun-Woo Park, Shahrzad Rahmani, Devon Powers, Ryszard Wycisk, Trung Van Nguyen, Ahmad Arefazarand](#)

2552 [Proton Conducting Nanocomposites Using Phosphonic Acid Grafted Polyhedral Oligomeric Silsesquioxane \(POSS\)](#)

[Taeyung Youn, Hee-Woo Rhee](#)

2553 [Polymer Electrolyte Fuel Cells Fabricated with Direct Membrane Deposition \(DMD\)](#)

[Severin Vierrath, Matthias Breitwieser, Matthias Klingele, Carolin Klose, Niklas Wehkamp, Roland Zengerle, Simon Thiele](#)

[2554 Cation- and Anion-Conducting Membranes for Fuel Cell and Electrolysis Applications Prepared Via the Acid-Base Blend Concept](#)

[Jochen Kerres](#)

[2555 Synthesis of Highly Crosslinked Polymer/Inorganic Membranes and Discussion of the Resulting High Proton Conductivity and Chemical Stability](#)

[Andrew R Motz, James L Horan, Mei-Chen Kuo, Andrew M Herring](#)

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[Shogo Takamuku](#)

[2557 \(Invited\) Self-Humidifying Membrane Electrode Assembly Prepared by Adding Moisture Preserve Materials in Anode Catalyst Layer](#)

[Shijun Liao, Sanying Hou](#)

[2558 Numerical Simulation of PEFC Stack System for Design of Configuration and Control of Anode Systems](#)

[Tsutomu Takayama, Hideto Yoshimura, Haruki Motegi, Takayuki Tsukamoto, Ryo Takayama, Masakazu Yoneda](#)

[2559 Water Balance in Non-Humidified PEM Fuel Cell with Different Membrane Thicknesses](#)

[Ivan Pivac, Zeljko Penga, Frano Barbir](#)

[2560 \(Invited\) Fuel Cell Stack Technology of Toyota](#)

[Toshiyuki Suzuki](#)

[2561 Thermal Modelling and Validation of PEM Fuel Cell System for Automotive Applications](#)

Vincenzo Liso, Mads Pagh Nielsen, Saher Al Shakhshir

2562PEMFC Stack Diagnostics Using EIS

Samuel Smon Araya, Christian Jeppesen, Søren Knudsen Kær

2563Further Insights into PEMFC Stack Degradation Modes Depending on Operating Strategies

Fabrice Micoud, Sébastien Rosini, Guillaume Gaudemer, Anaïs Finkler, Hortense Laforêt, Benjamin Decoopman, Gino Paganelli, Pierre-André Jacques, Sylvie Escribano

2564Investigation on the Improvement of PEM Fuel Cell Performance through Two Novel Flow Field Designs

Shuiyun Shen, Chao Wang, Qinglei Zhang, Junliang Zhang

2565Laboratory-Scale Method for Fabricating High Performance Catalyst-Coated Membranes and Membrane Electrode Assemblies

Yannick Garsany, Megan B. Sassin, Benjamin D. Gould, Karen Swider-Lyons

2566Impact on Diffusion Parameters Computation in Gas Diffusion Layers, Considering the Land/Channel Region, Using the Lattice Boltzmann Method

Mayken Espinoza, Bengt Sundén, Martin Andersson

2567Multi-Layer Thin Film Coatings on Bipolar Metal Plates for PEMFC

Kerrie K. Gath, Mark Ricketts, Jun Yang, Chunchuan Xu, Shinichi Hirano

2568Gas Diffusion Media for Open-Cathode Fuel Cells in Atmospheric Flight

Robert W. Atkinson, Matthew W. Hazard, Joseph A. Rodgers, Richard O'Neil Stroman, Benjamin D. Gould

2569Metal Mesh Gas Diffusion Layers for PEM Fuel Cells

[Kieran F. Fahy, Jacek Lapinski, Anthony R. J. Kucernak](#)

[2570 Pfaem: A Novel Anionic Exchange Membrane for Fuel Cell Applications and Its Characterization](#)

[Ashutosh G Divekar, Andrew Michael Park, Zbyslaw Owczarczyk, Bryan S Pivovar, Andrew M Herring](#)

[2571 Morphology of Elastomeric Anion Exchange Membranes: A Dissipative Particle Dynamics Study](#)

[Fatemeh Sepehr, Stephen J. Paddison](#)

[2572 Resonance-Stabilized Guanidinium-Tethered Poly\(Phenylene\)s](#)

[Kwan-Soo Lee, Cy Fujimoto, Yu Seung Kim](#)

[2573 Poly\(2,6-dimethyl-1,4-phenylene oxide\) Based Anion Exchange Membranes for Fuel Cell Applications](#)

[Himanshu N Sarode, Mei-Chen Kuo, Paolo Ferrari, Andrew M Herring](#)

[2574 Effect of Bulky Cations on the Stability and Properties of Anion Exchange Membranes](#)

[Ye Liu, Haomiao Yuan, Junhua Wang, Bingzi Zhang, Bryan E Coughlin, Yushan Yan, Matthew W Liberatore, Andrew M Herring](#)

[2575 Synthesis of Anion Exchange Membranes with Side-Chain-Type Benzylic Cationic Groups Using Chloromethylbenzoylation](#)

[Zhenghui Zhang, Lihui Wang, Vijay K Ramani](#)

[2576 Anion Exchange Membrane Separators Based on Polystyrene-Block-Poly\(ethylene-ran-butylene\)-Block-Polystyrene Triblock Copolymers](#)

[Zhongyang Wang, Javier Parrondo, Vijay K Ramani](#)

[2577Effect of Chemical Structure on Properties of Multiblock Copolymers for Alkaline Membrane Fuel Cell](#)

[Dongwon Shin, Sojeong Lee, Eunyoung Kim, Byungchan Bae](#)

[2578Alkaline-Stable Anion Exchange Blend Membranes \(AEBMs\) with a Novel Sterically Hindered Cationic Head Group](#)

[Jochen Kerres, Hyeongrae Cho](#)

[2579Ab Initio Molecular Dynamics Study of the Grotthuss Mechanism for Hydroxide Ions in a Homogenous Anion-Exchange Membrane Used in Fuel Cells](#)

[Sergio Castañeda Ramírez, Rafael Esteban Ribadeneira Paz](#)

[2580Evaluating Electrospun Polyacrylic Acid-Nafion Composite As Stable Catalyst Support for PEM Fuel Cell Electrodes](#)

[Manoj Krishna Kayarkatte, Öznur Delikaya, Christina Roth](#)

[2581Enhanced Stability of Novel Hierarchical Carbon Supports in PEMFC Application](#)

[Silver Sepp, Jaak Nerut, Kersti Vaarmets, Rait Kanarbik, Indrek Tallo, Heisi Kurig, Emm Lust](#)

[2582\(Invited\) Recent Progress in Analysis Methods of PEFCs: From Catalysts to Meas](#)

[Hideto Imai](#)

[2583Hierarchical "Core-Shell" Pt-Ni ORR Electrocatalysts Based on Graphene "Cores" and Carbon Nitride "Shells"](#)

[Enrico Negro, Antoine Bach Delpuech, Keti Vezzù, Federico Bertasi, Graeme Nawn, Gioele Pagot, Yannick Bang, Francesco Bonaccorso, Vito Di Noto](#)

[2584Novel Catalyst-Layer Structures with Rationally Designed Catalyst/Ionomer Interfaces and Pore Structures Aided By Catalyst Functionalization](#)

[Le Xin, Yu Kang, Fan Yang, Aytekin Uzunoglu, Tommy Rockward, Paulo Jorge Ferreira, Rod L. Borup, Jan Ilavsky, Lia Stanciu, Jian Xie](#)

2585 [Highly Stable Hierarchical Polybenzimidazole \(PBI\) Grafted Graphene/Nanographene Hybrids As Catalyst Supports for Polymer Electrolyte Membrane Fuel Cells](#)

[Le Xin, Fan Yang, Aytekin Uzunoglu, Tommy Rockward, Rod L. Borup, Lia Stanciu, Jian Xie](#)

2586 [Development of Highly Active and Stable Compressive Pt Cathode Catalyst for Pemfcs](#)

[Taekeun Kim, Branko N Popov](#)

2587 [Fluorination: A New Way to Enhance the Durability of Carbon Supports for PEMFC Application](#)

[Sandrine Berthon-Fabry, Fabien Labbé, Rudolf Metkemeijer, Yasser Ahmad, Nicolas Batisse, Marc Dubois, Katia Guerin, Belen Molina Concha, Frederic Maillard, Laetitia Dubau, Raphaël Chattot, Marian Chatenet](#)

2588 [The Synthesis of Platinum and Non-Precious Metal Catalysts Based on Carbonized Polyaniline Matrix and Its Application to Fuel Cell](#)

[Hyunjoon Lee, Yong-Hun Cho, Yung-Eun Sung, Oh Joong Kwon](#)

2589 [Ultra-Low Pt Decorated Porphyrinic Carbon Based Hybrid Electrocatalysts for Oxygen Reduction Reaction](#)

[Sun-Mi Hwang, YongMan Choi, Sang Hoon Joo, Sung-Dae Yim, Gu-Gon PARK](#)

2590 [\(Invited\) Tomographic Analysis of Fuel Cell Catalyst Layers - Methods, Challenges and Validity](#)

[Simon Thiele, Severin Vierrath, Lukas Zielke](#)

2591 [Bilayer Cathode Structure to Improve Ice Tolerance in PEM Fuel Cells](#)



Chao Lei, Carmen Chuy, Tran Ngo, Sharon Wong, Scott McDermid

2592 TEM Study of the Ionomer/Catalyst Interface and 3D Pore Structure of Catalyst Layer for PEMFC

Kang Yu, Le Xin, Andres Godoy, Jian Xie, Paulo Jorge Ferreira

2593 Towards Understanding of the Anode Catalyst Layer Structure for Extended Reversal Tolerance: An Advanced Characterization Approach

Darija Susac, Jasna Jankovic, Arash Ash, Andreas Michael Vincent Putz, Chao Lei, Hao Zhang, Wendy Lee, Jürgen Stumper

2594 Dispersion of Ionomer in Catalyst Ink of Polymer Electrolyte Fuel Cell Visualized By Cryogenic Transmission Electron Microscopy

Shinichi Takahashi, Junichi Shimanuki, Tetsuya Mashio, Atsushi Ohma, Hajime Tohma, Ayumi Ishihara, Yoshiko Ito, Yuri Nishino, Atsuo Miyazawa

2595 Establishing Targets for the Cathode Catalyst Layer Kinetic & Transport Parameters in PEMFC Designs

Alan P Young, Siyu Ye, Kyoung Bai, Drew Stolar

2596 Fibsem Tomography: Connecting the Roles of Corrosion and Microstructure to Polymer Electrolyte Fuel Cell Performance and Durability

Andrew G. Star, Thomas F Fuller

2597 Interplay Between Chemistry and Morphology of the Catalytic Layer in Platinum Group Metal-Free Cathodes

Kateryna Artyushkova, Michael J Workman, Jonathan Gordon, Ivana Matanovic, Alexey Serov, Plamen Atanassov

2598 Structural Characterization and Transport Modeling of Pt and Pt Alloy Polymer Electrolyte Fuel Cell Cathode Catalyst Layers

Firat Cetinbas, Rajesh Ahluwalia, Nancy Kariuki, Karren L. More, David A. Cullen, Brian Sneed, Robert P. Winarski, Jan Ilavsky, Vincent De Andrade, Deborah J Myers

2599 Investigation of Ion Conductivity and ORR on Metal/Water Interfaces in Proton Exchange Membrane Fuel Cells

Leiming Hu, Muxing Zhang, Siddharth Komini Babu, Shawn Litster

2600 (Invited) Membrane Development and Transport Study for Redox Flow Batteries

Wei Wang

2601 The Development and Characterization of Aliphatic Sulfonated Polyimide Charged-Transfer Complex Hybrid Film for High Temperature Fuel Cell

Masamichi Nishihara, Liana Christiani, Kazunari Sasaki, Feng Shiyun

2602 Toughened Membrane/Catalyst Layer Interface with Mechanical Nano-Fastener for Hydrocarbon Membrane Based Polymer Electrolyte Membrane Fuel Cell

Hee-Tak Kim, Seongmin Yuk

2603 Proton Conduction in Nanocellulose - Paper Fuel Cells

Thomas Bayer, Benjamin Vaughan Cuning, Roman Selyanchyn, Masamichi Nishihara, Shigenori Fujikawa, Kazunari Sasaki, Stephen Matthew Lyth

2604 Development of Sulfonated Poly(Arylene Ether Sulfone) Multi-Block Membranes for Low RH PEMFC Operation

Byungchan Bae, Sojeong Lee, Hyejin Lee, Dongwon Shin

2605 1,2,3-Triazole-Functionalized Polysulfone Synthesis and Application in Proton Exchange Membranes for Low and High Temperature PEMFC

Rakhi Sood, Anna Donnadio, Stefano Giancola, Aurélien Kreisz, Deborah J. Jones, Jacques Rozière, Sara Cavaliere

[2606 Stability and Efficiency Improvement of Sulfonated Poly\(para-phenylene\): Study of Random Co-Polymer for Proton Exchange Membrane for Fuel Cell](#)

[Thomas Skalski, Benjamin Britton, Timothy J Peckham, Steven Holdcroft](#)

[2607 High Performance, High Catalyst-Efficiency Hydrocarbon Fuel Cells](#)

[Steven Holdcroft, Benjamin Britton, Thomas Skalski](#)

[2608 Development of Highly-Reliable Hydrocarbon-Based Membrane for Polymer Electrolyte Fuel Cells](#)

[Hiroaki Umeda, Shinya Adachi, Daisuke Izuhara](#)

[2609 Proton Exchange Membranes Based on Polymeric Ionic Liquids for Fuel Cell Applications](#)

[Alfredo Ortiz Sainz De Aja, Mariana Díaz Vejo, Inmaculada Ortiz Uribe](#)

[2610 Proton-Conducting SnP<sub>2</sub>O<sub>7</sub> Electrolyte for Intermediate Temperature PEMFC Under Low Humidificatio](#)

[Kwan-Soo Lee, Yu Seung Kim, Cortney R Kreller, Mahlon S. Wilson, Rangachary Mukundan](#)

[2611 A Molecular Dynamics Study of Transport Properties in Degraded Nafion Membranes](#)

[Susumu Kono, Takuya Mabuchi, Takashi Tokumasu](#)

[2612 Gas Permeation Study in Thin and Ultra-Thin Ionomer Films](#)

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

[2613 External Reinforcement of Hydrocarbon Membrane By Combining Toughened Catalyst Layers and Interlocking Interfaces for High Mechanical Robustness of PEMFC](#)

[Seongmin Yuk, Dong Hyun Lee, Sungyu Choi, Gisu Doo, Hee-Tak Kim](#)

[2614Development of Interpenetrating Polymer Network Charge-Transfer Complex Polymer Films As Polymer Electrolyte Membranes](#)

[Masamichi Nishihara, Liana Christiani, Kazunari Sasaki, Feng Shiyang](#)

[2615Performance Evaluation on Hydrocarbon Polymer Electrolytes for PEFC Cathode](#)

[Toyoaki Matsuura, Kenichi Ogu, Masahiro Rikukawa](#)

[2616Sulfonated and Partially Fluorinated Poly\(aryl\) Multiblock-Co-Ionomers for Fuel Cells](#)

[Johannes Bender, Jochen A. Kerres](#)

[2617Effect of Heterocyclic Ring Systems on Properties of Aromatic Proton Exchange Membranes for PEFCs](#)

[Shuntaro Amari, Shinji Ando, Takeo Yamaguchi](#)

[2618Development of a Novel Sulfated Poly \(ether sulfone\) with Aliphatic Chain for High Temperature Fuel Cell](#)

[Shiyang Feng, Liana Christiani, Kazunari Sasaki, Masamichi Nishihara](#)

[2619Heteropolyacids - Chitosan Membranes for H<sub>2</sub>/O<sub>2</sub> Low Temperature Fuel Cells](#)

[Monica Santamaria, Claudio Maria Pecoraro, Francesco Di Franco, Francesco Di Quarto](#)

[2620Fabrication of Acid-Grafted Polybenzimidazole Membranes for High Temperature Polymer Fuel Cell and Their Properties](#)

[Hoon Han, Tsuyohiko Fujigaya, Naotoshi Nakashima](#)

[2621Nitrogen and Sulfur Co-Doped Three-Dimensional Reduced Graphene Oxide Networks-Supported Cobalt Nanoparticles with High Catalytic Activity in the Oxygen Reduction Reaction](#)

[Yi Li, Juan Yang, Yazhou Zhou, Zulei Chen, Jipei Huang](#)

[2622Molecular Dynamics Study on Proton Transport in Supported Nafion Ionomer Thin Films on Lennard-Jones Walls](#)

[Joji Aochi, Takuya Mabuchi, Takashi Tokumasu](#)

[2623Effect of Water Balance in Ionomer Solution for Novel Membrane Electrode Assembly of Polymer Electrolyte Membrane Fuel Cells](#)

[Seok-Hee Park, Seunghee Woo, Sung-Dae Yim](#)

[2624Mechanically Robust and Highly Conductive Polybenzimidazole\(PBI\)-Based Reinforced Membrane for High Temperature Polymer Electrolyte Membrane Fuel Cell](#)

[Dong Hyun Lee, Seongmin Yuk, Hongkyung Lee, Sungyu Choi, Gisu Doo, Hee-Tak Kim](#)

[2625Reflection Characteristics of Oxygen Molecule on Ionomer Surface](#)

[Masataka Nakauchi, Takuya Mabuchi, Ikuya Kinefuchi, Hideki Takeuchi, Takashi Tokumasu](#)

[2626Water Transport in Ionomer and Ice Formation during Cold Startup with Supercooled State in PEFC](#)

[Naoyuki Wakatake, Yutaka Tabe, Takemi Chikahisa](#)

[2627Ionomer Fibers-Decorated Polymer Electrolyte Membrane for Low Pt-Loaded Fuel Cells](#)

[Sungyu Choi, Min-Ju Choo, Seongmin Yuk, Dong Hyun Lee, Gisu Doo, Hee-Tak Kim](#)

[2628Hydrogen Oxidation Reaction-Selective Electrocatalysis Via Fine Tuning of Platinum Ensemble Sites Using Dodecanethiol to Enhance the Durability of Automotive Fuel Cells](#)

[Gi-Woong Park, Su-Won Yun, Yong-tae Kim](#)

[2629Novel Non-Stoichiometric Tungsten Oxide Based Catalyst Support for the Increased CO Tolerance in PEMFC](#)

[Milica P Marceta Kaninski, Snezana M Brkovic, Ivana M Perovic, Petar Z Lausevic, Igor A Pasti, Djordje P Saponjic, Vladimir M Nikolic](#)

[2630 Low Platinum Content Catalyst on the Non-Stoichiometric Tungsten Oxide Based Catalyst Support for the Increased CO Tolerance in PEMFC](#)

[Milica P Marceta Kaninski, Snezana M Brkovic, Ivana M Perovic, Petar Z Lausevic, Djordje P Saponjic, Igor A Pasti, Vladimir M Nikolic](#)

[2631 Hydrogen Oxidation Reaction Activity of RuO<sub>2</sub> Nanosheets Modified Pt–Ru / C](#)

[Tomohiro Ohnishi, Daisuke Takimoto, Yusuke Ayato, Dai Mochizuki, Wataru Sugimoto](#)

[2632 Differential Electrochemical Mass Spectroscopy Study of CO<sub>2</sub> Concerned Anode Reaction in Polymer Electrolyte Fuel Cell](#)

[Shigehisa Tamura, Siyuan Jia, Kazutaka Sato, Sayoko Shironita, Minoru Umeda](#)

[2633 EC-XPS Analysis of Oxygen Species Adsorbed on Pt-Nanoparticle Model Electrodes](#)

[Shota Miyashita, Mitsuru Wakisaka, Akihiro Iiyama, Hiroyuki Uchida](#)

[2634 Fundamental Studies on Oxygen and Hydrogen Peroxide Reduction Reaction with Different Pt/C Catalyst Loadings Using Rrde Technique](#)

[Nozomi Kawakami, Hirohisa Yamada, Zyun Siroma, Katsumi Katakura, Minoru Inaba](#)

[2635 IL-FE-SEM and ICP-MS Study for Degradation of Pt/C Catalyst](#)

[Taro Kinumoto, Misako Ikeyama, Miki Matsuoka, Tomoki Tsumura, Masahiro Toyoda](#)

[2636 Enhancement of ORR Activity and Durability of Pt Single Crystal Electrodes Modified with Alkylamines](#)

[Keiichiro Saikawa, Masashi Nakamura, Nagahiro Hoshi](#)

[2637The Oxygen Reduction Reaction on Pt\(322\) and Pt\(553\) Electrodes Modified with Cotpp and Au](#)

[Tomoki Takeda, Masashi Nakamura, Nagahiro Hoshi](#)

[2638Effect of HClO<sub>4</sub> Concentration on Oxygen Reduction Reaction Activity at Pt and Pt-Co Alloy Single Crystal Electrodes](#)

[Shun Kobayashi, Mitsuru Wakisaka, Donald A. Tryk, Akihiro Iiyama, Hiroyuki Uchida](#)

[2639Effect of Crystallographic Ordering in PtCo/C Alloy Catalyst on Durability](#)

[Yuuki Matsui, Takayuki Doi, Hideo Daimon, Minoru Inaba](#)

[2640Superlative Activity and Durability of Stabilized Pt-Skin Pt-M \(M=Fe, Co, Ni\) Alloy Cathode Catalysts](#)

[Satoshi Ogawa, Hiroshi Yano, Masahiro Watanabe, Akihiro Iiyama, Hiroyuki Uchida](#)

[2641Effect of the Sulfate Anions on the Oxygen Reduction Reaction Activity on Stabilized Pt Skin-PtCo Cathode Catalysts at Practical Temperatures](#)

[Honami Nishikawa, Satoshi Ogawa, Hiroshi Yano, Akihiro Iiyama, Hiroyuki Uchida](#)

[2642Messtructured Pt-Based Bimetallic Nanospheres As Ultrastable Self-Supported Oxygen Reduction Electrocatalysts](#)

[Ho Young Kim, Seonghun Cho, Young Jin Sa, Gu-Gon PARK, Sung-Dae Yim, Sang Hoon Joo](#)

[2643Preparation of Pt-Cu Catalyst Particles Using Electrodeposition Method and Evaluation of Durability and ORR Activity](#)

[Yuichi Shigihara, Eiji Tada, Atsushi Nishikata](#)

[2644Synthesis and Study of Structurally Ordered FePt Nanoparticles As Highly Active and Durable Catalysts for Oxygen Reduction Reaction](#)

[Junrui Li, Qing Li, Zheng Xi, Michelle Muzzio, Shouheng Sun](#)

[2645PdFe Nanoparticles for Oxygen Reduction Reaction in Polymer Electrolyte Fuel Cells](#)

[Kug-Seung Lee, Yun Sik Kang](#)

[2646High Activation Protocol and Cu-O<sub>2</sub> Treatment for Highly Active Pd Core-Pt Shell Catalyst for PEFCs](#)

[Shunya Higuchi, Naoya Aoki, Hideo Inoue, Hideo Daimon, Takayuki Doi, Minoru Inaba](#)

[2647Preparation of Ultrathin Palladium Nanosheet and Its Application in Pd@Pt Core-Shell Catalyst for Oxygen Reduction Reaction](#)

[Zhongrong Shen, Daisuke Takimoto, Jeerapat Nutariya, Yusuke Ayato, Dai Mochizuki, Wataru Sugimoto](#)

[2648ORR Activity of Large-Scale Synthesized Pd Core-Pt Shell Catalysts](#)

[Takehito Nishikawa, Naoya Aoki, Hideo Daimon, Minoru Inaba, Hideo Inoue](#)

[2649ORR Properties for Model Pt-Shell Layers Prepared on Nitrogen-Beam Irradiated Pt<sub>25</sub>Ni<sub>75</sub>\(111\) Substrate](#)

[Masato Asano, Ryutaro Kawamura, Naoto Todoroki, Toshimasa Wadayama](#)

[2650Synthesis of Two-Dimensional Nanosheets Catalyst with Ru-Core@Pt-Shell Towards Oxygen Reduction Reaction](#)

[Daisuke Takimoto, Tomohiro Ohnishi, Jeerapat Nutariya, Zhongrong Shen, Yusuke Ayato, Dai Mochizuki, Arnaud Demortiere, Adrien Boulineau, Wataru Sugimoto](#)

[2651Oxygen Reduction Reaction Activity and Durability for Model Pt Shell Layers on Ir\(111\) Prepared by Molecular Beam Epitaxy](#)

[Hirofumi Watanabe, Soma Kaneko, Naoto Todoroki, Toshimasa Wadayama](#)



[2652Oxygen Reduction Reaction Activity and Durability for Pt/TaN<sub>x</sub> Model Catalysts Fabricated in Ultra-High-Vacuum](#)

[Shuntaro Takahashi, Naoki Takahashi, Naoto Todoroki, T Tanabe, Toshimasa Wadayama](#)

[2653Relating the Influence of Surface Characteristics of Carbon Electrocatalyst Support to the Performance and Durability of a PEMFC through Calorimetric, Adsorption, Spectroscopic and Electrochemical Measurements](#)

[Ignacio Jimenez Morales, Marc Dupont, Sara Cavaliere, Deborah J. Jones, Jacques Rozière, Jerzy Zajac, Mikkel Juul Larsen, Madeleine Odgaard, Flavio Mornaghini, Marlene Rodlert](#)

[2654Development of MEAs by Controlling Carbon Structures in Cathode Layers](#)

[Bo Fu, Yasuto Minamida, Zhiyun Noda, Kazunari Sasaki, Akari Hayashi](#)

[2655A Development of the Nanostructured Conducting Carbon/Polymer Composites As a Stable Electrode for Polymer Electrolyte Membrane Fuel Cells](#)

[Youjung Song, JuHee Lee](#)

[2656Understanding Pt Nanoparticle Anchoring on Graphene Supports through Surface Functionalization](#)

[Le Xin, Somaye Rasouli, Fan Yang, Aytakin Uzunoglu, Cheng-Jun Sun, Paulo Jorge Ferreira, Yuzi Liu, Lia Stanciu, Jian Xie](#)

[2657Investigation of a Correlation Between Structures of Mesoporous Carbon an Gas Adsorption Characteristics](#)

[Masataka Katagami, Etsuo Akiba, Akari Hayashi](#)

[2658Correlation Between Metal-Support Interaction and the Stability of Platinum Nanoparticles Supported on Heteroatom Doped Mesoporous Carbons for Oxygen Reduction Reaction](#)

[Jae Hyung Kim, Jong Hoon Kim, Jeong Young Park, Sang Hoon Joo](#)

[2659 Porous Graphene Layers on Pt Catalyst for Long-Term Stability of Fuel Cell Electrode](#)

[Heeyeon Kim, Alex W Robertson, Jamie H Warner, Sang Ouk Kim](#)

[2660 Effects of Transition Metal Doping in Pt/M-TiO<sub>2</sub> \(M = V, Cr, and Nb\) on the Oxygen Reduction Reaction](#)

[Sang-Mun Jung, Jun-Hyuk Kim, Yong-tae Kim](#)

[2661 Synthesis of Pt Catalysts Supported on W/Ta-Doped TiO<sub>2</sub> As a Highly Durable Electrocatalyst for PEMFCs](#)

[Kriangsak Ketpang, Katsuyoshi Kakinuma, Akihiro Iiyama, Makoto Uchida](#)

[2662 Nanofibrous Electrode Design By CNT-Winded Pt/TiO<sub>2</sub> for Superior PEMFC Performance and Durability at High Temperature](#)

[Yunseong Ji, Yongil Cho, Yukwon Jeon, Ho Jeong Hwang, Jin Goo Lee, Myeonggeun Park, Gicheon Lee, Jeongseok Jang, Oksung Jeon, Oh Chan Kwon, Jusoon Hwang, Yong Gun Shul](#)

[2663 SnO<sub>2</sub>-Supported Electrocatalysts on Conductive Fillers for PEMFCs](#)

[Yoshiki Nakazato, Masahiro Iwami, Makito Okumura, Zhiyun Noda, Akari Hayashi, Kazunari Sasaki](#)

[2664 PEMFC Alloy Electrocatalysts Supported on SnO<sub>2</sub>: A Study on the Preparation Method](#)

[Shohei Matsumoto, Masahiro Iwami, Zhiyun Noda, Junko Matsuda, Akari Hayashi, Kazunari Sasaki](#)

[2665 The Oxygen Reduction Reaction Activity of Pt-Co Catalysts Supported on Ta-Doped SnO<sub>2</sub> for Polymer Electrolyte Fuel Cells](#)

[Mizuki Hayashi, Katsuyoshi Kakinuma, Akihiro Iiyama, Makoto Uchida](#)

[2666 Comparison of the Stability of Niobium and Antimony Doped Tin Oxide Supports on in Situ Load and Stop/Start Cycling of Pt/Nb-SnO<sub>2</sub> and Pt/Sb-SnO<sub>2</sub>](#)

[Ignacio Jimenez Morales, Marc Dupont, Sara Cavaliere, Deborah J. Jones, Jacques Rozière](#)

[2667 Gram-Scale Synthesis of High Surface Area Metal-Free Nitrogen-Doped Carbon Foams for the Oxygen Reduction Reaction](#)

[Albert Mufundirwa, Yu Shundo, Jianfeng Liu, Bretislav Smid, Benjamin Vaughan Cuning, Kazunari Sasaki, Stephen Matthew Lyth](#)

[2668 Oxygen Reduction Reaction at Carbon-Based Particles Prepared by Microwave-Assisted Catalytic Decomposition Measured in Acetonitrile](#)

[Fumihiko Koderu, Narumi Yoshida, Hiroya Ishikawa, Ryo Saito, Shogo Nakagawa, Akihiko Miyakoshi, Minoru Umeda](#)

[2669 High-Performance Polymer Electrolyte Membrane Fuel Cells Based on Fe/N/C ORR Catalyst](#)

[Yu-Cheng Wang, Yu-Jiao Lai, Zhi-You Zhou, Shi-Gang Sun](#)

[2670 Iron-Polypyrrole Electrocatalyst with Remarkable Activity and Stability for Oxygen Reduction Reaction](#)

[Thanh-Nhan Tran, Min Young Song, Jong-Sung Yu](#)

[2671 Advanced Microscopy of Non-Precious Metal Catalysts for Structure-Property-Performance Correlations](#)

[Michael J. Dzara, Chilan Ngo, Michael J Workman, Plamen Atanassov, Kateryna Artyushkova, Svitlana Pylypenko](#)

[2672 Magnetic Purification of PGM-Free Catalysts](#)

[Xi Yin, Ulises Martinez, Hoon T Chung, Ling Lin, Piotr Zelenay](#)

[2673 Development of Nitrogen-Doped Titanium Oxide Electrocatalysts for PEFCs](#)

Yoshinori Yamato, Kunchan Lee, Hailin Wang, Takuya Imai, Akimitsu Ishihara, Kenichiro Ota

2674 Reduced Titanium Oxide as Carbon-Free Support of Non-Precious Metal Oxide-Based Cathodes for PEFCs

Hikaru Igarashi, Akimitsu Ishihara, Takaaki Nagai, Satoshi Tominaka, Koichi Matsuzawa, Teko W. Napporn, Shigenori Mitsushima, Ken-ichiro Ota

2675 Electrochemical Decontamination of Platinum Nanocrystals and Its Electrocatalytic Performances for Methanol

Leilei Lu, Baozhong Du

2676 Nitrogen-Incorporated Amorphous Carbon Catalysts with Higher Reactivity toward Oxygen Reduction Reaction

Kensuke Honda, Yohosuke Shimai, Yuta Waki, Keigo Okafuji, Shinpei Ohtomo, Ryutaro Kobayashi, Hiroshi Naragino

2677 NiMo As Non-Precious Metal Catalyst for Hydrogen Oxidation Reaction in Alkaline Media

YongKeun Kwon, MinJoong Kim, EunAe Cho

2678 Development of Hydroxide-Stable Anion-Conducting Functional Groups

Thomas Weissbach, Andrew G. Wright, Steven Holdcroft

2679 Anodic Activity of Pt and PtRu Catalysts on Ta-Doped SnO<sub>2</sub> Supports for Direct-Fuel Fuel Cells Using a New Energy Carrier

Naoki Hirayama, Katsuyoshi Kakinuma, Akihiro Iiyama, Masahiro Watanabe, Makoto Uchida

2680 Monolithic Carbon Foam-Supported Pd-Ni Catalysts for Ethanol Electro-Oxidation in Alkaline Media

[Yinshi Li](#)

[2681 Oxygen Reduction Reaction Activity and Durability of Platinum/Cobalt Alloy Nanoparticle Catalysts in Alkaline Media](#)

[Yuma Shimizu, Makoto Uchida, Kenji Miyatake](#)

[2682 Effect of Methylated Polybenzimidazole As an Electrolyte for Anion-Exchange Membrane Fuel Cells](#)

[Ziyi Han, Tsuyohiko Fujigaya, Naotoshi Nakashima](#)

[2683 A General Approach to Preferential Formation of Active Fe-N<sub>x</sub> Sites in Fe-N/C Electrocatalysts for High-Performance Polymer Electrolyte Fuel Cells](#)

[Young Jin Sa, Jinwoo Woo, Min Gyu Kim, Tae-Young Kim, Sang Hoon Joo](#)

[2684 On-Line Mass Spectrometry for Ethanol Oxidation on Well-Defined Sn/Pt\(hkl\) Electrode Surfaces](#)

[Hiroki Nakamura, Tatsuhiko Inoue, Tetsuhiko Matsuda, Naoto Todoroki, Toshimasa Wadayama](#)

[2685 Glycerol Oxidation Reaction Mechanism on Ag-Modified Pt Electrode in Alkaline Medium](#)

[Akihisa Ochi, Masanobu Chiku, Eiji Higuchi, Hiroshi Inoue](#)

[2686 Systematic Studies on the Phase Separations at Bulks and Surfaces of the Anion Exchange Membranes with Different Polymer Structures](#)

[Taro Kimura, Ryo Akiyama, Kenji Miyatake, Junji Inukai](#)

[2687 A Successive One-Pot Synthesis of Au@Pt - q ML/C with Enhanced Ethanol Oxidation Activity in Alkaline Media](#)

[Kuang-Heng Wu, Han Wang, Bei Jiang, Wen-Bin Cai](#)

[2688Electrocatalysts for Direct Alcohol Oxidation Fuel Cells Prepared Using Ion Beam Assisted Deposition Technique](#)

[Vasily Poplavsky](#)

[2689Structure of Anion-Conducting Polymers from x-Ray Scattering and MD Simulations](#)

[Eric Matthew Schibli, Barbara J Frisken](#)

[2690The Effect of Hydrogen Containing NH<sub>3</sub> on Aemfc Performance](#)

[Yuki Kikkawa, Takayuki Negishi, Takenori Isomura](#)

[2691Novel Catalyst Support Based on Mesoporous Cobalt and Molybdenum Carbide for Enhanced ORR Kinetics in Alkaline Fuel Cells](#)

[Vladimir M Nikolic, Ivana M Perovic, Aleksandra P Saponjic, Maja Kokunesoski, Milos P Tosic, Dubravka Milovanovic, Milica P Marceta Kaninski](#)

[2692Catalyst Support on Carbon Nanoballoon and Evaluation of Its Catalytic Activity in Direct Methanol Fuel Cells](#)

[Tatsuo Ohiro, Kohei Mizui, Yoshiyuki Suda, Yoshiaki Shimizu, Toru Harigai, Hirofumi Takikawa, Hitoshi Ue](#)

[2693Metallocomplex-Based Electrocatalysts for the Oxidation of Hydrazine Derivatives](#)

[Shin-ichi Yamazaki, Koichiro Asazawa, Hirohisa Tanaka, Tsutomu Ioroi](#)

[2694Synergetic Effects of Edge Formation and Sulfur Doping in Graphene-Based Catalyst for an Efficient Oxygen Reduction Reaction](#)

[SeKwon Oh, Jong Hoon Kim, MinJoong Kim, Jeong Young Park, EunAe Cho, HyukSang Kwon](#)

[2695Synthesis and Properties of Partially Fluorinated Anion Exchange Membranes Containing Ammonium-Functionalized Fluorenyl Groups](#)

Mizuki Ozawa, Junpei Miyake, Kenji Miyatake

2696 Synthesis of Metal-Free Electrocatalyst Obtained from Different Biomass Sources with High Performance for Oxygen Reduction Reaction in Fuel Cells

Ivonne Liliana Alonso-Lemus, Beatriz Escobar-Morales, Fransico Javier Rodríguez-Varela, Diego González-Quijano, Daniel Lardizabal, Kehila Pacheco-Saucedo, Luis de la Torre Saenz

2697 Enhanced Water Activation By High Oxophilicity of LaMnO<sub>3</sub> Supports for Ag-Based Electrocatalysts in Alkaline Media

A-Yeong Lee, Shin-Ae Park, Yong-tae Kim

2698 Investigation of Solvent Effects on the Dispersion of Carbon Agglomerates and Nafion Ionomer Particles in Catalyst Inks Using Ultra Small Angle X-Ray Scattering Method

Fan Yang, Le Xin, Aytakin Uzunoglu, Lia Stanciu, Jan Ilavsky, Steven Son, Jian Xie

2699 Evaluating in Situ Platinum Deposition As a Preparative Step for Fibsem Tomography of PEMFC Cathodes

Andrew G. Star, Thomas F Fuller

2700 Platinum Thin Catalyst Layer for Proton Exchange Membrane Fuel Cell

Youngkwang Kim, Jiyong Kim, Oh Joong Kwon

2701 Comprehensive Studies of Spatial PEMFC Performance Under CH<sub>3</sub> Br Poisoning of Cathode

Tatyana V. Reshetenko, Kateryna Artyushkova, Jean St-Pierre

2702 A PEFC Parametric Study: CO Tolerance As a Function of Operating Conditions

Stefan Williams, Tommy Rockward, Rangachary Mukundan

[2703Performance Benefits of Multiwall Carbon Nanotubes in the Polymer Electrolyte Membrane Fuel Cell Gas Diffusion Layer](#)

[Jongmin Lee, Rupak Banerjee, Nan Ge, Stéphane Chevalier, Michael Gerald George, Hang Liu, Pranay Shrestha, Daniel Muirhead, James Hinebaugh, Aimy Bazylak](#)

[2704Investigation of Degradation at the PEFC Cathode Layer under Higher Temperature Operation](#)

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

[2705Model and Experimental Analysis of Transport Resistances of Oxygen in Various Structures of PEFC Catalyst Layer](#)

[Tomoya Hayashi, Yutaka Tabe, Takemi Chikahisa](#)

[2706Characterizing the Pt-Electrolyte Interface in PEM Fuel Cells](#)

[Taylor Reed Garrick, Thomas E Moylan, Venkata Yarlalagadda, Anusorn Kongkanand](#)

[2707Analysis of the Catalyst Layer and the Ionomer for PEFCs of the Different Operating Conditions](#)

[Junichi Tsuji, Tsuyoshi Akiyama, Yoshihiro Ueno, Akihiro Masuda, Naoto Kaneko, Yu Yamaga](#)

[2708Liquid Cooled PEMFC Bipolar Plates Development for Stationary Applications](#)

[Laurentiu G Patularu, Dorin Schitea, Mihai Varlam, Elena Carcadea, Ioan Stefanescu](#)

[2709Pt/C Spontaneously Decorated with Citrate As a Catalyst for Formic Acid Electro-Oxidation](#)

[Joshua Wayne Cisco, Cynthia A. Rice](#)

[2710Probing the Electrochemical Characteristics of Carbon-Supported Platinum Catalysts](#)



Tommy Rockward, Andre Spears, Joseph H Dumont, José-María Sansiñena, Jerzy Chlistunoff

2711 Pore Structure Effect of Cathode Catalyst Layer on Performance and Durability of PEMFC

Sang-Kyung Kim, Hye-Yeong Lee, Dong-Hyun Peck, Chang-Soo Kim

2712 Water Transport Simulation in a Gas Diffusion Layer of PEMFC Using Lattice Boltzmann Method

Dong Hyup Jeon, Jung-Hoon Song

2713 Reaction and Mass Transport Simulation of Polymer Electrolyte Fuel Cell for the Analysis of the Key Factors Affecting the Output Performance in the Catalyst Layer

Ryotaro Kotoi, Gen Inoue, Motoaki Kawase

2714 Performance of Membrane-Electrode-Assembly Using Anode Catalyst Layers with Carbon Nanomaterials of Particle and Fiber Geometries in Direct Methanol Fuel Cell

Kohei Mizui, Tatsuo Ohiro, Yoshiyuki Suda, Toru Harigai, Hirofumi Takikawa, Hitoshi Ue

2715 Degradation of Polymer Electrolyte Membrane Fuel Cell By Siloxane in Biogas

Tae-Young Kim

2716 Influence of Aromatic Hydrocarbons in Air on Spatial PEMFC Performance

Tatyana V. Reshetenko, Jean St-Pierre

2717 A Hybrid of Palladium-Graphitic Carbon Nitride-Reduced Graphene Oxide for Methanol and Formic Acid Electrooxidation

Wenyao Zhang, Xin Wang, Lili Zhang, Weiguang Zhang

2718 Dissolution Behavior Analysis of Model for PEFC Electrodes Using Eqcm

[Tetsuta Jozuka, Taishi Ando, Noriaki Asakura, Takamasa Kaito, Toshihiko Matsuda](#)

[2719Development on Measuring Methods of Catalyst Layer Structure Parameters Under Operating Condition of PEFCs](#)

[Koji Yokoyama, Junpei Oyama, Masato Ohashi, Seiho Sugawara](#)

[2720Review on Dimensionless Numbers Relevant for Polymer Electrolyte Fuel Cells](#)

[Martin Andersson, Tingshuai Li](#)

[2721Enthalpy Analysis and Heat Exchanger Sizing of an Air-Cooled Proton Exchange Membrane Fuel Cell System](#)

[Xin Gao](#)

[2722Promotion Effect of Adding Cr/Al/Fe to Cu/ZnO on the Stability of Hydrogen Production Catalyst for Dimethyl Ether Steam Reforming](#)

[Jing Xie, Kaijie Ding, Ranjia Li, Changchun Yu, Shuai Ban, Hongjun Zhou](#)

[2723Comparative Analysis of the Noise Elimination Based on the Wtbmra with Various Decomposition/Reconstruction Levels Level for a PEMFC](#)

[JunHwan Baek, Yongsug Tak, Y. Yoon, Jonghoon Kim](#)

[2724Development of a Portable Polymer Electrolyte Membrane Fuel Cell System Using Metal Hydride as the Hydrogen Storage Medium](#)

[Moegamat Wafeeq Davids, Ivan Tolj, Ting-Chu Jao, M Lototskyy, S Pasupathi, C Sita](#)

[2725Peald-TiN Protective Coatings for Metallic Bipolar Plates of PEMFC](#)

[Eun-Young Yun, Da-Young Kim, Han-Bo-Ram Lee, Se-Hun Kwon](#)

[2726CFD Analysis of a Fuel Cell Stack Package Using LNG for a Ship](#)

Gill-Tae Roh, Jong-Woo Ahn, Jong-Chun Song, Jae-Hoon Lee

2727 Durability of Methane Steam Reforming Catalysts Prepared By Exsolution and Infiltration

Ye Sol Lim, Wan-Keun Bang, Hae Jin Hwang

2728 A Study on Property and Performance According to the Pore Structure of Metallic Porous Separator for Fuel Cell Vehicle

Myong-Hwan Kim, Seung Eul Yoo, Youngmo Goo

2729 Preparation and Characterization of Cgo-Based Catalyst for Methanol Steam Reforming By Glycine-Nitrate Process

Junghun Lee, Eunyeong Choi, Hyunjin Ji

2730 Numerical Study on Flow Distribution in PEMFC with Metal Foam Bipolar Plate

Kyoungyoun Kim, Myeongho Song

2731 Numerical Simulation of PEMFC Performance Considering Striped Wettability Distribution of GDL

Koji Takaya, Takuto Araki

2732 A Study on Degradation of Membrane Electrode Assembly By Operating Conditions of Fuel Cell Vehicle

Seung Eul Yoo, Myong-Hwan Kim, Youngmo Goo

2733 A Study on Performance By Oxygen Concentration According to Driving Environmental of Fuel Cell Vehicle

Youngmo Goo, Myong-Hwan Kim, Seung Eul Yoo

2734 Long Life Operating Algorithm for 5kW High Temperature Polymer Electrolyte Fuel Cell Stack

[Minjin Kim, Young-Jun Sohn, Seung-Gon Kim, Won-Yong Lee](#)

[2735 Nickel/Carbide Based Catalysts for Oxygen Evolution Reaction in Alkaline Solution](#)

[DongHoon Song, MinJoong Kim, EunAe Cho](#)

[2736 Preferential Horizontal Growth of WS<sub>2</sub> Nanoplate on Porous Carbon: A Highly Efficient Electrocatalyst for the Hydrogen Evolution Reaction](#)

[Bora Seo, Gwan Yeong Jung, Jae Hyung Kim, Sang Kyu Kwak, Sang Hoon Joo](#)

[2737 Performances of Polymer Electrolyte Membrane Water Electrolysis Cells with IrO<sub>x</sub>/Doped SnO<sub>2</sub> Oxygen Evolution Catalysts](#)

[Hideaki Ohno, Shinji Nohara, Katsuyoshi Kakinuma, Akiko Miyake, Shigehito Deki, Hiroyuki Uchida](#)

[2738 Analysing Gas-Liquid Flow in PEM Electrolyser Micro-Channels](#)

[Saeed Sadeghi Lafmejani, Anders Christian Olesen, Søren Knudsen Kær](#)

[2739 Preparation of Iridium-SnO<sub>2</sub>/VGCF Electrocatalysts for Water Electrolysis](#)

[Hiroki Anai, Junko Matsuda, Ziyun Noda, Yuya Tachikawa, Akari Hayashi, Kohei Ito, Kazunari Sasaki](#)

[2740 Evaluation of Selected Anode and Cathode Gas Diffusion Layers for Use in PEM Water Electrolysis with Focus on Compatibility with 3M's Ir-Nstf Based Electrolyzer Catalyst Coated Membranes](#)

[Fuxia Sun, Krzysztof A. Lewinski](#)

[2741 Electrochemical Fabrication of Ag and Au Foams for Electrochemical Conversion of CO<sub>2</sub>](#)

[Hyunju Lee, Hoyoung Kim, Hyanjoo Park, Junhyeong Kim, Hyunki Kim, Eunkyong Hwang, Soo-Kil Kim, Sang Hyun Ahn](#)

[2742Effect of Gdl\(+MPL\) Compression on the PEM Fuel Cell Performance](#)

[Elena Carcadea, Mihai Varlam, Derek B. Ingham, Laurentiu G Patularu, Adriana Marinoiu, Daniela Ion-Ebrasu, Ioan Stefanescu](#)

[2743Temperature and Humidification Effect on Mass Transfer of PEMFC Via EIS and Soft X-Ray Measurement](#)

[Ting-Chu Jao, Takashi Sasabe, Suguru Uemura, Toshihiko Yoshida, Shuichiro Hirai](#)

[2744Structural Effects of Non-Uniform Deformation of Porous-Streaming Paths on Transport Phenomena and Electrochemical Reactions in Polymer Electrolyte Fuel Cells](#)

[Ah-Reum Kim, Joo-Hee Park, Jiawen Liu, Sukkee Um](#)

[2745Experimental Study of Thermal Conductivity and Compression Measurements of the GDL-MPL Interfacial Composite Region](#)

[Robert Bock, Andrew Shum, Thulile Khoza, Frode Seland, Nabeel Hussain, Iryna V Zenyuk, Odne Stokke Burheim](#)

[2746Influence of GDL Properties on Liquid Water Distribution and Temperature at CL Surface](#)

[Takuto Araki, Koki Kobayashi, Ryotaro Minami, Sota Hashimura](#)

[2747Influence of Binder Porosity on Gdl Gas Phase Transport](#)

[Jens Eller, Adrien Lamibrac, Federica Marone, Felix N Büchi](#)

[2748Gas Diffusion Layer Coated with a Microporous Layer Containing Hydrophilic CNTs to Enhance PEFC Performance without Humidification Using Anode Gas Recirculation](#)

[Tatsumi Kitahara, Hironori Nakajima, Kenta Ishikawa](#)

[2749Diagnostic Analysis of the Oxygen Fraction at the Boundary Between Cathode Flowfield and Gas Diffusion Layer in the PEMFC](#)

[Shinichi Hirano, Jixin Chen, Sirivatch Shimpalee, Chunmei Wang, George Saloka](#)

[2750 Wettability of Gas Diffusion Layers for Proton Exchange Membrane \(PEM\) Fuel Cells](#)

[Pradeep Kumar Sow, Sebastian Prass, Benjamin Zahiri, Walter Mérida](#)

[2751 Scale Model Experiment of Liquid Water Transport in Gas Diffusion Layer of PEFC and Optimization of the Structure](#)

[Satoshi Sakaida, Yutaka Tabe, Takemi Chikahisa](#)

[2752 Acceleration of Liquid Water Removal from Cathode Electrode of PEFC by Combination of Channel Hydrophilization and Diffusion Medium Perforation](#)

[Kosuke Nishida, Yudai Kono, Masahiko Sato, Daisuke Mizuguchi](#)

[2753 Impact of Liquid Water on Oxygen Transport Resistance in a PEMFC Cathode Via Limiting Current Methods and Concurrent Synchrotron X-Ray Radiography](#)

[Daniel Muirhead, Rupak Banerjee, Stéphane Chevalier, Nan Ge, Michael Gerald George, James Hinebaugh, Jongmin Lee, Hang Liu, Pranay Shrestha, Aimy Bazylak](#)

[2754 \(Invited\) Structure-Property Relationships of Proton Conducting Membranes Studied By Synchrotron Radiation](#)

[Giuseppe Portale](#)

[2755 Effect of Water Cluster Structure on Proton Transport in Proton-Exchange Membranes Using Reactive Molecular Dynamics Simulations](#)

[Takuya Mabuchi, Takashi Tokumasu](#)

[2756 Mechanism of Proton Conduction in Perfluorinated Sulfonic Acid Polymers with High Ionic Exchange Capacity at Water-Freezing Temperature Region](#)

[Yoshiki Iwai, Hideto Imai, Yuhei Oshiba, Takanori Tamaki, Takeo Yamaguchi](#)

[2757 Observation and Analysis of Nafion Solution By Frozen TEM Technology](#)

[Toshihiko Yoshida, Hidekazu Sugimori, Atsuo Miyazawa, Hidetoshi Matsumoto, Yuichi Konosu, Takashi Sasabe, Suguru Uemura, Yuki Kameya, Takeshi Terao, Norio Iriguchi, Kazuhiko Shinohara, Shuichiro Hirai](#)

[2758 Tensiometric, IR- and <sup>19</sup>F-NMR Analysis of Nafion Solutions for PEMFCs and PEMELs](#)

[Anne Schulz, Nicole Luehmann, Markus Stähler, Wiebke Lüke, Werner Lehnert](#)

[2759 Time-Resolved Nanostructural Analysis of Thin-Film Formation Process from Nafion Solution by Synchrotron X-Ray Scattering](#)

[Yuichi Konosu, Hiroyasu Masunaga, Takaaki Hikima, Masatoshi Tokita, Hidetoshi Matsumoto, Takashi Sasabe, Toshihiko Yoshida, Kazuhiko Shinohara, Shuichiro Hirai](#)

[2760 Mechanical Response of Thin Nafion Films during Hydration Cycles](#)

[Bradley R. Frieberg, Joshua R. Graybill, Kirt A. Page, Gery R. Stafford, Christopher L. Soles, Christopher M. Stafford](#)

[2761 Origins of Suppressed Swelling and Increased Mechanical Properties of Ultrathin Nafion](#)

[Christopher M. Stafford, Bradley R. Frieberg, Cheol Jeong, Brandon W. Rowe, Kirt A. Page, Christopher L. Soles](#)

[2762 Impact of Polymer Electrolyte Membrane Properties on Transport, Performance and Durability](#)

[Monica Dutta, Lida Ghassemzadeh, Alan P Young, Michael Victor Lauritzen, Shanna Knights](#)

[2763 Impact of Equivalent Weight and Side-Chain on Structure/Functionality of PFSA Ionomers and Thin Films](#)

[Ahmet Kusoglu, Shouwen Shi, Peter Dudenas, Adam Z Weber](#)

[2764Decoupling the Influences of Molecular- and Mesoscales on Macroscopic Transport Properties in Perfluorosulfonic-Acid Membranes](#)

[Andrew Robert Crothers, Shouwen Shi, Clayton J. Radke, Adam Z Weber](#)

[2765GISAXS Analysis for Ionomer Thin Films](#)

[Peter Dudenas, Ahmet Kusoglu, Alex Hexemer, Adam Z Weber](#)

[2766Thermal Behaviour of Nafion Thin Films](#)

[Chi Zhang, Vinayraj Ozhukil Kollath, Kunal Karan](#)

[2767Non-Nitrogen Doped Defective Multi-Walled Carbon Nanotubes \(MWCNT\) As the Cathode Catalyst for PEMFC](#)

[Jiuting Chen, Keiko Waki](#)

[2768Nitrogen Doped Defective Carbon Nanotube Electrocatalyst for Oxygen Reduction Reaction](#)

[Ti Chen, Haryo Satriya Oktaviano, Keiko Waki](#)

[2769Ultrafine N-Doped Carbon Nanoparticles with Controllable Size As High Performance Electrocatalysts for Oxygen Reduction Reaction](#)

[Yang Shi, Wenxi Wang, Mingchan Li, ShaoFei Wu, Fucong Lyu, Chaoqun Shang, Zhouguang Lu](#)

[2770Gram-Scale Synthesis of Nitrogen-Doped Carbon Foams As Template-Free, Metal-Free, Non-Precious Electrocatalysts for Oxygen Reduction and CO<sub>2</sub> Conversion](#)

[Stephen Matthew Lyth, Jianfeng Liu, Albert Mufundirwa, Bretislav Smid, Sichao Ma, Paul J.A. Kenis, Kazunari Sasaki](#)

[2771Probing the Active Site Structures of Iron-Based ORR Catalysts](#)

[Yang Hu, Qingfeng Li, Jens Oluf Jensen, Lijie Zhong, Lars Nilausen Cleemann](#)



[2772 Identification of Iron Nanoparticles As Active Species for Oxygen Reduction in Non-Precious Metal Catalysts](#)

[Andrew A. Gewirth, Jason A. Varnell](#)

[2773 Estimation of the Rate Constants for the 2x2-Electron ORR by Combining the Voltammograms of O<sub>2</sub> and H<sub>2</sub>O<sub>2</sub> Reduction Reactions](#)

[Azhagamuthu Muthukrishnan, Yuta Nabae](#)

[2774 Pyrolyzed Stable Ferrocene-Co-Corrole N<sub>4</sub> As a Promising Non-Precious Electrocatalyst for Oxygen Reduction Reaction](#)

[Satyanarayana Samireddi, Indrajit Shown, Ken-Tsung Wong, Li-Chyong Chen, Kuei-Hsien Chen](#)

[2775 Design of Highly Active Fe-N/C Catalysts with Abundant Fe-N<sub>x</sub> Sites for Oxygen Reduction Reaction](#)

[Sang Hoon Joo](#)

[2776 Relationship of Chemical Composition, Crystalline Structure, and Morphology to ORR Performance in Transition Metal-Nitrogen-Carbon \(MNC\) Catalysts](#)

[Michael J Workman, Alexey Serov, Michael J. Dzara, Chilan Ngo, Jonathan Gordon, Samuel McKinney, Svitlana Pylypenko, Plamen Atanassov, Kateryna Artyushkova](#)

[2777 Modeling PGM-Free Active Site Structures: Activity and Durability](#)

[Edward F. Holby, Ulises Martinez, Hoon T Chung, Piotr Zelenay](#)

[2778 \(Invited\) High Performance Fe/N/C-Based ORR Electrocatalyst and Its Application in Alkaline Fuel Cell](#)

[Zhi-You Zhou, Chi Chen, Muhammad Rauf, Xiao-Dong Yang, Yu-Cheng Wang, Shi-Gang Sun](#)

[2779 Origin of Superior Activity of Ru@Pt Core-Shell Nanoparticles towards Hydrogen Oxidation in Alkaline Media](#)

Jan Nicolas Schwämmlein, Hany A El-Sayed, Björn Marcel Stühmeier, Klaus F Wagenbauer, Hendrik Dietz, Hubert A. Gasteiger

2780 Systematic in Situ Infrared Study of the Electro-Oxidation of C3 Alcohols on Carbon-Supported Pt and Pt-Bi Catalysts for Energy Applications

Jesus Gonzáles-Cobos, Stève Baranton, Christophe Coutanceau

2781 Enhanced Performance of Pristine Au Catalysts in the Presence of Ag for Alcohol Electrooxidation

Brahma Teja M S, Sai Siddhardha R S, Sai Saihish R, Sai Siva Kumar B

2782 Methanol Oxidation on Ru- or Ni-Modified Pd-Electrocatalysts in Alkaline Media: A Comparative Differential Electrochemical Mass Spectrometry Study

Tilman Jurzinsky, Birgit Kintzel, Robin Bär, Carsten Cremers, Karsten Pinkwart, Jens Tübke

2783 Metal Oxide Nanocrystals Supported on Carbon Nanotubes As Bifunctional Electrocatalysts in Reversible Alkaline Membrane Fuel Cells

Shuai Zhao, Brian Rasimick, William E Mustain, Hui Xu

2784 Fe/N Co-Doped Carbon Materials with Controllable Structure As Highly Efficient Electrocatalysts for Oxygen Reduction Reaction

Haiyan Wang, Minhua Shao, Jiajie Chen

2785 Power Generation Characteristics of the Direct Formic Acid Fuel Cell Using Silica Containing Carbon Nanofiber as the Anode Supports

Takuya Tsujiguchi, Norraihanah Mohamed Aslam, Ryo Onishi, Fumihiko Matsuoka, Nozomi Yamazaki, Yugo Osaka, Akio Kodama

2786 Novel Highly Acidic Mixed-Metal (W, Zr) Catalytic Matrices for Dispersed Noble Metal Nanoparticles: Electrooxidation of Hydrogen and Small Organic Molecules

Pawel J Kulesza, Iwona Agnieszka Rutkowska

2787Platinum-Nickel Nanowires As Electrocatalysts in Alkaline Hydrogen Oxidation and Evolution

Shaun M Alia, Chilan Ngo, Sarah Shulda, Svitlana Pylypenko, Bryan S Pivovar

2788Investigation of CeO<sub>2</sub>/Graphene and Nb<sub>2</sub>O<sub>5</sub>/Graphene Supported Pt and PtCo Catalysts Towards Methanol and Ethanol Oxidation and Oxygen Reduction Reactions

Virginija Kepeniene, Raminta Stagniunaite, Loreta Tamasauskaite-Tamasiunaite, Algirdas Selskis, Eugenijus Norkus

2789Graphitic Carbon Nitride-Graphene Hybrid Nanostructure as a Catalyst Support for Polymer Electrolyte Membrane Fuel Cells

Noramalina Mansor, Jingjing Jia, Tom Miller, Theo Suter, Ana Belen Jorge, Christopher Gibbs, Paul R. Shearing, Paul F. McMillan, Cecilia Mattevi, Milo Shaffer, Daniel J.L Brett

2790Accelerated Durability Tests for Pt-Nanoclusters Modified Carbide Derived Carbons Catalysts in Acidic Solution

Kersti Vaarmets, Silver Sepp, Jaak Nerut, Enn Lust

2791Conductive Si-B-C Ceramics As Durable Catalyst Supports

Graham Smith, Colleen Jackson, Denis Kramer, Pieter Levecque

2792Oxide-Coated Carbon Black for Cathode Catalyst Support

Yuki Nako, Takashi Sonoda, Tetsuya Itoh, Taro Kinumoto

2793Sb or Nb Doped Tin Dioxide Aerogels Based PEFC Cathode

Guillaume Ozouf, Frederic Maillard, Gwenn Cognard, Laure Guetaz, Marie Heitzmann, Christian Beauger

[2794Core-Shell Support for PEFC Electrocatalysts : A Case Study with Doped-SrTiO<sub>3</sub>](#)

[Masahiro Iwami, Shohei Matsumoto, Zhiyun Noda, Junko Matsuda, Akari Hayashi, Kazunari Sasaki](#)

[2795Effect of Carbon Monoxide on the Performance of Polymer Electrolyte Fuel Cell with Hydrogen Circulation System](#)

[Yoshiyuki Matsuda, Takahiro Shimizu, Yoshiyuki Hashimasa](#)

[2796\(Invited\) Core-Shell Nanosheet Catalysts: Enhanced Activity and Durability for Oxygen Reduction and Hydrogen Oxidation Reactions](#)

[Wataru Sugimoto, Daisuke Takimoto, Tomohiro Ohnishi, Jeerapat Nutariya, Zhongrong Shen, Yusuke Ayato, Dai Mochizuki, Adrien Boulineau, Arnaud Demortiere](#)

[2797Highly Active, CO-Tolerant and Robust Hydrogen Anode Catalysts: Pt-M \(M=Fe, Co, and Ni\) Alloys with Stabilized Pt Skin](#)

[Guoyu Shi, Hiroshi Yano, Donald A. Tryk, Akihiro Iiyama, Hiroyuki Uchida](#)

[2798Mechanistic Analysis of Electrocatalytic CO Oxidation By a Rh Porphyrin on a Carbon Support](#)

[Shin-ichi Yamazaki, Yasushi Maeda, Masafumi Asahi, Zyun Siroma, Tsutomu Ioroi](#)

[2799Carbon Supported IrRu<sub>4</sub> Catalyst for the Cell Reversal Tolerant Anode in Automotive Pemfcs](#)

[Eunyoung You, Myoungki Min, Seon-Ah Jin, Tae-yoon Kim, Chanho Pak](#)

[2800Investigation of Microstructure, Porosimetry, Water Uptake and Proton Conductivity of Machine Prepared Catalyst Layers for Pemfcs](#)

[Nelly M. Cantillo, Christopher A. Neal, Gabriel A. Goenaga, Karren L. More, Thomas A. Zawodzinski](#)

[2801Optimization of Catalyst Layer Properties for High Temperature Polymer Fuel Cells](#)

[Thomas Steenberg, Hans A. Hjuler, Jens Oluf Jensen, Qingfeng Li](#)

[2802An FIB-SEM Study on Correlations between PEFC Electrocatalyst Microstructure and Cell Performance](#)

[Makito Okumura, Zhiyun Noda, Junko Matsuda, Masamichi Nishihara, Akari Hayashi, Kazunari Sasaki](#)

[2803Investigation of Solvent Effects on the Dispersion of Carbon Agglomerates and Nafion Ionomer Particles in Catalyst Inks Using Ultra Small Angle X-Ray Scattering and Cryo-TEM](#)

[Fan Yang, Le Xin, Aytakin Uzunoglu, Lia Stanciu, Jan Ilavsky, Steven Son, Jian Xie](#)

[2804Non-Destructive Optical Measurement of Oxygen Concentration on PEFC Catalyst Layer](#)

[Suguru Uemura, Toshihiko Yoshida, Ting-Chu Jao, Takashi Sasabe, Shuichiro Hirai](#)

[2805Bridging the Gap: PEMFC Isothermal Water Storage Capacity Tests and Automotive Cold-Starts](#)

[Cynthia A. Rice, Antonio Pistono](#)

[2806The Effect of Catalyst Layer Coating Irregularities on Initial Fuel Cell Performance](#)

[Guido Bender, Adam Phillips, Jocelyn Mackay, Jason Morgan Porter, Michael Ulsh](#)

[2807Effects of High Oxygen Permeability Ionomers on the Cathode Performance of Polymer Electrolyte Fuel Cells](#)

[Young-Chul Park, Katsuyoshi Kakinuma, Akihiro Iiyama, Makoto Uchida](#)

[2808Statistical Analysis for the Electrochemical Performance of a 3D Reconstructed Catalytic Layer](#)

[Romeli Barbosa, Beatriz Escobar, Victor Soberanis](#)

[2809 Resolving Active Sites and Porosity in PGM-Free Catalysts By Electron Microscopy](#)

[David A. Cullen, Brian Sneed, Karren L. More, James H Brewster, Madeleine Odgaard, Hoon T Chung, Piotr Zelenay](#)

[2810 Quantitative Analysis of Pemel and PEMFC Electrode Drying](#)

[Fabian Scheepers, Andrea Burdzik, Markus Stähler, Wiebke Lüke, Werner Lehnert](#)

[2811 The Challenges to Ultra-Low-Platinum PEMFC Cathode and the Electrocatalyst Design Thereof](#)

[Junliang Zhang, Shuiyun Shen, Fengjuan Zhu, Chao Wang, Liuxuan Luo](#)

[2812 Effect of Model Fuel Impurities for Reformed Jet Fuels on the Hydrogen Oxidation at Platinum Based Catalyst under HT-PEMFC Conditions](#)

[Carsten Cremers, Maria Sol Rau, André Niedergesäß, Karsten Pinkwart, Jens Tübke](#)

[2813 Hydrogen Sulfide Tolerance in High Temperature Pemfcs](#)

[Anton Vassiliev, Lars Nilausen Cleemann, Qingfeng Li, Jens Oluf Jensen](#)

[2814 Metal Phosphide-Based Novel Anodes for Intermediate Temperature Fuel Cells](#)

[Ryuji Kikuchi, Takahiro Ataku, Atsushi Takagaki, Shigeo Ted Oyama](#)

[2815 Phosphoric Acid Tolerant Oxygen Reduction Reaction Catalysts for High-Temperature Polymer Electrolyte Fuel Cells](#)

[Alexander Schenk, Stefan Gamper, Christoph Grimmer, Merit Bodner, Stephan Weinberger, Viktor Hacker](#)

[2816 On the Degradation of Pt Nanocatalysts Supported on Carbon Nanotubes in High Temperature PEM Fuel Cells](#)

[Somaye Sadat Rasouli, Tsuyohiko Fujigaya, Paulo Jorge Ferreira, Naotoshi Nakashima](#)

[2817Systematic Study of Durability of High Temperature PEM Fuel Cells at Selected Temperatures, Flow Rates and Loads](#)

[Jens Oluf Jensen, Mark Tonny Dalsgaard Jakobsen, Lars Nilausen Cleemann, Thomas Steenberg, Hans A. Hjuler, Qingfeng Li](#)

[2818Control of Fe-Ni Nanoparticle Activity for the Oxygen Evolution Reaction \(OER\) and Methanol Electrooxidation](#)

[Lauren F Greenlee, Stephanie L Candelaria](#)

[2819Facile Synthesis of High Performance Platinum-Cerium Oxide Nanocatalysts for Methanol Oxidation](#)

[Peeter Valk, Jaak Nerut, Rait Kanarbik, Enn Lust](#)

[2820The Potential of Zero Total Charge As a Descriptor of Catalytic Activity of Ru@Pt Core-Shell Catalysts](#)

[Svein Sunde, Jørgen Svendby, Frode Seland](#)

[2821Design and Fabrication of Pt-Au Nanocatalyst with High Performance](#)

[Geping Yin](#)

[2822A Simple and Inexpensive Organometallic Compound Catalyzing Oxygen Reduction Reaction](#)

[Kothandaraman Ramanujam, Anjaiah Sheelam](#)

[2823Platinum Based Catalysts for Direct Alcohol Oxidation and Oxygen Reduction Reaction](#)

[Tran Van Man](#)

[2824Cathode Catalyst Layer Design and Optimization for Portable Power Applications Using Non-Precious Metal Catalysts](#)

[Takeaki Kishimoto, Tetsutaro Sato, Yoshikazu Kobayashi, Kumi Narizuka, Dustin Banham, Yingjie Zhou, Emil Marquez, Kyoung Bai, Siyu Ye](#)

2825 [High-Temperature Synthesized PGM-Free Oxygen Reduction Reaction Catalyst](#)

[Hoon T Chung, David A. Cullen, Brian Sneed, Ling Lin, Xi Yin, Ulises Martinez, Geraldine M Purdy, Karren L. More, Piotr Zelenay](#)

2826 [Zinc-Derived Microporous Structure in Non-Precious Metal Catalysts for Polymer Electrolyte Fuel Cell Cathodes](#)

[Ling Lin, Hoon T Chung, Xi Yin, Ulises Martinez, Piotr Zelenay](#)

2827 [Binary Fe-Free Transition Metal Catalysts for the Oxygen Reduction Reaction](#)

[Ulises Martinez, Edward F. Holby, Joseph H Dumont, Piotr Zelenay](#)

2828 [Graphene Oxide-Based Non Precious Metal Catalysts for Oxygen Reduction Reaction with Improved Selectivity and Performance](#)

[Joseph H Dumont, Ulises Martinez, Geraldine M Purdy, Andrew M Dattelbaum, Piotr Zelenay, Plamen Atanassov, Aditya Mohite, Gautam Gupta](#)

2829 [Non-Precious ORR Catalyst for PEMFC Application Using Iron, Nitrogen and Sulfur Co-Doped Few Layer Graphene](#)

[Bhaghavathi Parambath Vinayan](#)

2830 [Electro-Polymerized Metalloporphyrins As Electrocatalysts for Oxygen Reduction](#)

[Lior Elbaz, Naomi Levi, Atif Mahammed, Zeev Gross, Ariel Friedman](#)

2831 [Advancement of Group 4 and 5 Metal Oxide Cathode with Oxide Support for PEFCs](#)

[Kenichiro Ota, Yuko Tamura, Takaaki Nagai, Koichi Matsuzawa, Shigenori Mitsushima, Akimitsu Ishihara](#)



[2832Emergence of Oxygen Reduction Activity in Niobium-Doped Titanium Oxides As Non-Platinum Cathode for PEFCs](#)

[Akimitsu Ishihara, Masazumi Arao, Chihiro Yogi, Masashi Matsumoto, Hideto Imai, Chumeng Wu, Takaaki Nagai, Koichi Matsuzawa, Teko W. Napporn, Shigenori Mitsushima, Ken-ichiro Ota](#)

[2833Key Factors to Display Oxygen Reduction Reaction Activity on Support-Free Group IV Metal Oxynitride Catalysts in Acidic Media](#)

[Mitsuharu Chisaka, Yusuke Yamamoto, Noriaki Itagaki](#)

[2834Catalytic Activity of Titanium Dioxide Nanoparticles As a Non-Platinum Cathode Catalyst for Oxygen Reduction Reaction](#)

[Gholamreza Mirshekari, Pezhman Shirvanian](#)

[2835Models to Couple Mechanics and Electrochemical Transport in Solid Electrolytes](#)

[Priyamvada Goyal, Charles W Monroe](#)

[2836Correlation Between Crack Initiation and Chemical Decomposition in the Ionomer Membrane of Polymer Electrolyte Fuel Cells](#)

[Mohamed El Hannach, Ka Hung Wong, Yadvinder Singh, Erik Kjeang](#)

[2837Computational Modelling of Cationic Contamination in PEFCs: a Multiphase Mixture Approach](#)

[Charles Joseph Banas, Ugur Pasaogullari](#)

[2838Correlation between the Swelling Characteristic and Humidity Cycle Durability of a Polymer Electrolyte Membrane](#)

[Yoshiyuki Hashimasa, Hiroshi Daitoku, Tomoaki Numata, Yoshiyuki Matsuda](#)

[2839Numerical Analysis of Nanostructure Around Ferrous Ion in Hydrated Nafion Membrane](#)

[Kiyoto Kawai, Takuya Mabuchi, Takashi Tokumasu](#)

2840 [A Rapid Ex-Situ alternative for Mechanical Accelerated Stress Testing of Fuel Cells](#)

[Alireza Sadeghi Alavijeh, Erik Kjeang, Senthil velan Venkatesan, Will Kim, Ramin M.H. Khorasany](#)

2841 [Evolution of Membrane Degradation in Fuel Cells Observed By X-Ray Computed Tomography](#)

[Dilip Ramani, Yadvinder Singh, Frank Orfino, Monica Dutta, Erik Kjeang](#)

2842 [Modeling of Chemical Membrane Degradation Mitigation and Performance Tradeoffs in Ceria-Supported Fuel Cells](#)

[Ka Hung Wong, Erik Kjeang](#)

2843 [Determining Membrane Degradation in Polymer Electrolyte Fuel Cells by Effluent Water Analysis](#)

[Merit Bodner, Mija Rami, Bernhard Marius, Alexander Schenk, Viktor Hacker](#)

2844 [Quantitative Evaluation of Chemical Degradation of Polymer Electrolyte Membrane for Fuel Cells and the Method of Lifetime Prediction](#)

[Atsushi Hiraide](#)

2845 [Cerium Migration in Polymer Electrolyte Membranes](#)

[Andrew M. Baker, Rangachary Mukundan, Dusan Spornjak, Suresh G. Advani, Ajay K. Prasad, Rod L. Borup](#)

2846 [An Examination of Voltage Losses for the Hydrogen Oxidation and Reduction Reactions in an Alkaline Membrane Fuel Cell](#)

[Andrew Michael Park, Ami C. Yang-Neyerlin, Huai-Suen Shiau, Shaun M Alia, Adam Z Weber, K.C. Neyerlin, Bryan S Pivovar](#)

[2847A Highly Active and Ultra-Durable Methanol Oxidation Electrocatalyst Based on the Synergy of Pt-Ni\(OH\)<sub>2</sub>-Graphene](#)

[Yanguang Li](#)

[2848Performance of Pd/Graphene Nanocomposite Catalysts in H<sub>2</sub>/O<sub>2</sub> Anion Exchange Membrane Fuel Cells](#)

[Sadia Kabir, Alexey Serov, Plamen Atanasov](#)

[2849Detection of Superoxide Anion Radical in Anion Exchange Membrane Fuel Cells Using in-Situ Fluorescence Spectroscopy](#)

[Yunzhu Zhang, Vijay K Ramani](#)

[2850On the Design of a Comb-Shaped, Poly\(phenylene oxide\)-Based Anodic Binder for Anion-Exchange Membrane Direct Methanol Fuel Cell \(AEM-DMFC\)](#)

[Tilman Jurzinsky, Robin Bär, Nils Heppe, Markus Kübler, Florina Jung, Carsten Cremers, Jens Tübke](#)

[2851Method for Studying High Temperature Aqueous Electrochemical Systems: A Self Pressurized Autoclave](#)

[Thomas Holm, Per Kristian Dahlstrøm, Svein Sunde, David A. Harrington, Frode Seland](#)

## **I02-Solid State Ionic Devices 11**

[2852Electrical Conductivity and Defect Equilibria of MoO<sub>3-d</sub>, a Catalyst for Biofuel Upgrading](#)

[Sean R. Bishop, Vanessa Mortola, Manish Shetty, Yuriy Roman, Harry L. Tuller](#)

[2853Utilisation of Solid Oxide Fuel Cells for Conversion of Biodiesel Waste Streams](#)

[Matthew Drewery, Eric Kennedy, Bogdan Dlugogorski, Michael Stockenhuber](#)

[2854Development of Fuel-Flexible SOFC](#)

Yusuke Shiratori, Mio Sakamoto, Long Dang Tran, Shuji Kita, Huong Thi Giang Nguyen, Tuyen Quang Tran, Tin Duc Chanh Doan, Chien Mau Dang

2855Research and Development of Ammonia-Fueled SOFC Systems

Hiroki Muroyama, Atthapon Srika, Takeou Okanishi, Toshiaki Matsui, Masashi Kishimoto, Motohiro Saito, Hiroshi Iwai, Hideo Yoshida, Koichi Eguchi, Masaki Saito, Takeshi Koide, Hiroyuki Iwai, Shinsuke Suzuki, Yosuke Takahashi, Toshitaka Horiuchi, Hayahide Yamasaki, Shohei Matsumoto, Shuji Yumoto, Hidehito Kubo, Jun Kawahara, Akihiro Okabe, Yuki Kikkawa, Takenori Isomura

2856Novel Anode Catalysis for Ammonia Solid Oxide Fuel Cell

Michihiro Hashinokuchi, Mengjia Zhang, Ryuji Yokochi, Takayuki Doi, Minoru Inaba

2857Electrochemical Property of Ni-Ba(Zr,Y)O<sub>3</sub> Anode for Direct Ammonia-Fueled SOFC

Kazunari Miyazaki, Takeou Okanishi, Hiroki Muroyama, Toshiaki Matsui, Koichi Eguchi

2858(Invited) Steam Electrolysis Using Proton-Conducting Perovskite

Hiroshige Matsumoto, Kwati Leonard, Young-Sung Lee, Yuji Okuyama, Kuninori Miyazaki

2859Reduction of Thermal Stress during Soec Unsteady Operation

Kentaro Watanabe, Atsushi Maeda, Tatsuya Mizusawa, Takuto Araki, Masashi Mori

2860CO<sub>2</sub>/H<sub>2</sub>O High Temperature Co-Electrolysis Using LaFeO<sub>3</sub>-Based Oxide Cathode

Kuan-Ting Wu, Tatsumi Ishihara

2861A Decade of Improvements for Solid Oxide Electrolysis Cells. Long-Term Degradation Rate from 40%/Kh to 0.4 % Kh

Anne Hauch, Karen Brodersen, Ming Chen, Christopher Graves, Søren Højgaard Jensen,

[Peter Stanley Jørgensen, Peter Vang Hendriksen, Mogens Bjerg Mogensen, Simona Ovtar, Xiufu Sun](#)

2862 [Water Electrolysis Using Water Absorbing Porous Electrolyte Cell](#)

[Yuki Terayama, Takamasa Haji, Kouhei Mori, Hiroshige Matsumoto](#)

2863 [The Impact of Strong Cathodic Polarization on SOC Electrolyte Materials](#)

[Kosova Kreka, Karin Vels Hansen, Torben Jacobsen, Kion Norrman, Christodoulos Chatzichristodoulou, Mogens Bjerg Mogensen](#)

2864 (Invited) [Multi-Element-Doped Ceria-Based Metal Oxides for Advanced Proton Conducting SOFCs](#)

[Venkataraman Thangadurai, Kalpana Singh](#)

2865 [Progress and Accomplishment in Development of High Performance Pefcs at Kist](#)

[Jong-Ho Lee, Hyegsoon An, Sung Min Choi, Jongsup Hong, Kyung Joong Yoon, Hyoungchul Kim, Ji-Won Son, Byung-Kook Kim](#)

2866 [Efficiency of Proton Ceramics Fuel Cells Considering Mixed Conduction in Solid Electrolyte](#)

[Koji Amezawa, Takashi Nakamura, Shusuke Mizunuma, Kosuke Yamauchi, Yuichi Mikami, Tomohiro Kuroha](#)

2867 [Proton Conduction Properties of Bzcy and Szcyc Perovskites Type Oxides; Addressing the Effect of Dopant Levels and Proton Content](#)

[Kwati Leonard, Young-Sung Lee, Yuji Okuyama, Kuninori Miyazaki, Hiroshige Matsumoto](#)

2868 [Mixed Proton/Electron Conductivity in Nano-Grained Bulk Body of TiO<sub>2</sub>](#)

[Keiichiro Honda, Shu Yamaguchi](#)

[2869 Fabrication and Characterization of Strontium-Doped Lanthanum Manganite Cathode Supports for Micro-Tubular Solid Oxide Fuel Cells](#)

[Dhruba Panthi, Bokkyu Choi, Atsushi Tsutsumi](#)

[2870 Phase Stability and Electrochemical Characterization of Solid Oxide Fuel Cell Cathodes Containing  \$K\_2NiF\_4\$  Structured Oxides](#)

[Deniz Cetin, Sophie Poizeau, Srikanth Gopalan](#)

[2871 Effects of Electrolytes on Electrochemical Properties of Cathode Material  \$LaNi\_{0.6}Fe\_{0.4}O\_{3-d}\$  based Fuel Cells](#)

[Peng Yang, Jing Sui, Lifeng Dong](#)

[2872 Surface Segregation in Strontium Doped Lanthanum Cobalt Ferrite: Effect of Composition and Strain](#)

[Yang Yu, Karl F Ludwig, Srikanth Gopalan, Uday Bhanu Pal, Joseph C Woicik, Tiffany C Kaspar, Soumendra Nath Basu](#)

[2873 Phase Evolution in  \$\(Pr\_{1-x}Nd\_x\)\_2NiO\_{4+d}\$  Cathodes for Intermediate Temperature Solid Oxide Fuel Cell Applications](#)

[Emir Dogdibegovic, Christopher J. Wright, Xiao-Dong Zhou](#)

[2874 Developing Cost-Effective Dense Continuous SDC Barrier Layers for SOFCs](#)

[John S Hardy, Christopher A Coyle, Hoang V. P. Nguyen, Zigui Lu, Jeffrey W Stevenson](#)

[2875 Surface Modification of  \$Ba\_{0.5}Sr\_{0.5}Co\_{0.8}Fe\_{0.2}O\_{3-d}\$  By Using Atomic Layer Deposition](#)

[Yoshiaki Hayamizu, Itaru Oikawa, Hitoshi Takamura](#)

[2876 Fundamental Understanding of Electro-Chemo-Mechanical Properties of Layered Rare Earth Cuprate-Based Systems](#)

[Chang Sub Kim, Harry L. Tuller](#)

[2877 Electro-Chemo-Mechanical Studies of Perovskite-Structured Mixed Ionic-Electronic Conducting  \$\text{SrSn}\_{1-x}\text{Fe}\_x\text{O}\_{3-x/2+d}\$](#)

[Chang Sub Kim, Sean R. Bishop, Nicola H. Perry, Harry L. Tuller](#)

[2878 Chromium Impurity Effects on SOFC Cathodes Using Half-Cell Measurements](#)

[Yiwen Gong, Yuexing Zhu, Ruofan Wang, Zhihao Sun, Uday Bhanu Pal, Soumendra Nath Basu, Srikanth Gopalan](#)

[2879 Investigation of Cr-Poisoning in SOFC Cathode By Using the Patterned Thin Film Electrode](#)

[Yusuke Shindo, Yoshinobu Fujimaki, Takashi Nakamura, Keiji Yashiro, Fumitada Iguchi, Hiroo Yugami, Tatsuya Kawada, Koji Amezawa](#)

[2880 Effect of Chromium Poisoning on Performance of Sr-Doped  \$\text{LaMnO}\_3\$  \(LSM\)-Based Cathode in Anode-Supported Solid Oxide Fuel Cells](#)

[Ruofan Wang, Manuel Würth, Uday Bhanu Pal, Srikanth Gopalan, Soumendra Nath Basu](#)

[2881 Chromium Resistive  \$\text{BaCeO}\_3\$  Infiltrated  \$\text{La}\_{0.6}\text{Sr}\_{0.4}\text{Co}\_{0.2}\text{Fe}\_{0.8}\text{O}\_3\$  Cathode of Solid Oxide Fuel Cells](#)

[Kongfa Chen, Meng Li, Na Ai, San Ping Jiang](#)

[2882 \(High Temperature Materials Division Outstanding Achievement Award\) A Country Boy Finds Materials Science](#)

[Harlan U. Anderson](#)

[2883 Origin of Electrochemical Capacitance of Ni/YSZ Anode and Its Application to Evaluation of Active Reaction Site](#)

[Keiji Yashiro, Mirai Takeda, Shin-ichi Hashimoto, Tatsuya Kawada](#)

[2884  \$\text{SrVO}\_3\$ -Based Fuel Electrode Material for Solid-Electrolyte Cells: Stability, Electrical Properties and Thermochemical Expansion](#)

[Aleksey Yaremchenko, Javier Macias, Jorge Frade](#)

[2885 Degradation of SOFCs By Phosphorus Impurities: Impedance Spectroscopy and Microstructural Analysis](#)

[Yuhdai Kikuchi, Kyouhei Sunada, Junko Matsuda, Shunsuke Taniguchi, Yusuke Shiratori, Kazunari Sasaki](#)

[2886 Alternative SOFC Anode Materials with Ion- and Electron-Conducting Backbones for Higher Fuel Utilization](#)

[Shotaro Futamura, Xuesong Shen, Yuya Tachikawa, Yusuke Shiratori, Shunsuke Taniguchi, Kazunari Sasaki](#)

[2887 Temperature Dependence of Carbon Deposition in Ni-YSZ Cermet with Various Steam/Carbon Ratio](#)

[Yuki Shinomiya, Nobuaki Ohmura, Takashi Nakamura, Koji Matsuoka, Takao Kudo, Keiji Yashiro, Tatsuya Kawada, Koji Amezawa](#)

[2888 Influence of a Ni Metal Phase and Geometrical Structures of YSZ in Ni-YSZ SOFC Anode to Its Mechanical Properties](#)

[Fumitada Iguchi, Hiroo Yugami, Makoto Shimizu, Yoshiki Akaza, Sarana Akraseev, Yutaro Miyoshi](#)

[2889 Stability and Performance Investigation of Co-Sputtered Ni Cermet Thin Films at Reduced Temperature](#)

[Yeageun Lee, Wonjong Yu, Yoon Ho Lee, Yusung Kim, Suk Won Cha](#)

[2890 New Material Design of Electron-Proton Mixed Conductor Ru-Doped  \$\text{BaCe}\_{0.90}\text{Y}\_{0.10}\text{O}\_{3-d}\$  Thin Film As Fuel Cell Anode Electrode](#)

[Masanori Ochi, Takashi Tsuchiya, Tohru Higuchi](#)

[2891 Hydrogen Oxidation Reaction Mechanisms in Mixed Ionic and Electronic Conducting Oxide Anode for Solid Oxide Fuel Cells](#)



Wenyuan Li, Xingbo Liu

2892 (Invited) Engineering Electronic and Electrochemical Nanoscale Oxides

Harry L. Tuller, Jae Jin Kim, Sean R. Bishop, Di Chen

2893 Innovative Approach on Nano-Structuring of Electrode for Solid Oxide Cells

Jaeha Myung, Dragos Neagu, John T. S. Irvine

2894 Enhancement of Thermal Stability of Sputtered Nanoporous Pt Thin Film Using Oxygen Plasma Treatment in Low Temperature Solid Oxide Fuel Cells

Kang-Yu Liu, Pei-Chen Su

2895 Long-Term Stability of Anode-Supported Solid Oxide Fuel Cells with a Co-Sintered Cathode Backbone and Infiltrated  $\text{La}_{0.95}\text{Co}_{0.4}\text{Ni}_{0.6}\text{O}_3$  (LCN) Electro-Catalyst

Rainer Küngas, Sune Veltzé, Simona Ovtar, Yu Xu, Søren Bredmose Simonsen, Kawai Kwok, Henrik Lund Frandsen, Alfred Samson, Philipp Zielke, Wolff-Ragnar Kiebach

2896 (Invited) Investigation on the Selective Exsolved Electro-Catalytic Nanoparticles from Perovskite Oxide Lattices

Ohhun Kwon, Young-Wan Ju, Guntae Kim

2897 The Effect of the Electrode Particle Size Reduction to Nanoscale on the Low-Temperature-Operating Solid Oxide Fuel Cells

Jung Hoon Park, Seung Min Han, Jongsup Hong, Byung-Kook Kim, Hae-Weon Lee, Hyoungchul Kim, Kyung Joong Yoon, Jong-Ho Lee, Ji-Won Son

2898 Surface Modification of Solid Oxide Fuel Cell Cathodes Using Atomic Layer Deposition

Hyung Jong Choi, Kiho Bae, Jun Woo Kim, Suk Won Park, Gwon Deok Han, Dong Hwan Kim, Ji-Won Son, Joon Hyung Shim

[2899Effect of PEALD YSZ on Bi-Layered Electrolyte with Nanoscale Structure](#)

[Wonjong Yu, Suk Won Cha, Gu Young Cho, Soonwook Hong, Yeageun Lee, Jihwan An](#)

[2900High-Performance Low-Temperature Solid Oxide Fuel Cells By Atomic Layer Deposition of Yttria-Stabilized Zirconia on Silver Cathode](#)

[Junmo Koo, You Kai Li, Hyung Jong Choi, Ke Chean Neoh, Dong Young Jang, Joon Hyung Shim](#)

[2901Change in Surface Composition of  \$\text{La}\_{0.9}\text{Sr}\_{0.1}\text{Ga}\_{1-x}\text{Mg}\_x\text{O}\_{3-d}\$  Investigated with Low Energy Ion Scattering Analysis](#)

[Henning Schraknepper, Tatsumi Ishihara](#)

[2902Evidence of the Space Charge Layer Evolution at the YSZ Grain Boundaries upon Long Term Electrochemical Operation of Solid Oxide Fuel Cells](#)

[Xueyan Song, Yun Chen, Liang Liang, Harry Abernathy, Gregory Hackett, Kirk Gerdes](#)

[2903Limitations of Grain Boundary Engineering - Ionic Versus Electronic Conductivity](#)

[Tobias M. Huber, Edvinas Navickas, Kazunari Sasaki, Bilge Yildiz, Harry L. Tuller, Juergen Fleig, Yan Chen](#)

[2904Secondary Phases at Cathode/Electrolyte Interfaces](#)

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

[2905Elucidating the Origin of Oxide Ion Blocking Effect at GDC/SrZr\(Y\)O<sub>3</sub>/YSZ Heterointerfaces](#)

[Katherine Develos- Bagarinao, Harumi Yokokawa, Haruo Kishimoto, Tomohiro Ishiyama, Teruhisa Horita, Katsuhiko Yamaji](#)

[2906\(Invited\) Surface Reactivity and Ionic Transport of Mixed Conductors in Wet Atmospheres](#)

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

[2907 Practical Considerations for Determining Thin Film Oxygen Surface Exchange Coefficients, Elastic Constants, Thermal Expansion Coefficients, Thermo-Chemically Induced Stresses, and Thermo-Chemically Induced Strains from Wafer Curvature Measurements](#)

[Jason D. Nicholas](#)

[2908 Bulk- and Powder Surface Exchange Coefficients of \(La,Sr\)CoO<sub>3-d</sub>](#)

[Hiroshi Chiba, Keiji Yashiro, Hiroki Sato, Shin-ichi Hashimoto, Tatsuya Kawada](#)

[2909 Oxygen Activation and Dissociation on Transition Metal-Free Perovskite Surfaces. Insights on the Surface Reactivity of SrTiO<sub>3</sub>](#)

[Aleksandar Staykov, Taner Akbay, John Druce, Helena Téllez, Tatsumi Ishihara, John A. Kilner](#)

[2910 Chemical and Electrochemical Stability on Perovskite Oxides As a Function of Surface Reducibility](#)

[Qiyang Lu, Nikolai Tsvetkov, Lixin Sun, Ethan J Crumlin, Bilge Yildiz](#)

[2911 \(La,Sr\)\(Cr,Ni\)O<sub>3</sub>/CeO<sub>2</sub>-Based Composite Anode with Various Ni Content and Mixing Ratio for SOFC](#)

[Hiroshi Fukunaga, Makoto Saito, Yuta Takei, Iori Shimada, Mitsumasa Osada, Nobuhide Takahashi](#)

[2912 Degradation Analysis of SOFC Stack Performance-Durability Test and Verification of Improved SOFCs-](#)

[Masahiro Yoshikawa, Tohru Yamamoto, Kenji Yasumoto, Yoshihiro Mugikura](#)

[2913 Fabrication of the Large Area Thin-Film Solid Oxide Fuel Cells with Anodized Aluminum Oxide](#)

[Soonwook Hong, Young-Beom Kim, Hun Park, Tae Hee Han](#)

2914 [Development of Methanol Fueled Micro-SOFC System for Mobile Electronic Devices](#)

[Shinpei Takahara, Koki Kato, Fumitada Iguchi, Makoto Shimizu, Hiroo Yugami](#)

2915 [Enhanced Charge Transfer at Electrolyte/Electrode Interfaces in SOFCs](#)

[Mingi Choi, Sangyeon Hwang, Doyoung Byun, Wonyoung Lee](#)

2916 [Materials Diffusion Stability at Interface Between Stabilized ZrO<sub>2</sub> Electrolyte and CeO<sub>x</sub> Interlayer in Model SOFC Cell](#)

[Masakuni Ozawa, Kensuke Imura](#)

2917 [Design and Fabrication of a Flat Tubular SOFC Stack](#)

[Bin Xie, Weijie Ji, Li Ming, Yousong Jiang](#)

2918 [Rapid Structure Degradation of Silver Under SOFC Conditions with a Ni-YSZ Anode and Methane-Oxygen Mixed Gas](#)

[Zhihong Wang, Zhe Lü](#)

2919 [Electrochemical Synthesis of Ammonia Using Proton Conducting Solid Electrolyte and Ru-Doped BaCe<sub>0.8</sub>Y<sub>0.1</sub>Ru<sub>0.1</sub>O<sub>3-d</sub> Electrode Catalyst](#)

[Yusuke Kobayashi, Yutaka Kimura, Naohiro Shimoda, Shigeo Satokawa](#)

2920 [First-Principles Analysis of Oxygen Incorporation into Sr\(Ti<sub>1-x</sub>Fe<sub>x</sub>\)O<sub>3-D</sub>: Using External Dopants to Tune the Incorporation Mechanism](#)

[Namhoon Kim, Elif Ertekin](#)

2921 [Electrochemical Characteristics of Nickel and Ceria Infiltrated Nano-Structured La<sub>0.2</sub>Sr<sub>0.8</sub>TiO<sub>3</sub> Anodes for Solid Oxide Fuel Cells By Infiltration](#)

[Min-Jin Lee, Byung Hyun Choi, Mi Jung Ji, Hae Jin Hwang](#)

[2922Blocking in Ionic Conduction By Defect Segregation Near Grain-Boundaries in Nanocrystalline Yttria-Doped Ceria Thin Films](#)

[Jihwan An, Jiwoong Bae, Young Beom Kim, Turgut M. Gür, Fritz B. Prinz](#)

[2923Effect of the WO<sub>3</sub>/Lipon Solid Electrolyte Interface on the Performance of All Thin Film Inorganic Electrochromic Devices](#)

[Sami Oukassi, Séverine Poncet, Cédric Giroud-Garampon, Raphaël Salot](#)

[2924Pathway Selection in Wet-Chemical Reaction for Hierarchical High Surface Nano-Ceria](#)

[Hanbit Kim, Tae Ho Shin](#)

[2925Electrochemical and Thermal Catalytic Syntheses of Ammonia over Yttrium-Doped Barium Zirconate and Cerate Perovskites Supported Ruthenium Catalysts](#)

[Naohiro Shimoda, Yusuke Kobayashi, Yutaka Kimura, Shigeo Satokawa](#)

[2926Understanding the Effect of Temperature on the Sulfur Tolerance of a Ca Rich Ferrite SOFC Electrode](#)

[Paul Addo, Ali Ahsen, Aligul Buyukaksoy, Beatriz Molero-Sánchez, Osman Ozturk, Viola Birss](#)

[2927A Material Study on Na-SrSiO<sub>3</sub> Ionic Conductor](#)

[Youngseok Jee, Xuan Zhao, Kevin Huang](#)

[2928Processing of Solid Oxide Fuel Cell Anodes for Enhanced Intermediate Temperature Catalytic Activity at High Fuel Utilization](#)

[Paul Joseph Gasper, Yanchen Lu, Soumendra Nath Basu, Uday Bhanu Pal](#)

[2929 Fabrication of Dense Ceramics and the Electrical Conductivity Anisotropy of the Textured MgO-Doped Lanthanum Silicate Oxyapatite](#)

[Yuki Shimura, Kiyoshi Kobayashi, Tohru S. Suzuki, Tetsuo Uchikoshi, Yoshio Sakka, Takaya Akashi](#)

[2930 The Effect of Partial Substitution of Alkaline Earth Ion for La Site in  \$\text{LaNi}\_{0.2}\text{Fe}\_{0.8}\text{O}\_{3-\delta}\$  on Crystal Structure and Electrical Conductivity](#)

[Kazuhiro Kurata, Nozomi Kondo, Tomoki Hosokawa, Eiki Niwa, Takuya Hashimoto](#)

[2931 Measurement of Chemical Potential in Beryllium Electrolyte with Varying Thickness and Configuration Using Embedded Reference Electrodes](#)

[Seon Yeong Bae, Hyung-Tae Lim](#)

[2932 Effect of Chromium Poisoning on Performances of LSCF-SDC Composite Oxygen Electrodes Under Reversible Operation of Solid Oxide Cells](#)

[Kazuki Shimura, Kongfa Chen, San Ping Jiang, Hanako Nishino, Manuel E. Brito, Hiroyuki Uchida](#)

[2933 Synthesis of Gadolinium Doped Cerium Oxide at Low Temperature for Ion Transport Membrane](#)

[Yun Ho Jin, Chul-Han Song, Dae Hwan Jang, Jae-Kyo Yang](#)

[2934 Fabrication of Thin Film Layer Between the Cathode and Electrolyte of Solid Oxide Fuel Cell By Using a Spin Coating Method](#)

[Inyoung Jang, Chanho Kim, Sungmin Kim, Yeongil Jung, Heesung Yoon, Ungyu Paik](#)

[2935 Application of Electrospun  \$\text{Ba}\_{0.5}\text{Sr}\_{0.5}\text{Co}\_{0.8}\text{Fe}\_{0.2}\text{O}\_{3-d}\$  Nanoweb Cathode for Solid Oxide Fuel Cells](#)

[Chanho Kim, Inyoung Jang, Sungmin Kim, Taeseup Song, Heesung Yoon, Ungyu Paik](#)

[2936 GDC Diffusion Layer for Improving Electrochemical and Mechanical Property of the Intermediate Temperature Solid Oxide Fuel Cell](#)

[Sungmin Kim, Inyoung Jang, Chanho Kim, Taeseup Song, Heesung Yoon, Ungyu Paik](#)

2937 [Synthesis and Evaluation of Ni/BaCe<sub>0.5</sub>Zr<sub>0.3</sub>Y<sub>0.2</sub>O<sub>3-d</sub> Hydrogenelectrode for Proton Conducting Soecs](#)

[Ryosuke Nishikawa, Hanako Nishino, Katsuyoshi Kakinuma, Manuel E. Brito, Hiroyuki Uchida](#)

2938 [Effect of Dispersion of Platinum Nanoparticles on the Proton-Conducting Properties of Strontium Cerate and Zirconate](#)

[Yasuhiro Takamura, Kwati Leonard, Hiroshige Matsumoto](#)

2939 [A Study of Transition Metal Doping on the Electrical Properties of Perovskite Type Proton Conductor](#)

[Young-Sung Lee, Kwati Leonard, Yuji Okuyama, Hiroshige Matsumoto](#)

2940 [Novel Gradient-Porosity Structure Cathode for Intermediate-Temperature Solid Oxide Fuel Cells](#)

[Jin Li, Lichao Jia](#)

2941 [Effect of SrZrO<sub>3</sub> Formation at Lscf-Cathode/GDC-Interlayer Interfaces on the Electrochemical Properties of Solid Oxide Fuel Cells](#)

[Jeffrey Centeno De Vero, Katherine Develos- Bagarinao, Tomohiro Ishiyama, Haruo Kishimoto, Teruhisa Horita, Katsuhiko Yamaji, Harumi Yokokawa](#)

2942 [Morphology and Structure of SOFC Components Fabricated By Spray Pyrolysis](#)

[George Tsimekas, Efthimis Papastergiades, Nikolas Euripides Kiratzis](#)

2943 [SrZrO<sub>3</sub> Formation in SOFCs : Microstructural Characterization and Cell Performance](#)

[Shu Kanae, Yasuhiro Toyofuku, Tsutomu Kawabata, Yuko Inoue, Junko Matsuda, Jyh-Tyng Chou, Yusuke Shiratori, Shunsuke Taniguchi, Kazunari Sasaki](#)

[2944 Oxidation-Induced Degradation of SOFC Ni Anodes at High Fuel Utilizations](#)

[Tatsuya Kawasaki, Junko Matsuda, Yuya Tachikawa, Yusuke Shiratori, Shunsuke Taniguchi, Kazunari Sasaki](#)

[2945 Effects of Trace Copper on Shrinkage and Low-Temperature Co-Firing of Solid Oxide Fuel Cells](#)

[Yong Gun Shul, Oksung Jeon, Jin Goo Lee, Ho Jeong Hwang, Yukwon Jeon, Myeonggeun Park, Gicheon Lee, Yunseong Ji, Jeongseok Jang, Oh Chan Kwon, Jusoon Hwang](#)

[2946 Mechanical and Durable Properties of Ni-YSZ Electrode Under High Temperature for Solid Oxide Electrolysis Stack](#)

[Byung-Koog Jang, Tsuneaki Matsudaira, Sun-Dong Kim, Sang-Kuk Woo](#)

[2947 Analysis of Crystal Structure of  \$\text{BaCe}\_{0.80}\text{Y}\_{0.20}\text{O}\_{3-\delta}\$  at Room Temperature with Various Diffraction Technique](#)

[Takahiro Onoe, Takuya Hashimoto, Eiki Niwa, Masatomo Yashima, Daisuke Morikawa, Yusuke Yokoyama, Kenji Tsuda](#)

[2948 Biomass Integrated Gasification Fuel Cell in CO<sub>2</sub> Atmosphere](#)

[Jong-Pil Kim, Chung-Hwan Jeon](#)

[2949 Feasibility of \(Ni-GDC/GDC half-cell\) Manufactured By Tape Casting and Reactive Magnetron Sputtering Processes](#)

[Carlos Hernandez Londono, Lionel Combemale, Fei Gao, Alain Billard, Pascal Briois](#)

[2950 Effect of Heterointerface on Cathode Performance of Solid Oxide Fuel Cells: \(Sm,Sr\)CoO<sub>3</sub>-Based Oxide](#)

[Kohei Manriki, Hiroki Muroyama, Toshiaki Matsui, Koichi Eguchi](#)

[2951 Electrical Conductivity Behavior of Impregnated Lstm on Selectively Ni Removed Ni/YSZ Anode Substrate](#)



DaeSoo Park, Jung Hyun Kim

2952The Effect of B-Cation Disordered Structure on the Electrocatalytic and Electrochemical Performance of  $A_2CrMoO_6$  (A= Ca, Sr, Ba)

Xin Yang, Jing Chen

2953Nanocomposite YSZ-NiO Particles with Tailored Structure Synthesized in a Two-Stage Continuous Hydrothermal Flow Reactor

Philipp Zielke, Yu Xu, Wolff-Ragnar Kiebach, Søren Bredmose Simonsen, Poul Norby, Peter Vang Hendriksen

2954Semi-Solid Typed Ionic Conductor for Solid-State Electrochromic Approaches

Joo Yeon Kim, Ji Young Oh, Sanghoon Jeon, Hojun Ryu, Seong M. Cho, Chil-Sung Ah, Yong-Hae Kim, Chi-Sun Hwang

29553D Reconstruction and Thermal Stress Analysis of Re-Oxidized Ni-YSZ Anode Functional Layer of Solid Oxide Fuel Cells

Jun Woo Kim, Kiho Bae, Hyung Jong Choi, Namkeun Kim, Stefan Stenfelt, Joon Hyung Shim

2956Understanding the Conductivity Degradation Mechanism of  $Er_2O_3$ -Stabilized  $Bi_2O_3$

Byung-Hyun Yun, Kang Taek Lee

2957Fabrication and Characterization of LSM/YSZ/GDC Tri-Composite Cathode-Supported Tubular Solid Oxide Direct Carbon Fuel Cell

Seung-Bok Lee, Saeed ur Rehman, Jong-Won Lee, Tak-Hyoung Lim, Seok-Joo Park, Rak-Hyun Song

2958Effect of the Stabilized Bismuth Oxide Interlayer on Oxygen Reduction Reaction at the Cathode/Electrolyte Interface

Dong Woo Joh, Do Yeub Kim, Jeong Hwa Park, Kang Taek Lee

[2959 Surface Ce Decorated Exsolved Ni Nanoparticles Pinned Titanate Based Perovskite for Solid Oxide Fuel Cells](#)

[Yaqian Zhang, Yi-Fei Sun, Jing-Li Luo](#)

[2960 In-Situ Exsolved Co-Fe Alloy Nanoparticles on Double Layered Perovskite for the Cogeneration of Ethylene and Electricity in Proton Conducting Fuel Cell](#)

[Subiao Liu, Jing-Li Luo](#)

[2961 Reduced Temperature Sintering of GDC Electrolyte for IT-SOFCs](#)

[Sang-Kuk Woo, Hyun-Jong Choi, Doo-Won Seo, Sun-Dong Kim](#)

[2962 Electron-Ion Mixed Conduction of  \$\text{Nd}\_{0.6}\text{Sr}\_{0.4}\text{FeO}\_3\$  Cathode Electrode Thin Film for Solid Oxide Fuel Cell](#)

[Wataru Namiki, Takashi Tsuchiya, Makoto Minohara, Masaki Kobayashi, Koji Horiba, Hiroshi Kumigashira, Tohru Higuchi](#)

[2963 Ion Conduction of  \$\text{BaPrO}\_{3-\delta}\$  Thin Film with Mixed Valence State for SOFC Anode Electrode](#)

[Shoto Furuichi, Takashi Tsuchiya, Makoto Minohara, Masaki Kobayashi, Koji Horiba, Hiroshi Kumigashira, Tohru Higuchi](#)

[2964 An Operando Fluorescence XAS Study of a Ni/YSZ Anode in a Solid Oxide Fuel Cell](#)

[Yusaku F Nishimura, Tomoyuki Kayama, Keisuke Kobayashi, Chikaaki Okuda, Tetsuro Kobayashi, Satoru Fujita](#)

[2965 Proton Conduction on YSZ Electrolyte Thin Films Prepared by RF Magnetron Sputtering](#)

[Makoto Takayanagi, Takashi Tsuchiya, Makoto Minohara, Masaki Kobayashi, Koji Horiba, Hiroshi Kumigashira, Tohru Higuchi](#)

[2966Densification of Gadolinia-Doped Ceria Diffusion Barriers for Solid Oxide Cells By Sol-Gel Process](#)

[Hyun-Jong Choi, Young-Heum Na, Minjun Kwak, Doo-Won Seo, Sang-Kuk Woo, Sun-Dong Kim](#)

[2967System Design Optimization with Process and Heat Balance Analysis to Enhance SOFC Performance](#)

[Yuya Tachikawa, Yoshio Matsuzaki, Takaaki Somekawa, Shunsuke Taniguchi, Kazunari Sasaki](#)

[2968Recent Developments in 3D Multiphysics Modelling of Whole Fuel Cell Systems for Assisting Commercialisation and Improved Reliability](#)

[Murat Peksen, Ali Al-Masri, Roland Peters, Ludger Blum, Detlef Stolten](#)

[2969Electrophoretically Deposited Copper Manganese Spinel Coatings for Interconnections in Solid Oxide Fuel Cells](#)

[Zhihao Sun, Srikanth Gopalan, Uday Bhanu Pal, Soumendra Nath Basu](#)

[2970Characterization of Reliability of Solid Oxide Fuel Cell Sealants and Anodes](#)

[Jianping Wei, Goran Pećanac, Jürgen Malzbender](#)

[2971Research and Development on Oxygen Transport Membranes at the Technical University of Denmark from Materials to Modules](#)

[Ragnar Kiebach, Steven Pirou, Simona Ovtar, Astri Bjørnetun Haugen, Peter Vang Hendriksen](#)

[2972Oxygen Transport of Lscrf-Scsz Based Mixed Conducting Ceramic Composites](#)

[Zonghao Shen, Stephen J. Skinner, John A. Kilner](#)

[2973Substantial Oxygen Flux in Fluorite-Rich Dual-Phase Membrane By Tailoring the Surface](#)

Jong Hoon Joo, Ji Haeng Yu, Chung-Yul Yoo, Kyong Sik Yun, Younki Lee

2974 Hydrogen Permeability of TiN<sub>x</sub> Membrane Based on Bulk Mixed Hydride Ion and Electron Conductivity

Chiharu Kura, Yoshitaka Aoki, Chunyu Zhu, Etsushi Tsuji, Hiroki Habazaki

2975 Oxygen Activity in a-Site Ordered Perovskites through in-Situ Neutron and Synchrotron X-Ray Diffraction

Daniel D. Taylor, Benjamin D. Levitas, Efrain E. Rodriguez

2976 In SITU Transmission Electron Microscopy on Operating Electrochemical CELLS

Fabrizio Gualandris, Søren Bredmose Simonsen, Mogens Bjerg Mogensen, Kristian Mølhav, Simone Sanna, Jakob Birkedal Wagner, Shunsuke Muto, Kimitaka Higuchi, Luise Theil Kuhn

2977 In Situ TEM Observation on Redox Cycling of SOFC Anode

Junko Matsuda, Tatsuya Kawasaki, Tsutomu Kawabata, Shunsuke Taniguchi, Kazunari Sasaki

2978 In-Situ Investigation on the Crystal and Microstructure Change of Nickel Interacted with Methane at High Temperatures

Jiang Liu, Fangyong Yu, Xiaoqiang Wang, Yapeng Zhang, Xing Ou, Chenghao Yang, Meilin Liu

2979 (Invited) Characterization of Thermally and Cathodic Polarization Induced LSM Electrode/YSZ Electrolyte Interface of Solid Oxide Fuel Cells By Combined FIB-STEM Techniques

San Ping Jiang, Na Li, Shuai He, Kongfa Chen, Yi Cheng, Aaron Dodd, Martin Saunders

2980 Ex-Situ 3D Nano-Ptychography of Ni-YSZ SOFC Anode during Redox Cycling

Salvatore De Angelis, Jacob Ross Bowen, Peter Stanley Jørgensen

[2981The Correlative Approach of 3D Imaging Techniques, Simulation and Diffusion Experiments to Explore Transport Properties in Porous Otm Support Material](#)

[Bernhard Tjaden, Daniel J.L Brett, Jonathan Lane, Paul R. Shearing](#)

[2982Beyond Pretty Pictures to Useful Quantities: The Next Step in 3D Quantification of SOFC Electrodes](#)

[Farid Tariq, Vladimir Yufit, Kristina Kareh, Enrique Ruiz-Trejo, Antonio Bertei, Ed Cohen, Masashi Kishimoto, Nigel P. Brandon](#)

[2983Design-Led Solid Oxide Fuel Cell Manufacturing: Using 3D Imaging and Modeling to Optimize Electrode Performance](#)

[Kristina Maria Kareh, Enrique Ruiz-Trejo, Antonio Bertei, Farid Tariq, Vladimir Yufit, Masashi Kishimoto, Nigel P. Brandon](#)

[2984Current Constriction at Electrode/Electrolyte Interfaces in Solid Oxide Cell Electrochemical Devices Calculated Via 3D Reconstructions](#)

[Jimmi Nielsen, Peter Stanley Jørgensen, Christopher Graves](#)

[2985Degradation of \(La,Sr\)\(Co,Fe\)O<sub>3-Δ</sub> SOFC Cathodes at the Nanometre Scale and below](#)

[Na Ni, Samuel Cooper, Stephen J. Skinner, Robert Williams, David McComb](#)

[2986Oxygen-Excess-Type Ionic Conducting Thin Film for Fuel Cell Application](#)

[Atsushi Mineshige, Mio Kobayashi, Atsushi Saito, Hideki Yoshioka, Ryohei Mori, Tetsuo Yazawa](#)

[2987Synthesis and H<sup>-</sup> Conductivity of Ba<sub>2</sub>LiH<sub>3-2x</sub>O<sub>1+x</sub>](#)

[Genki Kobayashi, Akihiro Watanabe, Kota Suzuki, Masaaki Hirayama, Masao Yonemura, Ryoji Kanno](#)

[2988\(Invited\) All-Solid-State Sodium-Ion Battery with Nasicon](#)

[Atsushi Inoishi, Eiji Kobayashi, Ayuko Kitajou, Shigeto Okada](#)

2989 [\(Invited\) Ionic Conduction in Metal Borohydrides and Their Application to All-Solid-State Batteries](#)

[Keita Kurigami, Itaru Oikawa, Hitoshi Takamura](#)

2990 [Garnet Based Li-Metal Batteries](#)

[Liangbing Hu](#)

2991 [\(Invited\) Origin of the Low Grain Boundary Conductivity in Lithium Ion Conducting Perovskites:  \$\text{Li}\_{3x}\text{La}\_{0.67-x}\text{TiO}\_3\$](#)

[Xin Guo](#)

2992 [Interface Structure in Solid-State Lithium Batteries](#)

[Kazunori Takada, Takahisa Ohno](#)

2993 [Solid-Oxide Rechargeable Fe-Air Battery Using Fe Modified with Cr-Ni-PrBaMm<sub>2</sub>O<sub>5</sub> for Low Temperature Operation](#)

[Hackho Kim, Shintaro Ida, Tatsumi Ishihara](#)

2994 [Lithium-Ion Conduction in  \$\text{LiBH}\_4\$  Hydrated  \$\text{H}\_2\text{O}\$  and  \$\text{D}\_2\text{O}\$](#)

[Akira Takano, Itaru Oikawa, Hitoshi Takamura](#)

2995 [Fabrication of Solid State Ionic Devices Using Additive Manufacturing](#)

[Angelica D Benavidez, Lok-kun Tsui, Adam Cook, Christopher Diantonio, Tom Chavez, Fernando H Garzon](#)

2996 [3D Printing Microstructured Li-Garnet Electrolytes for Solid-State Lithium Batteries](#)

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

2997 Structure Control of Thin Films Via Advanced Electrostatic Spray Coating Technique and Its Application of Fuel Cells

Dongwook Shin, Sewook Lee, Taejun Lee, Hunhyeong Lee, Sangho Park

2998 Thin-Film SOFC Fabrication Using Flash Light Annealing

Jun-Sik Park, Wan-Ho Chung, Duk-Joong Kim, Hak-Sung Kim, Young Beom Kim

2999 Controlled SOFC Anode Porosity Using Aligned Sacrificial Fibers

Thomas H Hays, Eric D Wachsman

3000 Novel Thin Film Solid State Ionic Device with Electrochemically Tunable Resistance Based on Lithium Plating/Stripping

Sami Oukassi, Bruce Berr, Séverine Poncet, Christophe Secouard, Johnny Amiran, Sylvain Poulet, Raphaël Salot

3001 (Invited) Correlating Ion Transport with Structure in Interstitial Containing Oxides: Potential for New Electrolytes?

Stephen J. Skinner

3002 Structural and Transport Properties of the Blc-Pbco System; Effects of Cation Ordering

John Druce, Tianqi Wang, Helena Téllez, John A. Kilner, Tatsumi Ishihara

3003 Defect-Structure Analysis on  $\text{La}_2(\text{Ni,Cu})\text{O}_{4+d}$  with Reverse Monte Carlo Simulation Using Neutron and Synchrotron X-Ray Total Scatterings

Naoto Kitamura, Yasunori Mizoguchi, Naoya Ishida, Yasushi Idemoto

3004 Long Range Charge Transfer and Oxygen Vacancy Interactions in Strontium Ferrite

[Tridip Das, Jason D. Nicholas, Yue Qi](#)

3005 [Disorder and Conductivity in Pyrochlore Thin Films](#)

[Cortney R Kreller, James Valdez, Terry Holesinger, Yongqiang Wang, Blas Uberuaga](#)

### **I03-Electrosynthesis of Fuels 4**

3006 [\(Invited\) Development of Transformational Technologies](#)

[Grigorii L. Soloveichik](#)

3007 [\(Invited\) Electrochemical Reduction of CO<sub>2</sub> to Value-Added Chemicals: Status and Remaining Challenges](#)

[Paul J.A. Kenis](#)

3008 [\(Invited\) Electrochemical and Photoelectrochemical Reduction of Carbon Dioxide: The Twain Shall Meet at Copper Oxide/Copper Nanocube/Liquid Interfaces](#)

[Krishnan Rajeshwar](#)

3009 [\(Invited\) Converting Petroleum Coke into Hydrogen](#)

[Greg Gege Tao](#)

3010 [CO<sub>2</sub> Electrochemical Reduction to Hydrocarbon Fuels on Copper Nanoparticles Supported on Nanostructured Carbons](#)

[Qin Lu, Andrew Purdy, Boris Dyatkin, Jan-Philip Grote, Serhiy Cherevko, Katharine Page, Raymond R Unocic, Yury Gogotsi, Olga A Baturina](#)

3011 [Phase Segregated Bimetallic Alloys As Electrocatalysts for Electrochemical Carbon Dioxide Reduction](#)

[Drew Christopher Higgins, Christopher Hahn, Toru Hatsukade, Thomas F Jaramillo](#)



[3012Development of Novel Tin Nanostructures Using Pulse Plating Methods for the Electroreduction of Carbon Dioxide to Formic Acid](#)

[Fikile R. Brushett, Sujat Sen, Brian Skinn, Timothy D Hall, Maria E. Inman, E. J. Taylor](#)

[3013Single-Atom Catalysts for CO<sub>2</sub> Electroreduction with Significant Activity and Selectivity Improvements](#)

[Seoin Back, Juhyung Lim, Na-Young Kim, Yong-Hyun Kim, Yousung Jung](#)

[3014Highly Dense Cu Nanowires for CO<sub>2</sub> and CO Reduction](#)

[David Raciti, Chao Wang](#)

[3015Surface Structure Engineering of Cu Thin Films for Electrochemical CO<sub>2</sub> Reduction](#)

[Christopher Hahn, Toru Hatsukade, Arturas Vailionis, Drew Christopher Higgins, Stephanie Anne Nitopi, Jeremy T Feaster, Anna L Jongorius, Thomas F Jaramillo](#)

[3016\(Invited\) Electrocatalysis of CO<sub>2</sub> Reduction. from Fundamental Understanding to Catalyst Design and Preparation](#)

[Na Tian, Tian Sheng, Li Liu, Ai-Yun Xie, Feng-Yang Zhang, Yu-Hao Hong, Long Huang, Zhi-You Zhou, Shi-Gang Sun](#)

[3017\(Invited\) CO<sub>2</sub> Electrolysis for Syngas Production](#)

[Richard I Masel, Zengcai Liu, Robert Kutz, Syed Sajjad, Hongzhou Yang](#)

[3018\(Invited\) Improvements in the Anion Exchange Membrane Transport of Carbonate and Bicarbonate for Low-Temperature CO<sub>2</sub> Capture and Energy Conversion](#)

[Travis J Omasta, Xiong Peng, John Varcoe, William E Mustain](#)

[3019Electroreduction of CO<sub>2</sub> to CO: Analyzing the Effect of Electrolytes on Ag, Au Electrodes and Defining Technoeconomic Benchmarks](#)

[Sumit Verma, Xun Lu, Yuki Hamasaki, Chaerin Kim, Molly Jhong, Byoungsu Kim, Sichao Ma, Tsuyohiko Fujigaya, Naotoshi Nakashima, Paul J.A. Kenis](#)

3020 [Predictive Control of Catalyst Selectivity in the Electroreduction of Carbon Dioxide](#)

[Joshua Billy, Anne Co](#)

3021 [Influence of Anion-Exchange Ionomers on Electrocatalysts for Carbon Dioxide Reduction](#)

[Karthish Manthiram, Aidan Q. Fenwick, Julian P. Edwards, Robert H. Grubbs](#)

3022 [Tuning the Selectivity of CO<sub>2</sub> Electrochemical Reduction Toward Hydrocarbon with Ligand Modified Metal Electrocatalyst](#)

[Yuxin Fang, Xun Cheng, Ye Xu, John Flake](#)

3023 [An Investigation into the Electrocatalytic Activity of Nitrogen Doped Metalated Carbons](#)

[Scott W Donne, Laurence Kwong](#)

3024 [Metal-Free Heterogeneous Nanoporous Carbon for CO<sub>2</sub> electrochemical Reduction to CO and CH<sub>4</sub> in Aqueous Solution](#)

[Wanlu Li, Barbara Herkt, Mykola Seredych, Teresa J Bandoz](#)

3025 [Carbon Nanostructures for the Electrochemical Conversion of CO<sub>2</sub> to Fuels: Defect & Electrocatalytic Activity](#)

[Jingjie Wu, Ram Manohar Yadav, Mingjie Liu, Pranav P. Sharma, Pranav P. Sharma, Christopher J. Wright, Chandra Tiwary, Boris I. Yakobson, Jun Lou, Pulickel M Ajayan, Xiao-Dong Zhou](#)

3026 [Tungsten Carbide As a Catalyst for CO<sub>2</sub> Electrochemical Reduction](#)

[Subiao Liu, Jing-Li Luo](#)

[3027CO<sub>2</sub> Electro-Reduction on Bio-Inspired Iron Sulfide Under Mild Conditions](#)

[Alberto Roldan, Nora de Leeuw](#)

[3028Influence of Alloying on CO<sub>2</sub> Electroreduction on Ag-Zn System](#)

[Toru Hatsukade, Kendra P Kuhl, Etosha R Cave, David N Abram, Jeremy T Feaster, Christopher Hahn, Anna L Jongerius, Thomas F Jaramillo](#)

[3029Understanding Selectivity of Carbon Dioxide Reduction to Carbon Monoxide and Formic Acid on Sn Electrodes](#)

[Jeremy T Feaster, Chuan Shi, Etosha Cave, Toru Hatsukade, David N Abram, Christopher Hahn, Kendra Kuhl, Jens Nørskov, Thomas F Jaramillo](#)

[3030Co-Electrolysis Cell Configurations for CO<sub>2</sub> Electrochemical Reduction Using Gold Electrodes](#)

[Alexandra Patru, Julien Durst, Juan Herranz, Anastasia A. Permyakova, Thomas J. Schmidt](#)

[3031Carbon Monoxide-Tolerant Palladium-Based Electrocatalyst for Carbon Dioxide Reduction](#)

[Toshihiro Takashima, Tomohiro Suzuki, Hiroshi Irie](#)

[3032Quantifying Potential Contributions in the Hybrid Sulfur Electrolyzer at Elevated Temperatures and Pressures](#)

[Taylor Reed Garrick, Cody Herbert Wilkins, Alexander Gullede, Brian C Benicewicz, John W. Weidner](#)

[3033Modeling of a Bayonet Reactor for Sulfuric Acid Decomposition in Thermo-Electrochemical Hydrogen Production Processes](#)

[Claudio Corgnale, Sirivatch Shimpalee, Maximilian Gorensek, John W. Weidner, William Summers](#)

[3034 Utilization of Solar Fuels By Implementation of NiFe-LDH and Fe-N-C As Bifunctional Catalyst for the Oxygen Reduction Reaction and the Oxygen Evolution Reaction](#)

[Sören Dresch, Fang Luo, Roman Schmack, Stefanie Kühl, Manuel Gliech, Peter Strasser](#)

[3035 Direct Charge and Discharge Using the Glycolic Acid/Oxalic Acid Redox Couple for the Carbon-Neutral Energy Circulation](#)

[Miho Yamauchi, Shinichi Hata, Syo Kitano, Masaaki Sadakiyo, Tatsuya Takeguchi](#)

[3036 Activity and Selectivity of Ni-Fe Layered Double Hydroxide Electrocatalyst for Seawater Electrolysis](#)

[Fabio Dionigi, Tobias Reier, Manuel Gliech, Stefanie Kühl, Peter Strasser](#)

[3037 Key Parameters for the Design of Composites Electrodes for Water Splitting in Alkaline Medium](#)

[Paul Arcidiacono, Frederic Favier](#)

[3038 Durability and Activity of \(Li\)NiO/Ni Anode Prepared with Thermal Decomposition for Alkaline Water Electrolysis](#)

[Sho Fujita, Koichi Matsuzawa, Ikuo Nagashima, Yoshio Sunada, Akiyoshi Manabe, Yoshinori Nishiki, Shigenori Mitsushima](#)

[3039 Electrochemical Methane Reforming Using SrZr<sub>0.5</sub>Ce<sub>0.4</sub>Y<sub>0.1</sub>O<sub>3-d</sub> proton-Conductor Cell](#)

[Shota Maeda, Daisuke Kurashina, Kwati Leonard, Young-Sung Lee, Hiroshige Matsumoto](#)

[3040 The Role of Doped Ceria Buffer Layer on Phase Evolution in Pr<sub>2</sub>NiO<sub>4+d</sub> cathode and Approached to Suppress Their Reaction in Solid Oxide Fuel Cells](#)

[Emir Dogdibegovic, Nawf Saif Alabri, Christopher J. Wright, Xiao-Dong Zhou](#)

[3041 Performance Enhancement of  \$\text{La}\_{0.3}\text{Sr}\_{0.7}\text{Fe}\_{0.7}\text{Cr}\_{0.3}\text{O}\_3\$  \(LSFCr\) Electrodes in  \$\text{CO}\_2/\text{CO}\$  Atmosphere](#)

[Paul Addo, Suresh Mulmi, Beatriz Molero-Sánchez, Parastoo Keyvanfar, Venkataraman Thangadurai, Viola Birss](#)

[3042 Microwave Synthesis and Sintering Methods for Reversible Solid Oxide Fuel Cell Fabrication](#)

[Beatriz Molero-Sánchez, Paul Addo, Emilio Morán, Viola Birss](#)

[3043 X-Ray Diffraction and in-Situ Synchrotron Studies on Phase Evolution in  \$\text{Pr}\_2\text{NiO}\_4\$ : Understanding the Local Structure Changes](#)

[Emir Dogdibegovic, Christopher J. Wright, Xiao-Dong Zhou](#)

[3044 Relating Microstructure to Surface Exchange Kinetics Using in Situ Optical Absorption Relaxation](#)

[Ting Chen, Kazunari Sasaki, Nicola H. Perry](#)

[3045 Fabrication and Evaluation of Silver-Indium Catalysts for Electrochemical  \$\text{CO}\_2\$  Reduction to CO](#)

[Hyanjoo Park, Jihui Choi, Hoyoung Kim, Eunkyong Hwang, Don-hyung Ha, Taejong Paik, Sang Hyun Ahn, Soo-Kil Kim](#)

[3046 Electrochemically Fabricated Binary Alloy Catalysts for  \$\text{CO}\_2\$ -C1 Fuel Inter-Conversion](#)

[Eunkyong Hwang, Hoyoung Kim, Hyanjoo Park, Sang Hyun Ahn, Soo-Kil Kim](#)

[3047 Electrochemical Membrane Reactor for Hydrogen & Syn Gas Fabrication](#)

[Sung Pil Yoon, Jonghee Han, Suk Woo Nam, Hyung Chul Ham](#)

[3048 Pomegranate-Inspired Design of Highly Active and Durable Bifunctional Electrocatalysts for Rechargeable Metal-Air Batteries](#)

[Ge Li, Xiaolei Wang, Zhongwei Chen](#)

[3049 in-Situ Formed Ce<sub>0.8</sub>Gd<sub>0.2</sub>O<sub>1.9</sub> Barrier Layer on Yttria Stabilized Zirconia Backbone for Infiltrated Oxygen Electrodes](#)

[Simona Ovtar, Ming Chen, Anne Hauch, Wolff-Ragnar Kiebach](#)

[3050 Self-Supported Nickel Phosphide Nanoparticles with High Activity for Hydrogen Evolution Reaction](#)

[Injoon Jang, Hyun-Seo Park, Jin Young Kim, Jong Hyun Jang, Hyoung-Juhn Kim, Yung-Eun Sung, Sung Jong Yoo](#)

[3051 A Novel Two-Step Water-Splitting Electrochemical Cycle for Hydrogen Production](#)

[Bokkyu Choi, Dhruva Panthi, Masateru Nakoji, Kaduo Tsutsumi, Atsushi Tsutsumi](#)

[3052 Electrochemical Conversion of Carbon Dioxide on the Exfoliated Single-Crystal Copper Membranes](#)

[Naoki Yoshihara, Masaru Noda](#)

[3053 Reaction Analysis of Electrochemical Synthesis of Ammonia with Proton Conducting BaCe<sub>0.9</sub>Y<sub>0.1</sub>O<sub>3</sub> Solid Electrolyte](#)

[Fumihiko Kosaka, Takehisa Nakamura, Junichiro Otomo](#)

[3054 Electrochemical Synthesis of Ammonia By a Transition Metal Complex in Ionic Liquid](#)

[Akira Katayama, Tomohiko Inomata, Tomohiro Ozawa, Hideki Masuda](#)

[3055 Ammonia Synthesis at Intermediate Temperatures from N<sub>2</sub> and Steam in Solid-State Electrochemical Cells Using Cesium Hydrogen Phosphate Based Electrolytes](#)

[Ryuji Kikuchi, Shota Kishira, Geletu Qing, Atsushi Takagaki, Shigeo Ted Oyama](#)

[3056\(Invited\) Electrosynthesis of Ammonia Using Intermediate Temperature Solid Electrolyte Membranes](#)

[Fernando H Garzon, Angelica D Benavidez, Lok-kun Tsui, Cortney R Kreller, Yu Seung Kim, Rangachary Mukundan, Shekar Balagopal](#)

[3057\(Invited\) Proton-Conducting Ceramics for Fuels Synthesis](#)

[Neal P Sullivan, Sandrine Ricote, Hanping Ding, Wade Rosensteel, Long Le, Chuancheng Duan, Ryan O'Hayre](#)

[3058A Systems Perspective in the Conversion of CO<sub>2</sub>/H<sub>2</sub>O Feedstocks Using Intermediate-Temperature Reversible Solid Oxide Cell Technology for Energy Storage Applications](#)

[Robert J. Braun, Evan Reznicek](#)

[3059Comparing Low- and High-Temperature Electrochemical Process Pathways for Converting H<sub>2</sub>O and CO<sub>2</sub> into Synthetic Natural Gas](#)

[Robert J. Braun](#)

[3060Development of Intermediate Temperature Fuel Cells for Direct Conversion of Methane to Liquid Fuels](#)

[Carl A. Willman, Joseph Barton, Hossein Ghezel-Ayagh, Alireza Torabi, Radenka Maric, Abhinav Poozhikunnath, Na Li, Olga A Marina, Hoang V. P. Nguyen, Alex Mitroshkov, Lirong Zhong, Evgueni Polikarpov, Larry Pederson](#)

[3061High Temperature and Pressure Alkaline Electrochemical Reactor for Conversion of Power to Chemicals](#)

[Christodoulos Chatzichristodoulou](#)

[3062\(Invited\) Molecular Mechanisms of Oxygen Evolution and Water Splitting at Elevated Temperatures](#)

[William C Chueh](#)

[3063\(Invited\) Thermodynamic Theory of Durability of Soecs and SOFCs: The Role of Electrode Polarization](#)

[Anil V. Virkar](#)

[3064\(Invited\) Degradation Mechanisms in Reversible Solid Oxide Cells](#)

[Scott A Barnett, Justin Railsback, Hongqian Wang](#)

[3065\(Invited\) High-Temperature Electrosynthesis of Hydrogen and Chemicals](#)

[Nguyen Minh, Paulo Emilio V. de Miranda](#)

[3066Detailed Study of Degradation Behaviour of Solid Oxide Cells in Electrolysis and Co-Electrolysis Mode](#)

[Guenter Schiller, Michael P. Hoerlein, Aziz Nechache](#)

[3067Localized Carbon Deposition in Solid Oxide Electrolysis Cells Studied By Multiphysics Modeling](#)

[Maria Navasa, Christopher Graves, Henrik Lund Frandsen, Bengt Sundén](#)

[3068Electrochemical Impedance Spectroscopy on Industrially-Relevant Solid Oxide Electrolyzer Cell Stacks: A Powerful Tool for in-Situ Investigations of Degradation Mechanisms](#)

[Philipp Zielke, Jens Valdemar Thorvald Høgh, Ming Chen, Ragnar Kiebach, Rainer Küngas, Peter Blennow, Johan Hjelm, Peter Vang Hendriksen](#)

[3069In Situ Optical Studies of CO<sub>2</sub> and Co-Electrolysis](#)

[Syed Noorullah Qadri, John D. Kirtley, Daniel A Steinhurst, Robert Benjamin Balow, Pehr E. Pehrsson, Jeffrey C Owrutsky](#)

[3070\(Invited\) Elevated Temperature CO<sub>2</sub> Adsorption Separation and Electrochemical Conversion□Reaction Mechanism and Technology Development](#)



Xiang Yi Shi, Yu Luo, Ningsheng Cai

3071(Invited) Direct Conversion of Methane to Methanol and Other Value Products in SOFC

Olga A Marina, Evgueni Polikarpov, Lirong Zhong, Alex Mitroshkov, Larry Pederson, Chris Coyle, Gregory W Coffey

3072Correlating the Onset of Coking with Electrode Surface Chemistry during CO<sub>2</sub> Electrolysis with Near Ambient Pressure X-Ray Photoelectron Spectroscopy

Sean R. Bishop, Jiayue Wang, Nikolai Tsvetkov, Qiyang Lu, Jean-Jacques Gallet, Fabrice Bournel, Ethan J Crumlin, Qiang Lu, Bilge Yildiz

3073Spontaneous Hydrogen and Electricity Production in a Nested Carbon Fuel Cell

David U. Johnson, Reginald E. Mitchell, Turgut M Gur

3074(Invited) Synthesis and Upgrading of Fuels Using Solid State Electrochemical Devices

S Elangovan, Joseph J Hartvigsen, Dennis Larsen, Tyler Hafen, James M Mosby, Jessica Elwell, Lyman J Frost

3075(Invited) Reversible Operation of Solid Oxide Cells for Sustainable Fuel Production and Solar/Wind Load-Balancing

Christopher Graves, Diego Villarreal, Jon S. G. Myrdal, Søren Højgaard Jensen, Ming Chen, Peter Vang Hendriksen, Mogens Bjerg Mogensen

3076(Invited) Modeling Charged-Defect Transport within Calcium Doped Lanthanum Ferrite Oxide-Ion Transport Membranes

Robert J. Kee, Canan Karakaya, Huayang Zhu, Gregory S Jackson

3077Characterisation of a Planar Solid Oxide Cell Stack Operated at Elevated Pressure

Søren Højgaard Jensen, Christopher Graves, Ming Chen, Xiufu Sun, John Bøgild Hansen

[3078 Investigation of Manganese-Cobalt Oxide Nanoparticles As Electrocatalysts for the Oxygen-Evolution Reaction: Influence of Synthesis Conditions on Structure and Activity](#)

[Manuel Gliech, Malte Klingenhof, Camillo Sporer, Arno Bergmann, Peter Strasser](#)

[3079 In Situ, Non-Contact Studies of Oxygen Exchange Kinetics in Thin Film Mixed Conducting Electrodes](#)

[Nicola H. Perry, Ting Chen, Kazunari Sasaki, Jae Jin Kim, Yuxi Ma, Jason D. Nicholas, Harry L. Tuller](#)

[3080 Physically Based Impedance Modelling of Ni/8YSZ-Cermet Anodes](#)

[Sebastian Dierickx, André Weber, Ellen Ivers-Tiffée](#)

[3081 NO Electrochemical Reduction on Pt Electrocatalysts: A DFT Approach](#)

[Hee-Joon Chun, Vesa Apaja, Karoliina Honkala, Jeff Greeley](#)

[3082 3D Printed Reversible Solid Oxide Electrochemical Reactors](#)

[Nicholas Michael Farandos, Lisa Kleiminger, Geoff H. Kelsall](#)

[3083 Carbide Supported Phosphides Are Superior Electrocatalysts for Hydrogen Generation Than Nanocrystalline Phosphides](#)

[Yagya N Regmi, Asa Logan Roy, Gabriel A. Goenaga, Thomas A. Zawodzinski, Nicole Labbe, Stephen Chmely](#)

[3084 Kinetic Study of Iron Based Storage Materials for the Use in Rechargeable Oxide Batteries \(ROB\)](#)

[Waldemar Braun, Viktoria Erfurt, Lorenz Singheiser, Florian Thaler](#)

## **I04-Energy/Water Nexus: Power from Saline Solutions**

[3085 \(Invited\) Development of Reverse Electrodialysis System](#)

[Chan-Soo Kim, Kyo-Sik Hwang, Ji-Hyung Han, Han-Ki Kim, Nam-Jo Jeong, Young-Woo Choi, Sung-Kook Hong](#)

3086 [Potential Generation Using Salinity Gradients](#)

[Aishwarya Chandran, Ashwini Khandelwal, Sivakumar Amaravati, Subramaniam Chittur Krishnaswamy](#)

3087 [Hydrogen Production through a Multi-Ion Exchange Membrane Based Electrolysis System](#)

[Mohammadreza Nazemi, James Padgett, Marta C. Hatzell](#)

3088 [Experimental Investigation of Operating Parameters in Power Generation By Lab-Scale Reverse Electro-Dialysis \(RED\)](#)

[Insoo Choi, Jun Young Han, Sung Jong Yoo, Dirk Henkensmeier, Jin Young Kim, So Young Lee, Jonghee Han, Suk Woo Nam, Jong Hyun Jang, Hyoung-Juhn Kim](#)

3089 [A New Mode of Reverse Electrodialysis Operation to Reduce Seawater RO Energy Demand](#)

[Marjolein Vanoppen, Griet Walpot, Ella Criel, Arne R.D. Verliefde](#)

3090 [Improvement of Reverse Electrodialysis Cells for Generating Electrical Power from Salinity Gradient](#)

[Byeong Dong Kang, Dong-Kwon Kim, Hyun Jung Kim, Baek Yoon, Jaisuk Yoo](#)

3091 [Solar Generation of Ion Gradients Using Dye-Sensitized Ion-Exchange Membranes](#)

[William White, Christopher D. Sanborn, Ronald S. Reiter, Claudia P. Ramirez, Shane Ardo](#)

3092 [Perfluorinated or Hydrocarbon Ionomer-Poly\(tetrafluoroethylene\) Reinforced Membranes for Renewable Energy Generation](#)

[Chang Hyun Lee](#)

[3093 Fouling Behavior of Multivalent Cations to Cation Exchange Membranes in Reverse Electrodialysis](#)

[Da-Eun Kim, Yoontaek Oh, Jang-Uk Choi, Chan-Ho Song, Soryong Chae, Chan-Soo Kim, Nam-Jo Jeong, Moon-Sung Kang, Jin-Soo Park](#)

[3094 Development of Cost-Effective Ion-Exchange Membranes for High Performance Reverse Electrodialysis](#)

[Do-Hyeong Kim, So-Eun Kim, Jin-Soo Park, Moon-Sung Kang](#)

[3095 Capillarity Based Ion Concentration Polarization for Desalination and Energy Harvesting](#)

[Sung Jae Kim, Sungmin Park, Keon Huh, Yeonsu Jeong, Seok Young Son, Inhee Cho, Hyomin Lee, Ho-Young Kim](#)

[3096 \(Invited\) Reverse Electrodialysis for Unique Devices](#)

[Seung-Ryong Kwon, Seol Baek, Ji Tae Kim, Joohee Jeon, Daye Seo, Taek Dong Chung](#)

[3097 Fouling Behavior of Negatively Charged Natural Organic Matters to Anion Exchange Membranes in Reverse Electrodialysis](#)

[Da-Eun Kim, Yoontaek Oh, Jang-Uk Choi, Chan-Ho Song, Soryong Chae, Chan-Soo Kim, Nam-Jo Jeong, Moon-Sung Kang, Jin-Soo Park](#)

[3098 Energy Generation from CO<sub>2</sub> Capture Associated RED Power Generation System](#)

[Han-Ki Kim, Young-Eun Kim, Yeo-Il Yoon, Kyo-Sik Hwang, Ji-Hyung Han, Nam-Jo Jeong, Chan-Soo Kim](#)

[3099 Efficient Enrichment Applications for Capacitive Deionization in Conventional Carbon Capture Processes](#)

[James Landon, X. Gao, A. Omosebi, Nicolas Holubowitch, K. Liu](#)

[3100 Capacitive Deionization Using Composite Carbon Electrodes](#)

[X. Gao, A. Omosebi, A. Liu, K. Ruh, N. Holubowitch, J. Landon, K-L. Liu](#)

[3101\(Invited\) Deionization and Energy Recovery in Capacitive Systems with Inverted Operation Characteristics](#)

[Ayokunle Omosebi, Zhiao Li, Xin Gao, Nicolas Holubowitch, James Landon, Aaron M Cramer, Kunlei Liu](#)

[3102The Study of Porous Geometry Design for Capacitive Deionization Devices through Vertically-Aligned Carbon Nanotube Electrodes](#)

[Heena K Mutha, Mazdak Hashempour, Brian L Wardle, Carl V. Thompson, Evelyn N Wang](#)

[3103Effects of Natural Organic Matter on Desalination of Coal Mine Wastewater Using a Capacitive Deionization System](#)

[Soryong Chae, Jin-Soo Park, Yong-Seog Seo](#)

[3104Electrochemical Conditioning, Energy Consumption, and Long-Term Performance of Inverted Capacitive Deionization Cells](#)

[Nicolas Holubowitch, A. Omosebi, Xin Gao, J. Landon, K-L. Liu](#)

[3105The Role of Temperature on Salt Removal Using Capacitive Deionization](#)

[Jiankai Zhang, Mohammadreza Nazemi, Caitlin Leksana, Marta C. Hatzell](#)

[3106Performance Enhancement of Capacitive Deionization By Using Ionomer-Combined Carbon Electrodes and Pore-Filled Ionomer Membranes](#)

[Do-Hyeong Kim, Young-Eun Choi, So-Eun Kim, Jin-Soo Park, Moon-Sung Kang](#)

## **J01-Luminescence and Display Materials: Fundamentals and Applications**

[3107\(Invited\) Luminescence of Lanthanide-Doped Nanocrystals](#)

[Andries Meijerink](#)

[3108 Rare Earth Molybdate Nano-Rod Phosphor Self-Assembled without Organic Solvent By Dilute Acid Proton Exchange Method](#)

[Mizuki Watanabe, Sun Woog Kim, Kazuyoshi Uematsu, Kenji Toda, Mineo Sato](#)

[3109 Hydrothermal Synthesis of Fluorescent Carbon Dots By Microwave-Assisted Autoclave Treatment](#)

[Taishu Yoshinaga, Yoshiki Iso, Tetsuhiko Isobe](#)

[3110 \(Invited\) Intense Red Light Emitting Mesoporous Silicon Nanowires for Luminescent Devices](#)

[Colm O'Dwyer, William McSweeney, Gillian Collins](#)

[3111 \(Invited\) Applications of Highly Bright PbS Quantum Dots to Non-Invasive Near-Infrared Fluorescence Imaging in the Second Optical Window](#)

[Takashi Jin, Yukio Imamura](#)

[3112 \(Invited\) Photoluminescence Properties of ZnO Nanostructures Growth Vertically on Transparent and Conductive Al-Doped ZnO Substrates](#)

[Chaoyang LI, Shengwen Hou](#)

[3113 Gadolinium Doped NaLaF<sub>4</sub> Nanocrystals in Glass-Ceramics and Polycrystalline Powders](#)

[Edgars Elsts, Andris Antuzevics, Meldra Kemere, Guna Kriekē, Janis Jansons, Reinis Ignatans, Uldis Rogulis](#)

[3114 Synthesis of Luminescent La<sub>2</sub>O<sub>3</sub>:Eu<sup>3+</sup> Nanosheet By Graphite Oxide Nanosheet Templating](#)

[Ryota Saito, Yusuke Ayato, Dai Mochizuki, Sakae Takenaka, Wataru Sugimoto](#)

[3115 \(Invited\) Missing Link Between Solid State and Solution Reactions for the Nanophosphors](#)

Kenji Toda, Sun-Woog Kim, Kazuyoshi Uematsu, Mineo Sato

3116Enhancing the Brightness of Cesium Lead Halide Perovskite Quantum Dots Based Green and Red Light-Emitting Devices through Fast Anion-Exchange

Yun-Hyuk Ko, Mohammed Jalalah, Seung-Jae Lee, Tae-Hun Shim, Jea-Gun Park

3117(Invited) Fabrication and Characterization of Transparent Fluorescence Nanocomposite Film Containing Inorganic Phosphor Nanoparticles

Yoshiki Iso, Tetsuhiko Isobe

3118Near Infrared YVO<sub>4</sub>:Nd,Yb Nano Phosphor Synthesized By Microreaction Method for In Vivo Bioimaging

Toru Inagaki, Tadashi Ishigaki, Ryousuke Sakata, Wataru Uehara, Koutoku Ohmi

3119Microelectrode-Less Control of Semiconducting Fluorescent Nanoparticles By Dielectrophoretic (DEP) Force for High Degree of Freedom

Jinsik Kim, Hyejin Kim, Kyo Seon Hwang

3120Novel Strategies for Preparing Highly Luminescent Gold Nanoclusters

Kyunglim Pyo, Sook Young Yoon, Dongil Lee

3121(Invited) Synthesis and Luminescent Characterization of Core-Shell Nanophosphors

Jungmin Ha, Jin Kyu Han, Chenhui Zhou, Ekaterina Novitskaya, Gustavo Hirata, Olivia A Graeve, Joanna McKittrick

3122(Luminescence and Display Materials Division Centennial Outstanding Achievement Award) An Investigation of New Sources of Visible Light

Baldassare Di Bartolo

3123(Invited) Exploiting Luminescence for Measurements of Temperature

Miroslav Dramicanin

3124Direct Visualization of Stress Distribution Related to Adhesive through Mechanoluminescence

Nao Terasaki, Yuki Fujio, Yoshitaro Sakata, Masato Uehara, Tatsuo Tabaru

3125(Invited) Luminescent Metamaterials for Solid State Lighting

Jaime Gomez Rivas, Mohammad Ramezani

3126Filter of SSI-LED Light Using Thin Films

Yue Kuo, Shumao Zhang

3127(Invited) Considerations of LED Efficiency for the Development of Phosphors for Solid State Lighting

Alan Piquette, Kailash C. Mishra, Werner Bergbauer, Bastian Galler

3128(Invited) Impact of LED Implementation on Rare-Earth Usage in Lighting

Anthony Ku, Anant A Setlur

3129Self-Supporting Gel Electrolyte Material for Electrochemiluminescent Sticker Display

Kihyon Hong

3130Using Luminescent Materials As the Active Component for Multipurpose Sensors

William A Hollerman, Ross Fontenot, Armin B DeVera, Stephen Williams

3131Laser Cooling of CdSe/ZnS Quantum Dots

Ross Fontenot, Veerendra Mathur, John Barkyoumb, Carl Mungan, Thanh Tran



[3132\(Invited\) Advanced Transparent Conductive Top Electrode for Transparent and Top-Emitting Organic Light-Emitting Diodes](#)

[Jeong-Ik Lee, Hyunkoo Lee, Jong Tae Lim, Sunghee Park, Won-Yong Jin, Byoung-Hwa Kwon, Chunwon Byun, Nam Sung Cho, Jae-Wook Kang, Seunghyup Yoo](#)

[3133\(Invited\) Luminescence Spectroscopy of Metal-Halide Perovskites: A Solution-Processed High-Efficiency Photonic Material](#)

[Yoshihiko Kanemitsu](#)

[3134Strong Photoluminescence and Thermal Stability of Eu\(III\) Coordination Polymers with Thiophene-Based Bridge](#)

[Yuichi Hirai, Takayuki Nakanishi, Yuichi Kitagawa, Koji Fushimi, Yasuchika Hasegawa](#)

[3135\(Invited\) Foldable Circuits and Organic Electronic Devices Based on Solution-Processed Graphene Composites and Inkjet Printing](#)

[Byung Doo Chin, Sung Min Jo](#)

[3136UV-Blue Emitting SiO<sub>2</sub> Sintered Glass for Radiation Dosimetry](#)

[Go Okada, Noriaki Kawaguchi, Takayuki Yanagida](#)

[3137Both Directional Organic Light-Emitting Diodes Using Thin Film Electrodes](#)

[Jong-Lam Lee, Illhwan Lee](#)

[3138Low Temperature Fluorinated Silicon FILMS Synthesis](#)

[Dmitry Evgenyevich Milovzorov](#)

[3139Reduction of Europium Ions in SrAl<sub>2</sub>O<sub>4</sub> Glass Composites Using Aluminum Nitride](#)

[Takayuki Nakanishi, Koji Fushimi, Yasuchika Hasegawa](#)

[3140Optically and Thermally Stimulated Luminescence in X-Ray Irradiated Sn-Doped SrO-B<sub>2</sub>O<sub>3</sub> and ZnO-P<sub>2</sub>O<sub>3</sub> Glasses for Passive-Type Dosimeter](#)

[Hidehito Nanto, Ryota Nakagawa, Yoshinori Takei, Kazuki Hirasawa, Yuka Miyamoto, Hirokazu Masai, Go Okada, Takayuki Yanagida](#)

[3141Luminescence Properties of Nd-Doped Strontium Aluminate with Six Coordination Sites](#)

[Takafumi Matsui, Takayuki Nakanishi, Yuichi Kitagawa, Koji Fushimi, Mikio Higuchi, Yasuchika Hasegawa](#)

[3142Optically and Thermally Stimulated Luminescence in x-Ray Irradiated Sn-Doped SrO-B<sub>2</sub>O<sub>3</sub> and ZnO-P<sub>2</sub>O<sub>3</sub> Glasses for Passive-Type Dosimeter](#)

[Hidehito Nanto, Ryota Nankagawa, Yoshinori Takei, Kazuki Hirasawa, Yuka Miyamoto, Hirokazu Masai, Hirokazu Masai, Go Okada, Takayuki Yanagida](#)

[3143Fabrication of Y<sub>2</sub>O<sub>3</sub>:Bi<sup>3+</sup>,Eu<sup>3+</sup> Fluorescent Nanosheet Films By Electrophoretic Deposition](#)

[Yuta Kosuge, Yoshiki Iso, Tetsuhiko Isobe](#)

[3144Upconversion Emission from Li-Gd<sub>2</sub>O<sub>3</sub> Phosphors Embedded into PS Films](#)

[S. Carmona-Tellez, A. Carro-Gastelum, L. Mariscal B., G. Alarcon-Flores, Evelyn Huerta, D. Medina-Velazquez, Ciro Falcony](#)

[3145On the Photoluminescence Linearity of Eu<sup>2+</sup> Based LED Phosphors upon High Excitation Density](#)

[Thomas Jansen, David Boehnisch, Thomas Juestel](#)

[3146Application of Near Infra-Red Optical Probes in a Second Optical Window for Pathological Analyses in a Mouse Brain](#)

[Yukio Imamura, Sayumi Yamada, Setsuko Tsuboi, Takashi Jin](#)

[3147Scintillation and Dosimeter Properties of MgO Transparent Ceramic Doped with C](#)

[Takumi Kato, Go Okada, Takayuki Yanagida](#)

3148 [Cathodoluminescence in Rare Earth Doped Perovskite Films for RGB Colors](#)

[Hiroshi Takashima, Masayoshi Nagao](#)

3149 [Optical, Scintillation and Dosimeter Properties of Ce-Doped and Eu-Doped LiCaAlF<sub>6</sub> Crystals](#)

[Takayuki Yanagida, Yutaka Fujimoto, Go Okada, Noriaki Kawaguchi, Kenichi Watanabe, Kentaro Fukuda](#)

3150 [Evaluation of La<sub>3</sub>Ta<sub>0.5</sub>Ga<sub>5.3</sub>Al<sub>0.2</sub>O<sub>14</sub> and Sr<sub>3</sub>NbGa<sub>3</sub>Si<sub>2</sub>O<sub>14</sub> Piezoelectric Crystals on Scintillation Properties](#)

[Takayuki Yanagida, Yutaka Fujimoto, Yoshisuke Futami, Go Okada, Noriaki Kawaguchi](#)

3151 [Scintillation Properties of Ga<sub>2</sub>O<sub>3</sub> Crystal](#)

[Takayuki Yanagida, Go Okada, Noriaki Kawaguchi, Satoko Yanagida](#)

3152 [Visualization of Relative Strain Distribution for Carbon Fiber Reinforced Plastic Plate By Mechanoluminescent Technique](#)

[Yuki Fujio, Chao-Nan Xu, Yoshitaro Sakata, Naohiro Ueno, Nao Terasaki](#)

3153 [High Photostability of Fluorescent InP/ZnS Quantum Dots Embedded in Tmas-Derived Silica](#)

[Taichi Watanabe, Chikako Wada, Yoshiki Iso, Tetsuhiko Isobe, Hirokazu Sasaki](#)

3154 [Zinc Phosphate Glasses Doped Yttrium-Europium Oxide, a Luminescence Study](#)

[L. Mariscal B., S. Carmona-Tellez, H. Murrieta, Ciro Falcony, Zacarias Rivera-Álvarez](#)

3155 [P-Type and n-Type Doping for Polymer Semiconductor](#)

[Shin Sakiyama, Naoki Mizutani, Katsuhiko Fujita](#)

3156 [Investigation of Mechanoluminescent Light-Emitting Devices Based on ZnS:Cu Composite Embedded Elastomer Film](#)

[Gi-Seok Heo, Jeung pyo Oh, Eun Mi Kim, Young Baek Kim, Jeong Ju Woo](#)

3157 [Synthesis, Structure and Luminescence of Mn<sup>4+</sup>-Doped ATiO<sub>3</sub> \(A=Ca, Mg, Zn\) Deep Red Phosphors](#)

[Mina Medic, Mikhail G. Brik, Alok M Srivastava, Vesna Djordjevic, Jelena Papan, Miroslav Dramicanin](#)

3158 [Europium Tetrakis Dibenzoylmethide Triethylammonium: Synthesis, Additives, and Applications Review](#)

[Ross Fontenot, Kamala Bhat, William A Hollerman, Mohan Aggarwal](#)

3159 [Radiation Dose Response of Ag-Doped Phosphate Glasses with Different Alkali Metal Compositions in the Host](#)

[Hironori Tanaka, Yutaka Fujimoto, Masanori Koshimizu, Takayuki Yanagida, Keiichiro Saeki, Keisuke Asai](#)

3160 [Optical and Scintillation Properties of CsCaCl<sub>3</sub>-Based Crystals](#)

[Keiichiro Saeki, Yutaka Fujimoto, Masanori Koshimizu, Takayuki Yanagida, Hironori Tanaka, Keisuke Asai](#)

3161 [High Electroluminescence of ZnS:Cu Phosphor with a CNT-Incorporated Dielectric Layer](#)

[SeGi Yu](#)

3162 [Thermal Neutron Response of Tungsten Doped Lithium Fluoride Single Crystal](#)

[Noriaki Kawaguchi, Go Okada, Takayuki Yanagida](#)

[3163X-Ray Excited Luminescence of Terbium Doped Sodium Aluminium Phosphate Glass](#)

[Noriaki Kawaguchi, Tomoaki Kuro, Go Okada, Takayuki Yanagida](#)

[3164Radioluminescence Properties of Europium Doped Strontium Aluminum Borate Glass](#)

[Noriaki Kawaguchi, Go Okada, Takayuki Yanagida](#)

[3165\(Invited\) Investigation of Thermal Ionization Quenching and Design of Persistent Luminescence in Ce<sup>3+</sup>-Doped Garnet Phosphors](#)

[Jumpei Ueda](#)

[3166\(Invited\) Red-Emitting Manganese-Doped Aluminum Nitride Phosphor](#)

[Nerine Cherepy, Stephen Payne, Nicholas Harvey, Daniel Aberg, Zachary Seeley, Kiel Holliday, Ich Tran, Fei Zhou, H. Paul Martinez, Jessica Demeyer, Alexander Drobshoff, Alok M Srivastava, Samuel Camardello, Holly A Comanzo, Deborah Schlagel, Thomas Lograsso](#)

[3167Simple Techniques to Improve the Measurement of Basic Optical Parameters in Luminescent Materials](#)

[Florencio Garcia-Santamaria, Anant A Setlur, Alok M Srivastava, Samuel Camardello, James Murphy, Srinivas P Sista, Holly A Comanzo, Swarnagowri Addepalli](#)

[3168\(Invited\) Non-Thermal Detrapping in Persistent Phosphors: Drawbacks and Opportunities](#)

[Philippe F Smet, Claude Tydtgat, Simon Michels, Mathias Kersemans, Dirk Poelman](#)

[3169A Study on Synthesis of SrLu<sub>2</sub>O<sub>4</sub>:Eu<sup>2+</sup> Red Phosphor and Its Photoluminescence Properties](#)

[Kyeong-Ho Kim, Eun-Hee Kang, Seong-Hyeon Hong](#)

[3170\(Invited\) Efficient Phosphor Materials: The Fundamental Physics](#)

[Uwe Happek](#)

[3171 Co-Doped Effect of Afterglow Properties in  \$R\_3GaO\_6:Eu^{3+}\$  \(R = Y, Gd\)](#)

[Takuro Dazai, Shintaro Yasui, Tomoyasu Taniyama, Mitsuru Itoh](#)

[3172 Nonlinear Interaction of Electronic Excitations Created at High-Densities in Luminescent Materials and Scintillators](#)

[Vitali Nagirnyi, Raul Laasner, Marco Kirm, Sebastian Vielhauer, Rimantas Grigonis, Valdas Sirutkaitis, Stephane Guizard, Andrey Vasil'ev](#)

[3173 \(Invited\) Local Environment Analysis of Dilute Rare-Earth Dopants in Phosphor Materials](#)

[Tomoyuki Yamamoto](#)

[3174 \(Invited\) X-Ray-Induced Changes in Spectroscopic Properties of  \$LuPO\_4:Eu\$  and  \$LuPO\_4:Sm\$  Ceramic Phosphors](#)

[Eugeniusz Zych, Justyna Zeler, Andries Meijerink](#)

[3175 \(Invited\) Computational Design of Lanthanide-Doped Optical Materials By a Combined DFT and Crystal-Field Approach: Recent Developments and Applications](#)

[Chong-Geng Ma](#)

[3176 First-Principles Calculation on the Emission Energy Level of Ruby Based on DV-X \$\alpha\$  Molecular Orbital Method and Ligand Field Theory](#)

[Mega Novita, Akane Ito, Kazuyoshi Ogasawara](#)

[3177 \(Invited\) "Structure-Property", "Composition-Property" and "Property-Property" Relations As Useful Tools for Understanding of Optical Materials Performance](#)

[Mikhail G. Brik, Alok M Srivastava, Sam Jospeh Camardello](#)

[3178 Systematic First-Principles Calculations of Charge Transfer Transitions of Transition Metal Ions in  \$\alpha\$ -Al<sub>2</sub>O<sub>3</sub> and Optimization of the Computational Condition](#)

[Shota Takemura, Kazuyoshi Ogasawara](#)

[3179 Creation of  \$4f^n-4f^{n-1}5d^1\$  Transition Energy Diagram of Trivalent Lanthanide Ions in Fluorides Based on First-Principles Calculations](#)

[Kazuyoshi Ogasawara](#)

[3180 Relationship Between, the Centroid Shift of Eu<sup>2+</sup> and Ce<sup>3+</sup> with the Band Gap of the Host Lattice](#)

[Sam Jospeh Camardello, Alok M Srivastava, Paul J Toscano, Anant A Setlur](#)

[3181 \(Invited\) Artificial Intelligence Integrated Multiscale, Multiphysics Computational Chemistry Methods Based on Ultra-Accelerated Quantum Chemical Molecular Dynamics for Luminescence Materials](#)

[Akira Miyamoto, Patrick Alain Bonnaud, Ryuji Miura, Ai Suzuki, Naoto Miyamoto, Nozomu Hatakeyama](#)

## **J02-Materials for Solid State Lighting**

[3182 Novel Measurement Technique for Time Dependant Intensity Variations of AC-LEDs](#)

[Simon Dominik Korte, Thomas Juestel](#)

[3183 Crystal Structure Refinement of BaCaSiO<sub>4</sub>:Eu<sup>2+</sup>/Mn<sup>2+</sup> and Its Tunable Luminescence](#)

[Jieun Park, Choong Ki Lee, Young Jin Kim](#)

[3184 Dependence of Optical Properties of Mn<sup>4+</sup> on Temperature and Chemical Environment in A<sub>2</sub>Ge<sub>4</sub>O<sub>9</sub> \(A = K, Rb\)](#)

[Florian Baur, Thomas Juestel](#)

[3185Light Extraction Enhancement in GaN-Based Light-Emitting Diodes with Patterned Micro-Pillars](#)

[Heera Kwon, Hyunsoo Kim, Jaehee Cho](#)

[3186Photoluminescence Properties and Energy Transfer in Color-Tunable Garnet Phosphor for High Quality LED Lighting](#)

[Seob Won, Paulraj Arunkumar, Won Bin Im](#)

[3187Phellodendron Chinense Schneid: A Novel Yellow-Emitting Luminescent Materials for White Light-Emitting Diodes Applications](#)

[Pin-Chun Lin, Kuei-Ting Hsu, Wei-Ren Liu](#)

[3188Synthesis and Luminescence Properties of  \$\text{Eu}^{3+}\$ -Activated  \$\text{La}\_5\text{BSi}\_2\text{O}\_{13}\$  Phosphor for W-LED Applications](#)

[Chun-Ting Chen, Wei-Ren Liu](#)

[3189New Red-Emitting Boronitrides:  \$\text{Ca}\_3\(\text{BN}\_2\)\_2:\text{Eu}^{2+}\$  and  \$\text{Sr}\_3\(\text{BN}\_2\)\_2:\text{Eu}^{2+}\$](#)

[Tobias Dierkes, Thomas Juestel](#)

[3190A New Green Phosphor Using Solid-Solution and Their Structural and Optical Properties](#)

[Yoon Hwa Kim, Won Bin Im](#)

[3191Synthesis of New Melilite Structured Blue Phosphor for UV LED](#)

[Ha Jun Kim, Won Bin Im](#)

[3192Synthesis of Deep-Red  \$\text{La}\_2\text{MgGeO}\_6:\text{Mn}^{4+}\$  Phosphors for Indoor Plant Cultivation By Polymerized Complex Method](#)

[Mizuki Watanabe, Tsubasa Yoshizawa, Sun Woog Kim, Kohei Seki, Tadashi Ishigaki, Kazuyoshi Uematsu, Kenji Toda, Mineo Sato](#)



[3193\(Invited\) Discovery and Structural Design of New LEDs Phosphors](#)

[Zhiguo Xia](#)

[3194Tunable Eu<sup>2+</sup> Emission in K<sub>x</sub>Na<sub>1-x</sub>LuS<sub>2</sub> Phosphors for Circadian LEDs](#)

[Vitezslav Jary, Lubomir Havlak, Jan Barta, Maksym Buryi, Martin Rejman, Valentin Laguta, Martin Nikl](#)

[3195\(Invited\) Phosphors-By-Design: Developing the Next Generation of Luminescent Materials for Solid State Lighting](#)

[Jakoah Brgoch](#)

[3196Discovery of Novel Narrow-Band Red Phosphors Using High-Throughput First Principles Descriptors](#)

[Zhenbin Wang, Iek-Heng Chu, Fei Zhou, Shyue Ping Ong](#)

[3197Rapid Screening of Novel LED Phosphors Using Melt Quenching Method](#)

[Kenji Toda, Sun-Woog Kim, Kazuyoshi Uematsu, Mineo Sato](#)

[3198\(Invited\) Investigation of Eu Doped Silicate Phosphor Family M<sub>2</sub>Ln<sub>8</sub>\(SiO<sub>4</sub>\)<sub>6</sub>O<sub>2</sub> \(M=Mg, Ca, Sr; Ln=La, Y\) with Apatite Structure for LED Applications](#)

[Marco Kirm, Sebastian Vielhauer, Eliko Töldsepp, Henri Mägi, Vitali Nagirnyi, Thomas Juestel, Thomas Jansen, Nicolas M Khaidukov, Vladimir N Makhov](#)

[3199\(Invited\) Thermal Quenching of Phosphors: How to Reduce/Remove It?](#)

[Won Bin Im, Yoon Hwa Kim](#)

[3200New Strategy for the Design of Yellow, Red and IR-Emitting LED Phosphors](#)

[Kenji Toda, Sun-Woog Kim, Kazuyoshi Uematsu, Mineo Sato](#)

[3201\(Invited\) New Phosphor Exploration By the Single Particle Diagnosis Approach](#)

[Takashi Takeda, Shiro Funahashi, Rong-Jun Xie, Naoto Hirosaki](#)

[3202A Single Phase  \$\text{LaAl}\(\text{Si}\_{6-z}\text{Al}\_z\)\(\text{N}\_{10-z}\text{O}\_z\):\text{Eu}^{2+}\$  Phosphor with Large Red-Shift of the Emission and Anomalous Decay Behavior](#)

[Chunyun Wang, Takashi Takeda, Otmar Melvin ten Kate, Shiro Funahashi, Masatako Tansho, Kohsei Takahashi, Rong-Jun Xie, Tadashi Shimizu, Naoto Hirosaki](#)

[3203\(Invited\) White LEDs Using Oxynitride Green Phosphor and Mn-Doped Red Phosphor for Wide-Color Gamut Display Applications](#)

[Kenichi Yoshimura, Hiroshi Fukunaga, Makoto Izumi, Masatsugu Masuda, Toyonori Uemura, Kohsei Takahashi, Rong-Jun Xie, Naoto Hirosaki](#)

[3204\(Invited\) Investigation of Blue Excitation Flux Dependent Conversion Efficiency in Phosphors for High Luminance Applications](#)

[Madis Raukas, James Avallon, John Kelso, Alan Lenef, Jingzhou Wang](#)

[3205\(Invited\) Phosphor-in-Glass Luminescent Materials for Solid State Laser Lighting](#)

[Rong-Jun Xie, Qiang-Qiang Zhu, Takashi Takeda, Naoto Hirosaki](#)

[3206Synthesis, Crystal Structure and Optical Spectroscopy of  \$\text{Eu}^{2+}\$  in  \$\text{Sr}\_3\text{SiO}\_4\text{Br}\_2\$ , Along with Potential Applications in LEDs](#)

[Sam Josph Camardello, Alok M Srivastava, Jae-Hyuk Her, Anant A Setlur](#)

[3207\(Invited\) Polymeric Materials in LEDs: Outlook and Challenges](#)

[Alan Piquette, Maxim Tchoul, Alexander Linkov](#)

## **K01-Bioengineering Based on Electrochemistry**

[3208\(Keynote\) Advanced Platform Technologies for the Near Future Electrochemical Biosensing](#)

[Koji Sode](#)

[3209\(Invited\) Printable Paper-Based Wearable Diaper-Type and Adhesive Bandage-Type Biofuel Cells for Urine Sugar and Sweat Lactate Monitoring](#)

[Isao Shitanda](#)

[3210A Stretchable, Wearable Lactate Sensor with a Textile-Based Biofuel Cell](#)

[Yuto Kato, Yudai Ogawa, Hiroyuki Kai, Matsuhiko Nishizawa](#)

[3211Printing of Enzyme Electrodes on Nonwoven Fabric for Flexible Biofuel Cells](#)

[Yunchen Hsieh, Yudai Ogawa, Yuto Kato, Hiroyuki Kai, Matsuhiko Nishizawa](#)

[3212High Catalytic Current Density Based on Direct Bioelectrocatalysis of a PQQ Domain of Pyranose Dehydrogenase](#)

[Kouta Takeda, Ryo Kusuoka, Makoto Yoshida, Kiyohiko Igarashi, Masahiro Samejima, Hiroyuki Ohno, Nobuhumi Nakamura](#)

[3213Investigation of Intra- or Inter-Electron Transfer Pathway of Multiheme Electron Transfer Subunit of Iron Sulfur Flavo Cytochrome Type Glucose Dehydrogenase Complex](#)

[Nanoha Suzuki, Yuki Yamashita-Tsukada, Nana Hirose, Masaki Shiota, Katsuhiko Kojima, Wakako Tsugawa, Koji Sode](#)

[3214\(Keynote\) Enzymatic Biofuel Cell Based on Porous Carbon Materials](#)

[Seiya Tsujimura](#)

[3215Structural Based Investigation of Artificial Electron Acceptor Interaction of Fungus Derived Flavin Adenine Dinucleotide Dependent Glucose Dehydrogenase](#)

[Madoka Okurita, Hiromi Yoshida, Kazushige Mori, Kojima Katsuhiko, Koji Sode](#)

[3216Bioelectronically Initiated Cyt P450s Catalysis without NADPH](#)

[Songqin Liu, Xuan Xu](#)

[3217 Electrochemically Switchable Fluorescence in Rhodamine Derivatives](#)

[Martina Cizkova, Laurent Cattiaux, Jean-Maurice Mallet, Christian Andre Amatore, Eric Labbe, Olivier Buriez](#)

[3218 \(Invited\) Biohybrid Photoelectrodes Exploiting Effective Photosystem I - Electrode Contacts](#)

[Fred Lisdat, Sven Christian Feifel, Kai Stieger](#)

[3219 Fast Electron Transfer Reaction of Azurin Fixed on the Self-Assembled Monolayer Gold Nanoparticle Electrode in Hydrated Ionic Liquids](#)

[Kyoko Fujita, Jun Kuwahara, Nobuhumi Nakamura, Hiroyuki Ohno](#)

[3220 \(Keynote\) Towards Implantable Miniature Glucose-O<sub>2</sub> Biofuel Cells](#)

[Nicolas Mano](#)

[3221 \(Invited\) Cyborg Insect: Insect Computer Hybrid Robot](#)

[Kee Chun Poon, Desmond Chun Long Tan, Yao Li, Feng Cao, Tat Thang Vo Doan, Hirotaka Sato](#)

[3222 Self-Powered Environmental Monitoring Using Insect-Mountable Biofuel Cell](#)

[Kan Shoji, Yoshitake Akiyama, Nobuhumi Nakamura, Hiroyuki Ohno, Keisuke Morishima](#)

[3223 \(Invited\) Construction of an Enzymatic Biofuel Cell Which Produces Electric Energy and a Platform Chemical Simultaneously](#)

[Nobuhumi Nakamura](#)

[3224 In Operando neutron Imaging of Enzymatic Electrochemical Cells](#)

[Ryan Longchamps, Zachary van Zandt, Hassina Bilheux, Indu Dhiman, Louis Santodonato, Yevgenia Ulyanova, Sameer Singhal, George J. Nelson](#)

[3225\(Keynote\) Utilizing Bioengineering for Fabricating Catalytic Cascade Bioanodes](#)

[Shelley D. Minteer](#)

[3226High-Energy Density Metal-Free Biobatteries Powered By Soft Drinks](#)

[Zhiguang Zhu, Y-H Percival Zhang](#)

[3227Optimization of Enzyme-Reconstituted Electrodes in Enzymatic Biofuel Cell for Low Power Applications](#)

[Sarthak Parmar, Siddarth Durga, Sivakumar Amaravati, Subramaniam Chittur Krishnaswamy](#)

[3228Molecular Design for Catalysts of Microbial Extracellular Electron Transfer: Redox Active Molecules Bound with Outer-Membrane Cytochrome C in Shewanella Oneidensis MR-1](#)

[Yoshihide Tokunou, Kazuhito Hashimoto, Akihiro Okamoto](#)

[3229Development and Characterization of Cellulolytic Enzymatic Fuel Cells with DNA-Organized Multi-Enzyme Cascade](#)

[Sooyoun Yu, Qi Chen, Wilfred Chen, Nosang Vincent Myung](#)

[3230Molecular Dynamics Simulation of Substrate Transport on Alpha-Helix Peptide for Multistep Catalysis](#)

[Yuanchao Liu, Scott Calabrese Barton](#)

[3231\(Keynote\) Novel Materials for Catalytic Cascades: Integrating Experimental and Computational Strategies](#)

[Ivana Matanovic, Sadia Kabir, Albert Thomas Perry, Kateryna Artyushkova, Alexey Serov, Plamen Atanassov](#)

[3232Synthetic Nerve Endings for Restoring the Axo-Axonal Transport](#)

[Nazrin Abdullayeva, Deniz Naz Seckin, Mehmet Sankir, Nurdan Demirci Sankir, Hakan Seckin](#)

[3233\(Invited\) Nanopore Sensing with a Stable Lipid Bilayer in Microfabricated Devices](#)

[Ryuji Kawano](#)

[3234Porous Polymer Microneedles with Interconnecting Microchannels Toward Efficient Sensing of Interstitial Fluid](#)

[Hiroyuki Kai, Liming Liu, Kuniaki Nagamine, Yudai Ogawa, Matsuhiko Nishizawa](#)

[3235Quantitative Assessment of Channeling Mechanisms in Nanoscale Catalytic Architectures](#)

[Erica Earl, Scott Calabrese Barton](#)

[3236An Electrochemical Scaffold for Wound-Relatedbiofilms Elimination](#)

[Sujala T. Sultana, Erhan Atci, Jerome T. Babauta, Azeza Mohamed Falghoush, Kevin Snekvik, Douglas R Call, Haluk Beyenal](#)

[3237\(Invited\) Electrochemical Activity of Cyanobacteria: From Biophotovoltaics to Environmental Monitoring](#)

[Stefano Freguia, Libertus Darus, Rita Vieira Lemos, Pablo Ledezma](#)

[3238In-Situ Electrochemical Synthesis of a Potential Bacterial Killing Catholyte from Ceramic Microbial Fuel Cells Treating Urine](#)

[Irene Merino Jimenez, Grzegorz Pasternak, Iwona Gajda, John Greenman, Ioannis Ieropoulos](#)

[3239Electrochemical and Power Performance of Microbial Fuel Cells: A Novel Numerical Approach](#)

[Giacomo Falcucci, Rosa Anna Nastro, Viviana Cigolotti, Mariagiovanna Minutillo, Elio Jannelli](#)

[3240 Bioelectrochemical Catalysis Reversal Reaction in Purification and Resources of Mineral Processing Flue Gas Via BECR](#)

[Li Wang, Yang Sun, Ning Hu, Jie Wang](#)

[3241 Study of Microbial Fuel Cell for Implantable Application](#)

[Aashray Narla, Dhruv Upadhyaya, Sivakumar Amaravati, Subramaniam Chittur Krishnaswamy](#)

[3242 Relationship Between Surface Chemistry, Biofilm Structure and Electron Transfer in Shewanella Anodes](#)

[Kateryna Artyushkova, Jose Alberto Cornejo, Carlo Santoro, Dan Roizman, Enrico Marsili, Plamen Atanasov](#)

[3243 Kinetic Competition Between Extracellular Electron Transport and Upstream Reactions in Microbial Electrode Catalysis](#)

[Junki Saito, Kazuhito Hashimoto, Akihiro Okamoto](#)

[3244 Synthetic Strategy for Controllable Electrochemical Regulation of Metabolism in Living Cells Using Biocompatible Amphiphilic Redox-Active Polymers](#)

[Masahiro Kaneko, Masahito Ishikawa, Souichiro Kato, Kazuhito Hashimoto, Shuji Nakanishi](#)

[3245 Iron Corrosive Sulfate Reducing Bacteria Uptake Extracellular Electrons Via Outer Membrane C-Type Cytochromes](#)

[Xiao Deng, Kazuhito Hashimoto, Akihiro Okamoto](#)

[3246 Demonstration of an Energy Neutral, Off-Grid Microbial Fuel Cell System for Decentralized Wastewater Treatment](#)

[Lewis Hsu, Meriah Arias-Thode, Orianna Bretschger, Michael Salvacion, Shing Chen, Zach Benavidez, Sofia Babanova](#)

[3247 Development of HeLa Cell Lines Expressing Specific Connexins](#)

Mikako Saito, Shoya Hiratoko, Naruwa Tokunaga, Yoshihide Ogawa

3248Development of Immunochromatography Incorporated with Electrochemical Systems for Detecting the Activity of Labeled Enzyme

Kohei Tominaga, Fumio Mizutani, Tomoyuki Yasukawa

3249Sodium Cobalt Oxide As a Non-Platinum Cathode Catalyst for Microbial Fuel Cells

Osamu Ichihashi, Kayako Hirooka, Tatsuya Takeguchi, Takashi Kusui

3250Dielectrophoretic Manipulation for Picking up and Relocating Single Cells By a Microdisk Electrode with Microcavity

Taishu Tanaka, Fumio Mizutani, Tomoyuki Yasukawa

3251Immobilization of the Pyrroloquinoline Quinone Dependent Alcohol Dehydrogenase with Polyelectrolyte Membranes on the Glassy Carbon Electrode

Yuki Sakurada, Chikanobu Sugimoto, Kouta Takeda, Hiroyuki Ohno, Nobuhumi Nakamura

3252Direct Electron Transfer of Hemoglobin on Indium-Tin Oxide Electrodes Synthesized By Dip-Coating Methods Under Different Sintering Temperature

Yusuke Ayato, Dai Mochizuki, Wataru Sugimoto

3253Electrochemical Deposition of Materials for Biomedical Applications

Igor Zhitomirsky

3254Designing Macro-Meso Pore Structure of MgO-Templated Carbon for Det-Based Enzyme Electrodes

Hiroto Funabashi, Seiya Tsujimura

3255Simultaneous Production of Electricity and Galactaric Acid from Pectin with an Enzymatic Biofuel Cell



[Riku Sakuta, Kouta Takeda, Hiroyuki Ohno, Nobuhumi Nakamura](#)

[3256 Bioelectrocatalytic Interconversion Between Formate and Carbon Dioxide By Tungsten-Containing Formate Dehydrogenase](#)

[Kento Sakai, Arato Suzuki, Yuki Kitazumi, Osamu Shirai, Kenji Kano](#)

[3257 Electrochemistry Based Platform for the Highly Sensitive Detection of Human Parathyroid Hormone Using Au Electrode with MoS<sub>2</sub>/Graphene Matrix](#)

[Min-Ho Lee, Hye Youn Kim, Kook-Nyung Lee, Youngtai Seo](#)

[3258 Dual Gas Diffusion H<sub>2</sub>/O<sub>2</sub> Biofuel Cell in Direct Electron Transfer-Type System](#)

[Qingsheng Song, Yuki Kitazumi, Osamu Shirai, Koji Nishikawa, Yoshiki Higuchi, Kenji Kano](#)

[3259 Cytochrome C-Calixarene Crystals on Electrodes: Electron Transfer Between Defined Redox Sites](#)

[Sven Christian Feifel, Roise McGovern, Peter Crowley, Fred Lisdat](#)

[3260 Effects of Temperature and Calciums on the Treatment of Organics and Nutrient in Swine Wastewater Using an Integrated Bioelectrochemical Ion-Exchange System](#)

[Seung Joo Lim, Tak-Hyun Kim](#)

[3261 High Power Glucose/O<sub>2</sub> Biofuel Cell Constructed from MgO-Templated Carbon Modified Carbon Cloth](#)

[Ayumu Niiyama, Seiya Tsujimura](#)

[3262 \(Keynote\) Skin-Worn Biosensors and Biofuel Cells](#)

[Joseph Wang](#)

[3263 Identification of Substrate Binding Site of Fungus Derived Flavin Adenine Dinucleotide Dependent Glucose Dehydrogenase](#)

Asuka Sorada, Kazushige Mori, Katsuhiro Kojima, Hiromi Yoshida, Koji Sode

3264Development of the Electrochemical Detection System Using the Combination of Aptamer and Enzyme

Kaori Tsukakoshi, Jinhee Lee, Yasuko Yamagishi, Hiromi Hayashi, Kaoru Konda, Koji Sode, Kazunori Ikebukuro

3265High Efficiency Insertion of Antibody-Immobilized Nanoneedle into Living Cells for in Situ detection of Cytoskeletal Proteins

Chikashi Nakamura, Keita Shimizu, Ryuzo Kawamura, Masumi Iijima, Shun'ichi Kuroda, Kyoko Fukazawa, Kazuhiko Ishihara

3266Elasticity Measurement of High-Metastatic Breast Cancer Cells That Highly Express Intermediate Filament Protein Nestin

Ayana Yamagishi, Yuta Takano, Mari Mishima, Miku Imaizumi, Tomoko Okada, Chikashi Nakamura

3267Detection of Specific Nucleic Acids Utilizing DNA Nano-Tweezers Structures

Hisakage Funabashi, Keisuke Yoshinaga, Hajime Shigeto, Keisuke Nakatsuka, Akio Kuroda

3268(Keynote) Labelless Photoelectrochemical and Impedimetric Aptasensors and Immunosensors Based on Biofunctionalized Electropolymerized Polymers

Serge Cosnier, Robert Marks, Michael Holzinger, Karine Gorgy, Chantal Gondran, Alan Le Goff, Quentin Palomar, Imen Kazane, Fatima Haddache

3269Development of a Detection System for Epigenetic Modifications By Enzyme Fused Zinc Finger Protein

Jinhee Lee, Wataru Yoshida, Daisuke Hiraoka, Aki Kezuka, Atsuro Tasumi, Yuko Osawa, Koichi Abe, Kazuhiko Nakabayashi, Hironobu Wakeda, Kenichiro Hata, Koji Sode, Kazunori Ikebukuro

[3270Metabolic Assay System Using Skeletal Muscle Cells Cultured with a Stretchable Fiber Electrode](#)

[Hiroataka Sato, Kuniaki Nagamine, Hiroyuki Kai, Hirokazu Kaji, Matsuhiko Nishizawa](#)

3271([Invited](#)) [Diamond Electrodes for Sensitive Electrochemical Detection](#)

[T. Kondo](#)

3272[Minimally-Invasive Transepidermal Potential Measurement System with Microneedle Salt Bridge](#)

[Yuina Abe, Kuniaki Nagamine, Mayu Nakabayashi, Hiroyuki Kai, Takeshi Yamauchi, Kenshi Yamasaki, Matsuhiko Nishizawa](#)

3273[Seif-Anchoring of Transformable Electrode-Hydrogel Hybrid Sheet for Intraoperative Physiological Monitoring](#)

[Daiki Okabe, Kuniaki Nagamine, Hiroyuki Kai, Hirokazu Kaji, Matsuhiko Nishizawa](#)

3274([Invited](#)) [Electrical Detection of Biomolecules Using Graphene-Based Devices](#)

[Kenzo Maehashi](#)

3275[Chemiresistive and Switching Characteristic with Reduced Graphene Oxide Biosensor Fabricated Using Antibody-Antigen Binding System](#)

[Yo-Han Kim, Hunsang Jung, Hyun Ho Lee](#)

3276[Bioengineering of Solution Processed Graphene for the Development of Ultrasensitive Flexible Biosensing Platform](#)

[Arnab Halder, Suhith Hemanth, Stephan Sylvest Keller, Jens Ulstrup, Qijin Chi](#)

3277([Invited](#)) [Electrochemical Luminescent Imaging of Activated Neutrophils Using Multi-Microwell Array Electrode](#)

[Eiichi Tamiya](#)

[3278 Highly Sensitive Detection of Catalase Modified Magnetic Nanoparticle Using Signal-Off ECL Imaging of Multichamber Electrode](#)

[Yuki Inoue, Akiko Araki, Hiroyuki Yoshikawa, Masato Saito, Eiichi Tamiya](#)

[3279 Electrochemical Measurement of Coenzyme Q<sub>10</sub> Using Disposable Interdigitated Array Electrode](#)

[Wakako Tsugawa, Kentaro Watanabe, Koji Sode](#)

[3280 \(Keynote\) Recent Advance in Sensor Technologies for Mobile Healthcare](#)

[Christopher Lowe](#)

## **K02-Recent Advances in the Application of Electrochemistry to Problems in Organic Chemistry and Biology**

[3281 \(Invited\) Photoredox Catalysis: An Easy Access to Versatile Radical Functionalization](#)

[Takashi Koike](#)

[3282 Electrochemical Reduction of Alkenes Mediated By Vitamin B12 Model Complex](#)

[Hisashi Shimakoshi, Luo Zhongli, Yoshio Hisaeda](#)

[3283 Electrochemical Reduction of Primary Alkyl Halides with the Aid of a Structurally Modified Nickel Salen Catalyst](#)

[Austin Goodson, Caitlyn M. McGuire, Mohammad S. Mubarak, Dennis G Peters](#)

[3284 Efficient Diels-Alder Reaction of O-Quinone Electrogenerated in a Flow Microreactor](#)

[Hirona Yoshizawa, Hiroyuki Tateno, Mahito Atobe](#)

[3285 Competition Studies and the Use of Mechanistic Insight to Overcome Synthetic Barriers](#)

[Kevin D Moeller, Robert J Perkins, Luisalberto Gonzalez, Ruozhu Feng](#)

3286 [\(Invited\) Electron-Transfer Approaches to Metal-Free Ring-Opening Metathesis Polymerization](#)

[Andrew J Boydston, Adam E Goetz, Laura M M Pascual, Yosuke Ashikari, Kelli A Ogawa](#)

3287 [Anodic Chlorination of Chalcogenophenes in Conjugated Polymers](#)

[Shinsuke Inagi, Daichi Okazaki, Naoki Shida, Hiroki Nishiyama, Ikuyoshi Tomita](#)

3288 [Electrooxidative Polymerization of 3-Hexylthiophene in a Flow Microreactor](#)

[Masatsugu Mizuno, Hiroyuki Tateno, Mahito Atobe](#)

3289 [Highly Soluble Quinones As Active Materials for Nonaqueous Redox Flow Batteries](#)

[Keisuke Takenaka, Akihiro Shimizu, Jun-ichi Yoshida](#)

3290 [Synthesis and Electrochemical Properties of Thiophene-Based Polymers As Organic Cathode Materials for Lithium-Ion Batteries](#)

[Hideya Tanizawa, Akihiro Shimizu, Yusuke Yaso, Yuu Inatomi, Nobuhiko Hojo, Hirotetsu Suzuki, Jun-ichi Yoshida](#)

3291 [\(Invited\) One-Step Aerobic Oxygenation of Hydrocarbons By Electron Transfer](#)

[Kei Ohkubo](#)

3292 [Dissymmetric Bis\(dipyrrinato\)Zinc\(II\) Complexes: Rich Variety and Bright Red to Near-Infrared Luminescence with a Large Pseudo-Stokes Shift](#)

[Ryota Sakamoto, Hiroshi Nishihara](#)

3293 [Expanded Scope of Methodology and Polymer Functionality for Photoredox-Mediated Ring-Opening Metathesis Polymerization](#)

[Laura M M Pascual, Adam E Goetz, Damian G Dunford, Kelli A Ogawa, Yosuke Ashikari, Andrew J Boydston](#)

3294 [TEMPO-Mediated Electro-Oxidation of 1,2-Diol on Boron-Doped Diamond Electrode](#)

[Keisuke Naba, Takashi Yamamoto, Tsuyoshi Saitoh, Rika Obata, Shigeru Nishiyama, Yasuaki Einaga](#)

3295 [Microelectrode Arrays and the Move Toward Practical Applications](#)

[Kevin D Moeller, Sakshi Uppal, Matthew Graaf, Nai-Hua Yeh, Weiqiang Li](#)

3296 [Electrochemical Transformation of 2,5-Diphenyltellurophene](#)

[Naoki Shida, Yusuke Komatsuzaki, Dwight Seferos, Hiroki Nishiyama, Ikuyoshi Tomita, Shinsuke Inagi](#)

3297 [Electrooxidative Coupling of Functional Primary Alkylamines and Aromatics Via Heterocyclization](#)

[Jun-ichi Yoshida, Tatsuya Morofuji, Akihiro Shimizu](#)

3298 [Alzheimer Disease Amyloid Beta Peptides: AFM and Voltammetric Characterization](#)

[Ana Maria Oliveira-Brett, Ana-Maria Chiorcea-Paquim, Teodor Adrian Enache](#)

3299 [\(Invited\) Electrolytic Macrocyclizations on Scale](#)

[Patrick Harran](#)

3300 [Redox-Responsive Dimerization in a Ferrocene-Containing Ureidopyrimidone Supramolecular Assembly](#)

[Diane K. Smith, Mario Cedano](#)

3301 [Zinc and Nickel-Salophen Catalysts in Mediated Electrohydrocyclization Reactions](#)

[James A Miranda, Nancy Zepeda, Lauren Littell, Brittanie Clendenin](#)

3302 [Cyclic Voltammetry Studies of a Redox-Responsive 4 H-Bond Ureidopyrimidinone Alkyl-Pyridinium Capable of Self-Dimerization](#)

[Ghazwan M Darzi, Diane K. Smith](#)

3303 [Electrocatalytic Generation of Amidyl Radicals for N-Heterocycle Synthesis](#)

[Hai-Chao Xu](#)

3304 [Coupling Xanthine Dehydrogenase to Electrodes By Means of a Polymer and 3D Structures](#)

[Fred Lisdat](#)

3305 [Synthesis of Fluorinated Triazole and Isoxazole Derivatives By Electrochemical Fluorination](#)

[Shunsuke Kuribayashi, Naoki Shida, Shinsuke Inagi, Toshio Fuchigami](#)

3306 [Electrochemical Studies of Cysteine](#)

[Matthew A. Worosz, Graham T. Cheek](#)

3307 [Electroreduction of Nitrobenzene: Nominal Simulation of Voltammogram](#)

[Inam ul Haque](#)

3308 [Hole Transfer Property at Single Crystal Prepared from Triphenylamine-Derivative Based on Solubility and Supersolubility Curves](#)

[Yasuaki Nakasone, Sayoko Shironita, Norio Nagayama, Minoru Umeda](#)

3309 [Electrochemical Homo-Coupling Reaction of Brominated Phenols](#)

[Rika Obata, Takashi Yamamoto, Keisuke Naba, Shigeru Ohba, Yasuaki Einaga, Shigeru Nishiyama](#)

3310 [Electrochemical Behavior of Aromatic Diamines and the Growth of Conducting Films](#)

[Katsuhiko Tsunashima, Naoki Minami, Yasushi Ono, Mitsutaka Imoto, Seiichi Mori, Motonori Takeda](#)

3311 [Structure-Activity Relationship of AMP-Luciferin Analogs for In Vivo Imaging](#)

[Nobuo Kitada, Satoshi Iwano, Masahiro Kiyama, Ryohei Saito, Takashi Hirano, Haruki Niwa, Shojiro Maki](#)

3312 [Innovation of New Luciferin Analog for In Vivo Imaging](#)

[Ryohei Saito, Masahiro Kiyama, Nobuo Kitada, Shoko Higashi, Satoshi Iwano, Rika Obata, Haruki Niwa, Takashi Hirano, Shojiro Maki](#)

3313 [Metal Nanoparticles Dispersion By Chaperonin Complexes](#)

[Hiromi Yoda, Ayumi Koike-Takeshita](#)

3314 [Electrochemical Metal-Free Ring-Opening Metathesis Polymerization](#)

[Yosuke Ashikari, Laura M M Pascual, Kelli A Ogawa, Andrew J Boydston](#)

3315 [Biological Decontamination of Water Using Non-Thermal Plasma Treatment](#)

[Tarek M Abdel-Fattah, Ekrem Cetinkaya, William Pell, Muhammad Malik](#)

3316 [The Unusual Redox Properties of Fluoroferrocenes Revealed through a Comprehensive Study of the Haloferrocenes](#)

[Michael Inkpen, Shuoren Du, Mariana Hildebrand, Andrew White, Nicholas Harrison, Tim Albrecht, Nicholas Long, Nicholas Long](#)



[4179\(Europe Section Alessandro Volta Medal\) Alzheimer Disease and Oxidative Stress: Thou Shalt not Breathe nor Think!](#)

[Christian Andre Amatore](#)

## **L01-Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry General Session**

[3317Noble Metal Nanoparticle for Oxygen Electroreduction: Size, Shape, Ligand and Composition Effects](#)

[Zhenghua Tang, Likai Wang, Hongyu Yang, Qiannan Wang, Wei Yan, Shaowei Chen](#)

[3318Copper-Modified Covalent Triazine Frameworks As Efficient Electrocatalysts for Oxygen Reduction Reactions](#)

[Kazuyuki Iwase, Kazuhide Kamiya, Shuji Nakanishi, Kazuhito Hashimoto](#)

[3319Exploring Selective, Efficient 2 e<sup>-</sup> and 4 e<sup>-</sup> Electrochemical Oxygen Reduction Using Electrocatlays Based on Reduced Graphene Oxide](#)

[Hyo Won Kim, Bryan D McCloskey](#)

[3320Rationalized Onion-like Non-PGM Catalyst Development for Oxygen Reduction Reaction](#)

[Claudia Wuillma Narvaez Villarrubia, Hung-Ju Yen, Gen Chen, Hombo Li, Ming Zhou, Ying-Bing Jiang, Kateryna Artyushkova, Plamen Atanassov, Gautam Gupta, Gang Wu, Hsing-Lin Wang](#)

[3321Non-Precious Metal Electrocatalysts for the Oxygen Reduction Reaction Based on Nitrogen Doped Graphene: Catalysts Development and Electrode Structure Design](#)

[Krzysztof Miecznikowski, Beata Dembinska, Sylwia Zoladek, Iwona Agnieszka Rutkowska, Magdalena Skunik-Nuckowska, Enrico Negro, Pawel J Kulesza, Vito Di Noto](#)

[3322Electrochemiluminescence Resonance Energy Transfer Between Traditional Luminescent Reagents and Nanomaterials and Their Biosensing Application](#)

[Jun-Jie Zhu, Yong-Ping Dong](#)

[3323 Structural Manipulation of Carbon Nitride for Electrochemiluminescent Analysis](#)

[Yuanjian Zhang](#)

[3324 Electrochemiluminescence Microscopy Imaging Using Ru\(bpy\)<sub>3</sub><sup>2+</sup> Doped in Silica Microspheres](#)

[Cheng Ma, Jun-Jie Zhu](#)

[3325 Enhanced Electrochemiluminescence on Indium Tin Oxide Modified with Dendrimer-Encapsulated Nanoparticles](#)

[Joohoon Kim](#)

[3326 Electrochemiluminescent Molecular Sensor for Point of Care Testing for Homocysteine Measurement](#)

[Iksoo SHIN](#)

[3327 The Oxygen Evolution Reaction at Transition Metal Oxide \(TMO\) Films in Alkaline Media](#)

[Michelle Phillipa Browne, Shelley Stafford, Maria O'Brien, Hugo Nolan, Nina Berner, Georg S. Duesberg, Paula E Colavita, Micheal E.G Lyons](#)

[3328 Cobalt Oxide Nanoflake Modified Electrodes and Their Application As Supercapacitors and Oxygen Evolution Catalysts](#)

[Aur lie A. S. Rovetta, Andrew Harvey, Michelle Phillipa Browne, Jonathan N Coleman, Micheal E.G Lyons](#)

[3329 Enhancement of the Oxygen Evolution and the Oxygen Reduction Reactions in Mn<sup>3+</sup> based Electrocatalysts](#)

[Shigeto Hirai, Shunsuke Yagi, Masaya Fujioka, Tomoya Ohno, Takeshi Matsuda](#)

[3330 Validation of a Central Approximation in Theories of Regular and Random Electrochemical Electrode Arrays. Extraction of Statistical Information from Amperometric Response of Random Electrode Arrays](#)

[Oleksii Sliusarenko, Alexander Oleinick, Irina Svir, Christian Andre Amatore](#)

[3331 Morphology-Controllable Ni<sub>3</sub>Se<sub>2</sub> Nanostructures; Synthesis, Characterization and Electrocatalytic Activity Towards Oxygen Evolution Reaction](#)

[Abdurazag T Swesi, Jahangir Masud, Manashi Nath](#)

[3332 A New Family of Perovskite Catalysts for Oxygen evolution Reaction in Alkaline Media: BaNiO<sub>3</sub> and BaNi<sub>0.83</sub>O](#)

[Byungchan Han, Jeemin Hwang](#)

[3333 Production of Ni\(OH\)<sub>2</sub> Nanosheets By Liquid Phase Exfoliation: High Performance Oxygen Evolution Catalysts and Supercapacitor Electrodes](#)

[Ian Godwin, Andrew Harvey, Xiaoyun He, David McAteer, Micheal E.G Lyons, Jonathan N Coleman](#)

[3334 Microkinetic Modeling of the Oxygen Evolution Reaction on Oxide Surfaces](#)

[Charlotte S Kirk, Colin F Dickens, Joseph H Montoya, Jens Nørskov](#)

[3335 New Family of High-Efficiency Oxygen Evolution Electrocatalyst Based on Ni-Fe Mixed Chalcogenides](#)

[Abdurazag T Swesi, Jahangir Masud, Manashi Nath](#)

[3336 Electrocatalytic Reduction of CO<sub>2</sub> on Cu and Au/W Electrode Surfaces: Empirical \(DEMS\) Confirmation of Computational \(DFT\) Predictions](#)

[Alnald Javier, Jack Hess Baricuatro, Youn-Geun Kim, Manuel P Soriaga](#)

[3337 Electrochemical Reduction of CO<sub>2</sub> on Copper Oxidized By Electrochemical Methods](#)

[Sachin Daulatgir Giri, Arindam Sarkar, Sanjay Mahajani, A.K. Suresh](#)

[3338 Identification of Carbon Dioxide Electroreduction Products on Multilayered Metallic Catalysts Based on Palladium](#)

[Aneta Januszewska, Rafal Robert Jurczakowski, Pawel J Kulesza](#)

[3339 Electrochemical Reduction of CO<sub>2</sub> over Phase Segregated Cuag Bimetallic Electrodes with Enhanced Oxygenate Selectivity By CO Spillover](#)

[Ezra L Clark, Alexis T. Bell](#)

[3340 \(Invited\) Enhanced Hydrogen Oxidation Activity at Pt-M Alloy Catalysts in Acid: A DFT Study](#)

[Donald A. Tryk, Guoyu Shi, Hiroshi Yano, Hiroyuki Uchida, Masahiro Watanabe, Akihiro Iiyama](#)

[3341 \(Invited\) Structural Stability and Ionic Defects in Transition Metal-Oxides from Diffusion Quantum Monte Carlo](#)

[Juan A. Santana, Jaron T. Krogel, Paul R. C. Kent, Reboredo A. Fernando](#)

[3342 \(Invited\) A First-Principles Molecular Dynamics Study on Active Sites on Metal Nano Particles: Application of the Compressed Gas Model](#)

[Manabu Sugimoto](#)

[3343 \(Invited\) Theoretical Investigation on Proton Conductance Mechanism in Proton Exchange Membranes](#)

[Takao Tsuneda](#)

[3344 \(Invited\) First-Principles Simulations of Electrochemical Reactions and Properties at Water|Pt Interfaces](#)

[Tamio Ikeshoji](#)

[3345 Rational Band Structure Engineering of TiO<sub>2</sub> for Photoelectrochemical Water Splitting](#)

[Wan-Jian Yin](#)

[3346 Nitrogen and Transition-Metal Codoped Titania Nanotube Arrays for Visible-Light-Sensitive Photoelectrochemical Water Oxidation](#)

[Tomiko M. Suzuki, Gaku Kitahara, Takeo Arai, Yoriko Matsuoka, Takeshi Morikawa](#)

[3347 Engineering Molybdenum Disulfide Protected Silicon Photocathodes for Corrosion Resistance in Acid](#)

[Laurie Ann King, Thomas R Hellstern, Thomas F Jaramillo](#)

[3348 Designing IrO<sub>2</sub> Nanoparticles for Oxygen Evolution](#)

[Fatih G. Sen, Alper Kinaci, Badri Narayanan, Michael J. Davis, Stephen K. Gray, Subramanian K. R. S. Sankaranarayanan, Maria K. Y. Chan](#)

[3349 Electrochemical Reduction of Hydrogen Carbonate Using Porous Diodes](#)

[Yevedzo E Chipangura, Allen Chaparadza](#)

[3350 \(Invited\) Photoelectrochemical Water Splitting and CO<sub>2</sub> Fixation Using Powdered Photocatalyst Materials](#)

[Akihiko Kudo](#)

[3351 \(Keynote\) Artificial Photosynthesis: Synthesis of Organic Substances from CO<sub>2</sub>, H<sub>2</sub>O and Sunlight Using Semiconductor Photoelectrodes Coupled with Metal-Complex Catalysts](#)

[Takeshi Morikawa](#)

[3352 Molecular Encapsulation and Association of Ionic Species with Dendrimers at Polarized Liquid|Liquid Interfaces](#)

[Hirohisa Nagatani](#)

[3353Metal Extraction Driven By Galvani Potential at the Interface Between Two Immiscible Electrolyte Solutions](#)

[Lasse Murtomäki, Eemi Nieminen](#)

[3354Permselective Ion Transfer at the Nanoscopic Ities Array](#)

[Bin Su, Xiao Huang](#)

[3355Electrochemistry with Ion Transfer Processes at Microhole-Liquid/Gel Interfaces for Sensing Applications](#)

[Hye Jin Lee](#)

[3356Ion-Transfer Voltammetry of Drugs at the Oil|Water Interface and Evaluation of Their Artificial Membrane Permeability By Digital Simulation](#)

[Toshiyuki Osakai](#)

[3357Ionic Liquid|Water Interface As an Electrochemical Reaction Field for the Formation of Novel Metal Nanostructure](#)

[Naoya Nishi](#)

[3358Liquid Junction Potential Between Hydrophobic Ionic Liquid and Aqueous Electrolyte Solution](#)

[Masahiro Yamamoto, Kenji Kawai, Takashi Kakiuchi, Ryo Murakami](#)

[3359Electrocatalysis for Carbon Dioxide Reduction By Molecular Cobalt Complexes Adsorbed at Liquid/Liquid Interfaces](#)

[Jinheung Kim, Soojin Kim, Ha Jang, Ju Lee](#)

[3360Lipophilic Redox Buffers for Polymeric Solid-Contact Electrodes](#)

[Philippe Buhlmann, Xu U. Zou, Xue V Zhen, Jinbo Hu, Andreas Stein](#)

[3361 Integrating Two CdS-Based Z-Scheme Heterostructures for Realizing Overall Photoelectrochemical Water Splitting](#)

[Yung-Shan Chang](#)

[3362 Investigating the Photo-Electrochemical Properties of Quantum Rods Using Scanning Electrochemical Microscopy](#)

[Philippe Hapiot, Sebastien Lhenry, Benoit Boichard, Yann Leroux, Pascale Even-Hernandez, Valerie Marchi](#)

[3363 Photoelectrochemical Evaluation of Single Nanoparticles](#)

[Kevin Tkacz, Christopher D. Sanborn, Shane Ardo](#)

[3364 \(Invited\) Utilization of Photoluminescence from Semiconductor Nanoparticles to Probe Electron Transfer Reactions Influenced By Their Surface Conditions](#)

[Susumu Kuwabata, Taro Uematsu, Eisuke Shimomura, Tsukasa Torimoto](#)

[3365 \(Invited\) Plasmon-Induced Charge Separation: Mechanisms and Applications](#)

[Tetsu Tatsuma, Hiroyasu Nishi](#)

[3366 Development of Site-Selective Nanoscale-Polymerization Method Based on Plasmon Induced Charge Separation](#)

[Yukina Takahashi, Yoshitaka Furukawa, Yusuke Sota, Takuya Ishida, Sunao Yamada](#)

[3367 Fast Near-Infrared Electrochromism of Redox-Active Plasmonic Copper Sulfide Nanoparticles](#)

[Hiroyasu Nishi, Keisuke Asami, Tetsu Tatsuma](#)

[3368 Electroswitchable Emission and Coloration Based on Single-Molecular Fluoran Derivatives](#)

[Kazuki Nakamura, Kenji Kanazawa, Norihisa Kobayashi](#)

[3369 Profiling Carrier Generation in Semiconductor Microwire Arrays Via Photoelectrochemical Metal Deposition](#)

[Mita Dasog, Azhar I Carim, Sisir Yalamanchili, Harry A Atwater, Nathan S Lewis](#)

[3370 \(Invited\) A Fingerprint of Metal Oxide Powders: Characterization and Identification with Energy-Resolved Distribution of Electron Traps](#)

[Bunsho Ohtani, Akio Nitta, Mai Takashima, Mai Takase, Naoya Murakami](#)

[3371 \(Invited\) Development of the Hybrid Solar Cells Using Copper Iodide As a Hole Transport Material](#)

[Akinori Konno](#)

[3372 Photoinduced Charge Transfer Kinetics and Electrochemical Investigation on Porphyrin](#)

[Xiaoquan Lu, Samrat Devaramani, Shouting Zhang, Wenqi Li, Jiajian Du, Zhuoyue Zhang, Dongxu Zhang](#)

[3373 Enhanced Photoelectrochemical Performance of Nanostructured Zinc Oxide Photoelectrodes Via Morphology Control](#)

[Nurdan Demirci Sankir, Demet Yolacan, Pelin Komurcu, Mehmet Sankir](#)

[3374 Photoluminescence and Photoelectrochemical Properties of ZnTe-AgInTe<sub>2</sub> Solid Solution Nanocrystals](#)

[Tatsuya Kameyama, Kouta Sugiura, Susumu Kuwabata, Tsukasa Torimoto](#)

[3375 Core-Shell Si-Ta<sub>3</sub>N<sub>5</sub> Heterostructures As Photoanodes for Photoelectrochemical Water Splitting](#)

[Ieva Narkeviciute, Pongkarn Chakthranont, Christopher Hahn, A. Mackus, Stacey F. Bent, Thomas F Jaramillo](#)



[3376Maskless Generation of Highly Periodic 3D Semiconductor Nanostructures in Response to Defined Illumination Inputs](#)

[Azhar I Carim, Nicolas A. Batara, Anjali Premkumar, Harry A Atwater, Nathan S. Lewis](#)

[3377The Effect of Oxidation Ratio of Conducting Polymer on Potential Stability of the Conducting Polymer-Coated Electrode](#)

[Emi Kusakabe, Yui Nakamura, Mao Fukuyama, Kohji Maeda, Yumi Yoshida](#)

[3378Highly Efficient Electrogenerated Chemiluminescence of Au<sub>22</sub>SG<sub>18</sub> Nanocluster in Aqueous Solution](#)

[Jaeyoon Kim, Kyunglim Pyo, Dongil Lee, Won-Yong Lee](#)

[3379Interfacial Behavior of Fluorescent Species Associated with Dendritic Polymers at Polarized Liquid|Liquid Interfaces](#)

[Hiroki Sakae, Masataka Fujisawa, Hirohisa Nagatani, Hisanori Imura](#)

[3380Electrochemical Property of Boron-Doped Heteroepitaxial Diamond Treated By Different Oxidation Method](#)

[Hideyuki Kodama, Kimiyoshi Ichikawa, Kazuhiro Suzuki, Atsuhiro Sawabe](#)

[3381The Role of Supporting Electrolyte on the Electrocatalytic Reduction of Organic Halides on Nanostructured Silver Electrodes in Water](#)

[Agnieszka Brzózka, Anna Brudzisz, Urszula Nowak, Grzegorz Dariusz Sulka](#)

[3382The Electrostatics of the Semiconductor-Electrolyte Interface](#)

[Dimiter N. Petsev, Frank van Swol, Mark Fleharty](#)

[3383Modified Electrodes with Nanocomposite Films Based on Conducting Polymers and Functionalized Carbon Nanotubes](#)

[Florina Branzoi, Viorel Branzoi, Zoia Pahom](#)

[3384 Selective Determination of Chloride Ion and Sulfide Ion Using Flow Coulometry at Ag Electrode](#)

[Maki Hasebe, Manami Sawada, Hiroaki Fukutake, Mao Fukuyama, Yumi Yoshida, Kohji Maeda](#)

[3385 Bifunctional Electrocatalysts for Oxygen Reduction and Evolution Reactions \(ORER\) in Alkaline Electrolyte](#)

[Yohannes Kiros, Alagar Raj Paulraj](#)

[3386 Preparation of Pt@Cu Core-Shell Particles Incorporated in Poly-\(3,4-ethylenedioxythiophene\) for Catalytic Applications](#)

[Ralf Peipmann, Anna Endrikat, Andreas Bund](#)

[3387 Quartz Crystal Microbalance Electrode Modified with Thermoresponsive Crosslinked and Non-Crosslinked N- Isopropylacrylamide Polymers. Response to Changes in Temperature](#)

[Marcin Karbarz, Kamil Marcisz, Zbigniew Jan Stojek](#)

[3388 Enhancement of Porphyrin Photocurrent Based on Plasmonic Cu Light-Harvesting Nanoantenna](#)

[Kosuke Sugawa, Daisuke Yamaguchi, Joe Otsuki](#)

[3389 Specific Surface Nitride Groups on Glassy Carbon Model Surfaces to Catalyze the Vanadium Redox Reactions](#)

[Tobias Greese, Franziska Friedrich](#)

[3390 A Bifunctional ZnCo<sub>2</sub>O<sub>4</sub> Electrocatalyst Derived from Zeolitic Imidazolate Frameworks for Oxygen/Hydrogen Evolution Reaction in Alkaline Media](#)

[Lanlee Lee, Jin Ho Bang](#)

[3391 Detection of Moisture Adsorption on Joining Surface Using Static Electricity Distribution](#)

[Kazuya Kikunaga, Nao Terasaki](#)

3392 [Pd/Uio-66/Ti Electrode for Electrocatalytic Debromination of Tetrabromobisphenol a](#)

[Fang Jiang, Xiangwen Feng, Huan Chen](#)

3393 [Modification of Microelectrode Surface with Hydrogel Layers and Determination of Pore Size in Layers](#)

[Klaudia Kaniewska, Marcin Karbarz, Wojciech Hyk, Zbigniew Jan Stojek](#)

3394 [Electroactive, Multisensitive Nanocomposite. Electrocatalytic Activity and Attachement to Gold Electrode Surface](#)

[Marcin Mackiewicz, Marcin Karbarz, Jan Romański, Zbigniew Jan Stojek](#)

3395 [One-Step Fabrication of Whisker Catalyst By Galvanic Displacement Reaction and Its Application As the Electrocatalyst](#)

[Seungyeon Baek, Myung Jun Kim, Kwang Hwan Kim, Jae Jeong Kim](#)

3396 [New Software for Simulation of Electrochemical Reaction Mechanisms of Any Complexity](#)

[Irina Svir, Oleksiy Klymenko, Alexander Oleinick, Christian Andre Amatore](#)

3397 [Platinum Electrodeposition on in-Situ Grown Prussian Blue Nanostructures and Reduced Graphene Oxide Composite for Synergistic Methanol Oxidation](#)

[Kyuwon Kim, Inhak Kang, Shanmugam Manivannan](#)

3398 [Virus-Assisted Growth of Metal Alloy Nanostructure and Its Use an Electrocatalyst](#)

[Kyuwon Kim, Yeji Seo, Inhak Kang, Shanmugam Manivannan](#)

3399 [Study of the Ammonia Oxidation Mechanism By a Normal Pusle Voltammetry](#)

[Ryo Shirasaka, Hidenobu Shiroishi, Yuya Harada, Mikka Nishitani-Gamo, Keiji Nagai](#)

[3400 New Insights on Formic Acid Electrooxidation at a Polycrystalline Au Film Electrode: Simultaneous in Situ ATR-Ftirs and Online Dems Measurements](#)

[Zenonas Jusys, Rolf Jürgen Behm](#)

[3401 Mechanism of Ethanol Oxidation on Unsupported Noble Metal Nanoalloys Studied By Differential Electrochemical Mass Spectrometry](#)

[Justyna Piwovar, Adam Lewera](#)

[3402 Towards Rational Optimization of a Wastewater Treatment Electrocatalyst for the Chlorine Evolution Reaction Using a Method for Finding Active Sites on Brush Coated Samples](#)

[Cody Enslin Finke, Stefan R Omelchenko, Michael R Hoffmann](#)

[3403 Comparison of Voltammetric Techniques for the Electroanalysis of Dissolved Solids and Gases in Water, Acetonitrile and Room Temperature Ionic Liquids \(RTILs\): Unusual Behaviour for Gases](#)

[Ghulam Hussain, Debbie S. Silvester](#)

[3404 Validation of Mixed Potential Theory Using Formic Acid and Ferric Ion As a Redox Couple](#)

[Nilam L. Chauhan, Arindam Sarkar, Vinay A Juvekar, Sanjay M. Mahajani, A.K. Suresh](#)

[3405 Structure, Electronic Properties and Electrochemical Behavior of a Boron-Doped Diamond/Quartz Optically Transparent Electrode](#)

[Greg M Swain, Romana Jarosova, Naihara Wachter, Catherine Munson](#)

[3406 New Advances in Ambient Pressure X-Ray Photoelectron Spectroscopy: Operando Probing of the Electrical Double Layer at the Solid/Liquid Interfac](#)

Marco Favaro, Beomgyun Jeong, Philip N Ross, Junko Yano, Zahid Hussain, Zhi Liu, Ethan J Crumlin

3407In-Situ Electrochemical Microscopy Techniques (AFM-SECM, sMIM and Liquid SEM) to Study Solid/Liquid Interface

Jeyavel Velmurugan, Amit Agarwal, Sangmin An, Eric Choudhary, Ana Stevanovic, Feng Yi, David LaVan, Alexander Tselev, Anton Ievlev, Sergei V. Kalinin, Andrei Kolmakov, Veronika Szalai

3408Electrochemical Photocurrent X-Ray Spectroscopy: A Novel Analytical Surface Technique

Matthew James Strom, Donald F. Roeper, Paul M. Natishan, William E. O'Grady

3409Tunable Electrocatalytic Performance of Metal Nanocrystals By Tailoring Surface Electronic Structures

Yujie Xiong

3410Molybdenum-Based Nanomaterials As High Efficient Electrocatalysts for HER

Zexing Wu, Jie Wang, Huolin L. Xin, Deli Wang

3411Growth of Transition Metal Nanoclusters to Get Enhanced Catalytic Abilities

Tajamal Hussain, Munazza Ashraf, Adnan Mujahid, Muhammad Hamid Raza, Khurram Shehzad

3412Electrochemistry of Superatomic  $M@Au_{24}(SR)_{18}$  (M=Pd, Pt) Clusters and Their Application in Electrocatalysis

Kyuju Kwak, Woojun Choi, Minseok Kim, Qing Tang, De-en Jiang, Dongil Lee

3413Electrocatalytic Alcohol Oxidation By a Ruthenium-Modified Covalent Triazine Framework

Shingi Yamaguchi, Kazuhide Kamiya, Shuji Nakanishi, Kazuhito Hashimoto

[3414Catalytic Activity of Unsupported Pd-Pt Nanoalloys Towards Formic Acid and Ethanol Electrooxidation](#)

[Barbara Gralec, Adam Lewera](#)

[3415Electronic Regulation on Mo<sub>2</sub>c Nanowires Toward Efficient Hydrogen Evolution Reaction](#)

[Qingsheng Gao, Huanlei Lin](#)

[3416Elucidating the Synergetic Mechanism of Ni-Mo Electrocatalysts for the Hydrogen Evolution Reaction](#)

[Jay Schwalbe, Ian Salmon McKay, Matteo Cargnello](#)

[3417Nanocrystal Seeded Growth of High Activity Ni-Mo Electrocatalysts for the Hydrogen Evolution Reaction](#)

[Ian Salmon McKay, Jay Schwalbe, Matteo Cargnello, Arun Majumdar](#)

[3418Discovering Pd-B/C As a Potential Bifunctional Catalyst in the Formic Acid ↔ Carbon Dioxide Conversion Cycle](#)

[Bei Jiang, Kun Jiang, Wen-Bin Cai](#)

[3419Integrating Enzymes into Cytochrome c –Based Multilayer Architectures – General Considerations and Example with Fructose Dehydrogenase](#)

[Fred Lisdat, Ulla Wollenberger, Kenji Kano, Christoph Wettstein](#)

[3420Improved Understanding and Use of Generated Oxidizing Species in Liquid Waste Disinfection](#)

[Edgard Ngaboyamahina, James O. Thostenson, Katelyn L. Sellgren, Brian T. Hawkins, Charles B. Parker, Brian R. Stoner, Marc A. Deshusses, Jeffrey T. Glass](#)

[3421Systematic Two-Dimensional DRT-Analysis of Battery and Fuel Cell Impedance Data](#)

[Andreas Mertens, Kevin Schiemann, Steffen Alexander Kayser, Shicheng Yu, Svitlana Eurich, Hermann Tempel, Hans Kungl, L.G.J. de Haart, Rüdiger-Albrecht Eichel, Josef Granwehr](#)

3422 [Developing Molecular Imprinted Layers As Electro-Analytical Probes for Dydrogesterone Determination](#)

[Adnan Mujahid, Tajamal Hussain, Sobia Ashraf, Hamid Raza](#)

3423 [Electrochemical Approach to Evaluate the Wettability of Rough Surfaces](#)

[Beniamin Zahiri, Pradeep Kumar Sow, Chun Haow Kung, Walter Mérida](#)

3424 [Mediated and Direct Electrocatalytic Oxidation of Glucose and Cellulose: Towards Glucose and Cellulosic Air Batteries](#)

[Leigh Aldous, Habib Abdulkhalig](#)

3425 [\(Invited\) Solvent Effects on the Surface Charge Formation in Electric Double Layers](#)

[Dimiter N. Petsev, Frank van Swol, Mark Fleharty](#)

3426 [Experimentally Determined Correlation Between Electronic and Electrocatalytic Properties in Oxidation of Small Organic Molecules for Systems Consisting of Noble Metal](#)

[Adam Lewera, Maciej Tomasz Gorzkowski, Barbara Gralec, Justyna Piwowar](#)

3427 [Oxidation of Small Organic Molecules on Noble Metals and Pseudomorphic Layers of Noble Metals](#)

[Maciej Tomasz Gorzkowski, Adam Lewera, Rafal Robert Jurczakowski, Piotr Poleczynski](#)

3428 [Single Atom Modified Covalent Triazine Frameworks As Electrocatalysts](#)

[Kazuhide Kamiya, Ryo Kamai, Kazuhito Hashimoto, Shuji Nakanishi](#)

3429 [Electrochemical Reduction of Atrazine at Carbon and Silver Cathodes](#)

[Erin Theresa Martin, Dennis G Peters](#)

3430 [Insights from Near-Surface Atomic Structures and Composition for Catalytic Activity and Stability of Oxides in Electrochemical Reactions](#)

[Zhenxing Feng, Yang Shao-Horn](#)

3431 [Electrochemical Reduction of 2,2-Dichlorovinyl Dimethyl Phosphate \(Dichlorvos\) at Carbon and Silver Cathodes](#)

[Sonali Mali, Dennis G Peters](#)

3432 [Multiscale Computational Study of Electronic Structure and Properties of Electrochemical Nano-Systems](#)

[Sergey Gusarov](#)

3433 [Electrochemical Synthesis of Single Pt Atom Catalyst for Hydrogen Reactions](#)

[Wei-Fu Chen, Si-Lin Fang, Li-Chyong Chen, Kotaro Sasaki](#)

3434 [Epitaxial Graphene Nanowalls As Electrocatalysts Supports for Electrocatalytic Reactions](#)

[Yi-Rung Lin, Tsu-Chin Chou, Meng-Chia Hsieh, Kuei-Hsien Chen, Li-Chyong Chen](#)

## **L02-Molten Salts and Ionic Liquids 20**

3435 [\(Invited\) Ionic Liquids in Separations and Mass Spectrometry](#)

[Daniel Armstrong](#)

3436 [Selective Reversible Absorption of the Industrial Off-Gas Components CO<sub>2</sub> and NO<sub>x</sub> by Ionic Liquids](#)



[Peter Kjartan Kaas-Larsen, Peter Thomassen, Leonard Schill, Susanne Mossin, Anders Riisager, Rasmus Fehrmann](#)

[3437 Mechanism of CO<sub>2</sub> Capture in 1-Alkyl-3-Methylimidazolium Acetate: Is N-Heterocyclic Carbene Involved?](#)

[Hyung J Kim, Fangyong Yan, Nilesh R Dhumal](#)

[3438 Carbon Dioxide Absorption Behavior and Carbonate Ion Transport of Lithium Orthosilicate / Molten Carbonate Coexistence System](#)

[Minoru Mizuhata, Kyohei Kanki, Hideshi Maki](#)

[3439 Dense Carbon Coated Electrode for Biosensing Application Made By Plating in Molten Salt Bath](#)

[Ryo Warigaya, Toshikazu Okubo, Tatsuro Sasa, Hiroyuki Tsujimura, Tokujiro Nishikiori, Yasuhiko Ito](#)

[3440 A New Electrolytic Production Process of Silicon Using Liquid Zn Alloy Cathode in Molten Salt](#)

[Toshiyuki Nohira, Akifumi Ido, Takeyuki Shimao, Xiao Yang, Kouji Yasuda, Rika Hagiwara, Takayuki Homma](#)

[3441 Characterization of the Electrochemical Behavior of a Li-Bi Reference Electrode for the Molten LiCl-Li](#)

[William Phillips, Augustus Merwin, Vickram Singh, Dev Chidambaram](#)

[3442 \(Invited\) Development of Newfangled Nanotechnologies By Introducing Ionic Liquid to Vacuum Devices](#)

[Susumu Kuwabata, Tetsuya Tsuda, Taro Uematsu, Tsukasa Torimoto](#)

[3443 Ionic Liquids and Organic Ionic Plastic Crystals Based on Tris\(fluorosulfonyl\)methide](#)

[Hajime Matsumoto, Junji Mizukado, Peng-cheng Wan](#)

3444 [Preparation of Uniformly Dispersed ITO Nanoparticles Via Direct Oxidation of in-Sn Alloy in Ionic Liquids](#)

[Daisuke Sugioka, Tatsuya Kameyama, Susumu Kuwabata, Tsukasa Torimoto](#)

3445 (Invited) [Quantifying the Impact of Ionic Liquid Cations on the Properties of Cellulose Nanocrystals](#)

[Jeffrey W. Gilman, Jeremiah Woodcock, Douglas M Fox](#)

3446 (Invited) [Ionic Liquid Enables Technologies for Winning Rare Earth Elements](#)

[Anja-Verena Mudring](#)

3447 [Electrochemistry of Uranium and Plutonium in Ionic Liquids](#)

[Jerzy Chlistunoff, Kevin Sean Boland, Andrew Gaunt, George Scott Goff, Wolfgang Runde](#)

3448 [Electrochemical Measurement of  \$\text{Li}\_2\text{O}\$  in Molten LiCl Salt](#)

[Adam J Burak, Michael Forrest Simpson](#)

3449 [Fluoride Addition Effects on Voltammograms and UV-Vis Spectra of Neodymium Cation in Molten Chlorides](#)

[Haruaki Matsuura, Atsushi Nezu, Hiroshi Akatsuka, Akihiro Uehara, Toshiyuki Fujii](#)

3450 [Electrochemical Reduction of  \$\text{UO}\_2\$  to U in LiCl-KCl Molten Salt Eutectic Using the Fluidised Cathode Process](#)

[Rema Abdulaziz, Leon D Brown, Douglas Inman, Clint Sharrad, Paul R. Shearing, Daniel J.L Brett](#)

3451 [Methods for Determining the Working Electrode Interfacial Area for Electroanalytical Measurements of Metal Ions in Molten LiCl-KCl](#)

[Devin Rappleye, David Horvath, Zhonghang Wang, Chao Zhang, Michael Forrest Simpson](#)

3452 [\(Invited\) Challenge of Industrializing Novel Molten Salt Electrochemical Processes](#)

[Yasuhiko Ito, Tokujiro Nishikiori, Hiroyuki Tsujimura](#)

3453 [Historical Development of Pyrochemical Methods for Treating Used Nuclear Fuel](#)

[Perry N Motsegood, James L Willit, Mark A. Williamson](#)

3454 [Fluorination Behavior of Uranium-Zirconium Mixture by Hydrogen Fluoride](#)

[Takahiro Ono, Nobuaki Sato, Atsushi Nezu, Takafumi Uchiyama, Haruaki Matsuura](#)

3455 [Development of Carbon Anodes for Use in Electrolytic Reduction of Uranium\(IV\) Oxide](#)

[Perry N Motsegood, James L Willit, Mark A. Williamson](#)

3456 [Development and Optimization of Voltammetry for Real Time Analysis of Multi-Component Electrorefiner Salt](#)

[Chao Zhang, Devin Rappleye, Michael Forrest Simpson](#)

3457 [Demonstration of the Separation of Actinides from Lanthanides By Electrolysis with in-Situ Voltammetry](#)

[Melissa A. Rose, Javier Figueroa, James L Willit, Mark A. Williamson](#)

3458 [Dy Permeation through an Alloy Diaphragm Using Electrochemical Implantation and Displantation](#)

[Hirokazu Konishi, Tetsuo Oishi, Toshiyuki Nohira, Hideki Ono, Eiichi Takeuchi](#)

3459 [Carbon Material-Based Positive Electrodes for Aluminum Secondary Battery with a Chloroaluminate Ionic Liquid](#)

[Tetsuya Tsuda, Yuya Uemura, Chih-Yao Chen, Itsuki Kokubo, Susumu Kuwabata](#)

3460 [\(Invited\) Designer Ionic Liquids for Improved Magnesium Anode Behavior](#)

[Daniel A. Buttry, Tylan S Watkins, Ashok Kumar](#)

3461 [Intermediate-Temperature Operation of Sodium Secondary Batteries with High Rate Capability and Cyclability Using Ionic Liquid Electrolyte](#)

[Kazuhiko Matsumoto, Chih-Yao Chen, Tomohiro Kiko, Jinkwang Hwang, Takafumi Hosokawa, Toshiyuki Nohira, Rika Hagiwara](#)

3462 [Properties and Lithium Battery Applications of Solvate Ionic Liquid/CO<sub>2</sub> Binary Mixtures](#)

[Morgan L. Thomas, Katsuya Watanabe, Megumi Kato, Takashi Makino, Mitsuhiro Kanakubo, Kaoru Dokko, Masayoshi Watanabe](#)

3463 [Influence of Ion Diffusivity and Gas Solubility in Ionic Liquids on Li-Air Battery Performance](#)

[Samuel Seo, Tangqiumei Maggie Song, Fuminori Mizuno, Kensuke Takechi, Joan F Brennecke](#)

3464 [Characteristics of Capacitors Based on Ionic Liquids: From Dielectric Polymers to Redox-Active Adsorbed Species](#)

[Enn Lust, Liis Siinor, Heisi Kurig, Tavo Romann, Vladislav Ivaništšev, Carolin Siimenson, Thomas Thomberg, Jaanus Kruusma, Karmen Lust, Piret Pikma, Erik Anderson, Vitali Grozovski, Rasmus Palm, Laura Läll, Anton Ruzanov, Tauno Tooming, Ove Oll, Alar Jänes](#)

3465 [Influence of Electrode Gas Flow Rate and Electrolyte Composition on Thermoelectric Power in Molten Carbonate Thermocell](#)

[Sathiyaraj Kandhasamy, Luca Calandrino, Odne Stokke Burheim, Asbjørn Solheim, Signe Kjelstrup, Geir Martin Haarberg](#)

3466 [Hydrogen Diffusion and Trapping in Fluoride Salt Melts and Graphite Electrodes](#)

[Raluca Scarlat, Francesco Carotti, Huali Wu, Digby D. Macdonald](#)

3467 ["Click" Synthesis" of Mercaptosilyl-Functionalized Ionic Liquids via Thiol-Ene Chemistry for Use as Hydrophobic Surface Coating Agents](#)

[Manuel Sanchez Zayas, Stephen Nestor, Jamie Gaitor, Melissa Reardon, Arsalan Mirjafari](#)

3468 [Influence of Cathode Potential on Ti Electrodeposition in Molten Fluoride](#)

[Kazuyoshi Nishikawa, Sawada Humiya, Taiki Morishige, Toshihide Takenaka](#)

3469 [Electrochemical Synthesis and Electrocatalytic Activity of Nano-Powders of Tungsten Carbide](#)

[Inessa Novoselova, Sergei Kuleshov, Elena Fedoryshena](#)

3470 [Preparation of Functionalized Yarns Via Ionic Liquid Based Natural Fiber Welding](#)

[Katherine E. Ryall, Patrick J Fahey, David P. Durkin, Eric T Fox, Luke M. Haverhals, Hugh C. De Long, Paul C Trulove](#)

3471 [Availability Evaluation of SiC Anode in Chloride Molten Salt Electrolysis](#)

[Yoshihiro Takahashi, Toshihide Takenaka](#)

3472 [The Effect of Lengthening Cation Ether Tails on Ionic Liquid Properties](#)

[Sharon Lall-Ramnarine, Chanele Rodriguez, Rahonel Fernandez, Nicole Zmich, Eddie Fernandez, Surajdevparkash Dhiman, James F. Wishart](#)

3473 [Effect of Electrode Shape on Lithium Metal Fog in LiCl-KCl](#)

[Shogo Akimura, Taiki Morishige, Toshihide Takenaka](#)

3474 [Improved Electrocatalytic Oxidation of Urea Using Ru-Ni Binary Nanoparticles Prepared By an Ionic Liquid/Metal Sputtering Technique](#)

Hironori Kuwayama, Kazuya Itadani, Tatsuya Kameyama, Susumu Kuwabata, Tsukasa Torimoto

3475 An Ionic Liquid Consisting of Crown Ether – Coordinated Hydronium Cation and Amide Anion

Shun Takeoka, Atsushi Kitada, Kazuhiro Fukami, Kuniaki Murase

3476 The Effect of the Second Coordination Sphere on Vanadium Speciation in Molten Chlorides

Ilya B. Polovov, Mikhail V. Chernyshov, Vladimir A. Volkovich, Boris D. Vasin, Trevor R. Griffiths

3477 Currentless Deposition of Niobium-Based Protective Coatings for Application in Molten Salts

Aleksandr V. Abramov, Ilya B. Polovov, Vladimir A. Volkovich, Oleg I. Rebrin

3478 New Alloy for Application in Molten Chlorides: Design and Properties

Kirill V. Dedov, Mikhail A. Aseev, Aleksandr P. Pantyukhin, Alfiya F. Gibadullina, Vyacheslav V. Karpov, Aleksandr V. Abramov, Arkadiy Yu. Zhilyakov, Vladislav A. Khotinov, Aleksandr F. Shevakin, Peter A. Kharin, Ilya B. Polovov, Sergey V. Belikov, Vladimir A. Volkovich, Oleg I. Rebrin

3479 Oxidation of Woody Biomass Dissolved in Ionic Liquids By a Platina-Loaded Titanium Dioxide Electrode

Eri Yamaki, Kazuma Ikeda, Kyoko Fujita, Hiroyuki Ohno, Nobuhumi Nakamura

3480 Electrochemical and Thermodynamic Properties of Lanthanum in a Chloride Melt – Liquid Metal System

Alexander S. Dedyukhin, Andrey V. Shchetinskiy, Ekaterina A. Kharina, Ivan E. Shchepin, Vladimir A. Volkovich, Leonid F. Yamshchikov, Alexandr G. Osipenko

3481 Ionic Conduction Mechanism Analysis for Neodymium Complex in Phosphonium Ionic Liquids and Potassium Bis(trifluoromethylsulfonyl)amide Melts

[Atsuki Nishimura, Masahiko Matsumiya, Katsuhiko Tsunashima](#)

3482 [Influence of Fluid Dynamics on the Electrochemical Deposition of Tantalum](#)

[Sladjana Martens, Adriana Ispas, Ludwig Asen, Lukas Seidl, Ulrich Stimming, Oliver Schneider, Andreas Bund](#)

3483 [Application of Electrochemically Deposited Cobalt Films in a Hydrogen Evolution Reaction](#)

[Tarek M Abdel-Fattah, Clay Huff, Thomas Dushatinski](#)

3484 [Measurement of Adhesion Strength of Al Electroplating Film on AZ31, AZ61, and AZ91 Substrates](#)

[Masato Onishi, Mikito Ueda, Hisayoshi Matsushima, Hiroki Habazaki, Kota Washio, Akira Kato](#)

3485 [Electrodeposition of Al-W Alloys in  \$\text{AlCl}\_3\$ -NaCl-KCl Molten Salt Containing  \$\text{WCl}\_4\$](#)

[Kazuki Sato, Hisayoshi Matsushima, Mikito Ueda](#)

3486 [Precipitation of Rare Earth Phosphates from Molten Salts: Particle Size Distribution Analysis](#)

[Alexander B. Ivanov, Vladimir A. Volkovich, Dmitry S. Maltsev, Vladislav V. Sukhikh, Trevor R. Griffiths](#)

3487 [Electrodeposition of Pt - Rare Earth Alloys as ORR Catalysts for Fuel Cells](#)

[Ludwig Asen, Wenbo Ju, Ehab Mostafa, Sladjana Martens, Ueli Heiz, Ulrich Stimming, Oliver Schneider](#)

3488 [Electrochemical Synthesis of Nanomaterials in Molten Salts](#)

[Sergey A. Kuznetsov](#)

[3489 Electrochemical Formation of RE-Sn \(RE=Dy, Nd\) Alloys Using Liquid Sn Electrodes in a Molten LiCl-KCl System](#)

[Atsushi Kuriyama, Kohei Hosokawa, Hirokazu Konishi, Hideki Ono, Eiichi Takeuchi, Toshiyuki Nohira, Tetsuo Oishi](#)

[3490 Phase Control of Lyotropic Liquid Crystals Using Amino Acid Ionic Liquids As Solvents](#)

[Saki Fujiwara, Takahiro Ichikawa, Masafumi Yoshio, Takashi Kato, Hiroyuki Ohno](#)

[3491 Electrochemical Study of Zn/Zn<sup>2+</sup> Redox Behavior in Functionalized Ionic Liquids: Water Effect](#)

[Wei Zhou, Chengzi Qi, Aoqiu Yu, Xinhua Wu](#)

[3492 Electrochemical Synthesis of Tantalum Carbide in the NaCl-KCl-K<sub>2</sub>TaF<sub>7</sub>-K<sub>2</sub>CO<sub>3</sub> Melt](#)

[Vladimir S. Dolmatov, Sergey A. Kuznetsov](#)

[3493 Influence of the Alkaline Earth Metal Cations on the Standard Rate Constants of Charge Transfer for the Redox Couple Ti\(IV\)/Ti\(III\) in Chloride-Fluoride Melts](#)

[Daria A. Vetrova, Sergey A. Kuznetsov](#)

[3494 Solubility of Calcium and Zirconium Oxides in Melts CaO-\(CaCl<sub>2</sub>-MCl\)<sub>eut</sub> and CaO-CaCl<sub>2</sub>-MCl \(M - Li, Na, K\)](#)

[Ruslan N Savchuk, Larisa V. Gritsai, Anatolii A Omel'chuk](#)

[3495 Intervalence Charge Transfer of the Nb\(V\)/Nb\(IV\) Redox Couple in Alkali Chloride Melts: Experiment and Quantum-Chemical Calculations](#)

[Anna V. Popova, Vyacheslav G. Kremenetsky, Sergey A. Kuznetsov](#)

[3496 Electrochemical Reduction of Zirconia in Melts Based on Mixture of Calcium Chloride and Calcium Oxide](#)



[Larisa V. Gritsai, Anatolii A Omel'chuk](#)

3497 [Separation of Lanthanides and Actinides in a Chloride Melt - Liquid Metal System: The Effect of Phase Composition](#)

[Vladimir A. Volkovich, Dmitry S. Maltsev, Stanislav Yu. Melchakov, Leonid F. Yamshchikov, Alena V. Novoselova, Valery V. Smolensky](#)

3498 [Protective Ceramic Coatings on the Base of the Refractory Metals Carbides](#)

[Yuriy V. Stulov, Vladimir S. Dolmatov, Sergey A. Kuznetsov](#)

3499 [A Spectroscopic and Electrochemical Study of Molybdenum\(IV\) and Tungsten\(IV\) Species in Alkali Chloride Melts](#)

[Alexander B. Ivanov, Vladimir A. Volkovich, Mikhail A. Pukhov, Kristina O. Podlasova, Dmitry A. Poskryakov, Boris D. Vasin, Trevor R. Griffiths](#)

3500 [Ionic Liquid Polymer Electrolyte Based on Bis\(fluorosulfonyl\)Amide for Sodium Secondary Batteries](#)

[Mohd Azri Ab Rani, Kazuhiko Matsumoto, Rika Hagiwara](#)

3501 [Electrochemical Synthesis of  \$\text{LaSi}\_2\$  from a  \$\text{NaCl-NaF-LaF}\_3\text{-K}\_2\text{SiF}\_6\$  Melt at 1023 K](#)

[Svetlana Kochetova, Ruslan N Savchuk, Alexandr Dmitrievich Pisanenko, Sergei Vladimirovich Devyatkin](#)

3502 [Electrolytic Refining of Rare Earth Element from Neodymium Magnet Using Molten Salt](#)

[Yuki Kamimoto, Masaki Wakita, Ryoichi Ichino](#)

3503 [Electrolytic Production of Aluminium Using Gas Anode Supplied with Methane](#)

[Babak Khalaghi, Geir Martin Haarberg, Ole Sigmund Kjos, Henrik Gudbrandsen, Karen Sende Osen, Tommy Mokkelbost](#)

[3504 Rest Potentials of Binary Mixtures of Ionic Liquids and Threshold Voltages of Electric-Double-Layer Transistors](#)

[Chihiro Nanjo, Michio M. Matsushita, Kunio Awaga](#)

[3505 Double Salt Ionic Liquids Containing the Trihexyl\(tetradecyl\)phosphonium Cation: The Ability to Tune the Solubility of Aromatics, Ethers, and Lipophilic Compounds](#)

[Hui Wang, Paula Berton, Allan S. Myerson, Robin Don Rogers](#)

[3506 Porous Ionic Liquids: Challenges and Opportunities](#)

[Sheng Dai](#)

[3507 \(Invited\) Electrochemical Properties of Ionic Liquids Containing Aprotic Heterocyclic Anions \(AHA ILs\) and Their Mixtures with Lithium Salts](#)

[Liyuan Sun, Han Xia, Oscar Morales-Collazo, Joan F Brennecke](#)

[3508 Physicochemical and Electrochemical Properties of Glyme-Na Salt Molten Complex/Hydrofluoroether Mixtures](#)

[Shoshi Terada, Hiroko Susa, Kaoru Dokko, Masayoshi Watanabe](#)

[3509 Effect of Electrolyte Composition on the Current Efficiency for Aluminium Deposition from Molten Fluoride Electrolytes with Dissolved Alumina](#)

[Taiki Morishige, Geir Martin Haarberg, Henrik Gudbrandsen, Egil Skybakmoen, Asbjørn Solheim](#)

[3510 Electrochemical Methods for Determination of Activity Coefficients of Lanthanides in Molten Salts](#)

[Prashant Bagri, Tarcisio Bastos, Michael Forrest Simpson](#)

[3511 Electrochemical Behavior of Tris\(2,2'-bipyridine\)Cobalt Complex in Some Ionic Liquids](#)

[Yasushi Katayama, Shota Nakayama, Naoki Tachikawa, Kazuki Yoshii](#)

3512 [Electrochemical Reduction of Borosilicate Glass in Molten CaCl<sub>2</sub>](#)

[Yumi Katasho, Xiao Yang, Kouji Yasuda, Toshiyuki Nohira](#)

3513 [Reduction of TiS<sub>2</sub> by OS Process in CaCl<sub>2</sub> Melt](#)

[Nobuyoshi Suzuki, M Tanaka, H Noguchi, S Natsui, T Kikuchi, Ryosuke O. Suzuki](#)

3514 [Electrochemical Reaction of Bis\(acetylacetonato\)Palladium in an Amide-Type Ionic Liquid](#)

[Kazuki Yoshii, Yosuke Oshino, Naoki Tachikawa, Kazunobu Toshima, Yasushi Katayama](#)

3515 [Mesoporous Iron Doped Carbons Based on Protic Ionic Salt with Tunable Oxygen Reduction Activity](#)

[Mahfuzul Hoque, Shiguo Zhang, Morgan L. Thomas, Kaoru Dokko, Masayoshi Watanabe](#)

3516 [Anodic Reaction Mechanisms in Direct Carbon Fuel Cells Using Carbon Particles Dispersed in Molten Carbonate](#)

[Hirotsu Watanabe, Daisuke Umehara](#)

3517 [Spontaneous Reduction of Eu\(III\) in LiCl-KCl Melt: Spectroscopic and Rde Studies](#)

[Sang-Eun Bae, Nari Lee, Jong-Yun Kim, Tae-Hong Park, Jongwon Kim](#)

3518 [CO Gas Production by CO<sub>2</sub> Gas Decomposition in Molten Salt Electrolysis](#)

[Ryosuke O. Suzuki, Fumiya Matsuura, Shungo Natsui, Tatsuya Kikuchi](#)

3519 [Electrochemical Behavior of Samarium in Molten LiCl-KCl](#)

Vickram Singh, Dev Chidambaram

3520Probing Ionic Liquid/Electrode Interfaces by Hyperspectral Imaging

Muhammad Kasim Malik, Jacob R Chrestenson, Daniel Parr, David Gray, H Mitiku, Thomas Kahila, Aleksander Malinowski, José Sánchez, Luke M. Haverhals

3521Redox Behavior of the Hexacyanoferrate Complex Immobilized into an Ionic Liquid-Modified Electrode By Using Seiras Measurement

Tatsuya Kitagawa, Tomohiko Inomata, Tomohiro Ozawa, Hideki Masuda, Kenta Motobayashi, Masatoshi Osawa

3522(Invited) Ion Diffusion in Ionic Liquids: Effects of Electric Fields

Tom Welton, Joshua B Edel, Aleksandar Ivanov, Marina K Kuimova, Alastair J.S. McIntosh, Mohd A. B. Nawawi

3523Transport Properties of Ionic Liquid Mixtures Containing Heterodications

Sharon Lall-Ramnarine, Eddie Fernandez, Chanele Rodriguez, Sujun Wei, Surajdevparkash Dhiman, James F. Wishart

3524Effect of Paramagnetic Metal Ions on <sup>1</sup>H Diffusion in Trihexyltetradecylphosphonium Benzoate Ionic Liquid

Arunkumar Dorai, Mrutyunjay Panigrahi, Dmytro Kozak, Mariusz Grabda, Etsuro Shibata, Takashi Nakamura, Junichi Kawamura

3525Conductivity Maxima Vs. Temperature: Grotthuss Conductivity in Aprotic Molten Salts

Nikhil P. Aravindakshan, Colin Kuntz, Kyle Gemmell, Keith Johnson, Allan East

3526"Solvate" Ionic Liquids, "Solvent-in-salt" Ionic Liquids, and "Deep Eutectic" Ionic Liquids. What are the Relationships - and the Ionicities?

C Austen Angell, Mohammad Hasani

[3527\(The Max Bredig Award In Molten Salts and Ionic Liquid Chemistry\) Design and Electrochemical Application of Ionic Liquids Based on an Understanding of Their Nature](#)

[Masayoshi Watanabe](#)

[3528Lithium Ion Conduction in Single Lithium Perfluorosulfonylamides](#)

[Keigo Kubota, Hajime Matsumoto](#)

[3529On the Formation of Clusters of Li<sub>8</sub> in Molten Solutions of LiCl-Li](#)

[Augustus Merwin, William Phillips, Dev Chidambaram](#)

[3530Self-Assembled Multilayer Structures of Imidazolium Based Ionic Liquids at Mica Interfaces Are Induced By Confinement and the Presence of Water](#)

[Hsiu-Wei Cheng, Jan-Niklas Dienemann, Philipp Stock, Claudia Merola, Ying-Ju Chen, Markus Valtiner](#)

[3531Electrodeposition of Si Film from Water-Soluble KF-KCl Molten Salt and Feasibility of SiCl<sub>4</sub> as a Si Source](#)

[Kouji Yasuda, Kazumi Saeki, Kazuma Maeda, Toshiyuki Nohira, Rika Hagiwara, Takayuki Homma](#)

[3532Thin-Layer Electrodeposition of Thorium and Uranium from Molten LiCl-KCl](#)

[Milan Stika, Max Chaiken, Joshua Jarrell, Thomas Blue, Lei Raymond Cao, Michael Forrest Simpson](#)

[3533Electrodeposition of Titanium in Water-Soluble KF-KCl Molten Salt](#)

[Yutaro Norikawa, Kouji Yasuda, Toshiyuki Nohira](#)

[3534The Choice of Substrate Material and Electrodeposition of High Purity Niobium Coatings](#)

[Anton R. Dubrovskiy, Maxim A. Okunev, Olga V. Makarova, Sergey A. Kuznetsov](#)

[3535 Electrodeposition of Platinum in Some Amide-Type Ionic Liquids Containing Bis\(acetylacetonato\)Platinum\(II\)](#)

[Sharmin Sultana, Naoki Tachikawa, Kazuki Yoshii, Luca Magagnin, Yasushi Katayama](#)

[3536 Electrodeposition of ZnNi Alloys from Ethylene Glycol/Choline Chloride Based Ionic Liquid](#)

[Gabriele Panzeri, Matteo Tresoldi, Luca Nobili, Luca Magagnin](#)

[3537 Ionic Liquid Study: My Personal History](#)

[Masayoshi Watanabe](#)

[3538 Anodic Dissolution of Tungsten from Super Hard Alloys in Molten Sodium Hydroxide](#)

[Tetsuo Oishi](#)

[3539 Kinetic Studies on Direct Electrolytic Reduction of SiO<sub>2</sub> Granules in Molten CaCl<sub>2</sub>](#)

[Ming Zhong, Xiao Yang, Kouji Yasuda, Toshiyuki Nohira, Takayuki Homma](#)

[3540 \(Invited\) Innovations in Ionic Liquids Electrodeposition of Metals](#)

[Ramana Reddy](#)

[3541 Red-Ox Reactions in Ionic Liquids and Their Impact on Electrodeposition of Metals and Alloys](#)

[Evgeniya Freydina, Joshua G. Abbott](#)

[3542 Pd Nanoparticle Formation during Constant Potential Electrodepositions in Ionic Liquids](#)

[Sujan Shrestha, Miyan Nagib, Elizabeth J Biddinger](#)

[3543 In Situ TEM Observation of Lithium Electrodeposition/Stripping Process in Ionic Liquid](#)

[Chih-Yao Chen, Tetsuya Tsuda, Yoshifumi Oshima, Susumu Kuwabata](#)

[3544 Electrochemical Deposition of Aluminum and Aluminum-Manganese Alloys in Ionic Liquids](#)

[Adriana Ispas, Codruta Aurelia Vlaic, Magali Karina Camargo, Andreas Bund](#)

[3545 \(Invited\) Towards Advanced Functional Natural Polymer Materials through Ionic Liquid Based Methods](#)

[Paul C Trulove, David P. Durkin, Eric T Fox, Luke M. Haverhals, Patrick J Fahey, Katherine E. Ryall, Audrey C. Head, Tao Ye, Danmeng Shuai, D. Howard Fairbrother, Hugh C. De Long](#)

[3546 Combining Mechanical Tension with Natural-Fiber-Welding Treatments of Cellulose Yarns](#)

[Patrick J Fahey, Eric T Fox, David P. Durkin, Hugh C De Long, Paul C Trulove](#)

[3547 Towards Better Understanding of Molecular Solvent Behavior in Ionic Liquid-Biopolymer Mixtures](#)

[Eric T Fox, Patrick J Fahey, Mallory Gobet, Stephen Munoz, Audrey C. Head, Steven Greenbaum, Hugh C De Long, Paul C Trulove](#)

[3548 Homogeneous Functionalization of Biopolymers Utilizing Ionic Liquids](#)

[William Matthew Reichert, Edward Anderson](#)

[3549 \(Invited\) Green Composites from Cellulose, Wool, Hair and Chicken Feather. Synthesis, Structure and Antimicrobial Property](#)

[Chieu d Tran](#)

[3550 Natural Fiber Welding of Chitin and Chitosan on a Cotton Cloth Substrate: Novel Materials Displaying Antimicrobial Properties](#)

Robert Allen Russell, Eric T Fox, Robert Nolan, Molly Chandler, Audrey C. Head, Michael Brusoski, Hugh C De Long, Paul C Trulove

### **L03-Electrode Processes 11**

3551 (Invited) Electrochemical Soft Devices

Kazutake Takada

3552 Aqueous Solid-Liquid Interfaces at Atomic Scale

Pietro Papa Lopes, Dusan Strmcnik, Nenad M Markovic, Vojislav Stamenkovic

3553 Potential Dependent IR/Visible Double Resonance Sum Frequency Generation Spectroscopy to Probe Electronic Structure at Electrochemical Interfaces

Hidenori Noguchi, Shuo Yang, Kohei Uosaki

3554 the Enhanced Electrocatalytic Activity over Carbon-Supported Pd-Based Ordered Intermetallic Compounds

Takao Gunji, Toyokazu Tanabe, Shingo Kaneko, Takeo Ohsaka, Futoshi Matsumoto

3555 Vibrational Observation of Molecular Adsorbates on Various Well-Defined Metal Surfaces Using Gap-Mode Plasmon Enhanced Raman Scattering

Katsuyoshi Ikeda

3556 Facile Route for the Preparation of Ordered Intermetallic Pt<sub>3</sub>Pb-PtPb Core-Shell Nanoparticles and Its Enhanced Activity for Alkaline Methanol and Ethanol Oxidation

Futoshi Matsumoto, Takao Gunji, Toyokazu Tanabe, Shingo Kaneko, Takeo Ohsaka

3557 Mechanism of the Electrochemical Oxidation of Ammonia over Platinum: An in Situ attenuated Total Reflection Infrared Study

Yu Katayama, Takeou Okanishi, Hiroki Muroyama, Toshiaki Matsui, Koichi Eguchi



[3558 Insulating Boron Nitride Nanosheet on Inert Gold Electrode As a Novel Efficient Electrocatalyst for Oxygen Reduction Reaction](#)

[Kohei Uosaki, Ganesan Elumalai, Hidenori Noguchi, Hung Cuong Dinh, Andrey Lyalin, Tetsuya Taketsugu](#)

[3559 Copper-Based Electrocatalysts with Multinuclear Catalytic Sites for Oxygen Reduction Reaction](#)

[Masaru Kato, Marika Muto, Nobuhisa Oyaizu, Ichizo Yagi](#)

[3560 On the Electronic Effect of the Sn Atoms Towards Noble Metal Adsorption Sites: The Influence of the Structure on the Glycerol Electrooxidation Reaction](#)

[Antonio C.D. Angelo, Francielle Bortoloti, Amanda C Garcia, Maria L.F. DellaCosta](#)

[3561 Design of Metal Structure Encapsulated in N-Doped Carbon Layers As Tunable Catalyst for Electrochemical Applications](#)

[Takeo Ohsaka, Seung Hyo Noh, Min Ho Seo, Joonhee Kang, Takeyoshi Okajima, Byungchan Han, Futoshi Matsumoto](#)

[3562 Size Effect of Single Nanoparticle Electrodes on the Electrochemical Interface and Charge Transfer Kinetics and New Insights into Their Size-Activity Relations](#)

[Lixin Fan, Lin Gan](#)

[3563 High-Speed Surface X-Ray Diffraction for Monitoring Structural Changes of Electrode Surfaces: An Application to Methanol Oxidation on Pt\(111\)](#)

[Tetsuroh Shirasawa, Wolfgang Voelgeli, Etsuo Arakawa, Takuya Masuda, Toshio Takahashi, Kohei Uosaki, Tadashi Matsushita](#)

[3564 Real Surface Structures of the High Index Planes of Pt<sub>3</sub>Co in Electrochemical Environments](#)

[Nagahiro Hoshi, Yohei Kihara, Masashi Nakamura](#)

[3565SOFC Anode Process Characterization By Means of a Novel Spot-Sampling Set-up for in-Operando Gas Analysis](#)

[Stephen J. McPhail, Davide Pumiglia, Francesca Santoni, Bruno Conti, Carlos Boigues Muñoz, Barbara Bosio, Maurizio Carlini](#)

[3566Epitaxially Grown Pt and Pt-Ir Thin Films: Effect of the Deposition Conditions on the Electro-Oxidation of Ammonia](#)

[Nicolas Sacré, Gregor Hufnagel, Sebastien Garbarino, Andreas Ruediger, Lionel Roué, Daniel Guay](#)

[3567Electrochemical Properties of Polycrystalline Phosphorus-Doped Diamond](#)

[Kosuke Nakano, Keisuke Natsui, Yu Mukuda, Takeshi Watanabe, Yasuaki Einaga](#)

[3568\(Invited\) Behavior of Ionic Liquid and Solute Molecules at Electrode/Ionic Liquid Interface](#)

[Akihito Imanishi](#)

[3569Electrochemical Characterization of Pyrolytic Graphite and Bi\(111\) Electrodes in Bmimi and Pmimi Ionic Liquids](#)

[Carolin Siimenson, Liis Siinor, Ove Oll, Enn Lust](#)

[3570Potential-Dependent Structure of \[BMIM\]\[FSA\]/Au Interface Studied By Surface Enhanced Infrared Absorption Spectroscopy](#)

[Kenta Motobayashi, Ken-ichi Uchida, Masatoshi Osawa](#)

[3571Electrochemical Characterization of Au\(111\)|EMMImNTf<sub>2</sub> and Au\(111\)|2,2Bipyridine+EMMImNTf<sub>2</sub> Interfaces](#)

[Liis Siinor, Carolin Siimenson, Thomas Doneux, Claudine Buess-Herman](#)

[3572The Activity of Halide Ions and the Effect on the Electrochemical Stability of Bi\(111\) Electrode in a Mixture of Ionic Liquids](#)

[Ove Oll, Carolin Siimenson, Erik Anderson, Enn Lust](#)

[3573 Structural Behavior of Mixed Metal Oxide Nanoparticles As Electrocatalysts for the Oxygen-Evolution Reaction](#)

[Manuel Gliech, Malte Klingenhof, Arno Bergmann, Peter Strasser](#)

[3574 Redox Stability of Uranium in High Ionic Strength Media: An Electrochemical and Spectroscopic Study](#)

[Susanne Lehmann, Frank Bok, Atsushi Ikeda-Ohno, Andres Gabriel Munoz](#)

[3575 Beneficial Effect of Surface Decorations on the Surface Exchange of Lanthanum Strontium Ferrite and Dual Phase Composites](#)

[Simona Ovtar, Martin Sogaard, Jia Song, Peter Vang Hendriksen](#)

[3576 Lanthanide Voltammetry: Electrocatalysis and Electrochemistry in Acetonitrile](#)

[Nadeesha Rathuwadu, Krysti L. Knoche, Johna Leddy](#)

[3577 Selective Detection of Oxytocin on Diamond Electrodes in Preparation for Making In Vivo Measurements](#)

[Kai Asai, Tribidasari Anggraningrum Ivandini, Yasuaki Einaga](#)

[3578 Electrochemical Recovery of Copper from Model Wastewater Using Boron-Doped Diamond Electrodes](#)

[Keisuke Natsui, Chizu Yamaguchi, Yasuaki Einaga](#)

[3579 Understanding Inclusion Mechanisms and Effects in Hardened Gold Electrodeposits](#)

[Carlos R. Perez, Jamin Ryan Pillars, Andrew E Hollowell, Christian L. Arrington, W. Graham Yelton](#)

[3580 Seamless Three-Dimensional Carbon Nanotubes-Grown Graphene Hybrid Films Modified with Heme for Electrochemical Biosensing with High Stability and Sensitivity](#)

Kikuo Komori, Trupti Terse-Thakoor, Ashok Mulchandani

3581A Systematic Study of M(bpy) $\square^{z+}$  Complexes in Nafion: Concentration, Activity, and Electron Hopping

Wayne L. Gellett, Krysti L. Knoche, Nadeesha Rathuwadu, Johna Leddy

3582Electrochemical Nitrate Reduction at Sn-Modified Single Crystalline Metal Electrodes

Ichizo Yagi, Manabu Okui, Masaru Kato

3583Nano-Surface Finishing for Electrothermal Instability Evolution Studies

W. Graham Yelton, T.J. Awe, Jamin Ryan Pillars, E.P. Yu, K.J. Peterson, S.E. Rosenthal, D.B. Sinars, M.R. Gomez, R.a. Vesey, K.C. Yates, B.S. Bauer, T.M. Hutchinson, S. Fuelling

3584Introduction of Three-Dimensionally Distributed Catalytic Sites to Form Semi-Solid Redox Conducting Electrolytes: Enhancement of Electron Transfers within Iodine/Iodide Mediating System

Pawel J Kulesza, Justyna M. Orłowska, Iwona Agnieszka Rutkowska

3585Boron Concentration-Dependent Electrochemical Properties of Boron-Doped Diamond Electrodes

Shuhei Naoi, Keisuke Natsui, Yasuaki Einaga

3586CO<sub>2</sub> Reduction on Boron-Doped Diamond Electrode in Aqueous Ammonia Solution

Prastika Krisma Jiwanti, Keisuke Natsui, Kazuya Nakata, Yasuaki Einaga

3587Composition Dependence of Relative Permittivities of Binary Solvent Mixtures

Masaru Ogasawara, Shohei Suzuki, Noritoshi Nambu

3588Specific Response of Quinone Redox at 2-Aminoethanethiol Modified Electrode

[Kumi Naito, Yuri Maeda, Takashi Yasui, Kazutake Takada, Akio Yuchi](#)

3589 [Physical and Electrochemical Properties of Dialkyl Ethers](#)

[Shohei Suzuki, Masaru Ogasawara, Noritoshi Nambu](#)

3590 [Structural Effects on Reaction Rate and Selectivity for Direct Electrochemical Hydrogenation of Aromatic Hydrocarbons at Pt Electrocatalysts](#)

[Mitsuru Wakisaka, Masashi Kunitake](#)

3591 [Study about Overall Adhesion-Spreading Process of Liposomes on a Gold Electrode. Influence of the Presence of CdTe Quantum Dots](#)

[Eduardo Carlo Muñoz, Javier Román, Emilio Alonso Navarrete, Ricardo Silvio Schrebler](#)

3592 [Electrosynthesis of a Hybrid Film Consisting of Stacked Graphene and the Intercalated Manganese Oxide for Oxygen Evolution Reaction](#)

[Kotaro Fujimoto, Tamie Kobayakawa, Masaharu Nakayama](#)

3593 [Nano-Particle Metals Modified Boron Doped Diamond Electrode for Determination of Heavy Metal Ions](#)

[Jang-Hee Yoon](#)

3594 [Kinetic Regularities of Lead Dioxide Electrocrystallization](#)

[Olesia Shmychkova, Tatiana Luk'yanenko, Alexander Velichenko](#)

#### **L04-Photocatalysts, Photoelectrochemical Cells, and Solar Fuels 7**

3595 [Effect of Tridimensional Macroporous Copper Electrodes on the Electrochemical Reduction of Carbon Dioxide](#)

[Jean Sanabria-Chinchilla](#)

3596 [Modelling the Electrochemical Interface: Applications to CO<sub>2</sub> Reduction](#)

[Karen Chan](#)

[3597Cu<sub>2</sub>O/Nanocarbon Architectures for Photoelectrochemical CO<sub>2</sub> Conversion: Synthetic Aspects and Structure-Property Relationships](#)

[Balazs Endrodi, Egon Kecsenvity, Krishnan Rajeshwar, Csaba Janáky](#)

[3598Role of Metal Nanoparticles in Photo/ Catalytic Activation of Carbon Dioxide](#)

[Krzysztof Bienkowski, Renata Solarska, Jan Augustynski](#)

[3599Chopped-Illumination Pulse Frequency Effect on the Product Selectivity of CO<sub>2</sub> Reduction at Si Photocathodes](#)

[Bijandra Kumar, Joseph Patrick Brian, Joshua M Spurgeon](#)

[3600Electrochemical Carbon Dioxide Reduction to Hydrocarbons with a Nickel-Gallium Thin Film Catalyst at Low Overpotentials](#)

[Sonja A Francis, Daniel A Torelli, J Chance Crompton, Alnald Javier, Jonathan R Thompson, Bruce S Brunshwig, Manuel P. Soriaga, Nathan S. Lewis](#)

[3601A Cu-Zn Intermetallic Catalyst Utilized for Electrochemical, Photoelectrochemical and Photocatalytic CO<sub>2</sub> Reduction](#)

[Ge Yin, Hideki Abe, Etsuo Sakai, Masahiro Miyauchi](#)

[3602Characterizing CO<sub>2</sub> Reduction Mechanism Using Advanced Synchrotron-Based X-Ray Spectroscopy Techniques](#)

[Maryam Farmand, Walter Drisdell, Chenghao Wu, Junko Yano, Jeremy T Feaster, Thomas F Jaramillo, Apurva Mehta, Ryan Davis, Marco Favaro, Joaquin Resasco, Alexis T. Bell, Jinghua Guo, David Prendergast, William A Goddard](#)

[3603Plasmon-Enhanced Photocatalytic CO<sub>2</sub> Reduction Using Colloidal Nanocrystals](#)

[Erin Creel, Youngsang Kim, Elizabeth Corson, Fen Qiu, Robert Kostecki, Jeffrey J Urban, Bryan D McCloskey](#)

[3604 Design of Photonic and Plasmonic Materials for Photocatalytic CO<sub>2</sub> Reduction](#)

[E. Ashley Gauling, Ian D. Sharp, Francesca M. Toma](#)

[3605 \(Invited\) Titania-Silica Mesoporous Materials for Solar Hydrogen Evolution](#)

[Ranjit T Koodali](#)

[3606 \(Invited\) Engineering Bismuth-Based Ternary Oxide Thin Films for Photoelectrochemical Water Oxidation](#)

[Yun Hau Ng, Rose Amal](#)

[3607 \(Invited\) Photocatalytic and Photoelectrochemical Water Splitting Under Visible Light Irradiation](#)

[Ryu Abe](#)

[3608 \(Invited\) Evaluation of  \$\alpha\$ -Mn<sub>2</sub>O<sub>3</sub> As Catalyst for the Oxygen Evolution Reaction in Photoelectrochemical Devices](#)

[Peter Bogdanoff, Sebastian Fiechter, Moritz Kölbach, Roel van de Krol](#)

[3609 \(Invited\) Highly Efficient Visible Light Photocatalysis for Hydrogen Production](#)

[Yun Hang Hu](#)

[3610 \(Keynote\) Artificial Photosynthesis: Progress, Science Outlook and Technology Prospects](#)

[Harry A Atwater](#)

[3611 \(Keynote\) Interfacial Layers and Catalyst Approaches for Stabilizing a p-GaInP<sub>2</sub> Photoelectrode for Hydrogen Production](#)

[John A Turner](#)

[3612\(Keynote\) One-Electron Initiated Two-Electron Oxidation of Water Catalyzed By Aluminum Porphyrins, Incorporating Earth](#)

[Fazalurahman Kuttassery, Siby Mathew, Daisuke Yamamoto, Satomi Onuki, Yu Nabetani, Hiroshi Tachibana, Haruo Inoue](#)

[3613\(Keynote\) Electrochemical and Molecular Approaches for Artificial Photosynthesis](#)

[Kyung Byung Yoon](#)

[3614\(Invited\) Electrocatalysts for Solar-to-Chemical Conversion](#)

[Byoung Koun Min, Yun Jeong Hwang](#)

[3615\(Invited\) Si Photoelectrodes with Patterned Catalysts for Efficient and Stable Photoelectrochemical Solar Chemical Production](#)

[Jihun Oh](#)

[3616\(Invited\) Photo-Electro-Chemical Water Splitting and the Making of Renewable Chemicals](#)

[Ib Chorkendorff](#)

[3617\(Invited\) Latest Development in Design Strategies for Efficient Solar Water Splitting Photoelectrodes](#)

[Lionel Vayssieres](#)

[3618\(Invited\) Understanding the Chemistry of Photocatalytic Processes](#)

[Detlef Werner Bahnemann, Amer Hakki, Jenny Schneider](#)

[3619\(Invited\) Observing Photochemical Charge Transport at Particle Based Tandem Junctions for Overall Water Splitting](#)

[Frank E. Osterloh, Mauricio Alves De Melo, Yuxin Yang, Jiarui Wang](#)



[3620\(Invited\) Materials and Systems for Stand-Alone Solar Water Splitting](#)

[Jae Sung Lee](#)

[3621\(Invited\) Innovative Approaches to Addressing the Fundamental Materials Challenges in Advanced Water Splitting Technologies for Renewable Hydrogen Production](#)

[Eric Lars Miller, Katie Randolph, David Peterson, Neha Rustagi, Benjamin Klahr, Maxim Lyubovsky, Kim Cierpik-Gold, J Carlos Gomez](#)

[3622\(Invited\) Electrocatalyst Development for Solar Fuels: H<sub>2</sub> Evolution, O<sub>2</sub> Evolution, and CO<sub>2</sub> Reduction](#)

[Thomas F Jaramillo](#)

[3623\(Invited\) Interface Architecture Between TiO<sub>2</sub>/Perovskite, Perovskite/Hole Transport Layer, and Perovskite Grain Boundary for MAPbI<sub>3</sub>, MASnPbI<sub>3</sub> and CsPbI<sub>3</sub> Solar Cells](#)

[Shuzi Hayase](#)

[3624\(Invited\) Charge Carrier Dynamics and Origin of Instability of Organo-Metal Perovskite Films and Quantum Dots](#)

[Jin Z Zhang](#)

[3625\(Invited\) Plasmonic Photocatalysts for Extending Light Harvesting Range and Enhancing Charge Separation](#)

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

[3626\(Invited\) Generation of Hot Plasmonic Electrons and Heat in Nanocrystals with Hot Spots](#)

[Alexander O. Govorov](#)

[3627\(Invited\) Photocurrent Generation of PbS Nanoparticles with Narrower Bandgap Coupled with Localized Surface Plasmon Resonance](#)

[Kei Murakoshi, Xiaowei Li, Hiro Minamimoto](#)

[3628\(Invited\) In Situ Synchrotron x-Ray Spectroscopic Studies of Energy Materials](#)

[Chung-Li Dong](#)

[3629\(Invited\) Molecular Hydrogen-Evolution Electrocatalysts for Dye-Sensitized Solar Fuels](#)

[Yiyang Wu](#)

[3630\(Invited\) Development of Wide Bandgap Copper Chalcopyrite Materials for Economical Photoelectrochemical Hydrogen Production](#)

[Nicolas Gaillard, Alexander DeAngelis, Kimberly Horsley](#)

[3631\(Invited\) Shape-Dependent Photocatalytic H<sub>2</sub> Evolution Activity of ZnS-AgInS<sub>2</sub> Solid Solution Nanoparticles](#)

[Tsukasa Torimoto, Yutaro Kamiya, Susumu Kuwabata, Tatsuya Kameyama](#)

[3632\(Invited\) Hydrogen Evolution from Water Using Modified Chalcogenide Photocathodes](#)

[Shigeru Ikeda, Feng Jiang, Qing Shen, Yoshitaro Nose, Takashi Harada](#)

[3633\(Invited\) Unassisted Photoelectrochemical Solar Water Splitting with Greater Than 7% Solar-to-Hydrogen Conversion Efficiency](#)

[Jong Hyeok Park](#)

[3634\(Invited\) Novel Band-Gap Engineered III-V Alloys for Unassisted Water Photoelectrolysis](#)

[Mahendra Kumar Sunkara, Alejandro Martinez Garcia, Harry Russell, William F Paxton, Jacek B Jasinski, Todd G Deutsch, Madhu Menon, Srikanth Ravipati](#)

[3635\(Invited\) Computational Design of Chalcopyrite Photoabsorber for Photoelectrochemical H<sub>2</sub> Production Cell](#)

[Tadashi Ogitsu, Joel Varley, Fei Zhou, Vincenzo Lordi, Nicolas Gaillard](#)

[3636\(Invited\) Insight into Polyoxometalate-Induced Catalysis at Semiconducting Oxides](#)

[Renata Solarska, Jan Augustynski](#)

[3637Effect of Adding TiO<sub>2</sub> Nanoparticles in AC-Operated Electrochemiluminescent Device Using Ruthenium\(II\) Complex](#)

[Shota Tsuneyasu, Kazuki Ichihara, Kazuki Nakamura, Norihisa Kobayashi](#)

[3638Novel Light-Emitting Electrochemical Transistor Using Ruthenium Complex](#)

[Atsushi Aoki, Tomoyuki Nakano](#)

[3639Synthesis and Characterization of g-C<sub>3</sub>N<sub>4</sub>/B<sub>12</sub>O<sub>17</sub>Cl<sub>2</sub> Composites with Visible-Light Photocatalytic Performance](#)

[Lifeng Dong, Xuegang Yu, Yan Shan](#)

[3640Photoelectrochemical Hydrogen Production Using Inverted Perovskite Solar Cell](#)

[Oh Ilhwan, Han Jihun](#)

[3641Active Sites of Plasmon-Induced Charge Separation](#)

[Hiroyasu Nishi, Koichiro Saito, Tetsu Tatsuma](#)

[3642Visible Light-Sensitive Yttrium-Doped Indium Vanadate Photocatalysts for Hydrogen Evolution](#)

[Shota Higuchi, Hiroshi Irie](#)

[3643A Gold-Inserted Zinc Rhodium Oxide and Bismuth Vanadium Oxide Heterojunction Photocatalyst for Overall Water Splitting Under Visible Light](#)

[Kento Kamijo, Ryoya Kobayashi, Hiroshi Irie](#)

3644 [Multilayer Active Nanostructures of Metal Oxide Semiconductors-Assisted Photooxidation of Wastewater for Voltammetric Determination of Heavy Metals](#)

[Krzysztof Miecznikowski, Ewa Biadun, Sylwia Gajewska, Beata Krasnodebska-Ostrega](#)

3645 [Shortening Response Time of Light-Emitting Electrochemical Cell By Addition of Ionic Liquid into Iridium Complex Film](#)

[Takayuki Kubo, Atsushi Aoki](#)

3646 [Simultaneous Decomposition and Energy Production from Industrial and Bio-Waste Using Flexible Photocatalytic Fuel Cell](#)

[Gregory Lui, Gaopeng Jiang, Jared Lenos, Edric Lin, Michael Fowler, Aiping Yu, Zhongwei Chen](#)

3647 [Structural Design of Graphitic Carbon-Nitride Photocatalysts for Boosting Hydrogen Production from Water Decomposition](#)

[Yu-Jie Huang, Kwun-Han Wu, Hsisheng Teng](#)

3648 [High Efficiency Photoelectrochemical Water Splitting Using Graphene/GaN Nanowire Photoelectrode](#)

[Jun-Seok Ha, Hyojung Bae, Jung-Wook Min, Dong-Ju Seo, Hokyun Ryo, Hyo-Jong Lee, Dong-Seon Lee, Yong-Tak Lee, Sang Hyun Lee](#)

3649 [Photocatalytic Activities of Copper Oxides/Carbon Nanotube Composites](#)

[Mariko Matsunaga, Kensei Takahashi, Yuki Saito](#)

3650 [Effects of TiO<sub>2</sub> nanoparticle Size on Solar-to-Hydrogen Efficiency in Photoelectrochemical Cells](#)

[Bo Bonning, Farshid Salimijazi, Pezhman Shirvanian](#)

[3651 Photoelectrochemical Properties of Si-Doped InGaN Photoelectrode Grown By Plasma Assisted Molecular Beam Epitaxy](#)

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

[3652 Photoelectrochemical Properties of Colloidally Synthesized \(Cu<sub>2</sub>Ag\)<sub>2</sub>ZnSnS<sub>4</sub> solid Solution nanocrystals](#)

[Ryosuke Kakudo, Tatsuya Kameyama, Susumu Kuwabata, Tsukasa Torimoto](#)

[3653 Photocatalytic Degradation of Phenolic Compounds in Presence Electrogenearated O<sub>3</sub> and or H<sub>2</sub>O<sub>2</sub>](#)

[Halema Ali Al-Kandari, Aboubakr Moustafa Abdullah, Shekhah Ali Al-Kandari, Ahmed meslam Mohamed](#)

[3654 Photoreduction of Carbon Dioxide By the Zinc Phthalocyanine Immobilized Titanium Dioxide](#)

[Makoto Endo, Tsuyoshi Ochiai, Morio Nagata](#)

[3655 Photoelectrochemical Water Splitting By Using a Porous ZnRh<sub>2</sub>O<sub>4</sub> Photocathode Under Visible Light Irradiation and Significant Effect of Necking Treatment](#)

[Sunao Kamimura, Teruhisa Ohno](#)

[3656 Three-Dimensional ZnO-BiVO<sub>4</sub> Core-Shell Nanosturctured Array for Photoelectrochemical Water Oxidation](#)

[Jih-Sheng Yang, Jih-Jen Wu](#)

[3657 Photoelectrochemical CO<sub>2</sub> reduction By Using Different Buffer Layers \(In<sub>2</sub>S<sub>3</sub>, CdS\) -Decorated Cu<sub>2</sub>ZnSnS<sub>4</sub>](#)

[Yosuke Sasaki, Sunao Kamimura, Teruhisa Ohno](#)

[3658 Modification of the Electronic Structure and Surface State of LaFeO<sub>3</sub> for Improved Visible Light Photoelectrochemical Water Oxidation](#)

[Qi Peng, Yanwei Wen, Bin Shan, Rong Chen](#)

[3659 Photoanode-Driven Photoelectrochemical CO<sub>2</sub> Reduction By Using the TiO<sub>2</sub> Photoanodes and Different Metal Counter Electrodes\(Pt, Ti, Cu, Sn, Zn\)](#)

[Tatsuya Ishiku, Sunao Kamimura, Teruhisa Ohno](#)

[3660 Conjugated Organic Polymers As Photocathodes for Hydrogen Evolution](#)

[Patrick Fortin, Steven Holdcroft](#)

[3661 Increased Light Absorption in Dye-Sensitized Solar Cells with Light Harvesting Dye](#)

[Yuya Takekuma, Tsuyoshi Ochiai, Rei Furukawa, Morio Nagata](#)

[3662 Fabrication of WO<sub>3</sub>/BiVO<sub>4</sub> p-n Junction Photoanode for Efficient Solar Water Splitting](#)

[Hyungtak Seo, Shankara S. Kalanur](#)

[3663 Photoelectrochemical Hydrogen Production By Water Splitting over Dual-Functionally Modified Oxide: P-Type N-Doped Ta<sub>2</sub>O<sub>5</sub> Photocathode Active Under Visible Light Irradiation](#)

[Tomiko M. Suzuki, Shu Saeki, Keita Sekizawa, Kousuke Kitazumi, Naoko Takahashi, Takeshi Morikawa](#)

[3664 Photoelectrochemical Characterization of Tin Sulfide Nanoplatelet Films](#)

[Wei Cheng, Alan Rassoolkhani, Syed Mubeen](#)

[3665 Conversion of CO<sub>2</sub> in Methanol into HCOOCH<sub>3</sub> and CO By Photoelectrochemical Reduction with TiO<sub>2</sub> Photoanode](#)

[Tatsuhiko Yamamoto, Hideyuki Katsumata, Tohru Suzuki, Satoshi Kaneco](#)

[3666 H<sub>2</sub> Production Using Thermal Decomposition of Hcooh with Pd/ZnO Catalyst](#)

[Yuki Egawa, Hideyuki Katsumata, Tohru Suzuki, Satoshi Kaneco](#)

[3667 Quasi-Solid Electrolytes Comprising Cobalt Complexes for Efficient and Durable Dye-Sensitized Solar Cells](#)

[So-Eun Kim, Do-Hyeong Kim, Moon-Sung Kang](#)

[3668 Photoconversion of Carbon Dioxide and Water to Formate on Copper and Iron Mixed Oxide Catalysts](#)

[Unseock Kang, Dong Suk Han, Sun Hee Yoon, Ahmed Abdel-Wahab, Hyunwoong Park](#)

[3669 Enhanced Photocatalytic Activity of Phosphorus-Doped Graphitic Carbon Nitride Under Visible Light Irradiation](#)

[Tomoki Mitsuyama, Hideyuki Katsumata, Tohru Suzuki, Satoshi Kaneco](#)

[3670 Fabrication of Optical Gap Selective Amorphous Carbon Photocatalyst for Hydrogen Production Under Irradiation with Visible Light](#)

[Keigo Okafuji, Ryutaro Kobayashi, Shinpei Ohtomo, Hiroshi Naragino, Kensuke Honda](#)

[3671 Solar Visible Light Storage on WO<sub>3</sub>-CdS Heterojunction](#)

[Seonghun Kim, Dong Suk Han, Sun Hee Yoon, Ahmed Abdel-Wahab, Hyunwoong Park](#)

[3672 Synthesis of Gallium Nitride Photocatalysts By Reaction of Solution Synthesized Gallium Oxide and Solid Nitrogen Sources](#)

[Takashi Sugiura, Tatsuya Sano, Kazuhiro Manseki](#)

[3673 Mixed Valence Tin Oxide Sn<sub>3</sub>O<sub>4</sub>: A Visible-Light Driven Semiconductor for Photocatalytic Water Splitting Under Visible Light Irradiation](#)

[Toyokazu Tanabe, Masanari Hashimoto, Tatsuhiro Tanikawa, Takao Gunji, Shingo Kaneko, Takeo Ohsaka, Futoshi Matsumoto](#)

[3674 Photoelectrochemical Reduction of CO<sub>2</sub> to Ethylene Glycol on IL-SAM-Modified Au Electrodes](#)

[Yoshitsune Sugano, Jun Tamura, Akihiko Ono, Ryota Kitagawa, Masakazu Yamagiwa, Satoshi Mikoshiba](#)

[3675 Plasmonic Catalytic Layer for Visible-Light Enhanced Methanol Oxidation Reaction](#)

[Chun-Ting Lin, Hung Ji Huang, Mao-Nan Chang, Po-Li Chen, Chien-Nan Hsiao, Ming-Hua Shiao, Fan-Gang Tseng](#)

[3676 Highly Efficient Visible-Light Driven Carbon Particles/g-C<sub>3</sub>N<sub>4</sub> Photocatalysts with Enhanced Photocatalytic H<sub>2</sub> Production](#)

[Yuto Nakai, Hideyuki Katsumata, Tohru Suzuki, Satoshi Kaneco](#)

[3677 An Effective Way to Improve the Structural Stability and Photoelectrochemical Performance of BiVO<sub>4</sub> Photoanodes in Basic Media: Surface Passivation with Zinc Ferrite](#)

[Tae Woo Kim, Kyoung-Shin Choi](#)

[3678 Photoelectrochemical Behaviour of Pulse Electrodeposited CuIn<sub>0.9</sub>Al<sub>0.1</sub>Se<sub>2</sub> Thin Films](#)

[Kollegal Ramakrishna Murali](#)

[3679 Photo-Electrochemical Investigation of Single Crystalline and Polycrystalline TiO<sub>2</sub> Nanostructures for Solar Hydrogen Production](#)

[Bee Lyong Yang](#)

[3680 A Novel Photoelectrochemical Dens Thin Layer Flow Cell for the Online Product Analysis in C-1 Molecule Oxidation and Water Splitting](#)

[Zenonas Jusys, Robert Reichert, Rolf Jürgen Behm](#)

[3681 Hierarchical Cu<sub>2</sub>SnS<sub>3</sub> \(CTS\) Nanostructure As a Highly Efficient Visible Light Photocatalyst for CO<sub>2</sub> Reduction to Solar Fuels](#)



[Indrajit Shown, H. S. Chang, Yian Tai, Li-Chyong Chen, Kuei-Hsien Chen](#)

[3682\(Keynote\) Visible Light Photocatalysts Based on Interfacial Charge Transfer](#)

[Kazuhito Hashimoto](#)

[3683\(Invited\) CO<sub>2</sub> Photoreduction Using H<sub>2</sub>O: 4.6% Solar-to-Chemical Conversion Efficiency By Metal-Complex Catalysts Coupled with Semiconductors](#)

[Takeshi Morikawa, Shunsuke Sato, Takeo Arai, Keiko Uemura, Keita Sekizawa, Tomiko M. Suzuki](#)

[3684\(Invited\) Hybrid Photocatalysts Consisting of Metal Complexes and Semiconductors for CO<sub>2</sub> Reduction](#)

[Osamu Ishitani](#)

[3685\(Invited\) Bioinspired Water Oxidation and CO<sub>2</sub> Reduction Electrocatalysts](#)

[Ki Tae Nam](#)

[3686\(Invited\) Development of Photocatalytic and Photoelectrochemical CO<sub>2</sub> Reduction System](#)

[Teruhisa Ohno, Sunao Kamimura](#)

[3687\(Invited\) Regulating the CO-Reduction Product Distribution by the Atomic-Level Structural Modification of the Cu Electrode Surface](#)

[Youn-Geun Kim, Jack Hess Baricuatro, Alnald Javier, Manuel P. Soriaga](#)

[3688\(Invited\) Enhanced Photocatalysis on TiO<sub>2</sub>-Passivated III-V Compounds for Water Splitting and CO<sub>2</sub> Reduction](#)

[Stephen B. Cronin](#)

[3689\(Invited\) Development of Hybrid Structured Materials for Electrocatalytic, Bioelectrocatalytic and Photoelectrochemical Reduction of Carbon Dioxide](#)

[Pawel J Kulesza, Anna Wadas, Ewelina Seta, Ewelina Szaniawska, Krzysztof Bienkowski, Renata Solarska, Iwona Agnieszka Rutkowska](#)

3690(Invited) [Solar Synthesis of C1-C4 Chemicals from Carbon Dioxide and Water](#)

[Hyunwoong Park](#)

3691(Invited) [Stand-Alone Photoreduction of Carbon Dioxide on Copper Oxide Nanowires Powered By WO<sub>3</sub>/Dye Dual Absorber](#)

[Narayan Chandra Deb Nath, Seung Yo Choi, Hyunwoong Park, Jae-Joon Lee](#)

3692(Invited) [Photocatalytic CO<sub>2</sub> Conversion to Selective Hydrocarbons Using Graphene Oxides and Related 2D Hybrids](#)

[Li-Chyong Chen, Hsiang-Ting Lien, Indrajit Shown, Kuei-Hsien Chen](#)

3693(Invited) [SnS<sub>2</sub> Nanostructure As a Highly Efficient Photocatalyst for CO<sub>2</sub> Reduction to Solar Fuels](#)

[Kuei-Hsien Chen, Li-Chyong Chen, Indrajit Shown](#)

3694(Invited) [Photocatalytic CO<sub>2</sub> reduction with Water By Cu/TiO<sub>2</sub>: Mechanistic Studies Using in Situ XAS and FTIR](#)

[Lianjun Liu, Jeffrey Miller, Ying Li](#)

3695(Invited) [CO<sub>2</sub> Photoreduction By Cu<sub>x</sub> Nanocluster Loaded SrTiO<sub>3</sub> Nanorod Thin Film](#)

[Shusaku Shoji, Ge Yin, Daiki Atarashi, Etsuo Sakai, Masahiro Miyauchi](#)

3696 [Can Platinum Scale for PEC Hydrogen Evolution at the Terawatt Level?](#)

[Peter C. K. Vesborg, Anders Bodin, Thomas Pedersen, Bela Sebok, Bastian Timo Mei, Brian Seger, Ole Hansen, Ib Chorkendorff, Erno Kemppainen, Janne Halme, Peter Lund](#)

3697 [Copper Indium Sulfide Photoelectrode Design for Solar Water Splitting](#)

[Nurdan Demirci Sankir, Emre Yarali, Ahmet Selim Han, Erkan Aydin, Mehmet Sankir](#)

[3698CoP As an Acid-Stable Electrocatalysts for the Hydrogen-Evolution Reaction: Synchrotron-Based Operando Oxidation-State Determinations](#)

[Fadl Hussein Saadi, Azhar I Carim, Walter Drisdell, Junko Yano, Nathan S. Lewis, Manuel P. Soriaga](#)

[3699Fabrication of a Monolithic Heterostructured c-Si/BiVO<sub>4</sub> Core-Shell Photoanode for Unassisted Solar Water Splitting](#)

[Pongkarn Chakthranont, Thomas R Hellstern, Joshua M McEnaney, Thomas F Jaramillo](#)

[3700Experimental Demonstration of Integrated Photoelectrochemical Hydrogen Generation Utilizing Concentrated Irradiation](#)

[Saurabh Tembhurne, Fredy Nandjou, Sophia Haussener](#)

[3701Interface Engineering in Inorganic Hybrid Structures Towards Improved Photocatalysis](#)

[Yujie Xiong](#)

[3702New Reactor Designs for Z-Scheme Solar Water Splitting Photocatalysis](#)

[William Gaieck, Kevin Tkacz, Christopher D. Sanborn, Yuanxun Shao, Sasuke Breen, Rohini Bala Chandran, Houman Yaghoubi, Chengxiang Xiang, Adam Z Weber, Shane Ardo](#)

[3703Modification of Electronic States at Surface of Photocatalysts for Enhanced Photoelectrochemical Water Oxidation](#)

[Jong Hyeok Park, Myung Jin Jeong](#)

[3704Development of Efficient, Stable and Intrinsically Safe Photoelectrochemical Solar-Hydrogen Prototypes](#)

[Chengxiang\("CX"\) Xiang](#)

[3705](#)[Developing Cost Competitive Nanostructured Systems for Solar Fuel and Chemical Production](#)

[Syed Mubeen, Wei Cheng, Alan Rassoolkhani, Joun Lee, John Lewellen Stickney](#)

[3706](#)[Surface Processes at the Photoanode/Co-Catalyst/Electrolyte Interface Studied By Intensity Modulated Photocurrent Spectroscopy Using BiVO<sub>4</sub> Photoanodes As a Model System](#)

[Carolin Zachaeus, Fatwa Firdaus Abdi, Peter Bogdanoff, Roel van De Krol](#)

[3707](#)[Towards the Development of Practical Solar-Fuels Devices: Silicon-Based Solar-Hydrogen Generators with 14.2% Solar-to-Hydrogen Efficiency](#)

[Miguel A. Modestino, Jan-Willem Schuettauf, Enrico Chinello, Claudia A. Rodriguez, David Lambelet, Antonio Delfino, Didier Dominé, Antonin Faes, Matthieu Despeisse, Julien Bailat, Christophe Ballif, Demetri Psaltis, Christophe Moser](#)

[3708](#)[Tuning the Exposed Facets of Photocatalysts to Improve the Performance](#)

[Junying Zhang](#)

[3709](#)[Electrochemical Modification of Boron-Doped Diamond with Cu<sub>2</sub>O Nanoparticles for Photocatalytic Applications](#)

[Maksudul Hasan, Christos K. Mavrokefalos, James F. Rohan, John S. Foord](#)

[3710](#)[Photocatalytic Hydrogen Production with Zn-Based Photocatalyst](#)

[Satoshi Kaneco, Hideyuki Katsumata, Tohru Suzuki](#)

[3711](#)[The Effect of Anisotropic Physical Properties of Cu\(In<sub>x</sub>Ga<sub>1-x</sub>\)\(Se,S\)<sub>2</sub> \(CIGS\) Single Crystal Photocatalysts on Water Splitting](#)

[Jessica Jane Frick, Satya K Kushwaha, Jason W Krizan, Maor Baruch, Robert J Cava, Andrew B. Bocarsly](#)

[3712](#)[Inverted Metamorphic Multijunction Semiconductors for Exceptionally High Photoelectrolysis Efficiencies: Materials Development and Measurement Challenges](#)

Todd G Deutsch, James L. Young, Henning Döscher, Myles Steiner, John A Turner

3713 Photoelectrochemical Hydrogen Production Using a  $\text{CaFe}_2\text{O}_4$  Electrode Coated with  $\text{TiO}_2$  As a Surface Protective Layer

Shintaro Ida, Takamitsu Futagami, Hidehisa Hagiwara, Takaaki Sakai, Motonori Watanabe, Tatsumi Ishihara

3714 Solid-State Characterization of Wide-Bandgap  $\text{CuGa}(\text{S,Se})_2$  for PEC Water Splitting

Alexander D DeAngelis, Kimberly Horsley, Nicolas Gaillard

3715 Carrier Selective Contacts Design for Efficient Photocatalytic Water Reduction

Dowon Bae, Thomas Pedersen, Brian Seger, Ole Hansen, Peter C. K. Vesborg, Ib Chorkendorff

3716 Kinetic Study on Multielectron-Transfer Mechanism for Flake-Ball-Shaped Bismuth-Tungstate Photocatalyst

Haruna Hori, Mai Takashima, Mai Takase, Bunsho Ohtani

3717 Design of Metastable Alloys for Energy Conversion

Aaron M. Holder, Andre Bikowski, Sebastian Siol, Brian Gorman, Stephan Lany, Andriy Zakutayev

3718 Non-Precious Metal-Catalyzed Photoelectrodes for Hydrogen Production Via Solar Water Splitting

Thomas R Hellstern, Alexander D DeAngelis, Laurie Ann King, Pongkarn Chakthranont, Reuben J Britto, Nicolas Gaillard, Thomas F Jaramillo

3719 Facet-Selective Deposition of Metal Nanoparticles on Decahedral-Shaped Anatase Titania Photocatalyst Particles

Kenta Kobayashi, Mai Takashima, Mai Takase, Bunsho Ohtani

[3720 In Situ ATR-FTIR Investigation of the Effects of H<sub>2</sub>O and D<sub>2</sub>O Adsorption on the TiO<sub>2</sub> Surface](#)

[Detlef Werner Bahnemann, Hamza Belhadj, Peter Robertson](#)

[3721 Interfacial Charge Dynamics of in<sub>2</sub>S<sub>3</sub>-Decorated TiO<sub>2</sub> Nanowires](#)

[Ping-Yen Hsieh, Yung Jung Hsu](#)

[3722 Photocatalytically Generated Pt/C-TiO<sub>2</sub> Composite As ORR Catalyst](#)

[Raman Vedarajan, Rajashekar Badam, Noriyoshi Matsumi](#)

[3723 Advanced Device Design for Photoelectrochemical Water Splitting Derived By a Detailed Balance Approach](#)

[Henning Döscher, John F Geisz, James L Young, Myles Steiner, John A Turner, Todd G Deutsch](#)

[3724 Molybdenum Disulfide As a Protection Layer and Catalyst for Gallium Indium Phosphide Solar Water Splitting Photocathodes](#)

[Reuben J Britto, Jesse D Benck, James L. Young, Christopher Hahn, Todd G Deutsch, Thomas F Jaramillo](#)

[3725 Probing the Surface Oxidation of III-V Photoelectrodes with First-Principles Simulations and in Situ Experiments](#)

[Tuan Anh Pham, Xueqiang Zhang, Brandon C. Wood, Sylwia Ptasinska, Tadashi Ogitsu](#)

[3726 Nanoclusters-Grafted Photocatalyst to Drive Multi-Electron Reduction for Energy Production and Environmental Purification](#)

[Masahiro Miyauchi, Shusaku Shoji, Ge Yin](#)

[3727 Overall Water-Splitting Photocatalyst, Silver-Inserted Zinc Rhodium Oxide and Bismuth Vanadium Oxide, Sensitive to Red Light](#)

[Hiroshi Irie, Ryoya Kobayashi, Toshihiro Takashima, Bunsho Ohtani](#)

3728 [Efficiently Charge Transfer Promoted By Dual Vacancies Overlayer for Water Oxidation of WO<sub>3</sub> Photoanode](#)

[Ming Ma, Jong Hyeok Park](#)

3729 [Photoelectrochemical Properties of N-Doped Graphene/Hematite Composites](#)

[Kaushik Jayasayee, Suresh Kannan Balasingam, Paul Inge Dahl, Jannicke Kvello, Yahao Li, Marthe Emelie Melandsø Buan, T Srinivas, Murali Rangarajan, Thirugnasambandam Manivasagam, Ann Mari Svensson](#)

3730 [Site-Selective Binary Alloy Nanoparticles Deposition on TiO<sub>2</sub> Nanorod for Acetic Acid Oxidative Decomposition Under UV-Vis Irradiation](#)

[Toyokazu Tanabe, Wataru Miyazawa, Takao Gunji, Masanari Hashimoto, Shingo Kaneko, Takeo Ohsaka, Futoshi Matsumoto](#)

3731 [Solar Water Splitting Photoelectrodes Structured By Laser Interference Lithography](#)

[Herman Kriegel, Mauricio Schieda, Iris Herrmann-Geppert, Dmitry L. Voronov, Deirdre L. Olynick, Thomas Klassen](#)

## **M01-Chemical Sensors 12. Chemical and Biological Sensors and Analytical Systems**

3732 [ZnO Nanostructured Wires for Gas Sensing Applications](#)

[Amir Abidov, Sevara Abdukarimova, Umida Ziyamukhamedova, Eadi Sunil Babu, Soon-Wook Jeong, Sungjin Kim](#)

3733 [Resistive Sensors Based on Self-Assembled Core-Shell Nanoparticles](#)

[Linda Baklouti, Khalil Rajoua, Frederic Favier](#)

3734 [A Three Electrode Mixed Potential Sensor for Gas Detection and Discrimination](#)

[Lok-kun Tsui, Angelica D Benavidez, Ponnusamy Palanisamy, Lindsey Evans, Fernando H Garzon](#)

[3735 VOC-Sensing Properties of Adsorption/Combustion-Type Micro Gas Sensors Using Mesoporous Alumina Co-Loaded with Pt and Metal Oxide](#)

[Kazunori Nagae, Taro Ueda, Takahiko Sasahara, Osamu Nakagoe, Shuji Tanabe, Takeo Hyodo, Yasuhiro Shimizu](#)

[3736 \(Invited\) Design of Highly Sensitive and Selective Diode-Type H<sub>2</sub> Sensors](#)

[Takeo Hyodo, Wataru Sakata, Kai Kamada, Taro Ueda, Yasuhiro Shimizu](#)

[3737 \(Invited\) Development of the Battery-Driven SnO<sub>2</sub> Thin Film Gas Sensor](#)

[Hisao Ohnishi, Atsushi Nonaka, Takuya Suzuki](#)

[3738 Development of a Low Power Ammonia Gas Sensor](#)

[Milad Navaei, Peter Hesketh](#)

[3739 High Performance of SnO<sub>2</sub>-Based Gas Sensor by Introducing Perovskite-Type Oxides](#)

[Kengo Shimano, Nan Ma, Tokiharu Oyama, Maiko Nishibori, Ken Watanabe](#)

[3740 Towards p-Type Conductivity in SnO<sub>2</sub> Nanocrystals through Li Doping and Its Applications in Porous Diodes for Room Temperature Chlorine Gas Detection](#)

[Allen Chaparadza, Shankar Rananavare](#)

[3741 Fabrication of a Room Temperature Electrochemical Gas Sensor Using Paper Substrate](#)

[Praveen K. Sekhar, Jesse Kysar](#)

[3742 Sensor Response Under Humid Condition of Surface Modified SnO<sub>2</sub> with Zr<sup>4+</sup>](#)



[Hotaka Uchino, Takaharu Mizukami, Ken Watanabe, Maiko Nishibori, Kengo Shimanoe](#)

3743 [Electrochemical Detection of Hydrogen Using Two-Dimensional Carbon Nanosheets](#)

[Azumi Miyamoto, Yuta Kuwaki, Kazuto Hatakeyama, Quitain Armando, Mitsuru Sasaki, Yasumichi Matsumoto, Tetsuya Kida](#)

3744 [Fluorometric Bio-Sniffer \(Gas Phase Biosensor\) for Breath Acetone as a Volatile Product of Lipid Metabolism](#)

[Po-Jen Chien, Ming Ye, Takuma Suzuki, Koji Toma, Takahiro Arakawa, Kohji Mitsubayashi](#)

3745 [Sniff-Cam \(Bio-Fluorometric Gas-Imaging System\) for Breath Acetaldehyde after Drinking](#)

[Kenta Iitani, Munire Naisierding, Toshiyuki Sato, Koji Toma, Takahiro Arakawa, Kohji Mitsubayashi](#)

3746 [Improvement in Response/Recovery Characteristics of Mixed-Potential-Type Zirconia-Based CO Sensor Using  \$ZnCr\_2O\_4\$  Added with Au Particles-Sensing Electrode](#)

[Yuki Fujio, Sri Ayu Anggraini, Hiroshi Ikeda, Nao Terasaki, Norio Miura](#)

3747 [Biochemical Gas Sensors Using Self-Assembled Nanostructures](#)

[Do Hoon Lee, Taewan Kim, Wonbin Song, Byung Yang Lee](#)

3748 [Applications of a Novel Multi-Parametric/Multimodal Spectroscopy Apparatus on Characterization of Functional Interfaces](#)

[Lang Zhou, Mary A Arugula, Alex Simonian](#)

3749 [Layer By Layer Based Multifunctional Biointerfaces-Design and Applications](#)

[Mary Arugula, Yuanyuan Zhang, Aleksandr Simonian](#)

[3750Real-Time, in Situ Monitoring of Nitric Oxide and Hydrogen Peroxide Generated By Non-Thermal Plasma Irradiation: Use of an Amperometric Microsensor Array](#)

[Somin Shin, Jae Ho Shin, Seongsil Jeon, Gyungsoon Park](#)

[3751Continuous Interstitial Glucose Monitoring Sensors Modified with Biocompatible Nitric Oxide-Releasing Nanofiber Coatings: Wireless In Vivo Evaluation in a Rat](#)

[Jae Ho Shin, Min Heo, Minji Park, Hyunhee Yang, Soo Ji Son, Do Yeon Lee, Gi Ja Lee](#)

[3752\(Invited\) Rapid Formation of Single-Cell Pairs for Hybrid Cells](#)

[Tomoyuki Yasukawa, Fumio Mizutani](#)

[3753\(Invited\) Microfluidic Dual Sensors for In Vivo Measurement of Superoxide and Glutamate](#)

[Hui-Bog Noh, Jong-Min Moon, Jeon Ok Moon, Yoon-Bo Shim](#)

[3754Simulation of Specific Capture of Bacteria By Molecular Imprinting Method Under Dielectrophoresis](#)

[Mamoru Tamura, Shiho Tokonami, Takuya Iida](#)

[3755Wearable Mouthguard Biosensor Integrated with Wireless Electronics](#)

[Jayoung Kim, Joseph Wang](#)

[3756High Surface Area 3D Hierarchical Ni\(OH\)<sub>2</sub>-Coated Ni Microflowers for Non-Enzymatic Glucose Sensor with High Sensitivity and Low Detection Limit](#)

[Arumugam Manikandan, Ling Lee, Henry Medina, Chia-Wei Chen, Zhiming Wang, Yu-Lun Chueh](#)

[3757Faster Diagnosis of Alpha-1-Antitrypsin Deficiency through Electrochemical and Quartz Crystal Microbalance Testing](#)

Bryan Evans Materi, Bobby Gene Adams, Jonathan Sanders, Jeffrey Rice, Cynthia A. Rice

3758(Invited) Biomaterials Research Support at the National Science Foundation

Aleksandr Simonian

3759(Invited) Electrochemical Sensing Using Molecule-like Gold Nanoclusters

S. Senthil Kumar, Kyuju Kwak, Dongil Lee

3760Breast-Cancer-Stem-Cell Sensor Using Igzo Nomfet Implemented with Au Nano-Particles

Jong-Sun Lee, Seung-Hyun Song, Chul Geun Kim, Jea-Gun Park

3761Microwave Synthesized CdSe/ZnO Core-Shell Quantum Dots As a Biosensing Platform for Protein Detection

Erin Jenrette, Monique Farrell, Jasmin Flowers, Jonathan Skuza, Aswini K Pradhan

3762Electrochemical Detection of Neurotransmitters Using Modified PEDOT Electrodes

Violeta-Tincuta Gruia, Igor Efimov, Adriana Ispas, Andreas Bund

3763Label-Free, Fragmented Antibody (Fab')-Immobilized Immunosensors Via Use of Ferrocene-Modified Silica Nanoparticles

Hae Ry Hyun, Jiyeon Kwon, Jae Ho Shin

3764Performance of Whole-Cell Electrochemical Biosensor Using Integrated Microbes/Si Nano-Forest Structure

Nofar Mintz Hemed, Tal Yoetz-Kopelman, Annalisa Convertino, Yosi Shacham-Diamand

3765Signal Amplification Techniques By Effective Use of the Interfacial Region for Field Effect Transistor (FET) Based Biosensing

[Sho Hideshima, Shofarul Wustoni, Shigeki Kuroiwa, Takuya Nakanishi, Tetsuya Osaka](#)

3766[Printable Hecl Electrode Materials for Disposable Bioaffinity Assay Cartridges](#)

[Sakari Kulmala, Kalle Salminen, Päivi Kuosmanen](#)

3767[Development of Evaluation System of  \$\beta\$ -secretase Activity by Using Orientated Immobilizing Recombinant  \$\beta\$ -secretase](#)

[Yasuhiro Iida, Minoru Adachi, Yuki Shiraishi, Jyunichi Yamaguchi](#)

3768[Development of a Catalytic Combustion Type Gas Sensor with Low Power Consumption](#)

[Hironori Hadano, Atsuko Miyagi, Tatsuyuki Okuno, Yoshiharu Nagawa, Yoshiaki Ishiguro](#)

3769[Amyloid  \$\beta\$  Detection with Integrative Chip for Alzheimer Disease](#)

[Jeong Hoon Lee, Yong Kyoung Yoo, Kyo Seon Hwang](#)

3770[Surface Plasmon Resonance \(SPR\) Sensing Based on DNA Elongation by Site-Selective Surface Plasmon \(SP\) Field Heating toward Ultra-High Sensitive Detection of Single Pathogenic Particles](#)

[Yuki Kawahara, Akito Ishida](#)

3771[Highly Swellable Hydrogel Electrolyte for Metal Air Battery](#)

[Naoya Yamada, Kumkum Ahmed, Masato Wada, Ajit Khosla, Hidemitsu Furukawa](#)

3772[Disposable Plasmonic Plastic SERS Sensor Using Gold Nanoparticles Arrays](#)

[Minwoo Song, Dooyong Lee, Hee Jung Park, Seunghyun Lee](#)

3773[Mercury Chemical Sensors Based on Chalcogenide Glasses](#)

[Alla Paraskiva, Mariana Milochova, Sohayb Khaoulani, Eugene Bychkov](#)

[3774Development of Insect Derived Protein Based Electrochemical Impedance Biosensor Platform](#)

[Yue Rong, Eric S McLamore, Nemat O Keyhani](#)

[3775Development of a Novel Cell Monitoring System Based on Lens-Less Imaging Toward Cultivation of Circulating Tumor Cells](#)

[Atsushi Kogiso, Yoshiaki Maeda, Hironori Dobashi, Tomoko Yoshino, Tadashi Matsunaga, Tsuyoshi Tanaka](#)

[3776Copy Number Variation Analysis of Circulating Tumor Cells at a Single Cell Level Based on Hydrogel Encapsulation](#)

[Reito Iwata, Ryo Negishi, Tsuyoshi Tanaka, Tadashi Matsunaga, Tomoko Yoshino](#)

[3777Effects of Porous Structure for Gas Sensor on Sensitivity Using Tin Oxide with Low Density](#)

[Min-Ah Han, Ji Hea Jeong, Hee Jun Noh, Hyun-Jong Kim, Seong Ho Son, Jin-Seong Park, Ho-Nyun Lee](#)

[3778Dual Sensing By Simple Heteroditopic Salt Receptors Containing an Anthraquinone Unit](#)

[Jan Romański, Marcin Karbarz](#)

[3779Ag-Coated Polymeric Nanopillar Array for Quantitative Chemical Sensing By Surface-Enhanced Raman Spectroscopy](#)

[Anna Kim, Hyun-Jong Kim, Ho-Nyun Lee, Bongyoung Yoo, Hana Lim](#)

[3780Preliminary Advancement for an Electrochemical Biosensor for Early Diagnosis of Alpha-1-Antitrypsin Deficiency](#)

[Bobby Gene Adams, Bryan Evans Materi, Jeffrey Rice, Jonathan Sanders, Cynthia A. Rice](#)

3781 [Ultrasensitive CuInS<sub>2</sub> Quantum Dots for Detection of Nickel Ions in Drinking Water](#)

[Tarek M Abdel-Fattah, Shaker Ebrahim, Magdy Ali, Jehan El Nady, Moataz Soliman](#)

3782 [Graphene Quantum Dots As Optical Sensor for Glucose Detection](#)

[Tarek M Abdel-Fattah, Shaker Ebrahim, Moataz Soliman, Mona Shehab](#)

3783 [Evaluation of Acetylcholine Release and Hold Electrochemical Device by CCD Type Ion Image Sensor](#)

[Itsuki Kageyama, Ryo Kato, Kazuaki Sawada, Toshiaki Hattori](#)

3784 [Versatile Sensing Platform Assemble on Flexible Organic Transistors](#)

[Caizhi Liao, Feng Yan](#)

3785 [A Novel Electrochemical Sensing of HCO<sub>3</sub><sup>-</sup> with Amorphous RuO<sub>2</sub>-Ta<sub>2</sub>O<sub>5</sub> Catalyst](#)

[Ai Honda, Masatsugu Morimitsu](#)

3786 [Incubation-Free Electrochemical Immunosensor Using a Gold-Nanocatalyst Label Mediating Outer-Sphere-Reaction-Philic and Inner-Sphere-Reaction-Philic Species](#)

[Chiew San Fang, Cheolho Kang, Haesik Yang](#)

3787 [Development of High-Sensitive Detection System for Redox Analytes Having a Standard Potential Higher Than O<sub>2</sub> Evolution by Using Micropatterned Conductive Boron-Doped DLC Electrodes](#)

[Shinpei Ohtomo, Hiroshi Naragino, Keigo Okafuji, Ryutaro Kobayashi, Kensuke Honda](#)

3788 [Environmental Sensor Based on Stretchable Textile](#)

[Hyung-Kun Lee, Do Yeob Kim, Sung Q Lee, Wooseup Youm](#)

[3789Fabricating a QCM Device with the Nanostructures Using the AAO Template](#)

[Naoto Asai, Takeshi Ito, Tomohiro Shimizu, Shoso Shingubara](#)

[3790Highly Sensitive Measurement of Bioelectric Potentials by Boron-Doped Diamond Electrodes for Plant Monitoring](#)

[Tsuyoshi Ochiai, Shoko Tago, Mio Hayashi, Akira Fujishima](#)

[3791Fabrication of Ca<sup>2+</sup>-K<sup>+</sup> Image Sensor Using an Inkjet Method and Its Application to Living Cells](#)

[Sota Matsuba, Hikaru Sato, Ryo Kato, Kazuaki Sawada, Tomoki Matsuda, Takeharu Nagai, Toshiaki Hattori](#)

[3792Electrochemical Study of Conducting Poly\(thionine\) Electropolymerization in Two Methods and Its Significance for the Detection of Dopamine](#)

[Mohammad Mahbubur Rahman, Chuang-ye Ge, Jae Joon Lee](#)

[3793A Simple and Fast SELEX Using an Alternating Current Potential Modulated Microfluidic Channel and an Evaluation of Sensing Ability of Aptamers](#)

[Saeromi Chung, Jong-Min Moon, Changill Ban, Yoon-Bo Shim](#)

[3794Microarray Needle Sensor Composite Conducting Polymer Coated on Au/Zn Oxide Layer for Continuous Glucose Detection in Cells](#)

[Won-Chul Lee, Dong-Min Kim, Yoon-Bo Shim](#)

[3795Detection of Heavy Metal Ions Using a Long-Life Electrochemical Sensor Containing Conducting Polymer-Graphene Oxide Composite](#)

[Min-Ouk Park, Jang-Hee Yoon, Mi-Sook Won, Yoon-Bo Shim](#)

[3796Gas Ion Implanted Electrode Prepared By the Electron Cyclotron Resonance Ion Source and Catalytic Effects](#)

[Mi-Sook Won, Dong-Wook Lee, Jang-Hee Yoon, Jin Yong Park, Yoon-Bo Shim](#)

[3797The Electrochemical Nitrite Ion Sensor Using a Neuroglobin Bonded on Conducting Polymer](#)

[Jong-Min Moon, Gurudatt N. G, Yoon-Bo Shim](#)

[3798Ethanol Response of Semiconductor Gas Sensors Based on SnO<sub>2</sub> Layer Prepared from Acidic Solution](#)

[Masami Mori, Yoshihiko Sadaoka, Tsuyoshi Ueda, Hirokazu Mitsuhashi, Mikiya Nakatani](#)

[3799\(Invited\) Electrochemical Biosensors for Food and Agricultural Applications](#)

[Ramaraja P. Ramasamy](#)

[3800High-Content Analysis of Single Cells Using a Wide-Field Imaging Sensor](#)

[Tsuyoshi Tanaka, Tomoko Yoshino, Yoshiaki Maeda, Tatsuya Saeki, Ryo Negishi, Reito Iwata, Atsushi Kogiso, Hironori Dobashi, Tadashi Matsunaga](#)

[3801\(Sensor Division Outstanding Achievement Award\) Mixed Potential Sensors for Hydrogen Safety and Automotive Applications](#)

[Rangachary Mukundan, Cortney R Kreller, Eric L. Brosha](#)

[3802Impedance-Based Biosensing Using Virus-Poly\(3,4-ethylenedioxythiophene\)](#)

[Alana Ogata, Shae Schlegel, Jeffrey Briggs, Ming Tan, Gregory Weiss, Reginald Penner](#)

[3803Graphene Oxide-Based Supercapacitor Immunosensor for D-Dimer Detection](#)

[Allen Armando Rodriguez-Silva, Omar Movil-Cabrera, John A Staser](#)



3804 [Ultrasensitive Biosensors Based on Redox Cycling](#)

[Haesik Yang](#)

3805 [Thermal Stability of Phage Peptide Probes Vs. Aptamer for Salmonella Detection on Magnetoelastic Biosensors Platform](#)

[I-Hsuan Chen, Shin Horikawa, Songtao Du, Yuzhe Liu, Howard Clyde Wikle, James M Barbaree, Bryan A Chin](#)

3806 [A Single Protein Detection Using a Biological Nanopore Formed By Perforin](#)

[Hirokazu Watanabe, Ryuji Kawano](#)

3807 [Active Airflow Generation to Assist Robotic Gas Source Localization: Initial Experiments in Outdoor Environment](#)

[Ayano Murai, Haruka Matsukura, Ryuichi Takemura, Hiroshi Ishida](#)

3808 [Blackening in Zirconia-Based Electrochemical Oxygen Sensor at High Pumping Potentials](#)

[Richard E Soltis, Michael McQuillen, Gopichandra Surnilla](#)

3809 [Determination of Low Concentration of Multi-Target Gas Species Exhaled with the Breath](#)

[Kunihiko Nakamura, Teppei Hosokawa, Yukihiro Morita, Mikihiko Nishitani, Yoshihiko Sadaoka](#)

3810 [Amperometric Gas Sensors: From Classical Industrial Health and Safety to Environmental Awareness and Public Health](#)

[Michael T Carter, Joseph R Stetter, Melvin W Findlay, Bennett J. Meulendyk, Vinay Patel, David Peaslee](#)

3811 [Estimation of Gas Source Location from Fluctuating Readings of Gas Sensors and Anemometer on Mobile Robot in Outdoor Environment](#)

Yuta Wada, Haruka Matsukura, Hiroshi Ishida

3812Quantitative Decoding of Complex Gas Mixtures Using Mixed-Potential Sensor Arrays

Kannan Pasupathikovil Ramaiyan, Cortney R Kreller, Eric L. Brosha, Rangachary Mukundan, Unab Javed, Alexandre V Morozov

3813Sensor Design and New Material for an Intelligent System for People with Musculoskeletal Tension Problems

Mauricio Plaza, Willian Aperador, Mauricio Cifuentes

3814Ultra Stable Dual Functionalized Gold Nanoparticles for the Effective Colorimetric Detection of Clenbuterol

Turibius Simon, Ching-Chang Lin, Fu-Hsiang Ko

3815Probing the Small-Molecule Inhibition of an Anticancer Therapeutic Protein-Protein Interaction Using a Solid-State Nanopore

Ki-Bum Kim, Hongsik Chae, Dong-Kyu Kwak, Mi-Kyung Lee, Ji-Hyang Ha, Gaurav Goyal, Min Jun Kim, Seung-Wook Chi

3816Artificial Siderophore-Fe(III) Complexes-Modified Au Substrates for Microbe-Adsorption/Detection Tools

Tomohiko Inomata, Suguru Endo, Hiroki Ido, Takanori Murase, Tomohiro Ozawa, Hideki Masuda

3817Real-Time Monitoring of Bacterial Metabolites By Scanning Electrochemical Microscopy (SECM)

Vrushali S Joshi, Jens Kreth, Dipankar Koley

3818The Bathtub Method for Detecting Small Quantities of Specific Pathogens

[Shin Horikawa, Songtao Du, Yuzhe Liu, I-Hsuan Chen, Yating Chai, Howard Clyde Wikle, Bryan A Chin](#)

3819 [Fabrication of the TiN-Ag Double-Shell Hollow Nanosphere Structure As the Highly Sensitive Substrate](#)

[Rongcheng Ban, Jun Yin, Jing Li](#)

3820 [Optimization of GaN-Based HEMTs for Chemical Sensing: A Simulation Study](#)

[Madeline Sciallo, Mohua Choudhury, Erin Patrick, Mark E Law](#)

3821 [Direct Vacuum Inlet System Enabling Ultra-Sensitive in-Situ Analysis of Chemical Reaction Products](#)

[Daniel Bøndergaard Trimarco, Søren Bertelsen Scott, Thomas Pedersen, Ole Hansen, Ib Chorkendorff, Peter C. K. Vesborg](#)

3822 [Pumping Induced By Bio-Mimetic Magnetic Micro-Cilia in Creeping Flows](#)

[Peter Hesketh, Srinivas Hanasoge, Matt Ballard, Marilyn Erickson, Jie Xu, Alexander Alexeev](#)

3823 [Fiber Optic Sensors Based on Fiber Bragg Gratings for Methanol Steam Reforming Temperature Monitoring](#)

[Elizabeth Trudel, Brant A. Peppley, Peter Wild](#)

3824 [Piezoelectric Bending Motion Sensor for Simultaneous Detection of Bending Curvature and Speed](#)

[Sung Yun Chung, Hwa -Jin Lee, Duck-Jae You, Sanghun Cho, Buil Nam, Tae Il Lee, Youn Sang Kim](#)

3825 [Fabrication of Nanopore on Electron Beam Induced Membrane for Single Molecule Analysis](#)

[Seong Soo Choi, Myoung Jin Park, Tokutaro Yamaguchi, Chul Hee Han, Sae-Joong Oh, Kyoung Jin Park, Jung Ho Yoo, Yong-Sang Kim, Nam kyou Park](#)

3826 [Thin Film Surface Chemo-Resistivity Tuning Using Metal Deposition Via Slrr](#)

[Kamyar Ahmadi, Dongjun Wu, Othon Monteiro, Stanko R Brankovic](#)

3827 [Chemical Vapor Deposition Graphene Sensors for Scale Detection](#)

[Hammad Younes, Souhila Kaddour, Amal Al Ghaferi, Irfan Saadat, Lina Tizani](#)

3828 [The Study of Self-Assembled Au Nanoparticles As an Efficient SERS Substrate for Environmental Sensing Applications](#)

[Jasmin Flowers, Gugu Rutherford, Erin Jenrette, Monique Farrell, Jonathan Skuza, Sha'La Fletcher, Christian G Carvajal, Aswini K Pradhan](#)

3829 [Applications of Electrochemical Impedance Spectroscopy in pH Sensor Characterization and Failure Analysis](#)

[Jinshan Huo](#)

3830 [Three-Electrode on-Chip Sensors for Voltammetric Detection of Trace Metals in Natural Waters](#)

[Marianna Figuera, Peter D. Van der wal, Mary-Lou Tercier-Waeber, Herbert Shea](#)

3831 [Porous Co-Cu Electrode Fabricated By Electroplating through Sacrificial Glass Fiber Paper Template](#)

[Xiaochen Wang, Jared Church, Woo Hyoung Lee, Hyoung J. Cho](#)

3832 [Mobile Water Kit 2.0: A Field Deployable Solution for E. coli Detection in Potable Water](#)

[Naga Siva Gunda, Ravi Chavali, Sushanta Mitra](#)

[3833Cd \(II\) Ion-Selective Electrode Based on 2 –Acetylthiophene Semicarbazone in Polymeric Membrane](#)

[Chandra Mohan, Kusum Sharma, Sulekh Chandra](#)

[3834Ion Selective Microelectrodes and Scanning Electrochemical Microscopy to Study Dental Materials](#)

[Jyothir Ganesh Ummadi, Corey Downs, Dipankar Koley](#)

## **M02-Microfabricated and Nanofabricated Systems for MEMS/NEMS 12**

[3835\(Keynote\) Quantum Biophotonics and Its Applications in Life Sciences and Medicine](#)

[Luke Lee](#)

[3836\(Invited\) Single Molecule SERS with Directionally Arrayed Gold Nanoparticle Dimers on Substrate](#)

[Koji Sugano](#)

[3837\(Invited\) Where Is Dielectrophoresis \(DEP\) Going?](#)

[Ronald Pethig](#)

[3838\(Invited\) Fluorescent Frequency Domain Oxygen Sensing and Gradient Imaging within Microfluidic Structures](#)

[Jay W Grate, Ryan Kelly, Norm Anheier, Jonathan Suter, Bingwen Liu, Hans Bernstein, Andreas Vasdekis, Tom Schmidt, Ruby Ghosh](#)

[3839\(Invited\) Integrated Selection of Aptamers Against Biomolecules in Microfluidic Devices](#)

[Qiao Lin](#)

[3840In Vitro Angiogenesis: Co-Culture Model of the Retina in Microfluidic Devices](#)

[Li Jiun Chen, Nobuhiro Nagai, Matsuhiko Nishizawa, Toshiaki Abe, Hirokazu Kaji](#)

3841 [Enzyme-Immobilized Electrode Prepared Using Cellulose Nanofiber](#)

[Mikito Yasuzawa, Daisuke Mima, Yusuke Fuchiwaki, Toshihiko Harada](#)

3842 [Exosomes Detection by a Label-free Localized Surface Plasmonic Resonance Method](#)

[R. Duraichelvan, B. Srinivas, S. Badilescu, R. Ouellette, A. Ghosh, Muthukumarar Packirisamy](#)

3843 (Keynote) [Chemical Selectivity and Micro/Nano Sensors](#)

[K Prashanthi, A Phani, Thomas George Thundat](#)

3844 (Invited) [Cantilever-Based Resonant Chemical Microsensors](#)

[Oliver Brand, Patrick Getz, Christopher Carron](#)

3845 (Invited) [Microheater-Based Gas Sensing Platform for Low-Power Environmental Monitoring](#)

[Roya Maboudian, Carlo Carraro](#)

3846 (Invited) [Effect of Microfabrication Induced Stresses on the Sensing Characteristics of Dynamic MEMS Devices](#)

[Rudra Pratap, Ajay Dangi, Amruta Ranjan Behera](#)

3847 [Platinum Microscale Sensor for Electrochemical Determination of Manganese](#)

[Wenjing Kang, Cory Rusinek, Adam Bange, Erin Haynes, William R. Heineman, Ian Papautsky](#)

3848 (Keynote) [3D Gel Printer for Soft and Wet Matter Engineering and Gel MEMS](#)

[Hidemitsu Furukawa](#)

3849 [Sensor Based Low Cost Agriculture Monitoring System Using Polymeric Hydrogel](#)

[M. Hasnat Kabir, Kumkum Ahmed, Hidemitsu Furukawa](#)

3850 [Reduced Graphene Oxide \(rGO\) Based Alzheimer's Disease Diagnosing Biosensor with High Throughput](#)

[Jinsik Kim, Myung-Sic Chae, Dahye Jeong, Yong Kyoung Yoo, Gangeun Kim, Kyo Seon Hwang](#)

3851 [Ion Trap Micro-Fabrication on High Reflective Coatings](#)

[Christian L. Arrington, Patrick Sean Finnegan, Andrew E Hollowell, Peter L. Maunz, Jungsang Kim](#)

3852 [Process Integration of Electroformed MEMS Variable Capacitors for Magnetostriction Measurements](#)

[Patrick Sean Finnegan, Eric D Langlois, Christian L. Arrington, Andrew E Hollowell, Jamin Ryan Pillars, Todd Monson, Christopher R. St. John](#)

3853 [Magnetolastic Smart Tags Using Electroformed Cobalt Iron Boron](#)

[Eric Donald Langlois, Jamin Ryan Pillars, Todd Monson, Christian L. Arrington, Patrick Finnegan, Adam Thorpe, Christopher R. St. John](#)

3854 [Modeling and Characterization of Electroformed MEMS Variable Capacitors for Cobalt Iron Magnetostriction Measurements](#)

[Eric Donald Langlois, Patrick Finnegan, Mark Harry Ballance, Jamin Ryan Pillars, Todd Monson, Andrew E Hollowell, Christian L. Arrington, Charles Joseph Pearce, Christopher R. St. John](#)

3855 [A Photodetector Based on a Conjugated Polymer and PbS Colloidal Quantum Dots](#)

[Taher Ghomian, Jin-Woo Choi](#)

[3856Development of Some Alternative Chalcogenide Materials, Thin Films and Diodes for Fabrication of Low Cost Solar Cells](#)

[Naresh Padha, Chetan J. Panchal](#)

[3857Step Response Analysis of MEMS Electro-Thermal Gas Sensors of Differing Geometry](#)

[Peter Hesketh, Alireza Mahdavifar, Amol Shirke, Joseph R Stetter, Daniel Struk](#)

[3858Multi Factorial Study of Megasonic Enhanced Photoresist Strip with  \$\text{DiO}\_3\$](#)

[Jens Fittkau, Donald Dussault, Christiane Gottschalk, Conny Vikström, Tobias Zenger, Johannes Spreitzer, Laurent Bouvot](#)

[3859Enhanced ZnO Nanorods Field Emitter with Adsorbed Silver Nanoparticles](#)

[Sheng-Joue Young](#)

[3860Development of Instrument for Simultaneous Measurement of Rotating and Sliding Friction of Hydrogels](#)

[Masato Wada, Naoya Yamada, Ajit Khosla, Masato Makino, Masaru Kawakami, Hidemitsu Furukawa](#)

[38613-D Printed Polymer MEMS](#)

[Kyuichiro Takamatsu, Naoya Yamada, Masato Wada, Kumkum Ahmed, Masaru Kawakami, Sam Kassegne, Hidemitsu Furukawa, Ajit Khosla](#)

[3862Hydrogel Coating on Soft Polymeric Substrates for Microfabricated Devices](#)

[Kumkum Ahmed, Naoya Yamada, Masato Wada, Toshiki Kameyama, Masaru Kawakami, Ajit Khosla, Hidemitsu Furukawa](#)

[3863Effect of Post Deposition Annealing on ALD- \$\text{ZrO}\_2\$ /SiON Gate Stacks for Advanced CMOS Technology](#)



[Richa Gupta, Rakesh Vaid](#)

3864 [Electrocatalytic Sensing of Carbon Dioxide, Oxygen and Inert Inorganic Analytes at Network Films of Transition Metal Complexes](#)

[Pawel J Kulesza, Anna Wadas, Weronika Ozimek, Malgorzata Frik, Iwona Agnieszka Rutkowska](#)

3865 [Study of Alcohol Sensing Devices Using DMFC Technology](#)

[Muthuraja Soundrapandian, Subramaniam Chittur Krishnaswamy](#)

3866 [New Top-Down Approach for Fabricating Si-Based Nanostructures](#)

[Lingkuan Meng, Xiaobin He, Jianfeng Gao, Junjie Li, Yayi Wei, Jiang Yan](#)

3867 [Plasmonic Nanostructures for High-Performance Biosensing Devices](#)

[Bo Xiao, Sangram Pradhan, Kevin Santiago, Gugu Rutherford, Aswini K Pradhan](#)

3868 [An Inkjet-Printed Hydrogen Peroxide Sensor on Paper](#)

[Hamed Shamkhalichenar, Jin-Woo Choi](#)

### **M03-Electrochemical Analysis with Nanomaterials and Nanodevices**

3869 [Photoelectrochemistry for Biosensors](#)

[Jun-Jie Zhu, Gao-Chao Fan, Jian-Rong Zhang](#)

3870 [Detection of Telomerase Activity Based on the Steric Hindrance Change in the Pore of Anodic Alumina Nanochannels](#)

[Xu Liu, Yuan Jian Liu, Wei Wei](#)

3871 [Signal Switch and Signal Amplification for Electrochemical Biosensing](#)

[Huangxian Ju](#)

[3872 Probe Sensor Using Nano-Structured Multi Walled Carbon Nanotube Yarn for Direct Selective and Sensitive Dopamine Detection](#)

[Wed Al-Graiti, Javad Foroughi, Zhilian Yue, Xu- Feng, Gordon Wallace, Jun Chen](#)

[3873 A Universal Strategy for Aptamer-Based Nanopore Sensing Throughhost-Guest Interactions inside  \$\alpha\$ -Hemolysin](#)

[Ting Li](#)

[3874 Investigation of the Hybrid Catalytic System GC/Conducting Polymer/CdS/Enzyme for the Detection of Phenolic Compounds.](#)

[Justyna Widera, Diana Chaykina, Sophia King, Magdalena E Osial, Krystyna Jackowska](#)

[3875 Iron Oxide Plasmonic Nanostructures for Energy Harvesting](#)

[Naresh Das, Joshua P. McClure, Kyle N. Grew](#)

[3876 Investigation on High Charge Density of States in Electrochemical Polymer Transistor](#)

[Jiyoul Lee](#)

[3877 Bismuth-Activated Graphene Nanocomposite Modified Electrode for Electrochemical Determination of Trace Heavy Metals](#)

[Sohee Lee, Yuanzhe Piao](#)

[3878 Plasmonics Enhanced Spectroscopic and Electrochemical Analysis](#)

[Xing-Hua Xia](#)

[3879 Anionic-Exchange Ionomer-Films for Electrocatalytic Applications](#)

[Paolo Bertoncello, Thomas Ross Jones, Sandra Aldave Hernandez, Robert Kaspar, Michael Letterio, Yushan Yan](#)

3880 [Enabling Local Electrochemistry in Fast, High-Resolution Scanning Probe Microscopy](#)

[Nathan D. Kirchhofer, Roger Proksch, Maarten Rutgers, Irene Revenko](#)

3881 [Reduced Graphene Oxide Bridging Oriented Copper Nanowires for a Flexible, Annealing-Free and Air-Stable Electrode](#)

[Wang Zhang, Zhenxing Yin, Youn Sang Kim, Yuanzhe Piao](#)

3882 [Real-Time Monitoring of DNA Amplification By Nanogap Impedimetric Sensor](#)

[Hyunjung Lee, Joo-Oak Keem, Hyunmin Cho, Neha Verma, Junghoon Lee, Bong Hyun Chung](#)

3883 [Fabrication of Paper-Based Electrochemical Devices and Detection of Acetaminophen](#)

[Woo Sung Chung, Sung Hwan Lee, Joo Heon Lee, Van-Khue Tran, Euna Ko, Chan Ho Park, Gi Hun Seong](#)

3884 [An Novel Electrochemical Sensor for Indole-3-Acetic Acid Detection Based on the Peroxidase-like Activity of Hemin/Boron Nitride Composite Nanocomposite](#)

[Qin Xu, Jiaqian Tang, Fengping Liu, Xiaoya Hu](#)

3885 [Development of Film-Based Electrochemical Integrated Microfluidic Chip for Identification of Food-Borne Pathogens](#)

[Sujeong Shin, Tae Jae Lee, Sun Young Lim, Moon Keun Lee, Nam Ho Bae, Soon Woo Jeong, So Young Han, Min Ho Yang, Kyoung G Lee, Seok Oh Yun, Seok Jae Lee](#)

3886 [Mesoporous Hollow MnO<sub>2</sub> nanotubes Confined Sulfur As Cathode](#)

[Guowang Diao, Zhen Wu, Lubin Ni](#)

[3887 Electrochemistry and STM Observation of a Copper Complex-Based Molecular Rotor on Gold](#)

[Yusuke Takara, Amane Ohkubo, Tetsuro Kusamoto, Tetsuya Kambe, Michihiro Nishikawa, Yutaka Majima, Shoko Kume, Hiroshi Nishihara](#)

[3888 Facile Synthesis of Graphitic Carbon Nitride /Iron Oxide Composites and Their Enhanced Electrochemical Performance in the Supercapacitor and Enzyme-Free Glucose Sensor](#)

[Lin Liu, Hongying Lyu, Zhenyuan Teng, Chengyin Wang, Huaiguo Xue](#)

[3889 Graphene Polyaniline/Polyoxometalate Hybrid As Cathode for Lithium Ion Batteries with Improved Lithium Storage Capacity](#)

[Guowang Diao](#)

[3890 Preparation of  \$\text{Li}\_4\text{Ti}\_5\text{O}\_{12}\$  Nanosheets/Carbon Nanotube Composites and Application of Anode Materials for Lithium-Ion Batteries](#)

[Guowang Diao, Pengfei Zhang, Ming Chen](#)

[3891 Core/Shell  \$\text{Fe}\_3\text{O}\_4\$ @PANI and  \$\text{Fe}\_3\text{O}\_4\$ @C@PANI Nanospheres Nanospheres Nanocomposites for High-Performance Electrochemical Supercapacitors](#)

[Guowang Diao, Qianhui Wu](#)

[3892 Yb,Er-Doped  \$\text{CeO}\_2\$  Nanotubes for Photoconversion-Enhanced Dye-Sensitized Solar Cells](#)

[Guowang Diao, Rongfang Zhao](#)

[3893 Study about an Experimental Design for CdTe Quantum Dots Synthesis. Analysis of the Optical and Electrochemical Changes after Their Interaction with Hydroxyl Radicals](#)

[Eduardo Carlo Muñoz, Emilio Alonso Navarrete, Rodrigo Gonzalo Henríquez, Ricardo Silvio Schrebler, Ricardo Alejandro Córdova, Luis Felipe Aguilar, Manuel Andrés Bravo](#)

[3894Hybrid and Flexible Nanocomposite Paper of Porous Mn<sub>3</sub>O<sub>4</sub> Nanorod/Reduced Graphene Oxide for Lithium Ion Battery Anode](#)

[Chae-Yong Seong, Yuanzhe Piao](#)

[3895Detection of Heavy Metals By Anodic Stripping Voltammetry Using Nanocarbon Thin Film Electrodes in an Electrochemical Flow Cell](#)

[Yuka Miyao, Osamu Niwa, Ryoji Kurita, Tomoyuki Kamata, Hiromitsu Hachiya](#)

[3896Ionic Liquid Modified Carbon Paste Sensor Electrode for Determination of Antihypertensive Drug](#)

[Mohammad BinSabt, Nada Farouk Atta, Samar Hassan, Ahmed Galal](#)

[3897Electrochemical Analysis of Optical Switchable Filter with a NiO Thin Film for High-Performance Incubators](#)

[Kazuki Tajima, Machiko Nakagawa, Yoshihisa Oishi, Hidenobu Ohta](#)

[3898Preparation and Characterization for Ionic Liquid Coated Graphene Oxide Nanoparticles](#)

[Songqing Chen, Xiashi Zhu](#)

[3899Electrochemical Molecular Recognition System Utilizing Current Amplification of Metal Complexes Assembled on Gold Nanoparticles](#)

[Akira Endo, Takeshi Hashimoto, Takashi Hayashita](#)

[3900A Sensitive Electrochemical Glucose Biosensor Based on Flower-Shaped Zinc Oxide Nanostructures](#)

[Juan Li, Jingjing Tong](#)

[3901Streptavidin-Functionalized Nitrogen Doped Graphene Platform for Sensitive Electrochemical Immunoassay of Tumor Marker](#)

[Zhanjun Yang, Qingchun Lan](#)

[3902The Electrochemical Sugar Recognition Using a  \$\beta\$ -Cyclodextrin Assembled on the Gold Electrode](#)

[Keita Inoue, Akira Endo, Takashi Hayashita, Takeshi Hashimoto](#)

### **Z01-General Student Poster Session**

[3903Development of a Therapeutic Device for Wound Healing with Enzymatic Biofuel Cells](#)

[Ayaka Tsubota, Yudai Ogawa, Takeshi Yamauchi, Hiroyuki Kai, Kenshi Yamasaki, Matsuhiko Nishizawa](#)

[3904High Performance Piezoelectric Nanogenerators Using Vanadium-Doped Ferroelectric ZnO Nanosheets and Polymer Composite](#)

[Junghyo Nah, Sung-Ho Shin, Yang Hyeog Kwon, Min Hyung Lee](#)

[3905Nano-Biosensors: An Advanced and Essential Tool in Monitoring Microcystins in Water](#)

[Vasileia Vogiazzi, Lu Zhang, Daoli Zhao, Noe Alvarez, Soryong Chae, Laura Sagle, William R. Heineman, Vesselin N. Shanov, Ian Papautsky, Dionysios D. Dionysiou](#)

[3906Approaches for Extractive Hydrometallurgy of Niobium and Tantalum from Ethiopian Kenticha Ores](#)

[Goitom Gebreyohannes Berhe](#)

[3907Improvement of Hot Hole-Induced Degradation in HV Pmosfets](#)

[Dongjun Lee, Changsub Lee, Duheon Song, Byoung-deog Choi](#)

[3908Effect of Plasma Carburizing Treatment on Pitting Corrosion Resistance of Type 304 Stainless Steel](#)

Waka Inoue, Izumi Muto, Yu Sugawara, Nobuyoshi Hara

3909 Fabrication of TiO<sub>2</sub> Based Microspheres By Spray Drying Method and Their Application for Dye-Sensitized Solar Cells

Maho Mizuno, Koji Tomita, Yoshihito Kunugi

3910 CFD Systems Level Modeling of a Protonic Ceramic Fuel Cell

Kevin Anderson, Chris McNamara, Neal P Sullivan, Andrew Murphy

3911 Selenium-Decorated Graphene for Peroxynitrite Detection

Haitham Kalil, Shaimaa Maher, Mekki Bayachou

3912 Development of Novel Electrolyte for Rechargeable Aluminum Battery with a Wide Potential Window

Shota Matsumura, Eiji Higuchi, Masanobu Chiku, Hiroshi Inoue

3913 Development of a Flow Injection Biosensor System Enables Glucose and Cortisol Simultaneous Measurement for the Evaluation of Fish Stress

Haiyun Wu, Miri Arai, Hitoshi Ohnuki, Yasutoshi Yoshiura, Hideaki Endo

3914 Self-Standing Carbonaceous Sheets Composed of Micro and Nanometer Fibers Derived Bamboo and Application to PEFC and Edlc

Haruka Miyoshi, Taro Kinumoto, Takuya Matsumura, Miki Matsuoka, Yasuhiko Arai, Tomoki Tsumura, Masahiro Toyoda

3915 Reducing Polarization Using Novel Carbon Support in Polymer Electrolyte Fuel Cells

Koki Baba, Wataru Ozawa, Mikka Nishitani-Gamo, Toshihiro Ando, Mika Eguchi

3916 Capacity Enhancement of Electrochemical Flow Capacitor Using Quinonic Compounds Couple

[Hayate Saito, Takaaki Tomai, Itaru Honma](#)

[3917 Porous Silicon Nanoparticles Prepared By an Alkaline Process As an Anode for Use in Lithium Ion Batteries](#)

[Yu Sugawara, Masahiro Shimizu, Susumu Arai](#)

[3918 Effect of Impurities on Electrochemical Performance of Low-Purity Natural Graphite As Anode Active Material for Lithium Ion Batteries](#)

[Yoon-Tae Park, Ki-Tae Lee, Jae-Woo Park, Sang-Hun Lee](#)

[3919 Development of Potentiometric Lspr Sensors with Au and Au@TiO<sub>2</sub> Nanoparticles](#)

[Kazutaka Akiyoshi, Tetsu Tatsuma](#)

[3920 Tetraethylammonium Hydroxide with Polyacrylamide As Hydroxide Conducting Polymer Electrolytes for Electrochemical Capacitors](#)

[Jak Li, Keryn Lian](#)

[3921 Evaluation of the Durable Performance of the Pt/Marimo Carbon Catalyst in PEFC](#)

[Keisuke Odakura, Koki Baba, Mikka Nishitani-Gamo, Toshihiro Ando, Mika Eguchi](#)

[3922 the Relationship Between Brightness of Aluminum Films Fabricated Using an AlCl<sub>3</sub>-1-Ethyl-3-Methylimidazolium Chloride-Toluene Bath and Molecular Structure of Additives](#)

[Takao Gunji, Shingo Kaneko, Toyokazu Tanabe, Takeo Ohsaka, Futoshi Matsumoto](#)

[3923 the Application of a Water-Based Hybrid Polymer Binder to a High-Voltage and High-Capacity Li-Rich Solid-Solution Cathode and Its Performance in Li-Ion Batteries](#)

[Koki Miyamoto, Youhei Honma, Takao Gunji, Toyokazu Tanabe, Shingo Kaneko, Takeo Ohsaka, Shinsaku Ugawa, Hojin -J Lee, Yoshiharu Ootsuka, Futoshi Matsumoto](#)



[3924Development of Metal Oxide-Supported Metal and Ordered Intermetallic Nanoparticles to Enhance the Oxygen Reduction Reaction in PEMFC](#)

[Fuma Ando, Takao Gunji, Toyokazu Tanabe, Shingo Kaneko, Takeo Ohsaka, Futoshi Matsumoto](#)

[3925Electrical Characterization of Electron Beam Induced Damage on Sub-10nm SRAM Using Nano-Probing Technique](#)

[Jonghyuk Kang, Sungho Lee, Byoung-deog Choi](#)

[3926Effect of Polyhydric Alcohol Addition on Electrodeposition of Fe-Al Alloy in  \$\text{AlCl}\_3\text{-NaCl-KCl-FeCl}\_2\$  Molten Salts](#)

[Hiroaki Yamamoto, Masao Morishita, Akihiro Isoya](#)

[3927Effect of Epitaxially Deposited Gold Nanoparticles on Electroless Metallization of Silicon Wafers](#)

[Naoki Yamada, Susumu Sakamoto, Naoki Fukumuro, Shinji Yae](#)

[3928Effect of Disulfite on the Solubility of Molybdate and Passivation of Iron in Concentrated LiBr Solution](#)

[Hanami Tezuka, Shogo Tsukazawa, Hitoshi Yashiro, Yoichi Hirata, Takashi Hishinuma](#)

[3929Etching Studies of Mo in Aqueous Solutions](#)

[Sang-Min Lee, Chan-Yong Jung, Chi-Woo Lee](#)

[3930Development of Novel Immunosenser System for Sex Determination of Fish](#)

[Taro Sakurai, Haiyun Wu, Goro Yoshizaki, Hitoshi Ohnuki, Hideaki Endo](#)

[3931Crystal Structures and Ferroelectric Properties of  \$\(0.4-y\)\text{Bi}\_{0.5}\text{K}\_{0.5}\text{TiO}\_3\text{-}0.6\text{BiFeO}\_3\text{-}y\text{K}\(\text{Nb}\_x\text{Ta}\_{1-x}\)\text{O}\_3\$](#)

[Toru Iwabuchi, Naoya Ishida, Naoto Kitamura, Yasushi Idemoto](#)

[3932 Synthesis, Crystal Structure and Electrochemical Properties of Rock-Salt Type \(Mg,Ni,Co\)O<sub>2</sub> As Cathode Materials for Mg Secondary Battery](#)

[Tsukiko Takahashi, Naoya Ishida, Naoto Kitamura, Yasushi Idemoto](#)

[3933 Local Structure Analysis of Na<sub>0.5</sub>Bi<sub>0.5</sub>TiO<sub>3</sub> based Oxide Ion Conductor By DFT Calculations and RMC Method](#)

[Naoya Hayashi, Naoto Kitamura, Naoya Ishida, Yasushi Idemoto](#)

[3934 Microscopic Polarization Behavior of Cerium Sulfide Inclusions in Stainless Steel](#)

[Masashi Nishimoto, Izumi Muto, Yu Sugawara, Nobuyoshi Hara](#)

[3935 Synthesis of Al-Substituted Lanthanum Silicate with Oxyapatite Structure By Hydrothermal Method and Local Structural Analysis](#)

[Shohei Fujisawa, Naoto Kitamura, Naoya Ishida, Yasushi Idemoto](#)

[3936 Aqueous Phase Synthesis of Cu/Pt Core-Shell Nanoparticles Supported on Carbon Black By Controlling Cu and Pt Complexes for a PEFC Cathode Catalyst](#)

[Yosuke Terui, Shun Yokoyama, Shuzo Tsuchida, Ryohei Seki, Yasushi Taniguchi, Yasuhiro Ueyama, Hideyuki Takahashi, Kazuyuki Tohji](#)

[3937 Synthesis of CIGS\(Cu\(In,Ga\)Se<sub>2</sub>\) Photovoltaic Materials in an Aqueous Solution for the Printable Solar Cell Application](#)

[Masaki Takagi, Shun Yokoyama, Hideyuki Takahashi, Kazuyuki Tohji](#)

[3938 Synthesis of Oxidation-Resistant Copper Nanoparticles for Fabricating Conductive Patterns in Aqueous Solution](#)

[Ippei Suzuki, Shun Yokoyama, Kenichi Motomiya, Hideyuki Takahashi, Kazuyuki Tohji](#)

[3939 Local Structure and in-Situ Average Structure Analysis of LiNi<sub>0.8</sub>Co<sub>0.2</sub>O<sub>2</sub> Electrode during Charge-Discharge Process By Using Quantum Beam](#)

[Shohei Mikajiri, Naoya Ishida, Naoto Kitamura, Yasushi Idemoto](#)

[3940 Fabrication of an MWCNT-Reinforced Tin Anode for Use in Lithium Ion Batteries By Electrodeposition in Sulfuric Acid](#)

[Kouki Matsunaga, Masahiro Shimizu, Susumu Arai](#)

[3941 Examination of Ion Conduction Mechanism and Electronic Structure in Mg Ion Conductor  \$Mg\_{1-2x}\(Zr\_{1-x}Nb\_x\)\_4\(PO\_4\)\_6\$](#)

[Hideaki Kuwajima, Naoto Kitamura, Naoya Ishida, Yasushi Idemoto](#)

[3942 Composition Dependence of Crystal Structure, Electronic Structure, Ferroelectric and Piezoelectric Properties of  \$\(K,Na,Li\)NbO\_3\$](#)

[Kenichiro Mizuno, Naoya Ishida, Naoto Kitamura, Yasushi Idemoto](#)

[3943 Search for Spinel Type Cathode Materials of Magnesium Secondary Battery By First-Principles Calculation and the Battery Properties, Crystal and Electronic Structure of Cathode Material](#)

[Yusuke Mizutani, Naoya Ishida, Naoto Kitamura, Yasushi Idemoto](#)

[3944 Monitoring Ammonium Ions in Oral Microbiome](#)

[Jyothir Ganesh Ummadi, Chris Bernhard Bahro, Dipankar Koley](#)

[3945 Surface Roughening Process of Nickel Electrodes for Application of Supercapacitors](#)

[Sookyung Lee, Dongchul Choi, Eunji Jung, Yongkeun Son](#)

[3946 4-\(Trimethylsiloxy\)-3-Pentene-2-One As a Novel Film-Forming Agent for High-Voltage  \$LiNi\_{0.5}Mn\_{1.5}O\_4\$  Positive Electrode](#)

[Tae Jin Lee, Jeong Beom Lee, Jiwon Jung, Jiyong Soon, Ji Heon Ryu, Seung M. Oh](#)

[3947Dental Amalgam As an Electrode Material for the Electrochemical Conversion of Carbon Dioxide](#)

[Mijung Park, Sumi Yoon, Jina Kim, Woonsup Shin](#)

[3948Anion Conducting Multiblock Copolymers](#)

[Lisha Liu, John M. Ahlfield, Paul A Kohl](#)

[3949The Effect of Metal Oxide Supports on the Activity of Pt-Ru Towards Methanol Electrooxidation](#)

[Bahareh Alsadat Tavakoli, Roderick Eliel Fuentes, Shuai Tan, Christopher Williams, John W. Weidner](#)

[3950Fabrication and Electrochemical Evaluation of Tin Plated Three-Dimensional Copper Nanostructured Anode for Lithium Ion Battery](#)

[Mendsaikhan Munkhbat, Masahiro Shimizu, Susumu Arai](#)

[3951Electrochemical Impedance Spectroscopy \(EIS\) to Diagnose the Effect of Particle Morphology and As a Tool to Model the Aging Process of Li Batteries](#)

[Walter Wakem, Barzin Rajabloo, Martin Desilets, Gessie M Brisard](#)

[3952a Study on Degradation of Ni-YSZ Anode Materials in Terms of Redox Stability for Solid Oxide Fuel Cells](#)

[Jae-Woo Park, Yoon-Tae Park, Sang-Hun Lee, Ki-Tae Lee](#)

[3953Rechargeable Organic Batteries Using Naphthazarin Derivatives: The Effect of Chloro-Substituents on the Battery Performance](#)

[Shinji Umetani, Masaru Yao, Hisanori Ando, Tetsu Kiyobayashi, Nobuhiko Takeichi, Ryota Kondo, Hiroyuki T Takeshita](#)

[3954Electrochemical Properties of High-Voltage Spinel Positive Electrodes Prepared with Non-Fluorine PAN-Based Binders](#)

[Shinichi Tanaka, Takuya Narutomi, Shigeru Suzuki, Naoaki Yabuuchi](#)

[3955 Fabrication of Symmetrical  \$\text{La}\_{0.7}\text{Ca}\_{0.3}\text{Cr}\_{0.8}\text{Mn}\_{0.2}\text{O}\_{3-d}\$  Electrode Scaffold-Type Micro Tubular Solid Oxide Fuel Cells By Electrophoretic Deposition](#)

[Sang-Hun Lee, Yoon-Tae Park, Jae-Woo Park, Ki-Tae Lee](#)

[3956 Electrochemical Fabrication of Gold Nanoparticle Catalyst on CNTs for Glucose Fuel Cells](#)

[Yuta Hiraide, Susumu Arai, Tomoyuki Fujinami](#)

[3957 Construction of Lithium-Ion Battery Tin Anode Utilizing Cu/CNT Composite Plating Method](#)

[Masaki Kobayashi, Masahiro Shimizu, Susumu Arai](#)

[3958 Enhancement in Chemical Stability of Proton Conducting Solid Oxide Electrolysis Cell \(SOECs\)](#)

[Jun-Young Park, Muhammad Saqib, Ka-Young Park, Tae-Hee Lee](#)

[3959 Oxygen Evolution and Reduction Activity of Perovskite-Based Oxide Catalysts](#)

[Jun-Young Park, Nam-In Kim, Sung Ryul Choi, Sung Won Lee, Rana Arslan Afzal](#)

[3960 Selective Copper Electrodeposition to a 3D Copper Nanostructure](#)

[Yuma Kobayashi, Susumu Arai](#)

[3961 Ru-Core@Pt-Shell Nanosheet Anode Catalyst: High Activity and Durability for Hydrogen Oxidation Reaction in the Presence of CO](#)

[Daisuke Takimoto, Tomohiro Ohnishi, Jeerapat Nutariya, Zhongrong Shen, Yusuke Ayato, Dai Mochizuki, Arnaud Demortiere, Adrien Boulineau, Wataru Sugimoto](#)

[3962 Local Mass Transport Resistance of Low-Loaded PEM Fuel-Cell Catalyst-Layers](#)

[Anna Teresa Sophie Freiberg, Tobias Schuler, Michael C Tucker, Marc Secanell, Adam Z Weber](#)

3963 [Electrochemical Lithium Recovery from Aqueous Sources](#)

[Wook-Jin Chung, Chosel Pepito Lawagon, Grace Masbate Nisola, Hana Gebreegziabher, Jed Albarico, Seong Poong Lee](#)

3964 [Polymer Supported Metal-Salen Catalysts in Mediated Electrohydrocyclization Reactions](#)

[Brittanie Clendenin, James A Miranda](#)

3965 [Pitting Corrosion Behavior of Zirconium in a Simulated Body Fluid Containing Chloride Ions](#)

[Junichi Tsukada, Yusuke Tsutsumi, Maki Ashida, Peng Chen, Hisashi Doi, Yu Sugawara, Izumi Muto, Nobuyoshi Hara, Takao Hanawa](#)

3966 [High Rate TiO<sub>2</sub>\(B\) Electrodes Derived from TiO<sub>2</sub> Nanosheets with Different Size](#)

[Tomohiro Yoshida, Sho Makino, Yusuke Ayato, Dai Mochizuki, Wataru Sugimoto](#)

3967 [Electrochemical Manipulation of Living Cells Supported By Polymeric Nanosheets](#)

[Jin Suzuki, Taro Kondo, Nobuhiro Nagai, Matsuhiko Nishizawa, Toshiaki Abe, Hirokazu Kaji](#)

3968 [Synthesis, Crystal Structure Analysis and Electrochemical Properties of Mg<sub>x</sub>Ni<sub>1-x</sub>O<sub>2</sub>](#)

[Shoichiro Ando, Naoya Ishida, Naoto Kitamura, Yasushi Idemoto](#)

3969 [Bottom-Gate Self-Aligned Homojunction TFT with Double Oxide Semiconducting Layers](#)

[Hye-In Yeom, Chi-Sun Hwang, Sang-Hee Ko Park](#)

[3970Correlation Between Calcination Temperature and Bifunctional Catalytic Activity for Oxygen Electrode Reaction of Pyrochlore Type Metal Oxide Containing Bi and Ru](#)

[Makoto Eto, Taro Kinumoto, Kohei Ono, Tomoki Tsumura, Masahiro Toyoda](#)

[3971Site-Selective Etching of Silver Nanocubes on TiO<sub>2</sub> By Plasmon-Induced Charge Separation](#)

[Koichiro Saito, Ichiro Tanabe, Tetsu Tatsuma](#)

[3972Electrocatalytic Activity for Oxygen Reduction Reaction of Electrochemically Prepared Ni Core - Pt Shell Nanoparticles](#)

[Maya Ueda, Toshihiro Kondo](#)

[3973The Effect of Centrifugation Method for the Large Particle Removal from CMP Slurry](#)

[Jinsu Yoo, Dongjun Lee, Hyunjoo Yoon, Joonbae Jeon, Kyoungwoo Kim, Hasub Hwang](#)

[3974Electrochemical CO<sub>2</sub> reduction on EC Tag \(Cu\) Supported Carbon Electrode](#)

[Asuka Kawano, Yoshiyuki Takatsuji, Tetsuya Haruyama](#)

[3975Facile Synthesis of Cobalt-Copper Layered Double Hydroxide Nanosheets As Cathode Catalysts for Rechargeable Lithium-Air Batteries](#)

[Haohong Shi, Ying Liu, Zhouguang Lu](#)

[3976Improvement in Cycling Stability of Aqueous Organic Redox Capacitor Via Interface Control](#)

[Kazuki Hanzawa, Hayate Saito, Takaaki Tomai, Itaru Honma](#)

[3977Synthesis of Atomically Thin Pt Monolayer on HOPG](#)

[Eri Kuroiwa, Daisuke Takimoto, Jeerapat Nutariya, Zhongrong Shen, Yusuke Ayato, Dai Mochizuki, Wataru Sugimoto](#)

[3978](#)[Electrochemical Accessibility of Platinum Nanoparticles Supported on Anatase TiO<sub>2</sub> Using Conductive Carbon Additives](#)

[Saiki Sato, Takanobu Ishida, Yusuke Ayato, Dai Mochizuki, Wataru Sugimoto](#)

[3979](#)[Development of Nanoparticle Catalysts for Electrochemical Ammonia Production](#)

[Shelby L Foster, Julie N Renner, Katherine E Ayers, Andrew M Herring, Lauren F Greenlee](#)

[3980](#)[Synthesis of Nanocatalysts with Non-Precious Metals for Efficient Oxygen Evolution Reaction \(OER\) Catalysis](#)

[Prashant Acharya, Lauren F Greenlee](#)

[3981](#)["one-Pot" Graphene Sheets Functionalization during the Electrochemical Exfoliation of Graphite](#)

[Diby Benjamin Ossoonon, Daniel Bélanger](#)

[3982](#)[Liquid-Phase Synthesis of Argyrodite-Type Li<sub>6</sub>PS<sub>5</sub>Br Solid Electrolyte with High Lithium-Ion Conductivity](#)

[So Yubuchi, Akitoshi Hayashi, Masahiro Tatsumisago](#)

[3983](#)[Efficient Sterilization with Reactive Oxygen Produced By Radical Vapor Reactor \(RVR\)](#)

[Shoko Ishikawa, Nobuhiro Miyori, Tetsuya Haruyama](#)

[3984](#)[Molecular Carrier-Gox Fusion Protein for Electro-Catalytic Reaction](#)

[Honami Ikeuchi, Ryota Yamasaki, Tetsuya Haruyama](#)

[3985](#)[Temperature Dependence of Local Structure of Layered Cathode Material 0.4Li<sub>2</sub>MnO<sub>3</sub>-0.6LiMn<sub>1/3</sub>Ni<sub>1/3</sub>Co<sub>1/3</sub>O<sub>2</sub> during Charge and Discharge Process](#)

[Takuya Hiranuma, Naoya Ishida, Naoto Kitamura, Yasushi Idemoto](#)



[3986 CFD Analysis of Aggregation and Breakage of Li-Ion Precursor in Taylor-Reactor](#)

[Seung-Hun Lee, Dong Hyup Jeon, Jung-Hoon Song](#)

[3987 Layer-By-Layer Construction of Three-Dimensional MOF \[Cu<sub>2</sub>\(bdc\)<sub>2</sub>dabco\]<sub>n</sub> on Au Surface](#)

[Mariko Hase, Wang-Jae Chun, Toshihiro Kondo](#)

[3988 Pt-Ni Nanoparticle-Supported Multiwalled Carbon Nanotube Prepared By One-Pot Pyrolysis Method in Room-Temperature Ionic Liquids](#)

[Yu Yao, Reiko Izumi, Tsuyoshi Sakamoto, Tetsuya Tsuda, Susumu Kuwabata](#)

[3989 Facile Synthesis and Electrochemical Investigation of Na<sub>0.67</sub>Mn<sub>0.65</sub>Fe<sub>0.20</sub>Ni<sub>0.15</sub>O<sub>2</sub>: A Positive Electrode Material for Na-Ion Batteries](#)

[Brij Kishore, R Viswanatha, G Venkatesh, N Munichandraiah](#)

[3990 Study of Nafion Membrane below Freezing Temperature By Using Near Infrared-Spectroscopy and Electrochemical Impedance Spectroscopy](#)

[Yuu Kouno, Hisayoshi Matsushima, Toshiaki Ohtsuka, Mikito Ueda](#)

[3991 Evaluation of Al and Al Alloy Films Formed By Electrochemical Method](#)

[Kyohei Matsubara, Yuya Ito, Kohei Yanai, Shunya Fujimori, Rie Sumiyoshi, Nobuaki Watanabe, Ichiro Koiwa](#)

[3992 Influence of Hydrogen Adsorption on Electrodeposition of Platinum from Chloro Complex Solution](#)

[Ayano Yokoyama, Taizo Hagihara, Naoki Fukumuro, Shinji Yae](#)

[3993 Aluminum Secondary Battery Utilizing Graphite-Leaf Powder As an Active Material for Positive Electrode](#)

[Yuya Uemura, Chih-Yao Chen, Tetsuya Tsuda, Susumu Kuwabata](#)

[3994In Situ SEM Study on Electrochemical Lithiation/Delithiation Behavior of Silicon Anodes with Polyimide Binder](#)

[Amane Sawamura, Teruki Sano, Satoshi Uchida, Masaki Yamagata, Masashi Ishikawa, Chih-Yao Chen, Hajime Matsumoto, Tetsuya Tsuda, Susumu Kuwabata](#)

[3995Sweat Lactic Acid Monitoring System for Assessment of Exercise Intensity](#)

[Keigo Enomoto, Yota Jingushi, Hiroyuki Kudo](#)

[3996Mechanistic Study of Methanol Oxidation over Platinum Electrode in Alkaline Aqueous Solutions](#)

[Ryoma Kubota, Takeou Okanishi, Hiroki Muroyama, Toshiaki Matsui, Koichi Eguchi](#)

[3997Structural Study of Electrochemically Lithiated Si](#)

[Asami Omachi, Nana Aoki, Kohei Uosaki, Toshihiro Kondo](#)

[3998Photo-Electrochemical Characteristics of Two-Dimensional Porphyrin Molecular Layers on Semiconductor Surfaces](#)

[Yuri Kondo, Ayumi Shokai, Mariko Hase, Toshihiro Kondo](#)

[3999Fabrication of Three-Dimensional Cu/CNT Composite Film By Electrodeposition](#)

[Masaya Ozawa, Susumu Arai](#)

[4000Synthesis of  \$\text{Li}\_3\text{BO}\_3\$  Based Glass-Ceramic Electrolytes and Their Application of All-Solid-State Batteries](#)

[Kenji Nagao, Akitoshi Hayashi, Masahiro Tatsumisago](#)

[4001Surface Treatment of Boron Doped Diamond Using Atmospheric-Pressure Nitrogen Plasma Jet](#)

[Toru Tomita, Taro Kinumoto, Ryuta Ichiki, Tomoki Tsumura, Masahiro Toyoda](#)

[4002 High Temperature Oxide Ion Conduction Path for  \$Pb\_{1-x}La\_xWO\_{4+x/2}\$](#)

[Souki Kaji, Shigeomi Takai, Takeshi Yabutsuka, Takeshi Yao](#)

[4003 Characterization of Sulfur-Phosphorus Sulfide Composite Electrodes in All-Solid-State Na/S Batteries](#)

[Naoto Tanibata, Akitoshi Hayashi, Masahiro Tatsumisago](#)

[4004 Crystal Structures and Electrochemical Properties of  \$Li\_2TiO\_3 - LiMeO\_2\$  \(Me = Cr, V and Mn\) Binary System](#)

[Yuki Kobayashi, Naoaki Yabuuchi](#)

[4005 High-Rate Homoepitaxial Growth of Heavily Boron-Doped Diamond \(100\) Films By Microwave Plasma-Enhanced Chemical Vapor Deposition Using High Microwave Power Density](#)

[Takahiro Yamamoto, Daiki Kaneta, Tsubasa Matsumoto, Osamu Ariyada, Masahiko Ogura, Hiromitsu Kato, Satoshi Yamasaki, Norio Tokuda, Takao Inokuma](#)

[4006 In-Situ Synthesis of Tungsten Carbides Functional Support for PEMFC Catalyst](#)

[JI-Won Oh, Hyunwoong Na, Sahn Nahm, Hanshin Choi](#)

[4007 Preparation of High Durable Catalyst By Morphological Change of Carbon Support for PEMFC](#)

[Hyunwoong Na, JI-Won Oh, Yong Soo Cho, Hanshin Choi](#)

[4008 Effects of Temperature on Electrochemical Sensing of  \$HPO\_4^{2-}\$  with Amorphous  \$RuO\_2-Ta\_2O\_5\$  Catalyst](#)

[Yuuki Yoshida, Masatsugu Morimitsu](#)

[4009 A Study on Making a Stable Loop Profile and Improving Bonding Time in Wire Bonding Process](#)

KwanHyub Nam, JangWoo Ryu, Sungho Lee, Hyunjoong Kim

4010 A Study on Contamination Control of Fume By Analyzation of Air Current

Sunghoon Lee, Byungsu Kim, Segeun Park, Sanghyun Choi, Taeyang Yoon

4011 Cathode Properties of Perovskite-Type Strontium Ferrite for Magnesium Rechargeable Batteries

Yuki Kubota, Mitsuhiro Hibino, Yoshiyuki Ogasawara, Kazuya Yamaguchi, Noritaka Mizuno

4012 Synthetic Variations of Hollow Graphene Nanoshells for Li-Ion Battery Anode

Kevin R. McKenzie, Nathan A Banek, Kevin Alan Hays, Michael J Wagner

4013 Preparation of Pt/Carbon-Sphere As Cathode Catalyst of PEFC

Kan Sakakibara, Takahiro Saida

4014 Investigation of the Sodiation and Desodiation of Hard Carbon By Electrochemical Testing and X-Ray Computed Tomography

Daniela Ledwoch, Paul Adamson, Daniel J.L Brett, Paul R. Shearing, Emma Kendrick

4015 In-Situ Analysis of the in-Plane Current Distributions in an Electrolyte-Supported Planar Solid Oxide Fuel Cell By Segmented Electrodes

Tatsuhiro Ochiai, Hironori Nakajima, Takahiro Karimata, Tatsumi Kitahara, Kohei Ito, Yusuke Ogura, Jun Shimano

4016 Facile Synthesis of Low and Non-Precious Metal Nanocatalysts for Oxygen Reduction Reaction in Fuel Cells

Shaofang Fu, Chengzhou Zhu, Junhua Song, Dan Du, Yuehe Lin

4017 Polybenzimidazoles for Hydrogen Generation in the Hybrid Sulfur Electrolyzer

[Taylor Reed Garrick, Cody Herbert Wilkins, Andrew T Pingitore, Brian C Benicewicz, John W. Weidner](#)

4018[Fabrication and Characterization of Composite Membranes for Vanadium Redox Flow Batteries](#)

[Su Mi Park, So Hee Lee, Haekyoung Kim](#)

4019[Electrochromic Devices Fabricated with Electrolyte Impregnated on Porous Substrate](#)

[So Hee Lee, Su Mi Park, Haekyoung Kim](#)

4020[Synthesis and Evaluation of Heat-Resistant Silver-Platinum Alloy Nanoprisms for Application in Cancer Therapy and Imaging](#)

[Masahiro Kato, Kosuke Sugawa, Joe Otsuki](#)

4021[Lithium - Redox Battery Using a Solvate Ionic Liquid](#)

[Masaru Sugiyama, Naoki Tachikawa, Kazuki Yoshii, Yasushi Katayama](#)

4022[Operando Observation of Cobalt Catalysts for Oxygen Evolution By Electrochemical XAFS Technique Using Soft X-Ray](#)

[Yosuke Mitsutomi, Masaaki Yoshida, Masanari Nagasaka, Hayato Yuzawa, Nobuhiro Kosugi, Hiroshi Kondoh](#)

4023[Fluorescence Enhancement and Quenching Properties of Dyes Positioned on Plasmonic Copper Arrays: Comparison with Those on Plasmonic Gold Arrays](#)

[Hideyuki Takeda, Natsumi Tsunenari, Kosuke Sugawa, Joe Otsuki](#)

4024[Electropolymerization of Thiophene in a Bis\(fluorosulfonyl\)Amide Based Phosphonium Ionic Liquid](#)

[Keiichi Nishihata, Katsuhiko Tsunashima, Yasushi Ono, Masahiko Matsumiya](#)

[4025Preparation of Large Pore Volume Carbon Materials for High Performance Li-S Battery](#)

[Yanhui Cui, Andrew Baker, Kevin Huang, Junwei Wu, XinHe Zhang](#)

[4026In-Situ XAFS Measurement of K:MnO<sub>x</sub> Oxygen Evolution Catalyst](#)

[Futaba Yamamoto, Masaaki Yoshida, Hiroshi Kondoh](#)

[4027Physical and Electrochemical Properties of Ionic Liquids Based on Quaternary Phosphonium Cations and Carboxylate Anions As Electrolytes](#)

[Jin Shimada, Katsuhiko Tsunashima, Mayu Ue, Kazuki Iwasaki, Tetsuya Tsuda, Susumu Kuwabata, Nobumitsu Hirai, Hideyuki Kanematsu, Takeshi Kogo, Akiko Ogawa](#)

[4028Studies on Energy Transfer Between Gold Nanoparticles and Quantum Dots](#)

[Kiryu Sato, Eisuke Shimomura, Taro Uematsu, Tsukasa Torimoto, Susumu Kuwabata](#)

[4029Carbon Nanotube Composite Electrodes Toward All Solid Alkali Metal Ion Batteries](#)

[Yuki Sakamoto, Li Canghao, Yosuke Ishii, Shinji Kawasaki](#)

[4030Electrochemical Surface Treatment for Controlling the Release of Silver Ion As Antibacterial Agent on Titanium](#)

[Masaya Shimabukuro, Yusuke Tsutsumi, Maki Ashida, Peng Chen, Hisashi Doi, Takao Hanawa](#)

[4031Electrocatalysts for Oxygen Reduction Reaction Synthesized from Co-Facial Cobalt Porphyrin and Graphene Oxide](#)

[Tsubasa Yoneuchi, Masaru Kato, Ichizo Yagi](#)

[4032Electrochemical Formation and Characterization of Cuprous Oxide Films on n-Type InP Porous Structures](#)

[Sayaka Omi, Yusuke Kumazaki, Taketomo Sato](#)

[4033 Spontaneous Motion of Oil Droplets on Au Electrode during Sn Electrodeposition in Nitric Acid Solutions](#)

[Yutaka Ishibashi, Yoshiharu Mukouyama](#)

[4034 Effects of Alkali Metal Ions on H<sub>2</sub>O<sub>2</sub> Reduction Current at Pt Electrodes](#)

[Daisuke Hara, Hirokazu Kawasaki, Mitsunobu Kikuchi, Yuri Yamada, Shuji Nakanishi, Yoshiharu Mukouyama](#)

[4035 Bifurcation Behavior in Oscillations during H<sub>2</sub>O<sub>2</sub> Reduction at Pt Electrodes](#)

[Hirokazu Kawasaki, Daisuke Hara, Mitsunobu Kikuchi, Yuri Yamada, Shuji Nakanishi, Yoshiharu Mukouyama](#)

[4036 N-Shaped Negative Differential Resistance in Nitrate Reduction Reactions on Cu Electrode](#)

[Terumasa Kuge, Yuri Yamada, Shuji Nakanishi, Yoshiharu Mukouyama](#)

[4037 Potential Oscillations during Oxidation of Methanol on Pt Electrode in the Absence of Water](#)

[Shinichi Yamaguchi, Terumasa Kuge, Yoshiharu Mukouyama](#)

[4038 Fabrication of Electrochemically Controllable Micropumping System Based on Concentration Gradient of Protons Between Two Gold Microelectrodes](#)

[Hiroki Fujiwara, Isao Shitanda, Yoshinao Hoshi, Masayuki Itagaki, Masahiro Motosuke](#)

[4039 Minimally Invasive Wearable Patch Device for Measurement of Interstitial Fluid Content](#)

[Jun Kubota, Kuniaki Nagamine, Hiroyuki Kai, Hirokazu Kaji, Matsuhiko Nishizawa](#)

[4040 Screen-Printed Paper-Based Impedimetric Sensor Using Flexible Silver Ink for Sweat Conductivity Measurement](#)

[Kazuki Watanabe, Isao Shitanda, Yoshinao Hoshi, Masayuki Itagaki](#)

[4041 Development of New Electrolytes for Electropolishing of Niobium](#)

[Shoma Kawamura, Hitoshi Yashiro, Yoshiaki Ida, Keisuke Nii, Hideaki Monjushiro, Song-Zhu Kure-Chu](#)

[4042 Operando X-Ray Absorption Spectroscopy Measurement Studies on Oxygen Reduction Reaction of Ionic-Liquid-Encapsulated Pd/Pt Core Shell Catalysts](#)

[Yuki Horie, Sho Uemoto, Junichi Ishihara, Kentaro Yamamoto, Yuki Orikasa, Yoshiharu Uchimoto](#)

[4043 Development of the Electric Device for Skin Barrier Healing](#)

[Mayu Nakabayashi, Yuina Abe, Kuniaki Nagamine, Hiroyuki Kai, Takeshi Yamauchi, Kenshi Yamasaki, Matsuhiko Nishizawa](#)

[4044 Development of an Intrinsically Stretchable Electrochromic Display with a Composite of Poly\(3,4-ethylenedioxythiophene\) and Polyurethane](#)

[Wataru Suda, Yuto Kato, Kuniaki Nagamine, Hiroyuki Kai, Matsuhiko Nishizawa](#)

[4045 The Enhancement of the Interface Reaction in  \$\text{LiFePO}\_4\$  Two-Phase System](#)

[Eri Kato, Takahiro Yoshinari, Kentaro Yamamoto, Takuya Mori, Yuki Orikasa, Koji Nakanishi, Yoshiharu Uchimoto](#)

[4046 Development of Miniaturized Nongassing Electroosmotic Pump for the Drug Delivery](#)

[Enhua Zhu, Woonsup Shin](#)

[4047 Deposition and Dissolution of Lithium through a Lithium Carbonate Thin Film in an Ionic Liquid Electrolyte](#)



[Hiroki Kotake, Naoki Tachikawa, Kazuki Yoshii, Yasushi Katayama](#)

[4048 In Situ X-Ray Absorption Spectroscopic Studies on Proton Conduction Mechanism of Zr, Y Co-Doped Barium Cerate for Organic Hydride Fuel Cell Operating at Intermediate Temperature](#)

[Tatsuma Yahara, Yousuke Imanishi, Aruto Watanabe, Takuya Mori, Kentaro Yamamoto, Yuki Oriksa, Toshiaki Ina, Koji Amezawa, Yoshiharu Uchimoto](#)

[4049 Phase Transition Dynamics of  \$\text{LiFePO}\_4\$  Via Intermediate Phase By Using Molten Salt Electrolyte](#)

[Toshiyuki Munesada, Kazufumi Otani, Takuya Mori, Yuki Oriksa, Yukinori Koyama, Koji Ohara, Katsutoshi Fukuda, Toshiyuki Nohira, Rika Hagiwara, Yoshiharu Uchimoto](#)

[4050 X-Ray Absorption Spectroscopic Analysis of  \$\text{Li}\_3\text{PS}\_4\$  Glass-Carbon Composite Cathodes for All-Solid-State Lithium Secondary Battery](#)

[Kohei Saito, Takuya Mori, Yuki Oriksa, Takashi Hakari, Minako Deguchi, Akitoshi Hayashi, Masahiro Tatsumisago, Kei Mitsuhashi, Toshiaki Ohta, Yoshiyuki Kowada, Yoshiharu Uchimoto](#)

[4051 An Assessment of Copper Electrodeposition into Bakky-Pepar Consisted of Single-Walled Carbon Nanotube](#)

[Kyohei Kirihata, Susumu Arai, Arinobu Katada, Mitsuhiro Hirota, Mitsugu Uejima](#)

[4052 Single Cell Performance of PEFC Using the Surface-Treated Stainless Steel Bipolar Plate](#)

[Takuya Ozawa, Hitoshi Yashiro, Masanobu Kumagai, Ichiro Yoshino, Masahiko Hatakeyama, Satoshi Sunada](#)

[4053 Development of Air-Stable n-Type Thermoelectric Single-Walled Carbon Nanotubes Doped By Benzimidazole Drivative](#)

[Yuki Nakashima, Tsuyohiko Fujigaya, Naotoshi Nakashima](#)

[4054 Fabrication of Nitrogen-Doped Porous Carbon from Covalent Organic Frameworks and the Electrocatalytic Activities for Oxygen Reduction Reaction](#)

[Gayoung Kim, Tomohiro Shiraki, Naotoshi Nakashima](#)

[4055 Electrochemical and Crystal Structural Analysis of Intermediate Phase Behavior in Co-Substituted LiFePO<sub>4</sub> with Reduced Lattice Mismatch](#)

[Naoya Hamaguchi, Takahiro Yoshinari, Yuki Orikasa, Motoaki Nishijima, Koji Ohira, Shogo Esaki, Toshitsugu Sueki, Takuya Ootani, Yuichi Kamimura, Koji Ohara, Katsutoshi Fukuda, Yukinori Koyama, Zempachi Ogumi, Yoshiharu Uchimoto](#)

[4056 Application of Ionic Liquid Electrolyte to Lithium Ion Capacitor Based on Electrodes with Porous Three-Dimensional Current Collector](#)

[Naoya Hirota, Kazuki Okuno, Masatoshi Majima, Satoshi Uchida, Masaki Yamagata, Masashi Ishikawa](#)

[4057 Electrical and Structural Properties of Bi-Substituted La<sub>2</sub>Mo<sub>2</sub>O<sub>9</sub> Annealed at Intermediate Temperature](#)

[Yun-Wen Liao, Shigeomi Takai, Takeshi Yabutsuka, Wen-Jauh Chen, Takeshi Yao](#)

[4058 Degradation Phenomenon of Ni-YSZ Anode Support Cells Under Various Operating Conditions](#)

[Jun-Young Park, Youdong Kim, Muhammad Saqib](#)

[4059 Charge-Discharge Characteristics of Sulfur Positive Electrode with Highly Capacitive Micro-Porous Carbon from N-Doped Carbon Precursor](#)

[Shinya Usuki, Masaki Yamagata, Satoshi Uchida, Hidenori Hinago, Masashi Ishikawa](#)

[4060 Operando Observation and Analysis of Reaction Distribution in Composite Electrodes for All-Solid-State Lithium Ion Batteries](#)

[Sae Shinjo, Takuya Mori, Kentaro Yamamoto, Yuki Orikasa, Atsushi Sakuda, Kentaro Kuratani, Tomonari Takeuchi, Yuta Kimura, Takashi Nakamura, Koji Amezawa, Yoshiharu Uchimoto](#)

[4061Development of a Software to Analyze the Dispersion State of Particles on a Flat Substrate](#)

[Kayato Ooya, Hidenobu Shiroishi, Yuya Harada](#)

[4062Effect of Electrode Pressing Process on the Electrode Characteristics of LiCoO<sub>2</sub> Cathode.](#)

[Takahiro Kobayashi, Hiroki Nara, Daikichi Mukoyama, Ichiro Koiwa, Toshiyuki Momma, Tetsuya Osaka](#)

[4063Chiral Sensing of Glucose Using Porous Pt-Modified Electrodes Exposing Pt High-Index Planes](#)

[Takuya Matsuzawa, Mariko Matsunaga](#)

[4064Thermoelectric Properties of Electrodeposited Bismuth Telluride Thin Films By Electron Beam Irradiation and Thermal Annealing](#)

[Daichi Takemori, Masayuki Takashiri](#)

[4065Preparation and Electrochemical Characteristics of the LiMn<sub>2</sub>O<sub>4</sub>/Marimo Carbon Composite](#)

[Haruto Gotoh, Kenta Iwasawa, Mikka Nishitani-Gamo, Toshihiro Ando, Mika Eguchi](#)

[4066Growth Behavior of ZnO during Discharge of Zinc Negative Electrode](#)

[Tomohiro Otani, Masato Nagata, Yasuhiro Fukunaka, Takayuki Homma](#)

[4067Effect of Pulse Frequency on Structural and Thermoelectric Properties of Bismuth Telluride Thin Films By Electrodeposition](#)

[Mitsuaki Okuhata, Masayuki Takashiri](#)

[4068Formation of Positive Composite Electrode By Aerosol Deposition Method for All-Solid-State Rechargeable Lithium Batteries](#)

[Kyoko Kozuka, Keiko Nitta, Mao Shoji, Takeshi Kimura, Hirokazu Munakata, Kiyoshi Kanamura](#)

[4069Preparation of Electrolyte Membrane Composite Composed of Ionic Liquid and Porous Polyimide for Non-Humidified Intermediate-Temperature Fuel Cell](#)

[Syojiro Kikuchi, Syuhei Hashizume, Hirokazu Munakata, Kiyoshi Kanamura](#)

[4070Electrochemical Oxidation and Reduction of Carbonaceous Materials and Their Electrochemical Properties](#)

[Koji Mikata, Kohei Miyazaki, Tomokazu Fukutsuka, Takeshi Abe](#)

[4071Pt Supported on Titanium Nitride/Graphene Nanocomposite As a Beneficial Catalyst for Oxygen Reduction Reaction in Acidic and Alkaline Solutions](#)

[Elahe Yousefi, Elham Yousefi, Mohammad Ghorbani, Abolghasem Dolati, Hitoshi Yashiro](#)

[4072Rechargeable Lithium-Air Batteries: Investigation of Redox Mediators Using DEMS](#)

[Mathias Kjærgaard Christensen, Mie Møller Storm, Poul Norby](#)

[4073Synthesis of High Surface Area Magneli-Phase  \$Ti\_5O\_9\$  from  \$SiO\_2\$  Supported  \$TiO\_2\$  Nanosheets](#)

[Yosuke Toda, Sho Makino, Yusuke Ayato, Dai Mochizuki, Satoshi Tominaka, Wataru Sugimoto](#)

[4074Cathode Composite Films for Oxide-Based All-Solid-State Rechargeable Lithium Batteries Prepared By Aerosol Deposition at Room Temperature](#)

[Yuki Kani, Shintaro Suzuki, Takehisa Kato, Munekazu Motoyama, Yasutoshi Iriyama](#)

[4075Consecutive Phase Transition of Lattice Strain Controlled  \$LiFePO\_4\$  for High-Power Li-Ion Batteries](#)

[Rina Yamamoto, Takahiro Yoshinari, Yuki Orikasa, Motoaki Nishijima, Koji Ohira,](#)

[Shogo Esaki, Toshitsugu Sueki, Takuya Ootani, Yuichi Kamimura, Koji Ohara, Katsutoshi Fukuda, Yukinori Koyama, Zempachi Ogumi, Yoshiharu Uchimoto](#)

[4076CMOS-Based Amperometric Sensor Utilizing Redox-Cycling Technique for Selective Detection of Dopamine from PC12 Spheroids](#)

[Hiroya Abe, Kosuke Ino, Yusuke Kanno, Kumi Y. Inoue, Ryota Kunikata, Atsushi Suda, Masahki Matsudaira, Hitoshi Shiku, Tomokazu Matsue](#)

[4077Numerical Analysis of Vanadium Ion Crossover Phenomena in All-Vanadium Redox Flow Batteries Based on the Concentrated Solution Theory](#)

[Milad Moazzam, Kyeongmin Oh, Hyunchul Ju](#)

[4078Noncovalent Functionalization of Quinone Derivatives on 2D Graphene for High Performance Pseudocapacitive Electrodes](#)

[Muhammad Boota, Chi Chen, Matthieu Bécuwe, Ling Miao, Yury Gogotsi](#)

[4079Electrodeposition of ZnO from Acetate Bath for Thermoelectric Devices](#)

[Hinako Matsuo, Koichiro Yoshitoku, Daiki Furuyama, Mikiko Saito, Takayuki Homma](#)

[4080Electronic Conductivity Measurements for  \$\text{Li}\_x\text{Ni}\_{0.45}\text{Mn}\_{1.5}\text{Cr}\_{0.05}\text{O}\_4\$  \( \$0 < x < 2\$ \) Thin Films](#)

[Morihiro Sato, Munekazu Motoyama, Yasutoshi Iriyama](#)

[4081Influence of Cathode Catalyst Layer Structure on PEFC Performance Using Two-Dimensional Carbon Support for Pt Catalyst](#)

[Kazuhiro Kachi, Iori Shimada, Mitsumasa Osada, Nobuhide Takahashi, Hiroshi Fukunaga](#)

[4082The Effects of Adding Heteropolyacids to Phosphoric Acid Doped Polybenzimidazole for Enhanced Conductivity in High Temperature Fuel Cell Applications](#)

[Vinh Nguyen, Hans A. Hjuler, Thomas Steenberg, Andrew M Herring](#)

4083 [Nanostructured Microcantilevers for the Sensing of Volatile Organic Compounds](#)

[Ryan J. McNeilly, Karolyn M. Hansen](#)

4084 [Developing a Sensitive in-Situ Rotating Ring Disk Electrode \(RRDE\) Detection Method for Understanding the Deactivation of Cu Catalysts during CO<sub>2</sub> Electroreduction](#)

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

4085 [Optimization of Cathode Catalyst Layer of PEFC Using Silk-Derived Activated Carbon By 2-Step Mixing Method Introduction](#)

[Naofumi Anto, Kanshi Kushibiki, Iori Shimada, Mitsumasa Osada, Nobuhide Takahashi, Hiroshi Fukunaga](#)

4086 [Temperature Dependence of Effective Thickness of Ni-GDC Anode for SOFC](#)

[Hiroki Kikuchi, Hidehito Tamura, Iori Shimada, Mitsumasa Osada, Nobuhide Takahashi, Hiroshi Fukunaga](#)

4087 [Electrodeposition of Cumn from a Deep Eutectic Electrolyte](#)

[Pu-Wei Wu, Wei-Shen Chiang, Chia-Yun Hsu, Tsai-Wei Chung, Po-Chun Chen, Yezdi Dordi, Aniruddha Joi](#)

4088 [Atomic-Scale Mechanisms for Electrolyte Decomposition in Li-Ion Battery Cathodes](#)

[Mallory Fuhst, Donald J Siegel](#)

4089 [Analysis of Electrochemical Behavior of Carbon Nanomaterials Doped with Sulfur and Their Use As Support of Pt Nanoparticles](#)

[Elizabeth Montiel-Macias, Perla B Balbuena, Ana Maria Valenzuela-Muñiz, Ysmael Verde Gómez](#)

4090 [Acid Stable Bismuth Vanadate for Photo Electrochemical Chlorine Production](#)

[Alan Rassoolkhani, Wei Cheng, Kevin Nguyen, Graham Young, Scott Tentinger, Austin McKee, Monica Hemingway, Syed Mubeen](#)

4091 [Estimation of the Cathodic Overpotential for the Double Layer Structure in Pemfcs Using MD](#)

[Laura Elisa Nuñez Toledo, Rafael Esteban Ribadeneira Paz](#)

4092 [Dual Electrolyte Hybrid Supercapacitor Using Liquid-Liquid Interface](#)

[Hiyori Sakata, Sho Makino, Yusuke Ayato, Dai Mochizuki, Hirosuke Tatsumi, Wataru Sugimoto](#)

4093 [Novel Ir@Pt Core@Shell Nanoparticles As Catalysts for Ethanol Oxidation](#)

[Jachym Slaby, Sanaz Ketabi, Ehab El Sawy, Viola Birss](#)

4094 [Microscale Fuel Cells for Portable Power Applications](#)

[Kelly L Miller, Mary Beth Burbules, Scott C DeLaney, Adam S Hollinger](#)

4095 [Characterization of Proton-Conducting  \$Y\(CrO\_4\)\_{1-x}\(PO\_4\)\_x\$  As a Cathode Material of Proton-Conducting Ceramic Fuel Cells](#)

[Kosuke Kuroda, Yoshitaka Aoki, Chunyu Zhu, Hiroki Habazaki](#)

4096 [Characterization of Proton-Conducting Solid Oxide Electrolysis Cells Using High Valence State Manganate\(V\)  \$Ba\_3\(MnO\_4\)\_2\$  As an Oxygen Evolution Reaction Electrocatalyst](#)

[Taisei Kobayashi, Yoshitaka Aoki, Chunyu Zhu, Hiroki Habazaki](#)

4097 [Self-Standing All-Solid-State Lithium Battery Prepared By Electrochemical in-Situ Electrode Growth Method](#)

[Yu Sugiura, Munekazu Motoyama, Yasutoshi Iriyama](#)

[4098Preparation and Electrochemical Properties of Semi-Perfluoroalkyl Compounds in a Li-Ion Electrolyte Solution](#)

[Daiki Shimada, Yuuki Ando, Yuki Morita, Hiroaki Okamoto](#)

[4099Quasi-Solid-State Dye-Sensitized Solar Cell with Ionic Gel Electrolytes By Semifluorinated Alkoxy Benzene Derivative](#)

[Banpeng Cao, Yuta Kaneshige, Yuki Morita, Hiroaki Okamoto](#)

[4100500 Hour Investigation of Electroless Ni-Plated AISI 441 Steel for Solid Oxide Fuel Cell Interconnect Applications Under Operating Conditions](#)

[John Ryter, Roberta Amendola, Madisen McCleary, Paul Gannon, Wei-Ja Shong, Paolo Piccardo, Roberto Spotorno](#)

[4101Vertical Oxide Thin-Film Transistor with Solution-Processed Channel Define Layer](#)

[Seung Hee Lee, Hye-In Yeom, Joon Yong Choe, Chi-Sun Hwang, Sang-Hee Ko Park](#)

[4102Effect of Dispersion Methods on Oxygen Reduction and Ammonia Oxidation Reactions for Multiwall Carbon Nanotube Supported Pt](#)

[Yuya Harada, Kayato Ooya, Ryo Shirasaka, Hidenobu Shiroishi, Mikka Nishitani-Gamo, Keiji Nagai](#)

[4103Praseodymium Doped Ceria Oxygen Surface Exchange Coefficient and Film Stress Measurements Via the Curvature Relaxation Technique](#)

[Yuxi Ma, Jason D. Nicholas](#)

[4104Thin Layer Sonoelectrochemistry in Aqueous and Non-Aqueous Systems](#)

[Nadeesha Rathuwadu, Patrick Dey, Johna Leddy](#)

[4105Proton Conducting  \$ZrO\_2-1.6P\_2O\_5\$  Electrolyte Hybridized with  \$ZnO-2P\_2O\_5\$  for Intermediate Temperature Fuel Cells](#)



[Kiya Ogasawara, Hidenobu Shiroishi, Morihiro Saito, Yumi Tanaka](#)

4106 [Multi-Scale Modeling of Lithium-Ion Batteries](#)

[Geonhui Gwak, Hyunchul Ju](#)

4107 [Morphology in Porous Silicon Prepared from Si-Nanowires Grown By Electroless Etching](#)

[Victor H. Velez, Kalpathy B Sundaram](#)

4108 [Bipolar Membrane Fabrication for Hybrid Acid/Alkaline Fuel Cell Systems](#)

[John M. Ahlfield, Lisha Liu, Paul A Kohl](#)

4109 [Nanocrystalline  \$\text{Li}\_3\text{V}\_{1.9}\text{Al}\_{0.1}\(\text{PO}\_4\)\_3\$  / Multi-Walled Carbon Nanotubes Positive Electrode for Hybrid Supercapacitors](#)

[Naohisa Okita, Kazuaki Kisu, Taichi Fukami, Etsuro Iwama, Wako Naoi, Patrick Rozier, Patrice Simon, Katsuhiko Naoi](#)

4110 [Application of Phase Change Material to Increase Solar Panel Efficiency](#)

[Kyle Duane Rose, Mohan Aggarwal](#)

4111 [Development of New Task-Specific Ionic Liquids with an Epoxy Group](#)

[Kohei Kumagai, Kazuki Iwasaki, Hajime Matsumoto, Tetsuya Tsuda, Susumu Kuwabata](#)

4112 [Vertical Distribution of Ammonium Ion Concentration to the Air-Cathode of a Single-Chamber Microbial Fuel Cell](#)

[Ayuri Motoyama, Osamu Ichihashi, Kayako Hirooka](#)

4113 [Electrocatalytic Activity of Pt Nanoparticles Prepared in Biocompatible Ionic Liquids By Accelerated Electron Beam Irradiation](#)

[Tomoya Sasaki, Tetsuya Tsuda, Satoshi Seino, Susumu Kuwabata](#)

4114 [Effect of Surface Nanocrystallization on the Sensitization and Desensitization Behaviors of the Novel Super304H Stainless Steel](#)

[Rui Kun Wang](#)

4115 [2D Metal Carbide\( \$Ti\_3C\_2T\_x\$ \) Electrochemical Capacitors in Ionic Liquids](#)

[Mohamed Alhabeab, Katherine L Van Aken, Babak Anasori, Yury Gogotsi](#)

4116 [In-Situ Cross-Sectional SEM Observations of Li Plating and Stripping on Oxide-Based-Solid-State Electrolytes](#)

[Ryusuke Tsukamoto, Fumihiro Yonemoto, Munekazu Motoyama, Yasutoshi Iriyama](#)

## **Z02-Nanotechnology General Session**

4117 [Integrating Ultrafast Coherent Diffractive Imaging and Atomistic Simulations to Investigate Externally Stimulated Metallic Nanocrystals](#)

[Kiran Sasikumar, Mathew Cherukara, Jesse N Clark, Tom Peterka, Ross Harder, Subramanian K. R. S. Sankaranarayanan](#)

4118 [Bond Order Potential for Two-Dimensional Stanene to Probe Thermal Transport Using Molecular Dynamics Simulations](#)

[Badri Narayanan, Mathew Cherukara, Alper Kinaci, Kiran Sasikumar, Fatih G. Sen, Michael J. Davis, Stephen K. Gray, Maria K. Y. Chan, Ross Harder, Subramanian K. R. S. Sankaranarayanan](#)

4119 [First-Principles Study on Mechanical Strain and Defect in Materials](#)

[Minseok Choi](#)

4120 [Nanoparticle Dynamics in Room Temperature Ionic Liquids](#)

[Eden E L Tanner, Christopher Batchelor-McAuley, Richard G Compton](#)

[4121Antibacterial Property of Si Nanopillar Array Fabricated Using Metal Assisted Etching; Mimic a Cicada Wing](#)

[Takeshi Ito, Kazuki Nakade, Naoto Asai, Tomohiro Shimizu, Shoso Shingubara](#)

[4122Drug Delivery System Using Injectable Polymeric Sheets](#)

[Taro Kondo, Zhaleh Kashikouli Nezhad, Jin Suzuki, Nobuhiro Nagai, Matsuhiko Nishizawa, Toshiaki Abe, Hirokazu Kaji](#)

[4123Fullerene-Enhanced Photodegradation in Polymers](#)

[Kaan Kalkan, Linqi Zhang, Sriharsha Karumuri](#)

[412417.6%-Efficient Radial Junction Solar Cells Using Silicon Nano/Micro Hybrid Structure](#)

[Inchan Hwang, Kangmin Lee, Kwanyong Seo](#)

[4125Electrochemical Codeposition of TiO<sub>2</sub> Nanoparticles with Zinc](#)

[Magali Karina Camargo, Udo Schmidt, Andreas Bund](#)

[4126Best-Match Electrocatalysts from Homologous Ni<sub>x</sub>M<sub>y</sub> \(M=O, S, P\) Nanobelt Arrays in Overall Water Splitting](#)

[Wei Zhou, Jinlong Zheng, Lin Guo, Yuzhen Lv](#)

[4127Facile and Green Synthesis of Carbon-Supported Nanoparticle Catalysts By Physical Vapor Deposition on Soluble Powder Substrate](#)

[Injoon Jang, Hee-Young Park, Hyun-Seo Park, Jin Young Kim, Jong Hyun Jang, Hyoung-Juhn Kim, Yung-Eun Sung, Sung Jong Yoo](#)

[4128Peroxidase-Enhanced Photocatalytic Activity of Au-Cu<sub>2</sub>O Core-Shell Nanocrystals](#)

[Ming-Yu Kuo](#)

[4129 Atomistic Picture of the Catalytic Activity of Platinum Nanoparticles through Coherent Diffraction Imaging and Reactive Molecular Dynamics Simulations](#)

[Mathew Joseph Cherukara, Dongjin Kim, Wonsuk Cha, Hyunjung Kim, Badri Narayanan, Ross Harder, Subramanian K. R. S. Sankaranarayanan](#)

[4130 High Resolution TEM Study on Phase Transformations in Redox Active Silver Nanoparticles](#)

[Poonam Singh, Ray Carpenter, Daniel A Buttry](#)

[4131 from Bare Metals to Metal Oxides Nanoparticles and Hierarchical Supramolecular Metal Oxide Nanoparticle Network Assemblies](#)

[Engelbert Redel](#)

[4132 A Two-Dimensional Supramolecular Carpet with Widely Uniform Interfacial Structure](#)

[Ju-Hyung Kim, Maki Kawai, Jaehoon Jung, Takanori Fukushima, Yousoo Kim](#)

[4133 Controlled Formation of Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub>-C Hollow Hybrid Microspheres for an Improved Battery Performance in Lithium Ion Batteries](#)

[An-Min Cao, Li-Ping Yang](#)

[4134 In Situ Tuning of Magnetization Via Double Layer Charging and Topotactic Li Insertion in Polymer-Templated Mesostructured Thin Films](#)

[Christian Reitz, Torsten Brezesinski](#)

[4135 Fabrication and Characterization of Ag Doped CeO<sub>2</sub> Nanoparticles By a Hydrothermal Process](#)

[Dong Sik Bae](#)

[4136 Dry Reforming of Methane on Ni@SiO<sub>2</sub> Core-Shell Nanoparticles: Influence of Core-Shell Morphology on Catalytic Performance](#)

[Dong Sik Bae](#)

4137 [Comparative Study on Synthesis of CeO<sub>2</sub>-ZrO<sub>2</sub> Nanocrystalline Materials](#)

[Masakuni Ozawa](#)

4138 [Synthesis, Morphology Control and Deposition of CeO<sub>2</sub> Nanocrystals Toward Thin Film](#)

[Masakuni Ozawa, Takashi Hattori, Katsutoshi Kobayashi](#)

4139 [Electrochemical Characterization of Lithium-Oxygen Cells Employing a Bi-Functional Metal-Free Catalyst Composed of Dual-Doped Graphene and Mesoporous Carbon](#)

[Jae-Hong Kim, Aravindaraj G Kannan, Hyun-Sik Woo, Dong-Won Kim](#)

4140 [Synthesis of Ferromagnetic Cobalt Nanofibers By Electrospinning](#)

[Joseph Edward Kessler, Christopher Paul Ruge, Nataly Rosales Espitia, Nosang Vincent Myung](#)

4141 [Direct Evaluation about Structure and Optical Property of Individual Multi-Shell Quantum Dot By TEM](#)

[Masato Uehara, Yohei Sato, Masami Terauchi](#)

4142 [Formation of Nanoporous Electrode on Aligned CNT Films Using Dealloying](#)

[Mikiko Saito, Jun Mizuno, Michiko Kusunoki, Hiroshi Nishikawa](#)

4143 [Study about Electrostatic Deposition of CdTe Quantum Dots on Glassy Carbon Electrodes](#)

[Eduardo Carlo Muñoz, Emilio Alonso Navarrete, Víctor Rojas, Mario Romero, Rodrigo Gonzalo Henríquez, Ricardo Silvio Schrebler, Ricardo Alejandro Córdova](#)

[4144 Synthesis and Characterization of Gold Nanoparticles and Study of Their Interaction with Hydroxyl Radicals](#)

[Eduardo Carlo Muñoz, Renzo Milesi, Emilio Alonso Navarrete, Rodrigo Gonzalo Henríquez, Ricardo Silvio Schrebler](#)

[4145 Supported Heterogeneous Gold Nanoparticles As a Catalyst for the 4-Nitrophenol Hydrogenation Reaction](#)

[Tarek M Abdel-Fattah, Angelica Jusino](#)

[4146 Gold Nanoparticles Supported over Low-Cost Adsorbents for Hydrogen Generation from a Solid Hydrogen Feedstock](#)

[Tarek M Abdel-Fattah, Mitchell Horten, Justin Osborn](#)

[4147 Formation and Characterization of a Well-Packed Particulate Structure Consisted of Cu Nanoparticles By Capillary Force for Low Resistivity at Low Temperature](#)

[Shun Yokoyama, Kenichi Motomiya, Hideyuki Takahashi, Kazuyuki Tohji](#)

[4148 Growth Mechanism of Silver Nanowires By Polyol Process and Their Application for Transparent Conductive Thin Film](#)

[Hsun-Feng Hsu, Liang-Zheng Hong, Cheng-Fu Lin, Cheng-Han Lyu](#)

[4149 Hybrid Film Deposition for High-Aspect-Ratio Structures with Functional Surfaces](#)

[Jeong Hwan Kim, Seong Woong Lee, Jae-Sung Yoon, Yeong-Eun Yoo](#)

[4150 In Situ EC-TEM Studies of Hyper-Dendritic Zn Growth and Potential Cycling for Secondary Battery Applications](#)

[Jeung Hun Park, Tanya Gupta, Frances M Ross, Daniel A Steingart](#)

[4151 Enhanced Thermoelectric Properties in One-Dimensional Mg/Ge Nanostructures](#)

[Hsieh-Chang Lin, Ming-Xun Jiang, Cheng-Lun Hsin, Jeng-Kuei Chang, Sheng-Wei Lee](#)

[4152 Controlled Synthesis of BaTiO<sub>3</sub> Nanofibers for Enhanced Piezoelectric Properties](#)

[Paymon Shirazi, Christopher S. Anderson, Meghann C. Ma, Nosang Vincent Myung](#)

[4153 A Comparative Study of Anodic Aluminum Oxide Preparation for Synthesis of Nanomaterials](#)

[Agnieszka Brzózka, Anna Brudzisz, Grzegorz Dariusz Sulka](#)

[4154 Non-Plasma Based Atomic Layer Dry Removal Technology for 10nm Node and Beyond](#)

[Yongzhuo Su, Tomoki Suemasa, Aelan Mosden, Peter Biolsi](#)

[4155 Carbon Materials Converted from PIM-1](#)

[Byoung Gak Kim, Jun Woo Jeon, Young Jae Yoo, Yong Seok Kim](#)

[4156 H<sub>2</sub>TiO<sub>3</sub> Composite Nanofibers for Lithium Recovery from Spent Lithium-Ion Secondary Batteries](#)

[Wook-Jin Chung, Grace Masbate Nisola, Chosel Pepito Lawagon, Hana Gebreegziabher, Jed Albarico, Seong Poong Lee](#)

[4157 Development of Effective Extraction Process of Insoluble Sb Species in Urban Mine By Controlling the Metal Complexes Condition - Relationship Between the Local Structure of Sb in Urban Mine and the Condition of Sb Complexes in Sb-Tartaric Acid-OH Aqueous System -](#)

[Hideyuki Takahashi, Shunya Ueno, Shun Yokoyama, Kazuyuki Tohji](#)

[4158 A Study on Profile Control at Wafer Edge By CMP Head Separated Retainer Ring](#)

[Jinsu Yoo, Dongjun Lee, Hyunjoo Yoon, Joonbae Jeon, Kyoungwoo Kim, Hasub Hwang](#)

### **Z03-Electrochemical Energy Summit (E2S) - Poster Session**

[4159 Evaluation of HEV Batteries for Recycle~Investigation for Practical Use of the Low Capacity Retention Sorting Technology By Electrochemical Impedance Spectroscopy~](#)

[Daisuke Koba, Hiroki Nishi, Shinichiro Ito, Takeshi Yao, Daikichi Mukoyama, Hiroki Nara, Shingo Tsuda, Toshiyuki Momma, Tetsuya Osaka](#)

4160 [Influence of Nanopore Size on the Performance of Salinity Gradient Power](#)

[Shiojenn Tseng, Yu-Ming Li, Chih-Yuan Lin, J.P. Hsu](#)

4161 [Ionic Current Rectification in a Conical Nanopore: Influence of Salt](#)

[Shu-Tuan Yang, Chih-Yuan Lin, J.P. Hsu, Shiojenn Tseng](#)

4162 [Advanced Membrane Technologies to Enable Sustainable Energy](#)

[Andrew M Herring, Andrew R Motz, Himanshu N Sarode, Tara P Pandey, Ye Liu, Ashutosh Divekar, Vinh Nguyen, Mei-Chen Kuo, James L Horan](#)

4163 [Additional Voltage Loss to Explain an Equilibration Process in Response to a Change in the Anode Gas Using Sm-Doped Ceria Electrolytes](#)

[Tomofumi Miyashita](#)

4165 [Construction and Optimization of the Dye Sensitization Solar Cell Using a Au Particle and a Natural Vegetable Pigment](#)

[Masaharu Komatsu, Sei Shinkuma, Takayuki Sakakibara, Yuto Okaniwa, Takuya Kiyota](#)

4166 [Fabrication of Tin-Plated Three-Dimensional Copper Nanostructure Using Electroless Plating and Its Anode Performance in Lithium-Ion Battery](#)

[Tatsuya Itoh, Masahiro Shimizu, Susumu Arai](#)

4167 [Aerosol Synthesis of Mesoporous Carbon Spheres with High Electrochemical Double-Layer Capacitance](#)

[Byeong Ho Min, Kyeong Youl Jung](#)

4168 [Development of Lithium Ion Conducting Glass-Ceramics and Their Properties](#)



[Takashi Katoh, Kousuke Nakajima, Brion Hoffman](#)

[4169 Characteristics of  \$\text{Sr}\_x\text{Y}\_{1-x}\text{Ti}\_y\text{Ni}\_{1-y}\text{O}\_{3-d}\$  anode in Humidified Methane Fuel for Intermediate-Temperature Solid Oxide Fuel Cells](#)

[Jeong Woo Yun, Eun Kyung Park](#)

[4170 Electrochemistry Modeling for Energy Conversion and Storage](#)

[Chris Lueth](#)

[4171 Electrochemical and Impedance Investigation of Ni-Rich  \$\text{LiNi}\_{1-x-y}\text{Co}\_x\text{Al}\_y\text{O}\_2\$  Cathode Material for Lithium-Ion Batteries](#)

[En Mei Jin, Min Woo Lee, Sang Mun Jeong](#)

[4172 Estimation Technology of Residual Life of HEV Batteries Using Electrochemical Impedance Spectroscopy](#)

[Shinichiro Ito, Daisuke Koba, Hiroki Nishi, Takeshi Yao, Daikichi Mukoyama, Hiroki Nara, Shingo Tsuda, Toshiyuki Momma, Tetsuya Osaka](#)

[4173 Electrospun Polyimide Based Composite Fibrous Separator with High Heat Resistance for Lithium Ion Batteries](#)

[Seong Mu Jo, Han-Ik Joh, Sungho Lee](#)

[4174 Development of Community Energy Management System \(CEMS\) to Introduce Next Generation Secondary-Batteries into Market](#)

[Tetsuya Osaka, Atsushi Sugiyama, Tokihiko Yokoshima, Hiroki Nara, Daikichi Mukoyama, Hitoshi Mikuriya, Moongook Jeong, Toshiyuki Momma, Yasuro Mori](#)

[4175 The Effect of the Amount of Intercalated Li-Ions on the Electrochemical Performances and the Color Changes in the Electrochromic Layer](#)

[Taeyeong Han, Hoogil Lee, Seokwoo Kim, Myung-Hyun Ryou, Yong Min Lee](#)

4176[Hydrogen Trap in Seashells](#)

[Yoshimine Kato, Hirotsugu Tsuchida, Kent Dohara, Masatoshi Aramaki, Osamu Furukimi](#)

4177[Crystalline Cd<sub>3</sub>As<sub>2</sub>](#)

[Nikolai Kouklin, Tahereh Hosseini, Niloufar Yavarishad](#)

4178[The Importance of Renewable Hydrogen in Decarbonization](#)

[Katherine E Ayers, Nemanja Danilovic](#)

## **Z04-Electrochemical Energy Summit (E2S): Recent Progress in Renewable Energy Generation, Distribution, and Storage**

4164[\(Keynote\) Japan's Policy and Activity on Hydrogen Energy](#)

[Eiji Ohira](#)

4181[\(Keynote\) DOE's Efforts to Accelerate Federally-Funded Technology to the Marketplace](#)

[Robert K. Dixon](#)

4182[\(Keynote\) Recent Trend in New and Renewable Energy Generation in Korea and KIER's R&D Activities](#)

[Won-Yong Lee](#)

## **Z05-Late Poster Session**

4183[Inductive Loops in Impedance Spectra of Polarized SrTiO<sub>3</sub> Thin Films: A Trace of Oxide Ion Motion Rather than an Experimental Artefact](#)

[Juergen Fleig, Stefanie Taibl, Guenter Fafilek](#)

4184[Solid Oxide Photo-electrochemistry with Oxides "Breathing" upon UV Light and Solar Cells Operating at 400°C](#)

Juergen Fleig, Gregor Walch, Alexander Karl Opitz, Markus Kubicek, Georg Christoph Brunauer, Bernhard Rotter, Karl Ponweiser

4185 Investigating the Effect of Chlorides on the Reaction Kinetics of a Copper Electrodeposition Process

Ritesh Vyas, Michael Kubicko

4186 Electrochemical Detection of Low-Concentration Ammonia Gas on Miniaturised Electrodes in Room Temperature Ionic Liquids

Ghulam Hussain, Debbie S. Silvester

4187 Design and Fabrication of an Ultrasonic Waveguide for Microchip Cooling Applications

Hyunse Kim, Euisu Lim

4188 Visual Detection of Denatured Ferritin via Plasmonic Gold Nanoparticle Exposure through an Aminosilane

Monique Farrell, R. Reaume, D. Franklins, Erin Jenrette, Jasmin Flowers, Aswini K Pradhan

N/A High-Rate Supercapacitors with Mesoporous Carbons for AC Line Filtering

Yongju Yoo, Woong Kim

N/A Mesoporous Materials

Duc Tai Dam, Jong-Min Lee

4191 Ceramic Polymer Composite Electrolytes (CPCE) for Wearable Metal Battery

Brian E Henslee, Jitendra Kumar, Priyanka Bhattacharya, Guru Subramanyam