

ПН  
E 43/S

VOL. 160, NO. 6, 2013



**JES**  
JOURNAL OF THE ELECTROCHEMICAL SOCIETY



## Table of Contents

### Batteries and Energy Storage

#### Correlating Microstructure and Activity for Polysulfide Reduction and Oxidation at WS<sub>2</sub> Electrocatalysts

*Ifan E. L. Stephens, Caterina Ducati, Derek J. Fray . . . . . A757*

#### A Heat-Resistant Silica Nanoparticle Enhanced Polysulfonamide Nonwoven Separator for High-Performance Lithium Ion Battery

*Jianjun Zhang, Liping Yue, Qingshan Kong, Zhihong Liu, Xinhong Zhou, Chuanjian Zhang, Shuping Pang, Xuejiang Wang, Jianhua Yao, Guanglei Cui . . . . . A769*

#### Thermal Characterization of LiNi<sub>0.8</sub>Co<sub>0.15</sub>Al<sub>0.05</sub>O<sub>2</sub>/Graphite Battery

*Thanh-Ha Tran, Souad Harmand, Bernard Desmet, Frederic Pailhous . . . . . A775*

#### Study on Cycling Performance and Electrochemical Stability of 1-Hexyl-3-methylimidazolium Bis(trifluoromethanesulfonyl)imide Assembled with Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> and LiFePO<sub>4</sub> at 333 K

*Hassan Srour, Hélène Rouault, Catherine C. Santini . . . . . A781*

#### Reversible Oxygen Participation to the Redox Processes Revealed for Li<sub>1.20</sub>Mn<sub>0.54</sub>Co<sub>0.13</sub>Ni<sub>0.13</sub>O<sub>2</sub>

*Hideyuki Koga, Laurence Croguennec, Michel Ménétrier, Kaïs Douhil, Stéphanie Belin, Lydie Bourgeois, Emmanuelle Suard, François Weill, Claude Delmas . . . . . A786*

#### Failure Investigation of LiFePO<sub>4</sub> Cells in Over-Discharge Conditions

*Hao He, Yadong Liu, Qi Liu, Zhefei Li, Fan Xu, Clif Dun, Yang Ren, Mei-xian Wang, Jian Xie . . . . . A793*

#### Sulfur-Polypyrrole/Graphene Multi-Composites as Cathode for Lithium-Sulfur Battery

*Wei Wang, Guo-chun Li, Qing Wang, Guo-ran Li, Shi-hai Ye, Xue-ping Gao . . . . . A805*

#### Algorithmic Improvements and PDE Decoupling, for the Simulation of Porous Electrode Cells

*Jan N. Reimers . . . . . A811*

#### High Rate Performance, Wide Temperature Operation and Long Cyclability of All-Solid-State Rechargeable Lithium Batteries Using Mo-S Chevrel-Phase Compound

*Motohiro Nagao, Hirokazu Kitaura, Akitoshi Hayashi, Masahiro Tatsumisago . . . . . A819*

#### Thermal Stability of Li<sub>2</sub>O<sub>2</sub> and Li<sub>2</sub>O for Li-Air Batteries: In Situ XRD and XPS Studies

*Koffi P. C. Yao, David G. Kwabi, Ronald A. Quinlan, Azzam N. Mansour, Alexis Grimaud, Yueh-Lin Lee, Yi-Chun Lu, Yang Shao-Horn . . . . . A824*

#### Graphene-Sandwiched LiNi<sub>0.5</sub>Mn<sub>1.5</sub>O<sub>4</sub> Cathode Composites for Enhanced High Voltage Performance in Li Ion Batteries

*S. J. Richard Prabakar, Yun-Hwa Hwang, Bichna Lee, Kee-Sun Sohn, MyoungHo Pyo . . . . . A832*

#### Electrolyte Formulations Based on Dinitrile Solvents for High Voltage Li-Ion Batteries

*Hugues Duncan, Nuha Salem, Yaser Abu-Lebdeh . . . . . A838*

#### Conductive Polymer Binder-Enabled Cycling of Pure Tin Nanoparticle Composite Anode Electrodes for a Lithium-Ion Battery

*Shidi Xun, Xiangyun Song, Vincent Battaglia, Gao Liu . . . . . A849*

#### Development of a Regenerative Hydrogen-Vanadium Fuel Cell for Energy Storage Applications

*V. Yufit, B. Hale, M. Matian, P. Mazur, N. P. Brandon . . . . . A856*

#### In Situ Spectroscopic Measurements of Individual Cation and Anion Dynamics in a RuO<sub>2</sub> Electrochemical Capacitor

*Francis W. Richey, Yossef A. Elabd . . . . . A862*

#### Sodium Insertion into Tin Cobalt Carbon Active/Inactive Nanocomposite

*L. D. Ellis, P. P. Ferguson, M. N. Obrovac . . . . . A869*

#### Effect of Fluoroethylene Carbonate on Electrochemical Performances of Lithium Electrodes and Lithium-Sulfur Batteries

*Ju-Hye Song, Jin-Tak Yeon, Jun-Yeong Jang, Jung-Gu Han, Sang-Min Lee, Nam-Soon Choi . . . . . A873*

**Electrochemical Study and Material Characterization of  $x\text{SiO} \cdot (1-x)\text{Sn}_{30}\text{Co}_{30}\text{C}_{40}$  Composite Anode Material for Lithium-Ion Batteries**

*Bo Liu, Ali Abouimrane, Yang Ren, Jörg Neufeind, Zhigang Z. Fang, Khalil Amine* ..... A882

**Surface Coverage and SEI Induced Electrochemical Surface Stress Changes during Li Deposition in a Model System for Li-Ion Battery Anodes**

*Hadi Tavassol, Maria K. Y. Chan, Maria G. Catarello, Jeffery Greeley, David G. Cahill, Andrew A. Gewirth* ..... A888

**Electrochemical Sodium Ion Intercalation Properties of  $\text{Na}_{2.7}\text{Ru}_4\text{O}_9$  in Nonaqueous and Aqueous Electrolytes**

*Young Hwa Jung, Seung-Tae Hong, Do Kyung Kim* ..... A897

**Understanding the Effects of Cationic and Anionic Substitutions in Spinel Cathodes of Lithium-Ion Batteries**

*A. Gutierrez, A. Manthiram* ..... A901

**Roles of Oxygen and Interfacial Stabilization in Enhancing the Cycling Ability of Silicon Oxide Anodes for Rechargeable Lithium Batteries**

*Cao Cuong Nguyen, Hyun Choi, Seung-Wan Song* ..... A906

**The Roles of  $\text{V}_2\text{O}_5$  and Stainless Steel in Rechargeable Al-Ion Batteries**

*Luke D. Reed, Erik Menke* ..... A915

**High Performance  $\text{LiMn}_{1-x}\text{Fe}_x\text{PO}_4$  ( $0 \leq x \leq 1$ ) Synthesized via a Facile Polymer-Assisted Mechanical Activation**

*P. F. Xiao, B. Ding, M. O. Lai, L. Lu* ..... A918

**First-Principles Investigations on the  $\text{Na}_2\text{MnPO}_4\text{F}$  as a Cathode Material for Na-Ion Batteries**

*Y. Zheng, P. Zhang, S. Q. Wu, Y. H. Wen, Z. Z. Zhu, Y. Yang* ..... A927

**Development of High Capacity Cathode Material for Sodium Ion Batteries  $\text{Na}_{0.95}\text{Li}_{0.15}(\text{Ni}_{0.15}\text{Mn}_{0.55}\text{Co}_{0.1})\text{O}_2$**

*Riki Kataoka, Takashi Mukai, Akihiro Yoshizawa, Tetsuo Sakai* ..... A933

**Structural and Electrochemical Characterization of Vanadium-Doped  $\text{LiFePO}_4$  Cathodes for Lithium-Ion Batteries**

*Arianna Moretti, Gabriele Giuli, Francesco Nobili, Angela Trapananti, Giuliana Aquilanti, Roberto Tossici, Roberto Marassi* ..... A940

**Electrochemical Characterization of Lithium and Manganese Rich Composite Material for Lithium Ion Batteries**

*Wenquan Lu, Qingliu Wu, Dennis W. Dees* ..... A950

**Stochastic Analysis of Diffusion Induced Damage in Lithium-Ion Battery Electrodes**

*Pallab Barai, Partha P. Mukherjee* ..... A955

**Molecular Dynamics Simulations of SOC-Dependent Elasticity of  $\text{Li}_x\text{Mn}_2\text{O}_4$  Spinels in Li-Ion Batteries**

*Seungjun Lee, Jonghyun Park, Ann Marie Sastry, Wei Lu* ..... A968

**Analysis of the Oxidation of the V(II) by Dissolved Oxygen Using UV-Visible Spectrophotometry in a Vanadium Redox Flow Battery**

*Nak Heon Choi, Soon-kwan Kwon, Hansung Kim* ..... A973

**Preparation and Electrode Performance of Fiber-Type Cu-Sn Negative Electrode for Li-Ion Battery**

*Jinhan Yao, Tomoaki Takasaki, Kazuya Nishimura, Takashi Mukai, Tetsuo Sakai* ..... A980

**Experimental Study on Specific Heat Capacity of Lithium Thionyl Chloride Batteries by a Precise Measurement Method**

*Guangfeng Yu, Xingjuan Zhang, Chao Wang, Wenwei Zhang, Chunxin Yang* ..... A985

**Modeling the Thermal Behaviors of a Lithium-Ion Battery during Constant-Power Discharge and Charge Operations**

*Ui Seong Kim, Jaeshin Yi, Chee Burm Shin, Taeyoung Han, Seongyong Park* ..... A990

**Sulfur Cathodes with Carbon Current Collector for Li-S cells**

*M. Hagen, G. Feisthammel, P. Fanz, H. T. Grossmann, S. Dörfler, J. Tübke, M. J. Hoffmann, D. Börner, M. Joos, H. Althues, S. Kaskel* ..... A996

---

**Chemical and Biological Sensors**

---

**Electroanalytical Determination of Disperse Red-13 in Wastewaters**

*Bahram Mokhtari, Kobra Pourabdollah* ..... B67

**Inorganic-Organic Composite Matrix for the Enzymatic Detection of Phosphate in Food Samples**

*R. Karthikeyan, Sheela Berchmans* ..... B73

**ZnO/Silicon Nanowire Hybrids Extended-Gate Field-Effect Transistors as pH Sensors**

*Bohr-Ran Huang, Jun-Cheng Lin, Ying-Kan Yang* ..... B78

**Methane Recognition and Quantification by Differential Capacitance at the Hydrophobic Ionic Liquid-Electrified Metal Electrode Interface**

*Zhe Wang, Xiaoyi Mu, Min Guo, Yue Huang, Andrew J. Mason, Xiangqun Zeng* ..... B83

---

**Corrosion Science and Technology**

---

**Preparation and Corrosion Resistance Property of Molybdate Conversion Coatings Containing SiO<sub>2</sub> Nanoparticles**

*Yingwu Yao, You Zhou, Chunmei Zhao, Yuxiang Han, Chunxia Zhao* ..... C185

**Oxide Film Growth Kinetics on Metals and Alloys****I. Physical Model**

*Antoine Seyeux, Vincent Maurice, Philippe Marcus* ..... C189

**Oxide Film Growth Kinetics on Metals and Alloys****II. Numerical Simulation of Transient Behavior**

*Kirsten Leistner, Charles Toulemonde, Boubakar Diawara, Antoine Seyeux, Philippe Marcus* ..... C197

**Electrochemical Corrosion Behavior of Orthopedic Biomaterials in Presence of Human Serum Albumin**

*Shima Karimi, A. M. Alfantazi* ..... C206

**Dielectric Properties of Materials Showing Constant-Phase-Element (CPE) Impedance Response**

*Mark E. Orazem, Isabelle Frateur, Bernard Tribollet, Vincent Vivier, Sabrina Marcelin, Nadine Pébère, Annette L. Bunge, Erick A. White, Douglas P. Riemer, Marco Musiani* ..... C215

**Mechanisms and Morphology Evolution in Dealloying**

*Qing Chen, Karl Sieradzki* ..... C226

**Nanoscale Morphology and Atomic Structure of Passive Films on Stainless Steel**

*Toni Massoud, Vincent Maurice, Lorena H. Klein, Philippe Marcus* ..... C232

**Growth and Crystallization of Titanium Oxide Films at Different Anodization Modes**

*Jun-Heng Xing, Zheng-Bin Xia, Jian-Feng Hu, Yan-Hong Zhang, Li Zhong* ..... C239

**Effect of Counter-ion and Solvent on the Morphology and Barrier Layer Properties****of Nanoporous/Nanotubular TiO<sub>2</sub> Films Grown by Anodization in Fluoride Containing Media**

*Próspero Acevedo-Peña, Donato Valdez-Pérez, Ignacio González* ..... C247

**Anodic Behavior and Corrosion Resistance of the Pb-MnO<sub>2</sub> Composite Anodes for Metal Electrowinning**

*Maysam Mohammadi, Akram Alfantazi* ..... C253

**The Role of Oxide Films on TiS and Ti<sub>4</sub>C<sub>2</sub>S<sub>2</sub> Inclusions in the Pitting Corrosion Resistance of Stainless Steels**

*Naoya Shimahashi, Izumi Muto, Yu Sugawara, Nobuyoshi Hara* ..... C262

**Alkanethiols as Inhibitors for the Atmospheric Corrosion of Copper Induced by Formic Acid: Effect of Chain Length**

*Saman Hosseinpour, C. Magnus Johnson, Christofer Leygraf* ..... C270

**Ti Anodization in Alkaline Electrolyte: The Relationship between Transport of Defects, Film Hydration and Composition**

*Próspero Acevedo-Peña, Jorge Vazquez-Arenas, Román Cabrera-Sierra, Luis Lartundo-Rojas, Ignacio González* ..... C277

**Re-Anodizing Technique as a Method of Investigation of Thermally Activated Defects in Anodic Alumina Films**

*Igor A. Vrublevsky, Arunas I. Jagminas, Katsiaryna V. Chernyakova* ..... C285

**Effect of pH on the Barrier Layer of TiO<sub>2</sub> Nanoporous Films Potentiostatically Grown in Aqueous Media Containing Fluoride Ions**

*Próspero Acevedo-Peña, L. Lartundo-Rojas, Ignacio González* ..... C291

---

**Electrochemical/Electroless Deposition**

---

**Modulation of Crystallographic Texture and Twinning Structure of Cu Nanowires by Electrodeposition**

*Chien-Neng Liao, Yi-Cang Lu, Di Xu* ..... D207

**Anodic Electro Deposition of CeO<sub>2</sub> and Co-Doped CeO<sub>2</sub> Thin Films**

*M. Santamaria, L. Asaro, P. Bocchetta, B. Megna, F. Di Quarto* ..... D212

**Highly Uniform 2D Growth, Substrate Transfer, and Electrical Characterization of Electrodeposited ZnO Thin Films**

*M. A. Thomas, J. B. Cui* ..... D218

**Stress and Strain Evolution in Electroless Copper Films Evaluated with X-ray Diffraction and Substrate Curvature**

*Tanu Sharma, Ralf Brüning, Colby Brown, Allison Sibley, Johannes Eitzkorn, Lutz Stamp* ..... D226

**Electroless Deposition of Highly Solderable Fe-Ni Films**

*Haifei Zhou, Jingdong Guo, Jianku Shang* ..... D233

**Synthesis of Laminated Alumina Films by AC Oxidation**

*Hiroyo Segawa, Hironaga Okano, Kenji Wada, Satoru Inoue, Ikjoo Byun* ..... D240

**Co-Reduction of Electrochemically Active  $[\text{Co}(\text{H}_2\text{O})_6]^{2+}$  and  $[\text{CoCl}(\text{H}_2\text{O})_5]^+$  Complexes onto Gold Electrode**  
*K. Mech, P. Žabiński, R. Kowalik . . . . . D246*

**Electrodeposition of Lead from 1-butyl-1-methylpyrrolidinium Bis(trifluoromethylsulfonyl)amide Ionic Liquid**  
*Yasushi Katayama, Ryuta Fukui, Takashi Miura . . . . . D251*

**Correlation between Filled Via and Produced Cuprous Ion Concentration by Reverse Current Waveform**  
*Taro Hayashi, Kazuo Kondo, Takeyasu Saito, Naoki Okamoto, Masayuki Yokoi, Minoru Takeuchi, Masaru Bunya, Masao Marunaka, Takayuki Tsuchiya . . . . . D256*

**Pore Propagation Directions and Nanoporous Domain Shape in n-InP Anodized in KOH**  
*Robert P. Lynch, Colm O'Dwyer, Nathan Quill, Shohei Nakahara, Simon B. Newcomb, D. Noel Buckley . . . . . D260*

**The Effect of Fe(III)/Fe(II) Redox Couple on Nucleus Density during Cu Electrodeposition Process**  
*Feng Qiao, Brendan B. O'Brien, Kathleen A. Dunn, Alan C. West . . . . . D271*

**The Potentiostatic Electrodeposition of Gold Nanowire/Nanotube in  $\text{HAuCl}_4$  Solutions Based on the Model of Recessed Cylindrical Ultramicroelectrode Array**  
*M. Bagheri Hariri, A. Dolati, R. Siavash Moakhar . . . . . D279*

**An Investigation on Polyethyleneimine and Saccharin on Controllable Electro-Healing Cracks in Nickel**  
*X. G. Zheng, Y.-N. Shi, K. Lu . . . . . D289*

---

## Electrochemical Engineering

---

**Ball-Milled (Cu-Ni-Fe +  $\text{Fe}_2\text{O}_3$ ) Composite as Inert Anode for Aluminum Electrolysis**  
*S. Helle, B. Davis, D. Guay, L. Roué . . . . . E55*

**Studies of the Surface Reaction Mechanisms of Pb-3 wt%Sn-0.5 wt% Ag Anode in  $\text{CrO}_3$  Solutions**  
*Jianzhong Li, Xiuli Sun, Yanwen Tian, Yue Zhao . . . . . E60*

---

## Fuel Cells, Electrolyzers, and Energy Conversion

---

**Effect of Channel Material on Water Droplet Dynamics in a PEMFC Gas Channel**  
*Preethi Gopalan, Satish G. Kandlikar . . . . . F487*

**In-Situ Temperature Measurement on Cathode GDL in a PEMFC Using an Optical Fiber Temperature Sensor**  
*K. Inman, X. Wang . . . . . F496*

**Titanium Nitride Nanoparticle Electrocatalysts for Oxygen Reduction Reaction in Alkaline Solution**  
*Ryohji Ohnishi, Masao Katayama, Dongkyu Cha, Kazuhiro Takanabe, Jun Kubota, Kazunari Domen . . . . . F501*

**Effects of Pyrrole Polymerizing Oxidant on the Properties of Pyrolysed Carbon-Supported Cobalt-Polypyrrole as Electrocatalysts for Oxygen Reduction Reaction**  
*Hao-Dong Sha, Xianxia Yuan, Xin-Xin Hu, He Lin, Wen Wen, Zi-Feng Ma . . . . . F507*

**An Experimental Study of Polymer Electrolyte Fuel Cell Operation at Sub-Freezing Temperatures**  
*Jeffrey Mishler, Yun Wang, Roger Lujan, Rangachary Mukundan, Rodney L. Borup . . . . . F514*

**Tutorial on the Fundamental Characteristics and Practical Properties of Nanostructured Thin Film (NSTF) Catalysts**  
*Mark K. Debe . . . . . F522*

**A 1D Mathematical Model of a  $\text{H}_2/\text{Br}_2$  Fuel Cell**  
*Venkata Yarlagadda, Trung Van Nguyen . . . . . F535*

**Density Functional Study of the Structure, Stability and Oxygen Reduction Activity of Ultrathin Platinum Nanowires**  
*I. Matanović, P. R. C. Kent, F. H. Garzon, N. J. Henson . . . . . F548*

**Oxygen Transport Kinetics in Infiltrated SOFCs Cathode by Electrical Conductivity Relaxation Technique**  
*Yihong Li, Kirk Gerdes, Xingbo Liu . . . . . F554*

**Effects of Plasma-Sprayed  $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3$  Coating on Thermally Grown Oxide Scale and Electrical Conductivity of Fe-Cr Interconnect for SOFCs**  
*Kyeong Ho Baik . . . . . F560*

**Enhanced Electrochemical Activity of Pt Supported on Three-Dimensional  $\text{WO}_3 \cdot 0.33\text{H}_2\text{O}$  Networks for Methanol and Ethanol Oxidation**  
*Xiaoyu He, Chenguo Hu, Qianning Yi, Xue Wang, Hao Hua, Xiaoyan Li . . . . . F566*

**Poly(arylene ether) Ionomers with Pendant Quinuclidium Groups and Varying Molecular Weight for Alkaline Electrodes**  
*Junfeng Zhou, Krishna Joseph, John M. Ahlfield, Doh-Yeon Park, Paul A. Kohl . . . . . F573*

**Influence of Ni–Oxide Anode Thickness on Performance Stability in Internal Reforming of Methane for Solid Oxide Fuel Cells**

*Yi-Hsuan Lee, Hirofumi Sumi, Hiroki Muroyama, Toshiaki Matsui, Koichi Eguchi . . . . . F579*

**Considerable Hydrogen Permeation Behavior through a Dense  $\text{Ce}_{0.8}\text{Sm}_{0.2}\text{O}_{2-\delta}$  (SDC) Asymmetric Thick Film**

*Wenping Sun, Zhen Shi, Wei Liu . . . . . F585*

**Structure and Electrochemical Stability of Pt-Enriched Ni/Pt(111) Topmost Surface Prepared by Molecular Beam Epitaxy**

*Naoto Todoroki, Yuki Iijima, Ryota Takahashi, Yu Asakimori, Toshimasa Wadayama . . . . . F591*

**Proton-Conducting Solid Oxide Fuel Cells with Yttrium-Doped Barium Zirconate for Direct Methane Operation**

*Hiroyuki Shimada, Xinyu Li, Akifusa Hagiwara, Manabu Ihara . . . . . F597*

**Probing Degradation by IL-TEM: The Influence of Stress Test Conditions on the Degradation Mechanism**

*Alessandro Zana, Jozsef Speder, Melanie Roefzaad, Lena Altmann, Marcus Bäumer, Matthias Arenz . . . . . F608*

**Electrochemical Measurement of the Oxygen Permeation Rate through Polymer Electrolyte Membranes**

*Jingxin Zhang, Hubert A. Gasteiger, Wenbin Gu . . . . . F616*

**Conductivity Relaxation in Mixed Perovskite-Type Oxide  $\text{Ba}_3\text{Ca}_{1.18}\text{Nb}_{1.82}\text{O}_{8.73}$  upon Oxidation/Reduction and Hydration/Dehydration**

*Dae-Kwang Lim, Bhupendra Singh, Sang-Yun Jeon, Sun-Ju Song . . . . . F623*

**Effect of Chromium on  $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$  Solid Oxide Fuel Cell Cathodes**

*Soo-Na Lee, Alan Atkinson, John A. Kilner . . . . . F629*

**Oscillation of PEFC under Low Cathode Humidification: Effect of Gravitation and Bipolar Plate Design**

*Daniel G. Sanchez, Alfredo Ortiz, K. Andreas Friedrich . . . F636*

**Investigation of Carbon Corrosion Behavior and Kinetics in Proton Exchange Membrane Fuel Cell Cathode Electrodes**

*Paul T. Yu, Zhongyi Liu, Rohit Makharia . . . . . F645*

**Poisoning Effect of Selected Hydrocarbon Impurities on the Catalytic Performance of Pt/C Catalysts towards the Oxygen Reduction Reaction**

*Mohamed S. El-Deab, Fusao Kitamura, Takeo Ohsaka . . . F651*

**Characterizing Local  $\text{O}_2$  Diffusive Losses in GDLs of PEFCs Using Simplified Flow Field Patterns (“2D”, “1D”, “0D”)**

*P. Oberholzer, P. Boillat, A. Kaestner, E. H. Lehmann, G. G. Scherer, T. J. Schmidt, A. Wokaun . . . . . F659*

**Investigation of the ORR Using the Double-Trap Intrinsic Kinetic Model**

*M. Moore, A. Putz, M. Secanell . . . . . F670*

**Effect of Boron Deposition and Poisoning on the Surface Exchange Properties of LSCF Electrode Materials of Solid Oxide Fuel Cells**

*Ling Zhao, Junji Hyodo, Kongfa Chen, Na Ai, Sudath Amarasinghe, Tatsumi Ishihara, San Ping Jiang . . . F682*

**Microscopic Investigation of Platinum Deposition in PEMFC Cross-Sections Using AFM and SEM**

*Stefan Helmly, Renate Hiesgen, Tobias Morawietz, Xiao-Zi Yuan, Haijiang Wang, K. Andreas Friedrich . . . . . F687*

**Kinetics of Carbon Monoxide Electro-Oxidation in Solid-Oxide Fuel Cells from Ni-YSZ Patterned-Anode Measurements**

*J. Hanna, W. Y. Lee, A. F Ghoniem . . . . . F698*

**Simulation of Solid Oxide Fuel Cell Anode Microstructure Evolution Using Phase Field Method**

*Zhenjun Jiao, Naoki Shikazono . . . . . F709*

**Oxygen Evolution during Water Electrolysis from Thin Films Using Bimetallic Oxides of Ir-Pt and Ir-Ru**

*Justin M. Roller, M. Josefina Arellano-Jiménez, Rishabh Jain, Haoran Yu, C. Barry Carter, Radenka Maric . . . . . F716*

---

**Organic and Bioelectrochemistry**

---

**Designing Thin Films of Redox Hydrogel for Highly Efficient Enzymatic Anodes**

*Emmanuel Suraniti, Solange Vivès, Seiya Tsujimura, Nicolas Mano . . . . . G79*

**Electrochemical Synthesis and Properties of Poly(azure B)**

*Chao Shen-Tu, Zhong Liu, Yong Kong, Chao Yao, Yongxin Tao . . . . . G83*

**Electrochemical Synthesis of Functional Organosilanes II: Direct Electrochemical Formation of Si-C Bonds**

*Christa Grogger, Bernhard Loidl, Harald Stueger, Thomas Kammel, Bernd Pachaly . . . . . G88*

---

**Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry**

---

**Cyclic Voltammetric Diagnostics for Inert, Uniform Density Films**

Krysti L. Knoche, Chaminda Hettige, Paul D. Moberg, Sudath Amarasinghe, Johna Leddy ..... H285

**NO<sub>x</sub> Reduction on Ag Electrochemical Cells with a K-Pt-Al<sub>2</sub>O<sub>3</sub> Adsorption Layer**

Jing Shao, Kent Kammer Hansen ..... H294

**Kinetic Study of Oxygen Reduction Reaction on Carbon Supported Pd-Based Nanomaterials in Alkaline Medium**

D. Diabaté, T. W. Napporn, K. Servat, A. Habrioux, S. Arrii-Clacens, A. Trokourey, K. B. Kokoh ..... H302

**Effects of the Interaction between Ionic Liquids and Redox Couples on Their Reaction Entropies**

Yoshinori Yamato, Yasushi Katayama, Takashi Miura ..... H309

**Effect of Redox Mediator on the Photo-Induced Current of a Photosystem I Modified Electrode**

Gongping Chen, Gabriel LeBlanc, G. Kane Jennings, David E. Cliffel ..... H315

**Preparation of Chitosan-Based Activated Carbon and Its Electrochemical Performance for EDLC**

Yonghui Hu, Haibo Wang, Lufeng Yang, Xiangrong Liu, Bin Zhang, Yingliang Liu, Yong Xiao, Mingtao Zheng, Bingfu Lei, Haoran Zhang, Honggang Fu ..... H321

**Electrocatalytic Oxidation of Ascorbic Acid on Quaternized Carbon Nanotubes/Ionic Liquid-Polyaniline Composite Film Modified Glassy Carbon Electrode**

Lingling Xi, Zuoyi Zhu, Fengli Wang ..... H327

**A One-Step Electrochemical Method for the Production of TiO<sub>2-x</sub>N<sub>x</sub> Nanotubes**

Xi-ying Zhou, Jiajia Shao, Bin Wan ..... H335

**Redox-Magneto-hydrodynamics for Microfluidic Control: Remote from Active Electrodes and Their Diffusion Layers**

Preston G. Scrape, Matthew D. Gerner, Melissa C. Weston, Ingrid Fritsch ..... H338

**Electrochemical and Mass Change Study of the Growth of Poly-(o-Phenylenediamine) Films on Au Substrates**

Samar A. Gharaibeh, Ehab N. El Sawy, Hebert Molero, Viola I. Birss ..... H344

**Tris(4,4'-di-*t*-butyl-2,2'-bipyridine)cobalt: Cation Effects on the Voltammetry at ITO and on Mediator Performance in Dye Sensitized Solar Cells**

Di Xue, Lance N. Ashbrook, Ross S. Gaddie, C. Michael Elliott ..... H355

**Electrochemical Characteristics of Closely Spaced Defect Tuned Carbon Nanotube Arrays**

M. Hoefler, P. Bandaru ..... H360

**Comparative Impedance Study of Cd(0001) Electrode in EMImBF<sub>4</sub> and KI Aqueous Solution at Different Temperatures**

Vladislav Ivaništshev, Anton Ruzanov, Karmen Lust, Enn Lust ..... H368

**Experiment and Simulation of Ion Transport through Nanopipettes of Well-Defined Conical Geometry**

Niya Sa, Lane A. Baker ..... H376

**Investigation of the Kinetics and Mechanism of the Hydrogen Evolution Reaction on Copper**

Samin Sharifi-Asl, Digby D. Macdonald ..... H382

**Preparation, Characterization, and Properties of Anticoagulation and Antibacterial Films of Carbon-Based Nanowires Fabricated on Surfaces of Ti Implants**

Chiung-Fang Haung, Yu-Hao Chan, Li-Kai Chen, Chung-Ming Liu, Wei-Chen Huang, Shih-Fu Ou, Keng-Liang Ou, Duen-Jeng Wang ..... H392

**Chemical Analysis of Fluorine in Niobium Electropolishing**

Denise C. Ford, Charlie Cooper, Lance D. Cooley, Chad Thompson, Donald Bouchard, Brian Albee, Sandra Bishnoi ..... H398

---

**Miscellaneous**

---

**Erratum: Ce(Mn,Fe)O<sub>2</sub> as An Effective Interlayer for Intermediate Temperature SOFCs Using Doped LaGaO<sub>3</sub> Films Prepared by Screen Printing Method [J. Electrochem. Soc., 160, F375 (2013)]**

Jong-Eun Hong, Shintaro Ida, Tatsumi Ishihara ..... X7