

VOL. 159, NO. 10, 2012



JOURNAL OF THE ELECTROCHEMICAL SOCIETY



Table of Contents

Batteries and Energy Storage

Insight into Fe Incorporation in $\text{Li}_3\text{V}_2(\text{PO}_4)_3/\text{C}$ Cathode Material

Lu-Lu Zhang, Gan Liang, Gang Peng, Yun-Hui Huang,
Long Wang, Long Qie, Mark C. Croft, Alexander Ignatov,
John B. Goodenough A1573

Investigation of Active Electrodes Modified with Platinum/Multiwalled Carbon Nanotube for Vanadium Redox Flow Battery

Rong-Hsin Huang, Chung-Hsing Sun, Tung-mo Tseng,
Wen-kai Chao, Kan-Lin Hsueh, Fuh-Sheng Shieu A1579

Carbene Adduct as Overcharge Protecting Agent in Lithium Ion Batteries

Christian Dippel, René Schmitz, Romek Müller,
Tobias Böttcher, Miriam Kunze, Alexandra Lex-Balducci,
Gerd-Volker Rösenthaller, Stefano Passerini,
Martin Winter A1587

Cobalt Content Optimization of Layered $0.6\text{Li}[\text{Li}_{1/3}\text{Mn}_{2/3}]\text{O}_2-0.4\text{LiNi}_{0.5-x}\text{Mn}_{0.5-x}\text{Co}_{2x}\text{O}_2$ ($0 \leq x \leq 0.5$) Cathode Materials Prepared by the Carbonate Coprecipitation

F. L. Liu, S. Zhang, C. Deng, Q. Wu, M. Zhang,
F. L. Meng, H. Gao, Y. H. Sun A1591

Pseudocapacitive NiO Fine Nanoparticles for Supercapacitor Reactions

Matthew P. Yeager, Dong Su, Nebojsa S. Marinković,
Xiaowei Teng A1598

Three Dimensional Simulation of Galvanostatic Discharge of LiCoO_2 Cathode Based on X-ray Nano-CT Images

Bo Yan, Cheolwoong Lim, Leilei Yin, Likun Zhu A1604

Lithium Redistribution in Lithium-Metal Batteries

Anthony Ferrere, Paul Albertus, Jake Christensen,
John Newman A1615

Revisit of Polypyrrole as Cathode Material for Lithium-Ion Battery

Long Qie, Li-Xia Yuan, Wu-Xing Zhang,
Wei-Min Chen, Yun-Hui Huang A1624

Reaction Mechanism of "SiO"-Carbon Composite-Negative Electrode for High-Capacity Lithium-Ion Batteries

Masayuki Yamada, Akira Inaba, Atsushi Ueda,
Kazunobu Matsumoto, Tomio Iwasaki,
Tsutomu Ohzuku A1630

Correlation between the Stability of Redox Shuttles in Li Ion Cells and the Reactivity Defined by the Binding Energy of Redox Shuttle Cations with Ethyl Radical

J.-H. Chen, L.-M. He, R. L. Wang A1636

Electrical Characterization of High Voltage Polymer Tantalum Capacitors

Y. Freeman, G. F. Alapatt, W. R. Harrell,
P. Lessner A1646

Electrochemical Stability of Carbon Fibers Compared to Aluminum as Current Collectors for Lithium-Ion Batteries

Surendra K. Martha, Nancy J. Dudney,
James O. Kiggans, Jagjit Nanda A1652

$\text{Li}_{2-x}\text{Fe}_{0.5}(\text{VO})_{0.5}(\text{PO}_4)\text{F}_{0.5}$, a New Mixed Metal Phosphate Cathode Material

Chris J. Allen, Sanjeev Mukerjee, K. M. Abraham A1659

Solid-State Supercapacitors Based on Pulse Polymerized Poly(3,4-ethylenedioxythiophene) Electrodes and Ionic Liquid Gel Polymer Electrolyte

G. P. Pandey, A. C. Rastogi A1664

The Rate of Active Lithium Loss from a Soft Carbon Negative Electrode as a Function of Temperature, Time and Electrode Potential

Nupur Nikkan Sinha, T. H. Marks, H. M. Dahn,
A. J. Smith, J. C. Burns, D. J. Coyle, J. J. Dahn,
J. R. Dahn A1672

Morphology Controlled Growth of Meso-Porous Co_3O_4 Nanostructures and Study of Their Electrochemical Capacitive Behavior

Anirudha Jena, N. Munichandraiah,
S. A. Shivashankar A1682

**Silver Vanadium Phosphorous Oxide, Ag_{0.48}VOPO₄:
Exploration as a Cathode Material in Primary
and Secondary Battery Applications**

Amy C. Marschilok, Young Jin Kim,
Kenneth J. Takeuchi, Esther S. TakeuchiA1690

**Synergies in Blended LiMn₂O₄ and Li[Ni_{1/3}Mn_{1/3}Co_{1/3}]O₂
Positive Electrodes**

A. J. Smith, S. R. Smith, T. Byrne, J. C. Burns,
J. R. DahnA1696

**Three-Dimensional Graphene/Polyaniline Composite
Hydrogel as Supercapacitor Electrode**

Zhixin Tai, Xingbin Yan, Qunji XueA1702

**Capacity Fading of Lithium-Ion Cells Having
Li[Li_{1/3}Ti_{5/3}]O₄ (LTO)-Negative Electrodes
for the First- and Second-Generation 12 V
Lead-Free Batteries**

Lina Wang, Kensuke Nakura, Mitsuyasu Imazaki,
Narumi Kakizaki, Kingo Ariyoshi,
Tsutomu OhzukuA1710

**In Situ X-ray Diffraction Study of Electrochemical
Insertion in Mg_{0.5}Ti₂(PO₄)₃: An Electrode Material
for Lithium or Sodium Batteries**

C. Vidal-Abarca, J. M. Ateba Mba, C. Masquelier,
J. L. Tirado, P. LavelaA1716

**Review: An Economic Perspective on Liquid
Solar Fuels**

John Newman, Paul G. Hoertz, Christopher A. Bonino,
James A. TrainhamA1722

**Battery Cycle Life Prediction with Coupled
Chemical Degradation and Fatigue Mechanics**

Rutooj Deshpande, Mark Verbrugge, Yang-Tse Cheng,
John Wang, Ping LiuA1730

**Lithium-Ion Batteries Working at 85°C: Aging
Phenomena and Electrode/Electrolyte Interfaces
Studied by XPS**

Lucille Bodenes, Rémi Dedryvère, Hervé Martinez,
Florent Fischer, Cécile Tessier, Jean-Paul PèrèsA1739

**Optimization of the Cathode Structure of Lithium-
Air Batteries Based on a Two-Dimensional,
Transient, Non-Isothermal Model**

Xianglin Li, Amir FaghriA1747

Chemical and Biological Sensors

**Graphene Based Electrochemical Sensor and Its
Application for Detection and Quantification
of Antifibrinolytic Drug Tranexamic Acid**

Ratnanjali Shrivastava, Ramkishor Sharma,
Soami Piara Satsangee, Rajeev JainB795

**Working Mechanism of Novel Mn-Based Reference
Electrode for Solid-State Electrochemical Gas Sensors**

Han Jin, Michael Breedon, Vladimir V. Plashnitsa,
Norio Miura B801

**Improved Internal Reference Oxygen Sensors
with Composite Ceramic Electrodes**

Qiang Hu, Torben Jacobsen, Karin Vels Hansen,
Mogens Mogensen B811

**Blocking Agent Optimization for Nonspecific
Binding on Phage Based Magnetoelastic Biosensors**

Wen Shen, Suiqiong Li, Mi-Kyung Park,
Zhongwu Zhang, Zhongyang Cheng,
Valery A. Petrenko, Bryan A. Chin B818

Corrosion Science and Technology

**Long-Term Corrosion Behavior of Biocompatible
β-Type Ti Alloy in Simulated Body Fluid**

Y. Tsutsumi, S. Bartakova, P. Prachar, Suyalatu,
S. Migita, H. Doi, N. Nomura, T. Hanawa C435

Electrochemical/Electroless Deposition

**Electrolyte Additive Chemistry and Feature
Size-Dependent Impurity Incorporation
for Cu Interconnects**

J. Kelly, T. Nogami, O. van der Straten, J. Demarest,
J. Li, C. Penny, T. Vo, C. Parks, P. Dehaven,
C. K. Hu, E. Liniger D563

**Modeling Extreme Bottom-Up Filling of Through
Silicon Vias**

D. Josell, D. Wheeler, T. P. Moffat D570

**A Comparative Study of Cu-Co Alloys versus
Cu/Co Multilayered Coatings Obtained
by Electrodeposition Techniques**

N. Rajasekaran, S. Mohan D577

**Facile Synthesis of Large-Area Hierarchical
Bismuth Molybdate Nanowires for Supercapacitor
Applications**

Zhao-Qing Liu, Ling-Ying Tang, Nan Li, Kang Xiao,
Jing Wang, Jian-Hua Zhang, Yu-Zhi Su,
Ye-Xiang Tong D582

**Galvanic and Chemical Deposition of Bismuth
Powders from Aqueous Solutions**

Stojan S. Djokić, Nada S. Djokić, T. Thundat D587

**DC Electrodeposition of Thick SmCo Films
for MEMS Applications**

K. Chouarbi, M. Woytasik, E. Dufour-Gergam,
E. Lefevvre, J. Moulin D592

Wetting Behavior of Carbon in Molten Carbonate

Chia-Chin Chen, Toru Maruyama, Ping-Hsun Hsieh,
J. Robert Selman D597

Nucleation and Growth of Extremely Thin CdSe Films Electrodeposited from Near-Neutral Electrolytes

Hasti Majidi, Khoa T. Van, Jason B. Baxter D605

Electrochemical Study of Copper in Room Temperature Protic Ionic Liquids Ethylammonium Nitrate and Triethylammonium Methylsulfonate

Christian A. Gunawan, Bryan H. R. Suryanto,
Chuan Zhao D611

Electrochemical Atomic Layer Deposition (E-ALD) of Pt Nanofilms Using SLRR Cycles

Nagarajan Jayaraju, Deepa Vairavapandian,
Youn Guen Kim, Dhego Banga, John L. Stickney D616

Electrochemical Deposition and Characterization of Ni in Mesoporous Silicon

A. Dolgiy, S. V. Redko, H. Bandarenka,
S. L. Prischepa, K. Yanushkevich, P. Renzi,
M. Balucani, V. Bondarenko D623

Fuel Cells, Electrolyzers, and Energy Conversion

Theoretical Study of Magnesium and Zinc Tantalates and Niobates as Prospective Catalyst Supports for Water Electrolysis

Oleg I. Velikokhatnyi, Karan Kadakia, Sung-Kyoo Park,
Prashant N. Kumta F607

The Extraction of the Diffusion Coefficient and Solubility of Sulfur Dioxide in Bi-Layer Proton Exchange Membranes

Jai Vishnuvarman Jayakumar, John Staser,
Chang-Hee Kim, Simon G. Stone,
John W. Weidner F617

Platinum Nanoplates as Fuel Cell Electrocatalysts

Brian A. Larsen, K. C. Neyerlin, Justin B. Bult,
Christopher Bochert, Jeffrey L. Blackburn,
Shyam S. Kocha, Bryan S. Pivovar F622

Investigation into Electrochemical Oxygen Reduction on Platinum in Tetraethylammonium Hydroxide and Effect of Addition of Imidazole and 1,2,4-Triazole

A. Sarkar, X. Zhu, H. Nakanishi, J. B. Kerr,
E. J. Cairns F628

Using Ruthenium to Map Invasion of the Microporous Layer by Liquid Water in a Polymer-Electrolyte Fuel Cell

Robert Darling F635

Study on the Electrode Reaction Mechanism of Pulsed-Laser Deposited Thin-Film

$\text{La}_{1-x}\text{Sr}_x\text{CoO}_{3-\delta}$ ($x = 0.2, 0.4$) Cathodes
Jaeyeon Hwang, Heon Lee, Kyung Joong Yoon,
Hae-Weon Lee, Byung-Kook Kim, Jong-Ho Lee,
Ji-Won Son F639

A Model for DMFC Cathode Performance

A. A. Kulikovskiy F644

Electrocatalytic Activity of Platinum-Niobium Nanoparticles for Ethanol Oxidation

Thairo A. Rocha, José J. Linares, Flavio Colmati,
Eduardo G. Ciapina, Ernesto R. González F650

Stability of $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$ as SOFC Cathode

Mi-Young Oh, Atsushi Unemoto, Koji Amezawa,
Tatsuya Kawada F659

Organic and Bioelectrochemistry

Electrochemical Behaviors of Ascorbic Acid at CuGeO_3 /Polyaniline Nanowire Modified Glassy Carbon Electrode

L. Z. Pei, Z. Y. Cai, Y. K. Xie, Y. Q. Pei, C. G. Fan,
D. G. Fu G107

Redox Behavior of a Derivative of Vitamin K at a Glassy Carbon Electrode

Shamsa Munir, Afzal Shah, Fateen Zafar, Amin Badshah,
Xuemei Wang, Zia-ur Rehman, Hidayat Hussain,
Suzanne K. Lunsford G112

Competing Reaction Pathways in the Anodic Oxidation of Diphenylacetaldehyde: Differentiation by ^{18}O Isotopic Labeling

Rachel L. Merzel, Albert J. Fry G117

Physical and Analytical Electrochemistry, Electrocatalysis, and Photoelectrochemistry

Electrochemical Determination of Neurotransmitters Using Gold Nanoparticles on Nafion/Carbon Paste Modified Electrode

Nada F. Atta, Ahmed Galal, Shereen M. Azab H765

Effect of Aqueous Environment on Monolayer of Tetrairon(III) Single Molecule Magnet

Satoshi Kanata, Tomoaki Nishino, Hiroshi Aoki H772

UV-Assisted Chemical Sintering of Inkjet-Printed TiO_2 Photoelectrodes for Low-Temperature Flexible Dye-Sensitized Solar Cells

Yeonjun Oh, Sung-Nam Lee, Han-Ki Kim,
Jihoon Kim H777

Investigation of Surface Oxidation Processes on Manganese Oxide Electrocatalysts Using Electrochemical Methods and Ex Situ X-ray Photoelectron Spectroscopy

Yelena Gorlin, Thomas F. Jaramillo H782

Electric Current and Irreversible Faradaic Reaction on Electrode in Contact with Electrolyte

Y. Zhang, A. L. Yarin H787

Kinetic Study of the Oxidation of 4-Morpholinoaniline and *N,N*-Dialkyl-*p*-phenylenediamines in the Presence of Barbituric Acids Derivatives by Digital Simulation of Cyclic Voltammograms

Roya Esmaili, Davood Nematollahi H792

Anisotropic Magnetization Behavior of Electrodeposited Nanocrystalline Ni-Mo Alloy Thin Films and Nanowires Array

T. Ohgai, R. Washio, Y. Tanaka H800

Investigation of Electrochemical Behavior of 2-(5-Bromo-2-Pyridylazo)-5-[*N*-Propyl-*N*-(3-Sulfopropyl)Amino] Phenol Disodium Salt Dihydrate

Yeliz Karaman, Necati Menek H805

In-Situ Monitoring the Growth of Polypyrrole Films at Liquid/Solid Interface Using a Combination of Polarized Infrared Spectroscopy and Reflectance Anisotropy Spectroscopy

Guoguang Sun, Xin Zhang, Christian Kaspari, Kolja Haberland, Jörg Rappich, Karsten Hinrichs H811

Simultaneous Electrochemical and Mechanical Impedance Spectroscopy Using Cantilever Curvature

M. C. Lafouresse, U. Bertocci, C. R. Beauchamp, G. R. Stafford H816