INTI-Extensión y Desarrollo División Biblioteca

11 1 SEP 2009

# Electrochemical Society

2009 • Volume 156, Number 9

JESOAN 156 (9)



A Journal for Solid-State and Electrochemical Science and Technology

# **Table of Contents**

Batt	teries and Energy Storage
Ch	fects of Surface-Film Formation on the Electrochemical paracteristics of LiMn <sub>2</sub> O <sub>4</sub> Cathodes of Lithium Ion Batteries P. C. Goonetilleke, J. P. Zheng, D. Roy
Th	rough Polyetheramine Coating C. Sisbandini, D. Brandell, T. Gustafsson, L. Nybolm
Mo	orphological Transitions on Lithium Metal Anodes C. M. López, J. T. Vaughey, D. W. Dees
La Li-	ructural and Electrochemical Characterization of Composite yered-Spinel Electrodes Containing Ni and Mn for Ion Batteries 1. Cabana, SH. Kang, C. S. Johnson, M. M. Thackeray, C. P. Grey
Ele Na	ectrochemical Growth of Iron Oxide Thin Films with morods and Nanosheets for Capacitors MS. Wu, RH. Lee
Ca	Divalent Lithium Salt Li <sub>2</sub> B <sub>12</sub> F <sub>12</sub> Dissolved in Propylene rbonate Studied by NMR Methods  K. Hayamizu, A. Matsuo, J. Arai
Wl	nether EC and PC Differ in Interphasial Chemistry on aphitic Anode and How  (X. Xu
Sv	lid Solution Phases in the Olivine-Type LiMnPO <sub>4</sub> /MnPO <sub>4</sub> stem G. Chen, T. J. Richardson
Lit	uttered Crystalline V <sub>2</sub> O <sub>5</sub> Thin Films for All-Solid-State hium Microbatteries C. Navone, R. Baddour-Hadjean, J. P. Pereira-Ramos, R. Salot
Eff Lit	fects of Synthesis Methods on $\text{Li}_{1+x}V_3O_8$ as Cathodes in hium-Ion Batteries  T. Feng, X. Liu, X. Zhang, J. Jiang, J. Zhao, M. Wang
Fue	Cells and Energy Conversion
Hi	sorption Density Control of N719 on TiO <sub>2</sub> Electrodes for ghly Efficient Dye-Sensitized Solar Cells F. Hirose, K. Kuribayashi, M. Shikaku, Y. Narita, Y. Takahashi, Y. Kimura, M. Niwano  B987
Ce	casurement of Oxygen Transport Resistance in PEM Fuel  lls by Limiting Current Methods  D. R. Baker, D. A. Caulk, K. C. Neyerlin, M. W. Murphy
Pa	odeling Electrochemical Oxidation of Hydrogen on Ni–YSZ ttern Anodes D. G. Goodwin, H. Zhu, A. M. Colclasure, R. J. Kee
Hy	ectrocatalytic Promotion of Palladium Nanoparticles on drogen Oxidation on Ni/GDC Anodes of SOFCs via Spillover  4. Babaei, S. P. Jiang, J. Li
WI	th Mixed Conducting Electrolytes  K. L. Duncan, E. D. Wachsman
Ste	rady-State Permeation of Oxygen Through $La_{1.9}Sr_{0.1}NiO_{4+\delta}$ Z. Li, R. Haugsrud, J. B. Smith, T. Norby
Ca	netics of Hydrogen Evolution Reaction at Nickel-Coated rbon Fiber Materials in 0.5 M H <sub>2</sub> SO <sub>4</sub> and 0.1 M NaOH lutions 3. Pierozynski, L. Smoczynski
Lin	nit Operating Temperature in Polymer Electrolyte embrane Fuel Cells E. A. M. Riascos, D. D. Pereira



# Journal of The Electrochemical Society

2009 · Vol. 156, No. 9

#### Editor

#### Daniel Scherson

Case Western Reserve University Cleveland, Ohio 44106

Associate Editors

# Cor L. Claeys

IMEC

B-3001 Leuven, Belgium

## Takayuki Homma

Waseda University Tokyo, Japan

#### Charles L. Hussey

University of Mississippi University, Mississippi 38677, USA

## Yue Kuo

Texas A&M University
College Station, Texas 77843, USA

## Dolf Landheer

National Research Council – Canada Ottawa, Ontario, Canada

#### Mark E. Orazem

University of Florida Gainesville, Florida 32611, USA

#### Ashok K. Shukla

Indian Institute of Science Bangalore, Karnataka 560 012 India

## Martin Winter

University of Münster Münster, Germany

## Editorial Board

Doron Aurbach Cor Claeys Dennis Hess Charles Hussey Dolf Landheer Daniel Scherson

Martin Winter

Jennifer Bardwell Andrew Gewirth Takayuki Homma Yue Kuo Mark E. Orazem Ashok K. Shukla

## Publications Staff

Annie Goedkoop, Director of Publications

Dinia Agrawala Anne L. Clementson
Paul Cooper Andrea L. Guenzel
John Lewis Beth Anne Stuebe

## **Publication Committee**

Subhash Singhal, Chairman

Scott Calabrese Barton Johna Leddy Andrew Lin Yunny Meas Krishnan Rajeshwar Daniel Scherson Steven Visco

John Weidner

Dennis Hess Randy Leising Stephen Lipka Hiroshi Nishihara Andrea Russell Enrico Traversa Jennifer Wang

The Electrochemical Society (ECS) is an educational, nonprofit 501(c)(3) organization with more than 8000 scientists and engineers in over 75 countries world-wide who hold individual membership. Founded in 1902, ECS has a long tradition in advancing the theory and practice of electrochemical and solid-state science by dissemination of information through its publications and international meetings.

The Journal of The Electrochemical Society (J. Electrochem. Soc.) (USPS 284-140) (ISSN 0013-4651) is published monthly by The Electrochemical Society, 65 South Main Street, Pennington, NJ 08534-2839, USA, at Cummings Printing Co., 4 Peters Brook Drive, PO Box 16495, Hooksett, NH 03106-6495, USA. Periodicals postage paid at Pennington, New Jersey, USA and at additional mailing offices. POSTMASTER: Send address changes to: The Electrochemical Society, 65 South Main Street, Pennington, NJ 08534-2839, USA. Canada Post: Publications Mail Agreement #40612608 Canada Returns to be sent to Bleuchip International, P.O. Box 25542, London, ON N6C 6B2.

© Copyright 2009 by The Electrochemical Society, Inc.

# **Publication Information**

ECS Members: Access to the online edition of the current volume plus the entire online archive of the Journal is available to ECS members as part of their ECS Member Article Pack. The paper edition of the current volume is available to the members at an additional charge. Annual dues: \$98 for Active Members and \$18 for Student Members.

Subscriptions: Rates and packages vary. Send inquiries to Corey Eberhart, Global Sales Manager, ECS, 65 South Main Street, Pennington, New Jersey, 08534-2839, USA. Tel.: 609.647.3616; Fax: 609.737.2743; E-mail: corey.eberhart@electrochem.org. Visit the ECS website for more information.

Address: The address for the Executive Offices and Editorial Department of the Journal is: The Electrochemical Society, 65 South Main Street, Pennington, New Jersey, 08534-2839, USA. Tel.: 609.737.1902; Fax: 609.737.2743; E-mail: ecs@ electrochem.org; Web: www.electrochem.org.

The address of the Circulation Department for ECS members is: 65 South Main Street, Pennington, New Jersey, 08534-2839, USA.

The address for the nonmembers' Circulation Department is: American Institute of Physics, P.O. Box 503284, St. Louis, MO 63150-2839, USA.

Manuscripts: Manuscripts are accepted for publication by the *Journal* with the understanding that they are unpublished, original works that have not been submitted elsewhere while under consideration by the *Journal* Editorial Board. See the "Instructions to Authors," which can be found in this issue. To help offset publication costs, a payment of \$80 per printed page is required. A discount is given if at least one author is a Society member at the time of a paper's submission.

Permission to Re-publish: The Journal is a copyrighted publication, and manuscripts submitted to the Journal become the property of ECS. Permission to re-publish parts of papers in the Journal is granted to current periodicals, provided due credit is given and that not more than one-sixth of any one paper is used in derivative works. Reproduction or replication of more then one-sixth of a paper is forbidden and illegal unless prior written authorization is obtained from ECS, along with permission from the author. Please use the Permission Request Form on the ECS Website (www.electrochem.org).

Permission to Reproduce: Reprographic copying beyond that permitted by the fair use provisions of the Copyright Act of 1976 is granted to libraries and other users registered with the Copyright Clearance Center provided that the fee (CCC Code 0013-465 1/97) is paid directly to: Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, USA; Tel: 978.750.8400; Fax: 978.750.4744; E-mail: info@copyright.com. Copying for other than internal or personal use without the express written permission of ECS is prohibited; please use the Permission Request Form on the ECS website (www.electrochem.org).

Article Copies: Single copies of articles are available from ECS to members at \$19.20 (US) per article, and to nonnembers at \$24 (US) per article. Orders may be placed via the ECS website.

Single Issues: ECS has available for sale a limited inventory of single issues of the *Journal*. Contact the ECS Circulation Department for more information. Positive microfilm copies of issues may also be obtained from ProQuest Information and Learning, 300 North Zeeb Road, Ann Arbor, MI 48106, USA; Tel:, USA and Canada: 800.248.0360; all other countries 415.433.5500; Fax: 415.433.0100; E-mail: orders@infostore.com.

**Claims:** All claims for missing issues should be reported within 60 days of normal delivery date, and should be directed to the Circulation Department at the address given above.

**Address Changes:** Notice of a change in address should be sent to the Circulation Department at the address given above.

Notice: Statements and opinions given in articles and papers in the *Journal of The Electrochemical Society* are those of the contributors, and The Electrochemical Society, assumes no responsibility for them.

Online Edition: Full-text articles are available either through ECS membership, an institutional subscription, or by purchase, for all issues from 1948 (Vol. 93) and forward. The online edition is available at:

Structural Properties and Electrochemical Characteristics of Ba<sub>0.5</sub>Sr<sub>0.5</sub>Co<sub>1-x</sub>Fe<sub>x</sub>O<sub>3-\delta</sub> Phases in Different Atmospheres Hydrogen Production Using Solid Oxide Membrane Electrolyzer with Solid Carbon Reductant in Liquid Metal Anode Analysis of Proton Transport in Pseudo Catalyst Layers H. Iden, A. Ohma, K. Shinobara B1078 Measurements of Electrical Conductivity and Oxygen Nonstoichiometry of La<sub>0.5</sub>Sr<sub>0.5</sub>Ga<sub>0.2</sub>Fe<sub>0.8</sub>O<sub>3-δ</sub> Using Gastight **Electrochemical Cells** Model Studies of the Durability of a Titania-Modified Nafion Fuel Cell Membrane Durability Study on SWNT/Nanofiber Buckypaper Catalyst Support for PEMFCs W. Zhu, J. P. Zheng, R. Liang, B. Wang, C. Zhang, Corrosion, Passivation, and Anodic Films Electrochemical Anodic Dissolution Kinetics of Titanium in Fluoride-Containing Perchloric Acid Solutions at **Open-Circuit Potentials** Steam Oxidation and Chromia Evaporation in Ultrasupercritical Steam Boilers and Turbines Effects of KF, NaOH, and KOH Electrolytes on Properties of Microarc-Oxidized Coatings on AZ91D Magnesium Alloy Enhanced Efficiency of Dye-Sensitized Solar Cells Using Anodic Titanium Oxide Nanotube Arrays Characterization of the Corrosion Products of Crevice Corroded Alloy 22 Characterization of Zr(IV)-Phosphonate Thin Films Which Inhibit O2 Reduction on AA2024-T3 Iron Corrosion in CO<sub>2</sub>/Brine at Low H<sub>2</sub>S Concentrations: An Electrochemical and Surface Science Study Electrochemical/Chemical Deposition and Etching Formation of Nanoscopic MOS Junctions by Electrochemical Conditioning of n-Si(111) in Ir(III) Solutions A. G. Muñoz, Th. Stempel, K. Skorupska, M. Lublow, Effect of NH<sub>3</sub>/He Plasma Treatment on Electrical Reliability and Early-Stage Electromigration Behavior of Copper Interconnects Synthesis of Highly Active Ag/Pd Nanorings for Activating **Electroless Copper Deposition** Mechanistic Analysis of the "Bottom-Up" Fill in Copper **Interconnect Metallization** 

Surface Metallization on High Temperature Liquid-Crystal-Polymer Film by UV-Irradiation Process T. Sugiyama, Y. Iimori, K. Baba, M. Watanabe, H. Honma
Design and Performance of an LPCVD Reactor for the Growth of 3C-Silicon Carbide  M. P. Orthner, L. W. Rieth, F. Solzbacher
Electrochemical Synthesis and Engineering
Electrochemical Properties of Solid–Liquid Interface of CuIn <sub>1-x</sub> Ga <sub>x</sub> Se <sub>2</sub> Prepared by Electrodeposition with Various Gallium Concentrations  YP. Fu, RW. You, KK. Lew
Electroless Deposition of Ferromagnetic Cobalt Nanoparticles in Propylene Glycol  M. Donnabelle L. Balela, S. Yagi, Z. Lockman, A. Aziz, A. V. Amorsolo, Jr., E. Matsubara
Physical and Analytical Electrochemistry
Numerical Simulation of Ionic Mass-Transfer Rates with Natural Convection in CuSO <sub>4</sub> –H <sub>2</sub> SO <sub>4</sub> Solution I. Numerical Study on the Developments of Secondary Flow and Electrolyte Stratification Phenomena S. Kawai, Y. Fukunaka, S. Kida
Numerical Simulation of Ionic Mass-Transfer Rates with Natural Convection in CuSO <sub>4</sub> –H <sub>2</sub> SO <sub>4</sub> Solution II. Comparisons Between Numerical Calculations and Optical Measurements S. Kawai, Y. Fukunaka, S. Kida
A Comparison of the Acidity Levels in Room-Temperature  Ionic Liquids T. Robert, L. Magna, H. Olivier-Bourbigou, B. Gilbert
THE REPORT OF THE PROPERTY OF
Dielectric Science and Materials
Area-Selective Atomic Layer Deposition Using Self-Assembled Monolayer and Scanning Probe Lithography W. Lee, F. B. Prinz
Area-Selective Atomic Layer Deposition Using Self-Assembled Monolayer and Scanning Probe Lithography
Area-Selective Atomic Layer Deposition Using Self-Assembled  Monolayer and Scanning Probe Lithography  W. Lee, F. B. Prinz  G125  Effects of Annealing Environment on Interfacial Reactions and Electrical Properties of Ultrathin SrTiO <sub>3</sub> on Si  T. I. Park, J. H. Kim, J. H. Jang, J. Jee, S. W. Jee, S. Y. Jee
Area-Selective Atomic Layer Deposition Using Self-Assembled  Monolayer and Scanning Probe Lithography  W. Lee, F. B. Prinz  G125  Effects of Annealing Environment on Interfacial Reactions and Electrical Properties of Ultrathin SrTiO <sub>3</sub> on Si  T. J. Park, J. H. Kim, J. H. Jang, J. Lee, S. W. Lee, S. Y. Lee, H. S. Jung, C. S. Hwang  G129  Electrical Properties of Bi <sub>2</sub> Mg <sub>2/3</sub> Nb <sub>4/3</sub> O <sub>7</sub> Multilayer Films
Area-Selective Atomic Layer Deposition Using Self-Assembled Monolayer and Scanning Probe Lithography  W. Lee, F. B. Prinz  G125  Effects of Annealing Environment on Interfacial Reactions and Electrical Properties of Ultrathin SrTiO <sub>3</sub> on Si  T. J. Park, J. H. Kim, J. H. Jang, J. Lee, S. W. Lee, S. Y. Lee, H. S. Jung, C. S. Hwang  G129  Electrical Properties of Bi <sub>2</sub> Mg <sub>2/3</sub> Nb <sub>4/3</sub> O <sub>7</sub> Multilayer Films  Combined with Percolative Capacitors  JK. Abn, N. D. Cuong, NJ. Seong, SG. Yoon  G134  Plasma-Enhanced Atomic Layer Deposition of TiO <sub>2</sub> and Al-Doped TiO <sub>2</sub> Films Using N <sub>2</sub> O and O <sub>2</sub> Reactants
Area-Selective Atomic Layer Deposition Using Self-Assembled Monolayer and Scanning Probe Lithography  W. Lee, F. B. Prinz  G125  Effects of Annealing Environment on Interfacial Reactions and Electrical Properties of Ultrathin SrTiO <sub>3</sub> on Si  T. J. Park, J. H. Kim, J. H. Jang, J. Lee, S. W. Lee, S. Y. Lee, H. S. Jung, C. S. Hwang  Electrical Properties of Bi <sub>2</sub> Mg <sub>2/3</sub> Nb <sub>4/3</sub> O <sub>7</sub> Multilayer Films  Combined with Percolative Capacitors  JK. Abn, N. D. Cuong, NJ. Seong, SG. Yoon  G134  Plasma-Enhanced Atomic Layer Deposition of TiO <sub>2</sub> and Al-Doped TiO <sub>2</sub> Films Using N <sub>2</sub> O and O <sub>2</sub> Reactants  GJ. Choi, S. K. Kim, SJ. Won, H. J. Kim, C. S. Hwang  Pulsed CVD-W Nucleation Layer Using WF <sub>6</sub> and B <sub>2</sub> H <sub>6</sub> for Low  Resistivity W  CH. Kim, IC. Rho, SH. Kim, IK. Han, HS. Kang, SW. Ryu,
Area-Selective Atomic Layer Deposition Using Self-Assembled  Monolayer and Scanning Probe Lithography  W. Lee, F. B. Prinz  G125  Effects of Annealing Environment on Interfacial Reactions and Electrical Properties of Ultrathin SrTiO <sub>3</sub> on Si  T. J. Park, J. H. Kim, J. H. Jang, J. Lee, S. W. Lee, S. Y. Lee, H. S. Jung, C. S. Hwang  G129  Electrical Properties of Bi <sub>2</sub> Mg <sub>2/3</sub> Nb <sub>4/3</sub> O <sub>7</sub> Multilayer Films  Combined with Percolative Capacitors JK. Abn, N. D. Cuong, NJ. Seong, SG. Yoon  G134  Plasma-Enhanced Atomic Layer Deposition of TiO <sub>2</sub> and Al-Doped TiO <sub>2</sub> Films Using N <sub>2</sub> O and O <sub>2</sub> Reactants GJ. Choi, S. K. Kim, SJ. Won, H. J. Kim, C. S. Hwang  G138  Semiconductor Devices, Materials, and Processing  Pulsed CVD-W Nucleation Layer Using WF <sub>6</sub> and B <sub>2</sub> H <sub>6</sub> for Low Resistivity W
Area-Selective Atomic Layer Deposition Using Self-Assembled Monolayer and Scanning Probe Lithography  W. Lee, F. B. Prinz  G125  Effects of Annealing Environment on Interfacial Reactions and Electrical Properties of Ultrathin SrTiO <sub>3</sub> on Si  T. J. Park, J. H. Kim, J. H. Jang, J. Lee, S. W. Lee, S. Y. Lee, H. S. Jung, C. S. Hwang  Electrical Properties of Bi <sub>2</sub> Mg <sub>2/3</sub> Nb <sub>4/3</sub> O <sub>7</sub> Multilayer Films Combined with Percolative Capacitors JK. Abn, N. D. Cuong, NJ. Seong, SG. Yoon  G134  Plasma-Enhanced Atomic Layer Deposition of TiO <sub>2</sub> and Al-Doped TiO <sub>2</sub> Films Using N <sub>2</sub> O and O <sub>2</sub> Reactants GJ. Chot, S. K. Kim, SJ. Won, H. J. Kim, C. S. Hwang  Pulsed CVD-W Nucleation Layer Using WF <sub>6</sub> and B <sub>2</sub> H <sub>6</sub> for Low Resistivity W CH. Kim, IC. Rho, SH. Kim, IK. Han, HS. Kang, SW. Ryu, HJ. Kim  H685  Oxygen Plasma Treated Aluminum as a Gate Dielectric for AlGaN/GaN High Electron Mobility Transistors

## Society Officers

President Paul Natishan

U.S. Naval Research Laboratories Washington, DC 20375, USA

Vice-President

William D. Brown

University of Arkansas Fayetteville, Arkansas 72701, USA

Vice-President

Esther Takeuchi

University at Buffalo Buffalo, New York 14260, USA

> Vice-President Fernando H. Garzon

Los Alamos National Laboratory Los Alamos, New Mexico 87545, USA

Secretary

Johna Leddy

University of Iowa Iowa City, Iowa 52242, USA

Treasurer

John R. Susko

JRS Technology

Owego, New York 13827, USA

Executive Director Roque J. Calvo

The Electrochemical Society

65 South Main Street

Pennington, New Jersey 08534-2839, USA Phone: 609 737 1902

Fax: 609 737 2743

E-mail: ecs@electrochem.org

E-mail: ecs@electrochem.org Web: www.electrochem.org

# **Benefits of Membership**

The Journal of The Electrochemical Society. Society
membership includes this top-quality, peer-reviewed
monthly publication. Each issue includes some 70 or
more original papers selected by a prestigious editorial
board, on topics covering both electrochemical and
solid-state science and technology. The electronic
edition is available to members at:

http://ecsdl.org/JES/

 Electrochemical and Solid-State Letters. This peerreviewed, rapid publication electronic journal is available to members at:

http://ecsdl.org/ESL/

- Interface. This quarterly publication features articles and news of general interest to those in the field.
- Professional Development and Education. Exchange technical ideas and advances at the Society's semiannual international meetings or through the programs of the 19 local sections in the USA, Canada, Europe, Israel, Korea, and Japan.
- Publications. Stay aware of pertinent scientific advances through the Society's publications, including ECS Transactions, proceedings volumes, meeting abstracts, and monograph volumes.
- Opportunity for Recognition. Recognize the accomplishments of your peers through the Awards Program, which provides over two dozen ECS Awards annually.
- Networking and Contacts. Take advantage of the numerous opportunities to meet with your peers and expand your circle of valuable contacts.
- Membership Directory. Available only to members, the Directory provides easy reference to your colleagues throughout the world.
- Money Savings. Get exceptional discounts on all ECS publications, page charges, meetings, and short courses.

Divisions
Battery
Kuzhikalail Abraham, <i>Chair</i> Charles R. Walk, <i>Vice-Chair</i> Zempachi Ogumi, <i>Secretary</i> Nancy J. Dudney, <i>Treasurer</i> Curtis F. Holmes, <i>Advisor</i>
Corrosion  Patrik Schmuki, Chair
Alison Davenport, <i>Vice-Chair</i> Douglas C. Hansen, <i>Secretary-Treasurer</i> Gerald Frankel, <i>Advisor</i>
Dielectric Science and Technology
Durga Misra, <i>Chair</i> Kalpathy Sundaram, <i>Vice-Chair</i> Oana Leonte, <i>Secretary</i> Dolf Landheer, <i>Treasurer</i> John Flake, <i>Advisor</i>
Electrodeposition
Gery Stafford, <i>Chair</i> Christian Bonhote, <i>Vice-Chair</i> Hariklia Deligianni, <i>Secretary</i> Giovanni Zangari, <i>Treasurer</i> Cynthia Bruckner-Lea, <i>Advisor Electronics and Photonics</i>
Yue Kuo, Chair
Ping-Chih Chang, First Vice-Chair Bernd Kolbesen, Second Vice-Chair Andrew M. Hoff, Secretary Ren Fan, Treasurer M. Jamal Deen, Advisor
Energy Technology
Sundar Narayanan, <i>Chair</i> Jean St-Pierre, <i>Vice-Chair</i> Jeremy P. Meyers, <i>Secretary</i> Jim Zheng, <i>Treasurer</i> Alok Srivastava, <i>Advisor</i>
Fullerenes, Nanotubes, and Carbon Nanostructur
Dirk Guldi, <i>Chair</i> R. Bruce Weisman, <i>Vice-Chair</i>
Jean-Fransois Nierengarten, <i>Secretary</i> Francis D'Souza, <i>Treasurer</i> Carl F. Holmes, <i>Advisor</i>
High Temperature Materials
Eric Wuchina, Chair
Enrico Traversa, Senior Vice-Chair Jeffrey Fergus, Junior Vice-Chair Timothy Armstrong, Secretary-Treasurer David Shifler, Advisor
Industrial Electrochemistry and
Electrochemical Engineering
John Weidner, <i>Chair</i> Vijay K. Ramani, <i>Vice-Chair</i> Gerardine Botte, <i>Secretary-Treasurer</i> Gerald Frankel, <i>Advisor</i> <i>Luminescence and Display Materials</i>
Uwe Happek, Chair
Kailash Mishra, <i>Vice-Chair</i> Holly Comanzo, <i>Secretary</i> John Collins, <i>Treasurer</i> Alok Srivastava, <i>Advisor</i>
Organic and Biological Electrochemistry
Albert Fry, Chair
James D. Burgess, <i>Vice-Chair</i> Jun-Ichi Yoshida, <i>Secretary-Treasurer</i> M. Jamal Deen, <i>Advisor</i>
Physical and Analytical Electrochemistry
Paul Trulove, <i>Chair</i> Shelley D. Minteer, <i>Vice-Chair</i> Robert A. Mantz, <i>Secretary</i>
Pawel J. Kulesza, Treasurer
Patrik Schmuki, Advisor Sensor
Rangachary Mukundan, <i>Chair</i>
Jing Li, Vice-Chair
Zoraida P. Aguilar, Secretary Michael T. Carter, <i>Treasuer</i> David Shifler, <i>Advisor</i>

The Annihilation of Threading Dislocations in the Germanium  Epitaxially Grown within the Silicon Nanoscale Trenches  GL. Luo, SC. Huang, CH. Ko, C. H. Wann, CT. Chung, ZY. Han,  CC. Cheng, CY. Chang, HY. Lin, CH. Chien
Fabrication of Electroless CoWP/NiB Diffusion Barrier Layer on SiO <sub>2</sub> for ULSI Devices  T. Osaka, H. Aramaki, M. Yoshino, K. Ueno, I. Matsuda, Y. Shacham-Diamand
Distribution of Light Elements in Multicrystalline Silicon for Solar Cells Grown by Directional Solidification  H. Matsuo, S. Hisamatsu, Y. Kangawa, K. Kakimoto
Charge Storage Characteristics of Mo Nanocrystal Memory influenced by Ammonia Plasma Treatment CC. Lin, TC. Chang, CH. Tu, WR. Chen, CW. Hu, S. M. Sze, TY. Tseng, SC. Chen, JY. Lin
Correlation Between Specific Contact Resistance and Dislocations for Nonalloyed Ohmic Contacts to p-GaN J. S. Kwak, M. J. Park
Characteristics of Thermally Robust 5 nm Ru–C Diffusion  Barrier/Cu Seed Layer in Cu Metallization  CW. Chen, J. S. Chen, JS. Jeng
Selection of Optimized Materials for CBRAM Based on HT-XRD and Electrical Test Results  R. Bruchbaus, M. Honal, R. Symanczyk, M. Kund
Integration of Atomic Layer Deposition-Grown Copper Seed Layers for Cu Electroplating Applications L. Wu, E. Eisenbraun
Dhmic Contact Properties and Annealing Effect for Au/Ni on p-Type P-Doped ZnO G. Hu, H. Gong, E. F. Chor
Pulsed Anodization for Control of Porosity Gradients and Interface Roughness in Porous Silicon T. D. James, A. J. Keating, G. Parish, C. A. Musca
Enhancement of NiSi-Based Nanocrystal Formation by Incorporating Ge Elements for Nonvolatile Memory Devices  CW. Hu, TC. Chang, CH. Tu, CN. Chiang, CC. Lin,  SW. Lee, CY. Chang, S. M. Sze, TY. Tseng
Development of Barrier Slurry for Improved Electrical Performance L. S. Leong, J. J. Keleber, B. F. Lin, X. B. Wang, P. P. Yap, F. Zhao,
M. S. Zhou, A. Lau
nsors and Displays: Principles, Materials, and Processing
nsors and Displays: Principles, Materials, and Processing  An Orange-Emitting, Long-Persistent Phosphor,
An Orange-Emitting, Long-Persistent Phosphor,  Ca <sub>2</sub> Si <sub>5</sub> N <sub>8</sub> :Eu <sup>2+</sup> , Tm <sup>3+</sup> Y. Miyamoto, H. Kato, Y. Honna, H. Yamamoto, K. Obmi  Energy Transfer Between Activators at Different Crystallographic Sites
An Orange-Emitting, Long-Persistent Phosphor,  Ca <sub>2</sub> Si <sub>5</sub> N <sub>8</sub> :Eu <sup>2+</sup> , Tm <sup>3+</sup> Y. Miyamoto, H. Kato, Y. Honna, H. Yamamoto, K. Ohmi  Energy Transfer Between Activators at Different  Crystallographic Sites  D. Ahn, N. Shin, K. D. Park, KS. Sohn  J24.  Property of Highly Oriented SrAl <sub>2</sub> O <sub>4</sub> :Eu Film on Quartz Glass  Substrates and Its Potential Application in Stress Sensor
An Orange-Emitting, Long-Persistent Phosphor,  Ca <sub>2</sub> Si <sub>5</sub> N <sub>8</sub> :Eu <sup>2+</sup> , Tm <sup>3+</sup> Y. Miyamoto, H. Kato, Y. Honna, H. Yamamoto, K. Ohmi  Crystallographic Sites  D. Ahn, N. Shin, K. D. Park, KS. Sohn  J24.  Property of Highly Oriented SrAl <sub>2</sub> O <sub>4</sub> :Eu Film on Quartz Glass
An Orange-Emitting, Long-Persistent Phosphor, Ca <sub>2</sub> Si <sub>5</sub> N <sub>8</sub> :Eu <sup>2+</sup> , Tm <sup>3+</sup> Y. Miyamoto, H. Kato, Y. Honna, H. Yamamoto, K. Ohmi  Energy Transfer Between Activators at Different Crystallographic Sites D. Ahn, N. Shin, K. D. Park, KS. Sohn  Property of Highly Oriented SrAl <sub>2</sub> O <sub>4</sub> :Eu Film on Quartz Glass Substrates and Its Potential Application in Stress Sensor X. Fu, H. Yamada, CN. Xu  J243 Investigation of Metal Peel-Off Technique for the Fabrication
An Orange-Emitting, Long-Persistent Phosphor,  Ca <sub>2</sub> Si <sub>5</sub> N <sub>8</sub> :Eu <sup>2+</sup> , Tm <sup>3+</sup> Y. Miyamoto, H. Kato, Y. Honna, H. Yamamoto, K. Ohmi  Crystallographic Sites  D. Ahn, N. Shin, K. D. Park, KS. Sohn  Property of Highly Oriented SrAl <sub>2</sub> O <sub>4</sub> :Eu Film on Quartz Glass  Substrates and Its Potential Application in Stress Sensor  X. Fu, H. Yamada, CN. Xu  J249  Investigation of Metal Peel-Off Technique for the Fabrication  of Flexible Organic Light-Emitting Diodes  S. Y. Kim, K. Kim, K. Hong, JL. Lee  Photoluminescence Properties of La <sup>3+</sup> , Eu <sup>3+</sup> Co-Doped YVO <sub>4</sub>

Preparation, Electronic Structure, and Photoluminescence Properties of $Eu^{2+}$ -Activated Carbonate $Sr_{1-x}Ba_xCO_3$ for White Light-Emitting Diodes Z. Ci, Y. Wang
Optical Properties of Transparent Wavelength-Conversion Film Prepared from YVO <sub>4</sub> :Bi <sup>3+</sup> ,Eu <sup>3+</sup> Nanophosphors S. Takeshita, K. Nakayama, T. Isobe, T. Sawayama, S. Niikura
Glycothermal Synthesis and Characterization of Scheelite-Type  NaEuW <sub>2</sub> O <sub>8</sub> Nanophosphors  R. Kasuya, T. Isobe
Sol-Gel Synthesis of an Efficient Blue CaMgSi <sub>2</sub> O <sub>6</sub> :Eu <sup>2+</sup> Thin-Film Phosphor with Two-Dimensional Triangular-Lattice SiN <sub>x</sub> Air-Hole Photonic Crystal  K. N. Lee, J. H. Moon, J. H. Oh, Y. R. Do
Tunable NO <sub>2</sub> -Sensing Characteristics of YSZ-Based  Mixed-Potential-Type Sensor Using Ni <sub>1-x</sub> Co <sub>x</sub> O-Sensing Electrode  P. Elumalai, V. V. Plashnitsa, Y. Fujio, N. Miura
Nanostructured Materials, Carbon Nanotubes, and Fullerenes
Template Epitaxial Growth of Thermoelectric Bi/BiSb Superlattice Nanowires by Charge-Controlled Pulse Electrodeposition X. Dou, G. Li, H. Lei, X. Huang, L. Li, I. W. Boyd
Controllable Synthesis of Highly Dispersed ZnO Nanoparticles and Nanorods G. Gao, W. Shi, L. Xiang
Photocatalytic Properties of TiO <sub>2</sub> Nanostructures Fabricated by  Means of Glancing Angle Deposition and Anodization  Y. Pibosh, I. Turkevych, J. Ye, M. Goto, A. Kasaḥara, M. Kondo, M. Tosa
nterdisciplinary Topics
Simulation of the Two-Phase Flow Hydrodynamics in an IRDE  Reactor  T. Nierhaus, H. Van Parys, S. Dehaeck, J. van Beeck, H. Deconinck, J. Deconinck, A. Hubin

## Sections

## Council of Section Officers

Venkat Srinivasan, Chair Lawrence Bottomley, Vice-Chair James Noel, Secretary Don Gervasio, Past-Chair

## Brazilian

Luís Frederico P. Dick, Chair lfdick@ufrgs.br

#### Canadian

Sasha Omanovic, Chair sasha.omanovic@megill.ca

## Chicago

Giselle Sandi, Chair gsandi@anl.gov

#### Chin

Ming Yang, Chair myang@icspectrum.com

## Cleveland

Irina Serebrennikova, Chair Irina.Serebrennikova@energizer.com

## Detroit

Alvaro Masias, Chair

#### European

Carmel Breslin, Chair

## Georgia

Peter Hesketh, Chair peter.hesketh@me.gatech.edu

#### Israel

Doron Aurbach, Chair aurbach@mail.biu.ac.il

## Japan

Shunri Oda, Chair soda@pe.titech.ac.jp

## Korea

Kwang Bum Kim, Chair kbkim@yonsei.ac.kr

## Mexican

Ignacio Gonzalez, Chair igm@xanum.uam.mx

# Pittsburgh

Konstantin Pimenov, Chair konstantinpimenov@consolenergy.com

## San Francisco

Kenneth Lux, Chair ken@altextech.com

## Taiwan

Jing-Yih Cherng, *Chair* amitajim@yahoo.com

# Texas

Harovel G. Wheat, Chair hwheat@mail.utexas.edu

# Twin Cities

Michael Root, Chair michael.root@bsci.com