PHYSICAL AND ANALYTICAL ELECTROCHEMISTRY DIVISON (PAED) NEWSLETTER

April 2010

Division Website: www.electrochem.org/ecs/tia/paed/paed.htm

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INSIDE THIS ISSUE

Recent Activities

Symposia

The division was a very active sponsor and co-sponsor of symposia during the last year. At the Fall 2009 meeting in Vienna, the division sponsored or co-sponsored 9 symposia and at Spring 2010 Meeting in Vancouver, the division sponsored or co-sponsored 8 symposia. The division also provided financial support to many of the symposia it sponsored or co-sponsored in. As a division we provided over $10,000 in supporting funds to help organizers assist in the travel of speakers. A list of these symposia appears later in this newsletter. The PAED also has an impressive slate of symposia for the next few meetings, and a list of these also appears at later in this newsletter.

Individuals wishing to submit symposia topics for future meetings should contact Robert Mantz, robert.a.mantz@us.army.mil

Last PAED Luncheon

Hugh De Long stepped down as PAED chair and handed off the reigns to vice chair Paul Trulove and Secretary-Treasurer Shelley Minteer

PAED chair Hugh Delong presented Gessie Brisard with a certificate of appreciation for her contributions to PAED including being the previous chair.

PAED chair Hugh De Long congratulated 3 of the student travel award winners.

Student Travel Awards

Vienna, Austria, October 2009

Five students received travel awards for the 2009 Fall Meeting in Vienna, Austria. The awardees and their University affiliations are:

1. Ruzniza Mohd Zawawi, Durham University, UK
2. Urbanova Veronika, University of Pardubice, France
3. Ileana Feliciano Ramos, University of Puerto Rico, USA
4. Badri Shyam, George Washington University, USA
5. Liya Wang, Simon Fraser University, Canada

Vancouver, Canada, April 2010

Five students received travel awards through PAED at the 2010 Spring meeting in Vancouver, Canada. These five students will be recognized at the Annual Luncheon and Business Meeting on Monday 25th of April. The awardees and their University affiliations are:

1. Juan A. Santana, University of Puerto Rico, USA
2. Ping-Hsun Hsieh, Illinois Institute of Technology, USA
3. Linais Vilciauskas, Max Planc Institute for Solid State Research, Germany
4. Noureen Siraj, Graz University of Technology, Austria
5. Siven Le Vot, Université du Québec à Montréal, Canada

Requesting Member Opinions

The PAED Chair (Paul Trulove, trulove@usna.edu) is soliciting the membership for both new symposia topics and members to help organize future symposia. This is a perfect opportunity for member to serve their professional community and gain insight into the operation of their society.

PAED Awards

David C. Grahame Award

The David C. Grahame Award is one of two awards given by the Physical and Analytical Electrochemistry Division. It was established in 1981 through the sponsorship of General Electric and the Ford Foundation to encourage excellence in physical electrochemistry research. The award is given in the spring of odd-numbered years and consists of a scroll and prize of $1,500

The Award Rules specify that, "The David C. Grahame Award shall be granted to a currently Active Member of the Society upon some recent outstanding scientific contribution to physical electrochemistry. For the purpose of the Award, currently active is to be measured by publication of more than one paper in the Journal and attendance at more than one Society meeting, as a member of the Society, within the previous five years."

Award packages are due to Paul Trulove on 1 May 2010.

Max Bredig Award in Molten Salt Chemistry

The Max Bredig Award in Molten Salt Chemistry is the other award given by the Physical and Analytical Electrochemistry Division. It was established in 1984 through the sponsorship of ARCO Metals Company and the Aluminum Company of America in order to recognize excellence in molten salt chemistry research and to stimulate publication of high quality research papers in this area in the Journal of The Electrochemical Society. The awarded is granted to a scientist working in the area of molten salt chemistry to recognize important scientific contribution(s) to molten salt chemistry.

The Award will consist of a certificate the recipients receives a check payable to him or her for the sum of at least $1,500. The recipient is required to attend the Society meeting at which the Award is given and to present an Award lecture, which will be given at the International Molten Salt Symposium sponsored by the Physical and Analytical Electrochemistry Division at that meeting.

Award packages were submitted and a winner selected by the committee. The announcement will be made after approval by the Society's Honors and Awards Committee.

Symposia

Vienna Sponsored Symposia

B2 - Alkaline Electrochemistry in Fuel Cells (D. Chu, R. Mantz and C. Wang)

B8 - Proton Exchange Membrane Fuel Cells 9 (PEMFC9) (T. F. Fuller, P. Bele, S. Cleghorn, H. A. Gasteiger, C. Hartnig, T. Jarvi, D. J. Jones, C. Lamy, V. Ramani, P. Shirvanian, P. Strasser, H. Uchida, T. A. Zawodzinski and P. Zelenay)

B9 - Semiconductor Electrolyte Interface and Photoelectrochemistry (K. Rajeshwar, M. A. Ryan and T. A. Zawodzinski)

C2 - New Biomimetic Materials for Electrochemical Sensing (C. Kranz, M. Bayachou and H. De Long)

C3 - Synthetic and Mechanistic Organic Electron Transfer Reactions (T. Fuchigami, G. Cheek, D. Evans and F. Maran)

I1 - Physical, Electroanalytical and Bioanalytical Electrochemistry (P. J. Kulesza, M. Fojta, A. Kuhn, S. Minteer and Z. J. Stojek)

I2 - Electrochemistry: Symposium on Interfacial Electrochemistry in Honor of Brian E. Conway (B. MacDougall, C. Bock, E. Gileadi, S. Gottesfeld, D. Harrington, J. Leddy, W. Lorenz, S. Morin, B. Scrosati and S. Trasatti)

I3 - Physical and Analytical Electrochemistry in Ionic Liquids (P. Trulove, H. De Long and R. Mantz)

J2 - Impedance Techniques: Diagnostics and Sensing Applications (V. Lvovich, D. C. Hansen, M. E. Orazem, B. Tribollet and P. Vanysek)

Vancouver Sponsored Symposia

B4 - Biological Fuel Cells 4 (S. Calabrese Barton, P. Atanassov, K. Kano, S. Minteer and I. Taniguchi)

B7 - Electrode Processes Relevant to Fuel Cell Technology (V. I. Birss, P. Kulesza, W. Mustain, K. Ota and D. P. Wilkinson)

C1 - Electrochemistry in Medicine and Biomedical Applications (C. Bock, J. Burgess, B. Eggers, P. Hesketh, C. Holmes and J. Mauzeroll)

I1 - Physical and Analytical Electrochemistry General Session (S. Minteer, Z. P. Aguilar, J. Burgess and P. Tunon-Blanco)

I3 - Charge Transfer: Electrons, Protons, and Other Ions (S. Paddison and P. Trulove)

I4 - Progress in Spectro-Electrochemistry and Surface Science of Electrocatalytical Interfaces (In Memory of E. B. Yeager) (R. Holze and D. Gervasio)

I5 - In Situ Scanning Probe Microscopy and Spectroscopy in Electrochemistry (S. Morin, O. Magnussen and N. Missert)

J2 - Electrochemical Nano/Bio Sensors 2 (J. Burgess, H. De Long, L. Nagahara, A. L. Simonian, I. Taniguchi and E. Traversa)

UPCOMING SYMPOSIA

218th Meeting – Las Vegas, NV
October 10-15, 2010

The Executive committee of the Physical and Analytical Electrochemistry Division cordially invites you to participate at the fall 2010 Meeting, which will be held October 10 – October 15 in Las Vegas, NV. There will be 10 symposia where the Physical Division is either the organizer or a co-organizer.

PAED Sponsored and Co-Sponsored Symposia

B4 - Electrode-Electrolyte Interfaces in Li-ion Batteries (Battery / Physical and Analytical Electrochemistry)

Electronic and ionic transport across electrode-electrolyte interfaces is crucial to the operation of Li-ion batteries. Understanding structure and reactivity at interfaces is particularly important for understanding battery performance and failure modes. Formation of stable interphases at the surface of anodes and cathodes represents an important factor that determines electrochemical properties of Li-ion systems. A better understanding of the underlying principles that govern these phenomena is inextricably linked to our ability to sense and monitor electrode surface proceses in situ, in real time, and with adequate spatial resolution.

Papers that leverage advances in each of these areas are welcome. Contributions on experimental and theoretical modeling approaches to characterize and describe the mechanism of interfacial phenomena and their impact on the electrochemical performance of the materials, composite electrodes, and Li-ion systems are strongly encouraged. Communications on new research opportunities offered by emerging in situ instrumentation and methods are sought.

An issue of ECS Transactions is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than November 19, 2010. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: B. Y. Liaw, Hawaii Natural Energy Institute, SOEST, University of Hawaii, e-mail: bliaw@ hawaii.edu; and R. Kostecki, Lawrence Berkeley National Laboratory, e-mail: r_kostecki@lbl.gov.

B6 - Non-Aqueous Electrolytes for Lithium Batteries (Battery / Physical and Analytical Electrochemistry)

The electrolyte plays a vital role in the performance of rechargeable lithium batteries. A better understanding of the elementary processes involved in the formation of the electrolyte/electrode interface and charge transfer kinetics in relation to solvent, salt, additive and electrode material is crucial to the further optimization of Li and Li-ion batteries. This symposium will focus on both the fundamental and applied aspects of the electrolyte for Li and Li-ion batteries. Topics of interest include, but are not restricted to, the theoretical and experimental studies of structure-property relationships of electrolytes; development of new salts, solvents and additives; development of ionic liquid electrolytes; development of electrolytes for 5 V Li and Li-ion batteries; studies and approaches leading to the understanding of electrode/electrolyte interfacial phenomena and the charge transfer processes; electrolytes with enhanced non-flammability; electrolytes for wide temperature range operations; and cell performance improvement with respect to that of electrolyte materials.

An issue of ECS Transactions is planned to be published "AFTER" the meeting. All authors accepted for presentation are encouraged to submit their full text manuscript for the issue no later than November 19, 2010. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: B. Lucht, University of Rhode Island, e-mail: blucht@chm.uri.edu; W. A. Henderson, North Carolina State University, e-mail: whender@ncsu.edu; T. R. Jow, U.S. Army Research Laboratory, e-mail: rjow@ arl.army.mil; and M. Ue, Mitsubishi Chemical Corporation, e-mail: 3707052@cc.m-kagaku.co.jp.

B7 - Polymer Electrolyte Fuel Cells 10 (Energy Technology / Physical and Analytical Electrochemistry / Battery / Industrial Electrochemistry and Electrochemical Engineering)

This international symposium is devoted to all aspects of research, development, and engineering of polymer electrolyte fuel cells (PEFCs), as well as low-temperature direct-fuel cells using either anion or cation exchange membranes. The intention is to bring together the international community working on the subject and to enable effective interactions between research and engineering communities. The symposium is structured as five different sections: diagnostic techniques and systems design/components for both acid

and alkaline fuel cells, catalysts and membranes for acid fuel cells, and catalysts and membranes for alkaline fuel cells. Abstracts for oral or poster contributions must be submitted to the symposium via the ECS website; please send a copy of your abstract to the respective Session Chairs (please cc the Lead Editor). Since the number of time slots for oral presentations are limited, we would appreciate it if research groups which submit several abstracts could seek a reasonable balance between oral and poster contributions.

Section A: Diagnostics/Characterization Methods, MEA Design/Model Organizers: H. Gasteiger, F. Büchi, V. Ramani, and A. Weber

Presentations related to acid and alkaline fuel cells that discuss: (1.) novel gas diffusion medium substrates and micro-porous layer designs; (2.) modeling and diagnostic methods to characterize mass- and heat-transport related phenomena (e.g., water flooding) in cells and membrane electrode assemblies; (3.) CO2 tolerance modeling of anion- exchange membrane fuel cells; (4.) in-situ measurement or visualization (X-ray tomography, neutron scattering, etc.); (5.) advanced ex-situ characterization methods (TEM, STM); (6.) AC-impedance methods; and (7.) electrode and MEA electrochemical modeling.

Section B: Fuel Cell Systems, Stack/BOP Design, Gas Processing Organizers: P. Shirvanian, T. Fuller, R. Darling, and S. R. Narayanan

Presentations related to acid and alkaline fuel cells that discuss: (1.) hydrogen or hydrogen-reformate fuel cells; (2.) direct-fuel fuel cells (DMFC, borohydride, etc.); (3.) alkaline (membrane) fuel cells; (4.) portable fuel cells; (5.) new cell and stack structures, including new types of bipolar plates and flow fields; (6.) hydrogen-reformate synthesis; and (7.) balance-of-plant (BOP) components; and (8.) design and specifications of complete power systems in the context of transportation and stationary power generation applications as well as for micro-fuel cell systems.

Section C: Cation-Exchange Membrane Performance/ Durability Organizers: M. Inaba, S. Cleghorn, D. Jones, and T. Zawodzinski

Presentations related to acid fuel cells that discuss: (1.) advanced cation-exchange membranes and ionomers (PFSAs, hydrocarbon-based, etc.); (2.) high-temperature membranes; (3.) physical-chemical properties of fuel cell membranes; (4.) structural characterization of membranes; (5.) degradation/ aging of membranes (chemical and mechanical); and (6.) molecular modeling of membrane properties.

Section D: Catalyst Activity/Durability for Acid Fuel Cells Organizers: H. Uchida, C. Lamy, and P. Strasser

Presentations related to acid fuel cells that discuss: (1.) fuel cell electrocatalysts for hydrogen and hydrogen-reformate fuel cells; (2.) fuel cell electrocatalysts for direct-fuel fuel cells; (3.) novel catalyst supports; (4.) degradation of fuel cell electrocatalysts and catalyst supports; and (5). ab initio computational studies of catalytic mechanisms and for the design of novel catalysts.

Section E: Alkaline Fuel Cell Membranes and Catalysts Organizers: R. Mantz, D. Chu, and T. Schmidt

Presentations related to alkaline fuel cells that discuss: (1.) electrocatalysts for hydrogen oxidation and oxygen reduction; (2.) catalysts for the direct electrooxidation of alternative fuels (e.g., methanol, ethanol, ammonia, etc.); (3.) catalysts for direct-borohydride applications; (4.) novel anion- exchange membranes; and (5.) degradation mechanisms of anion-exchange membranes.

A hard-cover issue of ECS Transactions is planned to be available “AT” the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than June 18, 2010. All manuscripts will be submitted online, and must be in either MS Word or PDF format.

Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers:
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Section E: R. Mantz, U.S. Army Research Office, USA, e-mail: robert.a.mantz@us.army.mil; D. Chu, U.S. Army Research Laboratory/SEDD, USA, e-mail: deryn.chu@us.army.mil; and T. Schmidt, BASF Fuel Cell GmbH, Frankfurt, Germany, e-mail: thomas.justus.schmidt@basf.com.

In order to encourage active participation of new and talented researchers in the field, we anticipate awarding Travel Grants of at least $500 and free registration in support of outstanding graduate students and postdoctoral fellows. Awards will be made based on originality of the work and importance to the field. To be considered for the award, an abstract for an oral or poster presentation as well as a manuscript for the symposium proceedings must be submitted by the respective deadlines. If you would like to apply for the travel grant, please submit your abstract, your proceedings manuscript, your resume, and your publication list to Adam Weber (azweber@lbl.gov) before the deadline for the proceedings manuscript. Student Poster Prizes of a total of $3,000 will be awarded with a $1,000 top prize. Students who want to participate need to submit an abstract for a poster contribution to the ECS and send a copy of their abstract to Jim Fenton (jfenton@fsec.ucf.edu). A Short Course on fundamental catalysis and how it can be applied to low-temperature fuel cell diagnostics and kinetic studies will be held the Sunday of the meeting (Instructors: T. Schmidt and H. Gasteiger).

B9 - Solid State Ionic Devices 8 – NEMCA (High Temperature Materials / Energy Technology / Battery / Physical and Analytical Electrochemistry / Sensor / New Technology Subcommittee)

Solid-state electrochemical devices, such as batteries, fuel cells, membranes, and sensors, are critical components of technologically advanced societies in the 21st century and beyond. The development of these devices involves common research themes such as ion transport, interfacial phenomena, and device design and performance, regardless of the class of materials or whether the solid state is amorphous or crystalline. The intent of this international symposia series is to provide a forum for recent advances in solid-state ion conducting materials and the design, fabrication, and performance of devices that utilize them.

For this, the eighth in the series of international symposia, emphasis will be given to electrocatalysis and non- Faradaic electrochemical modification of catalytic activity (NEMCA). Papers on heterogeneous electrocatalytic activity at electrode interfaces and the modification of catalytic activity by applied fields are particularly encouraged. In addition, papers are solicited in such topics as modeling and characterization of defect equilibria, ionic and electronic transport; novel synthesis and processing of thin films, membranes;

permeation studies; materials characterization and crystallographic investigations; extreme engineering applications; and the design, and performance of solid state ionic devices: fuel cells, thermal energy converters, solid-state batteries and microbatteries, chemical sensors, supercapacitors, membranes, and electrochromic devices.

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Abstracts should be submitted electronically to ECS headquarters, and questions and inquiries should be sent to the symposium organizer: E. D. Wachsman, University of Maryland, e-mail: ewach@umd.edu; C. Bock, National Research Council of Canada, e-mail: Christina.Bock@nrc- cnrc.gc.ca; G. Hunter, NASA Glenn Research Center, e-mail: ghunter@grc.nasa.gov; and E. Traversa, International Research Center for Materials Nanoarchitectonics (MANA), National Institute for Materials Science (NIMS), Tsukuba, Japan, e-mail: traversa.enrico@nims.go.jp.

I1 - Physical and Analytical Electrochemistry General Session (Physical and Analytical Electrochemistry)

Papers concerning any aspect of physical electrochemistry not covered by topic areas of other specialized symposia at this meeting are welcome. Contributed papers will be programmed in some related order, depending on the titles and contents of the submitted abstracts.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizer: S. Minteer, Saint Louis University, minteers@slu.edu.

I2 - Electrochemistry in Nanospaces (Physical and Analytical Electrochemistry)

This symposium will provide an international and interdisciplinary forum for researchers to present their recent research on electrochemical studies involving nanospaces (nanopores, nanoholes) having controlled structures. Papers are invited in the following areas: electrochemical approaches to synthesize nanoporous materials, electrochemical studies on mass/electron/charge transport behavior within nanospaces, and applications of nanospaces for electroanalytical sensing and power sources.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: T. Ito, Kansas State University, e-mail: ito@ksu.edu; and L. Baker, Indiana University, e-mail: lanbaker@indiana.edu.

I3 - International Symposium on Molten Salts and Ionic Liquids 17 (Physical and Analytical Electrochemistry / High Temperature Materials / Electrodeposition / Energy Technology)

This symposium will provide an international and interdisciplinary forum to present the latest research on systems involving molten salts and ionic liquids. Papers on basic and applied research in all areas of chemistry, engineering, electrochemical systems, and physics related to molten salts and ionic liquids are solicited.

The topics will include: (1.) power and energy applications (e.g., batteries, fuel cells, semiconductors, photovoltaics, and phase change energy storage); (2.) rare Earth and nuclear chemistry (e.g., lanthanides, actinides, radioisotopes, nuclear reprocessing); (3.) electrodeposition (e.g., deposition of alloys, characterization of electroactive species, and surface characterization); (4.) reactions (e.g., catalysis, synthesis, oligomerizations, and polymerizations); (5.) separations (e.g., selective extractions and biphasic systems); (6.) corrosion phenomena (e.g., corrosion protection and molten salt promoted corrosion); (7.) solute and solvent properties (e.g., structural investigations, melting behavior, dynamics, and stability of molten salts); (8.) biochemical and biomedical applications (e.g., dissolution of biopolymer, enzymatic reactions, and bioelectrocatalysis); and (9.) new ionic liquids and molten salt mixtures (e.g., liquid clathrates, binary and ternary melts, and task specific ionic liquids).

Keynote lectures will be presented by invited speakers. A poster session will be planned. Student participation is highly encouraged, and it is anticipated that some funds will be available for student and young scientist support.

A hard-cover issue of ECS Transactions is planned to be available "AT" the meeting. All authors accepted for presentation are obligated to submit their full text manuscript for the issue no later than June 18, 2010. All manuscripts will be submitted online, and must be in either MS Word or PDF format. Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: D. M. Fox, American University, e-mail: dfox@american.edu; H. De Long, AFRL/AFOSR, Directorate of Chemistry and Life Sciences, e-mail: hugh. delong@afosr.af.mil; W. A. Henderson, North Carolina State University, e-mail: whender@ncsu.edu; R. A. Mantz, Army Research Office, e-mail: Robert.a.mantz@us.army.mil; M. Mizihata, Kobe University, mizuhata@kobe-u.ac.jp; and P. C. Trulove, United States Naval Academy, e-mail: trulove@usna.edu.

I4 - Oscillations and Pattern Formation in Electrochemical Systems (Physical and Analytical Electrochemistry)

This symposium will be held to provide a forum for reviewing recent advances in application of nonlinear science to electrochemical systems. Papers are solicited on characterization of far-from-equilibrium phenomena including bistablity, oscillations, chaos, and pattern formation in electrocatalytic, electrodeposition, and metal dissolution systems. Special attention will be paid to the description of dynamical behavior of fuel cells and corrosion processes. Both experimental (e.g., spatially resolved microscopic techniques, time series analysis, control problems) and theoretical (e.g., numerical modeling, stability analysis, perturbation methods) approaches will be considered.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: I. Z. Kiss, Saint Louis University, e-mail: izkiss@slu.edu; and H. Varela, Universidad de São Paulo, e-mail: varela@iqsc.usp.br.

I5 - Professor V. S. Bagotsky: 65 Years in Theoretical Electrochemistry, Electrocatalysis, and Applied Electrochemistry (Physical and Analytical Electrochemistry / Energy Technology)

This symposium is being held to honor one of the most significant figures in the field of electrochemistry during the past 60+ years: Prof. Vladimir S. Bagotsky. Coincidentally, Prof. Bagotsky marks his 90th birthday in 2010, so there are several reasons to celebrate his achievements during that year. Prof. Bagotsky's career in electrochemistry began in the mid-1940s, and he has continued to actively contribute to the field until the present time. He was a colleague and co- worker of Prof. Alexander Frumkin from 1944 until Frumkin's death in 1976. His contributions to the understanding of direct-methanol fuel-cell reactions during the '60s and '70s are legendary. He was the first to prove that the dissociative- splitting mechanism was a crucial step in the adsorption and oxidation of methanol at noble-metal electrodes. This initial-stage reaction step is accepted to this day. He has also been actively engaged in research and development of the silver–zinc, and other, storage battery systems; indeed, the battery systems he developed were extensively used in the Russian Space Program of the late 1950s and early 1960s. Prof. Bagotsky took part in the launching of the first Russian Sputnik satellite in 1957, and the first flight of man in space (1961). In some respects, one could consider him as a living legend, and this symposium will honor his accomplishments and contributions to the field.

Contributions to this symposium are invited in the following research areas (based on the life and career of V. S. Bagotsky): (1.) chemical and electrochemical power systems for generation, conversion and storage; (2.) electrochemical reaction kinetics; (3.) electrocatalysis for fuel cell and related electrochemical reactions; (4.) the direct methanol fuel cell [DMFC] system, and its many machinations over the years; and (5.) open questions in electro-kinetics, catalysis and power systems, especially related to the research career of V. S. Bagotsky.

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Abstracts should be submitted electronically to the ECS headquarters, and questions and inquiries should be sent to the symposium organizers: B. MacDougall, National Research Council of Canada, e-mail: barry.macdougall@ nrc-cnrc.gc.ca; C. Bock, National Research Council of Canada, Institute for Chemical Processes and Environmental Technologies, e-mail: Christina.Bock@nrc-cnrc.gc.ca; E. Shembel, Enerize Corporation, e-mail: eshembel@enerize. com; and K. Zaghib, Institut de Recherche d'Hydro-Québec (IREQ), e-mail: zaghib.karim@ireq.ca.

J3 - Microfabricated and Nanofabricated Systems for MEMS/NEMS 9 (Sensor / Dielectric Science and Technology / Physical and Analytical Electrochemistry / Electronics and Photonics)

This symposium continues the series of symposia that focus on all aspects of MEMS/NEMS technology including micro/nanomachining, fabrication processes, packaging, and the application of these structures and processes to the miniaturization of chemical sensors, physical sensors, biosensors, miniature chemical analysis systems and other devices. Particular emphasis should be placed on processes and potential applications of these devices. The following is a partial list of topics to be solicited: (1.) fabrication and processing of nano/microsystems; (2.) nanomaterials for sensors and actuators; (3.) novel methods of

processing at the nano/microscale; (4.) use of nano/microstructures applicable to environmental and biological studies; (5.) chemical, electrical and physical testing of devices; (6.) integrated microfabricated sensors into arrays; (7.) reliability of micro/ nanomechanical structures; (8.) new materials for NEMS/ MEMS including aluminum nitride and silicon carbide films.

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219th Meeting – Montreal
May 1 - 6, 2010

The Executive committee of the Physical and Analytical Electrochemistry Division cordially invites you to participate at the 219th Meeting of the Electrochemical Society, which will be held May 1 – 6, in Montreal, Canada. There are currently nine tentative symposia where the PAED Division is either the organizer or co-organizer.

Graham Award Symposium and Physical and Analytical Electrochemistry General Session
(Physical and Analytical Electrochemistry)
Organizer: S. Minteer

Nanostructured and Functionalized Conducting Polymer Films and Related Materials 2
(Physical and Analytical Electrochemistry)
Organizer: P. Kulesza

Charge Transfer Processes in Biological Systems
(Physical and Analytical Electrochemistry, OBE)
Organizer: H. De Long

Role of Electrochemistry in Addressing of Climate Change - Materials, Batteries, Fuel Cells, Photoelectrochemistry, and Environmental Analysis
(Physical and Analytical Electrochemistry)
Organizer: I. Fritsch

Bioelectrocatalysis
(Physical and Analytical Electrochemistry, ET)
Organizers: S. Minteer, S. Calabrese Barton

Computational Electrochemistry
(Physical and Analytical Electrochemistry)
Organizers: S. Paddison

Direct Methanol Fuel Cells 2
(Physical and Analytical Electrochemistry)
Organizers: T. Zawodzinski

Electrocatalysis 5
(Physical and Analytical Electrochemistry)
Organizers: G. Brissard, A. Wieckowski

Fundamentals Electron transfer in honor of Ves Childs
(Physical and Analytical Electrochemistry and IEEE)
Organizer: Ingrid Fritsch

Future Meeting Dates

Fall 2010	October 10 - 15	Las Vegas
Spring 2011	May 1 – 6	Montreal
Fall 2011	October 9 – 14	Boston
Spring 2012	May 6 – 11	Seattle
Fall 2012	TBD	TBD
Spring 2013	May 12 -17	Toronto
Fall 2013	October 27 – November 1	San Francisco
Spring 2014	May 11 – 16	Orlando