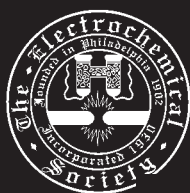


CALL FOR PAPERS

1999 Joint International Meeting

196th Meeting of The Electrochemical Society
1999 Fall Meeting of The Electrochemical Society of Japan
with technical cosponsorship of The Japan Society of Applied Physics



Honolulu, Hawaii
October 17-22, 1999
Hilton Hawaiian Village

For more information contact:
The Electrochemical Society, Inc.
10 South Main Street
Pennington, NJ 08534-2896 USA
Phone: (609) 737-1902
Fax: (609) 737-2743
E-mail: ecs@electrochem.org
Web Site: <http://www.electrochem.org>

The 1999 Joint International Meeting will be held from October 17-22, 1999 and it combines the 196th Meeting of The Electrochemical Society (ECS) and the 1999 Fall Meeting of The Electrochemical Society of Japan (ECSJ) and is technically cosponsored by The Japan Society of Applied Physics (JSAP). This major international conference offers a unique blend of electrochemical and solid-state science and technology. The 1999 Joint International Meeting continues this tradition of the 1987 and 1993 Hawaii Meetings and serves as a major conference for the discussion of interdisciplinary research from around the world through a variety of formats, such as oral presentations, poster sessions, exhibits, panel discussions, and tutorial sessions.

HOTEL & MEETING REGISTRATION

Hotel Information—The 1999 Joint International Meeting will be held at the Hilton Hawaiian Village (2005 Kalia Road, Honolulu, HI 96815-1999 USA). The Hilton Hawaiian Village is situated on Waikiki's best white sand beach and it is one of Hawaii's most contemporary and unique resorts. With 20 acres of paradise, the Village surrounds its guests with lush tropical plants, flowers, cascading waterfalls and priceless art treasures from around the world. The site of the 1987 and 1993 Hawaii Meetings, this hotel is an ideal Headquarters Hotel for the 1999 Joint International Meeting.

Since the Hilton Hawaiian Village is the Headquarters Hotel, we have special rates for our attendees. Please note that October is a very busy month in Hawaii and space is limited, so we encourage you to make your reservations early. To obtain these special convention rates, you must mention that you are planning to attend The 1999 Joint International/Electrochemical Society Meeting. The deadline for reservations is September 17, 1999. In addition, a limited number of government rate rooms are available (please contact the ECS Headquarters Office for details).

Diamond Head Tower - \$157 for Single or Double Occupancy
Tapa Tower - \$175 for Single or Double Occupancy
Rainbow Tower - \$209 for Single or Double Occupancy

The Hilton Hawaiian Village reservations telephone number is (808) 949-4321, toll free (800) hiltonts, or fax (808) 947-7898.

Meeting Registration Information—The deadline for advance registration is October 1, 1999. Refunds are subject to a 10% processing fee and will only be honored if written requests are received by October 8, 1999. Registration will open on Sunday and the technical sessions will be conducted Monday through Friday. All participants of the 1999 Joint International Meeting are required to pay the appropriate registration fees. Individuals choosing to register in advance or on-site must use US dollars, Visa and MasterCard are also accepted.

The Electrochemical Society will handle the meeting operations and registration. The registration fees are:

Category	Advance	On-Site
Member (ECS, ECSJ & JSAP)	\$245	\$275
Student Member	\$65	\$75
One Day Member	\$200	\$220
Emeritus & Honorary (ECS only)	\$0	\$0
Nonmember	\$345	\$375
Student Nonmember	\$80	\$90
One Day Nonmember	\$210	\$230
Nontechnical Registrant	\$50	\$60

TECHNICAL EXHIBITION

The 1999 Joint International Meeting will also include a Technical Exhibition, featuring presentations and displays by over 50 manufacturers of instruments, materials, systems, publications, and software of interest to meeting attendees. Parties interested in exhibiting should contact The Electrochemical Society Headquarters Office for more information. Coffee breaks are scheduled each day in the exhibition along with evening poster sessions.

ABSTRACT SUBMISSION

Submit one original, **ONE PAGE**, properly formatted, Meeting Abstract either electronically or on paper by **May 14, 1999** to The Electrochemical Society Headquarters Office, with a copy to the appropriate Symposium Organizer(s). Meeting Abstracts should explicitly state objectives, new results, and conclusions or significance of the work. Programming for this Meeting will occur in June of 1999, with some papers scheduled for poster presentation. All presenting authors will receive a letter from The Electrochemical Society Headquarters Office notifying them of the date and time of their presentation. Check the ECS Home Page (<http://www.electrochem.org/abstracts.html>) for further program details.

PAPER PRESENTATION

All authors of papers selected for either oral or poster presentations will be notified in June of 1999. Oral presentations must be in English. Presenting authors are requested to use standard 24 x 36 mm slides in 50 x 50 mm mounts, or transparencies for overhead projectors. Poster presentations will be displayed in English, on a board 96 inches (2.45 m) wide by 48 inches (1.22 m) high, corresponding to their abstract number and day of presentation in the final program. Speakers requiring special equipment must make a written request to the ECS Headquarters Office and appropriate arrangements will be worked out at the expense of the author.

MANUSCRIPT PUBLICATION

All Meeting Abstracts will be published both on the ECS Web Site and in the Meeting Abstracts Volume copyrighted by The Electrochemical Society, Inc. and become the property of the ECS upon presentation. To publish in the *Journal of The Electrochemical Society* or *Electrochemical and Solid-State Letters*, a full manuscript must be submitted within six months of the symposium date. "Instructions to Authors" are available from the ECS Headquarters Office, the *Journal* or *Letters*, or the ECS web site. If publication elsewhere is desired after presentation, written permission from the ECS Headquarters Office is required.

FINANCIAL ASSISTANCE

Financial assistance is very limited and generally governed by the Symposium Organizers. Individuals may inquire directly to the Symposium Organizers of the symposium in which they are presenting their paper to see if funding is available. Individuals requiring an official letter of invitation should write to the ECS Headquarters Office; such letters will not imply any financial responsibility of either the ECS, ECSJ or JSAP.

SECOND MEETING ANNOUNCEMENT

The second meeting announcement will include complete details on the technical sessions, a meeting registration form, travel, hotel and tour reservation information, and additional meeting information. This announcement will be mailed to all ECS, ECSJ and JSAP members, all authors of papers and technical session co-chairs in the summer of 1999.

CONTACT INFORMATION

If you have any questions or require additional information, contact The Electrochemical Society, Inc., 10 South Main Street, Pennington, New Jersey 08534-2896 USA, Phone: (609) 737-1902, Fax: (609) 737-2743, E-mail: ecs@electrochem.org, Web: <http://www.electrochem.org>.

A1 - GENERAL STUDENT POSTER SESSION



(All Divisions and Groups)

This Poster Session provides a forum for graduate and undergraduate students to present research results of general interest to the Society. The purpose of this session is to foster and promote work in both electrochemical and solid-state science and technology, and to stimulate active student interest and participation in the Society. A competition for the two best posters will be part of the session. A cash prize of \$250 and a scroll will be awarded to the winning student authors. In the case of coauthors, a maximum award of \$750 per winning poster will be divided equally between student coauthors. The awards will be made without regard to sex, citizenship, race, or financial need.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Session Organizers: **P. S. Fedkiw**, Department of Chemical Engineering, North Carolina State University, 113 Riddick Laboratories, Box 7905, Raleigh, NC 27695-7905 USA, Phone: (919) 515-3572, Fax: (919) 515-3465, E-mail: peter_fedkiw@ncsu.edu; **D. Misra**, Department of Electrical & Computer Engineering, New Jersey Institute of Technology, Newark, NJ 07102-1982 USA, Phone: (201) 596-5680, Fax: (201) 596-5680, E-mail: dmisra@megahertz.njit.edu; and **T. Watanabe**, Institute of Industrial Science (IIS), University of Tokyo, Roppongi, Minato-ku, Tokyo 106-8558, Japan, Phone and Fax: 81-3-3401-5975, E-mail: watanabe@cc.iis.u-tokyo.ac.jp.

B1 - HEAVY DUTY BATTERIES FOR ELECTRIC VEHICLES AND PORTABLE DEVICES



(Battery Division/Energy Technology Division)

Papers are solicited on all aspects of batteries related to stationary, portable, and transportation applications. This symposium will provide a forum for papers on applied and basic research describing the development and performance of batteries for stationary uses such as utility, customer side of the meter, and uninterruptible power sources; mobile electronic products such as laptop and palmtop computers, cellular phones, and camcorders, and for transportation applications such as electric and hybrid vehicles, buses, and trains. This symposium will cover a wide range of topics related to the electrochemistry, materials' development, component technologies, and auxiliaries that are used with batteries for the specific applications. Recent development of batteries with high power and energy density, high efficiency, and longer life are welcome. Papers on aqueous and nonaqueous batteries, including their chemistry, status, operating characteristics, failure modes, testing, reliability, safety, methods of production, costs, environmental considerations, recycling of used batteries and commercialization are invited.

Due to the large number of papers expected at this Meeting, some submitted papers may be selected for a poster session.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **A. R. Landgrebe**, International Electrochemical Technology Systems, 14B Sussex Lane, Long Neck, DE 19966 USA, Phone: (302) 945-2219, Fax: (302) 945-2219, E-mail: albert@dmv.com; and **Z. Ogumi**, Department of Energy and Hydrocarbon Chemistry, Graduate School of Engineering, Kyoto University, Sakyo-ku, Kyoto 606-8051, Japan, Phone: 81-75-753-5522, Fax: 81-75-753-5889, E-mail: ogumi@scl.kyoto-u.ac.jp.

B2 - INTERCALATION COMPOUNDS FOR BATTERY MATERIALS



(Battery Division/Energy Technology Division)

This symposium will provide an international forum to discuss recent progress that has been made in the development of intercalation compounds for battery applications. The symposium will focus on both basic and applied research findings that have led to improved mate-

rials and to the understanding of the fundamental processes that determine and control electrochemical performance. A major (but not exclusive) theme of the symposium will be intercalation anodes and cathodes for lithium batteries. Specific topics of interest include: 1. Synthesis, characterization and materials engineering; 2. Electrochemical properties and cell performance characteristics; 3. Structure and reaction mechanisms; 4. Chemical, electrochemical and structural stability as a function of the state-of-charge; 5. Fundamental aspects of redox processes and charge transfer; 6. Electronic properties; and 7. Theoretical modeling of intercalation compounds and electrochemical processes.

Because of the large number of papers expected at this meeting, some submitted papers may be selected for a poster session. Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript before, or at the time of the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **G. A. Nazri**, General Motors Research and Development Center, Physics and Physical Chemistry Department, RCEL, MS: 480-102, Warren, MI 48090-9055 USA, Phone: (810) 986-0737, Fax: (810) 986-2244, E-mail: gnazri@cmsa.gmr.com; **T. Ohzuku**, Department of Chemistry, Faculty of Applied Engineering, Osaka City University, Sugimoto 3-3138, Sumiyoshi, Osaka 558-8585, Japan, Phone: 81-6-605-2693, E-mail: ohzuku@chem.eng.osaka-cu.ac.jp; and **M. Thackeray**, Chemical Technology Division, Argonne National Laboratory, 9700 South Cass Avenue, Argonne, IL USA 60439-4837, Phone: (630) 252-9184, Fax: (630) 252-4176, E-mail: thackeray@cmt.anl.gov.

B3 - LITHIUM BATTERIES



(Battery Division/Energy Technology Division)

Papers are solicited on the both fundamental and applied aspects of primary lithium batteries (liquid and solid cathode) and secondary lithium batteries (lithium metal, lithium ion and lithium metal polymer, lithium ion polymer). Specific areas to be covered include, but are not limited to: 1. Anode materials; 2. Cathode materials; 3. Electrolytes; 4. Separators; 5. Cell reaction mechanistic studies; 6. Overcharge/over discharge protection studies; 7. Novel electrode processing/cell manufacturing methods; 8. Performance and safety characteristics of cells and batteries; 7. Failure modes/mechanisms; and 8. Cell/battery modeling studies.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript including a list of key words for subject index by **September 15, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **R. A. Marsh**, Wright Laboratories/POOB, Wright-Patterson Air Force Base, Dayton, OH 45433-7251 USA, Phone: (937) 255-7770, Fax: (937) 255-7770; **Z. Ogumi**, Graduate School of Engineering, Kyoto University, Yoshida, Sakyo-ku, Kyoto, Japan 606-8051, Phone: 81-75-753-5522, Fax: 81-75-753-5889, E-mail: ogumi@scl.kyoto-u.ac.jp; **J. Prakash**, IIT, Department of Chemical and Environmental Engineering, 10 West 33rd Street, Chicago, IL 60616 USA, Fax: (312) 567-6914; and **S. Surampudi**, Jet Propulsion Laboratory, MS 277-211, 4800 Oak Grove Drive, Pasadena, CA 91109 USA, Phone: (818) 354-0352, Fax: (818) 383-6951, E-mail: subbarao.surampudi@jpl.nasa.gov.

B4 - BATTERY/ENERGY TECHNOLOGY JOINT GENERAL SESSION



(Battery Division/Energy Technology Division)

Papers are solicited on the fundamental and applied aspects of energy conversion, storage, and transmission not covered by other symposia at this Meeting. Of particular interest are unconventional conversion methods and applications, new materials for batteries and fuel cells,

and novel methods for energy storage and transmission. In the case of batteries, examples are: 1. Zinc-manganese dioxide; 2. Lead-acid; 3. Nickel-cadmium; 4. Nickel-zinc batteries; and 5. Lithium batteries. Papers on theoretical models and the economics of energy systems are also welcome.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Session Organizers: **Y. Matsuda**, Yamaguchi University, Department of Industrial Chemistry, Faculty of Engineering, Tokiwadai, Ube-shi, Yamaguchi-ken, 755-8611 Japan, Phone: 81-836-35-9111; **M. A. Ryan**, Mail Stop 303-308, Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena CA 91109 USA, Phone: (818) 354-8028, Fax: (818) 393-4272, E-mail: mryan@jpl.nasa.gov; and **R. Surampudi**, Mail Stop 277-212, Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109 USA; Phone: (818) 354-0352, Fax: (818) 393-6951, E-mail: subbarao.surampudi@jpl.nasa.gov.

C1 - CORROSION AND CORROSION CONTROL IN SALTWATER ENVIRONMENTS



(Corrosion Division)

This symposium seeks to address a wide spectrum of corrosion research in marine and other saltwater environments. The goal of this symposium is to provide a forum to examine the most recent ideas and advances in the understanding of corrosion processes, mechanisms, and means of corrosion prevention or control. Contributions from both basic and applied research areas are encouraged. Suggested topic areas include, but are not limited to: 1. General corrosion in seawater and other seawater media; 2. Passivity and localized corrosion; 3. Environmentally-assisted cracking; 4. Microbiologically influenced corrosion; 5. Hydrodynamic effects on corrosion processes; 6. Seawater and brackish water variables that affect corrosion rates; 7. Predictive and mechanistic corrosion modeling; 8. Sensors for corrosion monitoring; 9. Corrosion behavior and protection of advanced materials; 10. Processing variables affecting corrosion and corrosion control; 11. Surface preparation and pretreatments; 12. Environmentally compliant inhibitors and coatings; 13. Cathodic protection and alternative control methods; 14. Use of electrochemical, surface analytical, and nondestructive detection methods; and 15. Corrosion simulation and testing methodologies.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **P. M. Natishan**, Code 6314, Naval Research Laboratory, Washington, DC 20375 USA, Phone: (202) 767-9255, Fax: (202) 404-7297, E-mail: natishan@anvil.nrl.navy.mil; **S. Ito**, Nippon Steel Corporation, Steel Research Laboratory, Chiba, 293-8511 Japan, E-mail: s-ito@lab.re.nsc.co.jp; **D. A. Shifler**, Carderock Division, Code 613, Naval Surface Warfare Center, West Bethesda, MD 20817-5700 USA, Phone: (301) 227-5128, Fax: (301) 227-5548, E-mail: shifler@metals.dt.navy.mil; and **T. Tsuru**, Tokyo Institute of Technology, Tokyo 152-8552 Japan, Phone: 81-3-5734-3143, Fax: 81-3-5734-2835, E-mail: tsuru@mtl.titech.ac.jp.

C2 - INTERNATIONAL SYMPOSIUM IN HONOR OF PROFESSOR NORIO SATO: PASSIVITY AND LOCALIZED CORROSION



(Corrosion Division)

This international symposium will be held in honor of the outstanding achievements of Professor Norio Sato in the field of passivity and localized corrosion. The purpose of the symposium is to provide a forum for the presentation and discussion of recent advances and research in this field. Both experimental and theoretical contributed papers are being solicited in the following areas: 1. Structure, composition, and thickness of passive films on metals, alloys, and semiconductors; 2. Optical, electronic, ionic, and mechanical properties of passive films; 3. Growth and breakdown processes of passive films, and repassivation process; 4. Noise analysis of precursor processes of localized corrosion; 5. Statistical and stochastic analyses of localized

corrosion; 6. Kinetics, stability, and morphology of corrosion pits; 7. Transport processes within pits and crevices.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **R. G. Kelly**, Department of Materials Science and Engineering, University of Virginia, Thornton Hall, Charlottesville, VA 22903, USA, Phone: (804) 982-5783, Fax: (804) 982-5799, E-mail: rgkelly@virginia.edu; **B. MacDougall**, Institute for Chemical Process and Environmental Technology, National Research Council Canada, Montreal Road, Ottawa, Canada K1A 0R6, Phone: (613) 990-3819, Fax: (613) 941-2529, E-mail: barry.macdougall@nrc.ca; **M. Seo**, Graduate School of Engineering, Hokkaido University, Kita-13, Nishi-8, Kita-ku, Sapporo 060-8628, Japan, Phone: 81-11-706-6735, Fax: 81-11-706-6735, E-mail: seo@elechem1-mc.eng.hokudai.ac.jp; and **H. Takahashi**, Graduate School of Engineering, Hokkaido University, Kita-13, Nishi-8, Kita-ku, Sapporo 060-8628, Japan, Phone: 81-11-706-7110, Fax: 81-11-706-7881, E-mail: takahasi@elechem1-mc.eng.hokudai.ac.jp.

C3 - LOCALIZED IN-SITU METHODS FOR INVESTIGATING ELECTROCHEMICAL INTERFACES



(Corrosion Division)

The heterogeneous nature of electrode surfaces, including the local structure and chemistry associated with surface defects and chemical and structural inhomogeneities, plays a critical role in the behavior of electrochemical processes. These processes range from corrosion and electrocrystallization to electrocatalysis and membrane-based separations. The ability to monitor and spatially resolve these dynamic electrochemically-driven processes in situ provides considerable insight into these phenomena.

This symposium will provide a forum for recent advances on methodologies that have been developed for the characterization of localized in situ electrochemical phenomena. Topics of special interest include, but are not limited to: 1. Advances of scanning probe techniques in electrochemical systems, including scanning electrochemical, impedance, tunneling, and force microscopies; 2. Spatially resolved characterization of electrochemical processes; 3. Theoretical developments regarding the detection of localized electrochemical processes; 4. Novel methods for dynamic high resolution measurements; and 5. Benefits and limitations of various techniques.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **A. C. Hillier**, Department of Chemical Engineering, University of Virginia, Charlottesville, VA 22903 USA, Phone: (804) 924-1302, Fax: (804) 982-2658, E-mail: ach3p@virginia.edu; **M. Seo**, Graduate School of Engineering, Hokkaido University, Nishi-8 Chome Kita-13 Jo, Kita-ku, Sapporo 060-8628, Japan, Phone: 81-11-706-6735, Fax: 81-11-706-6735, E-mail: seo@elechem1-mc.eng.hokudai.ac.jp; and **S. R. Taylor**, Center for Electrochemical Science and Engineering, University of Virginia, Charlottesville, VA 22903 USA, Phone: (804) 982-5788, Fax: (804) 982-5799, E-mail: srt6p@s1.mail.virginia.edu.

C4 - CORROSION GENERAL SESSION



(Corrosion Division)

Papers concerning all aspects of corrosion and associated phenomena in liquid and gaseous phases not covered by topic areas of other specialized Corrosion Division symposia at this Meeting are welcome. Theoretical analyses, experimental techniques for the study of corrosion processes, and corrosion products are also of interest. Contributed papers will be ordered depending on the titles and content of the Meeting Abstracts.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Session Organizers: **C. R. Clayton**,

State University of New York at Stony Brook, Department of Materials Science and Engineering, Stony Brook, NY 11794 USA, Phone: (516) 632-8381, Fax: (516) 632-8381, E-mail: cclayton@ccmail.sunysb.edu; **K. Hashimoto**, Institute for Metal Research, Tohoku University, Sendai, 980-8577, Japan, Phone: 81-22-215-2080, Fax: 81-22-215-2081, E-mail: koji@imr.tohoku.ac.jp; and **T. Tsuru**, Department of Metal Engineering Tokyo Institute of Technology, 2-12-1, O-Okayama, Meguro-Ku, Tokyo, 152-8552, Japan, Phone: 81-3-5734-3143, Fax: 81-3-5734-2835, E-mail: tsuru@mtl.titech.ac.jp.

D1 - CORROSION AND RELIABILITY OF ELECTRONIC MATERIALS AND DEVICES



(Corrosion Division/Dielectric Science and Technology Division)

Papers dealing with the fundamental and applied aspects of corrosion, reliability, and materials degradation in the design, manufacture, and use of electronic and optoelectronic devices and equipment are solicited.

The specific areas to be covered include: 1. Mechanistic studies of corrosion, reliability, and performance degradation; 2. Degradation caused by processing and the processing environment, including processing variables and procedures, thermal effects, humidity effects, and the effects of airborne contaminants; 3. Materials performance degradation inherent in the design or operational characteristics of devices, including diffusion, electromigration, loss of surface insulation resistance, and thermal expansion mismatch; 4. Surface modification and passivation techniques for improved resistance to degradation; 5. Methods for evaluating reliability and improving yield and failure rate through appropriate materials selection, coatings, and other means of environmental protection; 6. Environmental testing methods and strategies, including temperature-humidity-bias studies, corrosive gas and particle exposures, ion migration studies, and investigations relating environmental parameters to materials degradation; and 7. Packaging methods and strategies for high reliability applications.

The scope of this symposium will include: 1. Fundamental corrosion and materials degradation studies of bulk and thin film metals, semiconductors, optoelectronic devices, ceramics, polymers, and composites; 2. Design and materials selection for components and ICs, including bipolar, MOS, high voltage devices, and photonic devices; and 3. Packaging and interconnect technologies, connector designs, and contact materials.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript no later than **September 1, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **R. B. Comizoli**, Bell Laboratories, Lucent Technologies, Room 1E-217, P.O. Box 636, Murray Hill, NJ 07974-0636, USA, Phone: (908) 582-3403, Fax: (908) 582-2226, E-mail: rbc007@lucent.com; **R. P. Frankenthal**, Bell Laboratories, Lucent Technologies, Room 1E-217, P.O. Box 636, Murray Hill, NJ 07974-0636, USA, Phone: (908) 582-4032, Fax: (908) 582-2226, E-mail: rfrankenthal@lucent.com; **O. Hiramoto**, Reliability Engineering Section 1, Quality and Reliability Department, CS Center, Sony Corporation, 6-7-35 Kita Shinagawa, Shinagawa-ku, 141, Japan, E-mail: hiramoto@rqa.sony.co.jp, Phone: 81-3-5448-2358, Fax: 81-3-5448-2389, E-mail: hiramoto@rqa.sony.co.jp; **Y. Ishikawa**, Hitachi, Ltd., Mechanical Engineering Research Laboratory, 502 Kandatsu-Machi, Tsuchiura-Shi, 300-0013, Japan, Phone: 81-298-32-4111, Fax: 81-298-32-2808, E-mail: ishiy@merl.hitachi.co.jp; and **J. D. Sinclair**, Bell Laboratories, Lucent Technologies, Room 1D-259, P.O. Box 636, Murray Hill, NJ 07974-0636, USA, Phone: (908) 582-3345, Fax (908) 582-3574, E-mail: ntcg@lucent.com.

E1 - PLASMA ETCHING PROCESSES FOR SUB-QUARTER MICRON DEVICES



(Dielectric Science and Technology Division/Electronics Division)

This symposium solicits original papers on fundamental and applied aspects of plasma etching processes for the fabrication of quarter and sub-quarter micron semiconductor devices. The following topics are suggested: 1. Novel plasma sources and reactor designs; 2. Process and reactor modeling; 3. High plasma density processes for thin film etching; 4. Plasma diagnostics and process control; and 5. Modeling of and issues relating to plasma device damage.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **D. W. Hess**, School of Chemical Engineering, Georgia Institute of Technology, Atlanta, GA 30332, USA, Phone: (404) 894-5922, Fax: (404) 894-2866, E-mail: dennis.hess@che.gatech.edu; **Y. Horiike**, Department of Electrical & Electronics Engineering, Faculty of Engineering, Tokyo University, 2100 Kujirai-Nakanodai, Kawagoe 350-8585, Japan, Phone: 81-492-39-1351, Fax: 81-492-39-1351, E-mail: horiike@eng.toyo.ac.jp; **T. Lii**, Motorola Corporation, MS K-10, 3501 Ed Bluestein Boulevard, Austin, TX 78721 USA, Phone: (512) 933-6541, Fax: (512) 933-5262, E-mail: tom_lii@email.sps.mot.com; **G. S. Mathad**, Siemens Microelectronics, Inc., International Technology Transfer Management, 1167 Route-52, Suite 203, Fishkill, NY 12524 USA, Phone: (914) 897-1134, Fax: (914) 897-5713, E-mail: smathad@ittm.siemens.com; **D. Misra**, Department of Electrical & Computer Engineering, New Jersey Institute of Technology, Newark, NJ 07102-1982 USA, Phone: (201) 596-5680, Fax: (201) 596-5680, E-mail: dmisra@megahertz.njit.edu; and **L. Simpson**, Applied Materials, Inc., 9050 Capital of Texas Highway, Suite 320, Austin, TX 78759 USA, Phone: (512) 272-7606, Fax: (512) 272-7600, E-mail: logan_simpson@amat.com.

F1 - INTERCONNECTS AND CONTACT METALLIZATION FOR ULSI



*(Dielectric Science and Technology Division/
Electronics Division/Electrodeposition Division)*

This symposium will emphasize and focus on all aspects of material, process, equipment and reliability of multilevel interconnections in sub-0.25 μm semiconductor devices and circuits ULSI technologies. Three focus areas are planned: 1. Copper as conductor material and its processes; 2. Low-k dielectric materials and processes; and 3. Reliability issues.

Papers will be solicited in the following areas: 1. Integration processes in copper multilevel interconnects: integration processes with low-k ILD (inter-layer dielectrics), device characteristics, reliability; 2. Barrier/adhesion materials in copper interconnects: deposition, microstructure, properties, resistance to diffusion; 3. Contact, via and wiring, trench fill processes including single and dual damascene, and borderless contact process: deposition processes such as PVD, CVD, Cu plating, reflow, ionized PVD, and other advances in collimated and long throwed deposition, stability and reliability, other novel processes; 4. Silicide and metal cladding processes for shallow junction in source and drain with very short channel gate: thin silicide and tungsten selective CVD processes, electrical characteristics, shallow junction degradation, SOI device applications, local interconnect processes; 5. Low-k inorganic and organic materials: electrical, physical, chemical and mechanical properties, deposition processes for film formation such as fluorinated carbon, fluorinated polyimide, spin-on glass, fluorinated oxides, other new polymer and aerogel, xerogel, airgaps and nanofoam materials; their stability and reliability including hot carrier degradation, resistance to copper diffusion, applications, device characteristics; 6. Electromigration of copper and copper alloys, damascene multilevel interconnections in devices, contacts, vias, plugs, stripes, microstructure analysis, migration resistance; 7. Stress migration, mechanical and thermal stressing in copper and copper alloy damascene multilevel interconnections with low-k ILD; and 8. Simulation and modeling of deposition, reaction, electro- and stress-migration, performance improvement using low-k ILD and copper wiring interconnects technologies.

Publication of a Proceedings Volume is planned. Acceptance of a presentation at the symposium obligates the author to submit a camera ready manuscript, including a list of key words for the subject index, by the first day of the meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **Y. Arita**, NTT, LASI Laboratories, Atsugi-shi, Kanawaga Pref. 243-0204, Japan, Phone: 81-462-40-2450, Fax: 81-462-40-4316, E-mail: aritay@aecl.ntt.co.jp; **J. O. Dukovic**, IBM T. J. Watson Research Center, PO Box 218, Yorktown Heights, NY 10598-0218 USA, Phone: (914) 945-2827, Fax: (914) 945-2141, E-mail: dukovic@us.ibm.com; **S. Mathad**, Siemens Microelectronics, Inc., International Technology Transfer Management, 1167 Route-52, Suite 203, Fishkill, NY 12524 USA, Phone: (914) 897-1134, Fax: (914) 897-5713, E-mail: smathad@ittm.siemens.com; **D. Misra**, Department of Electrical & Computer Engineering, New Jersey

Institute of Technology, Newark, NJ 07102-1982 USA, Phone: (201) 596-5680, Fax: (201) 596-5680, E-mail: dmisra@megahertz.njit.edu; **H. S. Rathore**, IBM, Department 525M, Zip AE1, East Fishkill Facility, Hopewell Junction, NY 12533, Phone: (914) 892-2905, Fax: (914) 892-3039, E-mail: rathore@fshvm1.vnet.ibm.com; and **C. Reidsema Simpson**, Motorola, 3501 Ed Blustein Boulevard, K-10, Austin, TX 78721-3501, Phone: (519) 933-3184, Fax: (519) 933-5497, E-mail: ra1557@email.sps.mot.com.

G1 - III-V NITRIDE MATERIALS AND DEVICES



*(Dielectric Science and Technology Division/
Electronics Division/High Temperature Materials Division/
Luminescence and Display Materials Division)*

This symposium will address all aspects of III-IV nitride science and technology, including recent advances in epitaxy, substrates, device processing and design, characterization, modeling, packaging and defect control. Submissions on high power light-emitting diodes and lasers, solar-blind UV detectors, high frequency transistors, cold cathodes and high power electronics are especially welcomed. While the binary materials GaN, InN, AlN, BN and ScN are clearly of interest, ternary and quaternary alloys such as InGaN, AlGaIn and AlGaInN will be highlighted due to the potential importance of phase separation in these systems. The symposium will combine keynote, invited and contributed papers, and a late news session.

Publication of a Proceedings Volume is planned. All authors accepted for presentation (oral or poster) are obligated to submit a camera-ready Proceedings Volume manuscript at the meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **D. N. Buckley**, Department Physics, University of Limerick, Limerick, Ireland, Phone: 383-61-202-902, Fax: 383-61-207-423, E-mail: noel.buckley@ul.ie; **J. P. Dismukes**, College of Engineering, 1016 Nitschke Hall, University of Toledo, Toledo, OH 43606-3390 USA, Phone: (419) 530-8060, Fax: (419) 530-8065, E-mail: jpdismuke@eng.utoledo.edu; **S. E. Mohnhey**, The Pennsylvania State University, Department of Materials Science and Technology, 221 Steidle Building, University Park, PA 16802 USA, Phone: (814) 863-0744, Fax: (814) 865-2917, E-mail: sem2@psu.edu; **T. D. Moustakas**, Department Electrical and Computer Engineering, Boston University, 44 Cummington Street, Boston, MA 02215 USA, Phone: (617) 353-5431, Fax: (617) 353-6440, E-mail: tdm@enga.bu.edu; **S. Nakamura**, Nichia Chemical Industries, Ltd., 491 Oka, Kaminaka, Anan, Tokushima 774-0044, Japan, Phone: 81-884-22-2311, Fax: 81-884-23-1802, E-mail: shuji@nichia.co.jp.; and **S. J. Pearton**, Department Materials Science and Engineering, Rhines Hall, P.O. Box 116400, University of Florida, Gainesville, FL 32611 USA, Phone: (352) 846-1086, Fax: (352) 846-1182, E-mail: speart@mse.ufl.edu.

H1 - SIXTH INTERNATIONAL SYMPOSIUM ON DIAMOND MATERIALS



*(Dielectric Science and Technology Division/High Temperature
Materials Division/Electronics Division/Physical Electrochemistry
Division/Japan New Diamond Forum)*

The objective of this symposium is to provide an international forum for the presentation and discussion of recent developments in the science, technology and applications of diamond and related materials. The following is a partial list of topics to be addressed: 1. Modeling and simulation; 2. Gas phase chemistry; 3. Nucleation and growth; 4. Plasma, flame and arc diagnostics; 5. Growth techniques; 6. c BN, Carbon-Nitrogen films; 7. Equipment and process issues; 8. Advanced nitride films; 9. Microstructure evolution; 10. Characterization techniques; 11. Physical properties; 12. Application of diamond and related materials; 13. Manufacturing issues; and 14. Electrochemistry of diamond electrodes.

The symposium will include a session on the emerging field of diamond electrodes for electrochemistry. Papers are sought on electrosynthesis on diamond, diamond electrodes for sensors, and fundamental electrochemical characterization of diamond electrodes. Also, doping of diamond and related materials is an area of emphasis. As in the preceding symposia in this series, a hard bound symposium

proceedings volume will be published, including invited, contributed, poster and late news papers. Contributed papers will include oral and poster presentations.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **J. C. Angus**, Case Western Reserve University, 10900 Euclid Ave., Chemical Engineering Department, Cleveland, OH 44106-7217 USA, Phone: (216) 368-4133, Fax: (216) 368-3016, E-mail: jca3@po.cwru.edu; **W. D. Brown**, Department of Electrical Engineering, University Of Arkansas, 3217 Bell Engineering Center, Fayetteville, AR 72701 USA, Phone: (501) 575-6045, Fax: (501) 575-7967, E-mail: wdb@Engineeringuark.edu; **J.L. Davidson**, Vanderbilt University, Box 99-b, Nashville, TN 37235 USA, Phone: (615) 322-3479; Fax: (615) 322 7996, E-mail: Jld@vuse.vanderbilt.edu; **J. P. Dismukes**, College of Engineering, 1016 Nitschke Hall, University of Toledo, Toledo, OH 43606-3390 USA, Phone: (419) 530-8065, Fax: (419) 530-8066, E-mail: jpdismuke@eng.utoledo.edu; **M. D. Drory**, Crystal-lume, Inc., 3506 Bassett St., Santa Clara, CA 95954 USA, Phone: (408) 653-1700, Fax: (481) 653-1710, E-mail: mddrory@aip.org; **A. Gicquel**, Laboratoire d'Ingenierie des Matériaux et des Hautes Pressions, Centre National de la Recherche Scientifique (CNRS) - Université de Paris, Nord-Ave, Jean Baptiste Clement 93430 Villetaneuse France, Phone: 33 (1) 40 49 34 57, Fax: 33-1-49-40-34-14, E-mail: gicquel@limhp.univ-paris13.fr; **A. Grill**, IBM-T. J. Watson Research Center, P.O. Box 216, Yorktown Heights, NY 10598 USA, Phone: (914) 945-1492, Fax: (914) 945-1492, E-mail: agrill@watson.ibm.com; **R. H. Hauge**, Rice University, Houston, TX 77081, Phone: (713) 527-8101, (713) 285-5155, E-mail: hauge@rice.edu; **H. Kwarada**, Department of Electrocommunication, Waseda University, 3-4-1 Ohkubo, Shinjuku-ku, Tokyo 169-8555, Japan, Phone: 03-5286-3391; **C.-P. Klages**, Fraunhofer Institut für Schicht und Oberflächentechnik, Bienroder Weg 54, D-38108 Braunschweig, Germany, Phone: 49 531 2155 510, Fax: 49-531-2155-900; E-mail: klages@ist.fhg.de; **R. L. Opila**, Room 1C-260, AT&T Bell Labs, P.O. Box 636, Murray Hill, NJ 07974-0636 USA, Phone: (908) 582 3390, Fax: (908) 582-3427, E-mail: rlo@allwise.att.com; **A. Paoletti**, Università Degli Studi die Roma, "Tor Vergata," Dipartimento de Scienze e Technologie Fische et Energetiche, Via della Ricerca Scientifica, 00133, Roma Italy, Phone: 39 6202 55 35, Fax: 39-6-202-55-38, E-mail: paoletti@tovvx1.utovrm.it; **Y. Sato**, NIRIM, 1-1 Namiki, Tsukuba Ibaraki 305-0044, Japan, Phone: 81-298-51-3354, Fax: 81-298-52-7449, E-mail: satoy@nirim.go.jp; **K. E. Spear**, Department of Ceramic Engineering, The Pennsylvania State University, 201 Steidle Building, University Park, PA 16802 USA, Phone: (814) 863-0990, Fax: (814) 865-2917, E-mail: kes@psuvm.psu.edu; and **B. V. Spitsyn**, Russian Academy of Sciences, Phone: 7-095-955-4427, Fax: 7-095-995-4427, E-mail: spitsyn@imm.phyche.msk.su.

I1 - FUNDAMENTAL ASPECTS OF ELECTROCHEMICAL DEPOSITION AND DISSOLUTION INCLUDING MODELING



(Electrodeposition Division)

This symposium will provide a forum for discussion of all aspects of electrochemical deposition and dissolution processes, including structure and properties of electrochemically deposited (or electrochemically etched) metals, alloys, semiconductors, conducting polymers, metal oxides, and superconductors. Original papers are solicited on electrochemical and electroless deposition and dissolution in the following areas: 1. Nucleation and growth; 2. Kinetics and mechanisms; 3. Structure and physical properties; 4. Mathematical modeling and numerical analysis of deposition and dissolution processes; and 5. Processing and tooling aspects of micro-engineered structures.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **R. Aogaki**, Department of Product Design, The Polytechnic Institute, Hashimoto-Dai 4-1-1, Sagami-hara-Shi 229-1132, Japan, Phone: 81-427-63-9219, Fax: 81-427-63-9224, E-mail: aogaki@uitec.ac.jp; **D. Landolt**, Laboratoire de Metallurgie Chimique, Departement des Matériaux, Ecole Polytechnique Federale de Lausanne (EPFL), CH-1015 Lausanne, Switzerland, Phone 41 21 693 2981, Fax: 41 21 693 39 46, E-mail: dieter.landolt@epfl.ch; **M. Matlosz**, LSGC-ENSIC, 1, rue Grandville, BP 451, F-54001 Nancy, France, Phone: 33-383-17-52-57, Fax: 33-383-

32-29-75, E-mail: matlosz@ensic.u-nancy.fr; **Y. Sato**, Department of Applied Chemistry, Faculty of Engineering, Kanagawa University, 3-27-1, Rokkakubashi Kanagawa-ku, Yokohama, 221-8686, Japan, Phone: 45-481-5661 Ex. 3106, Fax: 45-491-7915, E-mail: satoy@kamome.cc.kanagawa-u.ac.jp; and **J. B. Talbot**, Department of AMES, University of California, 9500 Gilman Drive, La Jolla, CA 92093 USA, Phone: (619) 534-3176, Fax: (619) 534-4543, E-mail: jtalbot@ucsd.edu.

I2 - THIRD INTERNATIONAL SYMPOSIUM ON ELECTROCHEMICAL TECHNOLOGY APPLICATIONS IN ELECTRONICS



(Electrodeposition Division)

The purpose of this symposium is to provide a forum for the presentation and discussion of topics relating to theory and practice of electrochemistry and electrochemical engineering as applied in electronic industry to fabrication, operation, and protection of electronic devices, and components, including computers, storage products, office machines, consumer products, telephony, wireless communication, photography, MEMS, and automotive applications.

Papers are solicited in the areas of applications of electrochemistry in: fabrication, operation, and protection of switching devices, chips, chip metallization and interconnects (BEOL), ceramic, plastic and thin film chip carriers, photocircuit boards, connectors, magnetic recording devices, inductive and magnetoresistive film heads, thin film recording media, optical memory, display devices, monitors, sensors, capacitors, resistors, contacts, wire and C-4 connects, and other components and devices.

Papers are anticipated in such areas of electrochemical processes as: electrodeposition using dc and pulse plating, electroless deposition, surface activation for electroless plating (catalysis), chemical etching, electroetching, and chemical polishing, anodization, electrophoretic deposition, codeposition of particulates, composite formation, plating through mask technology, LIGA, laser and laser enhanced plating and etching, selective maskless plating, high speed plating solutions, specialized cell designs for electronic parts plating, continuous reel-to-reel plating, plating uniformity and reproducibility in through hole plating, shaping by electroetching, electrochemically layered structures, plated alloys with unusual structural and material properties desired in electronic and magnetic devices, also papers on relation between the process parameters, structure of deposit and their properties, and/or device operation.

Papers are also solicited in the area of effect of purity of solution on the properties of deposits, effect of contaminants and lab cleanliness of the yield of electronic parts, etc.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **C. Madore**, Ecole Polytechnique Federale de Lausanne, Laboratoire de Metallurgie Chimique, MX-C Ecublens, 1015 Lausanne, Switzerland, Phone: 41-21-693-39-66, Fax 41-21-693-39-46, E-mail: charles.madore@epfl.ch; **T. Osaka**, Department of Applied Chemistry, School of Sciences and Engineering, Waseda University, 3-4-1 Okubo, Shinjuku-ku, Tokyo, 169-8555, Japan, Phone: 81-3-5286-3202, Fax: 81-3-3205-2074, E-mail: osakatet@mn.waseda.ac.jp; **L. T. Romankiw**, IBM T. J. Watson Research Center, P.O. Box 218, Mail Stop 01-111, Yorktown Heights, NY 10598-0218 USA, Phone: (914) 954-1208, Fax: (914) 945-4081, E-mail: roman@ibm.watson.com; and **Y. Yamazaki**, Department of Innovative and Engineered Materials, Tokyo Institute of Technology, Interdisciplinary Graduate School of Science and Engineering, 4259 Nagatsuta, Midori-ku, Yokohama, 226-8502, Japan, Phone: 81-45-924-5411, Fax: 81-45-924-5433, E-mail: yamazaki@iem.titech.ac.jp.

J1 - FIFTH INTERNATIONAL SYMPOSIUM ON SEMICONDUCTOR WAFER BONDING: SCIENCE, TECHNOLOGY AND APPLICATIONS



(Electronics Division)

Semiconductor wafer bonding, also frequently referred to as "fusion bonding," has emerged as an important fabrication technology which

can be used to create composite materials and devices that would otherwise be unattainable. While originating from SOI research, wafer bonding has rapidly broadened, opening many new avenues and is finding applications today in such diverse fields as photonics, sensors and MEMS, X-ray optics, high performance power electronics, non-electronic microstructures and silicon-on-insulator (SOI).

This Symposium will cover the gamut from basic science and materials characterization, to processing techniques and device applications. Both theoretical and experimental papers are solicited. Sessions will be topically oriented with invited speakers in each. As with previous Wafer Bonding Symposia sponsored by the Society, a poster session will be held in addition to the oral presentations. Sessions will include (but not be limited to) the following topics: Bonding mechanisms; Low-temperature wafer bonding; UHV bonding methods; Characterization of interfaces and bonded materials; Integration of dissimilar materials; Electronic device applications (CMOS, power, microwave, bipolar); Compliant substrates; Sensor and micromechanical applications (MEMS, aligned bonding); and Novel applications (epi replacement, nonlinear optics, 3-d devices).

Publications of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting. For a paper to be considered for inclusion in the Symposium, a meeting abstract must be submitted to The Electrochemical Society and Symposium Organizer C. E. Hunt no later than the deadline, **May 14, 1999**. After notification of acceptance, lead authors will receive a detailed information package including instructions for preparation of a camera-ready manuscript which is due at the meeting. The submission must also indicate if there is any preference for verbal or poster presentation, underline the presenting author and advise if it is a student presentation.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **C. E. Hunt**, Department of Electrical and Computer Engineering, University of California, One Shields Avenue, Davis, CA 95616 USA, Phone: (530) 754-1958, Fax: (530) 754-9217, E-mail: hunt@ece.ucdavis.edu; **T. Abe**, Shin-Etsu-Handotai, 13-1, Isobe 2-Chome, Annaki-shi, Gunma-ken, 379-0196 Japan, Phone: 81-27-385-2575, Fax: 81-27-385-2774, E-mail: ldw00303@niftyserve.or.jp; **H. Baumgart**, Siemens Microelectronics and White Oak Semiconductor, 6000 Technology Boulevard, Sandston, VA 23150 USA, Fax: (804) 952-7902, E-mail: baumgarh@whiteoaksemi.com; and **U. Goesele**, Max-Planck-Institute for Microstructure Physics, Weinberg 2, D-06120 Halle Germany, Phone: 49-245-5582-556, Fax: 49 (345)-5582-566, E-mail: goesele@mpi-halle.de.

J2 - INTEGRATED FERROELECTRICS FOR MEMORY APPLICATIONS



(Electronics Division)

There is currently significant activity in both academia and in industry on the integration of ferroelectric materials into mainstream Si-based memory. The primary memory devices include both DRAMs, and ferroelectric nonvolatile memories. In the case of DRAMs, ferroelectric materials in the paraelectric phase are anticipated for the storage node capacitors for Gbit generation devices. For nonvolatile memories, the lower density devices are already achieving limited production, using ferroelectric films in the switching capacitor. In addition, advanced memory schemes for both primary and archival storage are in early stages of development. All of these memory devices present material, process integration, performance and reliability issues which need to be addressed for these memory opportunities to be fully exploited.

Papers are solicited in topics that relate to the integration and use of ferroelectric materials and devices for memory applications. Areas of interest are: alternative ferroelectrics for memory devices; alternative electrodes and electrode-film interactions; processing effects; film growth issues; deposition trade offs: economic, technical and performance; microstructure-property relationships; process integration issues; material property degradation; hydrogen degradation; improvement and basic fundamentals of: fatigue, retention, imprint performance; scaling to thinner films; ferroelectric materials, process, device, performance modeling and simulation; clever design approaches which circumvent ferroelectric material problems and limitations; reliability of ferroelectric design approaches; and testing techniques that simulate product performance.

It is planned to include several invited speakers to provide state-of-the-art overviews of key topics of interest.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **C. Araujo**, Symetrix Corp., 5055 Mark Dabling Boulevard, Colorado Springs, CO 80918 USA, Phone: (719) 594-6145, Fax: (719) 598-3437, E-mail: araujo@symetrix.usa.net; **D. Hadnagy**, Ramtron International, 1850 Ramtron Drive, Colorado Springs, CO 80921 USA, Phone: (719) 481-7116, Fax: (719) 481-9170, E-mail: dhadnagy@ramtron.com; **H. Ishiwara**, Precision & Intelligence Lab, Tokyo Institute of Tech., 4259 Nagatsuda, Midoriku, Yokohama, 226-8503, Japan, Phone: 81-45-924-5040, Fax: 81-45-921-0898, E-mail: ishiwara@pi.titech.ac.jp; **A. I. Kingon**, Department of Materials Science and Engineering, North Carolina State University, P.O. Box 7919, Raleigh, N.C. 27695-7919 USA, Phone: (919) 515-8636, Fax: (919) 515-3419, e-mail: kingon@mte.ncsu.edu; **T. Kunio**, NEC, Silicon System Research Laboratory, 1120 Shimikuzawa, Sagawahara, Kanagawa 229-1198, Japan, Phone: 81-427-71-0796, Fax: 81-427-71-0886, E-mail: kunio@mel.c.l.nec.co.jp; **G. Oleszek**, University of Colorado, Microelectronics Research Laboratory, Department of Electrical and Computer Engineering, P.O. Box 7150, Colorado Springs, CO 80933 USA, Phone: (719) 262-3490, Fax: (719) 262-3589, E-mail: goleszek@ece.uccs.edu; and **T. Yamazaki**, Fujitsu, Ltd. 4-1-1 Kamidodanaka, Nakahara, Kawasaki, Kanagawa 211-8588, Japan Phone: 81-44-754-2467, Fax: 81-44-754-2575, -mail: ytatsuya@ulsim.ed.fujitsu.co.jp.

J3 - SIXTH INTERNATIONAL SYMPOSIUM ON CLEANING TECHNOLOGY IN SEMICONDUCTOR DEVICE MANUFACTURING



(Electronics Division)

The Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing sponsored by the Electronics Division will follow the symposia on the same subject held biannually starting in 1989. As before, its goal will be to bring together specialists involved in surface processing in semiconductor device research and manufacturing, and to provide them with a forum for an exchange of views and information. The 1999 symposium will be organized within the framework of the Joint Meeting of The Electrochemical Society, Inc. and The Electrochemical Society of Japan with technical cosponsorship of The Japan Society of Applied Physics.

This symposium will cover a wide range of topics related to the removal of contaminants from the silicon surfaces, as well as topics related to broadly understood surface conditioning. Contributed papers will be solicited in the broad range of issues related to the scope of the symposium. Area of interest includes, but is not limited to the following topics: Characteristics of key surface contaminants in silicon processing, metallics, organics, particles; Mechanisms of contaminant transfer to and from the surface in process/cleaning environment; Cleaning and surface conditioning in liquid and gaseous ambients; New cleaning chemistries and tools; Implementation of wafer cleans toward desired surface passivation; Correlation between cleaning/surface condition, and device performance; Evaluation of cleaning through surface analysis, electrical, and optical measurements; In-line monitoring of wafer cleans; Equipment for wafer cleaning; Application specific cleaning (before epitaxy, oxidation, metallization, etc.); Post-CMP cleaning methods including copper processing; Cleaning in integrated processing, in situ cleaning, clusterability of cleans; Cleaning of high aspect ratio structures, back-end-of-line cleaning operations; Environmental and cost issues in wafer cleaning technology.

Publication of a Proceeding Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript by **September 15, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **T. Hattori**, ULSI R&D Laboratories, Sony Semiconductor Company, 4-14-1, Asahicho, Atsugi, 243-0014 Japan, Phone: 462-305461, Fax: 462-305572, E-mail: hattori@ulsi.sony.co.jp; **R. E. Novak**, SubMicron Systems, Inc. 2000 Fountain Lane, Plymouth, MN 55447 USA, Phone/Fax: (612) 473-8691, E-mail: richnovak@aol.com; and **J. Ruzyllo**, Penn State University, 214 Electrical Eng. West, University Park, PA 16802 USA, Phone: (814) 865-5193, Fax: (814) 865-7065, E-mail: ruzyllo@psu.edu.

J4 - STATE-OF-THE-ART PROGRAM ON COMPOUND SEMICONDUCTORS XXXI



(Electronics)

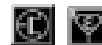
The thirty-first SOTAPOCS will address recent advances in compound semiconductor technologies. Original contributions are solicited on materials growth, characterization, processing, device fabrication, reliability, and other related topics. Papers on both fundamental studies and practical issues will be included. The following areas are of particular interest: 1. Advances in materials growth technologies; 2. Advances in processing technology including wet and dry etching, novel metallization, selective oxidation, dielectric deposition, ion implantation, diffraction grating formation, microcleaving etc.; 3. In situ and ex situ process characterization; 4. Wide bandgap material growth and processing; 5. Device passivation, encapsulation and packaging; 6. Device degradation mechanisms; 7. Characterization of materials and devices, including non-destructive evaluation; 8. Wafer-level testing and mapping; 9. Novel device structures and processing; 10. Monolithic device integration; 11. High-speed III-V electronics technologies for wireless, automotive and microwave applications; and 12. Fundamental optical, electrical, and other physical properties.

The program will consist of both invited and contributed papers.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript no later than **June 15, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **M. Abe**, Fujitsu, 10-1 Morinosato-Wakamiya Atsugi, 243-0124, Japan, Phone: 81-462-50-8815, Fax: 81-462-485192, mabe@flab.fujitsu.co.jp; **C. R. Abernathy**, Materials Science and Engineering, University of Florida, Rhines Hall, Gainesville, FL 32611 USA, Phone: (352) 846-1087, Fax: (352) 846-1182, E-mail: caber@silica.mse.ufl.edu; **D. N. Buckley**, Head, Department of Physics, University of Limerick, Limerick, Ireland, Phone: 353-61-202902; Fax: 353-61-202423; E-mail: noel.buckley@ul.ie; **S. N. G. Chu**, Bell Labs., Lucent Technologies, Room 7C-221, 600 Mountain Avenue, Murray Hill, NJ 07974-0636 USA, Phone: (908) 582-7318, Fax: (908)582-7660, sngchu@bell-labs.com; **M. J. Deen**, Simon Fraser University, Engineering Science, Burnaby, BC, Canada V5A 1S6, Phone: (604)291-3248, Fax: (604)291-4951, E-mail: jamal@cs.sfu.ca; **F. Ren**, Room 1C-413, Bell Labs, Lucent Technologies, Murray Hill, NJ 07974-0636 USA, Phone: (908) 582-6902, Fax: (908) 582-6322, E-mail: fren@lucent.com; and **R. E. Sah**, Fraunhofer Institute for Applied Solid State Physics, Tullastrasse 72, 79108 Friburg, Germany, Phone: 49-761-5159-765, Fax: 49-761-5159-400, E-mail: sah@iaf.fhg.de.

K1 - FIFTH SYMPOSIUM ON LOW TEMPERATURE ELECTRONICS



(Electronics Division/Dielectric Science and Technology Division)

This symposium is intended to provide a forum for discussion of the latest developments and evolutions in the field of Low Temperature Electronics. Beside providing an opportunity to review developments since the 4th symposium, which took place two years ago in Montreal, it will focus on new aspects of electronic materials, devices, and systems operating at cryogenic temperatures. The symposium will consist of both invited and contributed papers, and the publication of a Proceedings Volume is being considered.

Contributed papers are solicited in the following areas: 1. Fundamentals: theoretical limitations and restrictions, physical phenomena, new low temperature effects; 2. Devices: semiconductor components, infrared components, optoelectronic devices, hybrid and monolithic integration, nanostructures and novel devices, process optimization, modeling; 3. Circuits: integrated circuits; digital and analog, charge coupled devices and read out circuits, low temperature systems, design consideration; 4. Systems: packaging, assembly and interconnections, reliability performance, low-room temperature interfaces, heat transfer and refrigeration systems, device and system testing; and 5. Applications: computer and telecommunication, space applications, infrared astronomy, instrumentation, low temperature measurement systems.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript by **June 1, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **W. D. Brown**, University of Arkansas, Bell Engineering Centre, Fayetteville, AR 72701, Phone: (501) 575-6045, Fax: (501) 575-7967, E-mail: wdb@engr.uark.edu; **C. L. Claeys**, IMEC, Kapeldreef 75, B-3001 Leuven, Belgium, Phone: (32) 16 281328, Fax: (32) 16 281214, E-mail: claeys@imec.be; **M. J. Deen**, Simon Fraser University, Burnaby, British Columbia, Canada, Phone: (604) 291-3248, Fax: (604) 291-4951, E-mail: jamal@cs.sfu.ca; **S. Matsumoto**, Keio University, Hiyoshi-Ku, Yokohama 223, Japan, Phone: (081) 45 5631141, Fax: (81) 45 563 2773, E-mail: matumoto@elec.keio.ac.jp; **S. I. Raider**, IBM, T. J. Watson, P.O. Box 218, Yorktown Heights, NY 10598 USA, Phone: (914) 945-3822, Fax: (914) 945-2018, E-mail: raider@watson.ibm.com; and **K. B. Sundaram**, Department of Electrical Engineering, University of Central Florida, Orlando, FL 32816 USA, Phone: (407) 823-5326, Fax: (401) 823-5326, E-mail: kbs@ece.engr.ucf.edu.

K2 - THIRD INTERNATIONAL SYMPOSIUM ON CHEMICAL MECHANICAL POLISHING IN IC DEVICE MANUFACTURING



(Electronics Division/Dielectric Science and Technology Division)

This symposium will address the fundamentals of chemical mechanical planarization (CMP) and its application in Inter Layer Dielectrics (ILD) polishing, metal polishing, and trench and mesa isolation. This will also address post-CMP cleaning, consumable characterization, polish end point detection, CMP process integration and manufacturability issues with this emerging technology.

Papers will be solicited in the following areas: 1. Polishing science and technology; 2. Process modeling; 3. Process optimization and control; 4. Consumables characterization; 5. Process integration issues; 6. Surface and electrochemical aspects of CMP and post-CMP cleaning; 7. Defect detection and characterization; 8. Electrical characterization of post-CMP surfaces; and 9. Environmental aspects of CMP.

Publication of a Proceedings Volume is planned and will be available at the Meeting. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript by **June 15, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **I. Ali**, Apex Inc., 830 Stewart Dr., Sunnyvale, CA 94086, Phone: (408) 617-1429, Fax: (408) 617-1501, E-mail: ial@aplexinc.com; **Y. A. Arimoto**, Fujitsu Labs, Ltd., 10-1 Morinosato-Wakamiya, Atsugi 243-01, Japan, Phone: 81-462-50-8156, Fax: 81-462-48-3473, E-mail: arimoto@flab.fujitsu.co.jp; **R. L. Opila**, Bell Labs-Lucent Technologies, 1D 352, 600 Mountain Ave., Murray Hill, NJ 07974-0636 USA, Phone: (908) 582-3390, Fax: (908) 582-3957, E-mail: rlo@lucent.com; **C. Reidsema Simpson**, Motorola, 3501 Ed Blustein Boulevard, K-10, Austin, TX 78721-3501 USA, Phone: (519) 933-3184, Fax: (519) 933-5497, E-mail: ra1557@email.sps.mot.com; **K. B. Sundaram**, Department of Electrical Engineering, University of Central Florida, Orlando, FL 32816 USA, Phone: (407) 823-5326, Fax: (401) 823-5326, E-mail: kbs@ece.engr.ucf.edu; and **Y. Homma**, Central Research Laboratory, Hitachi, Ltd., Kokubunji, Tokyo 185-8601, Japan, Phone: 81-423-23-1111, Fax: 81-423-27-7683, E-mail: yhomma@crl.hitachi.co.jp.

K3 - ELECTRONICS/DIELECTRIC SCIENCE AND TECHNOLOGY JOINT GENERAL SESSION



(Electronics Division/Dielectric Science and Technology Division)

Original papers are solicited on all aspects of electronic materials, devices, and processing technologies not covered by specialized topical symposia at this Meeting. The sessions will be organized depending on the content of the Meeting Abstracts. One or more of the sessions may be organized as a poster session. Contributors should specify their preference as to poster or oral presentation, and all efforts will be made to accommodate their requests.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Session Organizers: **W. D. Brown**, 3217 Bell Center, University of Arkansas, Fayetteville AR 72701, Phone: (501) 575-6045, Fax: (501) 575-7965, E-mail: wdb@engr.uark.edu; **M. J. Deen**, School of Engineering, Simon Fraser University, Burnaby, B.C. Canada,

V5A 1S6, Phone: (604) 291-3248, Fax: (604) 291-4951, E-mail: jamal@cs.sfu.ca; **R. B. Fair**, Duke University, Department of Electrical and Computer, Engineering, Durham, NC 27708, Phone: (919) 660-5277, Fax: (919) 660-5221, E-mail: rfair@ee.duke.edu; **S. Oda**, Research Center for Quantum Effect Electronics, Tokyo Institute of Technology, 2-12-1 O-okayama, Meguro-ku, Tokyo 152-8552, Japan, Phone: 03-5734-3048, Fax: 03-3720-9806, E-mail: soda@pe.titech.ac.jp; and **R. K. Ulrich**, 3202 Bell Center, University of Arkansas, Fayetteville AR 72701, Phone: (501) 575-5645, Fax: (501) 575-7926, E-mail: rku@Engineeringuark.edu.

L1 - FIRST INTERNATIONAL SYMPOSIUM ON ULSI PROCESS INTEGRATION



(Electronics Division/Electron Devices Society of IEEE)

This symposium provides a forum for reviewing and discussing all aspects of process integration. In addition, to full technologies and future trends, both front- and back-end integration issues will be addressed. The symposium will consist of both invited and contributed papers and posters, with an emphasis on process integration aspects rather than on the development of individual process modules.

Contributed papers are solicited in the following areas: A. Full process integration; trends in deep submicron technologies; embedded memory logic; mixed analog and digital technologies; integration of active and passive elements (e.g. inductors); process integration yield; B. Front-end-of-the-line integration: 1. Gate/gate dielectric integration issues for scaled technologies, alternatives to polysilicon, ultrathin nitride barrier layers, growth of ultrathin gate dielectrics, gate electrodes/dielectrics for memory capacitors, alternative gate dielectrics; 2. Rapid thermal processing integration issues: pattern effects, anneal ambients, ultrashallow junction formation, shallow junctions and salicides; and 3. Isolation Schemes: shallow trench isolation, limits of isolation schemes, mechanical stress, reliability and yield aspects; and C. Back-end of the line integration: 1. Advanced metallization schemes: Cu integration in ULSI, contact metals and vias, limitations of Cu, reliability aspects, deposition technologies, CVD, plating), cladding issues; and 2. Multilevel metallization systems: low K dielectrics; planarization and/or CMP.

Publication of a Proceedings Volume, available at the meeting, is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript along with the Meeting Abstract by **May 14, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **G. Bronner**, IBM, East Fishkill Facility, Hopewell Junction, NY 12533 USA, Phone: (914) 892-3315, Fax: (914) 892-9068, E-mail: gbronner@us.ibm.com; **C. L. Claeys**, IMEC, Kapeldreef 75, B-3001 Leuven, Belgium, Phone: 32-16-281328, Fax: (31) 16 281214, E-mail: claeys@imec.be; **R. B. Fair**, Department Electrical & Computer Engineering, Duke University, Durham, NC 27708 USA, Phone: (919) 660-5277, Fax: (919) 660-5221, E-mail: rfair@ee.duke.edu; and **H. Iwai**, Toshiba Corp, 1 Komukai-Toshiba-cho, Saiwai-ku, Kawasaki 210-8582, Japan, Phone: 81-44-549-2335, Fax: (81) 44 5492291, E-mail: h.iwai@ieee.org.

M1 - DIAGNOSTIC TECHNIQUES FOR SEMICONDUCTOR MATERIALS AND DEVICES



(Electronics Division/SPIE)

Diagnostic characterization techniques for semiconductor materials, devices and device processing will be addressed at this symposium. It will cover new techniques as well as advances in routine analytical technology applied to semiconductor process development and manufacture. Presentations are solicited on: 1. Emerging diagnostic techniques and illustrations of their strengths and weaknesses; 2. The application of standard methods of monitoring to specific problems in materials growth, processing, or device failure; 3. Variations and improvements in routine diagnostic methods now employed on the process line; 4. Issues related to state-of-the art IC production, such as time and cost of measurements, measurement induced device damage, technique modifications needed for sub-micron characterization, comparisons of techniques, optimum combinations of metrology, defect and yield correlations, and measurement needs for next generation manufacturing.

Sessions will be organized around current and coherent topics in order to attract professionals with complementary interests and to provide a venue to explore solutions to specific problems. Special emphasis will be focused on MOS device diagnostics and detection of low levels of metal contamination in silicon processing.

Publication of a joint proceedings volume is planned with the "Analytical Techniques for Semiconductor Materials and Process Characterization" symposium in Leuven, Belgium. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript by **June 20, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers by **April 19, 1999**: **J. L. Benton**, Bell Laboratories, Lucent Technologies, 600 Mountain Ave., Murray Hill, NJ 07974-0636 USA, Phone: (908) 582-3643, Fax: (908) 582-4228, E-mail: jlb@bell-labs.com; **P. Rai-Choudhury**, SPIE, P.O. Box 10, Bellingham, WA 98227-0010 USA, Phone: (360) 676-3290, Fax: (360) 647-1445, E-mail: jit@spie.org; **T. J. Shaffner**, Texas Instruments, Inc., P.O. Box 655012, 13536 North Central Expressway, M/S 921, Dallas, TX 75243, USA, Phone: (972) 995-6764, Fax: (972) 995-7785, E-mail: shaffner@resbld.csc.ti.com; and **D. K. Schroder**, Department of Electrical Engineering, Arizona State University, Tempe, AZ 85287-5706 USA, Phone: (602) 965-6621, Fax: (602) 965-8118, E-mail: schroder@asuvas.eas.asu.edu.

N1 - PHOTOELECTROCHEMISTRY, PHOTOCATALYSIS AND PHOTOACTIVE MATERIALS



(Energy Technology Division/Physical Electrochemistry Division)

This symposium is designed to foster the participation of scientists and engineers in the field of solar energy conversion and photoelectrochemistry. In particular, an interdisciplinary forum for discussion is planned in the areas of electrochemistry, photocatalysis, and thin-film technology. Papers are invited on the following topics: 1. Liquid-junction and hybrid solar cells using single crystal, thin-film or amorphous semiconductors; 2. Semiconductor and surface film characterization by techniques using electrolyte contacts, e.g. photocurrent spectroscopy, electrolyte electro-reflectance spectroscopy, photocurrent imaging; 3. Semiconductor/metal and other contacts prepared by electrochemical or photoelectrochemical methods; 4. Modeling and theoretical aspects of photoelectrochemistry; 5. Novel solar energy storage approaches; 6. Semiconductor thin-film preparation by electrochemical and chemical methods; 7. Surface modification and photoetching of semiconductor electrodes; 8. Dye-sensitization of semiconductor electrodes; 9. Colloidal, porous, or quantum-confined semiconductors; 10. Photoelectrochemical sensors; 11. Environmental pollution abatement by photocatalytic methods; and 12. Photoconductive films, phosphors, and photoelectrochromic materials.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **J. Augustynski**, Departement de Chimie Minerale, Université de Geneve, Section de Chimie - Sciences II, 30, Quai Ernest Ansermet, CH-1211 Geneve 4, Switzerland, Phone: 41-22-329-6102, Fax: 41-22-702-6413, E-mail: jan.augustynki@cabe.unige.ch; **H. Minoura**, Department of Chemistry, Gifu University, Yanagido 1-1, 501-1193, Japan, Phone and Fax: 81-58-293-2587, E-mail: minoura@apchem.gifu-u.ac.jp; and **K. Rajeshwar**, Department of Chemistry and Biochemistry, The University of Texas at Arlington, Arlington, TX 76019-0065 USA, Phone: (817) 272-3810, Fax: (817) 272-3808, E-mail: raj@utarlg.uta.edu.

O1 - FULLERENES SCIENCE AND TECHNOLOGY



(Fullerenes Group)

This symposium is intended to provide a forum for the presentation of the latest developments in the field of fullerenes science and technology. Several invited overview papers are planned in addition to contributed papers on these subjects. Invited papers will be scheduled as oral presentations and contributed papers will be scheduled as poster presentations. There will be no Proceedings Volume published from this symposium.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **R. S. Ruoff**, Novel Carbon Materials Laboratory, Department of Physics, Washington University, CB 1105, One Brookings Drive, St. Louis, MO 63130-4899, USA, Phone: (314) 935-8746, Fax: (314) 935-5258, E-mail: ruoff@wuphys.wustl.edu; **Y. Achiba**, Tokyo Metropolitan University, Department of Chemistry, Hachioji, Tokyo 192-0397 Japan, Phone: 81-426-77-2534, Fax: 81-426-77-2525, E-mail: achiba-yohji@c.metro-u.ac.jp; **D. M. Guldi**, Radiation Laboratory, University of Notre Dame, Notre Dame, IN 46556, USA Phone: (219) 631-7441, Fax: (219) 631-8068, E-mail: guldi@marconi.rad.nd.edu; **E. Osawa**, Department of Knowledge Based Information Engineering, Toyohashi University of Technology, Toyohashi, Aichi 44-8580, Japan, Phone: 81-5332-48-5588, Fax: 81-532-48-5588, E-mail: osawa@cochem.tutkie.tut.ac.jp; **H. Shinohara**, Nagoya University, Department of Chemistry, Nagoya 464-8602, Japan, Phone: 81-52-789-2482, Fax: 81-52-789-2962, E-mail: nori@chem2.chem.nagoya-u.ac.jp; and **S. R. Wilson**, Department of Chemistry, New York University, 100 Washington Square East, New York, NY 10003-6688 USA, Phone: (212) 998-8461, Fax: (212) 260-7905, E-mail: spherebio@aol.com.

P1 - SIXTH INTERNATIONAL SYMPOSIUM ON SOLID OXIDE FUEL CELLS (SOFC VI)



(High Temperature Materials Division/Battery Division)

This sixth symposium (SOFC-VI) will provide an international forum for the presentation and discussion of recent developments related to solid oxide fuel cells based on zirconia or another oxide electrolyte. Papers are solicited on all aspects of solid oxide fuel cells. Following is a partial list of topics to be addressed: 1. Materials for cell components (e.g. electrolyte, electrodes, and interconnection); 2. Fabrication methods for cell components and complete cells; 3. Cell design, electrochemical performance and modeling; 4. Stacks and systems including system studies; and 5. Field tests.

Papers presented at the Symposium will be published in a Proceedings Volume which will be available at the Meeting. Acceptance of a paper for presentation obligates the author(s) to submit a full Proceedings Volume manuscript in camera-ready form by **May 1, 1999**.

In order to facilitate planning of the symposium and to receive detailed instructions for preparing the abstract and manuscript, please submit a title of your proposed paper by **April 1, 1999** to one of the Symposium Organizers.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **M. Dokiya**, Institute of Environmental Science & Technology, Yokohama National University, Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan, Phone: 81-45-339-4365, Fax: 81-45-339-4374, E-mail: dokiya@kan.ynu.ac.jp; and **S. C. Singhal**, Science and Technology Center, Westinghouse Electric Corporation, 1310 Beulah Road, Pittsburgh, PA 15235-5098 USA, Phone: (412) 256-1208, Fax: (412) 256-1233, E-mail: singhasc@westinghouse.com.

Q1 - FIFTH INTERNATIONAL SYMPOSIUM ON MOLTEN CARBONATE FUEL CELLS



(High Temperature Materials Division/
Battery Division/Energy Technology Division)

This symposium provides an international forum to review the status of molten carbonate fuel cell (MCFC) technology, discuss various aspects of its commercialization, report recent advances in MCFC technology, and present results of MCFC related fundamental research. The focus of this 5th symposium will be on cascaded generation systems, high power density performance, performance stability in 20,000h+ operation, and novel materials. Reviews will be invited in these areas. However, the symposium is comprehensive, and papers on other topics will be accepted. The symposium topics include: 1. Recent MCFC technology advances and their relevance to commercialization; 2. Systems analysis of power generation systems involving the MCFC, including cascaded systems with other fuel cell types and combustion powered generation; 3. Reports of electrode, cell, and stack performance at high power density; 4. Performance modeling and prediction for electrodes, cells, and stacks, especially at high

power density and in pressurized operation; 5. Analysis and prediction of corrosion, electrolyte loss, matrix material changes and other life-limiting processes; 6. Innovation or improvement in cell and stack materials; 7. Effect of electrolyte composition and additives on high-power performance and on performance decay; 8. Interaction of wetting and electrochemical or chemical phenomena in corrosion and porous electrode operation; 9. Effect of contaminants on MCFC performance, and methods of elimination; and 10. MCFC related fuel cell or electrolyzer concepts and demonstrations.

Publication of a Proceedings Volume is planned, which will be available at the meeting. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript by **May 1, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **G. Halpert**, Jet Propulsion Laboratory, Pasadena, CA USA, Phone: (818) 354-5474, Fax: 818-393-6951, E-mail: gerald.halpert@jpl.nasa.gov; **K. Hemmes**, Laboratory of Materials Science, Delft University of Technology, Delft, Netherlands, Phone: 31-15-278- 2550, Fax: 31-15-278-6730, E-mail: hemmes@stm.tudelft.nl; **G. Lindbergh**, Dept. of Applied Electrochemistry and Corrosion Science, KTH, Stockholm, Sweden, Phone: 46-8-790-8143, Fax: 46-8-108-087, E-mail: gl@ket.kth.se; **J. R. Selman**, Department of Chemical and Environmental Engineering, IIT, Chicago, IL USA, Phone: (312) 567-3037, Fax: (312) 567-6914, E-mail: selman@charlie.cns.iit.edu; **D. A. Shores**, Corrosion Research Center, University of Minnesota, Minneapolis, MN USA, Phone: (612) 625-0014, Fax: (612) 625-7246, E-mail: dshores@maroon.tc.umn.edu; and **I. Uchida**, Department of Applied Chemistry, Tohoku University, Sendai 980-8579, Japan, Phone 81-22-217-7220, Fax: 81-22-217-8646, E-mail: uchida@est.che.tohoku.ac.jp.

R1 - PER KOFSTAD MEMORIAL SYMPOSIUM ON HIGH TEMPERATURE CORROSION AND MATERIALS CHEMISTRY



(High Temperature Materials Division/Corrosion Division)

This symposium is dedicated to the memory of Per Kofstad who was a leader in establishing the fundamental understanding of high temperature oxidation processes. His books on high temperature corrosion and point defects have educated many students in the field. This symposium will focus on those topics which were of particular interest to Per Kofstad. Specifically, contributions in the following areas are solicited: 1. Defect chemistry of metal oxides pertaining to oxidation reactions; 2. Diffusion and transport-related phenomena in oxidation and corrosion reactions; 3. Hot-corrosion phenomena; 4. Effects of hydrogen and water vapor on oxidation and corrosion mechanisms; and 5. Vaporization phenomena. Other papers on fundamental aspects of high temperature corrosion, protective coatings, and high temperature chemistry will also be considered.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the author(s) to submit a paper in camera-ready format to one of the symposium organizers at the time of the meeting. The paper should be concise and should emphasize current results and conclusions.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **P. Y. Hou**, Lawrence Berkeley National Laboratory, Materials Science Division, One Cyclotron Road, M/S 62-203, Berkeley, CA USA 94720, Phone: (510) 486-5560, Fax: (510) 486-4995, E-mail: pyhou@lbl.gov; **T. Maruyama**, Department of Metallurgical Engineering, Tokyo Institute of Technology, 2-12-1, O-okayama, Meguro-ku, Tokyo 152-8552, Japan, Phone: 3-5734-3136, Fax: 3-5734-2874, E-mail: maruyama@mtl.titech.ac.jp; **M. J. McNallan**, University of Illinois, Room 3083 Engineering Research Facility, M/S 246, 842 West Taylor Street, Chicago, IL 60607 USA, Phone: (312) 996-2436, Fax: (312) 996-2426, E-mail: mcnallan@uic.edu; **T. Narita**, Graduate School of Engineering, Hokkaido University, Kita-13 Nishi-8 Kitaku, Sapporo 060-8628, Japan, Phone: 81-11-706-6355, Fax: 81-11-706-7814, E-mail: narita@eng.hokudai.ac.jp; **E. J. Opila**, NASA Lewis Research Center, MS 106-1, 21000 Brookpark Road, Cleveland, OH USA, 44135, Phone: (216) 433-8904, Fax: (216) 433-5544, E-mail: opila@lerc.nasa.gov; and **D. A. Shores**, University of Minnesota, Corrosion Research Center, 221 Church St., S.E., Minneapolis, MN 55455 USA, Phone: (612) 625-0014, Fax: (612) 626-7246, E-mail: dshores@maroon.tc.umn.edu.

S1 - ENVIRONMENTAL ASPECTS OF ELECTROCHEMICAL TECHNOLOGY



(Industrial Electrolysis and Electrochemical Engineering Division)

The growing concern regarding the environment and the need to conserve materials and resources has encouraged research and development focused upon pollution prevention, process optimization, the recovery and re-use of chemicals and materials and the remediation of contaminated sites. This symposium will consider all aspects of: 1. The application or development of electrochemical technology for pollution prevention, recycling and remediation in the electronics, chemicals and metals industries; 2. The development of clean energy systems based upon electrochemical technology, particularly focused upon the hydrogen energy systems; and 3. The environmental factors and issues associated with established industrial electrochemical processes and the improvements developed to meet environmental regulations applied to these processes.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **K. Ota**, Department of Energy and Safety Engineering, Yokohama National University, 79-5 Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan, Phone: 81-45-339-4021, Fax: 81-45-339-4024, E-mail: ota@ene.bsk.ynu.ac.jp; and **E. J. Rudd**, ELTECH Research, 625, East Street, Fairport Harbor, OH 44077USA, Phone: (440) 357-4073, Fax: (440) 357-4077.

S2 - R.B. MACMULLIN MEMORIAL SYMPOSIUM: CHLOR ALKALI AND CHLORATE TECHNOLOGY



(Industrial Electrolysis and Electrochemical Engineering Division)

The late R. B. MacMullin, a pioneer in industrial electrochemical engineering and an active member of The Electrochemical Society for some 60 years, published many papers of interest to Society members and contributed considerably to the field of design and optimization of chlor-alkali electrolytic cells. This symposium will be devoted to a wide spectrum of research, development, engineering, business, and historical aspects of chlor-alkali and chlorate technology to appropriately honor Dr. MacMullin. Papers are encouraged in the following areas: 1. Advances in production methods; 2. Fundamental studies of process changes, cell design, performance optimization, energy reductions, or plant design; and 3. Improved technology, equipment, or materials. Presentations dealing with business, economics, environmental, or historical aspects of chlorine, caustic soda, or sodium chlorate production are also encouraged. Other papers that relate to the symposium title will be considered.

It is planned to include several invited speakers to provide overviews of key topics of interest.

Publication of a Proceedings Volume, to be available at the meeting, is also planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript by **May 1, 1999**.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **H. S. Burney**, B-2234, The Dow Chemical Company, 2301 North Brazosport Boulevard, Freeport, TX 77541-3257 USA, Phone: (409) 238-2373, Fax: (409) 238-0526, E-mail: hsburney@dow.com; **N. Furuya**, Department of Applied Chemistry, Yamanashi University, Takeda 4, Kofu 400-8511, Japan, Phone: 81-552-20-8559, Fax: 81-552-20-8772, E-mail: furuya@ab11.yamanashi.ac.jp; **F. Hine**, 4-4-6 Jinnan, Ikaruga, Nara, 636-0143, Japan, Phone: 81-745-74-6598, Fax: 81-745-74-6599; and **K. Ota**, Department of Energy and Safety Engineering, Yokohama National University, 79-5 Tokiwadai, Hodogaya-ku, Yokohama 240-8501, Japan, Phone: 81-45-339-4021, Fax: 81-45- 339-4024, E-mail: ota@ene.bsk.ynu.ac.jp.

T1 - HIGH ENERGY PHOSPHORS



(Luminescence and Display Materials Division)

Papers are invited on topics related to phosphors excited by high energy radiation. Representative topics include X-ray and cathode ray phosphors, their preparation and characterization; X-ray intensifying screen structures and their fabrication, new binder systems, film screen systems including dyes, pigments, and special substrates; absorption efficiency, persistence or lag, phosphor screen evaluation including MTF, sharpness and noise, phosphor conversion efficiency and loss mechanisms; scintillation spectroscopy, time-resolved spectroscopy with X-ray sources, photodiode systems, image processing, filmless radiography, digital radiography, thermoluminescence after X-ray irradiation, optically stimulated luminescence and storage phosphors and panels; phosphor stabilization through screen design, the use of X-ray phosphors in nondestructive testing, and dual scintillators for CT, non-medical applications for storage phosphors in biology and crystallography; and new X-ray detectors such as charge coupled devices.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **M. J. Weber**, Mail Stop 55-121, Lawrence Berkeley National Laboratory, University of California, One Cyclotron Road, Berkeley, CA 94720 USA, Phone (510) 486-6369, Fax: (510) 486-4768, E-mail: mjweber@lbl.gov; **T. Welker**, Fachhochschule Köln Fachbereich Elektrische Energietechnik, Betzdorfer Strasse 2, 50679 Köln, Germany, Phone: 49-221-8375-2279, Fax: 49-2471-3581, E-mail: be175@aix.dvz.fh-koeln.de; and **W. M. Yen**, Department of Physics and Astronomy, University of Georgia, Athens, GA 30602 USA, Phone: (706) 542-2491, Fax: (706) 542-2492, E-mail: wyen@hal.physast.uga.edu.

T2 - EIGHTH INTERNATIONAL SYMPOSIUM ON THE PHYSICS AND CHEMISTRY OF LUMINESCENT MATERIALS



(Luminescence and Display Materials Division)

This symposium is a forum for physicists and chemists working on various aspects of luminescence, in both organic and inorganic solids. Topics would include photo-luminescent materials for lamp and laser applications, cathode-luminescent materials, X-ray phosphors, scintillators, electro-luminescent materials, and phosphors for plasma panel displays. Presentations on chemical aspects of luminescence include synthesis of conventional and novel luminescent materials, including nano-phases; optimization of luminescence properties, such as brightness, color, response time, excitation spectra, etc.; identification of luminescent and loss centers; non-radiative processes; energy transfer; and concentration effects. In presentations involving physics of luminescent properties; novel luminescence processes such as core valence luminescence, cooperative phenomena, multi photon transitions, the influence of quantum confinement, etc.; nonlinear optical processes; nonradiative processes; and ultra-fast transactions. Papers on luminescence from novel materials such as ceramics, glass, and nano-particles are encouraged.

Publication of a Proceedings Volume is planned. All authors accepted for presentation (oral or poster) are obligated to submit a camera-ready Proceedings Volume manuscripts at the meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and the Symposium Organizers: **K. C. Mishra**, Sylvania Products, Inc., 71 Cherry Hill Drive, Beverly, MA 01915 USA, Phone: (508) 750-1575; Fax: (508) 750-1799, E-mail: mishra@osi.sylvania.com; **L. E. Shea**, Sandia National Laboratories, MS 0527, P.O. Box 5800, Albuquerque, NM 87185-0527, Phone: (505) 844-6627, Fax: (505) 844-8168, E-mail: leshea@sandia.gov; **A. Srivastava**, General Electric Corporation R&D Center, KWB 316, Niskayuna, NY 12301-0008 USA, Phone: (518) 387-7535, Fax: (518) 387-5299; E-mail: srivastava@crd.ge.com; and **H. Yamamoto**, Tokyo Engineering University, 1404-1, Katakura, Hachioji, Tokyo 192-8580, Japan, Phone 81-426-37-2547, Fax: 81-426-37-2547, E-mail: yamamoto@cc.teu.ac.jp.

U1 - ADVANCED LUMINESCENT MATERIALS AND QUANTUM CONFINEMENT



*(Luminescence and Display Materials Division/
Dielectric Science and Technology Division/Electronics Division)*

This symposium will address recent developments in the area of nanoscale semiconductor, metallic, and organic structures. Emphasis will be placed on quantum effects and single electron storage in small scale silicon and III-V compound devices. It will also cover fundamental issues in luminescence physics and chemistry of new classes of phosphor and porous materials including both atomic and molecular structures. Papers are solicited that cover fundamental aspects of science and engineering of quantum confinement in nanostructures, as well as related technology and applications.

It is anticipated that external funding will be available to partially support students presenting papers at the meeting. Letters of support for a travel grant from student's advisor should be forwarded to S. Bandyopadhyay.

Areas of particular interest include: 1. Clusters and other nanostructures; 2. Chemistry of nanostructure; 3. Novel fabrication techniques for nanostructures; 4. Electron transport in nanostructures; 5. Cooperative phenomena in nanocluster; 6. New device concepts; 7. Layered magnetic structures and giant magnetoresistance; 8. Quantum architectures and circuits; 9. Optical properties (wells, wires, and dots); 10. Organic, phosphor, and porous materials; and 11. Spectroscopy of luminescent materials (photo-, cathode-, electro-, radio-luminescence, and coherent luminescence).

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the Meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **S. Bandyopadhyay**, Department of Electrical Engineering, University of Nebraska, Lincoln, NE 68588-0511, USA, Phone: (402) 472-0294; Fax: (402) 472-4732, E-mail: bandy@engr.unl.edu; **M. M. Cahay**, Department of Electrical and Computer Engineering, 832 Rhodes Hall, University of Cincinnati, Cincinnati, OH 45221, Phone: (513) 556-4754, Fax: (513) 556-7326, E-mail: mcahay@planck.ceecs.uc.edu; **N. Koshida**, Faculty of Technology, Tokyo University of Agriculture and Technology, Koganei, Tokyo 184, Japan, Phone: 81-423-887128, Fax: 81-423-855395, E-mail koshida@cc.tuat.ac.jp; **J. P. Leburton**, Beckman Institute, 405 N. Mathews Avenue, University of Illinois, Urbana, Illinois, IL 61801, USA, Phone: (217) 333-6813, Fax: (219) 244-4333, E-mail: leburton@ceg.uiuc.edu; **D. J. Lockwood**, National Research Council, Ottawa K1A 0R6, Canada, Phone: (613) 993-9614, Fax: (613) 993-6486, E-mail: david.lockwood@nrc.ca; **M. Meyyappan**, NASA Ames Research Center, Mailstop 229-3, Moffett Field, CA 94035, Phone: (415) 604-2616, Fax: (415) 605-5244, E-mail: meyya@orbit.arc.nasa.gov; **D. Misra**, Department of Electrical & Computer Engineering, New Jersey Institute of Technology, Newark, NJ 07102-1982 USA, Phone: (201) 596-5680, Fax: (201) 596-5680, E-mail: dmisra@megahertz.njit.edu; and **T. Sakamoto**, Director of Electron Device Division, Electrotechnical Laboratory, Ministry of International Trade and Industry, Japan, 1-1-4 Umezono, Tsukuba-shi, Ibaraki 305-0045, Japan, Phone: 81-298-54-5220, Fax: 81-298-54-5088, E-mail: tsakamot@etl.gp.jp.

V1 - ELECTRON TRANSFER IN BIOLOGICAL AND BIOMIMETIC SYSTEMS



(Organic and Biological Electrochemistry Division)

This symposium will focus on all aspects of electron transfer processes involving biological macromolecules, including proteins, enzymes, nucleic acids, and related molecules and systems. Papers are solicited which take electrochemical, combined electrochemical-spectroscopic, theoretical, or alternative experimental approaches to studies of biologically important electron transfer processes. The program will stress studies of fundamental aspects of electron transfer and enzyme catalysis, but papers on novel practical applications will also be considered. We would like this symposium to bring together electrochemists, biochemists, and other researchers working on the fundamentals of electron transfer in biology.

Abstracts, suggestions, and inquiries should be sent to the ECS

Headquarters Office and to the Symposium Organizers: **F. M. Hawkrige**, Department of Chemistry, Virginia Commonwealth University, Box 842006, Richmond, VA 23284, Phone: 804-828-7505, FAX: 804-225-4427, E-mail: fmhawkri@saturn.vcu.edu; **K. Niki**, Department of Chemistry, Iowa State University, Ames, Iowa 50011-3111 USA, Phone: 515-294-3955, Fax: (515) 294-0105, E-mail: kniki@iastate.edu; **J. F. Rusling**, Department of Chemistry, U-60, University of Connecticut, Storrs, CT 06268-4060 USA, Phone: 860-486-4909, Fax: 860-486-2981, E-mail: Jrusling@nucleus.chem.uconn.edu; and **I. Taniguchi**, Department of Applied Chemistry & Biochemistry, Kumamoto University, Kurokami, Kumamoto, 860-8555 Japan, Phone: 81-96-342-3655, Fax: 81-96-342-3655, E-mail: taniguch@gpo.kumamoto-u.ac.jp.

V2 - ELECTROORGANIC AND ELECTROANALYTICAL ASPECTS OF ENVIRONMENTAL CHEMISTRY



(Organic and Biological Electrochemistry Division/
Physical Electrochemistry Division/Sensor Division)

Electrochemistry is playing an ever increasing role in the area of environmental chemistry. Electrochemistry has an impact not only in the creation of analytical methods for the identification and detection of toxic materials, but also in the development of innovative approaches to detoxify such materials. Advancements in this area draw from a vast array of fundamental research and technology. Examples include the design of new electrode materials, mechanistic electroorganic and photoelectroorganic chemistry, and high performance electrochemical detection methodologies. Indeed, past contributions to environmental chemistry by the electrochemical community have often reflected the strong cross-disciplinary nature of electrochemistry. This symposium, in recognition of the breadth of the emerging opportunities in environmental chemistry for electrochemistry, seeks to bring together researchers from a wide range of interests to present recent results in this general area of research. The symposium will consist of both invited and contributed papers, and contributed papers in all areas related to this general topic are solicited.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **D. C. Johnson**, Department of Chemistry, Iowa State University, Ames, IA 50011 USA, Phone: (515) 294-7530, Fax: (515) 294-9623, E-mail: dcj@iastate.edu; **M. D. Porter**, Department of Chemistry, Iowa State University, Ames, IA 50011 USA, Phone: (515) 294-6433, Fax: (515) 294-3254, E-mail: mporter@porter1.ameslab.gov; **K. Shimazu**, Graduate School of Environmental Earth Science, Hokkaido University, Sapporo 060-0810 Japan, Phone: 81-11-706-2276, Fax: 81-11-709-1248, E-mail: shimazu@ees.hokudai.ac.jp; and **J. R. Stetter**, Illinois Institute of Technology, Department of Chemistry, 3101 South Dearborn Street, Chicago, IL 60616 USA, Phone: (312) 567-3425, Fax: (312) 567-3494, E-mail: jrstetter@aol.com.

V3 - NEW CONCEPTS AND METHODOLOGIES FOR ORGANIC ELECTROCHEMISTRY



(Organic and Biological Electrochemistry Division)

Despite the numerous advances and successes of organic electrochemistry in this century, both in academic research and industrial applications, the development of new concepts and methodologies is still strongly needed in order to propel organic electrochemistry into one of the leading scientific fields. In this symposium, the prospects for organic electrochemistry in the 21st century will be discussed and assessed through invited and contributed papers. Original contributions are solicited on various areas including theory, basic concepts and principles, new methods and reactions, reaction mechanisms, synthesis, analytical methods, and electrochemistry of biological systems.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **J. Lessard**, Department of Chemistry, University of Sherbrooke, Sherbrooke, Quebec, Canada J1K 2R1, Phone: (819) 821-7091, Fax: (819) 821-8017, E-mail: jlessard@courrier.usherb.ca; **K. D. Moeller**, Department of Chemistry, Washington University, St. Louis, MO 63130 USA, Phone: (314) 935-4270, Fax: (314) 935-4481, E-mail: moeller@wuchem.wustl.edu;

T. Nonaka, Department of Electronic Chemistry, Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology, Nagatsuta, Midori-Ku, Yokohama 226, Japan, Phone: 81-45-924-5407, Fax: 81-45-921-1089, E-mail: nonaka@echem.titech.ac.jp; and **J. Yoshida**, Graduate School of Engineering, Kyoto University, Yoshida-honmachi, Sakyo-ku, Kyoto, 606-8501, Japan, Phone: 81-75-753-5651, Fax: 81-75-753-5911, e-mail: yoshida@sbchem.kyoto-u.ac.jp

W1 - BIOSENSORS AND BIOMOLECULAR ELECTRONICS



(Organic and Biological Electrochemistry Division/Sensor Division)

This symposium will be devoted to recent developments in the highly multidisciplinary fields of interfacial electrochemistry of biomolecules, organelles, and cells. Its unifying theme is the application of electrochemical and related principles and methods for elucidation of fundamental molecular processes and utilization of this information for the construction of "biological instrumentation," i.e., practical molecular electronic devices and techniques whose primary signal transducing component is derived from a living organism. The following is a partial list of proposed topics to be represented in this symposium: biomolecular optoelectronic devices utilizing photosynthetic reaction centers and bacteriorhodopsin, nanowires, oriented biomolecular structures on planar arrays, spatial light modulators, autotransduction (self-assembly) and nanoengineering, cyclic peptides and nanotubes, molecular wires and girders, supramolecular switches, DNA chips and biocomputing, enzyme electrodes, microorganism-based sensors, immunoelectrochemistry, ion-selective electrodes and biosensors, biosensors and redox electrode potentiometry, amperometric enzyme electrode sensors, enzymatic reactions and cyclic voltammetry, electron transfer reactions between electrodes and biomolecules, bioelectrochemical fuel cells, biosensors for process control and clinical applications, biosensors based on silicon fabrication technology, and chemically sensitive field effect transistors.

Scientists, engineers, and entrepreneurs working in the field of biosensors and biomolecular electronics are cordially invited to present their work. Invited speakers presenting general overviews of their respective specialties as well as poster presentations focusing on new developments of works in progress will be featured.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **M. Aizawa**, Department of Bioengineering, Faculty of Bioscience and Biotechnology, Tokyo Institute of Technology, Nagatsuta, Midori-ku, Yokohama 226-8501, Japan, Phone: 81-45-924-5759, Fax: 81-45-924-5779, E-mail: maizawa@bio.titech.ac.jp; **E. Greenbaum**, Oak Ridge National Laboratory, Lockheed Martin Energy Research Corp., P. O. Box 2008, Bethel Valley Road, Oak Ridge, TN 37831 USA, Phone: (423) 574-6835, Fax: (423) 574-1275, E-mail: exg@ornl.gov; **P. J. Hesketh**, University of Illinois at Chicago, Department of Electrical Engineering and Computer Science, MC 154, 851 South Morgan Street, Chicago, IL 60607 USA, Phone: (312) 413-7574, Fax: (312) 413-0447, E-mail: peter@eecs.uic.edu; **T. Matsunaga**, Department of Biotechnology, Tokyo University of Agriculture and Technology, 2-24-16 Nakacho, Koganei, Tokyo 184-8588, Japan, 81-423-88-7021, Fax: 81-423-85-7713; E-mail: tmatsuna@cc.tuat.ac.jp; and **P. Vanysek**, Northern Illinois University, Department of Chemistry and Biochemistry, DeKalb, IL 60115 USA, Phone: (815) 753-6876, Fax: (815) 753-4802, E-mail: pvanysek@niu.edu.

W2 - PHYSICAL ELECTROCHEMISTRY GENERAL SESSION



(Physical Electrochemistry Division)

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 content of the Meeting Abstracts.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Session Organizers: **K. Tokuda**, Department of Electronic Chemistry, Tokyo Institute of Technology, 4259 Nagatsuta, Midori-ku, Yokohama 226-8502, Japan, Phone: 81-45-924-5405, Fax: 81-45-921-1089, E-mail: tokuda@echem.titech.ac.jp; and **A. Wieckowski**, Department of

Chemistry, RAL 58B, Box 56-5, University of Illinois, 600 S. Mathews Avenue, Urbana, IL 61801-3602 USA, Phone: (217) 333-7943, Fax: (212) 244-8068, E-mail: andrzej@aries.scs.uiuc.edu.

X1 - ELECTROCATALYSIS



(Physical Electrochemistry Division/Energy Technology Division)

This symposium will cover a wide range of studies on the electroactivity at the electrode/solution interface and what determines such activity, with emphasis on catalytic processes, their study and their application. In parts of the Symposium devoted to fundamental studies of electrocatalysis, the emphasis will be on electrochemical and spectroscopic techniques applied for electrocatalytic reaction path diagnostics and surface species identification and determination. Theoretical work on electrocatalysis and the key factors determining surface reactivity at the electrochemical interface, is welcome. Parts of the Symposium devoted to experimental work on electrocatalytic process rate enhancement cover the optimization of electrode materials and surfaces and, particularly, various forms of dispersed electrocatalysts, their preparation and their long term stability as correlated with variations in surface composition and structure. Parts on applications of electrocatalysts could cover a wide range of technical areas, including fuel cells, other air electrodes and bifunctional oxygen electrodes, electrocatalysis in electrolytic processes, enzyme modified electrode surfaces as means for surface catalyzation and other types of electrodes with surfaces modified to achieve enhanced electrocatalysis.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **S. Gottesfeld**, Los Alamos National Laboratory, Mail Stop D-429, Los Alamos, New Mexico 87545 USA, Phone: (505) 667-0853, Fax: (505) 665-4292, E-mail: gottesfeld@lanl.gov; **T. Kamo**, Electrochemical Power System Group, Department of Energy Devices, Hitachi Research Laboratory, Japan; **H. R. Kunz**, University of Connecticut, Department of Chemical Engineering, 191 Auditorium Road, U-222, Storrs, CT 06269-3222, Phone: (860) 486-5389, Fax: (860) 486-2959, E-mail: russkunz@enr.uconn.edu; **P. N. Ross**, Lawrence Berkeley National Laboratory, Mail Stop 2/100, 1 Cyclotron Rd., Berkeley, CA 94720, Phone: (510) 486-6226, Fax: 510-486-5530, E-mail: pnrross@lbl.gov; and **M. Watanabe**, Laboratory of Electrochemical Energy Conversion, Faculty of Engineering, Yamanashi University, Takeda 4-3, Kofu City 400-8511, Japan, Phone: 81-552-20-8620, Fax: 81-552-54-0371, E-mail: mwatanab@ab11.yamanashi.ac.jp.

Y1 - ELECTROCHEMISTRY OF ORDERED INTERFACES



*(Physical Electrochemistry Division/
Energy Technology Division/Electrodeposition Division)*

This symposium will provide an interdisciplinary forum for discussing topics of interest to research in contemporary interfacial electrochemistry, such as: 1. Morphological and electronic structures of single crystalline electrodes; 2. Electrochemical epitaxial growth and nanofabrication of metals and semiconductors; 3. Formation, structure and electrochemical characteristics of self-assembled monolayers (SAMs); 4. Interfacial structural control in atomic and molecular dimensions for high-performance electrocatalysts, batteries, sensors and other functionality materials; 5. Photon induced electrochemical reactivity and electrochemical control of photoactive functions; 6. Nanotechnology, and the application of nanoparticles in catalysis and analytical chemistry; 7. Non-electrochemical techniques for the study of interfacial structure such as IR, NMR, STM, AFM, non-linear spectroscopic methods (SHG, SFG), and X-ray related methods (SXRD, XAFS); 8. Interfacial charge redistribution dynamics; and 9. Surface structure and/or electrode modification effects on interfacial electron transfer. Wherever feasible, theoretical aspects of the topics covered by the symposium will be presented.

All oral presentations will be invited, with a poster session scheduled to accommodate contributed papers.

Publication of a Proceedings Volume is planned. Acceptance of a paper in this symposium obligates the authors to submit a typed camera ready copy of the full manuscript at the meeting.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **K. Kinoshita**, Lawrence Berkeley National Laboratory, 90-1142, One Cyclotron Road, Berkeley, CA 94720-3200 USA, Phone: (510) 486-7389, Fax: (510) 486-4260, E-mail: k_kinoshita@lbl.gov; **Y. Nakato**, Division of Chemistry, Graduate School of Engineering Science, Osaka University, Osaka, Japan, Phone: 81-6-850-6235, Fax: 81-6-850-6236, E-mail: nakato@chem.es.osaka-u.ac.jp; **J. L. Stickney**, Department of Chemistry, University of Georgia, Athens, GA 30602 USA, Phone: (706) 542-1967, Fax: (706) 542-9454, E-mail: stickney@sunchem.chem.uga.edu; **I. Taniguchi**, Department of Applied Chemistry, Faculty of Engineering, Kumamoto University, Kumamoto 860-8555, Japan, Phone: 81-96-342-3655, Fax: 81-96-342-3655, E-mail: taniguchi@gpo.kumamoto-u.ac.jp; **K. Uosaki**, Division of Chemistry, Graduate School of Science, Hokkaido University, Sapporo 060-0810, Japan, Phone: 81-11-706-3812, Fax: 81-11-706-3812, E-mail: uosaki@pchl.sci.hokudai.ac.jp; **A. Wieckowski**, Department of Chemistry, RAL 58B, Box 56-5, University of Illinois, 600 S. Mathews Avenue, Urbana, IL 61801-3602 USA, Phone: (217) 333-7943, Fax: (212) 244-8068, E-mail: andrzej@aries.scs.uiuc.edu; and **H. Yoneyama**, Division of Applied Chemistry, Graduate School of Engineering, Osaka University, Osaka 565-0871, Japan, Phone: 81-6-879-7372, Fax: 81-6-877-6802, E-mail: yoneyama@ap.chem.eng.osaka-u.ac.jp.

Z1 - TWELFTH INTERNATIONAL SYMPOSIUM ON MOLTEN SALTS



*(Physical Electrochemistry Division/
High Temperature Materials Division/Electrodeposition Division)*

This symposium will provide an international and interdisciplinary forum centered on innovative basic and applied research performed in molten salts and ionic liquids. Contributed papers are solicited in all areas of chemistry, electrochemistry, electrochemical engineering, and physics related to molten salt research. Topics of interest include: 1. Electrochemical power, e.g., batteries, fuel cells, capacitors, and photovoltaics; 2. Homogeneous and heterogeneous reactions, e.g., catalysis, inorganic and organic syntheses, oligomerizations, and polymerizations; 3. Electrodeposition, e.g., metal electrowinning, the deposition of alloys, semiconductors, intermetallics and layered structures, the structural characterization of electrodeposits, metal-liding and surface modification, and characterization of electroactive species; 4. Separations, e.g., selective extractions, immobilized molten salt gas membranes, and electrochemical gas separations; 5. Molten salt promoted corrosion phenomena; 6. Solute and solvent structural investigations; and 7. New innovative molten salts and molten salt mixtures, e.g., hydrophobic molten salt systems and molten salt mixtures, liquid clathrates, low vapor pressure (vacuum resistant) molten salts, air-insensitive molten salts.

Keynote lectures will be presented by invited speakers. Depending upon the number of papers received, a poster session may be planned. Student participation is highly encouraged, and it is anticipated that some funds will be available for student support.

Publication of a Proceedings Volume is planned. Authors are required to provide a camera-ready copy of their papers in the correct format and a list of keywords at or before the Meeting. All papers will be reviewed for content.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and one of the Symposium Organizers: **H. C. De Long**, AFOSR/NL, 110 Duncan Avenue, Suite B115, Bolling AFB, DC 20332-8080 USA, Phone: (202) 767-7761, Fax: (202) 404-7475, E-mail: hugh.delong@afosr.af.mil; **R. W. Bradshaw**, Sandia National Laboratories, P.O. Box 969, Livermore, CA 94551-0969 USA, Phone: (925) 294-3229, Fax: (925) 294-3410, E-mail: rwbrads@sandia.gov; **S. Deki**, Department of Chemical Science and Engineering, Faculty of Engineering, Kobe University, Rokkodai, Nada, Kobe 657-8501, Japan, Phone: 81(78) 803-1155, Fax: 81 (78) 803-1169, E-mail: deki@kobe-u.ac.jp; **G. R. Stafford**, National Institute of Standards and Technology, Metallurgy Division, Building 224/B166, Gaithersburg, MD 20899-3956 USA, Phone: (301) 975-6412, Fax: (301) 926-7679, E-mail: stafford@tiber.nist.gov; and **P. C. Trulove**, Department of

AA1 - CHEMICAL SENSORS IV



(Sensor Division)

This symposium will address all aspects of chemical sensor research and development. All chemical sensors involve a transduction mechanism in which the presence of a chemical species to be detected is converted into a physical effect that is detected by a device. Thus, electrochemical sensors produce changes in potential or current flow, acoustic sensors produce changes in sound velocity or attenuation, optical sensors produce changes in light intensity, etc. This common problem of transduction from chemical species to physical effect provides a unifying theme for all chemical sensors and is the major theme that we wish to adopt for this symposium. All kinds of chemical sensors including: electrochemical, acoustic, semiconducting, and optical are of interest. While the symposium will concentrate on the transduction from chemical species to physical effect, we are also interested in papers that address sensor arrays, sensor systems and associated signal processing, and applications of chemical sensors. Papers on phenomena relevant to sensor performance will also be considered; examples include mass and electron transfer, and interfacial and homogeneous kinetics. Authors of papers on biosensors are

advised of a separate symposium devoted to Biosensors and Biomolecular Electronics (W1).

Due to the limited time available during the meeting and the desire of the organizers that parallel chemical sensor sessions not be held, poster sessions will be necessary to accommodate everyone, if a large number of papers is received. Please indicate in your cover letter if you would prefer being part of a poster session. Allocation of presentations between oral and poster sessions will be at the discretion of the Symposium Organizers.

Publication of a Proceedings Volume is planned to be available at the meeting. Manuscripts will be due by **May 1, 1999** and should be mailed from the Americas and Europe to M. A. Butler, from Japan and vicinity to N. Yamazoe.

Abstracts, suggestions, and inquiries should be sent to the ECS Headquarters Office and to the Symposium Organizers: **M. Aizawa**, Department of Bioengineering, Faculty of Bioscience and Biotechnology, Tokyo Institute of Technology, Nagatsuta, Midori-ku, Yokohama 226, Japan, Phone: 81-45-924-5759, Fax: 81-45-924-5779, E-mail: maizawa@bio.titech.ac.jp; **M. A. Butler**, Microsensor Department, 1315, Mail Stop, 1425, Sandia National Laboratories, Albuquerque, NM 87185 USA, Phone: (505) 844-6897, Fax: (505) 844-1198, E-mail: mabutle@sandia.gov; **P. Vanysek**, Northern Illinois University, Department of Chemistry and Biochemistry, DeKalb, IL 60115 USA, (815) 753-6876, Fax: (815) 753-4802, E-mail: pvanysek@niu.edu; and **N. Yamazoe**, Department of Molecular and Material Sciences, Graduate School of Engineering Sciences, Kyushu University, Kasuga-shi, Fukuoka 816-8580, Japan, Phone: 81-92-583-7537, Fax: 81-92-575-2318, E-mail: noborigz@mbox.nc.kyushu-u.ac.jp.

IMPORTANT DEADLINES

1. Meeting Abstracts - May 14th, 1999 (Submitted to ECS)

Go to: <http://www.electrochem.org/meetings/196/meet.html>

2. Proceedings Volume Manuscripts: (Submitted to ECS)

May 14th, 1999 – for Proceedings published in time for the Meeting

October 17, 1999 – for Proceedings published after the Meeting

3. Meeting Program and Abstracts available:

July 15, 1999 – on ECS Web Site: www.electrochem.org/meetings/196/meet.html

August 15, 1999 – in **Interface**

4. Hotel Reservations - September 17th, 1999

Call the Hilton Hawaiian Village at 808.949.4321 or 800 Hiltons

5. Meeting Registration - October 1st, 1999

Contact the ECS Headquarters Office

Tel 609.737.1902

Fax 609.737.2743

E-mail: ecs@electrochem.org

Web Site: www.electrochem.org

Abstract Preparation Instructions

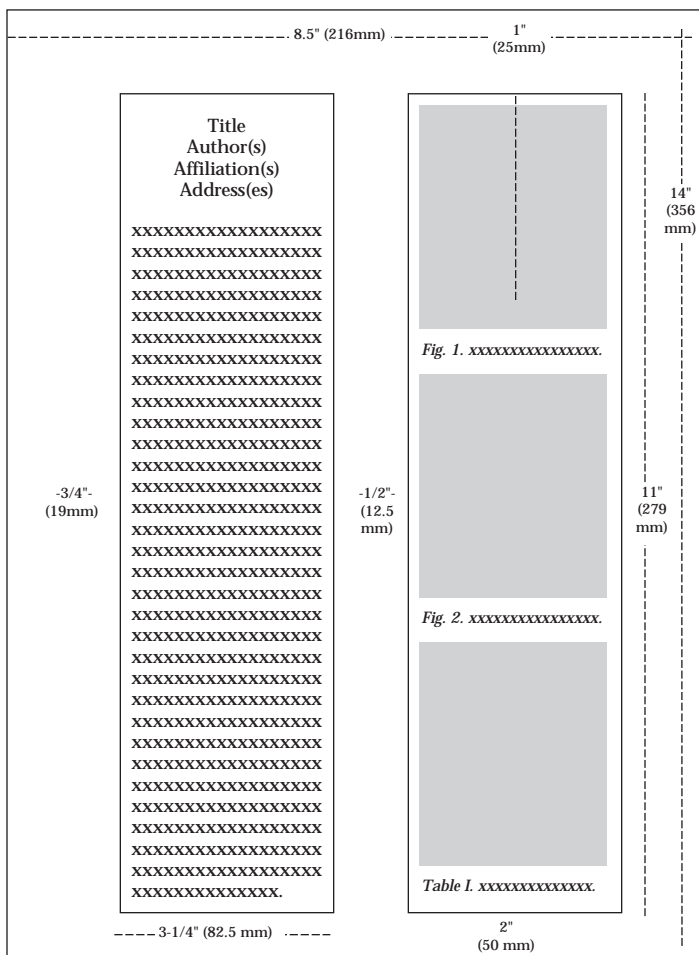
Abstract Format—Abstracts are required to be no more than one page in length consisting of two columns 3.25 x 11 in. (82.5 x 279 mm), approximately 800 words total or 400 words per column. A recommended format is one column of text and references and an additional column of tables, graphs, or figures. You may use any white bond paper 8.5 x 14 in. (216 x 356 mm). For international standards, white bond A3 paper (297 x 420 mm) may also be used, but the right side should be trimmed so that the total trimmed width is 216 mm and trim the length so that the total trimmed length is 356 mm. Type the body of the abstract **single-spaced** using black ink. The preferred font for laser printers is 10-point Times Roman. Type author(s), affiliation(s), and address(es) at the top as shown above. Failure to follow these guidelines will result in the rejection of the paper. Abstracts may be submitted either electronically or on paper.

Preparing Abstracts Electronically—All authors are encouraged to submit their meeting abstracts electronically. For those authors with access to the World Wide Web, you may read information about preparing your meeting abstract electronically from "http://www.electrochem.org/abstracts.html". Processing of the electronic submissions is accomplished by the ECS Tool for Abstract Submission via the Internet (ECSTASI). To use the ECSTASI Web interface, go to "http://www.electrochem.org/ecstasi". These instructions, and much more information about the ECS electronic meeting abstracts, are available from the ECS World Wide Web Home Page at "http://www.electrochem.org".

Preparing Abstracts on Paper—Camera-ready typing mats may be obtained from the Society Headquarters Office. Follow the instructions carefully. If you are using a laser printer which cannot accommodate legal size paper, make each column 3.25 x 11 in. (82.5 x 279 mm) and securely paste the column onto the camera-ready typing mats or a legal size sheet within the proper margins. Published abstracts are photo-offset from the copy that you prepare. We will not retype your abstract and it will appear the way you prepare it. Abstracts will NOT be accepted via FAX or ordinary E-mail.

Publication—All scheduled papers will be published in the Meeting Abstracts Volume, copyrighted by The Electrochemical Society, Inc. The volume is published photo-offset directly from copy submitted by the author. The volume size is 7 X 10 in. (178 x 254 mm); therefore, it is mandatory that the typing be clear and all lettering should be the size of ordinary type or at least 1/16 in. (1.6 mm) high so that it will be legible after reduction.

Sample Abstract Diagram



Note: Diagram Not Drawn to Scale.

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With a copy to the Symposium Organizer(s)—by May 14, 1999

PLEASE TYPE

Symposium Code and Title: _____

Sponsoring Division(s)/Group(s) _____

Title of Paper: _____

Check here if presenting author is a student.

Author(s), with complete mailing address(es) - (List presenting author FIRST and include contact author's telephone and fax numbers and e-mail address. Please group authors at the same address when possible).

1 _____

2 _____

3 _____

4 _____

5 _____

Do you plan to present more than one paper at this Meeting?

No Yes; If so, indicate Symposia _____

Do you require any audio-visual equipment?

35mm (2x2") slide projector Overhead projector
 Please indicate other equipment at author's expense and subject to availability.

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Deadline for Submission of Abstracts May 14, 1999

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All abstracts and oral presentations must be in English and are required to be **no more than one page** in length.