

Dokiya Memorial International Symposium on Solid Oxide Fuel Cells

MASAYUKI DOKIYA, an internationally renowned researcher, passed away on June 25, 2003 in Yokohama, Japan at the age of 64, after a struggle against pancreatic cancer for almost ten years. Dr. Dokiya was an advocate of highly efficient and environmentally friendly solid oxide fuel cells (SOFCs) for power generation. To commemorate the first anniversary of his death and to recognize his many and varied contributions to solid oxide fuel cell technology, a Dokiya Memorial International Symposium on Solid Oxide Fuel Cells was organized by the SOFC Society of Japan in

Tokyo, Japan on June 24-25, 2004. Chairing the symposium were Subhash C. Singhal of the Pacific Northwest National Laboratory (USA) and Harumi Yokokawa of the National Institute of Advanced Industrial Science and Technology (AIST), Japan.

Dr. Dokiya, born in Osaka, Japan on January 1, 1939, obtained a bachelor's degree in 1963 and a master's degree in 1965 in applied chemistry from the University of Tokyo. Immediately after that, he joined the Governmental Research Institute for Chemical Investigation (which later became the National Chemical Laboratory for Industry) in Tsukuba, Japan. From August 1968 to January 1970, he was a guest researcher at Northwestern University in Evanston, Illinois.

After he became the group leader/section chief in the Energy Chemistry Division of the National Chemical Laboratory for Industry in 1975, he started an investigation on energy-related research topics. He obtained a doctor of engineering degree, working on thermochemical production of hydrogen, in 1979, from the University of Tokyo. After that, he organized a large research group in the field of solid oxide fuel cells, which required a detailed knowledge of a wide range of properties of materials, strategic thinking, and enthusiasm for a new technology. After serving as the principal research scientist in the National Institute of Material and Chemical Research (formerly the National Chemical Laboratory for Industry), he moved to Yokohama National University on April 1, 1997 as a professor. He took over the position, which until then had been held by the late Prof. H. Tagawa, the founding president of the SOFC Society of Japan. This gave Professor Dokiya the opportunity to promote the research and development of SOFCs in Japan, particularly under international collaboration with the U.S. and Europe.

From his investigations on catalysis, thermochemical methods of hydrogen production, and aluminum blast furnaces, he recognized the importance of high temperature materials science and high temperature electrochemistry for innovative research work in energy-related fields. He easily recognized the beneficial attributes of SOFCs in obtaining high electric conversion efficiency and decreased CO₂, SO₂, and other environmental pollutant gases; and he started investigations on SOFCs in the late 1980s. He also recognized that to commercialize SOFCs, the technologies for low-cost fabrication, long-term stability, and high power density would be crucial.



A view from the Dokiya Symposium; from left to right are Mogens Mogensen, Risø National Laboratory, Denmark; Anil Virkar, University of Utah, U.S.; and Mark Williams, Department of Energy, U.S.



MASAYUKI DOKIYA, an internationally renowned researcher was honored with an international memorial symposium on solid oxide fuel cells. It was organized by the SOFC Society of Japan in Tokyo this past June. Director of Development Troy Miller (fourth from left) presented a resolution on behalf of the ECS Board of Directors to Dokiya's widow, Dr. Yukiko Dokiya (third from left). Daughters Fumiko (left) and Mariko (second from left), and symposium chairman Subhash Singhal (far right) look on.

His major efforts were directed at clarifying the fundamental basis for such technological issues. In particular, his development of cell fabrication processes such as wet-sintering were essential for the low-cost cell fabrication and led to the development of low-cost SOFC stacks by Japanese SOFC manufacturers.

Dr. Dokiya served as the chair of the steering committee on SOFC development in the New Energy and Industrial Technology Development Organization (NEDO) of Japan. He was also the founding organizer of the SOFC Society of Japan with Prof. Tagawa and others in 1988 within The Electrochemical Society of Japan. He initiated collaboration with the ECS High Temperature Materials Division, which resulted in the now well-established international symposium series on Solid Oxide Fuel Cells. Professor Dokiya co-chaired SOFC-IV (Yokohama, Japan), SOFC-VI (Honolulu, Hawaii), SOFC-VII (Tsukuba, Japan), and SOFC-VIII (Paris, France) with Dr. S. C. Singhal. He also served as a member of the Executive Committee of the High Temperature Materials Division of ECS and as an officer of the International Society for Solid State Ionics.

At the Dokiya Memorial International Symposium on Solid Oxide Fuel Cells in Tokyo, the following leading researchers on solid oxide fuel cells were invited: Nigel Brandon, Imperial College and Ceres Power, U.K.; Koichi Eguchi, Kyoto University, Japan; Ellen Ivers-Tiffée, University of Karlsruhe, Germany; Tatsuya Kawada, Tohoku University, Japan; Nguyen Minh, General Electric, U.S.; Mogens Mogensen, Risø National Laboratory, Denmark; Takashi Ono, Kyocera Corporation, Japan; Subhash C. Singhal, Pacific Northwest National Laboratory, U.S.; Anil Virkar, University of Utah, U.S.; Mark Williams, National Energy Technology Laboratory, U.S.; and Harumi Yokokawa, AIST, Japan.

These speakers presented and discussed the latest research and developments in SOFC materials, electrochemical reactions and interfaces, and cell performance, as well as progress toward SOFC system development and commercialization. The audience consisted of about 200 scientists and others involved in SOFC technology, mainly from Japan. A lively discussion followed each invited presentation, and it was the consensus of those present that the symposium lived up to the high standards and expectations generally required by Dr. Dokiya.

In addition to the technical presentations mentioned above, Harumi Yokokawa presented in detail the scientific efforts of Dr. Dokiya in SOFC development. Also, Hiroyasu Iwahara of Nagoya University and Tomoji Hakita of The Japan Institute of Energy, two longtime friends of Dr. Dokiya, reminisced on the life and times of Dr. Dokiya, including his many trips abroad at SOFC-related conferences.

On the evening of the first day, a grand banquet was held for the participants, which was also attended by Mrs. Yukiko Dokiya (Dr. Masayuki Dokiya's widow), and their two daughters, Fumiko and Mariko. At the banquet, Troy Miller, Director of Development at ECS, thanked Mrs. Dokiya and her family for the generous contribution that they have made toward the Society's Development Fund. ■

Dokiya Symposium Fund

On November 19, 2003, Yukiko Dokiya, a professor at Edogawa University, and her daughters Fumiko and Mariko donated 10 million yen (>\$90,000) to The Electrochemical Society. The donation was made to encourage young researchers in the field of solid oxide fuel cells (SOFCs) and high temperature materials, and was given in memory of Masayuki Dokiya, a 14-year member of ECS. Dr. Dokiya, who, along with the late Professor Tagawa and others, founded the SOFC Society of Japan. That society has collaborated with the High Temperature Materials Division (HTM) of ECS to create the international series of symposia on Solid Oxide Fuel Cells.

At the recent Dokiya Memorial International Symposium on Solid Oxide Fuel Cells in Tokyo, June 24-25, 2004, Director of Development Troy M. Miller delivered an ECS Board of Directors resolution thanking the Dokiya family for their support of young investigators and the field of high temperature materials. The symposium was attended by over 150 Japanese researchers and invited speakers from abroad.

ECS has established the Dokiya Symposium Fund with the 10 million yen to support young attendees (30 years or younger) to SOFC symposia, HTM and HTM co-sponsored symposia, and other solid-state ionic meetings, regardless of nationality. The 2004 Joint International Meeting held in Honolulu, Hawaii, October 3-10 was the first meeting to take advantage of this new fund set up by the generosity of the Dokiya family. ■

Corporate Member News

ECS welcomes its four newest corporate members: Degussa AG (Patron), Samsung SDI Co., Ltd. (Sponsoring), Ballard Power Systems, Inc. (Sustaining), and CITIC Guoan Mengguli Power Source Tech (Sustaining).

DEGUSSA AG, centered in Dusseldorf, Germany was established in 2001 with the merger of Degussa-Huls AG (founded in 1873) and SKW Trostberg AG (founded in 1908) and is Germany's third-largest chemical company and the world market leader in specialty chemicals. Responsibility for Degussa AG operational business is held by five divisions—construction chemicals, fine and industrial chemicals, performance materials, coatings and advanced fillers, and specialty polymers—divided into 21 business units. In April 2004, Degussa AG opened its new Research and Development Center in Shanghai, China.

SAMSUNG SDI, with headquarters in South Korea, is concerned with digital display and energy. Among other products, Samsung SDI develops rechargeable batteries such as lithium-ion batteries, lithium polymer batteries, and energy sources for solar cells and fuel cells that help lessen conflicts between energy and the environment. On the display side, Samsung SDI develops digital products involving display technology from color Braun tubes to flat displays, plasma display panels (PDP), liquid crystal displays (LCD), and organic light-emitting diodes (OLED).

BALLARD POWER SYSTEMS, located in Burnaby, British Columbia, Canada, is a world leader in developing, manufacturing, and marketing zero-emission proton exchange membrane cells. Ballard's goal is commercializing fuel cell engines for transportation applications and fuel cell systems for portable and stationary products. Ballard is also commercializing electric drives for fuel cell and other electric vehicles, power conversion products, and supplies friction materials to automobile companies for power train components. Ballard currently partners with world-renowned companies such as DaimlerChrysler, Ford, EBARA, ALSTOM, Honda, Mitsubishi, Nissan, Volkswagen, Yamaha, Cinergy, and FirstEnergy.

CITIC GUOAN MENGGULI Co., LTD. (MGL) of Beijing, China is primarily engaged in the production of new composite metal oxide materials, Li-ion secondary batteries, and saline chemical products, as well as the technological development and investment in such fields as new energy sources and materials. With integration of research, development and production, MGL is China's largest and one of the most technologically advanced new and high-tech enterprises in the industry. With special synthesizing techniques, MGL produces cathode materials for Li-ion batteries with superior electrochemical properties, and these products have been adopted by many different battery manufacturers. ■

New Division Officers

New officers for the 2004-2006 term have been elected for the following Divisions.



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Darby Makel

Michael Sailor

Masood Tabib-Azar

Thomas Thundat

Ted Zellers

Fellowships for ECS Members from Semizone

Beginning January 1, 2005, The Electrochemical Society (ECS) and Semizone will launch a fellowship program that provides \$12,000 annually to ECS members enrolling in Semizone distance-learning courses.

In an effort to assure the continuous availability of up-to-date training and education of fundamental and applied scientists and engineers in the fields of electrochemistry and solid-state science, ECS has partnered with Semizone, a provider of a comprehensive array of online learning resources for semiconductor, microelectronics, and related fields.

Starting with the first calendar quarter of 2005, ECS will award three \$1,000 Semizone fellowship grants to three qualified ECS members in each calendar quarter. These fellowships entitle each fellowship recipient to enrollments in up to \$1,000 of Semizone online learning courses and programs free of charge.

These fellowships are in addition to the current partnership between the two organizations, in which ECS members can enroll in Semizone courses and receive a 10% discount.

Founded in partnership with the Stanford Center for Professional Development, Semizone (www.semizone.com) provides online learning content and infrastructure, corporate online universities, and web services. Companies can implement Semizone's e-learning resources for workforce and business development throughout their global sites, resulting in higher productivity and training ROI. Semizone's Knowledge-on-Demand learning solutions enable professionals to develop industry-focused knowledge within a collaborative environment and to apply that knowledge on the job. Semizone partners with its corporate customers to meet their workforce and business development requirements in support of key corporate initiatives. Semizone is recognized

as the leading provider of e-learning services to the semiconductor, microelectronics, and related industries.

The Semizone fellowships will be awarded on a first-come, first-served basis. Applicants must be ECS student members; ECS members who are currently unemployed/or in job transition; ECS members who are full-time employees of academic and other non-profit institutions (*e.g.*, university faculty, postdoctoral students, and other academic staff); retired professionals; or industry members under the age of 30. All interested parties should contact Troy M. Miller at troy.miller@electrochem.org.

Recipients must utilize their fellowship grant for Semizone enrollments by the last day of the calendar quarter subsequent to the calendar quarter during which the grant is given. For instance, if awarded the fellowship by January 10, 2005, the recipient is able to enroll in any Semizone courses (up to a cumulative value of \$1,000 free of charge) anytime between 1/11/2005 and 3/31/2005 (the enrollments provide one-year course and curriculum access for the enrollees).

Whether you are a researcher, student, or corporate employee who wants to acquire additional training without the expense or time outlay associated with attending on-site training sessions, the Semizone-ECS distance learning resources are a valuable alternative. Enroll in any Semizone course between now and March 31, 2005, and receive an ECS-special enrollment discount of 25%. To receive this time-limited discount, use the offer code: `ecs2004` during your online course enrollment. Visit www.semizone.com/ecs or <http://www.electrochem.org/development/services/introduction.htm>. ■