LOCAL SECTION NEWS

National Capital Designated Master Section

The National Capital Local Section has been designated an ECS Master Section. National Capital has been awarded this distinction because of its many accomplishments in the 1999-2000 year. It sponsored six technical sessions and participated in four science fairs. The Section held two joint meetings with the National Association of Corrosion Engineers (NACE) and one joint meeting with NACE and ASM International.

At the Section's annual awards banquet, it presented the 21st William Blum Award to William E. O'Grady. Also honored were 18 Science Fair Award recipients from local area middle and high schools. On the more social end of the scale, it held a family social night at a local minor league ballpark as a joint event with NACE.

Congratulations National Capital Master Section!

2000 Student Award of the Canadian Local Section

Byung-kyu Park *(left) received the 2000 Student Award from the Chairman of the Canadian Local Section,* ***Benoit Marsan*** *(right). Park presented a seminar entitled "Design and Fabrication of Large-Area Low-Energy X-Ray Imaging Arrays using Mo/a-Si:H Schottky Diodes and a-Si:H Thin Film Transistors."*

Canadian

The 2000 fall symposium of the Canadian Local Section of ECS was organized by Christina Bock and was held at the National Research Council Canada, Institute for Chemical Processes and Environmental Technology, in Ottawa, on October 6. Nine speakers presented lectures on the topic of "The Role of Electrochemistry for Energy and the Environment." Prof. E. Gileadi from Tel-Aviv University, Israel, gave the plenary lecture entitled "Probing the Metal-Solution Interface with the QCM: Opportunities and Limitations."

A poster session followed the oral presentations. During the reception, a $100 award for the best student poster was given to Sandra Rifai (University of Ottawa) and a $50 award was given to France Payment (Université du Québec à Montréal). A student travel grant of $200 was also given to Huan Huang (University of Waterloo) who presented a poster at the meeting.

National Capital

The November meeting of the Section met on November 14 at the Eisenhower Metro Center in Alexandria, VA. Dr. Carl M. Osburn, Professor of Electrical and Computer Engineering at North Carolina State University and current ECS President, first spoke about where The Electrochemical Society is presently and where it plans to go in the future.

Dr. Osburn also gave a technical presentation on "Electrochemical and Solid-State Science and Technology in ULSI Technology." He described the importance of electrochemical and solid-state science in semiconductor technology. Technical advances in semiconductor technology have brought about revolutions in communications and computing and have fostered what many call the New Information Age. Dr. Osburn illustrated some of the materials and processing science that has facilitated these advances, including work on thin gate insulators, metal silicides, chemical vapor deposition, ion implantation, and diffusion. He finished his presentation by detailing the key challenges that must be met if the industry is to continue making progress in the next decades.

The Section met on December 5 in Alexandria, VA. Dr. Patricia Smith, Director of the Electrochemical Power Sources R&D Group at the Naval Surface Warfare Center, Carderock Division, spoke on "Investigating High Energy, Rechargeable Lithium Batteries." Dr. Smith spoke about the more than two decades of government and industrial research that has finally resulted in rechargeable lithium batteries being available to both the commercial and military market. Although widely successful, there is still the desire for these batteries to have increased specific energy and safety. To address these issues, the Department of Navy is developing novel polymer electrolytes and high capacity, intercalation cathode materials. Dr. Smith reviewed her group's efforts to develop rechargeable lithium cells containing cathodes synthesized by using the sol-gel process to improve the specific energy density for vanadium pentoxide cells.

New England

On November 14, the Section assembled in South Windsor, CT, for a tour of the International Fuel Cells (IFC) facility. IFC, a division of United Technology, is the world's leader in fuel cell production. They build and install phosphoric acid fuel cells (more than 200 world wide) and are involved in developing membrane fuel cells for automobile and residential applications.

Dr. Richard Bellows gave a brief introduction to the company and its very recent history including a market survey and projection. Section members were advised of the plans for future growth and investment in research and development facilities and immediate growth in manufacturing space. A tour of the assembly lines and a viewing of the clean rooms followed.

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Local Section News

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Philadelphia

On November 8, the Section held a dinner meeting at Villanova University in Villanova, PA. Dr. Paul Natishan of the Naval Research Laboratory, and Secretary of ECS, presented, "The Use of Ion Beam Surface Modification Techniques for Corrosion Protection." Ion beam alloying techniques overcome many of the problems associated with conventional alloying and provide a means to produce a new generation of corrosion resistant alloys. These techniques can be used to tailor metal surfaces to enhance the corrosion resistance of the surface without affecting the bulk properties of the metal.

San Francisco ES&T

The Section held a meeting on September 27 in Hayward, CA. The presentation, "Carbon and Electrochemistry," was given by Kimio Kinoshita of Lawrence Berkeley National Laboratory. A summary on the preparation, properties, and structure of various forms of carbonaceous materials was discussed. Also covered was an overview of the significant role that carbon plays in electrochemical technologies.

The Section held a meeting on October 18 in Hayward, CA. The presentation, "Performance Assessment Issues Associated with High-Level Radioactive Waste Containers," was given by Allen Lingenfelter of Lawrence Livermore National Laboratory. The speaker first gave a general description of the Yucca Mountain radioactive waste repository project. The goal of the project is to store high level radioactive waste for ten thousand years. To achieve this, the container must be able to withstand radiation, high temperature, and corrosion of chemical and microbial nature. Test pieces of potential materials were subjected to high stress and were exposed to atmosphere and aqueous solution of different ionic composition. The test pieces were analyzed using surface chemical techniques, including atomic force microscopy. Mr. Lingenfelter concluded the talk by discussing some issues that affect the decision of nuclear fuel reprocessing versus disposal in the repository.

The Section held a meeting in November in Berkeley, CA. The presentation, "The role of surface film in corrosion," was given by Thomas Devine of UC Berkeley. Three case studies were discussed: Alaskan oil pipeline, fire sprinklers, and computer hard disks. In the case of Alaskan oil pipeline, the fluid contains brine and is corrosive to the steel pipeline. The addition of organic corrosion inhibitors reduces the corrosion rate by a factor of hundred. However, the expense is significant. Through the use of Raman spectroscopy, the effective ingredient in the inhibitor mixture was identified. The non-effective ingredients were eliminated, resulting in much cost saving. In the case of fire sprinkler corrosion, the failure of a part was found to be due to stress corrosion cracking, which gave a morphology very different from that of a failure due to mechanical stress alone. The root cause of the stress corrosion cracking was traced to bacteria. The problem was solved by improving chlorination of water supply. In the case of computer hard disk, the magnetic alloy is covered by a layer of carbon coating. It was not known whether the corrosion of the magnetic alloy was caused by preexisting pinholes on the carbon layer, or corrosion of the intact carbon layer. Through the use of SEM and voltage polarization techniques, it was found that the carbon layer itself was susceptible to corrosion. ■