



The Electrochemical Society – Detroit Section

Seminar Notice: Thursday, March 8th, 2007

Electrochemical Supercapacitors: From High Power Sources to Neural Stimulation

Professor Daniel Scherson, Case Western Reserve University

Solid electrode materials incorporating redox active sites play a key role in energy storage applications. The rates at which charge can be injected into or released from such electrodes are governed by the intrinsic kinetics of electron transfer, structural rearrangements due to changes in lattice parameters, and mass transport hindrances within the electrode itself associated with charge balance within the lattice. Hydrated oxides of Ru and Ir display unusual properties in aqueous electrolytes in that both charge injection and release occur at rates much higher than those observed for other hydrated transition metal oxides even for layers equivalent to thousands of lattice diameters. A better understanding of the structure and behavior of these remarkable supercapacitive electrode materials has been of major focus over the last two decades owing to the need of developing high power sources for a variety of technical applications. Efforts in our laboratories have centered on the use of *in situ* spectroscopic probes to elucidate electronic and structural aspects of these materials as a function of their state of charge that may help identify the factors responsible for their unusual properties. Considerable insight into some of these issues has been gained from information derived from x-ray absorption fine structure measurements (XAFS) and to a lesser extent from surface enhanced Raman scattering. Based on our observations hydrated RuOx and IrOx are characterized. Aspects related to the physical electrochemistry of neural stimulation will also be discussed.

Professor Daniel Scherson is currently the Director of the Ernest Yeager Center for Electrochemical Science, a Center recognized internationally for fundamental and applied electrochemistry. Professor Scherson is also editor of the Journal of the Electrochemical Society. He holds a PhD degree in Electrochemical Engineering from University of California Los Angeles, and was postdoctoral fellow at the Case Western Reserve University, before joining the faculty of the Chemistry Department at the CWRU. Professor Scherson is well known for his significant contributions on fundamentals and applied physical electrochemistry. He has been consultants to many industries and government agencies for energy related programs. He has published widely in the area of analytical and physical electrochemistry.

Date: *Thursday, March 8th, 2007*

Location: Lawrence Technological University
21000 West Ten Mile Road
Southfield, MI 48075

**NEW
BUILDING**

Building # 5 in Taubman Welcome Center, 4th Floor, Room 406
Use Parking Lot A, C or D (Parking Lot C & D are accessed off NW Highway)

Time: 5:30 pm Reception / 6:30 pm Dinner / 7:30 pm Speaker

Price: \$20 Members / \$22 Guests / \$15 Students

Payment: Cash or Check

RSVP by: Monday, March 5th, 2007 to Alvaro Masias

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