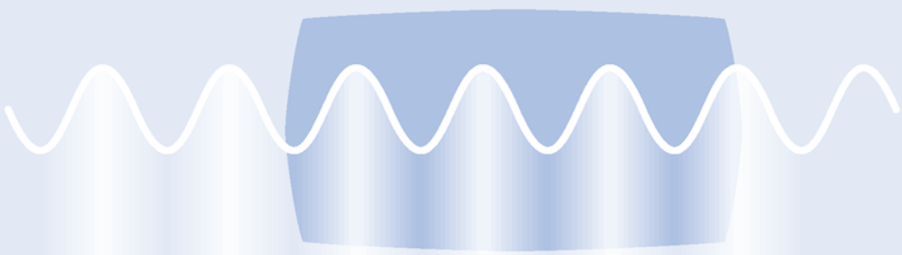
EIS 2006 Materials Research Company, LLC
PO Box 2696
Madison, MS 39130-2696

Sponsored by:

solartron analytical

GAMRY INSTRUMENTS

Materials Research Company, LLC



ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY

Theory, Applications, and Laboratory Instruction

A Short Course, May 1-5, 2006 in Jackson, Mississippi

Course Overview

Impedance spectroscopy is an extremely powerful experimental technique that compares the electrical response of a test system to a time varying electrical excitation to delineate interfacial and bulk material parameters. When applied to an electrochemical system, impedance spectroscopy can provide information on reaction parameters, corrosion rates, oxide integrity, surface porosity, coating integrity, inhibitor function, mass transport, and many other electrode/interface characteristics. However, effective utilization of this spectroscopy technique has been hindered by the lack of a comprehensive and cohesive explanation of the theory, measurement, and analysis techniques. This course has been designed to fill this void.

Course Objective

The objective of this short course is to provide a working knowledge of electrochemical impedance spectroscopy. This will include a discussion of the theory, applications, and measurement methods. A key objective of this course is to provide hands-on laboratory experience. The attendee will use EIS to measure corrosion rates and battery performance, and will learn methods of impedance data analysis, interpretation, and model fitting both in the classroom and in the laboratory. The student will become familiar with major brands of commercially available impedance systems as well as with software for experiment control, data analysis, and model fitting. Since it is intended for all participants to use the equipment in the laboratory sessions, the class size will be limited to 30 students.

The course is designed for scientists and engineers from industry, government, and academia who have had no prior experience with EIS. However, since the range of information presented is from an introductory to advanced level, this course will also be of interest to those who already have experience with EIS and wish to discuss more advanced topics. An understanding of basic chemistry and physics is requisite, and an understanding of basic electrochemistry will be beneficial.

Course Organizer

S. Ray Taylor — Professor, Department of Biomedical Materials Science
University of Mississippi Medical Center, Jackson, MS

Tuition

Fee and Enrollment: $1,795 includes: **lodging**, class materials, daily lunches, refreshment breaks, continental breakfast, welcome reception, and the cookout. Meals not specifically mentioned will be extra. Please complete the registration and forward it to the address on the form. The inclusion of laboratory sessions requires that the enrollment be limited to 30 people.

Registration Deadline: April 3, 2006.
Refunds: Cancellations made after April 15th will not be refunded.

Course Schedule

Monday, May 1	Basic Concepts/Incentives Transfer Function Theory Impedance Modeling, Equivalent Circuit Approach Methods of Presentation and Analysis
Tuesday, May 2	Distributed Elements (mass transport, porous electrodes, etc.) Impedance Modeling via Continuum Reaction CNLS Fitting
Wednesday, May 3	Kramers-Kronig Transforms Applications: corrosion rates of bare metals, low conductivity environments, passive film behavior
Thursday, May 4	Applications: coatings, inhibitors, reaction parameters, batteries and fuel cells
Friday, May 5	(**course ends at 12:00 Noon**) Special Topics: limitations of the method, equipment considerations

Daily Format

8:30 - 10:00	AM	Lecture and Discussion
10:00 - 10:15	AM	Break
10:15 - 12:00	Noon	Lecture and Discussion
12:00 - 1:00	PM	Lunch
1:00 - 2:00	PM	Lecture and Discussion
2:00 - 4:30	PM	Laboratory
4:30 - 5:00	PM	Wrap-up and Adjourn

Special Scheduled Events

Sunday, April 30
7:00 PM Registration and Reception

Thursday, May 4
6:30 PM Cook Out

Lecturers

Rudy Buchheit	Professor, The Ohio State University, Columbus, OH
John Harper	Solartron Analytical, Farnborough, UK
Martin W. Kendig	Senior Scientist, Rockwell Science Center, Thousand Oaks, CA
Bob Rodgers	Gamry Instruments, Warminster, PA
Robert Spotnitz	Battery Design Company, Pleasanton, CA
S. Ray Taylor	Professor, University of Mississippi Medical Center, Jackson, MS

General Information

Location: Classes and laboratory sessions will be held at the Cabot Lodge Millsaps in Jackson, Mississippi. Classrooms are located off of the main lobby of the hotel.

Lodging: Lodging at the **Cabot Lodge Millsaps** will be provided Sunday through Thursday as part of the course fee and standard arrangements for lodging will be made through the short course administrator. Participants will be responsible for additional companion(s) and incidental room charges.

CABOT LODGE MILLSAPS
2375 North State Street
Jackson, MS 39202
(601) 948-86450
800-874-4737

The **Cabot Lodge Millsaps** is located directly across from the University of Mississippi Medical Center. There is ample free parking at the hotel for guests. A generous continental breakfast is included each morning. Also provided is a complimentary evening cocktail hour from 5:30-7:30 p.m. each evening. Each room has cable TV with HBO and telephone data ports for your convenience. Guests may relax at the Cabot Lodge's outdoor swimming pool.

Travel: Jackson is easily assessable by Interstates 55 and 20, rail, bus, or by air travel. Jackson International Airport provides air services through American Eagle, ASA, Comair, Continental Express, Delta, Northwest Airlines, Southwest Airlines, and US Airways. For more information, contact Jackson International Airport, 100 International Drive, (601) 939-5631 or www.jmaa.org. Railway information is available from Amtrak Passenger Station, 300 West Capital Street, (601) 355-6350 or www.amtrak.com.

Ground distances to Jackson:

Atlanta	441 miles	Birmingham	248 miles
Dallas	412 miles	New Orleans	185 miles
Memphis	208 miles	St. Louis	505 miles

Attractions: Jackson, the vibrant historical capital of Mississippi, has a wide variety of cultural attractions at its doorstep. Jackson features museums celebrating art and science including the Mississippi Museum of Art, Jackson Zoological Park, Museum of Natural Science, Museum of the Southern Jewish Experience, and the Russell C. Davis Planetarium. Historical government buildings and homes are located within the downtown area. A calendar of special events can be viewed at www.visitjackson.com.

More Information:

Technical Information:
S. Ray Taylor: UMMC, (601)984-6170
email: srtaylor@sod.umsmed.edu
Conference Information:
Carolyn Taylor: (601)898-1632 (phone and FAX)
email: EIScourse@jam.rr.com
Web Site Information on the Course:
Go to www.solartronanalytical.com or www.gamry.com

Registration for the Short Course: ELECTROCHEMICAL IMPEDANCE SPECTROSCOPY

Course Fee: $1,795.00. Enrollment will be limited to 30 persons. Early notification of your interest is requested. Please do not remove mailing label when returning this card.
Cancellation Policy: Cancellations after April 15th will not be refunded. However, an alternate participant may be substituted. Cancellations after April 1st but before April 15th will be refunded less $100 for processing.

Return to: Materials Research Company, LLC
2006 EIS Short Course
PO Box 2696
Madison, MS 39130-2696

Dr./Mr./Ms. _____
Title _____
Organization _____
Address _____
_____
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Telephone (_____)_____
FAX_____ e-mail_____

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