The Blue Ridge Chemist

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Virginia Blue Ridge Section, American Chemical Society

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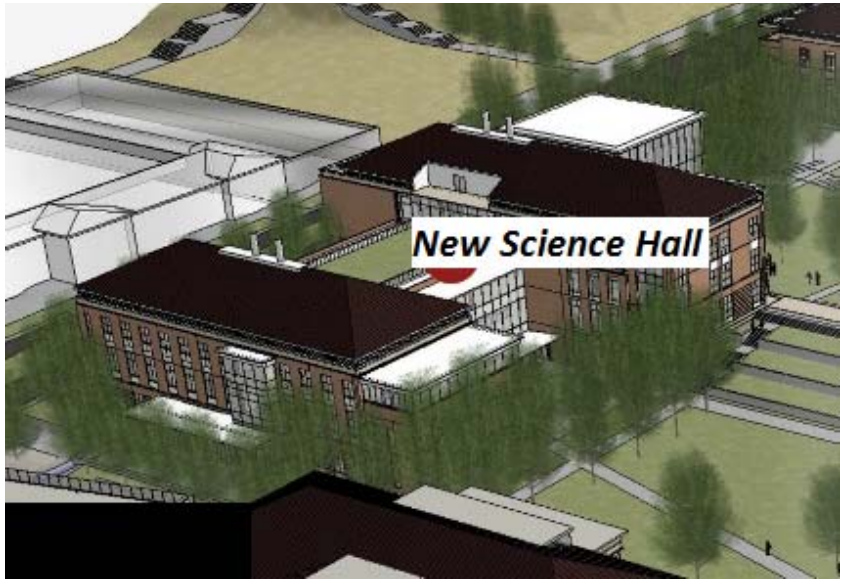


Liberty University Hosts the September Meeting

(We celebrate the launch of our chemistry major and the start of construction on our new science building.)

VIRGINIA BLUE RIDGE SECTION AMERICAN CHEMICAL SOCIETY

657th SECTION MEETING
Liberty University
Tuesday, September 17, 2013

PROGRAM:

5:30-6:00 Social time, Reber-Thomas, Executive Dining Hall
6:00-7:00 Dinner, Reber-Thomas, Executive Dining Hall
7:00-8:00 Talk, Reber-Thomas, Executive Dining Hall

The social time, dinner, and presentation will all take place in the Reber-Thomas, Executive Dining Hall at Liberty University. The speaker will be Dr. Mike Goldin. His talk is "Electrodes Large and Small: Medical and Environmental Applications of Electrochemical Parameters" or "Electrochemistry and How Not to go Through Airport Security with Science Equipment".

The buffet will consist of choice of chicken marsala, vegetarian lasagna, salad, oven roasted herbed potatoes, steamed vegetable medley, rolls, fruit cobbler, and chocolate cake along with choice of beverages. The dinner is $14, with students and retired members being half price.

Reservations for the dinner must be made by TUESDAY September 10, (7 DAYS BEFORE THE MEETING) by contacting Nancy Richardson at (434) 592-4302, or by e-mail to narichardson@liberty.edu, or by writing Nancy Richardson, Liberty University, Department of Biology and Chemistry, 1971 University Blvd., Lynchburg, VA 24502.

Dr. Mike Goldin, Director of Chemistry,
Assistant Professor, Liberty University

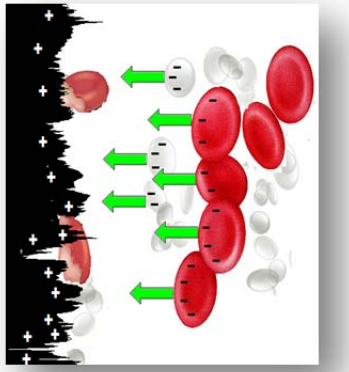
Dr. Mikhail (Mike) Goldin hails from Moscow, Russia, but has received most of his academic credentials in the U.S., receiving his B.S. in chemistry from Western Michigan University and his M.S. in inorganic chemistry at Michigan State University. Going back to his roots, Goldin earned his Ph.D. in electrochemistry at Mendeleev University in Moscow, though the majority of his doctoral research work took place at Liberty University's Department of Biology and Chemistry.

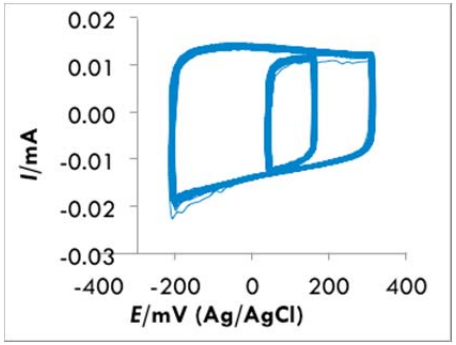
Dr. Goldin's research interest is in studying the electrochemical aspects of interaction of porous and surface-modified electrodes with aqueous solutions and other media and electrochemically controlling this interaction for medical and environmental applications. Recently he has worked in collaboration with microbiology colleagues and students on some preliminary experiments to investigate the interaction of *E. coli* and *S. aureus* with modified activated carbons to determine optimal conditions for bacteria removal from aqueous media.

Dr. Goldin also has a continuing interest in chemical education. With nearly 10 years of teaching experience, he teaches the residential general chemistry course for majors, as well as the residential and online one-semester general, organic, and biological chemistry course for allied-health students, and has recently been named the Director of Chemistry.

Electrodes Large and Small: Medical and Environmental Applications of Electrochemical Parameters

Electrochemistry is a field that "straddles" the boundaries of physics, chemistry, and engineering: electrochemical systems must involve conductors in contact with an electrolyte, with the most interesting phenomena occurring at the heterogeneous interface between the conductor and the electrolyte. Many natural systems can be described in electrochemical terms, especially when living organisms are involved: it is well known that cells possess a transmembrane potential that is simply the potential difference between the interior and the exterior of a biological cell measured with an electrochemical cell. Thus, it is a "natural" fit to apply electrochemical methods and models both as a descriptive tool in testing systems like blood and other biological fluids, and as a modification tool where electrochemical apparatus and methods are used to address a problem.





Two recently investigated electrochemical approaches to environmental and medical applications are interesting because of their inherent differences and, oddly, their striking similarity. One is the measurement of so-called "redox potential," or "ORP," in aqueous and biological media on platinum or oxide-film electrodes that are electrochemically pre-modified in a

standardized way, while the other is the use of electrochemically modified porous carbon materials for selective adsorption from aqueous or biological media. Although both methods involve electrochemical modification of the electrode material and electrochemical monitoring of the interface, differences in the nature and properties of electrode materials determine both the electrochemical data that can be obtained and its practical significance. This presentation will focus primarily on the interplay between the composition of the electrode surface and the electrolyte, and the measured electrochemical potential, emphasizing how processes at the interface can be used to describe or control changes that occur in systems ranging from the pond to the bloodstream to major organs in the human body.

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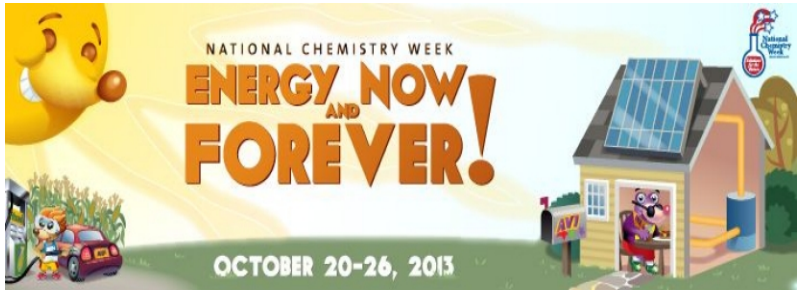
National Chemistry Week *NCW) October 20-26 2013



Illustrated Poem Contest

As part of every NCW celebration, the American Chemical Society (ACS) sponsors an illustrated poem contest for students in Kindergarten – Grade 12. Details on entering the contest will be given in the next issue of the Blue Ridge Chemist.

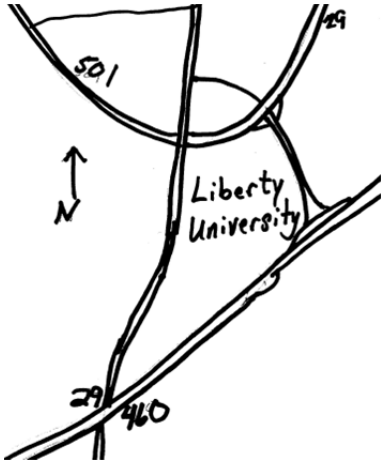
More related to electrochemistry:
Accounts of Chemical Research

[Ancient Mercury-Based Plating Methods: Combined Use of Surface Analytical Techniques for the Study of Manufacturing Process and Degradation Phenomena]

Artists and craftsmen more than 2,000 years ago developed thin-film coating technology unrivaled even by today's standards for producing DVDs, solar cells, electronic devices and other products. Understanding these sophisticated metal-plating techniques from ancient times, described in the ACS journal *Accounts of Chemical Research*, could help preserve priceless artistic and other treasures from the past. Gabriel Maria Ingo and colleagues point out that scientists have made good progress in understanding the chemistry of many ancient artistic and other artifacts — crucial to preserve them for future generations. Big gaps in knowledge remained, however, about how gilders in the Dark Ages and other periods applied such lustrous, impressively uniform films of gold or silver to intricate objects. Ingo's team set out to apply the newest analytical techniques to uncover the ancients' artistic secrets.

Illustration: Artisans centuries ago (AD 825) achieved sophisticated gilding on the St. Ambrogio golden altar.

Credit: American Chemical Society



Directions to Liberty University

Northbound on 29 - Take 460 E to the exit for Candlers Mtn. Rd/Liberty University. At the stop sign, make a right. Go to the first light and make a left onto University Blvd. Continue on this road into Liberty's Main Campus.

Southbound on 29 Business - Take Exit 8b. Go through the first light. At the second light, make a right on S 670 (there is a Liberty University sign with an arrow pointing to the right). Go two more lights. Make a right on University Blvd. Continue on this road into Liberty's Main Campus.

Eastbound on 460 - Take the Candlers Mtn. Rd./Liberty University exit. At the stop sign, make a right. Go to the first light and make a left onto University Blvd. Continue on this road into Liberty's Main Campus.

Westbound on 460 or Northbound on 501 - Take the Candlers Mtn. Rd. / University Blvd. exit. At the light make a left to Liberty's main campus.

On campus: Several entrances to the campus lead to University Blvd. Follow this past the football stadium on the right. Continue on this same road further as it curves gently right with the bookstore on the left and then further with the visitor center to the right. Continue to an intersection where Religion Hall is ahead to the left and DeMoss Learning Center ahead to the right. Turn right on Reber-Thomas Drive. This will put DeMoss on your left. Continue on Reber-Thomas Drive to the next parking area on the right. Anyone may park here after 5 pm except in reserved spaces. The executive dining hall entrance is closest to the next intersection or can be accessed through the main dining hall entrance. See http://www.liberty.edu/index.cfm?PID=6506 for a zoomable campus map.

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Vernon Miller, Nancy Richardson , Co-Editors
VA Blue Ridge Section, American Chemical Soc.
Chemistry Dept., Roanoke College
Salem, VA 24153-3789

Return Service Requested

The October meeting will be held at Ferrum College during National Chemistry Week on Wednesday October 23rd at 6:02 PM. The speaker will be Tim Long from Virginia Tech.