



AMERICAN CHEMICAL SOCIETY KENTUCKY LAKE SECTION

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KLS-ACS Web Page

<http://kentuckylake.sites.acs.org/>

March 2014 Kentucky Lake Section Meeting @

Majestic Family Pizza and Steakhouse

700 S. 6th Street, Mayfield, KY

Thursday, March 27, 2014

Dinner @ 6:00 pm, Presentation @ 7:00 pm

Buffet-style Dinner for \$10 (Students \$5)

**Presentation: "Analytical and Electro-Chemistry with
Nanomaterials"**

Lloyd P. Horne, PhD

Assistant Professor, Murray State University

See next page for Abstract and Biographical Sketch

Comments from the Chair

Thank you to everyone who attended the February Meeting in Milan. I hope you all enjoyed the talk dealing with the hazardous chemicals and lab safety issues. This month's meeting will focus on analytical and electrochemistry of nanomaterials and their potential applications. This is a great opportunity to learn some cutting edge research results. In addition, preparations for April meeting and Earth Day activities are underway. Please plan to attend this meeting, participate in the activities as much as possible and support your local section. We are looking forward to seeing you soon.

~Bommanna Loganathan, Chair

Analytical and Electro-Chemistry with Nanomaterials

There is increasing interest in the fundamental study and application of materials at very small length scales. As the size of a material decreases from that of bulk material and approaches that of single molecules, very unique properties (e.g., optical, electronic) begin to emerge. Consequently, such nanomaterials have potential utility in many areas, including catalysis, energy, electronics, measurement science, environmental remediation, and human health. This lecture will focus on small nanoparticles and nanopores.

Nanoparticles, such as those comprised of iridium oxide, are one of the best-known catalysts for facilitating the water-splitting half reaction in artificial photosynthesis. Thus, there is ample interest in understanding, and hopefully improving, the catalytic nature of such promising catalysts in addition to gaining insight into their formation, structure, and size-control.

Nanopores, the size equivalent to biological ion channels, are very useful in study of fundamental transport phenomena and interactions in very confined spaces and provide a means for abiotic evaluation, or modeling, of biological transport problems. These small pores also provide a unique framework for designing and constructing selective chemical and biological sensors.

This lecture will present contemporary results on analytical and electrochemical phenomena drawn from these two areas of nanotechnology.

Biographical Sketch

Lloyd P. Horne, Ph.D., lhorne@murraystate.edu, Assistant Professor, Department of Chemistry, Murray State University.

Dr. Horne holds a B.S. in Chemistry from The University of North Carolina at Chapel Hill and a M.S. certificate in Chemistry from East Carolina University. In collaboration with the East Carolina School of Medicine, his master's research focused on developing an electrochemical analysis tool to help access structural study of pancreatic proteins involved in scorpion sting-induced acute pancreatitis.

He obtained his Ph.D. in analytical chemistry from The University of Florida while working in the Center for Research at the Bio/Nano Interface on nanomaterials and sensors. While at Florida, Dr. Horne received 3 notable commendations and a competitive award for teaching excellence. He returned to The University of North Carolina at Chapel Hill where he served a 2-year post-doctoral appointment working with 3 members of the National Academy of Science, including a Nobel Laureate, on nanomaterials, electrochemistry, catalysis, and biological transport.

Dr. Horne joined the faculty in the Department of Chemistry at Murray State University in 2012. He is a recent recipient of a Kentucky EPSCoR Research Enhancement Grant sponsored by the National Science Foundation, the 2014 Marshall and Annette Gordon research award, and a 2014 Cottrell College Science Award. Dr. Horne's research interests are in nanomaterials, electrochemistry, sensors, and molecular design.

Prior to Murray State University, Dr. Horne spent 7 years working in industry. His industrial experience encompasses the areas of analytical toxicology, pharmaceutical R&D, technology transfer, pharmaceutical product commercialization, cGMP consulting, and the use of state-of-the-art measurement science in drug discovery, development, and manufacturing.