



THE FILTER PRESS

Newsletter of the Georgia Section of the American Chemical Society

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Analytical Methods for Homeland Security

Low Concentration Urine Uranium Isotope Ratio Analyses: Accuracy vs. Throughput

Dr. R. Steven Pappas,
Center for Disease Control

Thermal ionization-mass spectrometry (TIMS) has long been the benchmark technique for determining uranium isotope ratios. Instrumentation improvements and application optimizations on inductively coupled plasma-mass spectrometry (ICP-MS) instruments have enabled acquisition of data approaching the accuracy and precision obtained using TIMS with far less sample preparation time. However, problems remain for urine uranium isotope ratio analyses at low concentrations by ICP-MS. Solid phase chelation extraction of actinides from the matrix, use of a desolvating introduction system, and gas flow optimizations to minimize mass fractionation were employed to develop a magnetic sector ICP-MS method sensitive enough to accurately measure urine uranium isotope ratios at concentrations below 10 ng/L in 2 mL urine with little or no correction. This method was used to determine isotope ratios for internally and externally prepared natural and depleted uranium-spiked urine, and for other samples that we have received. Ratio accuracy obtained from triplicate digestions, preparations, and analyses were within 1% of expected values characterized or calculated from sources over concentrations ranging from 5 to 500 ng/L total uranium.

Dr. Pappas received his B.S. in Chemistry from Middle Tennessee State University (MTSU), followed by a Ph.D. in Analytical Biochemistry from Vanderbilt

University.

From 1992 to 1999, he occupied two non-tenure track assistant professor positions at MTSU and Georgia State University (GSU), teaching from freshman to graduate levels general chemistry, organic chemistry, biochemistry and supervising undergraduate research and graduate special analytical projects. During the latter three years of that period, due to Georgia state budget issues that impacted the GSU chemistry department, he taught part-time, while teaching high school chemistry and other science courses. He joined the CDC in 1999, and began to work on the addition of ^{235}U and ^{232}Th into the ^{238}U urine method, development of a ^{239}Pu and ^{240}Pu method, and putting them in Clinical Laboratory Improvement Act method format. An additional assignment was to develop a low concentration uranium isotope ratio method as veteran depleted uranium issues became important. Currently, he is involved in method development and training of U.S. state health department laboratories in various urine and blood toxic metals analyses and in method development and publication of levels of toxic metals in tobacco and tobacco smoke.

Reservation deadline is 8:00 PM, Tuesday, January 2nd—see page three for all details. →→☞☞



Georgia Section Officers and Board

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Holly Davis
The Coca-Cola Company
(404) 676-2980
hldavis@na.ko.com

CHAIR-ELECT:

Terry Say
Say Consulting, LLC
(404) 625-2136
terraysay@aol.com

PAST-CHAIR

David Sherrill
Georgia Institute of Technology
sherrill@chemistry.gatech.edu

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Georgia Institute of Technology
Toby.block@chemistry.gatech.edu

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(770) 423-6256
jpowers@kennesaw.edu

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Georgia Local Section 2008 Election Results

The 2008 Chair-Elect is Deborah Sauder, and John Hall is elected member-at-large. The 2008-2010 Councilor is Lihong D'Angelo, and David Sherrill is elected Alternate Councilor. Jennifer Powers was re-elected as the treasurer. Terry Say advances to Chair in 2008.

Thanks to all the candidates for agreeing to run and serve the Georgia Local Section of the American Chemical Society.

Connecting the local Chemical Industry to High Schools

2008 Chair, Terry Say, is leading an effort to encourage, create and assist with links between professional industrial chemists and local high schools. A letter was sent out with limited response.

If your company would like to connect with the students in a local high school, Terry has a database of high school chemistry departments in the area and would like to help you establish a link. If you already are involved with a school, please let Terry know, so that others can learn of your programs, and their perceived success, and assistance can be provided if this would be helpful.

If you would like to be involved with this endeavor please contact Terry at terraysay@aol.com or at (404)625-2136.

Reminder:

Anyone with pictures taken at Georgia Local Section 2007 events (including but not limited to meetings, National Chemistry Week events, Women or Younger Chemists events, sponsored events—Girl Scout science days, etc) are invited to submit these for future use by the section (posters, newsletters, etc). Email these to the editor or provide on a disk. **Thanks!**

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December Meeting: Tuesday, January 8, 2008**Analytical Methods for Homeland Security**

Dr. R. Steven Pappas, Center for Disease Control

Time: 6:30 - 7:00 PM Arrive

7:00 - 8:00 PM Dinner

8:00 - 9:00 PM Meeting & Presentation

Location: Pettit Microelectronics Research Center (MIRC), 791 Atlantic Dr, Georgia Tech Campus

Dinner Menu—Holiday Finale, served Buffet Style:
Mixed Greens with Sliced Pears, Goat Cheese & Pecans
Balsamic Vinaigrette

Maple Roasted Turkey with Sage Butter
Sugarcane Baked Ham with Spiced Apples and Pears

Fresh Cheddar Biscuits

Sautéed Haricot Verts with Red Bell Peppers; Sugar and Spice Acorn Squash; Rosemary Roasted New Potatoes

Dessert Buffet: Gingerbread Cookies; Red Velvet Cake

Iced Tea and Coffee

Cost for meal option: \$25 per person; \$15 for students and retirees. If you have a vegetarian preference, please note this with your reservation.

Payment should be made to the "Georgia Section ACS" and will be collected at the door. If you make a reservation and then don't attend, you will be charged for the meal, as we have to guarantee the number of meals.

RSVP to Deborah Sauder, dsauder@ggc.usg.edu
 (preferred) or 678-407-5844 by 8 pm January 2, 2008.

Directions to Pettit Microelectronics Research Center (MIRC), 791 Atlantic Drive, Georgia Tech

Building #95 on the Georgia Tech Campus Map

The closest paid Visitor Parking is in the public lot south of the intersection of Ferst and State.

From parking lot, walk east towards the traffic light at Ferst and Atlantic, turn right and walk down Atlantic to third building on the left, which is MIRC.

Driving directions:

From 85/75 take 10th Street exit west. Turn south on State Street, Continue ~ 2 blocks to entrance of Visitor's Parking on the far side of Ferst.

More information can be found at
<http://gtalumni.org/campusmap/>

2008 Fulton County Regional Science and Engineering Fair

The Georgia Local Section has been asked to provide judges for the 2008 Fulton County Regional Science and Engineering Fair. Several members participated last year in the Georgia science fair, and found it fun & rewarding.

Excerpted from the official invitation:

Fulton County Schools would like to invite you to participate as a judge in the 2008 Fulton County Regional Science and Engineering Fair. The fair gives students, grades 6 – 12, within our public, private, charter and home schools the opportunity to explore and investigate the world of science, mathematics, and technology through hands-on research and experimentation in order to refine their understanding of the scientific process. By participating in scientific research, students develop science problem solving and research skills and an appreciation for science that will prepare them for their future.

Serving as a science fair judge is a rewarding experience that will take little of your valuable time but provide students the chance to interact with an experienced professional from their own field of interest and give them constructive feedback on their research. Experiences such as this are essential in their growth and development as future scientists, mathematicians, and engineers. To participate as a judge, please complete and submit the attached registration form by January 14, 2008.

The Fulton County Science and Engineering Fair will take place February 19 – 20, 2008 at the Professional Learning Center. Senior and junior divisions will be judged separately. Judges should expect to arrive at approximately 8:30 A.M. for breakfast and orientation and finish at approximately 3:30 P.M. Lunch will be provided.

We appreciate your support and any assistance you may be able to offer. The application for participation in this event will be attached to the list-serve email that is sent to all members (with email) to announce the January meeting. If you would like an application faxed to you, please call the FP editor, Lissa at 404-389-0090. Applications will also be available at the January local section meeting on Tuesday, January 8, 2008.

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