AMERICAN CHEMICAL SOCIETY
DIVISION OF ANALYTICAL CHEMISTRY

electronic edition NEWSLETTER

NEWSLETTER

FALL 2007 EDITION

From the Chair

Dr. Laurie Locascio,
Division Chair

Recently, the division members overwhelmingly approved new bylaws. As a result of the change in bylaws, the Chair-Elect now progresses to the position of Program Chair, then Chair, then Past Chair. The executive committee felt that it was important to remove the programming duties from the Chair so that the Chair can focus on advancing the division's strategic goals and new initiatives. Because of this change, I will remain as Chair for a second year, Chris Enke will remain as Past Chair for a second year, Isiah Warner will act as the new Program Chair, and Dorothy Phillips will come on board as Chair-Elect. I believe that this new structure will greatly improve our ability to serve our members. Thank you for your support of this change.

I want to begin by reminding you of the four major strategic initiatives that the division is pursuing:

1) Develop new bylaws to change the structure of the executive committee;
2) Develop a comprehensive program to improve web services (webcasting, web seminars, overhaul of the Division website, employ-ment listings, etc.);
3) Develop a more inclusive approach to programming to meet our members' needs (joint programming at other meetings such as Pittcon, industry-focused workshops, international seminars, etc.);
4) Develop a plan to improve diversity and to reach out to the international community.

IN THIS ISSUE:

Since my last communication with you, these are some of our other accomplishments toward these goals:

- We announced in the last newsletter that the Division has established a partnership with the Analytical Sciences Digital Library (ASDL) to provide the foundation for our web initiative. The new joint website is www.analyticalsciences.org –

please visit the site often for information on our latest programs! We recently formed a Web Committee that has been extremely active and aggressive about upgrading our web presence. Chris Enke has been acting as Chair of this committee since its inception, and this position was recently turned over to our outgoing Secretary, Steve Petrovic. Cindy Larive is the lead ASDL representative on the committee. A recent major change on the site is the introduction of a job listings area. Look for a members-only site in the near future where you will have free access to journals and webinars.

- As a result of overwhelmingly positive feedback, the executive committee has made the decision to continue programming at Pittcon. Your Program Chair, Isiah Warner, has put together an exciting program for Pittcon 2008, and we look forward to seeing you there! The program is described in detail in this newsletter-also see the Pittcon website for more information on ACS at Pittcon.

  http://www.pittcon.org/news/pdf/pr_acs.pdf

- The Division finalized arrangements with the new journal, *Annual Review of Analytical Chemistry*, so that all members who have paid dues for 2008 will receive a complimentary hard copy of Volume I (2008), organized and edited by two of our members, Richard Zare and Edward Yeung. This hardbound book will be delivered for free to the address that you provided when you renewed your membership. Watch for the book to be delivered to you in early 2008 - I think it will be a spectacular issue! You will also have free access to the online version through our members-only website in 2008 and future years as well. (The value of the book and online access is $197 so we are very excited about providing this to you at no cost!) For more information on this issue, please go to: http://www.annualreviews.org/catalog/2008/ac01.aspx

- We have formed several new committees in the past 6 months and are actively recruiting new committee members. Please contact the Committee Chairs (listed on the Division website) if you are interested in participating in any of these activities. And thank you to our new Chairs for volunteering their time and energy!

  - Fundraising Committee (to raise funds for social programming and travel for invited speakers at National meetings) - Chair: Phillip Voegel, Southeastern Louisiana University
  - Web Committee (to evaluate, advise and plan new web services) - Chair: Steve Petrovic, Southern Oregon University
  - Industrial Liaison Committee (to improve our services to industrial members) – Chair: Thom Rossi, Agile Therapeutics

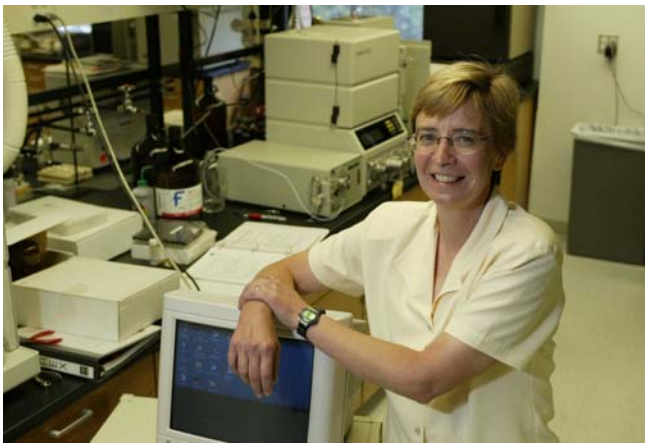
  We also have several other new committee Chairs that include: Pam Mabrouk, Northeastern University (Chair, Kolthoff Committee); Dimitri Pappas, Texas Tech University (Chair Publicity Committee); and Kim Frederick, Holy Cross University (Chair, Membership Committee).

  Thank you also to our outgoing Chairs who have served the Division so well – Cindy Larive (Kolthoff) and Carol Korzeniewski (Publicity).

This division is fortunate to have a rich history of dedicated executive committee members who have sought to increase the visibility of analytical sciences in the world of chemistry. This year, two more of those committee members, John Callahan (Past Past Chair) and Steve Petrovic (Secretary), will complete their tenure. We appreciate all of their hard work on behalf of the division, and their presence on the committee will be sorely missed.

Finally, I would like to welcome the talented incoming members of the executive committee, Dorothy Phillips (Chair-Elect) and Anna Cavinato (Secretary). This year, the executive committee will push forward with our strategic initiatives to make a strong and lasting positive impact on the division. Together, we promise that we will continue to strive to make your division, the Division of Analytical Chemistry, better than ever! We need your help to do that – express your opinion and get involved in the new division programs. There are a lot of exciting things going on in the Division of Analytical Chemistry -
We're Going Places – Come Along!

By Susan V. Olesik, Ph.D,
Subdivision Chair



I would like to personally thank Brian Bidlingmeyer for his strong contributions as chair of the subdivision for past two years and congratulate him on his election to Chair-Elect.

Year 2009 will be the 25th anniversary of the subdivision (SCSS). As we come closer to this milestone, we should take time to look back at the accomplishments of the division and most importantly plan for its future. We want the next two years to be very active as we approach this anniversary.

Strategic Planning for the Subdivision
The executive committee of the subdivision is in the midst of making plans for future endeavors.

The SCSS currently has two primary activities:
1) programming sessions at fall and spring national ACS meetings with the spring meeting currently hosted as a component of the Pittsburgh Conference.

2) administering the ACS Division of Analytical Chemistry Award for Young Investigators in Separation Science (YISS)

After almost twenty five years we should evaluate our activities. Also, we are interested in learning what other activities would be beneficial to the subdivision membership. Among the nearly 2000 members of the subdivision, approximately 60% are industrial chemists, 33% are academicians, and 7% are from national labs, government labs, contract labs and other. Each of these subgroups likely has different expectations of the subdivision. We would like to learn what these are and whether we need to make adjustments. For example, are there unmet educational needs or networking needs that you would like the subdivision to consider?

We are working on a questionnaire that will be sent to the members to begin to collect this information. You will receive this via e-mail. We will also do a random phone call sampling of the membership. If you would like to provide comments on possible enhancements to the subdivision's activities by e-mail, please contact me at olesik.1@osu.edu
Your input is very important!

Annual Meeting of the SCSS
The annual meeting of the SCSS will be held from Noon to 2:00pm on Monday, March 3, 2008 in Room 07 of the Morial Convention Center.

All subdivision members and individuals with interests in separation science, broadly speaking, are welcome to attend.

As part of that meeting, we will have a deep discussion of possible innovative activities that the subdivision might consider as it plans for its plans for future efforts.

ACS Division of Analytical Chemistry Award for Young Investigators in Separation Science (ANAL. YISS)
Professor Adam Woolley , Brigham Young University, has been selected as the recipient of the ANAL. YISS award. This year's symposium will be held on Wednesday, March 5, 2008 Morial Convention Center, New Orleans, in Room 276 from 8:30 am - 11:50 am arranged by Victoria L. McGuffin, Michigan State University.

Fall 2007 ACS National Meeting, Boston, MA Programming
The SCSS would like to thank Karen Phinney, National Institutes of Science and Testing (NIST) for arranging the invited sessions entitled, "Chromatographic Separations in Clinical Chemistry," Todd Palcic, Thar Technologies for arranging the invited session entitled, "Fast Preparative Chromatography in Pharmaceutical Drug Discovery Official," and Sut Ahuja,
Ahuja Consulting for arranging the session entitled, "Chiral Separations Made Easy." I thank all

organizers of these sessions for their strong contributions to the subdivision.

ACS Anal. Division Spring Meeting: PittCon 2008

The SCSS has two sessions at PittCon 2008. Hydrophilic Interaction Chromatography arranged by Andrew J. Alpert, PolyLC Inc., and Advances in Ion Exchange Chromatography arranged by Charles A. Lucy, University of Alberta.

Fall ACS Meeting, Philadelphia, PA , 2008

We plan to have both invited and contributed sessions. Please send your ideas on possible sessions to the Brian Bidlingmeyer, program chair, brian_bidlingmeyer@agilent.com

Other Conferences of Possible Interest to the Separation Science Community

22nd International Conference on Microscale Bioseparations, Berlin, Germany, March 9-14, 2008.

32nd International Symposium and Exhibit on High Performance Liquid Separations and Related Techniques (HPLC 2008), Baltimore, MD, May 10-18, 2008.

32nd International Symposium on Capillary Chromatography and 5th GCHGC Symposium, Riva del Garda, Italy, May 25-30, 2008.

21st International Symposium, Exhibit & Workshops on Preparative / Process Chromatography: Ion Exchange, Adsorption/Desorption Processes & Related Separation Techniques, Doubletree, San Jose Hotel, San Jose, CA, USA June 15 - 18, 2008.

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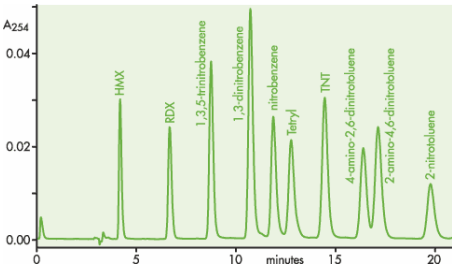

Recipients of the Division of Analytical Chemistry Awards 2007

Award in Chemical Instrumentation Sponsored by the Dow Chemical Foundation:

Scott A. McLuckey, Purdue University

Dr. Scott A. McLuckey earned his Ph.D. in 1982 from Purdue University in Analytical Chemistry. Directly following graduation from Purdue, he spent one year as a visiting scientist at the FOM Institute for Atomic and Molecular Physics in Amsterdam. In late 1983, he joined the Analytical Chemistry Division of Oak Ridge National Laboratory as a Eugene P.Wigner Fellow. In January 2000 McLuckey moved to Purdue as a Professor of Chemistry within the Analytical Chemistry Division of the department.

McLuckey's research emphases have been placed in the areas of gas-phase ion chemistry and instrumentation for organic and biological mass spectrometry. Fundamental aspects of ionization, unimolecular reactions, and bimolecular reactions have been studied with the goal of improving the capabilities of analytical mass spectrometry. Attention has been focused on ionization by glow discharge, positrons, and electrospray. Ion activation, ion/molecule reactions, and ion/ion reactions have been major focal areas within the context of the mass spectrometry / mass spectrometry experiment. Instrumentation for tandem mass spectrometry has also been highlighted with emphasis on electrodynamic ion traps and ion trap/hybrid instruments. The major current areas of emphasis are the identification and characterization of macromolecules, primarily via whole molecule tandem mass spectrometry, and ion/ion reaction chemistry.

Scott A. McLuckey

J. Calvin Giddings Award for Excellence in Education Sponsored by the Dekker Foundation:

Cynthia Larive, University of California – Riverside

Dr. Cynthia Larive is Professor of Chemistry at the University of California – Riverside. Her research contributions include application of NMR diffusion measurements for the study of ligand-protein binding, development of microcoil NMR probes for on-line separations in the analysis of mass-limited samples, and the application of metabonomics for chemical genomics studies in plants. She is editor-in-chief of the Analytical Sciences Digital Library, a free Internet-based resource for students, teachers and practitioners of analytical chemistry available at www.asdlib.org.

Cynthia Larive

Recipients of the Division of Analytical Chemistry Awards 2007

Award for Distinguished Service in the Advancement of Analytical Chemistry Sponsored by the Waters Corporation:

Ray E. Clement, Ontario Ministry of the Environment:

Ray E. Clement, Senior Research Scientist, Ontario Ministry of the Environment, will receive the Award for Distinguished Service in the Advancement of Analytical Chemistry, sponsored by the Waters Corp. Clement conducted pioneering research in detecting dioxins in the environment. He has since been active in education in Canada at all levels, service to the Canadian Society for Chemistry and other science organizations, and in organizing many meetings including founding the biennial *Enviro*Analysis conference. For Anal. Chem., Clement served on the Instrumentation Panel and initiated the environmental analysis review.

Ray E. Clement

Award for Young Investigators in Separation Science Sponsored by Agilent Technologies:

Adam T. Woolley, Brigham Young University:

Adam T. Woolley, Associate Professor of Chemistry at Brigham Young University, will receive the Award for Young Investigators in Separation Science, sponsored by Agilent Technologies. Woolley's research involves the use of microfabrication methods in making microfluidic systems for bioanalytical separations and the application of biological molecules as templates for assembling materials with nanometer-scale dimensions.

Adam T. Woolley

ACS Division of Analytical Chemistry Award in Spectrochemical Analysis:

Robert Corn, University of California, Irvine:

Dr. Corn is a leader in the development and application of surface-sensitive spectroscopic techniques such as surface plasmon resonance (SPR) imaging, optical second harmonic generation (SHG), and polarization modulation Fourier transform infrared (PM-FTIR) spectroscopy. His primary research interests include the study of biopolymer adsorption onto surfaces and the chemical modification of surfaces for the creation of ultrathin films and adsorption-based biosensors. Prof. Corn also has ongoing research projects in the implementation of DNA computing algorithms at surfaces and the study of ion transfer processes at liquid/liquid interfaces. Prof. Corn received a B. A. in Chemistry summa cum laude in 1978 from the University of California, San Diego, and subsequently earned a Ph. D. in 1983 from the University of California, Berkeley. In 1985, Prof. Corn moved to Wisconsin where he was a member of the Analytical Sciences Division of the Department of Chemistry and the Water Chemistry Program until 2004, when he moved to the University of California, Irvine, where he joined the Departments of Chemistry and Biomedical Engineering. Prof. Corn is also a co-founder of two companies in Madison, WI: GWC Technologies, Inc. and GenTel Biosciences, Inc.

Robert M. Corn

Recipients of the Division of Analytical Chemistry Awards 2007

ACS Division of Analytical Chemistry ColeParmer Award in Electrochemistry:

Hector D. Abruña, Cornell University:

Professor Abruña completed his graduate studies with Royce W. Murray and Thomas J. Meyer at the University of North Carolina at Chapel Hill in 1980 and was a postdoctoral research associate with Allen J. Bard at the University of Texas at Austin. After a brief stay at the University of Puerto Rico, he came to Cornell in 1983.

Prof. Abruña has been the recipient of numerous awards including a Presidential Young Investigator Award, Sloan Fellowship, J. S. Guggenheim Fellowship and J. W. Fulbright Senior Fellow. Most recently he received the C.N. Reilley Award in Electrochemistry for 2007. He was elected Fellow of the American Association for the Advancement of Science in 2007 and elected member of the American Academy of Arts and Sciences in 2007.

The signal accomplishment of Abruña's research has been to take a multidisciplinary approach to the study of electrochemical phenomena by combining elements of various branches of chemistry, physics and biochemistry. He has incorporated concepts of coordination chemistry and biochemistry into the area of chemically modified electrodes and their analytical application in sensors, for transition metal ions and organic functionalities, biosensors and in electrocatalytic applications.

Hector D. Abruña

He pioneered the use of x-ray based techniques such as surface EXAFS, x-ray standing waves and surface diffraction (including time-resolved studies) to the in-situ study of electrochemical interfaces. In particular, his group has carried out extensive studies of the underpotential deposition (UPD) of metal monolayers onto single crystal electrode surfaces using these techniques to obtain structural and compositional information in-situ.

Most recently, his work has focused on the synthesis and development of nanometric building blocks, including extensive studies on redox and photoactive dendrimers as well as novel families of terpyridine-based bridging ligands capable of self-assembly (via-metal ion coordination) onto surfaces into exceptionally well-ordered arrays. These materials have also been incorporated into high efficiency OLED's (organic light emitting devices) with long-term stability.

Prof. Abruña is the co-author of over 275 publications and has given over 400 invited lectures world-wide.

ACS Division of Analytical Chemistry Arthur F. Findeis Award for Achievements by a Young Analytical Scientist Sponsored by Philip Morris USA:

Garth J. Simpson, Purdue University

Garth J. Simpson received his Ph.D. in 2000 working with Kathy Rowlen at the University of Colorado, Boulder, and worked as a Life Sciences Research Foundation Postdoctoral Fellow with Richard Zare at Stanford before accepting a faculty position at Purdue University in 2001. Research interests include fundamental and applied aspects of nonlinear optics with an emphasis on polarization-dependent phenomena, and the use of AC electrokinetics for scanning probe imaging. Notable recognitions include a Sloan Fellowship (2005), a Cottrell Teacher-Scholar Award (2004), a Beckman Young Investigator Award (2004), an Eli Lilly Faculty Grantee Award (2003), a Dreyfus New Faculty Award (2001), a Research Corporation Research Innovation Award (2001), and the ACS Victor K. LaMer Award (2001).

Garth J. Simpson

Standing on the Shoulders of Giants: One Woman's View of the Future of Analytical Chemistry Education

Cynthia K. Larive, University of California – Riverside

Recipient of the J. Calvin Giddings Award for Excellence in Education Sponsored by the Dekker Foundation

Fall 2007 ACS meeting, Boston, MA August 20, 2007

Thinking about the future of analytical chemistry education is a somewhat daunting task. In considering the future possibilities, it is helpful to conduct a stepwise analysis by evaluating our current position in the context of recent history, take an accounting of the current state-of-the art, and examine the pressures that are shaping our future. In the process of considering the history of analytical chemistry education, it is especially appropriate to consider the contributions of J. Calvin Giddings, in whose name this award is given.

In addition to being a brilliant scientist, a caring mentor and an outstanding educator, he was also a prolific writer. An author of many journal articles, Giddings was also an editor for Separation Science and Technology, one of the founding editors of the series Advances in Chromatography, and the author of several books including Unified Separation Science, Dynamics of Chromatography: Principles and Theory, Field Flow Fractionation Handbook, Our Chemical Environment, Chemistry, Man, and Environmental Change: An Integrated Approach, and Demon River Apurimac: The First Navigation of Upper Amazon Canyons. In the last title, Giddings provided a first-person account of his 1970s kayaking adventure through the Apurimac River gorge, from near its source above 4000 m to the jungle below. Never having met Giddings, I can only imagine that he must have been an excellent teacher, having had a variety of experiences and interests that probably allowed him to build connections with his students.

As indicated by the title of this presentation, our field owes a lot to leaders like Giddings who set the stage for our current activities. While you might think that my title was taken from the Google Scholar slogan "Stand on the shoulders of giants", this phrase is usually attributed to a quotation from Isaac Newton "If I have seen further [than certain other men] it is by standing upon the shoulders of giants." Actually it seems that Newton himself may have borrowed this phrase. The earliest attribution I could find is to Bernard, thanks to John of Salisbury who wrote in 1159 "Bernard of Chartres used to say that we are like dwarfs on the shoulders of giants, so that we can see more than they, and things at a greater distance, not by virtue of any sharpness of sight on our part, or any physical distinction, but because we are carried high and raised up by their giant size." Throughout this presentation, I will refer to contributions of several giants of analytical chemistry. Like Giddings, they have been leaders in our field and serve as role models as we address the challenge of educating the new generation of analytical chemists.

A fun aspect of receiving an award is that it gives one some license to look back nostalgically on their life and career thus far. I grew up in South Dakota on a small farm just outside of Deadwood. Although my parents were not well educated, perhaps spurred on by the post-sputnik drive for scientific competitiveness or a desire that I should have a better life, they fostered my interest in science. One particularly exciting Christmas brought a Chemistry set. Unlike today's version, this was a chemistry set that one could use to do some real chemistry. My parents also encouraged me to think that I could accomplish anything if I just set my mind to it and was willing to work hard enough.

A major impact on my life was the Homestake Gold mine in Lead, SD where my dad was employed as a laborer. Before its closing in 2002 the Homestake Gold Mine was the oldest, largest and deepest mine in the Western Hemisphere, reaching more than 8000 feet below the town of Lead. It was also the primary employer in the northern Black Hills. I got to experience the mine twice while working as a guide for the surface tours in the summers of 1976-77. It was during one of those tours that I first realized that being a scientist was an actual career possibility because of a chance encounter with a scientist working on the Homestake solar neutrino experiment. This experiment was conducted in a stope on the 4850 ft level of the mine that housed an enormous tank containing 615 tons of liquid perchloroethylene (C_2Cl_4) that was monitored for the appearance of atoms of radioactive ^{37}Ar as a result of collisions with high energy neutrinos:

$\nu_e + {}^{37}Cl \rightarrow e^- + {}^{37}Ar, \quad E_{threshold}=0.814$ MeV

The instrument panel and an array of primitive computers occupied an adjacent drift. During the tour, we were treated to an explanation of the project by a scientist who kindly answered all my questions. The Homestake neutrino project started at Brookhaven National Laboratory in the late 1960s as a collaborative project led by Ray Davis. The now abandoned Homestake mine will hopefully continue to make contributions to particle physics as on July 10, 2007, the mine was selected by the National Science Foundation as the location for the Deep Underground Science and Engineering Laboratory (DUSEL).

After high school I attended South Dakota State University where I pursued a professional chemistry degree and did undergraduate research with Henry Gherke and Mark Pearce. While there I was pleased to receive a letter from Frank Guthrie informing me that I had been awarded the ACS Division of Analytical Chemistry's undergraduate award. A few years after receiving my BS degree, I got a job working at the Engineering and Mining Experiment station at the South Dakota School of Mines and Technology. This was a great job, because my responsibility was to perform a wide variety of wet chemical and AA/ICP analyses to solve whatever problems walked in the door. I did major and trace element analysis for a group of geologists, gold assays for a Black Hills Gold jewelry manufacturer, wood chip water content for the local cabinet plant and water quality analyses for the US Forest Service. There were a wide variety of problems to be solved, so it was a great way to learn practical analytical chemistry. During this period my daughters were born. Everything was going well and I might be in Rapid City today except that in 1988 my husband was offered a position

teaching high school English in San Bernadino, so off we went to Southern California.

I took advantage of this move to enter the graduate program at the University of California - Riverside, a school with a history of strength in analytical chemistry, where I worked with Dallas Rabenstein, a wonderful mentor. I finished my Ph.D. in 1992 and that August joined the Chemistry faculty at the University of Kansas. KU was a great place to land because I was surrounded by a group of mentors and colleagues who had a keen interest in teaching and research, most importantly Ralph Adams, Ted Kuwana, George Wilson, Susan and Craig Lunte and Ken Ratzlaff. I arrived on the heels of Clark Bricker's retirement, a man whose knowledge, skill and style allowed him to teach general chemistry to 800-1000 students at one time. Many of us lament the impersonal nature of large lecture courses, but Clark was not deterred, and he managed to have a lasting impact on a great many students.

During the time I was at KU, the analytical faculty spent a lot of time talking, often over lunch, about what and how we should be teaching analytical chemistry. One outcome of these discussions was the development of a semester long problem-based learning laboratory for the Instrumental Analysis course.[1] On the first day of class, students fill out applications and are hired into "companies" whose goal is to solve a real world problem. In addition to teaching students a lot about practical analytical chemistry, the course emphasizes problem solving, experimental design, team work, written and oral communication. The TAs assume the role of managers and learned a great deal themselves from the experience.

As George Wilson often reminded us, this attention to "problem solving" was not really new, but drew on the ideas of Laitinen, who wrote "Too many and perhaps most chemists, the object of chemical analysis is to obtain the composition of a sample. It may seem a small and niggling point that the analysis of a sample is not the true aim of analytical chemistry, because the sample is a selected, and hopefully, a representative portion of the subject under scrutiny … the real purpose of the analysis is to solve a problem."[2]

The person who made the largest impact on my development as an educator is Ted Kuwana. I was privileged to participate in the series of NSF-sponsored Workshops on Curricular Reform in the Analytical Sciences" that Ted organized in the late 1990's with the support of NSF program officers Henry Blount and Frank Settle. These workshops brought together participants from community colleges, PUIs, research universities, industry and government to think about how analytical chemistry should be taught. At these workshops, I interacted with a number of people who have themselves made significant impacts on the fields of analytical chemistry including; Royce Engstrom, Dan Harris, James Leary, Patricia Mabrouk, Peggy Merritt, Royce Murray, Harry Pardue, Jeanne Pemberton, Tom Wenzel, and Ted Williams. The workshops culminated in the production of a report that offered many recommendations, a few of which are summarized here.

Table 1. Selected Recommendations from the Workshops in Curricular Reform in the Analytical Sciences.

1. That the academic community develop context-based analytical science curricula that incorporate problem-based learning.
2. That more students be offered hands-on learning opportunities.
3. That the ACS take a more active role in promoting curricular improvements in the education and teaching of analytical chemistry.
4. That the analytical community develop a list of appropriate and well-developed technologies that faculty may consider for classes and labs.
5. That faculty strive to incorporate today's technology into classrooms and laboratories and to use technology as an access to real-world learning.
6. That analytical faculty drive the revisions to undergraduate analytical curricula and help spread the word about the need for these revisions.
7. That the community of analytical educators take an active role in the design, assessment, and purchase of technology as it applies to education and in their own continuing education.
8. That everyone involved in undergraduate education look for ways to share information about curricular reform.

After the workshops, it became apparent that there were barriers to implementing some of the most important recommendations. Although many faculty embraced the idea of problem-based learning, they reported challenges in adopting this approach in their classrooms because it requires first and foremost the identification of interesting and appropriate problems and because problem-solving typically requires information that is not available in textbooks. To address these needs, the Analytical Sciences Digital Library (ASDL) was developed. ASDL is a free online resource available at www.asdlib.org, for students, teachers, and practitioners of the analytical sciences (chemical measurements and instrumentation). ASDL contains a variety of features including nearly 400 annotated and peer-reviewed electronic resources, publication of online articles and curriculum modules, e-posters, and the Analytical Sciences Professional Directory. Many of these e-resources can be used directly to enhance courses, for example animations and simulations, e-texts, and tutorials.

In 2005, I had the chance to return to UCR as a faculty member. This has been a terrific opportunity in part because it presented a new set of challenges. One challenge that instructors across the country face is adapting to a changing student body. I often hear colleagues lamenting the nature of "students now days". I have been reluctant to join in these conversations because the phrase is so cliché. Haven't faculty been saying this for decades? Besides which, as Hal Richtol (NSF DUE) is fond of reminding us, "We have to teach the students we have, not the students we wish we had." Perhaps learning more about our students can inform our attempts to reach them. A 2006 survey of 58,000 (30%) University of California system undergraduates provides some important insights into the student body makeup and behavioral norms.

Table 2. Summary of 2006 UC Undergraduate Student Survey Results

55% use the Internet as their primary news source
56% belong to campus clubs or organizations
44% participate in community service
56% work an average of 14.6 hrs/week
23% were born outside the US
37% said they have at least one parent who was born outside of the US
35% said English was not their first language
42% said they are easily distracted and not being able to concentrate hampers their success
They report spending 13.1 hrs per week studying

They spend 11.1 hrs per week using the Internet for non-academic purposes

They spend 5.7 hrs per week watching TV

This data makes several points that I did not fully appreciate from my interactions with students at UCR. On the positive side, as a group these students are more engaged than I realized with 44% participating in community service. Because of necessity or ambition, more than half work outside of school; with their jobs taking up about the same number of hours as they are in class. Although I knew that the Internet has been a powerful and transformative force, I did not realize the extent to which it is part of students' daily life. I was surprised to see the large percentage of students from immigrant families and to learn that a third have a mother language that is not English. Because they study on average 13 hours a week, it is now obvious why my admonition to study 3 hours per week for every hour spent in class appeared to fall on deaf ears. I also realize why some otherwise well-prepared students seem to have difficulty making the transition to graduate school culture.

In addition to these social/behaviorial characteristics, as a group these students are fairly diverse, but even at UC Riverside, they are not as diverse as the state of California as a whole.

Table 3. Ethnic Composition of the 2007 UC Freshman Class

	California	UC Aggregate	UCR
White	43%	35.5%	14.6%
Asian	12	35.3	44.9
Hispanic	36	18.7	28.0
Black	6	3.6	8.0

UCR is a designated Hispanic-serving institution and the most diverse of the UC campuses. Our diverse student body provides a unique opportunity for us to contribute to workforce diversity in science and technology fields, providing we can reach our students. If we really want to have a large scale impact, it will have to be in the introductory chemistry course. Introductory chemistry is an important opportunity to introduce the concepts and language of analytical chemistry, not just equilibrium chemistry and titrations. For example, it should be possible to devise relatively simple introductory chemistry laboratory experiences that introduce concepts like measurement sensitivity, selectivity, calibration, method validation, etc. Shouldn't our future lawyers and policymakers be introduced to the idea of confidence intervals as it relates to population size, mean and standard deviation? If they do not receive this education in introductory chemistry, it seems doubtful that they will encounter it elsewhere in their studies.

Other impacts on the future of analytical chemistry education are imposed by a changing educational climate. This can come from within the University, from accrediting bodies, and from the ACS approval process. Currently 633 departments in the United States are approved by the ACS committee on professional training (CPT). Approved departments can then offer ACS certified degrees.

Recently CPT initiated the process of guidelines revision with a goal of simplifying the guidelines and procedures for approval of chemistry programs, providing greater flexibility to approved departments for designing certified degrees, encouraging innovation and improvement in curriculum and pedagogy by approved departments and defining faculty and infrastructure attributes that support excellent undergraduate chemistry programs. Perhaps the new guidelines will open the door for rethinking the way that we teach analytical chemistry. Quant and Instrumental Analysis could become a first semester course of "Foundations of Analytical Chemistry" in which analytical chemistry concepts are introduced, followed by an instrumentation intensive, in depth analytical chemistry course. I know that some departments have already moved in this direction.

Although the draft guidelines are available in their entirety for your review on the ACS CPT website, I would like to take this opportunity to review a few of the important features. Five one-semester foundation courses will provide breadth of coverage beyond introductory chemistry in each of the major areas of chemistry: analytical, biochemistry, inorganic, organic, and physical. An equivalent of additional twelve semester credit hours will further develop or integrate topics introduced in foundation courses. In-depth courses have a foundation course pre-requisite, or contain a significant amount of chemistry. The guidelines require 400 hours of laboratory beyond the introductory chemistry experience. Undergraduate research producing a comprehensive written report can be counted for up to 180 of the required 400 laboratory hours.

Although CPT does not mandate the curriculum of courses, it does require that students completing ACS certified degrees have certain experiences. In the area of instrumentation, the guidelines specify that students should understand the operation and theory of modern instrumentation and use them to solve chemical problems as part of their laboratory experience. Student must have hands on experience with a variety of instruments, including spectrometers, chemical separations instruments and electrochemical instruments.

Under the current approval guidelines, departments can offer ACS approved options in several topical areas like chemical biology and environmental chemistry. Under the new guidelines, options will be replaced by department-defined degree tracks. Departments could continue to offer their current curriculum for the certified degree as a Chemistry degree track, or create a new, more specialized curriculum focusing on a specific chemistry sub-discipline, like analytical chemistry or a chemistry-related interdisciplinary area such as nanoscience.

I would like to close by sharing with you some of the ideas I have tried to pass onto my own students.

Table 4. Important Lessons for a successful career

It is a privilege to do science
Work hard and consistently
Persistence pays off
Think creatively
Read the literature
A failed experiment can be an opportunity
Ethical practices in science and life
Being a faculty member is a great job
Live a balanced life
When all is said and done – people are the most important consideration

I would also like to share with you a piece of career advice I heard recent from Richard Zare, "Seek challenges. A little known secret is that it takes about as much effort to solve a hard problem as an easy one. Don't wait for your ship to come in. Row out to meet it."

1. G. Wilson, M. Anderson, C. Lunte, *Anal.Chem*. 71, 677A (1999).
2. H.A. Laitinen *Anal. Chem.* 38, 1441 (1966)

Treasurer's Report

by Al Ribes

For 2008 the Executive Committee approved a balanced budget totaling $297K. The figure translates into a 12% increase in both expenses and income.

The additional income is to be brought in through extra funds raised from innovative project grants, increased member enrollment and corporate sponsorships.

The Division leaders have been working on widening the appeal and the relevance of the Division by creating new services and benefits for corporate sponsors and members. The most visible upgrade has been so far the new web site http://www.analyticalsciences.org with a new Analytical Division employment posting service. Many other improvements are on the works and the 2008 budget includes additional support for web development.

The Division has signed on a new membership benefit to provide our members with the publication *Annual Reviews of Analytical Chemistry*, co-edited by Edward S. Yeung and Richard N. Zare. This new publication is to address measurement science in general, with a focus on concepts, chemicals, and processes.

As a service to the profession, the Division will start providing funds to the Analytical Sciences Digital Library (ASDL) (www.asdlib.org). The ASDL is a peer-reviewed, open access, community-linked (via discussion forums) cutting edge publisher of pedagogical papers, experiments, and courses. The site includes a Directory of Analytical Sciences Professionals, to become a valuable resource for analytical scientists.

Finally, as a pilot the Division will be contracting clerical help to deal with the routine aspects of the provision of Divisional services and to free Division officers' time to allow them to focus on deploying the 2006 Division strategic plan.

Expenses for the Analytical Division as of Sept 1st, 2007 totaled $141K, 40% of which was spent in support of graduate fellowships. Eighteen per cent of the funds went to recognize excellence in peers and undergraduate students, including awards for undergraduate students to attend national ACS meetings. Over 20% went to funding of scientific programming at national and regional meetings, while 11% was used for publication and ballot expenses, 8% for administrative expenses, and 4% in support of Divisional social activities.

Left:
At the ACS Meeting in Boston.

Division Chair Lori Locascio (right) and Dorothy Phillips (Waters Corporation) present the Award for Distinguished Service in the Advancement of Analytical Chemistry Sponsored by the Waters Corporation to Ray E. Clement (Ontario Ministry of the Environment).

DONOR OPPORTUNITIES FOR THE ANALYTICAL DIVISION

Since late 2005, the Division of Analytical Chemistry has undertaken steps to better serve its membership through the development of a strategic plan. A critical aspect of the plan that the Division identified in September 2006 during its strategic planning meeting is an expanded web presence, providing additional services of value to the Division members. In early 2007, at the Pittsburgh Conference in Chicago, IL, the Division – in collaboration with the Analytical Sciences Digital Library (ASDL) – unveiled its new website, http://www.analyticalsciences.org, which serves as the focal point for this expanded web presence. In addition to information about the Division governance, communications and award opportunities, which were available on the past Division website, the new Division website houses the following functions of interest to our members:

- The full resources of ASDL
- An employment listing service
- News of Division activities and upcoming scientific meetings

Additional professional support functions are currently being developed which will allow the Division to serve its members in all facets of their professional careers. In order to assist us in maintaining and developing these support functions, we have recently developed a donor page on the Division website. Donors will be recognized at the under the following categories and levels of giving:

- Corporate, Government and Non-Profit Affiliate Patrons (Silver: $200, Gold: $500, Platinum: $1500)
- Academic Partners (Undergraduate Institutions: $100, Graduate and Research Institutions: $200)
- Individual Donors (Silver: $50, Gold: $200, Platinum: $500)

Currently, becoming a Patron or a Partner includes the following benefits:

- A link to the donor's home page from our **Corporate, Government or Non-profit Patrons or Academic Partners web page**.
- Links to our patrons and partners will be featured on a rotating basis on www.analyticalsciences.org.
- Announcement of donor-sponsored publicly available events and workshops on the website calendar
- Free use of the Division employment listing service.
- A link to Application Notes on the donor's website, if applicable.

All Patrons and Individual Donors who support the Division at the Silver level and above, as well as all Academic Partners, will be publicly recognized on the web, in our newsletter, and at meetings. In addition, Patrons at the Platinum level may choose which of the Division activities they would like to support. The Division has made it easy to donate at any level, no matter how large or small, by credit card via Click & Pledge, a company that allows the Division to accept donations in a secure manner. Of course, all of our members in the Division are truly appreciated. Without your interest and support in the Division's mission and vision, we could not help serve the professional needs of the Analytical Chemistry community. The Division leadership is truly excited about these developments. It is our hope that the Division continues to serve as an important partner in each member's professional career.

Sincerely,
Steven Petrovic
Secretary, ACS Analytical Division
Chair, Web Committee

ACS Division of Analytical Chemistry
Pittcon 2008 in New Orleans, March 2-7, 2008

The ACS Division of Analytical Chemistry is pleased to announce that we are again programming at Pittcon. This venue worked very well for us last year in Chicago and we expect it to be equally as exciting for New Orleans. **Find below a list of the six contributed oral sessions (organized by Douglas Gilman of Louisiana State University, Kristen Fletcher of ATMI, and Gloria Thomas MaGee of Xavier University), the seven invited symposia, and a brief overview of the teacher and high school student workshops.**

Contributed Sessions

New Directions in Analytical Instrumentation and Techniques: This session will highlight recent advances in analytical instrumentation and/or methodology. The development of novel techniques or the application of established techniques to new and emerging areas of science will be considered.

Small Instrumentation for a Small World: This session will focus on miniaturized instrumentation designed to analyze small-scale samples. For example, instruments and methods aimed at single-cell analysis, nanoparticle analysis or microscopy methods will be considered along with advances in sampling from small environments.

New Concepts and Instruments for Biosensors: This session will emphasize new approaches in biosensor instrumentation as well as original methods to leverage nature, e.g., biological molecules or organisms, for chemical detection.

Mass Spectrometry Meets the World: This session will focus on the application of mass spectrometry to solve interesting analytical problems in areas such as environmental chemistry, forensics, homeland security, and biology.

Aptamers in Separation Science: This session will highlight this growing area of separation science. Talks will focus particularly on the high selectivity which can be achieved via use of aptamers.

Theory and Practice of Fast LC: This session will highlight this growing area of separation science. Talks will focus primarily on the important developments in this area of research.

Poster Sessions: The open poster session will be held on Monday afternoon, March 3rd.

Invited Symposia and Organizers

Interdisciplinary Analytical Chemistry. Highlights of the many disciplines inside and outside of chemistry which are impacted by the discipline of analytical chemistry will be discussed using high profile speakers who are outstanding in their own rights. The speakers will talk about how they have applied analytical chemistry principles to their own disciplines. Organizers: Isiah M. Warner of LSU and James W. Mitchell of Howard University.

Analytical Chemistry for Crime Scene Investigations. This will be two half-day symposia designed to highlight the analytical chemistry behind forensic chemistry, with a focus on topics relevant to some of the more popular crime scene investigation television shows (CSI series and NCIS). Symposium organizers: Gabor Patonay of Georgia State University and Steve Morgan of the University of South Carolina.

New Perspectives in Optical Sensing: From Ions to Molecules and Beyond. This symposium will highlight an array of new developments in sensing technologies. In the spirit of the Interdisciplinary Analytical Chemistry theme, the symposium will bring together scientists from different disciplines working on various aspects of optical sensors. The topics will be very interdisciplinary, in terms of both the techniques employed and the target analytes. Symposium organizer: Matthew McCarroll of Southern Illinois University.

Environmental Impact of Hurricane Katrina on New Orleans and the Surrounding Areas. The focus here is on analytical chemistry involved in environmental measurements associated with the Katrina and Rita hurricane disasters in and around the New Orleans area. Symposium organizers: Robert L. Cook of LSU and Matthew Tarr of the University of New Orleans.

Advances in Ion Exchange Chromatography. This symposium focuses on recent developments in ion analysis by use of ion chromatography, including fast IC, new stationary phase materials and monolithic columns. Symposium organizer: Charles Lucy of the University of Alberta.

Hydrophilic Interaction Chromatography (HILIC). HILIC is one of the fastest-growing techniques in analytical chemistry. This symposium covers its application to histones and other proteins, phosphopeptides, oligosaccharides and pharmaceuticals. Various column materials are compared and synthesis of new ones described. Organizer: Andrew Alpert of PolyLC Inc.

"Quant": A New Look at Introductory Quantitative Analysis Courses. This symposium will focus on the current status of teaching the first introductory course for analytical chemistry, i.e. quantitative analysis. It will include the current state of analytical chemistry both in the USA, where the curriculum varies dramatically from college to college, and in Europe, where there is far more continent-wide uniformity. Organizers: Cynthia Larive of University of California at Riverside and Peter Griffiths of the University of Idaho.

Teacher and High School Student Workshops:

The workshop activities will follow the forensic chemistry theme. Topics are: 1) High School Forum on Forensic Chemistry and 2) Forensics Experiments for the high school and college laboratory. Organizers: Elzbieta Cook and Ginger Powe, both of LSU.

LIST OF SESSIONS

NEW ORLEANS ACS NATIONAL MEETING
APRIL 6-10, 2008
DIVISION OF ANALYTICAL CHEMISTRY

ORGANIZED CONTRIBUTED SYMPOSIA/SESSIONS

Analytical Separations

Organizer: Sayo O. Fakayode, Department of Chemistry, Winston-Salem State University, Winston-Salem, NC 27110

Analytical Spectroscopy

Organizer: Mark Lowry, Department of Chemistry, Louisiana State University, 436 Choppin Hall, Baton Rouge, LA 70803

Directed Assemblies Using Surface Templates - *Coprogrammed with AIChE Materials Engineering and Sciences Division*

Organizers: Susan Olesik, Department of Chemistry, Ohio State University, 100 W. 18th Ave., Columbus, OH 43210; Micheal Hu, Oak Ridge National Laboratory, 4500 N, A34, MS 6181, Oak Ridge, TN 37831

Environmental Chemistry

Organizer: Robert L. Cook, Department of Chemistry, Louisiana State University and Southern University at Baton Rouge, 636 Choppin Hall, Baton Rouge, LA 70803

General Poster Session

Organizer: Isiah M. Warner, Department of Chemistry, Louisiana State University, 436 Choppin Hall, Baton Rouge, LA 70803

Mass Spectrometry

Organizer: Kermit K. Murray, Department of Chemistry, Louisiana State University, 434 Choppin Hall, Baton Rouge, LA 70803

Nanomaterials in Analytical Chemistry

Organizer: Matthew A. Tarr, Department of Chemistry, University of New Orleans, 2000 Lakeshore Drive, New Orleans, LA 70148

Undergraduate Research Poster Session

Organizer: Elzbieta Cook, Department of Chemistry, Louisiana State University, 232 Choppin Hall, Baton Rouge, 70803

Benchmarking Report Recently Released

By Tina M. Masciangioli, Ph.D.
Program Officer; Board on Chemical Sciences and Technology; National Research Council

The Future of U.S. Chemistry Research: Benchmarks and Challenges
http://books.nap.edu/catalog.php?record_id=11866
Chemistry plays a key role in conquering diseases, solving energy problems, addressing environmental problems, and the development of new materials, technologies, and industries. In response to concerns about the future health of the field, the National Science Foundation and the U.S. Department of Energy asked the National Research Council to conduct an in-depth benchmarking analysis to gauge the current standing of the U.S. chemistry field in the world. The report concludes that chemistry research in the United States is stronger than in any other single country, but competition from Europe and Asia is rapidly increasing. The United States publishes more papers than any other nations, but its percentage of the world's chemistry papers has dropped from 23 percent in 1988 to 19 percent in 2003, as other nations have increased their rate of publication. The analysis showed U.S. chemists leading in the quality of their publications, with about 50% of total citations in 30 prominent chemistry journals over the last 16 years and 50% percent of the 100 most frequently cited chemistry papers. U.S. chemistry is expected to be strong in emerging areas such as nanoscience, biological chemistry, and materials chemistry, but core research areas, such as in physical chemistry and organic chemistry, will likely to continue to struggle for research support. The report finds it is likely that the number of U.S. citizens receiving chemistry Ph.D.s will continue to decrease. There is an assessment of analytical chemistry research on page 43.

Call for Contributions

Contributions are solicited for the next Division of Analytical Chemistry newsletter (Spring 2008, printed edition).

Please, send your contributions (such as announcements, upcoming meeting programs, transcription of speeches of general interest to analytical chemists, pictures, etc.) or suggestions to Victor Ryzhov, the DAC newsletter editor at ryzhov@niu.edu.

Reception Sponsored by Division of Analytical Chemistry at Pittcon 2008 in New Orleans

Date: Tuesday, March 4, 2007

Time: 5:30-7 PM

Place: Hilton New Orleans Riverside
in the Compass Room

An opportunity to learn more about what's happening in the Division!!

Results of the 2007 Division of Analytical Chemistry Elections

Chair-Elect:	Dr. Dorothy J. Phillips, *Waters Corporation*
Secretary:	Dr. Anna Cavinato, *Eastern Oregon University*
Councilor:	Dr. Catherine Fenselau, *University of Maryland*
Alternate Councilor:	Dr. Sally Stafford, *Hewlett-Packard*
Approval of Bylaw Changes:	YES

On behalf of Division of Analytical Chemistry - ACS, Campus-Vote/Vote-now conducted an election for the positions of Chair-Elect, Secretary, and Councilor, as well as a bylaw change referendum, from June 1, 2007 to 5 PM, July 10, 2007. Of the 1204 total voters participating, 1189 made a selection for one or more candidates while 15 abstained.

ISRANALYTICA 2008

The 11th Annual Conference of the Israel Analytical Chemistry Society

It is our pleasure to invite you to participate in ISRANALYTICA 2008, The 11th Annual Meeting of the Israel Analytical Chemistry Society. The Conference and Exhibition will take place in January 22-23, 2008, in the David Intercontinental Hotel, in Tel-Aviv, Israel.

In the recent years, ISRANALYTICA events became by far the most important analytical chemistry event in Israel. In 2007 ISRANALYTICA attracted over 2000 participants from the academy, the chemical industry, major laboratories and companies from Israel and 40 other countries. In fact, ISRANALYTICA combines the largest chemistry convention in Israel with the largest analytical chemistry exhibition in one location.

The scientific program will cover a large variety of modern topics in analytical chemistry. Leading academic researchers and industrial practitioners will present their recent achievements providing a forum for exchange of exciting developments as well as problem sharing with leading scientists and expert representatives of major instrumentation companies. The program will consist of 4 plenary lectures by international top scientists, oral presentations (in parallel sessions) featuring speakers from Israel and abroad and a large poster session. The exhibition will take place in a large and central location adjacent to the seminar rooms.

The success of the last ten ISRANALYTICA events presents a large challenge to the ISRANALYTICA 2008 organizing committee, but we hope that with your participation and help the coming conference will be even larger and will arouse as much excitement and refreshing ideas as its predecessors.

The program will cover an assortment of topics in Analytical Chemistry, including:

- Separation Methods (CE, LC, GC and others)
- Mass Spectrometry
- Nano Analytical Chemistry
- Analytical Methods
- Bio-Analytical Methods
- Analytical Spectroscopy
- Proteomics, Genomics and Metabolomics
- Water Analytical Chemistry
- Analytical Chemistry in Homeland Security
- Forensic Analytical Chemistry
- Analytical Electrochemistry
- Analytical Sensors
- Chemometry
- Computerized Analytical Chemistry
- Legal aspects of Analytical Chemistry
- Regulations and Metrology
- The Teaching of Analytical Chemistry

URL of event web site: http://www.isranalytica.org.il/

A Spring 2008 ACS Symposium of Interest to Analytical Chemists

By Paul Bohn, University of Notre Dame

Dear Colleagues:

I am writing to draw your attention to a Symposium on Sensors for Detection and Quantification of Contaminants in Drinking Water and the Environment that Daniel Chiu and I are organizing for the Spring ACS meeting in New Orleans. This symposium will bring together leading scientists to focus on issues of chemical sensors relevant to detection and identification problems in natural waters. This symposium will be part of the ACS/AIChE focus on Energy and the Environment. An abstract is given below.

If you cannot attend yourself, you might want to consider sending a student or postdoctoral associate. Abstracts can be submitted online at http://oasys2.confex.com/acs/235nm/jointcfp.htm and need to be entered by October 28.

Many thanks and I hope to see you in New Orleans!

Sensors for Detection and Quantification of Contaminants in Drinking Water and the Environment

The use of increasingly scarce water resources for agricultural, industrial, mining, and municipal applications compounded with various other point and non-point sources of contamination has resulted in most source waters being contaminated at various levels with a broad range of chemical and microbial contaminants. There is a need for the development of new analytical techniques for their detection and quantitation. This symposium will bring together a diverse group of scientists and engineers who are advancing the analytical science and investigating their application to drinking water treatment. Topics of interest include, but are not limited to:

- Novel materials
- Microfluidic devices
- Detection and quantitation of waterborne pathogens
- Detection and quantitation of chemicals
- Sensor networks in drinking water distribution systems
- Sensor application to water infrastructure security
- Sustainability issues

Symposium Organizers:

Paul Bohn (AIChE member), University of Notre Dame, Notre Dame, IN 46556-5637
Email: pbohn@nd.edu.

Daniel T. Chiu, Department of Chemistry, University of Washington, Seattle, WA 98195,
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Eberhard Morgenroth, Department of Civil and Environmental Engineering,
University of Illinois at Urbana-Champaign, 3219 Newmark Civil Engineering Laboratory,
MC-250, 205 North Mathews Avenue, Urbana, IL 61801, emorgenr@uiuc.edu, Phone:
217-333-6965 (Fax 217-333-6968).