
THE OCTAGON



Volume 89, No. 3, March 2006

Lehigh Valley Section of the American Chemical Society

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Meeting Announcement:

786th LVACS Meeting: Albright College

Date: Thursday, March 30, 2006

Reception: 5:30 Center for the Fine Arts Mezzanine

Dinner: 6:30 Center for the Fine Arts Mezzanine

Meeting: ~7:45 Merner-Pfeiffer Hall of Science Rm 217

Talk: 8:00 Merner-Pfeiffer Hall of Science Rm 217

Menu: Assorted Bread Sticks w/ Butter Pear Salad with Spring, Greens, Prosciutto & Mozzarella Stuffed Chicken Breast topped with Brown Basil Sauce OR Broiled Fresh Fish (lightly breaded) with Tarragon Mustard Green Peppercorn Sauce, Wild Rice with Pine Nuts, Stir Fry Vegetables, Chocolate/Raspberry Mousse Parfait

Contact: Reservation by 4:00 P.M. Thursday March 23, 2006 through Nancy Kerper at (610) 921-7720 or Pam Artz at partz@alb.edu (E-mail is preferred with LVACS as the subject). Please specify a choice of entrée.

Cost: \$22.00 members \$11.00 students

Directions: Available at <http://www.albright.edu/about/directions.html>

Speaker: Ian J. Rhile, Ph.D., Assistant Professor, Dept. of Chemistry and Biochemistry, Albright College

Dr. Ian J. Rhile was born in 1973 as an identical twin in West Chester, Pennsylvania. He attended Ursinus College in Collegeville, Pennsylvania, where he earned the Rhône-Poulenc Rorer scholarship and was elected as a member of Phi Beta Kappa. He graduated valedictorian with a B.S. in Chemistry with a minor in Mathematics in May 1996. In the summer of that year, he entered Cornell University in Ithaca, NY, as a graduate student, where he joined the research group of Dr. Barry K. Carpenter studying carbene and

combustion intermediate reactivity. Throughout graduate school years, he complemented his studies with outreach work with local high school students. Upon graduating with his doctorate from Cornell in 2002, he became a postdoctoral associate at the University of Washington in Seattle, Washington, studying proton-coupled electron transfer in the laboratories of Dr. James M. Mayer. In the fall of 2005, he returned to his liberal arts roots as Assistant Professor of Chemistry and Biochemistry at Albright College in Reading, PA. He has authored 5 papers, including a communication in the *Journal of the American Chemical Society*. He enjoys traveling, hiking, camping, reading, and choral singing.

Talk: One-Electron Oxidation of Hydrogen-Bonded Phenols Occurs by Coupled Proton-Electron Transfer

Abstract: Phenols with pendant, hydrogen-bonded bases (**HOAr-B**; B = CPh₂NH₂, substituted imidazole, and pyridine) have been oxidized in MeCN with various one-electron oxidants. The product in each case is the phenoxyl radical in which the phenolic proton has transferred to the base, **[•]OAr-BH⁺**, a proton-coupled electron transfer (PCET) process. Thermochemical arguments, isotope effects, and

G^{\ddagger}/G° favor a concerted proton-electron transfer (CPET) mechanism. The data rule out stepwise paths involving initial electron transfer to form the phenol radical cations [**^{•+}HOAr-B**] and initial proton transfer to give the zwitterions [**⁻OAr-BH⁺**]. For oxidations of the amino compound, the dependence of the solution rate constants on driving force, on temperature, and on the nature of the oxidant are all consistent with the application of adiabatic Marcus Theory. The CPET reorganization energies, $\lambda = 34\text{--}56 \text{ kcal mol}^{-1}$, are large in comparison with those for electron transfer reactions of aromatic compounds. These are among the first detailed analyses of CPET reactions where the proton and electron move to different sites.

Meeting Announcement:

787th LVACS Meeting:

Moravian College

Student Poster Session & Student Awards Night

Students are encouraged to attend

Date: Wednesday, April 18, 2006

Location: Moravian College – North Campus

Reception and Undergraduate Student Research

Poster Session: 5:00 – 6:15 pm, Lobby Collier Hall of Science

Dinner: 6:15 pm – UBC Room, Hauptert Union Building

Meeting & student Awards Presentation: 7:30 pm
Dana Lecture Hall, Collier Hall of Science

Talk: At the conclusion of the meeting - Dana Lecture Hall, Collier Hall of Science

Menu: Buffet featuring Almond Crusted Chicken and Pasta Primavera

Cost: members \$20, students & retirees \$10

Contact: Reservations: LouAnn Vlahovic by **Noon, Thursday, April 13th** (Note: Moravian College will be closed Friday, April 14th). Please include your name, affiliation, and for students whether they are an awardee, poster presenter or both. Registration can be made by phone (610-861-1300) or by email melnv01@moravian.edu (the last two digits are numbers). Please put LVACS Registration in the subject line. (Note: email registration will be confirmed by return email.)

Directions:

Directions to Moravian can be found on the web at <http://www.moravian.edu/admission/directions.htm>. Suggested parking is in Lots M, N, & O, along Locust Street.

A campus map is available at

<http://www.moravian.edu/campusMaps/north.htm>.

Speaker: Carl Salter

Dr. Salter is an Associate Professor of Chemistry at Moravian College, where he has taught physical chemistry since 1993. He received his Ph. D. in 1986 from Vanderbilt University under the direction of Prof. Joel Tellinghuisen. His research interests focus on electronic structure calculations and molecular spectroscopy, as well as computer interfacing and unusual applications of least squares fitting. His interest in swimming pools is strictly academic and athletic.

Talk: Details of the talk will be published in the April Octagon

Final 2005-2006 Meeting

May - DeSales (H.S. Teacher's night)

LVACS Officers - 2006:

Chair: T. Michelle Jones-Wilson
East Stroudsburg University
East Stroudsburg, PA 18301
mjwilson@po-box.esu.edu 570-422-3703

Chair Elect: Paul Bouis
pbmbi@rcn.com

Immediate Past Chair: Tara Baney
Merck & Co., Inc. West Point, PA 19486
tara_baney@merck.com 215-652-7486

Secretary: Chester Crane
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Treasurer: John Freeman
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Councilor: Carol Baker Libby
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cblibby@cs.moravian.edu 610-861-1629

Councilor: Pamela D. Kistler
Cedar Crest College, Allentown, PA 18104
pdkistle@cedarcrest.edu 610-437-4471 x 3508

Alternate-Councilors: Roger Egolf & T. Michelle Jones-Wilson (see above)

Octagon Editor & Webmaster:
T. Michelle Jones-Wilson (see above)

LVACS Meeting Minutes - January 2006

The 784th meeting of the Lehigh Valley Section of the American Chemical Society was held on January 24, 2006 at the Davinci Science Center. President T. Michelle Jones-Wilson called the meeting to order at 5:50 pm. After welcoming everyone, she introduced Dr. David Smith of the DaVinci Discovery Center of Science and Technology.

Dr. Smith welcomed the Section and introduced the Center. The primary focus of the Center is to provide scientific education for the Lehigh Valley from kindergarten through college. Dr Smith is the Director of Professional Development. There are three segments of the Professional Development Program

1. The Center itself.
2. Outreach – travel to schools to educate the community.
3. Teacher Development – the Center works with educators in scientific education.

The Center's exhibits are designed with a spirit of exploration, curiosity, and questioning. Everyone is encouraged to experiment with materials in the exhibits to develop understanding. The January, 2006 *Octagon* Volume 89, No. 1 contains more details about the Center.

Immediate Past-Chair Tara Baney introduced Megan Zellner Cedar Crest Chemistry Club President and thanked her for all of her work in preparation of the meeting.

Sherman Cox of Minerals Technologies mentioned that there is a conference upcoming.

The conference is entitled "Polymer Nanocomposites 2006: Innovations, Applications, and Performance" and will be held at Lehigh University on March 7, 2006. To Register: Contact Pat Kelley at (570) 992-7041 OR E-mail PKelley@Northampton.edu for registration details. The Web site of the conference is:

https://fp1.cc.lehigh.edu/inpolctr/SPE_Nanocomposites_Home_Page.htm

The members were invited to explore the Center until 7:30, with food provided by Simply Smooth. Following the activities at the center, there was a poster session at the Dorothy Rider Pool Science Center. The posters described current and recent scientific research conducted by Cedar Crest College students.

Respectfully Submitted,
Chester Crane
Secretary LVACS
February 20, 2006

Upcoming Changes in the Octagon

This message comes to you in my dual role as section chairperson and newspaper/website editor. It is no secret that costs are increasing for almost everything - each of us has experienced that at work and at home. Publishing and mailing the Octagon is no exception. The Octagon is our sections biggest expense, costing approximately \$4500 per year to print and mail eight issues. Of course as our primary means of communication the Octagon is a critical part of our section and it needs to continue.

The executive council has been investigating ways to decrease our sections deficit budget (approximately \$2500 per year for the past 3 years) and also funnel money into critical areas, like student support through meeting fees and scholarships. Many of our members support the section by electing electronic delivery of the Octagon rather than traditional "snail mail". However, approximately 535 members, or about 50%, receive a printed, mailed copy. This costs the section between \$400 and \$600 per issue each year. Most of these members have email access, but for varied reasons have not taken the time to elect email delivery. While we would like to accommodate everyone's wishes, it is simply not good practice to continue to deficit spend. At the February meeting of the executive council we decided to curtail our sections publishing expenses by publishing and providing the Octagon electronically as the default, rather than providing the printed, mailed version as the default.

So beginning with the September 2006 issue, the Octagon will be mailed only to those members who specifically request to receive the publication via the US postal service. In the April and May issues of the Octagon a post card addressed to the editor will be provided. **If you wish to continue to receive the US Postal Service mailed version of the Octagon you must fill out return a card by August 1, 2006.** Otherwise email addresses provided by the national ACS office will be used to provide the publication to our current USPS members. If you currently receive the Octagon via email you need do nothing and will continue to receive email issues at your current email address.

We hope that this decision will allow those members without email access to continue to receive the Octagon while eliminating a huge expense for our section. The savings will balance our budget and allow us to provide thousands of dollars per year in additional scholarships and student support.

Sincerely,
T. Michelle Jones-Wilson
Chairperson LVACS
Octagon Editor and Webmaster

This Month in Chemical History - Part 2

(Continued from the February issue of the Octagon)

By Harold Goldwhite, California State Univ., Los Angeles, hgoldwh@calstatela.edu

Prepared for SCALACS, the Journal of the Southern California, Orange County, and San Geronio Sections of the American Chemical Society

In my last column I began to present a view of the chemistry of medical practice as presented in "The Elements of Medical Chemistry" by John Ayrton Paris M.D., F.R.S., F.L.S., Fellow of the Royal College of Physicians of London, published in New York in 1825. When this text was published Dalton's atomic theory, as first published by Thomas Thompson, was only a decade and a half old, and electrochemistry was only a decade older than that, but Paris, a really up-to-date author for his time, has much to say about both these concepts.

His chapter "On the Proportions in which Bodies Combine, and on the Atomic Theory" has sections on "the Daltonian doctrine, or atomic theory; On the weights of atoms; Chemical equivalents; Wollaston's logometric scale; Importance of the doctrine of definite proportion; and Practical application of the doctrine of equivalents." Of Dalton, Paris, quoting Thomas Thompson, says that he "deservedly enjoys the glory of having permanently established a theory...which...must be considered as the greatest step which Chemistry has yet made as a science." The explanation of the atomic theory which follows is clear and comprehensible – very much as you or I might give it before an elementary chemistry class – but it is noteworthy that Paris does not use the Daltonian symbols for the atoms of the elements, probably because his printer did not wish to make the expensive engravings that were required. Instead he uses abstract alphabetic letters like A and B in his numerical examples. He notes that the basis of the atomic weight scale differs with different chemists: "Mr. Dalton has made election of Hydrogen for this purpose because it is the lightest of all known bodies,...on the other hand, Wollaston, Thomson, and Berzelius, have assumed Oxygen, from its almost universal relations to chemical matter [i.e. many more elements form oxides than hydrides] as the decimal unit (the first making it 10, the second 1, and the third 100." Paris skips lightly over the question that vexed chemists for the next 40 years, that is how is one to assign formulas to molecules. Though we are 14 years after Avogadro's hypothesis it was not to make much of an impact on most chemists until after 1860. He simply points out that Davy has not accepted the Daltonian doctrine; that Dalton assumes water to be made up of one atom of hydrogen and one atom of oxygen (by his rule of simplicity); that Davy supposes that equal measures of different gases contain equal numbers of

atoms, from which it is concluded that water contains two atoms of hydrogen to one of oxygen. And that: "It is, however, quite indifferent which we adopt, a very simple process reconciles them." [!]

Wollaston's logometric scale, referred to above, was an ingenious contrivance developed by that distinguished scientist (one of my favorites of the early nineteenth century) to facilitate quantitative calculations in analytical chemistry. It is a slide rule on which are marked the chemical equivalents of many reagents, both elements and compounds., It proved to be so useful that it was produced commercially and sold to chemists not only in Europe but also in the United States in the first decades of the nineteenth century.

Finally, in concluding my discussion of this most interesting volume, let me turn to the brief chapter on the then very new field of electrochemistry. After explaining the difference between static and galvanic electricity –or, as we might call it, voltaic electricity – Paris describes some fascinating experiments by Dr. W. Philip and other English physiologists in which the digestion of parsley by rabbits was found to be stimulated by the application of electric currents to certain stomach nerves. After describing a more practical battery than Volta's original pile, the author explains the laws of electrochemistry as deduced by Sir. H. Davy. The terms electro-negative and electro-positive, so familiar to all chemists these days, were still quite novel in 1825. Dr. Paris explains them clearly with reference to electrolysis experiments and even suggest the possibility of using electricity to dissolve calculi such as kidney- or gall-stones.

The study of old texts is recommended to all serious students of the history of chemistry. These books show the subjects and theories that were deemed of importance in their times, and give students a perspective on the chemists of former times that is hard to achieve even reading between the lines of histories of chemistry.

Part-time Adjunct Faculty Positions – Lafayette College Department of Chemistry

The Department of Chemistry at Lafayette College anticipates the need for part-time adjunct faculty to teach lecture courses in General Chemistry I and Analytical Chemistry I in the fall semester of 2006. Please contact David Husic, Larkin Professor and Head, Department of Chemistry, Lafayette College, Easton, PA 18042 (husich@lafayette.edu , 610-330-5222) if you are interested.

Undergraduate Research Poster Session

Sponsored by
The Lehigh Valley Section of The American Chemical Society

April 18, 2006

Moravian College

5:00-6:15 PM

Preceding the 787th meeting of the Lehigh Valley Section of the ACS
(Meeting details will be published in the April Octagon)

Who may participate?

Undergraduates attending a college or university within the Lehigh Valley section of the ACS. Research may have been done at the student's home institution with a chemistry or chemical engineering faculty member or during a summer research experience elsewhere.

To participate

Submit an abstract by **April 10, 2006**, as a Microsoft Word attachment to an email to cblibby@cs.moravian.edu. Please indicate "LVACS Poster Session" in the subject line of your email header.

Abstract format

Times font

TITLE (all capitals)

Authors' names, authors' institutions and addresses

Abstract of research, 150 words maximum

Travel Award

One poster session participant will be chosen to receive a \$250 award to support travel to present research at a national or regional ACS or AIChE meeting.

Other requirements and information

Poster presenters must provide their own pins and poster board (preferably 30 x 40 inch foam core, available at A. C. Moore, Michael's craft stores, or art supply dealers). Easels will be provided for displaying the posters.

"Tips for Effective Poster Presentations" can be found in Chapter 2 of the ACS Style Guide (2nd Edition).

Abstracts will be acknowledged by an email message that will include details about meeting room, set-up time, and the travel award.

Undergraduate Research



Travel Award \$250

Sponsored by
The Lehigh Valley Section of the ACS

The prize must be used to help defray expenses associated with presentation of undergraduate research at a national or regional meeting.

To Quality:

Student must present research at the Undergraduate Research Poster Session, to be held at the April 18, 2006, meeting of the Lehigh Valley ACS Undergraduate Research Poster Session details available at <http://www.esu.edu/lvacs>. The winner will be chosen by lottery.

Terms:

The award must be used between March 26, 2006* and April 18, 2007 to pay for travel, registration, or accommodations associated with attending a national or regional American Chemical Society or American Institute of Chemical Engineers (AIChE) conference to present research carried out as an undergraduate (or the summer after you graduate if you receive your B.A. or B.S. this spring).

Ask your research advisor if you might present at these meetings:

MARM, May 22-25, Hershey, PA

<http://www.marm2006.org>, abstract deadline March 17

NERM, Oct. 5-7, 2006, Binghamton, NY,

<http://www.nerm2006.org>

232th National Meeting of the ACS, Sept. 10-14,

2006, San Francisco <http://www.chemistry.org>

233th National Meeting of the ACS, March 25-29,

2007, Chicago <http://www.chemistry.org>

AIChE Spring 2006 National Meeting, April 23-

\$1000. Additionally the top essay will receive \$100. Details for the letter and the essay follow below. The student should be below the junior level currently enrolled in organic chemistry attending college at an institution in the section. The student also must be a chemistry biochemistry or chemical engineering major. Students should indicate their interest in the scholarship in advance to John Freeman at 522 Raub St Easton PA 18042 , jcf2@rcn.com

Letters of Recommendation:

When writing a letter of recommendation on behalf of a student who is applying for Lehigh Valley ACS Scholarship, please speak to the student's skills in lecture and laboratory from Organic Chemistry I and Organic Chemistry II. In addition to performance on written exams and a course grade for Organic Chemistry I, it would be helpful to comment on the student's proficiency in organic lab and his or her participation in recitations. We would also like, if possible, the letter to address the students' quantitative skills by commenting on their performance in quantitative analysis or its local equivalent. Please place your letter of recommendation in a sealed plain envelope and place your signature over the seal. The student will be required to bring the sealed letter to the ACS Organic Chemistry Standardized Exam on April 29, 2005.

Essays:

The student should choose a molecule, a group of molecules or a process in organic chemistry including its synthesis or structural elucidation for a molecule or a representative molecule of a group or a number or examples and mechanism for a process. Judicious use of structures is expected. The essay should address the impact of the molecule or process on society, and the student's personal interest in the process or molecule. The essay should run approximately 3 pages \pm a quarter page of text not including figures in times new roman 12 point font or equivalent with 1 inch margins on all sides. The student's name and page number should appear in the header of each page. An additional page with references should be included. References should be presented as end notes according to the style of the Journal of Biological Chemistry

(See <http://www.jbc.org/misc/ifora.shtml>).

The essay will be rated on:

- 20% - Ease of reading, including grammar, spelling, and logical flow of the material.
- 40% - Appropriate depth of coverage on the development of the molecule.
- 30% - Appropriate depth of coverage on the impact on society and student's interest.
- 10% - Appropriate use of references.
- 5% - Adherence to the formatting rules provided.

LVACS Scholarship Opportunities Organic Chemistry Scholarship

The Lehigh Valley Section of the American Chemical Society's Scholarship for Organic Chemistry Competition takes place on Saturday April 29, at Moravian College, Bethlehem, PA. 9:00AM-10:30AM. The competition entails taking the ACS Organic Chemistry Examination (50%), a letter of recommendation from the student's organic chemistry professor (10%), and an essay on a topic in organic chemistry (40%). The value of the scholarship is



Plenary Sessions:

- Paul Anderson – A Retrospective View of Drug Discovery**
- Howard and Sally Peters – Chocolate – Food of the Gods**
- Edward Yeung – Single Molecule Spectroscopy for Early Diagnosis of Disease**

Special Programs and Symposia:

- Celebration of 100 years of FDA Regulation
- The Alfred Burger Award in Medicinal Chemistry
- The Cope Scholar Award in Organic Chemistry
- Proteins as Biomarkers and Protein Rational Design
- Mass Spectroscopy in Toxicology and Metabolite Identification
- The ACS Regional Industrial Innovation Award
- Joseph Priestley History
- Chemistry of Chocolate, Beer, Tea and Wine
- Delaware Valley Chromatography Forum Student Awards
- Major Symposia in Analytical Chemistry, Medicinal/Organic Chemistry, Chemical Education, Solid State and Materials Science, and Chemical History

REMINDER: Abstract Submission Closes on March 17.

The 2006 ACS Middle Atlantic Regional Meeting (MARM) will be held in Hershey, PA, June 4-7, 2006. For more information visit us at <http://www.marm2006.org>



Call for WCC - Overcoming Challenges Award Nominations

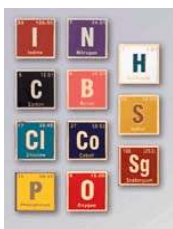
The Overcoming Challenges Award (OCA) acknowledges the efforts of women and undergraduates who have overcome economic, personal, and/or academic hardships in pursuit of an education in the chemical sciences. The award consists of a plaque, a \$250 honorarium, and \$1,000 for travel expenses to the fall ACS National Meeting where the award is presented. Award candidates must be women matriculating as an undergraduate chemical science major/minor in a two-year program or at a four-year school not granting a doctoral degree in chemical-related disciplines. Nominations are due May 1, 2006, and should be sent to: Women Chemists Committee, American Chemical Society, 1155 16th Street, N.W., Washington, DC 20036. For additional information, contact the WCC at wcc@acs.org or visit <http://membership.acs.org/W/WCC>.

Hall while attending the 2006 National Meeting in Atlanta, Georgia. All 111 Periodic Table element pins will be available for purchase. And while you are visiting the booth purchasing your national meeting pin, shirts, pens, pencils, mugs, tattoos, kites, and mole toys, make sure you stock up on whatever element pins you are missing from your collection.



ACS Scholars Program Accepting Applications

The American Chemical Society (ACS) Scholars Program is now accepting applications for the 2006-2007 academic year. This renewable, undergraduate scholarship is for African American, American Indian and Hispanic/Latino students majoring in a chemical science and planning a career in that science. Now beginning its 12th year, the ACS Scholars Program has identified over 1600 scholarship recipients and disbursed more than \$8.2 million since 1994. More information and the application documents are available at <http://chemistry.org/scholars>, toll-free 1-800-227-5558, ext. 6250, or e-mail request to scholars@acs.org, or by writing to American Chemical Society Scholars Program, 1155 16th Street, N.W., Washington, D.C. 20036. Application deadline is March 1, 2006.



Last 10 Periodic Table Element Pins Available in March - You've Got to Have them ALL!!

The last 10 element pins will be available in March. Please stop by the ACS Membership Store in the Main Exhibit