



Chemical Bond

Volume 56
Number 8
November 2005

St. Louis Section, American Chemical Society



Congress Supports

The Joy of Toys

National Chemistry Week

St. Louis Chemical Science and Technology Award 2005 Call For Nominations

The St. Louis Science and Technology Award will be presented to a chemist in the St. Louis area who has demonstrated a high degree of professionalism and scientific contribution. Criteria used to judge the award include technical proficiency, presentations, coaching/teamwork and additional professional activities. The award will consist of a plaque, a check for \$500.00 and dinner for the awardee and a guest at the annual Chemical Progress Week Awards Night. The award will be presented to the winner at the Awards Night event, which will be held in April of 2006.

The Chemical Science and Technology Award will be presented to a person whose training includes successful completion of an Associate, Bachelor or Masters degree in chemistry or a chemistry-related curriculum.

Letters of nomination must be received by Joel Krauser, Pfizer Corp., mail code T2A, 700 Chesterfield Parkway West, Chesterfield, MO 63017 by December 20, 2005. Nominations, including seconding letters, must not exceed six pages. The nominating letters should address the criteria above. A current work address, phone number and fax number must be provided for each nominee. Please include an e-mail address. Nominees need not be a St. Louis Section member to be eligible for this award. This award is administered by the St. Louis Section of the American Chemical Society (ACS).

For more information contact: Joel Krauser at 314-274-8430,
FAX 314-274-4426, joel.a.krauser@pfizer.com

Legislators Recognize National Chemistry Week

Representatives Rush Holt (D-NJ) and Vernon Ehlers (R-MI) introduced a Congressional resolution on September 21 that recognizes the importance and positive contributions of chemistry to our everyday lives. The resolution also supports the goals of ACS' National Chemistry Week program and encourages the people of the United States to observe the week with appropriate recognition, ceremonies, activities, and programs. National Chemistry Week begins on October 17 and is focused on, "The Joy of Toys." To date, 16 members of Congress, including Science Committee Chairman Sherwood Boehlert (R-NY), have cosponsored the resolution.

According to Congressman Holt, a former ACS Public Service Award recipient, "Toys spark imagination; imagination fuels innovation. The celebration of chemistry, a science which is the backbone to the health of many industries including pharmaceuticals, electronics, automotive, and aerospace, through the chemistry of toys is worthy of Congressional support."

To be adopted, the resolution must now go before the House of Representatives for a vote. To check out the resolution visit: http://www.chemistry.org/portal/resources/ACS/ACSCContent/government/capitolconnection/images/ccOct05_NCWResolution.pdf

Chemical Bond

Volume 56

No. 8

November, 2005

The *Chemical Bond* is published in January Through May and September through December by the St. Louis Section-American Chemical Society. It is mailed free of charge to members of the section at their address on file at ACS National Headquarters. Changes of address for members will be made automatically upon notification to National ACS Headquarters; send old address and new address with zip codes to ACS Subscription Service Department, 1155 16th St. N.W., Washington, DC 20036 or visit chemistry.org, log in, and go to Update my Profile. Allow eight weeks for change to take effect.

The domestic subscription rate for non-members/affiliates is \$8.00 per year. Subscription orders and changes of address for non-members/affiliates should be mailed to the editor.

Editor	Andrea Reaka	<i>areaka@siue.edu</i> 618/650-5166
Advertising Manager	Sue Saum	<i>ssaum@stlcc.edu</i> 314/595-2308
Business Manager	Donna Friedman	<i>dfriedman@stlcc.edu</i> 314/513-4388
Staff Writer	John Bornmann	<i>jbornmann@msn.com</i> 636/946-5161
World Wide Web Webmaster	Eric Ressler	http://www.umsl.edu/~acs/ ressner@worldnet.att.net

*Correspondence, letters to the Editor, etc., should be sent to
St. Louis Section-American Chemical Society
125 West Argonne Drive, St. Louis, MO 63122*

Copyright © 2005 American Chemical Society and the St. Louis Section-ACS

In this issue . . .

- 4 **Meetings & Seminars**
 - 6 **Letters, Words & More: 4D Molecular Orbitals**
 - 8 **Congressional Leaders Praise ACS Congressional Fellowship**
 - 8 **Higher Education Act (HEA) Update**
 - 9 **National Academies Call for \$10-Billion Increase in Science Funding**
 - 10 **Call for Nominees: St. Louis Award**
 - 11 **Continuity Dinner 2005: Reservation Form**
-

Meeting & Seminars

Board of Directors

St. Louis Section–ACS Board of Directors meets on the second Thursday of each month, at the **Glen Echo Country Club** (map available on website). Meetings are open to all members, and all are encouraged to attend. Elected officers and chairs of major committees have the right to vote; others in attendance have voice but no vote. If you want to attend the dinner, please contact Ted Gast (ted@cfgastco.com) at least one week prior to the meeting date. The cost of dinner is \$18. Members wishing to become active in section activities are welcomed to their first dinner for free, compliments of the section.

Date: Note change: Dec. 1 *
Continuity Dinner
Social hour: 5:30 pm
Dinner: 6:30 pm
Business Meeting will start
during dinner.

NMR Discussion Group

The NMR group also has an email listserv. To join, send email to sarahj@wustl.edu with “subscribe NMR Discussion Group” in the subject line. The schedule is also posted on-line at:

<http://www.chemistry.wustl.edu/seminars.stlnmr.html>.

For more information contact:

Mark Conradi (Physics) at 935-6418 or msc@wuphys.wustl.edu
Joel Garbow (Radiology & Chem) 362-9949 or garbow@wustl.edu
Sophia Hayes (Chemistry) at 935-4624 or hayes@wustl.edu

November 10, 4:00 pm

Heiko Niessen

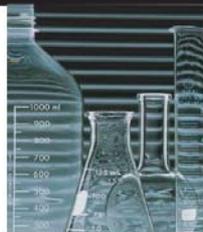
University of Magdeburg,
Center for Advanced Imaging
& Dept. of Neurology
*Magnetic Resonance
Progression Markers in the
Transgenic SOD1 Mouse Model*

Chemical Analysis Services

- Materials Identification and Deformulation
- Product Defects / Failure Analysis
- Thermal and Physical Testing (ASTM)
- Polymer Analysis and Testing



C H E M I R
Analytical Services



chemir.com

(800) 659-7659

2672 Metro Blvd., Maryland Heights, MO 63043

**University of Missouri-
St. Louis**

Seminars are held on Mondays at 4:00 pm in Room 451 Benton Hall unless otherwise specified. Refreshments 15 minutes prior to seminar time. Please check the website at: <http://www.umsl.edu/chemistry>.

November 14
Honggao Yan
Michigan State University
*Role of Conformational
Dynamics in Enzymatic
Catalysis - A Tale of 6-
Hydroxymethyl-7,8-
dihydropterin*

November 21
Fall Break

November 28
David Mootoo
City University of New York
*Carbohydrates: Templates for
the Discovery of New Synthetic
Methodologies*

December 5
Shelley Minteer
St. Louis University
*Designing Enzyme
Immobilization Architectures
for Electrodes Using Micellar
Polymers*



micron inc.

Analytical Services

Complete Materials Characterization
Morphology Chemistry Structure

SEM - TEM - EPA - ESCA - AUGER
XRF - XRD - FTIR - DSC - TGA

3815 LANCASTER PIKE, WILMINGTON DE.19805
PHONE 302 - 998 - 1184, FAX 302 - 998 -1836
E-MAIL MICRONANALYTICAL@COMPUSERVE.COM
WEB PAGE WWW.MICRONANALYTICAL.COM

4D Molecular Orbitals

by Jack Bornmann

Last month I wrote about my experiences looking (or trying to look) into multiple dimensions. Thus, I felt prepared to consider the shape of the Periodic Chart of the Elements in a 5-dimensional space-time world, i.e. 4-dimensional space.

Letters & More

When I was teaching, I taught the students about molecular orbitals. I told them about the shapes, the relative energies, and the directions of the orbitals. Then, I used their knowledge of the character of the orbitals to explain the shape of the Periodic Chart of the Elements. I had to be careful when writing the exam. I wanted to test their understanding of the orbitals and the Periodic Chart, but I did not want to give them an essay question. Instead, I gave them a question in the following manner: Use your understanding of orbitals in 3-dimensional space and the resultant shape of the Periodic Chart to predict what the Periodic Chart would look like if there were only two dimensions.

So, here is the answer I was looking for: (instead of using subscripts and especially superscripts on subscripts I will use parentheses): In 3-dimensional space we have the following orbitals:

s p(x) p(y) p(z)
d(xy) d(xz) d(yz) d(x²-y²) d(z²)

The s orbital is spherical and has no dominant direction. The p orbital is dumbbell shaped with its axis in the x, y or z direction. The d orbital is a double dumbbell that fits in a plane; the d(xy), d(xz), and d(yz) lie in the

indicated plane with its lobes at a 45 degree angle with the axes. The d(x²-y²) and d(z²) have their lobes pointed in the axes indicated inside the parenthesis.

In two dimensions, we have only x and y. Thus the 2-dimensional orbitals are: s p(x) p(y) d(xy) d(x²-y²)

Each orbital can hold two electrons and each orbital is represented by two elements on the Periodic Chart. Therefore, the 2-dimensional periodic chart would have the usual two families on the left, four families on the right, and four elements in the transition elements.

OK, that was the question for chemistry students. Here is the question for those who have graduated as chemistry majors and had several years of experience working as a chemist: "What will the Periodic Chart of the Elements look like in 4-dimensional space (or in the 5-dimension space-time realm)?" Answer: Let us label the four space dimensions as w, x, y, and z. It is my hypothesis that the orbitals in 4-dimensional space would be the following. s p(w) p(x) p(y) p(z) d(wx) d(wy) d(wz) d(xy) d(xz) d(yz) d(w²-x²) d(y²-z²)

Two electrons go into each orbital and, therefore, two elements go into each orbital's position on the Periodic Chart. The s orbital gives the alkali metals and the alkaline earth metal families. The four p orbitals permit eight columns of elements instead of our six families of elements in our 3-dimensional Periodic Chart. There are eight d orbitals in 4-dimensional space and therefore there will be 16 transition elements in the hypothetical Four Dimensional Periodic Chart.

It would be nice if someone would solve the Schroedinger Equation in four dimensions and check my hypothesis. Any takers? I am using my blindness as an excuse for not doing it myself.

Pick up

rotating

Mass-Vac ad

from p. 9 of June 2005

Congressional Leaders Praise ACS Fellowship Program

In a recent video, congressional leaders praised the importance of the ACS fellowship program. Fellows provide science expertise to Washington, D.C. policymakers on issues such as homeland security, water resources and containment, climate change, science education, and much more.

To view the video, please visit www.chemistry.org/government.

Fellowship applications are due by December 31, and the fellowships run for one year, beginning in September. Here is a wonderful opportunity for anyone who has an interest in public policy. To learn more about these fellowship opportunities, please visit chemistry.org/policyfellowships.

POLYMER STANDARDS
FOR GPC/SEC MOLECULAR
WEIGHT ANALYSIS
GPC/SEC COLUMN REPACKING
American Polymer Standards Corporation
8680 Tyler Boulevard, Mentor, OH 44060
Phone: 440-255-2211 Fax: 440-255-8397



Higher Education Act Update

In September, legislation to extend the Higher Education Act (HEA) through 2005 became law. The Act technically expired in 2004.

HEA is the education law governing federal programs involving student financial assistance, aid to strengthen institutions, aid to improve K-12 teacher training at postsecondary institutions, and support services to help students complete high school and succeed in college. Both the House and Senate education committees have been working diligently to suggest changes to the act, however, efforts have been stalled due to the busy congressional schedule.



COBERT ASSOCIATES

QUALITY PRODUCTS FOR CHROMATOGRAPHY

XPERTEK® • CAPILLARY COLUMNS • HPLC COLUMNS • SPE VIALS AND ACCESSORIES • FILTRATION PRODUCTS

Stocking Distributor for More than 75 Manufacturers, Including:

	• ABI-Brownlee	• Hamilton	• Rheodyne	• Upchurch
	• Agilent/J&W	• Pierce	• Shodex	• Vydac
	• Alltech	• Optimize	• Synchrom	• Whatman

P.J. COBERT ASSOCIATES, INC. • P.O. BOX 460046 • ST. LOUIS, MO 63146
1-800-972-4766 • (314) 993-2390 • FAX: (314) 993-2491
E-MAIL cobert@cobertassoc.com • WEBSITE www.cobertassoc.com



National Academies Call for \$10-Billion Increase in Science Funding

Responding to a congressional request to identify the top 10 actions that “federal policy makers could take to enhance the science and technology enterprise so that the U.S. can successfully compete, prosper, and be secure in the global community,” the National Academies issued a report on how the federal government could improve U.S. innovation and competitiveness. Recommendations were made in four areas (K-12 science education, research, university education, and investment incentives) and were designed to strengthen the availability of high-tech workers, the generation of new ideas, and the incentives for investment. These programs would require a \$10 billion federal-funding increase for science and technology.

The National Academies committee comprised extraordinary leaders of the S&T community: university presidents, CEOs, Nobel laureates, and former high-ranking government officials. Chair Norman Augustine, retired chairman of the Board and CEO of Lockheed Martin, released the report in a one-hour press event on October 12 with members Craig Barrett, chairman of Board, Intel; P. Roy Vagelos, retired chairman of the Board and CEO of Merck; and other science and technology leaders, including Madeleine Jacobs, executive director and CEO of the American Chemical Society, in attendance.

The report, *[Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future](#)*, outlines specific recommendations to meet threats to our national competitiveness and address American job security. Some key points it addresses are the following:

- K-12 science education is central to all other solutions.
- A rapid increase in investment for physical science and engineering research is needed and should not be made at the expense of the recently expanded biological and health sciences.
- U.S. undergraduate and graduate programs must attract the best and the brightest students from the U.S. and abroad.

Chair Augustine highlighted the investment nature of the recommendations and indicated the necessity of finding money to fund the combined annual price tag of \$10 billion. In response to a question about whether the recommendations would ensure future American jobs, Barrett replied, “I can guarantee that there won’t be jobs, if you don’t do the things listed in this report.”

The Senate Committee on Energy and Natural Resources will formally receive the report by October 18. ACS is working with the Senate Science & Technology Caucus on further highlighting it at an end-of-October Capitol Hill briefing. The report can be viewed online at <http://www.nationalacademies.org/morenews/20051012.html>.

Don't be left out!

Subscribe Now!

If you would like to receive e-mail reminders of upcoming ACS events and activities, subscribe to the Reminders Listserve. You will be informed of ACS activities including meetings, lectures, banquets, etc. Send your e-mail address to Alexa Serfis, Chair Elect, at BARNOSKI@SLU.EDU.



Nominate a Colleague for the St. Louis Award

The St. Louis Award, sponsored by the Monsanto Company, is presented to an individual who had made outstanding contributions to the profession of chemistry and demonstrated potential to further the advancement of the chemical profession. The award, consisting of a \$1,500 honorarium and a plaque, is presented at the St. Louis Award Banquet, the final event of Chemical Progress Week in April.

Please help the Awards Committee identify outstanding chemists in the St. Louis Section by submitting your nominations to the St. Louis Award Chair. The nominations should include a nominating letter, two or more seconding letters from individuals who have had a close professional affiliation with the nominee, a brief biography, a description of the nominee's accomplishments, and a list of publication and patents.

At the time of the nomination, the nominee must not have previously received the Midwest Award or any ACS-sponsored award. The nominee must be a member or affiliate of the St. Louis Section of the ACS. The deadline for nomination packets to be received is December 10, 2005. Please send nominations and inquiries to:

Dr. Joseph Ackerman
St. Louis Award Chariman
Department of Chemistry
Campus Box 1134
Washinton University
1 Brookings Drive
St. Louis, MO 63130-4899
Phone: 1-314-935-6593
FAX: 1-314-935-4481
ackerman@wuchem.wustl.edu

ELEMENTAL ANALYSIS

C, H, N, O, S, P • Halogens • Ash • Metals
TOC • TOX • BTU • Molecular Weights
ICP • ICP/MS • IC
Custom Analysis • Problem Solving

HUFFMAN

LABORATORIES, INC.

Quality Analytical Services Since 1936

4630 Indiana Street • Golden, CO 80403
Phone: (303) 278-4455 • Fax: (303) 278-7012

Chemistry@huffmanlabs.com
www.huffmanlabs.com



Continuity Dinner 2005

Thursday, December 1, 2005
Glen Echo Country Club
3401 Lucas and Hunt Road
St. Louis, MO 63121
(314) 383-1500

Every December the St. Louis Section of the ACS holds a fancier than average board meeting celebrating the year's achievements, recognizing certain members, and the passing of the gavel to the new slate of section officers. There is also the Henry Godt Memorial Lecture (recapping the past year) which is always a surprise.

Please join us to celebrate. The evening will begin with a social hour and open bar (beer, wine, and soft drinks) at 5:30 pm. Dinner will be served at 6:30, and the business meeting will begin at during dinner. Cost is \$20.00 per person. Please send in payment and the reservation form below by November 28.

Continuity Dinner Reservation Form

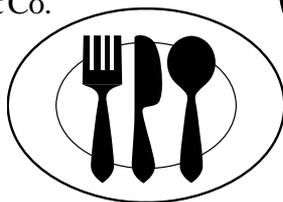
Member name _____

Number attending _____ X \$20 = Amount remitted _____

Reservations must be received by November 28, 2005.

Please make check payable to the St. Louis Section-ACS
and mail to:

Dr. Samir El-Altably
Camela Medical Equipment Co.
P.O. Box 50168
St. Louis, MO 63105



St. Louis Section
American Chemical Society
125 West Argonne Drive
Kirkwood, MO 63122

Rush-Dated Material Inside

Non-Profit U.S. Postage PAID St. Louis, MO Permit No. 850

Pick up

Sigma ad

from back cover

of previous issue