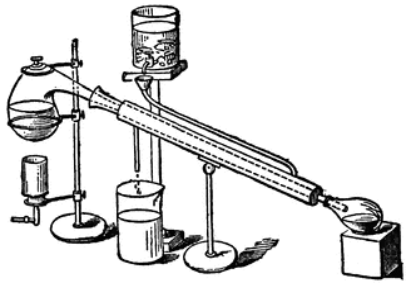
SOUTHWEST RETORT



SIXTY-SEVENTH YEAR **NOVEMBER 2014**

Published for the advancement of
Chemists, Chemical Engineers
and Chemistry in this area

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Contact the DFW Section

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EMPLOYMENT CLEARING HOUSE

Job applicants should send name, email, and phone, along with type of position and geographical area desired; employers may contact job applicants directly. If you have an opening, send your listing, including contact info for your company, to retort@acsdfw.org. Deadlines are the 7th of each month.

JENKEM TECHNOLOGY

The PEG and PEGylation Technology People

Job Title: Sales/Marketing Assistant

Name of Company: JenKem Technology USA Inc.

Nature of Business: Polyethylene Glycol (PEG) Polymers for Pharmaceutical and Biotech Applications

Job ID: JKUSA-20140801

Job Type: Full-time

Salary Range: Base salary $25,000.00 to $35,000.00; plus Sales Commission

Location: United States - Texas – Plano

Additional notes: Must be legally authorized to work in the United States. Local candidates preferred, no relocation benefits are provided for the position.

Job Functions: Sales and marketing for PEGylation products and services: provides quotations and information on product availability, and provides answers to technical questions to customers, by phone or email; processes orders, shipping, and payments; develops and maintains customer relationships; identifies and develops new customers and new markets for PEGylation products and services; and performs other tasks as assigned by the manager.

Job Requirements: Bachelor's degree or higher (Chemistry/Biology/Biochemistry or similar background REQUIRED); Excellent interpersonal and communication skills; Excellent reading, speaking, and writing skills in business English; Good arithmetic skills and attention to details required; Proficiency in the use of Microsoft Word, Excel, PowerPoint, and Outlook required; English/Chinese bilingual preferred; Ability to work independently required.

To Apply:
Interested candidates should submit a cover letter including salary expectations, and an updated resume at email: hr@jenkemusa.com. Please do not call, we will contact only select candidates.

hr@jenkemusa.com.

SERVICES

FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The winner of the 1964 ACS Southwest Regional Award is Dr. Raymond Reiser, Professor of Biochemistry and Nutrition at Texas A&M. Dr. Reiser received his undergraduate degree from Western Reserve, his Ph.D. from Ohio State, and did his post-doc at the Duke University School of Medicine. In 1940 he joined the Texas Agricultural Experiment Station at College Station. He served with the US Army in 1942-46. In 1947 he joined the new A&M Department of Biochemistry and Nutrition. He was promoted to Professor in 1954, and he received an NIH Career Award. His work deals with the biochemistry of fat including digestion, transport, storage, and utilization.

With 24 new graduate students accepted, the chemistry program at Texas A&M University now has 72 graduate students plus eleven post-docs. The holder of the new Welch Chair at A&M is Professor Fred Duke, formerly of Iowa State U.

The ACS tour speakers for November are Dr. Jack W. Sears from Harding College, Dr. W. Albert Noyes, Jr. from UT-Austin, and Dr. Ralph Shriner of SMU. Please remember the ACS Southwest Regional Meeting, to be held in Shreveport Dec. 3-5.

The new South Plains ACS Section came into being last May, 1964. The first meeting featured a lecture and a visit by Sir Christopher Ingold. Texas Tech faculty members who attended conferences last summer included H. J. Shine, C. M. McPherson, and J. Adamik.

Dr. Raymond Seymour has joined the faculty of the University of Houston. Work has begun on the new University of Houston chemistry building, which will be named the Lamar Fleming Building. Rice University will undergo a large expansion in faculty, student body, and number of buildings as a result of an evaluation led by President Kenneth Pitzer. To help finance this, Rice will begin charging tuition for the first time in 1965. At Humble Dr. Frank H. Field has returned from England after spending a year at Leeds University with a Guggenheim Fellowship.

The two new faculty members at Texas Christian University are Dr. H. C. Kelly and Dr. Manfred B. Reinecke. Dr. Kelly received his Ph.D. from Brown University and joined TCU after working with Metal Hydrides Corp. Dr. Reinecke received his Ph.D. from UC-Berkeley and came to TCU from the faculty of UC-Riverside. Nobel Laureate Dr. Peter Debye was the guest speaker at the Appreciation Dinner hosted by the Texas Christian University Research Foundation. Dr. William H. Watson attended the meeting of the American Crystallographic Society in Bozeman, Montana.

The speaker at the Central Texas ACS section's monthly meeting was Ralph Shriner of SMU, and his topic was "Chemistry of Lignin." Presentations were given at summer conferences by UT faculty W. A. Noyes, Jr., A. J. Bard, W. C. Gardiner, M. J. S. Dewar, and Norman Hackerman. Grants were received by J. B. Longnecker, W. C. Gardiner, A. H. Cowley, L. F. Harch, W. A. Noyes, Jr., and Earl Ingerson.

Contributed by
E. Thomas Strom

CO_2 Capture and Sequestering at Electric Power Plants: Proven Technology?
by
John E. Spessard, PhD, PE

A friend and mentor taught me that a plant or process could be reduced to squares on a flow sheet. Each square represented a major process step or piece of equipment. If every square was "proven technology" the plant would be easy to build and operate. Proven technology meant that every square had (1) been done before, (2) on this scale and (3) in this country. All else was unproven technology. One square of unproven technology would present problems that could be handled. Two squares of unproven technology meant that the first Plant Manager would be fired. Three squares would present a nightmare. I have followed this through the years and it works.

EPA has defined proven technology for yet to be constructed coal fired power plants. The requirement is such that a new plant must achieve carbon capture and sequestration (CCS) controlling at least 40% of the CO2 to be in compliance. There is no plant in the world that has successfully attained this level of achievement. Plants have been built but these plants are over budget, behind schedule and have frequent unscheduled shutdowns. EPA's standard is "an adequately demonstrated system is one which has been shown to be reasonably reliable, reasonably efficient and which can be reasonably be expected to serve the interests of pollution control without becoming exorbitantly costly in an environmental way. An achievable standard is one which is within the realm of the adequately demonstrated system's efficiency and which, while not as a level that is purely theoretical or experimental, need not necessarily be routinely achieved within the industry prior to its adoption." This standard has numerous adjectives subject to interpretation.

It is interesting to me that a 2012 EPA Best Available Technology (BACT) environmental control determination concluded that CCS was not a commercially available, technically achievable option.

There are two paths to generate electricity from coal. The most common is the coal is burned. The heat is used to provide high pressure steam. The steam drives a turbine which generates electricity. The stack gases contain fine ash, O_2, N_2, CO_2, CO, SO_2 and SO_3 and nitrogen oxides. An electrostatic precipitator captures the ash and a limestone scrubber captures the acid gases. The O_2, N_2, CO, and CO_2 are emitted. For CCS, CO_2 is captured after the generation of electricity.

EPA estimates that the environmental controls capture 90 to 99% of the pollutants. I prefer to use 90% because if the emission control devices fail, the plant must keep running. You can't quickly shut down or start up a large piece of hot running equipment without damaging the equipment. As an example, EPA finds that it takes 6 hours from startup to have a power plant running at 60% of rated capacity.

Amine absorption technology is routinely

used to remove H_2S and CO_2 from natural gas so that the gas can be moved through pipelines. However, the CO_2 level in a utility stack gas is 13 to 15% and is an entirely different operation. A weak base (an ethanol amine solution) removes CO_2 and H_2S from a gas stream. In a separate operation the acid gases are stripped from the amine solution with steam and regenerate the amine. This has been demonstrated at the Southern Company's Alabama power plant. A partial stream of gas from an existing plant stack of a conventional coal-fired power plant corresponding to about 25 megawatts electric generating capacity was diverted to the amine system.

There is mention of fouling of the amine at this facility. As a comparison, the ionization constant of an ethanol amine is about 1.1E-9 compared with 1.8 E-5 for ammonia. I would expect this. The emission controls are not 100% effective. Fly ash will accumulate in the amine stream and the equipment. This is a source of potential equipment problems. Also CO_2 and H_2S are much, much weaker acids than the nitrogen and sulfur oxy acids. These more acid gases will not strip with steam.

The second is a combined cycle plant which is relatively rare. Using the water gas reaction, the coal provides H_2S and CO_2. CO_2 and H_2S are removed with an amine unit prior to the generation of any electricity. The H_2S is converted to elemental sulfur. The hydrogen is burned and the hot gases drive a turbine, generating electricity. The hot gases generate steam which drives a second turbine generating more electricity. In the combined cycle version of CCS, the CO_2 is removed before generating electricity. The combined cycle plant is expected to have greater thermal efficiency and higher capital costs.

Duke Energy Company has built and is operating a CCG plant in Edwardsport, Indiana. The investment community regards Duke Energy as a well-managed utility. The rated capacity is 681 megawatts. The original cost estimate was $1.9 billion The plant began operations in June 2013. The Indiana regulators capped the costs that could be passed on to utility customers at $2.6 billion with Duke Energy having to pay an additional 0.9 billion. In the plant's best month, it operated at 60% of rated capacity. There have been months of operating at less than 10% capacity. There are some interesting legal battles about how much of the cost overrun can be passed on to the customers.

The Kemper County, Mississippi plant has a 582 megawatt rated capacity. The plant will be operated by Mississippi Electric Company. Construction began in 2010. The initial target date for completion was May 31,2014. The completion date was rescheduled to May 31,2015 and then "sometime in 2015". The current estimated cost is $5.85 billion, even more than the Duke Energy plant. However, there have been monthly multi-million dollar cost escalations and it is reasonable to expect more of the same. It will be interesting how much of the plant's cost overruns will be borne by the utility's customers.

This is the "Proven Technology" on which EPA bases a requirement than any new coal-fired power plant adopt CCG technology. It is somewhat amusing that the Sierra Club is opposing the plant because of its impact on wetlands.

I heard two people from an EPA research group estimate that CCG would use one-third of the power plants output. Suppose that the electricity needs of an area are six units. There are two plants producing three

units each. CCG reduces their combined output to four units. A third plant will be needed to provide the needed electricity. This will double the particulates, CO_2, sulfur oxides and nitrogen oxides that escape the less than 100% effective emission controls.

All of this is meaningless unless the captured CO_2 is pipelined at a pressure of 1,000 to 2,000 psi to a site, pumped into the ground and stays in the ground for centuries. I am unaware of any existing sites where CO_2 has been naturally stored. I have to question what happens when the 1,000 to 2,000 psi pressure is relieved? A frequently cited use for CCG CO_2 is enhanced oil recovery where CO_2 is pumped into an oil formation and pushes out the oil. The CO_2 replaces the oil. What next?

The University of Texas at Austin has received research grants to study underground CO_2 storage. They were $38 million in 2007 (ten years),S15,5 million in 2009 (five years) and $12 million (four years) in 2014. I have searched for but have not found any progress reports. There was a DOE-funded symposium "Project Storage R&D" from August 12-14, 2014. There were several papers with titles relating to measuring leakage from CO_2 storage sites. Since underground CO_2 storage is about a 20-year-old issue, there is no long range data.

There is also a legal issue concerning liability if underground stored CO_2 migrates onto another person's property. Underground storage is part of EPA's proven technology decisions.

From the ACS Press Room

Biobased Polymers

Chemical & Engineering News

Your next pair of spandex pants could be made out of corn — or, more precisely, from dextrose derived from corn. This option is part of a new wave, albeit a small one, of consumer goods that are being produced from plants rather than petroleum-based materials. But a complete transition to a biobased economy won't be easy, according to an article in Chemical & Engineering News (C&EN), the weekly newsmagazine of the American Chemical Society.

Melody M. Bomgardner, a senior editor at C&EN, notes that a range of companies, from start-up firms to industrial giants, have been searching for ways to fill a growing consumer demand for sustainable materials. Invista and Genomatica say they will pursue nylon intermediates from sugar. Coca-Cola is making progress toward a 100 percent biobased soda bottle (they're already at 30 percent). But trading in all conventional materials for ones that might be more sustainable won't be easy.

The main challenge to this shift is economics. Prices for biobased raw materials to feed the supply chain must drop to competitive levels. Manufacturers must invest in new facilities to process the raw materials. And ultimately, it's the consumers' pocketbooks that will likely decide just how far this trend will go.

...And Another Thing…

by Denise L. Merkle, PhD

Money, Money, Money

According to data available on the Federal Election Commission's website, over the two year period culminating in this month's midterm elections, the two major political parties disbursed $8.37x10^8$ in order to promote the election of their candidates of choice.[1] Estimates of total spending on the elections—including Political Action Committees, which often fund the smear tactics that candidates tend to disavow, reach as high as $4x10^9$. Yes. That is four billion dollars—nearly 3,500 McLaren P1s. The numbers boggle the mind.

Consider: In a Bloomberg Buisnessweek article from August of this year, Bjerga and Klimasinska report a middle-income family will spend ~$245,000 to raise a 2013 baby to age 18—not quite $14,000 a year to feed, clothe, house, educate, and vaccinate a healthy child. One year of a political party's spending would support 29,000 children.[2] (This is right around 4% of the US child population in 2012).[3]

The average salary for all chemists surveyed by the ACS is $1x105 if one of your chromosomes is truncated, and $7.94x104 if all of your chromosomes match, with industry paying significantly higher salaries than academia (which of course is not going to surprise anyone.) One year of a political party's spending? Four thousand average XY chemists bringing home the nitrites.[4]

In 2013, NIH awarded not-quite $15x10^9$ in Research Project Funds to approximately15% of all the applicants for RO1 and RO2 grants, for an average grant amount of something like $300,000.[5]

That's four billion dollars over 2 years to support the campaigns of elected —or not elected officials. More than 1/4 of the grant money awarded to NIH-supported scientists was spent to fulfill the democratic process which governs our lives. Could this be so? This is probably the only time I really want my data analysis to be ***Wrong***. It would be nice if these conclusions were just not correct —but I don't think they're far off.

What is the point of all this, you ask? The point, as I see it, is: What are we thinking? What are we doing? Where are we focusing our precious resources? And why? Can't tell. Don't know. It doesn't look good. No clue. What do we do about this? Don't know that either, but a Super PAC to support the average chemist is starting to look pretty good.

On a more optimistic note, it's still very possible to put together your best talk ever for SWRM 2014 —and it won't cost you four billion dollars, either!

[1]http://www.fec.gov/disclosure/partySummary.do
[2]http://www.businessweek.com/news/2014-08-18/cost-of-raising-child-climbs-at-slowest-pace-since-2009
[3]http://www.childrensdefense.org/child-research-data-publications/state-of-americas-children/documents/2014-SOAC_child-population.pdf
[4]http://www.acs.org/content/dam/acsorg/careers/salaries/cen-salary-article.pdf
[5]http://nexus.od.nih.gov/all/2014/01/10/fy2013-by-the-numbers/

From the ACS Press Room

Why plants don't get sunburn

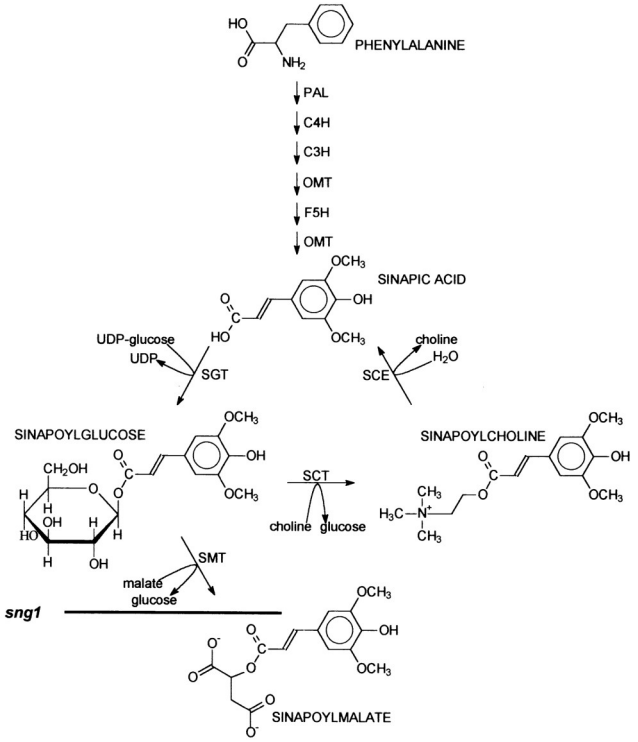
"Plant Sunscreens in the UV-B: Ultraviolet Spectroscopy of Jet-Cooled Sinapoyl Malate, Sinapic Acid, and Sinapate Ester Derivatives"
Journal of the American Chemical Society

Plants rely on sunlight to make their food, but they also need protection from its harmful rays, just like humans do. Recently, scientists discovered a group of molecules in plants that shields them from sun damage. Now, in an article in the Journal of the American Chemical Society, one team reports on the mechanics of how these natural plant sunscreens work.

Timothy Zwier and colleagues at Purdue University note that the harsh ultraviolet radiation plants are exposed to daily can cause serious damage to plant DNA and, as a result, hinder plant growth. Biochemical tests have shown that plants produce special molecules and send them to the outer layer of their leaves to protect themselves. These molecules, called sinapate esters, appear to block ultraviolet-B radiation from penetrating deeper into leaves where it might otherwise disrupt a plant's normal development. Although researchers have been amassing evidence that points to sinapate esters as the protective molecules, no one had investigated in detail what happens to them under UV exposure. Zwier's team wanted to understand this process.

The researchers coaxed these molecules into the gas phase and zapped them with UVB radiation from a laser in the laboratory. They found that the particular sinapate ester that plants use as a screen against UVB was inherently capable of soaking up radiation at every wavelength across the UVB spectrum. Thus, it is remarkably efficient at absorbing harsh radiation that could otherwise damage the plant. Their findings further shore up the idea that this class of molecules does indeed comprise plant-made sunblock, the researchers say.

The authors acknowledge funding from the Department of Energy Basic Energy Sciences.



From the ACS Press Room

Interesting facts about our favorite candies mark National Chemistry Week

Chemists around the world last month helped children explore the chemical tricks that confectioners use to transform their ingredients into irresistible treats. These efforts to explain the science behind jelly beans, licorice, chocolate and other gooey delights were all part of National Chemistry Week, Oct. 19-25. This year's theme celebrated "The Sweet Side of Chemistry: Candy." Among the interesting and curious scientific facts about candy are:

Hard candy is technically a glass — so much so that it is sometimes used to make the "bottle" that gets broken over someone's head in a fight scene.

The same chemical that makes grapefruit taste sour — citric acid — is in sour-tasting candy.

Peppermint oil comes from a plant, and some research shows that candies flavored with it can help people concentrate better.

Ever wonder how they get liquefied cherries into a chocolate-covered cherry without leaving an injection hole? The candy actually starts with a hard cherry center that slowly softens after the chocolate is applied, thanks to the enzyme invertase that's added to the recipe.

Cotton candy is almost pure sugar that has been melted and then spun.

Gummies contain flavor, sugar and a seaweed chemical called carrageenan, which makes them chewy.

Licorice contains a smelly compound that's found in a spice called anise.

During National Chemistry Week, chemists to participate in chemistry demonstrations and other outreach events in schools, shopping malls, science museums, libraries and other public venues. For kid-friendly, candy-themed activities that families can do at home, click **here**, and for a fun ACS Reactions video that explains why we love our sweets, visit **http://youtu.be/FaBFyEa8-eI.**

Earlier in October, President Barack Obama thanked ACS professionals and volunteers participating in this year's National Chemistry Week "who are opening eyes, sparking imaginations and cultivating tomorrow's leaders in chemistry." In addition, the U.S. Senate passed a resolution designating the week beginning Oct. 19 as National Chemistry Week.

National Chemistry Week 2014

The Science of Sweet and Harry Potter

NCW By the numbers!

4600+ visitors!

(867 just for elementary school night!)
250+ Volunteers from 10 Universities and 6 High Schools

University Participants

Southern Methodist University
Texas Christian University
UNT Health Science Center
Tarrant County College
Eastfield College
University of Texas at Dallas
Texas Woman's University
University of Texas at Arlington
University of North Texas
University of Dallas

Participating High Schools

Ft. Worth Country Day
Southwest Christian School
Trinity Valley High School
Birdville High School
Lamar High School
Denton High School

Support from the DFW community

Don Wharry, Tracy Hannah, Scott Dunkle, Benjamin Janesko, Julie Fry

Museum Collaborator

Cathy Barthelemy

Sponsors

DFW ACS local section, ZS Pharma

'The Science of Sweet' inspired DFW student groups from 10 universities and 6 high schools to work collaboratively with the Fort Worth Museum of Science and History (FWMSH) for the 4th annual 'Chemistry Connections' event for National Chemistry Week. Cathy Barthelemy, our collaborator at the FWMSH, hosted a meeting organize experiments and activities in early September. During the meeting the groups organized themes around the 'The Science of Sweet' put forth by the ACS in addition to 'Myth Busters' and 'Harry Potter' exhibits showing at the museum. This meeting gave rise to an array of educational, hands-on activities for museum guests of all ages.

Over 4600 museum guests enjoyed a broad spectrum of experiments during the week of October 21-26 provided by the 250 volunteers in excess. These guests included visitors during normal museum hours, a special museum night for two local elementary school groups, and a special afternoon for homeschool students and their families.

The consistent growth in volunteer numbers that included 3 new high schools in addition to museum guests that now plan visits to the museum for National Chemistry Week is sufficient data to consider this year's event a success! I would like to thank the ACS local section and ZS Pharma for financial contributions to support the event in addition to Cathy Barthelemy at the FWMSH for allowing us to take

Continued on next page

over the Innovation Studios with FWMSH for five full days of controlled chaos. I am also very grateful to the following individuals for their support in organizing components of the week: Don Wharry, Julie Fry, Tracy Hannah, Scott Dunkle, and Benjamin Janesko.

Kayla Green, TCU

national chemistry week

national chemistry week

November 2014
ACS DFW Local Section
Networking Social

Wednesday, November 19, 2014
7:00 PM to 9:00 PM

Where: Uno Pizzeria and Grill, 300 Houston Street, Fort Worth TX 76102
Conveniently located in historic Sundance Square, Fort Worth!
http://uno.know-where.com/pizzeria/cgi/selection?place=fort+worth

The American Chemical Society Dallas-Fort Worth Local Section invites you and your colleagues to our November Networking Social! Take a break from all of your SWRM activities and the work week, and join us for appetizers and drinks. Come socialize and meet members of the local section and the SW region!
Ticket Price: $10 per DFW local section members and $15 per non-local section members. All ticket prices at the door will increase by $2. ($12 / $17)
EVERYONE MUST RSVP EVEN IF YOU PLAN TO PAY AT THE DOOR
Menu: Assorted appetizers and a choice of beer/margaritas/tea/soda/water.
Payment by credit card will be available online in advance, but only cash or check will be accepted at the door. An invoice will be emailed to you to allow you to pay online with your credit card.
Please note that you are financially responsible for unused reservations.
For more information and to RSVP please follow the link:
http://bit.ly/1vBQaRx
Deadline for RSVP: Sunday, November 16th at 5:00 PM
If you have any questions, please feel free to contact the local ACS DFW Chair-elect, Shana Santos at shana.marie.santos@gmail.com.
We hope to see you all there!

Shana Marie Santos, Ph.D.
Authentix, Addison, TX

Dallas-Fort Worth of the American Chemical Society
Local Section Chair-Elect 2014

SOUTHWEST REGIONAL MEETING 2014

Fort Worth, TX | November 19-22, 2014

TECHNICAL PROGRAM and ABSTRACTS now AVAILABLE

This link can be used by anyone to view the online technical program; click on titles to see abstract.

http://abstracts.acs.org/chem/swrm2014/program?nl=1

Itinerary (ACS log-in required) http://abstracts.acs.org/chem/swrm2014/program

This link can be used by attendees to create an itinerary to bookmark presentations and download abstracts. They will need to log-in using an ACS ID to create the itinerary www.acs.org. If you do not have one please follow the prompts to create one—it is free for members and non-members.

To attend the 2014 Southwest Regional ACS Meeting! SWRM 2014 will be held at the Fort Worth Renaissance Worthington Hotel, November 19-22, 2014.

Symposium

Functional Polymers:

Synthesis, Characterization, and Applications

Southwest Regional Meeting 2014

Fort Worth, Texas

Friday, November 21, 2014

Topics include

- State of the art synthetic methodologies
- Novel approaches for characterization methods
- Synthesis and polymerization of functional and/or bio-derived monomers
- Controlled/living polymerizations
- Efficient post-polymerization chemical transformations
- Methods for controlling macromolecular architecture and placement of functional groups

Speakers

Mihaela Stefan (UT Dallas)
Bruce Novak (UT Dallas)
Daniel Siegwart (UTSW)
Donghui Zhang (LSU)
John Pojman (LSU)
David Bergbreiter (Texas A&M)
David Son (SMU)
Scott Grayson (Tulane)
Igor Rubstov (Tulane)
Toby Nelson (Oklahoma State)
Patty Wisian-Neilson (SMU)
Nick Tsarevsky (SMU)
Christopher Hobbs (Texas A&M–Kingsville)
Young Lim (Texas A&M)
Bobin Lee (Duke)

Organizers: Nicolay V. Tsarevksy and Patty Wisian-Neilson

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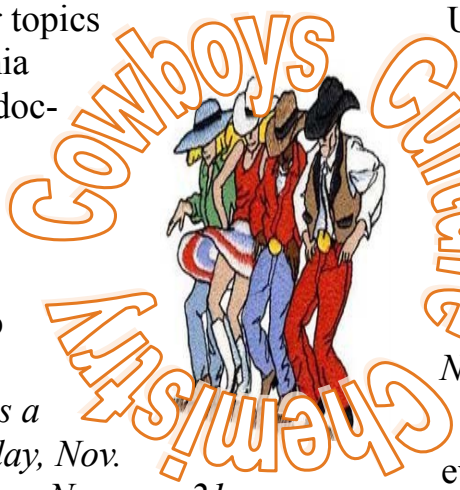
SMU | Department of Chemistry

SWRM2014.org

Undergraduate? Grad student? Postdoc? Considering a career change? SWRM 2014 has career development opportunities!

The Southwest Regional Meeting (November 19-22, 2014) in Fort Worth presents a great opportunity for undergraduates, grad students, postdocs, and those considering career changes to get intense career-related programming at an unbelievable value. Sign up today to experience some or all of the following:

Preparing for Life After Graduate School (PfLAGS) Workshop: This is a 2-day career development workshop designed to teach graduate students and postdocs about career options and how to prepare for them. The course will cover topics including careers in academia and industry, finding a postdoctoral position, intellectual property and patents, non-traditional careers, interviews and mock interviews, and new technologies in job searching. *Sessions: This workshop is being offered as a series of sessions on Thursday, Nov. 20 from 1-5:15pm and Friday, Nov. 21 from 8am to 12 noon, and 1-5pm.* ACS Career Consultants will be available by appointment to conduct Resume/CV reviews on Friday and Saturday. For more information contact Beatriz Rios-McKee, beatrizmckee@me.com



Finding Your Pathway Workshop: You can learn about the four main career pathways available to chemical professionals: higher education, industry, government, and entrepreneurial careers and why each one may or may not be the right choice for you. In addition to learning about careers available in each pathway, you'll also learn about the job market and hiring trends. The workshop allows time for you to inventory your own values, interests, background, strengths and weaknesses, so that you can select which career pathway you'd like to explore in detail. *Thursday, Nov. 20, 8am to noon.*

Undergraduate programming also will include career paths. This session will include presentations from professionals working in different areas including food chemistry, forensics, and patent law. *Morning session, Friday, Nov. 21.*

Other social and networking events will be available where students and professionals alike can interact and learn more about careers and opportunities. These events include dine-around options on the evenings of Wednesday, Nov. 19, and Friday, Nov. 21, the gala reception sponsored by Klemchuk Kubasta LLP on the evening of Thursday, Nov. 20, and the women chemists luncheon on Thursday, Nov. 20.

C&E News Editor to Provide Keynote for Sustainability Symposium at SWRM 2014

The keynote address by **Rudy M. Baum** will focus on Climate Change.

Abstracts on sustainability topics of concern and interest to chemists continue to be solicited for sessions on *Climate Science With and Beyond the ACS Toolkit, New Processes for Water Purification,* and *General Topics in Chemical Sustainability.*

At least one presentation employing a panel discussion is anticipated, and interest in participating in such a discussion may be explored with session organizers. The procedure for abstract submission to Sustainability Sessions may be found under the 'Program' link at: **http://www.swrm2014.org/.**

SWRM2014.org

From the ACS Press Room

Scientists rank thousands of substances according to potential exposure level

High Throughput Heuristics for Prioritizing Human Exposure to Environmental Chemicals"
Environmental Science & Technology

An overwhelming number of chemicals from household and industrial products are in the environment – and hundreds are in our bodies. But for most of them, scientists have yet to determine whether they cause health problems. Now they've taken the first step toward doing that by estimating which substances people are exposed to the most. Their new method is published in the ACS journal Environmental Science & Technology.

John F. Wambaugh and colleagues note that the risks to human health of any given substance depend primarily on two factors: the potential hazards a chemical presents, and how much of it people are getting exposed to. But public data on these variables are lacking for many substances already in widespread use. About 80,000 chemicals are registered in the U.S. under the Toxic Substances Control Act, and industry adds 700 to 1,000 new chemicals every year. Directly measuring how much of these substances people are getting exposed to would be a Herculean task requiring the time-consuming analysis of thousands of blood or urine samples. Wambaugh's team sought a more practical approach.

The researchers developed a mathematical model to predict which household and industrial chemicals people are exposed to the most. They based their method on answering five simple questions about the substances, such as whether they are used in consumer products or whether they are pesticides. They used this approach to rank nearly 8,000 chemicals, from highest potential exposure level to lowest. While a few of the top 10 were familiar compounds such as DEHP, a common phthalate that has been shown to cause reproductive problems in rodents, most were substances that scientists know very little about. The researchers say the ranking could help prioritize future efforts that aim to understand potential health risks of thousands of chemicals.

The authors acknowledge funding from the U.S. Environmental Protection Agency.

Join us for Our Winter Event!

Featuring Scroll-A-Rama

Wednesday, December 3rd 7:30-10:30p

TOPIC TBA

@A5A 1628 5th Ave FW 76104

$15/$7 students & in-transition

Caterer: Events by Joanna

Co-Sponsored by FTI & SCI

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www.fwlsc.org

FWLSC is a non-profit grassroots organization founded to educate, & to promote & support all aspects of Metroplex Life Sciences. Informative and Interesting programs in a jazz club setting.

Around the Area

UT Dallas

Draper

Professor **Rockford K. Draper**, Associate Professor **Paul Pantano**, and Research Scientist **Ruhung Wang** received a three-year award from the Semiconductor Research Corporation to study the *Bioaccumulation, Biopersistence, and Toxicity of CMP Nanoparticles in Mammalian and Aquatic Organisms*.

Pantano

The book is based on the symposium of the same name that Dr. Strom and co-organizer Dr. Jeff Seeman arranged for last Spring's ACS national meeting in Dallas. Book chapters are being written by past Norris Award winners Ron Breslow (Columbia), Ned Arnett (Duke), Paul Schleyer (Georgia), Andy Streitwieser (UC-Berkeley), Ken Wiberg (Yale), Wes Borden (UNT), and Keith Ingold (NRC-Canada), with an introductory chapter on James Flack Norris written by Art Greenberg (University of New Hampshire). It is expected that the book will issue in the second half of 2015

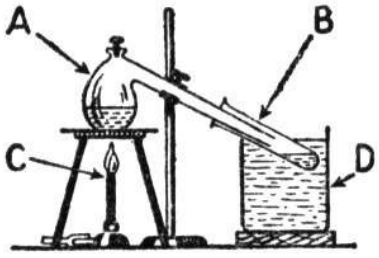
UT Arlington

Professor **Kevin Schug** has been named by Analytical Scientist magazine to their 2014 Top 40 under 40 Power List. He also has been invited and accepted an invitation to be on the Analytical Advisory Board for the Journal of the American Society for Mass Spectrometry.

Emeritus Professor **Martin Pomerantz** has become a member of the National Academy of Inventors.

Dr. **E. Thomas Strom** is a co-editor for the upcoming ACS Symposium Book titled "Fifty Years of the James Flack Norris Award. The Foundations of Physical Organic Chemistry." His co-editor is Dr. Vera Mainz of the University of Illinois.

Send your seminar schedules for the semester or the year to the RETORT.



A, retort; B, receiver; C, flame to heat retort; D, water to keep receiver cool.

TWU UNIVERSITY
Department of Chemistry and Biochemistry
P.O. Box 425859, Denton, TX 76204-5859

Fall 2014 Seminar Series

September 26
Dr. Smith T Powell
Berea College (Retired)
"Lives of stars and the evolution of the elements"

October 3
Dr. William E. Acree
University of North Texas
"TBD"

October 10
Dr. Susan Pedigo
University of Mississippi
"TBD"

October 17
Dr. Kayunta Johnson-Winters
University of Texas at Arlington
"TBD"

October 24
Dr. John J. Correia
University of Mississippi
"Hydrodynamic, Thermodynamic and Structural Characterization of Elastin-Like Peptides"

November 14
Dr. Matthew Auton
Mayo Clinic Division of Hematology Research
"TBD"

December 5
Dr. Joseph P. Emerson
Mississippi State University"
"TBD"

All seminars will be presented in 251 Ann Stuart Science Complex (ASSC) at 12:00 PM

UT DALLAS
The University of Texas at Dallas
CHEMISTRY

Date	Speaker	School
January 23	Dr Eduard Chekmenev	Vanderbilt University
January 30	Dr Donovan Haines	Sam Houston State University
February 6	Dr Wei Zhang	University of Colorado
February 13	Dr Ivan Aprahamian	Dartmouth
February 20	Dr Susan Kauzlarich	University of California Davis
February 27	Dr Wei Chen	University of Central Oklahoma
March 6	Dr Jose Gutierrez-Gonzales	University of Texas Pan American
March 13	Dr Richard Willson	University of Houston
March 27	Dr Saiful Chowdhury	University of Texas Arlington
April 6	Dr Ali Trabolsi	New York University Abu Dhabi
April 10	Dr. Warren Chan	University of Toronto
April 17	Dr Gang-Yu	University of California Davis
April 24	Dr Nathaniel Rosi	University of Pittsburgh
May 1	Dr Jennifer Irvin	Texas State University

800 West Campbell Rd. Richardson, TX Contact: gassensmith@utdallas.edu

FIVE QUESTIONS FOR…

Our November 5Q interviewee, **Kayla N. Green**, Assistant Professor in the TCU Department of Chemistry. Dr. Green contributes to ACS via her work as TCU Chemistry Club Sponsor (with Drs. Ben Janesko and Julie Fry) and Coordinator for Chemistry Connections at the Fort Worth Museum of Science and History with Cathy Barthelemy (FWMSH). As you know, each year NCW activities at the FWMSH reach many thousands of nascent chemists and their families.

1. How old were you when you realized you wanted to be a scientist?

Apparently quite young! My first grade drawing of myself regarding what I wanted to be when I grew up depicts me in pigtails behind a bench wearing a white lab coat with goggles and beakers. That is the earliest data point that I have.

2. A compound's ability to permeate the Blood-Brain Barrier (BBB) is crucial if it is to be efficacious in treating or preventing disease. What the most important aspect of the BBB to consider when developing neuroactive drugs?

I'd have to say that BBB permeability may or may not be crucial. There is growing evidence that peripheral conditions may lead to neurodegeneration as well. Nevertheless, BBB permeability is a key target to date, with Lipinski's Rules still providing an excellent guide to follow in therapeutic design.

3. Your impressive involvement in National Chemistry Week has resulted in activities that reached at least 10,000 people! What do you like most about volunteering for the ACS and promoting chemistry?

I really enjoy seeing our young volunteers gain confidence in communicating their knowledge to the younger audiences. These students leave the volunteer activities with a new skillset and a deeper understanding of what they have just taught others. Helping them learn to communicate science to the general public is very rewarding.

4. What is your favorite part of your career in science? And what do you like least?

Favorite: Observing my research students mature to the point where they work out problems completely independently and continue to thrive from there. I've got a wonderful group and it is very rewarding.

Least: Grading papers. Well, I can't say that really…I like seeing my students improve through the semester there too. Maybe the time it takes to grade papers.

5. Who is your Science Hero and why?

I have two. My dad, Howard Nance, taught General Chemistry and other courses at Tarleton for many years. He is a great teacher, and I really hope to be able to make chemistry relatable to my students in the way that he did. I have always admired the endurance and drive that Lise Meitner approached her research with. She was in it for the right reasons.

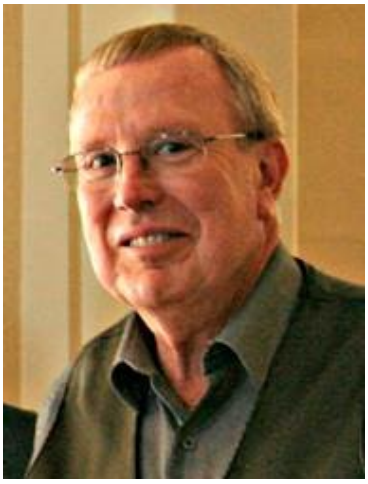
Thank you, Dr. Green, for your interesting comments, and thank you for your amazing National Chemistry Weeks.

Editor's notes:

From a press release from TSU in 2009:

Chemical Society endows scholarship in honor of former adviser and professor

The Tarleton State University Chemical Society recently donated $10,000 to establish an endowed scholarship in honor of **Howard Nance**, former faculty member and longtime society adviser.



The Howard Nance Chemical Society Scholarship will be awarded to a College of Science and Technology student with first preference given to chemistry majors and secondary preference to chemistry minors.

In attendance at a ceremonial gift agreement signing on May 1 were Nance and his wife, Kathy, of Tolar, Tarleton State University Foundation, Inc. Vice President Nancy Allen and Tarleton President F. Dominic Dottavio.

Nance was the sponsor of the Chemistry Club for more than 30 years. Under his leadership, the club was named outstanding or commendable club numerous times. Nance also was named a recipient of the outstanding teaching award while on faculty at Tarleton.

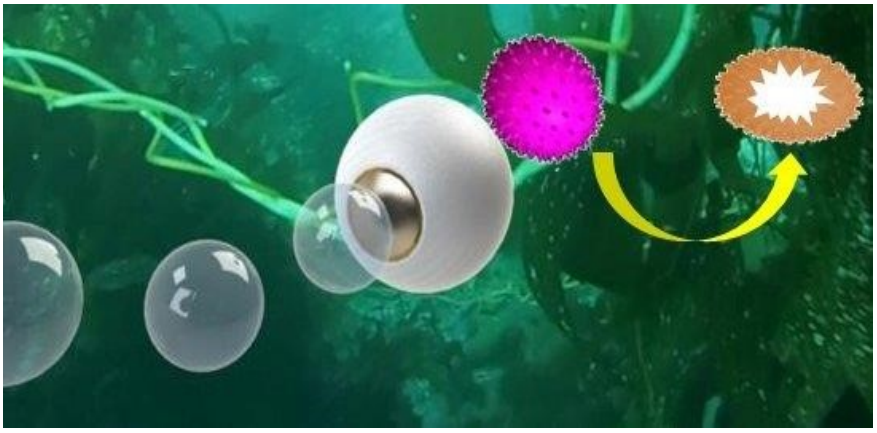
From Wikipedia:

Lise Meitner (1878-1968) was an Austrian physicist who worked in the area of radioactivity and nuclear physics. Meitner was part of the team that discovered nuclear fission, an achievement for which her colleague Otto Hahn was awarded the Nobel Prize. Meitner is often mentioned as one of the most glaring examples of women's scientific achievement overlooked by the Nobel committee. A 1997 ***Physics Today*** study concluded that Meitner's omission was "a rare instance in which personal negative opinions apparently led to the exclusion of a deserving scientist" from the Nobel. Element 109, meitnerium, is named in her honour. Meitner studied physics and became the second woman to obtain a doctoral degree in physics at the University of Vienna in 1905; her dissertation was on *Heat conduction in an inhomogeneous body*. Women were not allowed to attend public institutions of higher education, but Meitner was able to achieve a private education in physics in part because of her supportive parents, and she completed in 1901 with an *externe Matura* examination at the Akademisches Gymnasium. In 1926, Meitner became the first woman in Germany to assume a post of full professor in physics, at the University of Berlin. There she undertook the research program in nuclear physics which eventually led to her co-discovery of nuclear fission in 1939, after she had left Berlin. She was praised by Albert Einstein as the "German Marie Curie".

Microrockets fueled by water neutralize chemical and biological warfare agents

Water-Driven Micromotors for Rapid Photocatalytic Degradation of Biological and Chemical Warfare Agents"
ACS Nano

With fears growing over chemical and biological weapons falling into the wrong hands, scientists are developing microrockets to fight back against these dangerous agents, should the need arise. In the journal ACS Nano, they describe new spherical micromotors that rapidly neutralize chemical and biological agents and use water as fuel.



Joseph Wang and colleagues point out that titanium dioxide is one of the most promising materials available for degrading chemical and biological warfare agents. It doesn't require harsh chemicals or result in toxic by-products. Current approaches using titanium dioxide, however, require that it be mixed in whatever solution that needs to be decontaminated. But there's no way to actively mix titanium dioxide in waterways if chemical and biological agents are released into the environment. So scientists have been working on ways to propel titanium dioxide around to accelerate the decontamination process without the need for active stirring. But approaches so far have required fuel and other compounds that hinder neutralization. Wang's team wanted to fix this problem.

To give titanium dioxide a source of thrust, the researchers coated it over a magnesium sphere core. When put in a watery environment, a single hole in the shell allows water to enter and react with the magnesium core. This produces hydrogen gas, which bubbles out and propels the titanium dioxide through the surrounding liquid. This enables it to more efficiently and rapidly contact and degrade harmful agents. When tested, the micromotors successfully neutralized nerve agents and anthrax-like bacteria in considerably less time compared to titanium dioxide microparticles that aren't propelled.

The authors acknowledge funding from

From the editor

With over 4500 visitors, that was quite a successful and fun National Chemistry Week event at the Fort Worth Museum of Science and History!

And, now , after that comes SWRM 2014! You may have noticed that this month's issue is loaded with SWRM stuff. It's the place to be in November; see you there.

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