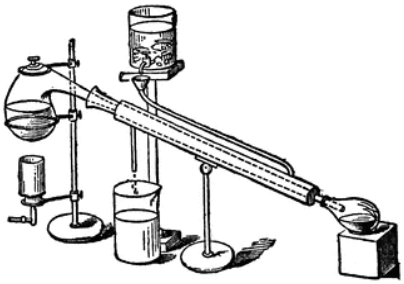
SOUTHWEST RETORT



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and Chemistry in this area

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Contact the DFW Section

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candidates@acsdfw.org

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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.

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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.

Job Title: **Field Sales Specialist — Analytical and Process Sales**
Location: Dallas area

Summary: The successful candidate will be responsible for direct sales for both the Analytical and Process business units. Candidate must be willing to seek out and establish relationships with prospects in the chemical, general food, meat, dairy, university, and testing lab industries in order to obtain orders for CEM equipment. Territory to include: TX, OK, NM

Responsibilities: Prospecting, closing, developing markets, providing installations and operator training as well any other duties as defined to promote sales, grow the territory and achieve the territory goals on an annual basis.

Requirements: BS degree in Chemistry, Biochemistry, Pharmacy, Biology or related science
2-5 years prior sales experience in a related industry (or lab experience)
Ability to travel up 70% with overnight stays
Proven direct sales experience preferably into the above industries
Strong work ethic
Excellent communication skills
Microsoft Office and/or other computer software package aptitude
Salesforce.com training a plus

Salary: Base salary will be paid based upon market rates, experience, education and achievements.

Other: Expenses remunerated via CEM policy. Company car and employee benefits package (medical/dental/flexspending/401k/ProfitSharing).

Please forward your resume to **Greg.Barlow@cem.com**. Click the logo or the button for more information.

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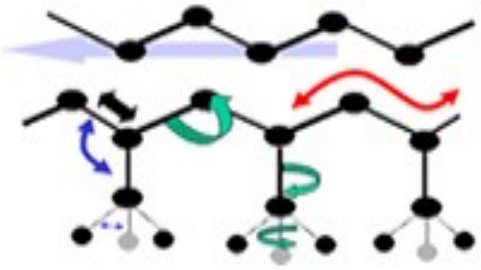

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FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The student affiliate chapter at East Texas State College in Commerce, TX, has been selected as outstanding by the ACS Council Committee on Chemical Education. The Faculty Sponsor for the chapter is Dr. Stephen L. Razniak.

News items from the Southeastern Texas ACS Section include the following: Organic chemist Dr. Ernst Bayer of the University of Tubingen will be a visiting professor at the University of Houston during the spring semester. President Kenneth Pitzer of Rice University announced a number of faculty appointments. Those involving the chemical sciences include Professor Friedrich Horn, formerly of the University of London, in chemical engineering, Assistant Professor Dr. Philip Brooks in chemistry, and assistant professor Dr. Gary Fisher in chemical engineering.

A meeting of chemistry heads from the Southwestern and Intermountain regions was held at Texas Tech on Oct. 9. A new member of the staff at Eastern New Mexico University is Dr. William Burg. Dr. H. Hecht of Texas Tech attended the Varian ESR and NMR workshop in Palo Alto in October. Dr. Hecht will be spending a nine months leave of absence next year at the CSIRO in Melbourne, Australia. Texas Tech architects are now working on the design for the new Chemical Research Building.

In the Central Texas Section Drs. M. J. S. Dewar and Rowland Pettit presented invited papers at the ACS Southeastern Regional Meeting. Vice Chancellor Norman Hackerman gave a talk at the Schenectady laboratories of General Electric.

Dr. Bruno J. Zwolinski of the Texas A&M Chemical Thermodynamics Properties Center attended a meeting in Washington, D.C., of the National Academy of Science-National Research Council committee, which evaluates applications for NATO postdoctoral fellowships. Dr. Zwolinski and Dr. R. C. Wilhoit and Dr. Alfred Danti attended the Welch Conference on Biochemistry held in Houston Nov. 16-18.

The alumni and faculty of the University of Arkansas chemistry department had an informal luncheon Dec. 4 at the ACS Southwest Regional Meeting in Shreveport.

Contributed by

E. Thomas Strom

Solar Power Electric Plants: Current Status
by
John E. Spessard, PhD, PE

There are two kinds of solar powered electric plants. One is photo-voltaic (PV) where sunlight strikes an electricity generating panel providing DC electricity. The second kind is solar thermal power (STP) where mirrors concentrate the sun's radiation at a point (trough). The trough contains a working fluid such as superheated water or molten salts. The heat generates steam which generates electricity as in a conventional power plant. The decreasing cost and the increased efficiency of new solar panels has made the PV plant the preferred choice.

The Agua Caliente Power Plant is a PV type. It started up on April 30, 2014. I have found no information on how well it is operating but some start-up issues would be expected and would not indicate any defects in the design. The plant is rated at 290 megawatts and it sits on 2,400 acres (3.75 square miles and 8.27 acres per megawatt) located between Yuma and Phoenix, AZ, in the desert. The plant was built with a $967 million DOE guaranteed loan ($3.33 million per megawatt).

Agua Caliente Power Plant

The Ivanpath Dry Lake, California, plant is on the Mojave Desert and is rated at 392 megawatts. This plant uses the STP technology. The previous largest STP plant was a 20 megawatt facility in Spain. Thus, this plant violates the proven technology criteria of having previously been done on this scale and in this country. The plant cost $2.2 billion ($5.6 million per megawatt) and was financed by $1.6 billion DOE loan guarantees. The site occupies 4,000 acres of public land (10.2 acres per megawatt). The plant began operations at the end of 2013. The plant has consistently failed to produce electricity at anything approaching the design production rate.

Ivanpath Dry Lake plant

The plant uses molten salts as the heat transfer medium. To facilitate operations, the plant uses natural gas to heat the molten salt (just before dawn) so that the plant will be operating when the sun rises. The gas-

fired boilers are operating at about 4.5 hours per day rather than the design objective of one hour per day.

Another problem is when birds have flown into the high energy concentrated sunlight while pursuing their diet of insects, the birds fall to earth in flames. The plant operators do not consider this to be a major problem.

For electric power plants, there are two criteria that determine the cost of electricity production. The first is the capital cost per megawatt of rated capacity. The second is the fraction of the time the plant is operating. A coal or natural gas-fired power plant can run at night and is considered by the Federal Energy Information Authority (EIA) to be available 85% of the time. A nuclear plant is considered to have 90% availability. The difference between 100% and the rated capacity is due to scheduled shutdowns for maintenance and unscheduled outages.

For wind, the EIA estimates a 35% capacity factor (no wind no electricity). For solar plants the EIA estimate is 25%. Nothing is generated at night. Clouds and rain reduce the output. For Agua Caliente, the operator's estimate is 22%. For Ivanpath, the operator's estimate is 31% capacity. Neither has been achieved.

The Federal Energy Information Authority (FIA) has provided capital cost estimates for several types of electric power plants. The methodology is consistent and by dividing the capital cost in millions of dollars per megawatt, valid cost comparisons can be made.

For dual coal-fired plants with advanced pollution control, it is $2.934 million divided by 0.85 or $3.452 million per megawatt. For natural gas with advanced combustion control, it is $1.023 million divided by 0.85 or $1.024 million per megawatt. For PV solar it is $3.873 million divided by 0.22 or $17.60 million per megawatt. For STP solar it is $5.067 million divided by 0.32 or $15.83 million per megawatt. Historic costs for Agua Caliente are 3.3 million divided by 0.22 or $15 million per megawatt. For Ivanpath it is $5.6 million divided by 0.32 or $17.7 million per megawatt. Neither plant is operating at the design production rate. The solar plants have no fuel costs which off-sets some of the higher actual capital costs.

All of the solar plants have been located in the desert southwest. There is plenty of government owned land available and the solar strength is about seven kilowatt hours per square meter per day. That is the highest solar intensity in the United States. In Illinois the solar intensity would be about 4.3 kilowatt hours per square meter per day. In Maine it would be about 3.3 kilowatt hours per square meter per day. Lower solar intensities would require more solar gathering power. This would increase the capital cost and the land requirements. Outside of the desert southwest wind electricity could be cheaper. Most of Germany lies north of the 50th parallel. Much of the U.S. Canadian border is at the 49th parallel. A German said

Solar power plant in Andalusia, Spain

"Solar electricity in Germany is like growing pineapples in Alaska."

Solar electric power plants require more land. For Agua Caliente, the plant sits on 2,400 acres (3.75 square miles) or 8.27 acres per megawatt. The Ivanpath plant sits on 4,000 acres (6.25 square miles) or 10.3 acres per megawatt. For lower solar intensities more land would be required. A wind farm also requires much land but the land adjoining the wind turbines can be simultaneously used for grazing and agriculture. Light gathering apparatus will occupy most of the solar plant land. Entergy's Arkansas Nuclear One Station generates 1,800 megawatts on an 1100 acre site (0.61 acres per megawatt). Estimated land requirements for a 200 megawatt natural gas powered electric plant in Alaska was 2.5 acres.

Nuclear One Station, Russellville, AR

Solar power is being used in homes in increasing quantities. In the simplest form, it can be used to heat water to provide heating and hot water. In a more advanced form, solar panels can be used to provide some of the electricity used in the home. Auxiliary electricity from the grid is needed at night and possibly during cloudy or rainy or cold weather. Often the utility is required to buy electricity from the homeowner at or near the price paid by the homeowner.

Tax considerations make investing in solar electricity more practical. First 30% of the cost of the facility can be deducted from your federal income tax. This is not an authorized deduction. It is a reduction of taxes due. Utilities are often required to by states and localities to have a part of their electric output be "green energy." As long as this requirement exists, it makes sense for the utility to buy electricity from the homeowner. However, the utility has to maintain an electric grid, power lines, transmission stations, etc. The utility has to bear this cost with no contribution from the homeowner's electric power sales even though the homeowner also needs the grid. Therefore, the utility is beginning to try to charge the solar electric panel owner for grid maintenance. How this will play out remains to be seen. An estimated time for solar panels to pay for themselves is about ten years. How long will any of us stay in one place?

I have maintained in these columns that energy storage is the most needed cure. In the November 8, 2014, *Dallas Morning News*, Oncor announced that they were going to set up storage batteries to save electricity for when it is needed. Oncor has contacted Tesla Motors about producing utility scale batteries. If successful, this would make electric and wind electricity more practical. It would also reduce pollution from coal-fired power plants. Older, less efficient plants could be retired. Existing plants could be run full out at night when pollution generation is less of a problem. This would also make their operation more efficient in that more hours of generation between shutdowns would be achievable. (The plant would not have to be as much on spinning reserve when it was running but not generating any electricity.) There would also be less need for lower efficiency peaking units for situations like a hot summer afternoon.

...And Another Thing…

by Denise L. Merkle, PhD

Musings on an Information Age

One may not have experienced them, but one should take my word that post-SWRM days give rise to contemplation of *Why did I do that?* which leads to ponderings like *Is the DFW Local Section really so valuable that it's worth all that time and energy?* and *Is the local section so crucial to the Region and the Region so important to the Society that such massive volunteer effort is warranted?* Thousands of hours are donated to a SWRM, and therefore to the local sections, which are part of the Region, and...

What are these Regions and Local Sections (LS) and Divisions? What is the American Chemical Society? Maybe it would be helpful to read a summary on *Who Are We and How Did We Get Here?* And here is where the article veers from what it was supposed to be, because, if one wants this information from www.acs.org —one cannot get it. I tried. It's possible to find that there are187 (or is it 186?) Local Sections. Which are they, exactly? I still don't know. Those with websites are cited, but there's not just a list—or an easily accessible list. The ACS divided the USA into geographical Regions, the names of which are? And they include which LS? Hmm. Those data are not easy to find, either, even if you are someone who very nicely answers the phone at ACS National and helpfully searches acs.org to assist a member. ACS is comprised of Technical Divisions, to allow members to focus on their interests and expertise. The link to the divisions is on the ACS website and takes only two clicks, as long as one associates Science with 'Memberships and Networks'. Not too bad, but still...

What is the point of all this? you may ask. The point is this: the magnitude of information available to the world is absolutely mind-boggling—and we need to be sure we evolve a way to determine what is important and what is not. We can know such things as the number of organelles in a cell or chromosomes specific to a particular creature. Or we can know how to join and leave organizations, what the board decided at its last meeting, when to attend conferences, and how to nominate others for awards—but that doesn't help if meeting minutes and nomination forms aren't what's sought. Why cloud the info stream with organelles and chromosomes if what's needed is a bactericide effective against the organism? And who would join an organization without first discovering, for example, that it never meets near work?

How do we decide what we need to know? Or who needs to know? Who? What? Where? When? How? Why? Hmm. And this is how an article intended to summarize the impact of Regional Meetings on their Hosting Local Sections morphs into musings on information and how it is gleaned from all the other data —or how it's not.

From the ACS Press Room

Discarded cigarette ashes could go to good use — removing arsenic from water

"Synthesis of Alumina-Modified Cigarette Soot Carbon as an Adsorbent for Efficient Arsenate Removal"
Industrial & Engineering Chemistry Research

Arsenic, a well-known poison, can be taken out of drinking water using sophisticated treatment methods. But in places that lack the equipment or technical know-how required to remove it, it still laces drinking water and makes people sick. To tackle this problem, scientists have come up with a new low-cost, simple way to remove arsenic using leftovers from another known health threat — cigarettes. They report their method in ACS' journal *Industrial & Engineering Chemistry Research*.

Jiaxing Li and colleagues explain that naturally occurring and industry-related arsenic contaminates groundwater at high levels in many countries, including Chile, China, Hungary and Mexico. The odorless, tasteless element can cause skin discoloration, stomach pain, partial paralysis and a range of other serious health problems. While the technology for removing arsenic from water exists and is in widespread use in industrialized areas, it is expensive and impractical for rural and developing regions. Scientists have been exploring the use of natural waste materials such as banana peels and rice hulls for removing arsenic from water, but these so far have shown limited efficiency. Recognizing that the porous structure of cigarette ash could be better suited to this purpose, Li's team decided to test it.

In a simple, inexpensive, one-step method, the researchers prepared cigarette ash with a coating of aluminum oxide. When they tested the material with contaminated ground water, they found it removed more than 96 percent of the arsenic, reducing its levels to below the standard set by the World Health Organization. Because cigarette ashes are discarded in countries around the world and can be easily collected in places where public smoking is allowed, it could be part of a low-cost solution for a serious public health issue, they say.

The authors acknowledge funding from the National Natural Science Foundation of China and Hefei Center for Physical Science and Technology.

ACS DFW Local Section Activity
January 17, 2015
Dallas Stars Hockey Game

The Dallas-Fort Worth Local Section of the ACS invites you, your family, and your colleagues to our January group outing on Saturday, January 17, 2015. The section has reserved a block of terrace tickets at a discounted price to watch the Dallas Stars take on Alex Ovechkin and the Washington Capitals! The game starts at 7:00 PM but come a bit early as the American Airlines Center is conveniently located in Victory Park near the historic West End neighborhood filled with shops and great restaurants. Begin the new year with local friends and family enjoying some exciting and action-packed hockey.

Meeting Date: Saturday, January 17, 2015.

Meeting Times: 7:00 PM until approximately 9:30 PM

For more information and to **RSVP** please follow the link: **http://bit.ly/1zcY5du**

Deadline for RSVP: Friday, January 2, 2015

Location: American Airlines Center, 2500 Victory Ave, Dallas, Texas

Parking Directions

The American Airlines Center is easily accessible from the TRE and the DART (orange and green lines); if you chose to drive, $10 parking is available at the Perot Museum, which is a short walk from American Airlines Center.

Ticket Price: $15 (a $30 value) per ticket paid for online by PayPal. $17 per ticket paid for in person; if you chose to pay in person, arrangements will be made with chair-elect, Shana Santos to collect the money during the first period of the game. Tickets will be distributed via email. Please be sure that the email that you provide is correct as this is our only means to distribute the electronic ticket. You will have to print out the ticket and present it at the arena. **EVERYONE MUST RSVP. THERE WILL BE NO TICKETS AVAILABLE FOR OUR GROUP AT THE DOOR.** Please RSVP as soon as possible; the sooner the RSVPs are submitted, the better chance we will have to all sit in close proximity as one group.

Payment by credit card will be available online in advance, but only cash or check will be accepted at the game. 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 reservations made but not used.

As always, if you have any questions, 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!!

No section meeting in December

From the ACS Press Room

As winter approaches, switching to cleaner heating oils could prevent health problems

"The Public Health Benefits of Reducing Fine Particulate Matter through Conversion to Cleaner Heating Fuels in New York City
Environmental Science & Technology

With temperatures dipping, homeowners are firing up their heaters. But systems that require heating oil release fine particles outside that could have harmful health effects. Regulations to curb these emissions in New York City, however, could save hundreds of lives, a new study has found. The report in the ACS journal *Environmental Science & Technology* may have ramifications for the entire northeast, the country's largest consumer of heating oil.

Iyad Kheirbek and colleagues note that when some people breathe in fine particulate matter from the air, they suffer from increased airway inflammation, reduced lung function and changes in heart rhythm and blood pressure. In New York City alone, this type of air pollution has been linked to more than 2,000 premature deaths, close to 5,000 emergency room visits for asthma and 1,500 hospitalizations for respiratory and cardiovascular disease each year. To address the problem, the city and New York state have put in place a multi-year plan to dramatically lower fine particulate matter from heating oil emissions by mandating a switch to cleaner oils. Other northeast states are set to follow suit. Kheirbek's team wanted to see what effects the new regulations might have.

The researchers used a computer model to analyze partial and complete phase-outs of various heating oils. They estimated that in New York City, a complete phase-out could prevent about 290 premature deaths, 180 hospital admissions for respiratory and cardiovascular disease and 550 emergency room visits for asthma each year. They also found that emissions reductions could benefit residents of high-poverty neighborhoods the most.

The authors acknowledge funding from New York City.

Fruit flies like beer

Your beer may attract annoying fruit flies, but listen up before you give them a swat. Researchers found the yeast cells in beer are producing odor compounds — acetate esters — that lure flies and that could lead to the best beer you haven't even tasted yet. This week's *Speaking of Chemistry* explains why. Check it out at **http://youtu.be/HQNlGuZvCvA**.

From the ACS Press Room

Can eating blueberries really help you see better in the dark?

"Blueberry Effects on Dark Vision and Recovery after Photobleaching: Placebo-Controlled Crossover Studies"
Journal of Agricultural & Food Chemistry

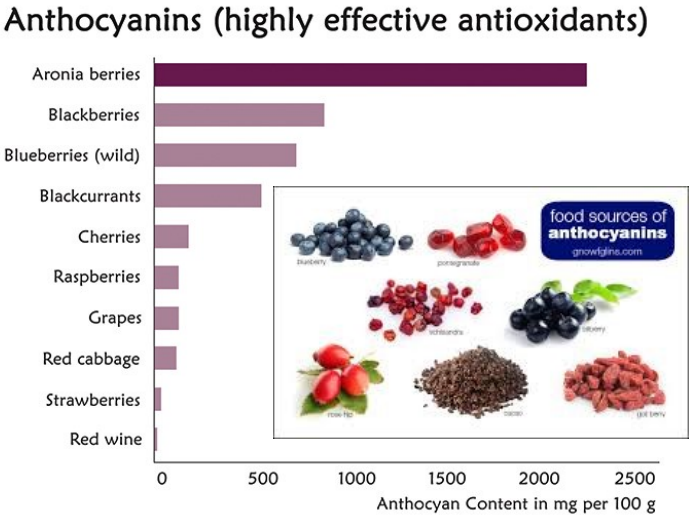
Blueberries are super stars among health food advocates, who tout the fruit for not only promoting heart health, better memory and digestion, but also for improving night vision. Scientists have taken a closer look at this latter claim and have found reason to doubt that the popular berry helps most healthy people see better in the dark. Their report appears in ACS' *Journal of Agricultural & Food Chemistry*.

Wilhelmina Kalt and colleagues note that studies published decades ago provided the first hints that blueberries might improve people's night vision. Later lab experiments appeared to shore up these early findings. For example, anthocyanins, which are pigment molecules in blueberries and other plants, encourage the regeneration of key molecules in the eye involved in perceiving light. But reviews of the earlier clinical research that tested the effect of blueberries on night vision in human subjects revealed that the studies were poorly controlled. Kalt's team wanted to revisit the matter with a new set of carefully designed experiments.

The researchers found that a blueberry-supplemented diet did not improve sight in the dark, but they did help subjects recover normal vision after exposure to a bright light. The enhancement, however, was small and not likely noticeable to most healthy people, the researchers concluded. But they added that anthocyanins might improve visual health among people who have existing eye disorders, though this remains to be demonstrated with well-designed studies.

The authors acknowledge funding from Agriculture & Agri-Food Canada and the U.S. Highbush Blueberry Council.

From JAFC 2006



Anthocyanins (phenols) are highly effective antioxidants. The comparison shows the prominent position of aronia berries compared to other berries.

Source: Journal of Agricultural and Food Chemistry 2006

Around the Area

Texas Woman's University

KEM club (Kappa Epsilon Mu) is the student organization for the Department of Chemistry and Biochemistry at Texas Woman's University, and is the local student section of the American Chemical Society. The American Chemical Society Committee on Education selects Student chapters to receive special recognition on the basis of their programs and activities, as described in their chapter reports. Awards are classified as outstanding, commendable, and honorable mention. This year KEM Club received a commendable mention award from the American Chemical Society's Committee on Education for its activities conducted during the 2013-2014 academic year.

KEM club was also selected to receive a Green Chemistry Award for engaging undergraduate students in the principles of green chemistry:

http://www.acs.org/content/acs/en/funding-and-awards/awards/community/sachapter.html

University of Arkansas

NSF-EPSCoR Annual Conference, Little Rock, AR, Sept. 4, 2014:

Z. Ryan Tian made an oral presentation, *New Science in H_2O-to-H_2 Photolysis in Photoelectrochemical Cell (PEC).* This progress was recognized in the Conference as a broadly impacting breakthrough in 2013-2014 in both solar cell and artificial photosynthesis fields.

Posters:

Braden Henderson, Andrew Zhou, Simon Ang, Z. Ryan Tian, *Titanate Nano-Composite Electrode for Rechargeable Mg Ion Battery*. This new work was rated by Program Advisory Committee as the most interesting discovery due to its great potential to help Tesla Motors, the world leader in battery powered cars.

Huajun Zhou, Tyler F. Chism, Xiaodong Yang, Z. Ryan Tian, *Structure and function oriented multi-step nanosynthesis of arrayed hierarchical tree-like wide light-incidence-angle photocatalysts* .

Tyler Chism, Huajun Zhou, Z. Ryan Tian, *ZnO Nanostructures' new behavior in harvesting and converting solar-energy* .

Hulusi Turgut, Rachel Rogers, Cale White, Z. Ryan Tian, *Industry-viable graphene oxide based non-flammable, flexible, proton-conducting fuel cell membranes.*

Julie Stenken gave two invited talks.

In vivo Microdialysis Sampling for Biochemical Quantitation of the Foreign Body Reaction was presented September 30, 2014, at the SciX Meeting in Reno, NV.

In vivo Microdialysis Sampling of Cytokines in Subcutaneous Tissue and Brain- was presented October 28, 2014, at UT Austin in the Department of Pharmacology Seminar.

Julie Stenken served on an NIH Biomaterials and Biointerface (BMBI) study section Oct 1-3, Annapolis, MD.
Nan Zheng gave a talk, *The Chemistries of Amine Radical Cations Enabled by Visible Light Photoredox Catalysis*, at LSU on October 7, and the same talk at the University of Tulsa on October 20.
Pooja Bajwa presented a poster, *Multi-Shells vs. Gradient-alloyed Shells on Core Quantum Dots: Ensemble and Single Molecule Optical Properties* at the ***From Abstract to Contract*** poster session held Nov. 14 in Mullins Library. Co-authors are **Feng Gao, Benard Omogo**, and **Colin Heyes**.

Publications

Dongshan Wei and **Feng Wang**, *Graphene: A Partially Ordered Non-periodic Solid.* J. Chem. Phys. (in press).
L Feng, A Sharma, DF Muresanu, R Patnaik, ZR Tian, HS Sharma, *Nanowired Delivery of Mesenchymal Stem Cells (MSCs) Attenuates Pathophysiology of Spinal Cord Injury and Enhances Brain-Derived Neurotrophic Factor and Insulin-like Growth Factor-1 Concentrations in the Plasma and the Spinal Cord*. Cell Transplantation 2014, 23 (6), 769-770.
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Julie A. Stenken and **Andreas J. Poschenrieder**, *Bioanalytical Chemistry of Cytokines —A Review*. Analytica Chimia Acta, doi:10.1016/ .aca.2014.10.009.
Geoffrey D. Keeler, Jeannine M. Durdik, Julie A. Stenken, *Localized Delivery of Dexamethasone-21-Phosphate via Microdialysis Implants in Rat Induces M(GC) Macrophage Polarization and Alters CCL2 Concentrations*. Acta Biomaterialia, doi:10.106/ j.actbio.2014.10.022.
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Dongshan Wei and Feng Wang, *Graphene: A partially ordered non-periodic solid.* J. Chem. Phys. 2014, 141, 144701.

Recognition

Congratulations to Drs. **Colin Heyes** (tenured and promoted to Associate Professor), **Feng Wang** (tenured), and **Nan Zheng** (tenured and promoted to Associate Professor) in July 2014.
Paul Adams served on an NIH Study Section at the meeting held in San Francisco, CA, October 23-24. He was also awarded a Mini-Grant from the Protein Society to assist in sponsoring the November INBRE Conference. **Roger Koeppe** assisted with the application to the society.

In November 2014, **Tap OChem**, the iPhone animation app developed by **Neil Allison** and **Joseph Allison** for use by faculty and students outside of the classroom and faculty in the classroom, reached a milestone by being downloaded by students and instructors from a total of 50 countries. A presentation about Tap OChem will be given at the next American Chemical Society meeting.

ARKANSAS INBRE
IDeA Networks of Biomedical Research Excellence

2014 INBRE Conference a Success

The 2014 Arkansas NIH INBRE Conference featuring undergraduate research was hosted Nov. 7-8 in Fayetteville by the Departments of Chemistry/ Biochemistry, Biological Sciences and Physics. Rec- ord participation for the conference involved 477 registrants and 177 abstracts.

Invited faculty talks were presented by:
Dr. **Joel Funk**, Assistant Professor in the Biology Department at John Brown University, Siloam Springs, AR;
Dr. **Andres A. Caro**, Associate Professor in the Chemistry Department at Hendrix College, Conway, AR, and
Dr. **Joseph Herzog**, Visiting Assistant Professor in the Physics Dept. at the University of Arkansas, Fayetteville, AR.
The keynote speaker, Professor **Paul Selvin** of University of Illinois, captivated the audience with an animated presentation, *Your Body is Made of Trillions of Tiny Walking Molecular Motors*. Dr. Selvin addressed several ways to learn about biological mechanisms using the methods of single-molecule physics. To measure the tiny steps taken by motor proteins, the Selvin lab members have invented a new form of microscopy, Fluorescence Imaging with One Nanometer Accuracy ("FIONA"). Needing a partner, FIONA found SHREC — Single-molecule High Resolution Co-localization — which extends the technique.

From among 120 undergraduate presentations, the following awards were presented:

Physics

1st Place Oral—Avery Hill, UA-Fayetteville
2nd Place Oral—Gavin Hester, Missouri State University
1st Place Poster—Joshua Grant, Southern Arkansas University
2nd Place Poster—Lafayette DeRamus, UA-Little Rock

Biology

John Brown University
1st Place Oral—Mary-Kate Williams, UA –Little Rock
2nd Place Oral—Kelley Ballard, Ouachita Baptist University
1st Place Poster—Baronger Bieger, Ouachita Baptist University
2nd Place Poster—Luke DeYoung, John Brown University

Chemistry

1st Place Oral—T. Ryan Roger, University of Central Arkansas
2nd Place Oral—Lindsey Orgren, Hendrix College
1st Place Poster—Jennifer Rote, Rhodes College
2nd Place Poster—Hayden Pacl, UA-Fayetteville

Tentatively, the next Arkansas INBRE Conference is being planned for Nov. 6-7, 2015.

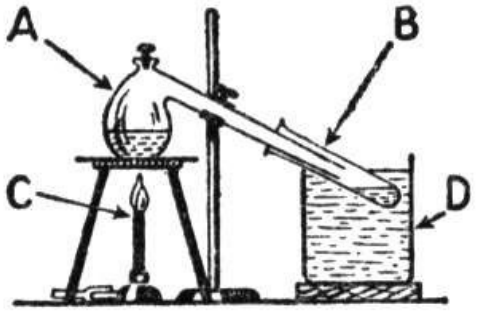
UT Arlington

Jenkins Garrett Professor of Chemistry **Purnendu (Sandy) Dasgupta** was named a Fellow of the Institute of Electrical and Electronics Engineers.

Kevin Schug participated in a forum in Bogota, Colombia, on *Questions and Answers about Fracking*. He presented water quality research done in Texas on the Barnett Shale. Kevin also organized and presided over a full-day session at the ACS Southwest Regional Meeting in Fort Worth on the topic *New Advances in Mass Spectrometry Research*. Also giving talks in the session from UTA were **Saiful Chowdhury** and **Zachary Breitbach**. Schug students who gave either oral or poster presentations in the general session were **Dananjaya Kalu Appulage, Ines Santos, Veronica Waybright,** and **Evelyn Wang**. Dr. **Li Li**, Shimadzu Institute Manager, gave a poster presentation at the meeting.

Dr. **E. Thomas Strom** gave an oral presentation at the regional meeting in the symposium *History of Chemistry in North Texas*. The symposium was organized by Dr. Strom and Dr. **Manfred Reinecke** of TCU, both of whom presided at the symposium.

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.

retort@acsdfw.org

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…

This month's '5Q' participant is **Frank M. Raushel**, Ph.D., Distinguished Professor of Chemistry, Texas A&M University and Recipient of the 2014 ACS Southwest Regional Award for meritorious contributions to the advancement of chemistry.

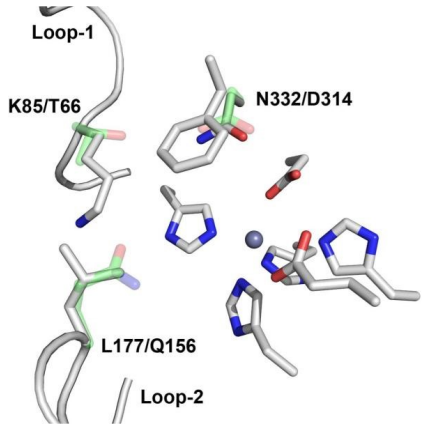
Dr. Raushel has been the Chair of the local ACS section in College Station, Secretary of the Division of Biological Chemistry and a member of the Executive Committee for the Division of Biological Chemistry. Dr. Raushel is currently a member of the Editorial Advisory Board for the ACS journal Biochemistry.

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

At the age of 10, I wanted to be an astronomer. However, since I was unable to identify any constellations other than Orion and the Big Dipper, I soon abandoned that ambition and began to think about chemistry. I had a Gilbert chemistry set as a youngster but the defining moment came in 11th grade when I took high school chemistry from Palmer K. Peterson at Cloquet High School in Minnesota. He was an outstanding teacher who had a boundless enthusiasm for teaching chemistry. As an undergraduate at St. Thomas College in St. Paul, Minnesota, I was lucky to take Organic Chemistry from Richard Morath. It was the best chemistry course that I have ever taken. Since there were only five students in the class, he announced on the first day that he was not going to lecture but that we would be expected to ask him questions for the entire hour. If we ran out of questions we would be sent to the board and he would then ask us questions.

2. Your studies of structures involved in enzyme function have led to the elucidation of numerous interesting and novel aspects of enzyme configuration. Have you discovered an enzyme characteristic which you feel will be most important in designing new, functional enzymes? If so, which is it?

I have been fascinated with enzymes for the last 40 years of my life. We started working with enzymes in an attempt to understand how they were capable of such large rate enhancements. We are now more interested in the discovery of new enzymes and taking existing enzymes and creating new enzymes with novel catalytic properties. The laboratory has made significant progress in the design of modified enzymes that are able to detect and degrade the chemical warfare agents sarin, soman, and VX.



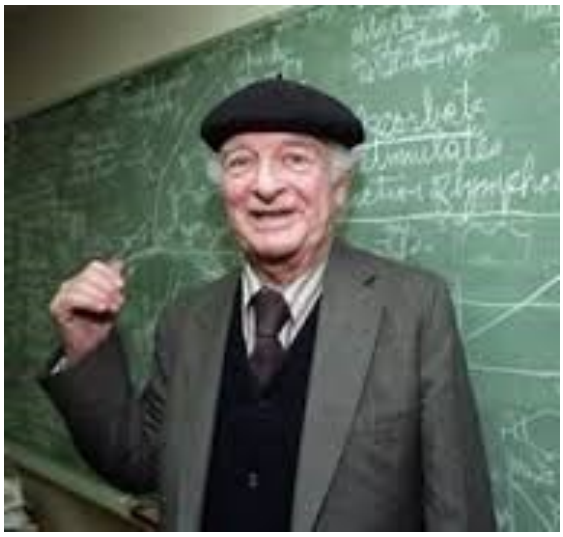
3. If you had the option to change one thing about your early career in science, what would it be?

I would have worked much harder at be-

coming a better public speaker.

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

The best part of my job is working with young students and helping them with their research projects. The worst part of my job is the never-ending quest for research funds that must be raised to ensure that there are sufficient resources for each project.

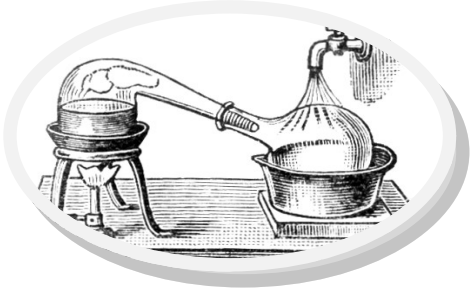


5. Who is your Science Hero? And why?

As an undergraduate student, I was most fascinated by Linus Pauling. He received the Nobel Prize in Chemistry in 1954 and the Peace Prize in 1962. His views on the stabilization of transition states for enzyme catalyzed reactions have been instrumental for the design of potent inhibitors and have enhanced our understanding of how enzymes actually function.

Thank you, Dr. Raushel, for participating in '5Q'! To be e-interviewed in 2015, please let us know via retort@acsdfw.org.

to send your articles, news items, and opinion pieces to the Southwest RETORT!



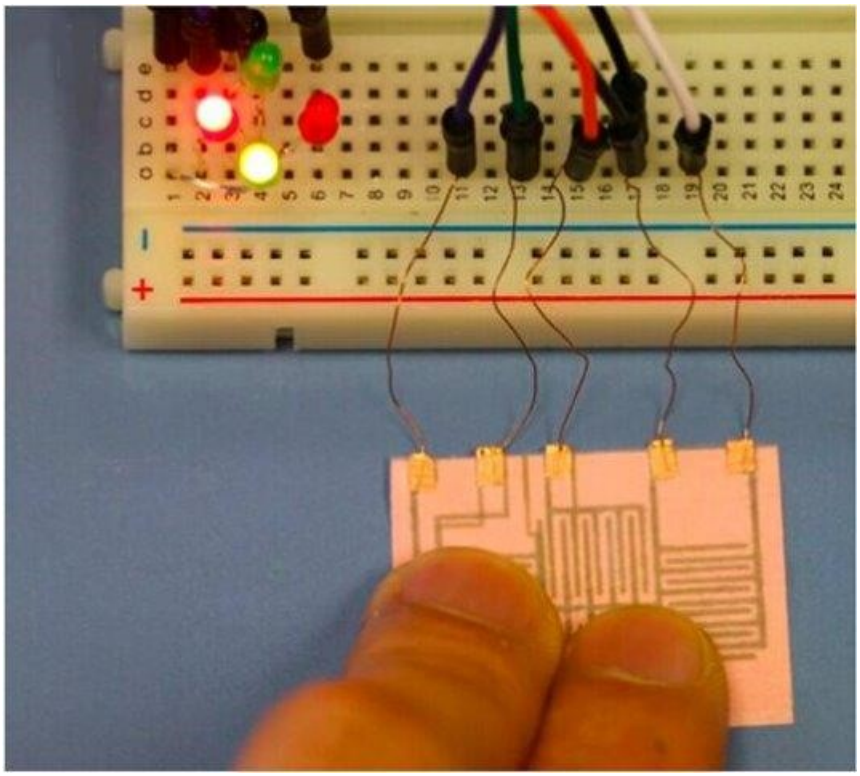
Click on the retort to access email.

From the ACS Press Room

Paper electronics could make health care more accessible

"Direct Writing on Paper of Foldable Capacitive Touch Pads with Silver Nanowire Inks"
ACS Applied Materials & Interfaces

Flexible electronic sensors based on paper — an inexpensive material — have the potential to cut the price of a wide range of medical tools, from helpful robots to diagnostic tests. Scientists have now developed a fast, low-cost way of making these sensors by directly printing conductive ink on paper. They published their advance in the journal ACS *Applied Materials & Interfaces.*



Anming Hu and colleagues point out that because paper is available worldwide at low cost, it makes an excellent surface for lightweight, foldable electronics that could be made and used nearly anywhere. Scientists have already fabricated paper-based point-of-care diagnostic tests and portable DNA detectors. But these require complicated and expensive manufacturing techniques. Silver nanowire ink, which is highly conductive and stable, offers a more practical solution. Hu's team wanted to develop a way to print it directly on paper to make a sensor that could respond to touch or specific molecules, such as glucose.

The researchers developed a system for printing a pattern of silver ink on paper within a few minutes and then hardening it with the light of a camera flash. The resulting device responded to touch even when curved, folded and unfolded 15 times, and rolled and unrolled 5,000 times. The team concluded their durable, lightweight sensor could serve as the basis for many useful applications.

From the editor

I hope you all enjoyed SWRM 2014; I didn't even get to go! A very nasty strep throat and laryngitis kept me away the entire week. Now, I'm not saying that *some* people wouldn't have been grateful for the laryngitis (mine, that is!), but what a week to get sick. I didn't even get to chair the session on sustainability, but I am sure that the audience and speakers enjoyed having Bob Landolt and his dulcet tones in charge.

Other than myself not being there, SWRM was a great success. We'll have the numbers after the first of the year. The December RETORT is generally a short issue, so we're saving the reviews and reports on SWRM until January, when everyone will have more time to read them.

Best wishes for the holidays and the New Year,

Best regards,
Connie