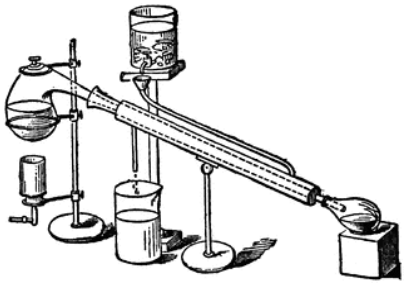
SOUTHWEST RETORT



SIXTY-EIGHTH YEAR **JANUARY 2016**

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

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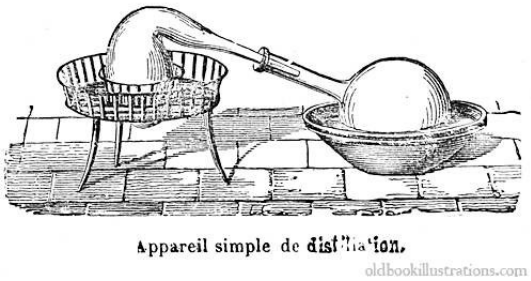

EMPLOYMENT CLEARING HOUSE

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-20150501

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.

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FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The January ACS tour speakers are **Professor Robert S. Hansen** from Iowa State University and **Professor Donald D. DeFord** of Northwestern University.

LSU has been awarded a $3,787,000 grant from NSF for the development of excellence in four departments on the campus: chemistry, physics, mathematics, and geology. From the Analytical Division of the Chemistry Department, **Dr. Philip West** was recently installed as President of the Analytical Division of IUPAC. He will serve as President through 1969, after which he will become Vice President for two years.

At Texas Woman's University (TWU) Welch grants were recently received by **Dr. L. R. Caswell,** $45,000 for three years; **Dr. Robert W. Higgins,** $12,000 for one year; and **Dr. L. C. Sams**, $36,000 for three years. TWU has received a $134,654 grant from the U.S. Office of Education for a biology-chemistry research building. Previously TWU had received an NSF grant of $130,625 for construction of that same building. Construction is planned to begin in February with completion by January, 1967. The building will consist of a basement and ground floor with a total of 23,464 square feet of floor space.

The following people were elected as officers of the Dallas-Ft. Worth ACS Section: Chairman, **William R. Foster**; Chairman-Elect, **Russell Walker**; Secretary, **Donald S. Wiggans**; Treasurer, **William H. Glaze**; Councilors, **Robert W. Higgins, Harold H. Jeskey.** The new officers of the Dallas Society of Analytical Chemists are Chief Analyst, **Morton Mason**; Assistant Chief Analyst, **Herb Belknap**; Recording Analyst, **Bob Crawford**; Statistical Analysist, **Charles Teer.**

At Baylor, two-year, $30,000 Welch grant renewals were received by **Thomas C. Franklin, James L. McAtee, Jr.,** and **A. G. Pinkus.** Baylor faculty members attending the Welch Conference on "Chemical Research on Organometallic Compounds" in November were **John S. Belew, T. J. Bond, Leone Cockerell, Thomas C. Franklin, James L. McAtee, Jr., A. G. Binkus, Charles E. Reeder,** and **Virgil Tweedie.**

Acting Head of the Texas A&M Chemistry Department **Dr. A. F. Isbell** recently made an inspection tour of the Maxwell Air Force Base in Montgomery, Alabama. He got his first ride in an Air Force jet. Recently he gave a seminar at the University of Arkansas and attended the ACS Southwest-Southeast Regional meeting in Memphis, where he presented a paper.

Compiled by E. Thomas Strom

SENCER

SCIENCE EDUCATION FOR NEW CIVIC ENGAGEMENTS AND RESPONSIBILITIES

SENCER Center for Innovation–Southwest
Spring 2016 Regional Symposium

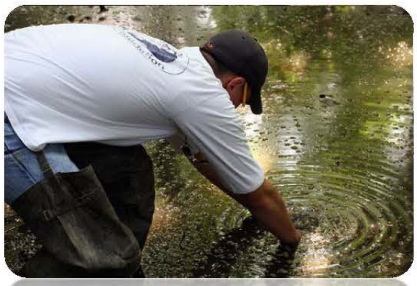
SAVE THE DATE:
Friday, January 29, 2016
9:00am-4:00pm

Expanding Civic Capacity:
Connecting learning to critical real-world issues through undergraduate research and sustainability education

This regional symposium focuses on use of SENCER* course design in two sessions:

- SENCER Ways of Undergraduate Research
- People, Planet, Profits: Multidisciplinary Trouble?

Such courses develop students' higher order thinking skills while providing experiential learning opportunities and community service.



Participants will

- See/hear applications of SENCER methods to a variety of undergraduate research topics
- Learn practical ways of assessing SENCER courses
- Gain expertise in teaching multidisciplinary topics
- Acquire new strategies to use in meeting teaching and learning objectives
- Network with experienced SENCER faculty from other disciplines/institutions

Texas Woman's University Department of Chemistry and Biochemistry facilitators include

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Nasrin Mirsaleh Kohan, Assistant Professor
Cynthia Maguire, Senior Lecturer
Richard D. Sheardy, Professor and Chair

Ann Stuart Science Complex
Texas Woman's University, Denton

*SENCER (supported by NSF) improves education and student learning by connecting classroom knowledge to critical real-world issues through civic engagement, and facilitates faculty expertise through symposia and workshops.

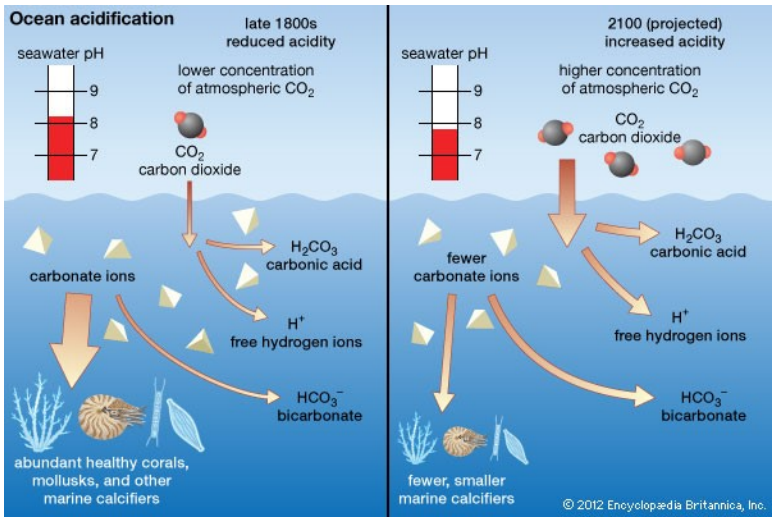
TWU
TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

Measuring the pH of Seawater

By

John E. Spessard, PhD, PE

It has been widely reported that the pH of sea water has increased by 0.1 pH units over the past 100 years. A question is how do you compare 0.1 pH units with the uncertainty in pH measurements? Recent work indicates that using spectrophotometric measurements and pH sensitive dyes, an accuracy of plus or minus 0.001 pH units is attainable. Using a pH sensitive electrode (glass electrode), an accuracy of plus or minus 0.003 pH units is attainable. However obtaining this level of accuracy is by no means straight forward. Great care is required. Sea water is a poorly buffered, nearly neutral solution where small changes in acidity provide relatively large changes in pH. It is by no means certain that pre-1989 pH measurements possess this level of accuracy. A PhD thesis by Jason F. Waters of the University of Miami (Florida) "Measurement of Seawater pH: A Theoretical and Analytical Investigation, December 5, 2012" provides an excellent summary of the required methods.



I have interest and experience in accurate pH measurements. At American Potash & Chemical Company, we were interested in the pH levels of polyborate species in Searles Lake Brines ranging from acidic (H_3BO_3) to basic ($NaBO_2$). This required titrations of boric acid with NaOH. For starters, all solutions including the base were made from freshly boiled distilled water. The NaOH was taken from a saturated NaOH solution (carbonate free). All solutions were kept in a 25° C oil bath. (No water evaporation to affect temperature. This was the desert.) We could not use a hydrogen electrode because the brine contained sulfides. Therefore we used the best pH meter available. The pH meter was calibrated with pH 4, pH 7, pH 10 and pH 12.454 (saturated $Ca(OH)_2$ solution) standards. We titrated boric acid solutions in NaCl, KCl, and CsCl media and compared the NaCl and KCl results with

published work before using Searles Lake brine. Three titrations of each solution were carried out and the pH's were averaged. The standard deviation of the pH measurements was plus or minus 0.012 pH units. We used a computer program developed by Lars Gunnar Sillen to calculate the levels of borates and polyborates. The work on the salt solutions but not Searles Lake brine was published (*J. Inorg. Nucl. Chem.* Vol. 32,2607-13 (1970)).

To compare sea water samples for present and past pH measurements, the samples needed to be taken in the same ocean, at the same temperature and not soon after a rain. For example, the salt level in the Baltic Sea is lower than that of the Atlantic Ocean. The samples would need to be handled and treated in the same manner and using the same analytical technique. Already this is possible but not easy. Due to bromide levels in sea water, a hydrogen electrode can't be used and a glass electrode is necessary.

The NOAA National Oceanographic Data Center (NODC) World Ocean Data Base has nearly 250,000 profiles. The data collected prior to 1989 are typically not well documented. The uncertainty of these pH measurements is unlikely to be less than 0.03 pH units and can be much more than 0.02 pH units.

Reasons for these uncertainties include: the samples were taken in situ and pH was measured at laboratory temperatures, calibration issues of the glass electrode such as the sea water having a higher ionic strength than the pH standard solutions, glass electrode drift, reference electrode drift and liquid junction issues. The present pH measurements are done using a 2-amino-2methyl-1,3-propane diol buffer in a synthetic sea water solution. All of the earlier pH measurements used a NBS style buffer with an ionic strength of 0.1 mole per kilogram. (We were not aware of that issue in my day.) The temperature corrections for the past and modern sea water temperatures can be more than 0.1 pH units. This creates problems when the observed result is a 0.1 pH unit increase.

Even sea water from the same ocean can be variable. Assmann, Frank and Kortinger (Ocean Sci.7.597-607, 2011) measured North Sea water on a six-day cruise from July 13-19, 2011. The pH ranged from 7.95 to 8.25. The temperature ranged from 15-21° C. The salinity ranged from 29-35 grams per liter. This complicates the problem of evaluating reported small pH changes.

The ocean pH studies that I found assumed that all pH changes were due to increased CO_2 levels. However, nitrogen and sulfur oxoacids are much stronger than carbonic acid. Close to the sea power plant emissions of SO_2, SO_3, and nitrogen oxides were ignored. Undersea volcanic eruptions such as those found in the Arctic Ocean and off the coast of Hawaii were ignored. Volcanic eruptions provide SO_2, HCl, HF and CO_2.(This action is building a new Hawaiian island that will break the surface in 10,000 or so years. It has already been named Loihi.)

The extrapolations of ever increasing oceanic CO_2 levels are based on uncertain earlier pH measurements, fairly reliable present CO_2 levels and possibly an additional reliable data point extrapolation into the future.

Carbon dioxide is introduced into the ocean by CO_2 dissolving in the ocean. Carbon dioxide is removed from the ocean by organisms such as coral and shellfish using it to build their structures. The CO_2 is taken from the ocean as aragonite, a metastable form of $CaCO_3$. The archaic course I took in chemical kinetics taught me that you must consider both the mechanism by which a species is generated and the mechanism by which it is transformed. I have difficulty understanding how increasing the supply of aqueous CO_2 increases acidity while it reduces the supply of aragonite. A simple calculation using the two ionization constants of carbonic acid shows that increased CO_2 levels does not change carbonate ion concentrations. The prevailing assumptions are that increased acidity diminishes available carbonate ions, even if the supply of available CO_2 increases. Frequently an increased food supply (CO_2) leads to a population increase. Thus higher CO_2 levels could increase the populations of marine organisms dependent on CO_2.

If you summarize the calculations: the first and second ionization constants of carbonic acid are 4.30 E-7 and 5.6 E-11, respectively. Considering the first ionization, hydrogen ion and bicarbonate ion levels are equal at 6.56 E-4 of the CO_2 levels. On the second ionization (the source of carbonate ions and assuming the acid produced by the second ionization is negligible), then bicarbonate ions still equal hydrogen ions, and the carbonate ion level is unchanged with an increase in CO_2 levels.

Send your seminar schedules for the semester or the year to the Southwest RETORT!

retort@acsdfw.org

SMU 26th Austin Symposium on Molecular Structure and Dynamics at Dallas, March 5-7, 2016 ASMD@D

Welcome To ASMD@D - The Somewhat Different Conference
http://smu.edu/austinsymposium/

The **26th Austin Symposium on Molecular Structure and Dynamics at Dallas (ASMD@D)** will be held at *Highland Dallas Curio Hotel* close to the SMU campus from **March 5-7, 2016.**

The ASMD@D 2016 will be organized in the spirit of previous symposia: Meet international experts – Listen and discuss – No parallel sessions – A place where important interdisciplinary work can start – A place where experimentalists and computational chemists can join forces - A place where graduate students and postdocs can create networks for their future academic career.

The conference theme will be **"New Developments in the Fields of Spectroscopic and Diffraction Methods for Structure Determination."**

Featured speakers

Professor Susan Dexheimer
Terahertz Spectroscopy

Professor Neil Hunt
Ultrafast 2D-IR

Professor Ralf Ludwig
In Situ-Spectroscopy

Professor Melanie Ohi
Cryo-EM

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Professor Marius Schmidt
Time-Resolved X-Ray

Professor John Spence
X-Ray Free-Electron Lasers

Professor Jürgen Gauss
Quantum Chemical Methods for Accurate Spectroscopic Data

(For the list of all confirmed speakers, please see: http://smu.edu/austinsymposium/speakers.html)

We hope to see you in March,
Professor Dieter Cremer
Chairs of the Organizing Committee of ASMD@D
Computational and Theoretical Chemistry Group (CATCO)
http://smu.edu/catco/, SMU, Dallas, Texas, USA

Professor Elfi Kraka

...And Another Thing…

by Denise L. Merkle, PhD

It's a new year! Yet another winter solstice orbited its way behind us (or in front of us, depending on one's world view). Among other harbingers of the future, 2016 and this latest month mean that it's time for another '...and Another Thing'. And the thing is, sometimes the selection of topic is blatantly obvious, and sometimes it's a struggle to pick only one from the smorgasbord of interesting options. Politics, resolutions, revolutions, advances in medicine, amusing stories, hideous lab accidents, fortuitous lab accidents, how to avoid lab accidents — and more— are all potential grist for the mill of composition. So, the issue is, where does one start?

And there, of course, is the issue for anything. Where does one start? Anyone who has ever planned an experiment knows that there are questions to be answered. On a really good day, there's an obvious solution to an obvious question; then that solution leads to other defined questions that yield more definitive-yet-inspirational answers, and before one knows it, voila!, *Nature, JACS* and *JBC* are clamoring for the resultant paper. Life works this way — Not. Systems' inherent complexity allows investigation of unlimited characteristics. Macro, micro, nano, intrinsic, extrinsic, destructive, non-destructive, optical, chemical, mechanical, animal, vegetable, mineral... and another list of options pops into being. How will one pick? How will one *know*?

Obviously, a lot of the knowledge of how to proceed has been learned. Since the scientist brain and the *need* to know appear to be established from birth, or at least in childhood, the knowledge is empirical as well as formally instilled. By the time scientists are working in lab, and especially if they're advising others in lab, the components of a well-planned experiment are as natural to them as breathing. If an important control is missing, it's missing. One knows it by looking. The knowledge just exists. Of course, this is the same for every field; those in which natural ability and curiosity are the base for the formal education, and those in which hard work and determination alone, led to the ability to select the right options.

What is the point of all this, you ask? The point is, while scientist-inventor-writer-whatevers might have to ponder topics and Just Pick One, For Petey's Sake!, the mixture of options that generates successful experiments and happy lives is really a serendipitous combination of heredity, environment, education, and knowledge. All those semi-random aspects give us choices that, if one knows enough and thinks enough, lead one straight to the answers that Yield More Questions. I love science —and options, and maybe I should have bought a Powerball ticket...

From the ACS Press Room

Devising an inexpensive, quick tuberculosis test for developing areas

Naked-Eye Colorimetric and Electrochemical Detection of Mycobacterium tuberculosis – towards Rapid Screening for Active Case Finding

ACS Sensors

Tuberculosis (TB) is a highly infectious disease and a major global health problem, especially in countries with developing health care systems. Because there is no fast, easy way to detect TB, the deadly infection can spread quickly through communities. Now, a team reports in *ACS Sensors* the development of a rapid, sensitive, and low-cost method for detecting the disease in resource-limited areas.

The typical way that physicians screen for TB, which is caused by the bacterium Mycobacterium tuberculosis (Mtb), is with a tuberculin skin test or an examination of a patient's sputum under a microscope. To weed out false positives, a more reliable test that involves growing Mtb cultures can be performed, but that requires weeks to complete. For all of these methods, experienced personnel are needed. Another approach that is both quick and accurate is a nucleic acid amplification test, which makes many copies of the Mtb DNA in a sample. However, it is expensive and requires a lab setting. So, Matt Trau, Nicholas P. West and colleagues set out to create a simple, inexpensive and reliable way to quickly test for TB.

The researchers began with a newly created nucleic acid amplification test that does not require expensive lab equipment to detect Mtb. Still, this modified test typically uses costly fluorescence technology to read the results. So the team substituted the fluorescence detector with a colorimetric assay that changes to a blue hue if the infection is present, allowing health care workers to identify positive test results right away with the naked eye. They demonstrated how the modified diagnostic could be put on cheap, disposable electrochemical sensors for increased sensitivity, even in the field. Because the assay is inexpensive, quick and highly specific for the Mtb bacterium, the researchers say it could have a big impact in low-resource communities.

The researchers acknowledge funding from the TB Sailors', Soldiers' & Airmen's Association of Queensland.

From the ACS Press Room

Toward roads that de-ice themselves

Gelation-Stabilized Functional Composite-Modified Bitumen for Anti-icing Purposes

Industrial & Engineering Chemistry Research

As winter approaches, stores, cities and homeowners are stocking up on salt, gravel and sand in anticipation of slippery roads. But this annual ritual in colder climates could soon become unnecessary. Researchers report in ACS' journal *Industrial & Engineering Chemistry Research* a new road material that could de-ice itself.

Every winter, when weather forecasters predict snow or icy conditions, local governments deploy trucks that dust roads with salt, sand or other chemical mixtures to help prevent ice build-up. Residents break out their own supply to keep their walkways and driveways from freezing over and becoming dangerously slick. But the de-icer doesn't stay on the streets for long. Melting snow and vehicles driving by wash or force it off, making re-application necessary. To break this cycle, Seda Kizilel and colleagues wanted to see if they could devise a way to ice-proof the road itself.

The researchers started with the salt potassium formate and combined it with the polymer styrene-butadiene-styrene. They added this mixture to bitumen, a major component of asphalt. The resulting material was just as sturdy as unmodified bitumen, and it significantly delayed ice formation in lab studies. The new composite released de-icing salt for two months in the lab, but the effects could last even longer when used on real roads, the researchers note. In that instance, the salt-polymer composite would be evenly embedded throughout the asphalt. Thus, as cars and trucks drive over and wear away the pavement, the salt could continually be released — potentially for years.

The authors acknowledge funding from Turkish Petroleum Refineries (TUPRAS).

From the ACS Press Room

Fish flavored cat food could contribute to feline hyperthyroidism

Organohalogen Compounds in Pet Dog and Cat: Do Pets Biotransform Natural Brominated Products in Food to Harmful Hydroxlated Substances?

Environmental Science & Technology

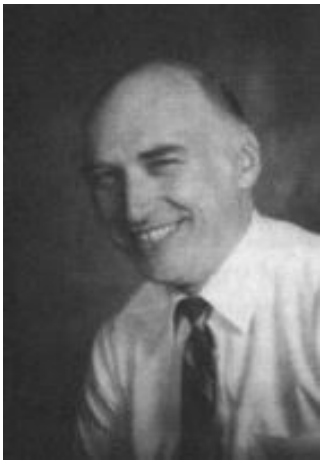
Over the past three decades, the number of cats diagnosed with hyperthyroidism has increased. According to research reports, many factors such as exposure to flame retardants could be responsible, and now a new study in ACS' journal *Environmental Science & Technology* points in another direction. It suggests that fish-flavored cat food could be among the culprits.

Hyperthyroidism is a hormonal disorder that can cause weight loss, hyperactivity, aggression, vomiting and other symptoms in cats. No one knows for sure what causes it. But some studies have suggested a connection between environmental pollutants including polychlorinated biphenyls (PCBs) and polybrominated diphenyl ethers (PBDEs), which have been banned in many countries because they could potentially harm humans. Previous studies have detected these compounds and their byproducts in blood samples from cats. But the byproducts, which can also have toxic effects, could come naturally from other sources such as fish, a common ingredient in cat food. Hazuki Mizukawa, Kei Nomiyama and colleagues wanted to investigate whether cats were getting exposed from their fish-flavored food.

The researchers tested cat food and blood samples from cats. They also simulated how a feline's body would process various PCB- and PBDE-related compounds. Based on their results, the team concluded that the byproducts that were detected at high levels in cats' blood samples likely came from fish-flavored food and not exposure to PCBs or PBDEs. The researchers say further work is needed to clarify whether these metabolites specifically contribute to hyperthyroidism.

The authors acknowledge funding from the Japan Society for the Promotion of Science.

George Hague Memorial Travel Award



The National Mole Day Foundation, NMDF, was created with the intention to get everyone, especially students, enthused about chemistry. The NMDF supports many different avenues for instructors to generate enthusiasm among themselves and their students. The biennial ChemEd conference is an outstanding resource for teachers.

George Hague was a Board member of the NMDF and a strong supporter of Chemical Education. George passed away in the summer of 2002 and this travel award is established to financially support a young chemistry instructor in attending a ChemEd conference as a tribute to George Hague and all he meant to chemical education. A maximum of three grants may be awarded.

Purpose: To offer financial support for a young Chemistry instructor to attend the ChemEd conference the year of this award.

Award Amount: Not to exceed $750 U.S. funds.

Deadline: Postmark by March 1, 2016 (To attend ChemEd2016)

Eligibility: Any Chemistry Instructor that is a member of the NMDF with 2-6 years of Chemistry teaching experience and has never attended a ChemEd conference by the application deadline.

Grant Guidelines

The applicant must be a Chemistry teacher with 2-6 years of Chemistry experience. They must also be a member of the NMDF. The award winner can only win one grant.

All grant application materials must be completely filled out and submitted by the deadline.

The funds will not exceed $750. This money can be used to cover: Registration Fees; Lodging and Meals; Workshops; Travel.

Any costs in excess of the awarded $750 are the responsibility of the award winner.

The winner must attend the Mole Day Breakfast at the ChemEd conference.

The winner must also complete and submit a Final Summary after the

ChemEd conference to the NMDF along with itemized receipts.

Grant awards will be provided in two portions. Up to one-half of the award will be paid directly to the ChemEd conference for Registration Fees, lodging, and the costs of the Mole Day Breakfast. The other half will be paid upon completion of the Final Summary and submission of any necessary receipts and attendance at the Mole Day Breakfast.

Submit online using the form in the link or print the application and mail: The George Hague Memorial Travel Award Application

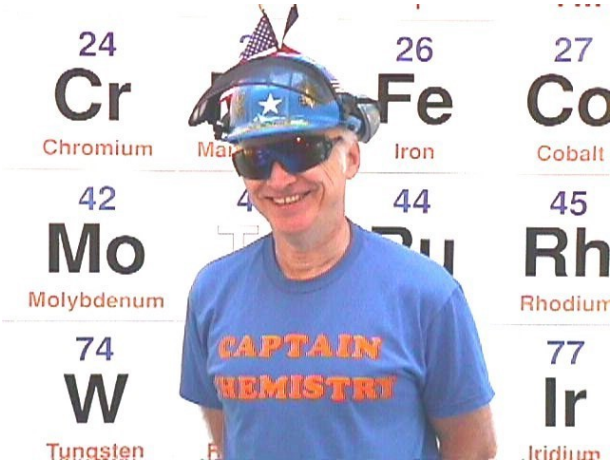
CLICK HERE FOR APPLICATION

Remembering George Hague "Captain Chemistry"

A few words about George

By Connie Hendrickson

George as Captain Chemistry was unforgettable. He could rock an auditorium, not just with booms and lights, but with cheering students. The only memory more vivid for me is from the National Chemistry Day dinner at the 1989 ACS National Meeting here in Dallas: George was a cheerleader, Clo Reen, from West Texas, and I was



football player number 40, Cal C. Umm. We bonded ionically.

George died in 2002 of leukemia at age 61.

If you're teaching chemistry, and you're not having fun, you must be doing something wrong.

-George Hague

Around the Area

University of Arkansas

On the Road

Repurposing ampicillin for photothermal therapy of bacterial infections using carbon nanotubes. Nalinikanth Kotagiri, Ju Seok Lee, **Joshua Sakon**, Haewook Han, Vladimir P. Zharov, Jin-Woo Kim, Univ. of Arkansas, USA; Pohang Univ. of Science & Technology, Korea; Univ. of Arkansas for Medical Sciences, USA. The 9th IEEE-Nanomed International Conference, Waikiki Beach, Hawaii, Nov. 15-18, 2015.

Feng Wang gave 3 invited talks: "Simple high quality force fields for aqueous salt solutions from adaptive force matching," Dept. of Chemistry, Jackson State University, MS, Nov. 20, 2015. "MP2 solvation free energy of simple ions obtained through force matching to simple pairwise potentials." Jicun Li, Feng Wang, ACS Joint Southeastern/ Southwest Regional Meeting, Memphis, TN, Nov. 6, 2015. "From water to salt solutions, electronic structure free energies from adaptive force matching." Dept. of Chemistry, Univ. of Vermont, Oct. 8, 2015.

Julie Stenken gave an invited lecture in the Dept. of Chemistry at the Univ. of Missouri, Columbia. "In vivo Microdialysis Sampling and Associated Chemical Analysis Challenges for Monitoring Proteins in Neurochemistry and Tissue Engineering." She also gave an invited symposium lecture at Eastern Analytical Symposium, Somerset, NJ, entitled "Membrane Alterations and Additives to Improve Micro-dialysis Sampling Recovery."

Publications

Zong, G.; **Barber, E**.; Aljewari, H.; Zhou, J.; Hu, Z.; Du, Y.; **Shi, W.Q.** Total Synthesis and Biological Evaluation of Ipomoeassin F and its Unnatural 11R-Epimer. *J. Org. Chem*. 2015, 80, 9279-9291.

Jicun Li and **Feng Wang**, Pair-wise-additive Force Fields for Selected Aqueous Monovalent Ions from Adaptive Force Matching. *J. Chem. Phys.*, 2015, 143, 194505.

Honors

Julie Stenken served on the NIH Biomaterials and Biointerfaces (BMBI) study section in October in Washington, DC. Dr. Stenken is a federally-appointed member of this review panel that meets 3 times a year to review grant proposals.

TKS Kumar was elected a Fellow of the University of Arkansas Teaching Academy. This honor recognizes his outstanding performance as a teacher. The Teaching Academy, established in 1988 by Dan Ferritor, Chancellor of the university, is a society committed to excellence in teaching at the University of Arkansas. He will be inducted December 7, 2015.

UT Arlington

The third book on the history of chemistry co-edited by **Dr. E. Thomas Strom** was published in electronic form last November with hard copies set to appear in March. The title of the book is "The Foundations of Physical Organic Chemistry. Fifty Years of the James Flack Norris Award." The publication is No. 1209 in the ACS Symposium Books series. Tom's co-editor was **Dr. Vera V. Mainz** of the University of Illinois. The book resulted from a symposium that Tom and **Dr. Jeffrey Seeman** had arranged for the Mar., 2014, ACS meeting in Dallas. The two previous volumes Tom has co-edited in the ACS Symposium Books series were on the histories of polymer chemistry and quantum chemistry.

The current book contains a chapter on James Flack Norris by **Arthur Greenberg**, seven chapters by past Norris winners **Kenneth Wiberg, Edward Arnett, Ronald Breslow, Andrew Streitwieser, Paul Schleyer**, **Keith Ingold,** and **Weston Borden,** plus chapters on deceased Norris award winners **Paul Schleyer, Glen A. Russell,** and **William Doering**. The chapter on Glen Russell was written by Strom and **Kathleen Trahanovsky;** the chapter on Doering by **Ronald Magid** and **Maitland Jones.** Because of the death of Paul Schleyer while the book was in progress, his Dallas presentation on "Norbornyl Cation Isomers Still Fascinate" was edited by Mainz and Strom, while his autobiographical memoir was edited by Andrew Streitwieser.

Welch Professor **Daniel Armstrong** and Jenkins Garrett Professor **Purnendu "Sandy" Dasgupta** are ranked among the top 100 most influential people in the world of analytical science according to the monthly journal *The Analytical Scientist*. UTA and UT-Austin were the only two Texas universities on the list, and UTA was the only one with two honorees.

Wilkins Receives 2015 Southwest Region of the ACS Award

Charles Wilkins, Distinguished Professor of analytical chemistry in the Department of Chemistry and Biochemistry, received the 2015 Southwest Region of the American Chemical Society Award. The $2000 award and plaque were presented during the Southeast and Southwest Regional meeting of the American Chemical Society Awards Luncheon Nov. 6 in Memphis, Tennessee.

The annual award is given to someone working in the region who has made significant contributions to the field of chemistry.

Wilkins was a key contributor in the development of computer-assisted data acquisition systems and the development of Fourier-transform mass spectrometry as an important tool for chemical analysis. He served as Chairman of the Analytical Division of the American Chemical Society from 1991-1992.

FIVE QUESTIONS FOR…

Our first interviewee of 2016 is Trish Smith, Ph.D. Dr. Smith is a Plasma Process Engineer in the New Technology Integration group at Qorvo, Incorporated (formerly RFMD & TriQuint). In 2007, Dr. Smith retired as Distinguished Member of the Technical Staff from Texas Instruments, and was awarded numerous Patent Incentive Awards before and since retirement from TI. An ACS Fellow since 2011, the 2005 ACS DFW Wilfred T. Doherty Award winner, and recipient of the 2001 ACS SW Regional Industrial Innovation Award, Dr. Smith's distinguished ACS interactions include significant volunteerism. Dec 31, 2015 marked the end of a 16-year stint as Secretary of the DFW local section (2000-2015). Dr. Smith also served on the Awards Committee from 1992 to 1997.

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

In high school I developed an interest in physics and chemistry. I loved to understand how and why things work and react the way that they do. I didn't know how I wanted to use my interest in science and thought that I might want to become a veterinarian or a teacher. In college, I majored in chemistry. As I went through the course sequence, I liked all of the sub-disciplines: organic, inorganic and physical chemistry. In graduate school, I decided that I wanted to apply science to solve technical problems. I applied for and was offered several opportunities in a range of fields after I completed the Ph.D. I accepted a position with Texas Instruments in Dallas, and enjoyed working in that rapidly changing and challenging technical environment. With each decision point along the path to becoming a scientist I remained open minded to opportunities that presented themselves. I feel fortunate to have chosen a path that was satisfying and personally rewarding.

2. *What one aspect of your career do you most enjoy?*

Innovation that results in the creation of a new product or improvement of existing products has given me tremendous satisfaction in my career. Applying my education and experience to solve technical problems and to come up with solutions that create or advance new products make a job seem much more like exploration and fun, rather than work. I have been privileged to work alongside many people who shared their knowledge and strengths with me, and I have also had opportunities in the course of my work to mentor others. The tangible evidence of innovations, produced at Texas Instruments through my associations with various teams, is over 30 U.S. and international patents.

3. *Which educational opportunities or*

life experiences were/are most helpful in your career?

Majoring in chemistry at Brown University, I had the honor to work with Professor Aaron Wold. He advised me for my senior thesis, which related to the sulfurization of an inorganic compound. While a student in his laboratory I was introduced to the idea that I should pursue a Ph.D. rather than enter the work force with a B.S. degree. I was in Professor Wold's laboratory for many hours and learned from him and his graduate students what to expect in graduate school. I also received a lot of valuable advice about how a Ph.D. would enable me to become a technical leader and innovator. I ultimately decided to pursue a Ph.D. and went to Princeton University expecting to work in an electrochemistry group because I had an interest in learning more about how to produce solar energy. Princeton required all of the graduate students in the chemistry department to attend introductory seminars given by all of the professors in the department before choosing an advisor and area of study. Through the seminars, I was introduced to the topic of surface science and decided that I would pursue my degree in that area with Professor Steven Bernasek. For my Ph.D., I studied tris(allyl)rhodium and its catalytic reaction with a fully characterized single crystal TiO_2 substrate. In this work, I collaborated with Professor Jeffrey Schwartz (organometallic chemistry at Princeton) and two of his post-doctoral students, who synthesized the Rh and other compounds I used in my ultra-high vacuum experiments. This work was exciting and groundbreaking. It provided a solid foundation for the innovative work in my subsequent years at Texas Instruments, Fresnel Technologies, Inc., and with my current employer, Qorvo, Inc.

4. *You were Secretary of the ACS DFW local section for many years. Thank you very much for your service! What advice would you give to ACS members who wish to increase their involvement in ACS? Do you feel your dedication was worth the effort?*

I first became involved with the DFW section in 1992 when I was asked to serve a five-year term with the ACS DFW Awards Committee. This was a great way for me to become more involved with the Section as the time commitment was relatively low. I soon was asked to run for Secretary of the local Section and again, because most of the work for this could be done on the weekends or evenings, I was happy to do it. I believe that as a member of the governance of the DFW Section I made an important contribution to the ACS. A bonus of my involvement in the Section governance was meeting and spending time with many other local chemists who were dedicated and interesting people. I have truly enjoyed my more than 20 years of involvement with the Section. I would like

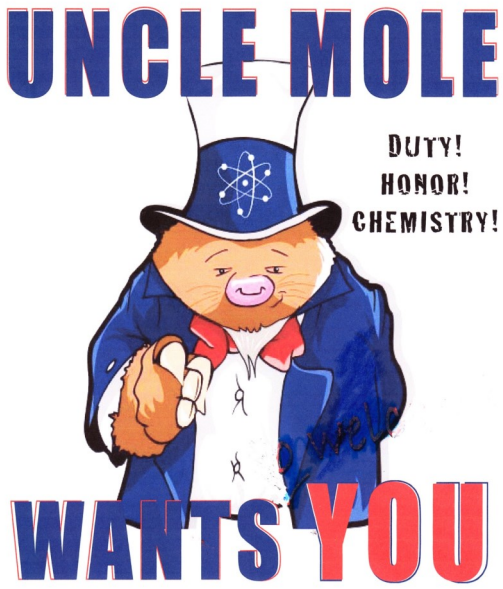
to tell others who wish to help run the Section, please step up and do it! There are some positions that require more effort than others, and there are many committees that need leaders to organize activities for the local membership. Volunteer and meet some other members and you will see for yourself that the commitment is worth the effort.

5. *Who is your science hero, and why?*

   I don't think of scientists as heroes, but as inspirational people. Carl Sagan and Bill Nye come immediately to mind. I loved watching Carl Sagan as host of the *Cosmos* series on PBS. I attended a seminar he gave at Princeton and still fondly remember his ability to excite the audience with his passion for astronomy. Bill Nye is another scientist who has a gift for making scientific ideas accessible to people in and out of science, especially children. I started watching Bill Nye the Science Guy when my children were young and love the way he presents scientific concepts. He has a wonderful ability to make science interesting and exciting, and I am sure he has influenced many kids to want to grow up to become scientists.

Thank you, Dr. Smith, for your interesting remarks and your many years of dedication to the DFW local section of the ACS!

We're seeking Interviewees for 2016! To share your love of chemistry, contact retort@acsdfw.org.



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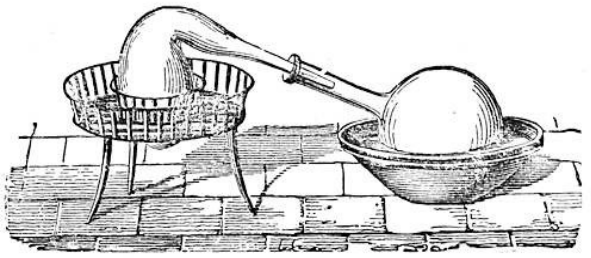

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From the editor

Congratulations to Tom Strom on the publication of his third book on the history of chemistry; it was published in electronic form last November, with hard copies set to appear in March. The title of the book is "The Foundations of Physical Organic Chemistry. Fifty Years of the James Flack Norris Award," and is No. 1209 in the ACS Symposium Books series.

To my thinking, the most important article in this issue is the report from *ACS Sensors* on a fast and easy test for tuberculosis. The article states *"Tuberculosis (TB) is a highly infectious disease and a major global health problem, especially in countries with developing health care systems".* That is true, but not so long ago, it was a major health problem in many places. Many well-known figures died of consumption, spanning countries and centuries, including Nelson Mandela, Andrew Jackson, Doc Holiday, James Monroe, Eleanor Roosevelt, Alexander Graham Bell, the Bronte siblings Anne, Branwell, and Emily, to name only a few (famouspeopletb, famouspeopletb2). For me, the quick, easy test has personal implications: in 1952, my cousin Lois and I, both age 3, contracted tuberculosis from raw milk on our grandfather's farm. As well as causing lung disease, the tubercle bacillus can migrate from the lungs and the typical wasting disease, into kidney, brain, and bones, among other locales. I was left with lung calcium deposits and a positive TB test, but in Lois, the disease progressed to tubercular meningitis, and she died. A fast, inexpensive test allows early detection and early treatment without equipment not available in underdeveloped areas.

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Best regards,
Connie