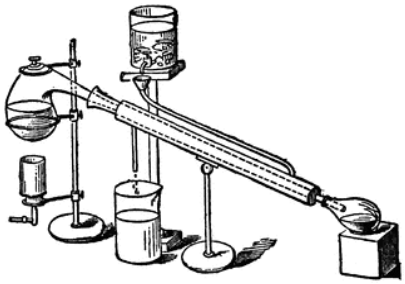
SOUTHWEST RETORT



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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

New *Retort* Editor. With this issue **Dr. Herman C. Custard**, Senior Research Chemist in the Exploration Division of Socony Mobil's Field Research Laboratory in Dallas, takes over as Editor and Business Manager. For the past five years **Richard Ashmore**, Safety Engineer for Texas Instruments, has served as Editor. During this time the *Retort*'s circulation has grown by almost 1000.

Dr. Custard received his B.S. in Chemistry from Baylor in 1957 and his Ph.D. in Physical Chemistry from Baylor in 1962. His research interests include the physical chemistry of membrane systems, colloid chemistry, and dipole moments. Besides his membership in ACS, he belongs to the Electrochemical Society, for which he serves as Secretary for the North Texas Section, the Scientific Research Society of America, and the Metropolitan Philosophical Society. He is also Vice President of the Walnut Hill Rotary Club of Dallas. He is married to the former Peggy Jones. Herman and Peggy have three children, two boys and a girl.

The Sixth Annual Hydrocarbon Symposium will be held in Houston April 13-14. The guest speaker at the banquet will be UT's **Dr. Norman Hackerman**, whose topic is "The Public University, 1966." The speakers and their affiliations are as follows: **Saul Winstein**, UCLA; **Herbert Brown**, Purdue; **Paul von R. Schleyer**, Princeton; **Norman Deno**, Penn State; **Michael Szwarc**, State University College of Forestry, Syracuse University; **Stanley Cristol**, Colorado; **Leon Stock**, University of Chicago; **A. J. Speziale**, Monsanto; **Isaac Dvoretzky**, Shell Development; and **Abraham Schneider**, Sun Oil.

In the Dallas-Ft. Worth ACS Section, at Tarleton State College **Dr. P. W. Selwood** addressed the students and faculty in the Department of Physical Sciences on the topic "Heterogeneous Catalysis." At Arlington State College (now UT-Arlington) **Dr. Peter Girardot** is one of three new members named to the Editorial Advisory Board of the *Journal of the American Chemical Society* by its Editor **Marshall Gates**.
The Welch speaker at East Texas State University on April 19 was **Dr. Charles Overberger** of the Brooklyn Polytechnic Institute. His topic was "New Monomers and Polymers." At TCU the chemistry department recently received an NSF grant for the purchase of a Varian HA-100 NMR spectrometer.

In the South Plains ACS Section, **Dr. M. Rahman** has recently come to the Texas Tech Chemistry Department as a post-doctoral fellow to work with **Dr. Henry Shine. Dr. L. Hughes** returned to Wales in March after spending 18 months as a post-doc with Professor Shine.

Compiled by E. Thomas Strom

Comparing Freight Costs: Air, Truck, Rail, Pipeline, and Water

By

John E. Spessard, PhD, PE

I worked in American Potash and Chemical Company's (AMPOT) research lab. We were considering building a new production plant. Our products were commodity chemicals costing less than $100 per ton. A crucial point in the practicality of the new plant was the cost of getting our products to the customer. We also had to consider the shipping costs for potential competitors. So we gave serious thought to shipping costs and alternatives. For example, could and should we consider building a shipping terminal on the California sea coast.

A significant factor in the cost of products is the cost of getting the product from the producer to the customer. For cheap commodity chemicals such as ammonia, sulfuric acid, coal and potash fertilizer (aka potassium chloride), transportation costs can be a significant part of the price paid by the buyer. For uniformity, freight costs are expressed as money per ton-mile, the cost of moving one ton of freight one mile. L.L Bean and Richard Torian have provided comparative cost estimates. L.L. Bean does ship their merchandise by different carriers.

Air freight is the most expensive. Memphis, Tennessee is one of the busiest commercial airports in the United States. It is also FEDEX's headquarters. Two estimates are 70 and 90 cents per ton-mile. These costs vary because of the expense of truck transportation to and from the airport and loading and unloading the airplane. Few producers and customers have adjacent airports capable of accommodating large jets. Air freight excels at hauling perishable cargo such as flowers and sea food, light weight and valuable cargo. Air freight's advantages are speed and delivery reliability. However, for shipment distances of 500 miles and less, direct trucking from the producer to the customer can be as quick and much cheaper. Air freight by far carries the lowest volume of freight of any of the alternatives.

Truck freight runs about 40 cents per ton-mile. There is an extensive highway network in the United States. Compared to rail, trucking is faster, more reliable,

more likely to be on schedule and has less damage. It has been argued that trucking, through highway maintenance, has the advantage of governmental subsidies. This is offset to some degree by higher fuel taxes. In Texas, the gasoline and diesel fuel taxes are 34.9 and 44.4 cents per gallon respectively. A heavy truck also uses more fuel. At 59 miles per ton-mile for a tractor trailer combination, that is 0.73 cents per ton-mile. Trucking, compared to rail and water, does get more expensive on long hauls.

Rail runs about three cents per ton-mile. Railroads are particularly efficient for transporting low-value, high-density bulk products long distances between major distribution centers. Examples are coal, minerals, ores and recently oil. Rail is slower than trucking and is much less reliable than trucking. Schedules are less flexible and time is needed to assemble trains. This is particularly true if more than one rail line is involved. Rail freight service has the worst quality performance of all modes of freight, having about ten times more delivery issues than trucking.

Railroads have improved performance by hauling truck trailers on flat bed railcars, by double-stacking two shipping containers on a flatbed railcar and by having truck trailers with both steel wheels for rail travel and rubber tires for highway service. Intermodal shipping that combines rail and truck is a growing segment of the freight industry. This has improved matters but trucking is still more reliable.

Rail costs can be reduced to as little as one cent per ton-mile by the unit train. A unit train is an entire train carrying a single product from the producer to a single customer. The 120 car trains carrying coal from Wyoming mines to a Texas power plant are examples. You have seen these trains when you go to and from Amarillo on US287.

Pipelines average less than two cents per ton-mile. They are well suited for carrying liquid fuels such as gasoline, diesel fuel and natural gas. Pipeline shipping speeds compare with water shipping speeds. Pipelines have high capital costs and heavy usage is a must. Constructing a new pipeline is difficult with obtaining right-of-ways and permits (Keystone Pipeline). If a pipeline is practical and available, it is a possible option.

The cost of hauling by water can be as low as 0.1 cent per ton-mile. Fuel cost is very low and much of the cost is in loading and unloading the ship. For ocean shipping, air freight is the only alternative. For inland waterways such as the Great Lakes and the Mississippi River, the waterway must be available. Rivers have lots of bends, which increases shipping times. But for long hauls water is practical even if slower. An example is Florida electric power plants. Coal shipped from the Appalachian coal fields costs about $24 per ton at the mine mouth and $40 per ton delivered to the plant by rail. Ocean shipping from Colombian coal fields can be cheaper if the ship can be unloaded by a conveyer belt directly to the electric plant.

49th Annual Meeting-in-Miniature

Saturday, April 23, 2016

April 2016 Meeting
Dallas-Fort Worth Section
of the
American Chemical Society

Texas Woman's University
Ann Stuart Science Complex, Denton Texas

TEXAS WOMAN'S UNIVERSITY
DENTON DALLAS HOUSTON

Call for Abstracts: All Graduate and Undergraduate Students are invited to submit abstracts for a 10-12 minute oral presentation, allowing 3-5 minutes for questions.

Abstract Deadline: Thursday March 31, 2016

Submission: Use the format below to email your ACS-style abstract to twu.mim2016@gmail.com with the subject line, "Meeting in Miniature Abstract Submission" (format below).

Awards: Multiple Awards given to top presentations from each session.

Registration: **Free!**

Abstract Details:

Title of Presentation
Authors: Underline presenting author and put an * next to advisor
Affiliation (Department and University) Division: (Analytical, Biochemistry, Inorganic, Organic, Physical, etc. There is no limit to division participants.)
Email address of presenting author
Category: Undergraduate or Graduate
Abstract: Paragraph, which should include "Motivation, Methods, Results,Conclusions" – C. Elliot; and be limited to 200 words

Tentative Schedule:

8:00-8:30	Check-In
8:30-10:00	Oral Presentation
10:00-10:15	Morning Break
10:15-11:45	Oral Presentations
11:45- 12:45	Lunch Break
1:00 - 3:00	Oral Presentations
3:00 – 3:30	Tours and Reception
3:30	Awards Ceremony

TWU Denton Campus:

http://www.twu.edu/maps/denton-campus-map/

Visitors may park in lot 65 or any surrounding parking lots for FREE on Saturday

From the ACS Press Room

Mind-altering drugs could treat mental disorders

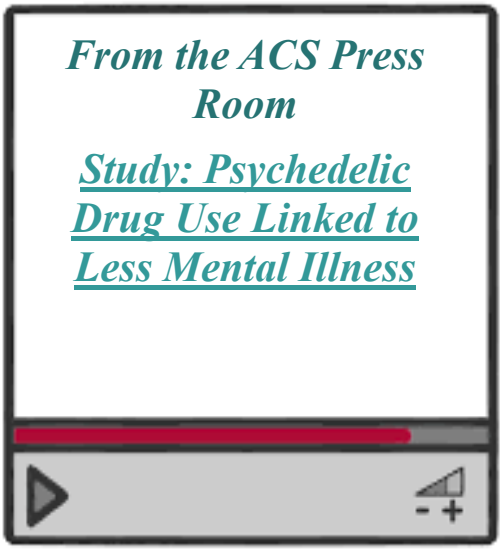
Psychedelic Medicines

Chemical & Engineering News

Psychedelic compounds have had a colorful past. Although initially investigated for medical uses, they were banned after cultural and political times changed in the 1960s and 1970s. Now, the compounds are getting another chance in the mainstream, according to the cover story of *Chemical & Engineering News* (C&EN), the weekly newsmagazine of the American Chemical Society.

Jyllian Kemsley, a senior editor at C&EN, explains that the tide turned against psychedelics once the baby boom generation started taking them recreationally about 50 years ago. But now, as physicians discover that conventional drugs are failing many patients with mental health issues, interest in psychedelics as treatments is growing. For example, many patients who had experienced long-term symptoms of posttraumatic stress disorder found significant relief after just two or three treatments with a compound called MDMA, which is better known by its street name, ecstasy. Other potential applications for psychedelics include treatment of addiction, depression, neuropathic pain, epilepsy and anxiety.

Research into using these compounds as medicines is in early stages, and the legal, societal and business environment surrounding them makes studies difficult to conduct and funding hard to come by. But the possible payoff is so great that some researchers are determined to carry on their work despite these barriers.



...And Another Thing…

by Denise L. Merkle, PhD

It's spring. The earth's orbit has taken us past the first frost and well into cold vegetable growing season. Even though technically, vegetables don't exist and we've been eating only fruits and roots all these years, the leafy greens that really aren't fruits and the carroty-beety-turnipy roots that definitely aren't in the same taste profile as apples are either sprouting or are waiting to - and, in no time at all, will be fully present in all their unvegetable-y glory. Ornamentals, too, will soon exuberantly reveal all their colorful, sometimes unnatural-looking foliage and blooms.

Bloom. My (now late) mom countered complaint with the phrase, "Bloom where you are planted!" Variations of the inspirational little snippet of positivity abound, and it's possible to purchase quite a number of ornamental items inscribed, painted, mosaic-ed or engraved with it. My next-sister-down and I shared a room in which the phrase was actually displayed on a plaque - to remind us to make the best of any situation. But Mother Merkle did not require that plaque or even the entire phrase. When her offspring exhibited less-than-contented attitudes, she would focus her gaze on the whiner and command: BLOOM! And, you know, we bloomed. Or, at least, we groused elsewhere, which was, I imagine, a significant chunk of the intention.

In my 64 ft^2 of the Fairmount Community Garden, I hopefully planted the tiny seeds of the carroty-beety roots that, with the right attitude and some environmental fortuity, will become actual food. (No turnips!) Since the sowing was interrupted with distractions beyond my control, the leafy greens that will soon emerge from the earth will be as much of a surprise to me as they will to other gardeners who might happen to wander by. But I will harvest them whether or not they are what I thought I planted, and I'm sure they'll be delicious. I will deal. Bloom. What is the point of all this, you ask? The point is, as with gardens, lives and projects take time, flexibility, and the ability to accept those events that are beyond one's control. It's pretty much impossible to figure out what exact seed will sprout and grow into a lovely beet, and it's even harder to tell which gardeners- or scientists- will turn into the human equivalent of nasturtiums or roses, and which are really Bermuda grass. (Don't even talk to me about Bermuda Grass). So now, when anyone is bewailing something that isn't going quite right, we should all envision an implacable blue-eyed gaze transfixing the whiner, and a stern voice emanating from every leaf and flower in the vicinity: BLOOM!

Grow Happy, all you gardeners out there.

From the ACS Press Room

Nicotine vaccine delays the drug's effects in mice

Investigations of Enantiopure Nicotine Haptens using an Adjuvanting Carrier in Anti-Nicotine Vaccine Development

Journal of Medicinal Chemistry

Many people who smoke want to quit, but the urge to light up is often irresistible. An effective vaccine to help people kick the habit once and for all has been elusive. But now, scientists report in ACS' *Journal of Medicinal Chemistry* a new vaccine design that could help achieve this goal.

Smokers who want to quit have a few tools to turn to. There are nicotine patches and gum, but they're not always effective. There are drugs that target nicotinic acetylcholine receptors, but these come with a risk for nasty side effects such as hallucinations, depression and severe mood swings. Vaccines that target the nicotine molecule itself would be an alternate strategy. Two candidates advanced into clinical trials recently. They ultimately failed — but not without first yielding clues as to how scientists could improve upon them. Individuals in the trials who produced the highest levels of anti-nicotine antibodies were more likely to abstain from smoking for over six months. Kim D. Janda and colleagues wanted to build on this lead.

The researchers designed a new vaccine that could increase the number of antibodies that could attach to nicotine molecules. Testing in mice found that the vaccine delayed the effects of nicotine within the first 10 minutes after injection. They also found that treated mice had lower concentrations of nicotine in their brains, which is where the drug exerts its effects. The researchers say future efforts will focus on further refining the vaccine formula to get it ready for potential clinical trials.

The authors acknowledge funding from the Skaggs Institute and the National Institutes of Health.

DFW Section

Nominations are invited for 2016 Wilfred T. Doherty and Werner Schulz awards

The Doherty Award is given for excellence in chemical research or chemistry teaching, meritorious service to ACS, establishment of a new chemical industry, solution of pollution problems, and advances in curative or preventive chemotherapy. Nominees may come from industry, academia, government, or small business. The nominee should be a resident member in the area served by the DFW Section, and the work should have been done here. The award is $1500 and an engraved plaque. A photo of the Doherty Award winner will be displayed permanently in the Gallery of Doherty Award winners, Berkner Hall, UT-Dallas.

The Schulz Award is given to high school chemistry teachers, who, like the late Dr. Werner Schulz, bring that something extra to the teaching of chemistry. The nominee and/or nominator need not be ACS members. Nominees should show excellence in chemistry teaching as demonstrated by testimonials from students and fellow teachers, results in student competitions, and diligence in updating and expanding scientific/teaching credentials. A photo of the Schulz Award winner will be displayed for one year at the Perot Museum of Nature and Science in Dallas, and then displayed permanently in the Gallery of Schulz Award winners, Science Bldg., Tarleton State University. A traveling plaque stays at the winner's high school for the year of the award. Winners will normally receive their awards and give their lectures at a fall meeting of the section.

CLICK HERE FOR NOMINATION FORMS DUE MAY 15, 2016

Remember, a continuous flow of nominations is needed to maintain the quality of awards. Each nomination should contain completed nomination form, cover letter highlighting the nominee's accomplishments, and a copy of the CV. One seconding letter may accompany nominations. The nomination package should be sent by email as a single pdf file to Sean O'Brien at sobrien@ti.com. Nominations remain active for five years but should be updated annually. Nomination forms and additional information are available online at http://dfw.sites.acs.org/locallocalsectionawards.htm.

DFW Section

ACS Councilor Report from Spring 2016 ACS National Meeting in San Diego

By Prof. Mary Anderson, Texas Women's University

The national meeting in San Diego was very well attended (16,327)! All four of your councilors (Linda Schultz, Jason McAfee, Tom Strom and myself) were in attendance. There was exciting chemistry and many old and new friends met.

Items in no particular order from the Council meeting include:

1. The Committee on Nominations and Elections put forth a slate of four nominees for the upcoming ACS presidential election: **Peter K. Dorhout**, **Thomas R. Gilbert**, **C. Bradley Moore**, **Gregory H. Robinson**; the first two candidates will appear on the fall ballot along with any selected via petitions.

2. The Committee on Nominations and Elections put forth a slate of four nominees for District IV (ours) Director: **Rigoberto Hernandez** (incumbent), **Larry K. Krannich**, **Richie Streusand**; the first two were elected to the Fall Ballot.

3. The Committee on Nominations and Elections announced the selection of the following candidates for Directors-at-Large for 2017-2019 terms: **Joseph A. Heppert**, **Kristin M. Omberg**, **Dorothy J. Phillips**, and **Kathleen M. Schulz**. The election of two Directors-at-Large from among those candidates and any selected via petition will be conducted in the fall.

4. 2017 Member Dues: The Council voted to set the member dues for 2017 at the rate of $166 (up from $162 for 2016). This rate is established pursuant to an inflation-adjustment formula in the ACS Constitution and Bylaws.

5. Academic Professional Guidelines: the Council approved an update to the academic profession guidelines, the first since 2008. It should be found on the ACS website.

6. The Committee on Nominations and Elections asked for suggestions from members, send to nomelect@acs.org. Any suggestions on how to improve the process of nominations and elections, send comments to vote2020@acs.org.

7. The society budget is strong, but there could be more in Unrestricted Net Assets (reserves) to cover expenses during economic downturns. Additional information can be found at www.acs.org, at bottom, click 'About ACS', then 'ACS Financial Information'. There you will find several years of the Society's audited financial statements and IRS 990 filings.

8. Membership (MAC—my committee): As of December 31, the ACS membership was nearly 157,000,

which is 0.96% less than on the same date in 2014. The number of new members who joined in 2015 is 25,000. The Society's overall retention rate is 84%. The committee also reported that the number of international members has increased to 26,022. That number is 965 higher than in December of 2014.

The international growth rate is 3.85%. MAC is considering several affinity programs to enhance membership. Please send me your comments and suggestions (manderson3twu@yahoo.com).

9. Early Member Registration Fee: In compliance with the National Meeting Long Range Financial Plan and the recommendations of the 2015 Task Force on Implementing National Meeting Financial Targets, the Committee on Meetings and Expositions has recommended that the Early Member Registration Fee for the 2017 national meetings be $440. The Board will vote on this recommendation later this year.

San Diego Meeting Attendance

As of Tuesday evening, March 15:

Attendees 8398

Students 5979

Exhibitors 1094

Expo only 473

Guest 383

Total 16,327

10. Petitions to Amend Constitution and Bylaws. New petitions to amend the Constitution or Bylaws must be received by the Executive Director no later than May 4 to be included in the Council agenda for consideration at the fall 2016 meeting in Philadelphia. Contact C&B with any questions or requests for information at bylaws@acs.org. NOTE: If Bylaws have not been updated, electronic elections may not be valid. Deadline for next reviews is May 4, 2016.

11. The Philadelphia meeting will have an interesting program, including something on Fracking.

12. Chemical Educators Professional Liability Insurance: a big benefit of membership and is underwritten by a subsidiary of Lloyds of London. We have gotten it back and it is relatively inexpensive (estimated $200-500; a small cost for peace of mind). For more information: https://acs-aiche.haysaffinity.com or (http://www.acs.org/content/acs/en/membership-and- networks/insurance/propertycasualty/professionalliability.html?_ga=1.760094 5.267853231.1427750334

13. Check out ChemIDP.org: it is a professional development tool for graduate students and beyond.

14. The SOCED (committee on education) made a number of recommendations to Council, including those for 2-year programs.

15. Local Section Activities Commit-

tee gave out 19 grants for about $39,000 total. Congratulations DFW-local section for earning $3000 for Comet Chemistry Camp!

16. The Committee on Economic and Professional Affairs reported that the unemployment rate for chemists remains low (3.1%), but still high for new graduates (13%).

17. I also was the liaison to the Graduate Education Advisory Board (GEAB). They with staff have implemented the ChemIDP.org site as a tool for professional development.

18. MAC (my committee) is recommending that the waiver of ACS dues for unemployed chemists be extended from 2 to 3 years; vote coming up at Summer meeting.

19. There was a long discussion with President Donna Nelson's Task Force on the US employment of chemists.

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

retort@acsdfw.org

Around the Area

University of Arkansas

On the Go

Foysal Khan, **Benjamin J. Jones**, **Christena K. Nash**, and **Ingrid Fritsch**. Expanding lab-on-a-chip applications for redox-magnetohydrodynamic microfluidics through polymer-modified electrodes and enhanced current-magnet relationships." Invited talk in the symposium on Magnetoanalytical Science: Separation, Characterization, and Imaging, Pacifichem 2015, Honolulu, HI, December 15-20, 2015.

Ingrid Fritsch gave an invited talk "Electrochemistry, Magnetic Fields, and Fluid Flow: Programming the Next Generation of Microfluidics" at Brigham Young University on March 24, 2016, and the University of Utah on March 25, 2016.

S.J. Jenkins, **E.K. Miller**, **D.G. Meeker**, **M.S. Smeltzer**, **J. Chen**. Engineering gold nanostructures for targeted delivery and controlled release of antibiotics. NanoEngineering for Medicine and Biology, 2016, Houston, TX; Poster (February 21-24, 2016). Miller received "Honorable Mention" among 67 students and post-docs who attended the poster competition of 2016 ASME NEMB.

J. Chen, **S.V. Jenkins**, **E.K. Miller**, **D.G. Meeker**, **M.S. Smeltzer**. Polymer-coated gold nanocages for photothermally-controlled release of therapeutic agents. International Congress of Hyperthermic Oncology, 2016, New Orleans, LA (Oral presentation, April 11-15, 2016).

Jingyi Chen gave a departmental seminar at the University of Texas Rio Grande Valley March 29, 2016, titled "Shaping bimetallic nanostructures with tunable optical and catalytic properties." This trip was also part of the recruiting activities of the department.

Publications

N. Kotagiri, J. Sakon, H. Han, V.P. Vladimir, P. Zharov, and J.W. Kim. Fluorescent ampicillin analogues as multifunctional disguising agents against opsonization. Nanoscale (2016) accepted.

Vishal Sahore, **Adam Kreider- macher**, **Foysal Z. Khan**, and **Ingrid Fritsch**. Visualization and measurement of natural convection from electrochemically-generated density gradients at concentric microdisk and ring electrodes in a microfluidic system. 2016. *Journal of Electrochemical Society*, 163(4):H3135- H3144.

Christena K. Nash and **Ingrid Fritsch**. Poly(3,4-ethylenedioxythiophene)-modified electrodes for microfluidics pumping with redox-magnetohydrodynamics: Improving compatibility for broader applications by eliminating addition of redox species to solution. 2016. *Analytical Chemistry* 8(3):1601-1609.

M. Fruchtl, **J. Sakon**, R. Beitle. Alternate carbohydrate and nontraditional inducer leads to increased productivity

Around the Area

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UT Arlington

Dr. Junha Jeon has recently received an NIH AREA R15 grant. The grant title is "Catalytic Reductive C-H and C -C Silylation with Silyl Acetate. The grant is for three years for $424,720 starting April 1, 2016.

Dr. Alejandro Bugarin attended the NSF Chemistry Early Career Investigator Workshop held Mar. 11-12 in Arlington, VA. Alex will also be presenting his research in July at the Gordon Research Conference on "Organic Reactions and Processes" held in Easton, MA.

From the ACS Press Room

Transparent wood could one day help brighten homes and buildings

Optically Transparent Wood from a Nanoporous Cellulosic Template: Combining Functional and Structural Performance
Biomacromolecules

When it comes to indoor lighting, nothing beats the sun's rays streaming in through windows. Soon, that natural light could be shining through walls, too. Scientists have developed transparent wood that could be used in building materials and could help home and building owners save money on their artificial lighting costs. Their material, reported in ACS' journal *Biomacromolecules,* also could find application in solar cell windows.

Homeowners often search for ways to brighten up their living space. They opt for light-colored paints, mirrors and lots of lamps and ceiling lights. But if the walls themselves were transparent, this would reduce the need for artificial lighting — and the associated energy costs. Recent work on making transparent paper from wood has led to the potential for making similar but stronger materials. Lars Berglund and colleagues wanted to pursue this possibility.

The researchers removed lignin from samples of commercial balsa wood. Lignin is a structural polymer in plants that blocks 80 to 95 percent of light from passing through. But the resulting material was still not transparent due to light scattering within it. To allow light to pass through the wood more directly, the researchers incorporated acrylic, often known as Plexiglass. The researchers could see through the resulting material, which was twice as strong as Plexiglass. Although the wood isn't as crystal clear as glass, its haziness provides a possible advantage for solar cells. Specifically, because the material still traps some light, it could be used to boost the efficiency of these cells, the scientists note.

The authors acknowledge funding from the Knut and Alice Wallenberg Foundation.

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From the ACS Press Room

Using glucose monitors to detect other diseases

Enzyme Encapsulated Liposome-Linked Immunosorbent Assay Enabling Sensitive Personal Glucose Meter Readout for Portable Detection of Disease Biomarkers

ACS Applied Materials & Interfaces

Diagnosing disease can be highly technical, costly and time-consuming, which are all challenges that become particularly problematic in low-income and remote locations. Now scientists are reporting in the journal *ACS Applied Materials & Interfaces* a new way to repurpose portable glucose monitors to harness these simple devices' practicality and low cost for the detection of other diseases.

There are many benefits to diagnosing disease quickly. Treatment can start earlier, which can lead to better outcomes. It saves time and money. It can also minimize patients' anxiety as they wait for results. But rapid diagnoses aren't always possible using current technology. The personal glucose monitor, however, is one medical testing device that can deliver results rapidly. Building on its success, scientists have started repurposing it to test for other substances, such as cocaine or Salmonella bacteria in milk. But the methods they used so far required complicated and time-consuming steps. Chaoyong James Yang and colleagues wanted to take a simpler approach and apply it to biological disease markers.

The researchers started with tiny spherical pouches called liposomes and filled them with enzymes that produce glucose. In the presence of a target molecule, the liposomes were designed to burst open and cause an increase of glucose in the test solution.

The researchers tried it with thrombin, a protein that can indicate restricted blood flow or heart disease. A commercial glucose monitor accurately detected the levels of glucose, which corresponded to the amount of thrombin in samples. In addition, the researchers say their method could be used to detect other disease-associated proteins.

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From the editor

Transparent wood…which of you Trekkies remembers Scotty's remarkable feat in Star Trek IV (always and forever my favorite Star Trek movie)? He barters the formula for "trrrransparent aloominom" for plexiglass in order to build the tanks to bring the long-extinct whales back (forward?) from the 20th to the 23rd century. (I particularly like the part where he talks into the mouse.) So,when I read the ACS news release on transparent wood, I had an urge to watch that scene again and googled *Scotty transparent aluminum*. Guess what? Transparent aluminum now exists! It is aluminium oxynitride (AlON), a ceramic composed of aluminium, oxygen and nitrogen. Surmet Corp. markets it under the name ALON. The cubic spinel structure allows fabrication of windows, rods, tubes and other forms using ceramic powder processing techniques.

Here are a few links to more information:

http://www.surmet.com/

https://en.wikipedia.org/wiki/Aluminium_oxynitride

http://www.ubergizmo.com/2015/11/transparent-aluminum/

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Best regards,
Connie