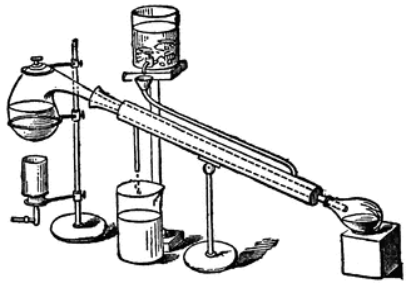
SOUTHWEST RETORT



SEVENTIETH YEAR **NOVEMBER 2017**

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and Chemistry in this area

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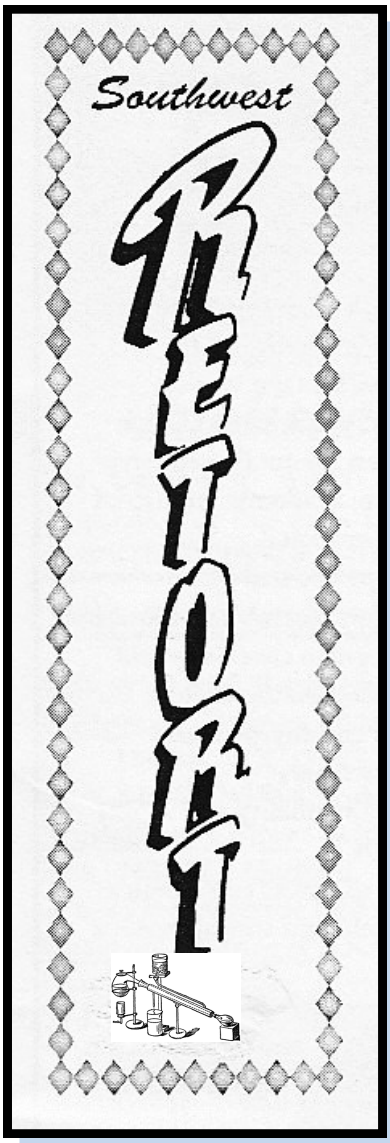

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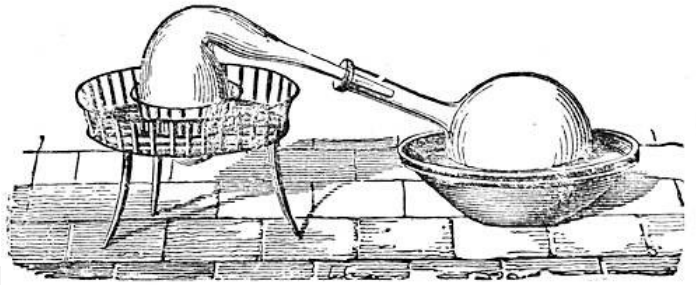
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EMPLOYMENT CLEARING HOUSE

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

Position Available:
Sales and Marketing Assistant

Job Type: Full-time
Location: United States, Texas, Plano
Additional notes: Must be legally authorized to work in the United States. Local candidates preferred, as no relocation benefits are provided for the position.

Responsibilities:
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.

Requirements:
Bachelor's degree or higher (Chemistry/Biology/Biochemistry or similar background preferred); 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. Prior sales, marketing, or accounting experience are considered a plus.

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FIFTY YEARS AGO IN THE SOUTHWEST RETORT

The November ACS tour speakers are Dr. E. M. Kosower, State University of New York, Long Island, NY, and Dr. Gert Schlessinger, Newark College of Engineering, Newark, NJ. Dr. Kosower will be speaking from three possible topics: "Stable Pyridinyl Radicals"; "Topics in Molecular Medicine"; and "Protein Transformation." Dr. Schlessinger's topic is "Modern Developments in Aromatic Chemistry.

From the Texas A&M-Baylor ACS Section we learn that Baylor professors W. O. Milligan, Virgil Tweedie, and James L. McAtee have recently given outside lectures. The Welch lecture at Baylor will be given by Dr. Robert S. Hansen from Iowa State.

Texas A&M is embarking on the first step in the expansion of its chemistry graduate program. Five new chemical research institutes are being formed, Polymer Chemistry, Heterogeneous Catalysis, Solid State Chemistry, Nuclear Chemistry, and Molecular Biophysical Chemistry, and thirteen new faculty have been appointed. They are Professors Thomas T. Sugihara, Herman A. Liebhafsky, Ronald D. Macfarlane, Joe S. Ham, Associate Professors Daniel H. O'Brien, Alan S. Rodgers, and Assistant Professors Yi-Noo Tang, Howard Kaye, David W. Brooks, Joseph R. Natowitz, Rand L. Watson, Robert D. Stipanovic, and Emil A. Schweikert. Department Chair Arthur E. Martell and Science Dean Clarence Zener announce that as part of this expansion large amounts of new equipment have been purchased. This includes a Varian 100 MHz nmr spectrometer, a Varian EPR spectrometer, several recording infrared and ultraviolet recording spectrophotometers, electronic counting equipment, a gel permeation chromatograph, gas chromatography equipment, and other instruments for the physical properties of polymers. It is planned to increase the size of the chemistry department faculty to about 60 in the next five years to lead a research team of about 250 graduate students and 60 post docs, and adequate supporting staff.

From the Dallas-Ft. Worth ACS Section we learn that Dr. James L. Marshall has joined the faculty at North Texas State University. Jim has received an ACS-PRF grant for the 1967-1969 time period. Dr. W. T. Brady has received a Welch grant of $36,000 for three years. Dr. W.H. Glaze presented a paper at an organometallic conference in Munich, Germany. During the summer Texas Woman's University added a Varian A-60-A NMR spectrometer and a Perkin-Elmer 225 Infrared Spectrophotometer and the Single Focusing Mass Spectrometer obtained in May. These three instruments will shortly be moved to the new graduate research quarters where they will give the department a big boost in analytical capabilities.

The Permian Basin ACS Section's first local section meeting of the academic year featured a tour by the 54 attendees of the new El Paso Product Research and Development Center. Instrumentation demonstrated included gc/mass spec, infrared, X-ray, nmr, pulse polarography, and atomic absorption.

contributed by
E. Thomas Strom

From the ACS Press Room

A better way to wash pesticides off apples

Effectiveness of Commercial and Homemade Washing Agents in Removing Pesticide Residues on and in Apples
Journal of Agricultural and Food Chemistry

Polishing an apple with your shirt might remove some dust and dirt, but getting rid of pesticide residues could take a little more work. Researchers now report in ACS' **Journal of Agricultural and Food Chemistry**, that washing apples with a common household product — baking soda — could do the trick for residues on the surfaces of the fruit.

The use of pesticides can help increase crop yield, but concerns over their potential effects on human health have been raised over the years. Washing could be one effective strategy to clean pesticides off produce, and it is standard practice in the food industry. But some of the plant-protecting compounds that get absorbed by fruits and vegetables might not be easily removed using current cleaning methods. Lili He and colleagues wanted to find out which washing method can most effectively reduce pesticides.
The researchers applied two common pesticides — the fungicide thiabendazole, which past research has shown can penetrate apple peels, and the insecticide phosmet — to organic Gala apples. They then washed these apples with three different liquids: tap water, a 1 percent baking soda/water solution, and a U.S.-EPA-approved commercial bleach solution often used on produce. The baking soda solution was the most effective at reducing pesticides. After 12 and 15 minutes, 80 percent of the thiabendazole was removed, and 96 percent of the phosmet was removed, respectively. The different percentages are likely due to thiabendezole's greater absorption into the apple. Mapping images showed that thiabendazole had penetrated up to 80 micrometers deep into the apples; phosmet was detected at a depth of only 20 micrometers. Washing the produce with either plain tap water or the bleach solution for two minutes, per the industry standard, were far less effective.

The authors acknowledge funding from the National Institute of Food and Agriculture of the U.S. Department of Agriculture.

From the ACS Press Room

The making of medieval bling

Medieval Gilding Technology of Historical Metal Threads Revealed by Electron Optical and Micro -Raman Spectroscopic Study of Focused Ion Beam-Milled Cross Sections
Analytical Chemistry

Gold has long been valued for its luxurious glitter and hue, and threads of the gleaming metal have graced clothing and tapestries for centuries. Determining how artisans accomplished these adornments in the distant past can help scientists restore, preserve and date artifacts, but solutions to these puzzles have been elusive. Now scientists, reporting in ACS' journal **Analytical Chemistry**, have revealed that medieval artisans used a gilding technology that has endured for centuries.

Researchers can learn a lot about vanished cultures from objects left behind. But one detail that has escaped understanding has been the manufacturing method of gold-coated silver threads found in textiles from the Middle Ages. Four decades of intensive research yielded some clues, but the findings have been very limited. Study of the materials has been hindered by their extremely small size: A single metal thread is sometimes only as thick as a human hair, and the thickness of its gold coating is a hundredth of that. Tamás G. Weiszburg, Katalin Gherdán and colleagues set out to fill this gap.

Using a suite of lab techniques, the researchers examined medieval gilded silver threads, and silver and gold strips produced during and after the Middle Ages. The items come from European cultures spanning the 13th to 17th centuries. The researchers characterized the chemistry of the silver thread, its gold coating, the interactions between the two and the shape of metal strips' edges. To characterize the threads and strips, the researchers combined high-resolution scanning electron microscopy, electron back-scattered diffraction with energy-dispersive electron probe microanalysis and other analytical methods. Though previous studies indicated that these tiny objects were manufactured by a mercury-based method in fashion at that time, the new results suggest that the threads were gilded exclusively by using an ancient method that survived for a millennium. The goldsmiths simply heated and hammered the silver sheets and the gold foil together, and then cut them into strips. It was also possible to determine whether scissor- or knife-like tools were used for cutting. The results also show that this process was used widely in the region well into the 17th century.

The authors acknowledge funding from the European Social Fund.

Around the Area

DFW SECTION

The ***Dallas-Fort Worth Local Section*** 2016 Innovative Project Grant (IPG) proposal has been approved to fund the Dallas-Fort Worth proposal entitled, "Comet Chemistry Camp" in the amount of $3,000.

Section Officers Election Results:

The following DFW section members have been elected to office:

Chair-Elect	Denise L. Merkle
Secretary	Mandy Dark
Councilor	Mary E. Anderson
Alternate councilor	Edward Donnay

UTA

Professors **Daniel Armstrong** and **Purnendu "Sandy" Dasgupta** were honored by being included in the 2017 Power List of *The Analytical Scientist* magazine. This list honors the top ten scientists in each of the ten analytical chemistry catagories.

Dr. **Kevin Schug** was appointed interim Associate Dean for Research and Graduates Studies in the College of Science.

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

retort@acsdfw.org

From the ACS Press Room

Triclosan accumulates in toothbrushes, potentially prolonging users' exposure

Nylon Bristles and Elastomers Retain Centigram Levels of Triclosan and Other Chemicals from Toothpastes: Accumulation and Uncontrolled Release

Environmental Science & Technology

In September, a ban on triclosan in over-the-counter antiseptic soaps, gels and wipes went into effect in the U.S. But the antibacterial ingredient is still allowed in toothpastes for its reported ability to reduce gum inflammation, plaque and cavities. Now a study in **ACS' Environmental Science & Technology** has found that triclosan accumulates in toothbrush bristles and elastomer parts, and is readily released when users switch toothpastes, potentially prolonging users' exposure to the compound.

Past research has demonstrated that triclosan has the potential to disrupt hormones in animals and humans, contribute to antibiotic resistance and cause acute toxicity to aquatic organisms. In light of the reported adverse effects and the lack of scientific evidence on its benefits over plain soap and water, the U.S. Food and Drug Administration banned triclosan in antiseptic washes. However, the ruling doesn't apply to toothpaste and other products, including clothing and cookware. Jie Han, Wei Qiu, Baoshan Xing and colleagues suspected that triclosan might stick to materials commonly used on commercial toothbrush heads and get released in an uncontrolled manner, creating a hidden route of exposure and transport of the chemical that hadn't been previously considered.

The researchers simulated toothbrushing with a range of commercial brushes and pastes. Their testing showed that more than one third of the 22 toothbrushes tested, including two children's varieties, accumulated significant amounts of triclosan equivalent to seven to 12 doses of the amount used per brushing. Toothbrushes with "polishing cups" or "cheek/tongue cleaners," typically made of a class of materials called elastomers, absorbed the largest amounts. When the researchers switched to triclosan-free toothpastes but continued to use the same brushes, triclosan was continuously released from the toothbrushes over the next two weeks. This release could lead to a user receiving prolonged exposure to triclosan, and potentially to other transformation products that previously hadn't been accounted for, even after switching toothpastes. Additionally, regular landfill disposal of used toothbrushes that have accumulated triclosan could result in the chemical leaching into the environment. The study also raises broader questions about the design of consumer products — particularly those used for personal care — with absorptive polymer components that are regularly exposed to chemicals during use.

The authors acknowledge funding from the Marsden Fast-Start Fund and USDA NIFA Hatch Program.

From the ACS Press Room

LIGHTS, CAMERA, ACTION!

The chemistry of Hollywood bloodbaths

https://youtu.be/8OC5rji1stI

Star Wars' parody yields insight into the battle among sperm

https://youtu.be/uXDGbtPGSTo?list=PLLG7h7fPoH8JRH8bEJdgnwZnyA5N-9UaE

How rubber makes sports possible

https://youtu.be/n2zOdsxC_eo

Cassini's legacy and the atmospheric chemistry of Titan

https://youtu.be/Dee0V7axuPI

From the ACS Press Room

Jellyfish-inspired electronic skin glows

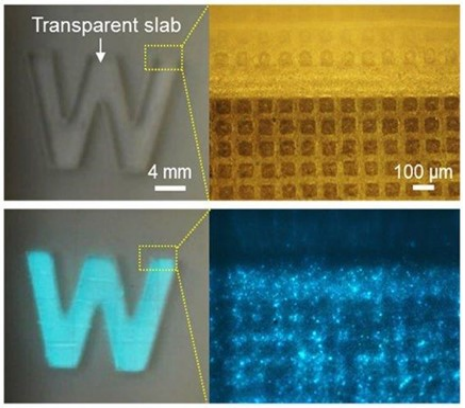
Dual-Mode Electronic Skin with Integrated Tactile Sensing and Visualized Injury Warning
ACS Applied Materials & Interfaces

Electronic-skin technologies for prosthetics and robots can detect the slightest touch or breeze. But oddly, the sensors that make this possible do not respond effectively to a harmful blow. Now researchers report in **ACS Applied Materials & Interfaces** the development of a jellyfish-inspired electronic skin that glows when the pressure against it is high enough to potentially cause an injury.

An electronic skin that can mimic the full range of biological skin's sensitivity has great potential to transform prosthetics and robotics. Current technologies are very sensitive, but only within a narrow range of weak pressures. Under high pressures that could cause damage, the electronic skins' sensitivity fades. To address this shortcoming, Bin Hu and colleagues at the Huazhong University of Science and Technology turned to the Atolla jellyfish for inspiration. This bioluminescent, deep-sea creature can feel changes in environmental pressure and flashes dramatically when it senses danger.

Building on the idea of a visual warning in response to a physical threat, the researchers combined electric and optical systems in a novel electronic skin to detect both slight and high-force pressures. They embedded two layers of stretchy, polydimethysiloxane, or PDMS, film with silver nanowires. These layers produce an electrical signal in response to slight pressures, such as those created by a breeze or contact with a leaf. Sandwiched in between the silver nanowire electrodes is a PDMS layer embedded with phosphors. This layer kicks in and glows with growing intensity as the physical force increases. The researchers say this approach more closely copies the wide range of pressures the human skin can feel.

The authors acknowledge funding from the National Natural Science Foundation of China, Frontier and Key Technological Innovation Special Foundation of Guangdong Province and the Fundamental Research Funds for the Central Universities of China.



An electronic skin glows when a transparent "W" is pressed onto it, and a voltage is applied (bottom).
Credit: American Chemical Society

From the ACS Press Room

A fashionable chemical and biological threat detector-on-a-ring

Wearable Ring-Based Sensing Platform for Detecting Chemical Threats

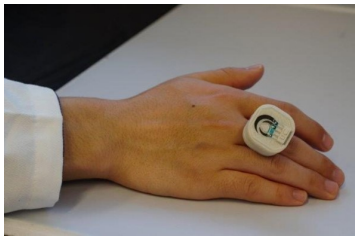
ACS Sensors

Wearable sensors are revolutionizing the tech-world, capable of tracking processes in the body, such as heart rates. They're even becoming fashionable, with many of them sporting sleek, stylish designs. But wearable sensors also can have applications in detecting threats that are external to the body. Researchers now report in **ACS Sensors** a first-of-its kind device that can do just that. And to stay fashionable, they've designed it as a ring.

According to a global analyst firm called CCS Insight, wearable electronics will be a $34 billion industry by 2020. Wearable chemical sensors currently in development include those made in the form of tattoos, mouth guards, wristbands and headbands, but all of these types of sensors face challenges. For example, a sweat sensor worn on an arm could be useful, but patients would need to produce enough sweat for the device to be successful. There is a demand for sensors that are compact, affordable, noninvasive and can be incorporated into everyday life. But more advanced sensors can be costly and difficult to produce. Joseph Wang and colleagues at the University of California, San Diego wanted to develop a portable, affordable, wearable sensor that would detect external chemical threats.

The team designed their sensor as a ring that can be worn on a finger. The ring has two parts, an electrochemical sensor cap for detecting chemical and biological threats, and a circuit board under the cap for processing and sending data wirelessly to a smartphone or laptop. It can perform voltammetric and chronoamperometric measurements, which allow the ring to detect a wide array of chemical threats. The team exposed the prototype to explosives and organophosphate nerve agents, both in vapor and liquid phases. The ring was highly selective and sensitive. Although this ring-based sensor was designed to detect explosives and organophosphate nerve agents, the researchers say the device could be expanded to other hazardous environmental or security agents.

The authors acknowledge funding from the Defense Threat Reduction Agency Joint Science and Technology Office for Chemical and Biological Defense.



A first-of-its kind ring sensor can detect chemical and biological threats.

Credit: American Chemical Society

From the editor

The article from *J. Ag. Food Chem*. was especially interesting to me this month, since my business consists of cleaning things, mostly metals. But washing fruit is a serious business...not only do you want to get pesticide residues off the fruit for shipping, you want to be able to ship them afterward. I've worked with grape growers; grapes are particularly tricky; water is held between the grapes and can cause mildew, mold, rot, you name it, during shipping. But if you wash them with a surfactant, the taste of the surfactant residue causes problems. The home-washing process in the article uses baking soda, which effectively removes residue from apples.

Going into the end of the semester and into the holiday season, there's never a lot of Retort news. National Chemistry Week is over. The Schulz and Doherty awards have been presented. The next national ACS meeting isn't until April. The Southwest Regional meeting is over. But we'll have a December issue as usual.