THE OCTAGON

Volume 92, No. 7 , October 2009 Lehigh Valley Section of the American Chemical Society

In This Issue:

811th Meeting of the LVACS

Friday, October 9, 2009
Muhlenberg College

Reception: 5:30 - 6:00, Seegers Union Room 113 (The Great Room)
Dinner: 6:00, Seegers Union Room 113
Business Meeting: During dessert
Talk: 7:15, Trumbower Room 130
Menu: choice of: chicken picata, roasted salmon in a balsamic glaze, or vegetarian ravioli. Includes salad, vegetable, cous cous, dessert, coffee.
Cost: $20 for members, $10 for students and retirees
Contact: Send reservation information to banderso@muhlenberg.edu or call 484-664-3260 and leave a message with your name, affiliation, and meal selection.
Directions: on the web at http://www.muhlenberg.edu/muhlinfo/directions.html

Speaker: Dr. Kian Tan
Kian Tan joined the faculty at Boston College in 2006 as an assistant professor. Kian received his B.S. degree from the University of Virginia. While at UVA he worked in the labs of Professor Dean Harman in which he explored the chemistry of Os(II) complexes. Upon graduating Kian attended the University of California-Berkeley, where he received his Ph.D. At Berkeley, he pursued a collaborative project with Professors Jonathan Ellman and Robert Bergman. Over the course of his Ph.D. he developed and studied the mechanism of a novel coupling reaction between heterocyclic C-H bonds and olefins. Upon completion of his degree, Kian joined the Jacobsen group at Harvard University as an NIH post-doctoral fellow. During his time in the Jacobsen group Kian designed and synthesized an urea-based catalyst that promotes the asymmetric allylation of hydrazones.

Talk: Catalytic Scaffolding Ligands: an Efficient Directing Group Strategy

Abstract: There is a fundamental need to develop chemical transformations that are highly selective and atom-economical. Directing groups have played a pivotal role in controlling regio- and stereochemistry in a range of organic transformations. However, often directing-group strategies require the introduction of stoichiometric quantities of synthetically undesirable functional groups (such as phosphines) into the organic substrates. We are developing a new class of ligands that address this limitation. We have synthesized ligands that simultaneously and reversibly bind to a metal catalyst and common organic functional groups (such as alcohols and amines). By using a ligand as a scaffold to temporarily join the catalyst and substrate together, the power of directing groups to control selectivity is coupled to the practicality of catalysis. The value of the scaffolding strategy is that we can

apply a synthetically useful functional group to bind to the ligand, and then tailor the ligand for optimal performance in the desired transformation.

2009-2010 LVACS Meetings

November 12- Lehigh University
January- Penn State University Lehigh Valley
February- TBA
March- TBA
April- Moravian College
May- TBA

Councilor's Report

Lehigh Valley Section

ACS National Meeting, Washington, DC

August 16 - 20, 2009

Attendance at the Meeting by your Councilors

The candidates for 2010 ACS President Elect will be Nancy B. Jackson (Sandia National Laboratories), Cheryl A. Martin (Rohm and Haas), and Mary Virginia Orna (College of New Rochelle). Our ACS District I is also holding an election this year for Director. The candidates will be D. Richard Cobb (Eastman Kodak) and Neil D. Jespersen (St. Johns Univ.) Please that the time to read the candidate information that arrives with your ballot and exercise your right to vote.

Actions of Council

There were two competing petitions before Council, both on the issue of how Petition Candidates for ACS president are placed on the ballot. The Nominations and Elections (N&E) committee had placed a Petition which, if passed, would have required petition candidates to be vetted by the Council before being placed on the ballot. A competing petition, which was submitted "for urgent action" would have changed the ACS Constitution to disallow the effects of the other petition. That "urgent action" portion of that petition was voted down, and the constitutional amendment petition will be voted on at the next Council meeting. The N&E petition was recommitted to committee for modification based on the discussion which occurred at the Council meeting.

Committee Review

As part of a regular performance review, the Council VOTED to continue the Committees on Chemical Safety, Minority Affairs, Chemical Abstracts Service, Technician Affairs, and Analytical Reagents. Continuing the first three committees requires Board of Directors concurrence.

Registration Report and 2010 National Meeting Registration Fee

As of August 19, 2009, the ACS fall national meeting had attracted 14,319 registrants. This was the largest Washington meeting in history. Totals in select categories are as follows: Regular attendees 8,575; Students 3,159; Guests 462; Exhibit Only 676; and Exhibitors 1,447. In keeping with the objective of the National Meeting Long Range Financial Plan, previously approved by the Board of Directors and Council, the Meetings and Expositions Committee recommended to the Board an increase of $10 for the 2010 national meeting registration fee. The Board will act on this recommendation shortly.

Membership Activity

The provisions of the Petition on Membership Categories and Requirements were fully implemented this past June with the transfer of former Student Affiliates to Student Member status, and Associate Members to regular Member status. As of July 31, the Society had 9,732 Student Members – 6,500 of them former Student Affiliates and more than 3,000 of them new Student Members.

Dissolution of the Division of Chemical Technicians

At the 2009 spring Council meeting, the Divisional Activities Committee (DAC) reported that it had voted to accept a recommendation from the Division of Chemical Technicians (TECH) that the division disband and to recommend this action to Council in the fall. On recommendation of DAC, as recommended by TECH, the Council VOTED to disband the Division of Chemical Technicians effective December 31, 2009. DAC agreed that TECH has accomplished its mission of enhancing the status of technicians in the American Chemical

Society, and now they are integrated into the other technical divisions.

Changes to Charter Bylaws for New Local Sections and International Chemical Sciences Chapters and Bylaws for Divisions in Probationary Status

The Council VOTED to accept changes to charter bylaws for new local sections and international chemical sciences chapters, and bylaws for divisions in probationary status. These changes, which were developed in cooperation with the Committees on Divisional Activities, Local Section Activities, and International Activities, are a result of changes to the Constitution and Bylaws made as a result of the Petition on Membership Categories and Requirements, which became effective on June 30.

The Society's Finances

In view of the ongoing global recession and its impact of the Society's finances, the Board received an update on the Society's current financial position and the projected financial performance for 2009. The Society is projected to end the year with a net contribution from operations of $11.2 million, or $528,000 favorable to the 2009 approved budget. The favorable projection is largely the result of Contingency Plan actions and expense management initiatives implemented in early 2009, which are expected to fully offset revenue shortfalls in the Approved Budget across several categories.

Respectfully submitted,
Roger A. Egolf
Carol B. Libby
Lehigh Valley Section Councilors

Call for Nominations

Now accepting nominations for LVACS officers for 2010.
Positions open are: Chair Elect, Secretary, Treasurer, Councilor
Please forward nominations to any officer (see last page of this newsletter for contact information) or nominate at the October meeting. Elections will be held in November.

LVACS Organic Scholarship Winner

The winner of the 2009 Organic Scholarship was Nicholas J. Barna from Lafayette College. His essay follows:

DDT: History's Most Notorious Insecticide

Throughout recorded history, the development of new compounds and reactions in the field of organic chemistry has played a vital role in the advancement of mankind. Some of the most important discoveries were the result of an unprecedented growth of scientific knowledge in the nineteenth century known as the Industrial Revolution. The synthesis of powerful insecticides in the wake of this era marked a significant progress of man against nature, resulting in the saving of countless lives that would have fallen to a variety of diseases transmitted by insects. Arguably the most important insecticide of this period was dichlorodiphenyltrichloroethane, better known as DDT. Viewed initially as a miracle chemical, DDT has and continues to play a crucial role in the eradication of malaria across the world; however the discovery of its adverse environmental impact in the twentieth century forever changed its role in shaping health policy. The storied history of this compound serves as a powerful example of the potential wonders and unseen consequences of advancements in organic chemistry.

DDT was first synthesized in 1873 by an Austrian student; however it was not until 1939 that Swiss chemist Paul Müller of the Geigy chemical company discovered its use as an insecticide.1 The chemical saw its first great use in World War II, when it was by applied by Allied soldiers in a 10% talcum powder to drastically cut back on cases of typhus, a bacterial infection spread by lice that had devastated troops several years earlier in World War I. The DDT-powder was commonly applied to clothing and bedding, which resulted in significantly fewer noncombat deaths as compared to the Germans, who did not use DDT. In the Pacific theater, DDT was also used to stop the spread of diseases such as yellow fever and malaria. Following WWII, DDT's seemingly miraculous qualities led to its implementation in developing tropical societies for

public health and in developed countries for agricultural applications.

The relatively simple synthetic procedure for DDT allowed for industrial production and widespread implementation of the chemical in the twentieth century. DDT belongs to a class of pesticides known as organochlorides, as is evidenced by its structure containing two o-o-chlorophenyl groups and a 2,2,2,-trichloro ethyl section (Figure 1).

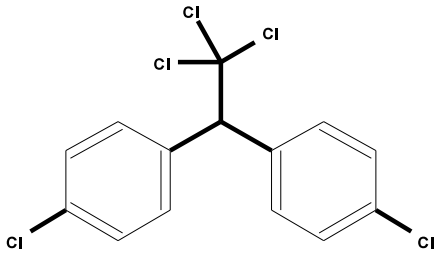

Figure 1. Structure of DDT (1-chloro-2-[2,2,2-trichloro-1-(4-chlorophenyl)ethyl] benzene).

Some of the most common methods of production involved a reaction between chloral hydrate and chlorobenzene in the presence of sulfuric acid. The readily attainable starting materials for this process were also a highly important factor in providing economic incentive for DDT production. Chloral hydrate is made from chloral, a compound formed through the chlorination of ethanal that has its own unique history (popularized in nineteenth century detective stories, chloral acts as a sedative often referred to as "Mickey Finn"). Chlorobenzene can similarly be attained from chlorination of benzene, a compound produced during coking of coal in the steel industry prior to World War II.1 Although DDT can also be made in the presence of concentrated sulfuric acid, the difficulties associated with this substance on a large scale led to the use of other acids such as chlorosulfonic acid.2

The synthetic processes for DDT that involve the aforementioned starting materials are commonly taught as a part of an introductory organic chemistry curriculum. In the presence of water and an acid catalyst (in this case chlorosulfonic acid), the aldehyde functional group of chloral undergoes a hydration to form a geminal diol. Chlorosulfonic acid then reacts with the chloral hydrate in nucleophilic substitution reaction in which the alcohol is deprotonated and converted to a sulfonate. Hydrochloric acid is a byproduct of this reaction. The newly generated sulfonate compounds can then be reacted with chlorobenzene in a process involving electrophilic aromatic substitution, giving off hydrochloric acid as a byproduct. As chlorine is an ortho-para director, both types of products can be formed; however the para-compound is the one required for insecticidal DDT. Nucleophilic substitution of chlorosulfonic acid and electrophilic aromatic substitution of chlorobenzene are then repeated for the remaining alcohol group, resulting in the final product (Figure 2).

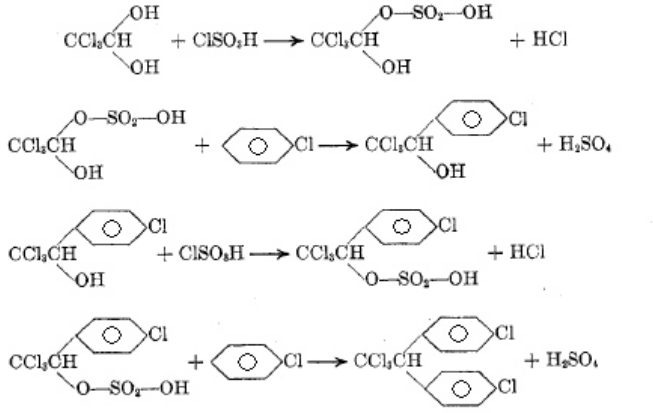

Figure 2. Synthesis of DDT from chloralhydrate and chlorobenzene in chlorosulfonic acid.2

As is evidenced by the preceding synthesis, the industrial production of DDT can be accomplished with ease; however there are several drawbacks to these methods. Hygiene is a concern, as the chlorine gas (used to prepare chloral) and chlorobenzene can be toxic to workers. The byproduct solutions contain sulfuric and hydrochloric acid, which are both dangerous and must be disposed of properly. Other byproducts include p-chlorophenyl sulfonate, which has been used in the dye industry for the preparation of water-sulfur dyes. Technical grade DDT primarily consists of the p,p'-DDT isomer (ca. 85%) with the o,p'-DDT and o,o'-DDT isomers present in much smaller concentrations; these isomers are formed due to the directing properties of the chlorine group of chlorobenzene during the

electrophilic aromatic addition steps.3 The isomers present in solution have been shown to have no insecticidal activity.4

When used as an insecticide, DDT is often applied as an aqueous spray as the compound is a solid under normal conditions. The highly effective insecticidal properties of DDT are due to its ability to interfere with the nerve membranes of insects. The accumulation of DDT in plasma membranes of nerve cells is a result of its interaction with lipoprotein structures; the actual mechanism of action involves an inhibition of potassium ion current, thus preventing sodium-potassium ion channel impulses.5 This effect only occurs for insects, as DDT is nontoxic to humans in the dosage used for spraying. These properties, combined with the cheap production, led to DDT's indiscriminant use to destroy insects that threatened human populations via crop destruction or the spreading of disease. The compound was celebrated globally, culminating in the awarding of the 1948 Nobel Prize for physiology or medicine to Paul Müller for his discovery.

Despite its seemingly perfect insecticidal properties, the negative effects of DDT on the environment began to be recognized in the late 1950s. DDT is a persistent, fat soluble chemical that is not readily metabolized by higher organisms on the food chain. Due to the principle of biological accumulation, larger amounts of DDT (ex. 25 ppm) are found in higher organisms such as bald eagles, which have their reproductive cycle interrupted by the chemical.1 Additionally, the development of DDT-resistant insects through the process of natural selection was observed. The compound became the subject of national concern in the United States following the 1962 publication of Rachael Carson's Silent Spring, a book often cited as sparking the modern environmentalist movement in America. DDT was banned in the U.S. in 1973, following the example of many other industrialized nations. Numerous other organochloride pesticides met the same regulatory fate, including chlordane, heptachlor, and aldrin.

Great strides have been made in the past decades with regard to understanding the adverse effects of persistent, bioaccumulative organochloride pesticides in larger mammals. Chemicals such as DDT have been found to impair endocrine, immune-system, liver, reproductive, and neurologic function as well as causing cancer.6 In response to the regulation and ban of organochloride pesticides, many new scientific developments have been made to either find ways to remedy the contamination of ecosystems or to find alternative, more environmentally friendly pesticides as substitutes. The removal of pesticides such as DDT from the environment has resulted in new fields of environmental chemistry, with current research indicating potential applications of mesoporous silica materials in surface water and groundwater filter systems.7 The growth of the organophosphate insecticide industry (containing esters of phosphoric acid) has provided a popular alternative to organochlorides but also carry an added danger of greater toxicity to humans.

In recent years DDT has use has played an increasingly large role in United Nations health policy concerning malaria, primarily in Africa. Each year between 300 and 500 million cases of malaria are reported worldwide, resulting in an estimated 2.7 million deaths.8 Malaria is virtually a nonexistent problem in the U.S.; however the disease continues to wreak havoc in unindustrialized nations, especially in sub-Saharan Africa. Most of the 2.7 million malaria deaths are those of children in such countries, where the climate provides an opportune breeding environment for mosquitoes that carry the disease. Although the U.N. Stockholm Treaty called for the phase out of DDT, it also recognized its efficacy in undeveloped countries. Recent decisions by the World Health Organization (a subdivision of the U.N.) have endorsed wider DDT spraying despite protest from both the environmentalist and medical communities.9

Although alternative insecticides have been developed, the low cost still associated with DDT has led to its continued implementation. Opponents of DDT use in Africa cite the detrimental effects to humans and the environment while those in favor of the chemical often debate as to the proper administration (nets or spraying). Studies have shown the use of DDT-impregnated nets to be more cost-effective than spraying in regions of Thailand with both methods found to be more cost-efficient than malaria surveillance alone, yet the policy dispute

continues for Africa.10 Developments such as the increased number of mosquitoes due to increased global temperatures and a trend of increasing resistance to anti-malaria drugs have only compounded the problem in sub-Saharan Africa and put a greater focus on DDT. The debate will likely play a significant role the future foreign policy of the U.S., where DDT has become a point of contention between environmentalists and (typically) right-wing advocates of expanded spraying. Although the cessation of production in the U.S. may have dampened the social awareness of the chemical's dangers, the issue of DDT is far from rest on a global level as China and India continue to produce the compound in unknown quantities. The continued impact of DDT on societies and environments across the world serves as an important reminder of the power and consequences of advancements in the field of organic chemistry.

References

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This Month in Chemical History: Part I

Harold Goldwhite, California State University, Los Angeles, hgoldwh@calstatela.edu

Some of my most prized acquisitions of material related to history of chemistry – perhaps because they cost very little – have been obtained at thrift shops and flea markets. In early 2008 I was browsing at a thrift shop in Eugene, Oregon when I came across one of these treasures and snapped it up for a quarter. It is titled "Nuclear Milestones": speeches by Glenn T. Seaborg, Chairman U.S. Atomic Energy Commission 1961-1971. This particular compilation was presented to participants of the 1990 "Instrumentation" Institute for Chemical Education held at the Lawrence Hall of Science and the Department of Chemistry, University of California at Berkeley. My copy (perhaps all the copies?) is autographed by Seaborg. In this column and the next I will be looking at some of the interesting contents of this paperbound volume. It is generously illustrated with many photographs of historical interest; the frontispiece shows some of those present at the Atomic Pioneer Award Ceremony in February 1970. The awardees at this unique ceremony were Vannevar Bush, James B. Conant, and General Leslie Groves – certainly among the most important of the U.S. pioneers in support of nuclear research – and the presentation was made in the presence of Seaborg and President Richard M. Nixon, both of whom are in the photograph.

The first section of the book, "307 Gilman Hall …Some Reminiscences" is a talk given in February 1966 at the dedication of this modest room at UC Berkeley as a National Historic Landmark (long before the ACS began its Historical Chemical Landmark program). The date of this dedication was the 25th. anniversary of the discovery of plutonium not only in Room 307 but in adjacent laboratory spaces. As Seaborg said "a less significant or

historical looking room hardly existed on the campus .... The little cubbyhole with its low slanting ceiling directly under Gilman Hall's roof, where we kept our electroscope and various samples, is still an appendage to the room".

Seaborg's story of the discovery of plutonium is attractively personal, and he dates it back to 1936 when he gave a graduate student seminar reporting on the now-famous work of Fermi and Segre in Rome and Hahn and Strassman in Berlin on the radioactivities observed when uranium was bombarded with neutrons. The accepted explanation at the time was the production of new transuranium isotopes. It was not until 1939 that the explanation of the new activities in terms of fission was put forward by Meitner and Frisch. Seaborg became fascinated by this new research and appreciated in 1939 that in fact no transuranium isotopes had yet been identified. Other workers at Berkeley were not so sure! McMillan and Abelson observed that some of the radioactivities behaved anomalously, in particular a beta-decay with a half-life of about 2.3 days. In further work they confirmed that they did indeed have in hand an isotope of element 93 and by Spring 1940 they had isolated and discovered the first isotope of a trnsuranium element, which came to be called neptunium. This followed a tradition of naming some heavy elements after planets, like uranium after Uranus. McMillan began to look for other transuranium elements, and began experiments on bombarding uranium with deuterons in the Berkeley cyclotron, but he was called away to work on radar at M.I.T. and agreed that his close colleague Seaborg should continue the search.

Seaborg and Wahl in December 1940 bombarded a target of uranium oxide on a copper plate with fast moving deuterons. They detected a plutonium isotope plus another material that was, significantly, an alpha emitter. They deduced that they had produced an isotope of element 94 with a mass number of 238 and a half-life of under 100 years; it was consequently strongly radioactive. In late January 1941 they sent a note, with authors McMillan, Wahl, Kennedy, and Seaborg, which was later published in "Physical Review". By late February Wahl and Seaborg had produced chemical evidence, via oxidation studies, that element 94 was chemically different from 92 or 93. These experiments were described in a manuscript sent in March 1941 that confirmed that a new transuranium element had been discovered. By March 1942, after a year in which the new element was called variously just element 94 or even "copper", for security reasons, it was decided to name the new element after the then-planet Pluto. After lengthy discussions trying to decide between "plutium" and "plutonium" the latter, more euphonious, name was chosen along with the symbol Pu. By this time the Seaborg group had also isolated the more stable and fissile isotope of plutonium of mass 239 and half-life 24,000 years.

In a report to the "Uranium Committee" in March 1942, by which time the US was at war, Abelson wrote: " It is probable that the cost of isotope separation will be great. The decision to spend perhaps a million dollars on a separation plant may well hinge on the results of these experiments". As Seaborg observes: "We had no idea that our work would play a major role in a program that would eventually cost more than two billion dollars within a few years."

This Month in Chemical History: Part II

In my previous column I discussed the discoveries of the first two transuranium elements nerptunium and plutonium, elements number 93 and 94, by McMillan, Seaborg and their colleagues at U.C. Berkeley. The source material came from a pamphlet "Nuclear Milestones" which includes speeches given by Seaborg while he was Chairman of the U.S. Atomic Energy Commission from 1961 – 1971. In this column I continue the transuranium story with the next two elements, numbers 95 and 96, as presented in a speech given in 1969 –at the Mendeleev Centennial at the Robert A. Welch Foundation Conference in Houston, Texas.

The discoveries of these elements came from experiments at the Metallurgical Laboratory in the New Chemistry Building at the University of Chicago, a key laboratory in the work that led to the first atomic bombs. (By the way, if you want to read a comprehensive and absorbing account of the Manhattan Project I strongly recommend Richard Rhodes' "The Making of the Atomic Bomb" published in New York by Simon & Schuster in 1987

and available in paperback). By 1944 Seaborg had moved to Chicago and his co-workers included Albert Ghiorso, Ralph A. James, and Leon O. Morgan. They began their work by bombarding plutonium 239 with deuterons; plutonium was now available in quantity – that is to say milligrams rather than the micrograms on which its original discovery was based – from the Clinton Laboratories in Tennessee. These experiments did not yield positive results. Similarly bombarding plutonium 239 with neutrons, though giving valuable experience to the team, did not yield new transuranium isotopes.

By now the chemistry of neptunium and plutonium had suggested to the team that the new elements they sought should be regarded as a group, the actinides, with affinities to the lanthanides, the rare-earth elements. The first positive indications came in early 1944 as a result of bombarding plutonium 239 with high energy alpha particles (helium ions). The target material was dissolved, oxidized, and co-precipitated with insoluble lanthanum fluoride. Alpha decay was recorded from this material distinct from plutonium's known alpha decay. Both the chemistry and the alpha decay indicated production of element 95 or 96. While re-reading the notebooks of the group Seaborg came across the entry by Ralph James dated June 15, 1944: "Time out to get married"! James was back at work on June 19. As the work progressed it became more and more likely that the new activity was due to the isotope of mass 242 of element 96. In September, after receiving 200 milligrams of plutonium 239, deuteron bombardment of this "macro" sample was undertaken and eventually yielded definitive evidence of the production of an isotope of element number 95. Then long-term bombardment of plutonium 239 with neutrons gave clear evidence of the production of isotopes of both elements 95 and 96.

Workers at Los Alamos carried out mass spectrographic examinations of irradiated plutonium samples from Chicago and identified an isotope of element 95 of mass 241. This turned out to have a half-life of 13 years. Further irradiation of plutonium at Bekeley with higher energy alpha particles produced two isotopes of element 96, of masses 240 and 242.

The announcement to the world of the production of two new elements, planned for presentation at an ACS symposium at Northwestern University in November 1945, was actually anticipated on a "Quiz Kids" radio broadcast a little earlier in the same month! Seaborg was a guest on the program and was asked by a participant if any new elements had been discovered? Seaborg replied:" …Recently there have been two new elements discovered – elements with atomic numbers 95 and 96 – out at the Metallurgical Laboratory here in Chicago. So now you'll have to tell your teachers to change the 92 elements in your schoolbook to 96 elements."

There remained the question of naming the new elements. Morgan referred to them as "pandemonium" and "delirium" but those names were not deemed acceptable to the community of science. At a talk given at the ACS meeting in April 1946 the group presented the names. Element 95 was called "americium" following the model of the lanthanide europium. To honor the great pioneers of radioactivity element 96 was called "curium" again following the lanthanide example of gadolinium named for its discoverer Johan Gadolin.

National Chemistry Week Seminar

A Process to Convert Carbon Dioxide (CO2) and Hydrogen Sulfide (H2S) into harmless compounds? Discussion on an exothermic chemical reaction that could contribute to the fight against global warming

The Stenger-Wasas Process (SWAP): A suite of hydrocarbon refining solutions that has
been verified in the laboratory to rapidly reduce H2S to below detectable levels by gas chromatography (under 4ppb) and can convert CO2 into carbon, water and sulfur industrially. Discoverers of the SWAP invite academicians and experts to discuss the science and its potential contribution to the global warming solution.

WHERE: Philip Alampi Auditorium, Rutgers University Cook Campus, School of Environmental and Biological Sciences, 71 Dudley Road (corner of College Farm and Dudley Rd.) New Brunswick, NJ
WHEN: Wed., Oct. 21, 2009, 2:30 p.m. - 4:30 p.m.
RSVP: www.swapsol.com/events.php
Open Admission, & A Following

WHO: Raymond Stenger and James Wasas invite members of the academic and professional communities on Wednesday, Oct. 21, 2009, to learn about the Stenger-Wasas Process (SWAP), proposing that a reaction between carbon dioxide (CO2) and hydrogen sulfide (H2S) eliminates both (2H2S + CO2 => 2H2O + 2S + C) in a mildly exothermic reaction and could alter the course of climate change and impact escalating energy costs. Hear and discuss the science behind the SWAP and its potential impact on the hydrocarbon industry.

PARTICIPANTS

1. Raymond Stenger (B.S.,WV University '57)
2. James Wasas (B.S., Rutgers '68)
3. Wolf Koch, Ph.D, Chemical Engineering, University of Cincinnati (B.S., Rutgers '68), President, Technology Resources International, Inc.
4. Gene Hall, Ph.D, Analytical Chemistry, Rutgers University (independent GC verification)
5. Roy Drayton, Ph.D, President, Thermal Hazard Solutions, Inc. (independent thermodynamics and chemical kinetics verification)
6. Randa Fahmy-Hudome, Former U.S. Associate Deputy Energy Secretary

Stenger and Wasas will discuss the catalytic and recombinant science behind the reaction. Dr. Wolf Koch will discuss the potential commercial applications. Q & A will follow: Dr. Hall will answer questions about his independent chemical and gas chromatography (GC) analysis; Dr. Drayton will answer questions about his findings and verifications of thermodynamic and chemical kinetic results showing scalability of the SWAP.

If you would like to attend, please visit: www.swapsol.com/events.php

News From National

Undergraduate Students Can Now Participate in Local Sections

Effective June 2009, all ACS Student Affiliates are now Student Members. Last fall, the ACS membership voted to change the Society bylaws to grant all undergraduates the rights of full membership as Student Members, including membership in ACS Local Sections. For further details regarding the membership categories changes, please refer to the June 15, 2009 article in Chemical & Engineering News.

ACS is now actively recruiting undergraduates to become members of the ACS. Undergrad.ACS.org is the primary recruitment tool staff members have developed for this audience. Please refer students to this Web site if they are interested in joining ACS. The site describes all of the benefits of ACS membership geared specifically for undergraduates. We hope that by bringing in new undergraduate student members, ACS Local Sections will benefit from an increase in participation and contributions from the next generation of chemical scientists.

Don't forget, every new student member you recruit also applies toward your local section commission claim and the 2009 ACS President's Challenge. Just be sure to have the student select your local section as the referral on the online membership application found undergrad.ACS.org.

We encourage you to reach out to this audience of new members and welcome them into your local sections. Additional information can be found at http://undergrad.ACS.org. Feel free to send any questions to ACS Membership Marketing by clicking on "Contact Us," which is found at the bottom of every page on the Web site.

Equipping the 2015 Chemical Technology Workforce Mini-Grant Winners

The most recent winners of Equipping the 2015 Chemical Technology Workforce mini-grants were announced at the 238th ACS National Meeting. The following will receive $500 for their activities to support technician education and professional development.

Bellingham Technical College/BP Cherry Point Refinery/Ferndale High School Partnership for workshops on the use of computers in process technology industries. High school and college educators will learn the theory and practice of using computers for controlling and simulating process operations.

Cincinnati State College for the development of an introductory course on bio-fuels. The hybrid course (on-line lecture, in-house lab) would be open to both students and working technicians and would address a growing field in the Cincinnati area.

Colorado Mountain College for a luncheon and open house to promote opportunities in chemical process technology. Participants will be able to examine some common equipment, learn about

opportunities in local industry, and talk with career counselors.

Delaware Technical & Community College for the introduction of a networking unit to the first-year chemistry course in the college's Chemical Technology program. Students will learn about and practice networking as a vital career skill.

The mini-grant winners have proposed intriguing programs that bring together industry, academia, and the community for the education and professional development of applied chemical technology professionals.

The deadline for the next round of mini-grants is Thursday, February 11, 2010. For more information on Equipping the 2015 Chemical Technology Workforce, visit www.acs.org/cta, call 1-800-227-5558 ext. 6108, or email cta@acs.org.

Call for Abstracts for the 42nd Central Regional Meeting of the ACS

CeRMACS-2010 will be held June 16-19 at the Dayton Convention Center and Crown Plaza Hotel in Historic Downtown Dayton, Ohio. The following Featured Symposia will support the theme: Chemistry: Reacting to Provide New Technologies:

- Computational Materials Science: Theory, Modeling, & Simulation
- Nanomaterials: Synthesis, Structures, Functionalization & Applications
- New Vistas in Biotechnology: Chemistry, Materials & Applications
- Combinatorial Characterization in Nano-Bio Systems
- Chemistry & Materials for Alternative Energy
- Metamaterials
- Chemistry for Peace
- Small Chemical Business Programming
- Materials for Aerospace and Space Applications
- Chemical Education Symposium and HS Teacher Award
- Chemical Information and the Patterson-Crane Award
- Minority Leaders in Nanomaterials Research Workshop
- Traditional areas, such as Organic, Inorganic, Biochemistry, and P-Chem
- Student Poster Sessions

Go to CeRMACS2010.org for more information and to submit your abstract! And don't forget the long list of Pre- and Post-Meeting Attractions:

- Dayton Dragons Baseball at Fifth-Third Field, Downtown Dayton – daytondragons.com
- US Air Force Museum – www.nationalmuseum.af.mil
- The Dayton Art Institute – www.daytonartinstitute.org
- Boonshoft Museum of Discovery – www.boonshoftmuseum.org
- Schuster Performing Arts Center – www.schustercenter.org
- Historical Oregon District – www.oregondistrict.org
- Carillon Historical Park – www.carillonpark.org
- The Dayton International Peace Museum – www.daytonpeacemuseum.org
- Paramount's Kings Island (just 35 miles south)
- And a Plethora of Wright-Brothers Activities – www.nps.gov/daav

Willing to grow your outreach to area high schools?

Consider supporting your local ACS High School Chemistry Clubs, which provide opportunities for students to cultivate their interest in chemistry beyond the classroom. There are over 200 clubs across the U.S. and Puerto Rico. The ACS Education Division provides organizational support for these clubs such as start-up handbooks and ideas for activities throughout the year. To find the ACS High School Chemistry Clubs in your area check out the ChemClub Directory at www.acs.org/chemclub.

How can you and your Local Section support your area High School Chemistry Clubs? Following are just some ideas:

- Provide the information about the ACS High School Chemistry Club program to a high school teacher in your area and encourage them to sponsor a ChemClub
- Invite your local High School Chemistry Club sponsors and students to participate in National Chemistry Week or Chemists Celebrate Earth Day activities.

- Invite your local High School Chemistry Club to attend a Speaker Service program, Science Café, or Meeting.
- Organize a symposium about the diversity of careers in chemistry
- Plan and co-sponsor a community outreach event
- Provide small grants for High School Chemistry Clubs in your area.
- Apply for an Innovative Project Grant to provide an activity for a High School Chemistry Club.

To find out more about the out about the ACS High School Chemistry Club program visit our website at www.acs.org/chemclub or contact us at hschemclubs@acs.org.

Chemical technology programs earn ACS approval

The ACS Chemical Technology Program Approval Service (CTPAS) has granted ACS approval to the Laboratory Science Technology program at the National Technical Institute for the Deaf (NTID), Rochester Institute of Technology, and the Chemical Technology program at Ivy Tech Community College.

The Laboratory Science Technology Program at NTID is the 15th chemistry-based technology program to be approved by ACS and the first approved program designed for deaf and hard-of-hearing students. It is also the first approved program to work with industry and community partners nationwide, rather than with local partners.

The Chemical Technology program at Ivy Tech Community college is the 16th chemistry-based technology program to be approved by ACS. Just over 10% of the chemistry-based technology programs in the U.S. have earned ACS approval.

Because chemistry-based technology students must learn a great deal of theory and technique in a relatively short period of time, programs work closely with industry and community partners to tailor the curriculum appropriately. Many technology programs also work with academic partners to give students more educational options. Such partnerships are rapidly becoming the new model for relationships among industry, academia, and the community.

CTPAS was established in 1990 to nurture, review, and grant ACS approval to associate-level chemistry-based technology programs. CTPAS evaluates programs based on such criteria as partnerships and alignment with industry/community, program assessment, and facilities and resources.

For more information on ACS approval or to see a list of approved programs, visit "Chemical Technology Program Approval" at www.acs.org/education, call 202-872-6108, or email ChemTechLinks@acs.org.

Want to Support Your Local Chemistry Teachers? Need Materials for a High School Event?

Consider the ChemMatters publication. ChemMatters is a bimonthly magazine for high school students published by the ACS Education Division, and its mission is to help students find connections between the chemistry they learn and the world around them. Each issue brings intriguing stories informing readers about creative applications of chemistry or real-life mysteries solved by chemistry. A free, web-based Teacher's Guide contains background information, follow-up hands-on activities, classroom demonstrations, and other resources allowing teachers to incorporate ChemMatters into their instruction, or assign it as supplemental reading. A 25- year archive of the ChemMatters magazine is now also available on CD.

Support high school teachers and students in your area and present them with a gift of a ChemMatters subscription (only $14) or ChemMatters CD ($30). For more information about these great resources visit www.acs.org/ChemMatters . To receive a limited number of free copies of ChemMatters contact Marta Gmurczyk at m_gmurczyk@acs.org or 202-452-2105

Elements of Excellence – ACS Volunteers Recognized at ChemLuminary Awards Event

The 11th Annual ChemLuminary Awards celebration was held in conjunction with the ACS National Meeting in Washington, DC, on August 18, at the Capital Hilton Hotel. Approximately 400 chemists came together to recognize 105 local sections, 8 regional meetings, and five divisions, that received accolades for their tireless efforts and work in promoting chemistry and the chemical sciences in local areas.

The night's celebration started with a social hour and poster session where all award finalists

displayed materials from their events. ACS President Tom Lane opened the event with welcoming remarks and the presentation of 44 awards that included the ACS Volunteer Service Award to Sr. Mary Virginia Orna of the College of New Rochelle, and the Helen M. Free Award for Public Outreach to David A. Katz of Pima Community College. A celebration of dancing followed until midnight.

A complete video of the awards ceremony and list of local sections, divisions, and regional meetings that were honored on August 18 can be found at www.acs.org/awards (and then click on ACS Community Recognition).

All Local Section ChemLuminary Award nominations are submitted by self-nomination via Annual Reports. For outstanding events or activities sponsored during 2009, self-nominations must be submitted by February 15, 2010.

Looking for Ways to Go Green and Partner with ACS Student Chapters?

Your local section can partner with an undergraduate ACS Student Chapter to help them earn a Green Chemistry Student Chapter Award. To earn the award, undergraduate student chapters must complete at least three different green chemistry activities over the course of the academic year and include them in their chapter report. With the start of the school year, now is a great time to reach out to a local student chapter as they're planning the year's activities. The upcoming National Chemistry Week (October 18–24, 2009) is a good opportunity to try your first green chemistry event in partnership with an ACS Student Chapter!

To read more about the award and for ideas of green chemistry activities, visit www.acs.org/greenchemistry and click on "Green Chemistry Education" then "Green Chemistry Student Chapter Awards".

Call for Papers: Partnerships with Industry

As budgets tighten and resources shrink, partnerships between industry and academe become increasingly critical to the sustainability of the chemistry-based technology workforce.

The ACS Division of Chemical Education (CHED) and the ACS Chemical Technology Program Approval Service (CTPAS) are sponsoring "Partnerships with Industry: Building a Sustainable Workforce" at the 239th ACS National Meeting in San Francisco, CA. This symposium will explore the role of partnerships in the education and professional development of technicians, operators, analysts, and other applied chemical technology professionals. Speakers from all sectors of industry, academe, and the community are cordially invited to submit papers on

- Impact of partnerships on the education, employability, and professional development of technicians
- Development and growth of industry/academic partnerships
- ACS-supported activities, including ACS chemical technology program approval, Equipping the 2015 Chemical Technology Workforce, and ChemTechStandards & Partnerships
- Related topics

The deadline for submission is October 19, 2009. Abstracts may be submitted through the meeting website at www.acs.org/meetings. For more information, please contact Blake Aronson, ACS Office of Technician Education & Resources, 202-872-6108, b_aronson@acs.org.

INVEST IN YOURSELF by attending ACS ProSpectives Conferences

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- Tactical Approaches to the Challenge of Drug Failure

(Formerly Topics & Tactics in Current Drug Design)
Oct. 4 – 6, 2009 in Philadelphia, PA at the Crowne Plaza Philadelphia Center City
Co-chairs: Nick Meanwell of BMS, Milind Deshpande of Achillion

- Process Chemistry in the Pharmaceutical Industry with Special emphasis on Continuous Manufacturing

Nov. 2 – 4, 2009 in Durham, NC at the Sheraton Imperial

Co-chairs: Vittorio Farina of Johnson & Johnson, Mo Movassaghi of MIT

‣Continuous manufacturing program developed by James Evans of the Novartis-MIT Center for Continuous Manufacturing and Kevin Bittorf of Vertex

Please check www.pred.acs.org regularly to obtain the most complete, up-to-date information available on all 2009 conferences, including confirmed speakers and abstracts as they become available.

If you have any questions, please email acsprospectives@acs.org or call
1- (800) 227-5558 and ask for ACS ProSpectives.

Get Involved in the ACS Celebration of IYC 2011: Support the U.S. Commemorative Stamp Campaign

The ACS is working to urge the United States Postal Service to adopt chemistry as a theme for a commemorative stamp in 2011 in view of the contributions of chemistry to the wellbeing of humankind in the U.S. and worldwide and on the occasion of the 2011 International Year of Chemistry.

The USPS gets 50,000 subject requests per year and awards only 25 commemorative stamps per year - Your efforts to contribute to this cause this year are very important and very much appreciated!

How to get involved:

‣Visit www.acs.org/iyc2011 to download the petition

‣Distribute the petition for signature among your colleagues, students, and friends (all chemists and friends of chemistry are encouraged to sign!)

‣Mail or FAX completed petitions to the ACS Office of International Activities no later than November 1. (see petition for fax number and address)

To learn more about IYC 2011 and to contribute ideas to the ACS celebration of this historic event, visit www.acs.org/iyc2011.

Free Teleconference from ACS Careers Industry Forum

ACS Careers Industry Forum presents

"Career Flexibility: How to Build and Balance a Successful Career in Academia and Industry". An interactive hour of idea sharing with guest speaker: James A. Wells, Ph.D, a Professor at both the Department of Pharmaceutical Chemistry and the UCSF School of Medicine's Department of Cellular and Molecular Pharmacology. Dr. Wells is also Director of the Small Molecule Discovery Center (SMDC), which he founded

How You Will Benefit

‣Get insight into the various alternate career options available for chemists in industry.

‣Learn tips on how to transform (retool) and sell yourself.

‣Discover 'hidden' opportunities available for chemists seeking alternate careers.

‣And much more.

Who Should Attend

Scientists, Engineers, R&D, and Chemical Professionals

Teleconference Details

Date: Thursday, October 8, 2009

Time: 2:00-3:00 pm EST

Fee: Complimentary

Don't miss out - Register in advance

More information: http://acscareers.wordpress.com/industry-forum/

About the Speaker:

James A. Wells, PhD, an internationally recognized biochemist and leader in the development of new technologies for engineering proteins and for identifying small molecules to aid in drug discovery, is a member of the prestigious National Academy of Sciences. He joined UCSF in 2005 as the first holder of the Harry Wm. and Diana V. Hind Distinguished Professorship in Pharmaceutical Sciences, and has been the chair of the Department of Pharmaceutical Chemistry in the UCSF School of Pharmacy since July 1, 2008. Wells is a professor in his home Department of Pharmaceutical Chemistry and holds a joint appointment as professor in the UCSF School of Medicine's Department of Cellular and Molecular Pharmacology.

Careers Industry Forum teleconference series now using Twitter

To follow the ACS Careers Industry Forum update, or to ask questions to the presenter in

advance, please use #acscif hashtag. Include this in your twitter text and we will capture group colleagues twittering about this webinar and post the comments or questions to the presenter.

For additional information about upcoming speakers, click on the ACS Careers Industry Forum tab located at the top of the ACS Careers Blog at www.acs.org/careers.

Finding the Training You Need Shouldn't Be Hard

The ACS Office of Professional Education has dramatically revamped its website and registration system so you can find the courses you're looking for in no time. Bookmark this link today: http://www.proed.acs.org. You can now search our short courses, webcast courses and ProSpectives Conferences by topic area, date, or location and even browse our full instructor list. We are continuously investing in new course development, so if you don't see what you're looking for, just drop us a line at shortcourses@acs.org and we'll do our best to serve your technical training needs.

Below is a list of the course locations we have for Fall 2009.

Short Course Circuits

The ACS Short Course Circuit offers the opportunity to take advantage of a wider range of course offerings in a single location and network with a variety of your colleagues.

‣October 12-16, 2009 | Central New Jersey Circuit

Courses in Analytical Chemistry, Biochemistry, Organic Chemistry, Medicinal Chemistry, Engineering, Management and Quality Assurance

‣October 18-20, 2009 | Louisville, KY Circuit in conjunction with the 2009 FACSS meeting

Courses in Analytical Chemistry, Organic Chemistry, Laboratory Safety and Quality Assurance

‣November 2-6, 2009 | La Jolla, CA Circuit

Courses in Analytical Chemistry, Organic Chemistry, Medicinal Chemistry, Laboratory Safety, Management, Cheminformatics, and Quality Assurance

‣November 30 – December 2, 2009 | Durham, NC Circuit

Courses in Organic Chemistry, Laboratory Safety, Management, and Patents

‣December 7-11, 2009 | Houston, TX Circuit

Courses in Organic Chemistry, Laboratory Safety, Engineering, Management, Cheminformatics, Polymer Chemistry and Quality Assurance

Laboratory/Lecture Courses

Get in-class and hands-on experience with Laboratory/Lecture Courses from the ACS.

‣October 4-9 | Virginia Tech, Blacksburg, VA

Fundamentals of Polymers and Interfaces for Adhesives, Composites, and Sustainable Structures

‣October 5 – 9; November 16-20 | Chicago, IL

High Performance Liquid Chromatography: Fundamentals, Troubleshooting, and Method Development

‣November 9 – 13; December 7-11 | Chicago, IL

Gas Chromatography: Fundamentals, Troubleshooting, and Method Development

‣December 6 – 11 | Virginia Tech, Blacksburg, VA

Polymer Chemistry: Principles and Practice

Has Your Local Section WCC joined the WCC Groupsite?

Have you been invited to join our Groupsite for Local Section WCC chairs, powered by Groupsite.com? If not, email contact information for your Local Section WCC chair/representative to jcohen@its.jnj.com to receive an invitation. Upon receiving the email invitation, signup is simple and takes less than a minute.

This Groupsite will enable us to share, network, and coordinate our WCC efforts. All information provided through this platform is privately maintained for the exclusive use of Local Section WCC chairs. We plan to use this group to communicate opportunities and deadlines (e.g., travel awards, networking opportunities, national meeting programs, ChemLuminary Awards) and give you a mechanism to communicate and exchange with other Local Section WCC chairs.

Don't Have a Local Section WCC?

If your ACS Local Section does not have a WCC…start one today! Visit http://membership.acs.org/W/WCC/ for information on how to start a Local Section WCC in your area.

Try out an ACS Webcast! It's easy and economical.

Few companies are immune from the economic hardships in the headlines and many budgets have been trimmed. But it is still crucial to your career to engage in continuing education to expand your skills and stay abreast of new topics. So save your time and money and take a look at the courses available online through ACS. ACS offers a wide variety of webcast short courses and our summer/fall schedule is open for registration now.

ACS Webcast Short Courses provide the same quality training that ACS has long been known for, but, because the courses are presented over the Internet, they offer added convenience and flexibility.

- Economical: Most ACS Webcasts cost less than $100 an hour, which is far less than most technical training.

- Easy: Our technology is easy to use and works with all typical computer systems so virtually anyone can easily take a webcast from the comfort of their home, office, or lab.

- Convenient: Class attendance is NOT required. If you miss a class, simply use your on-demand access to the session recording so you can catch up on your own time.

- Informative: All class materials are available for download and you can email the instructor anytime.

There are expanded course offerings in analytical, organic, pharmacology, engineering, instrumentation, and other areas. For the full list of Webcast Short Courses and more information on available discounts, visit http://www.proed.acs.org/

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