



# ISOTOPICS

The Cleveland Section of the American Chemical Society

Volume 84

Issue 7

October 2008

## On Deck:

**Wednesday, November 19**

2009 Central Regional Meeting  
Overview

**Dan Scherson and Ken Street**

CSU Mather Mansion

## October Meeting Notice

**Monday, October 20, 2008**

Winking Lizard Tavern, Peninsula, OH

4:30 pm	Executive Committee Meeting
5:30 pm	Social Time
6:30 pm	Dinner
7:30 pm	Lecture

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### Zymurgy: The Art and Science of Brewing Beer

*Dr. Tracy P. Hamilton – University of Alabama at Birmingham*

The seminar covers both the practical aspects of brewing (how to) and the chemistry of brewing. After a brief introduction of the history of beer, the steps of the process are outlined. The first step that is required is the malting of grain. This is a complex process that even breweries do not perform themselves, leaving to specialized malting companies. The second step is mashing. This is accomplished by steeping the grain (which is crushed to allow access of the hot water to the inside, but not powdered so that intact grain husks can act as a filter) in hot water. The influence of temperature and pH on the final product is discussed. The third step is lautering (sparging). Lautering is separation of the sugar solution from the grain. Temperature, viscosity from complex carbohydrates, and fluid dynamics are important variables to control. The fourth step is the boil, which serves several purposes: 1) Sterilization 2) extract the bittering compounds from hops (flowers containing bitter olefinic acids that balance the sweetness of beer), and isomerize the olefinic acids 3) precipitation of excess protein 4) browning reactions (Maillard - linking of amino acid and sugars) and 5) removal of excess water. The hot liquid (called wort) is cooled, and the final step (fermentation) is initiated. A discussion of important compounds in the final product is the final part of the talk. A side by side comparison of a homebrew or two with a commercial example may be possible after the talk.

**DINNER RESERVATIONS REQUIRED:** Please RSVP by contacting Rachael Barbour, by phone at 216-839-7238 or by e-mail at rachael.barbour@basf.com by **5 pm on Friday, October 17** (For phone reservations, please clearly spell your last name and leave a return phone number). Cost of the dinner is \$20 for members & guests and \$10 for students. Checks made out to "Cleveland ACS" are greatly appreciated. Dinner will be roasted chicken breast and pork loin, Caesar salad with rolls, green bean almondine, and cheesy hash browns

#### Cleveland Section Web Site:

[http://www.csuohio.edu/sciences/dept/cleveland\\_acs/](http://www.csuohio.edu/sciences/dept/cleveland_acs/)

## Directions to the Winking Lizard

Take I-271 (either north or south, depending on where you're coming from) and take Exit #12 (Richfield/Peninsula). Turn east on OH-303 and go about 2 miles. The Tavern will be on your left, 1615 Main Street, in downtown Peninsula. Parking lot is on the near side of the building.

## Speaker Bio

Tracy P. Hamilton obtained a Ph.D. (advisor: Peter Pulay) from the University of Arkansas in 1987, and did four years of postdoctoral research (advisor: Fritz Schaefer) at the University of Georgia. Dr. Hamilton has been a professor at the University of Alabama at Birmingham since 1991.



In graduate school, he had to make a difficult choice between theoretical and experimental chemistry, and chose theoretical. As a result, the urge to synthesize irresistibly manifested itself in 1996, when he started brewing beer at home. Dr. Hamilton has been very active in the Birmingham Brewmasters (<http://hbd.org/bbm>), a group dedicated to the appreciation of different beer styles and how to brew them. He is also a certified beer judge in the Beer Judge Certification Program (BJCP <http://www.bjcp.org>).

## Chemistry is for the Birds - 2

By Dwight Chasar

In the March 2008 issue of *Isotopics* I initiated a series of articles with the above title and I urge you to go back to your archived issue to review the piece. I wrote about some chemistry of bird poop in that one. But I only gave you half of the information, to wit, the chemistry of the white stuff that hits your auto windshield. I would be remiss if I did not give you “the rest of the story.”

The other portion of bird poop, more commonly referred to as guano and processed by the intestines, is the dark stuff that drops out along with the white, which is processed by the kidneys. Chemists in the mid-nineteenth century discovered that guano contained high concentrations of nitrates and phosphates. As a consequence, guano came into high demand in commercial farming as a fertilizer. Guano islands, formed by years of sea bird defecation, were discovered, mined for their content, and then abandoned. Guano was so much in demand with 100s of ships carrying it away that skirmishes between workers, and between countries, including the US, occurred. In 1879 Chile defeated Bolivia in what became known as the Guano War.

Guano also provided saltpeter (potassium nitrate) for use in gunpowder. I can remember back to when I was a kid, preparing to be a chemist, buying saltpeter from the local drug store to make homemade rocket fuel as well as gunpowder. Guano for this later use in the US goes back as far as the War of 1812 and played a prominent role during the Civil War. The nitrate provides a ready source of oxygen for combustion of the fuel.

Selling at around five dollars a pound, bat (a mammal, not a bird) guano fertilizer has found a niche market today in organic farming -- just another example of recycling, both the product and the idea.

Much of the information gathered here came from an article in *Invention and Technology*, Spring, 2004 by F.D. Schwarz.

## **Call for Nomination: The Edward W. Morley Medal**

By Kenneth W. Street

The Cleveland Section annually sponsors a regional award, which consists of the Morley Medal and an honorarium of \$2,000. The next presentation of the Morley Medal will take place at the meeting of the Central Regional Meeting of the ACS at the Morley Award Symposium on Thursday, May 21, 2009.

The purpose of the award is to recognize significant contributions to chemistry through achievements in research, teaching, engineering, research administration and public service, outstanding service to humanity, or to industrial progress.

The area of eligibility includes those parts of the United States and Canada within about 250 miles of Cleveland. The contributions for which the award is given should have been made by the awardee when a resident of this area, or if a major contribution was made elsewhere, the nominee should have continued to make contributions while a resident of this area. Nominations may be made by any member of the American Chemical Society, The Chemical Society or the Chemical Institute of Canada.

Nominations for the Morley Medal should include a letter of nomination and curriculum vitae including the candidate's education, professional experience & activities, awards & honors, offices held and specifics on significant contributions. The letter of nomination should highlight these significant contributions. A representative list of references to the candidate's more important contributions, an evaluation of the significance of these achievements, and a listing of the nominee's most significant publications and patents are also appropriate. Strong seconding letters are suggested. The specific reference for every publication or patent is neither required nor encouraged. Electronic submissions are preferred.

Deadline for **receipt** of nominations is **November 19, 2008.**

Send nomination and supporting material to:

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Chair, Cleveland Section Awards Committee  
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### **March Historical Events in Chemistry**

By Leopold May

The Catholic University of America, Washington, DC

- |                      |  |
|----------------------|--|
| October 8, 1883      | One-hundred and twenty-five years ago, Otto H. Warburg was born. He was a researcher on respiration and cancer and received the Nobel Prize in Physiology or Medicine in 1931 for his discovery of the nature and mode of action of the respiratory enzyme.                              |
| October 13, 1916     | GM was incorporated on this date.  |
| October 21, 1833     | One-hundred and seventy-five years ago, Alfred Nobel, who invented dynamite, was born. On November 27, 1895, Nobel signed his last will providing for the establishment of the Nobel Prize. He later constructed companies and laboratories in more than 20 countries all over the world |
| October 23, Any Year | Mole Day, 6.02 a.m. through 6.02 p.m. (Mole time); Mole Moment: 50.453 s after 6.42 p.m.   |

**Case Western Reserve University** (Department of Chemistry)

Fall 2008 Chemistry Colloquia &amp; Frontiers Lectures

4:30 p.m. Clapp Hall, Room 108

Visitors are welcome for coffee at 4:15

Date	Title	Speaker Institutional Affiliation
Aug. 28	Age-Related Changes in Antioxidant and Photoprotective Properties of Retinal Pigment Epithelium Melanin	<b>Sarna Tadeusz</b> Jagiellonian University Krakow, Poland
Sep. 4	Polycyclic Aromatic Hydrocarbons: Phototoxicity and Photochemistry	<b>Hongtao Yu</b> Jackson State U.
Sep. 11	Small Molecule Control of Bacterial Biofilms	<b>Christian Melander</b> NC State University
Sep. 18	Translating and Expanding The Language of Bacterial Communication using Synthetic Ligands	<b>Helen Blackwell</b> U. Wisconsin-Madison
Sep. 25	Conservation through Kinetic Energy Harvesting (Frontiers in Chemistry Lecture)	John Miller <b>JME Inc.</b>
Oct. 2	The Archeology of a Work of Art: Looking at the History of an Oil Painting in the Colgate University's Picker Art Gallery Collection	<b>Patricia Jue</b> Colgate University
Oct. 9	One and Two Electron Transformations of High Valent Iron Imido and Nitrido Complexes	<b>Jeremy Smith</b> New Mexico State
Oct. 16	Optimizing Electrode Materials for Use in Lithium-Ion Batteries: NMR, Diffraction and Electrochemical Studies (Frontiers in Chemistry Lecture)	<b>Clare Grey</b> Stony Brook
Oct. 23	Three-Dimensional Battery Architectures for Micropower Applications (Frontiers in Chemistry Lecture)	<b>Bruce Dunn</b> UCLA
Oct. 30	Impact of Solvent-Solute Interactions upon the Photophysical Properties of Sunscreen Active Ingredients	<b>Sarah Schmidke</b> College of Wooster
Nov. 6	Hard-Hard-Hard Trianionic [NCN] and [OCO] Pincer Ligands: Uncomfortable Geometries and Reactivity of Mo≡N and Other M-X Multiple Bonds	<b>Adam Veige</b> U. Florida
Nov. 13	Chemistry and Biology of Bile Acids	<b>Alan Hofmann</b> UC San Diego
Nov. 20	First Principles Methods for Design of Materials (Frontiers in Chemistry Lecture)	<b>Gerbrand Ceder</b> MIT
Dec. 4	Alkaloid Biosynthesis in Periwinkle	<b>Sarah O'Connor</b> MIT
Feb. 12	Recent Materials Advances in Li-ion Battery Research and Future Challenges (Frontiers in Chemistry Lecture)	<b>Jean-Marie Tarascon</b> Universite de Picardie Jules Verne, Paris, France

## 2009 Central Regional Meeting of the American Chemical Society

May 20-23, 2009  
Cleveland, Ohio  
www.cermacs2009.org

Co-sponsored by:

The American Chemical Society  
The Electrochemical Society,  
The Society for Applied Spectroscopy  
The American Vacuum Society  
The Ernest B. Yeager Center for Electrochemical Sciences

CERMACS 2009, to be held at the Renaissance Hotel in Cleveland, is fast approaching. **We need volunteers to chair important committees, such as Social Events, Registration, etc. and we need volunteers to work these committees.** Over 800 attendees are expected. The program features plenary speakers Professor Charles Lieber of Harvard and Professor Daniel Nocera of Massachusetts Institute of Technology, each addressing the theme "Meeting Energy & Environmental Challenges Through Functional Materials."

**Your help is needed to make CERMACS 2009 a great success. To volunteer, please contact Professor Dan Scherson or Dr. Ken Street.**

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*Isotopics* is looking to highlight local chemistry professionals, companies, teachers, research groups, students, events, and more. If you have an idea for an *Isotopics* article, please contact the editor. *Isotopics* is also looking for local members to join our staff. Time commitments for staff members are minimal (a few hours a year!) and your contributions will be invaluable to our local section. If you are interested in joining *Isotopics*, please contact the editor.