

the Alembic

Chair's Corner

It is now early March and we are off and running. Please note that our next meeting will be in Eau Claire. The speaker will be Ahmad Nevissi, an ACS tour speaker from the University of Washington who will speak to us on public health aspects of radioactive wastes. In his state this is a particular problem in the Tri-cities area, and it will be interesting to see how they are progressing these days. You may recall Al Denio's challenge to us to come up with a solution to this disposal problem.

We had an enjoyable Meeting-in-Miniature at Marshfield recently and Tom Marty is to be thanked for hosting and making the arrangements. And many thanks to our speakers! There was a wide variety of talks, something to interest everyone in the section. Henry Hoftiezer's collection of wood samples and literature was impressive, including such difficult samples as poison sumac. Perhaps our editor will include the abstracts in this issue of the Alembic. In any event, he and I have extra copies of them.

The results of your ballots for 1998 officers were, for Chair-Elect, Gary McCauley; for Treasurer, Barbara

Bansenauer was reelected. I want to thank all of you who sent in ballots. Gary is enthusiastic about becoming more involved with CWS-ACS, and is planning this month to attend the Chair's training workshop in Missouri, put on by the national ACS.

I hear from Tom Zamis that his 1997 Annual Report was "Fed-Ex'ed" to ACS in plenty of time to meet the deadline, so we should be receiving our 1998 allotment in due course. Thanks a lot, Tom!

I received a letter from Al Denio recently, saying he is willing and eager to be the National Chemistry Week organizer for our section (again) this year, so please, let's be willing once again to support Al in this outreach program which builds so much goodwill for our profession. He should be back from his eastern vacation next month, and you might be seeing his chatty columns in this newsletter again.

Please plan to attend our monthly meeting this time. See you there.

Bob

ACS - CWS Mini-Directory

Chair

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Chair-Elect

Gary S. McCauley

Secretary - Treasurer

Barbara Bansenauer

Councilor

C. Marvin Lang

Alternate Councilor

Don Showalter

Awards

Tom Marty

Education

Laura Cole

Membership

Steve Leiterman

Newsletter Editor (Past Chair)

Tom Zamis
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American Chemical Society

Central Wisconsin Section



RADIOACTIVE WASTES AND PUBLIC HEALTH CONCERNS

by

Dr. Ahmad E. Nevissi
Laboratory of Radiation Ecology
University of Washington
Seattle, Washington 98195

Monday, March 16, 1998, 8:00 PM
Room 481, Phillips Science Hall
UW-Eau Claire, Eau Claire WI 54701

The history of radioactive waste began with the use of uranium compounds as coloring agents for ceramic glazes and thorium oxides for gas mantels, even before the discovery of radioactivity. However, the large scale generation of these wastes began after the use of uranium and plutonium in nuclear weapons. Uranium mining resulted in radioactive tailings piles, and plutonium production generated a new class of liquid radioactive wastes that have been kept in underground tanks. More wastes were and are generated by the nuclear power industry, where the spent fuel has been stored at the sites of approximately 100 power plants. Wastes from nuclear research and medical applications are considered low level, and are buried in shallow land fills. The principal problem with radioactive waste lies in the effects of radiation on health. The purpose of this talk is to provide an introduction to radioactive waste issues and the associated health concerns in a form which is suitable both for those who have no background in radioactivity and radioactive waste studies, and also for those who are familiar with environmental radiation issues in general but not with details of the radioactive waste problem.

Ahmad Nevissi received a B.S. in Chemical Engineering from Tehran University, Iran, an M.S. (Diplom) from Technische Hochschule Hanover, Germany, and in 1973 a Ph.D. in Nuclear and Radiochemistry from the University of Arkansas, Fayetteville. He has held various positions as an engineer and consultant in industry in Iran and Germany. He has been at the University of Washington's Laboratory of Radiation Ecology since 1973, and currently is a Research Associate Professor in the Department of Environmental Health, School of Public Health and Community Medicine.

The social mixer at 6:00 and dinner at 6:30pm will be at Sweetwaters Restaurant, 1104 W Clairemont Ave, Eau Claire (near the intersection of Clairemont (US 12) and State Highway 37). **For reservations call Bob St. Louis at (715) 836-5390(office) or Patricia Jenneman in the Chemistry Department office at 836-3417.**

7th CWS-ACS MEETING-IN-MINIATURE

UNIVERSITY OF WISCONSIN - MARSHFIELD/WOOD COUNTY

MARSHFIELD WI

FEBRUARY 25 1998

ABSTRACTS of PRESENTED PAPERS

Neutral-Radical Cation Electron Transfer Reactions for Molecules with Widely Varying Bond Reorganization

Jack Pladziewicz

Chemistry Department, UW-Eau Claire

Electrostatic corrections are unnecessary for outer-sphere single electron transfer (ET) reactions between monocations and neutral molecules, equation (1) and the Marcus-Hush cross-reaction relationship simplifies to equation (2). Where k_{12} and K_{12} are the cross-reaction ET rate constant and equilibrium constant, respectively for eq (1) and k_{11} and k_{22} are the related self-exchange ET rate constants.



$$k_{12}(\text{calcd}) = (k_{11}k_{22}K_{12}f_{12})^{1/2} \quad (2)$$

Stopped-flow spectrophotometry has been used to measure the cross-reaction rate constants for nearly 90 reactions between more than 30 compounds including methylated ferrocenes, tetraalkylhydrazines, p-phenylenediamines, tetrathiafulvalene, 9, 10-dimethyl-9,10-dihydro-phenazine and Alder's trimethylene bridged diamine.

Since many of the hydrazines have ring systems that introduce different amounts of bond strain, the hydrazines vary in the amount of inner-shell bond reorganization required during the ET activation process. Consequently, we have been able to assess the utility of eq (2) over an exceptionally wide range of inner-shell reorganization and intrinsic reactivity; a factor of 1×10^{14} in k for self-exchange ET (J. Amer. Chem. Soc. 1997, 5900). This represents the widest range of reactivity studied for organic molecules for which the related redox potentials, and self-exchange rate constants are precisely known.

This talk will discuss the correlation of these data with eq (2), the use of eq (2) to estimate difficult to measure self-exchange rate constants, and related features of ET reactivity that have emerged from this study.

Assay for the Amylase Content of Malted Barley

Thomas M. Zamis and Denny Yunk

Chemistry Department, UW-Stevens Point

An essential part of the brewing process is the conversion of starches (amylose and amylopectin) present in malted barley into mono-, di- and trisaccharides. This conversion is carried out by amylase enzymes present in the grain. The enzymes hydrolyze the $\alpha 1 \rightarrow 4$ linkages between glucose residues in the starch, producing glucose, maltose and maltotriose. This talk will describe an assay for determining the amylase activity of malted barley.

David Lewis

Chemistry Department, UW-Eau Claire

My research group has long been interested in the synthesis of 4-alkylamino-*N*-alkyl-1,8-naphthalimide dyes, compounds which exhibit extremely high fluorescence quantum yields, and their uses in applications ranging from engineering to medicine. We have also been interested in developing methods for the control of absolute stereochemistry in carbon-carbon bond-forming reactions. These two research directions are now merging as we have begun preparing chiral naphthalimide dyes with a view to using them as chiral derivatizing agents for assigning the absolute configuration of organic compounds by fluorescence. In addition, we are seeking to prepare chiral cavities with extremely high selectivity for a single enantiomer. Some of these chiral cavities will contain naphthalimide groups in an effort to use the dye as a fluorescent reporter group to evaluate the efficiency of binding of the substrate to the cavity. Our progress to date and the potential future directions of this research will be discussed.

Wisconsin Trees

Henry Hoftiezer

Rothschild, WI

Display of woods from 45 native Wisconsin trees, with a wide range of supporting and related literature.

The Synthesis of Chiral Tropocoronands

Philip J. Chenier and Tami L. Raguse

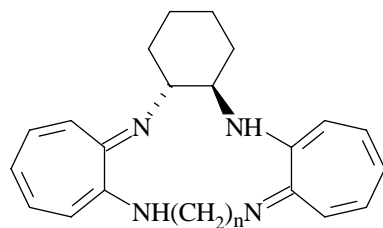
Chemistry Department, UW-Eau Claire

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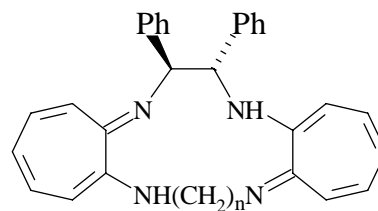
Thomas R. Hoye and Andrew S. Judd

Chemistry Department, University of Minnesota

The synthesis of tropocoronands containing chiral groups has been accomplished. These compounds have been shown to complex with various metals and may serve as good ligands to catalyze asymmetric reactions. Tropocoronands that have been synthesized include H₂(TC-3,cyhex), H₂(TC-4,cyhex), H₂(TC-6,cyhex), H₂(TC-4,diphen), and H₂(TC-6,diphen). The route is short and the tropocoronands are easily purified by chromatography or recrystallization. X-ray crystallography has confirmed the structure of two metal complexes, Cu(II)(TC-4,cyhex) and Ni(II)(TC-4,cyhex).



H₂(TC-n,cyhex)



H₂(TC-n,diphen)

Magnetite and the Verwey Transition

J.E. Sabol

Chemistry Department, UW-Eau Claire

Magnetite (Fe_3O_4), known since antiquity as lodestone, undergoes a curious phase transition at 120 K: as the metal/oxygen ratio is altered, the order of the transition changes. Magnetite is the only known example of a system having a phase transition that displays this character. Synthetic magnetite crystals were prepared and systematic studies of transport properties have revealed some insight into the nature of this transition. A brief review of the properties of magnetite, experimental methods, and our current understanding of the transition will be presented.



Letter from the Editor

Greetings from your past chair and new editor of the Alembic. I have been experimenting with a new format for the newsletter and some new items that I hope will become monthly features. Thanks to Chair Bob & Tricia Duyfhuizen at UWEC, who had one her English classes working on new designs for the newsletter - I got a lot of great ideas! Let me know what you think.

I want to remind everyone about our new ACS-CWS Web Page at :



<http://chemdept.uwsp.edu/acscws/>

or you can link there from the American Chemical Society home page - Local Sections. You should get the most up-to-date information about section activities on our page. There are also maps of all of the usual places where monthly meetings are held - so don't say you can't find us! Thanks to Bob Badger for helping to set up the Web Page and his ideas for it.

Also, many of our members are now routinely using electronic mail at home or at the office, and if you would like to receive your copy of the Alembic by email, please contact me. I can send them out as files in several different formats. I also plan to have a link on our Web page for the Alembic. I will probably have it listed there in pdf (portable document format) which is compact and will retain all of the graphics and formatting of the hard copy. These can be opened and read by a utility called Adobe Acrobat Reader that is freeware, and can be installed as a plug-in to your web browser.

Finally, I encourage all members to submit articles, letters, humor, announcements, comments - whatever - to me to include in the newsletter. Hope to hear from you!

Tom

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Chemistry Trivia

Born February 26, 1866, he grew up in Cleveland and entered the Case School of Applied Science in 1884. He once said, "I'd rather work for myself for \$3,000 a year than to work for someone else and make \$10,000." In 1889, he set forth to seek his fortune in what he and his partners named The Canton Chemical Company. Can you name him?

Metric Conversions?

2000 mockingbirds = 2 kilomockingbirds

454 graham crackers = 1 pound cake

10^{-15} bismol = 1 femtobismol

10^{-2} mental = 1 centimental

10 cards = 1 decacards

10^6 gross underestimates = 144 megalomaniacs



Call for Nominations



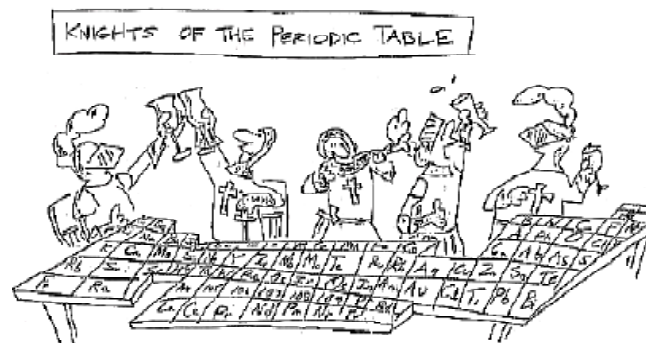
1998 Awards

One of the more significant activities that the Central Wisconsin Section of ACS sponsors each year is the recognition of outstanding performance by chemists in our area. Recipients of these awards are recognized at our annual Awards Banquet and Spouse's Night held in late April/early May. The time has come for **YOU** to submit your nominations. Criteria for each award are listed in the ACS-CWS Silver Anniversary Booklet that everyone should have received, and are also listed on our Web page. Please consider taking a little time and submitting nominations for:

Outstanding Contribution to Chemistry
Outstanding Company
Outstanding Service
Outstanding College Chemistry Senior

Nominations for these awards should be submitted to:

Tom Marty
Associate Professor of Chemistry
UWC - Marshfield/Wood County
Marshfield, WI 54449
phone (715) 389-6502
FAX (715) 389-6517
email tmarty@uwc.edu



Outstanding High School Chemistry Teacher

Nominations for this year's Outstanding High School Chemistry Teacher Award are now being sought by Don Showalter. If you know a teacher worthy of this recognition, please send his/her name and the name of the school where they teach. He will take it from there. There are surely many teachers in our 14 county area that are deserving of this recognition. **Please help Don find them!!!** Contact:

Don Showalter
Chemistry Department - UWSP
Stevens Point, WI 54481-3897
phone (715) 346-3708
FAX (715) 346-2640
email dshowalt@uwsp.edu



U. S. National Chemistry Olympiad

Laura Cole is once again coordinating the Central Wisconsin Section's participation in the National Chemistry Olympiad. High school teachers should be receiving information about the local section deadlines and testing this week. Information is also available on the CWS Web page. **PARTICIPATION IS FREE!** The Central Wisconsin Section provides funding for exam duplication and mailing - and our volunteers do the grading! In addition, the CWS uses local section test results to identify nominees for the Outstanding High School Chemistry Student Award. Please consider giving your top chemistry students a chance to compete for the National Team and the Local Section Award. Contact:

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