ACS of Western New York

Double Bond

The Newsletter of the Western New York Section of the American Chemical Society

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YOUR LOCAL SECTION EXECUTIVE BOARD FOR 2012

The selection of executive officers for the ACS Western New York section in 2012 is complete.

- The Section Chair will be Ronny Priefer, Associate Professor of Chemistry at Niagara University.
- Tim Gregg, Associate Professor in the Canisius College Department of Chemistry and Biochemistry will be doing double duty as Chair-Elect and editor of *The Double Bond*.
- The contest for Vice-Chair was close, with Sarbajit Banerjee, Assistant Professor in the Department of Chemistry, University at Buffalo, as the designee.
- The section Treasurer will continue to be Andrew Poss, Senior Project Leader at Honeywell.
- Our new Member-at-Large is Assistant Professor Sarah Evans, of the Department of Chemistry and Biochemistry at Canisius College.

The rest of the Executive Committee positions carry over from 2011, and are listed on the last page of this newsletter.

If any WNYACS members, new or seasoned, would be willing to help with events during 2012, please contact us.

SAVE THE DATE

The 5th annual **WNYACS Undergraduate Research Symposium** will be hosted by Canisius College on April 14, 2012. This celebration of the hard work and exciting discoveries of our students will include a Keynote Address by Prof. Todd Krauss, from the University of Rochester, and will offer great prizes for the best student posters and talks.

Registration information will be available soon on the Symposium website:

wny.sites.acs.org/undergradsymposium.htm

FROM THE CHAIR

Dear Western New York Chemists:

I would like to first wish you the very best during this upcoming year. As the newly elected Chair of the Western New York American Chemical Society I hope that together we can make 2012 special. My vision for 2012 will not be apocalyptic as with the Mayans, but that of excitement. There will be a collection of events that I hope you will be able to attend. It is my desire to bring us together at gatherings on a more regular basis. There is a strong and vibrant chemistry community in this geographic area, and I hope that we can begin to socialize more, and thus increase our networking opportunities.

Some of the upcoming events already scheduled for this year include the 5th annual Western New York Undergraduate Research Symposium to be hosted at Canisius College and the Education Night Banquet celebrating chemistry in our schools and colleges. I also hope to bring guest speakers to present at open-to-the-public forums. Perhaps a debate on man-made global warming or hydrofracking would not only be of interest to us chemists, but to the general public as a whole. I would be very open to, and appreciative of additional suggestions.

I am sure that we have all witnessed the incredible amount of pseudo-science on the internet, radio and late-night television. Everyone can and should make up their own mind, however, as Sir Francis Bacon wrote, "Knowledge is Power." I feel strongly that we can find opportunities to provide the general populace with more information and thus better educate. I hope that you can all join me in making 2012 a very memorable year.

Ron Priefer, PhD
Chair, WNYACS

FISH, HATS, AND THERMOMETERS

Guest editorial by Ronny Priefer, PhD
Niagara University

We, as consumers, are slowly becoming much more aware of dangers that we face every day. With the help of the media, we are regularly informed on the topics. We are informed that lead was being pumped into our atmosphere from cars, Freon in our refrigerators was destroying our ozone layer, and mercury causes neurological problems. These three things we take as fact. However, one of the above examples is not quite true. Ice core samples from the North Pole clearly do show a rapid increase in lead content from 1923 onward (the time lead was added to gasoline to decreasing engine "knocking") Also, our body's lead level is typically much greater than someone born before 1923. Freon, a DuPont tradename for chlorofluorocarbons, or CFCs, is safe to humans, however, it has been shown to do some interesting chemistry causing atomospheric ozone levels to diminish. I know what you are probably thinking, "Say it ain't so, is the mercury problem all a lie?"

Relax; I said one of the three examples was not QUITE true. I will give you a scenario first. Many of us know that pure sodium is a solid that can catch fire in water. I have done this. When I was young and stupid, I threw a chunk of sodium in the river. It appeared as if the water was on fire. So sodium is something that is definitely dangerous, but are all chemicals that contain sodium dangerous? It better not be. We consume a lot of it every day, sodium chloride (i.e. table salt); it is added to our food as a preservative (sodium benzoate); and sodium is used in our body to send impulse along our nerves. The point I am trying to make is that there is a clear difference between sodium in its elemental state and sodium in a complex. Mercury is the same way.

Mercury is one of only two elements that exist as a liquid at room temperature (bromine is the other). Liquid mercury cannot pass through unbroken skin, and is not normally toxic if swallowed due to its inability to be absorbed by the intestinal tract. So why is it so feared? Some of the compounds that mercury can form are nasty. For example mercury nitrate, is the culprit for the mad-as-a-hatter expression. Legend has it that mercury use by hat makers began with the ancient Turks. They used camel urine to accelerate the felt making process. The Crusaders brought this knowledge back to Europe; but the Europeans did not have camels handy, thus the hat makers used their own urine. One French felt maker had exceptional urine, and was also popular with the ladies. It was discovered that he was taking mercury chloride to cure his syphilis. This led to the eventual use of mercury nitrate. It was this compound that showed the adverse side effects. When in the brain, the mercury ion can bind to sulfur atoms of many proteins causing them to be deactivated. This can cause muscle tremors, memory loss, and delirium. Mercury vapor can also be converted to the same mercury ion in the brain and thus cause the same symptoms. Since its ban in 1941, mercury nitrate is no longer used by hat makers. But why has mercury been removed from thermometers?

As I mentioned, mercury is not absorbed through the skin or when swallowed, it is not easily vaporized. The issue is that thermometers break; it is inevitable. Now what do we do with the little balls of mercury once we have gotten bored of playing with them? Obviously, down the drain, and this begins the adventure. Pure mercury, whether in the ocean or ground water can be converted by aquatic bacteria into methylmercury. Microorganisms are eaten by tiny fish, which are eaten by small fish, which are eaten by big fish. All along the way the concentration of methylmercury increases, until we have a nice tuna steak on our dinner plate. Methylmercury we eat can go to the brain and become mercury ion, bringing all the problems associated with it.

With all this knowledge, do we still use mercury? Absolutely; just look up. The lights without the small coil of tungsten are filled with argon (these lights are sometimes incorrectly called neon lights). Manufacturers add a tiny drop of mercury to make them glow brighter.

So is mercury bad? Yes and no. Liquid mercury, not if we don't spill it or come in contact with vapors; methyl mercury, yes. Hopefully, now we can tip our hats and appreciate the long history of mercury and understand it better.

5-DAY WORKSHOP FOR HIGH SCHOOL CHEMISTRY TEACHERS

Ohio Northern University's Department of Chemistry and Biochemistry is hosting a five-day workshop designed to provide high school chemistry teachers with a unique professional development opportunity (June 18-22, 2012).

The 30-hour workshop features lecture, laboratory and networking time:

- Use a Vernier spectrophotometer and probes
- Conduct associated laboratory exercises
- Modify and troubleshoot existing protocols
- Participate in discussion sessions
- Receive a Vernier instrument for your school
- Join specialized breakout seminar/laboratory periods

All teachers who teach at least one high school course in chemistry are invited to apply. **Applications are due by March 1**.

All accepted teachers will be awarded a $1,200 grant that will cover housing, registration fees, some meals and purchase of a Vernier scientific instrument. Some travel grants (up to $300) also are available.

To learn more and complete an application, visit www.onu.edu/ctw. A continuing education certificate will be available upon workshop completion.

70 YEARS AGO IN *THE DOUBLE BOND*

The following excerpts appeared in the January, 1942 Double Bond

Editorial by Robert M. Fowler

Again amid the wreckage of the Christmas tree, work on the first *Double Bond* for the new year is under way. As in the past, the Editors wish to take this opportunity to hope that all our readers have had a very Merry Christmas and that 1942 will hold much that is good and desired and little that is bad and unwanted for each one.

To us 1942 will certainly be a different year. At no time have we, as Americans, faced a future which promises to change our lives and ways of living as much as 1942. Yet, for the second time in as many decades, America will have the opportunity of cooperating in outlawing war as an instrument of national policy. It may sound premature to talk of making an instrument obsolete while we are actively using it, but most research men work that way. Unfortunately, we will have to use war to defend ourselves, but we are going to do it so well that there will be no doubt as to the outcome of the present conflict.

If the governments of the world would only cooperate as scientific men have for several generations as a research team, they could certainly devise a much better and less expensive machine for world operation.

That is for the future. Now we can only think about it while we are helping with the blackout and with the increased production that is needed as never before. When the war is won let us do our share as chemists and as citizens to see that the world never again gets into such a mess as we face at the beginning of this new year.

Trivia

One average American is responsible for the consumption of the following in one year:

30	lbs. of textiles
600	lbs. of steel
2500	lbs. of oil products
250	lbs. of paper
2000	lbs. of food
7500	lbs. of coal

The sun's beam at the earth's surface contains energy at the rate of 1.0 to 1.5 calories per sq. cm. On a square meter of surface perpendicular to the beam this corresponds to from 1.02 to 1.5 hp. Many counties in the South receive as much solar energy in a year as is used in the whole country for heat, light and power.

Quick change artists

Special aircraft paints include a dull black which is hard to find with searchlights, a bright aluminum paint for sunny days, and another for hiding planes on hazy days. They still have to discover a chameleon paint which will automatically change with the background!

WNYACS Officers & Staff

ISSUE COPY DEADLINE: FIRST OF MONTH PRIOR TO PUBLICATION

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