



THE CHESAPEAKE CHEMIST

MARYLAND SECTION
AMERICAN CHEMICAL SOCIETY

VOL. II

SEPTEMBER, 1993

NUMBER 6

THE CHEMISTRY OF FIREWORKS

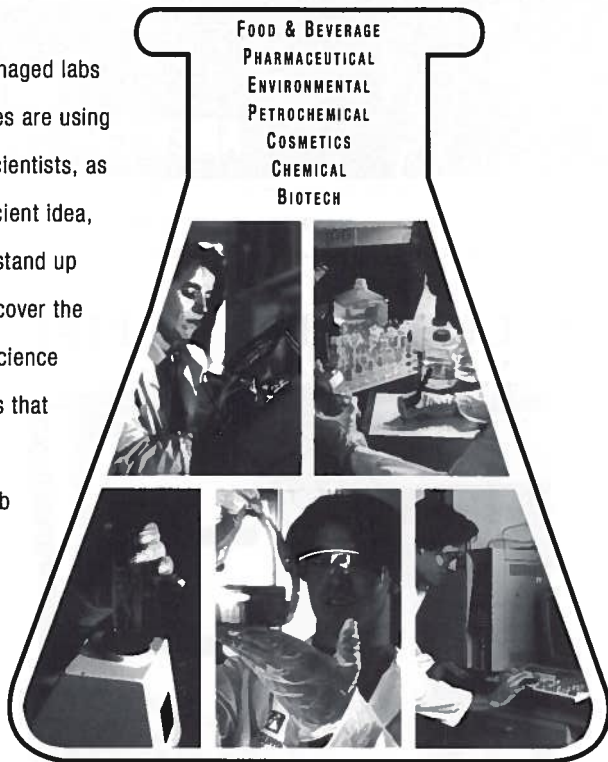


JO N.A. CONKLING

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THE CHESAPEAKE CHEMIST STAFF

Raymond C. Petersen.....Editor
9329 Joey Drive
Ellicott City, MD 21042
465-8520

Bruce L. Solnick.....Business Manager
P.O. Box 2355, Lab Adm.
Baltimore, MD 21203
225-6209

SECTION OFFICERS

Shree Iyengar.....Chairman
Anne Arundel Community College
Arnold, MD 21012
541-2266 or 541-2260

Alice Zeiger.....Chair-elect
Center for Indoor Air Research
1099 Winterson Rd., Suite 280
Linthicum, MD 21090
684-3777

Shekar Munavalli.....Secretary
700 Paige Circle
Bel Air, MD 21014
(410) 838-7565 (H)
(410) 671-2819 (W)

Mike Zapf.....Treasurer
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202 Wight Avenue
Hunt Valley, MD 21031
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The Chesapeake Chemist is published monthly September through May by the Maryland Section of the American Chemical Society. Address editorial comments to the Editor. Send advertising copy and inquiries to the Business Manager. The Maryland Section is not responsible for opinions expressed herein. Editorials express the opinions only of their authors. The Editor is responsible for all unsigned material.

DR. JOHN A. CONKLING

Dr. John Conkling has been active in the area of pyrotechnics and explosives chemistry and safety for more than 20 years. He holds a B.S. degree, with a major in Chemistry, from Washington College (1965), and a Ph.D. degree, with a major in physical organic chemistry, from the Johns Hopkins University (1969).

He joined the faculty of Washington College in September, 1969, and he currently serves as an Adjunct Professor of Chemistry. He was awarded the Lindback Award for Distinguished Teaching by Washington College in 1982. He is also the Director of the Washington College Summer Chemistry Seminar program, which has presented seminars on energetic materials to industry and government personnel since 1983.

Dr. Conkling is the author of *The Chemistry of Pyrotechnics - Basic Principles and Theory*, published by Marcel-Dekker, Inc. in 1985, and he has authored numerous papers and technical reports on pyrotechnics, including an article in the July, 1990 issue of *Scientific American*.

Dr. Conkling is the Executive Director of the American Pyrotechnics Association, an industry organization actively involved in the development and implementation of safety standards for the civilian pyrotechnics industry. He is also a consultant and lecturer on the chemistry and safety of explosives and pyrotechnics. He serves on both the Pyrotechnics and Explosives Committees of the National Fire Protection Association, and is the past Vice-President of the International Pyrotechnics Society. In addition, he is past chairman and a current member of the Maryland Explosives Advisory Council.

THE CHEMISTRY OF FIREWORKS
THINGS THAT GO **BOOM!!!** IN THE NIGHT

Fireworks, or pyrotechnics, provide entertainment for millions of people every year, especially around the 4th of July holiday. Pyrotechnic devices are also used in numerous aerospace, defense, and civilian applications.

Every pyrotechnic mixture contains an oxidizing agent and a fuel, carefully selected for effect and stability. Flame, spark, or other energy input may initiate a self-propagating chemical reaction that produces heat. This heat then generates visible and audible effects such as light, color, sparks, smoke, and noise, as well as "ooh's" and "aah's" from the audience.

The various components used in pyrotechnic mixtures will be discussed, and the ignition phenomenon -- the key to reliable performance and safety -- will be examined. Some of the engineering that goes into a successful aerial fireworks effect will also be examined.

BALTIMORE SCIENCE FAIR

On March 20th, for the 11th year in a row, the Maryland Section supplied six judges for the 38th Baltimore Science Fair. Our thanks to the judging team (mostly new this year). The Section awarded eleven certificates in addition to the two major awards. The major awards went to James Pociluyko of Calvert Hall College in Division I and to Aaron Macks of Pikesville Middle School in Division II. Each received a \$100 U.S. Savings Bond, an engraved ACS plaque and an invitation to attend, with a guest, our April meeting where they were acknowledged.

ADVERTISEMENT.- Would YOU be interested in representing the Section by being a judge in one of our events?

SEPTEMBER MEETING

DATE:

Wednesday, September 29, 1993

PLACE:

The College of Notre Dame
of Maryland
North Charles Street
Baltimore

Dinner reservations should be made by mailing checks, payable to Maryland Section of ACS, to

Dr. Stephen Gregory
College of Notre Dame
4701 North Charles Street
Baltimore, MD 21210

by September 22. Late reservations may be made by calling

(410) 532-5714

by September 24; answering machine is available at this number.

Dinner price is \$16.00 per person, but spouses and retired chemists may attend for \$14.00; students may attend for \$8.00.



JOHN CONKLING

SOCIAL HOUR & DINNER:

Social Hour 6:00 pm
Dinner 7:00 pm

SPEAKER & TOPIC:

8:00 pm
Dr. John Conkling
"The Chemistry of Fireworks -
Things that go **BOOM!!!** in the
Night"

It is not necessary to be a member of the American Chemical Society to attend. You may attend the lecture without attending the dinner.

PATTERSON-CRANE AWARD

Dr. Hideaki Chihara, Executive Director of the Japan Association for International Chemical Information (JAICI), Tokyo, Japan, is the 1993 recipient of the Patterson-Crane Award presented biennially by the Dayton and Columbus Sections of the American Chemical Society.

He is being recognized for his international contributions to chemical information and documentation spanning more than four decades. Through his leadership, worldwide access to the Japanese chemical literature became available. As early as 1954, he organized and directed the activities of the Japanese Chemical Abstracts Abstractors Association.

He has served on numerous national and international boards and commissions involved in scientific information transfer.

The Award, given in honor of two previous editors of *Chemical Abstracts*, Austin M. Patterson and E. J. Crane, recognizes outstanding contributions in chemical information theory or practice. The Award was presented at a joint meeting of the ACS Dayton and Columbus Sections at the University of Dayton on Tuesday, May 11, 1993.

ACS INITIATES HISTORIC LANDMARKS PROGRAM

The national office of the ACS is starting a program to seek out and, eventually, to mark with a plaque, items that are significant in the history of chemistry. In this way, the landmarks would become known to chemists and to members of the general public. The effort is dubbed "National Historic Chemical Landmarks Program" (NHCLP); there is an article on it in the March 22, 1993 issue of *Chemical and Engineering News*, pages 68-69.

Jeffrey Sturchio, chairman of the NHCLP Advisory Committee, wants local sections to nominate landmarks in their areas. Shree Iyengar has asked me, as archivist, to coordinate the Maryland Section's effort. In turn, I need your help!

Landmarks can be in one of three categories: (1) Milestones; this includes technical innovations, experimental or theoretical results and new industrial processes and products that had a strong impact on chemistry. (2) Sites, such as buildings, which played an important role in chemical history. (3) Collections, in museums or other institutions open to the public, which include objects of significance in the history of chemistry.

If you know of anything that might fit the NHCLP, please get in touch with me at Department of Chemistry, Morgan State University, Baltimore, MD 21239; telephone numbers (410) 319-3214 (Work) and (410) 358-0619 (Home). Perhaps we can nominate something that will, literally, "go down in history"!

Ernie Silversmith

COUNCILOR'S REPORT FROM DENVER

The meeting in Denver was expected to be smaller than those held near the centers of chemical research; especially in a period of financial decline and tight budgets. By Wednesday, there were 10940 total registered attenders of which 9420 were attending the scientific papers (4912). A big meeting, indeed!

The Council chose the two regular candidates for President-elect (Rushton and Wheland) and replaced members on the Committee on Committees (Sr. Marian Jose Smith) and Nominations and Elections (Carney). The dues escalator was accepted with little comment and the dues went to \$96.

There was a plethora of petitions to amend the by-laws and/or Constitution. The first two, relating to the status of the committee which gathers economic statistics on employment of chemists, has been a battleground for those who see the ACS like the AMA, an employment lobbying organization, and those who see it as merely an information source for such discussions between industry, government, and labor. The first petition, a compromise worked out by those tired of the prolonged wrangling, passed and combined this stand-alone statistics group with a committee concerned with the ACS employment guidelines, etc. The second petition failed (we hope that is settled for now). A third petition on creating a new set of committees with politically correct names (but programs that duplicated current committees) also failed. Change in the status of the Chemical Abstracts Committee passed easily since the change in the business arrangements required the change. A petition to simplify the membership requirements was recommitted to correct an oversight. Waived dues for new graduates, and improved bounties for local sections and divisions that recruit members, both passed without difficulty.

Chuck Rowell

October 17-20, 1993: MOLECULAR SIMULATION OF STRUCTURE AND PROPERTIES IN POLYMER SYSTEMS

Organized by: Prof. S. L. Hsu
Polymer Science and Eng. Dept
The University of Massachusetts
Amherst, Massachusetts 01003
Phone: 413-545-3953
Fax: 413-545-0082

Dr. T. Kavassalis
Xerox Research Centre of Canada
2660 Speakman Drive
Mississauga, Ontario
Canada L5K 2L1
Phone: 416-823-7091
Fax: 416-822-7022

Location: Asilomar Conference Center, Pacific Grove, CA

Sponsored by: The ACS Division of Polymer Chemistry, Inc.

The workshop will offer invited lectures dealing with : (1) Prediction of Polymer Structure and Properties, (2) Simulation of Phase Behavior, (3) The Link Between Experimentation and Molecular Simulation and (4) New Developments in Molecular Simulation.

NOMINATING COMMITTEE REPORT

The Nominating Committee presents the following slate of officers for the Maryland Section of the American Chemical Society for 1994:

Chairman-elect	Shekar Munavalli
Secretary	Mike Zapf
Treasurer	Jan Kolakowski
Councilors	Donald Jones David Roswell
Alternate Councilors	Alvin Bober Elwin Penski
Members-at-large	Subhash Dhanesar George Herold Donald Hoster Jackie Weitzel Dale Whalen

Members of the committee were Joseph DeFrank, Joseph Topping and Alice Zeiger

ChemHazIS

The Chemical Hazards Information System (ChemHazIS) is now available on the CIS. The database contains MSDS-like information on 2,280 chemicals drawn primarily from information compiled by the National Toxicology Program (NTP). Data were drawn from the literature and experimentally determined over a twelve year period under NTP sponsorship. Data were edited by the copywrite holders, Instant Reference Sources, Inc., and Jeffrey C. Howard.

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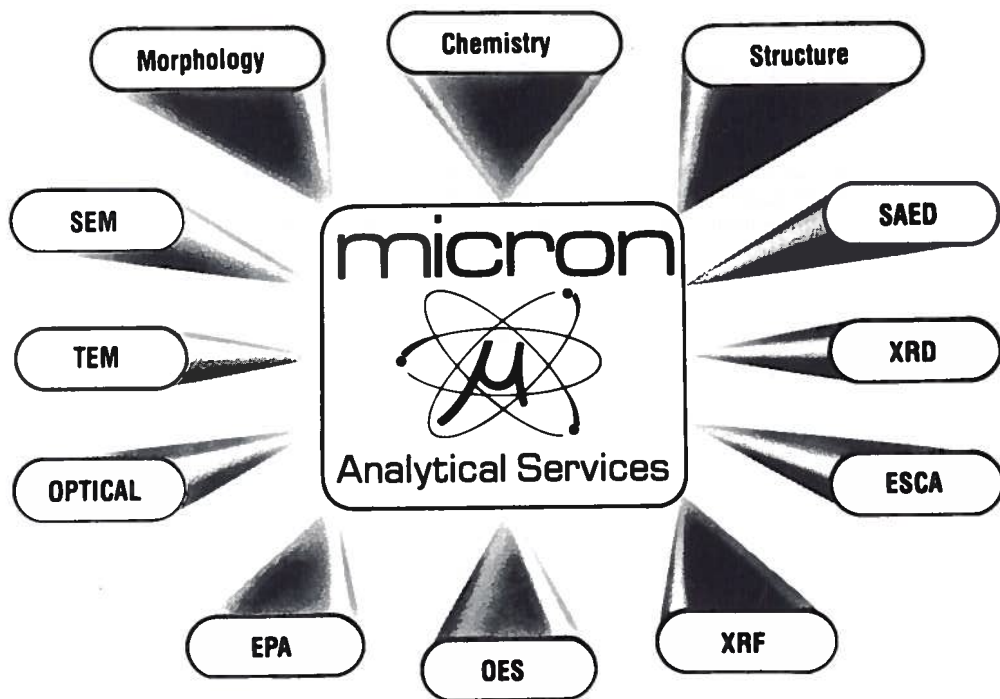
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