



THE

CHESAPEAKE CHEMIST

MARYLAND SECTION
AMERICAN CHEMICAL SOCIETY

VOL. XXVII

MAY, 1971

NUMBER 5

Presented to

George C. Pimentel

on the occasion of his

Remsen Memorial Lecture

sponsored by

*The Maryland Section of the American
Chemical Society*

in memory of

Ara Remsen

Teacher, Investigator, Author, Administrator

May 19, 1971

45.20 grams of priceless information...



... about Mettler's full line of 11 digital readout, high-speed, top-loading balances are contained in our newest catalog. Units that weigh unknowns, batch weigh, checkweigh, weigh-in, and weigh below the balance. Weigh fast—up to 5 items in

60 seconds. Weigh accurately—precision to one part in several hundred thousand. Extremely high reproducibility. Very-easy-to-read digital readout. Available in metric and other calibrations. For catalog, write or phone:

MACALASTER BICKNELL CO. OF NEW JERSEY, INC.

HARRIS MCKINNEY — 12 S. 12th ST., PHILA., PA.



THE CHESAPEAKE CHEMIST

VOL. XXVII

MAY, 1971

NUMBER 5

EDITORIAL STAFF

- William G. Galetto Editor
McCormick and Co.
204 Wight Ave.
Cockeysville, Md. 21030
Phone: 666-3155
- James Leslie Associate Editor
University of Maryland
Baltimore, Md. 21201
Phone: 955-7440
- Allen Bednarczyk Assistant Editor
McCormick and Co.
Cockeysville, Md. 21030
- David Gordon Contributing Editor
U. S. Food and Drug Adm.
Baltimore, Md.
- E. M. Glocker Contributing Editor
W. R. Grace and Company
Clarksville, Md.
- J. F. Lemp, Jr. Contributing Editor
Fort Detrick, Frederick, Md.
- M. R. Vansant Contributing Editor
The Johns Hopkins University
Baltimore, Md.

SECTION OFFICERS

- Richard J. Kokes Chairman
Chemistry Department,
The Johns Hopkins University
Baltimore, Md. 21218
- Joyce J. Kaufman Chairman-elect
Chemistry Department,
The Johns Hopkins University
Baltimore, Md. 21218
- Herbert S. Aaron Secretary
7412 Kathydale Road
Baltimore, Md. 21208
- Theodor C. Berenthien Treasurer
1328 Deanwood Rd.
Baltimore, Md. 21234

BUSINESS STAFF

- Yale H. Caplan Business Manager
- Merle I. Eiss Advertising Manager
- Sandi A. Kellman... Business Office Sec.
Surgical Research Department
Sinai Hospital of Baltimore, Inc.
Baltimore, Md. 21215
Phone 301-367-7800, ext. 8695

MEMBERSHIP CHAIRMAN

- John L. Kolbe
W. R. Grace & Co.
Clarksville, Md. 21029

IN THIS ISSUE

- Twenty-sixth Remsen Lecture 5
- The Remsen Memorial Lecture 7
- Essex Community College 8
- Maryland Section Award 9
- Maryland Section Lecture Series ... 9

The Chesapeake Chemist is published monthly September through May by the Maryland Section of the American Chemical Society. Address editorial comments to Dr. William Galetto, McCormick and Co., 204 Wight Ave., Cockeysville, Md. 21030. Phone 666-3155. Address advertising inquiries and plates to Merle I. Eiss, Sinai Hospital of Baltimore, Inc., Belvedere Ave. at Greenspring Ave., Baltimore, Maryland 21215.

right n ow

Does Fisher have stock of the supplies you need?

Call us. Within one minute, we can give you a definite answer. (Not an educated guess.) Without delaying phone calls or letters to other branches.

How? Through Fastback—a very apt name for our new real time computer system.

Fastback knows—down to every micro-second—the exact stock status of every item we carry. In all 16 U.S.A. inventory centers too. Not just the one you call. Hence: you have instant, current stock information.

Another thing: you can depend on far, far fewer back

orders. Fastback is actually programmed to avoid them. Because it has real time inventory information, Fastback can draw from Fisher's entire nation wide network of inventory centers to fill your orders.

So if you're tired of delays and back order hang-ups, call Fisher. Fastback will deliver what you need . . . when you need it.



Fisher Scientific Co.

©-888

7722 FENTON STREET, SILVER SPRING, MARYLAND 20910

PHONE: 587-7000

TWENTY-SIXTH REMSEN LECTURE

DATE AND TIME:

Wednesday, May 19, 1971 at 8:30 P.M.

Shaffer Hall, Homewood Campus, The Johns Hopkins University.

SPEAKER:

Dr. George C. Pimentel
Professor
Department of Chemistry, University of California, Berkeley, California.

SUBJECT:

"Chemical Lasers from Elimination Reactions"

DINNER:

Faculty Club
Cocktails 6:00 P.M., dinner 6:30 P.M.

(Reservations are necessary and limited; use form on page 11).

PARKING:

Free parking is available in the lot adjacent to Shriver Hall.

MIXER:

Refreshments will be served in the Clipper Room after the lecture. Everyone is welcome.



Dr. George C. Pimentel

CHEMICAL LASERS FROM ELIMINATION REACTIONS

The first chemical laser was discovered in the Berkeley laboratories in 1964. Since that time five different kinds of chemical reactions have been used to cause laser emission with at least 40 examples of these five types. Furthermore, it has been shown that unique kinetic information can be extracted from them through study of the relative gain displayed by different rotation-vibration transitions.

Elimination reactions furnish the most recent addition to the reaction types. Hydrohalide elimination can be initiated both through chemical reaction and through photolytic excitation. In either case, chemical laser emission can be obtained but it carries much lower vibrational excitation than is obtained in three-body reactions or in abstraction reactions. The quantitative results will help us refine our views of the activated complex and then point to possible new directions in chemical synthesis.

IMPORTANT

Advance Reservations
Must Be Made

THE REMSEN MEMORIAL LECTURE

Dr. George C. Pimentel

Professor George C. Pimentel is widely known for his scientific contributions in the fields of infrared spectroscopy, chemical lasers, molecular structure, free radicals, and hydrogen bonding. He was a pioneer in the diagnostic use of infrared spectroscopy, both for qualitative and quantitative analysis. Most of his 130 published research articles pertain to the development of new infrared spectroscopic techniques or to the exploitation of these techniques in the identification of chemical substances. With Dr. K. C. Herr, coinvestigator on the Mariner 1969 infrared spectrometer instrument, he pioneered rapid-scan infrared spectroscopy on the microsecond time scale. The low temperature techniques called matrix isolation was developed in his laboratory for the infrared study of very reactive substances at cryogenic temperatures. He was the first to identify correctly infrared spectral features attributed to organic material on Mars as absorptions of heavy water, HDO. The first chemical laser was discovered in his laboratory. With his students, he has identified by infrared spectroscopic methods fifteen chemical substances never detected by any other technique, including two inert-gas compounds and several free radicals.

Professor Pimentel is an enthusiastic teacher and has lectured in Freshman Chemistry at Berkeley for the last three years. He is coauthor of seven books, four of which are textbooks, and three of which concern areas of his research. He has long been interested in the quality of teaching in secondary schools and served as Editor of the CHEM Study Project. This project, sponsored by the National Science Foundation, was devoted to the development of a new high school chemistry textbook. The text, CHEMISTRY — AN EXPERIMENTAL SCIENCE, was published in 1963. It is now in use in high schools in every state (600,000 copies have been sold), and it

has been translated into thirteen languages, including Russian.

Professor Pimentel received the American Chemical Society California Section Award in 1957 and the A.C.S. Precision Scientific Award in 1959. He was elected to membership in the National Academy of Science in 1966, and he was elected a Fellow of the American Academy of Arts and Sciences in 1968. He is a member of the American Chemical Society, the American Physical Society, and the Optical Society of America.

A native of Rolinda, California, George Pimentel received the A.B. degree from University of California at Los Angeles in 1943. Following a year on the Manhattan Project at U.C. Berkeley, and more than two years in the U.S. Navy, he returned to Berkeley and completed his graduate work under the supervision of Professor Kenneth S. Pitzer. Upon receipt of the Ph.D. in 1949, Dr. Pimentel was immediately appointed a member of the faculty at the University of California and ten years later, attained the rank of Full Professor. From 1966 to 1968 he served as Chairman of the Chemistry Department at Berkeley. He is an active squash player and for the past three years he and two Chemistry Department graduate students have won intramural team championships.

ORGANIC MICROANALYSES

GALBRAITH
LABORATORIES, INC.

P. O. Box 4187
Knoxville, Tenn. 37921

(615) 546-1335

HARRY W. GALBRAITH, Ph.D.

NATIONAL ACS
MEETING

SEPT. 12-17, 1971

Washington, D.C.



Day in and day out, the reliability, long life and versatility of Tygon flexible plastic Tubing proves over and over that it's your best laboratory tubing investment.

TYGON® TUBING

Crystal-clear • Flexible • Chemically inert
Non-oxidizing • 73 standard sizes

At laboratory supply houses everywhere, or write Plastics & Synthetics Division, U. S. Stoneware, Inc., Akron, Ohio 44309.

NORTON PLASTICS AND SYNTHETICS DIVISION
FORMERLY U.S. STONEWARE INC. AKRON, OHIO 44309

CHEMISTRY AT ESSEX COMMUNITY COLLEGE

Essex Community College, a lower-division college supported by Baltimore County, is located at Ridge Road and I-95 in the eastern part of the County. After several years in temporary buildings in Essex, the College began to occupy its new campus when, in January, 1968, the Administration and Instructional building opened. A library was completed a year later. The Physical Education building will be completed this fall, and a Humanities and Arts Building in the fall of 1972. Construction has just begun on College Center, which will have food service, lounge and study, bookstore, and theater activity.

The Sciences are presently housed on the third floor of the main building. Two well-equipped labs and an instrumentation room are used by Chemistry for teaching a full two-year chemistry program. The Department of Chemistry is part of the Division of Science and Mathematics, and includes six faculty members. The Chairman of the Department, Dr. Carl Minnier, is also Education Committee Chairman of the Maryland Section. Other faculty include another organic chemist, Mr. Richard Angerer; an inorganic chemist, Mrs. Dale Patterson Adams; and two physical chemists, Dr. Mary Vennos and Dr. Joseph Testa. The Division Chairman, who finds very little time to teach, is an inorganic chemist with "side interests" in glass technology and "science for the non-scientist."

The academic program includes two general chemistry sequences. One of them, for science and engineering majors, uses a quantitative approach to the laboratory and makes extensive use of the Division's Hewlett Packard 2000 series computer. Dr. Minnier and Mr. Sticha, of Physics, presented a paper to the 6th MARM on this approach to computer use in the lab. The other first-year course, for non-majors and students in allied-health fields, has a semester each of general and organic chemistry. Students in this area can continue to a one-semester biochemistry course and one in clinical chemistry for medical laboratory technicians. Science majors and chem-

ical engineers take a full-year organic chemistry course in their sophomore year. Equipment available for student use is extensive, although space is at a premium and will remain so until the fall of 1973 when a new Science and Allied Health Building is to be completed and occupied by Chemistry and Biology, leaving the present science quarters for physics, engineering, technology and mathematics labs. Students have access to recording visible-UV and infrared spectrophotometers, precision visible-UV and atomic absorption units, gas chromatographs, a polarograph, a titrimeter, DTA, and a number of other units. The Department hopes to add the new student-type NMR in the near future. Much use is made of TLC and electrophoresis units. The fact that almost every student in Chemistry will work in a scientific or technical field makes extensive study and use of a modern instrumental approach absolutely necessary.

Essex Community considers that it is helping to meet the needs of its community by maintaining programs of high quality, for both transfer and career-program students, in the crucial first two years of the college student's career.

The Editor and Staff of the *Chesapeake Chemist* thank all those who contributed to the Chemist during the past year, and wish all the members a pleasant summer.

BRANDYWINE RESEARCH LABORATORY, INC.

Providing materials characterization of polymeric and chemical products.

IR-UV-VIS-NIR-NMR-GC

2610 PHILADELPHIA PIKE
CLAYMONT, DELAWARE 19703

302-798-1953

MARYLAND SECTION AWARD

Each year at this time the Awards Committee reminds the members of the Maryland Section that this committee welcomes and, in fact, urges their participation in the choice of this highly honored member.

The Maryland Section Award was established in 1962 to recognize and honor, each year, a member of the Maryland Section for outstanding achievement in the field of chemistry. The achievement may be in pure or applied chemistry, chemical engineering or chemical education.

Recipients to date have included:

1962 Dr. E. Emmet Reid

1963 Dr. W. Mansfield Clark

1964 Dr. Alsoph H. Corwin
1965 Dr. John C. Krantz, Jr.
1966 Dr. Belle Otto Talbot
1967 Dr. Walter S. Koski
1968 Dr. George L. Braude
1969 Dr. Leslie Hellerman
1970 Dr. Paul H. Emmett

Please submit your nomination(s), together with a supporting statement for each nominee, before 15 May 1971.

In making its selection, the Committee will consider nominations made in previous years as well as those received this year. Seconding statements are desirable and may help to advance the cause of your nominee. Send nominations to GEORGE M. STEINBERG, Chairman, Awards Committee, 3111 Hatton Road, Baltimore, Maryland 21208.

Maryland Section Plans Lecture Series

If sufficient interest is indicated by the membership, the Maryland Section will sponsor a series of eight two-hour lectures next spring. All lectures will be on the same topic or closely related topics (e.g. Thermal Methods of Analysis: DTA, TGA, DSC, etc.) and will thus be in the nature of a short course. There will be a nominal registration fee for participation.

In order to assess the need for this kind of activity within the Section, we need your response. Please complete the following questionnaire and return to:

Dr. Melvin P. Miller
Department of Chemistry
Loyola College
Baltimore, Maryland 21210

Maryland Section Lecture Series

I (would, would not) be interested in attending a "short course" sponsored by the Maryland Section. Some topics and speakers I would like to hear are:

Topic	Speaker
-------	---------

I would find _____ the most convenient evening to attend.

Name: _____

Address: _____

NOW... COLOR-CODED MICRO SYRINGES

You can easily identify the capacity of a Unimetrics Micro Syringe by the color of the plastic fitting on the scale, as well as on the plastic scale guide.

Unimetrics syringes feature a flat scale that reads like a ruler... without parallax. Graduations are permanently etched into a satin finish stainless steel slide with minimum glare. Once you've drawn your sample, the plunger can't back slide but stays put—even when used against maximum back pressure. The only sample not discharged is the minute amount remaining in the needle.

Until you use a Unimetrics needle, you can't appreciate how smoothly it can be inserted through the septum. Although stainless steel needles with Teflon seals are standardly supplied, special stainless steel needles with a baked-on Teflon tip are available for TLC spotting... to prevent the solvent from creeping back up the stainless steel needle.

Other features include: No sample contamination. Gas and liquid tight. Precision bore barrels all same diameter. Replaceable needles, barrels and plungers, scales and fittings. *Ask us for full information and detailed prices.*

Cat. No.	Type	Capacity	Color Code	Needle		Each
				O.D.	Length	
S-9926X	1001	1 μ l	Violet	0.028"	2 1/2"	\$39.00
	1005	5 μ l	Light Blue	0.025"	2 1/2"	39.00
	1010	10 μ l	Blue	0.028"	2"	26.00
S-9925-25X	1010T	10 μ l	Blue	0.018"	2"	26.00
	1025	25 μ l	Green	0.028"	2"	26.00
	1050	50 μ l	Yellow	0.028"	2"	26.00
S-9926X	1100	100 μ l	Orange	0.028"	2"	26.00
	1250	250 μ l	Red	0.028"	2"	26.00
	1500	500 μ l	Black	0.028"	2"	26.00

S-9926-30X Kloehn Adapter for consecutive injections, each.....\$17.50



SILVER SPRING, MD. OFFICE:
Wheaton Plaza Office Building — Phone: 587-5600

SCIENTIFIC GLASS APPARATUS CO., INC.
BLOOMFIELD, NEW JERSEY

◆ APPARATUS
◆ INSTRUMENTS
◆ CHEMICALS
◆ GLASSWARE

Branches: Boston Mass. • Danbury Conn. • Elk Grove Village Ill. • Fullerton Calif. • Philadelphia Penna. • Silver Spring Md. • Syracuse N. Y.

A LIQUID CRYSTAL SYMPOSIUM "THE NEMATIC STATE: KNOWLEDGE, PROBLEMS AND PROSPECTS."

To be held on Thursday, May 20, 1971, at Georgetown University (Reiss Science Building) in Washington, D.C.

The symposium is sponsored by the Department of Chemistry, Georgetown University, and is open to the scientific community.

Overnight Accommodations and Meals. Out-of-town attendees are requested to make their own arrangements for overnight accommodations and meals. Arrangements have been made for those wishing to purchase their luncheon meal at Georgetown University on the day of the symposium.

Location of the Symposium and Parking. The entrance to the main campus of Georgetown University is located at 37th and O Streets, N.W. The meeting will be held in one of the lecture halls (Room 112) located on the ground floor

of the Reiss Building. Those arriving by car are requested to park in Lot 1A located near the Reiss Building. The security guards at the campus entrance will provide the necessary directions.

Registration and Additional Information. There will be no registration charges for the symposium. No prior notification of intention to attend is requested. For questions or additional information please contact: Dr. Daniel E. Martire, Associate Professor of Chemistry, Georgetown University, Washington, D.C., 20007 (Telephone: 202-625-4171 or -4065).

COVER

Facsimile of the scroll to be presented to the twenty-sixth Remsen Memorial Lecturer, Dr. George C. Pimentel.

Twenty-Sixth Remsen Memorial Lecture MARYLAND SECTION American Chemical Society WEDNESDAY, MAY 19, 1971

Cocktails 6:00 P.M.

Dinner 6:30 P.M.

Faculty Club
The Johns Hopkins University

Mr. Allen Bednarczyk

McCormick & Co., 204 Wight Ave., Cockeysville, Md. 21030. Phone 666-3155.

There is enclosed \$..... (\$6.75 per person) for dinner reservations for the following persons in my party:

Return by May 7, 1971. Due to space limitations, only 63 reservations can be accepted on a first come, first served basis. Please make checks payable to Maryland Section, ACS.

Name Phone

Address

The Chesapeake Chemist
University of Maryland
636 W. Lombard Street
Baltimore, Maryland 21201

Nonprofit Org.
U.S. Postage
PAID
Baltimore, Md.
Permit No. 2917

PLEASE DO NOT DELAY — DATED NOTICE INSIDE



You could become attached to the *Thomas* Model 67 Concentration Readout

Hook up your Coleman 101 . . . or your Turner 330 . . . or your Bausch & Lomb Spectronic 20 to our inexpensive Model 67 Concentration Readout. This recently developed instrument is a linear/+log/-log display device operating on 1-volt or 100-millivolt input from a broad range of spectrophotometers.

Usable with Turner Models 330, 350, and 430; Bausch & Lomb Spectronic 20; Perkin-Elmer Model 139; Coleman Models 101, 111, 124, 44, Junior II and II-A, or any other instrument with a 1-volt or 100-millivolt output.

Nixie® readout, range 000 to 1999, shows transmittance, absorbance or concentration. Unit also provides negative log response for color reduction studies. Display includes overrange indication, negative polarity sign, and manually located decimal point.

The solid state, fast-responding Model 67 Readout is priced at \$695 and is in stock for immediate shipment. A 10-millivolt input model is also available. *Call or write us for details.*

®Registered trademark of Burroughs Corporation.



ARTHUR H. THOMAS COMPANY

Scientific Apparatus and Reagents

VINE STREET AT 3RD • P.O. BOX 779 • PHILADELPHIA, PA. 19105, U.S.A.