



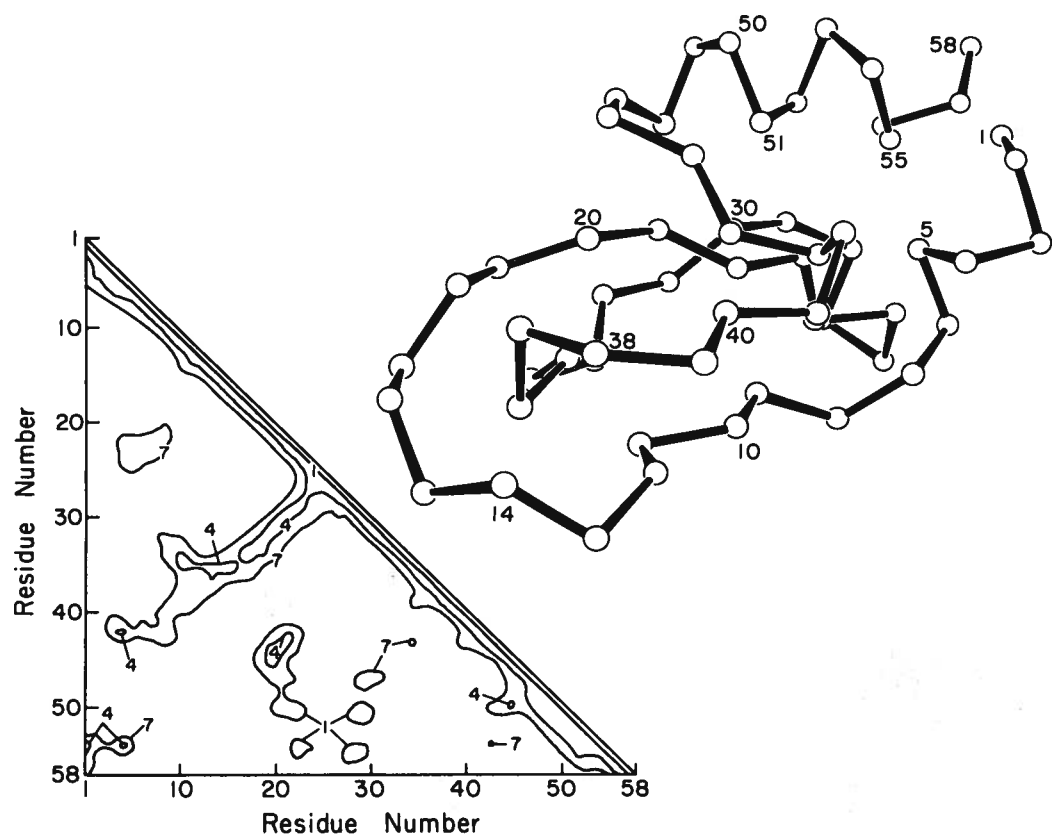
# THE CHESAPEAKE CHEMIST

MARYLAND SECTION  
AMERICAN CHEMICAL SOCIETY

VOL. XXXI

SEPTEMBER, 1975

NUMBER 6





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# THE CHESAPEAKE CHEMIST

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Baltimore, Maryland 21212

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Donald E. Jones (alternate)

COVER: Protein Folding  
(Courtesy H.A.S.)

Sept. Editor-in-Charge: E.F.

#### COMMITTEE CHAIRPEOPLE - 1975

Awards and National Nominations  
.....Joyce J. Kaufman  
The Johns Hopkins University  
366-3300

Chemical Education.....Melvin Miller  
Loyola College  
323-1010

Program.....John Kolbe  
Martin-Marietta Res. Labs.  
247-0700

House.....T. Berenthien  
Edgewood Arsenal  
671-3296  
.....Ronald Kassel  
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W. R. Grace & Co.  
531-5711

Public Relations.....Carl Minnier  
Essex Community College  
682-6000, x 316

Membership.....Frances Hummel  
Alcolac, Inc.  
355-2600

Publicity.....Dave Roswell  
.....Norbert Zaczek  
Loyola College  
323-1010

Remsen Award.....Brown Murr  
The Johns Hopkins University  
366-3300

MARM-1978.....William Galetto  
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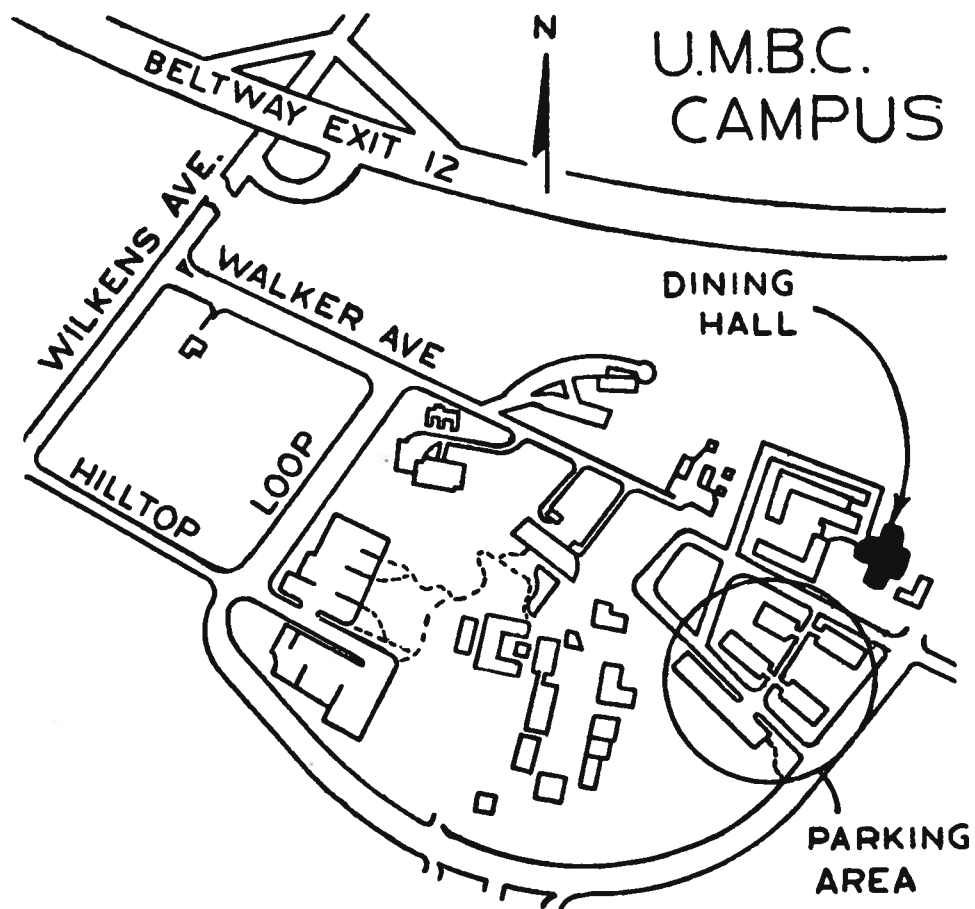
Finance.....William Stahl  
McCormick & Co.  
667-7474

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Hunt Valley, Maryland 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 Howard J. Cohen, Glidden-Durkee, Div. of SCM Corp., 3901 Hawkins Point Road, Baltimore, Md. 21226. Phone 633-6400. Address advertising inquiries and copy to Kent R. Zeller, McCormick & Co., Inc., 204 Wight Ave., Hunt Valley, Md. 21031.

## SEPTEMBER MEETING



**DATE:**

Wednesday, September 17, 1975

**PLACE:**

Dining Hall, Univ. of Maryland Baltimore County. Located 1/2 mile west of exit 12, Wilkens Avenue, off Baltimore Beltway (1-695). See map on p. 4.

**SPEAKERS & TOPICS:**

5:30 pm  
Dr. Karl Piez, National Institute of Dental Research:  
"Collagen"

8:30 pm  
Dr. Harold Scheraga, Cornell University:  
"Protein Folding"

**SOCIAL HOUR:**

There will be a social hour after the meeting. Refreshments will be served.



DR. HAROLD SCHERAGA

**COCKTAILS AND DINNER:**

Dining Hall, UMBC  
Cocktails 6:30-7:15 courtesy of VWR SCIENTIFIC.

Hot buffet dinner (7:15) \$5.50 per person. Retired chemists, students, and their spouses may attend the dinner at \$3.50 each. Reservations are necessary for the dinner and should be made no later than September 12 with

**ACS RESERVATIONS**  
c/o Martin-Marietta Laboratories  
USE THE CONVENIENT FORM  
(Or phone: 247-0700, X 283 or 261.)

It is not necessary to be a member of the American Chemical Society to attend the dinner or the talks; the talks may be attended without going to the dinner. You are invited to bring your spouse and friends to both the dinner and the meeting.



DR. KARL PIEZ

----- TEAR OUT DINNER RESERVATION FORM -----

There is enclosed \$ \_\_\_\_\_ (\$5.50 per person)\* for dinner reservations at the UMBC Dining Halls for the following persons:\*\*

Name (Please print or type) Affiliation

\_\_\_\_\_  
\_\_\_\_\_

\*Please make checks payable to Maryland Section, ACS, and mail together with the reservation form to Dr. John Kolbe, Martin-Marietta Laboratories, 1450 S. Rolling Road, Baltimore, MD 21227. Or phone 247-0700, ext. 283 or 261. ASK FOR ACS RESERVATIONS.

\*\*Return by Friday, September 12.

## KARL PIEZ

Karl Piez was born in Newton, Massachusetts, on August 30, 1924. His undergraduate education was at Yale, where he received a B.S. degree in 1947; he obtained his Ph.D. degree in 1952 from Northwestern University.

He has been a biochemist at the National Institute of Dental Research, National Institutes of Health, Bethesda, Maryland, since 1952. From 1961 to 1966 he was Chief of the Section on Protein Chemistry and since 1966 he has been Chief of the Laboratory of Biochemistry.

Dr. Piez has worked in the areas of amino acid analysis, protein chemistry, and the biochemistry of connective tissues.

## COLLAGEN

The fibrous protein collagen is one of the principal components of connective tissue and occurs in skin, tendon, and bone. Fibers of collagen can have remarkably high tensile strength, approaching steel wire in this respect. The molecular structure of collagen is based upon a multistranded helix, the three polypeptide chains of which are linked by secondary and some primary bonds. Upon heat treatment of collagen solutions, denaturation of the protein results in a loss of helical structure.

Physico-chemical studies upon solutions of solubilized collagen have indicated that the basic molecular unit has the shape of a rigid elongated cylinder of length about 3000 Å. The molecule can form rod-like aggregates in solution, and under appropriate conditions collagen fibrils may be regenerated.

When examined by the electron microscope, collagen fibers show a characteristic banded pattern with a well-defined periodicity. The band spacings are related to the arrangement of collagen units in the fibers.

The biological function of collagen is primarily structural. Collagen fibers help to give form and strength to tissues and organs.

In the case of bone and teeth, collagen exists in association with an inorganic mineral component.

## HAROLD SCHERAGA

Harold Scheraga was born in Brooklyn, New York, on October 18, 1921. He received his B.S. from City College in 1941, his M.A. from Duke University in 1942, and his Ph.D. from Harvard University in 1946. From 1946 to 1947 he was a postdoctoral fellow at Harvard Medical School. Since 1947 he has been with the Department of Chemistry, Cornell University, where he is currently the Todd Professor of Chemistry. He served as departmental chairman from 1960 to 1967.

He has been the recipient of numerous professional and academic honors. These include the award of Guggenheim and Fulbright Fellowships (1956-1957); the Townsend Harris Medal (1970); membership on the Molecular Biology Panel, National Science Foundation (1960-1962); the Eli Lilly award (1957); and membership in the National Academy of Science and the American Academy of Arts and Sciences.

Dr. Scheraga's research has been largely concerned with protein structure and the physical properties of proteins. He has made extensive and important contributions in such areas as the helix  $\rightarrow$  coil transition of polypeptides, internal hydrogen bonding in proteins, the origin of hydrophobic bonds in proteins, the mechanism of blood clotting, the mechanism of protein denaturation, the structure of water, and the theoretical predictions of protein structure.

## PROTEIN FOLDING

It is well-established that the complete 3-dimensional structure of a protein is essentially determined by its amino acid sequence and that it tends to assume this native structure spontaneously. This in turn implies that the molecular folding characteristic of the native structure is overwhelmingly favored thermodynamically over alternative forms.

cont'd on p. 8

## EXECUTIVE COMMITTEE MINUTES

Minutes of the Executive Committee Meeting of the Maryland Section of the American Chemical Society held on June 4, 1975, at McCormick & Co., Inc., Hunt Valley, Maryland. Present: C. Adams, A. Bednarczyk, P. Callery, Y. Caplan, H. Cohen, E. Freedman, F. Hummel, D. Jones, J. Kolbe, J. Leslie, M. Miller, C. Minnier, T. Parr, D. Roswell, E. Silversmith.

The meeting was called to order by Chairman A. Bednarczyk at 8:05 p.m.

The minutes of the meeting of January 9, 1975, as reported in the March, 1975, issue of *The Chesapeake Chemist* were corrected to read Jon Franklin (rather than John as reported), and then approved.

Two reports were presented by the Treasurer, E. Silversmith. The first, on general finances, showed a cash balance of \$9,130.75 as of May 26, 1975. The second, on the one-day workshop on the Wiswesser Line Notation held on April 19, showed the Section had a net expenditure of \$158.95 for this course.

A. Bednarczyk reported for J. Kaufman for the Awards Committee. The Committee had been formed and would meet over the summer to select the 1975 recipient of the Maryland Chemist Award.

N. Miller for the Education Committee reported that twenty-four chemists and seven students had participated in the one-day workshop on the Wiswesser Line Notation which was considered to be a successful presentation. Dr. Miller is to write to Mrs. Giles Cooke explaining that the Giles Cooke Memorial Fund was used to subsidize this workshop. A one-day course on computers for chemists and a half-day course on statistics for chemists is being contemplated for the fall. Audio short courses are to be loaned to interested groups; it is planned to publish a list of available courses in *The Chesapeake Chemist*.

K. Zeller reported to the executive committee via a letter which

showed that substantial savings were being realized with no sacrifice in printing quality by using a new printer, Associated Printers, Inc. The Committee voted an allocation of \$1,200 toward expenses of *The Chesapeake Chemist* for the remainder of 1975. The Editors of *The Chesapeake Chemist* requested that articles of local interest, either historical or on issues of current interest, be submitted to the Editors from Section Councilors and other interested parties. In view of the delay in receiving *The Chesapeake Chemist* by new members of the ACS, suggestions were made and the Secretary directed to take suitable action which would minimize the delay as far as the Maryland Section is involved.

A. Bednarczyk announced for Dr. Stahl that the Finance Committee would report in January, 1976.

F. Hummel reported for the Membership Committee that three hundred copies of *The Chesapeake Chemist* with a covering letter were sent to a list of prospective members supplied by the ACS, but only a few members had been enlisted in this way. She would continue this solicitation until the ACS list was exhausted. A letter had also been sent to those displaying posters updating the poster information.

C. Minnier for the Public Relations Committee suggested that, since the ACS centennial and that of the Johns Hopkins University coincide with the National Bicentennial celebrations, some effort should be made in obtaining local public coverage of these events.

J. Kolbe presented some preliminary information on the 1975-1976 program.

Councilors and alternate Councilors were requested to attend the Middle Atlantic Regional Councilor meeting to be held on June 14, 1975, near Newark, Delaware.

The meeting adjourned at 10:00 p.m.

Respectfully submitted,

James Leslie, Secretary

### PROTEIN FOLDING (concluded)

The complete determination of the structure of a protein involves specification of the amino acid sequence, the number and position of chemical cross-links, the nature of the folding of the polypeptide backbone, and the arrangement of the amino acid side-chains. A number of generalizations have emerged from the existing structural studies. Charged polar groups are normally confined to the surface of the protein, while the interior contains non-polar residues. Comparison of the structures of homologous proteins of different species indicates that considerable amino acid substitution may be consistent with the same 3-dimensional structure and biological function.

The dominant factors involved in the stabilization of protein structure include primary disulfide cross-links, hydrogen bonds within the polypeptide backbone and between amino acid side-chains, and hydrophobic bonds between non-polar amino acid side-chains. The latter two are profoundly influenced by the nature of the normal biological solvent, water.

The determinations by X-ray crystallography of the complete 3-dimensional structures of a number of proteins have stimulated efforts to predict the nature of folding by theoretical calculations utilizing the known amino acid sequence. The multitude of possible interactions make this a most difficult problem; there is a requirement for simplifying assumptions. Nevertheless, definite progress has been made in recent years, especially with the simpler polypeptides.

### EMPLOYMENT OPPORTUNITY

#### Laboratory Scientist

Position available for a laboratory scientist who will be responsible for the maintenance and operation of chemical instrumentation. B.S. in chemistry and experience with mass spectrometry and NMR spectrometry desired. Apply to Dr. James Leslie, Dept. of Medicinal Chemistry, School of Pharmacy, University of Maryland, 636 West Lombard Street, Baltimore, Maryland 21201. (301/528-7650)

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## EDITORIAL

### THE ACS AND PHOTOCOPYING

I have become increasingly concerned about the dispute over photocopying, in particular, the attitude of the American Chemical Society. The ACS has taken a firm stand against photocopying on several occasions. Since the ACS is primarily an association of chemists for chemists and not a publishing company, I would hope that ACS policy would reflect the needs of the membership. No individual member can possibly subscribe to every journal he will ever use and thus rapid accessibility to single articles is a must (reprints are very slow). On the other hand, no publisher can stay in business with gross abuse of this copying privilege such as that at NLM.

There are many ways that rapid accessibility for readers and solvency of the publisher can be reconciled. Journal printing could be done much more cheaply and quickly by simply copying the manuscript (*cf. Tetrahedron Letters*) instead of setting type and proof-reading several times. An individual member, instead of subscribing to a journal, might subscribe to a topic, e.g., steroid biosynthesis, and receive copies of all the articles published in ACS journals on that topic. The price of such a topic subscription could be determined by the number of articles; the selection of articles by topic could be done using the author's keyword list prepared for *Chemical Abstracts*. Individual journal subscriptions could be graduated in cost by usage or by number of copies made. The graduated charge would be a fair arrangement since, at the moment, Towson State College's subscription costs to JACS must be subsidizing the users at NLM (because of increased costs resulting from lost subscription revenue).

Clearly some revolutionary changes are needed in the area of journal publication. It is pointless to blame individuals who photocopy articles since the journals are published for just such people and without these readers there would be no publications. The publishing industry has been very slow to respond to the challenge of cheap copying; for example, many texts cost considerably less to photocopy (at 10-15¢ per page) than their retail price. If this "crisis" was not foreseen by publishers, they need new leadership. There must be a way for publishers to make more money while allowing photocopying --- look at what the gasoline companies have gained by not putting the lead in! --L.M.S.

#### CHANGES IN THE EDITORIAL STAFF

Mitchell Dudnikov has resigned from the editorial staff of *The Chesapeake Chemist* in order to have more time for the Baltimore Society for Coating

Technology, of which he is Membership Chairman. His generous help is much appreciated.

Linda M. Sweeting, associate professor of chemistry at Towson State College, joins the staff with this issue.

L' SHONAH TOVAH TIKOSEVAH

### ORGANIC MICROANALYSES

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MARYLAND SECTION

TREASURER'S REPORT: Jan. 1 - May 26, 1975

Cash on Hand in Banks, Jan. 1, 1975

Equitable Trust.....	\$3163.96	
Loyola Federal.....	<u>4282.97</u>	
TOTAL		\$7446.93

Receipts

ACS Allotment.....	4460.00	
ACS Commissions.....	15.00	
Local Dues.....	523.00	
Dinner Meetings.....	2138.50	
Giles Cooke Memorial.....	25.00	
Short Course.....	275.00	
Refund on liquor, April meeting....	150.00	
Bar support.....	232.00	
Interest on savings account.....	<u>230.85</u>	
TOTAL RECEIPTS		8049.35
TOTAL		<u>15496.28</u>

Disbursements

Administrative		
Office supplies.....	71.44	
Clerical help.....	30.00	
Officers' expenses.....	384.81	
Meetings		
Speakers' expenses.....	50.60	
Dinner Cost.....	3214.30	
Liquor, April meeting.....	150.00	
Sales Tax.....	105.69	
<i>The Chesapeake Chemist</i> .....	1500.00	
Short Course.....	433.95	
Awards.....	331.40	
Miscellaneous.....	93.34	
TOTAL EXPENSES		<u>-6365.53</u>
		9130.75

Cash on Hand in Banks, May 26, 1975

Equitable Trust.....	4616.93	
Loyola Federal.....	<u>4513.82</u>	
		\$9130.75

Respectfully submitted,

Ernest F. Silversmith  
Treasurer

*The Chesapeake Chemist*  
(through May 1975)

Cash on hand (from checking account)	\$ 90.38
Money due from May advertising	<u>323.24</u>

Total money available \$413.62

Money owed for addressographing	\$ 45.00
Startup money needed for September	<u>1 500.00</u>

Total money needed \$1 545.00

Total money needed from Maryland Section \$1 131.38

Money needed last year at this time \$1 500.00

Kent R. Zeller  
Business Manager

NOMINATIONS FOR NEW OFFICERS

The Nominating Committee is seeking suggestions for future officers of the Section. Give your suggestions to any member of the Committee:

- Tom Simmons (Edgewood Arsenal)
- Carl Minnier (Essex Comm. Coll.)
- Brown Murr (JHU)
- Robert Schneider (Beckman Instruments)
- Yale Caplan (State Medical Examiner's Office) *Chairman*.

\*\*\*\*

Iranian phone calls are expensive--  
they are Persian to Persian.

MINNESOTA CHEMIST

Maryland Section News

Dr. Allen Bednarczyk is now with Naarden, Incorporated, Owings Mills, Maryland.

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**CUTTER CUTS**

The new German management installed by Bayer, (who purchased Cutter Laboratories) is not exactly knocking itself out to become endeared to its workers. So far during this reverse Marshall Plan exercise they have laid off 60 employees--this includes 10 chemists and chemical engineers, all of whom are in the above 50-year age bracket with many years of service; gave none of them more than a few hours notice (in some cases less than half an hour); have violated ACS guidelines; have not answered any let-

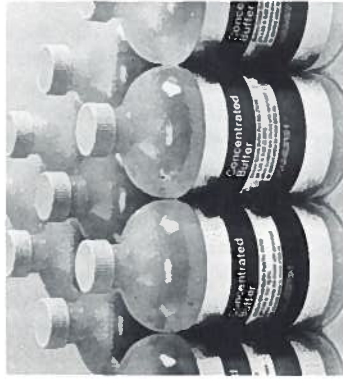
ters from the ACS inquiring about their practices, and have instituted a rigid check-in/check-out system for all employees.

The latter includes professional employees, who regardless of how late they stayed the night before, have to check in by 7:45 a.m. the next morning or face the prospect of having their pay docked.

The ironical thing about this is that they would never be allowed to get away with this in West Germany, which has very tough employee protection laws!

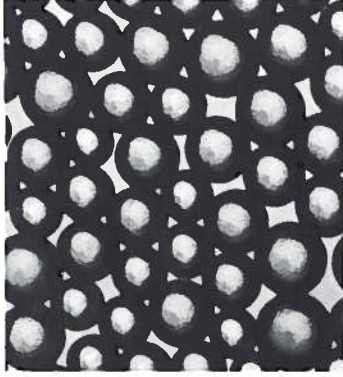
A. C. NIXON

# Here are three aids to fast, low cost Amino Acid Analysis. One of them is free.



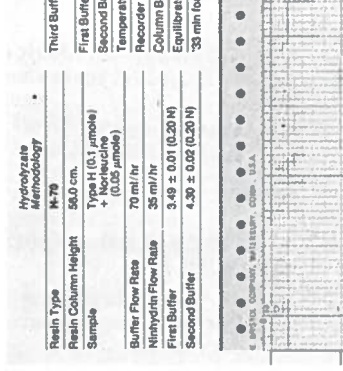
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