The Crucible

Published Monthly
by the
PITTSBURGH SECTION OF THE
AMERICAN CHEMICAL SOCIETY

VOLUME V. · APRIL, 1922 NUMBER 4.

THE 179TH MEETING

PITTSBURGH SECTION

AMERICAN CHEMICAL SOCIETY

Thursday April 20, 1922 at 8:15 P. M.

—AT—

BUREAU OF MINES AUDITORIUM, 4800 Forbes Street

DR. ALEXANDER LOWY

Professor of Organic Chemistry,
University of Pittsburgh

WILL SPEAK ON

"The Electrochemistry of Organic Compounds"

The enclosed card has a double purpose. Read your Crucible through and see what it is.

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PITTSBURGH SECTION OF THE
AMERICAN CHEMICAL SOCIETY

The Paper with the Triple Linkage
Goodfellowship Co-operation Loyalty

Volume V, No. 4 APRIL, 1922. 10 cents per copy

DELAY IN DELIVERY OF MARCH CRUCIBLE AND POSTPONEMENT OF MARCH MEETINGS

Last month the March Crucible was mailed at the usual time to insure delivery on Tuesday before the Thursday of the meeting, March 16th. Through a most unusual trick of circumstances the copies were misplaced by the local Post Office, and consequently did not get out until too late for the meeting.

Here is an extract from a letter from the local Post Office:

> "The irregularity was an unusual one and was due solely to negligent handling, for which a plausible explanation cannot be offered. Under the circumstances this office must assume full responsibility and I can only express my regret and assure you that appropriate action has been taken to prevent a recurrence."

In view of this and of the fact that a distinguished member of the American Chemical Society, Dr. H. E. Howe, would be in town Saturday March 18th, it was decided to postpone the meeting until Saturday afternoon. A special notice to this effect was mailed, and members employed in the larger local laboratories were notified by telephone of the postponement.

OUR FINANCE COMMITTEE ON THE JOB

Our Finance Committee is sending out a personal letter to each member of the Section in an effort to get a 100 per cent pledge subscription to defray the expenses of the Convention. The committee is on the job to make the Convention a success. If they can know this Spring how much money they have to spend, the plans for the Convention can be made with the certainty of easy consummation. The least YOU can do to co-operate is to let the committee know now how far you will back them.

THE APRIL MEETING

No one can say that our papers have a sameness about them. From the subject of sol-gel equilibrium to that of U. S. Patent Office methods is a far cry, yet all of these talks have been highly instructive and broadening.

At our April meeting, April 20th, 1922, which will be held in the Bureau of Mines auditorium at 8:15 P. M., Dr. Alexander Lowy will speak on a subject of interest to all chemists who have any vision into the future, namely "The Electro-chemistry of Organic Compounds." Dr. Lowy did all his undergraduate and graduate work at Columbia University, and is at present Professor of Organic Chemistry at the University of Pittsburgh. He is now conducting work along the lines indicated in the title of this paper. The paper is to be a discussion of the methods of operation in, the preparation for, and future possibilities, of the application of electro-chemistry to organic compounds.

This meeting will be preceded by the usual dinner at the Bureau of Mines. It will be served promptly at 6:30 P. M. This will be the next-to-the-last chance to eat with the rest of the fellows this Spring, so you can't afford to miss it. Be sure to fill out the enclosed card if you are coming.

REPORT OF EMPLOYMENT COMMITTEE

No inquiries during March for Chemists.

Applicants for positions:

No. 6—Metallurgical chemist and Mill Superintendent.

No. 7—Chemist. Alloy steel, ferro-alloy. Practical experience about 12 years. Salary $175.00 per month.

No. 8—Teacher of Chemistry or routine work in chemical line. Available after May 1st. No practical experience but several years teaching.

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by
The Pittsburgh Section

Editor
E. J. Casselman
Westinghouse Research Laboratory

Manager
H. H. Craver
Pittsburgh Testing Laboratory

ACKNOWLEDGMENT

For several months the Editor has been receiving the publications of two other sections of the Society.

The Chicago Section sends "The Chemical Bulletin" which is the organ of the Chicago, Milwaukee, Wisconsin, Minnesota, Iowa, Ames, Louisville, Nebraska, and Kansas City local sections. This interesting paper always contains inspiring editorials and is an evidence of the energy of the Chicago Section. Just as the Section itself shows the way to have interesting meetings by subdividing into group meetings, so the paper representing it has features that are worth noting. The members use their Bulletins more for discussions than we do. There is a column for "introducing" new members that should make them feel more at home in the Section.

The Philadelphia, Delaware, and South Jersey Sections send their joint publication "The Catalyst." Ingenious laboratory "wrinkles" are being published in this organ, also occasionally a few short scientific articles.

RECENT ADDITIONS TO CARNEGIE LIBRARY SERVICE

The frequency of requests for information concerning scientific and technical societies has emphasized the need for a source from which this information may be quickly obtained.

The Technology Department of the Carnegie Library of Pittsburgh is meeting this need through maintenance of a card file of national societies of this type. The cards, in so far as the information is available, contain the official name of the society, the names and addresses of President and Secretary, date of annual meeting, and the official "organ", or publication. A supplementary file lists those serials which regularly publish advance notices of national, state, and local meetings.

It is desired to make this file complete for all scientific and technical societies in Pennsylvania and to include all sections of national and state societies having headquarters in Pittsburgh. To this end, the co-operation of local secretaries is urged. Please send information to E. H. McClelland, Technology Librarian, Carnegie Library of Pittsburgh.

The Technology Department will be glad to post on its bulletin board notices of forthcoming meetings of local societies, thus bringing the meetings to the attention of the many engineers and other technical men who use the Library. Several local societies are now taking advantage of this service.

MARCH LUNCHEON AND MEETING

On account of the postponement of the regular Thursday night meeting to Saturday afternoon, it was preceded by a luncheon at the University Club on Saturday, March 18, 1922. One of the purposes of this lunch was to give our guest, H. E. Howe, the opportunity to express his views concerning improvements to the Journal of Industrial and Engineering Chemistry, of which he is the new Editor, and to develop for his benefit the views of the members in informal discussion.

Following the luncheon Chairman Handy introduced Mr. Howe, and the latter outlined the following points which he wanted discussed:

Printing Synopses of articles continued from one issue to the next.

Improvement in the "Notes and Correspondence" department. Should it include a page for discussion on the training of men?

Translation of important articles from foreign languages, especially little known languages such as Russian, Japanese, etc.

The form of printing market reports and quotations: tabular or graphically.

A larger proportion of articles devoted to industrial salesmanship, production, etc.

Inclusion of short paragraphs or articles from laboratory notes that are valuable but too short for formal writing, as a technical paper. Some of the needs of the Journal were stated by Mr. Howe, such as:

Appointment in each section of a correspondent to keep in close touch with the Editor.

More industrial and personal notes.

More reviewers for new books and for articles.

Mr. Howe made several interesting disclosures of the inner financial workings of the Journal. As regards advertising our Journal only lost 8 per cent of its advertising in the recent industrial depression as against an average of 40 per cent in other technical publications. The Chemical Catalogue Co. obtains all the ads and prepares the copy for which it receives 25 per cent of the advertising receipts. Our rate for advertising is $75.00 per page, which is low compared with other publications of like nature, and should be $125.00. Nevertheless the Journal made a net profit of $45,000 that was distributed amongst all three of the Society's journals. This year the operating expenses will be reduced $8 000 below last year's.

The efficiency of the A. C. S. news service was commented upon. Its cost of maintenance was about $13,600 in 1921 but the value of the publicity it gave the section in newspapers, etc. figured on space was about $100,000. The operating cost this year will be reduced to $11,500.

Mr. Handy opened the discussion by saying that he considered the present Journal excellent but would like to bring out an answer to the question "Why is 'Chemical & Metallurgical Engineering' consulted more frequently than the 'Journal of Industrial & Engineering Chemistry'?" Discussion followed by Messrs. Weidlein, Zimmerman, Fisher, McClelland, Silverman, Murray, and others. The main points brought out were:

There should be more articles on the manufacture of staples such as sulphuric acid for the benefit of the young engineer. In this connection Mr. Zimmerman brought out that the attitude of many young chemists today in aiming to hold executive positions was belittling the chemical profession to the detriment of the whole chemical field.

A new cover and short title for the Journal would be desirable. Very little confusion to libraries would be caused by omitting "Journal of."

Educational topics would be discussed if a page were given over to them.

A change in the present method of quoting prices would be helpful to some.

Those present at the luncheon were: R. H. Bogue, R. H. Brownlee, E. J. Casselman, H. H. Craver H. G. Elledge, A. C. Fieldner, C. G. Fisher, H. E. Gill, W. A. Hamor, J. O. Handy, O. F. Hedenburg, J. E. Hansen, Mr. Hartman, H. E. Howe, C. L. Jones, H. A. Kohman, W. W. Murray, E. H. McClelland, Mr. McFarland, C. J. Rodman, W. Riddle, G. E. Seil, Alex. Silverman, E. S. Stateler, E. W. Tillotson, H. C. P. Weber, E. R. Weidlein, R. E. Zimmerman.

The meeting following the dinner was opened at 3:30 P. M. Chairman J. O. Handy called the postponed meeting to order in the Fellows Room of the Mellon Institute. The minutes of the previous meeting were read and approved. Certain announcements were made including:

Change of address of the Journal of Industrial and Engineering Chemistry editorial office to 810 Eighteenth St., N. W., Washington, D. C.

Invitation to attend the meetings of the Pittsburgh Chapter of the American Society of Heating & Ventilating Engineers. E. W. Stitt, 607 Arrott Bldg. is Secretary, and the meetings are held the third Tuesday of the month. Programs of interest are scheduled for these meetings.

Attention was called to the Birmingham meeting of the A. C. S. and the special meeting there of the organization composed of local section officers.

Dr. R. H. Bogue, Industrial Fellow at the Mellon Institute then read the scheduled paper on "The Sol-Gel Equilibrium and the Structure of Elastic Gels." An abstract of the paper is printed elsewhere in this issue. In the discussion following the paper it was brought out that the 35°C transition temperature was about the same as that of the body. Other discussion showed the interest that was taken in this very well-read paper and a vote of thanks was extended to Dr. Bogue.

Chairman Handy gave a resume of the luncheon discussion concerning the Jour. of Ind. & Eng. Chem. involving the following topics.

1. Publication of the Market Reports and their importance.
2. Name recommended to be changed to INDUSTRIAL AND ENGINEERING CHEMISTRY.
3. Appointment of a Special Correspondent to the Journal. Motion made and seconded that the appointment of such correspondent be left with Chairman. No vote taken.

Dr. H. E. Howe, Editor of Jour. of Ind. and Eng. Chem. asked for comments on the importance of and demand for publication of:

1. Translation of articles appearing in foreign languages.
2. Analytical methods. He made a plea for the contribution of Procedure Notes usually found in personal notebooks and of any other professional information thought worthy of publication.
3. Foreign letters.
4. Change of title.

In his comments upon procedure followed by various sections in the conduct of their meetings, Dr. Howe cited the Chicago plan of:

1. General Assembly—45 minutes for business session and presentation and discussion of paper of the evening.
2. Group Meetings—30 minutes for presentation and discussion of group papers under the supervision of Group Leaders.
3. Reassembly for "eats", "smokes" and general social purposes until 10:00 or 10:15 P. M.

Milwaukee's plan of co-operation with municipal authorities for the betterment of living and industrial conditions was mentioned.

Meeting adjourned at 5:30 P. M.

ABSTRACT OF DR. R H. BOGUE'S PAPER ON "THE SOL-GEL EQUILIBRIUM AND THE STRUCTURE OF ELASTIC GELS"

Experiments have been conducted upon the viscosity-plasticity relations in gelatin solutions which have indicated, (1), That gelatin in aqueous solution as measured by the MacMichael viscosimeter follows the laws of viscous flow at elevated temperatures, and that the same exhibits the properties of plastic flow at lower temperatures (above the solidification point); and (2) That the transition between the sol and gel forms does not take place at any given point of temperature. but rather extends throughout a rather indefinite period of temperature.

The variation in viscosity with time was studied and it was found that at a given temperature (35°C.) the increase or decrease in viscosity with time was dependent upon the hydrogen ion concentration, the nature of the inorganic ions present, and the amount of hydrolyzed protein in the system. It is urged that the temperature at which servable may not be taken as a critical equilibrium temperature between the sol librium temperature between the sol and gel forms, but rather that, given sufficient time under aseptic conditions, there may be conditions reached at any temperature at which there will be no change in viscosity with further lapse of time. The expression, "no change in viscosity with time" means only that the relative volume of the particles of gelatin or gelatin aggregates in the system tends neither to increase nor decrease under the conditions attained. A lowering of the temperature will cause an increase in this relative volume and hence an increase in viscosity, but this increase being attained, (after the lapse of time) the viscosity will then again become constant. A rise in temperature will produce the opposite effect. The equation is, therefore, written:

$$\eta_{pH} = K/f(T)$$

indicating that the viscosity of pure gelatin at any given hydrogen ion concentration is inversely proportional to some function of the temperature, and that, at equilibrium, there will be some viscosity (at any given pH) which will correspond with every point of temperature.

The conclusions indicate that there is no sharp transition point between the sol and gel forms in protein systems, but that the transition is continuous and

reversible over a somewhat indefinite period.

The several theories of gel structure have been reviewed and discussed, and the postulations of the writer that were made in 1920 are repeated and amplified. Many contemporary investigations have been found to support a catenary or fibrilar structure hypothesis, and are set forth.

The premises of this theory are as follows: The sol consists of slightly pied by the swollen molecular threads together into short chains. When the temperature falls the threads increase in length and number, and their power of water absorption increases, resulting in an increase in viscosity. A solid jelly results when the relative volume occupied by the swollen mollecular threads has become so great that freedom of motion is lost, and the adjacent heavily swollen aggregates cohere. The rigidity is dependent upon the relative amount of free solvent in the interstices of the aggregates, and on the amount of solvent that has been taken up by the gelatin in a hydrated or imbibed condition. The resiliency or elasticity is dependent upon the length and number of the catenary threads. Solution is the reverse of gelation. Swelling is determined by osmotic forces and the Donnan Equilibrium.

The influence of electrolytes, of varying hydrogen ion concentration and of the valency of the combining ion has been studied upon several of the characteristic properties of gelatin and found to be entirely in agreement and to give additional evidence in support of the theory presented.

Data on the mutarotation of gelatin were found to be in accord with the theory.

The occlusion theory of Loeb is reviewed and found not to be out of harmony with the present theory, but rather to explain the distribution of absorbed water and its variation with hydrogen ion concentration mathematically in terms of the Donnan Equilibrium.

IMPORTANT COMMITTEE: Dr. W. F. Rittman of the Carnegie Institute of Technology has accepted the Chairmanship of the Committee on Chemical Industry Extension in the Pittsburgh District. A report will be made at the A. C. S. Convention in September.

THE BIRMINGHAM MEETING: The meeting was attended by the following Pittsburghers—Andrews, Bogue, Craver, Farragher, Fieldner, Gruse and Mrs. Gruse, Jones, G. W. and Mrs. Jones, Handy, Slocum, Rodman and Mayer. A report will be made at our next meeting.

ONE LAST SPASMODIC EFFORT FOR THE DIRECTORY

Those of you who have sent in your directory cards need not read this. Our effort to get the rest of the directory cards sent in last month was successful to the extent that we now have the names and addresses of most of the members of the Section for the Pittsburgh 1922 Directory. This appeal is addressed to the last few persons who for one reason or another have failed to fill out their cards. If the presence of the dinner catechism on the card that comes with this issue confuses you, forget the dinner part of it, but fill in your name and address. If from habit you never fill in post cards, change your mind just this once, because we want our directory complete. Our cataloguer hasn't the time to pry into the bosom secrets of those who send in the cards, but if you feel that filling in the blanks reveals these, fill in your name and address only, and send it in. If in doubt as to whether you have sent one in, send this one anyhow. WE don't object to duplication, but YOU will object to an incomplete directory. It only costs you one cent to do this and it is your own fault if your name is not in the 1922 Pittsburgh Section Directory when it comes out.

THE SECTION'S NEW MEMBERS

Frederick W. Arnold, Jr., 163 Knox Ave., Mt. Oliver P. O., Pittsburgh, Pa.
E. H. Balz, Westminster College, New Wilmington, Pa.
Arthur D. Bauer, 3721 Dawson St., Pittsburgh, Pa.
Fletcher C. Benton, 329 South Millvale Ave., Pittsburgh, Pa.
Lloyd C. Cooley, c/o Barber Asphalt Paving Co., 905 Peoples Savings Bank Bldg., Pittsburgh, Pa.
Fred W. Hall, 629 Sixth Avenue, Pittsburgh, Pa.
J. M. Hood, c/o Fort Pitt Malleable Iron Co., McKees Rocks, Pa.
V. L. Nickel, 118 So. Walnut St., Sharpsville, Pa.
Fred A. Nicholson, Springdale, Pa.
S. G. Richards, 401 Caldwell Ave., Wilmerding, Pa.
Kenneth C. Steele, 707 Second St., Juniata, Pa.
Henry A. Stobbs, 284 Prospect St., Morgantown, W. Va.
E. W. Summers, 503 Johnson Bldg., New Castle, Pa.
C. A. Taylor, 4800 Forbes St., Pittsburgh, Pa.
Maurice C. Walsh, Mellon Institute, Pittsburgh, Pa.
Leslie H. Webb, 615 Union Arcade Bldg., Pittsburgh, Pa.
T. Earl Williams, 413 Kelley St., Wilkinsburg, Pa.

LOCAL INDUSTRIAL NOTES

Pittsburgh—Bethlehem Laboratories, Inc., a $5,000,000 corporation, has been organized here to manufacture a new antiseptic known as Hyclorite, possessing 175 times the germicidal strength of hydrogen peroxide. Among incorporators are Homer D. Williams, president of Carnegie Steel; Taylor Allerdice, vice-president of National Tube; and Dr. J. J. Reilly, surgeon, United States Shipping Board. Plans include construction of modern chemical plant here.

The Stroh Process Steel Co., Pittsburgh, Pa., has been incorporated with a capital of $5,000, to manufacture steel products. A. R. Bassett, Westinghouse Bldg., Pittsburgh, is treasurer.

The Beaver Enameling Co., Ellwood City, Pa., has been incorporated with a capital of $33,000, to manufacture enameled products. A. Largue May Beaver Falls, Pa., is treasurer.

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The Faculty and ACS Student Affiliates of the Department of Chemistry
at Carlow University

In Service to
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Spring, 2017

Dr. David Gallaher, Department Chairperson (project lead)
Dr. Monique Hockman, Professor of Chemistry
Dr. William Kowallis, Assistant Professor of Chemistry
Mr. Michael Martucci, M.S., Assistant Professor of Chemistry

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