

is brought in contact with cotton, can be washed free of α -amylose with cold water. The adsorbate is then easily broken up by hot water to yield a clear solution of pure β -amylose. From the solution that has been passed several times through the regenerated cotton α -amylose can be obtained by concentration of the solution and precipitation with alcohol. On the other hand, the isolation of β -amylose from its aqueous solution in dry form is not possible. It can be precipitated with alcohol, but almost all of the substance so obtained becomes insoluble in water when dried in a desiccator. Also, the originally clear solution of β -amylose rapidly develops turbidity and the β -amylose precipitates out in granules (retrograded β -amylose or starch-cellulose), which are insoluble in cold water but soluble in cold, strong alkali solution. By addition of pyridine to the original aqueous solution of β -amylose the retrogradation can be prevented. On distillation of this solution with occasional

addition of pyridine finally a clear pyridine solution of β -amylose can be obtained, from which β -amylose can be precipitated with alcohol. Evaporation of this pyridine solution results in the formation of an insoluble film of β -amylose. Preliminary experiments showed that both our α - and β -amyloses possess identical specific rotation $[\alpha]^{20D} 145^\circ$ in a 20% sodium hydroxide solution, and both of them use almost exactly one mole of periodic acid for oxidation. So far the only chemical difference we have found between the two amyloses exists in the complete absence of phosphorus in β -amylose and the presence of this element (0.020%) in α -amylose. Furthermore, the original solution of β -amylose gives a deep blue color with iodine, whereas α -amylose shows a purple color. An extensive investigation of these two materials has been initiated in this Laboratory.

FRICK CHEMICAL LABORATORY
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EUGENE PACSU
JAMES W. MULLEN, 2ND

RECEIVED FEBRUARY 10, 1941

NEW BOOKS

Scattering of Light and the Raman Effect. By S. BHAGAVANTAM, M.Sc., Ranchandra Deo Professor of Physics, Andhra University. The Registrar, Andhra University, Waltair, India, 1940. x + 333 pp. 2 plates and 41 figs. 18 × 25.5 cm. Price 22s. or Rs. 15 net.

As remarked by the author in his preface, this book deals mainly with the physical aspects of the scattering of light and the Raman effect. The chapter headings are as follows:

- Preface, Foreword by Sir C. V. Raman
- I. Some Natural Optical Phenomena
- II. Light Scattering as a Residual Effect
- III. Laws of Scattering of Light
- IV. Experimental Results in Gases and Comparison with Theory
- V. Theory of Light Scattering by Dense Media
- VI. Experimental Results in Liquids and Comparison with Theory
- VII. Binary Liquid Mixtures and Liquid Boundaries
- VIII. Optical Anisotropy and Molecular Structure
- IX. Optical Anisotropy and Different Types of Birefringence
- X. The Principal Experimental Results in Raman Effect
- XI. Theory of Raman Scattering

- XII. Symmetry, Selection Rules and Molecular Oscillations
- XIII. Raman Effect and Molecular Structure
- XIV. Raman Effect in Relations to Crystal Structure
- XV. Experimental Technique
- XVI. Raman Effect in Relation to Inorganic Chemistry
- XVII. Raman Effect in Relation to Physical Chemistry
- XVIII. Raman Effect in Relation to Organic Chemistry

Appendices:

- I. Radiation from Moving Charges
- II. Convergence Correction
- III. Fluctuations
- IV. Evaluation of the Various Matrix Elements of Polarizability Tensor
- V. Tensor Components and their Transformation from One Coordinate System to Another
- VI. Groups and Group Characters
- VII. Group Theory and Normal Oscillations of Molecules

Over one-third of the book deals with Raleigh scattering. The experimental material and theory of Raleigh scattering form a natural background for the full understanding of the Raman effect. These are fully presented in an interesting manner with a mathematical formulation that can be followed easily. The chapter on birefringence will be

particularly interesting to an organic chemist with a moderate mathematical background, especially the parts on magnetic and electric birefringence.

The Raman effect is introduced by a consideration of the early experimental results in some detail so that it is made plain to a beginner just exactly what the effect is. The classical theory of the Raman effect in Chapter XI is presented quite clearly. The quantum treatment in the same chapter assumes a familiarity with the matrix mechanics which the average chemist does not possess. The development of the selection and polarization rules requires a better working knowledge of group theory than is obtained through the appendix. This subject is clarified somewhat by the consideration in detail of a number of simple examples including diatomic, triatomic, pyramidal and tetrahedral molecules as well as benzene. The chemist will regret the omission of a detailed discussion of force constants.

The section on the scattering of light by liquids and solids is written in an interesting and stimulating manner.

The book forms a useful summary of the most important aspects of the Raman effect. It is to be recommended as a short introduction to the subject for anyone who contemplates carrying out research in the field. In this respect the lack of a clear development of the elements of group theory is to be regretted. An adequate introductory book on molecular vibrations and spectroscopy for the chemist still remains to be written.

J. G. ASTON

Practice of Organic Chemistry. By HOMER ADKINS, S. M. McELVAIN and M. W. KLEIN, University of Wisconsin. Third edition. McGraw-Hill Book Company, Inc., 330 West 42nd Street, New York, N. Y., 1940. ix + 294 pp. 22 figs. 14.5 × 21 cm. Price, \$2.50.

With the services of a third author, Klein, this manual appears in a modernized edition. Certain new sections have been added, *e. g.*, one on iodine compounds in Chapter 8 and one on the Diels-Alder reaction in Chapter 15. The diagrams have been replaced by more attractive, albeit in some cases not perfect, ones. The steam distillation apparatus (p. 23) indicates, contrary to the best practice, a short-necked flask, three tubes of improper length, and an exit tube with much too great radiating surface. On pp. 31-32 the directions and the diagram fail to "track." In general the laboratory directions are very well presented. The reviewer enthusiastically agrees with the recommendations concerning the use of Erlenmeyer flasks for crystallizations. There is much valuable material well-presented in the sections on reaction types in the latter part of the book. Fifteen pages are devoted to helpful comments on organic literature, including the 4th edition of Beilstein.

The most obvious weakness of the manual is apparently the result of inexperienced, or too hasty, proof-reading, for misprints and omissions are numerous (pages 64, 105, 145, 173, 226, 236, 247, 264). The manual will "help the student grasp the broader concept that a particular preparation illustrates, and at the same time acquaint him with the details of current practice in laboratory operations." The reviewer is very glad to recommend this

volume to instructors of semester, and year, courses in elementary organic chemistry.

G. ALBERT HILL

Physical Chemistry of High Polymeric Systems. By H. MARK, Adjunct Professor of Organic Chemistry, Polytechnic Institute of Brooklyn, New York, N. Y. Volume II of "High Polymers." Interscience Publishers, Inc., 215 Fourth Avenue, New York, N. Y., 1940. vii + 345 pp. 99 figs. 16 × 23.5 cm. Price, \$6.50.

Except for minor details, this volume is a translation of the author's recently published "Allgemeine Grundlagen der hochpolymere Chemie." Since the German work has already been ably reviewed (THIS JOURNAL, 62, 2887 (1940)), an extended review of the present volume would be superfluous.

The title is somewhat misleading. The book is primarily a critical presentation and discussion of methods available for studying the structures of atomic aggregates (molecules, liquids, solids) and the relationships between these structures and ordinary physical properties. Most of the examples chosen to illustrate these methods and relationships are necessarily taken from the domain of small molecules or that of crystals. High polymers are mentioned only occasionally and usually incidentally, their detailed treatment being reserved for later volumes in the series. The reviewer has no objection to this, but merely expresses the fear that many who would find this work of interest and value will be misled by the reference in the title to "high polymeric systems."

The translation has, on the whole, been well done, although in a number of instances expressions are used which do not conform to customary English and American usage. For example, the "bending vibrations" of molecules are referred to as "break oscillations."

The publishers are also to be commended for their work. Printing and binding are well done and typographical errors are few.

The reviewer is glad to recommend this book to all interested in structural chemistry. It is an important addition to the literature of the subject. We Americans in this field should be (and are) proud to have its distinguished author now one of us.

MAURICE L. HUGGINS

Industrial Electrochemistry. By C. L. MANTELL, Ph.D., Consulting Chemical Engineer, New York; Member of the American Institute of Mining and Metallurgical Engineers, and of the American Institute of Chemical Engineers. Second edition. McGraw-Hill Book Company, Inc., 330 West 42nd St., New York, N. Y., 1940. x + 656 pp. 236 figs. 16 × 23.5 cm. Price, \$5.50.

This second edition is a revision of a text that first appeared in 1931. In the revision the book has been expanded from 528 to 656 pages. The additions are distributed fairly evenly throughout the book.

In his preface the author states that he regards electrochemical practice as a branch of chemical engineering and not a subdivision of physical chemistry. The treat-

ment of the subject clearly shows this point of view. Part I entitled "Theoretical Electrochemistry" and covering 82 pages is clearly the weakest part of the book. It contains an elementary discussion of the science in the spirit of Arrhenius, van't Hoff, Ostwald and Nernst and their schools. Even the mathematical symbols used are the same as those used in Nernst's "Theoretical Chemistry" which was the standard textbook forty years ago. There are a few very brief allusions to the more modern ideas of interionic attraction and to activities, but these comments are so brief and unenthusiastic that a student whose first knowledge of the subject comes from this source could scarcely fail to retain a complete faith in the older doctrines.

The place above all others where strict accuracy seems to be called for is in the discussion of the "electrical units." Here there are no allusions to either the electrostatic or electromagnetic c. g. s. units. There is no distinction stated between the "absolute units" and the "International Units." What is stated to be the definition of the "ohm" is actually a slightly inaccurate paraphrase of the definition of the "International Ohm."

The definition of the pH scale is relegated to a footnote in a later section. A mere half page is devoted to a description and discussion of the Glass Electrode. Even this brief discussion is by no means up-to-date or entirely accurate and makes no reference to any of the convenient forms of the instrument which are commercially available and now in common use in industrial laboratories.

However, when the author comes to his main theme of industrial electrochemistry the quality of the text improves enormously. It is clear, readable and interesting. The text abounds with detailed quantitative descriptions of the design and performance of forms of apparatus in actual use and comparisons of the numerous competitive forms, with clear discussions of principles of design and trends in development. There are many diagrammatic flow sheets, clear line drawings and photographs of actual installations, and graphs depicting the influence of the controllable variables on the performance.

GRINNELL JONES

Electrocapillarity. The Chemistry and Physics of Electrodes and other Charged Surfaces. By J. A. V. BUTLER, D.Sc., Lecturer in Chemistry, University of Edinburgh. Chemical Publishing Co., Inc., New York, N. Y., 1940. viii + 208 pp. 57 figs. 14.5 × 22.5 cm. Price, \$5.00.

The subject of electrochemistry, or electrocapillarity as Butler uses the term, has long presented a Dr. Jekyll and Mr. Hyde aspect to the world. In the realm to which thermodynamics can be applied, *i. e.*, the field of electrodes at equilibrium, the theory may be said to be complete, at least from a phenomenological point of view. On the other hand the problems which arise in connection with electrodes which are not at equilibrium are still far from solution. For many years the problem of equilibrium at electrode surfaces has completely overshadowed the kinetic problems at these surfaces, but recently these kinetic problems have enjoyed a revival of interest which promises to lead to very interesting developments.

In this book Butler seems to have two aims. One is to give a short account of the whole subject of the chemistry and physics of electrodes and other charged surfaces. The other is to give a connected account of his own work in the field. The result is that the subject of electrode kinetics is given a somewhat larger portion of the space than it really deserves on the basis of the amount of past attention it has received, but in view of the fact that it ordinarily receives too little discussion this readily can be forgiven.

It would perhaps have been better if the thermodynamics of reversible electrodes had not been included at all. Probably for lack of space, the subject of liquid junction potentials has been completely omitted, an omission which would not be serious if it were not for the fact that all but one of the illustrations used in this chapter involve cells with liquid junctions. Moreover, one would suspect (if one did not know better) from some of the statements made in this chapter that the author did not appreciate the difference between free energy and the work function.

The discussion of electrode equilibria is followed by two chapters on electrical double layers and electrokinetic phenomena. These chapters give an interesting and reasonably complete account of such phenomena as cataphoresis, electroendosmosis, and streaming potentials. It is somewhat marred, however, by the author's lack of appreciation of Guggenheim's proof of the impossibility of defining an absolute potential difference between two different phases. The very data cited by Butler in support of the concept of absolute potential serve only to strengthen Guggenheim's position.

The book closes with a discussion of overvoltage and electrode reaction kinetics. This discussion makes it clear that no single theory can explain all of the phenomena in this field. The various theories which have been advanced are outlined and criticized. The topics include hydrogen and oxygen overvoltage, concentration polarization, the deposition and solution of metals, and passivity.

This volume should furnish a valuable introduction to those who wish to learn the elements of electrochemistry. To the specialist in the field it presents a good working summary of the existing data and is well annotated with literature references.

GEORGE E. KIMBALL

Inorganic Chemistry. By FRITZ EPHRAIM with P. C. L. THORNE and A. M. WARD, Editors. Third English edition. Nordemann Publishing Company, Inc., 215 Fourth Avenue, New York, N. Y., 1940. 911 pp. Price, \$8.00.

The German original and the second English edition of this book have already been reviewed in *THIS JOURNAL*.¹ This third English edition follows the same general scheme which in previous editions has succeeded so well in presenting a wealth of information in a small compass and yet in a palatable form. The chapters on radioactivity and on the rare earths which appeared before as appendices have now been transferred to more logical positions. The chapters on the periodic system and on the Werner

(1) *THIS JOURNAL*, 44, 2066 (1922); 57, 593 (1935).

coördination theory have been considerably enlarged and afford excellent presentations of these subjects. While no new chapters have been added, recent advances in inorganic chemistry have been incorporated throughout the volume so that it is somewhat larger than the previous editions.

A wider utilization of present-day knowledge of the geometry of molecular structure would appear desirable provided it did not increase too greatly the size of the volume and thus jeopardize the admirable compactness and conciseness of this interesting and deservedly popular book.

Professor Ephraim died in 1935, so the revision of this edition has devolved wholly upon the English editors.

ARTHUR B. LAMB

Kinetics in Solution. Volume XXXIX, Art. 5, Pages 299-408 of the *Annals of the New York Academy of Sciences*. By Frank Brescia, Henry Eyring, Keith J. Laidler, Victor K. LaMer, Samuel H. Maron, Irving Roberts, George Scatchard, J. C. Warner and F. H. Westheimer. The New York Academy of Sciences, Care of the American Museum of Natural History, New York, N. Y., 1940. 15.5 × 23.5 cm. 109 pp. Price, \$1.25. This Monograph is one of several, which if purchased as a set, may be had at a reduced price.

This small volume, like the others of the series, consists of individual papers presented by invitation at a conference of the Physics and Chemistry section of the New York Academy. Consequently the main interest in each paper centers in the work of the author, his collaborators and associates; however, the related work in each field is thoroughly reviewed and many references to pertinent literature are included. An effort was made to cover the principal topics of current theoretical and experimental interest in the field of solution kinetics; there are in all six main papers, with a short introduction by V. K. LaMer and a brief discussion of one of the papers by G. Scatchard.

As Professor LaMer says in his introduction, the papers fall into three groups. Outstanding are the first two which "deal primarily with the underlying theory of chemical kinetics as modified by the presence of a solvent." In the first paper, Laidler and Eyring review briefly the Eyring theory of "absolute" reaction rates and proceed to show that its application to solutions with the same validity as to gases requires some method of referring activity coefficients to a common standard (actually the ideal gaseous state). The bulk of the paper is devoted to a discussion of modern methods of evaluating short-and-long-range intermolecular (and interionic) forces in solution, and the energy of transfer from dilute gas to solution (from which the necessary activity coefficients follow), and demonstrations of the type of application to experiment possible at the present time.

The second paper (Warner) emphasizes the necessity, in comparing rate constants and activation energies in solution with those in gas reactions, of eliminating or correcting for ionic strength and dielectric constant effects. Especially, it is shown to be useful to measure temperature coefficients in media of constant dielectric constant rather than of constant composition; activation energies

thus obtained are apparently independent of the temperature though not of the medium used to obtain the dielectric constant desired. Such activation energies, in spite of unavoidable difficulties, probably lead to closer correlation between solution and gas reaction rate theory than was thought possible previously.

The second group of three papers deals with the application of isotopes in kinetic studies: specifically, proton and deuteron exchange reactions of the nitroparaffin "pseudo-acids" in light and heavy water (Maron and LaMer); the use of O¹⁸ in the study of the rate of exchange of oxygen between water and organic compounds (Roberts); and the prediction of reaction rates in light and heavy water mixtures from known rate and equilibrium constants (Brescia and LaMer).

The final paper (Westheimer) concerns the study of certain reactions subject to specific amine catalysis (as opposed to general base catalysis) and the application of the knowledge gained in interpreting reaction mechanism.

These papers are carefully and clearly written, each by an expert in his own field and in solution kinetics in general. They have been thoroughly edited and well printed, with very few errors of any kind. In many respects such a collection of individual viewpoints is more interesting than a book intended to cover the entire subject more systematically. The volume should be welcome to every student of kinetics.

CECIL V. KING

Laboratoriumsbuch für den Lebensmittelchemiker. (Laboratory Manual for the Food Chemist.) By Prof. Dr. A. BEYTHIEN, Früher Direktor des chemischen Untersuchungsamtes der Stadt Dresden (Formerly Director of the Chemical Investigation Bureau of the City of Dresden). Second edition. Verlag von Theodor Steinkopff, Residenztrasse 32, Dresden-Blasewitz, Germany, 1939. xxiv + 602 pp. 15.5 × 23.5 cm. Price, RM. 28.50; bound, RM. 30.

This work is designated "the second completely revised edition." The first edition, appearing in 1931, was reviewed in *Industrial and Engineering Chemistry*, **23**, 850 (1931). The principal change in the make-up of this presentation is the substitution of references to original articles in the literature in place of those to the author's "Handbuch der Nahrungsmittel-Untersuchung," published in 1914. Occasionally, details of procedure are given instead of merely the direction to consult certain sections of the "Handbuch" for the analytical method. This elimination of dependence on the text of the "Handbuch" is an improvement. The references added include papers that have been published since the first edition, as well as a large number that appeared in years previous to 1931. In the main, however, literature references are still restricted to German works, and it is a rare exception to find mention of articles originating in the United States. The book retains the previous form and style, and presents practically the original directions for the examination of foods, air and tobacco; commodities such as utensils, paper, cosmetics, textiles fabrics, and petroleum; and organic and inorganic poisons. The text is devoted chiefly to methods on foods, and the chemist working along

these lines will find practical and proven procedures of examination and also a somewhat limited discussion of the significance and interpretation of results. Frequent references are made to German legal requirements. Added material is obvious in numerous places, that notable of observation being the inclusion of methods for the newer preservatives for food, namely, the esters of benzoic acid derivatives. However, one is impressed by the absence of any reference to the tests for pasteurization of milk based on the phosphatase reaction so fully developed in this country. Omission of any reference to the detailed methods for the determination of small quantities of lead in food developed by workers in the Association of Official Agricultural Chemists is especially noticeable.

While it is difficult fully to appreciate the claim of complete revision, there is much of added value, and the book should prove helpful to the food chemist engaged in regulatory work or in research.

HENRY A. LEPPER

The Endocrine Function of Iodine. By WILLIAM THOMAS SALTER, Assistant Professor of Medicine, Harvard Medical School, Associate Physician, Thorndike Memorial Laboratory, Boston City Hospital. Harvard University Press, Cambridge, Massachusetts, 1940. xviii + 351 pp. 40 figs. 16.5 × 24.5 cm. Price, \$3.50.

In the dedication of this book the author refers to himself as an iatrochemist or follower of Paracelsus, but much space is devoted to the defense of the doctrine of the imbalance of hormones which may be considered the modern version of Hippocrates' imbalance of humors. A large part of the book is on thyroid iodine and in it the excellent researches of the author are reviewed. In an attempt to link iodine to the pituitary gland, numerous iodine analyses are quoted, many of which are conflicting. The author states "the reader must be accustomed to thinking in terms of a sliding scale" and on page 5 quotes Saegesser that the same sample of blood has been analyzed by a number of microchemists who reported values from 8 to 69 γ /100 cc. This reader is at a loss to know which way to slide the scale and how far, without making more analyses.

To the research chemist, the book indicates a large number of problems which might be solved by more accurate analytical work. From this standpoint the book is very timely and worth while.

J. F. McCLENDON

Chemical Species. By JEAN TIMMERMANS, Professor of Physical Chemistry, University of Brussels. Translated from the Revised French Manuscript by RALPH E. OESPER, Professor of Analytical Chemistry, University of Cincinnati. Chemical Publishing Co., Inc., 148 Lafayette Street, New York, N. Y., 1940. viii + 177 pp. 14.5 × 22 cm. Price, \$4.00.

The hidden unknown in the evaluation of physico-chemical measurements is often the identity and purity of the substance being studied, and the significance of the results depends on the degree to which this purity can be

attested. Dr. Timmermans' small but valuable volume deals with this problem of the definition of a pure substance, its meaning in a general phase rule sense, the evaluation of methods for establishing purity, the determination of physical constants and the mathematical treatment of data—all presented in a readable and authoritative fashion through which one feels the background of rich and varied experience.

The book is divided into four parts: 1. The concept of chemical species, or the theoretical criteria of purity, including brief but careful expositions of the significance of allotropy, isomerism and metastability. 2. The realization of such systems, or the preparation of pure materials, covering methods of fractionation, general purification reagents, and chemical and physical tests of purity. 3. The measurement of physico-chemical constants, dealing mainly with units and standards of measurement and with the mathematical treatment of data. 4. A section entitled "Selection from the literature of the most suitable method of purification and of the most probable value of the constants of pure materials," with a few illustrations such as benzene and alcohol. In connection with the specific substances discussed in the book, one regrets the lack of an index.

It is probable that every reader of the book will feel that certain parts with which he happens to be particularly familiar, might well have been omitted. The inclusion however of apparently foreign and unnecessary subjects such as the inter-relation of units and of standards, the detailed explanation of the method of least squares for the treatment of numerical data, and the listing and description of reference books and collections of constants, adds to the chance that the book will prove of some interest to every one engaged in the determination or evaluation of physico-chemical properties. It is neither an exhaustive text nor a reference book, but a discussion of principles, which will repay a reading on the part of any chemist.

JOHN E. RICCI

Semi-micro Qualitative Analysis. By CARL J. ENGELDER, Ph.D., Professor of Analytical Chemistry, University of Pittsburgh, TOBIAS H. DUNKELBERGER, Ph.D., Assistant Professor of Chemistry in the Graduate School, Duquesne University, Pittsburgh, Pa., and WILLIAM J. SCHILLER, Ph.D., Head, Chemistry Department, Mount Mercy College, Pittsburgh, Pa. Second edition. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y., 1940. xii + 312 pp. 15.5 × 24 cm. Price, \$2.75.

Since the appearance of the first edition of this book [THIS JOURNAL, 58, 2344 (1936)] the semi-micro technique in qualitative inorganic analysis has found widespread favor, and the revised edition will be welcomed by old and new users alike. The following changes in the second edition may be noted. The theoretical section (136 pages) has been enlarged, rearranged, and modernized. Numerous questions and problems are now included throughout the book. A new systematic anion scheme has been introduced. The supplementary tests with references of the first edition have been omitted, but

there still are a fair number of references to the original literature.

E. B. SANDELL

Die Methoden der Fermentforschung. (Methods of Investigation of Enzymes.) Edited by Prof. Dr. Eugen Bamann, Tübingen, and Prof. Dr. Karl Myrbäck, Stockholm. Lieferungen 2, 3 and 4. Georg Thieme Verlag, Rossplatz 12, Leipzig C1, Germany, 1940. 302 + 392 + 407 pp. 6 + 249 + 177 figs. 20.6 × 27.5 cm. Price, RM. 22.80, 29.40 and 30.60.

The second, third and fourth "Lieferung" have now appeared and the reviewer has been greatly impressed with the comprehensive nature of this work, which reminds one somewhat of Abderhalden's "Biochemisches Handlexikon." It is a rich storehouse of interesting information covering not only enzyme chemistry but to a considerable extent organic analysis and organic preparations as well as numerous physical methods and their application. The work deserves prompt translation into English. The subject matter is highly dependable, accurate and, for the most part, up-to-date.

Lieferung 2 contains chapters dealing with: Starch and Glycogen; Starch Degradation Products; Galactogen; Fructans; Glucans and Cytans; Chitin; Polyuronides; Ascorbic Acid and Analogs; Chondroitin Sulfuric Acid and Related Substances; Biologically Important Derivatives of the Sugars excepting Phosphorus Compounds; Biologically Important Derivatives of the Sugars Containing Phosphorus; Nucleic Acids and their Hydrolysis Products; Proteins, their Hydrolysis Products and Peptides; Synthetic Polypeptides for Enzyme Research; the Preparation of Arginine, Histidine, Tyramine and Histamine; the Amides; Acceptor Coloring Matters; Thiols and Disulfides; the Preparation and Investigation of Conjugated Compounds; the Investigation of the Constitution of High-Molecular Compounds with the Help of Enzymes.

Lieferung 3 contains chapters on: X-Ray Studies of Natural Compounds; Estimation of the Absorption Spectrum; Raman Spectrum and Fluorescence; Polarography; Magnetic Investigations; Specific Viscosity; Ultracentrifugation and Diffusion; Dielectric Measurements of Proteins; Cryoscopic Estimation of Molecular Weights; the Estimation of Molecular Weights by the Osmotic Method; Micro-Determination of the Melting Point; Sublimation Methods; Evaluation of Analytical Results; the Adjustment and Testing of Suitable Reaction Conditions; Redox Potential; the Calculation of the Free Energy of Important Biochemical Reactions.

Lieferung 4 contains chapters on: Polarimetry; Refractometry; Interferometry; Spectrophotometry and Colorimetry; Nephelometric Estimations; the Glass Electrode and its Use; the Estimation of Viscosity; the Estimation of Surface Tension; Dilatometric Estimations; the Evaluation of Coagulation; Manometric Methods; the Estimation of Alcohols, Aldehydes and Acids; the Estimation of Carbohydrates; Colorimetric Methods for Sugars; the Estimation of Purine Bases; the Estima-

tion of Carboxyl and Amino Groups in Amino Acids and Peptides; Gasometric Estimation of Amino Acids; Biological Methods; Enzymatic Histo-Chemistry; the Preparation of Freely Dissolved Enzymes; the Preparation of Enzymes from Invertebrates; the Preparation of Enzymes from Bacteria; the Evaporation of Enzyme Solutions; the Freezing of Water from Enzyme Solutions; the Use of Bacteria as Biological Agents; Resting Bacteria.

JAMES B. SUMNER

BOOKS RECEIVED

February 10, 1941–March 10, 1941

- E. C. C. BALLY. "Photosynthesis." D. Van Nostrand Co., Inc., 250 Fourth Avenue, New York, N. Y. 248 pp. \$4.75.
- GERALD E. K. BRANCH AND MELVIN CALVIN. "The Theory of Organic Chemistry, An Advanced Course." Prentice-Hall Inc., 70 Fifth Avenue, New York, N. Y. 523 pp. \$4.00.
- H. N. BROCKLESBY, Editor. "The Chemistry and Technology of Marine Animal Oils with Particular Reference to Those of Canada." Fisheries Research Board of Canada, Ottawa, Canada. 442 pp. \$2.95; cloth bound, \$3.80.
- WALTER S. DYER. "A Practical Survey of Chemistry." Henry Holt and Co., 257 Fourth Avenue, New York, N. Y. 480 pp. \$2.80.
- CARLETON ELLIS AND ALFRED A. WELLS. "The Chemical Action of Ultraviolet Rays." Revised and enlarged edition by Francis F. Heyroth. Reinhold Publishing Corporation, 330 West 42nd St., New York, N. Y. 961 pp. \$12.00.
- T. R. HOGNESS AND WARREN C. JOHNSON. "Ionic Equilibria as Applied to Qualitative Analysis." Henry Holt and Co., 257 Fourth Avenue, New York, N. Y. 306 pp. \$2.00.
- M. RUHEMANN. "The Separation of Gases." Oxford University Press, 114 Fifth Avenue, New York, N. Y. 283 pp. \$5.75.
- WARREN C. VOSBURGH. "An Introduction to Quantitative Chemical Analysis." Henry Holt and Co., 257 Fourth Avenue, New York, N. Y. 356 pp. \$2.75.
- "Die Methoden der Fermentforschung." Edited by Eugen Bamann and Karl Myrbäck. Lieferung 5. Georg Thieme Verlag, Rossplatz, 12, Leipzig C1, Germany. 560 pp. Price, RM. 42.
- "Handbuch der Lebensmittelchemie." Edited by E. Bames, B. Bleyer and J. Grossfeld. Eighth volume. "Wasser und Luft." Third part. "Untersuchung und Beurteilung des Wassers II." Julius Springer Verlagsbuchhandlung, Linkstrasse 22–24, Berlin W 9, Germany. 347 pp. RM. 45.00, bound RM. 48.50.