

$$\bar{\sigma} = \frac{dv}{dr} = \frac{r d\omega}{dr} \quad (6)$$

Integrating eq. 6 between limits R_b to R_c and $\omega = 0$ to $\omega = \omega$, one obtains

$$\bar{\sigma} = \frac{\omega}{\ln(R_c/R_b)} \quad (7)$$

A comparison of eqs. 5 and 7 again shows that V is equal to σ_0 . By substituting the numerical values for the dimensions of the viscometer cylinders² in eq. 7, one obtains good agreement between eqs. 4 and 7 from the data of Table I.¹

(2) H. Green and R. N. Weltmann, *J. Applied Phys.*, **15**, 417 (1944).

A change in time does not affect the yield value but alters the plastic viscosity as a logarithmic function of time.³ Thus the force coordinate of the points of intersection of the downcurves from different top rates of shear will vary with time but the rate of shear coordinate will be a constant. Therefore, it is proposed here to refer to the constant V or σ_0 as the "Characteristic Shear" value for the particular material.

(3) R. N. Weltmann, *J. Applied Phys.*, **14**, 343 (1943).

E. I. DU PONT DE NEMOURS & CO., INC.
PHILADELPHIA LABORATORY
PHILADELPHIA, PA.

I. SHAPIRO

RECEIVED JUNE 8, 1946

NEW BOOKS

Acetanilid. A Critical Bibliographic Review. By MARTIN GROSS, M.D., Research Assistant (Assistant Professor), Laboratory of Applied Physiology, Yale University. Hillhouse Press, New Haven, Conn., 1946. 155 pp. 16 × 24 cm. Price, \$3.00.

The very promising developments in the field of synthetic analgesics during recent years, in particular the discovery of synthetic compounds which equal or exceed morphine in potency, and possibly in clinical usefulness, have reawakened interest in this subject. In view of this progress, the preparation of a series of Monographs of the Institute for the Study of Analgesics and Sedative Drugs is especially welcome at this time. The subject of this review is the first volume in the series; salicylates, antipyrin, bromides and phenacetin will be dealt with in subsequent volumes.

In "Acetanilid" there is presented a critical bibliographical survey of the history, physico-chemical properties, metabolism, therapeutic uses, pharmacology, toxicology and tolerance of the drug. Because of the very extensive use of acetanilid, especially as an ingredient of a great variety of proprietary preparations, unbiased opinion relative to its toxicity is of paramount importance. This subject, as well as the question of habituation or addiction, has been given lengthy and careful consideration. The bibliography and author index includes seven hundred and sixty-three references. It seems to the writer that this monograph is to be recommended to those interested in the field because of the interesting and thorough treatment of the subject.

F. F. BLICKE

Advances in Protein Chemistry. Vol. II. Edited by M. L. ANSON, Continental Foods, Hoboken, and JOHN T. EDSALL, Harvard Medical School, Boston. Academic Press, Inc., 125 East 23rd Street, New York, N. Y., 1945. xiii + 443 pp. 15.5 × 23.5 cm. Price, \$6.50.

The second volume of *Advances in Protein Chemistry* contains 11 reviews on various subjects of interest to the protein chemist. The discussions include proteins as they occur in nature as components of biological systems (copper proteins, mucoids and glycoproteins, wheat gluten), the estimation of amino acids by chemical and bacterial growth methods, the determination and reactivity of special groupings (reactions with formaldehyde, terminal amino acids and protein denaturation), the amino acid content of food proteins, the relation of protein nutrition to antibody formation and the implications of X-ray diffraction data on protein structure.

Most of these articles are of high quality, all have been written by authors who are actually working in the special field they describe. Unfortunately space does not permit every one of these contributions to be dealt with adequately so that for discussion only a few points can be singled out, in line with this reviewer's particular interests and bias.

Under the ambitious title "Analytical Chemistry of Proteins" Martin and Syngé have compiled, unfortunately not alphabetically, about 800 assorted references to work of the last 15 years. Only chromatographic and ionophoretic methods have been treated in detail. Martin and Syngé feel that it would be a great advance if editors insisted on the results of amino acid analysis being expressed in terms of amino acid N per 100 g. of total N in the protein. This reviewer rather hopes that results will continue to be reported as grams of amino acid (or of amino acid residue) yielded per 100 g. of protein. In addition, the figures could be presented in the manner suggested by the British authors.

The present state of our knowledge of the microbiological assay of amino acids is covered in an excellent, well organized review by E. E. Snell. Pertinent information is assembled in sixteen concise tables. The theoretical foundation of micro bioassays is by no means understood. It is apparent, nevertheless, that these techniques, in spite of their simplicity, are capable of yielding results whose accuracy compares with that of reliable chemical methods. The rapid development of microbiological methods during the past two years makes it understandable that many chemists still view them with suspicion. Snell's review will certainly help to overcome some of these doubts.

The identification of terminal amino acids in peptides and proteins is discussed by S. W. Fox. This timely review should prove valuable since much additional work on this important subject will no doubt be carried out in the future with the aid of new reagents.

The extensive literature on the reactions of formaldehyde with amino acids and proteins has been condensed by French and Edsall into a model review. All the pertinent information has been critically and lucidly discussed, although a vast number of reports, particularly technical ones, had to be omitted from consideration.

Research workers and students in many branches of science will look forward with anticipation to subsequent volumes of the *Advances in Protein Chemistry*, in which the Editors have promised us extensive and critical discussions of recent advances in the physical chemistry of amino acids, peptides and proteins.

ERWIN BRAND

Organic Reagents for Organic Analysis. By the staff of Hopkin and Williams, Research Laboratory. Chemical Publishing Co., 234 King St., Brooklyn 31, N. Y., 1946. 175 pp. 14 × 22 cm. Price, \$3.75.

The first section of the book, entitled "General Survey" and occupying twenty-four pages, is devoted to the listing of organic reagents suitable for the preparation of derivatives of each of seventeen major classes of organic compounds. For each class a list of "selected reagents" is presented with a brief discussion and with recommendations for the selection of the most appropriate reagent for particular compounds or compounds of particular types. The number of reagents so treated varies from one, for mercaptans, to seventeen, for primary amines. The discussion is followed by a list of "other reagents" and comments about them. The two lists together usually include most, but not all, of the organic reagents which have been proposed for use in the preparation of derivatives of compounds of the type concerned. The seventeen general classes of organic substances treated are as follows: acids (carboxylic), alcohols, aldehydes and ketones, alkaloids, amides, amines (primary), amines (secondary), amines (tertiary), barbituric acids, ethers, halides, hydrocarbons (aromatic), mercaptans, nitriles, phenols, sulfonamides, and sulfonic acids.

In the second section, entitled "Selected Reagents" and comprising seventy-four pages, the forty-two reagents given preference in the first section are discussed in some detail. The name, formula, molecular weight and the general field of utility of the reagent concerned appear at the beginning of each subsection. There follow a description of the reagent, with mention of its physical and chemical properties, and a procedure for its use in the preparation of derivatives of compounds of each of the classes to which it is applicable. When the reagent is of value in the quantitative estimation of one or more functional groups its use in this connection is discussed and procedures are given.

The third section of the book consists of fifty-four pages of tables of melting points of derivatives. The tables are arranged according to the major classes of organic compounds as listed in the first section with a few changes, such as the separate tables of aliphatic and aromatic primary amines, the separate tables of aldehydes and ketones, and the addition of heterocyclic compounds in a table listing eight such substances. The tables appear in the alphabetical order of the subjects (acids, alcohols, aldehydes, etc.) and the compounds within the tables are listed alphabetically. The tables usually have a column for each of the selected reagents listed in the first section. Only the melting points of the derivatives appear in the tabulations. It is unfortunate that physical constants of the parent compounds are not shown also. The melting points of many derivatives observed by the authors, and found to be in agreement with those listed in the literature, appear in bold-faced type; those of a smaller number, prepared by the authors either for the first time or for the purpose of resolving differences appearing in the literature, are shown in italic type.

The fourth and final section of the book consists of a recapitulation of the forty-two selected reagents, now called "selective reagents," printed in a single column with a facing column showing the classes of substances for which each is useful. This listing occupies about two and a half pages. The "general index" which follows fills nine pages.

The only typographical errors observed by this reviewer occur in the Table of Contents, where *p*-nitrobenzoyl bromide appears for *p*-nitrobenzyl bromide, and, on page 101, where "recrystallised" is to be seen. The formula of a sulfone (p. 51) is written with hexavalent sulfur. Benzene rings are indicated by simple hexagons. Single covalences are indicated sometimes by dots, sometimes by lines, separating parts of formulas. Spelling, abbreviations and idiom are British. Editorial conventions are treated with some laxity; as examples, M. P. and M. Pt. both are used as abbreviations for "melting

point," and expressions such as "5 ml. of glacial acetic acid" sometimes do and sometimes do not include the "of." The paper used in the printing is of so rough a surface that many letters are badly blurred. Fortunately, the figures in the tables are printed in a type large enough that they are clearly legible.

As stated in the Preface, the book is concerned with "the use of organic reagents in preparing derivatives of organic substances for purposes of identification by melting points." This definition of scope permits the authors to exclude the many valuable procedures for the preparation of derivatives with the aid of inorganic reagents only, and thus to offer a compact and comprehensive treatment of the organic reagents. Nevertheless, the exclusion of inorganic reagents is not quite complete. Hydroxylamine hydrochloride is among the forty-two "selected reagents," all others of which contain one or more carbon atoms, and chlorosulfonic acid is mentioned once. For a work of such limited scope the book presents much valuable information. The procedures for the preparation of derivatives and for quantitative analyses will be valuable, and the discussions of the application of the forty-two "selected reagents" are somewhat more extensive than those found in most textbooks on the subject. The tables will augment those hitherto available.

H. R. SNYDER

BOOKS RECEIVED

August 10, 1946–September 10, 1946

- HERBERT J. COOPER, Editor. "Scientific Instruments." Chemical Publishing Co., Inc., 234 King Street, Brooklyn 31, N. Y. 305 pp. \$6.00.
- XENIA JOUKOFF EUDIN, HELEN D. FISHER and H. H. FISHER, Editors. "The Life of a Chemist." Translated by V. Haensel and Mrs. R. H. Lusher. Stanford University Press, Stanford University, California. 658 pp. \$6.00.
- MARK R. EVERETT. "Medical Biochemistry." Paul B. Hoeber, Inc., Medical Book Dept. of Harper and Brothers, 49 East 33rd St., New York 16, N. Y. 767 pp. \$7.00.
- BERNARD GAUTHIER. "Theses présentées a la faculté des Sciences de l'Université de Paris pour obtenir le Grade de Docteur ès Sciences physiques." Masson et Cie, Éditeurs, 120, Boulevard Saint-Germain, Paris, France. 83 pp.
- E. HAVINGA, H. W. JULIUS, H. VELDSTRA and K. C. WINKLER. "Modern Development of Chemotherapy." Elsevier Publishing Co., Inc., 215 Fourth Ave., New York 3, N. Y. 175 pp. \$3.50.
- P. H. HERMANS. "Contribution to the Physics of Cellulose Fibers. A Study in Sorption, Density, Refractive Power and Orientation." Elsevier Publishing Co., Inc., 215 Fourth Ave., New York 3, N. Y. 221 pp. \$4.00.
- PAUL KARRER. "Organic Chemistry." Second English Edition, Revised and Enlarged. Translated by A. J. Mee. Elsevier Publishing Company, Inc., 215 Fourth Ave., New York 3, N. Y. 953 pp. \$7.50.
- J. MURRAY LUCK, Editor. "Annual Review of Biochemistry." Vol. XV. Annual Reviews, Inc., Stanford University P. O., California. 687 pp. \$5.00.
- F. F. NORD, Editor. "Advances in Enzymology." Vol. VI. Interscience Publishers, Inc., 215 Fourth Ave., New York 3, N. Y. 563 pp. \$6.50.
- "Nucleonics." Based on Official Material Prepared under the Auspices of the U. S. Navy Department. Progress Press, 2153 Florida Ave., Washington, D. C. 36 pp. \$1.00.