

Isomerism is not excluded in these condensations with the dihydroxybenzenes, and we have refrained from reporting our results. The publication of the note by Adams and his co-workers makes it desirable to point out what has already

been done in this type of condensation in these Laboratories.

CHEMISTRY LABORATORIES  
COLUMBIA UNIVERSITY  
NEW YORK, N. Y.

GARFIELD POWELL  
THOMAS H. BEMBRY

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## NEW BOOKS

### The Systematic Identification of Organic Compounds.

By RALPH L. SHRINER, Professor of Chemistry in the University of Illinois, and REYNOLD C. FUSON, Professor of Chemistry in the University of Illinois. Second edition. John Wiley and Sons, 440 Fourth Avenue, New York, N. Y., 1940. xi + 312 pp. 15.5 × 24 cm. Price, \$2.75.

The first edition of this book, in contrast to the more lengthy works in this field, was outstanding in its adaptability to the teaching of organic chemistry through the excellent medium of "organic qualitative" courses. This feature is retained in the second edition. Here also, the basic principle of dividing organic compounds into large groups according to their solubilities, and further subdividing these groups by certain classification reactions, remains unchanged. No discussion of the utility of this system as compared with others will be undertaken. That this method of attack is practical and useful, not only for the identification of organic compounds but also for teaching organic chemistry and as an introduction to organic research, has been abundantly demonstrated.

The considerably increased length of the book cannot be ascribed to any particular section or chapter but rather to the addition of new material and the introduction of modern ideas throughout. In Chapter II, the relation of solubility to structure is discussed in more detail. To many of the classification experiments have been added discussions of the limits of usefulness of the reactions. This information is extremely helpful in aiding the student to interpret the results of the tests. Five new experiments have been added in this chapter.

The chapter dealing with special laboratory methods includes, with the methods of determining physical constants, a discussion of the relationship of these constants to the structures of the compounds. New methods of analysis for the elements and for determination of saponification equivalent have been presented in detail.

The most extensive change in the form of the book is the separation of the tables of derivatives from the description of the methods of preparing them. These have been placed in separate chapters and arranged in a more convenient order. Almost an innovation for textbooks in this field are the tables and the data on derivatives of sulfonic acids which appear in this edition. A new chapter dealing

with the interpretation of experimental data might prove to be particularly instructive to students.

The inclusion of most of the important recent advances in the field, both with regard to new derivatives and new experimental methods, should make the book as useful to the organic research man as to the teacher and the student.

WILLIAM P. CAMPBELL

**Magnetism and Very Low Temperatures.** By H. B. G. CASIMIR, Kamerlingh Onnes Laboratory, Leiden. Cambridge: at the University Press; New York: The Macmillan Company, 60 Fifth Avenue, New York, N. Y., 1940. 93 pp. 14 figs. 14 × 21.5 cm. Price, 6 s. net.

This short book deals primarily with investigations in the low temperature regions which have been made accessible by the adiabatic demagnetization method.

The author deals principally with methods of attacking both the experimental and theoretical side of the problems involved. Advantages and disadvantages of the several experimental procedures used in making magnetic and other measurements are presented in a brief and interesting manner.

No adequate quantum statistical methods of treating the magnetic data at very low temperatures have been devised but some progress has been made and the author's comments on the present status of this subject give a clear picture of such conclusions as may be drawn and some of the difficulties to be overcome.

The thermodynamic methods of treating magnetic data are presented. The equations by means of which thermodynamic temperature may be obtained from magnetic and calorimetric observations are given. The measurement of magnetic moment by the several static and induction methods and the importance of demagnetization corrections are treated.

Magnetic heat capacity, stark splitting, magnetic interaction including ferromagnetism are discussed.

Although the book does not attempt to summarize the experimental results so far obtained, a number of actual cases notably compounds of titanium, chromium, iron and gadolinium are discussed and some data are included.

The question of equilibrium between the magnetic and lattice systems of paramagnetic salts is treated.

We are glad to recommend the book as an excellent introduction to the subject of magnetism at low temperatures.

W. F. GIAUQUE

**Elementary Quantitative Analysis. Theory and Practice.**

By HOBART H. WILLARD, Ph.D., Professor of Analytical Chemistry, University of Michigan, and N. HOWELL FURMAN, Ph.D., Professor of Chemistry in Princeton University. Third edition. D. Van Nostrand Company, Inc., 250 Fourth Avenue, New York, N. Y., 1940. 531 pp. 62 figs. 14.5 × 22.5 cm. Price, \$3.25.

The third edition of this popular text on quantitative analysis reflects the enthusiastic personal attention of the authors, who are actively interested in the teaching of the subject, and who have been responsive to suggestions from their colleagues. This revision is no mere scissors and paste rearrangement, but, as the authors state in the Preface, the book has been taken back to manuscript form and rewritten, resulting in a volume markedly different and approximately one hundred pages larger than the preceding edition. Notable changes include the transfer of sections on the use of mathematics and reference literature to the Appendix; the earlier presentation of practical laboratory operations including a simple gravimetric experiment, giving the student a more definite grasp of the use of the balance before he becomes involved in diversified volumetric operations, and a general introduction to gravimetric procedure immediately before that section of the book. New or revised procedures in this edition covering Kjeldahl nitrogen, phosphorus, zinc, and methyl orange titrations have been used.

The sections and chapters on theory have been extensively rewritten, enlarged and modified to accord with recent developments. Examples deserving commendation are the discussion of theories of neutralization and oxidation reduction methods, quantitative separations, electrolytic precipitation, and a new chapter on colorimetry. New problems, with answers, are found after chapters, and in some cases, after different sections or theoretical topics. The addition of a five place table of logarithms of numbers may be appreciated by students who do not follow the increasingly common practice of using a separate handbook of data. In general, the added material contributes to the completeness and thoroughness of presentation of the subject matter, and the authors have resisted the temptation to ride hobbies and to add material not reasonably involved in a normal year course in introductory quantitative analysis.

In the opinion of the reviewer, the applications of colorimetric analysis, the description of electrometric methods, and the use of isohydric indicators are points that might have been more emphasized, even at the expense of some of the details of the discussions of electrometric and neutralization theory.

The authors and publishers have given careful attention to proofreading, printing and binding, so that although the volume is becoming rather bulky for a laboratory guide it nevertheless can be used conveniently in the laboratory.

The reviewer may summarize his opinion of the book by

stating that the authors have rendered available to teachers a very complete, mature, and teachable, theoretical and practical textbook of elementary quantitative chemical analysis.

C. R. HOOVER

**Properties of Ordinary Water Substance.** Compiled by

E. ERNEST DORSEY, Physicist, National Bureau of Standards, Washington, D. C. American Chemical Society Monograph Series. Reinhold Publishing Corporation, 330 West 42nd Street, New York, N. Y., 1940. xxiv + 673 pp. Illustrated. 16 × 24 cm. Price, \$15.00.

This volume is a fine example of an extraordinarily painstaking work requiring the exercise of a high order of discriminating and well balanced critical judgment. The author states that the compilation was begun under the auspices of a committee of the National Bureau of Standards, the chairman of which was the late Edward W. Washburn. To quote the author, the plan adopted called for (a) "assembling from the 'I. C. T.' all data pertaining to the properties of the ordinary water substance in all its phases, (b) revision and extension of those data in the light of more recent work, (c) inclusion of types of data that had been omitted from the 'Critical Tables,' either through oversight or because of the plan adopted for those tables, and (d) the arrangement of the whole to facilitate its use." The plan was followed but much non-numerical information has been included because of its value in completing our knowledge of water.

A further valuable feature of the work lies in the fact that the presentation has not been formed on the basis of the requirements of the expert but for those who may not be especially well acquainted with any of the fields covered. Thus the units in which numerical data are expressed are plainly indicated and the significance of the data explicitly stated, thereby excluding the possibility of any misunderstanding. Frequently pertinent formulas are given or even derived and computed quantities are accompanied by basic data along with the formulas employed. Groups of interpolation formulas have been intercompared by preparing skeleton tables, thereby revealing errors in recognized compilations while at the same time indicating oft-quoted but nevertheless worthless formulas.

No information is given regarding the behavior of water in the presence of other substances except that the effect of the presence of air is covered along with the solubilities and diffusivities in water of the atmospheric gases, the rare gases, and also hydrogen, carbon monoxide, ammonia, ozone. The diffusion of water vapor in air, hydrogen, carbon dioxide and a few solids is also included. The methods of preparing dust free water mono-crystals of ice are stated and the volumes of liquid water menisci tabulated.

The author believes no important article appearing before 1938 has been omitted. The "International Critical Tables" have been depended upon for information prior to January 1, 1923, but the author has searched the journals from 1922 to 1938 and requests to be informed about omissions that may be detected.

There are one hundred sections (accompanied by a complete index) of which the last deals with miscellaneous

phenomena and data. Aside from the two short sections dealing with "Arrangement and Documentation" and "Symbols, Units and Equivalents," the remaining ninety-eight sections are arranged under the five classifications following: I, Synthesis and Dissociation, 6 sections; II, Single-Phase Systems, 75 sections; III, Multiple-Phase Systems, 11 sections; IV, Phase Transition, 5 sections; V, Miscellanea, 1 section. The volume contains 289 tables and 13 figures. The typography and arrangement of the material is unassailable.

It is not easy to express adequately in words the value of Doctor Dorsey's work but he may be assured that scientific men everywhere and in all fields will never cease to be grateful for his having presented them with a stupendously valuable and enduring piece of work.

F. G. KEYES

**Chemistry and Medicine.** Papers Presented at the Fiftieth Anniversary of the Founding of the Medical School of the University of Minnesota. Edited by MAURICE B. VISSCHER, Professor of Physiology at the University of Minnesota. The University of Minnesota Press, Minneapolis, Minnesota, 1940. v + 296 pp. Illustrated. 15.5 × 23.5 cm. Price, \$4.50.

The Medical Faculty of the University of Minnesota chose as an appropriate subject for its commemoration exercises on the fiftieth anniversary of the establishment of the Medical School the single theme: Some Trends in Medical Progress with Particular Reference to Chemistry in Medicine. The papers which were presented under this general title on October 12, 13 and 14, 1939, have been collected and published in this present volume.

Part I comprises some applications of physical chemistry to medicine: "Some Aspects of the Colloid Chemistry of Membranes" by Herbert Freundlich; "The Performance of Osmotic Work in Living Systems" by Maurice B. Visscher; "Some Reactions by which Solutes May Be Differentially Concentrated by the Kidney" by John P. Peters.

Part II describes some recent investigations in the chemistry of metabolism: "Organic Chemistry in the Pursuit of Vitamin Research" by Lee Irvin Smith; "On the Necessity of Fats in the Diet" by George O. Burr; "Heparin and Thrombosis" by Charles H. Best.

Part III considers some aspects of immunity and chemotherapy: "Recent Chemical Trends in the Study of Immunity" by Michael Heidelberger; "The Biology of Animal Viruses" by Robert G. Green; "The Mode of Action of Sulfanilamide and its Derivatives" by Perrin H. Long; "Chemistry in Urinary Antisepsis" by Henry F. Helmholz.

Part IV discusses some chemical approaches to the nervous control of the organism: "The Physicochemical Approach to the Mechanisms of Convulsive Reactivity" by Irvine McQuarrie; "Methods of Analysis of Nervous Action" by Herbert S. Gasser; "The Nervous Regulation of Visceral Processes" by Detlev W. Bronk; "The Argument for Chemical Mediation of Nerve Impulses" by Walter B. Cannon.

These summary presentations of rapidly developing fields are of great value to the investigators engaged

therein and even more widely to men working in adjacent fields and to the general "lay" scientist.

It would be presumptuous to attempt any general discussion or evaluation of all the contributions. One can, perhaps, list a few items which happened to be of particular interest to him personally:

(1) The stimulating and suggestive introductory article by Freundlich discussing electrochemical phenomena on membranes, for instance, the Becquerel phenomenon, and also retrograde diffusion, and their significance in vital phenomena; (2) the very thorough and scholarly account of the investigations of the nature of vitamin E (tocopherol) by Smith; (3) the timely article by Long on sulfanilamide and its derivatives and, finally; (4) the discussion of animal viruses by Green in which he marshalls very effectively the evidence for the theory that viruses are degenerate, parasitic adaptations of original free-living microbes.

The Medical School is certainly to be congratulated on so fitting and useful a commemoration of its fiftieth anniversary.

ARTHUR B. LAMP

**Poisons. Their Isolation and Identification.** By FRANK BAMFORD, B.Sc., Late Director of the Medico-Legal Laboratory, Cairo, with a Foreword by Professor SYDNEY SMITH, M.D., F.R.C.P., Regius Professor of Forensic Medicine, University of Edinburgh. The Blakiston Company, 1012 Walnut Street, Philadelphia, Pennsylvania, 1940. viii + 344 pp. 21 figs. 14.5 × 22 cm. Price, \$4.00.

Very few writers on the subject of poisons have had as great a wealth of practical experience to draw from as did the author of this book. There are few laboratories in the world that compare with the Medico-Legal Institute in Cairo in the annual number of cases of criminal poisonings investigated. Although all subjects are not uniformly well-treated, and although the bibliography is incomplete and in places inaccurate, the book constitutes a valuable contribution to the field of toxicology and is highly recommended.

It is regrettable that death prevented the author from making the final corrections and additions to his manuscript.

No pretense is made to an adequate treatment of the field of industrial toxicology. The sections on metallic poisoning and barbiturates are mediocre. In common with several other recently published books on toxicology, this one also fails to call attention to the usefulness of spectroscopic methods in toxicological analysis. However, the chapters dealing with the glucosides, alkaloids and miscellaneous organic poisons are particularly good. A detailed description of a modified and improved Stas-Otto process is a valuable contribution. One chapter is devoted to a "Systematic Scheme for the Identification of Alkaloids" and is deserving of special commendation. The book should be in every laboratory in which toxicological work is done if for no other reasons than its description of general procedures and its inclusion of methods for the detection of certain unusual and obscure poisons.

ALAN R. MORITZ

**Quantitative Analysis.** By WILLIS CONWAY PIERCE, Associate Professor of Chemistry, University of Chicago, and EDWARD LAUTH HAENISCH, Associate Professor of Chemistry, Villanova College. Second edition. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y., 1940. xii + 462 pp. 15.5 × 23.5 cm. Price, \$3.00.

The first edition of this text has been reviewed in *THIS JOURNAL* (59, 2750 (1937)). This edition is the result of a careful revision which has added 50 pages to the book and has included many minor changes. In the authors' words, "(it) shows no changes in arrangement and general content; however a large portion . . . has been rewritten to make those adjustments which laboratory and class use have shown to be desirable." Included in the new sections are discussions of preparation of samples for analysis, reduction-oxidation indicators, dimensional units in stoichiometric calculations and additional description of common techniques of volumetric analysis. The whole is combined in a logical order and with a clarity of presentation which is very pleasing. The questions and problems following the various chapters, again, present an exceptionally large choice of exercises. The binding, printing and quality of paper are excellent. The book has much to offer all who teach or study first year quantitative analysis.

R. L. TICHENOR

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### BOOKS RECEIVED

July 10, 1940-August 10, 1940

GEORGE L. CLARK. "Applied X-Rays." Third edition. McGraw-Hill Book Co., Inc., 330 West 42nd St., New York, N. Y. 674 pp. \$6.00.

CHARLOTTE A. FRANCIS AND EDNA C. MORSE. "Laboratory Manual to Accompany Fundamentals of Chemis-

try and Applications." The Macmillan Co., 60 Fifth Avenue, New York, N. Y. 147 pp. \$1.00.

IRA D. GARARD. "An Introduction to Organic Chemistry." Second edition. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y. 389 pp. \$3.00.

ESTELLE E. HAWLEY AND ESTHER E. MAURER-MAST. "The Fundamentals of Nutrition." Charles C. Thomas, Publisher, 220 East Monroe St., Springfield, Illinois. 477 pp. \$5.00.

ALEXANDER LOWY AND BENJAMIN HARROW. "An Introduction to Organic Chemistry." Fifth edition. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y. 400 pp. \$3.00.

JOSEPH EDWARD MAYER AND MARIA GOEPPERT MAYER. "Statistical Mechanics." John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y. 495 pp. \$5.50.

STEPHEN MIALL. "A New Dictionary of Chemistry." Longmans, Green and Co., 114 Fifth Avenue, New York, N. Y. 575 pp. \$15.00.

WILLIS CONWAY PIERCE AND EDWARD LAUTH HAENISCH. "Quantitative Analysis." Second edition. John Wiley and Sons, Inc., 440 Fourth Avenue, New York, N. Y. 462 pp. \$3.00.

LEON B. RICHARDSON AND ANDREW J. SCARLETT. "Laboratory Manual of General College Chemistry." Henry Holt and Co., 257 Fourth Avenue, New York, N. Y. 243 pp. \$1.40.

RALPH K. STRONG. "Kingzett's Chemical Encyclopaedia. A Digest of Chemistry and its Industrial Applications." Sixth edition. D. Van Nostrand Co., Inc., 250 Fourth Avenue, New York, N. Y. 1088 pp. \$14.00.

LOUIS WALDBAUER. "Theoretical Quantitative Analysis." The Blakiston Co., 1012 Walnut St., Philadelphia, Penna. 248 pp. \$2.75.