

Criegee's lead tetraacetate cleavage of 1,2-glycols, the Dem'janov rearrangement, the Wagner-Meerwein rearrangement, the Thorpe reaction, etc. On the other hand, the author apparently has a predilection for reactions used to synthesize quinoline and quinoline derivatives, a relatively large percentage being of this type. The author expresses the hope that the index "will be of value to the research chemist in searching for types of reactions pertinent to his immediate problems." This hope would more likely be realized, had the text been expanded to include more of not only the better known but also the less familiar reactions. Although the investigator will doubtlessly at times find the examination of this little volume fruitful, he will turn in a systematic search for suggestions obviously to a wider coverage of organic reactions than is to be found in a text designedly limited to name reactions chosen "on the basis of general interest" and "recurrence in the literature."

The text should be helpful to the graduate student preparing for preliminary examinations in that it provides him with concise discussions of a large number of organic reactions with which he should be familiar. The author has rendered a service in supplying biographical information which is not as conveniently obtainable elsewhere, and which serves "to convert a name into a person." The up-to-date references provide useful leads to the chemist wishing to keep abreast of developments involving the name reactions discussed in the text. These references will be especially welcome to him, if he finds articles in a foreign language a somewhat difficult hurdle to take in stride.

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The Alkaloids: Chemistry and Physiology, Volume IV.

Edited by R. H. F. MANSKE, Dominion Rubber Research Laboratory, Guelph, Ontario, and H. L. HOLMES, Cambridge, Massachusetts. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1954. x + 357 pp. 16 × 23 cm. Price, \$8.50.

Volume four of the contemplated five volumes of this series completes the volumes devoted for the most part to the chemistry of the alkaloids except for a chapter on miscellaneous alkaloids which is to appear in the last volume along with chapters on pharmacology. As in the previous volumes, the editors have maintained, for the most part, the principle of having experts who have done experimental work in the field write the various chapters. The result is authoritative, complete, and well-written reviews by authors from Argentina, Canada, Czechoslovakia, Scotland and the United States.

This volume consists of thirteen chapters: Biosynthesis of Isoquinolines (R. H. F. Manske), Simple Isoquinoline Alkaloids (L. Reti), Cactus Alkaloids (Reti), Benzylisoquinoline Alkaloids (A. Burger), Protoberberine Alkaloids (Manske and W. R. Ashford), Aporphine Alkaloids (Manske), Protopine Alkaloids (Manske), Phthalideisoquinoline Alkaloids (J. Stanek and Manske), Bisbenzylisoquinoline Alkaloids (M. Kulka), Cularine Alkaloids (Manske), α -Naphthaphenanthridine Alkaloids (Manske), Erythrophleum Alkaloids (G. Dalma) and Aconitum and Delphinium Alkaloids (E. S. Stern). In addition to Manske's chapter on biosynthesis there is frequent reference to this subject throughout the book, particularly in the chapter by Burger which also has a good treatment of the pharmacology of the benzylisoquinoline alkaloids. In the chapter on aconitum and delphinium alkaloids, Stern has performed a very useful service in a thorough and critical review of a still unsettled subject. The book is well indexed and singularly free of typographical errors (the only one the reviewer noticed was in the structure of compound XLIX, p. 53).

Although for the most part there has been little recent activity in many of the fields reviewed (*e.g.*, of a total of approximately fourteen hundred references, only 4% are to work later than 1950) the chapters do furnish up to date and complete summaries, and this volume is thus a helpful addition to alkaloid literature.

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Quantum Chemistry. By KENNETH S. PITZER, Professor of Chemistry, University of California. Prentice-Hall, Inc., 70 Fifth Avenue, New York 11, N. Y. 1953. x + 529 pp. 15 × 22 cm. Price, \$10.00.

This book, similar in name only to the well-known text by Eyring, Walter and Kimball, is primarily an introduction to nearly all phases of modern physical chemistry. (The choice of title, therefore, seems unfortunate.) Beginning with a brief but good introduction to quantum mechanics, there are treatments of atomic structure, molecular structure and valence, kinetic theory and statistical mechanics, molecular spectra, the crystalline state with emphasis on metals and semi-conductors, gas and liquid imperfections and intermolecular forces, electric and magnetic moments, chemical kinetics, and nuclear phenomena. Twenty-four appendices are used to lighten the mathematical development within the text proper, and allow the use of the book as a text on different levels of mathematical rigor. The appendices also include tables useful for calculating such things as thermodynamic functions for harmonic oscillation and even restricted internal rotation, together with miscellaneous information, such as the relation of magnetic quadrupole coupling energy to ionic and hybrid character of bonds.

To compress this material into a book of just over 500 pages an author must tread a narrow line between superficiality and cryptic imponderability. Dean Pitzer's highly original and scholarly contributions to nearly all the fields he covers have prepared him to walk the line with great skill. Fundamentals are presented with insight; examples, necessarily limited, are well chosen; and the selection of material to be covered is, in my opinion, excellent. The author uses the "live" nature of the subject to provide interest and inspiration.

Of course there are sacrifices to brevity. The chapter, "Kinetic Theory and Statistics," is almost too brief to be worthwhile, and the nine pages devoted to rate processes can give only a hint as to the method. Undoubtedly, most students need to combine a great deal of descriptive material with the section on valence before this can become a working part of their chemical training.

For the many chemists who do not specialize in theoretical chemistry, spectroscopy and molecular structure, Pitzer's book should provide a rewarding background, and for those who intend to specialize in these fields it should provide a valuable introduction.

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Méthodes et Réactions de l'Analyse Organique. Volume III. Réactions Colorées et Fluorescences. Edited by LÉON VELLUZ, Docteur ès Sciences physiques. Masson et Cie, Éditeurs, Libraires de l'Académie de Médecine, 120 Boulevard Saint-Germain, Paris VI, France. 1954. 296 pp. 17 × 25 cm. Price, 2,750 fr.

This volume describes useful colorimetric and fluorescent reactions of organic compounds. The material is organized according to types of reactions; *e.g.*, oxidation-reduction reactions, reactions with metals and metal ions, diazotization and coupling, imine formation, indophenols, aryl methane formation, formation of certain heterocyclic compounds from aminocarbonyl compounds and α -amino acids, active methylene condensations, and halochromism of steroids.

Each chapter has a good discussion of the chemistry of the reactions, followed by notes on functional groups and behavior of certain specific compounds. Brief procedures for the tests, and tables showing the compounds, reagents and results are given. Where data are available, the tables not only indicate the colors produced but also show λ -maximum. The complete references to the original literature, organized and arranged under both the discussions and tables, constitute a valuable time saving literature survey. Three indices are provided: an author index, compound index and reagent index. The Table of Contents is at the end of the book.

This volume, edited by Léon Velluz, was written by Maurice Pesez and Pierre Poirier with the help of J. Mathieu, A Petit and J. Wohlgemuth. It constitutes an excellent source of information not only for useful color reactions but

also for the discussions of the chemistry involved. The book is valuable to both research and analytical organic chemists.

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Spot Tests. By FRITZ FEIGL, Eng., D.Sc., Laboratorio da Producao Mineral, Ministerio da Agricultura, Rio de Janeiro; Professor at the University of Brazil; Member of the Brazilian Academy of Sciences. Translated by Ralph E. Oesper, Ph.D., Professor Emeritus, University of Cincinnati. The Elsevier Press, 402 Lovett Blvd., Houston, Texas. 1954. 15.5 x 23.5 cm. Volume I—Inorganic Applications. xii + 518 pp. Price, \$6.50. Volume II—Organic Applications. xv + 436 pp. Price, \$6.25.

Spot test analysis has increased in scope to such an extent that this edition of this well-known text is now split into two volumes. Volume I deals with the inorganic application of spot tests and Volume II with the organic applications. Each volume contains an introductory chapter which covers the development, present state and prospects of the spot test approach in the field of application being discussed. A chapter on general spot test techniques also is included in each volume. The body of the texts then includes the details of the various tests. At the end of each volume is a tabular summary of the limits of identification of the various tests.

The reviewer was much impressed, not only with the wealth of information contained in these books but also with the arrangement of the material. A very logical order of discussion is followed in both the inorganic and the organic volumes. Also, all the pertinent information concerning each test such as details of operation, interferences and limits of detection are covered whenever possible.

The spot test approach to qualitative inorganic analysis is already quite well established. The organic applications, however, are rather new, and the reviewer finds many of them quite interesting and intriguing. These tests should be quite valuable in dealing with many of our organic problems. It would be well for a discussion of the spot test approach to be included in the present courses in organic and inorganic qualitative analysis since these tests can quickly, and often quite specifically, establish the presence or absence of certain classes of elements, ions, groupings or compounds. This is a great aid in limiting the field of investigation.

The reviewer feels that these volumes are valuable texts which one can pick up and use without much searching for the pertinent information. These books should interest the teachers and students of analysis as well as the industrial analyst.

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SIDNEY SIGGIA

Chemical Pathways of Metabolism. Volume I. Edited by DAVID M. GREENBERG, Department of Physiological Chemistry, School of Medicine, University of California, Berkeley, California. Academic Press, Inc., Publishers, 125 East 23rd Street, New York 10, N. Y. 1954. x + 460 pp. 16 x 23.5 cm. Price, \$11.00.

The basic idea underlying this series whose first volume is now under review has been formulated by D. M. Greenberg as follows: "It is the purpose of this work to survey the existing knowledge of the chemical steps in the metabolism of the major constituents of living organisms." This means, of course, far more than the publication of monographs on the mode of action of certain enzyme systems, for example. Rather an attempt is made to offer to the chemically well-trained reader pictures of the cooperation of various biological systems, *i.e.*, broad outlines of assimilation and dissimilation processes in plant and animal organisms.

We submit that the papers contained in Vol. I approach this ambitious goal as closely as possible, considering our

still sketchy, although rapidly progressing, knowledge in this field.

All chapters of the book are authored by experimentally active, well-known specialists; and, furthermore, by glancing through the text one cannot but perceive the smoothing hand of a careful Editor.

The content of the volume follows: Free Energy and Metabolism, by A. B. Pardee (25 pp.); Enzymes in Metabolic Sequences, by D. E. Green (39 pp.); Glycolysis, by P. K. Stumpf (42 pp.); The Tricarboxylic Acid Cycle, by H. A. Krebs (63 pp.); Other Pathways of Carbohydrate Metabolism, by S. S. Cohen (61 pp.) (the wording of this title is not fortunate); Biosynthesis of Complex Saccharides, by W. Z. Hassid (41 pp.); Fat Metabolism and Acetoacetate Formation, by I. L. Chaikoff and G. W. Brown, Jr. (71 pp.); and Sterol and Steroid Metabolism, by D. K. Fukushima and R. S. Rosenfeld (63 pp.).

The book is well printed and illustrated. The detailed Indices occupy 10% of the available space. The more than 1600 literature references are located in footnotes which involves a somewhat complicated system of author indexing.

Evidently, the material offered will be of great value to the biochemist and biologist. It should be stressed, however, that in the present state of organic chemistry, serial publications such as Chemical Pathways of Metabolism; Vitamins and Hormones; Advances in Enzymology, etc., should also be made use of by "pure" chemists. This reviewer has repeatedly noticed that otherwise well-trained young organic chemists have but a poor notion of the metabolic processes operative in their own bodies. Thus, contributions like those under review have a clear mission to fulfill.

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L. ZECHMEISTER

BOOKS RECEIVED

November 10, 1954—December 10, 1954

ROBERT S. HARRIS, G. F. MARRIAN AND KENNETH V. THIMANN (Edited by). "Vitamins and Hormones. Advances in Research and Applications." Volume XII. Academic Press, Inc., Publishers, 125 East 23 Street, New York 10, N. Y. 1954. 305 pp. \$7.50.

M. S. KHARASCH AND OTTO REINMUTH. "Grignard Reactions of Nonmetallic Substances." Prentice-Hall, Inc., Publishers, 70 Fifth Avenue, New York 11, N. Y. 1954. 1384 pp. \$15.00.

ASCHER OPLER AND NEVIN K. HIESTER. "Tables for Predicting the Performance of Fixed Bed Ion Exchange and Similar Mass Transfer Processes." Stanford Research Institute, Stanford, California. 1954. 111 pp. A limited number of free copies are available and will be furnished as single copies to requestors.

EMIT OTT, HAROLD M. SPURLIN AND MILDRED W. GRAFFLIN (prepared under the editorship of). High Polymers. Volume V. "Cellulose and Cellulose Derivatives." Part II. Second Completely Revised and Augmented Edition. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1954. pp. 511-1055. \$12.00.

I. PRIGOGINE AND R. DEFAY. "Chemical Thermodynamics." Volume I. Translated by D. H. Everett. Longmans, Green and Co., Inc., 55 Fifth Avenue, New York 3, N. Y. 1954. 543 pp. \$12.50.

W. H. SEBRELL, JR. AND ROBERT S. HARRIS (edited by). "The Vitamins. Chemistry, Physiology, Pathology." Volume III. Academic Press Inc., Publishers, 125 East 23 Street, New York 10, N. Y. 1954. 665 pp. \$15.00.

ARNOLD WEISSBERGER (Editor). Technique of Organic Chemistry. Volume I—Part III. "Physical Methods of Organic Chemistry." Second Completely Revised and Augmented Edition. Interscience Publishers, Inc., 250 Fifth Avenue, New York 1, N. Y. 1954. pp. 2097-2530. \$8.50.