

as an amide in the parent molecule is a distinct possibility.

Other investigators³ have reported the isolation of oxalic, succinic, methyl succinic, and dimethyl malonic acids in addition to four unknown ones by the permanganate oxidation of acid-hydrolyzed vitamin B₁₂. Dimethyl malonic and succinic acids

(3) H. Schmid, A. Ebnother and P. Karrer, *Helv. Chim. Acta*, **36**, 65 (1953).

might be derived from moieties having structure III.

These imides I and II and their bearing upon the organic structure and coordination linkages of vitamin B₁₂ are being studied further.

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BOOK REVIEWS

Elsevier's Encyclopaedia of Organic Chemistry. Vol. 12B, Part VII. Naphthalene: "Naphthoic Acids and Their Halogen Nitrogen and Hydroxyl Derivatives." Edited by D. F. RADT, Editor-in-Chief. Elsevier Press, Inc., 402 Lovett Blvd., Houston 6, Texas. 1953. xliii + 640 pp. 25.5 × 18 cm. \$56.00 per single copy, \$49.00 for series subscribers and \$42.00 for set subscribers.

This latest volume of Elsevier covers the naphthoic acids and their derivatives, including the hydro derivatives. It is again a testament to the skill with which the technical details are handled: the arrangement, the method for citing references, use of formulas, and indexing. But perhaps the most useful feature is the careful editing of the literature. Thus the editors point out incomplete data such as solubility measurements at unspecified temperatures. Inconsistencies in the literature have been cleared up when possible by correspondence with the original investigator. Hence Elsevier is not only a guide to the literature, but frequently an invaluable source of additional information. Only occasionally is it evident that the editors are not writing in their native tongue. Thus yields are sometimes reported as "claimed," but the editors probably do not consider the figures less reliable than those reported without reservation. Again the statement that "In this volume the literature has been consulted up to and including 1944, the literature concerning the structure of compounds up to 1953" apparently means that the literature has been covered up to 1953 for those compounds that were known before 1945. This somewhat unorthodox approach is undoubtedly dictated by practical considerations and has the advantage that the common compounds are covered almost to the time of publication.

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The Sulphur Data Book. Compiled by the Technical Staff, Freeport Sulphur Company. Edited by WILLIAM N. TULLER, Superintendent of Laboratories, Louisiana Division, Port Sulphur, Louisiana. McGraw-Hill Book Company, Inc., 330 W. 42nd St., New York 36, N. Y. 1954. vi + 143 pp. 16 × 23.5 cm. Price, \$5.00.

"This book is a compilation of data of interest to the engineer and chemist using sulphur. The desire has been to offer working material, not a literature survey." The five sections deal respectively with the nature of sulfur, physical and chemical properties, reaction thermodynamics (in tabular form), solubility and analytical methods. Nineteen figures correlate the data in a clear and attractive fashion. In conclusion there are twelve pages of sulfuric acid conversion tables.

The somewhat limited objectives quoted above have admirably been attained. It should not be forgotten, however, that the volume on sulfur of Gmelin's "Handbuch der anorganischen Chemie," in the completely rewritten eighth edition which appeared in the fall of 1953, is much more com-

prehensive and detailed and will be generally preferred as a reference work on the subject.

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Name Reactions in Organic Chemistry. By ALEXANDER R. SURREY, Sterling-Winthrop Research Institute, Rensselaer, New York. Academic Press Inc., 125 East 23rd Street, New York 10, N. Y. 1954. viii + 192 pp. 16 × 23.5 cm. Price \$4.00.

This book consists of ninety-six short discussions of organic reactions which are usually designated by the names of the investigators who discovered or developed them. The general nature of each reaction is described and illustrated, often by examples selected from recent publications. Some additional information is then usually given, such as the experimental conditions, yields, mechanism, influence of substituents and recent applications. No attempt is made to supply experimental procedures. A short list of references (generally from three to seven) is given at the end of each discussion for the reader seeking an extensive and detailed treatment of the reaction. With the exception of the articles in which the reactions were originally described, the references are almost exclusively to more or less recent reviews, studies, and applications of the reactions published in the English language. Each discussion is preceded by a brief biographical sketch of the chemist after whom the reaction is named.

With a few exceptions, the reactions are considered in alphabetical sequence. The Stevens rearrangement is out of order, appearing between the McFayden-Stevens reduction reaction and the Mannich reaction. There are several instances where the author has included in the discussion of a name reaction a short description of another name reaction, because the reactions either are essentially similar or represent different methods for synthesizing the same type of compounds. Thus the Doebner reaction is included under the Knoevenagel reaction, and the Borsche carbazole synthesis under the Graebe-Ullmann synthesis. However, when each of two or more reactions, even though they are very closely related, deserves in the author's judgment at least a page of discussion, then each reaction is considered separately in alphabetical order, e.g., the Claisen condensation and the Dieckmann reaction, the Leuckart and the Wallach reactions. In the reviewer's opinion, it would have been preferable to have organized the text on the basis of the nature of the reactions. An alphabetical listing of the names applied to them could then have appeared in the index. The use of a chemist's name to designate a reaction is primarily for convenience. What should receive the emphasis is not the association of a name with a reaction but the relation between reactions.

The author recognizes that his choice of reactions may perhaps be questioned. The reader will discover that well-known reactions have been omitted, such as the Schotten-Baumann reaction, Strecker's synthesis of α -amino acids,

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), Benzyloisoquinoline Alkaloids (A. Burger), Protoberberine Alkaloids (Manske and W. R. Ashford), Aporphine Alkaloids (Manske), Protopine Alkaloids (Manske), Phthalideisoquinoline Alkaloids (J. Stanek and Manske), Bisbenzyloisoquinoline Alkaloids (M. Kulka), Cularine Alkaloids (Manske), α -Naphthaphenanthridine Alkaloids (Manske), Erythropleum 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 benzyloisoquinoline 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 Pesze 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