

## Book Reviews\*

**Steroids and Peptides.** By J. B. Dence (Washington University School of Medicine). John Wiley & Sons, New York. 1980. xii + 418 pp. \$39.50.

This volume is designed for readers who wish a good, basic introduction to the organic chemistry of steroids and peptides in order to use such information in terms of current biological and medical problems. The author possesses a firm grounding in organic chemistry and this background is seen throughout the text, where neat drawings and figures for biochemical processes are interwoven with basic organic reactions, simple equilibrium discussions, and problems associated with the synthesis of steroids and peptides.

The book begins with steroids and a nice, logical progression of the field is prepared for the interested individual. The first 60 pages provide reasonable accounts of their occurrence, structures, nomenclature, physical properties, and physiological activities. The next 40 pages are devoted to steroidal conjugates and synthesis; the latter topic includes good descriptions of both biosynthetic and formal chemical approaches. The remaining 60 or so pages examines along classical lines the principal reactions of steroids. Unfortunately, no discussion was made of mass spectrometry or of nuclear magnetic resonance spectroscopy, although there are probably dozens of citations that could have been given to help those who need to use these procedures in their work.

The last half of the book commences with a 90 page introduction to amino acids and peptides and systematically plows through structures, nomenclature, occurrence, physical properties, and biological activity studies. Then 75 pages are handed over to the synthesis of peptides, which includes terse sections on general preparative considerations, as well as reasonable accounts of protection and deblocking, coupling, and solid-phase methods. Alas, the problems associated with establishing that a newly formed peptide is pure or even identical with a natural compound are not mentioned in any depth. High-pressure liquid chromatography has become the procedure of choice here, but no mention exists to this technique. Indeed, some of the larger peptides made in the past by the solid-phase procedure are now considered to be hopeless mixtures and mere biological activity cannot be taken to wholly support the sequence of products derived from automated shakers. The closing 65 pages consider peptide modifications involving N-terminal, C-terminal, and side-chain groups. This section is nicely written and summarizes a large amount of information in the literature.

If this book should go into another edition, then the author might consider the addition of more references at the end of each chapter that would list reviews, advanced works, and other literature surveys. The impression remains here that all the problems associated with steroid and peptide syntheses are of the past and several punches of the touch-tone buttons are sufficient to deliver almost anything to medical workers. Also, a new section on genetic coding, gene sequencing, and the potential industrial use of gene splicing to make hormones and enzymes is badly needed, as nothing along these lines is found now.

Typographical mistakes are essentially nonexistent and the writing style is clear and direct. The text hits exactly the target for which the author was aiming and can serve as a model for others to emulate. It packs a lot of information into 400 or so pages and is a pleasure to read. Should the reader of this review now rush out and purchase the book? Well, at roughly ten cents per page it is no bargain, but for those who have an N.I.H. grant, why not! In summary, if you know peptides and steroids, stay away. Otherwise, buy it.

Boris Weinstein, *University of Washington*

**Trace Element Analysis of Geological Materials.** By R. D. Reeves and R. R. Brooks (Massey University, New Zealand). John Wiley and Sons, New York. 1978. x + 421 pp. \$41.50.

This is Volume 51 in the "Chemical Analysis Series of Monographs" published by Wiley. In the preface the authors state that they have attempted to provide an introduction to trace element analysis that will be of use to those with formal training in analytical chemistry and geochemistry, or to those who have been drawn into the field from other branches of science. Because the audience is so broad, the authors have not succeeded in completely pleasing anyone, including the reviewer.

The first part of the book is good. It deals with sampling, storage, physical preparation of samples, and chemical treatment of samples. This

is information that the geochemist wants to have in one source and the analytical chemist needs for understanding of the problem. However, the next 11 chapters are an outline of instrumentation and analytical techniques that is often too shallow to be worthwhile for any experimental chemist. For example, the first 3 chapters in this section are gravimetric and titrimetric methods, solution absorptiometry, and molecular fluorescence. The authors admit that these methods are only used in special situations in geochemistry. Then, they proceed to describe the techniques on a general level that can be found in most Instrumental Analysis texts. Why not describe the specific situations in detail so the reader can understand, for example, why aluminum, silicon, and phosphorus are often still analyzed by colorimetry?

The chapter on radiometric techniques is written in depth and here the authors describe methods that are specific to geologic materials, such as the analysis of uranium by  $\gamma$ -ray spectrometry. If the chapters on auxiliary techniques had been eliminated and the chapters on X-ray fluorescence, atomic emission, atomic absorption, and mass spectrometry written at the depth of the radiometric methods chapter, the book would be more useful.

Another problem with the book is that it is dated. The references are considerable but the citations typically stop at 1976. Consequently there is only a mention of optical emission using plasma excitation, trace element analysis by energy dispersive X-ray fluorescence, and the use of microprocessors on analytical instruments.

Thomas R. Wildeman, *Colorado School of Mines*

**Alkaloid Chemistry.** By Manfred Hesse (University of Zurich). John Wiley and Sons, New York. 1981. xii + 231 pp. \$28.50.

The text is intended as an introduction primarily for advanced undergraduates and graduate students interested in the organic chemistry of alkaloids. Four major areas are addressed. First, structural classifications of 16 alkaloid groups are presented (pp 10-58) with illustration of several specific alkaloids within each group (generally about 3-6) as examples of skeletal distinctions. Bibliographic references are provided for more detailed literature presentations of major alkaloid families. Second, biogenesis is considered in Sections 6 and 7 with presentation limited to formation of common subgroups of 1-benzyltetrahydroisoquinolines (Section 6), which includes the use of oxidation patterns, biomimetic reactions, and radioisotope studies, but not the use of  $^{13}\text{C}$  NMR. Section 7 (pp 83-111) discussed the basis of chemotaxonomy. Methods of structural elucidation are the focus of the third major area, in which Section 8 illustrates the structure determination of villastonine, and the application of spectroscopic techniques, especially mass spectrometry. This is followed by presentation of classical degradation processes (Section 9), the Hofmann, Emde, and von Braun degradations, with their utilization illustrated in a variety of alkaloids. The final area of discussion concerns the synthesis of alkaloids. Dimeric alkaloids are treated in Section 10 with description of the principal reactions leading to these species as the Mannich reaction, Michael condensation, aldehyde-amine reactions, and phenolic coupling. Section 11 (pp 175-200) illustrates selected syntheses of mesembrine, porantherine, oncinothine, and vincamine.

This book is not suitable as a primary classroom text since it fails to give general presentations of biogenesis and structure elucidation, but rather it describes only benzylisoquinolines and villastonine, respectively. Additionally, the presentation of synthetic work is very limited (Section 11) in comparison to the enormous amount of material available.

This is an English translation of the original "Alkaloidchemie" (1978) and is clearly written and well-organized and appropriate reading for the student who wishes to taste the flavor of alkaloid chemistry.

David R. Williams, *Indiana University*

**The Chemistry of the Sulphonium Group. Parts 1 and 2.** Edited by C. J. M. Stirling (University College of North Wales). John Wiley & Sons, Inc., New York. 1981. xiv + 847 pp. \$211.00.

It might at first seem surprising that such a narrow subject should require two volumes, but examination shows that the material is indeed there, without padding. The original plan for the series "The Chemistry of Functional Groups", which Dr. Saul Patai has been fathering for many years, and of which this is a part, did not make explicit provision for this subject, which would otherwise have been subsumed under the title "The Chemistry of Sulphur-containing Compounds", a volume still planned for the future.

\* Unsigned book reviews are by the Book Review Editor.

The 17 chapters cover the subject broadly, from electronic spectra to biochemistry. Only the planned chapters on NMR and mass spectra did not come forth. The preface is dated May 1980, but there are no statements in the chapters to inform the reader when the coverage of the literature ceased. It would take so little effort to include this useful information, and it is unfortunate that the editors do not insist on it.

The books in this series are always useful and well produced, as readers of reviews of previous volumes will be aware. There are occasionally some lapses, however, and one of them is a tendency to launch into a subject directly at a level that assumes the reader to be familiar with the general subject already. In this volume, for example, there is no obvious place where a survey of the characteristic reactions can be found. There is a chapter on Reactivity, but its emphasis is on physical organic chemistry, and it begins immediately with a discussion of the dependence of rates of solvolysis on solvent. There is also a chapter on Synthetic Applications, but there is nothing to cover the gap between these two approaches.

Another small problem with this and other volumes is inconsistency in the abbreviations in the literature citations. Few chemists are concerned with niceties in this respect, but they do want to be sure of the exact journal cited. In this volume, *J. Liebigs Ann. Chem.* and *Ann. Chem.* refer to the same journal, although the use of the two forms causes a little confusion and worry at first. *Chem. Pharm. Bull.* and *Chem. Pharm. Bull. Tokyo* are also both used for the same journal, leading one at first to think two different publications are meant. Another abbreviation, *C.R. Acad. Sci., Ser. C*, is still a cause of mystery, for there has not been time to sort out which national academy of science is meant, several countries having used this French title.

Part 2 concludes with author and subject indexes which cover both parts. They help make this a work of reference of major importance.

**Advances in Heterocyclic Chemistry. Volume 28.** Edited by A. R. Katritzky and A. J. Boulton. Academic Press, New York, 1981. ix + 367 pp. \$52.00.

This is an interesting volume for the diversity and timeliness of the topics covered in its five contributed chapters. The special characteristics of polyfluoro organic compounds are well known, and it is no surprise that they extend to heterocyclic compounds, as developed in a comprehensive chapter by Chambers and Sargent. 1,2- and 2,1-benzothiazines, about which only one publication was known before 1956, are reviewed by Lombardino and Kuhla. These compounds have become important as anti-inflammatory agents. In contrast, the chemistry of isatoic anhydride (the cyclic anhydride of *N*-carboxyanthranilic acid) was well known even in the 19th century. It is an important starting material for a wide range of useful compounds, including heterocyclic systems, yet has not before been comprehensively treated. The contribution by Kappe and Stadlbauer nicely fills this gap.

Benzene chemistry, largely the child of the 1960's, has grown to such an extent that a chapter on the reactions of benzene with heterocyclic compounds, written by Bryce and Vernon, appears for the first time in this book. A short review of methods of generating benzene is included. The last chapter, by Wenrup, reviews the intramolecular reactions of heterocyclic carbenes and nitrenes, a subject of unusual interest and complexity, involving interconversions of homocyclic and heterocyclic rings. The chapter embraces not only aromatic systems, such as pyridylmethylene, but saturated ones as well, such as "piperidyl nitrenes", derivatives of the parent structure  $H_2N^+ \equiv N^- \leftrightarrow H_2N-N$ . These compounds present a nomenclatural problem not yet solved, for they appear to have a well developed N-N double bond. If "aminonitrene" is therefore not fully appropriate, the alternative that has seen spontaneous generation in the literature, "1,1-diazene", is surely illegitimate ("isodiazenes" has been proposed as a practical trivial class name for them, however). This and two of the other chapters tell the reader when the reviewer terminated coverage of the literature (1979); it is a pity that all the chapters do not do this.

This book is of the usual high quality of the series, but it is slightly flawed by the lack of an index (the tables of contents of the individual chapters are a partial substitute, but do not meet all needs).

**Reagents for Organic Synthesis. Volume 9.** By Mary Fisher, Rick L. Danheiser, and William Roush. John Wiley and Sons, New York, 1981. 596 pp. \$39.50.

It is gratifying to see this series, begun by Mary and Louis Fieser, continuing in capable hands as a service to organic chemists. The purpose, style, and arrangement continue unchanged, with entries in al-

phabetical order, from acetaldehyde *N*-*tert*-butylimine to zinc chloride, giving brief information on recent (1978-1979) applications to synthesis. Generally a short paragraph of text, clear and prominent equations, and a reference or two comprise each entry. As the series advances, it becomes more of an alerting service and less of a reference work, owing to the necessity to consult each volume separately, but indexing separately by type of reaction, specific compounds or classes, and authors helps to maintain a reference-work character. The organization of this work by reagent rather than type of product or transformation gives it its own unique place among the useful sources of information.

**Kirk-Othmer Encyclopedia of Chemical Technology. Third Edition. Volume 15.** Edited by M. Grayson and D. Eckroth. John Wiley and Sons, New York, 1981. xxvi + 996 pp. \$145.00.

This volume contains entries from Matches to Nitrosamines, and includes the elements mercury, molybdenum, nickel, niobium, and nitrogen, together with their compounds, organic compounds such as methanol, methacrylates, naphthalenes, and nitro compounds, plus many other topics, such as membrane technology, metal anodes, microbial transformations, molecular sieves, milk, etc. Some entries are as short as five pages (Naphthenic Acids), whereas others are major reviews (Metallic coatings, 55 pp). The contributors are mostly chemists in United States industries, with a scattering of academic and governmental ones. As always in this work, the level of presentation is professional and scientifically sound, such that the content can be useful to chemists who do not consider themselves to be at all technological. The bibliographies are substantial, the formulas clear, and the illustrations pertinent.

**Two-Phase Flow Dynamics.** Edited by A. E. Bergies and S. Ishigai. Hemisphere Publishing Corp., Washington, New York, and London, 1981. vi + 554 pp. \$75.00.

This book contains the proceedings of a seminar held in Tokyo in 1979. It contains 26 papers, a list of participants, and an index of unusually good quality for a book of this sort. The first paper has the intriguing title Recent Researches on Two-Phase Flow in Universities and Colleges in Japan, but it is about flow of hot, wet gases in pipes and capillaries rather than educational institutions. Most of the papers, in fact, have a pronounced orientation toward engineering. Some are concerned with shock waves, vapor explosions, and nuclear power plant safety, and thus may be of more direct interest to chemists.

**Rodd's Chemistry of Carbon Compounds. Second Edition. Supplement. Volume III. Aromatic Compounds. Parts B and C.** Edited by M. F. Ansell. Elsevier Scientific Publishing Co., Amsterdam and New York, 1981. xviii + 360 pp. \$70.25.

This supplementary volume covers Chapters 8-12 of the main work, and thus deals with quinones and with benzene derivatives bearing various nitrogen-containing functional groups. It also contains as an unbound insert an appreciation of the late Samuel Coffey, who was responsible for editing most of the second edition of this major reference series.

The generally high quality and great reference value of this work are well known, and have been mentioned repeatedly in reviews in this Journal. This volume merits the same praise. It brings the subjects more or less up to date, with coverage up to mid-1979.

This volume makes a departure in policy that must have been (or should have been) fraught with misgivings: The text is no longer typeset, but is reproduced directly from typescript. This cheaper form of publication is widely used for more ephemeral literature, such as proceedings of conferences, but is hard to accept in a major work of reference. It has the substantial disadvantage that editorial and other corrections are difficult to make, and as a result, this volume has more than its share of errors, rhetorical transgressions, and other infelicities. The worst of these is the use of "sulphinyl" where "sulphonyl" is required (p 321), but one can also find such peculiar terms as "nitrosoation", and inconsistent nomenclature ("Aryldiazonium" and "Arene diazonium", for example). Another consequence is the disappearance of running headings, a fact that makes this volume more difficult to use. Some of these shortcomings might have been avoided if the manuscript had been retyped, especially with the aid of a word processor, but the publishers reproduced the authors' own typescripts, thereby introducing the esthetic fault of several different typefaces. Curiously, the patchwork impression is compounded by the use of typesetting for the table of contents and the index. In its production, this volume is not a worthy addition to the series, and it is to be hoped that the publishers will not repeat this gaucherie.