

## Book Reviews

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**Atomic Absorption Spectrometry.** Edited by MAURICE PINTA, Halsted Press, New York. 1975. xxii + 418 pp. \$95.00.

This book is an English translation of the text "Spectrometrie d'Absorption Atomique: Applications a l'Analyse Chimique" which was originally published in 1971. Pinta and 17 other contributors have collaborated to present their view of the state-of-the-art techniques of analysis during that period. By the author's own admission, the development of nonflame atomization techniques since 1971 has made certain portions of the text obsolete. However, since the bulk of routine analyses in the immediate future will probably be done by flame-atomization methods, this book will remain of value to the practicing analyst.

The book is divided into two sections, one devoted to fundamental principles and instrumentation of atomic absorption spectrometry, the other dealing with specific applications. The first section covers such important concepts as radiation sources and atomizers. Depth is lacking while specific operating parameters are overemphasized. For example, Table 2.1 lists characteristics of commercially available atomic absorption instrumentation from about 1971. Unfortunately, use of such a table is questionable, since newer models have replaced many of the instruments listed. No discussion of electrodeless discharge lamps is given, not surprising in view of the publication date. Stronger presentations in this section are the chapters on interferences and optimization of analytical conditions.

The remainder of the book, about 240 pages, deals with specific procedures for analysis, applied to rocks and soils, ores, water, vegetable matter, and biological samples. These chapters are well written and quite detailed and thus might be of use to novices who wish to do analyses on these specific samples. For the same reasons, they are of little use to seasoned analysts looking for general information or solutions to new problems. The expert may be further hampered by the lack of up-to-date references. As indicated above, a weak point is the reference section which is limited both as to overall quantity and recent coverage.

If the book is used as the author intends, it has value to the routine analyst lacking time or equipment to investigate the newer methodology. It can be therefore recommended to that group of analysts.

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**NMR. An Introduction to Proton Nuclear Magnetic Resonance Spectroscopy.** By A. AULT (Cornell College) and G. O. DUDEK (Harvard University). Holden-Day, San Francisco. 1976. vii + 141 pp. \$4.95.

This is an elementary and practical text. Proton NMR is treated as an empirical aid to determination of molecular structure. Simple problems are given at the end of each chapter. It is well-suited for first-year undergraduates or for practitioners of the more descriptive sciences who require a concise overview of the method.

My first impression was that this book must have been written ten years ago. Statements such as "Although most proton NMR spectrometers employ a magnetic field of 14,092 gauss . . ." are not representative of the present situation. The language is that of field-swept spectrometers, and only brief mention is made of the Fourier transform technique or the usefulness of NMR of other nuclei. Nevertheless, the book reads easily and could be assimilated in 8-10 hours by a beginner in the field. A generous supply of representative spectra is evenly distributed throughout.

The book starts with a brief description of the NMR phenomenon, then proceeds to deal with the chemical shift, spin-spin coupling,

second-order spectra, and a detailed chapter on how to use these observables to determine a structure. A large number of examples of this last point is given, as well as 36 problems. A very serious defect is the brief and empirical discussion on the use of spin-spin couplings through three or four bonds to determine conformation. An entire chapter is dedicated to sample preparation, down to the most minute but useful detail. The penultimate chapter deals with operation of the spectrometer; much of this information is still useful for present-day FT instruments, but it is unfortunate that the chapter does not include a brief description of FT operating techniques, advantages, and problems. The final chapter treats in the briefest possible terms high-field spectrometers, spin-decoupling, computer techniques, quantitative analysis, molecular weight determination, NMR of nuclei other than  $^1\text{H}$ , and shift reagents. Most of this is just too terse to be useful. Particularly regrettable is the short shrift given to spin-decoupling.

The book is well written. Its main disadvantage is that it does not bring the reader into the NMR language of the 1970s. A useful adjunct to this book, for the type of reader for which it is intended, is "Fourier Transform NMR Techniques: A Practical Approach" by K. Muller and P. S. Pregosin, Academic Press, New York, 1976.

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**Phosphorus: An Outline of Its Chemistry, Biochemistry and Technology.** By D. E. C. CORBRIDGE (University of Leeds). Elsevier Scientific Publishing Co., Amsterdam. 1978. x + 455 pp. \$56.60.

During the last twenty years, the study of phosphorus compounds has grown so rapidly that it must now be considered as a major branch of chemistry. In this book the entire subject has been reviewed in a surprisingly small number of pages (435 pp of text). As a result, some important and interesting details have been omitted, but the major topics in the organic, inorganic, and biochemical areas have been treated to a reasonable extent, along with some technological and environmental aspects.

The emphasis is on descriptive chemistry, and practically every page of this book has structural formulas and one-line chemical equations describing syntheses and other reactions. There are also a number of reaction diagrams in which individual compounds are centered in a ring of arrows indicating the products formed by reaction with various reagents. Unfortunately, these necessarily condensed modes of presentation oversimplify the chemistry and give no indication of the complicated sequence of intermediate compounds involved in many reactions.

Since 1958, when my book entitled "Phosphorus and Its Compounds" was published, there have only been two additional attempts (including the book being reviewed here) to treat the entire field of phosphorus chemistry—both very recent and by British authors. The other book is "The Chemistry of Phosphorus" by John Emsley and Dennis Hall (John Wiley & Sons, New York, 1976), which strongly emphasizes the organic aspects of this chemistry (in a total of only 523 pages). Both books are of great value to me and my co-workers, and I expect them to become dog-eared with wear in a relatively short time. For the chemist who is quite unfamiliar with the field, I think that the Corbridge work may offer a better-balanced introduction of wider scope. Indeed, I recommend this book to both the specialist and novice. For some readers, it might profitably share shelf space with Derek Corbridge's other recent book: "The Structural Chemistry of Phosphorus", Elsevier Scientific Publishing Co., Amsterdam, 1974.

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