Book Reviews

J. Nat. Prod., **1994**, 57 (9), 1325-1326• DOI:
10.1021/np50111a028 • Publication Date (Web): 01 July 2004

Journal of Natural Products
Vol. 57, No. 9, pp. 1325-1326, September 1994

BOOK REVIEWS

The Chemistry of Organophosphorus Compounds, Volume 3. FRANK R. HARTLEY. John Wiley & Sons, 605 Third Avenue, New York, NY 10158. 1994. xvi+442 pp. 15×23 cm. $395.00. ISBN 0-471-930571.

This book is part of a multi-volume work which provides extensive coverage of organophosphorus compounds in four volumes. Volume 1 covers primary, secondary, and tertiary phosphines (PR_3H_{3-n}, n=1–3), polyphosphines (both P-$(C)_n$-P and $R(P)_nR'$, n>1), and heterocyclic compounds containing phosphorus. Volume 2 covers phosphine oxides, sulphides, selenides, and tellurides. Volume 3 covers phosphonium salts, phosphonium ylides, and phosphoranes. Volume 4 will cover phosphinous, phosphonous, phosphinic, and phosphonic acid compounds and their halogen derivatives R_2PY, RPY_2, and $R_2P(X)Y_2$, where Y=halogen and X=O, S, or Se. The coverage concentrates on the most important recent developments and mainly on material that has not been adequately covered by reviews or other secondary sources and is presented at a fairly advanced postgraduate level.

The contents of the present volume contain the following seven chapters: 1. Structure and bonding in phosphonium ylides, salts, and phosphoranes (D.G. Gilheany) (44 pages, 308 references); 2. Preparation, properties, and reactions of phosphonium salts (H.-J. Cristau and F. Plénat) (140 pages, 910 references); 3. Preparation, properties, and reactions of phosphoranes (R. Burgada and R. Setton) (88 pages, 363 references); 4. Structure, bonding, and spectroscopic properties of phosphonium ylides (S.M. Bachrach and C.I. Nitsche) (30 pages, 95 references); 5. Electrochemistry of ylides, phosphoranes, and phosphonium salts (K.S.V. Santhanam) (22 pages, 58 references); 6. Photochemistry of phosphonium salts, phosphoranes, and ylides (M. Dankowski) (22 pages, 121 references); 7. Chemical analysis of organophosphorus compounds (H. Feilchenfeld) (44 pages, 403 references).

As indicated by the chapter headings, several of the topics are treated by different authors. These are presented from different points of view and provide for a comprehensive overview. In terms of the number of references cited per page, Chapters 1, 2, and 7 have the highest, ranging between 6.5 and 9, whereas the other chapters range between 2.5 and 5.5 references cited per page. The variation is partly related to the way each author has presented the material. For example, the chapter by Gilheany contains a number of tables that have summarized many useful results from structural and theoretical treatments, whereas the chapter by Burgada and Setton emphasizes synthetic methods and the depiction of structural formulas.

Overall, this volume is an excellent one for its coverage and contains a wealth of information at the forefront of this highly interesting area of research.

ROBERT R. HOLMES, *University of Massachusetts*

Destruction of Hazardous Chemicals in the Laboratory. 2nd Edition. GEORGE LUNN and ERIC B. SANSONE. John Wiley & Sons, Inc., 605 Third Avenue, New York, NY 10158. 1994. xiii+501 pp. 15.5×23.5 cm. $75.95. ISBN 0-471-57399-X.

As the title indicates, this book provides information on procedures for the degradation of a variety of hazardous chemicals in the laboratory. In this second edition new monographs, which expand the number and type of substances covered, have been added (e.g., a monograph on highly reactive materials such as butyllithium and phosgene). An appendix on alternative methods that replace metal hydrides with reusable or less hazardous materials, such as molecular sieves, for the preparation of dry solvents has also been included. Additionally, there is a discussion of current and potential methods for treating biomedical waste streams. The monographs are arranged alphabetically by chemical name or class of compound, making them easily accessible. Furthermore, compounds are well and simply indexed by name, molecular formula, and CAS registry number. In some instances references are provided for more detailed literature which is beyond the scope of this book. The methods of destruction are presented clearly and concisely and, whenever possible, analytically assayed estimates of the amounts of the hazardous chemical remaining are documented. The interest of the authors in chemotherapeutic agents has led to a comparatively large number of monographs on antineoplastic agents and other biologically active compounds. This emphasis may not always be relevant to workers in chemistry research and development laboratories, but will be of particular interest to some natural products scientists.

The authors generally describe a few basic methods of hazardous chemical destruction, which means that only a small number of clean up chemicals (mainly $KMnO_4$, Ni-Al alloy, H_2SO_4, and bases) are required. Most of the procedures have been validated. Special problems that may develop as a consequence of a particular protocol, e.g., the formation of a mutagen, are documented when known. In some cases, methods of destruction for solutions or mixtures are included.

Given the increasing expense and difficulty of disposing of hazardous waste, a reference volume such as this, which provides simple destruction methods, is very timely. The information contained will be most useful in laboratories where large volumes of the same chemical are frequently used and in laboratories using antineoplastics and other biologically active compounds. When general classes of compounds are covered in a single monograph, e.g., aromatic amines, the information may be too limited for much reduction in a synthetic laboratory's waste stream. The text may also be of lesser value for a research laboratory that generates residuals of complex mixtures or small amounts of many chemicals.

KAY CASTAGNOLI, *Virginia Polytechnic Institute and State University*