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## Phosphorus, Sulfur, and Silicon and the Related Elements

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### Book Review

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## Book Review

*A Guide to Organophosphorus Chemistry*, by Louis D. Quin, an internationally recognized authority, published by John Wiley and Sons (<http://www.wiley.com/chemistry>) ISBN 0-471-31824-8, \$94.95, 394pp.

The broad field of organophosphorus chemistry has grown tremendously over the last few decades, with a wealth of opportunities for research and applications development. *A Guide to Organophosphorus Chemistry* offers chemists in academia and industry complete, up-to-date coverage of the fundamentals with an eye on future developments in this area. It is written at the level of advanced undergraduates or graduate students, as a way of introducing the field to them. Industrial chemists undertaking phosphorus research for the first time or going into an unfamiliar aspect would also find it a useful introduction. The book could form the basis of a formal course in phosphorus chemistry. It covers most aspects of traditional phosphorus chemistry as well as describing many areas of current research. It is heavy in providing references to other books, review articles, and to the original literature, so students can go after more advanced material as needed. It also includes lists of compounds described in *Organic and Inorganic Syntheses*. The contents are as follows: introductions laying the groundwork on ideas on structure, bonding and general characteristics of phosphorus compounds; three chapters on the synthesis and properties of 3-coordinate forms, of 4-coordinates except acids, and a separate chapter on acids and derivatives; a whole chapter on interpreting P-31 NMR, followed by a chapter on other spectroscopic methods but heavy on C-13 and proton NMR; an introduction to the major classes of heterocycles; stereochemical properties, especially on chiral syntheses and chiral phosphines as ligands; unusual coordination states (1,2 5,6); finally practical aspects of phosphorus chemistry, especially biological phosphates and phosphonates, medicinals, and agrochemicals.

This book should be a welcome addition to the library of any chemist working in this rapidly developing field.

R.R. Holmes.

**Aminophosphonic and Aminophosphinic Acids: Chemistry and Biological Activity.** Editors: Valery P. Kukhar (Ukrainian Academy of Sciences) and Harry R Hudson (University of North London). Published by John Wiley and Sons Ltd., Chichester, UK, on 31 March, 2000. ISBN 0 471-89149-5, 175.00 Pounds sterling, 634 pages.

The aim of the book is to give an up-to-date account of the chemistry and biological activity of aminophosphonic and aminophosphinic acids and their derivatives, including peptides, with special emphasis on recent developments. It is the first book to be devoted exclusively to the phosphorus analogues of amino carboxylic acids and is intended to give a comprehensive insight into their occurrence, preparation, properties, and biological activity. Separate chapters are devoted to naturally occurring derivatives, synthetic procedures (including asymmetric synthesis), structural, spectroscopic, and analytical aspects, metal complexes, and the biological activity of compounds of current interest in the biomedical and agrochemical fields. The book contains 18 chapters. The authors of each chapter are well known in their respective fields. The titles are as follows: Naturally-occurring aminophosphonic and aminophosphinic acids, Synthesis of  $\alpha$ -aminoalkanephosphonic and  $\alpha$ -aminoalkanephosphinic acids, Synthesis of aminoalkanephosphonic and aminoalkanephosphinic acids with the amino substituent in other than the  $\alpha$  position,  $\alpha$ -Amino acid analogues bearing side-chain C-P linkages, Asymmetric synthesis of aminophosphonic and aminophosphinic acids, Synthesis of phosphono- and phosphinopeptides, Column chromatography of aminophosphonic acids and phosphinopeptides, Physical properties and NMR-spectroscopic characterization of aminophosphonates and aminophosphinates, Structure and stability constants of metal complexes in solution, X-Ray crystallographic studies, Mass spectrometry and gas chromatography-mass spectrometry of aminoalkanephosphonic acids, The biological activity of phosphono- and phosphinopeptides, Aminophosphonic and aminophosphinic acids and their derivatives as agrochemicals, Neuroactive aminophosphonic and aminophosphinic acid derivatives, Aminophosphonic and aminophos-

phinic acid derivatives in the design of transition state analogue inhibitors: Biomedical opportunities and limitations, Aminophosphonic and aminophosphinic acids in the design and synthesis of HIV protease inhibitors, Aminophosphonic acid derivatives as antithrombotic agents, and Aminophosphonic and aminophosphinic acid derivatives as inhibitors of human collagenase.

Phosphorus Ylides. Chemistry and Application in Organic Synthesis, by Oleg I. Kolodiaznyy. Published by Wiley-VCH, 1999, ISBN 3-527-29531-3, 220SF, 555 pages.

It is amazing to know how useful and versatile phosphorus ylides have become since Wittig first described and developed this class of compounds. This book provides a comprehensive and up-to-date compilation of the chemistry of phosphorus ylides and their applications in organic synthesis. Phosphorus ylides are discussed as reagents for the synthesis of a broad range of substances, among which are olefins, acetylenes, cyclic and heterocyclic compounds, naturally occurring compounds like pheromones, steroids and carotenoids, and pharmaceutically and biologically active compounds such as antibiotics and prostaglandins. A special feature of this book is the inclusion of about 150 key experimental procedures, thus one can avoid time-consuming literature searches. In addition, about 2500 references (up to 1998) supply easy access to the primary literature. This book would be a welcome addition to chemists in academia and industry working in this exciting area.

The primary topics covered are presented in six chapters and summarized as follows: C,P-carbon substituted phosphorous ylides, cumulene ylides, C-heterosubstituted phosphorus ylides, P-heterosubstituted phosphorus ylides, and the Wittig reaction in all of its ramifications.