

Book reviews

Synthetic Methods of Organometallic and Inorganic Chemistry

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Volume 3, Phosphorus, Arsenic, Antimony, and Bismuth

H. H. Karsch (Vol. Ed)

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Synthetic Methods of Organometallic and Inorganic Chemistry is a series of eight volumes covering both the synthesis and the spectroscopic data useful for identifying the most important compounds in inorganic or organometallic chemistry.

Volume 3 deals with organic compounds of group 15 elements. It contains only original contributions from top specialists in this field, i.e. synthetic methods that have been tested in their own laboratories.

A brief but consistent introduction explains the importance of these compounds, especially those of phosphorus, and presents a complete list of the compounds containing phosphorus, arsenic, antimony or bismuth discussed in the first two volumes.

The material is organized in six chapters, including the introduction. Chapters 2–5 concern phosphorus compounds, while the last one (Chapter 6) deals with substances containing arsenic, antimony and bismuth. Either common synthetic routes for classes of related (similar) compounds, or specific procedures for each derivative, are given.

For each compound the most suitable procedure is described in detail and, where necessary, the authors insist on caution to avoid risks in handling the substances. Alternative methods of synthesis are presented for many compounds, but these are not discussed in detail. When necessary, synthetic methods for starting materials are also specified. In many cases, the equipment used for the synthesis is illustrated. A representative literature list accompanies each preparative method.

IR and NMR (frequently ^1H and ^{31}P , sometimes ^{13}C) data are given to allow the identification of the compounds. Often, other physical data are available (conductivity measurements, solubility etc.).

Chapter 2 is devoted to acyclic phosphorus(III) compounds. The compounds are classified in three groups, according to the coordination number at phosphorus: one, two, or three. From the first group, methylidynephosphane ($\text{H}-\text{C}\equiv\text{P}$) and some of its derivatives $\text{R}-\text{C}\equiv\text{P}$, as well as lithium salts of $[\text{O}-\text{C}\equiv\text{P}]^-$ and $[\text{S}-\text{C}\equiv\text{P}]^-$ and compounds containing cationic $[\text{Ar}-\text{N}\equiv\text{P}]^+$ or bis(amino)-phosphenium and -arsenium, are discussed. From the second group, compounds with one $\text{P}=\text{N}$ or $\text{P}=\text{C}$ bond are presented; for coordination number three,

preparative methods for RPH_2 and R_3P , as well as for halogenated compounds RPH_2X or R_3PX , are described.

Chapter 3 deals with acyclic phosphorus(V) compounds, referring to different compounds with three- (phosphorane derivatives) or four-coordinated phosphorus atoms, while Chapter 4 gives details on acyclic compounds containing two or more phosphorus atoms, i.e. compounds with single $\text{P}-\text{P}$ or double $\text{P}=\text{P}$ bonds, as well as compounds containing $\text{P}-\text{Se}-\text{P}$, $\text{P}=\text{C}=\text{P}$, or $\text{P}=\text{CH}-\text{P}$ fragments.

The next chapter is devoted to mono- and poly-cyclic phosphorus compounds containing one or more phosphorus atoms. Only heterocyclic compounds are described.

Chapter 6, on the compounds of arsenic, antimony and bismuth, contains preparative methods and NMR data for some R_3E ($\text{E}=\text{As}$, Sb , Bi) and halogen-containing compounds of organoantimony(III) and (V), organoarsenic(III) and organobismuth(III).

The book is completed by a Subject Index and a Formula Index indicating all the compounds mentioned in the book and those for which specific preparative procedures are given.

The material presented here, providing a high level of information and applicability, will be an excellent tool for chemists, research workers and students involved in synthetic work, teaching or study at universities or in industrial laboratories, and for those interested in Group 15 element chemistry and generally in organoelement chemistry.

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Organotin: Environmental Fate and Effects

M A Champ and P F Seligman (eds)

Chapman and Hall, London, 1996

623 pages. £195.00

ISBN 0-412-58240-6

This monograph is divided into 29 chapters with contributions from 49 authors.