

### Book review

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*The Chemistry of Organophosphorus Compounds. Vol. 1. Primary, secondary and tertiary phosphines, polyphosphines and heterocyclic organophosphorus(III) compounds;* edited by F.R. Hartley. Wiley, Chichester, 1990, 739 pages, £185. ISBN 0 471 92607 8.

This is an extremely valuable book, beautifully produced and full of easily accessible information. It fits into the series on the Chemistry of Functional Groups initiated by S. Patai, and is the first of four volumes. The other three will cover phosphine oxides, sulfides and selenides, phosphonium salts and phosphoranes, and phosphorus oxyacids.

The present volume has a short introduction (7 pages) by F.R. Hartley covering mainly nomenclature, which will help to dispel some of the confusion in an area where both organic and inorganic systems are in use. There is then a review by D.G. Gilheany of structure and bonding (205 references), followed by chapters on optically active compounds by H.B. Kagan and M. Sasaki (196 references), electrochemistry by K.S.V. Santhanam (63 references), thermochemistry by G. Pilcher (47 references) and ESR by P. Tordo (92 references). There are then longer chapters on the synthesis of phosphines (394 references) by D.G. Gilheany and C.M. Mitchell, of bi- and poly-dentate phosphines, widely used as ligands in transition metal chemistry (356 references) by O. Stelzer and K.P. Langhans, and of cyclic phosphines by L.D. Quin and A.N. Hughes (342 references). The chemistry and ligating properties of phosphalkynes are reviewed by M.J. Maah and J.F. Nixon (100 references, all except 8 from the 1980s). Several long chapters cover the various reactions of phosphines, viz. nucleophilic reactions (650 references) and acid-base reactions (102 references) both by H.R. Hudson, photochemical reactions by M. Dankowski (293 references), and free radical reactions by W.G. Bentrude (125 references). The book concludes with chapters on phosphine complexes of transition metals by W. Levanson (764 references) and the biochemistry of phosphines by N.R. Price and J. Chambers (59 references). There are extensive author and subject indices (76 pages).

All the chapters are written by experts who have produced concise, authoritative accounts of their specialist areas. Their brief was not to be comprehensive but to concentrate on important recent developments not covered elsewhere, at a "fairly advanced post-graduate level". This seems to be a recipe for a somewhat incoherent collection of review articles and the point is reinforced by a glance at the table of contents where the rationale for the order is far from clear. For example, why should a specialist article on optically active phosphines (chapter 3) come before an account of phosphines in general (chapter 7)? The outcome, however, is an impressive scholarly up-to-date account of organophosphorus chemistry. Anyone seeking information in this area or a summary of current knowledge would do well to turn to this book in the first instance.