

for growth are best understood, but the reader must be patient for five chapters in order to see all the physical and mathematical concepts previously developed made concrete. In conclusion, while the first five chapters may appear a little disconnected from each other owing to their admittedly monographic treatment and to their being not always performed at the same level, the last two are very interesting for a research worker in this field.

This is mostly true for the last chapter where many open questions are discussed and some suggestions for new directions of research work in crystal growth from the vapour are given.

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The Structural Chemistry of Phosphorus

by D. E. C. Corbridge, Elsevier, Amsterdam, 1974.
Price Dfl. 250.0.

Dr. Corbridge, a leading X-ray crystallographer, is to be congratulated on his remarkable industry and application in compiling a reference work of this kind. The text occupies some 425 pages, with an additional appendix of 47 pages devoted almost entirely to unit cell and space group data. This is followed by a list of 2649 references which gives some idea of the literature coverage.

Phosphorus chemistry is a subject which has expanded enormously in the past 20 years and the recent advances, due in large part to the application of modern experimental techniques, are truly remarkable. Naturally structural determinations have played a major rôle in this subject, providing a sound basis for both theoretical and reactivity studies. "Structure" means different things to different people, and on approaching this book one feels that, as it is largely devoted to X-ray work, although i.r. and Raman spectra are quoted widely in parts, the title is something of a misnomer. A reader who is looking for a general theoretical account of the fascinating structural problems which have been tackled recently, or to the application of advanced nmr techniques to structure problems is likely to be disappointed.

The appeal of this work is largely to the inorganic chemist, interested in inorganic phosphates, poly-

phosphates and related systems, including organo-metallic complexes. These compilations and the chapters on phosphonitrilic compounds, phosphides and elemental phosphorus are excellent. The structural diagrams are superb and the Tables of bond lengths impressive. Several chapters commence with, or include, brief accounts of the theoretical basis of the structures of the simpler compounds considered.

Thus pp. 292-298 are devoted to 5-coordinated phosphorus, a subject of considerable contemporary interest. One feels that the treatment is hardly adequate. Five-coordination is a particularly important area of phosphorus chemistry in view of the wide range of substituents which can be used. Although structures other than the common bi-pyramidal one are mentioned and some spectroscopic evidence favouring C_{4v} square pyramid structures is quoted, it is a pity that the author did not discuss this area in more detail. It is surprising that the several X-ray structures of compounds with C_{4v} symmetry are not included, presumably because the literature survey was completed up to 1972. In view of the enormous cost of the book however, one feels that the author could have included more footnotes, drawing attention to the more important structural advances of 1973-4.

Similarly the introduction to Ring Molecules (Chapter 14), although clearly presented, hardly does justice to a structural area of phosphorus which has expanded rapidly in the past ten years. The examples which follow are fully representative of the most important heterocycles and this chapter will be of interest to organic chemists.

Planning and writing a monograph in a rapidly expanding subject is particularly difficult in this day and age. It is impossible to attain a balance which satisfies all readers, and a considerable amount of selection is necessary. The author has almost achieved this balance for the inorganic chemist, and the book is a useful source of information for all those interested in phosphorus compounds. The book is beautifully produced, but I fear that the price will preclude it from most private collections, and regrettably from some libraries in the present stringently economic times.

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