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Book review

NMR 16 Basic Principles and Progress; ^{31}P and ^{13}C NMR of Transition Metal Phosphine Complexes, by P.S. Pregosin and R.W. Kunz, Springer-Verlag, Heidelberg, 1979, DM 72.

There has been a need for some time for an account of the application of ^{31}P NMR to coordination compounds because the earlier reviews predate the widespread use of FT and ^{1}H-decoupling methods which have so dramatically improved the sensitivity and resolution of the technique. The first chapter on methodology is specifically concerned with principles and parameters affecting the spectra of phosphine complexes and this adds usefully to the broad statements available in more general texts. In the following two chapters the theories of coupling constants and shifts are presented and used to discuss results published up to the end of 1977. The skeleton of theory has changed rather little over the last decade but the body of results has filled out to give a reasonably satisfactory overall picture, especially for coupling constants. Although some correlations have been discovered for coordination shifts (and it has been suggested very recently that these may be fortuitous) they remain essentially a parameter for characterisation rather than for interpretation. The surveys in these chapters and in the extensive Tables at the end of the book do not aim to be comprehensive but all the main developments are considered and usefully summarized. The coverage is wider than suggested by the title since all types of phosphorus donor are included, as also are the coordination compounds of non-transition elements such as tin and boron. A chapter on applications illustrates the principal uses of ^{31}P NMR spectra and parameters in structure determination and in studies of dynamic systems. With the new instrumentation, valuable results are often easily obtained with fairly complex reaction mixtures, and as a structural tool the method is particularly powerful where the acceptor atom has an isotope with a nuclear spin of ½. The main text ends with a brief survey of ^{13}C NMR spectra in phosphorus-containing complexes covering both the atoms within the phosphorus ligands and other carbon containing ligands.

This book can be recommended to new students in the field of phosphorus coordination chemistry particularly if they have the appropriate instrumentation to hand; it will also be a useful volume on the shelves of workers already in the field.

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