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Book reviews

Phosphorus-31 NMR spectroscopy in stereochemical analysis. Methods in stereochemical analysis, Volume 9, edited by J.G. Verkade and L.D. Quin, VCH Publishers, Deerfield Beach, Florida, 1987, xvi + 717 pages, DM258. ISBN 3-527-26465-5.

The title of this volume might lead the potential reader to believe that it was only concerned with organic molecules, but this is far from the truth. In fact, along with Joan Mason's recent volume (Multinuclear NMR; Plenum; 1987; ISBN 0-306-42153-4), this is an invaluable addition to the published literature for anyone working with phosphine ligands, or in the heartland of phosphorus chemistry. This is a multi-author volume containing twenty chapters. These describe, in order of appearance, general experimental techniques and an extensive compilation of chemical shift data (J.C. Tebby; 60 pages; 487 refs.), empirical methods for interpreting chemical shifts of phosphorus compounds (E. Fluck and G. Heckmann; 53 pages; 236 refs.), special experimental techniques in phosphorus NMR spectroscopy, including double and multiple resonance techniques and two-dimensional experiments (W. McFarlane; 36 pages; 120 refs.), oriented phases (J.B. Robert; 33 pages; 112 refs.), the theoretical calculation of chemical shifts (D.B. Chesnut; 20 pages; 39 refs.), theoretical considerations of spin–spin coupling (C.J. Jameson; 26 pages; 105 refs.), NMR studies of the stereochemistry and fluxionality of five- and six-coordinate phosphorus compounds (R.G. Cavell; 24 pages; 103 refs.), mechanisms of reactions of phosphorus compounds (J. Michalski, A. Skowronska and R. Bodalski; 42 pages; 181 refs.), the conformation and stereochemistry of cyclic compounds (M.J. Gallagher; 34 pages; 194 refs.), higher order ^{31}P NMR spectra of polyphosphorus compounds, including open-chain polyphosphanes, cyclic organophosphanes and polycyclic phosphides (J. Hahn; 34 pages; 55 refs.), $^{n}J(PH)$ ($n = 1$–4) coupling constants (W.G. Bentrude and W.N. Setzer; 25 pages; 106 refs.), $^{n}J(PC)$ coupling constants (L.D. Quin; 34 pages; 193 refs.), $^{1}J(PM)$ (M = elements of Groups 1, and 5–17) coupling constants (J.G. Verkade and J.A. Mosbo; 39 pages; 284 refs.), unidentate phosphorus ligands and their complexes (P.S. Pregosin; 66 pages; 329 refs.), polydentate phosphorus ligands and their complexes (A.L. Crumbliss and R.J. Topping; 27 pages; 84 refs.), complexes containing phosphido bridging ligands (A.J. Carty, S.A. MacLaughlin and D. Nucciarone; 61 pages; 197 refs.), one- and two-coordinate phosphorus compounds, including phosphaalkenes and phosphaalkynes, and their complexes (A.H. Cowley and N.C. Norman; 24 pages; 103 refs.), phosphorus ylides and their complexes (S.O Grim; 20 pages; 125 refs.), phospholes and their complexes (J.H. Nelson and F. Mathey; 30 pages; 68 refs.), and phosphoranides and their complexes (J.G. Riess; 18 pages; 37 refs.). The book is type-set, splendidly illustrated and tabulated, and the only feature to mar it is its ludicrously short index ($4\frac{1}{2}$ pages).

This book clearly does not require a detailed review: it is every bit as good as its contents list suggests. It is an absolute necessity; it is totally inconceivable to use ^{31}P NMR spectroscopy without having access to this volume. Buy it, and order more than one copy for your library!

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One-dimensional organometallic materials—An analysis of electronic structure effects; by M.C. Böhm, *Lecture Notes in chemistry, Volume 45,* Springer-Verlag, Berlin, Heidelberg, New York, London, Paris and Tokyo, 1987, v + 181 pages, DM40. ISBN 3-540-17216-5.

This volume is the 45th in an established and respected series, but one (until now) which has had little relevance to the organometallic chemist. Although it eponymously concerns the whole of chemistry, examination of the titles published so far in the series (listed on the inside of the back cover) reveals that it is centred in chemical physics and theoretical chemistry. The aims of the series (rapid and cheap dissemination of the latest developments in chemistry) are admirable, and the attractive flexi-cover format has enabled Springer-Verlag to produce this research volume at the unbelievably low price of £0.07 per page. Indeed, this research volume is actually cheaper than a number of undergraduate textbooks. The volume is inevitably in camera-ready copy format, but when the cost savings to the publisher are actually passed on to the purchaser, there is no basis for complaint. Does the question "Why do other publishers charge at the same rates (or sometimes higher) for camera-ready copy as for type-set volumes?" have to be rhetorical?

Turning to the content of this volume, it is (despite its title) very much aimed at solid-state physicists. This is clear from the foreword, which states that the book "gives an analysis of electronic structure effects for a new class of molecular solids, i.e. one-dimensional organometallic systems formed by transition-metal atoms that are embedded in a matrix of macrocyclic organic ligands (sic)". The text is split into four sections, an introduction and historical review, experimental results and the properties of global band structure, theoretical methods based on the crystal orbital formalism, and model calculations based on the crystal orbital approach. Systems considered in this least section include (tetrathiosquarato)nickel(II), polydecker sandwich systems, mixed-valence systems (including Krogmann's salt), (tetraazaporphyrinato)cobalt(II), bis(glyoximato)nickel(II), (porphyrinato)nickel(II), tetrathiotetracene, and poly(ferrocenylene). It will be of interest to anyone working in the field of one-dimensional materials, and (at its bargain price) a compulsory purchase.

A final thought for the publisher: why not include some synthetic and structural volumes in your excellent series?

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