

Book reviews

Landolt-Börnstein. Numerical Data and Functional Relationships in Science and Technology. New Series. Group II; Atomic and Molecular Physics; Vol. 11. Magnetic Properties of Coordination and Organometallic Transition Metal Compounds, Supplement 3; editors, K.-H. and A.M. Hellwege. Springer-Verlag, Berlin etc., 1981, xxxiv + 1002 pages, DM. 1190.

This addition to this fine (but inevitably costly) series of compilations of physical data is concerned with publications on magnetic susceptibilities and electron spin resonance which appeared in 1971 and 1972. As usual, the presentation is immaculate. Organometallic chemists concerned with magnetic properties of transition metal compounds will find this volume and its earlier companion volumes of great value, and will regret that similar compilations for the years 1972—1981 are not yet available.

About three quarters of the pages are devoted to magnetic susceptibility data and one quarter to electron spin resonance data. As would be expected, compounds of Fe, Co, Ni, and Cu together take up a large amount of the total space.

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Silicon in Organic Synthesis; by E. Colvin, Butterworths, London etc., 1981, xi + 348 pages, Cased £30.00, Limp £15.00.

The most striking development of organosilicon chemistry in the past decade has been the use of organosilicon compounds in organic synthesis. The development will be further accelerated by the appearance of this book, which succeeds impressively in summarizing the most relevant features of organosilicon chemistry for the guidance of practising synthetic organic chemists. (It also, incidentally, provides a very useful summary for practising organosilicon chemists of the most important uses of organosilicon compounds in organic synthesis.)

The author has succeeded in his formidable task by using reaction mechanisms to rationalize the wide range of seemingly diverse material. For this purpose the account is divided into the following topics: physical properties, the β -effect, α -metallated organosilanes, rearrangements involving migration of silicon, organohalogenosilanes and substitution at silicon (a very brief account),

vinylsilanes, α , β -epoxysilanes as precursors of carbonyl compounds and heteroatom-substituted alkenes, allylsilanes, arylsilanes, organosilyl anions, alkene synthesis by 1,2-eliminations of β -functional organosilanes, alkynyl- and allenyl-silanes, silylketenes, alkyl silyl ethers, acyloxysilanes, silyl enol ethers and silyl ketene acetates (by far the largest chapter), trimethylsilyl-based reagents, nitrogen-substituted silanes, silicon-substituted bases and ligands, and silanes as reducing agents. The emphasis is rightly on illustrative examples and no attempt is made to present a comprehensive account (although there are, after allowing for some duplication, probably over 1000 references in all). Thus the book is a timely complement to the first-class annual surveys of the use of organosilicon compounds in organic synthesis which appear in the *Journal of Organometallic Chemistry Library Series*.

Other authors would, of course, have made some different choices of the aspects of organosilicon chemistry to include in a necessarily very limited survey. I would, for example, when dealing with replacement of trialkylsilyl groups on aromatic rings by nitro groups, have mentioned that such reactions normally (possibly always) proceed via nitrosodesilylation, since this could be relevant in choosing conditions for synthetic use of the reaction. I would also have devoted a little more space to nucleophilic cleavages of carbon-silicon bonds, at least to bring out the parallel between the ease of base cleavage of Si-R bonds and the acidities of the corresponding carbon acids RH; thus, contrary to the impression given by the book, some aryl-silicon bonds are readily cleaved by very dilute alkali, and indeed, some even by neutral methanol. But these are refinements, which can be included in a future more comprehensive account, and I suspect that with Dr. Colvin's admirable introduction now available to them to stimulate their interest, organic chemists will, as they use organosilicon compounds more and more, come to realize that only a small part of organosilicon chemistry has so far been exploited, and feel the need for a more detailed account of the subject.

The book is admirably up-to-date, is nicely produced, has a good index, and as far as I can see is impressively free from errors. (I am puzzled by the use of the symbolism σ^* for σ^+ constants, but this may represent a point of view rather than an error!) It can be recommended without reservation to libraries and individual purchasers, and for the latter the soft-cover version represents excellent value.

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