Book review

Advances in Metal Carbene Chemistry, NATO ASI Series, Series C: Mathematical and Physical Sciences, Volume 269; edited by U. Schubert, Kluwer Academic Publishers, 1989, xiv + 407 pages, US$114.00, £64.00, DFl 200.00, ISBN 0-7923-0156-0.

This volume is the proceedings of the NATO Advanced Research Workshop on Transition-Metal Carbene complexes, held in 1988. The organisers are to be congratulated on the fact that most of the leading workers in the field contributed, and the result is an excellent and stimulating volume.

The book opens with an introduction by K.H. Dötz, and a review of the early years of metal carbene chemistry by E.O. Fischer, marking twenty-five years since the first synthesis of carbene complexes. There are then 43 papers which cover all the current areas of interest. I think it might have been useful to the reader if these had been grouped in some way. In the field of monomeric complexes there are notable papers by Roper, on methylene complexes of ruthenium, osmium and iridium, from Dixneuf on the synthesis of metal carbene complexes from alkynes, and from Brookhart concerning very electrophilic cationic iron carbene derivatives. Papers on electron rich carbene complexes include two from M.F. Lappert's group, in which the carbenes are stabilised by nitrogen donors, and one from R.J. Angelici, in which the stabilising heteroatoms are sulphur. Bridging carbene complexes are well represented, with papers from F.G.A. Stone, describing some novel metal-loborane compounds, T. Kauffmann on briding methylene complexes of molybdenum and tungsten, and L. Busetto on cyanocarbene dinuclear derivatives of iron.

A significant proportion of the volume is occupied by studies of the uses of carbene complexes in organic synthesis. Quite a number of these are related to metathesis chemistry, with useful contributions from T.J. Katz, dealing mainly with alkyne polymerisation, Ivin on metathesis polymerisation of norbornene, and Schrock on tungsten alkylidene complexes and the related metallocyclobutanes in metathesis. Other papers are directed towards total synthesis applications, with papers from L.S. Hegedus on the synthesis of optically active compounds, and K.H. Dötz on applications of carbene annulation reactions.

The book has been produced fom the authors' camera ready manuscript. With only a few exceptions, the quality of both text and figures is good. There is an index, but I must admit I found it a little irritating, in that only ligands, and not metals, are indexed. Thus, there are many entries for alkoxycarbene complexes, but various types of carbene complexes of iron are found in five different places in the index. Such cross-referencing would surely not have required a major effort.

Overall this is an excellent volume, with up to the minute accounts from the major practitioners in the field. It should be in all serious chemistry libraries, and anyone working on metal carbene complexes should buy their own copy.

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