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Book review

Advances in organometallic chemistry, Volume 18; edited by F.G.A. Stone and R. West, Academic Press, New York, 1980, ix + 354 pages, $ 42.50.

The newest addition to this well-established series brings seven reviews. After two topical volumes devoted to molecular rearrangements (Vol. 16) and catalysis and organic synthesis (Vol. 17), the present volume returns again to the old format of presenting a potpourri of unrelated topics.

The book begins with a chemical autobiography, a feature found in some earlier volumes of this series, in this instance, by Helmut Behrens, whose 65th birthday and retirement from his chair of inorganic chemistry at the University of Erlangen was recently recognized in a special issue of this Journal. It is too bad that Professor Behrens concentrated on the chemistry. interesting though it is, at almost the complete expense of the personal. His account of the rebirth of inorganic and organometallic chemistry at the T.H. München after the ravages of World War II would have been interesting reading.

Two reviews deal with the use of organometallic systems as catalysts in the polymerization of olefins and dienes. The article by Halasa, Schulz, Tate and Moschel focuses on the mechanistic aspects of organolithium catalysis of olefin and diene polymerization. Some background on this important polymerization technique is provided and of special interest is the section on the use of organolithiums to prepare terminally functional diene and olefin polymers via reactions of the "living" polymers with appropriate substrates. Sinn and Kaminsky review Ziegler—Natta catalysis. Considering the amount of research which has been done on this subject, the authors, without doubt, could have written a whole book. However, they have managed a good overview of both the heterogeneous and homogeneous catalyst systems in their 51 page review.

The subject of optically active organotransition metal compounds containing chiral metal atoms was pioneered by Henri Brunner and his coworkers at the University of Regensburg. The 56 page review of this topic in this book by Brunner is authoritative and critical. All aspects are covered, inter alia, optical resolution, optical purity and configurational stability, reactions of optically active organotransition metal compounds, optical induction, chiroptical properties and absolute configuration. Metal clusters represent a very active field of transition metal organometallic chemistry, with emphasis on synthesis and possible applications in catalysis. The 67 page account of mixed metal clusters by Gladfelter and Geoffroy thus is welcome, although it is just a bit early (1978 cut-off date, with some 1979 references in an addendum) and does not include some important recent advances in this subject by the research groups of Vahrenkamp, Stone and Muetterties. However, this review will provide an excellent literature base for all of those who will wish to enter this currently fashionable field, since it gives a thorough and well-organized

coverage of the preparation, characterization, reactivity and NMR studies of mixed metal clusters.

While there are more detailed reviews dealing with aspects of the application of organosilicon compounds as medicinal and biological agents (especially the very recent ones by Tacke and Wannagat and by Voronkov in Vol. 84 of "Topics in Current Chemistry"), the short chapter by Ralph and Joan Fessenden which deals with this topic in the present book can be recommended as a good, readable introduction to the subject. It makes useful reading before the more detailed reviews and original papers are tackled. Your reviewer and many of his contemporaries have good reason to follow with interest the developments involving the biological applications of chloromethylsilatrane. It is ironic indeed that while quacks have made many millions on fake hair restorers wherever free enterprise prevails, the real McCoy, a bonafide hair growth promoter, which will be worth untold millions more, has been discovered in a non-capitalist country!

The last chapter, finally, deals with boron heterocycles as ligands in transition metal chemistry. The author, Walter Siebert, has been one of the most active workers in this field and he has provided an excellent, up-to-date review of not only his own contributions, but also those of others. This is a very narrow field, but it is a fascinating one characterized by exotic structures such as triple- and tetradecker sandwich complexes. It is, as the author points out, the area which links together "the classical areas of π-complexes and polyhedral systems with such topics as metalloboranes and metallocarboranes".

The editors may be commended for bringing out a fine addition to the review literature of organometallic chemistry.

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