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Book reviews

Macromolecule–Metal Complexes, E. Ciardelli, E. Tsuchida and D. Wöhrle (eds.), Springer, Berlin, Heidelberg and New York, 1996, pp. 318 + xviii, DM 198, ISBN 3-540-59383-7

This book attempts, for the first time, to provide an integrated coverage of the chemistry and applications of macromolecular metal complexes (MMC). To this end the editors have assembled a series of articles by distinguished practitioners of the art, with the remit of describing their chosen fields in relatively general terms, but deeply enough to stimulate those who might wish to take the subject further. In this one can only wish them well.

With a series of conferences devoted to the subject, and now a defining volume, one might not ponder whether there really is a discipline such as MMC. However, what is specific about MMC that requires such special treatment? This book goes some way to answering this question. There are properties of MMC that appear specific to the combined metal ion plus macromolecule that are not apparent if either partner is absent. The book begins with a chapter on classification which makes just this point, using well known examples such as haemoglobin and the allosteric effect in dioxygen binding. It then considers the synthesis and structure of MMC in a review of considerable length with 654 references. MMC are classified into three groups, depending upon how the metal ion is combined with the macromolecule, in the side chain of a polymer, as part of the polymer chain, or by 'physical' interaction as a result of impregnation, vapour deposition, etc. Although there is little new, it is certainly of value to have all this material collated in one place.

The short third section deals with polymer-metal ion complexes in living systems and is necessarily rather superficial, though it provides a good basis for an introduction to the subject. In contrast, the fourth section is again a considerable review of electronic processes in MMC with special emphasis on porphyrins and dioxygen coordination, and concluding with a discussion of catalysis and of multi-electron transfer. This section contains 348 references.

The last section concerns photo-induced electron transport, and this is an extension of the previous section. It appealed to me as an ingénue in the area, though I cannot judge the depth. It seems to be a good introduction to the area.

The editors claim that the study of MMC has reached "the scientific standard of an interdisciplinary and mature science". It is clearly interdisciplinary, and the sciences from which it stems are generally mature. Whether that makes MMC a mature science I very much doubt. There seems little that is specifically due to the nature of MMC. However, MMC is an area of large and growing interest, and this book does indeed provide a useful and readable introduction to the subject.

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Stereoselective Synthesis, Robert S. Atkinson, John Wiley, Chichester, 1995, pp. 529 + xii, £29.95 (paperback), ISBN 0 471 95419 5

A major contribution of organometallic chemistry to organic synthesis has been the development of novel stereoselective synthetic methodology. The importance of synthesizing pharmaceutical products as single enantiomers has given added impetus to this work. This book is a timely summary of these efforts. A problem involved in the presentation of this work is to find a simple classification of the methods that have been developed in such a way that it affords an insight into their potential application. This book develops a unique classification of stereoselective reactions which is based on the number of chiral centres that are created in the

product compared with those present in the starting material.

The book opens with a chapter devoted to the vocabulary of stereochemistry. There then follows a description of the classification of the stereoselective reactions. Thus, type I reactions are those in which no new chiral centre is created but inversion or retention of configuration takes place at an existing centre. Type II reactions involve the diastereoselective formation of a product containing at least two chiral centres from the reaction of one or more prochiral double bonds. These include cycloaddition and other electrocyclic processes. Within this section there is a useful chapter on diastereoselectivity in the aldol and related reactions. The major part of the book is devoted to the group of reactions brought together as type III. These reactions involve the stereoselective formation of one or more additional chiral centres in the starting material or the reagents. Substrate control in type III reactions is further subdivided into reactions involving asymmetric induction, those mediated by stereo-electronic effects and those mediated by ring formation. Reagent and catalytic control and enzyme-catalysed reactions are treated separately.

This book is written as a textbook rather than as a reference book. It is well-explained with useful diagrams, flow charts and literature references. There is a full index. Although it is quite lengthy, it can be recommended to students involved in research in stereoselective and asymmetric synthesis as a useful introduction to the subject.

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Gmelin Handbook of Inorganic and Organometallic Chemistry, Eighth Edition, Organoiron Compounds, Ferrocene, Part A11, Springer, Berlin and Heidelberg, 1995, pp. 210 + xii, DM 1300, ISBN 3-540-93709-9

This volume, that covers the literature up to at least 1993 with some material from 1994, deals with tetra- to deca-substituted mononuclear ferrocenes. It contains all that a preparative chemist would wish to know about such compounds, and a great deal more. Those who are familiar with the Gmelin format will need no reminder of the value and the ease of use of these compendia, as well as the minimal drawback of the encyclopaedic approach to literature presentation. The price works out at about 6.2 DM per page, which is about the average for the recent Gmelin volumes and is good value for money for such basic archival material.

The presentation is of the usual kind, replete with structural diagrams, details of preparations, and tables of spectroscopic data. A formula index makes compounds easy to find. Whether such compendia are easier to use than the more modern electronic methods of literature searching would be a matter for debate. For myself, I still prefer a book to a keyboard and a printer, which almost always require subsequent recourse to the original literature. These volumes are sufficiently comprehensive not to require a further search. Gmelin online may eventually bridge the gap between the book and the electronic format.

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