

Book Review

Advances in Transition Metal Coordination Chemistry, Volume 1, edited by C.-M. Che and V.W.W. Yam. JAI Press Inc., Greenwich, Conn., USA and Hampton Hill, Middlesex, UK. 293 + xii pages. Price £62.50/\$97.50. ISBN 1-55938-335-6.

I am so glad that there are still people who think that transition metal chemistry is marketable. Ever since Diesbach made Prussian Blue the interaction of synthesis, theory and application has stimulated top class research, and there is every sign that it will still do so. I wish this new series of review books a long and happy life.

There is a Pacific Rim feel about the first volume. The twelve contributors comprise two from China, three from Hong Kong (including the editors), and seven from the USA. These include Professor Harry B. Gray, and it is a tribute to his influence that this collection of reviews largely reflects his interests. All but one of the articles deal with complexes having metal to ligand multiple bonds. Some of these articles are preparative, some theoretical and some spectroscopic, so there is something for all tastes, but it will be a rare person who will use all the articles, even allowing for their common theme. I noticed five citations to the 1995 literature. It would have been helpful if each contribution stated the date of despatch, so we could do subsequent database searches with ease. Two of the reviews have abstracts, but the provision of a list of sections is just as helpful. Spot checks suggest to me the coverage is thorough. The paper and printing are rather old fashioned, with no fancy boxes, stereograms, or colour.

The book begins with the longest review, 103 pages on metal-carbon triple bonds by Mayr and Ahn. This is very thorough, but its wealth of detail makes it hard to read for newcomers to the topic, who will find it hard to sense the overall shape of the subject. However, if you want to check up on alkylidyne complex photochemistry [photochemistry is another recurring theme] or some such topic, this would be a good place to look. The molecular diagrams (327) and chemical equations (224) are admirably clear, but it is not very easy to locate compounds in the tables of data.

Then follows a 53 page review by Mayer on Mo and W complexes, with emphasis on ones derived from $[\text{WCl}_2(\text{P-MePh}_2)_4]$ by oxidation to give $\text{W}=\text{O}$ or similar complexes. This is a well argued review, notwithstanding the use of 'facile' for 'easy', and bravely tackling mechanistic problems and the interpretation of thermodynamic data, the latter

being given in obsolescent kCal units. The representation of metal oxo complexes with triple bonds may baffle novices, particularly as this style is not adopted consistently through the different reviews.

Next come two reviews with a more theoretical approach. Miskowski, Gray and Hopkins write 28 pages on metal-oxygen complexes, also sometimes using the triple bond formalism. To understand their article you will need to know about double groups and what AOM is. Although there is plenty of spectroscopic data (photochemistry again), there are not many illustrations. Those that are given show how hard it is to make assignments in this area. This review is followed by an article by Liu and Thorp (21 pages) on the mechanism of proton transfer reactions in the excited states of multiply bonded complexes, particularly $[\text{ReO}_2(\text{py})_4]^+$. This time you need to know your Marcus theory. This review reads more like an original contribution rather than a survey of past work, and is all the better for it.

Che and Yam contribute 29 pages on the electrochemistry of $\text{M}=\text{O}$ complexes, mostly with ruthenium. This well presented article draws extensively on their own work, but also deals fairly with that of the Meyer group. We read about the importance of the electrodes and their treatment, the roles of protonation and redox behaviour in combination, and the effects of ligands. Kinetic data are given as well as electrochemistry, and it was helpful to use Pourbaix diagrams extensively.

Finally we have 48 pages from You and Zhang on conducting metal complexes. This review is therefore not about the prevailing topic of metal-ligand multiple bonds at all, nor about photochemistry. This contribution begins with a very elementary introduction to one-dimensional conductors, including preparative detail and fundamentals of band structure, with notes in passing on C_{60} and buckytubes, but not explaining Peierls distortions. There is a survey of some experimental data, but this article is much more elementary than the others, and would have been better located elsewhere. However, that would have deprived the volume of a contribution from China, which the Hong Kong based editors may have thought inappropriate. It is to be hoped that diplomatic good relations can be maintained when Hong Kong becomes fully part of China once more.

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