

## Book reviews

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*Biocoordination Chemistry: Coordination Equilibria in Biological Systems*; edited by K. Burger, Ellis Horwood, Chichester, England, 1990, 349 pages, US \$90. ISBN 0-13-179912-6.

This is a book about coordination equilibria, rather than about the whole area of biocoordination chemistry. It is not intended to be a complete survey of the subject, but attempts to provide, using selected papers, a balanced picture of a wide and rapidly changing field.

The material covered starts with a discussion of the acid–base properties of bio-ligands, which means primarily amino acids, peptides, proteins and nucleic acids. This is informative and useful, though not restricted to bio-ligands in its applications. The next chapters discuss complexes of amino acids, and of peptides. Again, they are replete with useful information and a sufficiency of references. Most of the material concerns mononuclear complexes, which means that clusters are excluded.

Further chapters deal with metal ion interactions with carbohydrates and sugars, and with nucleic acid bases and nucleosides. I found these very interesting. The remaining chapter deals with thermodynamics and kinetics of metalloenzymes and metalloproteins, and presents a discussion of various metal systems such as carboxypeptidase and carbonic anhydrase. In fact it also deals with techniques but it excludes a great deal because of its selectivity.

The book suffers from the usual drawbacks of multi-author productions. That said, it is useful and informative, and provides a good basis for further exploitation of the literature. It is not about organometallic chemistry, but it does cover an area with which every well-informed chemist should have some acquaintance.

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*Electroorganic Synthesis; Best Synthetic Methods*, Tatsuya Shono, Academic Press, New York, xvi + 155 pages, 1991, £30, \$65, ISBN 0-12-640640-5.

This volume is the tenth in a series, published at intervals since 1985, each devoted to a particular technique in organic synthesis. Its special feature is that these books are intended as practical manuals, and have extensive sections which give full experimental details for the techniques.

After a brief introduction, chapter 2 gives a general discussion of techniques in electroorganic synthesis, which largely serves to point out its special features, and the advantages which it offers to the synthetic chemist. Chapters 3 and 4 describe respectively apparatus and techniques. At first sight these look a little alarming, but a helpful appendix lists suppliers in Europe, Japan and the USA. Nonetheless I would suspect that this is an area where it is a little difficult to get started, without the advice of a research worker with direct experience in the field.

Chapter 5 discusses oxidation reactions, beginning with hydrocarbon oxidation, which may have some long term potential for utilisation of hydrocarbon feedstocks. Oxidation of unsaturated systems, including aromatic compounds and heterocycles are also considered. Oxidations of substrates containing lone pairs of electrons and of anions are detailed. Chapter 6 deals with direct reductive reactions, and includes an interesting section on electroreductive cyclisations. Reductive coupling, substitution and elimination are also discussed. The final brief chapter deals with indirect reactions, using mediators.

References to organometallic chemistry are relatively few. The reductive coupling of organic halides in the presence of  $[\text{Fe}(\text{acac})_3]$  or  $[\text{Ni}(\text{acac})_2]$  (not  $[\text{Ni}(\text{acac})_3]$  as printed) is discussed, as is the arylation of alkenes using  $[\text{NiI}_2(\text{PPh}_3)_2]$ , and some metathesis reactions. However, I might have hoped for a more general discussion of reactions in which the metal is returned to a catalytically active state after reaction, by an electrochemical process.

The book is well-referenced and well presented, though with a few typographic errors, and the diagrams are clear. An excellent list of contents compensates for the lack of an index. I found the persistent use of non IUPAC nomenclature a little irritating; I doubt that all readers could write down the structure of methyl  $\alpha$ -(2-benzothiazolythio)caprylate without some thought. "Et<sub>4</sub>NOTs" and many related species appear consistently without the appropriate square brackets. The latest references come from 1990, but most are from the 1970's and presumably derived from the author's earlier monograph in this field (although the emphasis here is distinctly more practical).

Overall this book would make a good starting point for anyone who is seriously interested in getting involved in using electrochemical methods in organic synthesis. There are many transformations which can be achieved simply and in high yield by this route. The techniques involved do, however, require some specialist expertise, and some investment in equipment, both of which provide a significant activation barrier for most research workers. Although useful, I am not certain that this book will lower the activation barrier sufficiently for many synthetic chemists to react.

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