

Book reviews

Metal Ions in Biological Systems, Volume 4. Metal Ions as Probes; edited by Helmut Sigel, Marcel Dekker, New York, 1974, xii + 261 pages, \$24.75.

Metal ions whether they be naturally occurring or artificially introduced, and especially paramagnetic metal ions, have many uses in the study of biological systems. The latest volume in the series "Metal ions in biological systems" edited by Helmut Sigel, is entitled "Metal ions as probes". Though the preface to the series speaks of breaking down the barriers between chemistry, biochemistry and other subjects, these volumes are probably best viewed as an introduction to this very important area of research, written by chemists, mainly for chemists. The book contains much valuable material, but the price does seem high in relation to its length. Also, in a fast moving field such as this, it seems a pity that it has apparently taken the publishers some two years from submission of manuscripts to the appearance of the volume.

In general the older established field of metalloenzymes containing paramagnetic metal ions in their natural state is not covered and the book deals essentially with artificially introduced probe atoms. It consists of four chapters, differing greatly, both in length and in quality.

The first chapter by T.A. Kaden gives a short and useful review of magnetic circular dichroism studies on the active centres of artificial cobalt-containing enzymes and related model work, up to 1972. Another short chapter by J.J. Villafranca entitled "Enzyme, metal ion, substrate complexes", is devoted mainly to NMR studies on metal-activated enzymes. A good deal of the material in this chapter seems to have been covered elsewhere, e.g. by Cohn and by Mildvan.

More than half the volume is devoted to a chapter on the use of paramagnetic probes in studying proteins, by R.A. Dwek, R.J.P. Williams and A.V. Xavier. This chapter is undoubtedly the most valuable feature of the book. It gives a detailed account of the theory, together with some examples, of applications of NMR relaxation and shift probe work. Proton relaxation first entered the biological field from work by Shulman, Cohn and others, in 1962. The use of shift probes is of more recent origin. Unfortunately the chapter scarcely touches on the latest important developments from these authors' research group, in which they have been moving towards the determination of structures of protein molecules in solution, from a combination of relaxation and shift probe studies. Nevertheless, no doubt the chapter will serve as a good background to their later work. It must be added that the chapter by Villafranca comes dangerously close to covering the same ground as the one by Dwek et al. in one or two places [compare Table 1 on page 41 with Table 20 on page 163].

The final chapter of the book, by D.R. Williams, is its least satisfactory feature. It gives the impression of having been somewhat hastily written and in places it is difficult to understand [e.g. Figures 1 and 3]. To a biochemist

interested in finding out what thermochemistry has to offer in the study of metalloenzymes, little comes over in a quick reading, except the author's enthusiasm and the finding that thermochemical methods have been useful in the study of copper-histidine complexes.

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Chemical Analysis of Organometallic Compounds, Volume 1; by T.R. Crompton, Academic Press, London and New York, 1974, x + 258 pages, £ 5.80, \$16.25.

This book is the first volume in a set devoted to analysis of organometallic compounds. Chapters are arranged according to the groups of the periodic table, and this volume is devoted to compounds of Groups I-III, excluding aluminium and zinc, which the author dealt with in an earlier book. Each chapter starts with a discussion of the determination of elements and functional groups, and goes on to a consideration of the various techniques available for analysis of different classes of compounds of the element concerned. Full experimental detail is given for representative types of compounds, and where relevant, special sections are devoted to specific topics of current interest, e.g., the determination of mercury in environmental samples. Spectroscopic methods are given due emphasis, and the use of gas liquid chromatography is described where relevant.

The method of treatment is such that the book will be of direct use to a large number of organometallic chemists, and not just to those engaged in specialized analytical services. If the remaining volumes maintain this standard the whole set will be of considerable value to a very wide range of organometallic laboratories.

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