Book Reviews

Metals in Biological Systems
M.J. Kendrick, M.T. May, M.J. Plishka and K.D. Robinson, Ellis Horwood, Chichester, England, 1992, pp. 183. £19.95
ISBN 0-13-577727-5

This little book is intended as an introduction to the study of metal ions in biological systems for undergraduates. As such it has no claim to comprehensiveness, and intends merely to whet the appetite. It does this elegantly and informatively, and to my mind strikes just the right note to attract students beginning to learn about metals in biology. It finishes with a "Multiple Choice Self-Test" of 50 questions which range from the fundamental to the practical *via* the very basic (sodium nitroprusside contains which of the following transition metals, Fe, Co, Ni, Mn or Ru?), but which will be useful to many students.

It begins with a listing of elements found in biological systems and a very brief description of the entatic state hypothesis. Since there is relatively little later discussion of function and mechanism, the latter is of unclear value. It then discusses very cursorily (and in no way adequately if this is to be the only source of information) the physical methods used to study enzymes. This is nevertheless appropriate to the subsequent discussion, and it even includes more recent applications such as of EXAFS. The references are to basic texts which describe the fundamental principles of the methods surveyed.

There follow short (Ca – 3 pages, Mg – 5 pages, including photosynthesis and ATP, really too superficial; sodium – 3 pages, but again eschewing all detail; Co – 9 pages, with rather more detail, *etc. etc.*). I feel that some of these discussions are so brief that they contain little of pedagogic value; it will require careful instruction for the student to appreciate the significance of much that is discussed. The discussion of iron is much fuller, though the references are curiously sparse.

Nitrogenase is dealt with exceedingly briefly and the Figure labelled "Structures of 4Fe–4S cluster in component II of nitrogenase" is positively misleading. No N_2 complex is mentioned Table 11.2 is said to give a comparison of nitrogenase proteins, but actually omits all mention of them. Figure 11.4 is a K-edge EXAFS spectrum, presumably of iron, though this is not stated, and the caption is clearly wrong. There are short chapters on nickel, aluminium, and zinc, and then a discussion of inorganic drugs.

In summary, this is an attractively produced book, which is aimed at a rather low undergraduate level of understanding. The result can be a superficiality which at times detracts from the value of the project. However, it is a basic guide to the study, and could be very useful as a back-up to some undergraduate courses.

G.J. Leigh
AFRC IPSR Nitrogen Fixation Laboratory
University of Sussex,
Brighton BN1 9RQ
UK

Gmelin Handbook of Inorganic and Organometallic Chemistry, 8th Edition, Fe, Organoiron Compounds, B19, Springer Verlag, Berlin, 1992, pp. 493 + xxiv. DM 2754
ISBN 3-540-93649-1

The Gmelin treatment of organoiron compounds has been issued in three series, A (ferrocene and its derivatives including ferrocenophanes) of at least eleven volumes, B (all other mononuclear organoiron compounds) of which this is the nineteenth volume, and C (di- and poly-nuclear organoiron compounds other than ferrocenes) constituted of seven volumes to date.

The current, and probably the last, B volume continues the treatment of compounds with ligands bonded by six carbon atoms and with additional polycarbon ligands. It covers the literature up to at least the end of 1990. The cost is enormous, but the cost per page of text is only marginally more than that of its recent companion volumes. Consequently, if you have been prepared to pay for earlier volumes, you should not really bridle at the cost of this.

The format and presentation employ essentially the well-tried Gmelin methods. The contents are listed by compound with full details of preparations, structures, and physical properties. The initial compounds contain

one disubstituted benzene plus a cyclopentadienyl - there are 283 compounds in this class. Reactions are also discussed briefly, and the references (numbering 141) are gathered together at the end of the section. Compounds with a trisubstituted benzene and a cyclopentadienyl (88 in all) come next, similarly treated. The logical presentation then carries on through hexa-substituted benzenes to larger rings using six carbon atoms to bond to iron, and all with an additional C5 ligand. Finally, compounds with two six-carbon-donor ligands are categorised.

As usual, there is an extensive empirical formula index and a full ligand formula index, which enable rapid identification of the discussion of any particular compounds.

The authors and the editor are to be congratulated on another invaluable addition to the Gmelin corpus. These volumes are unlikely ever to be surpassed.

6j. **Leigh**
AFRC IPSR Nitrogen Fixation Laboratory
University of Sussex
Brighton BN1 9RQ
UK

Gmelin Handbook of Inorganic and OrganometaUic Chemistry, 8th Edition, Organogermanium Compounds, Part 5, Compounds with Germanium-Oxygen Bonds,
F. Glockling, Springer-Verlag, Berlin, 1993, pp. xv + 546. DM 3150
ISBN 3-540-93660-2

This is a further excellent volume in the series on organogermanium compounds written by Professor Glockling. It is focused on mononuclear compounds containing Ge-O bonds, but compounds containing more than one germanium atom are considered when chemical logic demands it. Thus the first chapter is concerned with the species RaGeOH (where the R groups may be all the same or differ), (R3Ge)20, RaGeORx (R=alkyl or substituted alkyl, or aryl), RaGeOOR1, RaGeOX in which X is not linked to oxygen through carbon *(e.g.* X--SO2C1, SO2Me, N=CHPh, NO2, POPh2, SiMe3, SnEt3, Li), and revant anionic five-coordinate germanium compoundS. The subsequent chapters deal mainly with the corresponding R2Ge and RGe derivatives *(e.g.* R2Ge(OR1)2, RGe(OR1)3, [(RGeO)20],), but there are also briefer sections on compounds containing Ge-H or Ge-Hal or Ge-Transition Metal bonds along with Ge-O bonds, and on peroxides *(e.g.* RaGeOQRl) organogermanium-oxygen radicals *(e.g.* Me3GeOCPh2, MeaGeON-(t3)Ph), organogermylenes with a Ge-O bond, and complexes between Ge-O compounds and Lewis bases. The literature was searched systematically up to the end of 1990 but there are some more recent entries.

The volume also contains (a) a very useful list of reviews of organogermanium compounds that appeared in 1986-1990; (b) an empirical formula index, and a ligand formula index. The account is very well organized, with much clearly-presented information packed into each page. Professor Glockling is to be congratulated on his work, and thanked by all those active in or interested in organogermanium chemistry, who will look forward to the appearance of the remaining volumes in the series.

As is usual with Gmelin volumes, this one is expensive *(ca.* £1260 or US$1875 at the time this review was written), but in the right surroundings such purchases well repay their cost.

C. Eaborn
School of Chemistry and Molecular Sciences
University of Sussex
Brighton BN1 9QJ
UK

Gmelin Handbook of Inorganic and Organometallic Chemistry, 8th Edition, In Organoindium Compounds, Part 1
J. Weidlein and W. Petz, Springer-Verlag, Berlin, 1991, pp. xiii + 442. DM 2400
ISBN 3-540-93641-6

The organometallic chemistry of indium has received so little attention over the years that this one volume suffices to deal with all the organoindium compounds reported up to Spring 1991 (and a few reported later). However, there has been some increase in activity in such compounds in recent years because of their actual or potential use in the production of semi-conducting films by vapour deposition.

Some 72 pages are devoted to the chemistry of InMe3- its preparation, physical properties, reactions, applications and its adducts, and a further 16 pages provide a similar treatment of InEt3. Other InR3 (or InR2R) species, with R = alkyl, substituted-alkyl, cycloalkyl, alkenyl, cycloalkenyl, or aryl, then take up a total of 43 pages. Most of the remainder of the volume is devoted to compounds containing, in addition to at least one In-C bond, bonds from In to halogen, oxygen (including hydroxides, carboxylates, and peroxides), sulphur, nitrogen, phosphorus, arsenic, antimony, boron, or a transition metal. Only one page is needed