Gmelin—Durrer; Metallurgy of Iron. Volume 8, Practice of Steelmaking 2; edited by H. Trenkler (Institut für Eisenhüttenkunde Montanuniversität Loeben Austria) and W. Krieger (Voest-Alpine A.G. Linz, Austria), Springer, Berlin, 1985, Vol. 8a: xv + 236 pages. Text. Vol. 8b; Illustrations, English and German Subject Index (244 pages). DM 1612. Not available separately.

Volume 8 of the Gmelin—Durrer Metallurgy of Iron continues the mammoth task begun with the publication of Volume 1 in 1964. It covers the practice of steelmaking by routes other than those involving oxygen-blown convertors. The first part (72 pages) deals with the open hearth process which, though declining in importance, still accounted for 20% of world raw steel production in 1982. There is detailed discussion of heating, construction, and lining and of melting practice for various hot metal-scrap feeds and various alloying elements. The second and biggest part (100 pages) covers electric arc furnace processes, with sections on design and construction, environmental protection and shop layout. Technology and metallurgy (charging, meltdown, refining and alloying) and melting practice are discussed in two chapters, one devoted to basic and the other to acid practice. Shorter sections then cover induction melting (24 pages), plasma melting (15 pages), direct current electric arc furnaces (4 pages) and continuous steelmaking (5 pages). As in previous volumes the text and diagrams are bound separately.

These volumes provide much more than an entree to the literature. By setting steelmaking practice in a historical perspective (bravely projecting into the future as well as reviewing the past) and by linking basic metallurgical theory with production, they show steelmaking as a flexible, adaptive on-going activity. Details do not obscure principles and the painstaking thoroughness of the contributors does not detract from the clarity of their writing. The literature has been covered to 1983, though there are also a number of 1984 references. As always with volumes of Gmelin, the technical printing and illustration are of the highest quality.

Unfortunately the price of these books will mean that they are held only by the wealthiest libraries. But there they will be invaluable to industrial and university metallurgists, to managers with many years' experience and to students discovering for the first time the intellectual content of steelmaking practice.

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Phosphorus. An Outline of its Chemistry, Biochemistry and Technology, 3rd edit. *(Studies in Inorganic Chemistry 6)*; by D.E.C. Corbridge, Elsevier Science Publishers BV, Amsterdam, The Netherlands, (in the USA/Canada P.O. Box 1663, Grand Central Station, New York, NY 10163), 1985, x + 762 pages Price US$ 157.50/Dfl. 425.00, ISBN 0-444-42468-7.

A glance at the contents of the twelve chapters that comprise the 3rd edition of this book namely: 1. Introduction and Background, 2. Phosphides

and Simple compounds, 3. Phosphates, 4. Phosphorus—carbon compounds, 5. Phosphorus—nitrogen compounds, 6. Esters and agrochemicals, 7. Phosphorus with Group VI elements, 8. Polyphosphines, ring compounds and high polymers, 9. Phosphorus with Group III and IV elements, 10. Metal—phosphorus coordination compounds, 11. Phosphorus biochemistry, 12. Special topics, reveals very clearly the wide variety of interest in phosphorus and its compounds.

Such has been the rapid rate of development in both academic and industrial aspects that it comes as no surprise to find that this new edition is over 200 pages longer than the previous volume, published only 5 years ago. There is also a new chapter on biochemical aspects.

The author is to be congratulated both on the way in which he has updated the 2nd edition and on his coverage of important new developments. There is much of interest for all kinds of chemists in the new sections on low coordination phosphorus compounds involving multiple bonds, fertilisers, pesticides and fluxional molecules.

In addition to the obvious importance to organometallic chemists of the wide variety of organophosphorus compounds described there is a substantial coverage of their use as ligands in transition metal complexes. Unfortunately space restrictions mean that catalytic aspects are treated very superficially.

The book succeeds in its overall purpose which is to convey clearly and concisely to its readers the enormous versatility exhibited by phosphorus. Although specific references to the hundreds of individual compounds do not appear in the text there are informative lists of review articles at the end of each chapter which will be useful for the specialist.

All libraries should certainly have a copy of this new edition on their shelves and I strongly recommend it to undergraduates, postgraduates, research workers and general readers alike, although the price may deter individuals from purchasing their own copy.

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