Book Reviews

Chemistry of Iron

Edited by J. Silver, published by Blackie Academic & Professional, an Imprint of Chapman and Hall, London, 1993, 306 pp.

The book consists of 8 main chapters: 1. Introduction to iron chemistry (J. Silver), 29 pp., 124 refs.; 2. Industrial chemistry of iron and its compounds (F.J. Berry), 15 pp., 7 refs.; 3. Inorganic chemistry of iron (E. Sinn), 26 pp., 121 refs.; 4. Organo-iron compounds (P.L. Pauson), 97 pp., 421 refs.; 5. Spectroscopic methods for the study of iron chemistry (B.W. Fitzsimmons), 9 pp., 11 refs.; 6. Biological iron (J.G. Leigh, G.R. Moore and M.T. Wilson), 62 pp., 271 refs.; 7. Models for iron biomolecules (A.K. Powell), 30 pp., 149 refs.; 8. Iron chelators of clinical significance (R.C. Hider and S. Singh) 24 pp., 117 refs. A subject index with about 550 entries completes the volume.

Chapter 1, following a brief introduction describing the important role of iron ranging from cosmology to human civilisation, consists mainly of a very concise description of iron chemistry arranged according to the oxidation states of the metal.

Chapter 2 deals mainly with the manufacture of different types of iron and steel and the corrosion of these materials. Only some important textbooks and compilations are given as references.

Chapter 3 is actually not a concise summary of inorganic iron chemistry but is an introduction to expected spin states and magnetism, and summarizes the lattice structures of important simple iron compounds like nitrides, sulfides, etc.

Chapter 4 is a systematic and thorough summary of organo-iron chemistry starting with carbonyl complexes (including cluster complexes and derivatives containing different heteroatoms), covering the vast area of iron–hydrocarbon compounds from η^1 to η^6 ligands and ending up with iron complexes of alkynes, heterodienes, carboranes, and polyphosphorus heterocycles.

Chapter 5 deals practically exclusively with Mössbauer spectroscopy, undoubtedly the most important spectroscopic method used in iron chemistry.

Chapter 6 is a very useful summary of the role of iron in biological systems and treats the subject according to: (a) mechanism of uptake, transport, and storage of iron; (b) iron–sulfur proteins, (c) haem proteins; (d) non-haem-non-Fe/S proteins. The discussion is not limited to the biochemical aspects of this exciting area but – especially in the case of iron–sulfur proteins – synthetic model compounds are also included.

Chapter 7 is devoted to this latter subject and includes in addition models for haem proteins, oxo-bridged di-iron centres, monomeric iron sites, and models for the uptake, transport, and biomineralization of iron (the process by which organisms form inorganic minerals).

Finally, Chapter 8 is leading already into clinical and medicinal chemistry: selective chelating agents can be used to scavenge non-protein bound forms of iron thereby reducing undesirable hydroxyl radical formation and thus enabling the treatment of a wide range of diseases caused by these radicals.

This book is an interesting attempt to provide a general introduction into the vast area of iron chemistry. To treat such a large subject in a relatively small book is almost impossible and the involvement of several authors may obviously lead to a not perfectly balanced result. The referee would be in a very easy situation to point out important omissions (e.g. the catalytic uses of iron), or to remark on some inconsistencies (in some of the chapters the references contain the titles of the publications, in others this is not the case). It seems to be much more useful, however, to emphasize the main merit of this book: it will call attention to the astonishing diversity of iron chemistry ranging from the blast furnace to poisoning by the herbicide paraquat and thus stimulate interdisciplinary thinking of scientists working in this area. It is a rewarding experience to go through the book and stop at sections not really familiar to the reader.

László Markó
Research Institute of Chemical Engineering
Hungarian Academy of Sciences
Egyetem u. 2, Veszprém
Hungary

Modern Perspectives in Inorganic Crystal Chemistry

Edited by Erwin Parthé, Nato ASI Series – Series C – Vol. 382, published by Kluwer, Dordrecht, Netherlands, 1992, 282 pp.

This book is a collection of the contributions (13) of the invited lecturers to a NATO summer school held in Erice, Sicily (June, 1992) and it represents the state-of-the-art view of inorganic crystal chemistry; in particular, it is devoted to material scientists, metallurgists and mineralogists. The geometrical relationships between the inorganic and intermetallic

compounds crystal structures are reviewed, particularly with the aim of predicting structural features in new compounds of practical interest and for rationalizing the cluster solid-state chemistry and bonding principles in the intermetallic structures. As a useful tool, each contribution, at the end, contains some problems, along with the solutions.

A. Dolmella and G. Bandoli
Università di Padova
Dipartimento Scienze Farmaceutiche
Padua, Italy

Inorganic Structural Chemistry

By Ulrich Müller, published by Wiley, Chichester, UK, 1993, 264 pp.

A valuable handbook, that can be profitably read by a number of different students. In fact, owing to the large space devoted to the discussion of structural arrangements, mineralogists can find here a quiet pool in which they can start to swim, before diving deeply into the matter. Likewise, pure chemists will learn useful, basic information on the fundamental properties of organized matter, as it is exposed in the chapters about chemical bonding. As a result, cornerstones of chemistry education are posed in an appropriate and pithy exposition that makes the reading of the text an easy and fruitful exercise. Professor Müller has produced a work that I would recommend as an introductory textbook to all those involved with problems in inorganic chemistry.

A. Dolmella and G. Bandoli
Università di Padova
Dipartimento Scienze Farmaceutiche
Padua, Italy