Bio-Inorganic Chemistry

by R.W. Hay

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210 pages. £9.50

This book is divided into nine chapters: the first is an overview of Bio-Inorganic Chemistry, the second is on general techniques, the third is devoted to the s-block cations, the next five chapters deal with transition-metal chemistry, whilst the last chapter crams together a cursory discussion of the non-metals with some toxicology and medical applications.

As a primer for research workers interested in Bio-Inorganic Chemistry, I feel the text is often superficial and has several serious deficiences.

In particular, when electron-transfer proteins and the metabolism of oxygen is discussed with respect to energy production, no mention is made of the mechanism for oxidative phosphorylation and there is no reference to the complementary process of photosynthesis, which is the cornerstone of aerobic life.

In addition, the 'non-metal' p-block elements are not well covered at all. Selenium enzymes are ignored, iodine barely rates a mention, even though it is critically important in calcium metabolism via the thyroid hormones. The general chemistry of this group of elements is best discussed using free-energy/oxidation state diagrams (Ebsworth diagrams) particularly nitrogen, phosphorus, oxygen and sulphur and even carbon.

One gets the general feeling that much of the information is a little dated, since the majority of references, in this rapidly changing field, are from the middle to late seventies. Indeed, the work on haemovanadins as possible O_2 carriers has been refuted, and more recent articles on haemoglobin and myoglobin are available. The importance of nickel in hydrogenases and the metabolism of carbon monoxide is not mentioned. Calmodulin is treated very superficially, whereas it is well characterized as a calcium modulator protein in cellular processes. Furthermore, it is a pity more space was not devoted to a discussion of the Na^+/K^+ pump and its importance in nerve function.

Iron-storage and transport proteins are discussed, but unfortunately the overall metabolism of iron is neglected, whereas this would be a very appropriate place to introduce the human gastrointestinal system to emphasize what we know of the redox, complexing, acid-base and solubility interactions in the biosystem.

In the section dealing with metal toxicity, it is not sufficient to enumerate toxic effects. More detail explaining the *chemical* toxicology of heavy metals is needed: for example, these elements usually inactivate many enzymes by binding to thiol residues on the protein; this can lead to deleterious cross-linking reactions and often protein precipitation.

There are few typographical errors, but two should be mentioned: on p. 136, fig. 5.5 has omitted the products of a cytochrome P-450 reaction, and, on p. 177, the iron/oxygen redox equation should be simplified to avoid confusion.

Overall, the book has some value as an introduction to Bio-Inorganic Chemistry, but in an area where other monographs and texts are available, it is not outstanding.

Colin Rix

and bioinorganic chemistry. This text provides a consistent and comprehensive description of the practica Infrared and Raman Spectra of Inorganic and Coordination Compounds Applications in Coordination, Organometallic, and Bioinorganic Chemistry. 245 PagesÂ·1997Â·66.74 MBÂ·563 DownloadsÂ·New! Applications in Coordination, Organometallic, and Bioinorganic Chemistry Nakamoto K. Bioinorganic Chemistry. January 1995. Authors: Ivano Bertini. Harry B Gray. Stephen J. Lippard. Joan Selverstone Valentine.Â The Biological Chemistry of Iron A Look at the Metabolism of Iron and Its Subsequent Uses in Living Organisms. Article. H. Brian Dunford. David Dolphin. Kenneth N. Raymond. L C Sieker. View. Although biochemistry generally focuses on the reactions and interactions of biological and organic molecules within the body, the roles and interactions of various inorganic molecules with the macromolecules in the body are just as important. Of all the elements known, only a few are essential for living organisms: Hydrogen (H), Carbon (C), Nitrogen (N), Oxygen (O), Sodium (Na), Phosphorus (P), Sulfur (S), Chlorine (Cl), Potassium (K), and Calcium (Ca). Additionally, a small amount of trace elements