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*Perspectives in Bioinorganic Chemistry, Vol. 3*

Published by: JAI Press inc., Greenwich, Connecticut, 1996.  
286 pages, 5 articles, 1749 references  
ISBN 1-55938-642-8

The third book in the series consists of five independent chapters written by different authors. This is the main reason why the chapters are not of uniform length and do not have a similar number of references. The chapter on manganese has 1041 references, while the one on nitric oxide only 140. All the authors, however, tried to produce comprehensive and up-to-date texts concerning the most interesting topics in bioinorganic chemistry. Therefore, the book has to be regarded primarily as a collection of review papers.

In the first chapter, David C. Weatherburn of the Victoria University of Wellington, New Zealand, deals with the structure and function of manganese-containing biomolecules (113 pages). All major groups of manganese-containing proteins are described: phosphatases (serine/threonine protein phosphatase and purple acid phosphatase), proteins with one bound metal (17 proteins), proteins with two bound metals (13 proteins), proteins with three bound metals (four entities) and proteins with four bound metals (inorganic phosphodiesterase). There is also an update of the literature up to the middle of 1994.

The Korean scientist Junghun Suh wrote an article on metal ions as Lewis acid catalysts in organic reactions. It is essentially a paper on reaction mechanisms in bioinorganic chemistry. The Lewis acid properties of a number of metals ( $\text{Cu}^{2+}$ ,  $\text{Co}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Mn}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Mg}^{2+}$ ,  $\text{Co}^{3+}$ ,  $\text{Fe}^{3+}$ ,  $\text{Al}^{3+}$ ,  $\text{Ti}^{4+}$ ,  $\text{Pd}^{2+}$ ) and their catalytic power are illustrated on ligands of biological origin. After the ten pages devoted to the general mechanism of Lewis acid catalysis, catalysis by metal-bound water and hydroxide ion is described. Catalysis by binuclear ions and cooperation of metal ions with organic functional groups are briefly discussed along with the effects of the nature of the metal ion and the ligand structure on catalytic efficiency. The last two paragraphs are devoted to two specific examples. The first deals with carboxypeptidase and the second with metal ions in artificial enzymes [derivatives of poly(ethyleneimine) and cyclodextrins].

The chapter written by Albrecht Messerschmidt of the Max Planck Institute for Biochemistry, München, is entirely devoted to just one enzyme, ascorbate oxidase. This multicopper enzyme is discussed from the biological

point of view (occurrence, functions) as well as from the viewpoint of physical and structural chemistry (molecular and spectral properties, X-ray structure, oxidation-reduction potentials and kinetic properties). Their functional derivatives are also described and the changes in the coordination site are discussed. The catalytic mechanism of the enzyme is presented on the last seven pages.

The article on bioinorganic chemistry of aluminium written by Hungarian scientists Tamas Kiss and Etelka Farkas presents all the complexity of coordination chemistry of the metal which has become very popular in recent years. There are three general topics in the paper: analytical (and environmental) chemistry, coordination chemistry of aluminium complexes with bioligands (phosphates, sulfates, fluorides, carboxylic and hydroxycarboxylic acids, amino acids, peptides, proteins and nucleotides). The binding of aluminium to salicylates and catecholates along with hydroxamates, pyrone and pyridinone derivatives and porphyrins is covered as well. Also, ternary complexes, containing bioligands and hydroxide ions are presented, and the last pages of the chapter are devoted to the aluminium absorption and metabolism, its toxic effects and pharmaceutical uses of aluminium compounds.

The Scottish scientists Anthony R. Butler, Frederick W. Flitney and Peter Rhodes wrote the chapter on the role of nitric oxide in animal physiology. This is a short paper (25 pages) covering a vast scientific field but the authors were satisfied to present only the major problems in the physiological effects of nitric oxide. To the newcomer in this field, the article should be a good guide, especially because the most important review papers are referenced.

At the end, I recommend the book to the scientists dealing with the particular research fields because the book presents a systematic literature search covering the papers published in recent years, but also everybody interested in this rapidly developing branch of biochemistry should find this book interesting because of its systematic representation of the most actual topics in bioinorganic chemistry.

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