

Book Reviews

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Organic and biological chemistry

John Wiley & Sons, New York, 2002

479 pp; price £21.50

ISBN 0-471-20607-5

This is one of many texts attempting to connect the chemical and biological sciences and is addressing a growing market for introductory texts in biological chemistry. The book consists of the last 18 chapters of a longer book, 'Fundamentals of General, Organic and Biological Chemistry, 5th edn.' The stated audience for the book is health-care students who have had a general chemistry introduction and need to know the fundamentals of organic and biological chemistry. Many special topics are included to increase the relevance of the knowledge gained for these students.

The first seven chapters introduce the rudiments of organic chemistry necessary for the study of biochemistry. Chapters 8–18 are used to illustrate the molecular basis of life, lipids, proteins, nucleic acids, energetics, carbohydrates, and metabolism of these compounds. Many review exercises are given at strategic spots, with answers provided in an appendix. A glossary is also included as an appendix. Supplementary materials are available for

students and instructors: a laboratory manual; a study guide; a test bank of questions and transparencies.

Given the stated audience of the book, a very elementary introduction is given to organic structures via alkanes, alkenes followed by chemistry of the C–O and C=O bonds. Many molecules of biological relevance are used to illustrate the text, as well as excellent special topic boxes. Important concepts are introduced at relevant points rather than being covered in isolation, e.g. hydrogen bonding is introduced in the chapter on alcohols. A separate chapter is, however, provided on stereoisomerism. The strategy used to explain the new concepts here is similar to that used in most texts at this level.

The real meat of this book starts in Chapter 8, where carbohydrates are covered. In this chapter, the boat and chair forms are described, but the anomeric effect is curiously missing. The remainder of this chapter is firmly aimed at the biological relevance of the polysaccharides. Lipids, and how they are used in membranes, are covered in Chapter 9. Proteins form the basis of Chapter 10, and a very basic survey of the elements of protein structure is given. Chapter 11 deals quickly with three huge topics, viz. enzymes, hormones and neurotransmitters; this is followed by the extracellular

fluids of the body in Chapter 12. Nucleic acids and the basis of heredity are covered in Chapter 13, as well as viruses and recombinant DNA technology. The remaining chapters deal with chemical energetics (Chapter 14) and the metabolism of the compounds introduced earlier in the book, carbohydrates, lipids, nitrogen compounds, followed by a final chapter on nutrition.

This book is definitely aimed at the health-care profession, with the danger that some other, equally exciting topics in biological chemistry are omitted. However, for the target audience, this text will form an excellent basis from which to launch into biochemistry, physiology, pharmacology and other medically important disciplines. I would recommend it to anyone teaching in this field, as the book is well written, the examples are chosen with care, and many special topics relevant to the audience are included. It is not for those who think this is a text for chemists who wish to learn more about biological chemistry; for them, other texts are more suitable.

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Edited by A. MESSERSCHMIDT, R. HUBER, T. POULOS AND K. WIEGHARDT

Handbook of metalloproteins, vols 1 & 2

John Wiley & Sons, Chichester, 2001,

1st edn, xiv 1472 pp; price £645

ISBN 0-471-62743-7

The essentiality of metal ions for life is common knowledge today. There is a vast and continually increasing number of papers dealing with special aspects of one or more metalloproteins. What has been missing until now is a comprehensive and compact handbook where one, especially one who is starting in this vast field of research, can look up at least a few of the proteins. The editors have decided to focus on the metalloproteins where detailed knowledge exists. They have chosen the authors of the various chapters among the experts of a particular protein. Experts in proteins that have not been included in the handbook might be disappointed by the exclusion of their protein, but, given the necessary limitations of a book and an area so vast, it was

necessary for the editors to limit the number of proteins to those that are well known.

The two volumes contain metalloproteins of iron, manganese, cobalt, copper, nickel, vanadium and molybdenum. Owing to the fact that most is known about the iron metabolism, the number of iron proteins described is the largest.

The different chapters are clearly and identically constructed in the two volumes. Each chapter gives background information about all relevant factors for the protein described and includes extensive graphics and tables. Each chapter starts with a description of the functional class and the occurrence and biological function of the protein. Information about amino acid sequence, protein purification, molecular characteristics, metal content, cofactors and activity tests follow. Spectroscopic data and 3-D structure, with special attention to the binding sites of cofactors, metals and substrate, are supplemented with a rich collection of tables and stereo views of the sites. The chapters are rounded off with descrip-

tions of the functional aspects and the reaction mechanism followed by a reference list that includes all relevant papers for a particular protein up to 2001.

The handbook of metalloproteins is certainly a useful and necessary addition to the publication list about metalloproteins, because it gives a very good summary of the knowledge of the proteins described. It will be a great help for experienced and new researchers in the field and also for students. The reference lists make it easy to find literature for a specific aspect of a protein which could not be included in the book owing to the necessary brevity of each description. It can only be hoped that volumes with similar detailed descriptions of other metalloproteins will follow or an electronic version that keeps the same format as the book and is as readable as the book.

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