Bioinorganic Chemistry

How much inorganic chemistry is there in biology? Quite a bit, as is demonstrated by the new textbook *Bioinorganic Chemistry*, written by Dieter Rehder. First, one is captured by the book's elegant cover: the ball-and-stick model of an iron-molybdenum cofactor placed in front of a shiny black background reminds the reader of a modern work of art. Then one begins to browse enthusiastically through the pages of this compact and handy-sized book. In fact, bioinorganic chemistry is a relatively young field, and its concepts are now summarized in a topical style by this well-made textbook. Bioinorganic chemistry deals with the structure, function, and reactive properties of inorganics in biological systems. Indeed, many fundamental processes, such as respiration and photosynthesis, depend on the special properties of catalytically active transition metal ions. In this respect, nature inspires chemists to develop efficient catalysts and materials for resource-friendly processes, as is shown by the current world-wide efforts to develop artificial photosynthesis.

Bioinorganic Chemistry delivers a fresh, balanced, and topical view of this fascinating subject in only 230 pages, divided into 14 chapters. The set of themes ranges from the bioelements (Chapter 1) to inorganics in medicine (Chapter 14). The informative scientific content of the well-structured chapters is often accompanied by an interesting story. The book is written for advanced students of chemistry and related sciences, but also provides teachers with numerous fresh ideas and inspiration for their lectures. A basic level of knowledge in chemistry and coordination chemistry is assumed. Some experience in organometallic chemistry, biology, and common analytical methods would be advantageous, but is not essential for the understanding of all the chapters. The many sidebars alongside the main text (19 in all) are extremely helpful for comprehensively summarizing important additional aspects such as magnetic properties, Mössbauer spectroscopy, or the organometallic bond. This elegantly avoids the otherwise tiresome need to look these topics up in other more specialized textbooks.

The different subjects are conceptually discussed from three different aspects. Thus, each chapter deals in turn with specific elements, specific functions, and certain other topics. Examples of this structure are seen in Chapter 12 on the biochemistry of zinc, Chapter 5 on oxygen transport and respiration, and Chapter 13 on metal–carbon and metalloid–carbon bonds. Through this approach, the textbook combines a rather traditional approach with a modern structure, focusing on general concepts instead of discussing each bioelement in turn. Although I would probably have preferred a more consistent emphasis on the concepts-based approach, the discussion of specific elements such as iron (Chapter 5), zinc (Chapter 12), and the s-elements (Chapter 3) is still justified because of their central roles in biological systems. For these reasons, the overall concept is thorough, balanced, and fully convincing. In addition, all chapters are thoughtfully structured and clearly arranged. Each chapter starts with a succinct abstract followed by distinct subchapters, which begin with a short introduction and then outline the most important aspects. A concise summary at the end of each chapter again skilfully pinpoints the most important information. Personally, I particularly enjoyed Chapters 8 and 11 on the sulfur cycle and on photosynthesis. The references for the chapters are well-balanced and up-to-date, covering literature up to 2013. For delving deeper into certain aspects, the book suggests selected publications and gives single-line summaries.

In this context, the interactive learning tools of the publisher's Online Resource Centre are more than inspiring. General themes are discussed further by asking questions about scientific papers within a "journal club". Since the corresponding answers are also provided, one can easily test one's own knowledge and refresh it where necessary. At the moment, this tool is already available for seven topics, and it is being continually updated and extended.

My only criticism concerns some unclear and erroneous presentations of chemical structures. This important aspect should be carefully revised in the second edition. Apart from this reservation, the book is entirely convincing. Until now, our bookshelves have lacked a modern and conceptual textbook on bioinorganic chemistry. Rehder's *Bioinorganic Chemistry* now fills that gap. This textbook covers general concepts, discusses current literature, and inspires students for individual additional examinations. For these reasons, I strongly recommend this textbook for students and will incorporate it into my future teaching.

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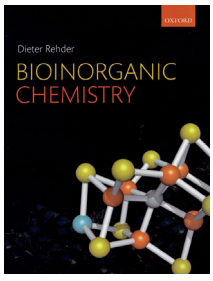

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