
Acces PDF Bioinorganic Chemistry Inorganic Elements In The Chemistry Of Life An Introduction And Inorganic Chemistry A Textbook Series

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9BA - LYNN REEVES

Volume 7 in the Metal Ions in Biology Series, divided into two parts, covers the nitrogenase enzyme complex and the molybdenum redox enzymes. Part one covers the chemistry of Mo-Fe-S clusters and their relationship to nitrogenase, cofactor chemistry and biochemistry of nitrogenase, spectroscopic and electrochemical studies of the Fe-Mo cofactor and Fe-S clusters, and more. Part Two surveys oxo-molybdenum chemistry, discusses the nature of the molybdo-pterin complex, and describes the characteristics of several of the Mo redox enzymes.

The study of the chemistry of living processes - biochemistry - has traditionally centered on the behavior of organic chemical

compounds in water, the principle solvent in all cells. Organic compounds and water account for 99 % of the matter in living systems. Some 20 inorganic elements are also essential for life, and they are found in similar amounts in most living systems. Bioinorganic Chemistry is essentially the border between inorganic chemistry and biology. The overall purpose of bioinorganic research is to study the relationship between inorganic metal ions such as copper and iron, and biologically specific macromolecules, experimentally as well as theoretically. The importance of inorganic chemistry in biology, especially metal ion coordination, has gained considerable attention during the last decade. The discoveries of the roles of metal ions and metalloproteins in health and disease through genetic and biochemical studies have drawn the

attention of both inorganic chemists and molecular and cell biologists. Bioinorganic courses deal with the specific properties of metal ions as expressed in the functioning of biochemical systems, with the objective to deepen student insight into the chemical behaviour of metal ions in biological systems. Ochiai is generally considered the father of the discipline. When first published in 1977, the very successful first edition provided a clear and concise introduction to the brand new field of bioinorganic chemistry.

- Provides the streamlined coverage appropriate for one-semester courses or independent study, with all of the necessary but none of the excessive information
- Prepares readers to move to the next level of study (whether they continue on in the field or transition to medicine/industry)
- Presents concepts through extensive four-color visuals, appealing to a range of learning styles
- Promotes critical thinking through open-ended questions throughout the narrative and at the end of each chapter

An updated, practical guide to bioinorganic chemistry *Bioinorganic Chemistry: A Short Course, Second Edition* provides the fundamentals of inorganic chemistry and biochemistry relevant to understanding bioinorganic topics. Rather than striving to provide a broad overview of the whole, rapidly expanding field, this resource provides essential background material, followed by detailed information on selected topics. The goal is to give readers the background, tools, and skills to research and study bioinorganic topics of special interest to them. This extensively updated premier reference and text: Presents review chapters on the essentials of inorganic chemistry and biochemistry Includes up-to-date information on instrumental and analytical techniques and computer-aided modeling and visualization programs Familiarizes

readers with the primary literature sources and online resources Includes detailed coverage of Group 1 and 2 metal ions, concentrating on biological molecules that feature sodium, potassium, magnesium, and calcium ions Describes proteins and enzymes with iron-containing porphyrin ligand systems-myoglobin, hemoglobin, and the ubiquitous cytochrome metalloenzymes-and the non-heme, iron-containing proteins aconitase and methane monooxygenase Appropriate for one-semester bioinorganic chemistry courses for chemistry, biochemistry, and biology majors, this text is ideal for upper-level undergraduate and beginning graduate students. It is also a valuable reference for practitioners and researchers who need a general introduction to bioinorganic chemistry, as well as chemists who want an accessible desk reference.

The text will provide a set of problems covering mechanistic, structural and spectroscopic issues in inorganic chemistry. Specific areas to be covered include coordination chemistry, physicochemical aspects of solution chemistry, inorganic chemistry of biological systems (both natural biomolecules and bioinorganic models). Illustrative worked examples will be included. The problems will be categorized by topic chapters for ease of reference and use in courses. They will provide a valuable resource for instructors, providing a means of testing and developing the many principles covered in texts and advanced courses. Often students find it difficult to find practical problems to test the principles they have learned in class. This text will provide a series of questions to test understanding and worked examples as a pedagogical aid.

Part A.: Overviews of biological inorganic chemistry : 1. Bioinor-

ganic chemistry and the biogeochemical cycles -- 2. Metal ions and proteins: binding, stability, and folding -- 3. Special cofactors and metal clusters -- 4. Transport and storage of metal ions in biology -- 5. Biominerals and biomineralization -- 6. Metals in medicine. -- Part B.: Metal ion containing biological systems : 1. Metal ion transport and storage -- 2. Hydrolytic chemistry -- 3. Electron transfer, respiration, and photosynthesis -- 4. Oxygen metabolism -- 5. Hydrogen, carbon, and sulfur metabolism -- 6. Metalloenzymes with radical intermediates -- 7. Metal ion receptors and signaling. -- Cell biology, biochemistry, and evolution: Tutorial I. -- Fundamentals of coordination chemistry: Tutorial II.

Helmut Sigel, Astrid Sigel and Roland K.O. Sigel, in close cooperation with John Wiley & Sons launch a new Series "Metal Ions in Life Sciences". There exists a whole range of books on Cytochromes P450, but none with the focus of this volume. This new volume in the Series concentrates on current hot topics in the area and tries to work out the underlying common developments. As a result the reader will find a systematic account of new results in this exciting research area. The table of contents gives an idea on the wide span of chapters, starting with overviews and the presentation of specific systems, and ending with chapters on carbon-carbon bond cleavage by P450 systems, drug metabolism as catalyzed by P450 systems, decomposition of xenobiotics by P450 enzymes and design and engineering of new P450 systems. The authors of this study on bio-inorganic chemistry seek to examine the importance of inorganic elements. They survey chemical and physical factors controlling the elements of life, discuss the functions of inorganic elements and examine the co-operative interaction in living systems.

Written by a preeminent teacher and scientist in the field, this book provides specialists, students, and general readers with an understanding of the basic chemistry of interactions of inorganic substances with biological systems at the molecular level. The author presents bioinorganic concepts in context and brings a distinct chemistry perspective to the subject. • Provides the streamlined coverage appropriate for one-semester courses or independent study, with all of the necessary but none of the excessive information • Prepares readers to move to the next level of study (whether they continue on in the field or transition to medicine/industry) • Presents concepts through extensive four-color visuals, appealing to a range of learning styles • Promotes critical thinking through open-ended questions throughout the narrative and at the end of each chapter

Designed for self study of inorganic chemistry at undergraduate level. Theoretical basis of inorganic chemistry explained. Subject matter developed from high school level. Large number of solved and practice problems given.

The importance of metals in biology, the environment and medicine has become increasingly evident over the last twenty five years. The study of the multiple roles of metal ions in biological systems, the rapidly expanding interface between inorganic chemistry and biology constitutes the subject called Biological Inorganic Chemistry. The present text, written by a biochemist, with a long career experience in the field (particularly iron and copper) presents an introduction to this exciting and dynamic field. The book begins with introductory chapters, which together constitute an overview of the concepts, both chemical and biologi-

cal, which are required to equip the reader for the detailed analysis which follows. Pathways of metal assimilation, storage and transport, as well as metal homeostasis are dealt with next. Thereafter, individual chapters discuss the roles of sodium and potassium, magnesium, calcium, zinc, iron, copper, nickel and cobalt, manganese, and finally molybdenum, vanadium, tungsten and chromium. The final three chapters provide a tantalising view of the roles of metals in brain function, biomineralization and a brief illustration of their importance in both medicine and the environment. Relaxed and agreeable writing style. The reader will not only find the book easy to read, the fascinating anecdotes and footnotes will give him pegs to hang important ideas on. Written by a biochemist. Will enable the reader to more readily grasp the biological and clinical relevance of the subject. Many colour illustrations. Enables easier visualization of molecular mechanisms. Written by a single author. Ensures homogeneity of style and effective cross referencing between chapters

Metal-based drugs are a commercially important sector of the pharmaceutical business, yet most bioinorganic textbooks lack the space to cover comprehensively the subject of metals in medicine. *Uses of Inorganic Chemistry in Medicine* approaches an understanding of the topic in a didactic and systematic manner. The field of inorganic chemistry in medicine may usefully be divided into two main categories - drugs which target metal ions in some form, whether free or protein-bound, and secondly, metal-based drugs where the central metal ion is usually the key feature of the mechanism of action. This latter category can further be subdivided into pharmacodynamic and chemotherapeutic applications, as well as those of imaging. The book summarises the

chemical and biological studies on clinically used agents of lithium, gold and platinum, as well as highlighting the research on prospective new drugs, including those based on vanadium and manganese. The coverage allows a clear distinction between pharmacodynamic and therapeutic properties of metal-based drugs and focuses not only on those clinical agents in current use, but also on new drugs and uses. This book serves to fill an important niche, bridging bioinorganic and medicinal chemistry and will undoubtedly be of use to senior undergraduates and postgraduates, as well as being an invaluable asset for teachers and researchers in the discipline.

As one of the most dynamic fields in contemporary science, bioinorganic chemistry lies at a natural juncture between chemistry, biology, and medicine. This rapidly expanding field probes fascinating questions about the uses of metal ions in nature. Respiration, metabolism, photosynthesis, gene regulation, and nerve impulse transmission are a few of the many natural processes that require metal ions, and new systems are continually being discovered. The use of unnatural metals - which have been introduced into human biology as diagnostic probes and drugs - is another active area of tremendous medical significance. This introductory text, written by two pioneering researchers, is destined to become a landmark in the field of bioinorganic chemistry through its organized unification of key topics. Accessible to undergraduates, the book provides necessary background information on coordination chemistry, biochemistry, and physical methods before delving into topics that are central to the field: What metals are chosen and how are they taken up by cells? How are the concentrations of metals controlled and utilized in cells? How do metals

bind to and fold biomolecules? What principles govern electron transfer and substrate binding and activation reactions? How do proteins fine-tune the properties of metals for specific functions? For each topic discussed, fundamentals are identified and then clarified through selected examples. An extraordinarily readable writing style combines with chapter-opening principles, study problems, and beautifully rendered two-color illustrations to make this book an ideal choice for instructors, students, and researchers in the chemical, biological, and medical communities.

The Earth's natural resources are finite and easily compromised by contamination from industrial chemicals and byproducts from the degradation of consumer products. The growing field of green and sustainable chemistry seeks to address this through the development of products and processes that are environmentally benign while remaining economically viable. Inorganic chemistry plays a critical role in this endeavor in areas such as resource extraction and isolation, renewable energy, catalytic processes, waste minimization and avoidance, and renewable industrial feedstocks. Sustainable Inorganic Chemistry presents a comprehensive overview of the many new developments taking place in this rapidly expanding field, in articles that discuss fundamental concepts alongside cutting-edge developments and applications. The volume includes educational reviews from leading scientists on a broad range of topics including: inorganic resources, sustainable synthetic methods, alternative reaction conditions, heterogeneous catalysis, photocatalysis, sustainable nanomaterials, renewable and clean fuels, water treatment and remediation, waste valorization and life cycle sustainability assessment. The content

from this book will be added online to the Encyclopedia of Inorganic and Bioinorganic Chemistry.

The book provides a detailed state-of-the-art overview of inorganic chemistry applied to medicinal chemistry and biology. It covers the newly emerging field of metals in medicine and the future of medicinal inorganic chemistry. It is an essential reading for every researcher and student in medicinal and bioinorganic chemistry.

This book is about the growth and differentiation processes underlying the growth and differentiation of filamentous fungi. The impetus for this work stems from our perception that the coverage of adequate source references for further information. This highly diverse and important group of organisms has been neglected in recent years, despite the fact that it is estimated conservatively that there are more than 1.5 million species of fungi - more than five times the number of vascular plants and second only to the insects. The extreme diversity of form in the fungi has always been a source of inspiration for mycologists. This book is primarily concerned with those systems that have established themselves as the model eukaryote for the analysis of the cell cycle, and basic studies of biochemical and physiological or genetic points of view. Although genetic regulation. This book does not deal with it has not been possible to illustrate the breadth of the detailed growth physiology of *S.*

Inorganic and Bio-Inorganic Chemistry is the component of Ency-

yclopedia of Chemical Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (E-OLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme on Inorganic and Bio-Inorganic Chemistry in the Encyclopedia of Chemical Sciences, Engineering and Technology Resources deals with the discipline which studies the chemistry of the elements of the periodic table. It covers the following topics: From simple to complex compounds; Chemistry of metals; Inorganic synthesis; Radicals reactions with metal complexes in aqueous solutions; Magnetic and optical properties; Inorganometallic chemistry; High temperature materials and solid state chemistry; Inorganic biochemistry; Inorganic reaction mechanisms; Homogeneous and heterogeneous catalysis; Cluster and polynuclear compounds; Structure and bonding in inorganic chemistry; Synthesis and spectroscopy of transition metal complexes; Nanosystems; Computational inorganic chemistry; Energy and inorganic chemistry. These two volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs

Written by major contributors to the field, Bioinorganic Chemistry provides students with an introduction and overview of the subject and gives them the background required to read and follow the current research literature.

Metal ions play an important role in analytical chemistry, organometallic chemistry, bioinorganic chemistry, and materials chemistry. This book, Descriptive Inorganic Chemistry Researches of Metal Compounds, collects research articles, review articles,

and tutorial description about metal compounds. To perspective contemporary researches of inorganic chemistry widely, the kinds of metal elements (typical and transition metals including rare earth; p, d, f-blocks) and compounds (molecular coordination compounds, ionic solid materials, or natural metalloenzyme) or simple substance (bulk, clusters, or alloys) to be focused are not limited. In this way, review chapters of current researches are collected in this book.

This book reviews the current diagnostic and therapeutic uses of metal-containing compounds in medicine, as well as the role of metals in disease.

Bioinorganic chemistry is primarily concerned with the role of metal atoms in biology and is a very active research field. However, even though such important structures of metalloenzymes are known, as the MoFeCo of nitrogenase, Cu or Mn superoxide dismutase and plastocyanin, the synthetic routes to the modelling of such centers remains a matter of acute scientific interest. Other metalloenzymes, such as the Mn center of the oxygen evolving complex of PSII, are still the focus of in-depth examination, both spectroscopic and structural. Another area of concern is the interaction between drugs and metals and metal ion antagonism. Understanding the chemistry of metal ions in biological systems will bring benefits in terms of understanding such problems as biomineralization and the production of advanced materials by micro-organisms. The 29 contributions to Bioinorganic Chemistry: An Inorganic Perspective of Life give an excellent summary of the state of the art in this field, covering areas from the NMR of paramagnetic molecules to the use of lanthanide porphyrins in artificial batteries.

This is one of the few books available that uses unifying theoretical concepts to present inorganic chemistry at the advanced undergraduate and graduate levels--most texts are organized around the periodic table, while this one is structured after bonding models, structure types, and reaction patterns. But the real strength of Porterfield's Second Edition is its clear presentation of ample background description, especially in recent areas of development such as cluster molecules, industrial catalysis, and bio-inorganic chemistry. This information will enable students to understand most current journals, empowering them to stay abreast of the latest advances in the field. Specific improvements of the Second Edition include new chapters on materials-science applications and bioinorganic chemistry, an extended discussion of transition-metal applications (including cuprate superconductors), and extended Tanabe-Sugano diagrams. Extended treatment of inorganic materials science--ceramics, refractories, magnetic materials, superconductors--in the context of solid-state chemistry. Extended coverage of biological systems and their chemical and physiological consequences--O₂ metabolism, N₂ fixation, muscle action, iron storage, cisplatin and nucleic acid structural probes, and photosynthesis. Unusual structures and species--silatranes, metallacarboranes, alkalides and electrides, vapor-deposition species, proton and hybrid sponges, massive transition-metal clusters, and agostic ligands. Thorough examination of industrial processes using organometallic catalysts and their mechanisms. Entropy-driven reactions. Complete discussion of inorganic photochemistry.

An introductory textbook on the structural principles of inorganic-chemical molecules and solids. Traditional concepts and modern

approaches are considered and demonstrated with the aid of examples. The most important structural types are examined from different perspectives.

A comprehensive treatment of the subject of microscale inorganic chemistry is provided through 45 laboratory experiments. These include experiments in main group and transition metal chemistry, instrumental techniques, kinetics, synthesis and the manipulation of air-sensitive material.

The present book might be regarded as a sequel to my previous work, *Bioinorganic Chemistry: An Introduction* (Allyn and Bacon, 1977). The latter is essentially a collection of chemical and physical data pertinent to an understanding of the biological functions of the various elements and the proteins dependent on them. The ten years since its publication have seen an enormous increase in research activity in this area, hence of research papers. A number of monographs and review series on specific topics have also appeared, including the volumes in the series of which the present volume is a part. Nevertheless, a gap has developed between the flood of information available at a detailed level (papers and reviews) and a general description of the underlying principles of biofunctions of the elements as presently conceived. It is hoped that this book will help bridge this gap and at the same time provide an overview of the entire *Biochemistry of the Elements* series. Specifically, the work attempts to focus on "why" questions, especially, "Why has an element been chosen by organisms for a specific biofunction?" and "Why does an element behave the way it does in biological systems?" It therefore complements my 1977 book and, together with *Laboratory Introduction to Bio-Inorganic Chemistry* (E. -I. Ochiai and D. R. Willi-

ams, Macmillan, 1979), completes a trilogy on the topic of bioinorganic chemistry. This book consists of five parts. Two chapters constitute Part I.

Practical Approaches to Biological Inorganic Chemistry, Second Edition, reviews the use of spectroscopic and related analytical techniques to investigate the complex structures and mechanisms of biological inorganic systems that contain metals. Each chapter presents an overview of the technique, including relevant theory, a clear explanation of what it is, how it works, and how the technique is actually used to evaluate biological structures. New chapters cover Raman Spectroscopy and Molecular Magnetochemistry, but all chapters have been updated to reflect the latest developments in discussed techniques. Practical examples, problems and many color figures are also included to illustrate key concepts. The book is designed for researchers and students who want to learn both the basics and more advanced aspects of key methods in biological inorganic chemistry. Presents new chapters on Raman Spectroscopy and Molecular Magnetochemistry, as well as updated figures and content throughout Includes color images throughout to enable easier visualization of molecular mechanisms and structures Provides worked examples and problems to help illustrate and test the reader's understanding of each technique Written by leading experts who use and teach the most important techniques used today to analyze complex biological structures

Over the last three decades a lot of research on the role of metals in biochemistry and medicine has been done. As a result many structures of biomolecules with metals have been characterized

and medicinal chemistry studied the effects of metal containing drugs. This new book (from the EIBC Book Series) covers recent advances made by top researchers in the field of metals in cells [the "metallome"] and include: regulated metal ion uptake and trafficking, sensing of metals within cells and across tissues, and identification of the vast cellular factors designed to orchestrate assembly of metal cofactor sites while minimizing toxic side reactions of metals. In addition, it features aspects of metals in disease, including the role of metals in neuro-degeneration, liver disease, and inflammation, as a way to highlight the detrimental effects of mishandling of metal trafficking and response to "foreign" metals. With the breadth of our recently acquired understanding of metals in cells, a book that features key aspects of cellular handling of inorganic elements is both timely and important. At this point in our understanding, it is worthwhile to step back and take an expansive view of how far our understanding has come, while also highlighting how much we still do not know. The content from this book will publish online, as part of EIBC in December 2013, find out more about the Encyclopedia of Inorganic and Bioinorganic Chemistry, the essential online resource for researchers and students working in all areas of inorganic and bioinorganic chemistry.

The field of Bioinorganic Chemistry has grown significantly in recent years; now one of the major sub-disciplines of Inorganic Chemistry, it has also pervaded other areas of the life sciences due to its highly interdisciplinary nature. Bioinorganic Chemistry: Inorganic Elements in the Chemistry of Life, Second Edition provides a detailed introduction to the role of inorganic elements in biology, taking a systematic element-by-element approach to the

topic. The second edition of this classic text has been fully revised and updated to include new structure information, emerging developments in the field, and an increased focus on medical applications of inorganic compounds. New topics have been added including materials aspects of bioinorganic chemistry, elemental cycles, bioorganometallic chemistry, medical imaging and therapeutic advances. Topics covered include: Metals at the center of photosynthesis Uptake, transport, and storage of essential elements Catalysis through hemoproteins Biological functions of molybdenum, tungsten, vanadium and chromium Function and transport of alkaline and alkaline earth metal cations Biomineralization Biological functions of the non-metallic inorganic elements Bioinorganic chemistry of toxic metals Biochemical behavior of radionuclides and medical imaging using inorganic compounds Chemotherapy involving non-essential elements This full color text provides a concise and comprehensive review of bioinorganic chemistry for advanced students of chemistry, biochemistry, biology, medicine and environmental science.

Metal-Sulfur clusters play an essential role in living organisms through the unique character of sulfur-metal bonding. The new volume in prestigious Metal Ions in Life Sciences explores different transition metal complexes with sulfur, their biosynthesis and biological functions in regulation of gene expression, catalysis of important metabolic reactions and protein structure arrangement.

Handbook of Molecular Life Sciences will focus on understanding biological phenomena at the level of molecules and their interactions that govern life processes. Volumes 1 to 3 will focus on

genes and genomes, volumes 4 to 6 on protein structure and function, volumes 7 & 8 will explore systems biology, using genomics and proteomics as the focus and volumes 9 and 10 on molecular aspects of cell structure and function. Volume 11 will explore unifying concepts and theory from biology, chemistry, mathematics and physics that are essential for understanding the molecular life sciences and will also include sections on teaching perspectives and assessment tools. Volume 12 will cover basic aspects of the various experimental approaches that are used in the Molecular Life Sciences.

This book covers the synthesis, reactions, and properties of elements and inorganic compounds for courses in descriptive inorganic chemistry. It is suitable for the one-semester (ACS-recommended) course or as a supplement in general chemistry courses. Ideal for major and non-majors, the book incorporates rich graphs and diagrams to enhance the content and maximize learning. Includes expanded coverage of chemical bonding and enhanced treatment of Buckminster Fullerenes Incorporates new industrial applications matched to key topics in the text

Both elementary inorganic reaction chemistry and more advanced inorganic theories are presented in this one textbook, while showing the relationships between the two.

Inorganic Chemistry for Geochemistry and Environmental Sciences: Fundamentals and Applications discusses the structure, bonding and reactivity of molecules and solids of environmental interest, bringing the reactivity of non-metals and metals to inorganic chemists, geochemists and environmental chemists from diverse fields. Understanding the principles of inorganic chemistry including chemical bonding, frontier molecular orbital theory, elec-

tron transfer processes, formation of (nano) particles, transition metal-ligand complexes, metal catalysis and more are essential to describe earth processes over time scales ranging from 1 nanosec to 1 Giga yr. Throughout the book, fundamental chemical principles are illustrated with relevant examples from geochemistry, environmental and marine chemistry, allowing students to better understand environmental and geochemical processes at the molecular level. Topics covered include: • Thermodynamics and kinetics of redox reactions • Atomic structure • Symmetry • Covalent bonding, and bonding in solids and nanoparticles • Frontier Molecular Orbital Theory • Acids and bases • Basics of transition metal chemistry including • Chemical reactivity of materials of geochemical and environmental interest Supplementary material is provided online, including PowerPoint slides, problem sets and solutions. *Inorganic Chemistry for Geochemistry and Environmental Sciences* is a rapid assimilation textbook for those studying and working in areas of geochemistry, inorganic chemistry and environmental chemistry, wishing to enhance their understanding of environmental processes from the molecular level to the global level.

This book gives a comprehensive overview about medicinal inorganic chemistry. Topics like targeting strategies, mechanism of action, Pt-based antitumor drugs, radiopharmaceuticals are covered in detail and offer the reader an in-depth overview about this important topic.

The series *Structure and Bonding* publishes critical reviews on topics of research concerned with chemical structure and bonding. The scope of the series spans the entire Periodic Table and ad-

resses structure and bonding issues associated with all of the elements. It also focuses attention on new and developing areas of modern structural and theoretical chemistry such as nanostructures, molecular electronics, designed molecular solids, surfaces, metal clusters and supramolecular structures. Physical and spectroscopic techniques used to determine, examine and model structures fall within the purview of *Structure and Bonding* to the extent that the focus is on the scientific results obtained and not on specialist information concerning the techniques themselves. Issues associated with the development of bonding models and generalizations that illuminate the reactivity pathways and rates of chemical processes are also relevant. The individual volumes in the series are thematic. The goal of each volume is to give the reader, whether at a university or in industry, a comprehensive overview of an area where new insights are emerging that are of interest to a larger scientific audience. Thus each review within the volume critically surveys one aspect of that topic and places it within the context of the volume as a whole. The most significant developments of the last 5 to 10 years should be presented using selected examples to illustrate the principles discussed. A description of the physical basis of the experimental techniques that have been used to provide the primary data may also be appropriate, if it has not been covered in detail elsewhere. The coverage need not be exhaustive in data, but should rather be conceptual, concentrating on the new principles being developed that will allow the reader, who is not a specialist in the area covered, to understand the data presented. Discussion of possible future research directions in the area is welcomed. Review articles for the individual volumes are invited by the volume editors.

Readership: research scientists at universities or in industry, graduate students
Special offer For all customers who have a standing order to the print version of Structure and Bonding, we offer free access to the electronic volumes of the Series published in the current year via SpringerLink.

Comprehensive Inorganic Chemistry II reviews and examines topics of relevance to today's inorganic chemists. Covering more interdisciplinary and high impact areas, Comprehensive Inorganic Chemistry II includes biological inorganic chemistry, solid state chemistry, materials chemistry, and nanoscience. The work is designed to follow on, with a different viewpoint and format, from our 1973 work, Comprehensive Inorganic Chemistry, edited by Bailar, Emeléus, Nyholm, and Trotman-Dickenson, which has received over 2,000 citations. The new work will also complement other recent Elsevier works in this area, Comprehensive Coordination Chemistry and Comprehensive Organometallic Chemistry, to form a trio of works covering the whole of modern inorganic chemistry. Chapters are designed to provide a valuable, long-standing scientific resource for both advanced students new to an area and researchers who need further background or answers to a particular problem on the elements, their compounds, or applications. Chapters are written by teams of leading experts, under the guidance of the Volume Editors and the Editors-in-Chief. The articles are written at a level that allows undergraduate students to understand the material, while providing active researchers with a ready reference resource for information in the field. The chapters will not provide basic data on the elements, which is available from many sources (and the original work), but instead concentrate on applications of the elements and their com-

pounds. Provides a comprehensive review which serves to put many advances in perspective and allows the reader to make connections to related fields, such as: biological inorganic chemistry, materials chemistry, solid state chemistry and nanoscience. Inorganic chemistry is rapidly developing, which brings about the need for a reference resource such as this that summarise recent developments and simultaneously provide background information. Forms the new definitive source for researchers interested in elements and their applications; completely replacing the highly cited first edition, which published in 1973.

Bioinorganic Chemistry provides a broad overview of this dynamic field, reviewing the key chemical elements that have important biological function, and exploring how the chemistry of these elements is central to the function of biological systems.

Destined to set the standard, this book meets the need for a didactic textbook focusing on the role of model systems in bioinorganic chemistry. The first part features concepts in bioinorganic chemistry such as electron transfer, medicinal inorganic chemistry, bioorganometallics and metal DNA complexes, while the second part presents inorganic model chemistry on metallo-enzymes, organized by metal ion. Experts in the pertinent fields provide a didactically well-organized background on relevant biological systems, as well as on their structural, functional and spectroscopic properties. All chapters are similarly structured, each one beginning with a timeline featuring the most important historical facts on the subject, followed by a table of the most significant enzymes. The authors also summarize key developments and open questions within the respective model systems. This book is

aimed at senior undergraduate and graduate students in chemistry, biochemistry, life science and related fields.