

Biological Inorganic Chemistry Structure And Reactivity

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 Bioinorganic Chemistry

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ANGELINA MONICA

Perspectives on Bioinorganic Chemistry Elsevier

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, physiochemical 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. A New Introduction to Molecular Structure and Function University Science Books Biological Inorganic Chemistry Structure and Reactivity University Science Books Biomineralization Univ Science Books Inorganic and Organometallic Transition Metal Complexes with Biological Molecules and Living Cells provides a complete overview of this important research area that is perfect for both newcomers and expert researchers in the field. Through concise chapters written and edited by esteemed experts, this book brings

together a comprehensive treatment of the area previously only available through scattered, lengthy review articles in the literature. Advanced topics of research are covered, with particular focus on recent advances in the biological applications of transition metal complexes, including inorganic medicine, enzyme inhibitors, antiparasital agents, and biological imaging reagents. Geared toward researchers and students who seek an introductory overview of the field, as well as researchers working in advanced areas Focuses on the interactions of inorganic and organometallic transition metal complexes with biological molecules and live cells Foscuses on the fundamentals and their potential therapeutic and diagnostic applications Covers recent biological applications of transition metal complexes, such as anticancer drugs,

enzyme inhibitors, bioconjugation agents, chemical biology tools, and bioimaging reagents

Inorganic and Bio-Inorganic

Chemistry - Volume II John Wiley & Sons
Part A.: Overviews of biological inorganic chemistry : 1. Bioinorganic 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.

A New Introduction to Molecular Structure and Function EOLSS Publications

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 of Copper Elsevier

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

Computational Inorganic and Bioinorganic Chemistry Springer

Inorganic Aspects of Biological and Organic Chemistry investigates the inorganic aspects of biological and organic chemistry. Topics include the inorganic chemistry of group Ia and IIa metals; complexes of Ia and IIa cations in organic and biological chemistry; atomic structure and structure-activity correlations; and bonding in ligands and metal complexes. Ligand exchange reactions and factors in complex stability are also discussed. Comprised of 12 chapters, this book begins with an overview of some of the important roles of metals in biological and organic chemistry, followed by an analysis of the inorganic chemistry of group Ia and

IIa metals. Complexes of Ia and IIa cations in organic and biological chemistry are then described, together with atomic structure and structure-activity correlations. Subsequent chapters deal with bonding in ligands and metal complexes; ligand exchange reactions and factors in complex stability; redox potentials and processes; and the influence of metal ions on equilibria. The book also considers catalysis by metal ions, metal complexes, and metalloenzymes before concluding with a chapter that examines the reactions of ligands in organometallic complexes. This monograph is written for teachers, students, and practitioners of organic, biological, and inorganic chemistry.

Biological Inorganic Chemistry Wiley-VCH
Biological Inorganic Chemistry: A New Introduction to Molecular Structure and Function, Second Edition, provides a comprehensive discussion of the biochemical aspects of metals in living systems. Beginning with an overview of metals and selected nonmetals in biology, the book then discusses the following concepts: basic coordination chemistry for biologists; structural and molecular biology for chemists; biological ligands for metal ions; intermediary metabolism and bioenergetics; and methods to study metals in biological systems. The book also covers metal assimilation pathways; transport, storage, and homeostasis of metal ions; sodium and potassium channels and pumps; magnesium phosphate metabolism and photoreceptors; calcium and cellular signaling; the catalytic role of several classes of mononuclear zinc enzymes; the biological chemistry of iron; and copper chemistry and biochemistry. In addition, the book discusses nickel and cobalt enzymes; manganese chemistry and biochemistry; molybdenum, tungsten, vanadium, and chromium; non-metals in biology; biomineralization; metals in the brain; metals and neurodegeneration; metals in medicine and metals as drugs; and metals in the environment. Winner of a 2013 Textbook Excellence Awards (Texty) from the Text and Academic Authors Association Readable style, complemented by anecdotes and footnotes Enables the reader to more readily grasp the biological and clinical relevance of the subject Color illustrations enable easy visualization of molecular mechanisms

Structure and Chemistry of the Apatites and Other Calcium Orthophosphates OUP Oxford

Biological Inorganic Chemistry: A New Introduction to Molecular Structure and

Function, Third Edition, provides a comprehensive discussion of the biochemical aspects of metals in living systems. The fascinating world of the role of metals in biology, medicine and the environment has progressed significantly since the very successful Second Edition of the book published in 2012. Beginning with an overview of metals and selected nonmetals in biology, the book supports the interdisciplinary nature of this vibrant area of research by providing an introduction to basic coordination chemistry for biologists and structural and molecular biology for chemists. Having built this accessible foundation, the book progresses to discuss biological ligands for metal ions, intermediary metabolism and bioenergetics, and methods to study metals in biological systems. The book also covers metal assimilation pathways; transport, storage, and homeostasis of metal ions; sodium and potassium channels and pumps; magnesium phosphate metabolism and photoreceptors; calcium and cellular signaling; the catalytic role of several classes of mononuclear zinc enzymes; the biological chemistry of iron; and copper chemistry and biochemistry. In addition, the book discusses nickel and cobalt enzymes; manganese chemistry and biochemistry; molybdenum, tungsten, vanadium, and chromium; non-metals in biology; biomineralization; metals in the brain; metals and neurodegeneration; metals in medicine and metals as drugs; and metals in the environment. Now in its Third Edition, this popular and award-winning resource highlights recent exciting advances and provides a thorough introduction for both researchers approaching the field from a variety of backgrounds, as well as advanced students. Includes a thorough survey of metals in biological systems: in the human body, in medicine and in the environment Previous winner (Second Edition) of the 2013 Textbook Excellence Award (Texty) from the Text and Academic Authors Association Features new sections: an overview of the different functions of essential metal ions; toxic metals in diagnosis and therapeutics; crystal and ligand field theory and their limitations; molecular orbital theory; genetic and molecular biological approaches to study metals; more complex cofactors and their biosynthesis; photosynthetic oxidation of water; man-made environmental pollution; and metals as poisons

Some New Facets Elsevier

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 Biom mineralization 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.

Uses of Inorganic Chemistry in Medicine
University Science Books

The book reviews the use of spectroscopic and related methods 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, clearly explains what it is and how it works and then presents how the technique is actually used to evaluate biological structures. Practical examples and problems are included to illustrate each technique and to aid understanding. Designed for students and researchers who want to learn both the basics, and more advanced aspects of bioinorganic chemistry. Many colour illustrations enable easier visualization of molecular mechanisms and structures Worked examples and problems are included to illustrate and test the reader's understanding of each technique Written by a multi-author team who use and teach the most important techniques used today to analyse complex biological structures

Medicinal and Biological Inorganic Chemistry Krieger Publishing Company
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.

Medicinal Inorganic Chemistry CRC Press
Over the past several decades there have been major advances in our ability to computationally evaluate the electronic structure of inorganic molecules, particularly transition metal systems. This advancement is due to the Moore's Law increase in computing power as well as the impact of density functional theory (DFT) and its implementation in commercial and freeware programs for quantum chemical calculations. Improved pure and hybrid density functionals are allowing DFT calculations with accuracy comparable to high-level Hartree-Fock treatments, and the results of these calculations can now be evaluated by experiment. When calculations are correlated to, and supported by, experimental data they can provide fundamental insight into electronic structure and its contributions to physical properties and chemical reactivity. This interplay continues to expand and contributes to both improved value of experimental results and improved accuracy of computational predictions. The purpose of this EIC Book is to provide state-of-the-art presentations of quantum mechanical and related methods and their applications, written by many of the leaders in the field. Part 1 of this volume focuses on methods, their background and implementation, and their use in describing bonding properties, energies, transition states and spectroscopic features. Part 2 focuses on applications in bioinorganic chemistry and Part 3 discusses inorganic chemistry, where electronic structure calculations have already had a major impact. This addition to the EIC Book series is of significant value to both experimentalists and theoreticians, and we anticipate that it will stimulate both further development of the methodology and its applications in the many interdisciplinary fields that comprise modern inorganic and bioinorganic chemistry. This volume is also available as part of Encyclopedia of Inorganic Chemistry, 5 Volume Set. This set combines all volumes published as EIC Books from 2007 to 2010, representing areas of key developments in the field of inorganic chemistry published in the Encyclopedia of Inorganic Chemistry.
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Inorganic and Organometallic Transition Metal Complexes with Biological Molecules and Living Cells
Academic Press

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 addresses 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.

Influence on Structure and Reactivity
Academic Press

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.

Principles, Techniques and

Applications John Wiley & Sons

Advances in Inorganic Chemistry presents timely, informative and comprehensive reviews of the current progress in all areas within inorganic chemistry ranging from bio-inorganic to solid state studies. This acclaimed serial features reviews written by experts in the area and is an indispensable reference to advanced researchers. Each volume of Advances in Inorganic Chemistry contains an index, and each chapter is fully referenced. The latest volume in this highly successful series is dedicated to redox-active metal complexes. Comprehensive reviews written by leading experts in the field. An indispensable reference to advanced researchers.

Biological Inorganic Chemistry Biological Inorganic Chemistry
Structure and Reactivity

Whenever nature has a difficult task to perform it can be expected that a metal ion or a cluster of such ions is employed. Metal ions are indispensable for the integrity of biological structures and the catalysis of biological reactions. Knowledge about their mode of action, their uptake in the cell, their handling and their storage is important for the development of new pharmaceuticals. This book summarizes latest results of interdisciplinary research on several universities.

Practical Approaches to Biological Inorganic Chemistry Royal Society of Chemistry

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.

Inorganic Chemistry Elsevier

Bioinorganic Chemistry of Copper focuses on the vital role of copper ions in biology, especially as an essential metalloenzyme cofactor. The book is highly interdisciplinary in its approach--the outstanding list of contributors includes coordination chemists, biochemists, biophysicists, and molecular biologists.

Chapters are grouped into major areas of research interest in inorganic copper chemistry, spectroscopy, oxygen chemistry, biochemistry, and molecular biology. The book also discusses basic research of great potential importance to pharmaceutical scientists. This book is based on the first Johns Hopkins University Copper Symposium, held in August 1992. Researchers in chemistry, biochemistry, molecular biology, and medicinal chemistry will find it to be an essential reference on its subject.

Bioinorganic Chemistry Academic Press
Inorganic and Bio-Inorganic Chemistry is the component of Encyclopedia of Chemical Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), 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.

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