

Metal Ions In Biological Systems Vol 30 Metalloenzymes Involving Amino Acid Residue And Related Radicals

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Probing Photosynthesis Mohamamd Yunus 2014-04-21 Probing Photosynthesis represents the cutting edge of research on photosynthesis and provides details of experimental approaches that have been adopted to understand it's complex regulatory and adaptive processes. Its twenty seven chapters have been divided into four sections: Evolution, structure and function; Biodiversity metabolism and regulatio

Methods of Soil Analysis, Part 3 D. L. Sparks 2020-01-22 A thorough presentation of analytical methods for characterizing soil chemical properties and processes, **Methods, Part 3** includes chapters on Fourier transform infrared, Raman, electron spin resonance, x-ray photoelectron, and x-ray absorption fine structure spectroscopies, and more.

Nickel and Its Surprising Impact in Nature Astrid Sigel 2007-03-13 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". The philosophy of the Series is based on the one successfully applied to a previous series published by another publisher, but the move from "biological systems" to "Life Sciences" will open the aims and scope and allow for the publication of books touching on the interface between chemistry, biology, pharmacology, biochemistry and medicine. Volume 2 focuses on the vibrant research area concerning nickel as well as its complexes and their role in nature. With more than 2,800 references and over 130 illustrations, it is an essential resource for scientists working in the wide range from inorganic biochemistry all the way through to medicine. In 17 stimulating chapters, written by 47 internationally recognized experts, Nickel and Its Surprising Impact in Nature highlights critically the biogeochemistry of nickel, its role in the environment, in plants and cyanobacteria, as well as for the gastric pathogen *Helicobacter pylori*, for gene expression and carcinogenesis. In addition, it covers the complex-forming properties of nickel with amino acids, peptides, phosphates, nucleotides, and nucleic acids. The volume also provides sophisticated insights in the recent progress made in understanding the role of nickel in enzymes such as ureases, hydrogenases, superoxide dismutases, acireductone dioxygenases, acetyl-coenzyme A synthetases, carbon monoxide dehydrogenases, methyl-coenzyme M reductases...and it reveals the chaperones of nickel metabolism.

Distance Measurements in Biological Systems by EPR Lawrence J. Berliner 2006-04-11 Distance measurements in biological systems by EPR. The foundation for understanding function and dynamics of biological systems is knowledge of their structure. Many experimental methodologies are used for determination of structure, each with special utility. Volumes in this series on Biological Magnetic Resonance emphasize the methods that involve magnetic resonance. This volume seeks to provide a critical evaluation of EPR methods for determining the distances between two unpaired electrons. The editors invited the authors to make this a very practical book, with specific numerical examples of how experimental data is worked up to produce a distance estimate, and realistic assessments of uncertainties and of the range of applicability, along with examples of the power of the technique to answer biological problems. The first chapter is an overview, by two of the editors, of EPR methods to determine distances, with a focus on the range of applicability. The next chapter, also by the batons, reviews what is known about electron spin relaxation times that are needed in estimating distances between spins or in selecting appropriate temperatures for particular experiments. Albert Beth and Eric Husted describe the information about spin-spin interaction that one can obtain by simulating CW EPR line shapes of nitroxyl radicals. The information in fluid solution CW

EPR spectra of dual-spin labeled proteins is illustrated by Hassane Mchaourab and Eduardo Perozo. **Oxygenic Photosynthesis. The Light Reactions** Donald R. Ort 2006-04-11 Structure and function of the components of the photosynthetic apparatus and the molecular biology of these components have become the dominant themes in advances in our understanding of the light reactions of oxygenic photosynthesis. Oxygenic Photosynthesis: The Light Reactions presents our current understanding of these reactions in thylakoid membranes. Topics covered include the photosystems, the cytochrome b6-f complex, plastocyanin, ferredoxin, FNR, light-harvesting complexes, and the coupling factor. Chapters are also devoted to the structure of thylakoid membranes, their lipid composition, and their biogenesis. Updates on the crystal structures of cytochrome f, ATP synthase and photosystem I are presented and a section on molecular biology and evolution of the photosynthetic apparatus is also included. The chapters in this book provide a comprehensive overview of photosynthetic reactions in eukaryotic thylakoids. The book is intended for a wide audience, including graduate students and researchers active in this field, as well as those individuals who have interests in plant biochemistry and molecular biology or plant physiology.

Essential Metals in Medicine: Therapeutic Use and Toxicity of Metal Ions in the Clinic Peggy L. Carver 2019-01-14 Volume 19, entitled Essential Metals in Medicine: Therapeutic Use and Toxicity of Metal Ions in the Clinic of the series Metal Ions in Life Sciences centers on the role of metal ions in clinical medicine. Metal ions are tightly regulated in human health; while essential to life, they can be toxic as well. Following an introductory chapter briefly discussing several important metal-related drugs and diseases and a chapter about drug development, the focus is first on iron; its essentiality for pathogens and humans as well as its toxicity. Chelation therapy is addressed in the context of thalassemia, its relationship to neurodegenerative diseases and also the risks connected with iron administration are pointed out. A subject of intense debate is the essentiality of chromium and vanadium. For example, chromium(II) compounds are taken as a nutritional supplement by athletes and bodybuilders; in contrast, chromate, Cr(VI), is toxic and a carcinogen for humans. The beneficial and toxic effects of manganese, cobalt, and copper on humans are discussed. The need for antiparasitic agents is emphasized as well as the clinical aspects of metal-containing antidotes for cyanide poisoning. In addition to the essential and possibly essential ones, also other metal ions play important roles in human health, causing harm (like the metalloids arsenic, lead or cadmium) or being used in diagnosis or treatment of human diseases, like gadolinium, gallium, lithium, gold, silver or platinum. The impact of this vibrant research area on metals in the clinic is provided in 14 stimulating chapters, written by internationally recognized experts from the Americas, Europe and China, and is manifested by approximately 2000 references, and about 90 illustrations and tables. **Essential Metals in Medicine: Therapeutic Use and Toxicity of Metal Ions in the Clinic** is an essential resource for scientists working in the wide range from pharmacology, enzymology, material sciences, analytical, organic, and inorganic biochemistry all the way through to medicine ... not forgetting that it also provides excellent information for teaching.

Environmental Chemistry Eric Lichtfouse 2005 This book describes advances in this new, fast developing science, which seeks to decipher fundamental mechanisms ruling the behaviour in water, soils, atmosphere, food and living organisms of toxic metals, fossil fuels, pesticides and other organic pollutants. Sections on eco-toxicology, green chemistry, and analytical chemistry round out this thorough survey of conditions and analytical techniques in an emerging specialty.

Metal Ions in Biological Systems Sanat Dhar 2013-03-09 The articles published in this volume are based on the papers deliv ered at a conference on the Role of Metal Ions in Biological Systems held November 20 and 21, 1972, at Argonne National Laboratory. The purpose of the conference was to present to an interdisciplinary audience of physical scientists some recent developments illustrating the chemical and environ mental participation of the heavy metal ions in the biological system. The invited speakers at the conference are special ists in the fields they describe, and the articles presented here are at a level of interest to readers with backgrounds in physical sciences who are not necessari ly doing research in the areas described. The articles are referenced through 1972, and in some cases early 1973, and thus should also be of value to research workers. It is hoped that the book will be of particular interest to chemists, biologists, workers in the fields of environmental science and public health, as well as graduate and senior undergraduate students in these discipl ines. The conference was sponsored by the Central States Universities, Inc., a consortium of sixteen midwestern univer sities, the Center for Educational Affairs, Argonne National Laboratory, and the United States Atomic Energy Commission. It is my pleasure to thank the members of the conference committee for their ideas and active help in organizing the conference.

Biochemistry of Lipids, Lipoproteins and Membranes Dennis E. Vance 1996-08-06 This is the third edition of this advanced textbook, written with two major objectives in mind. One is to provide an advanced textbook covering the major areas in the fields of lipid, lipoprotein, and membrane biochemistry, and molecular biology. The second objective is to provide a clear summary of these research areas for scientists presently working in these fields. The volume provides the basis for an advanced course for students in the biochemistry of lipids, lipoproteins and membranes. The book will satisfy the need for a general reference and review book for scientists studying lipids, proteins and membranes. Excellent up-to-date reviews are available on the various topics covered. A current, readable, and critical summary of these areas of research, it will allow scientists to become familiar with recent developments related to their own research interests, and will help clinical researchers and medical students keep abreast of developments in basic science that are important for subsequent clinical advances.

Bioinorganic Chemistry Ei-ichiro Ochiai 2010-07-20 Written by a preminent 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

Microorganisms in Soils: Roles in Genesis and Functions Francois Buscot 2006-03-30 For this third volume of the series Soil Microbiology, internationally renowned scientists shed light on the significant roles of microbes in soil. Key topics covered include: biorerosion, humification, mineralization and soil aggregation; interactions in the mycorrhizosphere; microbes and plant nutrient cycling; Microbes in soil surface or toxic metal polluted soils; Use of marker genes and isotopes in soil microbiology, and many more.

The Biology - Chemistry Interface Raymond Cooper 1999-07-22 A tribute to the pioneering scientific work of Professor Koji Nakanishi, whose studies of natural products have effaced some of the conventional boundaries between biology and chemistry. It discusses an array of chromatographic separation methods and determination of structures on a microscale, analyzes bioassay-directed fractionation and other means of isolating biologically active compounds from plants and other sources, covers vital enzymes isolated from marine organisms such as algae, and more.

Neurodegenerative Diseases and Metal Ions Astrid Sigel 2006-07-11 About the Series... Metal Ions in Life Sciences links coordination chemistry and biochemistry in their widest sense and thus increases our understanding of the relationship between the chemistry of metals and life processes. The series reflects the interdisciplinary nature of biological, inorganic chemistry and coordinates the efforts of scientists in fields like biochemistry, inorganic chemistry, coordination chemistry, molecular and structural biology, enzymology, environmental chemistry, physiology, toxicology, biophysics, pharmacy, and medicine. Consequently, the volumes are an essential source for researchers active in these and related fields as well as teachers preparing courses, e.g., in Bioinorganic Chemistry. About this Book... Volume 1, devoted solely to the vital research area concerning the role of metal ions in neurodegenerative diseases, offers in 15 stimulating chapters an authoritative and timely view of this fascinating subject. Written by 41 internationally recognized experts, Neurodegenerative Diseases and Metal Ions highlights, supported by 130 illustrations, the recent progress made in understanding the role metal ions play in diseases like transmissible spongiform encephalopathies (Creutzfeldt-Jakob and related diseases), Alzheimer's, Parkinson's, Huntington's, Wilson's and Menkes' diseases, as well as in familial amyotrophic lateral sclerosis and others. The interplay between metal ions, catecholamines and the formation of reactive oxygen species resulting in oxidative stress is considered, as is the metalloinorganic chemistry of zinc and the neurotoxicity of aluminum, cadmium, lead, and mercury. The need for novel drugs which manipulate metal-centered neuropathology is emphasized.

Metals Ions in Biological System Astrid Sigel 2002-03-06 Volume 39: Molybdenum and Tungsten: Their Roles in Biological Processes is devoted solely to the vital research area on molybdenum and tungsten and their role in biology. It offers a comprehensive and timely account of this fascinating topic by 40 distinguished international authorities. Topics include: transport, homeostasis, regulation and binding of molybdate and tungstate to proteins, crystallographic characterization, coordination of complexes, and biosynthesis.

Metal Ions in Biological Systems, Volume 44 Helmut Sigel 2005-03-01 Volume 44, devoted solely to the vital research areas concerning the biogeochemistry of metals and their transport in the environment and availability to living systems, offers 9 timely and authoritative chapters on these fascinating topics by 19 internationally recognized experts.

Progress in Inorganic Chemistry Kenneth D. Karlin 2009-09-17 This comprehensive series of volumes on inorganic chemistry provides inorganic chemists with a forum for critical, authoritative evaluations of advances in every area of the discipline. Every volume reports recent progress with a significant, up-to-date selection of papers by internationally recognized researchers, complemented by detailed discussions and complete documentation. Each volume features a complete subject index and the series includes a cumulative index as well.

Metal Ions in Biological Systems Helmut Sigel 1994-02-08 This volume is devoted solely to the research area of metalloenzymes involving amino acid-residue and related radicals. Topics covered include: general considerations; structure, function and engineering of peroxidases; and ribonucleotide reductase in mammalian systems.

Interrelations between Essential Metal Ions and Human Diseases Astrid Sigel 2014-01-27 MILS-13 provides an up-to-date review on the relationships between essential metals and human diseases, covering 13 metals and 3 metalloids: The bulk metals sodium, potassium, magnesium, and calcium, plus the trace elements manganese, iron, cobalt, copper, zinc, molybdenum, and selenium, all of which are essential for life. Also covered are chromium, vanadium, nickel, silicon, and arsenic, which have been proposed as being essential for humans in the 2nd half of the last century. However, if at all, they are needed only in ultra-trace amounts, and because of their prevalence in the environment, it has been difficult to prove whether or not they are required. In any case, all these elements are toxic in higher concentrations and therefore, transport and cellular concentrations of at least the essential ones, are tightly controlled; hence, their homeostasis and role for life, including deficiency or overload, and their links to illnesses, including cancer and neurological disorders, are thoroughly discussed. Indeed, it is an old wisdom that metals are indispensable for life. Therefore, Volume 13 provides in an authoritative and timely manner in 16 stimulating chapters, written by 29 internationally recognized experts from 7 nations, and supported by more than 2750 references, and over 20 tables and 80 illustrations, many in color, a most up-to-date view on the vibrant research area of the interrelations between Essential Metal Ions and Human Diseases.

Prokaryotic Gene Expression Simon Baumber 1999-05-27 Prokaryotic gene expression is not only of theoretical interest but also of highly practical significance. It has implications for other biological problems, such as developmental biology and cancer, brings insights into genetic engineering and expression systems, and has consequences for important aspects of applied research. For example, the molecular basis of bacterial pathogenicity has implications for new antibiotics and in crop development. Prokaryotic gene expression is a major review of the subject, providing up-to-date coverage as well as numerous insights by the prestigious authors. Topics covered include operons; protein recognition of sequence specific DNA- and RNA-binding sites; promoters; sigma factors, and variant tRNA polymerases; repressors and activators; post-transcriptional control and attenuation; ribonuclease activity, mRNA stability, and translational repression; prokaryotic DNA topology, topoisomerases, and gene expression; regulatory networks, regulatory cascades and signal transduction; phosphotransfer reactions; switch systems, transcriptional and translational modulation, methylation, and recombination mechanisms; pathogenicity, toxin regulation and virulence determinants; sporulation and genetic regulation of antibiotic production; origins of regulatory molecules, selective pressures and evolution of prokaryotic regulatory mechanisms systems. Over 1100 references to the primary literature are cited. Prokaryotic Gene Expression is a comprehensive and authoritative review of current knowledge and research in the area. It is essential reading for postgraduates and researchers in the field. Advanced

undergraduates in biochemistry, molecular biology, and microbiology will also find this book useful.

Metals in the Environment M.N.V. Prasad 2001-07-27 A summary of data on heavy metal accumulation, biomonitoring, toxicity and tolerance, metal contamination and pollution in the environment, and the importance of biodiversity for environmental monitoring and cleanup of metal-contaminated and polluted ecosystems. It advocates the use of bacteria, mycorrhizae, freshwater algae, salt marshes, bryo- an **The Ubiquitous Roles of Cytochrome P450 Proteins** Astrid Sigel 2007-04-30 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. *Metal Ions in Biological Systems* Astrid Sigel 1997-02-14 Details analytical methods for the determination of mercury and covers the biogeochemical cycling of mercury in lakes, rivers, oceans, the soil and the atmosphere. This volume also examines the microbial transformation of mercury species, their accumulation in the food chain, the physiology and toxicology, and more.

Multiple Contributors 1996-07-16 Comprehensive Supramolecular Chemistry covers for the first time in eleven detailed volumes the exciting inter- and multidisciplinary area of modern supramolecular chemistry. This subject, which has now reached an astonishing diversity and complexity, has developed at a remarkably rapid pace following the initial discoveries of crown ethers and cryptands in the late sixties. The numerous references, including many recent citations, constitute an unrivaled in-depth source for direct entry to the widespread primary literature on any aspect of this most highly topical area. The many carefully selected illustrations and instructive schematic representations make the chapters easily readable.

Lead: Its Effects on Environment and Health Astrid Sigel 2017-04-18 **Lead: Its Effects on Environment and Health**, entitled **Lead: Its Effects on Environment and Health** of the series **Metal Ions in Life Sciences** centers on the interrelations between biosystems and lead. The book provides an up-to-date review of the inorganic chemistry of this metal and its ions; it covers the biogeochemistry of lead, its use (not only as gasoline additive) and anthropogenic release into the environment, its cycling and speciation in the atmosphere, in waters, soils, and sediments, and also in mammalian organs. The analytical tools to determine and to quantify this toxic element in blood, saliva, urine, hair, etc. are described. The properties of lead(II) complexes formed with amino acids, peptides, proteins (including metallothioneins), nucleobases, nucleotides, nucleic acids, and other ligands of biological relevance are summarized for the solid state and for aqueous solutions as well. All this is important for obtaining a coherent picture on the properties of lead, its effects on plants and toxic actions on mammalian organs. This and more is treated in an authoritative and timely manner in the 16 stimulating chapters of Volume 17, which are written by 36 internationally recognized experts from 13 nations. The impact of this recently again vibrant research area is manifested in nearly 2000 references, over 50 tables and more than 100 illustrations (half in color). **Lead: Its Effects on Environment and Health** is an essential resource for scientists working in the wide range from material sciences, inorganic biochemistry all the way through to medicine including the clinic ... not forgetting that it also provides excellent information for teaching. **Cadmium: From Toxicity to Essentiality** Astrid Sigel 2013-02-26 Volume 11 provides in an authoritative and timely manner in 16 stimulating chapters, written by 40 internationally recognized experts from 11 nations, and supported by more than 2600 references, 35 tables, and over 100 illustrations, many in color, a most up-to-date view on the role of cadmium for life, presently a vibrant research area. MILS-11 covers the biogeochemical chemistry of Co(II), its biogeochemistry, anthropogenic release into the environment, and speciation in the atmosphere, waters, soils, and sediments. The analytical tools for Co determination, its imaging in cells, and the use of ¹¹³Cd NMR to probe Zn(II) and Ca(II) proteins are summarized, as are Co(II) interactions with nucleotides, nucleic acids, amino acids, and proteins including metallothioneins. The phyto remediation by Co(II)-accumulating plants, etc., the toxicology of Co(II), its damage to mammalian organs, and its role as a carcinogen for humans, are highlighted.

Metalloids and the Cell Lucia Banci 2013-04-18 Metalloids and the Cell provides in an authoritative and timely manner in 16 stimulating chapters, written by 37 internationally recognized experts from 9 nations, and supported by more than 3000 references, several tables, and 110 illustrations, mostly in color, a most up-to-date view of the "metalloids" which, as defined in the "omics" world, describe the entire set of biomolecules that interact with or are affected by each metal ion. The most relevant tools for visualizing metal ions in the cell and the most suitable bioinformatic tools for browsing genomes to identify metal-binding proteins are also presented. Thus, MILS-12 is of relevance for structural and systems biology, inorganic biological chemistry, genetics, medicine, diagnostics, as well as teaching, etc. **Theoretical Biochemistry** Lief A. Eriksson 2001-02-19 Theoretical chemistry has been an area of tremendous expansion and development over the past decade; from an approach where we were able to treat only a few atoms quantum mechanically or make fairly crude molecular dynamics simulations, into a discipline with an accuracy and predictive power that has rendered it an essential complementary tool to experiment in basically all areas of science. This volume gives a flavour of the types of problems in biochemistry that theoretical calculations can solve at present, and illustrates the tremendous predictive power these approaches possess. A wide range of computational approaches, from classical MD and Monte Carlo methods, via semi-empirical and DFT approaches on isolated model systems, to Car-Parrinello QM/MD and novel hybrid QM/MM studies are covered. The systems investigated also cover a broad range; from membrane-bound proteins to various types of enzymatic reactions as well as inhibitor studies, cofactor properties, solvent effects, transcription and radiation damage to DNA.

Biomineralization Astrid Sigel 2008-04-30 Biomineralization is a hot topic in the area of materials, and this volume in the Metals Ions in Life Sciences series takes a systematic approach, dealing with all aspects from the fundamentals to applications. Key biological features of biomineralization, such as gene directed growth and the role of enzymes are covered, as are new areas, including copper/zinc in the jaws of invertebrates or magnetic biomaterials that help birds with navigation **Lipid Second Messengers** Ronald P. Rubin 2020-10-29 Lipid Second Messengers provides detailed methodology for analysis of various lipid signaling pathways. Authoritative contributors explain the factors that regulate lipid second messenger production by agonist-activated enzymes and examine their products. Topics discussed include procedures used to measure lipid-derived mediators such as lysophospholipids, arachidonic acid, eicosanoids, anandamide, and ceramides, and the enzymes responsible for generating these messengers, such as phospholipases, prostaglandin endoperoxide synthetases, and sphingomyelinase.

Processes. The volumes reflect the interdisciplinary nature of bioinorganic chemistry and coordinate the efforts of researchers in the fields of biochemistry, inorganic chemistry, coordination chemis **Perspectives in Bioremediation** J.R. Wilo 2012-12-06 Bioremediation - the use of microorganisms for environmental clean-up - is a technology that is experiencing a rapid phase of development. From the opening chapter of Perspectives in Bioremediation, on the nature of environmental site assessment, on to the genetic manipulation of native soil microorganisms, the international collection of authors provide an understanding of the current progress and limitations of technologies that are designed ~~to improve the environment by~~ **Ce** **Microorganisms and the Environment** presents different aspects of environmental remediation: the environmental engineer is introduced to the bacteria of contaminated environments and the ideas developing from genetic engineering; the environmental microbiologist can grasp site assessment and the predictive kinetic analysis of potentials. The book provides a clear and concise introduction to the nature of and potential for bioremediation to contribute to a critical global effort in eliminating contamination of the world's resources and to start to reverse decades of environmental mismanagement and neglect.

Metal Ions in Biological Systems, Volume 43 - Biogeochemical Cycles of Elements Helmut Sigel 2005-02-28 Metal Ions in Biological Systems is devoted to increasing our understanding of the relationship between the chemistry of metals and life processes.

The Alkali Metal Ions: Their Role for Life Astrid Sigel 2016-02-09 MILS-16 provides an up-to-date review of the impact of alkali metal ions on life. Their bioinorganic chemistry and analytical determination, the solid state structures of bio-ligand complexes and the properties of alkali metal ions in solution in the context of all kinds of biologically relevant ligands are covered, this includes proteins (enzymes) and nucleic acids (G-quadruplexes). Minerals containing sodium (Na+) and potassium (K+) are abundant in the Earth's crust, making Na+ and K+ easily available. In contrast, the alkali elements lithium (Li+), rubidium, and cesium are rare and the radioactive francium occurs only in traces. Since the intra- and extracellular, as well as the compartmental concentrations of Na+ and K+ differ significantly, homeostasis and active transport of these ions are important; this involves transporters/carriers and pore-forming ion channel proteins. Systems like Na+/K+-ATPases, H+/K+-ATPases or Na+/H+ antiporters are thoroughly discussed. The role of K+ in photosynthesis and the role of Na+ in charging the "battery of life" are pointed out. Also, the relationships between alkali metal ions and diseases (e.g., Parkinson or traumatic brain injury) are covered and the relevance of Li+ salts in medicine (pharmacology and mechansim) is reviewed. This and more is treated in an authoritative and timely manner in the 16 stimulating chapters of Volume 16, **The Alkali Metal Ions: Their Role for Life**, which are written by 44 internationally recognized experts from 12 nations. The impact of this vibrant research area is manifested in nearly 3000 references, over 30 tables and more than 150 illustrations (two thirds in color). MILS-16 also provides excellent information for teaching. Astrid Sigel, Helmut Sigel, and Roland K. O. Sigel have long-standing interests in Biological Inorganic Chemistry. Their research focuses on metal ion interactions with nucleotides and nucleic acids and on related topics. They edited previously 44 volumes in the series Metal Ions in Biological Systems.

Inorganic Biochemistry J. A. Cowan 1997-03-21 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.

Metal Ions in Fungi Gunther Winkelmann 2020-08-26 Presents the latest advances in the study of the intracellular fate and transport of metal ions in fungi, emphasizing the mechanisms that regulate cellular concentration. The book explains the expanding relationship between molecular genetics and inorganic biochemistry.

The Metal-Driven Biogeochemistry of Gaseous Compounds in the Environment Peter M.H. Kroneck 2014-11-22 MILS-14 provides a most up-to-date view of the exciting biogeochemistry of gases in our environment as driven mostly by microorganisms. These employ a machinery of sophisticated metalloenzymes, where especially transition metals (such as Fe, Ni, Cu, Mo, W) play a fundamental role, that is, in the activation, transformation and syntheses of gases like hydrogen, methane, carbon monoxide, acetylene and those of the biological nitrogen and sulfur cycles. The **Metal-Driven Biogeochemistry of Gaseous Compounds in the Environment** is a vibrant research area based mainly on structural and microbial biology, inorganic biological chemistry and environmental biochemistry. All this is covered in an authoritative manner in 11 stimulating chapters, written by 26 internationally recognized experts and supported by nearly 1200 references, informative tables and about 100 illustrations (two thirds in color). MILS-14 also provides excellent information for teaching. Peter M. H. Kroneck is a bioinorganic chemist who is exploring the role of transition metals in biology, with a focus on functional and structural aspects of microbial iron, copper and holoerybdenum enzymes and their impact on the biogeochemical cycles of nitrogen and sulfur. Martha E. Sosa Torres is an inorganic chemist, with special interests in magnetic properties of newly synthesized transition metal complexes and their reactivity towards molecular oxygen, applying kinetic, electrochemical and spectroscopic techniques.

Hans Selzer 1994-01-25 Describes general aspects of metals in clinical chemistry focusing not only on the physiology of metal ions and their analytical determination in biological materials, but also on their geochemical distribution, technical uses and environmental effects.

Sustaining Life on Planet Earth: Metalloenzymes Mastering Dioxide and Other Chewy Gases Peter M. H Kroneck 2015-02-23 MILS-15 provides an up-to-date review of the metalloenzymes involved in the activation, production, and conversion of molecular oxygen as well as the functionalization of the chemically inert gases methane and ammonia. Found either in aerobes (humans, animals, plants, microorganisms) or in anaerobes (so-called "impossible bacteria") these enzymes employ preferentially iron and copper at their active sites, in order to conserve energy by redox-driven proton pumps, to convert methane to methanol, or ammonia to hydroxylamine or other compounds. When it comes to the light-driven production of molecular oxygen, the tetranuclear manganese cluster of photosystem II must be regarded as the key player. However, dioxygen can also be produced in the dark, by heme iron-dependent dismutation of oxoanions. **Metalloenzymes Mastering Dioxide and Other Chewy Gases** is a vibrant research area based mainly on structural and microbial biology, inorganic biological chemistry, and environmental biochemistry. All this is covered in an authoritative manner in 7 stimulating chapters, written by 21 internationally recognized experts, and supported by nearly 1100 references, informative tables, and over 140 illustrations (many in color). MILS-15 provides excellent information for teaching; it is also closely related to MILS-14, **The Metal-Driven Biogeochemistry of Gaseous Compounds in the Environment**. Peter M. H. Kroneck is a bioinorganic chemist who is exploring the role of transition metals in biology, with a focus on functional and structural aspects of microbial iron, copper, and holoerybdenum enzymes and their impact on the biogeochemical cycles of nitrogen and sulfur. Martha E. Sosa Torres is an inorganic chemist, with special interests in magnetic properties of newly synthesized transition metal complexes and their reactivity towards molecular oxygen, applying kinetic, electrochemical, and spectroscopic techniques.

Metallo-Drugs: Development and Action of Anticancer Agents Astrid Sigel 2018-02-05 Volume 18, entitled **Metallo-Drugs: Development and Action of Anticancer Agents** of the series **Metal Ions in Life Sciences** centers on biological, medicinal inorganic chemistry. The serendipitous discovery of the antitumor activity of cis-diamminodichloroplatinum(II) (cisplatin) by Barnett Rosenberg in the 1960s is a landmark in metallodrug-based chemotherapy. The success of cisplatin in the clinic, followed by oxaliplatin and carboplatin, along with their drawbacks relating mainly to resistance development and severe toxicity, initiated research on polynuclear platinum complexes and on Pt(IV) complexes as prodrugs. Furthermore, the indicated shortcomings led to the exploration of other transition and main group metal ions, among them Ru(II/III), Au(III), Ti(IV), V(IV/V), and Ga(III) including also the essential metal ions Fe(III), Cu(II), and Zn(II). Ions as well as covalent and non-covalent interactions between structurally very different complexes and biomolecules like nucleic acids, proteins, and carbohydrates are studied and discussed with regard to their possible anticancer actions. Hence, MILS-18 summarizes the research at the forefront of medicinal inorganic chemistry, including studies on the next-generation, tailor-made anticancer drugs. All this and more is treated in an authoritative and timely manner in the 17 stimulating chapters of this book, written by 39 internationally recognized experts from 10 nations (from the US via Europe to China and Australia). The impact of this vibrant research area is manifested by more than 2700 references, nearly 150 illustrations (more than half in color) and several comprehensive tables. **Metallo-Drugs: Development and Action of Anticancer Agents** is an essential resource for scientists working in the wide range from enzymology, material sciences, analytical, organic, and inorganic biochemistry all the way through to medicine including the clinic ... not forgetting that it also provides excellent information for teaching.

Metal Ions in Biological Systems

Comprehensive Supramolecular Chemistry: Supramolecular Reactivity and Transport: Bioinorganic Systems

metal-ions-in-biological-systems-vol-30-metalloenzymes-involving-amino-acid-residue-and-related-radicals