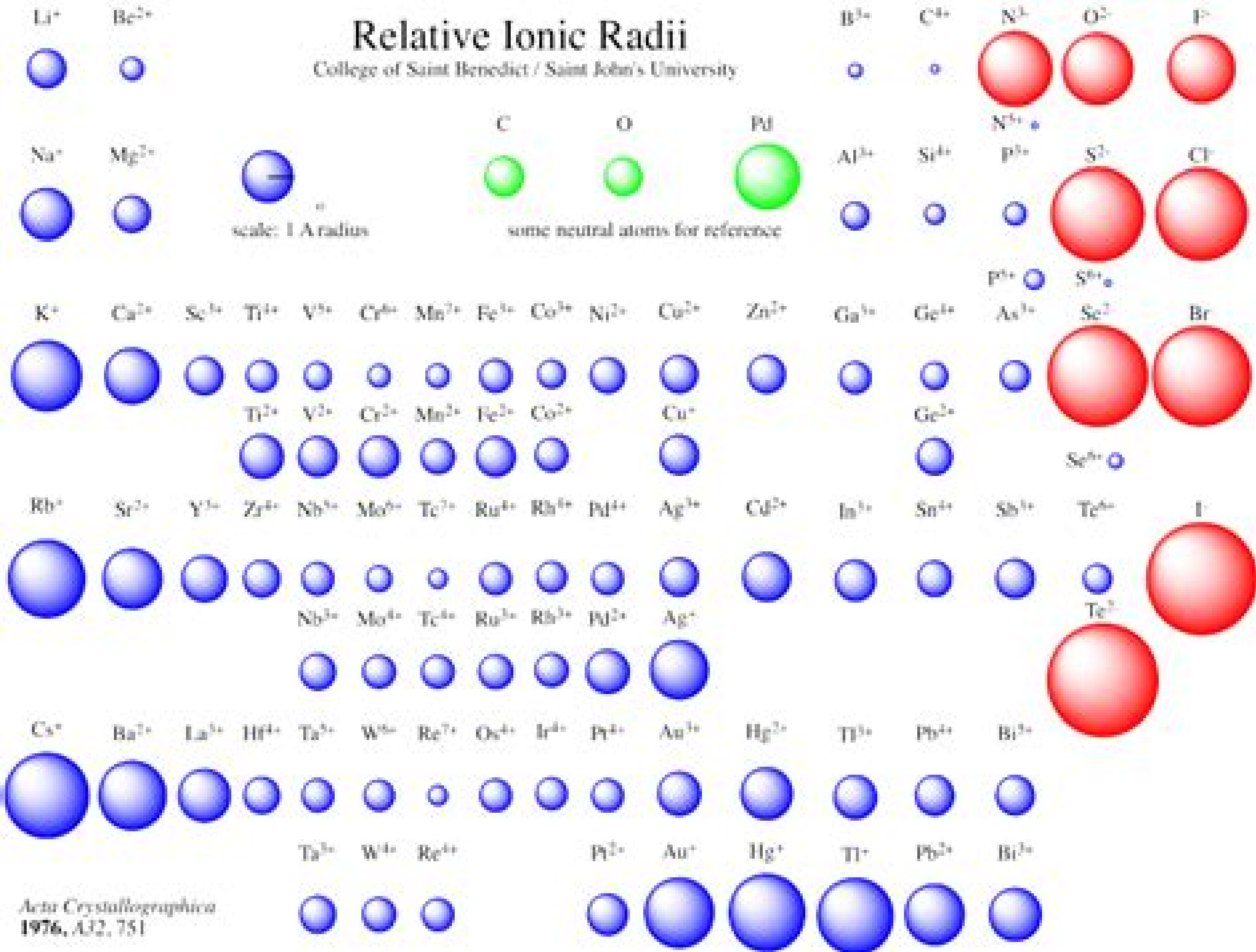


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Metal Ions Volume 3

Masashi Hojo



Metal Ions Volume 3:

Neurodegenerative Diseases and Metal Ions Astrid Sigel, Helmut Sigel, Roland K. O. 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 metalloneurochemistry of zinc and the neurotoxicity of aluminum cadmium lead and mercury The need for novel drugs which manipulate metal centered neuropathology is emphasized

Metal Ions in Toxicology: Effects, Interactions, Interdependencies Astrid Sigel, Helmut Sigel, Roland K.O. Sigel, 2015-07-24 Volume 8 solely devoted to the toxicology of metals and metalloids as well as their compounds focuses on human health Not surprisingly all related research areas are rapidly developing due to the role of metals and metalloids in the environment for the work place for food and water supply etc Written by 40 internationally recognized experts the 14 stimulating chapters provide an authoritative and timely resource for scientists working in the wide range from analytical physical inorganic and environmental biochemistry all the way through to toxicology physiology and medicine Volume 8 highlights supported by nearly 1900 references in a comprehensive and timely manner the principles of risk assessment regarding the effects of metals on human health It examines how metal ions and their compounds affect the pulmonary cardiovascular gastrointestinal including liver hematological immune and neurological systems the kidney skin and eyes as well as human reproduction and development MILS 8 terminates with the role of metal ions as endocrine disrupters in genotoxicity and cancer risk *Metal Ions in Bio-Imaging Techniques* Astrid Sigel, Eva Freisinger, Roland K.O. Sigel, 2021-03-08 Volume 22 entitled Metal Ions in Bio Imaging Techniques of the series Metal Ions in Life Sciences deals with metal ions as tools in imaging This dates back to the first half of the past century when barium sulfate was orally given to patients undergoing X ray examination The use of contrast agents has since developed into a large interdisciplinary field encompassing not only

medicine but also chemistry material sciences physics biology engineering and computer sciences MILS 22 provides deep and current insights in 17 stimulating chapters on the new research frontiers of this fast growing field on bio imaging and beyond For example adding bio sensing yields theranostic agents meaning diagnosis and therapy linked in the same molecule ions of Gd Mn Fe Co Ir ^{99m}Tc etc are involved Other important topics are e g metal complexes in paramagnetic Chemical Exchange Transfer paraCEST radiometals for Positron Emission Tomography PET imaging or paramagnetic metal ion probes for ¹⁹F magnetic resonance imaging MILS 22 is written by 57 internationally recognized experts from 12 countries that is from the US via Europe to China The impact of this vibrant research area is manifested by more than 2300 references and nearly 120 figures mostly in color and several informative tables To conclude Metal Ions in Bio Imaging Techniques is an essential resource for scientists working in the wide range from material sciences enzymology analytic organic and inorganic biochemistry all the way through to medicine including the clinic not forgetting that also excellent information for teaching is provided

Metal Ions in Biological Systems Helmut Sigel, Astrid Sigel, 2024-11-01 Continuing to explore the relationship between the chemistry of metals and life processes this volume in the Metal Ions in Biological Systems series examines the degradation of environmental pollutants by micro organisms It covers the action of micro organisms and metalloenzymes on lignin tannins hemicelluloses cellulose and aromatic compounds as well as on halogenated aromatics and aliphatics analyzes mechanistic aspects considers the role of metalloproteases in biotechnology and wastewater sludge treatment and describes the metal dependent conversion of inorganic nitrogen and sulfur compounds

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 III 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 metalloid 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 *Metal Ions In Biological Systems, Volume 44* Helmut Sigel, Roland 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 *Metallothioneins and Related Chelators* Astrid Sigel, Helmut Sigel, Roland K.O. Sigel, 2015-07-24 These sulfur rich chelators being important in metal ion homeostasis find increasing attention MILS 5 written by 30 internationally recognized experts focuses on this hot topic The reader is supported by about 20 tables more than 80 illustrations and nearly 2000 references This book is an essential resource for scientists working in a wide range of disciplines from environmental toxicology and inorganic biochemistry all the way through to physiology and medicine *Interplay between Metal Ions and Nucleic Acids* Astrid Sigel, Helmut Sigel, Roland K.O. Sigel, 2012-01-02 *Interplay between Metal Ions and Nucleic Acids* provides in an authoritative and timely manner in 12 stimulating chapters written by 24 internationally recognized experts from 8 nations and supported by nearly 1500 references about 20 tables and 125 illustrations many in color a most up to date view on metal ion nucleic acid interactions the characterization of which is covered in solution and in the solid state The volume concentrates on modern developments encompassing topics in the wide range from G quadruplexes via DNAzymes catalysis at the DNA scaffold and metal mediated base pairs to peptide nucleic acids PNAs being thus of relevance e g for chemistry and nanotechnology but also for molecular biology and genetic diagnostics **Toxicology of Metals, Volume I** Louis W. Chang, 2023-07-28 This volume offers the most comprehensive presentation available on metal toxicology It discusses not only metals but also the toxic endpoints such as neurotoxicity renal toxicity and cancer induction Chapters are written by experts in their respective fields focusing on carcinogenesis and human exposures and highlighting the major aspects and issues of toxicity in general *Metallo-Drugs: Development and Action of Anticancer Agents* Astrid Sigel, Helmut Sigel, Eva Freisinger, Roland K.O. 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 I III Ti IV V IV V and Ga III including also the essential metal ions Fe II III Cu I II and Zn II Ionic 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

Structural and Catalytic Roles of Metal Ions in RNA Astrid Sigel, Helmut Sigel, Roland K.O. Sigel, 2015-07-24 The discovery of ribozymes nearly 30 years ago triggered a huge interest in the chemistry and biology of RNAs Much of the recently made progress focusing on metal ions is addressed in MILS 9 This book written by 28 internationally recognized experts from 8 nations provides a most up to date view and is thus of special relevance for colleagues teaching courses in biological inorganic chemistry and for researchers dealing e g with nucleic acids gene expression and enzymology but also for those in analytical and bioinorganic chemistry or biophysics Structural and Catalytic Roles of Metal Ions in RNA describes in an authoritative and timely manner in 12 stimulating chapters supported by nearly 1600 references 13 tables and 75 illustrations mostly in color metal ion binding motifs methods to detect and characterize metal ion binding sites and the role of metal ions in folding and catalysis It deals with diffuse metal ion binding RNA quadruplexes the regulation of riboswitches metal ions and ribozymes including artificial ribozymes The spliceosome the ribosome ribozymes involving redox cofactors as well as the binding of kinetically inert metal ions to RNA are also covered

The Alkali Metal Ions: Their Role for Life Astrid Sigel, Helmut Sigel, Roland K. O. 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 mechanism 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

Metabolism of Trace Metals in Man Vol. II (1984) Owen M. Rennert, Chan Wai-Yee, 2017-11-22 A vast literature exists dealing with trace metals and a number of outstanding monographs deal with the biological biochemical or clinical effects of a specific trace metal or trace metals in general However newer aspects of trace metal research i e the developmental aspects and generic implications have not been systematically discussed in any existing texts The present two volumes will summarize the present status of research in these areas and serve as milestones for future development in these areas of trace metal research

Interrelations between Essential Metal Ions and Human Diseases Astrid Sigel, Helmut Sigel, Roland K.O. 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

The Metal-Driven Biogeochemistry of Gaseous Compounds in the Environment Peter M.H. Kroneck, Martha E. Sosa Torres, 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 dihydrogen 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 molybdenum 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 *Advances in Microfluidic Technologies for Energy and Environmental Applications* Yong Ren, 2020-05-20 Microfluidics have aroused a new surge of interest in recent years in environmental and energy areas and inspired novel applications to tackle the worldwide challenges for sustainable development This book aims to present readers with a valuable compendium of significant advances in applying the multidisciplinary microfluidic technologies to address energy and environmental problems in a plethora of areas such as environmental monitoring and detection new nanofluid application in traditional mechanical manufacturing processes development of novel biosensors and thermal management This book will provide a new perspective to the understanding of the ever growing importance of microfluidics **Fundamental Coordination Ability of s-Block Metal Ions** Masashi Hojo, 2025-09-12 Fundamental Coordination Ability of s Block Metal Ions New Aspects and Its Role in Solution Reactions delves into the intricate reaction chemistry and coordination chemistry of s block metal ions in various solutions This book explores the crystallization and subsequent re dissolution of s block metal compounds from solutions as well as their structures and the biochemistry of these ions in living organisms By examining the complex formation of s block metal ions with crown ethers the book highlights the significant advancements in host guest chemistry involving s block metal ions Additionally it discusses recent synthesization of lighter metal coordination polymers and more The complex formation of s block metal ions with crown ethers was discovered by C J Pedersen in 1967 and since then host guest chemistry of s block metal ions have been highly developed In recent years many lighter metal coordination polymers have been synthesized actively In this book some salt effects or abnormal phenomena are accounted for in terms of coordination interaction with s block metal ions in solution The mechanism of enhanced oxidation ability of dilute nitric acid is discussed and the dissolution of pure gold in seawater with nitric acid is demonstrated This important reference book will be useful to inorganic chemists specifically those working in solution chemistry main group metal chemistry and supramolecular chemistry both in industry and academia Features information on direct chemical interaction between s block metal ions and anions in solution Includes details on the activities of ions in solution Covers enhanced oxidation ability of dilute nitric acid **Hydrolysis of Metal Ions** Paul L. Brown, Christian Ekberg, 2016-02-23 Endlich ein Fachbuch das die

Theorie Methoden und die verschiedenen Arten von Metall Ionen Komplexen in Wasser Hydrolyse umfassend behandelt Geschrieben wurde dieses Referenzwerk von einem Kernchemiker aus dem Hochschulbereich und einem Geochemiker aus der Industrie Behandelt werden Kationen und Anionen Komplexe sowie die Metall Ionen Hydrolyse zu der zun chst Hintergrundinformationen geliefert werden bevor eine Beschreibung der Dissoziation von Wasser aller verschiedenen Hydrolysekomplexe und Verbindungen von Metall und Wasser folgt Ein Muss f r Wissenschaftler im universit ren Umfeld und in der Industrie die sich mit diesem interdisziplin ren Thema besch ftigen *Biom mineralization* Astrid Sigel, Helmut Sigel, Roland K. O. Sigel, 2008-04-30 Biom mineralization 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 biom mineralization 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 Inorganic Reaction Mechanisms Volume 4 A. McAuley, 1976 Annotation Specialist Periodical Reports provide systematic and detailed review coverage of progress in the major areas of chemical research Written by experts in their specialist fields the series creates a unique service for the active research chemist supplying regular critical in depth accounts of progress in particular areas of chemistry For over 80 years the Royal Society of Chemistry and its predecessor the Chemical Society have been publishing reports charting developments in chemistry which originally took the form of Annual Reports However by 1967 the whole spectrum of chemistry could no longer be contained within one volume and the series Specialist Periodical Reports was born The Annual Reports themselves still existed but were divided into two and subsequently three volumes covering Inorganic Organic and Physical Chemistry For more general coverage of the highlights in chemistry they remain a must Since that time the SPR series has altered according to the fluctuating degree of activity in various fields of chemistry Some titles have remained unchanged while others have altered their emphasis along with their titles some have been combined under a new name whereas others have had to be discontinued The current list of Specialist Periodical Reports can be seen on the inside flap of this volume

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