

Nomenclature Of Inorganic Chemistry Inorganic Chemistry Division Commission On Nomenclature Of Inorganic Chemistry Yong Zhou

Chemical nomenclature is used to identify a chemical species by means of written or spoken words and enables a common language for communication amongst chemists. Nomenclature for chemical compounds additionally contains an explicit or implied relationship to the structure of the compound, in order that the reader or listener can deduce the structure from the name. This purpose requires a system of principles and rules, the application of which gives rise to a systematic nomenclature. Of course, a wide range of traditional names, semisystematic or trivial, are also in use for a core group of common compounds. Detailing the latest rules and international practice, this new volume can be considered a guide to the essential organic chemical nomenclature, commonly described as the "Blue Book". An invaluable source of information for organic chemists everywhere and the definitive guide for scientists working in academia or industry, for scientific publishers of books, journals and databases, and for organisations requiring internationally approved nomenclature in a legal or regulatory environment.

The IUPAC system of polymer nomenclature has aided the generation of unambiguous names that reflect the historical development of chemistry. However, the explosion in the circulation of information and the globalization of human activities mean that it is now necessary to have a common language for use in legal situations, patents, export-import regulations, and environmental health and safety information. Rather than recommending a 'unique name' for each structure, rules have been developed for assigning 'preferred IUPAC names', while continuing to allow alternatives in order to preserve the diversity and adaptability of nomenclature. Compendium of Polymer Terminology and Nomenclature is the only publication to collect the most important work on this subject into a single volume. It serves as a handy compendium for scientists and removes the need for time consuming literature searches. One of a series issued by the International Union of Pure and Applied Chemistry (IUPAC), it covers the terminology used in many and varied aspects of polymer science as well as the nomenclature of several different types of polymer including regular and irregular single-strand organic polymers, copolymers and regular double-strand (ladder and spiro) organic polymers.

The contents of this textbook have been carefully compiled taking into account changes in the inorganic chemistry. It has been written using simple language with a view to rendering learning easy. Tabulated data, figures, equations and charts are provided throughout the book to help in easy assimilation of the various concepts. Solved problems and popular matter on the subject (in grey boxes) are two of the highlights of this book. An exhaustive question bank has been added to each chapter. This is intended not only for self-appraisal and preparation for examinations, but also to help the student in understanding concepts.

As a byproduct of historical development, there are different, unrelated systems of nomenclature for "inorganic chemistry", "organic chemistry", "polymer chemistry", "natural products chemistry", etc. With each new discovery in the laboratory, as well as each new theoretical proposal for a chemical, the lines that traditionally have separated these "distinct" subsets of matter continually grow more blurred. This lack of uniformity in characterizing and naming chemicals increases the communication difficulties between differently trained chemists, as well as other scientists, and greatly impedes progress. With the set of known chemicals numbering over 42,000,000 (in Chemical Abstracts' data base) and continually growing (about 2,000 new additions every day), the desirability for a unified system for naming all chemicals simultaneously grows. Moreover, in order to meet the requirements of disparate groups of scientists, and of society in general, the name assigned to a given chemical should, not only uniquely describe that substance, but also should be a part of a readily recognizable order for the entire field. For these purposes, a topology-based "bi-parametric" system of nomenclature is herein proposed. - In this book, a new nomenclature system is proposed - The new nomenclature is applicable to a three dimensional world, and is internally consistent - This nomenclature unifies ALL branches of chemistry, removing the need for various presently existing sets of rules

Advanced Inorganic Chemistry: Applications in Everyday Life connects key topics on the subject with actual experiences in nature and everyday life. Differing from other foundational texts with this emphasis on applications and examples, the text uniquely begins with a focus on the shapes (geometry) dictating intermolecular forces of attractions, leading to reactivity between molecules of different shapes. From this foundation, the text explores more advanced topics, such as: Ligands and Ligand Substitution Processes with an emphasis on Square-Planar Substitution and Octahedral Substitution Reactions in Inorganic Chemistry and Transition Metal Complexes, with a particular focus on Crystal-Field and Ligand-Field Theories, Electronic States and Spectra and Organometallic, Bioinorganic Compounds, including Carboranes and Metallacarboranes and their applications in Catalysis, Medicine and Pollution Control. Throughout the book, illustrative examples bring inorganic chemistry to life. For instance, biochemists and students will be interested in how coordination chemistry between the transition metals and the ligands has a direct correlation with cyanide or carbon monoxide poisoning (strong-field Cyanide or CO ligand versus weak-field Oxygen molecule). Engaging discussion of key concepts with examples from the real world Valuable coverage from the foundations of chemical bonds and stereochemistry to advanced topics, such as organometallic, bioinorganic, carboranes and environmental chemistry Uniquely begins with a focus on the shapes (geometry) dictating intermolecular forces of attractions, leading to reactivity between molecules of different shapes This book covers different aspects of Inorganic Chemistry in 10 chapters with up-to-date coverage. Some topics include VSEPR theory, delocalized p-bonding in polyatomic molecules, metal clusters and their bonding, stability constants of metal complexes, magnetochemistry, mechanism of inorganic reactions, and molecular orbital (MO) approach of bonding in transition metals. Safe and economical inorganic experiments at UG Levels is also presented.

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 This authoritative compendium updates and replaces the first edition, which proved so valuable for all who needed to use the officially recommended analytical nomenclature mandated by IUPAC. Since the first edition the demand for new analytical procedures has increased steadily and at the same time the diversity of the techniques has expanded and the quality and

performance characteristics of the procedures have come to be a focus of interest. New types of instrumental and automatic techniques have emerged and computerization has taken over. The scope of analytical chemistry has been widened as the question to be answered was not only the chemical composition of the sample, but also the structure of substances, and changes in composition and structure in space and time. This new volume will be an indispensable reference resource for the coming decade.

The first IUPAC Manual of Symbols and Terminology for Physicochemical Quantities and Units (the Green Book) of which this is the direct successor, was published in 1969, with the object of 'securing clarity and precision, and wider agreement in the use of symbols, by chemists in different countries, among physicists, chemists and engineers, and by editors of scientific journals'. Subsequent revisions have taken account of many developments in the field, culminating in the major extension and revision represented by the 1988 edition under the simplified title Quantities, Units and Symbols in Physical Chemistry. This 2007, Third Edition, is a further revision of the material which reflects the experience of the contributors with the previous editions. The book has been systematically brought up to date and new sections have been added. It strives to improve the exchange of scientific information among the readers in different disciplines and across different nations. In a rapidly expanding volume of scientific literature where each discipline has a tendency to retreat into its own jargon this book attempts to provide a readable compilation of widely used terms and symbols from many sources together with brief understandable definitions. This is the definitive guide for scientists and organizations working across a multitude of disciplines requiring internationally approved nomenclature.

Metal clusters are on the brink between molecules and nanoparticles in size. With molecular, nano-scale, metallic as well as non-metallic aspects, metal clusters are a growing, interdisciplinary field with numerous potential applications in chemistry, catalysis, materials and nanotechnology. This third volume in the series of hot topics from inorganic chemistry covers all recent developments in the field of metal clusters, with some 20 contributions providing an in-depth view. The result is a unique perspective, illustrating all facets of this interdisciplinary area: * Inter-electron Repulsion and Irregularities in the Chemistry of Transition Series * Stereochemical Activity of Lone Pairs in Heavier Main Group Element Compounds * How Close to Close Packing? * Forty-Five Years of Praseodymium Diiodide * Centered Zirconium Clusters * Titanium Niobium Oxychlorides * Trinuclear Molybdenum and Tungsten Cluster Chalcogenides * Current State of (B,C,N)-Compounds of Calcium and Lanthanum * Ternary Phases of Lithium with Main-Group and Late-Transition Metals * Polar Intermetallics and Zintl Phases along the Zintl Border * Rare Earth Zintl Phases * Structure-Property Relationships in Intermetallics * Ternary and Quaternary Niobium Arsenide Zintl Phases * The Building Block Approach to Understanding Main-Group-Metal Complex Structures * Cation-Deficient Quaternary Thiospinels * A New Class of Hybrid Materials via Salt Inclusion Synthesis * Layered Perrhenate and Vanadate Hybrid Solids * Hydrogen Bonding in Metal Halides * Syntheses and Catalytic Properties of Titanium Nitride Nanoparticles * Solventless Thermolysis * New Potential Scintillation Materials in Borophosphate Systems. With its didactical emphasis, this volume addresses a wide readership, such that both students and specialists will profit from the expert contributions. Etymology of Chemical Names gives an overview of the development of the current chemical nomenclature, tracing its sources and changing rules as chemistry progressed over the years. This book is devoted to provide a coherent picture how the trivial and systematic names shall be used and how the current IUPAC rules help to reconcile the conflicting demands.

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, electron 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 Gigayr. 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.

A systematic survey of the chemistry of the elements introduces the undergraduate student to the preparation, structure, chemical reactions and physical properties of manufactured inorganic substances.

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

How to Name an Inorganic Substance serves a guide to the use of nomenclature of inorganic chemistry. This book contains a few references to the rules for the nomenclature of organic chemistry as well as of inorganic boron compounds. This text defines inorganic compounds as substances consisting of combinations of all the elements except those that comprise mainly of certain chains and rings of carbon atoms with defined atoms and groups attached to these skeletal atoms. This book presents as well the background principles involved in or related to nomenclature, including oxidation number, coor ...

Environmental Inorganic Chemistry for Engineers explains the principles of inorganic contaminant behavior, also applying these principles to explore available remediation technologies, and providing the design, operation, and advantages or disadvantages of the various remediation technologies. Written for environmental engineers and researchers, this reference provides the tools and methods that are imperative to protect and improve the environment. The book's three-part treatment starts with a clear and rigorous exposition of metals, including topics such as preparations, structures and bonding, reactions and properties, and complex formation and sequestering. This coverage is followed by a self-contained section concerning complex formation, sequestering, and organometallics, including hydrides and carbonyls. Part Two, Non-Metals, provides an overview of chemical periodicity and the fundamentals of their structure and properties. Clearly explains the principles of inorganic contaminant behavior in order to explore available remediation technologies Provides the design, operation, and advantages or disadvantages of the various remediation technologies Presents a clear exposition of metals, including topics such as preparations, structures, and bonding, reaction and properties, and complex formation and sequestering

Handbook of Preparative Inorganic Chemistry, Volume 2, Second Edition focuses on the methods, mechanisms, and chemical reactions involved in conducting experiments on inorganic chemistry. Composed of contributions of various authors, the second part of the manual focuses on elements and compounds. Included in the discussions are copper, silver, and gold. Numerical calculations and diagrams are presented to show the properties, compositions, and chemical reactions of these materials when exposed to varying laboratory conditions. The manual also looks at other elements such as scandium, yttrium, titanium, zirconium, hafnium, and thorium. Lengthy discussions on the characteristics and nature of these elements are presented. The third part of the guidebook discusses special compounds. The manual also provides formula and subject index, including an index for procedures, materials, and devices. Considering the value of information presented, the manual can best serve the interest of readers and scientists wanting to institute a system in the conduct of experiments in laboratories.

Nomenclature of Inorganic Chemistry, Second Edition deals with the nomenclature of boron hydrides and higher hydrides of the Group IV–VI elements, organometallic compounds, and polyacids. This book deals with organoboron, organosilicon, and organophosphorus compounds. Organized into 11 chapters, this edition begins with an overview of the concept of oxidation number and coordination number, as well as the conventions governing the use of multiplying affixes, enclosing marks, letters, and numbers. This text then discusses the standardization of the formula of inorganic compounds to demonstrate the structural connections between atoms and to provide other comparative chemical information. Other chapters consider nomenclature for radicals and ions. This book discusses as well the nomenclature for binary and pseudobinary acids, oxoacids, peroxyacids, and chloroacids. The final chapter deals with the nomenclature for boron hydrides, boron radicals, and anions and cations derived from the boranes. This book is a valuable resource for organic and inorganic chemists.

Inorganic pharmaceutical chemistry text geared to actual practice in the profession of pharmacy & the health sciences. Provides theoretical & practical background to students. Compendial references.

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, metallocarboranes, 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

The present volume considers the most recent developments in the chemistry of cyclic inorganic and organoelement compounds. Nineteen of the 22 chapters are based on invited and other lectures presented at the 6th International Symposium on Inorganic Ring Systems held in Berlin on August 18-22, 1991. Main group compounds dominate the content from boron via carbon, silicon, germanium, tin, nitrogen, phosphorus and arsenic, to sulfur and selenium. The book is organized by element, moving from left to right in the main groups of the Periodic Table, followed by one chapter each on bonding and nomenclature of ring molecules. The list of contributors comprises distinguished scientists from 8 countries.

The 'Red Book' is the definitive guide for scientists requiring internationally approved inorganic nomenclature in a legal or regulatory environment.

At the heart of coordination chemistry lies the coordinate bond, in its simplest sense arising from donation of a pair of electrons from a donor atom to an empty orbital on a central metalloid or metal. Metals overwhelmingly exist as their cations, but these are rarely met 'naked' – they are clothed in an array of other atoms, molecules or ions that involve coordinate covalent bonds (hence the name coordination compounds). These metal ion complexes are ubiquitous in nature, and are central to an array of natural and synthetic reactions. Written in a highly readable, descriptive and accessible style Introduction to Coordination Chemistry describes properties of coordination compounds such as colour, magnetism and reactivity as well as the logic in their assembly and nomenclature. It is illustrated with many examples of the importance of coordination chemistry in real life, and includes extensive references and a bibliography. Introduction to Coordination Chemistry is a comprehensive and insightful discussion of one of the primary fields of study in Inorganic Chemistry for both undergraduate and non-specialist readers.

The object of this text is to examine, and elaborate on the meaning of the established premise that 'taste is a chemical sense.' In particular, the major effort is directed toward the degree to which chemical principles apply to phenomena associated with the inductive (recognition) phase of taste. A second objective is to describe the structure and properties

of compounds with varying taste that allow decisions to be made with respect to the probable nature of the recognition chemistry for the different tastes, and the probable nature of the receptor(s) for those tastes. A final objective is to include appropriate interdisciplinary observations that have application to solving problems related to the chemical nature of taste. Taste is the most easily accessible chemical structure-biological activity relationship, and taste chemistry studies, i.e. the chemistry of sweetness, saltiness, sourness, and bitterness, have application to general biology, physiology, and pharmacology. Because it involves sensory perception, taste is also of interest to psychologists, and has application to the food and agricultural industries. The largest portion of the text is directed toward sweetness as, due to economic and other factors, the majority of the scientific studies are concerned with sweetness. The text begins with a prologue to describe the problems associated with the study of taste chemistry. Then, there is an introductory chapter to serve as an overview of the general interdisciplinary knowledge of the subject. It is followed by a chapter on the fundamental chemical principles that apply to taste induction chemistry.

Chemical nomenclature has attracted attention since the beginning of chemistry, when the need to exchange knowledge was first recognised. The responsibility for providing nomenclature to the chemical community was assigned to the International Union of Pure and Applied Chemistry, whose Rules for Inorganic Nomenclature were published and revised in 1958 and 1970. Since then many new compounds have appeared, particularly with regard to coordination chemistry and boron chemistry, which were difficult to name using the 1970 Rules. Consequently, the IUPAC Commission on the Nomenclature of Inorganic Chemistry decided to thoroughly revise the last edition of the 'Red Book'. As many of the new fields of chemistry are very highly specialised and require complex nomenclature, the revised edition is in two parts. Whilst Part I is mainly concerned with general inorganic chemistry, this volume, Part II, addresses such diverse chemistry as polyanions, isotopic modification, tetrapyrroles, nitrogen hydrides, inorganic ring, chain, polymer, and graphite intercalation compounds. The recommendations bring order to the nomenclature of these specialised systems, based on the fundamental nomenclature described in Part I and the organic nomenclature publications. Each chapter has been subject to extensive review by members of IUPAC and practising chemists in various areas.

IUPAC Recommendations 2005 Royal Society of Chemistry

Aimed at pre-university and undergraduate students, this volume surveys the current IUPAC nomenclature recommendations in organic, inorganic and macromolecular chemistry.

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Since the early 1930's, Soviet chemists have played a leading role in the study of unfamiliar oxidation state compounds of the peroxide, superoxide, and ozonide types. Interest in the alkali and alkaline earth metal derivatives is now widespread and diverse, and numerous practical applications of these compounds have evolved, ranging from their use as air revitalization materials in space cabins to their use in compounding semiconductor materials. Professor Vol'nov is eminently qualified to write this monograph since for many years he has been a leading investigator and prolific writer in the field of peroxide, superoxide, and ozonide chemistry. He has succeeded in presenting a lucid and detailed discussion of past work, the present state, and the future potential of this area of unfamiliar oxidation state chemistry. Of particular interest is Professor Vol'nov's extensive compilation of available thermodynamic, kinetic, and structural data for the alkali and alkaline earth peroxides, superoxides, and ozonides. In addition, he has reviewed the known methods of synthesis, as well as the practical applications for which these compounds are suited. This monograph will be of interest and value to chemists, not only for the information it imparts, but equally for the information it does not impart, thereby illuminating the research paths and investigation which must be undertaken in order to increase our knowledge concerning the chemistry of this important class of chemical compounds.

Involved as it is with 95% of the periodic table, inorganic chemistry is one of the foundational subjects of scientific study. Inorganic catalysts are used in crucial industrial processes and the field, to a significant extent, also forms the basis of nanotechnology. Unfortunately, the subject is not a popular one for undergraduates. This book aims to take a step to change this state of affairs by presenting a mechanistic, logical introduction to the subject. Organic teaching places heavy emphasis on reaction mechanisms - "arrow-pushing" - and the authors of this book have found that a mechanistic approach works just as well for elementary inorganic chemistry. As opposed to listening to formal lectures or learning the material by heart, by teaching students to recognize common inorganic species as electrophiles and nucleophiles, coupled with organic-style arrow-pushing, this book serves as a gentle and stimulating introduction to inorganic chemistry, providing students with the knowledge and opportunity to solve inorganic reaction mechanisms.

- The first book to apply the arrow-pushing method to inorganic chemistry teaching
- With the reaction mechanisms approach ("arrow-pushing"), students will no longer have to rely on memorization as a device for learning this subject, but will instead have a logical foundation for this area of study
- Teaches students to recognize common inorganic species as electrophiles and nucleophiles, coupled with organic-style arrow-pushing
- Provides a degree of integration with what students learn in organic chemistry, facilitating learning of this subject
- Serves as an invaluable companion to any introductory inorganic chemistry textbook

The volumes in this continuing series provide a compilation of current techniques and ideas in inorganic synthetic chemistry. Includes inorganic polymer syntheses and preparation of important inorganic solids, syntheses used in the development of pharmacologically active inorganic compounds, small-molecule coordination complexes, and related compounds. Also contains valuable information on transition organometallic compounds including species with metal-metal cluster molecules. All syntheses presented here have been tested.

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