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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. The easy way to get a grip on inorganic chemistry Inorganic chemistry can be an intimidating subject, but it doesn't have to be! Whether you're currently enrolled in an inorganic chemistry class or you have a background in chemistry and want to expand

your knowledge, *Inorganic Chemistry For Dummies* is the approachable, hands-on guide you can trust for fast, easy learning. *Inorganic Chemistry For Dummies* features a thorough introduction to the study of the synthesis and behavior of inorganic and organometallic compounds. In plain English, it explains the principles of inorganic chemistry and includes worked-out problems to enhance your understanding of the key theories and concepts of the field. Presents information in an effective and straightforward manner Covers topics you'll encounter in a typical inorganic chemistry course Provides plain-English explanations of complicated concepts If you're pursuing a career as a nurse, doctor, or engineer or a lifelong learner looking to make sense of this fascinating subject, *Inorganic Chemistry For Dummies* is the quick and painless way to master inorganic chemistry.

Part A.: Overviews of biological inorganic chemistry : 1. Bioinorganic chemistry and the biogeochemical cycles -- 2. Metal ions and proteins: binding, stability, and folding -- 3. Special cofactors and metal clusters -- 4. Transport and storage of metal ions in biology -- 5. Biominerals and biomineralization -- 6. Metals in medicine. -- Part B.: Metal ion containing biological systems : 1. Metal ion transport and storage -- 2. Hydrolytic chemistry -- 3. Electron transfer, respiration, and photosynthesis -- 4. Oxygen metabolism -- 5. Hydrogen, carbon, and sulfur metabolism -- 6. Metalloenzymes with radical intermediates -- 7. Metal ion receptors and signaling. -- Cell biology, biochemistry, and evolution: Tutorial I. -- Fundamentals of coordination chemistry: Tutorial II. This textbook provides essential information for students of inorganic chemistry or for chemists pursuing self-study. The presentation of topics is made with an effort to be clear and concise so that the book is portable and user friendly. *Inorganic Chemistry 2E* is divided into five major themes (structure, condensed phases, solution chemistry, main group and coordination compounds) with several chapters in each. There is a logical progression from atomic structure to molecular structure to properties of substances based on molecular structures, to behavior of solids, etc. The author emphasizes fundamental principles-including molecular structure, acid-base chemistry, coordination chemistry, ligand field theory, and solid state chemistry -and presents topics in a clear, concise manner. There is a reinforcement of basic principles throughout the book. For example, the hard-soft interaction principle is used to explain hydrogen bond strengths, strengths of acids and bases, stability of coordination compounds, etc. The book contains a balance of topics in theoretical and descriptive chemistry. New to this Edition: New and improved illustrations including symmetry and 3D molecular orbital representations Expanded coverage of spectroscopy, instrumental techniques, organometallic and bio-inorganic chemistry More in-text worked-out examples to encourage active learning and to prepare students for their exams • Concise coverage maximizes student understanding and minimizes the inclusion of details students are unlikely to use. • Discussion of elements begins with survey chapters focused on the main groups, while later chapters

cover the elements in greater detail. • Each chapter opens with narrative introductions and includes figures, tables, and end-of-chapter problem sets. *Electrons, Atoms, and Molecules in Inorganic Chemistry: A Worked Examples Approach* builds from fundamental units into molecules, to provide the reader with a full understanding of inorganic chemistry concepts through worked examples and full color illustrations. The book uniquely discusses failures as well as research success stories. Worked problems include a variety of types of chemical and physical data, illustrating the interdependence of issues. This text contains a bibliography providing access to important review articles and papers of relevance, as well as summaries of leading articles and reviews at the end of each chapter so interested readers can readily consult the original literature. Suitable as a professional reference for researchers in a variety of fields, as well as course use and self-study. The book offers valuable information to fill an important gap in the field. Incorporates questions and answers to assist readers in understanding a variety of problem types Includes detailed explanations and developed practical approaches for solving real chemical problems Includes a range of example levels, from classic and simple for basic concepts to complex questions for more sophisticated topics Covers the full range of topics in inorganic chemistry: electrons and wave-particle duality, electrons in atoms, chemical binding, molecular symmetry, theories of bonding, valence bond theory, VSEPR theory, orbital hybridization, molecular orbital theory, crystal field theory, ligand field theory, electronic spectroscopy, vibrational and rotational spectroscopy P.J. van der Put offers students an original introduction to materials chemistry that integrates the full range of inorganic chemistry. Technologists who need specific chemical facts to manipulate matter will also find this work invaluable as an easy-to-use reference. The text includes practical subjects of immediate use for materials such as bonding, morphogenesis, and design that more orthodox materials science volumes often leave out. The importance of metals in biology, the environment and medicine has become increasingly evident over the last twenty five years. The study of the multiple roles of metal ions in biological systems, the rapidly expanding interface between inorganic chemistry and biology constitutes the subject called Biological Inorganic Chemistry. The present text, written by a biochemist, with a long career experience in the field (particularly iron and copper) presents an introduction to this exciting and dynamic field. The book begins with introductory chapters, which together constitute an overview of the concepts, both chemical and biological, which are required to equip the reader for the detailed analysis which follows. Pathways of metal assimilation, storage and transport, as well as metal homeostasis are dealt with next. Thereafter, individual chapters discuss the roles of sodium and potassium, magnesium, calcium, zinc, iron, copper, nickel and cobalt, manganese, and finally molybdenum, vanadium, tungsten and chromium. The final three chapters provide a tantalising view of the roles of metals in brain function,

biomineralization and a brief illustration of their importance in both medicine and the environment. Relaxed and agreeable writing style. The reader will not only find the book easy to read, the fascinating anecdotes and footnotes will give him pegs to hang important ideas on. Written by a biochemist. Will enable the reader to more readily grasp the biological and clinical relevance of the subject. Many colour illustrations. Enables easier visualization of molecular mechanisms. Written by a single author. Ensures homogeneity of style and effective cross referencing between chapters.

Foundations of Inorganic Chemistry by Gary Wulfsberg is our newest entry into the field of Inorganic Chemistry textbooks, designed uniquely for a one-semester stand alone course, or to be used in the first semester of a full year inorganic sequence. By covering virtually every topic in the test from the 2016 ACS Exams Institute, this book will prepare your students for success. The new book combines careful pedagogy, clear writing, beautifully rendered two-color art, and solved examples, with a broad array of original, chapter-ending exercises. It assumes a background in General Chemistry, but reviews key concepts, and also assumes enrollment in a Foundations of Organic Chemistry course. Symmetry and molecular orbital theory are introduced after the student has developed an understanding of fundamental trends in chemical properties and reactions across the periodic table, which allows MO theory to be more broadly applied in subsequent chapters. Key Features include: Over 900 end-of-chapter exercises, half answered in the back of the book. Over 180 worked examples. Optional experiments & demos. Clearly cited connections to other areas in chemistry and chemical sciences. Chapter-opening biographical vignettes of noted scientists in Inorganic Chemistry. Optional General Chemistry review sections. This textbook is divided into six parts: theoretical concepts and hydrogen, the s-block, the p-block, the d-block, the f-block, and other topics (the nucleus and spectra). It also focuses on the commercial exploitation of inorganic chemicals and the treatment of the inorganic aspects of environmental chemistry has also been extended.

Atomic structure and the Periodic table · Introduction to bonding · The ionic bond · The covalent bond · The metallic bond · General properties of the elements · Coordination compounds · Hydrogen and the hydrides · Group 1 - The alkali metals · The chlor-alkali industry · Group 2 - The alkaline earth elements · The group 13 elements · The group 14 elements · The group 15 elements · Group 16 - the chalcogens · Group 17 - the halogens · Group 18 - the noble gases · An introduction to the transition elements · Group 3 - The scandium group · Group 4 - The titanium group · Group 5 - The vanadium group · Group 6 - The chromium group · Group 7 - The manganese group · Group 8 - The iron group · Group 9 - The cobalt group · Group 10 - The nickel group · Group 11 - The copper group: Coinage metals · Group 12 - The zinc group · The lanthanide series · The actinides · The atomic nucleus · Spectra

Determining the structure of molecules is a fundamental skill that all chemists must learn. Structural Methods in Molecular Inorganic Chemistry is designed to help readers interpret

experimental data, understand the material published in modern journals of inorganic chemistry, and make decisions about what techniques will be the most useful in solving particular structural problems. Following a general introduction to the tools and concepts in structural chemistry, the following topics are covered in detail: • computational chemistry • nuclear magnetic resonance spectroscopy • electron paramagnetic resonance spectroscopy • Mössbauer spectroscopy • rotational spectra and rotational structure • vibrational spectroscopy • electronic characterization techniques • diffraction methods • mass spectrometry The final chapter presents a series of case histories, illustrating how chemists have applied a broad range of structural techniques to interpret and understand chemical systems. Throughout the textbook a strong connection is made between theoretical topics and the real world of practicing chemists. Each chapter concludes with problems and discussion questions, and a supporting website contains additional advanced material. Structural Methods in Molecular Inorganic Chemistry is an extensive update and sequel to the successful textbook Structural Methods in Inorganic Chemistry by Ebsworth, Rankin and Cradock. It is essential reading for all advanced students of chemistry, and a handy reference source for the professional chemist. Inorganic Aspects of Biological and Organic Chemistry investigates the inorganic aspects of biological and organic chemistry. Topics include the inorganic chemistry of group Ia and IIa metals; complexes of Ia and IIa cations in organic and biological chemistry; atomic structure and structure-activity correlations; and bonding in ligands and metal complexes. Ligand exchange reactions and factors in complex stability are also discussed. Comprised of 12 chapters, this book begins with an overview of some of the important roles of metals in biological and organic chemistry, followed by an analysis of the inorganic chemistry of group Ia and IIa metals. Complexes of Ia and IIa cations in organic and biological chemistry are then described, together with atomic structure and structure-activity correlations. Subsequent chapters deal with bonding in ligands and metal complexes; ligand exchange reactions and factors in complex stability; redox potentials and processes; and the influence of metal ions on equilibria. The book also considers catalysis by metal ions, metal complexes, and metalloenzymes before concluding with a chapter that examines the reactions of ligands in organometallic complexes. This monograph is written for teachers, students, and practitioners of organic, biological, and inorganic chemistry. Inorganic chemistry continues to generate much current interest due to its array of applications, ranging from materials to biology and medicine. Techniques in Inorganic Chemistry assembles a collection of articles from international experts who describe modern methods used by research students and chemists for studying the properties and structure The updated second edition of the popular Inorganic Materials Chemistry Desk Reference remains a valuable resource in the preparation of solid-state inorganic materials by chemical processing techniques. It also expands upon new chemical

precursors available to materials scientists, the applications of those materials, and existing or emerging topics where materials chemistry plays an important role, such as in microelectronics, surface science, and nanotechnology. This edition places additional emphasis on additives, characterization techniques and structure-property relationships, and materials classifications based on type and applications, including electronics, biomaterials, thin films, and coatings. Other new topics include combinatorial chemistry, nanostructures and technology, surface materials chemistry, biomimetic processing, and novel forms of carbon. The authors discuss the role of materials chemistry in micro- and nano-fabrication, self-assembly, scanning probe microscopy, and carbon fullerenes. The new edition adds forty black and white figures, over 200 new definitions, and 50% more new chemical precursors and their properties. With a new and improved reference format, Inorganic Materials Chemistry Desk Reference continues to be a constructive resource to specialists conducting research in materials chemistry.

A comprehensive introduction to inorganic chemistry and, specifically, the science of metal-based drugs, *Essentials of Inorganic Chemistry* describes the basics of inorganic chemistry, including organometallic chemistry and radiochemistry, from a pharmaceutical perspective. Written for students of pharmacy and pharmacology, pharmaceutical sciences, medicinal chemistry and other health-care related subjects, this accessible text introduces chemical principles with relevant pharmaceutical examples rather than as stand-alone concepts, allowing students to see the relevance of this subject for their future professions. It includes exercises and case studies. 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

Organic and inorganic chemistry are sub-disciplines of chemistry that study organic and inorganic compounds respectively. Organic chemistry studies the structure, properties and reactions of organic compounds. Such compounds contain carbon in covalent bonding. It is important to study their structure to determine their chemical composition and formula. This branch of chemistry studies the physical and chemical properties of organic compounds and evaluates their chemical reactivity to understand their behavior. Inorganic chemistry focuses on the synthesis and behavior of inorganic and organometallic compounds. Inorganic compounds are derived from nature as minerals. This book is a valuable compilation of topics, ranging from the basic to the most complex theories and principles in the field of organic and inorganic chemistry. Some of the diverse topics covered in this book address the varied branches that fall under this

category. It will provide comprehensive knowledge to the readers. While the boundaries between the areas of chemistry traditionally labeled as inorganic, organic and physical are gradually diffusing, the practical techniques adopted by workers in each of these areas are often radically different. The breadth and variety of research classed as "inorganic chemistry" is readily apparent from an inspection of some of the leading international journals, and can be quite daunting for newcomers to this domain who are likely to have only limited experience of the methodologies involved. This book has therefore been written to provide guidance for those unfamiliar with the techniques most often encountered in synthetic inorganic / metalorganic chemistry, with an emphasis on procedures for handling air-sensitive compounds. One chapter is devoted to more specialized techniques such as metal vapor synthesis, and a review of preparative methods for a selection of starting materials is included as an aid to those planning research projects. While this book is aimed primarily at postgraduate and advanced undergraduate students involved in inorganic research projects, synthetic organic chemists and industrial chemists will also find much useful information within its pages. Similarly, it serves as a useful reference source for materials and polymer scientists who wish to take advantage of recent progress in precursor synthesis and catalyst development.

Molybdenum is an element with an extremely rich and interesting chemistry having very versatile applications in various fields of human activity. It is used extensively in metallurgical applications. Because of their anti-wear properties, molybdenum compounds find wide applications as lubricants - particularly in extreme or hostile environmental situations. Many molybdates and heteropolymolybdates are white and therefore used as pigments. In addition, they are non-toxic and act as efficient corrosion inhibitors and smoke suppressants. Hydroprocessing of petroleum is one of the largest industries employing heterogeneous catalysts. Molybdenum catalysts have shown great promise in the liquefaction of coal and this may develop into one of its most important catalytic uses. The use of molybdenum compounds in homogeneous catalysis is also significant. Three important classes of molybdenum compounds in the solid state are reviewed, viz., oxides, sulphides and halides. The role of molybdenum in inorganic catalysis and enzymes receives prominent mention because of their impact on the progress of science and technology. Further biochemical and enzymic factors are discussed in separate chapters and their reaction to agriculture and animal husbandry. A new classification of covalent compounds which abandons the traditional oxidation state concept allows a powerful approach to the organisation of the complex and rich chemistry of molybdenum. Dramatic colour diagrams of abundances of molybdenum compounds provide broad insights into the important features and trends in the chemistry of molybdenum including reactivity and mechanism. The book is intended for use mainly as a research monograph by the many workers who may encounter molybdenum chemistry or who are looking for its application

and potential uses in different technological fields. However, it will also serve as an advanced text for university lecturers and postgraduate students interested in inorganic, physical and industrial chemistry, chemical technology or biochemistry and biotechnology. *Advances in Inorganic Chemistry, Volume 79*, the latest release in an esteemed series that highlights new advances in the field of inorganic chemistry, presents new and interesting topics authored by an international field of experts. Provides the authority and expertise of leading contributors from an international board of authors Presents the latest release in the *Advances in Inorganic Chemistry* series This book provides an up-to-date survey of modern industrial inorganic chemistry in a clear and concise manner. Production processes are described in close detail, aspects such as the disposition of raw materials and energy consumption, the economic significance of the product and technical applications, as well as ecological problems, being discussed. From reviews of the previous edition: '... Overall this is an extremely useful, authoritative reference book dealing with a topic in which it is often difficult to obtain up-to-date information. ...' *Chemistry and Industry* 'One of few texts available that concisely describes the current state of industrial inorganic chemistry. ...' *The New York Public Library* '... and as for modern uses of inorganic chemistry, I'd recommend this book as a welcome addition to any professional library...' *Chemtech* 'This book fills an important niche in its sector. Industrial scientists and engineers, academics, and students can be recommended to turn to it with reasonable confidence that the most important areas are described. ...' *Endeavour* '... it fills a currently existing gap in the market.' *Journal of Chemical Technology and Biotechnology* The fifth edition of this widely acclaimed work has been reissued as part of the *Oxford Classic Texts* series. The book includes a clear exposition of general topics concerning the structures of solids, and a systematic description of the structural chemistry of elements and their compounds. The book is divided into two parts. Part I deals with a number of general topics, including the properties of polyhedra, the nature and symmetry of repeating patterns, and the ways in which spheres, of the same or different sizes, can be packed together. In Part II the structural chemistry of the elements is described systematically, arranged according to the groups of the Periodic Table. The chemical compounds which lack carbon-hydrogen bond are known as inorganic compounds. Inorganic chemistry is a branch of chemistry that focuses on the study of the behavior and synthesis of inorganic compounds. Inorganic chemistry is broadly divided into a few major sub-fields which are involved in studying different aspects of inorganic compounds. Some of these sub-fields are descriptive inorganic chemistry, theoretical inorganic chemistry and mechanistic inorganic chemistry. It is utilized in diverse industries such as materials science, surfactants, medications, fuels, pigments and agriculture. This book is a valuable compilation of topics, ranging from the basic to the most complex theories and principles in the field of inorganic chemistry. Some of the diverse

topics covered herein address the varied branches that fall under this category. For all those who are interested in inorganic chemistry, this textbook can prove to be an essential guide. Market_Desc: · Primary and one semester Inorganic course taught at Junior and Senior level Special Features: · Concepts/models as organizing principle· New definitive chapters on group theory · Significant coverage of solid state· McDaniel and Douglas are well-known researchers About The Book: This text has a physical orientation, but thorough treatment of inorganic solids. It has a current/fresh approach to mechanisms of reactions. Bonding is offered on 2 levels: 1- using group theory, 2- more qualitative approach. It also covers bio-inorganic chemistry. Inorganic Chemistry provides essential information in the major areas of inorganic chemistry. The author emphasizes fundamental principles—including molecular structure, acid-base chemistry, coordination chemistry, ligand field theory, and solid state chemistry — and presents topics in a clear, concise manner. Concise coverage maximizes student understanding and minimizes the inclusion of details students are unlikely to use. The discussion of elements begins with survey chapters focused on the main groups, while later chapters cover the elements in greater detail. Each chapter opens with narrative introductions and includes figures, tables, and end-of-chapter problem sets. This text is ideal for advanced undergraduate and graduate-level students enrolled in the inorganic chemistry course. The text may also be suitable for biochemistry, medicinal chemistry, and other professionals who wish to learn more about this subject are. Concise coverage maximizes student understanding and minimizes the inclusion of details students are unlikely to use. Discussion of elements begins with survey chapters focused on the main groups, while later chapters cover the elements in greater detail. Each chapter opens with narrative introductions and includes figures, tables, and end-of-chapter problem sets. This unique text is ingeniously organized by class of compound and by property or reaction type, not group by group or element by element (which requires students to memorize isolated facts). This text is intended to provide students with instruction and valuable laboratory experience in the often neglected area of inorganic chemistry. Divided into four main parts, the book covers chemistry of the main group elements, chemistry of the transition metals, organometallic chemistry, and bioinorganic chemistry. Recognizing the high cost of materials, difficulties in waste disposal, and dangers of toxicity, the authors have adopted a "microscale" approach to experiments in the book, thereby also reducing the time students spend in preparation. With over 45 experiments, Microscale Inorganic Chemistry incorporates the use of a broad sampling of elements and also covers such topics as laboratory safety, equipment, report writing, and literature searching. Both elementary inorganic reaction chemistry and more advanced inorganic theories are presented in this one textbook, while showing the relationships between the two. 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 Metallocarboranes 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 updated edition of the Handbook of Inorganic Compounds is the perfect reference for anyone that needs property data for compounds, CASRN numbers for computer or other searches, a consistent tabulation of molecular weights to synthesize inorganic materials on a laboratory scale, or data related to physical and chemical properties. Fully revised The book reviews the use of spectroscopic and related methods to investigate the complex structures and mechanisms of biological inorganic systems that contain metals. Each chapter presents an overview of the technique including relevant theory, clearly explains what it is and how it works and then presents how the technique is actually used to evaluate biological structures. Practical examples and problems are included to illustrate each technique and to aid understanding. Designed for students and researchers who want to learn both the basics, and more advanced aspects of bioinorganic chemistry. Many colour illustrations enable easier visualization of molecular mechanisms and structures Worked examples and problems are included to illustrate and test the reader's understanding of each technique Written by a multi-author team who use and teach the most important techniques used today to analyse complex biological structures Synthetic Inorganic Chemistry: New Perspectives presents summaries of the work of some of the most creative researchers in the field. The book highlights the most novel approaches and burgeoning applications of synthetic inorganic chemistry in development. Topics include non-precious metals in catalysis, smart inorganic polymers, new inorganic therapeutics, new photocatalysts for hydrogen production, and

more. As the first volume in the Developments in Inorganic Chemistry series, this work is a valuable resource for students and researchers working in inorganic chemistry and material science. Illustrates the scope and vitality of modern synthetic inorganic chemistry Shows the centrality of inorganic chemistry, addressing a variety of global challenges Serves to define the current, important and expanding roles of synthetic inorganic chemistry in interdisciplinary areas such as materials science, synthetic organic chemistry, homogeneous and heterogeneous catalysis Aimed at senior undergraduates and first-year graduate students, this book offers a principles-based approach to inorganic chemistry that, unlike other texts, uses chemical applications of group theory and molecular orbital theory throughout as an underlying framework. This highly physical approach allows students to derive the greatest benefit of topics such as molecular orbital acid-base theory, band theory of solids, and inorganic photochemistry, to name a few. Takes a principles-based, group and molecular orbital theory approach to inorganic chemistry The first inorganic chemistry textbook to provide a thorough treatment of group theory, a topic usually relegated to only one or two chapters of texts, giving it only a cursory overview Covers atomic and molecular term symbols, symmetry coordinates in vibrational spectroscopy using the projection operator method, polyatomic MO theory, band theory, and Tanabe-Sugano diagrams Includes a heavy dose of group theory in the primary inorganic textbook, most of the pedagogical benefits of integration and reinforcement of this material in the treatment of other topics, such as frontier MO acid-base theory, band theory of solids, inorganic photochemistry, the Jahn-Teller effect, and Wade's rules are fully realized Very physical in nature compare to other textbooks in the field, taking the time to go through mathematical derivations and to compare and contrast different theories of bonding in order to allow for a more rigorous treatment of their application to molecular structure, bonding, and spectroscopy Informal and engaging writing style; worked examples throughout the text; unanswered problems in every chapter; contains a generous use of informative, colorful illustrations This go-to text provides information and insight into physical inorganic chemistry essential to our understanding of chemical reactions on the molecular level. One of the only books in the field of inorganic physical chemistry with an emphasis on mechanisms, it features contributors at the forefront of research in their particular fields. This essential text discusses the latest developments in a number of topics currently among the most debated and researched in the world of chemistry, related to the future of solar energy, hydrogen energy, biorenewables, catalysis, environment, atmosphere, and human health. The 'Red Book' is the definitive guide for scientists requiring internationally approved inorganic nomenclature in a legal or regulatory environment. The bond valence model is a recently developed model of the chemical bond in inorganic chemistry that complements the bond model widely used in organic chemistry. It is simple, quantitative, intuitive, and predictive - no

more than a pocket calculator is needed to calculate it. This book focuses on the theory that underlies the model, and shows how it has been used in physics, materials science, chemistry, mineralogy, soil science, and molecular biology.

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