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Crystal Structure of Hard Steel Apr 04 2020

Crystal Structure Analysis for Chemists and Biologists Aug 21 2021 This volume contains many examples of how crystallography is important to chemistry and biochemistry. It explains the results of X-ray diffraction analysis, placing it in context with other methods of structural analysis, such as solution studies and molecular modelling.

Theories and Techniques of Crystal Structure Determination Feb 24 2022 The book is a detailed but concise exposition of crystal structure determination at a graduate level. Discussions range from geometrical principles of crystallography, through relevant experimental methods, to techniques of reliable and accurate determination of crystal structures.

Crystal Structure Analysis Sep 21 2021 The purpose of this book is to explain why molecular structure can be determined by single-crystal diffraction of X rays. It is not an account of the practical procedural details, but rather an account of the underlying physical principles, and the kinds of experiments and methods of handling the experimental data that are used.

Crystal Structures Dec 25 2021 This classic text is devoted to describing crystal structures, especially periodic structures, and their symmetries. Updated material prepared by author enhances presentation, which can serve as text or reference. 1996 edition.

Crystallography Jan 14 2021 A long history -- Symmetry -- Crystal structures -- Diffraction -- Seeing atoms -- Sources of radiation

Crystal Structure Sep 09 2020

The Crystal Structure of Solids Sep 29 2019

X Rays and Crystal Structure May 30 2022

Crystal Structures: The structure of benzene derivatives Feb 01 2020

Crystal Structure and Morphology Mar 04 2020 Crystal Structure and Morphology

The Importance of Pi-Interactions in Crystal Engineering Nov 23 2021 Crystal engineers aim to control the way molecules aggregate in the crystalline phase and are therefore concerned with crystal structure prediction, polymorphism, and discovering the relative importance of different types of intermolecular forces and their influence on molecular structure. In order to design crystal structures, knowledge of the types, strengths, and nature of possible intermolecular interactions is essential. Non-covalent interactions involving p-systems is a theme that is under extensive investigation as these interactions can be inductors for the assembly of a vast array of supramolecular architectures. The Importance of Pi-Interactions in Crystal Engineeringcovers topics ranging from the identification of interactions involving p-systems, their impact on molecular and crystal structure in both organic and metallorganic systems, and how these interactions might be exploited in the design of new materials. Specialist reviews are written by internationally recognized researchers drawn from both academia and industry. The Importance of Pi-Interactions in Crystal Engineeringprovides an essential overview of this important aspect of crystal engineering for both entrants to the field as well as established practitioners, and for those working in crystallography, medicinal and pharmaceutical sciences, solid-state chemistry, physical chemistry, materials and nanotechnology

X Rays and Crystal Structure Mar 28 2022

Crystal Structures Nov 11 2020

Crystals and Crystal Structures Jan 06 2023 Crystals and Crystal Structures is an introductorytext for students and others who need to understand the subjectwithout necessarily becoming crystallographers. Using the book willenable students to read scientific papers and articles describing acrystal structure or use crystallographic databases with confidenceand understanding. Reflecting the interdisciplinary nature of the subject the bookincludes a variety of applications as diverse as the relationshipbetween physical properties and symmetry, and molecular and proteincrystallography. As well as covering the basics the book containsan introduction to areas of crystallography, such as modulatedstructures and quasicrystals, and protein crystallography, whichare the subject of important and activeresearch. A non-mathematical introduction to the key elements of thesubject Contains numerous applications across a variety ofdisciplines Includes a range of problems and exercises Clear, direct writing style "…the book contains a wealth of information and itfulfils its purpose of providing an interesting and broadintroduction to the terpenes." CHEMISTRY WORLD, February2007

Crystals and Crystal Structures Aug 01 2022 Crystals and Crystal Structures is an introductory text for students and others who need to understand the subject without necessarily becoming crystallographers. Using the book will enable students to read scientific papers and articles describing a crystal structure or use crystallographic databases with confidence and understanding. Reflecting the interdisciplinary nature of the subject the book includes a variety of applications as diverse as the relationship between physical properties and symmetry, and molecular and protein crystallography. As well as covering the basics the book contains an introduction to areas of crystallography, such as modulated structures and quasicrystals, and protein crystallography, which are the subject of important and active research. A non-mathematical introduction to the key elements of the subject Contains numerous applications across a variety of disciplines Includes a range of problems and exercises Clear, direct writing style "…the book contains a wealth of information and it fulfils its purpose of providing an interesting and broad introduction to the terpenes." CHEMISTRY WORLD, February 2007

Modern Methods of Crystal Structure Prediction Jun 18 2021 Gathering leading specialists in the field of structure prediction, this book provides a unique view of this complex and rapidly developing field, reflecting the numerous viewpoints of the different authors. A summary of the major achievements over the last few years and of the challenges still remaining makes this monograph very timely.

Novel Microstructures for Solids Apr 28 2022 For many years, evidence suggested that all solid materials either possessed a periodic crystal structure as proposed by the Braggs or they were amorphous glasses with no long-range order. In the 1970s, Roger Penrose hypothesized structures (Penrose tilings) with long-range order which were not periodic. The existence of a solid phase, known as a quasicrystal, that possessed the structure of a three dimensional Penrose tiling, was demonstrated experimentally in 1984 by Dan Shechtman and colleagues. Shechtman received the 2011 Nobel Prize in Chemistry for his discovery. The discovery and description of quasicrystalline materials provided the first concrete evidence that traditional crystals could be viewed as a subset of a more general category of ordered materials. This book introduces the diversity of structures that are now known to exist in solids through a consideration of quasicrystals (Part I) and the various structures of elemental carbon (Part II) and through an analysis of their relationship to conventional crystal structures. Both quasicrystals and the various allotropes of carbon are excellent examples of how our understanding of the microstructure of solids has progressed over the years beyond the concepts of traditional crystallography.

Crystal Structure Determination Nov 04 2022 This textbook gives a concise introduction to modern crystal structure determination, emphasising both its theoretical background and the way it is actually carried out. The theoretical sections are supported by many illustrations, and lay emphasis on a good understanding rather than rigorous mathematics. The most important data collection techniques, and the methods of data reduction, structure solution and refinement are discussed

from a practical point of view. Many tips and insights help readers to recognise and avoid possible errors and traps, and to judge the quality of results. The second edition has been considerably updated, especially the chapter on experimental methods, which is now mainly concerned with modern data collection using area-detectors.

Crystal Structures Oct 03 2022 This survey of the important types of inorganic and organic crystal structures treats its subject thoroughly and in sufficient depth for undergraduate modules in chemistry courses. Features of this book are the instructions for 3D stereoviewing which is central to a full appreciation of the presentation. Clear directions for making your own stereo have been provided in the book, which enables readers to examine the plentiful stereo of lattices and crystal structures which are illustrated. The introductory chapter explains point-group and space-group symmetry insofar as required to understand lattices and crystal structures. Crystal structures are sub-divided according to the atomic force mainly responsible for cohesion in the solid state, The descriptions of the structures are gi in crystallographic terms, including data on the space group, molecular symmetry and molecular geometry. Discussions of bonding theory for each sub-division of the structures enhance and strengthen the author's presentation. The book stems from the author's successful lecture courses, tested and refined in class teaching. It draws as necessary on equilibrium thermodynamics and other chemical topics, with avoidance of advanced mathematics, A level being the prerequisite. Examines the important types of inorganic and organic crystal structures Includes instructions for making simple stereoviewers and computer programs Draws, as necessary, on equilibrium thermodynamics and other chemical topics, with avoidance of advanced mathematics

Structure and Bonding in crystals Mar 16 2021 Structure and Bonding in Crystals presents a new understanding of the older topics such as bond length, bond strength, and ionic radii. These concepts have been used by geochemists and geophysicists to systematize and predict phase transitions at high pressure. The final group of chapters deals with the problems of classifying complex solids and with systematic descriptions of the relationships between their structures. This book comprises 13 chapters, with the first presenting a historical perspective by Linus Pauling. The following chapters then go on to discuss quantum theory and crystal chemistry; pseudopotentials and crystal structure; quantum-defect orbital radii and the structural chemistry of simple solids; and a pseudopotential viewpoint of the electronic and structural properties of crystals. Other chapters cover elementary quantitative theory of chemical bonding; the role and significance of empirical and semiempirical correlations; theoretical probes of bonding in the disiloxy group; a comparison of experimental and theoretical bond length and angle variations; the role of nonbonded forces in crystals; molecules within infinite solids; charge density distributions; and some aspects of the ionic model of crystals. This book will be of interest to practitioners in the fields of chemistry, physics, and geology.

Melting and Crystal Structure Jan 26 2022 "... approach to the study of liquids through the crystalline state of matter and through consideration of what can happen to it on melting ..." -- Pref.

Magnetism: Spin arrangements and crystal structure, domains, and micromagnetics Dec 01 2019

Bibliography of Crystal Structure Jan 02 2020

Crystal Structure Refinement Dec 05 2022 Accompanying CD-ROM contains all the files necessary to reproduce the refinements covered in the text.

Science of Crystal Structures Sep 02 2022 A volume which includes entries on quasicrystals, icosahedral packing, other packing considerations, extended structures, data treatment and data mining is presented by luminaries from the crystallography community. Several of the contributions are from the schools of such trend-setting crystallographers as J. Desmond Bernal and Aleksandr I. Kitaigorodskii. Internationally renowned scientists contributed such as Tom L. Blundell, Johann Jacob Burckhardt, John L. Finney, Jenny P. Glusker, Nobel laureate Herbert A. Hauptman, the 2014 Ewald-Prize winner A. Janner, Aminoff-Prize winner Isabella Karle, Nobel laureate Jerome Karle, Buckley-Prize winner Alan L. Mackay, Ewald-Prize winner David Sayre, Vladimir Shevchenko, and J. Fraser Stoddart. A few frontier topics dominate the selected material. Pioneers of the direct methods describe the phase problem and how it was solved, including the mathematical approach and the utilization of experience with gas-phase electron diffraction. The reviews by Herbert Hauptman, Jerome and Isabella Karle, and David Sayre reach to the present day in assessing the possibilities of X-ray crystallography. Another focus topic is the investigation of systems that are outside the so-called classical system of crystals. They include quasicrystals, imperfect and very small crystals, supramolecular species, crystal structures without lattice, clusters, nanomaterials among others. Application of synchrotron and cryoprotection techniques, the free-electron laser flash technique and others are mentioned in addition to X-ray crystallography. The relationship between structural and materials properties are examined and uncovered. The broader topics of the so-called generalized crystallography include polymers, clusters, polydisperse chain assemblies, and giant icosahedral fullerenes. There are some key contributions related to the structural investigation of biological macromolecules.

Crystal Structure Communications Jun 06 2020

Molecular and Crystal Structure Models Oct 11 2020

Spin Arrangements and Crystal Structure, Domains, and Micromagnetics Dec 13 2020 Spin Arrangements and Crystal Structure, Domains, and Micromagnetics deals with cooperative phenomena characterized by ordered arrangements of magnetic moments subject to strong mutual interactions. The emphasis is on the ferromagnetism, ferrimagnetism, and antiferromagnetism of magnetically ordered materials such as insulators and metals. Both theoretical and experimental points of view are presented. Comprised of 12 chapters, this volume begins with an introduction to magnetism and crystal structure in nonmetals, followed by an evaluation of exchange interactions from experimental data. Subsequent chapters focus on the theory of neutron scattering by magnetic crystals; spin configuration of ionic structures; spin arrangements in metals; and permanent magnet materials. Fine particles, thin films, and exchange anisotropy are also considered, with particular reference to the effects of finite dimensions and interfaces on the basic properties of ferromagnets. The book also examines micromagnetics; domains and domain walls; the structure and switching of permalloy films; magnetization reversal in nonmetallic ferromagnets; and preparation and crystal synthesis of magnetic oxides. This book will be a useful resource for professionals and students with physics or chemistry backgrounds.

Crystal Structure Determination Jul 20 2021 The central theme of this monograph is that the cosine seminvariants are the key to crystal structures. The cosine seminvariants are the cosines of those linear combinations of the phases (the so-called structure seminvariants) whose values, for a given functional form for the geometric structure factor, are uniquely determined by the crystal structure alone and are there fore independent of the choice of permissible origin. It follows that the cosine seminvariants themselves are uniquely determined, in general, by the observed magnitudes of the normalized structure factors. The values of the cosine seminvariants in turn lead unambiguously to the values of the individual phases and thus to the crystal structure by means of the E-map (Fourier synthesis). It is this property of the cosine seminvariants, that they serve to link the observed magnitudes with the desired phases of the normalized structure factors, which accounts for their importance and explains the emphasis which is here placed on their role.

Crystal Structure Analysis Feb 12 2021 This text focuses on the practical aspects of crystal structure analysis and provides the necessary conceptual framework for understanding and applying the technique. Many worked examples, problems with answers, and illustrations are included throughout to reinforce the material presented. Significantly updated from the first edition.

Crystallography and Crystal Defects Oct 23 2021 Crystallography and Crystal Defects Revised Edition A. Kelly, Churchill College, Cambridge, UK G. W. Groves, Exeter College, Oxford, UK and P. Kidd, Queen Mary and Westfield College, University of London, UK The concepts of crystallography are introduced here in such a way that the physical properties of crystals, including their mechanical behaviour, can be better understood and quantified. A unique approach to the treatment of crystals and their defects is taken in that the often separate disciplines of crystallography, tensor analysis, elasticity and dislocation theory are combined in such a way as to equip materials scientists with knowledge of all the basic principles required to interpret data from their experiments. This is a revised and updated version of the widely acclaimed book by Kelly and Groves that was first published nearly thirty years ago. The material remains timely and relevant and the first edition still holds an unrivalled position at the core of the teaching of crystallography and crystal defects today. Undergraduate readers will acquire a rigorous grounding, from first principles, in the crystal classes and the concept of a lattice and its defects and their descriptions using vectors. Researchers will find here all the theorems of crystal structure upon which to base their work and the equations necessary for calculating interplanar spacings, transformation of indices and manipulations involving the stereographic projection and transformations of tensors and matrices.

Modern Crystallography 2 May 06 2020 The four-volume treatment Modern Crystallography presents an encyclopaedic exposition of problems concerning the structure of crystals, their growth and their properties. Structure of Crystals deals with crystal structures in inorganic and organic compounds, polymers, liquid crystals, biological crystals and macromolecules.

A Study of Crystal Structure and Its Applications Jul 08 2020

Physical Properties and Crystal Structure of Polonium ... May 18 2021

The Preparation, Properties, and Crystal Structure Determination by X-ray Diffraction Analysis of Selenium Dithiocyanate Aug 28 2019

Elements of Structures and Defects of Crystalline Materials Oct 30 2019 Elements of Structures and Defects of Crystalline Materials has been written to cover not only the fundamental principles behind structures and defects, but also to provide deep insights into understanding the relationships of properties, defect chemistry

and processing of the concerned materials. Part One deals with structures, while Part Two covers defects. Since the knowledge of the electron configuration of elements is necessary for understanding the nature of chemical bonding, it is discussed in the opening chapter. Chapter Two then describes the bonding formation within the crystal structures of varied materials, with Chapter Three delving into how a material's structure is formed. In view of the importance of the effects of the structure distortion on the material properties due to the fields, the related topics have been included in section 3.4. Moreover, several materials still under intensive investigation have been illustrated to provide deep insights into understanding the effects of the relationships of processing, structures and defects on the material properties. The defects of materials are explored in Part II. Chapter 4 deals with the point defects of metal and ceramics. Chapter 5 covers the fundamentals of the characteristics of dislocations, wherein physics and the atomic mechanics of several issues have been described in detail. In view of the significant influence of the morphologies including size, shape and distribution of grains, phases on the microstructure evolution, and, in turn, the properties of materials, the final chapter focuses on the fundamentals of interface energies, including single phase (grain) boundary and interphase boundary. Discusses the relationship between properties, defect chemistry and the processing of materials Presents coverage of the fundamental principles behind structures and defects Includes information on two-dimensional and three-dimensional imperfections in solids

Crystals and Crystal Structures Jun 30 2022 An authoritative, updated text that offers an introduction to crystals and crystal structure with coverage of crystallography, and microscopy of materials Written in a friendly, non-mathematical style, the updated second edition of Crystals and Crystal Structures offers a comprehensive exploration of the key elements of crystals and crystal structures. Starting with the basics, it includes information on multiple areas of crystallography, including modulated structures, quasicrystals and protein crystallography, and interdisciplinary applications as diverse as the relationship between physical properties and symmetry. To enhance comprehension of the material presented, the book contains a variety of problems and exercises. The revised second edition offers new material and updates in the field including: An introduction to the use of high intensity X-ray analysis of protein structures Advances in imaging, scanning electron microscopy, and cryo-electron microscopy The relationship between symmetry and physical properties highlighting new findings and an introduction to tensor notation in describing these relationships in a concise fashion Nanoparticles as well as crystallographic aspects, defects, surface defects and the impact of these crystallographic features on properties Perovskite structures and their variations and the inclusion of their wide-ranging properties Written for students ofcrystallography, chemistry, physics, materials science, biosciences and geology, Crystals and Crystal Structures, Second Edition provides an understanding of the subject and enables students to read scientific papers and articles describing a crystal structure or use crystallographic databases.

Prediction and Calculation of Crystal Structures Apr 16 2021 The series Topics in Current Chemistry presents critical reviews of the present and future trends in modern chemical research. The scope of coverage is all areas of chemical science including the interfaces with related disciplines such as biology, medicine and materials science. The goal of each thematic volume is to give the non-specialist reader, whether in academia or industry, a comprehensive insight into an area where new research is emerging which is of interest to a larger scientific audience. Each review within the volume critically surveys one aspect of that topic and places it within the context of the volume as a whole. The most significant developments of the last 5 to 10 years are presented using selected examples to illustrate the principles discussed. The coverage is not intended to be an exhaustive summary of the field or include large quantities of data, but should rather be conceptual, concentrating on the methodological thinking that will allow the non-specialist reader to understand the information presented. Contributions also offer an outlook on potential future developments in the field. Review articles for the individual volumes are invited by the volume editors. Readership: research chemists at universities or in industry, graduate students.

Symmetry Relationships Between Crystal Structures Aug 09 2020 The book presents the basic information needed to understand and to organize the huge amount of known structures of crystalline solids. Its basis is crystallographic group theory (space group theory), with special emphasis on the relations between the symmetry properties of crystals.