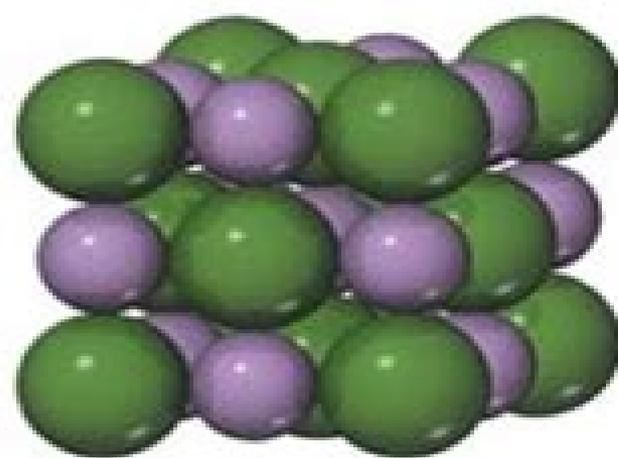


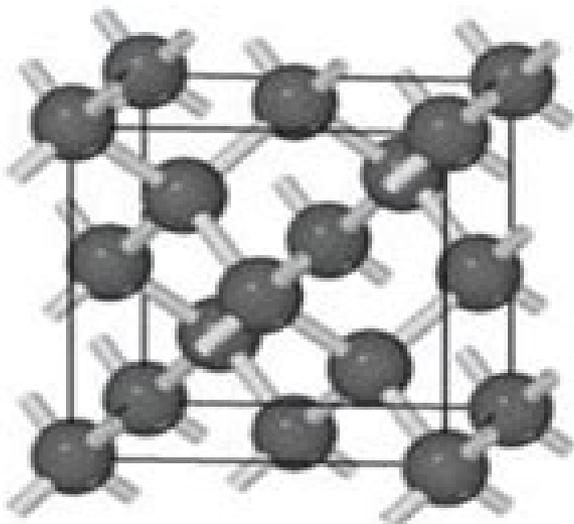
Metallic solids

Extended networks of atoms held together by metallic bonding (Cu, Fe)



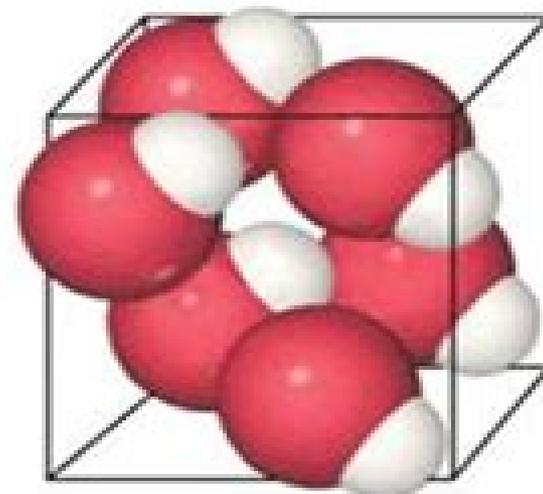
Ionic solids

Extended networks of ions held together by ion-ion interactions (NaCl, MgO)



Covalent-network solids

Extended networks of atoms held together by covalent bonds (C, Si)



Molecular solids

Discrete molecules held together by intermolecular forces (HBr, H₂O)

Chemistry Of Solids

Michael Seilmaier



Chemistry Of Solids:

The Chemical Structure of Solids N. Hannay, 2012-04-24 The last quarter century has been marked by the extremely rapid growth of the solid state sciences They include what is now the largest subfield of physics and the materials engineering sciences have likewise flourished And playing an active role throughout this vast area of science and engineering have been very large numbers of chemists Yet even though the role of chemistry in the solid state sciences has been a vital one and the solid state sciences have in turn made enormous contributions to chemical thought solid state chemistry has not been recognized by the general body of chemists as a major subfield of chemistry Solid state chemistry is not even well defined as to content Some for example would have it include only the quantum chemistry of solids and would reject thermodynamics and phase equilibria this is nonsense Solid state chemistry has many facets and one of the purposes of this Treatise is to help define the field Perhaps the most general characteristic of solid state chemistry and one which helps differentiate it from solid state physics is its focus on the chemical composition and atomic configuration of real solids and on the relationship of composition and structure to the chemical and physical properties of the solid Real solids are usually extremely complex and exhibit almost infinite variety in their compositional and structural features

The Physics and Chemistry of Solids Stephen Elliott, 1998-09-16 Taking an original imaginative approach to the subject Stephen Elliott's book is one of the first to bridge the gap between solid state physics and chemistry Considerable thought has gone into the structure and content of this book with the first four chapters covering the properties of atoms in solids and the remaining four concentrating on the behaviour of electrons in materials Fundamental principles are covered together with the very latest developments such as combinatorial library synthesis mesoporous materials fullerenes and nanotubes optical localization and the experimental observation of fractional electronic charge Clearly written and richly illustrated The Physics and Chemistry of Solids will be of great interest to Physicists Chemists Material Scientists and Engineers

Chemistry of the Solid State William Edward Garner, 1955 **The Physical Chemistry of Solids** Richard John Borg, George Julian Dienes, 1992 Principles of Solid State Chemistry Petr Petrovich Budnikov, Arkadii Mikhaïlovich Ginstling, 1968 *Treatise on solid state chemistry : the chemical structure of solids* Norman Bruce Hannay, **Treatise on Solid State Chemistry** N. Hannay, 2012-12-06 The last quarter century has been marked by the extremely rapid growth of the solid state sciences They include what is now the largest subfield of physics and the materials engineering sciences have likewise flourished And playing an active role throughout this vast area of science and engineering have been very large numbers of chemists Yet even though the role of chemistry in the solid state sciences has been a vital one and the solid state sciences have in turn made enormous contributions to chemical thought solid state chemistry has not been recognized by the general body of chemists as a major subfield of chemistry Solid state chemistry is not even well defined as to content Some for example would have it include only the quantum chemistry of solids and would reject thermodynamics and phase

equilibria this is nonsense Solid state chemistry has many facets and one of the purposes of this Treatise is to help define the field Perhaps the most general characteristic of solid state chemistry and one which helps differentiate it from solid state physics is its focus on the chemical composition and atomic configuration of real solids and on the relationship of composition and structure to the chemical and physical properties of the solid Real solids are usually extremely complex and exhibit almost infinite variety in their compositional and structural features

Reactions and Characterization of Solids Sandra E. Dann, 2000 The last twenty years or so has seen a change in the perception of solid state chemistry in particular the scientific significance of understanding the relationship between chemical structure and physical properties As such it now forms an important part of both mainstream chemistry and material science degrees Reactions and Characterization of Solids is designed as an introductory text with plenty of illustrative examples to reinforce the essentials of the topic In the first few chapters the fundamental principles of elementary crystal chemistry are introduced together with the principles of both preparing and characterizing materials in the solid state Some elementary thermodynamics are also included at this stage to introduce the idea of bond strength as a method of determining and predicting compound stability General physical properties such as electronic and magnetic behaviour are discussed together with specific topics relating to solid state materials such as non stoichiometry Furthermore several solid state materials are described in detail relating the fundamental properties and structural behaviour covered throughout the book to real systems and working materials Ideal for the needs of undergraduate chemistry students

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Solid State Chemistry and Its Applications Anthony R. West, 1991-01-08 The first broad account offering a non mathematical unified treatment of solid state chemistry Describes synthetic methods X ray diffraction principles of inorganic crystal structures crystal chemistry and bonding in solids phase diagrams of 1 2 and 3 component systems the electrical magnetic and optical properties of solids three groups of industrially important inorganic solids glass cement and refractories and certain aspects of organic solid state chemistry including the organic metal of new materials

Physical Chemistry Of Solids: Basic Principles Of Symmetry And Stability Of Crystalline Solids Fritz Franzen, 1994-01-19 This book is about the underlying principles of symmetry thermodynamics and electronic structure that pertain to crystalline solids After years of teaching graduate students in the areas covered the author has a good idea of what major notions of group theory and thermodynamics are useful to students of solid state chemistry and of what fundamental concepts are necessary for a clear understanding Thus the book deals with lattice symmetry space groups reciprocal space Landau theory X ray diffraction heterogeneous equilibria and simple band theory in a rigorous and thorough treatment

THE SURFACE CHEMISTRY OF SOLIDS S.J. GREGG, 1961 Solid State Chemistry Bernadett Kent, 2021-11-16 Solid

state chemistry refers to the study of structure properties and synthesis of solid materials It focuses on the making and characterization of the constituent particles of novel materials Solids are divided into two categories based on the arrangement of their particles and the nature of order present These categories are crystalline and amorphous solids A wide variety of techniques are used to study these properties of solids Some of these are oven techniques like gas reaction melt methods and solution methods along with chemie douce The field primarily overlaps with other areas such as thermodynamics crystallography solid state physics ceramics material science and electronics This book is a valuable compilation of topics ranging from the basic to the most complex theories and principles related to this discipline It studies analyzes and upholds the pillars of solid state chemistry and its utmost significance in modern times For someone with an interest and eye for detail this book covers the most significant topics of solid state chemistry

Chemical Bonding in Solids Jeremy K. Burdett, 1995 Chemical Bonding in Solids examines how atoms in solids are bound together and how this determines the structure and properties of materials Over the years diverse concepts have come from many areas of chemistry physics and materials science but often these ideas have remained largely within the area where they originated One of the goals of this text is to bring some of these ideas together and show how a broader picture exists once some of the prejudices which isolate one area from another are removed This book will be ideal for students taking courses in solid state chemistry materials chemistry and solid state physics

Physical Chemistry of Solids H. F. Franzen, Hugo Friedrich Franzen, Cheuk-Yiu Ng, 1994 This book is about the underlying principles of symmetry thermodynamics and electronic structure that pertain to crystalline solids After years of teaching graduate students in the areas covered the author has a good idea of what major notions of group theory and thermodynamics are useful to students of solid state chemistry and of what fundamental concepts are necessary for a clear understanding Thus the book deals with lattice symmetry space groups reciprocal space Landau theory X ray diffraction heterogeneous equilibria and simple band theory in a rigorous and thorough treatment

Electrochemistry of Solids Hans Rickert, 2012-12-06 This book is the completely revised and extended version of the German edition Einführung in die Elektrochemie fester Stoffe which appeared in 1973 Since then the subject of the electro chemistry of solids has developed further and a large number of new solid electrolytes have been discovered With the help of solid electrolytes i e solid ionic conductors galvanic cells are constantly being built for thermodynamic or kinetic investigations and for technical applications Though the book takes these new developments into consideration its main aim is to provide an introduction to the electrochemistry of solids emphasizing the principles of the subject but not attempting to present a complete account of the existing literature The latter can be found in handbooks and specialists reports of conferences in this field these are referred to in the text This book is written for scientists and graduate students who require an approach that will familiarize them with this field It is assumed that the reader will be acquainted with the fundamentals of physical chemistry The various chapters have been written so that most of them can be read independently

of each other Parts which may be omitted during a first reading are printed in small type Of vital importance for the publication of this English edition have been the comments suggestions and the help of colleagues and co workers I would particularly like to express my thanks to Dr Holzapfel DI Lohmar Professor Mitchell Dr Principles of Solid State Chemistry P. P.. Budnikov,A. M.. Ginstling,1962 *Understanding Solids* Richard J. D. Tilley,2005-09-27 A modern introduction to the subject taking a unique integrated approach designed to appeal to both science and engineering students Covering a broad spectrum of topics this book includes numerous up to date examples of real materials with relevant applications and a modern treatment of key concepts The science bias allows this book to be equally accessible to engineers chemists and physicists Carefully structured into self contained bite sized chapters to enhance student understanding Questions have been designed to reinforce the concepts presented Includes coverage of radioactivity Relects a rapidly growing field from the science perspective *Treatise on Solid State Chemistry* N. Hannay,2012-12-06 The last quarter century has been marked by the extremely rapid growth of the solid state sciences They include what is now the largest subfield of physics and the materials engineering sciences have likewise flourished And playing an active role throughout this vast area of science and engineer ing have been very large numbers of chemists Yet even though the role of chemistry in the solid state sciences has been a vital one and the solid state sciences have in turn made enormous contributions to chemical thought solid state chemistry has not been recognized by the general body of chemists as a major subfield of chemistry Solid state chemistry is not even well defined as to content Some for example would have it include only the quantum chemistry of solids and would reject thermodynamics and phase equilibria this is nonsense Solid state chemistry has many facets and one of the purposes of this Treatise is to help define the field Perhaps the most general characteristic of solid state chemistry and one which helps differentiate it from solid state physics is its focus on the chemical composition and atomic configuration of real solids and on the relationship of composition and structure to the chemical and physical properties of the solid Real solids are usually extremely complex and exhibit almost infinite variety in their compositional and structural features

Principles of Solid State Chemistry P. P. Budnikov,1948* *Treatise on Solid State Chemistry* N. Hannay,2013-05-14

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