Physical Properties Of Crystals Their Representation By Tensors And Matrices Oxford Science Publications

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Physical Properties of Crystals: Their Presentation by Tensors and Matrices
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Physical Properties of Crystals
With a General Introduction to Their Physical Properties; Being Selected Parts of the Physical Crystallography
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Bent-Shaped Liquid Crystals
Liquid Crystals
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Concepts and Physical Properties Illustrated by Experiments
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Their Representation by Tensors and Matrices

An Introduction to Composite Materials
Physical Properties of Liquid Crystals
Aperiodic Crystals
Nematic and Cholesteric Liquid Crystals

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Physical Properties of Crystals Palala Press
The demand for liquid crystals with better display parameters and lower power consumption has stimulated much research into their properties and characterization. A large team of over 50 leading researchers from the USA, Europe and Japan have focused their expertise to extract and review data on a wide range of properties of nematics, including those which are essential to the development of all types of liquid crystal device. Where appropriate these properties are also explained with expert commentary. The book is fully illustrated and structured for reference.
Physical Properties of Crystals: Their Presentation by Tensors and Matrices Oxford University Press
This 2001 book provides hands-on details of several important techniques for the study of liquid crystals.
Crystal Dislocations: Their Impact on Physical Properties of Crystals CRC Press
Crystals are everywhere, from natural crystals (minerals) through the semiconductors and magnetic materials in electronic devices and computers or piezoelectric resonators at the heart of our quartz watches to electro-optical devices. Understanding them in depth is essential both for pure research and for their applications. This book provides a clear, thorough presentation of their symmetry, both at the microscopic space-group level and the macroscopic point-group level. The implications of the symmetry of crystals for their physical properties are then presented, together with their mathematical description in terms of tensors. The conditions on the symmetry of a crystal for a given property to exist then become clear, as does the symmetry of the property. The geometrical representation of tensor quantities or properties is presented, and its use in determining important relationships emphasized. An original feature of this book is that most chapters include exercises with complete solutions. This allows readers to test and improve their understanding of the material. The intended readership includes undergraduate and graduate students in materials science and materials-related aspects of electrical and optical engineering; researchers involved in the investigation of the physical properties of crystals and the design of applications based on crystal properties such as piezoelectricity, electro-optics, optical activity and all those involved in the characterization of the structural properties of materials.
Physical Properties of Crystals CRC Press
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
With a General Introduction to Their Physical Properties; Being Selected Parts of the Physical Crystallography John Wiley & Sons
Complete with reference tables and sample problems, this volume serves as a textbook or reference for solid-state physics and chemistry, materials science, and engineering. Chapters illustrate symmetry, and its role in determining solid properties, as well as a demonstration of group theory.
Anisotropy, Symmetry, Structure John Wiley & Sons
Bent-Shaped Liquid Crystals: Structures and Physical Properties provides insight into the latest developments in the research on liquid crystals formed by bent-shaped mesogens. After a historical introduction, the expert authors discuss different kinds of mesophase structures formed by bent-shaped molecules. This book devotes the majority of its pages to physical properties such as polar switching, optics and non-linear optics, and behavior in restricted geometries. However, as chemistry is often highly relevant to the emergence of new phases, particularly with reflection symmetry breaking, it also involves a broad spectrum of interesting chemistry viewpoints.
From Modulated Phases to Quasicrystals: Structure and Properties Oxford University Press on Demand
This book contains classic material dating back to the 1900s and before. The content has been carefully selected for its interest and relevance to a modern audience. Carefully selecting the best articles from our collection we have compiled a series of historical and informative publications on the subjects of gemology and crystallography. The titles in this range include "Gemstone Manufacturing" "Geometrical Characters of Crystals" "The Thirty-Two Classes of Crystal Symmetry" and many more. Each publication has been professionally curated and includes all details on the original source material. This particular instalment, "The Physical Properties of Crystals and Gemstones" contains information on structure, hardness, cleavage and much more. Intended to illustrate the main physical properties it is a guide for anyone wishing to obtain a general knowledge of the subject and to understand the field in its historical context. We are republishing these classic works in affordable, high quality, modern editions, using the original text and artwork.
Physical Properties Of Crystals Their Representation By Tensovs AndMatrices Springer

Electron Density and Bonding in Crystals: Principles, Theory and X-Ray Diffraction Experiments in Solid State Physics and Chemistry provides a comprehensive, unified account of the use of diffraction techniques to determine the distribution of electrons in crystals. The book discusses theoretical and practical techniques, the application of electron density studies to chemical bonding, and the determination of the physical properties of condensed matter. The book features the authors' own key contributions to the subject as well a thorough, critical summary of the extensive literature on electron density and bonding. Logically organized, coverage ranges from the theoretical and experimental basis of electron density determination to its impact on investigations of the nature of the chemical bond and its uses in determining electromagnetic and optical properties of crystals. The main text is supplemented by appendices that provide clear, concise guidance on aspects such as systems of units, quantum theory of atomic vibrations, atomic orbitals, and creation and annihilation operators. The result is a valuable compendium of modern knowledge on electron density distributions, making this reference a standard for crystallographers, condensed matter physicists, theoretical chemists, and materials scientists.

Physical Properties of Crystals MDPI

This book is a printed edition of the Special Issue "Crystal Dislocations: Their Impact on Physical Properties of Crystals" that was published in Crystals

Physical Properties of Crystals, Their Representation by Tensors and Matrices Springer Science & Business Media

Liquid crystals are partially ordered systems without a rigid, long-range structure. The study of these materials covers a wide area: chemical structure, physical properties and technical applications. Due to their dual nature -- anisotropic physical properties of solids and rheological behavior of liquids -- and easy response to externally applied electric, magnetic, optical and surface fields liquid crystals are of greatest potential for scientific and technological applications. The subject has come of age and has achieved the status of being a very exciting interdisciplinary field of scientific and industrial research. This book is an outgrowth of the enormous advances made during the last three decades in both our understanding of liquid crystals and our ability to use them in applications. It presents a systematic, self-contained and up-to-date overview of the structure and properties of liquid crystals. It will be of great value to graduates and research workers in condensed matter physics, chemical physics, biology, materials science, chemical and electrical engineering, and technology from a materials science and physics viewpoint of liquid crystals.

CRC Press

Gives a unified and systematic presentation of the tensor properties of crystals, and explains their common mathematical basis and the thermodynamical relations between them.

The Physics of Liquid Crystals CRC Press

This book by Lev M. Blinov is ideal to guide researchers from their very first encounter with liquid crystals to the level where they can perform independent experiments on liquid crystals with a thorough understanding of their behaviour also in relation to the theoretical framework. Liquid crystals can be found everywhere around us. They are used in virtually every display device, whether it is for domestic appliances of for specialized technological instruments. Their finely tunable optical properties make them suitable also for thermo-sensing and laser technologies. There are many monographs written by prominent scholars on the subject of liquid crystals. The majority of them presents the subject in great depth, sometimes focusing on a particular research aspect, and in general they require a significant level of prior knowledge. In contrast, this books aims at an audience of advanced undergraduate and graduate students in physics, chemistry and materials science. The book consists of three parts: the first part, on structure, starts from the fundamental principles underlying the structure of liquid crystals, their rich phase behaviour and the methods used to study them; the second part, on physical properties, emphasizes the influence of anisotropy on all aspects of liquid crystals behaviour; the third, focuses on electro-optics, the most important properties from the applications standpoint. This part covers only the main effects and illustrates the underlying principles in greater detail. Professor Lev M. Blinov has had a long carrier as an experimentalist. He made major contributions in the field of ferroelectric mesophases. In 1985 he received the USSR state prize for investigations of electro-optical effects in liquid crystals for spatial light modulators. In 1999 he was awarded the Frederiks medal of the Soviet Liquid Crystal Society and in 2000 he was honoured with the G. Gray silver medal of the British Liquid Crystal Society. He has held many visiting academic positions in universities and laboratories across Europe and in Japan.

With a General Introduction to Their Physical Properties, Bring Selected Parts of the Physical Crystallography (Classic Reprint) Springer

Modern semiconductor and laser techniques would be unthinkable today without a highly developed physics of solids. As tailored materials increasingly gain significance, it is more important than ever to understand the basics of crystalline materials and the influence of their symmetry on phenomenological aspects. This first international edition of a classic German standard integrates the latest developments in the field, including two-dimensional crystals and Giant Magneto-Resistance. Its aim is to impart the knowledge necessary to comprehend the manifold peculiarities of crystalline substances in a comprehensive and easily accessible manner. The book devotes much space to a coherent introduction to tensor calculation, making this the first to address the topic in a readily understandable way. Supplemented by 40 exercises with their solutions, this is an ideal textbook for students of physics and chemistry, solid state physicists and chemists, and materials scientists, but also a comprehensive resource for those who wish to get an overview of this important topic.

An Introduction Oxford University Press

The use of single crystals for scientific and technological applications is now widespread in solid-state physics, optics, electronics, materials science, and geophysics. An understanding of the variation of physical properties with crystalline direction is essential to maximize the performance of solid-state devices. Written from a physical viewpoint and avoiding advanced mathematics, Tensor Properties of Crystals provides a concise introduction to the tensor properties of crystals at a level suitable for advanced undergraduate and graduate students. While retaining the successful basic format of the well-known first edition, this second edition brings the material up to date with the latest developments in nonlinear optics and modulated structures. Because of the increasing importance of nonlinear optics, a new chapter on optoelectronics has been added. This edition also includes a short discussion on incommensurate modulated structures in the final chapter because

they are relevant to high temperature superconductors and to ferroelectric and ferromagnetic materials. The book extensively contains diagrams, worked examples, and problems with answers throughout.

Structures and Physical Properties Springer

Modern semiconductor and laser techniques would be unthinkable today without a highly developed physics of solids. As tailored materials increasingly gain significance, it is more important than ever to understand the basics of crystalline materials and the influence of their symmetry on phenomenological aspects. This first international edition of a classic German standard integrates the latest developments in the field, including two-dimensional crystals and Giant Magneto-Resistance. Its aim is to impart the knowledge necessary to comprehend the manifold peculiarities of crystalline substances in a comprehensive and easily accessible manner. The book devotes much space to a coherent introduction to tensor calculation, making this the first to address the topic in a readily understandable way. Supplemented by 40 exercises with their solutions, this is an ideal textbook for students of physics and chemistry, solid state physicists and chemists, and materials scientists, but also a comprehensive resource for those who wish to get an overview of this important topic.

Liquid Crystals John Wiley & Sons

Physical Properties of CrystalsTheir Representation by Tensors and MatricesOxford University Press

Modern Crystallography IV Inst of Engineering & Technology

Properties of molecules -- Corresponding-states principle -- Molecular crystals including crystalline polymers -- Elastic properties of molecular crystals including polymer crystals -- Transport properties of molecular crystals -- Fusion -- Liquids -- p-v-T properties of the liquid -- Heat capacity of liquids and polymer melts -- Thermal conductivity of non-associated liquids -- Diffusion of liquids -- Viscosity -- Physical properties of molecular glasses -- Catalog of molecular properties -- Computing schemes.

Crystals and Crystal Structures Cambridge University Press

Liquid crystals allow us to perform experiments that provide insight into fundamental problems of modern physics, such as phase transitions, frustration, elasticity, hydrodynamics, defects, growth phenomena, and optics (linear and non linear). This excellent volume meets the need for an up-to-date text on liquid crystals.Nematic and Cholesteric Liq

Fundamentals Stewart Press

Tensors, matrices, symmetry, and structure-property relationships form the main subjects of the book. While tensors and matrices provide the mathematical framework for understanding anistropy, on which the physical and chemical properties of crystals and textured materials often depend, atomistic arguments are also needed to qualify the property coefficients in various directions. The atomistic arguments are partly based on symmetry and party on the basic physics and chemistry of materials.

Physical Properties of Crystals Springer

Excerpt from The Optical Properties of Crystals: With a General Introduction to Their Physical Properties, Bring Selected Parts of the Physical Crystallography Until recently, in the higher institutions of learning, crystallography has largely been taught only in connection with mineralogy, as an aid to the characterization of minerals and therefore in a purely descriptive manner. But this does not accord with the present state of the science. Hauy, the founder of crystallography, had already made an attempt to explain the forms of crystals, while the investigations of Brewster and the later ones of Senarmont and Grailich, together with those conducted recently by Mallard and others, have given us a detailed knowledge of the regular connection between the physical properties of crystals and the crystal form. As a consequence of these discoveries the conviction has gradually made its way that the form of a crystal is solely a consequence of its interior structure, - of its make-up from the smallest crystal particles, which act on one another with definite forces depending regularly on the crystallographic direction, - and is therefore a physical property of the substance in question. Hessel, and later Bravais and Gadolin, independently, succeeded in determining the entire number of possible crystal forms by purely geometrical methods; while reasoning based on the physical properties of crystals leads to exactly the same results. For the conclusions as to the interior structure of crystallized media - as set forth in the theories of Bravais, Sohncke, Fedorow, Schonfliess, and others - that necessarily follow on this basis, point to the existence of exactly the same kinds of symmetry. About the Publisher Forgotten Books publishes hundreds of thousands of rare and classic books. Find more at www.forgottenbooks.com This book is a reproduction of an important historical work. Forgotten Books uses state-of-the-art technology to digitally reconstruct the work, preserving the original format whilst repairing imperfections present in the aged copy. In rare cases, an imperfection in the original, such as a blemish or missing page, may be replicated in our edition. We do, however, repair the vast majority of imperfections successfully; any imperfections that remain are intentionally left to preserve the state of such historical works."