

Solid State Physics Wahab

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Solid State Physics Mohd Abdul Wahab 2005

Numerical Problems in Crystallography M. A. Wahab 2021-01-22 This book aims at enhancing the understanding of topics in crystallography through solving numerical problems. Designed into nine chapters on major topics in crystallography, the book deals with more than 600 carefully selected solved examples, problems, and multiple-choice questions. Unit cell composition, construction and calculations, Miller indices, structure factor calculations, and X-ray diffraction methods are some of the many useful topics discussed in this book. Each chapter begins with a brief theoretical explanation of the topic followed by solved numerical examples for further clarity on the subject. The topic "crystallography" is interdisciplinary in nature. Its rudimentary knowledge, therefore, is essential to the beginners in physics, chemistry, mathematics, molecular biology, geology, metallurgy, and particularly materials science and mineralogy. This book also is of immense value to senior undergraduate and graduate students of physics, chemistry, and other basic sciences.

Physics Of Amorphous Semiconductors Morigaki Kazuo 1999-04-29 This is a useful textbook for graduate students in the fields of solid state physics and chemistry as well as electronic engineering. Presenting the fundamentals of amorphous semiconductors clearly, it will be essential reading for young scientists intending to develop new preparation techniques for more ideal amorphous semiconductors e.g. a-Si:H, to fabricate stable and efficient solar cells and thin film transistors and new artificial amorphous materials such as multilayers for quantum devices.A large portion is devoted to the latest developments of amorphous semiconductors including electronic properties of a-Si:H, nature of weak bonds and gap states in a-Si:H, mechanisms for light-induced defect creation in a-Si:H and chalcogenides, quantum phenomena in multilayer films.

Fundamentals and Industrial Applications of Magnetic Nanoparticles Chaudhery Mustansar Hussain 2022-03-30 Fundamentals and Industrial Applications of Magnetic Nanomaterials highlights industrial applications of magnetic nanoparticles, reviews their rapidly emerging applications, and discusses future research directions. The book emphasizes the structure-property-functionality of magnetic nanoparticles for the most relevant industry applications. After reviewing the fundamentals, industry applications in the biomedical, pharma, environmental, cosmetics and energy industries are explored. Cross-cutting barriers to commercialization are then discussed, along with legal, health and safety implications. Finally, opportunities for enabling a more sustainable future are covered. This book is suitable for researchers and practitioners in academia and industry in materials science and engineering, chemistry and chemical engineering. Reveals fundamental concepts of magnetic nanoparticles for modern industries and perspectives Establishes routes for the utilization of magnetic nanoparticles in commercial-scale manufacturing Discusses opportunities for magnetic nanoparticles to help enable sustainable applications

Solid State Physics David Schmol 2016-07-26 Solid State Physics provides a broad introduction to some of the principal areas of the physical phenomena in solid materials and is aimed broadly at undergraduate students of physics and engineering related subjects. The physical properties of materials are intimately related to the crystalline symmetry of atoms as well as the atomic species present. This includes the electronic, mechanical, magnetic and optical properties of all materials. These subjects are treated in depth and provide the reader with the tools necessary for an understanding of the varied phenomena of materials. Particular emphasis is given to the reaction of materials to specific stimuli, such as the application of electric and magnetic fields. Nanotechnologies are based on the formation of nano-sized elements and structures. The final chapter of the book provides a broad introduction to the topic and uses some of the main tools of solid state physics to explain the behavior of nanomaterials and why they are of importance for future technologies. FEATURES: • Provides a broad introduction to the principal areas of the physical phenomena in solid materials • Includes the electronic, mechanical, magnetic and optical properties of all materials • Explains the behavior of nanomaterials and why they are of importance for future technologies

Environmental Mechanochemistry Matej Baláz

Studies in Symbolic Interaction Norman K. Denzin 2011-11-10 Volume 53 of Studies in Symbolic Interaction is divided into three parts, providing contemporary readings of social situations, including interpreting translational science, an analysis of the ‘Phantasmal in Qualitative Research’ and ‘Miami’s Sea-level Rise Committee’.

Nanomaterials and their Fascinating Attributes Sher Bahadar Khan 2016-01-21 Nanotechnology is a diverse science that has brought about new applications in fields such as colloidal science, device physics and supra molecular chemistry. This volume gives an overview of the development of nanomaterial applications in energy and power generation, medicine and healthcare, water purification, biotechnology, electronics, sporting goods, environmental issues, military defense, and textile/fabric industries. The text also explains the fundamentals of polymer nanocomposites and their industrial applications. Other chapters cover semiconductor applications of nanomaterials, nanomaterial synthesis, characterization of nanocomposites and uses of nanofillers. Readers will also find notes on the DFT study of II-VI semiconducting nano-clusters. This volume is intended to be an introductory reference for students and researchers undertaking advanced courses in nanomaterials science and engineering, giving readers a glimpse into the fascinating world of nanotechnology.

Carbon for Sensing Devices Danilo Demarchi 2014-10-07 This book reveals why carbon is playing such an increasingly prominent role as a sensing material. The various steps that transform a raw material in a sensing device are thoroughly presented and critically discussed. The authors deal with all aspects of carbon-based sensors, starting from the various hybridization and allotropes of carbon, with specific focus on micro and nano sized carbons (e.g., carbon nanotubes, graphene) and their growth processes. The discussion then moves to the role of functionalization and the different routes to achieve it. Finally, a number of sensing applications in various fields are presented, highlighting the connection with the basic properties of the various carbon allotropes. Readers will benefit from this book’s bottom-up approach, which starts from the local bonding in carbon solids and ends with sensing applications, linking the local hybridization of carbon atoms and its modification by functionalization to specific device performance. This book is a must-have in the library of any scientist involved in carbon based sensing application.

Principles of Radiation Interaction in Matter and Detection Claude Leroy 2015-12-17 The fourth edition of this book has been widely revised. It includes additional chapters and some sections are complemented with either new ones or an extension of their content. In his latest edition a complete treatment of the physics and properties of semiconductors is presented, covering transport phenomena in semiconductors, scattering mechanisms, radiation effects and displacement damages. Furthermore, this edition presents a comprehensive treatment of the Coulomb scattering on screened nuclear potentials resulting from electrons, protons, light- and heavy-ions — ranging from (very) low up to ultra-relativistic kinetic energies — and allowing one to derive the corresponding NIEL (non-ionizing energy-loss) doses deposited in any material. The contents are organized into two parts: Chapters 1 to 7 cover Particle Interactions and Displacement Damage while the remaining chapters focus on Radiation Environments and Particle Detection. This book can serve as reference for graduate students and final-year undergraduates and also as supplement for courses in particle, astroparticle, space physics and instrumentation. A section of the book is directed toward courses in medical physics. Researchers in experimental particle physics at low, medium, and high energy who are dealing with instrumentation will also find the book useful. Contents:Particle Interactions and Displacement

Damage:IntroductionElectromagnetic Interaction of Charged Particles in MatterPhoton Interaction and Electromagnetic Cascades in MatterNuclear Interactions in MatterPhysics and Properties of Silicon SemiconductorTransport Phenomena in SemiconductorsRadiation Effects and Displacement Damage in SemiconductorsRadiation Environments and Particle Detection:Radiation Environments and Damage in SemiconductorsScintillating Media and Scintillator DetectorsSolid State DetectorsDisplacement Damages and Interactions in Semiconductor DevicesGas Filled ChambersPrinciples of Particle Energy DeterminationSuperheated Droplet (Bubble) Detectors and CDM SearchMedical Physics ApplicationsAppendices:General Properties and ConstantsMathematics and Statistics Readership: Researchers, academics, graduate students and professionals in accelerator, particle, astroparticle, space, applied and medical physics. Key Features:Exceptional large coverage of the different types of detectors used in particle and nuclear physics and their principles of detectionKeywords:Radiation Interaction in Matter;Solid State Detectors;Scintillator Detectors;Gas Filled Chamber Detectors;Energy Determination;Dark Matter;Double Beta Decay;Processes of Energy Deposition;Radiation Damages;Medical Physics Applications "The fourth edition has been extensively revised and offers additional chapters. It presents a comprehensive treatment of the Coulomb scattering on screened nuclear potentials resulting from electrons, positrons, protons, light- and heavy-ions and allowing one to derive the corresponding NIEL doses deposited in any material and compound, because of atomic displacements caused by the interaction." Professor Karel Kudela Institute of Experimental Physics

Numerical Problems in Solid State Physics M.A. Wahab 2011 Numerical Problems in Solid State Physics presents a collection of solved examples, unsolved review problems and multiple type of questions on different topics of Solid State Physics/Condensed Matter. The author felt the need of such a book in view of the fact of growing number of competitive examinations at various levels conducted by universities, UGC/CSIR, UPSC, etc. where the questions are generally of numerical in nature. This book contains twelve chapters on different topics of Solid State Physics/ Condensed Matter and dealt with more than seven hundred solved examples and unsolved problems. This book will be extremely helpful to the faculty members associated with the field, the students of B.Sc (H), M.Sc and B. Tech in related subjects and the students appearing in various competitive examinations.

Proceedings of the Nuclear Physics and Solid State Physics Symposium 1972

Structure of Matter Attilio Rigamonti 2015-06-13 This textbook, now in its third edition, provides a formative introduction to the structure of matter that will serve as a sound basis for students proceeding to more complex courses, thus bridging the gap between elementary physics and topics pertaining to research activities. The focus is deliberately limited to key concepts of atoms, molecules and solids, examining the basic structural aspects without paying detailed attention to the related properties. For many topics the aim has been to start from the beginning and to guide the reader to the threshold of advanced research. This edition includes four new chapters dealing with relevant phases of solid matter (magnetic, electric and superconductive) and the related phase transitions. The book is based on a mixture of theory and solved problems that are integrated into the formal presentation of the arguments. Readers will find it invaluable in enabling them to acquire basic knowledge in the wide and wonderful field of condensed matter and to understand how phenomenological properties originate from the microscopic, quantum features of nature.

Advances in Physics of Materials Mushahid Husain 1989

Fundamentals of Crystallography, Powder X-ray Diffraction, and Transmission Electron Microscopy for Materials Scientists Dong ZhiLi 2022-04-26 The structure-property relationship is a key topic in materials science and engineering. To understand why a material displays certain behaviors, the first step is to resolve its crystal structure and reveal its structure characteristics. Fundamentals of Crystallography, Powder X-ray Diffraction, and Transmission Electron Microscopy for Materials Scientists equips readers with an in-depth understanding of using powder x-ray diffraction and transmission electron microscopy for the analysis of crystal structures. Introduces fundamentals of crystallography Covers XRD of materials, including geometry and intensity of diffracted x-ray beams and experimental methods Describes TEM of materials and includes atomic scattering factors, electron diffraction, and diffraction and phase contrasts Discusses applications of HRTEM in materials research Explains concepts used in XRD and TEM lab training Based on the author’s course lecture notes, this text guides materials science and engineering students with minimal reliance on advanced mathematics. It will also appeal to a broad spectrum of readers, including researchers and professionals working in the disciplines of materials science and engineering, applied physics, and chemical engineering.

Precipitate Shape and Coherency Loss Mechanisms in Rh-Au Alloys Peihua Jing 2008

Electromagnetic Theory and Wave Propagation S. N. Ghosh 2002 Although the fundamental concepts of Maxwell remain for the most part unchanged since their inception, electromagnetic theory has continued to evolve, extending, most significantly, to shorter and shorter wavelengths. This has revealed many of nature’s mysteries. And led to a myriad of applications that have literally changed our world. The second edition of Electromagnetic Theory and Wave Propagation begins by presenting the basic concepts of electromagnetic theory, then explores the field’s extended areas primarily discovered after World War II. The author elaborates on the work of pioneer investigators, particularly with respect to the identity of light and electromagnetic waves and then derives the fundamental laws of optics from electromagnetic considerations. He has also added several new topics including meteor astronomy, remote sensing and, most notably, discussions on relativistic electrodynamics.

MLI Physics Collection 2018-05-10 This digital collection of twelve book length titles encompasses all of the major subject areas of physics. All twelve titles are combined into one easily downloadable file and are fully-searchable in a Web.pdf, bookmarked, file format. Titles include electromagnetism, particle physics, quantum mechanics, theory of relativity, mathematical methods for physics, computational physics, electrical engineering experiments, multiphysics modeling, solid state physics, radio astronomy, Newtonian mechanics, and physics lab experiments. FEATURES: • Includes 12 full length book titles in one, fully searchable, Web.pdf file • Each book title is preceded by a descriptive page with overview and features • All titles include the complete front matter, text, and end matter from the original printed version • Over 5000 pages of physics information in one file • Complete file downloads in less than two minutes LIST OF TITLES Particle Physics. Robert Purdy, PhD Mathematical Methods for Physics Using MATLAB and Maple. J. Claycomb, PhD The Special Theory of Relativity. Dennis Morris, PhD Computational Physics. Darren Walker, PhD Quantum Mechanics. Dennis Morris, PhD Basic Electromagnetic Theory. James Babington, PhD Physics Lab Experiments. Matthew M. J. French, PhD Newtonian Mechanics. Derek Raine, PhD Solid State Physics. David Schmol, PhD Multiphysics Modeling Using COMSOL5 and MATLAB. R. Pryor, PhD Radio Astronomy. S. Joardar, PhD Electrical Engineering Experiments. G.P. Chhalotra, PhD

Springer Handbook of Electronic and Photonic Materials Safa Kasap 2006 Contributions from well known and respected researchers throughout the world Through coverage of electronic and opto-electronic materials that today’s electrical engineers, material scientists and physicists need Interdisciplinary approach encompasses research in disciplines such as materials science, electrical engineering, chemical engineering, mechanical engineering, physics and chemistry

Multifunctional Ferroelectric Materials Dipti Ranjan Sahu 2021-09-08 Ferroelectricity is a well-known phenomenon commonly used in scientific and

industrial communities. Ferroelectric materials are the building blocks of different devices and technological innovations. This book presents an overview of the basic phenomenon of ferroelectricity and different ferroelectrics and ferroelectric devices, including their theoretical study, synthesis, characterization, and application. Chapters cover such topics as the basics of ferroelectricity, perovskite ferroelectrics and relaxor ferroelectrics, piezoelectricity, and more.

Modulated Structures, Polytypes and Quasicrystals D. Pandey 1989

Principles of Radiation Interaction in Matter and Detection Claude Leroy 2011-09-23 This book, like the first and second editions, addresses the fundamental principles of interaction between radiation and matter and the principles of particle detection and detectors in a wide scope of fields, from low to high energy, including space physics and medical environment. It provides abundant information about the processes of electromagnetic and hadronic energy deposition in matter, detecting systems, performance of detectors and their optimization. The third edition includes additional material covering, for instance: mechanisms of energy loss like the inverse Compton scattering, corrections due to the Landau-Pomeranchuk-Migdal effect, an extended relativistic treatment of nucleus-nucleus screened Coulomb scattering, and transport of charged particles inside the heliosphere. Furthermore, the displacement damage (NIEL) in semiconductors has been revisited to account for recent experimental data and more comprehensive comparisons with results previously obtained. This book will be of great use to graduate students and final-year undergraduates as a reference and supplement for courses in particle, astroparticle, space physics and instrumentation. A part of the book is directed toward courses in medical physics. The book can also be used by researchers in experimental particle physics at low, medium, and high energy who are dealing with instrumentation. Errata(s) Errata Contents:Electromagnetic Interaction of Radiation in MatterNuclear Interactions in MatterRadiation Environments and Damage in Silicon SemiconductorsScintillating Media and Scintillator DetectorsSolid State DetectorsDisplacement Damage and Particle Interactions in Silicon DevicesGas Filled ChambersPrinciples of Particle Energy DeterminationSuperheated Droplet (Bubble) Detectors and CDM SearchMedical Physics Applications Readership: Researchers, academics, graduate students and professionals in accelerator, particle, astroparticle, space, applied and medical physics. Keywords:Interactions Between Radiation/Particles and Matter;High;Intermediate and Low Energy Particle Physics;Medical Physics;Radiation/Particle Detection;Space Physics;Detectors;Semiconductors;Calorimeters;Chambers;Scintillators;Silicon Pixels;Radiation Damage;Single Event Effects;Solar CellsKey Features:Covers state-of-the-art detection techniques and underlying theoriesAddresses topics of considerable use for professionals in medical physics, nuclear engineering, and environmental studiesContains an updated reference table set of physical properties

Johns and Cunningham’s The Physics of Radiology Eva Bezak 2021-03-01 The fifth edition of this respected book encompasses all the advances and changes that have been made since it was last revised. It not only presents new ideas and information, it shifts its emphases to accurately reflect the inevitably changing perspectives in the field engendered by progress in the understanding of radiological physics. The rapid development of computing technology in the three decades since the publication of the fourth edition has enabled the equally rapid expansion of radiology, radiation oncology, nuclear medicine and radiobiology. The understanding of these clinical disciplines is dependent on an appreciation of the underlying physics. The basic radiation physics of relevance to clinical oncology, radiology and nuclear medicine has undergone little change over the last 70 years, so much of the material in the introductory chapters retains the essential flavour of the fourth edition, updated as required. This book is written to help the practitioners in these fields understand the physical science, as well as to serve as a basic tool for physics students who intend working as medical radiation physicists in these clinical fields. It is the authors’ hope that students and practitioners alike will find the fifth edition of The Physics of Radiology lucid and straightforward.

Semiconductor Power Devices Josef Lutz 2018-02-16 Halbleiter-Leistungsbaulemente sind das Kernstück der Leistungselektronik. Sie bestimmen die Leistungsfähigkeit und machen neuartige und verlustarme Schaltungen erst möglich. In dem Band wird neben den Halbleiter-Leistungsbauelementen selbst auch die Aufbau- und Verbindungstechnik behandelt: von den physikalischen Grundlagen und der Herstellungstechnologie über einzelne Bauelemente bis zu thermomechanischen Problemen, Zerstörungsmechanismen und Störungseffekten. Die 2., überarbeitete Auflage berücksichtigt technische Neuerungen und Entwicklungen.

Silicon Solid State Devices and Radiation Detection Claude Leroy 2012 This book addresses the fundamental principles of interaction between radiation and matter, the principles of working and the operation of particle detectors based on silicon solid state devices. It covers a broad scope in the fields of application of radiation detectors based on silicon solid state devices from low to high energy physics experiments, including in outer space and in the medical environment. This book also covers state-of-the-art detection techniques in the use of radiation detectors based on silicon solid state devices and their readout electronics, including the latest developments on pixelated silicon radiation detector and their application.The content and coverage of the book benefit from the extensive experience of the two authors who have made significant contributions as researchers as well as in teaching physics students in various universities.

Thermoelectricity and Advanced Thermoelectric Materials Ranjan Kumar 2021-06-03 Thermoelectricity and Advanced Thermoelectric Materials reviews emerging thermoelectric materials, including skutterudites, clathrates, and half-Heusler alloys. In addition, the book discusses a number of oxides and silicides that have promising thermoelectric properties. Because 2D materials with high figures of merit have emerged as promising candidates for thermoelectric applications, this book presents an updated introduction to the field of thermoelectric materials, including recent advances in materials synthesis, device modeling, and design. Finally, the book addresses the theoretical difficulties and methodologies of computing the thermoelectric properties of materials that can be used to understand and predict highly efficient thermoelectric materials. This book is a key reference for materials scientists, physicists, and engineers in energy. Reviews the most relevant, emerging thermoelectric materials, including 2D materials, skutterudites, clathrates and half-Heusler alloys Focuses on how electronic structure engineering can lead to improved materials performance for thermoelectric energy conversion applications Includes the latest advances in the synthesis, modeling and design of advanced thermoelectric materials

Solid State Physics R. J. Singh 2012 Solid state physics forms an important part of the undergraduate syllabi of physics in most of the universities. The existing competing books by Indian authors have too complex technical language which makes them abstractive to Indian students who use English as their secondary language. Solid State Physics is written as per the core module syllabus of the major universities and targets undergraduate B.Sc students. The book uses lecture style in explaining the concepts which would facilitate easy understanding of the concepts. The topics have been dealt with precision and provide adequate knowledge of the subject.

Silicon Carbide Microsystems for Harsh Environments Muthu Wijesundara 2011-05-17 Silicon Carbide Microsystems for Harsh Environments reviews state-of-the-art Silicon Carbide (SiC) technologies that, when combined, create microsystems capable of surviving in harsh environments, technological readiness of the system components, key issues when integrating these components into systems, and other hurdles in harsh environment operation. The authors use the SiC technology platform suite the model platform for developing harsh environment microsystems and then detail the current status of the specific individual technologies (electronics, MEMS, packaging). Additionally, methods towards system level integration of components and key challenges are evaluated and discussed based on the current state of SiC materials processing and device technology. Issues such as temperature mismatch, process compatibility and temperature stability of individual components and how these issues manifest when building the system receive thorough investigation. The material covered not only reviews the state-of-the-art MEMS devices, provides a framework for the joining of electronics and MEMS along with packaging into usable harsh-environment-ready sensor modules.

Symmetry Representations of Molecular Vibrations M.A. Wahab 2022-09-01 This book presents a comprehensive theoretical basis of symmetry representations of molecular vibrations, matrix representation of symmetries, and the elements of group theory that are relevant to other symmetry elements/operations, crystallographic and molecular point groups. The book helps understand the reducible and irreducible representations of symmetry matrices and then derive the normal modes of vibration of different molecules by using suitable techniques independently. Targeted to graduate students and researchers, this book aims not only to derive the normal modes of vibration of any given molecule themselves but also compares and verifies them with the experimentally found modes by using IR and Raman-related techniques. For the first time in the crystallographic history, this book presents the group multiplication tables of all 32 point groups in both international and Schoenflies notations.

Solid State Physics Mohammad Abdul Wahab 2017-04-30

Matter

SOLID STATE PHYSICS V K BABBAR 1997 This book presents a comprehensive introduction to Solid State Physics for undergraduate students of pure and applied sciences and engineering disciplines. It acquaints the students with the fundamental properties of solids starting from their properties. The coverage of basic topics is developed in terms of simple physical phenomenon supplemented with theoretical derivations and relevant models which provides strong grasp of the fundamental principles of physics in solids in a concise and self-explanatory manner.

Principles of Radiation Interaction in Matter and Detection Claude Leroy 2011-09-23 This book, like the first and second editions, addresses the fundamental principles of interaction between radiation and matter and the principles of particle detection and detectors in a wide scope of fields, from low to high energy, including space physics and medical environment. It provides abundant information about the processes of electromagnetic and hadronic energy deposition in matter, detecting systems, performance of detectors and their optimization.The third edition includes additional material covering, for instance: mechanisms of energy loss like the inverse Compton scattering, corrections due to the Landau-Pomeranchuk-Migdal effect, an extended relativistic treatment of nucleus-nucleus screened Coulomb scattering, and transport of charged particles inside the heliosphere. Furthermore, the displacement damage (NIEL) in semiconductors has been revisited to account for recent experimental data and more comprehensive comparisons with results previously obtained.This book will be of great use to graduate students and final-year undergraduates as a reference and supplement for courses in particle, astroparticle, space physics and instrumentation. A part of the book is directed toward courses in medical physics. The book can also be used by researchers in experimental particle physics at low, medium, and high energy who are dealing with instrumentation.

Advances in Planar Lipid Bilayers and Liposomes Ales Iglıc 2011 Advances in Planar Lipid Bilayers and Liposomes volumes cover a broad range of topics, including main arrangements of the reconstituted system, namely planar lipid bilayers as well as spherical liposomes. The invited authors present the latest results of their own research groups in this exciting multidisciplinary field. Incorporates contributions from newcomers and established and experienced researchers Explores the planar lipid bilayer systems and spherical liposomes from both theoretical and experimental perspectives Serves as an indispensable source of information for new scientists

The British National Bibliography Arthur James Wells 2009

Cases on Interactive Technology Environments and Transnational Collaboration: Concerns and Perspectives Mukerji, Siran 2010-05-31 Technology is essential for access to learning and development of a knowledge society. Cases on Interactive Technology Environments and Transnational Collaboration: Concerns and Perspectives provides a comparative and comprehensive analysis of technologically enabled educational environments and various issues concerning education and collaborations across the world while also focusing on best practices and experiences from a varied range of countries.

Relativiteit Albert Einstein 1986 De opsteller van de relativiteitstheorie (1879-1955) behandelt ruimte- en tijdproblemen en de geldigheid van basisnatuurwetten in bewegende coördinaatstelsels.

International Physics & Astronomy Directory 1969 Intended as a comprehensive, current source of professional information for the use of physicists and astronomers. Faculty and brief biographical data listed under institutions, which are arranged alphabetically. Data about laboratories, international organizations, societies, meetings, financial support, awards, research, and books and journals. Faculty index, Geographical index of universities and colleges. **Intelligent Nanomaterials** Ashutosh Tiwari 2012-02-21 Intelligent Nanomaterials comprehensively provides up-to-date material of this fascinating field. The last three decades have seen extraordinary advances in the generation of new materials based on both fundamental elements and composites, driven by advances in synthetic chemistry and often drawing inspiration from nature. The concept of an intelligent material envisions additional functionality built into the molecular structure, such that a desirable response occurs under defined conditions. Divided into 4 parts: Inorganic Materials; Organic Materials; Composite Materials; and Biomaterials, the 22 chapters cover the latest research and developments in the processing, properties, and applications of intelligent nanomaterials. Included are molecular device materials, biomimetic materials, hybrid-type functionalized polymers-composite materials, information-and energy-transfer materials, as well as environmentally friendly materials.

SIC Materials and Devices Michael Shur 2006 After many years of research and development, silicon carbide has emerged as one of the most important wide band gap semiconductors. The first commercial SiC devices OCo power switching Schottky diodes and high temperature MESFETs OCo are now on the market. This two-volume book gives a comprehensive, up-to-date review of silicon carbide materials properties and devices. With contributions by recognized leaders in SiC technology and materials and device research, SiC Materials and Devices is essential reading for technologists, scientists and engineers who are working on silicon carbide or other wide band gap materials and devices. The volumes can also be used as supplementary textbooks for graduate courses on silicon carbide and wide band gap semiconductor technology. Contents: SiC Material Properties (G Pensi et al.); SiC Homoepitaxy and Heteroepitaxy (A S Bakin); Ohmic Contacts to SiC (F Roccaforte et al.); Silicon Carbide Schottky Barrier Diode (J H Zhao et al.); High Power SiC PIN Rectifiers (R Singh); Silicon Carbide Diodes for Microwave Applications (K Vassilevski); SiC Thyristors (M E Levinstein et al.); Silicon Carbide Static Induction Transistors (G C DeSalvo). Readership: Technologists, scientists, engineers and graduate students working on silicon carbide or other wide band gap materials and devices."