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Principles of Electronic Materials and Devices Electronic Materials & Dev 3E Sie Principles of Electronic Materials and Devices Springer Handbook of Electronic and Photonic Materials Principles of Electrical Engineering Materials and Devices Principles of Electrical Engineering Materials and Devices Zinc Oxide Materials for Electronic and Optoelectronic Device Applications Principles of Electrical Engineering Materials and Devices Optical Properties of Materials and Their Applications Studyguide for Principles of Electronic Materials and Devices by Kasap, Isbn 9780072393422 Electronic Properties of Materials Charge Transport in Disordered Solids with Applications in Electronics Optoelectronics and Photonics Spintronics for Next Generation Innovative Devices Electronic Properties of Materials Ceramic Materials Cambridge Illustrated Handbook of Optoelectronics and Photonics Inorganic Glasses for Photonics Outlines and Highlights for Principles of Electronic Materials and Devices by Safa O Kasap, Isbn Properties of Semiconductor Alloys Principles of Electrical Engineering Materials and Devices Magnetic Materials Optical Properties of Condensed Matter and Applications Metalorganic Vapor Phase Epitaxy (MOVPE) Thermoelectric Materials and Devices Understanding Solids Organic Semiconductors for Optoelectronics Functionalized Nanoscale Materials, Devices and Systems Optoelectronics and Photonics Glass Micro- and Nanospheres Kinetics in Materials Science and Engineering Liquid Phase Epitaxy of Electronic, Optical and Optoelectronic Materials The Materials Science of Thin Films Materials Chemistry Dielectric Films for Advanced Microelectronics Molecular Beam Epitaxy Characterisation of Ferroelectric Bulk Materials and Thin Films Handbook of II-VI Semiconductor-Based Sensors and Radiation Detectors Photoconductivity and Photoconductive Materials, 2 Volume Set Practical Injection Molding

The 3rd edition of this successful textbook continues to build on the strengths that were recognized by a 2008 Textbook Excellence Award from the Text and Academic Authors Association (TAA). Materials Chemistry addresses inorganic-, organic-, and nano-based materials from a structure vs. property treatment, providing a suitable breadth and depth coverage of the rapidly evolving materials field — in a concise format. The 3rd edition offers significant updates throughout, with expanded sections on sustainability, energy storage, metal-organic frameworks, solid electrolytes, solvothermal/microwave syntheses, integrated circuits, and nanotoxicity. Most appropriate for Junior/Senior undergraduate students, as well as first-year graduate students in chemistry, physics, or engineering fields, Materials Chemistry may also serve as a valuable reference to industrial researchers. Each chapter concludes with a section that describes important materials applications, and an updated list of thought-provoking questions. Zinc Oxide (ZnO) powder has been widely used as a white paint pigment and industrial processing chemical for nearly 150 years. However, following a rediscovery of ZnO and its potential applications in the 1950s, science and industry alike began to realize that ZnO had many interesting novel properties that were worthy of further investigation. ZnO is a leading candidate for the next generation of electronics, and its biocompatibility makes it viable for medical devices. This book covers recent advances including crystal growth, processing and doping and also discusses the problems and issues that seem to be impeding the commercialization of devices. Topics include: Energy band structure and spintronics Fundamental optical and electronic properties Electronic contacts of ZnO Growth of ZnO crystals and substrates Ultraviolet photodetectors ZnO quantum wells Zinc Oxide Materials for Electronic and Optoelectronic Device Applications is ideal for university, government, and industrial research and development laboratories, particularly those engaged in ZnO and related materials research. Liquid-Phase Epitaxy (LPE) is a technique used in the bulk growth of crystals, typically in semiconductor manufacturing, whereby the crystal is grown from a rich solution of the semiconductor onto a substrate in layers, each of which is formed by supersaturation or cooling. At least 50% of growth in the optoelectronics area is currently focussed on LPE. This book covers the bulk growth of semiconductors, i.e. silicon, gallium arsenide, cadmium mercury telluride, indium phosphide, indium antimonide, gallium nitride, cadmium zinc telluride, a range of wide-bandgap II-VI compounds, diamond and silicon carbide, and a wide range of oxides/fluorides (including sapphire and quartz) that are used in many industrial applications. A separate chapter is devoted to the fascinating field of growth in various forms of microgravity, an activity that is approximately 30-years old and which has revealed many interesting features, some of which have been very surprising to experimenters and theoreticians alike. Covers the most important materials within the field The contributors come from a wide variety of countries and include both academics and industrialists, to give a balanced treatment Builds-on an established series known in the community Highly pertinent to current and future developments in telecommunications and computer-processing industries. Following a semi-quantitative approach, this book presents a summary of the basic concepts, with examples and applications, and reviews recent developments in the study of optical properties of condensed matter systems. Key Features: Covers basic knowledge as well as application topics Includes theory, experimental techniques and current and developing applications Timely and useful contribution to the literature Written by internationally respected contributors working in physics and electrical engineering departments and government laboratories This text offers comprehensive discussions of topics which are important to both electrical engineering and materials science students. The chapters are designed so that instructors can teach out of sequence or skip topics if desired. Thermoelectric Materials and Devices summarizes the latest research achievements over the past 20 years of thermoelectric material and devices, most notably including new theory and strategies of thermoelectric materials design and the new technology of device integration. The book's author has provided a bridge between the knowledge of basic physical/chemical principles and the fabrication technology of thermoelectric materials and devices, providing readers with research and development strategies for high performance thermoelectric materials and devices. It will be a vital resource for graduate students, researchers and technologists working in the field of energy conversion and the development of thermoelectric devices. Discusses the new theory and methods of thermoelectric materials design Combines scientific principles, along with synthesis and fabrication technologies in thermoelectric materials Presents the design optimization and interface technology for thermoelectric devices Introduces thermoelectric polymers and organic-inorganic thermoelectric composites Never HIGHLIGHT a Book Again! Virtually all of the testable terms, concepts, persons, places, and events from the textbook are included. Cram101 Just the FACTS101 studyguides give all of the outlines, highlights, notes, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompany: 9780073104645 . Magnetic Materials is an excellent introduction to the basics of magnetism, magnetic materials and their applications in modern device technologies. Retaining the concise style of the original, this edition has been thoroughly revised to address significant developments in the field, including the improved understanding of basic magnetic phenomena, new classes of materials, and changes to device paradigms. With homework problems, solutions to selected problems and a detailed list of references, Magnetic Materials continues to be the ideal book for a one-semester course and as a self-study guide for researchers new to the field. New to this edition: • Entirely new chapters on Exchange Bias Coupling, Multiferroic and Magnetoelectric Materials, Magnetic Insulators • Revised throughout, with substantial updates to the chapters on Magnetic Recording and Magnetic Semiconductors, incorporating the latest advances in the field • New example problems with worked solutions The reference provides interdisciplinary discussion for diverse II-VI semiconductors with a wide range of topics. The third volume of a three volume set, the book provides an up-to-date account of the present status of multifunctional II-VI semiconductors, from fundamental science and processing to their applications as various sensors, biosensors, and radiation detectors, and based on them to formulate new goals for the further research. The chapters in this volume provide a comprehensive overview of the manufacture, parameters and principles of operation of these devices. The application of these devices in various fields such as medicine, agriculture, food quality control, environment monitoring and others is also considered. The analysis carried out shows the great potential of II-VI semiconductor-based sensors and detectors for these applications. Considers solid-state radiation detectors based on semiconductors of II-VI group and their applications; Analyzes the advantages of II-VI compounds to develop chemical and optical gas and ion sensors; Describes all types of biosensors based on II-VI semiconductors and gives examples of their use in various fields. This book presents a comprehensive review of the most important methods used in the characterisation of piezoelectric, ferroelectric and pyroelectric materials. It covers techniques for the analysis of bulk materials and thick and thin film materials and devices. There is a growing demand by industry to adapt and integrate piezoelectric materials into ever smaller devices and structures. Such applications development requires the joint development of reliable, robust, accurate and – most importantly – relevant and applicable measurement and characterisation methods and models. In the past few years there has been a rapid development of new techniques to model and measure the variety of properties that are deemed important for applications development engineers and scientists. The book has been written by the leaders in the field and many chapters represent established measurement best practice, with a strong emphasis on application of the methods via worked examples and detailed experimental procedural descriptions. Each

chapter contains numerous diagrams, images, and measurement data, all of which are fully referenced and indexed. The book is intended to occupy space in the research or technical lab, and will be a valuable and practical resource for students, materials scientists, engineers, and lab technicians. Principles of Electrical Engineering Materials and Devices has been developed to bridge the gap between traditional electronic circuits texts and semiconductor texts Ceramic Materials: Science and Engineering is an up-to-date treatment of ceramic science, engineering, and applications in a single, comprehensive text. Building on a foundation of crystal structures, phase equilibria, defects, and the mechanical properties of ceramic materials, students are shown how these materials are processed for a wide diversity of applications in today's society. Concepts such as how and why ions move, how ceramics interact with light and magnetic fields, and how they respond to temperature changes are discussed in the context of their applications. References to the art and history of ceramics are included throughout the text, and a chapter is devoted to ceramics as gemstones. This course-tested text now includes expanded chapters on the role of ceramics in industry and their impact on the environment as well as a chapter devoted to applications of ceramic materials in clean energy technologies. Also new are expanded sets of text-specific homework problems and other resources for instructors. The revised and updated Second Edition is further enhanced with color illustrations throughout the text. The primary objective of the NATO Advanced Study Institute (ASI) titled "Functionalized Nanoscale Materials, Devices, and Systems for Chem. -Bio Sensors, Photonics, and Energy Generation and Storage" was to present a contemporary and comprehensive overview of the field of nanostructured materials and devices and its applications in chem. -bio sensors, nanophotonics, and energy generation and storage devices. The study has become one of the most promising disciplines in science and technology, as it aims at the fundamental understanding of new physical, chemical, and biological properties of systems and the technological advances arising from their exploration. Such systems are intermediate in size, between the isolated atoms and molecules and bulk material, where the unique transitional characteristics between the two can be understood, controlled, and manipulated. Nanotechnologies refer to the creation and utilization of functional materials, devices, and systems with novel properties and functions that are achieved through the control of matter, atom-by-atom, molecule-by-molecule, or at a micro-molecular level. Advances made over the last few years provide new opportunities for scientific and technological developments in nanostructures and nanosystems with new architectures with improved functionality. The field is very actively and rapidly evolving and covers a wide range of disciplines. Recently, various nanoscale materials, devices, and systems with remarkable properties have been developed, with numerous unique applications in chemical and biological sensors, nanophotonics, nano-biotechnology, and in-vivo analysis of cellular processes at the nanoscale. From fundamental concepts to cutting-edge applications, this is the first encyclopaedic reference of important terms and effects in optoelectronics and photonics. It contains broad coverage of terms and concepts from materials to optical devices and communications systems. Self-contained descriptions of common tools and phenomena are provided for undergraduate and graduate students, scientists, engineers and technicians in industry and laboratories. The book strikes a balance between materials and devices related coverage and systems level terms, and captures key nomenclature used in the field. Equations are used where necessary, and lengthy derivations are avoided. Over 600 clear and self-explanatory illustrations are used to help convey key concepts, and enable readers to quickly grasp important concepts. Covers both the fundamentals and the state-of-the-art technology used for MBE Written by expert researchers working on the frontlines of the field, this book covers fundamentals of Molecular Beam Epitaxy (MBE) technology and science, as well as state-of-the-art MBE technology for electronic and optoelectronic device applications. MBE applications to magnetic semiconductor materials are also included for future magnetic and spintronic device applications. Molecular Beam Epitaxy: Materials and Applications for Electronics and Optoelectronics is presented in five parts: Fundamentals of MBE; MBE technology for electronic devices application; MBE for optoelectronic devices; Magnetic semiconductors and spintronics devices; and Challenge of MBE to new materials and new researches. The book offers chapters covering the history of MBE; principles of MBE and fundamental mechanism of MBE growth; migration enhanced epitaxy and its application; quantum dot formation and selective area growth by MBE; MBE of III-nitride semiconductors for electronic devices; MBE for Tunnel-FETs; applications of III-V semiconductor quantum dots in optoelectronic devices; MBE of III-V and III-nitride heterostructures for optoelectronic devices with emission wavelengths from THz to ultraviolet; MBE of III-V semiconductors for mid-infrared photodetectors and solar cells; dilute magnetic semiconductor materials and ferromagnet/semiconductor heterostructures and their application to spintronic devices; applications of bismuth-containing III-V semiconductors in devices; MBE growth and device applications of Ga₂O₃; Heterovalent semiconductor structures and their device applications; and more. Includes chapters on the fundamentals of MBE Covers new challenging researches in MBE and new technologies Edited by two pioneers in the field of MBE with contributions from well-known MBE authors including three AI Cho MBE Award winners Part of the Materials for Electronic and Optoelectronic Applications series Molecular Beam Epitaxy: Materials and Applications for Electronics and Optoelectronics will appeal to graduate students, researchers in academia and industry, and others interested in the area of epitaxial growth. Books are seldom finished. At best, they are abandoned. The second edition of "Electronic Properties of Materials" has been in use now for about seven years. During this time my publisher gave me ample opportunities to update and improve the text whenever the book was reprinted. There were about six of these reprinting cycles. Eventually, however, it became clear that substantially more new material had to be added to account for the stormy developments which occurred in the field of electrical, optical, and magnetic materials. In particular, expanded sections on flat-panel displays (liquid crystals, electroluminescence devices, field emission displays, and plasma displays) were added. Further, the recent developments in blue- and green emitting LED's and in photonics are included. Magnetic storage devices also underwent rapid development. Thus, magneto-optical memories, magneto resistance devices, and new magnetic materials needed to be covered. The sections on dielectric properties, ferroelectricity, piezoelectricity, electrostriction, and thermoelectric properties have been expanded. Of course, the entire text was critically reviewed, updated, and improved. However, the most extensive change I undertook was the conversion of all equations to SI units throughout. In most of the world and in virtually all of the international scientific journals use of this system of units is required. If today's students do not learn to utilize it, another generation is "lost" on this matter. In other words, it is important that students become comfortable with SI units. This title is designed for a course on electrical engineering materials. The author has not added or removed sections to render this edition a second edition. However, a number of sections, illustrations, examples and problems have been revised and updated in the current revised edition. The revisions have improved the rigour without sacrificing the original semiquantitative approach. For example, the thermoelectric effect now includes the Mott-Jones index (α) which is normally treated at the graduate level but has been introduced here through a semiquantitative discussion to explain the true sign of the Seebeck coefficient in metals (one of the most difficult graduate topics in quantum mechanics of metals). Overall, there are over some 300 individual changes to improve the textbook. Spintronics (short for spin electronics, or spin transport electronics) exploits both the intrinsic spin of the electron and its associated magnetic moment, in addition to its fundamental electronic charge, in solid-state devices. Controlling the spin of electrons within a device can produce surprising and substantial changes in its properties. Drawing from many cutting edge fields, including physics, materials science, and electronics device technology, spintronics has provided the key concepts for many next generation information processing and transmitting technologies. This book discusses all aspects of spintronics from basic science to applications and covers: • magnetic semiconductors • topological insulators • spin current science • spin caloritronics • ultrafast magnetization reversal • magneto-resistance effects and devices • spin transistors • quantum information devices This book provides a comprehensive introduction to Spintronics for researchers and students in academia and industry. The second, updated edition of this essential reference book provides a wealth of detail on a wide range of electronic and photonic materials, starting from fundamentals and building up to advanced topics and applications. Its extensive coverage, with clear illustrations and applications, carefully selected chapter sequencing and logical flow, makes it very different from other electronic materials handbooks. It has been written by professionals in the field and instructors who teach the subject at a university or in corporate laboratories. The Springer Handbook of Electronic and Photonic Materials, second edition, includes practical applications used as examples, details of experimental techniques, useful tables that summarize equations, and, most importantly, properties of various materials, as well as an extensive glossary. Along with significant updates to the content and the references, the second edition includes a number of new chapters such as those covering novel materials and selected applications. This handbook is a valuable resource for graduate students, researchers and practicing professionals working in the area of electronic, optoelectronic and photonic materials. Provides a semi-quantitative approach to recent developments in the study of optical properties of condensed matter systems Featuring contributions by noted experts in the field of electronic and optoelectronic materials and photonics, this book looks at the optical properties of materials as well as their physical processes and various classes. Taking a semi-quantitative approach to the subject, it presents a summary of the basic concepts, reviews recent developments in the study of optical properties of materials and offers many examples and applications. Optical Properties of Materials and Their Applications, 2nd Edition starts by identifying the processes that should be described in detail and follows with the relevant classes of materials. In addition to featuring four new chapters on optoelectronic properties of organic semiconductors, recent advances in electroluminescence, perovskites, and ellipsometry, the book covers: optical properties of disordered condensed matter and glasses; concept of excitons; photoluminescence, photoinduced changes, and electroluminescence in noncrystalline semiconductors; and photoinduced bond breaking and volume change in

chalcogenide glasses. Also included are chapters on: nonlinear optical properties of photonic glasses; kinetics of the persistent photoconductivity in crystalline III-V semiconductors; and transparent white OLEDs. In addition, readers will learn about excitonic processes in quantum wells; optoelectronic properties and applications of quantum dots; and more. Covers all of the fundamentals and applications of optical properties of materials Includes theory, experimental techniques, and current and developing applications Includes four new chapters on optoelectronic properties of organic semiconductors, recent advances in electroluminescence, perovskites, and ellipsometry Appropriate for materials scientists, chemists, physicists and electrical engineers involved in development of electronic materials Written by internationally respected professionals working in physics and electrical engineering departments and government laboratories Optical Properties of Materials and Their Applications, 2nd Edition is an ideal book for senior undergraduate and postgraduate students, and teaching and research professionals in the fields of physics, chemistry, chemical engineering, materials science, and materials engineering. "The third edition includes new topics and extended sections, such as diffusion, conduction in thin films, interconnects in microelectronics, electromigration, Stefan's radiation law, field emission from carbon nanotubes, piezoresistivity, amorphous semiconductors, solar cells, LEDs, Debye relaxation, giant magnetoresistance, magnetic data storage, Reststrahlen absorption, luminescence and white LEDs, and X-ray diffraction (Appendix). It also has a large number of new worked examples, numerous new homework problems, and many new illustrations and photographs. This text is one of the few books in the market that has the broad coverage of electronic materials and devices that today's scientists and engineers need."--Jacket. The topic of thin films is an area of increasing importance in materials science, electrical engineering and applied solid state physics; with both research and industrial applications in microelectronics, computer manufacturing, and physical devices. Advanced, high-performance computers, high-definition TV, broadband imaging systems, flat-panel displays, robotic systems, and medical electronics and diagnostics are a few examples of the miniaturized device technologies that depend on the utilization of thin film materials. This book presents an in-depth overview of the novel developments made by the scientific leaders in the area of modern dielectric films for advanced microelectronic applications. It contains clear, concise explanations of material science of dielectric films and their problem for device operation, including high-k, low-k, medium-k dielectric films and also specific features and requirements for dielectric films used in the packaging technology. A broad range of related topics are covered, from physical principles to design, fabrication, characterization, and applications of novel dielectric films. Systematically discusses the growth method, material properties, and applications for key semiconductor materials MOVPE is a chemical vapor deposition technique that produces single or polycrystalline thin films. As one of the key epitaxial growth technologies, it produces layers that form the basis of many optoelectronic components including mobile phone components (GaAs), semiconductor lasers and LEDs (III-Vs, nitrides), optical communications (oxides), infrared detectors, photovoltaics (II-IV materials), etc. Featuring contributions by an international group of academics and industrialists, this book looks at the fundamentals of MOVPE and the key areas of equipment/safety, precursor chemicals, and growth monitoring. It covers the most important materials from III-V and II-VI compounds to quantum dots and nanowires, including sulfides and selenides and oxides/ceramics. Sections in every chapter of Metalorganic Vapor Phase Epitaxy (MOVPE): Growth, Materials Properties and Applications cover the growth of the particular materials system, the properties of the resultant material, and its applications. The book offers information on arsenides, phosphides, and antimonides; nitrides; lattice-mismatched growth; CdTe, MCT (mercury cadmium telluride); ZnO and related materials; equipment and safety; and more. It also offers a chapter that looks at the future of the technique. Covers, in order, the growth method, material properties, and applications for each material Includes chapters on the fundamentals of MOVPE and the key areas of equipment/safety, precursor chemicals, and growth monitoring Looks at important materials such as III-V and II-VI compounds, quantum dots, and nanowires Provides topical and wide-ranging coverage from well-known authors in the field Part of the Materials for Electronic and Optoelectronic Applications series Metalorganic Vapor Phase Epitaxy (MOVPE): Growth, Materials Properties and Applications is an excellent book for graduate students, researchers in academia and industry, as well as specialist courses at undergraduate/postgraduate level in the area of epitaxial growth (MOVPE/ MOCVD/ MBE). This book takes a fresh look at the last three decades and enormous developments in the new electro-optic devices and associated materials. General Treatment and various proofs are at a semiquantitative level without going into detailed physics. Contains numerous worked examples and solved problems. Chapter topics include wave nature of light, dielectric waveguides and optical fibers, semiconductor science and light emitting diodes, photodetectors, photovoltaic devices, and polarization and modulation of light. For the study of optoelectronics by electrical engineers. Principles of Electronic Materials and Devices is one of the few books in the market that has a broad coverage of electronic materials that today's scientists and engineers need. The general treatment of the textbook and various proofs leverage at a semi quantitative level without going into detailed physics. The present book on electrical, optical, magnetic and thermal properties of materials is in many aspects different from other introductory texts in solid state physics. First of all, this book is written for engineers, particularly materials and electrical engineers who want to gain a fundamental understanding of semiconductor devices, magnetic materials, lasers, alloys, etc. Second, it stresses concepts rather than mathematical formalism, which should make the presentation relatively easy to understand. Thus, this book provides a thorough preparation for advanced texts, monographs, or specialized journal articles. Third, this book is not an encyclopedia. The selection of topics is restricted to material which is considered to be essential and which can be covered in a 15-week semester course. For those professors who want to teach a two-semester course, supplemental topics can be found which deepen the understanding. (These sections are marked by an asterisk [*].) Fourth, the present text leaves the teaching of crystallography, X-ray diffraction, diffusion, lattice defects, etc., to those courses which specialize in these subjects. As a rule, engineering students learn this material at the beginning of their upper division curriculum. The reader is, however, reminded of some of these topics whenever the need arises. Fifth, this book is distinctly divided into five self-contained parts which may be read independently. For one-semester, undergraduate-level courses in Optoelectronics and Photonics, in the departments of electrical engineering, engineering physics, and materials science and engineering. This text takes a fresh look at the enormous developments in electro-optic devices and associated materials. Prepared as a textbook complete with problems after each chapter, specifically intended for classroom use in universities. Never HIGHLIGHT a Book Again! Virtually all of the testable terms, concepts, persons, places, and events from the textbook are included. Cram101 Just the FACTS101 studyguides give all of the outlines, highlights, notes, and quizzes for your textbook with optional online comprehensive practice tests. Only Cram101 is Textbook Specific. Accompanys: 9780072393422 . Explore an authoritative resource with coverage of foundational concepts of photoconductivity and photoconductive materials In Photoconductivity and Photoconductive Materials, Professor Kasap delivers a definitive guide to the basic principles of photoconductivity and a selection of present topical photoconductive materials. Divided into two parts, the set begins with basic concepts and definitions and coverage of characterization using steady state, transient and modulated photoconductivity techniques, including the novel charge extraction by linearly increasing voltage (CELIV) method The physics of terahertz photoconductivity and fundamentals of organic semiconductors Isois are also covered. Part Two of the set starts with a comprehensive review of a wide range of photoconductive materials and then focuses on some of the most important photoconductors, including hydrogenated amorphous silicon, cadmium mercury telluride, various x-ray photoconductors, diamond films, metal halide perovskites, nanowires and quantum dots. Photoconductive antenna application is also included. Filled with contributions from leading authors in the field, this book also offers: A thorough introduction to the characterization of semiconductors from photoconductivity techniques, including uniform illumination and photocarrier grating techniques Comprehensive explorations of organic photoconductors, including photogeneration, transport, and applications in printing Practical discussions of time-of-flight transient photoconductivity, including experimental techniques and interpretation In-depth examinations of transient photoconductivity of organic semiconducting films and novel transient photoconductivity techniques Perfect for research physicists, materials scientists, and electrical engineers, Photoconductivity and Photoconductive Materials is also an indispensable resource for postgraduate and senior undergraduate students working in the area of optoelectronic materials, as well as researchers working in industry. The main purpose of this book is to provide a comprehensive treatment of the materials aspects of group-IV, III-V and II-VI semiconductor alloys used in various electronic and optoelectronic devices. The topics covered in this book include the structural, thermal, mechanical, lattice vibronic, electronic, optical and carrier transport properties of such semiconductor alloys. The book reviews not only commonly known alloys (SiGe, AlGaAs, GaInPAs, and ZnCdTe) but also new alloys, such as dilute-carbon alloys (CSiGe, CSiSn, etc.), III-N alloys, dilute-nitride alloys (GaNAs and GaInNAs) and Mg- or Be-based II-VI semiconductor alloys. Finally there is an extensive bibliography included for those who wish to find additional information as well as tabulated values and graphical information on the properties of semiconductor alloys. Comprehensive coverage of organic electronics, including fundamental theory, basic properties, characterization methods, device physics, and future trends Organic semiconductor materials have vast commercial potential for a wide range of applications, from self-emitting OLED displays and solid-state lighting to plastic electronics and organic solar cells. As research in organic optoelectronic devices continues to expand at an unprecedented rate, organic semiconductors are being applied to flexible displays, biosensors, and other cost-effective green devices in ways not possible with conventional inorganic semiconductors. Organic Semiconductors for Optoelectronics is an up-to-date review of the both the fundamental theory and latest research and development advances in organic semiconductors. Featuring

contributions from an international team of experts, this comprehensive volume covers basic properties of organic semiconductors, characterization techniques, device physics, and future trends in organic device development. Detailed chapters provide key information on the device physics of organic field-effect transistors, organic light-emitting diodes, organic solar cells, organic photosensors, and more. This authoritative resource: Provides a clear understanding of the optoelectronic properties of organic semiconductors and their influence to overall device performance Explains the theories behind relevant mechanisms in organic semiconducting materials and in organic devices Discusses current and future trends and challenges in the development of organic optoelectronic devices Reviews electronic properties, device mechanisms, and characterization techniques of organic semiconducting materials Covers theoretical concepts of optical properties of organic semiconductors including fluorescent, phosphorescent, and thermally-assisted delayed fluorescent emitters An important new addition to the Wiley Series in Materials for Electronic & Optoelectronic Applications, Organic Semiconductors for Optoelectronics bridges the gap between advanced books and undergraduate textbooks on semiconductor physics and solid-state physics. It is essential reading for academic researchers, graduate students, and industry professionals involved in organic electronics, materials science, thin film devices, and optoelectronics research and development. The field of charge conduction in disordered materials is a rapidly evolving area owing to current and potential applications of these materials in various electronic devices This text aims to cover conduction in disordered solids from fundamental physical principles and theories, through practical material development with an emphasis on applications in all areas of electronic materials. International group of contributors Presents basic physical concepts developed in this field in recent years in a uniform manner Brings up-to-date, in a one-stop source, a key evolving area in the field of electronic materials Advanced textbook on inorganic glasses suitable for both undergraduates and researchers. Engaging style to facilitate understanding Suitable for senior undergraduates, postgraduates and researchers entering material science, engineering, physics, chemistry, optics and photonics fields Discusses new techniques in optics and photonics including updates on diagnostic techniques Comprehensive and logically structured "A pedagogical gem.... Professor Readey replaces 'black-box' explanations with detailed, insightful derivations. A wealth of practical application examples and exercise problems complement the exhaustive coverage of kinetics for all material classes." --Prof. Rainer Hebert, University of Connecticut "Prof. Readey gives a grand tour of the kinetics of materials suitable for experimentalists and modellers.... In an easy-to-read and entertaining style, this book leads the reader to fundamental, model-based understanding of kinetic processes critical to development, fabrication and application of commercially-important soft (polymers, biomaterials), hard (ceramics, metals) and composite materials. It is a must-have for anyone who really wants to understand how to make materials and how they will behave in service." --Prof. Bill Lee, Imperial College London, Fellow of the Royal Academy of Engineering "A much needed text filling the gap between an introductory course in materials science and advanced materials-specific kinetics courses. Ideal for the undergraduate interested in an in-depth study of kinetics in materials." --Prof. Mark E. Eberhart, Colorado School of Mines This book provides an in-depth introduction to the most important kinetic concepts in materials science, engineering, and processing. All types of materials are addressed, including metals, ceramics, polymers, electronic materials, biomaterials, and composites. The expert author with decades of teaching and practical experience gives a lively and accessible overview, explaining the principles that determine how long it takes to change material properties and make new and better materials. The chapters cover a broad range of topics extending from the heat treatment of steels, the processing of silicon integrated microchips, and the production of cement, to the movement of drugs through the human body. The author explicitly avoids "black box" equations, providing derivations with clear explanations. 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 * Reflects a rapidly growing field from the science perspective This work focuses on the factors critical to successful injection moulding, including knowledge of plastic materials and how they melt, the importance of mould design, the role of the screw, and the correct use of the controls of an injection moulding machine. It seeks to provide operating personnel with a clear understanding of the basics of injection moulding This book summarizes the recent research and development in the field of glass micro- and nanospheres. With special focus on the physics of spherical whispering-gallery mode resonators, it presents selected examples of application of glass microspheres in biosensing, laser devices, and microwave engineering. Hollow microspheres also offer a perspective for hydrogen transport and storage. On the other hand, glass nanospheres are fundamental for a class of photonic crystals (e.g., direct and inverse opals), as well as for industrial composite materials. Both micro- and nanospheres find important applications in biomedicine. The book highlights examples of preparation techniques and applications, addresses recent challenges, and examines potential solutions. It addresses physicists, chemists, materials scientists, and engineers, working with glass materials on microcavities, on nanotechnologies, and on their applications.

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