

How Mocvd Aixtron

Right here, we have countless How Mocvd Aixtron collections to check out. We additionally come up with the money for variant types and furthermore type of to browse. The agreeable book, fiction, history, novel, scientific research, as with ease as various new sorts of books are readily user-friendly here.

As this How Mocvd Aixtron, it ends occurring brute one of the favored book How Mocvd Aixtron collections that we have. This is why you remain in the best w incredible ebook to have.

Optoelectronic Devices Razeghi 2004 Tremendous progress has been made in the last few years in the growth, doping and processing technologies of the wide bandgap semiconductors. As a result, this class of materials now holds significant promise for semiconductor electronics in a broad range of applications. The principal driving force for the current revival of interest in III-V nitrides is their potential use in high power, high temperature, high frequency and optical devices resistant to radiation damage. This book provides a wide number of optoelectronic applications of III-V nitrides and covers the entire process from growth to devices and applications making it essential reading for those working in the semiconductors or microelectronics. Broad review of optoelectronic applications of III-V nitrides

Microscopy of Semiconducting Materials 2001 2018-01-18 The Institute of Physics Conference Series is a leading international medium for the rapid publication of proceedings of major conferences and symposia reviewing new developments in physics and related areas. Volumes in the series comprise original refereed papers and are regarded as standard referee works. As such, they are an essential part of major library collections worldwide. The twelfth conference on the Microscopy of Semiconducting Materials (MSM) was held at the University of Oxford, 25-29 March 2001. MSM conferences focus on recent international advances in semiconductor studies and the forms of microscopy. The event was organized with scientific sponsorship by the Royal Microscopical Society, The Electron Microscopy and Analysis Group of the Royal Society and the Materials Research Society. With the continual shrinking of electronic device dimensions and accompanying enhancement in device performance, a deeper understanding of semiconductor microscopic properties at the nanoscale (and even at the atomic scale) is increasingly critical for further progress to be achieved. This proceedings provides an overview of the latest instrumentation, analysis techniques and state-of-the-art advances in semiconducting materials science for solid state physicists, chemists, and materials scientists.

Gallium Arsenide, Electronics Materials and Devices. A Strategic Study of Markets, Technologies and Companies Worldwide 1999 2004-05 The third edition of this highly respected market study provides a detailed insight into the global developments of the GaAs industry to 2004, and the implications for both supply and demand in GaAs technology. The report has been completely revised and updated with a new chapter added on competitive technologies. The report also supplies market data by component type and application sectors. For a PDF version of the report please call Tina Enright on +44 (0) 1865 843008 for price details.

Emerging Non-Volatile Memory Technologies Seungbum Hong 2014-11-18 This book is an introduction to the fundamentals of emerging non-volatile memories and provides an overview of future trends in the field. Readers will find coverage of seven important memory technologies, including Ferroelectric Random Access Memory (FeRAM), Ferroelectric Random Access Memory (FMRAM), Multiferroic RAM (MFRAM), Phase-Change Memories (PCM), Oxide-based Resistive RAM (RRAM), Probe Storage, and Polymer Memories. Chapters are written to reflect diffusions and clashes between different topics. Emerging Non-Volatile Memories is an ideal book for graduate students, faculty, and professionals working in the field of non-volatile memory. This book also: Covers key memory technologies, including Ferroelectric Random Access Memory (FeRAM), Ferromagnetic RAM (FMRAM), and Multiferroic RAM (MFRAM), among others. Provides an overview of non-volatile memory fundamentals. Broadens readers' understanding of future trends in non-volatile memories.

Proceedings of the First International Symposium on Long Wavelength Infrared Detectors and Arrays: Physics and Applications Society. Electronics Division 1995

III-nitride Zhe Chuan Feng 2006 III-Nitride semiconductor materials - (Al, In, Ga)N are excellent wide band gap semiconductors. This book presents the various uses and achievements in the field. It is useful for engineers, scientists and students.

Introduction to Semiconductor Lasers for Optical Communications David U. Klotzkin 2020-01-07 This updated, second edition textbook provides a thorough and accessible treatment of semiconductor lasers from a design and engineering perspective. It includes both the physics of devices as well as the engineering, designing and fabricating of these devices and have an excellent background for further study of optoelectronics.

Clean Electricity from Photovoltaics Mary D Archer 2001-06-04 Photovoltaic cells provide clean, reversible electrical power from the sun. Made from semiconductors, they are durable, silent in operation and free of polluting emissions. In this book, experts from all sectors of the PV community — materials scientists, physicists, product engineers, economists and environmentalists — give their critical appraisals of where the technology is now and what its prospects are. Contents: The Past and Present (M. D. Archer) Physics of Silicon Solar Cells (J O Schumacher & W Wuttling) Principles of Cell Design (J Poortmans et al.) Crystalline Silicon Solar Cells (M A Green) Amorphous Silicon Solar Cells (C R Wronski & D E Carlson) Cadmium Telluride Solar Cells (D Bonnet) Cu(In,Ga)Se₂ Solar Cells (U Rau & H W Schock) Super-High Efficiency III-V Tandem and Multijunction Cells (M Yamaguchi) Organic Photovoltaic Devices (J J M Halls & R H Friend) Quantum Well Solar Cells (J Nelson) Thermophotovoltaic Generation of Electricity (T J Coutts) Concentrator Cells and Systems (A Luque) Cells and Systems for Space Applications (C M Hardingham) Storage of Electrical Energy (R M Dell) Photovoltaic Systems and Applications (N M Pearsall & R Hill) The Photovoltaic Business: Manufacturers and Markets (B McNelis) The Economics of Photovoltaic Technologies (J Anderson) The Outlook for PV in the 21st Century (E H Lysen & B Yord) Readership: Physicists, chemists and engineers. Keywords: Electricity; Photovoltaics; Cadmium Telluride Reviews: "... is an excellent resource for its intended readership of students, scientists and technologists working in the area ... it is well indexed, and includes a useful web and library references. At the very least, the book deserves a place in the library of every research institution and company working on renewable energy." "With a broad range of coverage, many references in each chapter, and an appendix listing useful quantities, factors and symbols, this book would be an excellent source for any one working in the field of photovoltaics." IEEE Electrical Insulation Magazine "It is timely, up-to-date and a very comprehensive work. The chapters are written by leading experts in their field who are able to communicate the technology and their enthusiasm ... Photovoltaic R&D is a multi-disciplinary activity, and most chapters are accessible to advanced undergraduate students, postgraduates and researchers with a wide range of backgrounds. It can be recommended to those starting a new research project or to existing researchers in other fields who wish to find out what all the excitement is about." Contemporary Physics

Proceedings of the Twenty-First State-of-the-Art Program on Compound Semiconductors SSOI 2006 1995

Physics, Chemistry and Application of Nanostructures CVD of Compound Semiconductors Anthony C. Jones 2008-11-20 Chemical growth methods of electronic materials are the keystone of microelectronic device processing. This book discusses the applications of metalorganic chemistry for the vapor phase deposition of compound semiconductors. Vapor phase methods used for semiconductor growth and the materials properties that make the organometallic precursors useful in the electronics industry are discussed for a variety of materials. Topics included: compound semiconductor growth * metalorganic precursors for III-V MOVPE * metalorganic precursors for II-VI MOVPE * single-source precursors * chemical beam epitaxy Several useful appendixes and a critically selected, up-to-date list of references round off this practical handbook for materials scientists, solid state physicists, organometallic chemists, and engineers.

Introduction to Nitride Semiconductor Blue Lasers and Light Emitting Diodes Shuji Nakamura 2000-03-09 The "blue laser" is an exciting new device used in physics. The potential is now being recognized for its development into a commercial lighting system using about a tenth of the power and with a thousand times the operational life of a comparable conventional system. This comprehensive work introduces the subject at a level suitable for graduate students. It covers the basic physics of light emitting diodes (LEDs) and laser diodes (LDs) based on gallium nitride and related nitride semiconductors, and gives an outline of their structural, transport and optical properties relevant to device physics. It begins with the fundamentals, and covers both theory and experiment, as well as an examination of actual and potential device applications. Shuji Nakamura and Nichia Chemicals Industries made the initial breakthroughs in the field, and these have revealed that LEDs and LDs are a sophisticated physical phenomenon with a commercial reality.

Wide Bandgap Based Devices Essid Medjdoub 2021-05-26 Emerging wide bandgap (WBG) semiconductors hold the potential to advance the global industry in the semiconductor space. That, more than 50 years ago, the invention of the silicon (Si) chip enabled the modern computer era. SiC- and GaN-based devices are starting to become more widely available. Smaller, faster, and more efficient than their counterpart Si-based components, these WBG devices also offer greater expected reliability in tougher operating environments.

conditions. Furthermore, in this frame, a new class of microelectronic-grade semiconducting materials that have an even larger bandgap than the previously established wide bandgap semiconductors, such as GaN and SiC, have been created, and are thus referred to as "ultra-wide bandgap" materials. These materials, which include AlN, diamond, Ga₂O₃, and BN, offer theoretically superior properties, including a higher critical breakdown field, higher temperature operation, and potentially higher thermal stability. These attributes, in turn, make it possible to use revolutionary new devices for extreme environments, such as high-efficiency power transistors, becoming a key figure of merit, ultra-high voltage pulsed power switches, high-efficiency UV-LEDs, and electronics. This Special Issue aims to collect high quality research articles, review articles that focus on wide bandgap device design, fabrication, and advanced characterization. The Special Issue will also publish selected articles from the 43rd Workshop on Compound Semiconductor Devices and Integrated Circuits, held in France (WOCSDICE 2019), which brings together scientists and engineers working in the area of III-V, and other compound semiconductor devices and integrated circuits. In particular, the following topics are addressed: - GaN- and SiC-based devices for power and optoelectronic applications - Ga₂O₃ substrate development, and Ga₂O₃ thin film growth, doping, and devices - AlN-based emerging material and devices - epitaxial growth, characterization, and devices

Thermal Management of Gallium Nitride Electronics Tadjer 2022-07-15 Thermal Management of Gallium Nitride Electronics outlines the technical approaches and challenges they have faced, and the resulting advances in the field. This book serves as a one-stop reference for compound semiconductor device researchers tasked with solving this engineering challenge for future material systems based on ultra-wide bandgap semiconductors. A number of perspectives are included, such as the growth methods of nanocrystalline diamond, the materials integration of polycrystalline diamond through wafer bonding, the physics of thermal transport across heterogeneous interfaces. Over the past 10 years, the book's authors have performed pioneering experiments in the integration of nanocrystalline diamond capping layers into the fabrication process of compound semiconductor devices. Significant research efforts of integrating diamond and nanocrystalline diamond have been reported by a number of groups since then, thus resulting in active thermal management options that do not necessarily lead to performance derating to avoid radio frequency or power switching operation of these devices. Self-heating refers to the increased channel temperature caused by increased energy transfer from the channel to the lattice at high power. This book chronicles those breakthroughs. Includes the fundamentals of thermal management of wide-bandgap semiconductors, with historical review of common heating issues, thermal transport physics, and characterization methods Reviews the latest strategies to overcome heating issues through material growth and device design strategies Touches on emerging, real-world applications for thermal management strategies in power electronics

Silicon Germanium Materials and Devices - A Market and Technology Overview Sze 2006-11-26 The first edition of Silicon Germanium Materials & Devices - A Market & Technology Overview to 2006 examines the development of the silicon germanium business over a six-year period 2001 to 2006. It analyses the trends in technologies and industry structure and profiles all the major players. It is specifically aimed at users and manufacturers of substrates, epiwafers, equipment and analysis includes a competitive assessment of the market of silicon germanium vs. gallium arsenide, indium phosphide vs. other forms of silicon. Silicon Germanium Devices - A Market & Technology Overview to 2006 is designed to assist with business plans, R&D and manufacturing strategies. It will be an indispensable aid responsible for business development, technology assessment and market research. The report examines the rapid development of silicon germanium from an R&D production status. An extensive treatment from materials through processes to devices and applications it encapsulates the entire silicon germanium business and future directions. For a PDF version of the report please call Tina Enright on +44 (0) 1865 843008 for price details.

The Chinese Information War Wannis F. Poindexter 2018-06-07 Reviews of the First Edition: "The book raises important points and makes a strong case for more coordinated government and private sector efforts to address the information war problem effectively. Recommended" --Choice "A strong addition to current events and intelligence collections, recommended" --Midwest Book Review "Extensive factual research...provides ample references in this detailed research...an eye opening expose that the working of the Chinese government...fascinating" --Slashdot China's information war against the United States is clever technically, broadly applied and successful. The intelligence community in the U.S. has publicly stated this is a kind of war we do not know how to fight--yet it is the U.S. military that developed and expanded the information war. In fact, the U.S. military is at a disadvantage because it is part of a democratic, decentralized system of government that separates the state from business. China's political systems are more easily adapted to this form of warfare, as their recent land seizures in the South China Sea demonstrate. We call this a new form of conquest.

Handbook Of Synthetic Methodologies And Protocols Of Nanomaterials (2019 Volume) This comprehensive book set includes four volumes, covering the methods and protocols for the synthesis, fabrication, and characterization of nanomaterials. The first two books introduce the solution phase and gas synthesis approaches for providing a number of most widely used protocols for each nanomaterial. An exhaustive list of nanomaterials are included, which are arranged according to the main element in the compound for easy search. For each material, the protocols are categorized according to the morphology of the nanostructure. A detailed protocol is included in each protocol to point the readers to the source of the protocol. The third book describes many unconventional methods for the fabrication of nanomaterials, including lithography and printing, self-assembly, chemical transformation, templated synthesis, electrospinning, laser induced synthesis, flame and plasma synthesis, and chemical deposition processes. The fourth book covers the typical methods for structural characterization of nanomaterials, including electron diffraction, electron microscopy, scanning tunneling microscopy, X-ray diffraction, in-situ and operando X-ray techniques, X-ray absorption fine structure spectroscopy, static and dynamic light scattering, vibrational characterization methods, and NMR spectroscopy. In addition to the introduction of the basic operational principles of these tools, the book explicitly on how they can be applied for analyzing nanomaterials. The handbook is a complete reference that can provide readers easily accessible information on how to synthesize and characterize nanomaterials desired for their target applications.

The Physics of Semiconductor Devices Sharma 2019-01-31 This book disseminates the current knowledge of semiconductor physics and its applications across the scientific community. It is based on a biennial workshop that provides the participating research groups with a stimulating platform for interaction and collaboration within the same scientific community. The book discusses the latest developments in the field of III-nitrides; materials & devices, compound semiconductors, VLSI technologies, optoelectronics, sensors, photovoltaics, crystal growth, epitaxy and characterization, graphene and other 2D materials and organic semiconductors.

Comprehensive Semiconductor Science and Technology 2010-01-28 Semiconductors are at the heart of modern living. Almost everything we do, be it work, travel, communication, or entertainment, all depend on some feature of semiconductor technology. Comprehensive Semiconductor Science and Technology captures the essence of this important field, and presents it in a single source to the large audience who study, make, and exploit semiconductors. Previous attempts at this achievement have been fragmented and have omitted important topics. Written and Edited by a truly international team of experts, this work delivers an objective yet cohesive global review of the semiconductor world. The work is divided into three sections. The first section is concerned with the fundamental physics of semiconductors, showing how the electronic properties and dynamics change drastically when systems vary from bulk to a low-dimensional structure and further to a nanometer size. Throughout this section there is an emphasis on understanding of the underlying physics. The second section deals largely with the transformation of the conceptual framework of solid state physics into devices and structures which require the growth of extremely high purity, nearly defect-free bulk and epitaxial materials. The last section is devoted to exploitation of the knowledge of the previous sections to highlight the spectrum of devices we see all around us. Provides a comprehensive global picture of the semiconductor world Each of the volumes presents a complete description of one aspect of the whole Written and Edited by a truly international team of experts

Gallium Nitride and Related Wide Bandgap Materials and Devices Sze 2000-07-07 The second edition of Gallium Nitride & Related Wide Bandgap Materials and Devices provides a detailed insight into the global developments in GaN, SiC and other optoelectronic materials. This report also examines the implication for both suppliers and users of GaN technology. For a PDF version of the report please call Tina Enright on +44 (0) 1865 843008 for price details.

Epitaxy Marian A. Herman 2013-03-09 In a uniform and comprehensive manner the authors describe all the important aspects of the epitaxial growth processes on crystalline substrates, e.g. processes in which atoms of the growing film mimic the arrangement of the atoms of the substrate. Emphasis is put on sufficiently clear and unequivocal presentation of the subject in the form of an easy-to-read review. A large part of this book focuses on the problems of heteroepitaxy. The most important growth techniques which are currently widely used in basic research as well as in manufacturing processes of devices are presented and discussed in detail.

Handbook of GaN Semiconductor Materials and Devices (Wayne) Bi 2017-10-20 This book addresses material growth, device fabrication, device application, and commercialization of energy-efficient white light-emitting diodes (LEDs), laser diodes, and power electronics devices. It begins with an overview on basics of semiconductor materials, physics, growth and characterization techniques, followed by detailed discussion of advantages, drawbacks, design issues, processing, applications, and current state of the art GaN-based devices. It includes state of the art material synthesis techniques with an overview on growth technologies for emerging bulk and thin film and AlN substrates and their applications in electronics, detection, sensing, optoelectronics and photonics. Wengang (Wayne) Bi is Distinguished Chair Professor and Dean in the College of Information and Electrical Engineering at Hebei University of Technology in Tianjin, China. Hao-chung (Henry) Kuo is Distinguished Professor and Associate Director of the Photonics Center at National Chiao-Tung University, Hsin-Tsu, Taiwan, China. Pei-Cheng Ku is an associate professor in the Department of Electrical Engineering & Computer Science at the University of Michigan, Ann Arbor, USA. Bo Shen is the Cheung Kong Professor at Peking University in China.

Recent Developments in Superconductivity Baszler PhMartins 2007 Superconductivity is the ability of certain materials to conduct electrical current with no resistance.

and extremely low losses. High temperature superconductors, such as $\text{La}_{2-x}\text{Sr}_x\text{CuO}_x$ ($T_c=40\text{K}$) and $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$ ($T_c=90\text{K}$), were discovered in 1987 and have been studied since. In spite of an intense, world-wide, research effort during this time, a complete understanding of the copper oxide (cuprate) materials is still lacking. Fundamental questions are unanswered, particularly the mechanism by which high- T_c superconductivity occurs. More broadly, the cuprates are in a class of solid-state electron-electron interactions. An understanding of such "strongly correlated" solids is perhaps the major unsolved problem of condensed matter physics with which many researchers are working on this topic. High- T_c superconductors also have significant potential for applications in technologies ranging from electric power generation and transmission to digital electronics. This ability to carry large amounts of current can be applied to electric power devices such as motors and generators, and to power transmission in power lines. For example, superconductors can carry as much as 100 times the amount of electricity of ordinary copper or aluminium wires of the same size. Universities, research institutes and companies are working to develop high- T_c superconductivity applications and considerable progress has been made. This volume brings together new leading-edge research in the field.

Diode Laser Materials and Devices - A Worldwide Market and Technology Overview Swartz 2006-12-20 This report examines the development of the diode laser industry over a six-year period, 2000 to 2005, incorporating analysis of trends in markets, technologies and industry structure. It is designed to provide key information for investors and manufacturers of substrates, epitaxial wafers (epiwafers) and devices. The coverage includes components, laser diodes, and the semiconducting (SC) wafers on which most of these devices are made. The geographical coverage of the report includes North America, Japan and Europe, which together will account for over 90% of the production and consumption of diode laser materials and devices over the next five years. However, many other countries have activities in this field including South Korea (Taiwan, South Korea, Singapore, Malaysia etc), China, India, Australia and Eastern Europe (Russia, Poland, Hungary, the Czech Republic) amongst others. Activities in other countries are commented on in the text where relevant, but are not quantified in the market data. Chapter 1 is an introduction to the market study. Chapter 2 is a summary. Chapter 3 overviews materials markets. The size, quality, and particularly the price, of substrates and wafers are key factors in determining the ability to produce competitive laser products. Chapter 3 also examines trends in materials technologies for laser diodes, the impact of the device markets on wafer demand, and suppliers. This chapter introduces the semiconductor materials that are presently or will likely become important to the fabrication of diode laser devices. The physical and distinguishing properties of these materials are explained with reference to their application. Chapter 4 chapter examines the basic application sectors for laser diodes, as well as the basic commercial opportunities, changes and forces acting within each sector. The chapter also examines the market for the basic types of device and identifies promising newer types. For each type of device, market data and forecasts are provided and future prospects described. The application data are presented for the following industrial groups: • Automotive • Computers • Consumer • Industrial • Military and Aerospace • Telecommunications • Others A full 5-year forecast and analysis is provided for each application and region. Chapter 5 is a technology overview. In this chapter a background and overview of developments in the principal technological R&D and production processes for devices is provided. The main focus is on the most important enabling technology for the production of the present and future generations of laser diode devices. This process is crystal growth and involves the following sequence: • Bulk growth of single crystals • Epitaxial growth of semiconductor single crystal layers • Implantation • Device fabrication, ie gate and contact formation, etc • Packaging & test Chapter 6 profiles substrate suppliers, epiwafers suppliers and merchant manufacturers of GaAs devices. Chapter 7 lists universities and selected industrial labs involved in the areas of diode laser research. Chapter 8 is a directory of suppliers and provides acronyms and exchange rates. For a PDF version of the report please call Tina Enright on +44 (0) 1865 843008 for price details.

Science and Technology of Integrated Ferroelectrics Paz de Araujo 2001-01-11 The aim of this book is to present in one volume some of the most significant developments that have taken place in the field of integrated ferroelectrics during the last decade of the twentieth century. The book begins with a comprehensive introduction to ferroelectrics and follows with fifty-three papers selected by Carlos Paz de Araujo, Orlando Auciello, Ramamoorthy Ramesh, and George W. Taylor. These fifty-three papers were selected from more than one thousand papers published over the last eleven years in the proceedings of the International Symposium on Integrated Ferroelectrics. The papers were chosen on the basis that they (a) give a broad view of the advances that have been made and (b) indicate the future direction of research and technology development. Readers who wish for a more in-depth treatment of the subject are encouraged to refer to volumes 1 to 27 of Integrated Ferroelectrics, the main reference for papers in this field.

Optoelectronic Nanodevices Stilianakis 2020-04-15 During the last decade, novel graphene related materials (GRMs), perovskites, as well as metal oxides and metal nanostructures have received the interest of the scientific community. Due to their extraordinary physical, optical, thermal, and electrical properties, which stem from their 2D ultrathin atomic layer structure, large interlayer distance, ease of functionalization, and bandgap tunability, these nanomaterials have been applied in a wide range of applications. The development or the improvement of innovative optoelectronic applications, as well as the expansion of theoretical studies and simulations in the fast-growing field of nanotechnology (photovoltaics, energy storage, fuel cells, hydrogen storage, catalysis, etc.), electronics, photonics, spintronics, and sensing devices. The continuous nanostructure development and applications development has provided the ability to significantly improve existing products and to explore the design of materials and devices with novel functions. This book demonstrates some of the most recent trends and advances in the interdisciplinary field of optoelectronics. Most articles focus on light emitting diodes (LEDs) and semiconductor devices (SCs), including organic, inorganic, and hybrid configurations, whereas the rest address photodetectors, transistors, and other well-known dynamic optoelectronic devices. In this context, this exceptional collection of articles is directed at a broad scientific audience of chemists, materials scientists, physicists, and engineers, with the goal of highlighting the potential of innovative optoelectronic applications incorporating nanostructures and inspiring their realization.

Physics, Chemistry and Application of Nanostuctures Dubois 2009 The book presents invited reviews and original short notes with recent results obtained in fundamental study and application of nanostructures, which are promising for new generations of electronic and optoelectronic devices.

Compound Semiconductors Kasper 2000-01-01 An international perspective on the latest research, Compound Semiconductors 1999 presents an overview of the latest developments in all III-V compound semiconductors such as GaAs, InP, and GaN; II-VI compounds such as ZnS, ZnSe, and CdTe; IV-IV compounds such as SiC and Si; and VI-VI compounds such as PbTe and SnTe. The book emphasizes piezoelectric (or potentially smart) material heterostructures (Ga, Al, In)N, which will influence future technology development funding. As the preeminent forum for research in compound materials and their applications in devices, this essential library reference is invaluable for researchers in semiconductor physics, and electronic and electrical engineering.

Self-Assembled Quantum Dots Wang 2007-11-29 This multidisciplinary book provides up-to-date coverage of carrier and spin dynamics and energy transfer processes in quantum structural interaction among nanostructures. Coverage also includes current device applications such as quantum dot lasers and detectors, as well as future applications in quantum information processing. The book will serve as a reference for anyone working with or planning to work with quantum dots.

Assessment of Advanced Solid-State Lighting National Research Council 2013-04-27 The standard incandescent light bulb, which still works mainly as Thomas Edison intended, converts more than 90% of the consumed electricity into heat. Given the availability of newer lighting technologies that convert a greater percentage of electricity into light, there is potential to decrease the amount of energy used for lighting in both commercial and residential applications. Although technologies such as compact fluorescent lamps (CFLs) have emerged in the past few decades and will help achieve the goal of increased energy efficiency, solid-state lighting (SSL) stands to play a large role in decreasing U.S. energy consumption for lighting. This report summarizes the current status of SSL technologies and products—light-emitting diodes (LEDs) and organic light-emitting diodes (OLEDs)—and evaluates barriers to their improved cost and performance. Assessment of Advanced Solid State Lighting also discusses factors involved in achieving widespread deployment and consumer acceptance of SSL products. These factors include the perceived quality of light emitted by SSL devices, ease of use and the useful life of the devices, issues of initial high cost, and possible benefits of reduced energy consumption.

GaAs News 1989

Compound Semiconductors 2004

Metalorganic Vapor Phase Epitaxy (MOVPE) Irvine 2019-10-07 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 provides the basis for many optoelectronic components including mobile phone components (GaAs), semiconductor lasers and LEDs (III-Vs, nitrides), optical communication devices (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 compounds to quantum dots and nanowires, including sulfides and selenides and oxides/ceramics. Sections in every chapter of Metalorganic Vapor Phase Epitaxy cover Growth, Materials Properties and Applications cover the growth of the particular materials system, the properties of the resultant material, and its applications. Information on arsenides, phosphides, and antimonides; nitrides; lattice-mismatched growth; CdTe, MCT (mercury cadmium telluride); ZnO and related materials; 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 MOVPE. Includes chapters on the fundamentals of MOVPE and the key areas of equipment/safety, precursor chemicals, and growth monitoring Looks at important materials 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 Optoelectronic Applications series Metalorganic Vapor Phase Epitaxy (MOVPE): Growth, Materials Properties and Applications is an excellent book for graduate students and researchers in academia and industry, as well as specialist courses at undergraduate/postgraduate level in the area of epitaxial growth (MOVPE/ MOCVD/ MBE)

High Tc Superconductors Dumas 1993-05-05 A wide range of progress in materials development [single crystals, ceramics, thin films, wire and tapes] is reported in papers in this volume. The main focus of the papers is in attaining a better understanding of the relationship between microstructure and electrical properties. Topics such as the effects of substitution and doping; multilayers; nanostructure characterisation; electric field effects in High Tc Superconductors [HTS]; surface currents; flux pinning and magneto-optic imaging of flux patterns; effects of irradiation induced defects; properties and preparation of materials; microwave properties of electronic devices. A clearly broadened basis for understanding processes and mechanisms in [HTS] is portrayed. Appreciable progress has been achieved in the manufacturing of high quality materials supported by very efficient methods in microstructural analysis. This essential improvement is reflected in the increased practical devices encouraging the use of HTS in applications for electronics and power engineering, all of which are reviewed in depth in this work.

Simulation of Semiconductor Processes and Devices Densoukalis 2012-12-06 This volume contains the Proceedings of the International Conference on Simulation of Semiconductor Devices and Processes, SISPAD 01, held on September 5-7, 2001, in Athens. The conference provided an open forum for the presentation of the trends in process and device simulation. The trend towards shrinking device dimensions and increasing complexity in process technology demands the continuous development of advanced models describing basic physical phenomena involved. New simulation tools are developed to complete the hierarchy in the Technology Computer Aided Design (TCAD) simulation chain between microscopic and macroscopic approaches. The conference program featured 8 invited papers, 60 papers for oral presentation and 34 papers for poster presentation, selected from a total of 165 abstracts from 30 countries around the world. These papers disclose new and interesting concepts for simulating process and device simulation. Chemical Vapor Deposition Neralla 2016-08-31 This book provides an overview of chemical vapor deposition (CVD) methods and recent advances in developing new materials for application in various fields. CVD has now evolved into the most widely used technique for growth of thin films in electronics industry. Several book methods have emerged in the past, and thus the scope of this book goes beyond providing fundamentals of the CVD process. Some of the chapters included high temperature CVD, limitations in the CVD methods and offer alternatives in developing coatings through overcoming these limitations.

Chemical Vapour Deposition Anthony C. Jones 2009 "The book is one of the most comprehensive overviews ever written on the key aspects of chemical vapour deposition processes and it is more comprehensive, technically detailed and up-to-date than other books on CVD. The contributing authors are all practising CVD technology leading international experts in the field of CVD. It presents a logical and progressive overview of the various aspects of CVD processes. Basic concepts, such as fundamentals of CVD processes, the design of CVD reactors, reaction modelling and CVD precursor chemistry are covered in the first few"--BOOK JACKET.

Mid-infrared Optoelectronics Tournié 2019-10-19 Mid-infrared Optoelectronics: Materials, Devices, and Applications addresses the new materials, devices and applications that have emerged over the last decade, along with exciting areas of research. Sections cover fundamentals, light sources, photodetectors, new approaches, and mid-IR devices, with sections discussing LEDs, laser diodes, and quantum cascade lasers, mid-infrared optoelectronics, emerging research areas, dilute bismide and Group-IV materials, gallium nitride heterostructures, and new nonlinear materials. Finally, the most relevant applications of mid-infrared devices are reviewed in imaging, sensing, spectroscopy, and imaging. This book presents a key reference for materials scientists, engineers and professionals working in R&D in the area of semiconductor optoelectronics. Provides a comprehensive overview of mid-infrared photodetectors and light sources and the latest materials and devices Reviews emerging areas in the field of mid-infrared optoelectronics, including new materials, such as wide bandgap materials, chalcogenides and new approaches, like heterogeneous integration. Information on the most relevant applications in industry, like gas sensing, spectroscopy and imaging

III-Nitrides Light Emitting Diodes: Technology and Applications Lim 2020-08-31 The book provides an overview of III-nitride-material-based light-emitting diode (LED) technology, from the basic material physics to the latest advances in the field, such as homoepitaxy and heteroepitaxy of the materials on different substrates. It covers the latest advances in the field, such as approaches to improve quantum efficiency and reliability as well as novel structured LEDs. It explores the concept of material structure, packaging, reliability and application of LEDs. With spectra coverage from ultraviolet (UV) to entire visible light wavelength, the III-nitride-material-based LEDs have a broad application potential, and are not just limited to illumination. These novel applications, such as health & medical, visible light communications, fishery and aquaculture are also discussed in the book.