

Polycrystalline Semiconductors Vi

[#polycrystalline semiconductors vi](#) [#advanced semiconductor materials](#) [#polycrystalline material science](#) [#semiconductor research](#) [#materials physics volume 6](#)

This volume, 'Polycrystalline Semiconductors Vi', delves into the latest advancements and research findings concerning polycrystalline semiconductor materials. It explores the unique electrical, optical, and structural properties of these materials, which are critical for various modern electronic and optoelectronic applications. Topics covered include their fabrication techniques, performance optimization, and overcoming challenges in devices ranging from solar cells to high-performance transistors. This essential resource provides valuable insights for researchers, engineers, and students in semiconductor physics and materials science, focusing on the continuing evolution of polycrystalline semiconductor technology.

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Polycrystalline Semiconductors VI

This book comprises the contributions to the sixth conference on polycrystalline semiconductors (POLYSE). Volume is indexed by Thomson Reuters CPCI-S (WoS). The conference covered many aspects of polycrystalline semiconductors, but was more applications-oriented than on previous occasions; thereby reflecting the rapid evolution of these technologies. POLYSE 2000 brought together research specialists from >basic research, as well as from research & development engineering, all of whom are working on devices such as thin-film transistors, micro-electromechanical systems, or sensors and actuators. In particular, ten internationally recognized scientists (J. Morante, S.Périchon, M. Konagai, S. Wagner, R. Hagenbeck, D.A. Bonnell, G. Horowitz, T.Fuyuki, J. Kocka and V. Chuwere) were invited to review their work on several interesting and promising aspects of the subject: such as, micro-systems, solar cells, thin-film transistors, organic polycrystalline devices and polycrystalline ceramics.

Polycrystalline Semiconductors VI

This book summarizes the most recent aspects of polycrystalline semiconductors as presented at the conference Polycrystalline Semiconductors - Grain Boundaries and Interfaces. It contains 12 review articles on selected topics written by experts in their fields and 41 complementary contributed papers. The structure, chemistry and physics of grain boundaries and other interfaces are experimentally and theoretically studied. Aspects of the technologically important polycrystalline silicon are discussed in detail. Also covered are other polycrystalline semiconductors, germanium and compound semiconductors, that are currently of interest in fundamental research and in the technology of solar cells and thin

film devices. Anyone interested in polycrystalline semiconductors will be able to use this comprehensive collection to advantage. It also suggests directions for new research and development.

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Polycrystalline Semiconductors VI

The present volume covers many aspects of semiconductors, over the wide structural range from nano- to large-grained crystalline. Scientists working on polycrystalline semiconductors, with various chemistries, here review fundamental research, technology and applications.

Polycrystalline Semiconductors IV

Like the previous conferences in this series, POLYSE '98 covered many aspects of polycrystalline semiconductors. Whereas earlier proceedings had included many contributions on basic research, for example on the structural properties of single grain boundaries, later proceedings had included more articles on solar cells and thin-film transistors, seemingly marking a transition to a more technology-oriented conference. However, the contributions to POLYSE '98 show that the POLYSE-series is again bringing together researchers from basic research as well as engineers working on devices. The 84 papers cover topics such as: beam-induced currents, thin-film silicon, silicon crystallization, oxide semiconductor films, chalcogenide and spinel films, chalcopyrite films, thin-film junctions and devices; thus providing an extensive survey of the most recent results in polycrystalline semiconductor research.

Polycrystalline Semiconductors V

Volume is indexed by Thomson Reuters CPCI-S (WoS). This book comprises the over 100 contributions that were presented at the International Conference on Polycrystalline Semiconductors which took place from September 10 to 13, 2002, in Nara, Japan.

Polycrystalline Semiconductors

This is the first reference on amorphous silicon and polycrystalline silicon thin film transistors that gives a systematic global review of all major topics in the field. These volumes include sections on basic materials and substrates properties, fundamental device physics, critical fabrication processes (structures, a-Si: H, dielectric, metallization, catalytic CVD), and existing and new applications. The chapters are written by leading researchers who have extensive experience with reputed track records. Thin Film Transistors provides practical information on preparing individual functional a-Si: H TFTs and poly-Si TFTs as well as large-area TFT arrays. Also covered are basic theories on the a-Si: H TFT operations and unique material characteristics. Readers are also exposed to a wide range of existing and new applications in industries.

Polycrystalline Semiconductors I

This practical book shows how an understanding of structure, thermodynamics, and electrical properties can explain some of the choices of materials used in microelectronics, and can assist in the design of new materials for specific applications. It emphasizes the importance of the phase chemistry of semiconductor and metal systems for ensuring the long-term stability of new devices. The book discusses single-crystal and polycrystalline silicon, aluminium- and gold-based metallisation schemes, packaging semiconductor devices, failure analysis, and the suitability of various materials for optoelectronic devices and solar cells. It has been designed for senior undergraduates, graduates, and researchers in physics, electronic engineering, and materials science.

Polycrystalline Semiconductors

Contents: X-Ray Characterisation of II-VI Semiconductor Materials (D Gao et al.) Electronic Structure of II-VI Semiconductors and Their Alloys (S-H Wei) Radiative Recombination Processes in Rare Earth Doped II-VI Materials (M Godlewski et al.) Nonlinear Optical Properties of Heavily Doped CdS (U Neukirch) Nanostructures of Broad Gap (II,Mn) VI Semiconductors (W Heimbrodt & O Goede) Co-Based II-VI Semimagnetic Semiconductors (A Twardowski et al.) Photoluminescence and Raman Scattering of ZnSe-ZnTe Strained Layer Superlattices (K Kumazaki) Novel Electronic Processes in Mercury-Based Superlattices (J R Meyer et al.) Strain, Pressure and Piezoelectric Effects in Strained II-VI Superlattices and Heterostructures (E Anastassakia) Electronic Structures of Strained II-VI Superlattices (T Nakayama) Devices and Applications of II-VI Compounds (S Colak) Solar Cells Based on II-VI Semiconductors (H Uda) ZnSe and Its Applications for Blue-Light Laser Diodes (M Pessa & D Ahn) Molecular Beam Epitaxy of HgCdTe for Electro-Optical Infrared Applications (J M A Cortés) and other papers Readership: Condensed matter physicists and electronic engineers. keywords:

Polycrystalline Semiconductors VII

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 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.

Polycrystalline Semiconductors II

Knowledge of the refractive indices and absorption coefficients of semiconductors is especially important in the design and analysis of optical and photonic devices. This book presents data on the optical constants of various elemental and compound semiconductors. A complete set of the optical constants of the semiconductors are presented in tabular and graphical forms over the entire photon-energy range. They are: the complex dielectric constant $\mu(\mathbf{E})=\mu_1(\mathbf{E})+i\mu_2(\mathbf{E})$, the complex refractive index $n^*(\mathbf{E})=n(\mathbf{E})+ik(\mathbf{E})$, the absorption coefficient $\alpha(\mathbf{E})$, and the normal-incidence reflectivity $R(\mathbf{E})$. The book will aid many who are interested to know the optical constants of the elemental and compound semiconductors in the course of their work.

Polycrystalline Semiconductors

This book covers the physics and technology of polycrystalline semiconductors by presenting the work of scientists who are concerned with a variety of polycrystalline materials in research, technology, and application, with a view to bridge the gap between fundamental and technological aspects of polycrystalline semiconductors.

Thin Film Transistors: Polycrystalline silicon thin film transistors

The purpose of this book is to provide the reader with a self-contained treatment of fundamental solid state and semiconductor device physics. The material presented in the text is based upon the lecture notes of a one-year graduate course sequence taught by this author for many years in the Department of Electrical Engineering of the University of Florida. It is intended as an introductory textbook for graduate students in electrical engineering. However, many students from other disciplines and backgrounds such as chemical engineering, materials science, and physics have also taken this course sequence, and will be interested in the material presented herein. This book may also serve as a general reference for device engineers in the semiconductor industry. The present volume covers a wide variety of topics on basic solid state physics and physical principles of various semiconductor devices. The main subjects covered include crystal structures, lattice dynamics, semiconductor statistics, energy band theory, excess carrier phenomena and recombination mechanisms, carrier transport and scattering mechanisms, optical properties, photoelectric effects, metal-semiconductor devices, the p-n junction diode, bipolar junction transistor, MOS devices, photonic devices, quantum effect devices, and high speed III-V semiconductor devices. The text presents a unified and balanced treatment of the physics of semiconductor materials and devices. It is intended to provide physicists and materials scientists with more device backgrounds, and device engineers with a broader knowledge of fundamental solid state physics.

Microelectronic Materials

A large number of solar cell and solar cell systems are described in this volume. The theory of their operation, their design and the levels of their performance is discussed. Originally the book appeared in 1978 but extensive change over the intervening years in the fields of energy generation and consumption, solar energy and solar cells, has necessitated the publication of an updated version. The text initially surveys the requirements of humanity, the subsequent need for solar cells, the nature of sunlight and the properties of semiconductors. Concrete examples, extensive references and theoretical arguments are then used to present a comparison of options available in the design and operation of solar cells and solar cell systems. The cells - constructed from single, crystal, polycrystalline and amorphous semiconductors - and the systems - have varying designs and differing levels of solar energy for input and produce electricity or electrical and thermal energies. Solar cell production, economics and environmental effects are considered throughout the publication.

II-VI Semiconductor Compounds

IV-VI and IV-VI₂ semiconductors have attracted considerable attention due to their applications in the fabrication of electronic and optoelectronic devices as light-emitting diodes and solar cells. The electrical properties of these semiconductors can also be tuned by adding impurity atoms. Because of their wide application in various devices, the search for new semiconductor materials and the improvement of existing materials is an important field of study. Doping with impurities is a common method of modifying and diversifying the properties of physical and chemical semiconductors. This book covers all known information about phase relations in quaternary systems based on IV-VI and IV-VI₂ semiconductors, providing the first systematic account of phase equilibria in quaternary systems based on IV-VI and IV-VI₂ semiconductors and making research originally published in Ukrainian and Russian accessible to the wider scientific community. This book will be of interest to undergraduate and graduate students studying materials science, solid-state chemistry, and engineering. It will also be relevant for researchers at industrial and national laboratories, in addition to phase diagram researchers, inorganic chemists, and solid-state physicists. Key Features: • Provides up-to-date experimental and theoretical information. • A source of information for synthesizing semiconducting materials with predetermined properties. • Delivers a critical evaluation of many industrially important systems presented in the form of two-dimensional sections for the condensed phases.

Handbook of II-VI Semiconductor-Based Sensors and Radiation Detectors

This book provides new research on polycrystalline films. Chapter One reviews the characterization of polycrystalline $\text{Cu}_2\text{ZnSn}(\text{S}_x\text{Se}_{1-x})_4$ thin-films and solar-cells. Chapter Two explains the chemical vapor deposition process accelerated by the fragments of monomethylsilane. Chapter Three studies the regularities of formation of the nanostructured films of polycrystalline silicon doped with germanium as isovalent impurity.

The Handbook on Optical Constants of Semiconductors

This text is devoted to theoretical investigations of interrelations in between morphology, single-electron spectrum, and optical properties of polycrystalline and spatially non-homogeneous amorphous semiconductors.

Polycrystalline Semiconductors III

This book contains papers that were presented at the International Conference on Polycrystalline Semiconductors - Grain Boundaries, Dislocations and Heterointerfaces - (POLYSE '90), which was held in Schwabisch Hall, FRG, from July 30 to August 3, 1990. This conference was a satellite conference of the 20th International Conference on the Physics of Semiconductors. POLYSE '90, like its predecessor POLYSE '88, brought together scientists from research institutions and industrial laboratories with a view to bridging the gap between fundamental and technological aspects of polycrystalline semiconductors. With this aim, a total of 14 recognized scientists from universities and industry were invited to review their fields of interest. The expert presentations of these scientists were complemented by contributed papers and poster contributions, the authors of which were additionally allowed four minutes for an oral summary. This combination of different types of presentation led to very lively and stimulating discussions.

Semiconductor Physical Electronics

The book describes developments in the crystal growth of bulk II-VI semiconductor materials. A fundamental, systematic, and in-depth study of the physical vapor transport (PVT) growth process is the key to producing high-quality single crystals of semiconductors. As such, the book offers a comprehensive overview of the extensive studies on ZnSe and related II-VI wide bandgap compound semiconductors, such as CdS, CdTe, ZnTe, ZnSeTe and ZnSeS. Further, it shows the detailed steps for the growth of bulk crystals enabling optical devices which can operate in the visible spectrum for applications such as blue light emitting diodes, lasers for optical displays and in the mid-IR wavelength range, high density recording, and military communications. The book then discusses the advantages of crystallization from vapor compared to the conventional melt growth: lower processing temperatures, the purification process associated with PVT, and the improved surface morphology of the grown crystals, as well as the necessary drawbacks to the PVT process, such as the low and inconsistent growth rates and the low yield of single crystals. By presenting in-situ measurements of transport rate, partial pressures and interferometry, as well as visual observations, the book provides detailed insights into the kinetics during the PVT process. This book is intended for graduate students and professionals in materials science as well as engineers preparing and developing optical devices with semiconductors.

Electrical properties of polycrystalline semiconductor films

II-VI Semiconductor Materials and Their Applications deals with II-VI compound semiconductors and the status of the two areas of current optoelectronics applications: blue-green emitters and IR detectors. Specifically, the growth, characterization, materials and device issues for these two applications are described. Emphasis is placed on the wide bandgap emitters where much progress has occurred recently. The book also presents new directions that have potential, future applications in optoelectronics for II-VI materials. In particular, it discusses the status of dilute magnetic semiconductors for magneto-optical and electromagnetic devices, nonlinear optical properties, photorefractive effects and new materials and physics phenomena, such as self-organized, low-dimensional structures. II-VI Semiconductor Materials and Their Applications is a valuable reference book for researchers in the field as well as a textbook for materials science and applied physics courses.

Solar Energy Conversion

This book comprises the over 100 contributions that were presented at the International Conference on Polycrystalline Semiconductors which took place from September 10 to 13, 2002, in Nara, Japan.

Semiconductor Silicon

A companion volume to Ternary Alloys Based on II-VI Semiconductor Compounds (CRC Press, 2013) and Quaternary Alloys Based on II-VI Semiconductor Compounds (CRC Press, 2014), Multinary Alloys Based on II-VI Semiconductors provides up-to-date experimental and theoretical information on phase relations based on II-VI semiconductor systems with five or more components. Featuring

detailed figures and extensive references, this book: Delivers a critical evaluation of many industrially important systems presented in the form of two-dimensional sections for the condensed phases Summarizes the data from the last 15–20 years of literature on the study of organometallic compounds, which include zinc, cadmium, or mercury and sulfur, selenium, or tellurium Classifies all materials according to the periodic table groups of their constituent atoms, that is, possible combinations of Zn, Cd, and Hg with chalcogens S, Se, and Te and additional components in the order of their group number Specifies the diagram type, possible phase transformations and physical–chemical interaction of the components, methods of equilibrium investigation, thermodynamic characteristics, and methods for sample preparation in each multinary database description Multinary Alloys Based on II-VI Semiconductors contains valuable material useful for obtaining nanoscale II-VI semiconductors and for preparing thin films of these semiconductor materials, as well as for exploring the biological and medicinal applications of organometallic compounds, and for identifying new compounds with necessary properties.

Quaternary Alloys Based on IV-VI and IV-VI₂ Semiconductors

The book is devoted to theoretical investigations of interrelations in between morphology, single-electron spectrum, and optical properties of polycrystalline and spatially non-homogeneous amorphous semiconductors.

Polycrystalline Films

Single Crystals of Electronic Materials: Growth and Properties is a complete overview of the state-of-the-art growth of bulk semiconductors. It is not only a valuable update on the body of information on crystal growth of well-established electronic materials, such as silicon, III-V, II-VI and IV-VI semiconductors, but also includes chapters on novel semiconductors, such as wide bandgap oxides like ZnO, Ga₂O₃, In₂O₃, Al₂O₃, nitrides (AlN and GaN), and diamond. Each chapter focuses on a specific material, providing a comprehensive overview that includes applications and requirements, thermodynamic properties, schematics of growth methods, and more. Presents the latest research and most comprehensive overview of both standard and novel semiconductors Provides a systematic examination of important electronic materials, including their applications, growth methods, properties, technologies and defect and doping issues Takes a close look at emerging materials, including wide bandgap oxides, nitrides and diamond

Thin Film Transistor Technologies V

This book covers the chemistry of the major processes involved in the manufacture of integrated circuits. The authors describe all the major processes in use, together with some interesting processes which are currently being developed and hold future promise. Each chapter covers the current state of knowledge of the underlying chemistry of a particular process, and identifies areas of uncertainty requiring further research.

Polycrystalline and Spatially Non-Homogeneous Amorphous Semiconductors and Insulators

"... papers that were presented at the Sixth Symposium on High Purity Silicon held in Phoenix, Arizona at the 198th Meeting of the Electrochemical Society, October 22-27, 2000."--Preface.

Polycrystalline Semiconductors II

Vapor Crystal Growth and Characterization