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Titolo	Handbook of II-VI Semiconductor-Based Sensors and Radiation Detectors : Volume 1, Materials and Technology / / edited by Ghenadii Korotcenkov
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Descrizione fisica	1 online resource (XIII, 586 p. 300 illus., 1 illus. in color.)
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Soggetti	Semiconductors Chemical detectors Radiation dosimetry Materials Detectors Sensors Radiation Dosimetry and Protection Sensors and biosensors Materials for Devices
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction in II-VI semiconductors -- (general view, history) -- Cd-based II-VI semiconductors -- (CdSe, CdS, CdTe, structure, optical properties, luminescence, electrical conduction, photoconductivity) -- Zn-based II-VI semiconductors -- (ZnSe, ZndS, ZnTe, structure, optical properties, luminescence, electrical conduction, photoconductivity) -- Hg-based II-VI semiconductors -- (HgTe; HgS; HgSe, structure, elecrophysical propertie) -- Ternary II-VI compounds -- (CdZnTe, HgCdTe, HgZnTe) -- Bandgap engineering -- Synthesis of II-VI semiconductors -- (single crystals, polycrystals, wet chemical synthesis, features, crystallite sizes, sintering), -- Thin films of II-VI semiconductors -- (features, deposition, characterization) -- Epitaxial growth of II-VI semiconductors -- (approaches, deposition, characterization) -- Doping of II-VI semiconductors -- (approaches,

limitations, p-n junction forming, characterization) -- Schottky barriers and ohmic contacts to II-VI semiconductors -- (formation, approaches, parameters, limitations) -- Patterning of II-VI semiconductor films -- (etching: wet, dry) -- Stability of II-VI semiconductors -- (thermal, temporal, stabilization, surface passivation) -- Colloidal II-VI semiconductor-based nanoparticles -- (quantum dots, synthesis, stabilization) -- 1D II-VI semiconductor-based nanomaterials -- (nanowires, nanobelts, etc. synthesis, characterization) -- 2D II-VI semiconductor-based nanomaterials -- (nanoflakes, nanosheets, etc., synthesis, characterization) -- 3D II-VI semiconductor-based nanomaterials -- (core-shells, spherical, hierarchical structures, etc., synthesis, characterization) -- -- Introduction in IR detectors -- (Classification, Infrared Detector Market, materials, HgCdTe, limitations, applications) -- Photoconductive and photovoltaic IR detectors -- (HgCdTe, HgZnTe, high operation temperature (HOT) IR detectors, sensor design, p-n junction, barrier photodetectors, characterization, performances, application, advantage, disadvantages) -- Avalanche photodiodes for IR spectral region -- (HgCdTe, p-i-n, principles of operation, fabrication, performances, application, advantage, disadvantages) -- Photoelectromagnetic (PEM) detectors, magnetoconcentration detectors, and Dember effect IR detectors -- (design, characterization, performances, application, advantage, disadvantages) -- Quantum Cascade and Quantum well IR Detectors -- (HgCdTe, design, fabrication, characterization, performance, application, advantage, disadvantages) -- IR detectors array -- (photoconductive array, photodiode array, design, array technology, fabrication, performance, application) -- Nanomaterial-based IR detectors -- (HgTe, HgSe, QDs-based IR detectors, nanocrystals, colloidal, 1D and 2D structures) -- CdSe-based photodetectors for visible-NIR spectral region -- (all types of detectors, including nanomaterials (thin films, 1D, 2D, 3D, QDs, colloidal, nanocrystals), design, fabrication, performance, application) -- CdTe-based photodetectors for visible-NIR spectral region -- (all types of detectors, including nanomaterials (thin films, 1D, 2D, 3D, QDs, colloidal, nanocrystals), design, fabrication, performance, application) -- CdS-based photodetectors for visible-UV spectral region -- (all types of detectors, including nanomaterials (thin films, 1D, 2D, 3D, QDs, colloidal, nanocrystals), design, fabrication, performance, application) -- Photodetectors for visible spectral range based on ternary and -- multinary alloys of II-VI semiconductors -- (ZnSTe, CdZnTe, ZnSeTe, etc., design, fabrication, performance, application) -- Introduction in UV detectors -- (Principles of operation, materials used, classification, applications) -- Schottky barrier-based and heterojunction-based UV detectors -- (ZnS, ZnSe, design, fabrication, characterization, performance, application, advantage, disadvantages) -- Avalanche UV photodiodes -- (ZnS, ZnSe, p-i-n, design, fabrication, characterization, performance, application, advantage, disadvantages) -- Nanomaterial-based UV photodetectors -- (ZnS, ZnSe, 1D, 2D, 3D, QDs, design, fabrication, characterization, performance, advantage, disadvantages).

Sommario/riassunto

Three-volumes book “Handbook of II-VI Semiconductor-Based Sensors and Radiation Detectors” is the first to cover both chemical sensors and biosensors and all types of photodetectors and radiation detectors based on II-VI semiconductors. It contains a comprehensive and detailed analysis of all aspects of the application of II-VI semiconductors in these devices. The first volume "Materials and Technologies" of a three-volume set describes the physical, chemical and electronic properties of II-VI compounds, which give rise to an increased interest in these semiconductors. Technologies that are used

in the development of various devices based on II-VI connections, such as material synthesis, deposition, characterization, processing, and device fabrication, are also discussed in detail in this volume. It covers also topics related to synthesis and application of II-VI-based nanoparticles and quantum dots, as well their toxicity, biocompatibility and biofunctionalization. Consider of both chemical and biosensors and all types of radiation detectors based on II-VI semiconductors; Feature detailed analysis of all aspects of II-VI semiconductors; Maximize reader understanding of the present status of II-VI semiconductors and their role in the development of new generation of sensors and radiation detectors; Stands as an ideal reference for researchers concerned with electronics, optoelectronics, chemical and bio sensors, electrical engineering, biomedical applications and a robust supplement for university students and faculty.