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Titolo	Handbook of II-VI Semiconductor-Based Sensors and Radiation Detectors : Volume 2, Photodetectors // edited by Ghenadii Korotcenkov
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ISBN	3-031-20510-3
Edizione	[1st ed. 2023.]
Descrizione fisica	1 online resource (527 pages)
Disciplina	681.25
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
Note generali	Includes index.
Nota di contenuto	Basic principles of solid state X-ray radiation detector operation -- (classification, materials, requirements, advantages of II-VI compounds, limitations, application) -- ZnSe-based radiation detectors -- (Single crystal detectors, polycrystalline detectors, design, performances) -- CdTe/CdZnTe-based radiation detectors -- (Single crystal detectors, polycrystalline and epitaxial-based detectors, design, progresses in Growth of High Quality crystals, Performances) -- X-ray and gamma imaging using II-VI semiconductor-based detectors -- (approaches, applications) -- Introduction in gas and humidity sensing -- (principles of operation, main applications) -- II-VI semiconductor-based thin film electric and electronic gas sensors -- (conductometric, QCM, SAW-based sensors, thin film and thick film technology; light activation, surface decoration, performances) .-Nanocomposite and

hybrid-based electric and electronic gas sensors -- (all types of sensors based on polymer-II-VI composites, carbon-based- II-VI, and metal oxide-II-VI based composites and heterostructures) --  
 Nanomaterial-based electric and electronic gas sensors -- (all types of sensors based on QDs, 1D, 2D, 3D, core/shells structures) -- II-VI-based electric and electronic humidity sensors -- (all types of sensors; conventional materials; nanomaterials: QDs, 1D, 2D, 3D;) -- II-VI-based optical gas sensors -- (CdSe, CdTe, CdS, luminescence, fluorescence, fiber-optic, QDs, performances, etc.) -- Spectroscopic gas sensing systems -- (systems based on II-VI lasers) -- II-VI-based luminescence and fluorescence ion sensors -- (toxic metals, pH) -- Photoelectrochemical ion sensors -- (toxic metals, electrodes, ion-exchange reactions, applications) -- Introduction in biosensing -- (approaches, materials used, QDs, applications) -- Toxicity and biocompatibility of II-VI semiconductors -- (biocompatibility evaluation, toxicological researches, genotoxicity, cytotoxicity, photoinduced toxicity, QDs, mechanism of QDs toxicity, core-shell structures, surface treatment, ligand exchange, additional coating layers, etc.) -- Biofunctionalization of II-VI QDs -- (semiconductor/biomolecular heterojunctions, functionalization of QDs, solubilization, bioconjugation, functionalization chemistry, ligand exchange, chemical functional groups, biomolecules, limitations) -- Fluorescent biosensors based on II-VI QDs -- (principles of operation, performances, functionalization, advantages, disadvantages, applications, etc.) -- Bioluminescent biosensors based on II-VI QDs -- (principles of operation, performances, functionalization, advantages, disadvantages, applications, etc.) -- Chemiluminescent biosensors based on II-VI QDs -- (principles of operation, performances, functionalization, advantages, disadvantages, applications, etc.) -- Electrochemiluminescent biosensors based on II-VI QDs -- (principles of operation, performances, functionalization, advantages, disadvantages, applications, etc.) -- Electrochemical biosensors -- (principles of operation, performances, functionalization, advantages, disadvantages, applications, etc.) -- Photoelectrochemical biosensors -- (principles of operation, performances, functionalization, advantages, disadvantages, applications, etc.) -- Surface plasmon resonance biosensors -- (CdSe, CdTe, CdS, Au QDs, principles of operation, performances, functionalization, advantages, disadvantages, applications, etc.) -- Biomarkers, Bioimaging -- (in vitro and in vivo imaging, downconverting and upconverting nanophosphors for bioimaging) -- Specific application of biosensors-1 -- Specific application of biosensors-2 -- Specific application of biosensors-3 -- Magnetoresistive sensors -- (HgTe, HgSe, quantum wells) -- Infrared temperature sensors -- (principles of operation, thermal detectors, thermal imaging, Sprite detectors, applications, advantage, disadvantages) -- Strain and pressure sensors -- (HgTe, topological insulator, quantum dots).

## 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 second volume "Photodetectors" of a three-volume set, focus on the consideration of all types of optical detectors, including IR detectors, visible and UV photodetectors. This consideration includes both the fundamentals of the operation of detectors and the peculiarities of their manufacture and use. In particular, describes numerous strategies for their fabrication and

characterization. An analysis of new trends in development of II-VI semiconductors-based photodetectors such as graphene/HgCdTe-, nanowire- and quantum dot-based photodetectors, as well as solution-processed, multicolor, flexible and self-powered photodetectors, are also given. Considers all types of photodetectors based on II-VI semiconductors; Features detailed analysis of all aspects of II-VI semiconductors applications; Maximizes reader understanding of the present status of II-VI semiconductors and their role in the development of next generation of photodetectors; Stands as an ideal reference for researchers concerned with electronics, optoelectronics, solar cells, electrical engineering, biomedical applications and a robust supplement for university students and faculty. .

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