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Nota di contenuto	Part I General Topics -- Cyber-Physical Systems to Counter CBRN Threats – Sensing Payload Capabilities in Aerial Platforms for Real-Time Monitoring and Analysis -- Part II Material Preparation and Processing -- Application of Ionizing Irradiation for Structure Modification of Nanomaterials -- The Corona Triode Charging/Polarization System -- Transparent Organic-Inorganic Hybrids Obtained from Covalently Bonded Ureasilicate Monomers: Optical and Mechanical Properties -- Sol-Gel Technique to Design Hybrid Materials and Their Application in Water Purification -- BaTiO3 Structure as a Function of the Preparation

Method -- Part III Characterization -- Impedance Spectroscopy: Concepts and Applications -- Undesirable Aspects of Fatigue on Stretchable Elastomer Sensors -- Dielectric Characterization of (Bi1-xFex)NbO4 Ceramics Prepared by Wet-Chemical Route -- Part IV Thin Films -- Study of In2O3 Thin Films Doped with As as Active Layer in Position Sensitive Structures -- Design of Mesoscopic Ordered Titania and Silica Hybrid Sol-Gel Films as Planar Waveguide -- Part V Carbon-based Materials -- CVD Diamond and Nanodiamond: Versatile Materials for Countering a Wide Range of CBRN Threats -- Fabrication of Diamond AFM Tips for Quantum Sensing -- Nanostructured Biochar: Production Pathways and Applications -- Part VI Nanowires and Nanoparticles -- Nanowires for NEMS Switches -- Modification of TiO2 and ZnO Particles Under Mechanical Stress with Polypropylene -- Use of Magnetic Susceptibility Measurement for Analysis of Self-organized Magnetic Nanoparticles in Biological Systems -- Part VII Nanocomposites -- Solvent Dispersible Nanocomposite Based on RGO Surface Decorated with Au Nanoparticles for Electrochemical Genosensors -- Electrical Properties in PMMA/Carbon-Dots Nanocomposite Films Below the Percolation Threshold -- Microwave Characteristics (Reflection Losses) of Composite Materials Consisting of Magnetic Nanoparticles -- Dielectric Properties of PMMA/PPy Composite Materials -- Part VIII Polymer-based Materials -- Recent Advances of Electrospinning and Multifunctional Electrospun Textile Materials for Chemical and Biological Protection -- Temperature Effect on Dielectric Properties of Heterogeneous Material Based on Carbon Black Loaded Copolymer Nanocomposite -- Novel Photocross-Linked Polymers for Construction of Laccase-Based Amperometric Biosensors -- Part IX Oxide and Non-oxide glasses -- Surface Phenomena in Glassy Chalcogenides by Gas Sensing -- Phase Composition and Spectroscopic Characterization of Barium Titanate Containing Glass Ceramics -- Near Infrared Photoluminescence of Nd-Doped ZBP glasses -- Determination of the Surface Properties of Combined Metal-Oxide Layers, Obtained by AC-Incorporation of Ni and Cu in Preliminary Formed AAO Matrices -- Part X Applications: Sensors and Detectors -- Testing of pH Nanosensors Based on Polyaniline/Carbon Nanostructures Coated Screen Printed Electrode -- WO3-Based Glass-Crystalline Sensor for Selective Detection of Ammonia Gas -- Part XI Applications: Water Treatment, Environment and Energy- Optimizing Bacterial Cellulose Production Towards Materials for Water Remediation -- Sodium Ferrites: New Materials to be Applied in Energy Storage Devices in a Wide Frequency Range -- Fluorescent Thin Film Probe for Nitro Compounds: Si Containing Poly[Diphenylacetylene] Case Study -- Determination of Surface Groups of Activated Carbons from Different Sources and Their Application for Heavy Metals Treatment -- Recent Trends of the Use of Rare Earth Elements for Efficient Environmentally Compliant Corrosion Protection of Aluminum and Its Alloys -- Part XII Applications: Health and Biological Threats -- Synthesis of PLGA-PEG-PLGA Polymer Nano-Micelles – Carriers of Combretastatin-Like Antitumor Agent 16Z -- Poly(-caprolactone)/Chitosan Nanostructures for Cell Cultivation -- Preparation and Characterization of Zinc and Magnesium Doped Bioglasses -- Polarized Light for Detection of Pathological Changes within Biological Tissues -- Melanoma Cells Uptake and Hyperthermia Tests of Iron-Based Magnetic Nanoparticles -- Index.

Sommario/riassunto

This book is based on the lectures and contributions of the NATO Advanced Study Institute on “Nanoscience and Nanotechnology in Security and Protection Against CBRN Threats” held in Sozopol, Bulgaria, September 2019. It gives a broad overview on this topic as it

combines articles addressing the preparation and characterization of different nanoscaled materials (metals, oxides, glasses, polymers, carbon-based, etc.) in the form of nanowires, nanoparticles, nanocomposites, nanodots, thin films, etc. and contributions on their applications in diverse security and safety related fields. In addition, it presents an interdisciplinary approach drawing on the Nanoscience and Nanotechnology know-how of authors from Physics, Chemistry, Engineering, Materials Science and Biology. A further plus-point of the book, which represents the knowledge of experts from over 20 countries, is the combination of longer papers introducing the background on a certain topic, and brief contributions highlighting specific applications in different security areas.