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Nota di contenuto	Intro -- NEW DEVELOPMENTS IN QUARTZ RESEARCH -- NEW DEVELOPMENTS IN QUARTZ RESEARCH -- CONTENTS -- PREFACE -- QCM IN THE ACTIVE MODE: THEORY AND EXPERIMENT -- ABSTRACT -- ABBREVIATIONS (GLOBAL) -- 1. MEASUREMENT OF BOND RUPTURE FORCE WITH THE HELP OF A QUARTZ CRYSTAL MICROBALANCE -- 1.1. Introduction -- 1.2. Experimental, Theory, Results -- 2. A MATHEMATICAL MODEL -- 2.1. Introduction -- 2.2. One-Dimensional Resonator Model Based on Longitudinal Oscillatory Motions in Thin Plates -- 2.3. The Effect of a Point Load on a Quartz Crystal Microbalance -- 2.4. Oscillatory Motion in a Viscous Liquid -- 2.5. One-Dimensional Model of the QCM in Application to the Rupture Bond Strength Measurement -- 3. APPLICATION OF THE METHOD -- 3.1. Quantitative Detection and Separation of Bacteria Using Rupture Event Scanning -- 3.1.1. Introduction -- 3.1.2. Materials and Methods -- Preparation of Bacterial Samples -- Preparation of Antibody Coated Surfaces -- Detection of E. Coli and S. Aureus -- Scanning Electron Microscopy Imaging -- Data Processing -- 3.1.3. Results and Discussion -- Formation of Antibody Monolayers on the QCM -- Infectivity of REVS Recovered Bacteria -- Scanning Electron Microscopy Images -- Nature of the Acoustic Signal. Modeling -- 3.1.4. Effect of Temperature -- 3.2. Bacteriophage Identification QCM in t -- 3.3. Virus Detection -- 3.4. Quartz Crystal Microbalance as a Sensing Active

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4. FEATURES OF MASS LOAD MEASUREMENTS IN SENSORS BASED ON QUARTZ CRYSTAL MICROBALANCE -- CONCLUSION -- REFERENCES -- NATURE OF PARAMAGNETIC DEFECTS IN -QUARTZ: PROGRESSES IN THE FIRSTDECADE OF THE 21ST CENTURY -- ABSTRACT -- I. INTRODUCTION -- II. QUARTZ CRYSTAL STRUCTURE -- III. IMPURITY CENTERS -- Al Hole Centers -- Ge Centers -- Fe Centers -- IV. PARAMAGNETIC DEFECTS RELATED TO OXYGEN OR SILICON VACANCY -- The E' Centers -- The E" Centers -- The Silicon-Vacancy Hole Centers -- APPENDIX. SPIN HAMILTONIAN PARAMETERS OF PARAMAGNETIC DEFECTS IN QUARTZ -- ACKNOWLEDGMENT -- REFERENCES -- VEINED QUARTZ OF THE URALS: STRUCTURE, MINERALOGY, AND TECHNOLOGICAL PROPERTIES -- ABSTRACT -- INTRODUCTION -- SUBPOLAR URALS -- CENTRAL URALS -- SOUTH URALS -- Structural Position of Water in the Urals Quartz -- RACE ELEMENTS IN THE URALS QUARTZAND CONCENTRATION TECHNOLOGIES -- REFERENCES -- DENSIFICATION OF QUARTZ PARTICLE BEDS BY TAPPING -- ABSTRACT -- 1 QUARTZ AS THE MAJOR FILLER IN ENGINEERED STONE -- 2 DENSIFICATION OF MONOMODAL QUARTZ PARTICLE BEDS BY TAPPING -- 2.1. Proposed Kinetic Model -- 2.2. Verification of the Model 2 -- 3 DENSIFICATION OF BIMODAL QUARTZ PARTICLE BEDS BY TAPPING -- 3.1. Curves: Specific Volume of the Mixture, , Versus Mixture Composition, X. Mixture Efficiency Factor -- 3.1.1. Initial Bed Fractional Bulk Density, The -- 3.1.2. Final Bed Fractional Bulk Density Resulting from Tapping, -- 3.2. Kinetics of Densification by Tapping -- CONCLUSION -- REFERENCES -- RAPID DETECTION FOR POLLUTANTS AND BACTERIA BASED ON QUARTZ CRYSTAL MICROBALANCE BIOSENSOR -- ABSTRACT -- 1. INTRODUCTION -- 2. SENSITIVE RECOGNITION ELEMENTS -- 2.1. MIP Film -- 2.2. Aptamer Coated Film -- 2.3. Micro/Nanomaterials Coated on QCM Chip -- 2.4. Carbon Nanotubes Coated Electrode -- 3. QCM BASED ON MOLECULARLY IMPRINTED TECHNOLOGY. 4. QCM BASED ON IMMUNOLOGICAL METHOD -- 5. DNA QCM BIOSENSOR -- 6. QCM WITH DISSIPATION BIOSENSOR -- CONCLUSION -- REFERENCES -- NOVEL QUARTZ OSCILLATOR MEASUREMENT FOR GAS COMPOSITION CHANGES -- ABSTRACT -- INTRODUCTION -- PRINCIPLE OF MEASUREMENT -- GAS COMPOSITION MEASUREMENT USING QUARTZ OSCILLATOR -- 1. Hydrogen Sensing and Concentration Measurement -- 2. Air-Helium Gas Mixtures -- 3. Humidity Measurement -- 4. Silane-Hydrogen Gas Mixtures -- 5. Nitrogen-Hydrogen Gas Mixtures -- 6. Multi (More Than Three)-Component Gas Mixtures -- CONCLUSION -- ACKNOWLEDGMENT -- REFERENCES -- DETECTION/ADSORPTION OF CHEMICAL AND BIOLOGICAL MOLECULES BASED ON QUARTZ CRYSTAL MICROBALANCE (QCM) AS SENSOR -- ABSTRACT -- 1. INTRODUCTION -- 2. BASIC PRINCIPLES OF QCM -- 3. QCM MEASUREMENTS -- 4. ADSORPTION ROUTS ON THE QCM SURFACE -- 4.1. In-situ Route for Adsorption Process -- 4.2. Indirect Route for Adsorption Process -- 5. APPLICATIONS OF QCM -- 5.1. Environmental Applications -- 5.2. Gas Applications -- 5.3. Chemical Applications -- 5.4. Detection of Antigens and Antibodies -- 5.5. Detection of Enzymatic Proteins -- CONCLUSION -- REFERENCES -- USEFULNESS OF THE QUARTZ CRYSTAL MICROBALANCE TECHNIQUE TO ASSESS IN SITU

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Sommario/riassunto

In this book, the authors present new developments in quartz research.
 Topics discussed in this compilation include the nature of
 paramagnetic defects in a-Quartz; veined quartz of the Urals; QCM in
 the active mode; densification of quartz particle beds by tapping; rapid
 detection for pollutants and bacteria based on quartz crystal
 microbalance biosensors; novel quartz oscillator measurement for gas
 composition changes; detection/adsorption of chemical and biological
 molecules based on quartz crystal microbalance QCM as sensor;
 usefulness of quartz crystal microbalance techniques to assess in situ
 detergency process efficiency; ultra-stable quartz oscillators; and gold
 analysis after nanoparticle adsorption on quartz reflectors and total
 reflection x-ray fluorescence (TXRF) analysis.
