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Autore	Eggins Brian R
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Nota di contenuto	CHEMICAL SENSORS AND BIOSENSORS; Contents; Series Preface; Preface; Acronyms, Abbreviations and Symbols; About the Author; 1 Introduction; 1.1 Introduction to Sensors; 1.1.1 What are Sensors?; 1.1.2 The Nose as a Sensor; 1.2 Sensors and Biosensors - Definitions; 1.3 Aspects of Sensors; 1.3.1 Recognition Elements; 1.3.2 Transducers - the Detector Device; 1.3.3 Methods of Immobilization; 1.3.4 Performance Factors; 1.3.5 Areas of Application; 2 Transduction Elements; 2.1 Electrochemical Transducers - Introduction; 2.2 Potentiometry and Ion-Selective Electrodes: The Nernst Equation 2.2.1 Cells and Electrodes 2.2.2 Reference Electrodes; 2.2.3 Quantitative Relationships: The Nernst Equation; 2.2.4 Practical Aspects of Ion-Selective Electrodes; 2.2.5 Measurement and Calibration; 2.3 Voltammetry and Amperometry; 2.3.1 Linear-Sweep Voltammetry; 2.3.2 Cyclic Voltammetry; 2.3.3 Chronoamperometry; 2.3.4 Amperometry; 2.3.5 Kinetic and Catalytic Effects; 2.4 Conductivity; 2.5 Field-Effect Transistors; 2.5.1 Semiconductors - Introduction; 2.5.2 Semiconductor-Solution Contact; 2.5.3 Field-Effect Transistor; 2.6

Modified Electrodes, Thin-Film Electrodes and Screen-Printed Electrodes

2.6.1 Thick-Film - Screen-Printed Electrodes 2.6.2 Microelectrodes; 2.6.3 Thin-Film Electrodes; 2.7 Photometric Sensors; 2.7.1 Introduction; 2.7.2 Optical Techniques; 2.7.3 Ultraviolet and Visible Absorption Spectroscopy; 2.7.4 Fluorescence Spectroscopy; 2.7.5 Luminescence; 2.7.6 Optical Transducers; 2.7.7 Device Construction; 2.7.8 Solid-Phase Absorption Label Sensors; 2.7.9 Applications; Further Reading; 3 Sensing Elements; 3.1 Introduction; 3.2 Ionic Recognition; 3.2.1 Ion-Selective Electrodes - Introduction; 3.2.2 Interferences; 3.2.3 Conducting Devices 3.2.4 Modified Electrodes and Screen-Printed Electrodes 3.3 Molecular Recognition - Chemical Recognition Agents; 3.3.1 Thermodynamic - Complex Formation; 3.3.2 Kinetic-Catalytic Effects: Kinetic Selectivity; 3.3.3 Molecular Size; 3.4 Molecular Recognition - Spectroscopic Recognition; 3.4.1 Introduction; 3.4.2 Infrared Spectroscopy - Molecular; 3.4.3 Ultraviolet Spectroscopy - Less Selective; 3.4.4 Nuclear Magnetic Resonance Spectroscopy - Needs Interpretation; 3.4.5 Mass Spectrometry; 3.5 Molecular Recognition - Biological Recognition Agents; 3.5.1 Introduction; 3.5.2 Enzymes 3.5.3 Tissue Materials 3.5.4 Micro-Organisms; 3.5.5 Mitochondria; 3.5.6 Antibodies; 3.5.7 Nucleic Acids; 3.5.8 Receptors; 3.6 Immobilization of Biological Components; 3.6.1 Introduction; 3.6.2 Adsorption; 3.6.3 Microencapsulation; 3.6.4 Entrapment; 3.6.5 Cross-Linking; 3.6.6 Covalent Bonding; Further Reading; 4 Performance Factors; 4.1 Introduction; 4.2 Selectivity; 4.2.1 Ion-Selective Electrodes; 4.2.2 Enzymes; 4.2.3 Antibodies; 4.2.4 Receptors; 4.2.5 Others; 4.3 Sensitivity; 4.3.1 Range, Linear Range and Detection Limits; 4.4 Time Factors; 4.4.1 Response Times; 4.4.2 Recovery Times 4.4.3 Lifetimes

Sommario/riassunto

Covering the huge developments in sensor technology and electronic sensing devices that have occurred in the last 10 years, this book uses an open learning format to encourage reader understanding of the subject. An invaluable distance learning book Applications orientated providing invaluable aid for anyone wishing to use chemical and biosensors Key features and subjects covered include the following: Sensors based on both electrochemical and photometric transducers Mass-sensitive sensors Thermal-sensitive sensors Performance factors for sensors Examples o