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Based Selection; 1.4 Transduction Mechanisms; 1.4.1 Electrical Transduction; Optical Transduction; Mechanical Transduction
1.4.2 Sensitivity of a Transducer Responsivity; Noise in a Sensing System; Sensitivity; Thermal Noise; Example 1; Example 2; Example 3; 1.5 Performance of Molecular Sensors; 1.6 Animals as Molecular Sensors; 1.6.1 Sensitivity of Animal Olfactory Systems; Canine Olfactory System; Insect Olfactory System; 1.6.2 Applications of Animal Molecular Sensors; Explosive Detection; Canine Detection of Explosives; Pouched Rats for the Detection of Landmines; Honeybees for the Detection of Landmines; Disease Detection; Canines for Cancer Detection; Pouched Rats for the Detection of Tuberculosis
Other Applications Canine Detection of Pirated DVDs; Canine Detection of Bed Bugs; 1.6.3 Discussion on Animals as Molecular Sensors; 1.7 Conclusion; Problems; P1.1 Molecular Sensor; P1.2 Molecular Sensor; P1.3 Recognition Element; P1.4 Basics of Molecular Sensing; P1.5 Antibodies; P1.6 Immunosensing; P1.7 DNA Biosensor; P1.8 DNA Basics; P1.9 DNA Basics; P1.10 DNA Basics; P1.11 DNA Basics; P1.12 Thermal Noise; P1.13 Thermal Noise, Responsivity and Sensitivity; P1. 14 Sensitivity of a Force Sensor; P1.15 Animals as Molecular Sensors; References; Further Reading
2 Fundamentals of Nano/Microfabrication and Effect of Scaling 2.1 Introduction; 2.2 Scaling in Molecular Sensors; 2.3 Microfabrication Basics; 2.3.1 Silicon as a Material for Microfabrication; Silicon Crystal Structure; 2.3.2 Photolithography; Process of Photolithography; Resolution of Photolithography; Contact and Proximity Exposure; Projection Exposure; 2.3.3 Deposition; Spin Coating; Thermal Oxidation; Evaporation; E-beam Evaporation; Resistive Heat (Joule Heat) Evaporation; Problems Associated with Evaporation; Sputtering; Chemical Vapor Deposition; Polysilicon; Amorphous silicon
Silicon Dioxide

Sommario/riassunto

With applications ranging from medical diagnostics to environmental monitoring, molecular sensors (also known as biosensors, chemical sensors, or chemosensors), along with emerging nanotechnologies offer not only valuable tools but also unlimited possibilities for engineers and scientists to explore the world. New generation of functional microsystems can be designed to provide a variety of small scale sensing, imaging and manipulation techniques to the fundamental building blocks of materials. This book provides comprehensive coverage of the current and emerging technologies of molecular sens