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Nota di contenuto	Radioisotope Gauges for Industrial Process Measurements; Contents; Preface; Symbols, Units and Abbreviations; 1 Introduction; 1.1 Ionising Radiation; 1.2 Industrial Nucleonic Measurement Systems; 1.3 Historical Perspective; 1.4 The Objective of This Book; 2 Radiation Sources; 2.1 A Primer on Atomic and Nuclear Physics; 2.1.1 Radioactive Decay; 2.1.2 Modes of Decay; 2.1.3 -Rays; 2.1.4 Competitive Modes of Disintegration; 2.1.5 Characteristic X-rays; 2.1.6 Bremsstrahlung; 2.1.7 Activity and Half-life; 2.1.8 Radiation Energy; 2.1.9 Summary of Radioisotope Emissions; 2.2 Radioisotope Sources 2.2.1 Important Source Properties 2.2.2 Natural Sources; 2.2.3 Tracers; 2.2.4 Sealed Sources; 2.3 Other Radiation Sources; 2.3.1 X-ray Tubes; 2.3.2 Nuclear Reactors; 2.3.3 Accelerators; 2.4 Sealed Radioisotope Sources Versus X-ray Tubes; 3 Interaction of Ionising Radiation with Matter; 3.1 Charged Particle Interactions; 3.1.1 Linear Stopping Power; 3.1.2 Range; 3.1.3 Charged Particle Beam Intensity; 3.2 Attenuation of Ionising Photons; 3.2.1 The Intensity and the Inverse-Square Law; 3.3 The Attenuation Coefficient of Ionising Photons; 3.3.1 The Photoelectric Effect; 3.3.2 Compton Scattering

3.3.3 Rayleigh Scattering 3.3.4 Pair Production; 3.3.5 Attenuation Versus Absorption; 3.3.6 Mean Free Path and Half-thickness; 3.4 Attenuation Coefficients of Compounds and Mixtures; 3.4.1 The Attenuation Coefficient of Homogeneous Mixtures; 3.4.2 The Linear Attenuation Coefficients of Chemical Compounds; 3.4.3 Attenuation in Inhomogeneous Materials; 3.5 Broad Beam Attenuation; 3.5.1 The Build-Up Factor; 3.5.2 Build-Up Discrimination; 3.5.3 The 'Effective' Attenuation Coefficient; 3.6 Neutron Interactions; 3.7 Effective Atomic Number; 3.8 Secondary Electrons; 4 Radiation Detectors  
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## Sommario/riassunto

In order to fully utilise nucleonic measurement principles and their applications, it is important to have an understanding of the underlying physics. Radioisotope Gauges for Industrial Process Measurements combines theoretical background with practical experience in order to present an accessible overview of the use of radioisotopes in industry. This unique book explains the modes of operation of installed gauges and presents nucleonic methods relevant to measurement problems. The first part of the book deals with radiation sources, the interaction of radiation with matter and radiation

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