

1. Record Nr.	UNISA996499859803316
Autore	Garcia-Leon M (Manuel)
Titolo	Detecting environmental radioactivity // M. Garcia-Leon
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2023] ©2023
ISBN	9783031099700 9783031099694
Descrizione fisica	1 online resource (637 pages)
Collana	Graduate Texts in Physics
Disciplina	294.33653
Soggetti	Radiation, Background - Measurement Radioactive pollution - Measurement
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di contenuto	Intro -- Preface -- Contents -- 1 Radioactivity: History and Phenomenology -- 1.1 Basic Description of the Atomic Nucleus. Nuclear Stability -- 1.1.1 Simple Nuclear Models -- 1.1.2 Atomic and Mass Numbers. Isobars, Isotopes, and Isotone Nuclei -- 1.1.3 Unstable Nuclides -- 1.2 Discovery of Radioactivity -- 1.2.1 Some Historic Data -- 1.2.2 Phenomenology of Radioactivity -- 1.3 Types of Radioactivity -- 1.3.1 Alpha Radioactivity -- 1.3.2 Beta Radioactivity: Electrons, Positrons, and Electron Capture -- 1.3.3 Gamma Radioactivity: Electromagnetic Radiation, Conversion Electrons, and Isomers -- 1.3.4 Other Radioactivity Types: Double Beta Decay, Proton and Neutron Emissions, Exotic Radioactivity, Fission -- 1.4 X-rays. Auger Electrons -- References -- 2 Radioactivity: Decay Law, Definitions, and Units -- 2.1 Exponential Decay Law. Decay Constant, Half-Life and Mean-Life -- 2.2 Radioactive Activity and Units -- 2.2.1 Exponential Law of Activity -- 2.2.2 Becquerels and Curies -- 2.3 Radioactive Series -- 2.3.1 Bateman Equations -- 2.3.2 Transient and Secular Equilibria -- 2.4 Partial Activities. Branching Ratio and Intensity of Radiation -- 2.5 Decay Schemes -- References -- 3 Natural and Artificial Radioactivity -- 3.1 Primordial Radionuclides -- 3.1.1 Long-Lived Radionuclides -- 3.1.2 Natural Radioactive Series -- 3.2 Cosmogenic Radionuclides -- 3.2.1 Cosmic Radiation -- 3.2.2

Production of Radionuclides by Cosmic Radiation -- 3.3 Artificial Radionuclides -- 3.3.1 Some Historic Data -- 3.3.2 Production of Radionuclides in Accelerators -- 3.3.3 Production of Radionuclides in Nuclear Reactors -- References -- 4 Environmental Radioactivity -- 4.1 Presence of Natural Radioactivity in the Environment -- 4.1.1 Primordial Radionuclides -- 4.1.2 Cosmogenic Radionuclides -- 4.1.3 NORM Materials and Non-nuclear Industries. 4.2 Sources of Artificial Radionuclides -- 4.2.1 The Start of the Nuclear Era. The Bomb Pulse -- 4.2.2 Radioactive Fallout -- 4.2.3 Nuclear Fuel Reprocessing Plants -- 4.2.4 Other Nuclear Facilities and Activities: Nuclear Power Plants -- 4.2.5 Nuclear Accidents -- References -- 5 Levels and Behavior of Environmental Radioactivity -- 5.1 Dynamics of Radioactivity in the Environment -- 5.1.1 General Concepts of Radioecology -- 5.1.2 Radionuclide Speciation in the Environment -- 5.1.3 Exchange and Transport Processes. Transfer Parameters -- 5.1.4 Mathematical Modeling -- 5.2 Levels and Behavior of Radioactivity in the Atmosphere -- 5.2.1 Radioactivity in the Air -- 5.2.2 The Radon Problem -- 5.3 Levels and Behavior of Radioactivity in the Lithosphere. Radioactive Particles -- 5.3.1 Soils -- 5.3.2 Radioactive Particles -- 5.4 Levels and Behavior of Radioactivity in Fresh Waters -- 5.4.1 Rivers and Sediments -- 5.4.2 Lakes and Sediments -- 5.4.3 Groundwater -- 5.5 Levels and Behavior of Radioactivity in Oceans -- 5.5.1 Global Circulation -- 5.5.2 Seawater -- 5.5.3 Marine Sediments -- 5.6 Levels and Behavior of Radioactivity in the Biosphere -- 5.6.1 Plants, Animals -- 5.6.2 Seaweed and Other Marine Bioindicators -- 5.7 Levels and Behavior of Radioactivity in Foods -- 5.7.1 Drinking Water -- 5.7.2 Foodstuffs and Food Raw Materials -- References -- 6 Radiological Impact. Radiation Dosimetry -- 6.1 Radiation Dosimetry -- 6.1.1 Radiation Exposure, Absorbed Dose and Dose Equivalent: Magnitudes and Units -- 6.1.2 Effective and Committed Doses and Other Magnitudes -- 6.2 Biological Effects of Radioactivity -- 6.2.1 Stochastic and Deterministic Effects -- 6.2.2 Radiation Effects on Human Health -- 6.3 Radiological Impact -- 6.3.1 Radiation Protection Programs -- 6.3.2 Radiation Protection Regulations -- References. 7 Principles of Radiation Detection: Interaction of Radiation with Matter -- 7.1 Interaction of Gamma Radiation with Matter -- 7.1.1 Photoelectric Effect -- 7.1.2 Compton Effect -- 7.1.3 Pair Production -- 7.1.4 Attenuation and Absorption Coefficients -- 7.1.5 Designing Gamma Radiation Detectors -- 7.2 Interaction of Charged Particles with Matter -- 7.2.1 Ionization and Excitation -- 7.2.2 Stopping Power. The Bethe-Bloch Equation -- 7.2.3 Bremsstrahlung -- 7.2.4 Cherenkov Radiation -- 7.2.5 Range, Specific Ionization, and Bragg Curves -- 7.2.6 Designing Charged-Particle Detectors -- 7.3 Nuclear Reactions. Interaction of Neutrons with Matter -- 7.3.1 Nuclear Reactions with Neutrons -- 7.3.2 Path of Neutrons Through Matter -- 7.3.3 Designing Neutron Detectors -- References -- 8 Principles of Radiation Detection: Counting and Spectrometry -- 8.1 Introduction -- 8.2 Counting Efficiency -- 8.2.1 Absolute Efficiency -- 8.2.2 Partial Efficiencies. Photopeak Efficiency -- 8.3 Background of Detectors -- 8.3.1 Sources and Components -- 8.3.2 Background Corrections -- 8.4 Dead Time -- 8.4.1 Sources of Dead Time -- 8.4.2 Dead-Time Corrections -- 8.5 Energy Spectra -- 8.5.1 Components -- 8.5.2 Energy Resolution -- References -- 9 Gas Ionization Detectors -- 9.1 Physics of Gas Ionization Detectors -- 9.1.1 Ionization in Gases -- 9.1.2 Charge Transfer Reactions in Gases -- 9.1.3 Multiplication of Charge in Gases. Townsend Avalanche -- 9.2 Ionization Chamber -- 9.3 Proportional Counters -- 9.4 Geiger-Müller Counters -- 9.5 Radiation Counting and Spectrometry with Gas Ionization Detectors --

9.6 Background in Gas Ionization Detectors -- References -- 10  
Scintillation Detectors -- 10.1 Physics of Scintillation Detectors --  
10.1.1 Organic Scintillators -- 10.1.2 Inorganic Scintillators -- 10.1.3  
Gas Scintillators -- 10.1.4 Photomultipliers.  
10.2 Counting and Spectrometry with Scintillation Detectors -- 10.3  
Gamma-Ray Spectrometry with Scintillation Detectors -- 10.3.1 Pulse  
Height Spectrum -- 10.3.2 Identification of Radionuclides and Activity  
Calculation -- 10.4 Counting and Spectrometry with Liquid Scintillation  
Detectors -- 10.4.1 Technical Aspects -- 10.4.2 Applications -- 10.5  
Background in Scintillation Detectors -- References -- 11  
Semiconductor Detectors -- 11.1 Physics of Semiconductor Detectors  
-- 11.1.1 Electron-hole Production -- 11.1.2 Energy Resolution --  
11.1.3 Types of Semiconductor Detectors -- 11.2 Gamma-Ray  
Spectrometry with Semiconductor Detectors -- 11.2.1 Pulse Height  
Spectrum -- 11.2.2 Identification of Radionuclides and Activity  
Calculation -- 11.3 Alpha- and Beta-Spectrometry with Semiconductor  
Detectors -- 11.3.1 Pulse Height Spectrum -- 11.3.2 Activity  
Determination -- 11.4 X-ray Spectrometry with Semiconductor  
Detectors -- 11.4.1 Pulse Height Spectrum -- 11.4.2 Activity  
Determination -- 11.5 Background in Semiconductor Detectors --  
References -- 12 Dosimeters, Other Detectors, and Specific Designs --  
12.1 Dosimeters -- 12.1.1 Active Dosimeters -- 12.1.2 Passive  
Dosimeters -- 12.2 Track Detectors -- 12.3 E-E Telescopes -- 12.4  
Time-Of-Flight Spectrometers -- 12.5 Cherenkov Detectors -- 12.5.1  
Cherenkov Threshold Counters -- 12.5.2 Cherenkov Differential  
Detectors -- 12.5.3 Cherenkov Circular Image Detectors -- References  
-- 13 Radiochemistry for Environmental Samples -- 13.1 Sampling  
Techniques -- 13.1.1 Solid Samples -- 13.1.2 Liquid Samples --  
13.1.3 Atmospheric Samples -- 13.1.4 Biological Samples -- 13.2  
Sample Transport and Storage -- 13.3 Chemical Procedures -- 13.3.1  
Preconcentration Processes -- 13.3.2 Separation and Purification  
Procedures -- 13.3.3 Source Preparation for Counting  
and Spectrometry -- 13.4 Yield Determination.  
13.5 Efficiency Calibration of Radiation Counters and Spectrometers --  
13.5.1 Calibration Curves for Charged Particles -- 13.5.2 Calibration  
Curves for Gamma Radiation -- 13.6 Speciation Studies -- 13.7 Quality  
Assurance -- References -- 14 Principles of Low-Level Counting  
and Spectrometry -- 14.1 Need of Low-Level Counting Techniques  
(LLC) -- 14.1.1 Levels of Radioactivity in the Environment -- 14.1.2  
Problems Requiring LLC -- 14.2 Counting Statistics -- 14.2.1 The  
Random Nature of Radioactivity -- 14.2.2 Uncertainty Calculations  
in Radioactivity Measurements -- 14.3 Figure of Merit (FOM) -- 14.3.1  
Definition and FOM Equation -- 14.3.2 Analysis of the FOM Equation --  
14.4 Generalized Figure of Merit -- 14.4.1 Definition and Equation --  
14.4.2 Analysis of the Equation -- 14.5 Designing an LLC Experiment  
-- 14.5.1 Sampling Strategy -- 14.5.2 Counting or Spectrometry,  
or Both -- 14.6 Limit of Detection and Minimum Detectable Activity --  
References -- 15 Low-Level Counting and Spectrometry Techniques --  
15.1 Techniques for Detector Background Suppression -- 15.1.1  
Passive Shielding -- 15.1.2 Active Shielding -- 15.1.3 Underground  
Laboratories -- 15.2 Techniques for Increasing Counting Efficiency --  
15.2.1 External Counting and Spectrometry -- 15.2.2 Internal Counting  
and Spectrometry -- 15.2.3 Radiation Coincidence Techniques --  
References -- 16 Principles of Mass Spectrometry -- 16.1 Limitations  
of Radiometric Methods. Need for Mass Spectrometry Techniques --  
16.1.1 Loss of Information by Counting Emitted Radiation -- 16.1.2  
Counting Atoms Instead of Emitted Radiation -- 16.2 Basics of Mass  
Spectrometry -- 16.2.1 Electrostatic and Magnetic Rigidity -- 16.2.2

The Mass-Energy Plane -- 16.2.3 The Dynamic Approach -- 16.3 Low-Energy Mass Spectrometers: TIMS, SIMS, GDMS, RIMS, ICPMS -- 16.4 Applications to Environmental Radioactivity -- References -- 17 Principles of Particle Accelerators.

Sommario/riassunto

This textbook presents the principles and methods for the measurement of radioactivity in the environment. In this regard, specific low-level radiation counting and spectrometry or mass spectrometry techniques are discussed, including sources, distribution, levels and dynamics of radioactivity in nature. The author gives an accurate description of the fundamental concepts and laws of radioactivity as well as the different types of detectors and mass spectrometers needed for detection. Special attention is paid to scintillators, semiconductor detectors, and gas ionization detectors. In order to explain radiochemistry, some concepts about chemical separations are introduced as well. The book is meant for graduate and advanced undergraduate students in physics, chemistry or engineering oriented to environmental sciences, and to other disciplines where monitoring of the environment and its management is of great interest.

2. Record Nr.	UNINA9910792278803321
Autore	Garner Stephen Chapin <1969->
Titolo	Scattering seeds : cultivating church vitality / / Stephen Chapin Garner with Jerry Thornell
Pubbl/distr/stampa	Herndon, Virginia : , : Alban Institute, , 2011 ©2011
ISBN	1-56699-625-2
Descrizione fisica	1 online resource (246 p.)
Disciplina	254/.5
Soggetti	Leadership - Religious aspects - Christianity Christian leadership Church growth
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.

Nota di contenuto

Contents; Foreword; Preface; Part I: Tilling; Preparing a Pastor; Preparing a Congregation; Part II: Scattering Seeds; Soil, Climate, and the Mystery of Growth; A Vital Theology; Part III: Tending Growth; Ministry Teams; The Ministry of the Laity; The Ministry of the Pastor; Worship and Education for All; Part IV: Harvesting; Service to Others; Evaluating Success with an Eye to the Future; Notes

---

Sommario/riassunto

In *Scattering Seeds: Cultivating Church Vitality*, Stephen Chapin Garner and Jerry Thornell share the story of their home congregation, the United Church of Christ in Norwell, MA. This average congregation has approached congregational life in a not-so-average way. Each congregant is seen as a minister, bringing the good news of Christ to the community; the church has moved away from boards and committees, instead utilizing the people to form ministry teams; and they have revitalized the way they approach and practice worship and education. Garner and Thornell don't claim to have the secret to

---