

RADIATION DETECTION AND MEASUREMENT

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Radioactivity And Radiation Detection

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Radioactivity And Radiation Detection:

Radiation Detection W. H. Tait, 1980 **Radioactivity and Radiation Detection** Dudley G. Miller, 1972 Radiation Detection Douglas McGregor, J. Kenneth Shultis, 2020-08-19 Radiation Detection Concepts Methods and Devices provides a modern overview of radiation detection devices and radiation measurement methods The book topics have been selected on the basis of the authors many years of experience designing radiation detectors and teaching radiation detection and measurement in a classroom environment This book is designed to give the reader more than a glimpse at radiation detection devices and a few packaged equations Rather it seeks to provide an understanding that allows the reader to choose the appropriate detection technology for a particular application to design detectors and to competently perform radiation measurements The authors describe assumptions used to derive frequently encountered equations used in radiation detection and measurement thereby providing insight when and when not to apply the many approaches used in different aspects of radiation detection Detailed in many of the chapters are specific aspects of radiation detectors including comprehensive reviews of the historical development and current state of each topic Such a review necessarily entails citations to many of the important discoveries providing a resource to find quickly additional and more detailed information This book generally has five main themes Physics and Electrostatics needed to Design Radiation Detectors Properties and Design of Common Radiation Detectors Description and Modeling of the Different Types of Radiation Detectors Radiation Measurements and Subsequent Analysis Introductory Electronics Used for Radiation Detectors Topics covered include atomic and nuclear physics radiation interactions sources of radiation and background radiation Detector operation is addressed with chapters on radiation counting statistics radiation source and detector effects electrostatics for signal generation solid state and semiconductor physics background radiations and radiation counting and spectroscopy Detectors for gamma rays charged particles and neutrons are detailed in chapters on gas filled scintillator semiconductor thermoluminescence and optically stimulated luminescence photographic film and a variety of other detection devices

Nuclear Radiation Detection William James Price, 1964 **Naturally Occurring Radioactive Materials** T. Rick Irvin, 2018-12-19 Management of Naturally Occurring Radioactive Materials known in the industry as NORM has become an important part of the regular training required for workers in oil and gas production refinery and petrochemical manufacturing and in certain types of mining Proper handling of NORM contaminated wastes and use of appropriate radiation detection and protective equipment are now understood to be important components of good worker safety programs Until now no practical easy to read book was available to supplement worker training courses on NORM management Naturally Occurring Radioactive Materials Principles and Practices fills this void by providing in a single publication an ideal reference for industry managers supervisors and line personnel The book stresses the proper handling and management of NORM contaminated wastes and provides a firm understanding of the chemical properties of radioactive

agents their toxicological effects and the appropriate containerization and disposal methods for these materials Nuclear Radiation Detection, Measurements and Analysis K. Muraleedhara Varier, 2009 Nuclear Radiation Detection Measurements and Analysis covers various aspects of interactions of nuclear radiations like gamma and X rays charged particles like electrons protons alpha particles and other heavy ions and neutrons The important types of detectors for these radiations are described with reference to the principle of operation structure working key features etc Different types of electronic modules which are helpful in processing and analysing the output pulses from such detectors are also described The various techniques used for acquiring experimental data using the detectors and the associated electronic modules as well as for analysing the acquired data are discussed at length Some specialized detector configurations and special techniques are also elaborated Simple and informative illustrations help in understanding the various concepts presented in the text

Radiation Detection and Measurement Glenn F. Knoll, 1989-03-20 A new edition of the most comprehensive text reference available on the methods and instrumentation used in the detection of ionizing radiation Updated to reflect advances since the first edition came out in 1979 Retains the general organization of the first edition all topics of importance are covered in sufficient detail to lead the reader from basic principles to examples of modern applications Covers modern engineering practice provides useful design information and contains an up to date and thorough review of the literature Naturally Occurring Radioactive Materials T. Rick Irvin, 1996-04-25 Management of Naturally Occurring Radioactive Materials known in the industry as NORM has become an important part of the regular training required for workers in oil and gas production refinery and petrochemical manufacturing and in certain types of mining Proper handling of NORM contaminated wastes and use of appropriate radiation detection and protective equipment are now understood to be important components of good worker safety programs Until now no practical easy to read book was available to supplement worker training courses on NORM management Naturally Occurring Radioactive Materials Principles and Practices fills this void by providing in a single publication an ideal reference for industry managers supervisors and line personnel The book stresses the proper handling and management of NORM contaminated wastes and provides a firm understanding of the chemical properties of radioactive agents their toxicological effects and the appropriate containerization and disposal methods for these materials Physics and Engineering of Radiation Detection Syed Naeem Ahmed, 2007-04-12 Physics and Engineering of Radiation Detection presents an overview of the physics of radiation detection and its applications It covers the origins and properties of different kinds of ionizing radiation their detection and measurement and the procedures used to protect people and the environment from their potentially harmful effects It details the experimental techniques and instrumentation used in different detection systems in a very practical way without sacrificing the physics content It provides useful formulae and explains methodologies to solve problems related to radiation measurements With abundance of worked out examples and end of chapter problems this book enables the reader to understand the underlying physical principles and their applications

Detailed discussions on different detection media such as gases liquids liquefied gases semiconductors and scintillators make this book an excellent source of information for students as well as professionals working in related fields Chapters on statistics data analysis techniques software for data analysis and data acquisition systems provide the reader with necessary skills to design and build practical systems and perform data analysis Covers the modern techniques involved in detection and measurement of radiation and the underlying physical principles Illustrates theoretical and practical details with an abundance of practical worked out examples Provides practice problems at the end of each chapter *Atomic Radiation Detection and Measurement* Harold S. Renne,1955 *Radiation Monitoring in Atomic Defense* Dwight E. Gray,John H. Martens,1951 **Nuclear Radiation Detection** William James Price,1958 **Radioactivity and Its Measurement** W. B. Mann,R. L. Ayres,S. B. Garfinkel,2016-12-15 Begins with a description of the discovery of radioactivity and the historic research of such pioneers as the Curies and Rutherford After a discussion of the interactions of and rays with matter the energetics of the different modes of nuclear disintegration are considered in relation to the Einstein mass energy relationship as applied to radioactive transformations Radiation detectors and radioactivity measurements are also discussed

Detection of Radioactive Materials at Borders International Atomic Energy Agency,2002 The purpose of this publication is to provide guidance for Member States for use by customs police or other law enforcement bodies on the radiation monitoring of vehicles people and commodities at border crossing facilities as a countermeasure to illicit trafficking and also to detect inadvertent movement of radioactive materials Such monitoring may be one component of efforts towards finding radioactive materials that have been lost from control and which may enter a Member State **New Techniques for the Detection of Nuclear and Radioactive Agents** Gul Asiye Aycik,2009-01-25 Nuclear and radioactive agents are considerable concerns especially after the early 1990s and more attention has been focused on the radiation detection technologies This book comprises the selected presentations of NATO Advanced Training Course held 26 30 May 2008 in Mugla Turkey The contributions represent a wide range of documents related to control monitoring and measurement methods of nuclear radioactive isotopes and agents for both fundamental and applied works dealing with their use for different purposes This book presents environmental data from many locations of different countries and also contains the contributions in the detection monitoring programs of some authors from CIS countries The basic goal of this book is to deal with recent developments and applications of environmental monitoring and measurement techniques of environmental radionuclides and nuclear agents as well as the auxiliary techniques The many recent examples contributed by authors will be useful in monitoring measurement studies of radioactive nuclear agents in the present environment and can help not only in carrying out outdoor and laboratory experiments but also in protection of possible sources of radionuclides and nuclear agents Especially the contributions of experts and specialists involved in this book assured the highest level of knowledge in the field of techniques for the detection of radioactive and nuclear agents *Radiation Sensing* Kelum A. A. Gamage,C.

James Taylor, 2021-09-06 Radiation detection is important in many fields and it poses significant challenges for instrument designers. Radiation detection instruments particularly for nuclear decommissioning and security applications are required to operate in unknown environments and should detect and characterise radiation fields in real time. This book covers both theory and practice and it solicits recent advances in radiation detection with a particular focus on radiation detection instrument design, real time data processing, radiation simulation and experimental work, robot design, control systems, task planning and radiation shielding. Radiation, Ionization, and Detection in Nuclear Medicine Tapan K. Gupta, 2013-03-20 This book will serve as the definitive source of detailed information on radiation ionization and detection in nuclear medicine. It opens by considering fundamental aspects of nuclear radiation including dose and energy sources and shielding. Subsequent chapters cover the full range of relevant topics including the detection and measurement of radiation exposure with detailed information on mathematical modelling, medical imaging, the different types of radiation detector and their working principles, basic principles of and experimental techniques for deposition of scintillating materials, device fabrication, the optical and electrical behaviors of radiation detectors and the instrumentation used in nuclear medicine and its application. The book will be an invaluable source of information for academia, industry practitioners and researchers.

Introduction to Nuclear Radiation Detectors P. Ouseph, 2012-12-06 There have been many interesting developments in the field of nuclear radiation detectors especially in those using semiconductor materials. The purpose of this book is to present a survey of the developments in semiconductor detectors along with discussions about gas counters and scintillation counters. These discussions are directed to detector users usually scientists and technicians in different fields such as chemistry, geology, biochemistry and medicine. The operation of these detectors is discussed in terms of basic properties such as efficiency, energy resolution and resolving time which are defined in the first chapter. Differences among these detectors in terms of these properties are pointed out. Chapter 2 on interaction of radiations with matter discusses how different radiations lose energies in matter and how differences in their behavior in matter affect the design and operation of detectors. Although emphasis is placed on fundamentals throughout the book, the reader is also made aware of the new developments in the field of radiation quite often. The author has taught a course in radioisotopes for several years for science, engineering, medical and dental students. The emphasis on topics varied from time to time to satisfy the varying interests of the students. However, the contents of this book formed the core of the course. About ten selected experiments on detectors were done along with this course. A list of these experiments may be supplied on request. An Introduction to Radiation Protection Alan Martin, Sam Harbison, Karen Beach, Peter Cole, 2018-10-25 This highly readable account of the nature of the hazards presented by ionizing radiation and the methods of protection is an ideal introductory text for those new to the field and for the non-specialist. The seventh edition continues to cover the technical principles underlying the control of radiation hazards, radiation detection and measurement and the biological effects of radiation.

followed by a consideration of industry specific radiation protection issues Further specialised topics include risk assessment waste management and decommissioning radiological emergencies relevant legislation and organizational issues and new to this edition environmental radiation protection *General Handbook for Radiation Monitoring, LA-1835* Los Alamos Scientific Laboratory, 1959

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