Radiation Glossary G-I

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G

Gamma Rays

high-energy electromagnetic radiation emitted by certain radionuclides when their nuclei transition from a higher to a lower energy state. These rays have high energy and a short wave length. All gamma rays emitted from a given isotope have the same energy, a characteristic that enables scientists to identify which gamma emitters are present in a sample. Gamma rays are very similar to x-rays.

Gamma Rays
This fact sheet describes the basic properties, uses and the health effects. It also discusses radiation protection related to it.

H

I

Reference Information

People and Discoveries
Commonly Encountered Radionuclides
- Americium-241
- Cesium-137
- Cobalt-60
- Iodine-129 &-131
- Plutonium
- Radium
- Radon
- Strontium-90
- Technetium-99
- Tritium
- Thorium
- Uranium

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Geiger Counter

A radiation detection and measuring instrument. It consists of a gas-filled tube containing electrodes, between which there is an electrical voltage, but no current flowing. When ionizing radiation passes through the tube, a short, intense pulse of current passes from the negative electrode to the positive electrode and is measured or counted. The number of pulses per second measures the intensity of the radiation field. It is the most commonly used portable radiation detection instrument.

Generally Applicable Standards

Standards that apply to general categories of conditions or sites, rather than any specific situation.& Under the Atomic Energy Act of 1954, EPA has authority to establish "generally& applicable environmental standards for the protection of the general environment from radioactive material."

Genetic Effects

hereditary effects that can be passed on through reproduction due to changes in sperm or ova.

Radiation Health Effects
This page describes the effects of both long-term and acute exposure to radiation.

Geographical Information System(GIS)

a system for linking information to a particular geographical location. GISs are generally capable of producing maps that show the location of the information. For example, a GIS containing TENORM information might contain the name and number of acres at a TENORM site as well as information about its longitude and latitude. A map printed from this system would show locations and sizes of TENORM sites on a map of the United States.

Guidance

specific, suggested procedures and best practices that are similar to regulations but not legally enforceable.

Gray (gy)

a unit of measurement for absorbed dose. It relates to the amount of energy actually absorbed in a material, and is used for any type of radiation and any material. One gray is equal to one joule of energy deposited in one kg of a material. The unit gray can be used for any type of radiation, but it does not describe the biological effects of the different radiations. Absorbed dose is often expressed in terms of hundredths of a gray, or centi-grays. One gray is equivalent to 100 rads.

Half-life

the time in which one half of the atoms of a radioactive isotope disintegrates into another nuclear form. Half-lives vary from billionths of a billionth of a second to billions of years. Also called physical or radiological half-life.

biological half-life - the time an organism takes to eliminate one half the amount of a compound or chemical on a strictly biological basis
effective half life -incorporates both the radioactive and biological half-lives. It is used in calculating the dose received from an internal radiation source.

Half-Life
This page describes and explains half-life.

Hazardous Waste

waste products that can pose a substantial or potential hazard to human health or the environment when improperly managed. Hazardous waste is regulated at the federal level under the Resource Conservation and Recovery Act. A waste may be hazardous because it has at least one of four characteristics - ignitability, corrosivity, reactivity, or toxicity--or it may be included on one of several lists of waste groups that are known to be hazardous.

Hazardous and Solid Waste Amendments (HWSA)

1984 Act which amended RCRA to prohibit land disposal of untreated hazardous waste. It also increased enforcement authority for EPA and established a program requiring corrective action.

High-Level Radioactive Waste

the highly radioactive material resulting spent nuclear fuel reprocessing:

Health Physics

a scientific field that focuses on radiation protection of humans and the environment. Health Physics uses physics, biology, chemistry, statistics and electronic instrumentation to help protect individuals from any damaging effects of radiation.

Health Physics Society:Public and Media Information
EXIT Disclaimer
This Web site describes the activities of the organization, provides access to their ask the experts (radiation safety), fact sheets and a list of radiation definitions.
Careers in Radiation: Health Physicist
This link provides a description and explains the origin of health physicist.

liquid waste directly produced in reprocessing
any solid material derived from the liquid wastes having a sufficient concentration of fission products.

Other highly radioactive materials can be designated as high-level waste, if they require permanent isolation. This determination is made by the U.S. Nuclear Regulatory Commission based criteria established in U.S. law.

Hormesis

the theory that low levels of radiation are beneficial to health

In-situ Leaching

extracting metals or other minerals from ore by allowing an acid-containing liquid to flow through the ground that contains the minerals. The minerals are dissolved by the acid (leached) and captured when the liquid is collected. Leaching is also used to recover minerals from waste rock that contains too low a concentration of the mineral to be worth recovering by typical extraction (mining and processing) methods.

incineration
high temperature combustion of materials in an enclosed device.

incinerator ash
ash from the incineration of waste.

in growth
in a sample, the buildup of radionuclides that are products of radioactive decay.

internal conversion
transmission of the excess energy of the nucleus to one of the orbital electrons; the electron may be ejected from the atom (ionizing radiation).

Other Modes of Radioactive Decay: Isomeric Transition
This link describes and explains Isomeric Transition.

Iodine

a nonmetallic solid element. There are both radioactive and non-radioactive isotopes of iodine

Iodine
This fact sheet describes the basic properties and uses,

and the hazards associated with this radionuclide. It also discusses radiation protection related to it.

Ion

(1) an atom or molecule that has too many or too few electrons, causing it to have an electrical charge, and therefore, be chemically active (2) an electron that is not associated (in orbit) with a nucleus

Ionization

the process of adding one or more electrons to, or removing one or more electrons from, atoms or molecules, thereby creating ions. High temperatures, electrical discharges, or nuclear radiation can cause ionization.

Why Are Some Atoms Radioactive?
This page explains radioactive atoms.
Ionizing and Non-Ionizing Radiation
This page explains ionizing and non-ionizing radiation.

Ionizing Radiation

any radiation capable of displacing electrons from atoms or molecules, thereby producing ions. Some examples are alpha, beta, gamma, and X-rays. High doses of ionizing radiation may produce severe skin or tissue damage.

Ionizing and Non-Ionizing Radiation
This page explains ionizing and non-ionizing radiation.

Irradiation

exposure to radiation.

Food Irradiation
This page describes and explains food irradiation.

Isomer (isomeric transition)

A nuclide having the same number of protons and neutrons but a different energy. One isomer is usually less stable and (relatively) quickly transitions to the more stable form, releasing some energy in the process.

Other Modes of Radioactive Decay: Isomeric Transition
This link provides information on Neutron Radiation, Positron Decay, Electron Capture and Isomeric Transition.

Isotope

A nuclide of an element having the same number of protons but a different number of neutrons.

http://www.epa.gov/radiation/glossary/termghi.html#g
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Nuclides and Isotopes
This page describes the distinctions between nuclides and isotopes.