Marwari college Darbhanga

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Nuclear Radiation Detect

Radiation

Radiation is the emission or transmission of energy in the form of waves or particles through space or through a material medium. This includes:

- electromagnetic radiation, such as radio waves, microwaves, infrared, visible light, ultraviolet, x-rays, and gamma radiation (γ)
- particle radiation, such as alpha radiation (α), beta radiation (β), and neutron radiation(particles of non-zero rest energy)
- acoustic radiation, such as ultrasound, sound, and seismic waves (dependent on a physical transmission medium)
- gravitational radiation, radiation that takes the form of gravitational waves, or ripples in the curvature of space-time.

Radiation is often categorized as either ionizing or non-ionizing depending on the energy of the radiated particles. Ionizing radiation carries more than 10 eV, which is enough to ionize atoms and molecules and break chemical bonds. This is an important distinction due to the large difference in harmfulness to living organisms. A common source of ionizing radiation is radioactive materials that emit α, β, or γ radiation, consisting of helium nuclei, electrons or positrons, and photons, respectively. Other sources include X-rays from medical radiography examinations and muons, mesons, positrons, neutrons and other particles that constitute the secondary cosmic rays that are produced after primary cosmic rays interact with Earth's atmosphere

Radiation Detector

Radiation Detector or particle detector is a device that measures this ionization of many types of radiation, like- beta radiation, gamma radiation and alpha radiation with the matter. Thus, creating electrons and positively charged ions.

Radiation Detector is an instrument used to detect or identify high-energy particles, such as those produced by nuclear decay, cosmic radiation, or reactions in a particle accelerator.

Type of Detectors

Scintillator

When excited by ionizing radiation, a scintillator exhibits scintillation which is nothing but the property of luminescence. When a scintillator is coupled to an electronic light sensor such as a photomultiplier tube (PMT), photodiode, or silicon photomultiplier, a scintillator detector. Scintillator-type detectors first convert light into electrical pulses. They use vacuum tubes to perform so.

Gaseous Ionization Detectors

A radiation detection instrument used in particle physics to detect the presence of ionising particles, and in radiation protection applications to measure ionizing radiation is called Gaseous ionization detectors.

Geiger Counter

Geiger-Mueller counter, commonly called the Geiger counter is the most commonly used detector. A central wire in between a gas-filled tube at high voltage is used to collect the ionization produced by incident radiation. Although it cannot distinguish between them, it can detect alpha, beta, and gamma radiation.