



Innovator In Spectroscopy Equipment

RADIATION MONITOR
MODEL RM 2415





Innovator In Spectroscopy Equipment

RADIATION MONITOR MODEL RM 2415

Features:

- Detect the presence of a source of radiation
- Compare the effect of different types of materials to shield beta or gamma radiation
- Monitor variation in background radiation at different elevations
- Monitor radioactivity in the environment over long periods of time
- Measure radiation of common radioactive materials, such as lantern mantels or pre-World War II Fiesta ware
- Monitor counts/interval (rate) as different thicknesses of a particular type of shielding are placed between the
- Geiger-Mueller tube of the Radiation Monitor and a beta or gamma source



Description:

The Radiation Monitor senses ionizing radiation by means of a Geiger-Mueller (GM) tube. The tube is fully enclosed inside the instrument. When ionizing radiation or a particle strikes the tube, it is sensed electronically and monitored by a computer, or by a flashing count light. Radiation is measured in counts in a time interval, as configured in data-collection software. About 5 to 25 counts at random intervals (depending on location and altitude) can be expected every minute from naturally occurring background radiation.

The end of the GM tube has a thin mica window. This mica window is protected by the screen at the end of the sensor. It allows alpha particles to reach the GM tube and be detected. The mica window will also sense low energy beta particles and gamma radiation that cannot penetrate the plastic case or the side of the tube. Note: Some of very low energy radiation cannot be detected through the mica window. The tube is fragile and physical damage to the window is not covered by the warranty.

The CFP Radiation Monitor is used to monitor alpha, beta, and gamma radiation. It can be used with a number of interfaces to measure the total number of counts per specified timing interval.

Further Tips for Monitoring Radiation:

To measure gamma and X-rays, hold the tip of the Radiation Monitor toward the source of radiation. Low-energy gamma radiation (10–40 KeV) cannot penetrate the side of the GM tube, but may be detected through the end window.

To detect alpha radiation, position the monitor so the suspected source of radiation is next to the GM window. Alpha radiation will not travel far through air, so put the source as close as possible (within 1/4 inch) to the screen without touching it. Even a humid day can limit the already short distance an alpha particle can travel.

To detect beta radiation, point the end window toward the source of radiation. Beta radiation has a longer range through air than alpha particles, but can usually be shielded (e.g., by a few millimeters of aluminum). High energy beta particles may be monitored through the back of the case.



Innovator In Spectroscopy Equipment

RADIATION MONITOR MODEL RM 2415

To determine whether radiation is alpha, beta, or gamma, hold the tip of the monitor toward the specimen. If there is an indication of radioactivity, it is most likely gamma or high energy beta. Place a piece of aluminum about 3 mm (1/8") thick between the case and the specimen. If the indication stops, the radiation is most likely beta. (To some degree, most common radioactive isotopes emit both beta and gamma radiation.) If there is no indication through the back of the case, position the end window close to, but not touching, the specimen. If there is an indication, it is probably alpha or beta. If a sheet of paper is placed between the window, and the indication stops, the radiation is most likely alpha. In order to avoid particles falling into the instrument, do not hold the specimen directly above the end window. The Radiation Monitor does not detect neutron, microwave, radio frequency (RF), laser, infrared, or ultraviolet radiation. Some isotopes it will detect relatively well are cesium-137, cobalt-60, technetium-99m, phosphorus-32, and strontium-90.

Some types of radiation are very difficult or impossible for this GM tube to detect. Beta emissions from tritium are too weak to detect using the Radiation Monitor. Americium-241, used in some smoke detectors, can overexcite the GM tube and give an indication of a higher level of radiation than is actually there.

Application:

- Counts/Interval vs. Distance Studies
- Counts/Interval vs. Shielding Studies
- Half-Life Determination (Counts/Interval vs. Time)
- Histogram Data Analysis
- Lantern Mantles
- Background Radiation

Software:

- This sensor can be used with one of the above interfaces and the following data-collection software.
- CFP Logger Computer 4hour with internal battery
- PC Computer
- Tablet with USB host

Standard Accessories:

- Analyst utility software
- User guide DVD
- Delivered in hard case with foam insert



