

Handheld Radioisotope Identification Device (RIID)



This radiation detection and isotope identification device would be handheld, accurate and require little maintenance and calibration. It would offer direct display of identifying information for both gamma and beta emitting radioisotopes. The device can also be adapted to be a neutron detector. The market for radiation detectors that find, measure, and identify a specific radioisotope source is broad, ranging from military and customs personnel to emergency first responders to those that manage environmental hazards in the event of nuclear energy disasters. This RIID is different from existing products because it uses metal filters instead of a crystal scintillation counter and may be the easiest to use and least expensive to make.

COMMERCIAL OPPORTUNITY

- The world-wide market for Radioisotope Identification Devices (RIIDs) includes potential customers in Homeland Security, Department of Defense, customs, emergency first response, environmental waste surveillance, medical physics, freight monitoring, state and local government, and ports.
- Being able to identify the source of the radiation, not just the type, is a key piece of information required to properly handle the radioactive material, be it in a medical setting where there would be a need to verify the identity of the radioisotopes received by the hospital, or in a counterterrorism situation where you would need to distinguish between radioisotopes such as cesium from cobalt to determine the best way to deal with the contaminant.
- This market is attractive as evidenced by several companies that offer portable RIIDs, including the FLIR identiFINDER R300, the ORTEC Micro Detective, and Thermo Scientific's RIIDEye. However, currently marketed RIIDs use crystal based scintillation counters that must transform the signal through a photo-multiplier tube and a multi-channel analyzer which add weight and cost to the device. The Moffitt RIID utilizes a novel and simple method requiring metal filters and detectors that reduces the size, weight, and cost of the device, and this device may only need to be calibrated every other year. Moreover, the user does not need to interpret nuclear spectra in order to operate the device.
- Currently, the isotope identification software used by RIIDs can misidentify radioactive sources even when the data were collected with a properly calibrated RIID, as stated in the Homeland Security TechNote from October 2009. The Moffitt RIID does not utilize similar software and may therefore be more accurate.

TECHNOLOGY

Our technology leverages the fact that each distinct radioisotope emits a unique energy of radiation. The transmission of radiation through a metal filter is strongly determined by the energy of the radiation and the material the radiation passes through. For example, materials of high atomic number attenuate radiation transmission more than those with a low atomic number. Depending on the application, our new device would use multiple detectors and filters to uniquely identify isotopes by the ratio of readings generated at each filter/detector combination. This device could detect and identify radiation from both gamma and beta emitting radioisotopes. Moreover, a modified device has also been designed to detect neutrons. The RIID is in the prototype planning stage of development with a report describing a bill of materials with approximate costs for a prototype and a block diagram with key electrical components.

PUBLICATION/PATENT

- Patent applications have been filed for Dr. Kenneth Forster in the United States, Europe, and Japan.

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LICENSING OPPORTUNITY



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