IOWA | Health and Human Services

Major Uses of Radioisotopes

Americum-241

Used in many smoke detectors for homes and businesses… to measure levels of toxic lead in dried paint samples…to ensure uniform thickness in rolling processes like steel and paper production…and to help determine where oil wells should be drilled.

Cadmium-109

Used to analyze metal alloys for checking stock, scrap sorting

Calcium-47

Important aid to biomedical researchers studying the cellular functions and bone formation in mammals.

Californium-252

Used to inspect airline luggage for hidden explosives…to gauge the moisture content of soil in the road construction and building industries…and to measure the moisture of materials stored in soils.

Carbon-14

Major research tool. Helps in research to ensure that potential new drugs are metabolized without forming harmful by-products. Used in biological research, agriculture, pollution control, and archeology.

Cesuim-137

Used to treat cancerous tumors…to measure correct patient dosages of radioactive pharmaceuticals…to measure and control the liquid flow in oil pipelines…to tell researchers whether oil wells are plugged by sand…and to ensure the right fill level for packages of food, drugs, and other products. (The products in these packages do not become radioactive.)

Chromium-51

Used in research in red blood cell survival studies.

Cobalt-57

Used as a tracer to diagnose pernicious anemia

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Cobalt-60	Used to sterilize surgical instruments…and to improve the safety and reliability of industrial fuel oil burners. Used in cancer treatment, food irradiation, gauges, and radiography.
Copper-67	When injected with monoclonal antibodies into a cancer patient, helps the antibodies bind to and destroy the tumor.
Curium-244	Used in mining to analyze material excavated from pits…and slurries from drilling operations.
Gallium-67	Used in medical diagnosis
Iodine-123	Widely used to diagnose thyroid disorders and other metabolic disorders including brain function.
Iodine-125	Major diagnostic tool used in clinical tests and to diagnose thyroid disorders. Also used in biomedical research.
Iodine-129	Major diagnostic tool used in clinical tests and to diagnose thyroid disorders. Also used in biomedical research.
Iodine-131	Used to treat thyroid disorders. (Graves's disease)
Iridium-192	Used to test the integrity of pipeline welds, boilers and aircraft parts and in brachytherapy/tumor irradiation
Iron-55	Used to analyze electroplating solutions and to detect the presence of sulphur in the air. Used in metabolism research.
Krypton-85	Used in indicator lights in appliances such as clothes washers and dryers, stereos, and coffeemakers…to gauge the thickness of thin plastics and sheet metal, rubber, textiles and paper…and to measure dust and pollutant levels. Used to detect explosives, and in voltage regulators and current surge protectors in electronic devices, and in electron capture detectors for gas chromatographs.
Nickel-63	Used to detect explosives, and in voltage regulators and current surge protectors in electronic devices, and in electron capture detectors for gas chromatographs.

Phosphorus-32	Used in molecular biology and genetics research.
Phosphorus-33	Used in molecular biology and genetics research.
Plutonium-238	Has powered more than 20 NASA spacecraft since 1972
Polonium-210	Reduces the static charge in production of photographic film and other materials
Promethium-147	Used in electric blanket thermostats…and to gauge the thickness of thin plastics, thin sheet metal, rubber, textile and paper.
Radium-226	Makes lighting rods more effective
Selenium-75	Used in protein studies in life science research.
Sodium-24	Used to locate leaks in industrial pipe lines…and in oil well studies.
Strontium-85	Used to study bone formation and metabolism.
Strontium-90	Used in survey meters by schools, the military and emergency management authorities. Also used in cigarette manufacturing sensors and medical treatment.
Sulphur-35	Used in genetics and molecular biology research.
Technetium-99m	The most widely used radioactive pharmaceutical for diagnostic studies in nuclear medicine. Different chemical forms are used for brain, bone, liver, spleen and kidney imaging and also for blood flow studies.
Thallium-201	Used in nuclear medicine for nuclear cardiology and tumor detection.

Thallium-204	Measures the dust and pollutant levels on filter paper…and gauges the thickness of plastics, sheet metal, rubber, textiles and paper.
Thoriated Tungsten	Used in electric arc welding rods in construction, aircraft, petrochemical and food processing equipment industries. They produce easier starting, greater arc stability and less metal contamination.
Thorium-229	Helps fluorescent lights last longer.
Thorium-230	Provides coloring and fluorescence in colored glazes and glassware
Tritium	Major tool for biomedical research. Used for life science and drug metabolism studies to ensure the safety of potential new drugs…for self-luminous aircraft and commercial exit signs…for luminous dials, gauges and wrist watches…to produce luminous paint, and for geological prospecting and hydrology.
Uranium-234	Used in dental fixtures like crowns and dentures to provide a natural color and brightness.
Uranium-235	Fuel for nuclear power plants and naval nuclear propulsion systems…and used to produce fluorescent glassware, a variety of colored glazes and wall tiles.
Xenon-133	Used in nuclear medicine for lung ventilation and blood flow studies.