

Use of radiation

Radiation is effectively used in various fields around us in our society.

Use in medical care

Radiation is used for both diagnosis and treatment in the medical field. Radiographic examinations, X-rays, CT scans and nuclear medicine examinations (RI examinations) such as PET scans are widely used in diagnosis. In treatment, radiation is used to treat tumors effectively, which is one of the areas where further progress is expected.

- Boron Neutron Capture Therapy (BNCT) using neutron beams
- Particle therapy (proton therapy, heavy particle therapy)
- Sterilization of medical equipment and hygiene products



Use in agriculture

Selective breeding

Efficient breeding is possible by selecting breeds with useful characteristics among a variety of mutants created through irradiating plants with gamma rays. Many kinds of new breeds have been produced, such as large-grained, starchy rice for sake brewing and pears resistant to black spot disease.

Pest control

By releasing large numbers of pests sterilized by gamma irradiation, the probability that they will mate but not produce offspring is increased, and the number of pests is reduced and eventually eradicated over several generations. This method does not harm people or the environment whereas massive pesticide application could.

Food irradiation

Irradiating food and agricultural and livestock products with gamma rays or electron beams can prevent germination, have effects of sterilization and insecticide, and extend the shelf life of food products.

Use in industry

Material processing

Irradiation can modify materials to improve the functionality of strength, heat resistance, and wear resistance. For example, irradiating rubber with electron beams can increase strength and high-quality radial tires for cars can be precisely produced.

Inspection and measurement

Radiation is used for precise measurements of thickness, density, and moisture content and nondestructive inspections of parts and products, such as a nondestructive inspection to examine the internal damage and deterioration of concrete structures, plant equipment diagnosis, engine wear inspection and aircraft weld inspection.