Radioisotope Production and Radiation Technology

Objective

To support Member States in strengthening their capability to produce radioisotopes and radiopharmaceuticals. To support Member States in applications of radiotracers and radiation technology for industrial use, environmental remediation, preservation of cultural heritage artefacts and production of novel high performance, environmentally friendly materials for diverse purposes.

Recycling of Polymer Waste Using Ionizing Radiation

Pollution caused by plastics and rubber has become an issue of global concern. Radiation technology can help alleviate this problem by converting plastic waste into a variety of useful materials — such as fillers and binders for concrete and asphalt, and fuel and additives — presenting powerful opportunities for increased environmental sustainability and material innovations (Fig. 1). The Agency launched a new five year coordinated research project entitled 'Recycling of Polymer Waste for Structural and Non-Structural Materials by Using Ionizing Radiation' aimed at optimizing the recycling of plastic waste using radiation technologies by supporting applied research and development on the topic and generating feasibility studies for developing pilot recycling plants.

Production of Cyclotron Based Gallium-68 Radioisotope and Related Radiopharmaceuticals

Gallium-68 (^{68}Ga) is a positron emitter with a half-life of 68 minutes that has become one of the most important medical radioisotopes for theranostic applications in nuclear medicine. The use of ^{68}Ga radiopharmaceuticals for early detection of and follow-up for prostate, gastrointestinal and breast cancers has become routine nuclear medicine practice worldwide. A new coordinated research project entitled 'Production of Cyclotron-Based Gallium-68 Radioisotope and Related Radiopharmaceuticals' was launched in 2020 to focus on the production of ^{68}Ga without the use of a germanium-68 (^{68}Ge)–^{68}Ga generator, allowing Member States to produce it locally. The widespread availability of cyclotron technology, as reflected in the Agency's Database of Cyclotrons for Radionuclide Production, provides a great opportunity for such local production of crucial ^{68}Ga radiopharmaceuticals. Moreover, recent approvals of cyclotron produced ^{68}Ga-DOTATOC by the Food and Drug Administration in the United States of America and of accelerator produced ^{68}Ga chloride solution for radiolabelling by the European Medicines Agency attest to the quality of products prepared through this route, bringing immediate benefits to patients in Member States. The new project aims at formulating guidelines and promoting networks to enable cyclotron based production of ^{68}Ga radiopharmaceuticals for human use.

FIG. 1. Radiation technology can be used to convert plastic waste into useful materials, helping to address the global problem of plastic pollution.