GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
UNSTARRED QUESTION NO. 5302
ANSWERED ON 05.04.2023

Recovery of Isotopes from Radioactive Wastes

5302. SHRI PARVESH SAHIB SINGH VERMA:

Will the PRIME MINISTER be pleased to state:

(a) the percentage of useful isotopes which are actually being recovered and recycled from the radioactive wastes in the country;
(b) the details of the new technology that has been developed to utilize these isotopes; and
(c) whether the Government is making any economic gain from the recovered isotopes and if so, the details thereof?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (Dr. JITENDRA SINGH):

(a) High level radioactive waste contains isotopes like Caesium-137, Stronium-90, Ruthenium-106 etc., which are useful isotopes recovered. Caesium, Strontium and Ruthenium together constitute more than 90% of the radioactivity of High Level Liquid Waste (HLLW).

(b) Cs-137 is separated from High Level Liquid Waste(HLLW) using solvent extraction process with Calix Crown-6 (CC6) as the solvent. The Caesium so separated in nitric acid medium is further purified and then converted to glass pencils by adopting the vitrification process. Such glass pencils are contained in Stainless Steel (SS) tubes and are further encapsulated in another SS tube making it a sealed source. Such sealed sources are then subjected to Quality Assurance (QA) tests before being cleared for actual application. All these steps are carried out inside massively shielded enclosures, using remote operations, in line with the radioactive content of the waste.

Sr-90 is separated from HLLW by a solvent extraction process and is further subjected to a series of purification steps to achieve the purity as required for

medical application. Such purified Sr-90 source is stored for few weeks, before taking it up for milking Y-90 by solvent extraction process.

Ru-106 is separated and purified from HLLW. Further, Ru-106 is electrodeposited on silver plate and sandwiched between two more plates. The assembly is then brazed and given a concave shape to suit the eye application.

(c) Recovery of useful radio-isotopes from radioactive waste helps in reduction of waste volume for disposal and also in minimizing the waste burden.

The products made using the separated radioisotopes are import substitutes.

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