Radiochemical Engineering Development Center (REDC)

Specifications	
Hot Cells	7920: Nine hot cells with associated tanks 7930: Seven hot cells
Viewing Window	7920: Lead glass and mineral oil 7930: Lead glass with zinc bromide
Cell Construction	High-density concrete used for front, rear, and top shielding
Ventilation	All primary and secondary confinement systems exhaust streams are HEPA filtered
Services Available	Process and service compressed gases, air, demineralized water, process water, recirculating heating and cooling water, steam, vacuum, and electrical services
Intercell Movement	Pneumatic transfer system between facilities 7920: Pneumatic motor-driven intercell conveyer systems 7930: Pneumatic transfer tube system
Material Handling	Primary-secondary remote manipulators and glove boxes

The Radiochemical Engineering Development Center (REDC) is a multipurpose radiochemical processing and research facility that includes laboratories, glove boxes, and heavily shielded hot cells. The REDC includes personnel with radiochemical processing expertise and special equipment and systems to support the nation's research and development (R&D) needs in the production of unique radionuclides for use in research, defense, medical, and industrial applications. The REDC comprises two facilities – Building 7920, a two-level structure built in 1966, and Building 7930, a three-level structure built in 1968. Both buildings are classified as hazard category 2 nuclear facilities and include hot and cold laboratories, hot cells, and high bay space.

Isotope R&D and Production

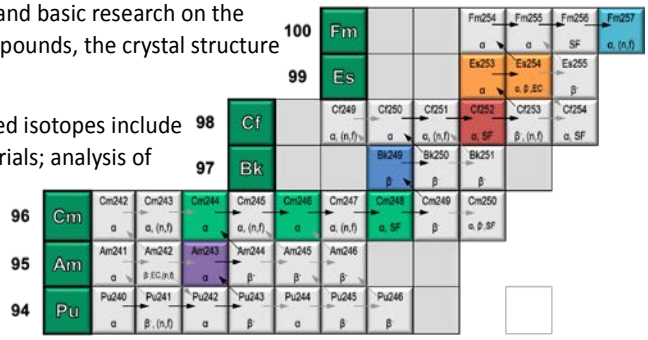
REDC's nuclear facilities, laboratories, and scientific and engineering staff provide world-class capabilities for use in isotope production, R&D, source fabrication, and the distribution of a variety of unique isotopes. The REDC is a key resource for the Office of Nuclear Physics' Isotope Program and other US Department of Energy and National Nuclear Security Administration programs supporting material science, nuclear science and technology, nuclear physics, chemical sciences/radioanalytical chemistry, nuclear security, and neutron science.

Typical activities include remote and hands-on fabrication of targets for irradiation in ORNL's High Flux Isotope Reactor and subsequent processing and recovery of valuable radioisotopes. REDC pioneered many radiochemical separation processes and continues to develop new techniques for the production, recovery, and purification of radioisotopes for shipment to locations throughout the world in support of myriad industrial, medical, and scientific applications.

REDC's primary mission areas currently include the production of ^{238}Pu for use in radioisotope power systems for the National Aeronautics and Space Administration, expanding the availability of isotopes for use in targeted alpha therapies in cancer treatment, expanding the availability of transcurium elements (Cf, Bk, Es, Fm) for industrial and research applications, and providing isotopes and expertise to support industrial applications as well as national security and nuclear nonproliferation programs.

Some of REDC's major scientific impacts arise from supplying heavy actinide isotopes for use in the discovery of new super-heavy elements and isotopes; basic research on the physics of heavy elements, electron behavior in orbitals, nuclear properties, and nuclear reactions; and basic research on the chemistry of heavy actinides, chemically stable compounds, the crystal structure of salts, solution chemistry, and spectroscopy.

Examples of industrial applications of REDC-produced isotopes include on-line monitoring of coal, cement, and other materials; analysis of fissile and transuranic material waste; radiography; and detection of explosive residues at airport security checkpoints, among others.



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