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Production and Distribution of Isotopically Enriched and Radioactive Isotopes for Research

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The US Department of Energy, Office of Nuclear Physics, Isotope Program has a mission to produce and distribute enriched stable and radioactive isotopes for research. Part of this effort is located at Oak Ridge National Laboratory and includes the Enriched Stable Isotope Prototype Plant, Radiochemical Engineering Development Center, High Flux Isotope Reactor, and various other facilities related to production and dispensing of stable and radioisotopes. The ORNL Isotope Program also includes capabilities to fabricate targets and sources including wires, thin films and other custom forms.

This talk will provide an overview of ORNL Isotope Program activities including recent developments of electromagnetic and gas centrifuge capabilities for production of enriched stable isotope products. Most recent stable isotope separations have concentrated on 96Ru 100Mo, 98Mo, and 176Yb. Stewardship of the US stockpile of enriched stable isotopes (e.g. 48Ca) continues with the emerging production capacity addressing those isotopes that have become depleted or that are in short supply.

ORNL Isotope Program activities related to radioisotope production include reactor-based production of various isotopes, such as 75Se, 252Cf, 133Ba, and 63Ni that are primarily used in industrial applications and medical radioisotopes important in cancer therapy such as 225Ac, 227Ac, 188W, 212Pb, 89Sr, and 223Ra. Other radioisotopes of interest that are produced and/or distributed through the ORNL Isotope Program include 244Pu, 249Bk, 251Cf, 248Cm, and 254Es in support of super-heavy element research and other fundamental scientific research.

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