

# Isotope Research Materials Laboratory

## Mission

The Isotope Research Materials Laboratory (IRML) at Oak Ridge National Laboratory provides enriched stable isotopes to the international medical, industrial, national security, and scientific communities. The IRML manages and distributes the DOE stable isotope inventory, which is valued at \$360M. It consists of over 2,000 quality - controlled batches of 225 stable isotopes of approximately 50 elements ranging in value from \$0.90/mg to \$19,279/mg. The batches are held in chemically stable forms and are readily available for delivery. IRML product specialists utilize dedicated equipment to provide custom chemical and physical forms to meet a variety of user requirements. IRML products are produced in compliance with ISO 9001:2008 standards.

**Over the Years, Custom Products and Services Have Been Provided by the ORNL for Most Elements and Their Respective Isotopes**

## Services

The IRML provides custom stable isotope services to chemically convert or physically prepare stable isotopes to customer specifications. These services include:

- Inorganic chemical conversions
- Arc melting and alloying
- Arc melting and drop casting
- Thin film evaporations
- Wire swaging and drawing
- Hot and cold rolling metal foils
- Sintering of metal and ceramic powders
- Scanning electron microscopy
- Energy dispersive X-ray spectroscopy
- Pyrochemical conversions
- Wire rolling
- Crucible melting and casting
- Vacuum hot pressing
- Plasma sputtering
- Precision sectioning with diamond wire saw
- Optical microscope/digital metrology
- Air sensitive processing with vacuum packaging

	Specifications
<b>Chemistry</b>	Four Labs
<b>Materials</b>	Seven Labs
<b>Equipment</b>	High temperature furnaces Inert glove box Rolling mills Reduction/ distillation systems Evaporation systems - resistance - e-beam - induction Vacuum hot press Swager SEM/EDS PARR reactor systems Gas Chromatography Diamond wire saw Induction casting machine Reactive ion etching Abrasive microblaster Hydraulic presses Inductively coupled plasma

## Applications

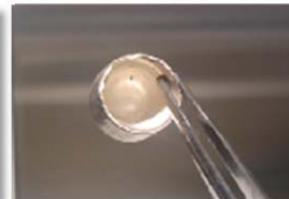
- Stable isotope precursors for nuclear reactor and accelerator produced radiopharmaceuticals
- Target materials for nuclear physics and other scientific research
- Ca, Fe, Cr, Mg, Se, Zn isotopes are used for biological and metabolic tracers
- Isotopic Mobility tracer studies for biological, medical, environmental, industrial and energy research

## Contact

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