NBL Program Office

U.S. Department of Energy

Certificate of Analysis

Certified Reference Material CRM U900 (10mg)
Uranium (U_3O_8) Isotopic Standard, 90% U-235, 10 mg U

	^{234}U	^{235}U	^{236}U	^{238}U
Atom Percent:	**0.7777**	**90.196**	**0.3327**	**8.693**
Uncertainty:	**±0.0015**	**±0.011**	**±0.0010**	**±0.008**
Weight Percent:	**0.7735**	**90.098**	**0.3337**	**8.795**

This Certified Reference Material (CRM) is primarily intended for the calibration of mass spectrometers used to perform uranium isotopic measurements. The specific purpose of this isotopic standard is for the determination of mass discrimination effects for uranium isotopes being measured under similar analytical conditions. Each unit of U900 consists of approximately 10 milligrams of uranium, in the form of highly purified U_3O_8, contained in a glass bottle.

The indicated uncertainties for the isotopic composition of the CRM are 95% confidence intervals for a single determination. This term can be defined as an approximate two-sigma limit, where sigma is the standard deviation of the measurements data obtained from the material. The uncertainties include allowances for inhomogeneity of the material as well as analytical error.

This CRM was originally issued in 1970 by the National Bureau of Standards (NBS) as Standard Reference Material (SRM) U-900. The measurements made at NBS leading to the certification were performed by E. L. Garner, L. A. Machlan, M.S. Richmond and W. R, Shields. In 1987, the technical and administrative transfer of NBS Special Nuclear SRMs into the NBL CRM Program was coordinated by the NBS Office of Standard Reference Materials and N. M. Trahey, NBL.

The certified isotopic abundance values were determined using a solid-sample thermal ionization mass spectrometer equipped with a Faraday cup detection system. The measured ^{238}U values were calculated from the $^{235}U/^{238}U$ values, which were corrected for mass discrimination effects by intercomparison with synthetic calibration mixtures of similar ^{235}U levels, prepared from high-purity ^{235}U and ^{238}U separated isotopes. The $^{235}U/^{238}U$ value for this standard, 10.375, is known to at least 0.1%.

The ^{234}U and ^{236}U abundances were determined by isotope dilution mass spectrometry using high-purity ^{233}U as the spike.

NOTE: NBS Special Publication 260-27 presents further details of the measurements made at NBS which provided the basis for the certification, and is available from the NBS Office of Standard Reference Materials upon request.

Expiration of Certificate: When stored in its original, unopened container, the certification of this material is valid indefinitely. The NBL PO will periodically monitor the materials in inventory and notify customers should degradation be detected.

Stability and Storage: This material should be stored in its original packaging under normal laboratory environmental conditions.

Minimum Sample Size: The NBL Program Office has validated that samples of 1 mg of oxide or larger are isotopically homogenous. The NBL Program Office recommends sampling of oxide of 1 mg or more for use of this material as an isotopic Certified Reference Material.