U. S. Department of Commerce
Malcolm Baldrige
Secretary

National Bureau of Standards
Ernest Ambler, Director

National Bureau of Standards

Certificate of Analysis

Standard Reference Material U-900

Uranium Isotopic Standard

(Nominally 90% Enriched)

	^{234}U	^{235}U	^{236}U	^{238}U
Atom Percent	0.7777	90.196	0.3327	8.693
	±.0015	±0.011	±.0010	±0.008
Weight Percent	.7735	90.098	.3337	8.795

This Standard Reference Material (SRM) is certified for use as an isotopic standard. The primary intended use is for the evaluation of mass discrimination effects encountered in the operation of a mass spectrometer.

The material consists of highly purified uranium oxide, U_3O_8. The atomic weight of the material is calculated to be 235.301, using the nuclidic masses 234.0409; 235.0439; 236.0457; and 238.0508.

The values for ^{234}U and ^{236}U are calculated from measurements at the National Bureau of Standards. The samples were spiked with high-purity ^{233}U to approximate the ^{234}U concentration, the ratios ^{233}U to ^{234}U and ^{233}U to ^{236}U were measured on a triple-filament equipped surface ionization mass spectrometer with d-c amplifier circuits.

The values for ^{235}U and ^{238}U were calculated from measurements made at the National Bureau of Standards of the ^{235}U to ^{238}U ratio. The observed ratios were corrected for mass discrimination effects by intercomparison with five synthetic mixtures at the 90-percent ^{235}U level prepared from high-purity ^{235}U and ^{238}U.

The indicated uncertainties for the isotopic concentrations are at the 95-percent confidence level for a single determination. The ^{235}U to ^{238}U ratio for this standard, 10.375, is known to at least 0.1 percent.

Measurements leading to the certification of this SRM were made by E. L. Garner, L. A. Machlan, M. S. Richmond, and W. R. Shields.

The technical and support aspects in the preparation, certification, and issuance of this Standard Reference Material were coordinated through the Office of Standard Reference Materials by J. L. Hague.

NOTE: In many industries traceability of their quality control process to the national measurement system is carried out through the mechanisms of SRM's. It may be therefore of interest to know the details of the measurements made at NBS in arriving at the certified values of this SRM. An NBS Special Publication, 260-27, is reserved for this purpose and is available from the NBS Office of Standard Reference Materials upon request.

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Certificate dated 7-30-70)

George A. Uriano, Chief
Office of Standard Reference Materials