

National Bureau of Standards

Certificate of Analysis

Standard Reference Material U-100

Uranium Isotopic Standard

(Nominally 10% Enriched)

	²³⁴ U	²³⁵ U	²³⁶ U	²³⁸ U
Atom Percent	0.0676	10.190	0.0379	89.704
	±.0002	±0.010	±.0001	±0.010
Weight Percent	.0666	10.075	.0376	89.821

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, U₃O₈. The atomic weight of the material is calculated to be 237.741, using the nuclidic masses 234.0409; 235.0439; 236.0457; and 238.0508.

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

The values for ²³⁵U and ²³⁸U were calculated from measurements made at the National Bureau of Standards of the ²³⁵U to ²³⁸U ratio. The observed ratios were corrected for mass discrimination effects by intercomparison with five synthetic mixtures at the 10-percent ²³⁵U level prepared from high-purity ²³⁵U and ²³⁸U.

The indicated uncertainties for the isotopic concentrations are at the 95-percent confidence level for a single determination. The ²³⁵U to ²³⁸U ratio for this standard, 0.11360, 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