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-0002

### Uranium Isotopic Standard

### (Nominally depleted to 0.02%)

| | $^{234}U$ | $^{235}U$ | $^{236}U$ | $^{238}U$ |
|---|---|---|---|---|
| Atom Percent | 0.00016 | 0.01755 | <0.00001 | 99.9823 |
| | ±.00001 | ±.00005 | ——— | ±0.0001 |
| Weight Percent | .00016 | .01733 | < .00001 | 99.9825 |

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 is a highly purified uranium oxide, $U_3O_8$. The atomic weight of the material is calculated to be 238.0503 using the nuclidic masses 234.0409; 235.0439; and 238.0508.

The value for $^{235}U$ is calculated from measurements made on samples spiked with high-purity $^{233}U$ to approximate the $^{235}U$ concentration, the ratio $^{233}U$ to $^{235}U$ was measured on a triple-filament equipped thermal ionization mass spectrometer with d-c amplifier circuits. Ratio determinations were corrected for mass discrimination by measurements made under similar conditions on SRM U-500.

The value for $^{234}U$ is calculated from measurements made on samples spiked with high-purity $^{233}U$, the ratio $^{233}U$ to $^{234}U$ was measured on a two stage mass spectrometer using a pulse counting technique.

The indicated uncertainties are at the 95 percent confidence level for a single determination, and include allowances for the inhomogeneities of the material as well as analytical error.

Measurements leading to the certification of this SRM were made by E. L. Garner, L. A. Machlan, and L. J. Moore.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of 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