U. S. Department of Commerce
Maurice H. Stans
Secretary

National Bureau of Standards
A. V. Astin, Director

Certificate

Standard Reference Material U-005
Uranium Isotopic Standard

	^{234}U	^{235}U	^{236}U	^{238}U
Atom percent	0.00218	0.4895	0.00466	99.504
	±.00004	±.0005	±.00005	±.001
Weight percent	0.00214	0.4833	0.00462	99.510

The material consists of highly purified oxide, U_3O_8. The atomic weight of the material is calculated to be 238.036 using the nuclidic masses 234.0409; 235.0439; 236.0457 and 238.0508.

The values for ^{234}U and ^{236}U were 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 ion-multiplier amplifier circuits.

The values for ^{235}U and ^{238}U were calculated from measurements of the ^{235}U to ^{238}U ratio made at the National Bureau of Standards on a triple-filament, surface ionization mass spectrometer equipped with dc amplifier circuits. The observed ratios were corrected for mass discrimination effects by intercomparison with synthetic mixtures prepared at the 0.5 percent ^{235}U level from high-purity ^{235}U and ^{238}U.

The limits indicated for the isotopic concentrations are at least as large as the 95-percent confidence limits for a single determination, and include terms for inhomogeneities in the material as well as analytical error. The ^{235}U to ^{238}U ratio for this standard, 0.004919, is known to at least 0.1 percent.

Mass spectrometry measurements at NBS were made by E. L. Garner on solutions prepared by L. A. Machlan.

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.

Washington, D. C. 20234
April 21, 1969

W. Wayne Meinke, Chief
Office of Standard Reference Materials

(This certificate supersedes certificate of March 2, 1959)