



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 3164

Spectrometric Standard Solution

Uranium

Batch Code 390709

This Standard Reference Material (SRM) is intended for use in atomic absorption spectrometry, optical emission (plasma) spectrometry, spectrophotometry, or any other analytical technique that requires aqueous standard solutions for calibrating instruments. SRM 3164 is a single element solution prepared gravimetrically to contain 10 mg/mL of uranium with a nitric acid concentration (V/V) of 10 percent. The certified value is based on a gravimetric procedure, i.e., weight per volume composition of the high-purity uranium oxide dissolved in NIST high-purity reagents. The uncertainty listed is based on gravimetric and volumetric uncertainties of the preparation and the effect of solvent transpiration through the container walls for one year after the bottle is removed from the plastic sleeve.

Metal	Concentration (mg/mL)	Source Purity, %	Acid Conc. (V/V) Approximate
U	10.00 ± 0.03	NBL-CRM 129 (99.968%) (formerly SRM 950b)	HNO ₃ , 10%

Procedures for Use

Stability: This certification is valid for one year from the date of shipment from NIST provided the solutions are kept tightly capped and stored under normal laboratory conditions. NIST will monitor the stability of representative solutions from this SRM lot and if changes occur that invalidate this certification, NIST will notify purchasers.

Preparation of Working Standard Solutions: All solutions should be brought to 22 ± 1 °C and all glass or plastic surfaces coming into contact with the standard must have been previously cleaned. A working standard solution can be prepared from the SRM solution by serial dilution. Dilutions should be made with certified volumetric class A flasks and 5 or 10 mL class A pipets. All volumetric transfers of solutions should be performed using a proven analytical technique. Each dilution should be acidified with an appropriate high-purity acid and diluted to calibrated volume using high-purity water. The stability of the working standard solution will depend on the final acid concentration; therefore, care should be exercised to ensure that the final acid concentration of the dilution closely approximates that of the SRM. To achieve the highest accuracy, the analyst should prepare daily working solutions from 100 µg/mL dilutions of the original SRM solution.

SRM 3164 was prepared by T.A. Butler of the NIST Inorganic Analytical Research Division. Inductively coupled plasma emission spectrometric analyses were made by T.A. Butler and L.J. Wood.

The technical and support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by J.S. Kane.

Gaithersburg, MD 20899
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Thomas E. Gills, Acting Chief
Standard Reference Materials Program