



# National Institute of Standards & Technology

## Certificate of Analysis

### Standard Reference Material 3111a

#### Spectrometric Standard Solution

#### Cesium

Batch Code 392604

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 3111a is a single element solution prepared gravimetrically to contain 10.00 mg/mL of cesium 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 salt dissolved in NIST high-purity reagents.

Metal	Concentration <sup>a</sup> (mg/mL)	Source Purity, %	Acid Conc. (V/V) Approximate
Cs	10.00 ± 0.03	Cs <sub>2</sub> CO <sub>3</sub> (99.995) <sup>b</sup>	HNO <sub>3</sub> , 1%

<sup>a</sup>The uncertainty listed is based on judgment and represents an estimate of the combined effects of any errors, attributable to weighing, dilutions, and purity of the metal or compound. (No attempt was made to derive exact statistical results as the imprecisions of most analytical methods are much larger than the errors listed above.)

<sup>b</sup>This high-purity material was analyzed by optical emission spectrometry and found to contain less than 100 µg/g total impurities.

#### Procedures for Use

**Stability:** This certificate is valid for one year from the shipping date 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 solution from 100 µg/mL dilutions of the original SRM solution.

Gaithersburg, MD 20899  
May 17, 1993

Thomas E. Gills, Acting Chief  
Standard Reference Materials Program

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SRM 3111a was prepared by T.A. Butler of the NIST Inorganic Analytical Research Division. Atomic absorption and emission spectrometry analyses were made by T.A. Butler and J.A. Norris.

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.