



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 3143

Spectrometric Standard Solution

Rhenium

Batch Code 392109

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 3143 is a single element solution prepared gravimetrically to contain a nominal 10 mg/mL of rhenium with a nitric acid concentration (V/V) of 10 percent. The certified value is based on gravimetric procedures, i.e., weight per volume composition of the high-purity metal 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
Re	10.00 ± 0.03	Re metal (99.83)*	HNO ₃ , 10%

*This high-purity material was analyzed for gaseous constituents using inert gas fusion for O₂ and N₂ and vacuum hot extraction for H₂. The metallic impurities levels were determined by inductively coupled plasma-mass spectrometry. It was found to contain 0.163 weight percent dissolved gases (H₂, O₂, N₂) and less than 100 µg/g total metallic impurities.

Procedures for Use

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

Preparation of Working Standard Solutions: All materials used in the preparation of working standard solutions should be brought to 22 ± 1°C before use and all glass or plastic surfaces coming into contact with the materials 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.

Gaithersburg, MD 20899
October 26, 1993

Thomas E. Gills, Acting Chief
Standard Reference Materials Program

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SRM 3143 was prepared by T.A. Butler, and inductively coupled plasma-mass spectrometric analyses were made by G.C. Turk, of the NIST Inorganic Analytical Research Division. Gas analyses were performed by Luvak, Inc., Boyleston, MA.

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.