



# National Institute of Standards & Technology

## Certificate of Analysis

### Standard Reference Material 3126a

#### Spectrometric Standard Solution

#### Iron

#### Batch Code 390710

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 3126a is a single element solution prepared gravimetrically to contain a nominal 10 mg/mL of iron 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 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. The density of the solution is 1.094 g/mL.

Metal	Concentration (mg/mL)	Source Purity, %	Acid Conc. (V/V) Approximate
Fe	10.00 ± 0.03	Fe metal (99.97+)*	HNO <sub>3</sub> , 10%

\*This high-purity material was analyzed for oxygen using inert gas fusion. The metallic impurities were determined by optical emission spectrometry. It was found to contain 0.029 weight percent dissolved oxygen and less than 100 µg/g total metallic impurities.

#### Procedures for Use

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

**Preparation of Working Standard Solutions:** All solutions should be brought to 22 ± 1 °C before use 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.

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

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SRM 3126a 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. Gas analyses were performed at Luvak, Inc., Boyleston, MA.

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