



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 3185

Anion Standard Solution

Nitrate

Batch Code 490405

This Standard Reference Material (SRM) is intended for use in anion ion chromatography, or any other analytical technique that requires aqueous standard solutions for calibration or as control samples. SRM 3185 is a single component solution prepared gravimetrically to contain 1000 micrograms nitrate per gram of solution. The certified value is based on gravimetric procedures, i.e. weight per weight composition of a high-purity sodium nitrate salt (NaNO_3) dissolved in filtered ($0.22 \mu\text{m}$) 18 megohm water using 22.9897, 14.01, and 16.00, respectively as the atomic weights of sodium, nitrogen, and oxygen. The value has been adjusted upward by 0.1% relative, based on estimated transpiration losses of solvent through the container walls of 0.2% relative for the certification period. To confirm the gravimetric value, samples were analyzed by ion chromatography. The density of the solution at 22°C is 0.998 g/mL.

Component	Concentration ($\mu\text{g/g}$)	Source Purity, %
Nitrate	1002 ± 4	NaNO_3 (99.873%)

The uncertainty in the certified value is calculated as

$$U = (2u_c + 0.001V) \text{ mg/mL}$$

where u_c is the "combined uncertainty" calculated according to the CIPM approach [1]. The value u_c is intended to represent, at the level of one standard deviation, the combined effect of uncertainty components associated with volumetric and gravimetric factors, as well as the purity of the nitrate salt. The additional quantity, $0.001V$, is an allowance for transpiration of the solution through the container walls, which is estimated to be less than $\pm 0.1\%$ of the certified value during the one year period of validity of the certification.

The combined uncertainty consists of Type B components due to uncertainty in the balance reading and uncertainty in the material handling and dilution. Each component is derived from its corresponding uniform probability distribution by division by $\sqrt{3}$.

SRM 3185 was prepared by T.A. Butler and ion chromatographic measurements were made by K.W. Pratt of the NIST Inorganic Analytical Research Division.

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
August 16, 1994
(Revision of certificate dated 6-1-94)

Thomas E. Gills, Chief
Standard Reference Materials Program

(over)

Procedures for Use

Stability: This certification is valid for one year from the date of shipment provided the solutions are kept tightly capped and stored under normal conditions in an area known to be free of acid fumes and sulfur dioxide. NIST will monitor the stability of this SRM and will notify purchasers of any changes that invalidate this certification.

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 made to calibrated volume with high-purity water. To achieve the highest accuracy, the analyst should prepare daily working solutions from 100 $\mu\text{g/mL}$ dilutions of the original SRM solution.

REFERENCE

- [1] *"Guide to the Expression of Uncertainty in Measurement"*, ISBN 92-67-10188-9, 1st Ed. ISO, Switzerland, 1993.