



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material[®] 3185

Standard Solution

Nitrate Anion

Lot Code 691608

This Standard Reference Material (SRM) is intended primarily 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 a nominal 1 000 mg/kg of nitrate dissolved in filtered (0.22 μm) 18 megohm water. The coulometric assay of the sodium nitrate used to prepare the solutions was determined to be 99.873 %.

Certified Value (Y) of Nitrate: 1001 mg/kg \pm 3 mg/kg at 22 °C

The certified value (Y) is based on the mass of high purity sodium nitrate, dissolved and diluted to known volume and confirmed by ion chromatography. 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 per year. The density of the solution is 0.999 g/mL \pm 0.002 g/mL at 22 °C.

The uncertainty in the certified value is calculated as

$$U = (2u_c + 0.001Y) \text{ mg/kg}$$

where u_c is the "combined uncertainty" calculated according to the ISO Guide [1]. The value of 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 starting material. The additional quantity, 0.001 Y , is an allowance for transpiration of solution through the container walls, which is estimated to be \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 uncertainties in material purity, balance reading, material handling, and dilution.

This SRM was prepared gravimetrically by T.A. Butler of the NIST Analytical Chemistry Division. Ion chromatographic analysis of the prepared solution was performed by J.M. Smeller of the NIST Analytical Chemistry Division.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, MD 20899
Certificate Issue Date: October 22, 1996

Thomas E. Gills, Chief
Standard Reference Materials Program

Procedures for Use

Expiration of Certification: 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 $22\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ before use and all glass or plastic surfaces coming into contact with the SRM must have been previously cleaned. A working standard solution can be prepared from the SRM solution by serial dilution. Each dilution should be acidified with an appropriate high purity water. 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, Geneva, Switzerland, (1993); see also Taylor, B.N. and Kuyatt, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results," NIST Technical Note, 1297, U.S. Government Printing Office, Washington D.C., (1994).