National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material 3183

Anion Standard Solution

Fluoride

Batch Code 491209

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 3183 is a single component solution prepared gravimetrically to contain a nominal 1000 mg/kg of fluoride in solution. The certified value (V) is based on replicate titrimetric fluoride assays using a lanthanum nitrate titrant, standardized using a gravimetric ethylenediaminetetraacetic acid (EDTA) titration. 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 at 22 °C is 1.000 g/mL.

Component	Concentration (mg/kg)	Source
Fluoride	995 ± 5	NaF

The uncertainty in the certified value is calculated as

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

where u_c is the "combined uncertainty" calculated according to the ISO Guide [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 fluoride 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 ± 0.1% of the certified value during the one-year period of validity of the certification.

The combined uncertainty consists of Type A components associated with replicate titrations, and Type B components due to uncertainty in the balance reading and uncertainty in the material handling and dilution.

SRM 3183 was prepared by T.A. Butler and analyzed by C.M. Beck II of the NIST Inorganic Analytical Research Division.

The 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
December 29, 1994
(Revision of certificate dated 11-9-94)

Thomas E. Gills, Chief
Standard Reference Materials Program

(over)

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 this 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 $\pm$ 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.

REFERENCE

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