



National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material[®] 918a

Potassium Chloride (Clinical Standard)

This Standard Reference Material (SRM) is certified as a chemical of known purity. It is intended primarily for use in the calibration and standardization of procedures for potassium (K) and chloride (Cl) determinations employed in clinical analysis and for routine critical evaluation of the daily working standards used in these procedures. SRM 918a is supplied in crystalline form as a 30 g unit.

Certified Purity

Potassium Chloride, mass fraction	99.9817 (± 0.0084) %
Potassium, mass fraction	52.4354 (± 0.0044) %
Chloride, mass fraction	47.5463 (± 0.0040) %

This certified purity is based on the results of independent coulometric assays as described in this Certificate of Analysis. Each uncertainty interval represents the expanded uncertainty, U, calculated according to the ISO Guide [1] with a coverage factor of 2 and represents the 95% level of confidence. The percent K and percent Cl are calculated by multiplying the KCL assay by the mass relationship (gravimetric factors for K to KCL and Cl to KCL). The factors are calculated from the 1991 IUPAC [2] recommended relative atomic masses: potassium 39.0983, chlorine 35.4527.

Expiration of Certification: This certification is valid for 5 years from the date of shipment from NIST. Periodic reanalysis of representative samples from this SRM lot will be performed, and if significant changes are observed within the five-year period, the purchaser will be notified by NIST. Please return the enclosed registration card to facilitate notification.

Coordination of the analysis was performed by J.R. Moody of the NIST Analytical Chemistry Division

Coulometric analyses were performed in the NIST Analytical Chemistry Division by K.W. Pratt. Trace element (ICP-MS) analyses were performed in the NIST Analytical Chemistry Division by E.S. Beary and P.J. Paulsen.

Statistical analysis of the experimental data was performed by L.M. Oakley of the NIST Statistical Engineering Division.

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.C. Colbert.

Gaithersburg, MD 20899
April 17, 1995

Thomas E. Gills, Chief
Standard Reference Materials Program

NOTICE AND WARNINGS TO USERS

This Standard Reference Material is intended for "in vitro" diagnostic use only.

Stability and Storage: Solutions prepared from SRM 918a, Potassium Chloride (KCl), are stable indefinitely when stored in a glass-stoppered bottle, excepting concentration changes due to evaporation. All such solutions should be clear and display no turbidity. This SRM should be stored in the well-closed original container under normal laboratory conditions (it must be tightly re-capped after use and protected from moisture and light). It is recommended that weighing and other manipulations of the solid SRM not be made when relative humidity exceeds 75%.

Homogeneity: This SRM was homogeneous within the uncertainty limits for the 380-mg sample size used for the coulometric assays. Samples less than 380 mg are not recommended in order to avoid possible inhomogeneities with smaller sample sizes.

INSTRUCTIONS FOR USE

Drying Instructions: Dry at 110-120 °C for 2 h.

Standard Stock Solutions of Potassium for Spectrometric Reference Method: A standard solution of KCl (10 mmol potassium per liter) may be prepared as follows. Quantitatively transfer 0.7456 g of SRM 918a dried for 2 h at 110-120 °C to a 1-L volumetric flask, add 3 mL of concentrated nitric acid (ACS Reagent Grade), dilute to volume with deionized water, and make the solution uniform by inverting the flask at least 30 times. The concentrations required for analysis may be prepared by accurate dilution of this standard with deionized water. If this solution is being used as a standard addition to a protein-containing sample, the nitric acid should be omitted.

A standard solution of chloride containing 100 mmol per liter may be prepared by transferring quantitatively 7.456 g of SRM 918a to a 1-L volumetric flask and adding 3 mL of concentrated nitric acid (ACS Reagent Grade) and 100 mL of deionized water. After all the salt is dissolved, dilute to volume with deionized water.

Source of Material: The KCl used for this SRM was obtained from the Aithaca Chemical Co., Uniondale, NY. The material was examined for compliance with the specification for reagent grade KCl as specified by the American Chemical Society [3]. The material was found to meet or exceed the minimum requirements in every respect.

Coulometric Assay: The assay value for this material was obtained by automated coulometric titration [4] of weighed KCl samples with coulometrically generated Ag^+ and amperometric detection of the endpoint. The certified value represents the average result of thirteen such titrations of samples from ten randomly selected bottles from the entire lot of SRM 918a.

Trace Metal Analyses: Semi-quantitative ICP-MS analyses for general information on impurities indicate that the only species present in this SRM at a level greater than 20 $\mu\text{g/g}$ are Bromine at 130 $\mu\text{g/g}$, Rubidium at 30 $\mu\text{g/g}$, and Sodium at $\leq 50 \mu\text{g/g}$ (detection limit).

REFERENCES

- [1] "Guide to the Expression of Uncertainty in Measurement", ISBN 92-67-10188-9, 1st Ed., ISO, Geneva, Switzerland, (1993).
- [2] De Laeter, J.R., et al., *Pure & Applied Chemistry*, **63** (7), 975-990, (1991).
- [3] *Reagent Chemicals*, 8th Ed., American Chemical Society, Washington, DC, (1993).
- [4] Pratt, K.W., *Anal. Chim. Acta.*, **289**, 125-134, (1994).