National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material® 723c

2-Amino-2-(hydroxymethyl)-1,3-propanediol

[tris(Hydroxymethyl)aminomethane]

$(HOCH_2)_3CNH_2$

Acidimetric Standard

This Standard Reference Material (SRM) 723c is intended primarily for use in acidimetric standardizations. The SRM consists of highly purified 2-amino-2-(hydroxymethyl)-1,3-propanediol [tris-(hydroxymethyl)aminomethane; "THAM"; "Tris"] hereafter referred to as "Tris" and is supplied in a unit consisting of 50 g of powdered material.

Certified "Tris" Assay, Mass Fraction (in %)

99.901 % ± 0.021 % [1]

Certified Value and Uncertainty: The certified value is based on the results of coulometric assays of dried material (see Drying Instructions). The assay value for this material was obtained by automated coulometric back-titration [2] to the inflection point (pH ca. 4.8), of weighed "Tris" samples after addition of excess coulometrically standardized HCl. The certified value represents the result of eight such titrations of samples from four randomly selected bottles from the entire lot of SRM 723c.

The uncertainty in the certified value is expressed as an expanded uncertainty, U, and is calculated according to the method described in the ISO Guide [3]. The expanded uncertainty is calculated as $U = ku_c$, where k is the coverage factor and u_c is the combined uncertainty; $k = 2.306$. The value of U represents an approximate 95 % level of confidence.

Use: This SRM is certified for acidimetric assay **ONLY** and is not intended for use in pH standardizations.

Expiration of Certification: This certification of this lot is valid until **31 January 2003**, within the measurement uncertainties specified, provided the SRM is handled and stored in accordance with the instructions given in this certificate. However, the certification is invalid if the SRM is contaminated or modified.

Maintenance of SRM Certification: NIST will monitor this SRM over the period of its certification. If substantive technical changes occur that affect the certification before the expiration of this certificate, NIST will notify the purchaser. Return of the attached registration card will facilitate notification.

Coulometric analyses were performed in the NIST Analytical Chemistry Division by K.W. Pratt and Michal Máriássy (Guest Scientist, Slovak Institute of Metrology).

Statistical analysis was provided by H.-K. Liu of the NIST Statistical Engineering Division

The 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
Certificate Issue Date: 30 January 1998

Thomas E. Gills, Chief
Standard Reference Materials Program

NOTICE AND WARNING TO USERS

Storage: This SRM should be stored in its original bottle at temperatures between approximately 22 °C and 25 °C. It must be tightly re-capped after use and protected from moisture and light.

Drying Instructions: Dry at room temperature between 22 °C and 23 °C for 24 h in a vacuum desiccator over anhydrous magnesium perchlorate. Drying of this material at elevated temperatures is not recommended due to the possibility of decomposition and/or loss of occluded water.

Homogeneity: Tests indicate that this SRM is homogeneous within the uncertainty limits for sample sizes greater than 500 mg. Samples less than 500 mg are not recommended in order to avoid possible inhomogeneity with smaller sample sizes.

Source of Material: The "Tris" used for this SRM was obtained from Sigma-Aldrich, St. Louis, MO. The material was examined for compliance with the specification for reagent grade "Tris" as specified by the American Chemical Society [4]. The material was found to meet or exceed these specifications in all respects.

REFERENCES

[1] Taylor, B.N., "Guide for the Use of the International System of Units (SI)," NIST Special Publication 811, 1995 Ed., (April 1995).

[2] Pratt, K.W., "Automated, High-Precision Coulometric Titrimetry. Part II. Strong and Weak Acids and Bases," Anal. Chim. Acta, **289**, pp. 135-142, (1994).

[3] *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 DC, (1994).

[4] *Reagent Chemicals*, American Chemical Society, 8th Ed., Washington DC, (1993).

It is the responsibility of users of this SRM to assure that the certificate in their possession is current. This can be accomplished by contacting the SRM Program at: Phone (301) 975-6776 (select "Certificates"), Fax (301) 926-4751, e-mail srminfo@nist.gov, or via the Internet http://ts.nist.gov/srm.