U. S. Department of Commerce
Maurice H. Stans
Secretary

National Bureau of Standards
A. M. Branscomb, Director

Certificate of Analysis

Standard Reference Material 723

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

[tris(Hydroxymethyl)aminomethane]

$(HOCH_2)_3CNH_2$

Basimetric Standard

George Marinenko

This standard reference material consists of highly purified 2-amino-2-(hydroxymethyl)-1,3-propanediol [*tris*(hydroxymethyl)aminomethane; "*tris*"] and is intended for use in basimetric standardization.

Basimetric assay . . . . . 99.9690 ± 0.0030 wt. percent

Fifteen samples randomly selected from a lot were assayed in duplicate by precise coulometric titration, as described on the reverse page. The above uncertainty represents the 95 percent confidence interval for the mean. No evidence was found for variability between samples beyond that accounted for by random error of measurement. Accordingly, the material is considered to be homogeneous. A pooled estimate of the random error (standard deviation of a single determination based on all 30 determinations) is 0.0081 assay units. Because of the homogeneity of this material, this value is an estimate of the standard deviation of a single determination made on a sample selected at random from the lot.

The *tris*(hydroxymethyl)aminomethane was prepared by the Sigma Chemical Company of St. Louis, Missouri.

The experimental sequence was developed by J. Mandel who also statistically evaluated the results.

The overall direction and coordination of the technical measurements leading to certification were performed under the chairmanship of J. K. Taylor.

The technical and support aspects involved in the procurement, certification, and issuance of this standard reference material were coordinated through the Office of Standard Reference Materials by T. W. Mears.

Washington, D. C. 20234
July 14, 1970

J. Paul Cali, Acting Chief
Office of Standard Reference Materials

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COULOMETRIC ASSAY: Since direct coulometric titration of *tris* has been shown by studies at the National Bureau of Standards to be infeasible, an indirect method was used. This consists in the quantitative addition of an excess amount of coulometrically standardized acid to the *tris* followed by coulometric titration of the residual acid.

Approximately 1.6 molar sulfuric acid solution, standardized coulometrically, was used in these titrations. Back-titration of the acid was carried out to a differential potentiometric inflection point. In each determination, about one gram of *tris* and about 5.5 grams of the acid solution were used. Using 100 ml 1M KCl supporting electrolyte, the $(\Delta pH/\Delta C)_{max}$ occurred in the vicinity of pH = 5.

The experimental procedure described by J. K. Taylor and S. W. Smith [J. Res. NBS 63A (Phys. and Chem.), 153 (1959)] with minor modifications was used. The value of the faraday used in this work was 96,487.0 coulombs per gram-equivalent. The 1967 values for the atomic weights based on the C-12 nuclide were used. The molecular weight of *tris* used was 121.1372. Corrections for the effect of buoyancy of air were applied to all mass measurements.

DRYING: The assay value is based upon samples dried at 70 °C in a vacuum oven for 24 hours. Samples assayed without this drying treatment are not expected to depart from assay value by more than 0.01 assay units.