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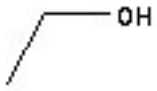
Certificate of Analysis
Certified Reference Material

Description: 80 mg/dL Aqueous Ethanol Standard Solution 5 x 1 mL
0.080% by Mass

Lot No.: 517757 Expiration Date: 6/21/2025

Catalog No.: ETH-080-1ML-5AMP Original issue date: 2/7/2024

Bulk Product Information: ethanol



Chemical Formula:	C2H6O
CAS Registry No:	64-17-5
Water Content:	<1%

Certified Values:

The certified value is based on gravimetric and volumetric preparation of this CRM. This CRM has been confirmed by gas chromatography (GC) or gas chromatograph/mass spectrometry (GC/MS) using an internally developed method against an independent source. The uncertainty value is calculated for a 95% confidence interval with a *k* value of 2.

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration, mg/d
ethanol	64-17-5	99.9	202.9.7P	80.12 ± 1.3

Packaging and Storage:

The solution should be stored according to the following storage requirements: 4ºC +/- 4ºC
Once the product is opened, it should be transferred to a vial with minimum head space if the product was in a seal ampule.
Once opened, the expiration is determined by user specifications.

FOR ANALYTICAL PURPOSES ONLY: NOT FOR HUMAN OR ANIMAL USE!

Intended Uses:

This Certified Reference material (CRM) is intended for use as a calibration standard or a quality control standard for Chromatography Equipment such as GC, GC/MS, HPLC, and HPLC/MS. It may aslo be used for various USEPA, NIOSH, EN, ISO, EPA and ASTM methods.

Recommended storage container for ampuled products after opening is a 12mmx32mm amber vial with screw cap Teflon

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lined silicon septum. The modeled % change per day can be calculated using the following:

$$\% \text{ Change} = (-0.018\ln(x+31) + 0.1157) + 636.54y^{-3.202}$$

where x = boiling point of the most volatile analyte in the mix (degrees K)
y = boiling point of the solvent (degrees K)

This model assumes the container is stored at -10 °C and is unopened during storage. The user should determine what the acceptable error for their process is and calculate the maximum number of days the opened ampule should be stored.

NIST Standard Solutions for Concentration Verification:

Solution	Concentration
Reference 1 (NIST 2892)	39.00 mg/dL
Reference 2 (NIST 2893a)	76.63 mg/dL

Position of Samples	Concentration (mg/dL)
Start	80.7
Middle	81.6
End	80.9

Concentration Verification/ Lot to Lot Consistency (HPLC analysis):

Standard Solution	Lot Number	Concentration mg/dL (+/- 2%) Compared to NIST SRM 2892, 2893a	Ampule to Ampule Consistency (<3%)
Actual Lot	517757	81.1	0.8
Previous lot	N/A		

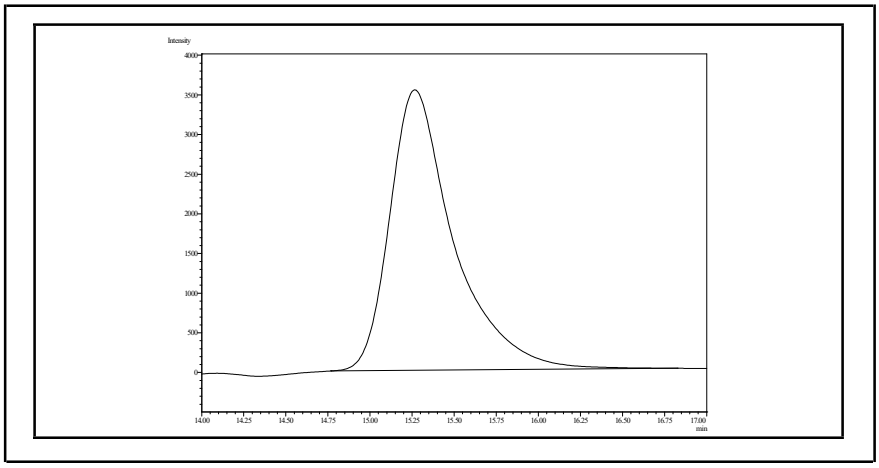
Random replicate samples of the final packaged CRM have been analyzed to prove homogeneity in accordance with internal procedure O2-QS-011. This is consistent with the intended use of this CRM. The homogeneity of this product has been confirmed by procedures consistent with ISO/IEC 17025:2017 and ISO 17034:2016.

Supportive Data:

Parameter	Specification	Result
Appearence	colorless	Conforms
Identity	HPLC analysis Rt corresponds to Rt of reference standard (+/- 0.5 min)	Conforms
Solution Purity	Ethanol, HPLC >99%	Conforms
Solvent Purity	Water, HPLC grade	Conforms
Extractable Volume	> 1 mL	Conforms

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Chromatography:



Method Conditions:

Instrument
HPLC/RID

Detection
RID

Column/Flow
Phenomenex Rezex ROA - Organic Acid H+ (8%) 300mm x 7.8mm ID / 0.8 mL/min

Method Details
0.005 N H2SO4

Isocratic

Inj.-Vol
10 µL

General Information:

Accreditation:

This CRM was manufactured by an ISO 17025:2017 chemical testing lab (Certificate number 3031.01) and ISO 17034:2016 Reference Material Producer (Certificate number 3031.02) accredited by The American Association of Laboratory Accreditation (A2LA).

Expiration Information:

The stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. These tests include the effect of temperature and packaging on the product. This standard is guaranteed until the following date: 21-Jun-2025

Method of Preparation:

All weights are traceable through N. I. S. T. Test No. 822/264157-00. Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.

Glassware Calibration:

Only Class A glassware is used in the manufacture and quality control of Standards. All glassware is calibrated using NIST traceable weights.

Calculation of Uncertainty:

The following equations are used to calculate the value of the expanded uncertainty: $u=ku_c$: u=Expanded Uncertainty, k= the coverage factor at the 95% confidence level, k=2, u_c = the combined uncertainty $u_c = \sqrt{\sum u_i^2}$ where u_i are the individual uncertainty components for characterization, transportation, homogeneity, and shelf life.

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Weights and Balance Calibration:

Weights used perform daily checks on balances calibrated annually by the State of South Carolina Department of Agriculture Metrology Laboratory and are traceable to N.I.S.T. Balances are checked daily in accordance to in house procedure O2-LB-G-002. Balances are calibrated annually by an ISO/IEC 17025:2017 and ISO 17034:2016 accredited metrology service.

Hazardous Information:

Refer to MSDS

Manufactured By:

Shane Overcash
Team Leader, Semi-Volatiles

Certified By:

Elizabeth Ford
Quality Control Chemist III

Released By:

Susan Mathews
Quality Control Team Lead

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The producer of this reference material is registered to ISO 9001:2015 under 56 100 19560019 by TUV USA and accredited to ISO 17025:2017 and ISO 17034:2016 by A2LA with the certification numbers 3031.01 and 3031.02.

ISO Guide 34 Accredited
Reference Material Producer
Cert. No. 3031.02