

**Prep Standard - Chemical Standard Summary****Order ID :** N6070**Test :** VOCMS Group3**Prepbatch ID :****Sequence ID/Qc Batch ID:** vx121522,**Standard ID :**

VP113990,VP115359,VP115432,VP115433,VP116911,VP117244,VP117471,VP117542,VP117544,VP117545,

**Chemical ID :**

V10601,V11274,V11275,V12010,V12080,V12224,V12411,V12412,V12684,V12685,V12757,V12766,V12779,V12780,V12865,V12866,V12867,V12886,V12889,V13016,V13049,V13051,V13052,V13077,V13078,V13187,V13189,V13213,V13214,V13224,V13363,V13371,V13372,V13373,V13374,W2606,

**284, Sheffield Street, Mountainside NJ 07092 (908) 789 - 8900**

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
719	8260 Working STD (BCM)-First source, 400PPM	<a href="#">VP113990</a>	07/28/2022	01/28/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/29/2022
<b><u>FROM</u></b> 1.00000ml of V12757 + 1.00000ml of V12766 + 1.00000ml of V12865 + 1.00000ml of V12866 + 1.00000ml of V12867 + 20.00000ml of V13016 = Final Quantity: 25.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1810	8260 Working Std(2-CVE)-800ppm	<a href="#">VP115359</a>	09/14/2022	03/14/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 09/14/2022
<b><u>FROM</u></b> 1.00000ml of V11274 + 1.00000ml of V11275 + 1.00000ml of V12779 + 1.00000ml of V12780 + 46.00000ml of V13224 = Final Quantity: 50.000 ml								

# CHEMTECH

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## VOC STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
247	8260 Internal Standard, 250PPM	<a href="#">VP115432</a>	09/16/2022	01/15/2023	Semsettin Yesilyurt	None	None	Maresh Dadoda
09/19/2022								

**FROM** 0.25000ml of V12080 + 24.75000ml of V13224 = Final Quantity: 25.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
617	8260 Surrogate, 400PPM	<a href="#">VP115433</a>	09/16/2022	03/14/2023	Semsettin Yesilyurt	None	None	Maresh Dadoda
09/19/2022								

**FROM** 0.40000ml of V12010 + 24.60000ml of V13224 = Final Quantity: 25.000 ml

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## VOC STANDARD PREPARATION LOG

[illegible]

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
51	8260 Working STD (Acrolein) -first source, 800PPM	<a href="#">VP117244</a>	11/30/2022	12/28/2022	Semsettin Yesilyurt	None	None	Mahesh Dadoda  12/02/2022
<b><u>FROM</u></b> 0.40000ml of V13374 + 1.20000ml of V13371 + 1.20000ml of V13372 + 1.20000ml of V13373 + 21.00000ml of V13363 = Final Quantity: 25.000 ml								



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## VOC STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
218	BFB, 25PPM	<a href="#">VP117471</a>	12/12/2022	06/12/2023	Semsettin Yesilyurt	None	None	Krupa Patel
12/14/2022								

**FROM** 0.25000ml of V10601 + 24.75000ml of V13214 = Final Quantity: 25.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
589	BFB TUNE CHECK	<a href="#">VP117542</a>	12/15/2022	12/16/2022	John Carlone	None	None	Mahesh Dadoda
12/15/2022								

**FROM** 39.98400ml of W2606 + 0.01600ml of VP117471 = Final Quantity: 40.000 ml

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<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
620	50 PPB CCC, 8260-Water	<a href="#">VP117544</a>	12/15/2022	12/16/2022	John Carlone	None	None	Mahesh Dadoda 12/15/2022
<b><u>FROM</u></b>	39.94450ml of W2606 + 0.00500ml of VP113990 + 0.00500ml of VP115433 + 0.00800ml of VP115432 + 0.01250ml of VP115359 + 0.01250ml of VP116911 + 0.01250ml of VP117244 = Final Quantity: 40.000 ml							

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
620	50 PPB CCC, 8260-Water	<a href="#">VP117545</a>	12/15/2022	12/16/2022	John Carlone	None	None	Mahesh Dadoda 12/15/2022
<u>FROM</u>	39.94450ml of W2606 + 0.00500ml of VP113990 + 0.00500ml of VP115433 + 0.00800ml of VP115432 + 0.01250ml of VP115359 + 0.01250ml of VP116911 + 0.01250ml of VP117244 = Final Quantity: 40.000 ml							

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30067 / BFB tuneing solution	A0147670	12/12/2023	12/12/2022 / SAM	01/09/2020 / sam	V10601

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	082620	03/14/2023	09/14/2022 / SAM	09/18/2020 / sam	V11274

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	082620	03/14/2023	09/14/2022 / SAM	09/18/2020 / sam	V11275

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555582 / Custom Mixture, 8260 A/B Surrogate Mix [CS 5179-2]	A0173020	03/16/2023	09/16/2022 / SAM	06/04/2021 / SAM	V12010

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555581 / Custom Standard, 8260 Internal Std [CS 5179-1]	A0173600	01/15/2023	07/15/2022 / SAM	06/22/2021 / SAM	V12080

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30470 / VOA Stock Solution, tert-butanol std, 1mL, P&TM	A0168291	01/25/2023	07/25/2022 / SAM	10/15/2021 / SAM	V12224

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95319 / Revised Additions Mix (Min = 5)	031921	04/14/2023	10/14/2022 / SAM	11/30/2021 / SAM	V12411

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95319 / Revised Additions Mix (Min = 5)	031921	04/14/2023	10/14/2022 / SAM	11/30/2021 / SAM	V12412

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30042 / VOA Mix,500 series method 502.2 Calibration Std #1 gases, 2000uq/ml, PTM, 1ml	A0177872	04/14/2023	10/14/2022 / SAM	03/07/2022 / SAM	V12684

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30042 / VOA Mix,500 series method 502.2 Calibration Std #1 gases, 2000uq/ml, PTM, 1ml	A0177872	04/14/2023	10/14/2022 / SAM	03/07/2022 / SAM	V12685

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0176219	01/28/2023	07/28/2022 / SAM	03/25/2022 / SAM	V12757

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0176219	01/28/2023	07/28/2022 / SAM	03/25/2022 / SAM	V12766

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	121321	03/14/2023	09/14/2022 / SAM	03/30/2022 / SAM	V12779

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	121321	03/14/2023	09/14/2022 / SAM	03/30/2022 / SAM	V12780

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0183824	01/28/2023	07/28/2022 / SAM	04/22/2022 / SAM	V12865

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0183824	01/28/2023	07/28/2022 / SAM	04/22/2022 / SAM	V12866

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0183824	01/28/2023	07/28/2022 / SAM	04/22/2022 / SAM	V12867

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95317 / Universal VOA Mega Mix (Min order = 5)	042921	04/14/2023	10/14/2022 / SAM	04/26/2022 / SAM	V12886

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95317 / Universal VOA Mega Mix (Min order = 5)	042921	04/14/2023	10/14/2022 / SAM	04/26/2022 / SAM	V12889

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	0000288323	01/28/2023	07/28/2022 / SAM	07/11/2022 / SAM	V13016

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30006 / VOA Mix, CLP method Calibration Std #1 ketones 5000uq/ml, PTM, 1ml	A0179406	04/14/2023	10/14/2022 / SAM	08/12/2022 / SAM	V13049

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30006 / VOA Mix, CLP method Calibration Std #1 ketones 5000uq/ml, PTM, 1ml	A0179406	04/14/2023	10/14/2022 / SAM	08/12/2022 / SAM	V13051

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30006 / VOA Mix, CLP method Calibration Std #1 ketones 5000uq/ml, PTM, 1ml	A0179406	04/14/2023	10/14/2022 / SAM	08/12/2022 / SAM	V13052

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555408 / Custom Standard, Vinyl Acetate Standard w/ Grav [CS 5066-6] TWO SEPARATE	A0187424	04/14/2023	10/14/2022 / SAM	08/12/2022 / SAM	V13077

LOTS

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555408 / Custom Standard, Vinyl Acetate Standard w/ Grav [CS 5066-6] TWO SEPARATE	A0187424	04/14/2023	10/14/2022 / SAM	08/12/2022 / SAM	V13078

LOTS

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30489 / VOA Mix, 8260B Acetates Mix, P&TM, 1mL	A0186868	04/14/2023	10/14/2022 / SAM	09/01/2022 / SAM	V13187

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30489 / VOA Mix, 8260B Acetates Mix, P&TM, 1mL	A0186868	04/14/2023	10/14/2022 / SAM	09/01/2022 / SAM	V13189

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2362001	05/11/2023	11/11/2022 / pedro	09/13/2022 / SAM	V13213

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2362001	06/12/2023	12/12/2022 / SAM	09/13/2022 / SAM	V13214

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	0000288323	03/14/2023	09/14/2022 / SAM	09/13/2022 / SAM	V13224

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2862010	05/29/2023	11/29/2022 / SAM	11/28/2022 / SAM	V13363

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	91980 / Acrolin Std (Min = 5)	112822	12/28/2022	11/29/2022 / SAM	11/29/2022 / SAM	V13371

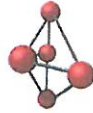
Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	91980 / Acrolin Std (Min = 5)	112822	12/28/2022	11/29/2022 / SAM	11/29/2022 / SAM	V13372

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	91980 / Acrolin Std (Min = 5)	112822	12/28/2022	11/29/2022 / SAM	11/29/2022 / SAM	V13373

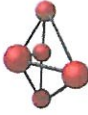
Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	91980 / Acrolin Std (Min = 5)	112822	12/28/2022	11/29/2022 / SAM	11/29/2022 / SAM	V13374

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	DIW / DI Water	Daily Lab-Certified	10/24/2024	10/24/2019 / apatel	10/24/2019 / apatel	W2606





## Certified Reference Material CRM



## CERTIFIED WEIGHT REPORT

## Part Number:

95318

## Lot Number:

082620

## Description:

2-Chloroethyl vinyl ether

Solvent(s): Lot#  
Methanol DX932-US

## Expiration Date:

082623

Refrigerate (4 °C)

## Nominal Concentration (µg/mL):

10000

## NIST Test ID#:

23060

Weight(s) shown below were combined and diluted to (mL):

30.0

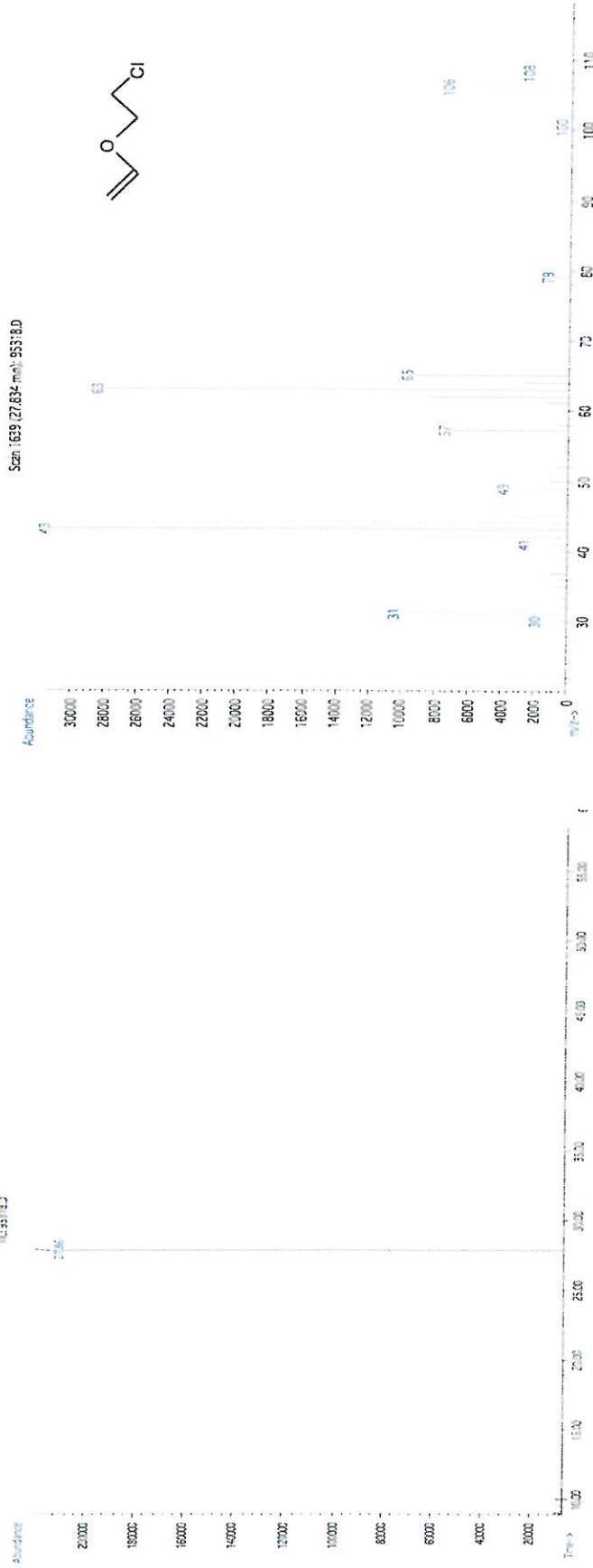
5E-05 Balance Uncertainty

0.002 Flask Uncertainty

Formulated By:	Benson Chan	DATE	082620
Reviewed By:	Pedro L. Rentas	DATE	082620

SDS Information												
Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight (g)	Actual Weight (g)	Actual Conc(µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	(Solvent Safety Info. On Attached pg.)		
										CAS#	OSHA PEL (TWA)	LD50
2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.30284	0.30289	10001.7	40.6	110-75-8	N/A	orl-rat 250mg/kg

Method: GC6MSD-1.M. Detector: MSD. Column: (60m X 0.25mm X 1.5 µm). Oven Profile: Temp 1 = 35°C (Time 1=10min.), Temp 2 = 200°C (Time 2=8.75 min.), Rate = 4°C/min., Injector B Temp = 200°C, Detector B Temp. = 220°C. Analyst: Candice Warren.



\* The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.  
 \* Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).  
 \* Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.  
 \* All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.  
 \* Uncertainty Reference: Taylor, B.N. and Kuyal, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).



**Safety Data Sheet (SDS)** GHS/OSHA Compliant




**Section I Product and Company Identification**

**IDENTITY** ANALYTICAL STANDARD DISSOLVED IN METHANOL

**Manufacturer's Name** ABSOLUTE STANDARDS INC  
**Address** 44 Rossetto Dr.  
Hamden CT, 06514  
**Emergency Telephone USA & CANADA** 1-800-535-5053  
**Emergency Telephone International** 1-352-323-3500  
**Date Prepared/Revised** May 1, 2015

**Section II - Hazards Identification**

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

H225 H370 P271 P302,332			
Highly Flammable Liquid and Vapor	Cause damage to organs	Use in ventilated area	If on skin, wash with soap and water
H301, 311, 331	H351	P280	P305,351,338
Toxic if swallowed, skin contact, inhaled	Suspected of causing cancer	Use gloves, eye protection/face shield	If in eyes, remove contacts, rinse with water

**Signal Word: DANGER**

**Components (Specific Chemical Identity; Common Name(s))** METHYL ALCOHOL  
**CAS#: 67-56-1**  
**% (optional)** > 97

**See Certified Weight Report For Other Analytes Present At Trace Quantities.**  
**INTENDED USE: REFERENCE MATERIAL**

**Section IV. FIRST AID MEASURES**

**General advice** Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.  
**If inhaled** If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
**In case of skin contact** Wash with soap and water. Consult a physician.  
**In case of eye contact** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
**If swallowed** Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

**Section V. FIREFIGHTING MEASURES**

**Flammability** Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.  
**Suitable extinguishing media** Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.  
**Protective equipment for fire** Wear self contained breathing apparatus for fire fighting if necessary.

**Section VI. ACCIDENTAL RELEASE MEASURES**

**Personal precautions** Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.  
**Environmental precautions** Prevent further leakage or spillage if safe to do so. Do not let product enter drains.  
**Clean up** Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

**Section VII. HANDLING AND STORAGE**

**Precautions for safe handling** Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.  
**Storage Conditions** Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

**Section VIII. EXPOSURE CONTROL/PERSONAL PROTECTION**

**Methanol** 67-56-1 TWA 200 ppm  
**Potential for skin absorption, ingestion and inhalation.** TWA 200 ppm  
**Personal protective equipment** Respiratory protection  
**Avoid contact with skin, eyes and clothing. Wash hands thoroughly after handling the product.**  
**Eye protection.**

**Section IX - Physical/Chemical Characteristics**

Boiling Point	65°C	Specific Gravity (H2O = 1)	0.79
Vapor Pressure (mm Hg)	96	Melting Point	-98°C
Vapor Density (AIR = 1)	1.11	Evaporation rate (Butyl Acetate = 1)	4.6
Solubility in Water	COMPLETE		
Appearance and Odor	CLEAR, COLORLESS LIQUID WITH CHARACTERISTIC PUNGENT ODOR.		

#### Section X. STABILITY AND REACTIVITY

Chemical stability  
Stable under recommended storage conditions.  
Possibility of hazardous reactions  
Vapours may form explosive mixture with air.  
Heat, flames, sparks, extreme temperature and sunlight.  
Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids  
Hazardous decomposition products formed under fire conditions. - Carbon oxides

#### Section XI. TOXICOLOGICAL INFORMATION

LD50 Oral - rat - 5,628 mg/kg  
LC50 Inhalation - rat - 4 h - 6400 ppm  
LD50 Dermal - rabbit - 15,800 mg/kg  
Toxic if absorbed through skin. Causes skin irritation.  
Eye damage/eye irritation  
Toxic if inhaled. Causes respiratory tract irritation.  
Toxic if swallowed.

#### Section XII. ECOLOGICAL INFORMATION FOR REPORTABLE QUANTITY OF 5000 lbs.

LC50 15,400 mg/l - 96 h  
EC50 24,500.00 mg/l - 48 h  
EC100 10,000.00 mg/l - 24 h

#### Section XIII. DISPOSAL CONSIDERATIONS

Dispose with normal Laboratory Solvent Waste.

#### Section XIV. TRANSPORT INFORMATION

DOT (US)  
UN number: 1230 Class: 3 Packing group: II  
Proper shipping name: Methanol  
IATA  
UN number: 1230 Class: 3 Packing group: II  
Proper shipping name: Methanol

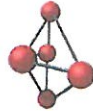
#### Section XV. REGULATORY INFORMATION

OSHA Hazards  
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

#### Section XVI. Misc. INFORMATION

The information in this Material Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and Global Harmonized System (GHS). This document is intended only as a guide to the appropriate precautionary handling of the material by trained personnel, or supervised by a person trained in chemical handling. The user is responsible for determining the precautions and dangers of this chemical for his or her particular application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, ABSOLUTE STANDARDS INC. cannot warn of all the potential dangers of use or interaction with other chemicals or substances. ABSOLUTE STANDARDS INC. warrants that the chemical meets the specifications set forth on the label. ABSOLUTE STANDARDS INC. DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR APPLICATION. The user should recognize that this product can cause severe injury or death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION. As new documented general safety information becomes available, Absolute Standards Inc. will periodically revise this Safety Data Sheet. If you have any questions, please call Technical Service at 1-203-281-2917 for assistance.





## Certified Reference Material CRM



## CERTIFIED WEIGHT REPORT

## Part Number:

95318

## Lot Number:

082620

## Description:

2-Chloroethyl vinyl ether

Solvent(s): Lot#  
Methanol DX932-US

## Expiration Date:

082623

Refrigerate (4 °C)

## Nominal Concentration (µg/mL):

10000

## NIST Test ID#:

23060

Weight(s) shown below were combined and diluted to (mL):

30.0

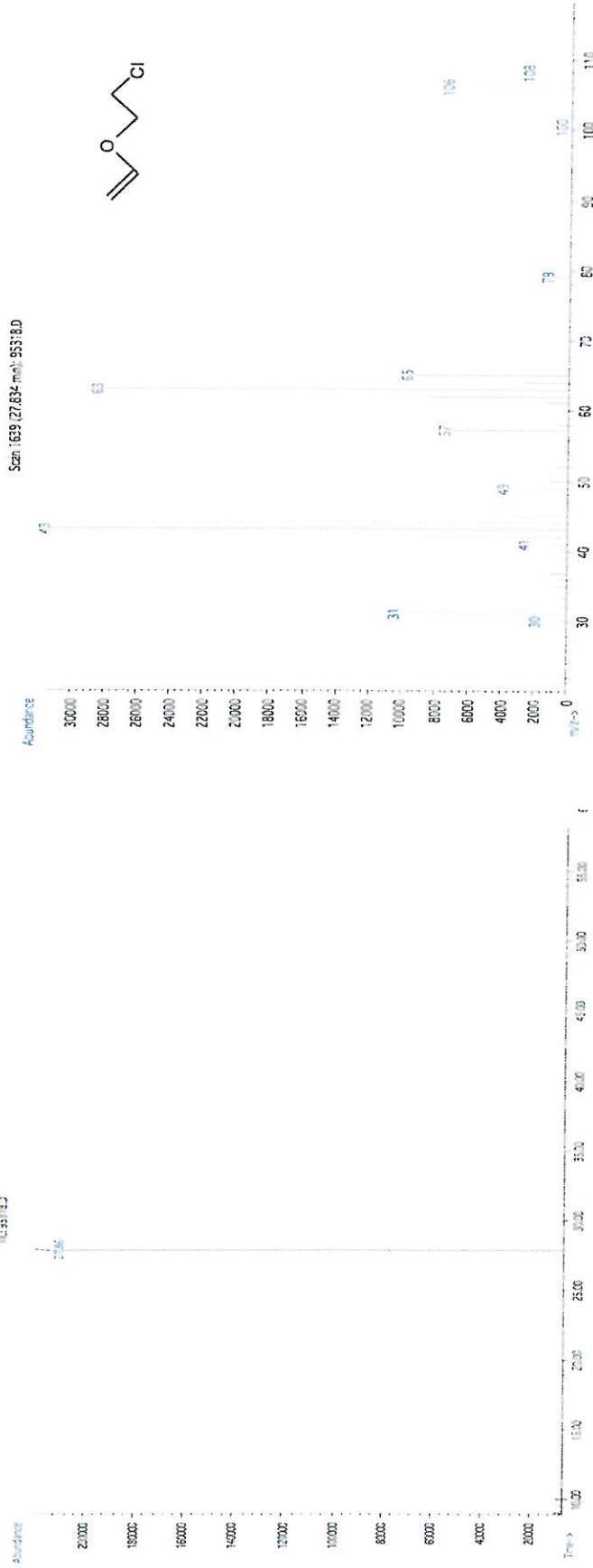
5E-05 Balance Uncertainty

0.002 Flask Uncertainty

Formulated By:	Benson Chan	DATE	082620
Reviewed By:	Pedro L. Rentas	DATE	082620

SDS Information												
Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight (g)	Actual Weight (g)	Actual Conc(µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	(Solvent Safety Info. On Attached pg.)		
										CAS#	OSHA PEL (TWA)	LD50
2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.30284	0.30289	10001.7	40.6	110-75-8	N/A	or-rat 250mg/kg

Method: GC6MSD-1.M. Detector: MSD. Column: (60m X 0.25mm X 1.5 µm). Oven Profile: Temp 1 = 35°C (Time 1=10min.), Temp 2 = 200°C (Time 2=8.75 min.), Rate = 4°C/min., Injector B Temp = 200°C, Detector B Temp. = 220°C. Analyst: Candice Warren.



- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).



## Safety Data Sheet (SDS) GHS/OSHA Compliant




## Section I Product and Company Identification

## IDENTITY ANALYTICAL STANDARD DISSOLVED IN METHANOL

Manufacturer's Name	ABSOLUTE STANDARDS INC	Emergency Telephone USA & CANADA	1-800-535-5053
Address	44 Rossetto Dr. Hamden CT, 06514	Emergency Telephone International	1-352-323-3500
		Date Prepared/Revised	May 1, 2015

## Section II - Hazards Identification

## GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

H225 H370 P271 P302,332	Highly Flammable Liquid and Vapor Cause damage to organs Use in ventilated area If on skin, wash with soap and water	  
H301, 311, 331 H351 P280 P305,351,338	Toxic if swallowed, skin contact, inhaled Suspected of causing cancer Use gloves, eye protection/face shield If in eyes, remove contacts, rinse with water	

## Section III - Composition

Components (Specific Chemical Identity; Common Name(s))	METHYL ALCOHOL
CAS#: 67-56-1	
% (optional)	> 97

See Certified Weight Report For Other Analytes Present At Trace Quantities.  
INTENDED USE: REFERENCE MATERIAL

## Section IV. FIRST AID MEASURES

**General advice**  
If inhaled: Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.  
If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
In case of skin contact: Wash with soap and water. Consult a physician.  
In case of eye contact: Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
If swallowed: Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

## Section V. FIREFIGHTING MEASURES

**Flammability**  
Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.  
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.  
Wear self contained breathing apparatus for fire fighting if necessary.

## Section VI. ACCIDENTAL RELEASE MEASURES

**Personal precautions**  
Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.  
**Environmental precautions**  
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.  
**Clean up**  
Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

## Section VII. HANDLING AND STORAGE

**Precautions for safe handling**  
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.  
Use ventilation. Keep away from sources of ignition. No smoking. Prevent the build up of electrostatic charge.  
**Storage Conditions**  
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

## Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Methanol**  
67-56-1 TWA 200 ppm  
Potential for skin absorption, ingestion and inhalation.  
Personal protective equipment: Respiratory protection. Handle with gloves. Gloves must be inspected prior to use. Eye protection.  
Avoid contact with skin, eyes and clothing. Wash hands thoroughly after handling the product.

## Section IX - Physical/Chemical Characteristics

Boiling Point	65°C	Specific Gravity (H2O = 1)	0.79
Vapor Pressure (mm Hg)	96	Melting Point	-98°C
Vapor Density (AIR = 1)	1.11	Evaporation rate (Butyl Acetate = 1)	4.6
Solubility in Water	COMPLETE		
Appearance and Odor	CLEAR, COLORLESS LIQUID WITH CHARACTERISTIC PUNGENT ODOR.		

#### Section X. STABILITY AND REACTIVITY

Chemical stability  
Stable under recommended storage conditions.  
Possibility of hazardous reactions  
Vapours may form explosive mixture with air.  
Heat, flames, sparks, extreme temperature and sunlight.  
Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids  
Hazardous decomposition products formed under fire conditions. - Carbon oxides

#### Section XI. TOXICOLOGICAL INFORMATION

LD50 Oral - rat - 5,628 mg/kg  
LC50 Inhalation - rat - 4 h - 6400 ppm  
LD50 Dermal - rabbit - 15,800 mg/kg  
Toxic if absorbed through skin. Causes skin irritation.  
Eye damage/eye irritation  
Toxic if inhaled. Causes respiratory tract irritation.  
Toxic if swallowed.

#### Section XII. ECOLOGICAL INFORMATION FOR REPORTABLE QUANTITY OF 5000 lbs.

LC50 15,400 mg/l - 96 h  
EC50 24,500.00 mg/l - 48 h  
EC100 10,000.00 mg/l - 24 h

#### Section XIII. DISPOSAL CONSIDERATIONS

Dispose with normal Laboratory Solvent Waste.

#### Section XIV. TRANSPORT INFORMATION

DOT (US)  
UN number: 1230 Class: 3 Packing group: II  
Proper shipping name: Methanol  
IATA  
UN number: 1230 Class: 3 Packing group: II  
Proper shipping name: Methanol

#### Section XV. REGULATORY INFORMATION

OSHA Hazards  
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

#### Section XVI. Misc. INFORMATION

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**CERTIFIED WEIGHT REPORT**

**Part Number:** 95318  
**Lot Number:** 121321  
**Description:** 2-Chloroethyl vinyl ether

**Solvent(s):** Methanol  
**Lot#** EA899-US

**Expiration Date:** 121324  
**Recommended Storage:** Refrigerate (4 °C)  
**Nominal Concentration (µg/mL):** 10000  
**NIST Test ID#:** 6UTB  
**Weight(s) shown below were combined and diluted to (mL):** 30.0  
**5E-05 Balance Uncertainty**  
**0.0003 Flask Uncertainty**

Formulated By:	Benson Chan	121321
Reviewed By:	Pedro L. Rentes	121321
DATE		

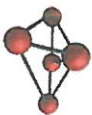
Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight (g)	Actual Weight (g)	Actual Conc (µg/mL)	Expanded Uncertainty (µg/mL)	(Solvent Safety Info. On Attached pg.)	CAS#	OSHA PEL (TWA)	LD50
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1. 2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.30320	0.30411	10030.2	40.7	110-75-8	N/A		or rat 250mg/kg
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**Method:** GC/MSD-1.M. **Detector:** MSD. **Column:** (60m X 0.25mm X 1.5 µm). **Oven Profile:** Temp 1 = 35°C (Time 1=10min.), Temp 2 = 200°C (Time 2=8.75 min.), Rate = 4°C/min.,  
**Injector B Temp= 200°C, Detector B Temp. = 220°C. Analyst:** Candice Warren.



- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N., and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).



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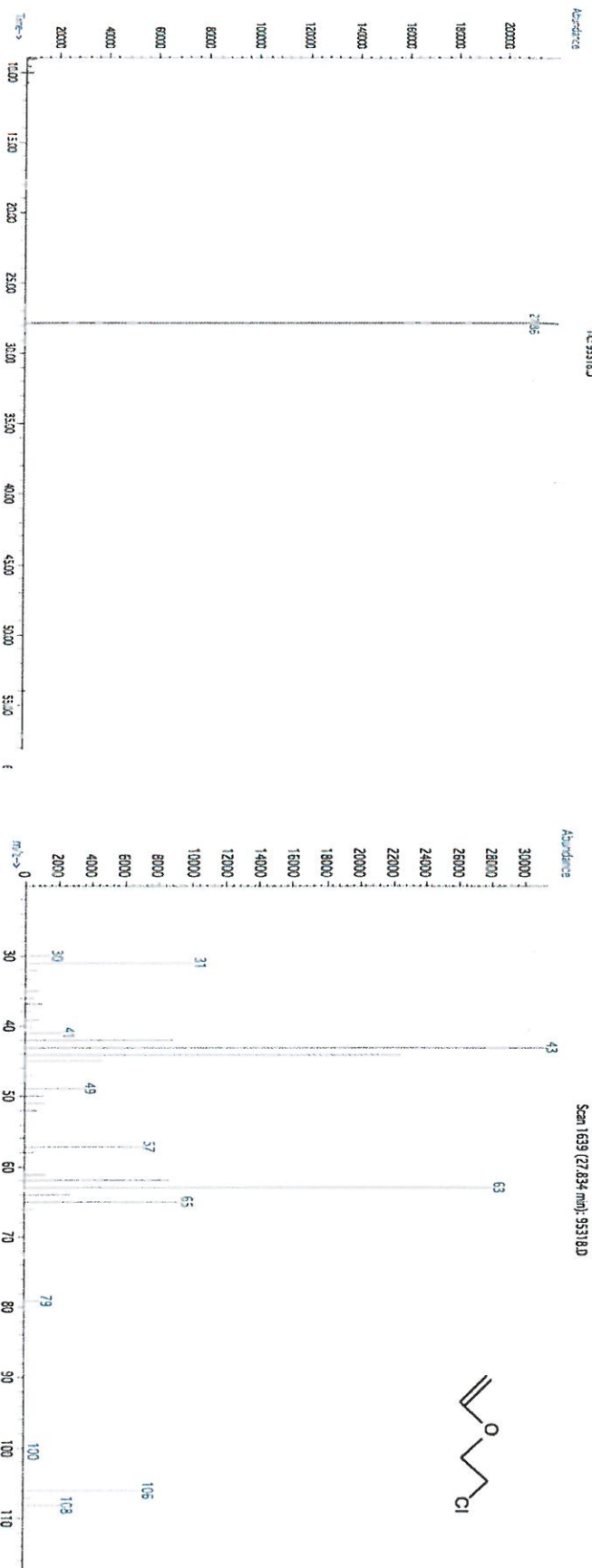
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**Nominal Concentration (µg/mL):** 10000  
**NIST Test ID#:** 6UTB  
**Weight(s) shown below were combined and diluted to (mL):** 30.0  
**5E-05 Balance Uncertainty**  
**0.0003 Flask Uncertainty**

Formulated By:	Benson Chan	121321
Reviewed By:	Pedro L. Rentes	121321
		DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight (g)	Actual Weight (g)	Actual Conc (µg/mL)	Expanded Uncertainty (µg/mL)	(Solvent Safety Info. On Attached pg.)	CAS#	OSHA PEL (TWA)	LD50
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1. 2-Chloroethyl vinyl ether 74 MKCD0033 10000 99 0.2 0.30320 0.30411 10030.2 40.7 110-75-8 N/A or rat 250mg/kg

**Method:** GC/MSD-1.M. **Detector:** MSD. **Column:** (60m X 0.25mm X 1.5 µm). **Oven Profile:** Temp 1 = 35°C (Time 1=10min.), Temp 2 = 200°C (Time 2=8.75 min.), Rate = 4°C/min., **Injector B Temp**=200°C, **Detector B Temp**=220°C. **Analyst:** Candice Warren.



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- Uncertainty Reference: Taylor, B.N., and Kuyal, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).





110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

# CERTIFIED REFERENCE MATERIAL

## Gravimetric Certificate



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

Catalog No. : 555582 Lot No.: A0173020

Description : Custom 8260A/B Surrogate Mix

Custom 8260A/B Surrogate Mix 25,000µg/mL, P&T Methanol, 1mL/ampul

Container Size : 2 mL Pkg Amt: > 1 mL


Expiration Date : June 30, 2024 Storage: 10°C or colder

Ship: Ambient

### CERTIFIED VALUES

Component #	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	1,2-Dichloroethane-d4 CAS # 17060-07-0 (Lot PR-29377) Purity 99%	25,060.0 µg/mL	+/-	231.9100	µg/mL	Gravimetric
			+/-	1,416.6261	µg/mL	Unstressed
			+/-	1,449.2417	µg/mL	Stressed
2	1-Bromo-4-fluorobenzene (BFB) CAS # 460-00-4 (Lot 20401KO) Purity 99%	25,188.0 µg/mL	+/-	233.0945	µg/mL	Gravimetric
			+/-	1,423.8618	µg/mL	Unstressed
			+/-	1,456.6441	µg/mL	Stressed
3	Dibromofluoromethane CAS # 1868-53-7 (Lot 012021) Purity 99%	25,212.0 µg/mL	+/-	233.3166	µg/mL	Gravimetric
			+/-	1,425.2185	µg/mL	Unstressed
			+/-	1,458.0320	µg/mL	Stressed
4	Toluene-d8 CAS # 2037-26-5 (Lot PR-31750) Purity 99%	25,104.0 µg/mL	+/-	232.3171	µg/mL	Gravimetric
			+/-	1,419.1134	µg/mL	Unstressed
			+/-	1,451.7863	µg/mL	Stressed

Solvent: P&T Methanol  
CAS # 67-56-1  
Purity 99%

  
Lane Kibe - Mix Technician

Date Mixed: 03-Jun-2021

Balance: B251644995

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397



## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

$k$  is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.





## Safety Data Sheet

Revision Date: 05/24/21

www.restek.com

2 Letter ISO country code/language code: US/EN

### 1. IDENTIFICATION

**Catalog Number / Product Name:** 555582 / Custom 8260A/B Surrogate Mix  
**Company:** Restek Corporation  
**Address:** 110 Benner Circle  
Bellefonte, Pa. 16823  
**Phone#:** 814-353-1300  
**Fax#:** 814-353-1309  
**Emergency#:** 800-424-9300 (CHEMTREC)  
703-527-3887 (Outside the US)  
**Email:** www.restek.com  
**Revision Number:** 7  
**Intended use:** For Laboratory use only

### 2. HAZARD(S) IDENTIFICATION

#### Emergency Overview:

GHS Hazard  
Symbols:



**GHS Classification:** Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 1  
Flammable Liquid Category 2  
Acute Toxicity - Dermal Category 3  
Acute Toxicity - Oral Category 3

**GHS Signal Word:** Danger

**GHS Hazard:** Highly flammable liquid and vapour.  
Toxic if swallowed or in contact with skin.  
Causes damage to organs.

**GHS Precautions:**

**Safety Precautions:** Keep away from heat/sparks/open flames/hot surfaces. – No smoking.  
Keep container tightly closed.  
Ground/bond container and receiving equipment.  
Use explosion-proof electrical/ventilation and lighting equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Do not breathe dust/fume/gas/mist/vapours/spray.  
Wash hands and skin thoroughly after handling.  
Do not eat, drink or smoke when using this product.  
Wear protective gloves/protective clothing/eye protection/face protection.

**First Aid Measures:** IF SWALLOWED: Immediately call a POISON CENTER/doctor/....  
IF ON SKIN: Wash with plenty of soap and water.  
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
IF exposed: Call a POISON CENTER or doctor/physician.  
Call a POISON CENTER or doctor/physician if you feel unwell.  
Specific treatment see section 4.  
Rinse mouth.  
Take off immediately all contaminated clothing and wash it before reuse.  
In case of fire: Use extinguishing media in section 5 for extinction.



**Storage:** Keep container tightly closed.  
Store in a well-ventilated place. Keep cool.  
Store locked up.

**Disposal:** Dispose of contents/container according to section 13 of the SDS.

**Single Exposure Target Organs:** Specific target organ toxicity - Single exposure - STOT SE 1: H370 Causes damage to organs. (C ≥ 10 %; No information to prove exclusion of certain routes of exposure); Specific target organ toxicity - Single exposure - STOT SE 2: H371 May cause damage to organs. (3 % ≤ C < 10 %; Concentration limits for acute toxicity cannot be translated into GHS from the DSD especially when minimum classifications are given)

**Repeated Exposure Target Organs:** No data available

### 3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
P&T Methanol	67-56-1	200-659-6	90
1-Bromo-4-fluorobenzene (BFB)	460-00-4	207-300-2	2.5
1,2-dichloroethane-d4	17060-07-0		2.5
dibromofluoromethane	1868-53-7		2.5
toluene-d8	2037-26-5	218-009-5	2.5

### 4. FIRST-AID MEASURES

**Inhalation:** Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not breathing, give artificial respiration and have a trained individual administer oxygen. Get medical attention immediately

**Eyes:** Flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention.

**Skin Contact:** Wash with soap and water. Remove contaminated clothing and launder. Get medical attention if irritation develops or persists.

**Ingestion:** Do not induce vomiting and seek medical attention immediately. Drink two glasses of water or milk to dilute. Provide medical care provider with this SDS.

### 5. FIRE- FIGHTING MEASURES

**Extinguishing Media:** Use alcohol resistant foam, carbon dioxide, or dry chemical extinguishing agents. Water may be ineffective but water spray can be used to extinguish a fire if swept across the base of the flames. Water can absorb heat and keep exposed material from being damaged by fire.

**Fire and/or Explosion Hazards:** Vapors may be ignited by heat, sparks, flames or other sources of ignition at or above the low flash point giving rise to a fire (Class B). Vapors are heavier than air and may travel to a source of ignition and flash back.

**Fire Fighting Methods and Protection:** Do not enter fire area without proper protection including self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location due to the potential of hazardous vapors and decomposition products. Flammable component(s) of this material may be lighter than water and burn while floating on the surface.

**Hazardous Combustion Products:** Carbon dioxide, Carbon monoxide

### 6. ACCIDENTAL RELEASE MEASURES

**Personal Precautions and Equipment:** Exposure to the spilled material may be severely irritating or toxic. Follow personal protective equipment recommendations found in Section 8 of this SDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred, and the expertise of employees in the area responding to the spill. Never exceed any occupational exposure limits.

**Methods for Clean-up:** Prevent the spread of any spill to minimize harm to human health and the

environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal evaluation.

## 7. HANDLING AND STORAGE

<b>Handling Technical Measures and Precautions:</b>	Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Use spark-proof tools and explosion-proof equipment
<b>Storage Technical Measures and Conditions:</b>	Store in a cool dry ventilated location. Isolate from incompatible materials and conditions. Keep container(s) closed. Keep away from sources of ignition

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States: Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
P&T Methanol	67-56-1	6000 ppm IDLH	250 ppm STEL	200 ppm TWA	200 ppm TWA; 260 mg/m3 TWA
1-Bromo-4-fluorobenzene (BFB)	460-00-4	Not established	None Known	Not established	No data available
1,2-dichloroethane-d4	17060-07-0	Not established	None Known	Not established	No data available
dibromofluoromethane	1868-53-7	Not established	None Known	Not established	No data available
toluene-d8	2037-26-5	Not established	None Known	Not established	No data available

### Personal Protection:

#### Engineering Measures:

Local exhaust ventilation is recommended when generating excessive levels of vapours from handling or thermal processing.

#### Respiratory Protection:

Respiratory protection may be required to avoid overexposure when handling this product. General or local exhaust ventilation is the preferred means of protection. Use a respirator if general room ventilation is not available or sufficient to eliminate symptoms. If an exposure limit is exceeded or if an operator is experiencing symptoms of inhalation overexposure as explained in Section 3, provide respiratory protection.

#### Eye Protection:

Wear chemically resistant safety glasses with side shields when handling this product. Do not wear contact lenses.

#### Skin Protection:

Wear protective gloves. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance, color:</b>	No data available
<b>Odor:</b>	Mild
<b>Physical State:</b>	No data available
<b>pH:</b>	Not applicable
<b>Vapor Pressure:</b>	No data available
<b>Vapor Density:</b>	1.1 (air = 1)
<b>Boiling Point (°C):</b>	151.5 °C Boiling Point (at 1013.25 hPa) 64.7 °C at 760 mmHg (HSDB)
<b>Melting Point (°C):</b>	-98 °C
<b>Flash Point (°F):</b>	50
<b>Flammability:</b>	Highly Flammable
<b>Upper Flammable/Explosive Limit, % in air:</b>	36
<b>Lower Flammable/Explosive Limit, % in air:</b>	6
<b>Autoignition Temperature (°C):</b>	464 deg C
<b>Decomposition Temperature (°C):</b>	No data available
<b>Specific Gravity:</b>	0.791 - 0.792 g/cm3 at 20 °C
<b>Evaporation Rate:</b>	No data available
<b>Odor Threshold:</b>	No data available
<b>Solubility:</b>	Moderate; 50-99%

Partition Coefficient: n-octanol in water: No data available  
VOC % by weight: 90  
Molecular Weight: 32.04

## 10. STABILITY AND REACTIVITY

Stability: Stable under normal conditions.  
Conditions to Avoid: None known.  
Materials to Avoid / Chemical Incompatibility: Strong oxidizing agents  
Hazardous Decomposition Products: Carbon dioxide Carbon monoxide

## 11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, Skin Contact, Eye Contact, Ingestion  
Target Organs Potentially Affected By Exposure: Eyes, Central nervous system stimulation, Skin, GI Tract, Respiratory Tract  
Chemical Interactions That Change Toxicity: None Known

### Immediate (Acute) Health Effects by Route of Exposure:

Inhalation Irritation: Can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache.  
Inhalation Toxicity: Harmful! Can cause systemic damage (see "Target Organs")Methanol can cause central nervous system depression and overexposure can cause damage to the optic nerve resulting in visual impairment or blindness.  
Skin Contact: Can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage.  
Eye Contact: Can cause moderate irritation, tearing and reddening, but not likely to permanently injure eye tissue.  
Ingestion Irritation: Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.Highly toxic and may be fatal if swallowed.  
Ingestion Toxicity: Toxic if swallowed. May cause target organ failure and/or death.May be fatal if swallowed.

### Long-Term (Chronic) Health Effects:

Carcinogenicity: No data.  
Reproductive and Developmental Toxicity: No data available to indicate product or any components present at greater than 0.1% may cause birth defects.  
Inhalation: Upon prolonged and/or repeated exposure, can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache.Harmful! Can cause systemic damage upon prolonged and/or repeated exposure (see "Target Organs")  
Skin Contact: Upon prolonged or repeated contact, can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage.  
Ingestion: Toxic if swallowed. May cause target organ failure and/or death.

### Component Toxicological Data:

#### NIOSH:

Chemical Name	CAS No.	LD50/LC50
Benzene, 1-bromo-4-fluoro-	460-00-4	Inhalation LC50 Rat 18 g/m3 4 h; Oral LD50 Rat 2700 mg/kg
Methanol	67-56-1	Inhalation LC50 Rat 22500 ppm 8 h

### Component Carcinogenic Data:

#### OSHA:

Chemical Name	CAS No.
No data available	

#### ACGIH:

Chemical Name	CAS No.
No data available	

#### NIOSH:

Chemical Name	CAS No.
No data available	

**NTP:**

Chemical Name  
No data available

CAS No.

**IARC:**

Chemical Name

CAS No.

Group No.

**12. ECOLOGICAL INFORMATION****Overview:**

Moderate ecological hazard. This product may be dangerous to plants and/or wildlife.

**Mobility:**

No data

**Persistence:**

No data

**Bioaccumulation:**

No data

**Degradability:**

Biodegrades slowly.

**Ecological Toxicity Data:**

No data available

**13. DISPOSAL CONSIDERATIONS****Waste Description of Spent Product:**

Spent or discarded material is a hazardous waste. Mixing spent or discarded material with other materials may render the mixture hazardous. Perform a hazardous waste determination on mixtures.

**Disposal Methods:**

Dispose of by incineration following Federal, State, Local, or Provincial regulations.

**Waste Disposal of Packaging:**

Comply with all Local, State, Federal, and Provincial Environmental Regulations.

**14. TRANSPORTATION INFORMATION****United States:****DOT Proper Shipping Name:**

Flammable liquids, n.o.s. (Methanol)

**UN Number:**

UN1993

**Hazard Class:**

3

**Packing Group:**

II

**International:****IATA Proper Shipping Name:**

Flammable liquids, n.o.s. (Methanol)

**UN Number:**

UN1993

**Hazard Class:**

3

**Packing Group:**

II

Marine Pollutant: No

Chemical Name	CAS#	Marine Pollutant	Severe Marine Pollutant
No data available			

**15. REGULATORY INFORMATION****United States:**

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
P&T Methanol	67-56-1	X	X	-	X
1-Bromo-4-fluorobenzene (BFB)	460-00-4	-	-	-	X
1,2-dichloroethane-d4	17060-07-0	-	-	-	-
dibromofluoromethane	1868-53-7	-	-	-	-
toluene-d8	2037-26-5	-	-	-	-

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Methanol	67-56-1	Prop 65 Develop Tox

**State Right To Know Listing:**

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
---------------	------	------------	---------------	--------------	------------

P&T Methanol	67-56-1	X	X	X	X
1-Bromo-4-fluorobenzene (BFB)	460-00-4	-	-	-	-
1,2-dichloroethane-d4	17060-07-0	-	-	-	-
dibromofluoromethane	1868-53-7	-	-	-	-
toluene-d8	2037-26-5	-	-	-	-

## 16. OTHER INFORMATION

**Prior Version Date:** 07/20/18

**Other Information:** Any changes to the SDS compared to previous versions are marked by a vertical line in front of the concerned paragraph.

**References:** No data available

**Disclaimer:** Restek Corporation provides the descriptions, data and information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. It is provided for your guidance only. Because many factors may affect processing or application/use, Restek Corporation recommends you perform an assessment to determine the suitability of a product for your particular purpose prior to use. No warranties of any kind, either expressed or implied, including fitness for a particular purpose, are made regarding products described, data or information set forth. In no case shall the descriptions, information, or data provided be considered a part of our terms and conditions of sale. Further, the descriptions, data and information furnished hereunder are given gratis. No obligation or liability for the description, data and information given are assumed. All such being given and accepted at your risk.



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www.restek.com

# CERTIFIED REFERENCE MATERIAL

## Gravimetric Certificate



ISO 17034 Accredited  
Reference Material Producer  
Certificate #3222.01



ISO/IEC 17025 Accredited  
Testing Laboratory  
Certificate #3222.02

### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

Catalog No. : 555581 Lot No.: A0173600

Description : Custom 8260 Internal Standard Mix

Custom 8260 Internal Standard Mix 25,000µg/mL, P&T Methanol, 1mL/ampul

Container Size : 2 mL Pkg Amt: > 1 mL

Expiration Date : June 30, 2024 Storage: 10°C or colder

Ship: Ambient

### CERTIFIED VALUES

Component #	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	1,4-Dichlorobenzene-d4 CAS # 3855-82-1 Purity 99% (Lot PR-30447)	25,040.0 µg/mL	+/-	231.7249	µg/mL	Gravimetric
			+/-	1,415.4955	µg/mL	Unstressed
			+/-	1,448.0851	µg/mL	Stressed
2	1,4-Difluorobenzene CAS # 540-36-3 Purity 99% (Lot MKBN8571 V)	25,216.0 µg/mL	+/-	233.3536	µg/mL	Gravimetric
			+/-	1,425.4447	µg/mL	Unstressed
			+/-	1,458.2633	µg/mL	Stressed
3	Chlorobenzene-d5 CAS # 3114-55-4 Purity 99% (Lot PR-29571)	25,120.0 µg/mL	+/-	232.4652	µg/mL	Gravimetric
			+/-	1,420.0178	µg/mL	Unstressed
			+/-	1,452.7116	µg/mL	Stressed
4	Pentafluorobenzene CAS # 363-72-4 Purity 99% (Lot MKCK2250)	25,092.0 µg/mL	+/-	232.2061	µg/mL	Gravimetric
			+/-	1,418.4350	µg/mL	Unstressed
			+/-	1,451.0923	µg/mL	Stressed

Solvent: P&T Methanol  
CAS # 67-56-1  
Purity 99%

  
Walker Workman - Operations Technician I

Date Mixed: 18-Jun-2021      Balance: 1128360905

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

$k$  is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.







## Safety Data Sheet

Revision Date: 05/24/21

www.restek.com

2 Letter ISO country code/language code: US/EN

### 1. IDENTIFICATION

Catalog Number / Product Name:	555581 / Custom 8260 Internal Standard Mix
Company:	Restek Corporation
Address:	110 Benner Circle Bellefonte, Pa. 16823
Phone#:	814-353-1300
Fax#:	814-353-1309
Emergency#:	800-424-9300 (CHEMTREC) 703-527-3887 (Outside the US)
Email:	www.restek.com
Revision Number:	8
Intended use:	For Laboratory use only

### 2. HAZARD(S) IDENTIFICATION

#### Emergency Overview:

GHS Hazard  
Symbols:



**GHS Classification:** Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 1  
Flammable Liquid Category 2  
Acute Toxicity - Dermal Category 3  
Acute Toxicity - Oral Category 3

**GHS Signal Word:** Danger

**GHS Hazard:** Highly flammable liquid and vapour.  
Toxic if swallowed or in contact with skin.  
Causes damage to organs.

#### GHS Precautions:

**Safety Precautions:** Keep away from heat/sparks/open flames/hot surfaces. – No smoking.  
Keep container tightly closed.  
Ground/bond container and receiving equipment.  
Use explosion-proof electrical/ventilation and lighting equipment.  
Use only non-sparking tools.  
Take precautionary measures against static discharge.  
Do not breathe dust/fume/gas/mist/vapours/spray.  
Wash hands and skin thoroughly after handling.  
Do not eat, drink or smoke when using this product.  
Wear protective gloves/protective clothing/eye protection/face protection.

**First Aid Measures:** IF SWALLOWED: Immediately call a POISON CENTER/doctor/....  
IF ON SKIN: Wash with plenty of soap and water.  
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
IF exposed: Call a POISON CENTER or doctor/physician.  
Call a POISON CENTER or doctor/physician if you feel unwell.  
Specific treatment see section 4.  
Rinse mouth.  
Take off immediately all contaminated clothing and wash it before reuse.  
In case of fire: Use extinguishing media in section 5 for extinction.

<b>Storage:</b>	Keep container tightly closed. Store in a well-ventilated place. Keep cool. Store locked up.
<b>Disposal:</b>	Dispose of contents/container according to section 13 of the SDS.
<b>Single Exposure Target Organs:</b>	Specific target organ toxicity - Single exposure - STOT SE 1: H370 Causes damage to organs. (C $\geq$ 10 %; No information to prove exclusion of certain routes of exposure); Specific target organ toxicity - Single exposure - STOT SE 2: H371 May cause damage to organs. (3 % $\leq$ C < 10 %; Concentration limits for acute toxicity cannot be translated into GHS from the DSD especially when minimum classifications are given)
<b>Repeated Exposure Target Organs:</b>	No data available

### 3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
P&T Methanol	67-56-1	200-659-6	90
1,4-difluorobenzene	540-36-3	208-742-9	2.5
pentafluorobenzene	363-72-4	206-658-7	2.5
1,4-dichlorobenzene-d4	3855-82-1		2.5
chlorobenzene-d5	3114-55-4	221-482-0	2.5

### 4. FIRST-AID MEASURES

<b>Inhalation:</b>	Remove to fresh air. If breathing is difficult, have a trained individual administer oxygen. If not breathing, give artificial respiration and have a trained individual administer oxygen. Get medical attention immediately
<b>Eyes:</b>	Flush eyes with plenty of water for at least 20 minutes retracting eyelids often. Tilt the head to prevent chemical from transferring to the uncontaminated eye. Get immediate medical attention.
<b>Skin Contact:</b>	Wash with soap and water. Remove contaminated clothing and launder. Get medical attention if irritation develops or persists.
<b>Ingestion:</b>	Do not induce vomiting and seek medical attention immediately. Drink two glasses of water or milk to dilute. Provide medical care provider with this SDS.

### 5. FIRE- FIGHTING MEASURES

<b>Extinguishing Media:</b>	Use alcohol resistant foam, carbon dioxide, or dry chemical extinguishing agents. Water may be ineffective but water spray can be used to extinguish a fire if swept across the base of the flames. Water can absorb heat and keep exposed material from being damaged by fire. Use alcohol resistant foam, carbon dioxide, dry chemical, or water spray when fighting fires. Water or foam may cause frothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the fire. Do not direct a water stream directly into the hot burning liquid.
<b>Fire and/or Explosion Hazards:</b>	Vapors may be ignited by heat, sparks, flames or other sources of ignition at or above the low flash point giving rise to a fire (Class B). Vapors are heavier than air and may travel to a source of ignition and flash back.
<b>Fire Fighting Methods and Protection:</b>	Do not enter fire area without proper protection including self-contained breathing apparatus and full protective equipment. Fight fire from a safe distance and a protected location due to the potential of hazardous vapors and decomposition products. Flammable component(s) of this material may be lighter than water and burn while floating on the surface.
<b>Hazardous Combustion Products:</b>	Carbon dioxide, Carbon monoxide

### 6. ACCIDENTAL RELEASE MEASURES

<b>Personal Precautions and Equipment:</b>	Exposure to the spilled material may be severely irritating or toxic. Follow personal protective equipment recommendations found in Section 8 of this SDS. Personal protective equipment needs must be evaluated based on information provided on this sheet and the special circumstances created by the spill including; the material spilled, the quantity of the spill, the area in which the spill occurred, and the expertise of employees in the
--------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

**Methods for Clean-up:**

area responding to the spill. Never exceed any occupational exposure limits.

Prevent the spread of any spill to minimize harm to human health and the environment if safe to do so. Wear complete and proper personal protective equipment following the recommendation of Section 8 at a minimum. Dike with suitable absorbent material like granulated clay. Gather and store in a sealed container pending a waste disposal evaluation.

**7. HANDLING AND STORAGE**

<b>Handling Technical Measures and Precautions:</b>	Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Use spark-proof tools and explosion-proof equipment
<b>Storage Technical Measures and Conditions:</b>	Store in a cool dry ventilated location. Isolate from incompatible materials and conditions. Keep container(s) closed. Keep away from sources of ignition

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION****United States:**

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
P&T Methanol	67-56-1	6000 ppm IDLH	250 ppm STEL	200 ppm TWA	200 ppm TWA; 260 mg/m <sup>3</sup> TWA
1,4-difluorobenzene	540-36-3	Not established	None Known	Not established	No data available
pentafluorobenzene	363-72-4	Not established	None Known	Not established	No data available
1,4-dichlorobenzene-d4	3855-82-1	Not established	None Known	Not established	No data available
chlorobenzene-d5	3114-55-4	Not established	None Known	Not established	No data available

**Personal Protection:****Engineering Measures:**

Local exhaust ventilation is recommended when generating excessive levels of vapours from handling or thermal processing.

**Respiratory Protection:**

Respiratory protection may be required to avoid overexposure when handling this product. General or local exhaust ventilation is the preferred means of protection. Use a respirator if general room ventilation is not available or sufficient to eliminate symptoms. If an exposure limit is exceeded or if an operator is experiencing symptoms of inhalation overexposure as explained in Section 3, provide respiratory protection.

**Eye Protection:**

Wear chemically resistant safety glasses with side shields when handling this product. Do not wear contact lenses.

**Skin Protection:**

Wear protective gloves. Inspect gloves for chemical break-through and replace at regular intervals. Clean protective equipment regularly. Wash hands and other exposed areas with mild soap and water before eating, drinking, and when leaving work

**9. PHYSICAL AND CHEMICAL PROPERTIES**

<b>Appearance, color:</b>	No data available
<b>Odor:</b>	Mild
<b>Physical State:</b>	No data available
<b>pH:</b>	Not applicable
<b>Vapor Pressure:</b>	No data available
<b>Vapor Density:</b>	1.1 (air = 1)
<b>Boiling Point (°C):</b>	64.7 °C at 760 mmHg (HSDB)
<b>Melting Point (°C):</b>	-98 °C
<b>Flash Point (°F):</b>	36
<b>Flammability:</b>	Highly Flammable
<b>Upper Flammable/Explosive Limit, % in air:</b>	36
<b>Lower Flammable/Explosive Limit, % in air:</b>	6
<b>Autoignition Temperature (°C):</b>	464 deg C
<b>Decomposition Temperature (°C):</b>	No data available
<b>Specific Gravity:</b>	0.791 - 0.792 g/cm <sup>3</sup> at 20 °C
<b>Evaporation Rate:</b>	No data available

Odor Threshold:	No data available
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available
VOC % by weight:	90
Molecular Weight:	32.04

## 10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	None known.
Materials to Avoid / Chemical Incompatibility:	Strong oxidizing agents
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

## 11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation, Skin Contact, Eye Contact, Ingestion
Target Organs Potentially Affected By Exposure:	Eyes, Central nervous system stimulation, Skin, GI Tract, Respiratory Tract
Chemical Interactions That Change Toxicity:	None Known

### Immediate (Acute) Health Effects by Route of Exposure:

Inhalation Irritation:	Can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache.
Inhalation Toxicity:	Harmful! Can cause systemic damage (see "Target Organs")Methanol can cause central nervous system depression and overexposure can cause damage to the optic nerve resulting in visual impairment or blindness.
Skin Contact:	Can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage.
Eye Contact:	Can cause moderate irritation, tearing and reddening, but not likely to permanently injure eye tissue.
Ingestion Irritation:	Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.Highly toxic and may be fatal if swallowed.
Ingestion Toxicity:	Toxic if swallowed. May cause target organ failure and/or death.May be fatal if swallowed.

### Long-Term (Chronic) Health Effects:

Carcinogenicity:	No data.
Reproductive and Developmental Toxicity:	No data available to indicate product or any components present at greater than 0.1% may cause birth defects.
Inhalation:	Upon prolonged and/or repeated exposure, can cause moderate respiratory irritation, dizziness, weakness, fatigue, nausea and headache.Harmful! Can cause systemic damage upon prolonged and/or repeated exposure (see "Target Organs")
Skin Contact:	Upon prolonged or repeated contact, can cause moderate skin irritation, defatting, and dermatitis. Not likely to cause permanent damage.
Skin Absorption:	Upon prolonged or repeated exposure, harmful if absorbed through the skin. May cause severe irritation and systemic damage
Ingestion:	Toxic if swallowed. May cause target organ failure and/or death.

### Component Toxicological Data:

#### NIOSH:

Chemical Name	CAS No.	LD50/LC50
Benzene, 1,2,3,4,5-pentafluoro-	363-72-4	Oral LD50 Rat 2 g/kg
Methanol	67-56-1	Inhalation LC50 Rat 22500 ppm 8 h

### Component Carcinogenic Data:

#### OSHA:

Chemical Name	CAS No.
No data available	

#### ACGIH:

Chemical Name	CAS No.
No data available	

**NIOSH:**

Chemical Name CAS No.  
No data available

**NTP:**

Chemical Name CAS No.  
No data available

**IARC:**

Chemical Name CAS No. Group No.

**12. ECOLOGICAL INFORMATION**

**Overview:** Moderate ecological hazard. This product may be dangerous to plants and/or wildlife.  
**Mobility:** No data  
**Persistence:** No data  
**Bioaccumulation:** No data  
**Degradability:** Biodegrades slowly.  
**Ecological Toxicity Data:** No data available

**13. DISPOSAL CONSIDERATIONS**

**Waste Description of Spent Product:** Spent or discarded material is a hazardous waste. Mixing spent or discarded material with other materials may render the mixture hazardous. Perform a hazardous waste determination on mixtures.  
**Disposal Methods:** Dispose of by incineration following Federal, State, Local, or Provincial regulations.  
**Waste Disposal of Packaging:** Comply with all Local, State, Federal, and Provincial Environmental Regulations.

**14. TRANSPORTATION INFORMATION**

**United States:**  
**DOT Proper Shipping Name:** Flammable liquids, n.o.s. (Methanol, Pentafluorobenzene)  
**UN Number:** UN1993  
**Hazard Class:** 3  
**Packing Group:** II

**International:**  
**IATA Proper Shipping Name:** Flammable liquids, n.o.s. (Methanol, Pentafluorobenzene)  
**UN Number:** UN1993  
**Hazard Class:** 3  
**Packing Group:** II

Marine Pollutant: No

Chemical Name	CAS#	Marine Pollutant	Severe Marine Pollutant
No data available			

**15. REGULATORY INFORMATION**

United States:					
Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
P&T Methanol	67-56-1	X	X	-	X
1,4-difluorobenzene	540-36-3	-	-	-	-
pentafluorobenzene	363-72-4	-	-	-	X
1,4-dichlorobenzene-d4	3855-82-1	-	-	-	-
chlorobenzene-d5	3114-55-4	-	-	-	-

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Methanol	67-56-1	Prop 65 Develop Tox

**State Right To Know Listing:**

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
P&T Methanol	67-56-1	X	X	X	X
1,4-difluorobenzene	540-36-3	-	-	-	-
pentafluorobenzene	363-72-4	-	-	-	-
1,4-dichlorobenzene-d4	3855-82-1	-	-	-	-
chlorobenzene-d5	3114-55-4	-	-	-	-

**16. OTHER INFORMATION**

**Prior Version Date:** 12/15/16

**Other Information:** Any changes to the SDS compared to previous versions are marked by a vertical line in front of the concerned paragraph.

**References:** No data available

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CERTIFIED REFERENCE MATERIAL

110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

Catalog No. : 30225 Lot No.: A0176219  
Description : Bromochloromethane Standard  
Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul  
Container Size : 2 mL Pkg Amt: > 1 mL  
Expiration Date : September 30, 2026 Storage: 0°C or colder  
Ship: Ambient

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Bromochloromethane CAS # 74-97-5 Purity 99% (Lot 00008541)	2,016.0 µg/mL	+/- 11.9744 µg/mL Gravimetric +/- 113.0617 µg/mL Unstressed +/- 115.7059 µg/mL Stressed

Solvent: P&T Methanol  
CAS # 67-56-1  
Purity 99%



**Column:**  
105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

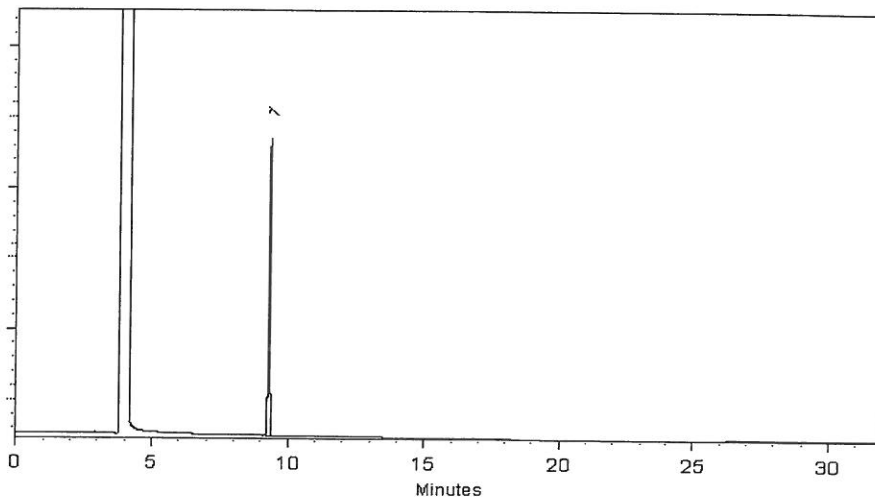
**Carrier Gas:**  
hydrogen-constant pressure 11.0 psi.

**Temp. Program:**  
40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**  
200°C

**Det. Temp:**  
250°C

**Det. Type:**  
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

*Dalton Stover*  
Dalton Stover - Operations Technician I

Date Mixed: 08-Sep-2021

Balance: 1128353505

*Marlina Cowan*  
Marlina Cowan - Operations Tech I

Date Passed: 10-Sep-2021

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

$k$  is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.





CERTIFIED REFERENCE MATERIAL

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## Certificate of Analysis



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Catalog No. : 30225 Lot No.: A0176219  
Description : Bromochloromethane Standard  
Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul  
Container Size : 2 mL Pkg Amt: > 1 mL  
Expiration Date : September 30, 2026 Storage: 0°C or colder  
Ship: Ambient

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Bromochloromethane CAS # 74-97-5 Purity 99% (Lot 00008541)	2,016.0 µg/mL	+/- 11.9744 µg/mL Gravimetric +/- 113.0617 µg/mL Unstressed +/- 115.7059 µg/mL Stressed

Solvent: P&T Methanol  
CAS # 67-56-1  
Purity 99%

**Column:**  
105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

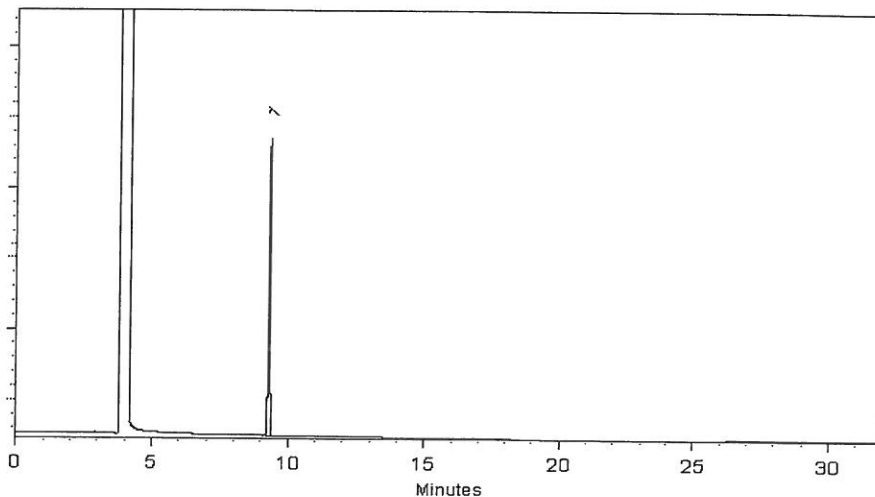
**Carrier Gas:**  
hydrogen-constant pressure 11.0 psi.

**Temp. Program:**  
40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

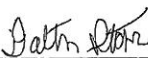
**Inj. Temp:**  
200°C

**Det. Temp:**  
250°C

**Det. Type:**  
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

  
Dalton Stover - Operations Technician I

Date Mixed: 08-Sep-2021

Balance: 1128353505

  
Marlina Cowan - Operations Tech I

Date Passed: 10-Sep-2021

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ $\mu$ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

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25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

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- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

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### Handling Notes:

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FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.  
This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No.: 30042  
Description: 502.2 Calibration Mix #1  
502.2 Calibration Mix #1 2,000µg/mL, P&T Methanol, 1mL/ampul  
Container Size: 2 mL  
Expiration Date: June 30, 2028  
Lot No.: A0177872  
Pkg Amt: > 1 mL  
Storage: 0°C or colder  
Ship: Ambient

## CERTIFIED VALUES

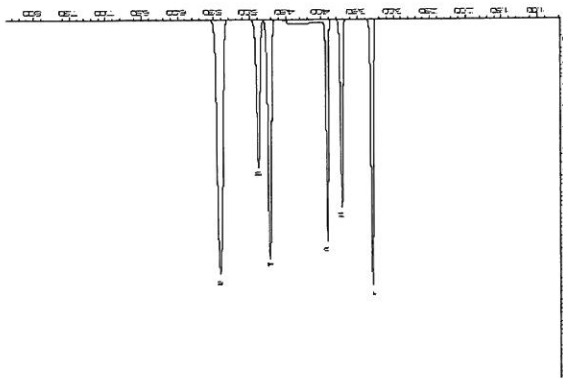
Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Dichlorodifluoromethane (CFC-12) CAS # 75-71-8 Purity 99% (Lot 00012554)	2,000.9 µg/mL +/- 13.9607 +/- 112.4514 +/- 115.0704	Gravimetric Unstressed Stressed
2	Chloromethane (methyl chloride) CAS # 74-87-3 Purity 99% (Lot SHBK6571)	2,000.2 µg/mL +/- 13.2566 +/- 112.3274 +/- 114.9474	Gravimetric Unstressed Stressed
3	Vinyl chloride CAS # 75-01-4 Purity 99% (Lot 00015559)	2,001.1 µg/mL +/- 13.8225 +/- 112.4449 +/- 115.0645	Gravimetric Unstressed Stressed
4	Bromomethane (methyl bromide) CAS # 74-83-9 Purity 99% (Lot 101604)	2,000.2 µg/mL +/- 13.6930 +/- 112.3836 +/- 115.0025	Gravimetric Unstressed Stressed
5	Chloroethane (ethyl chloride) CAS # 75-00-3 Purity 99% (Lot 107-401039114-1)	2,000.5 µg/mL +/- 15.6153 +/- 112.6506 +/- 115.2642	Gravimetric Unstressed Stressed
6	Trichlorofluoromethane (CFC-11) CAS # 75-69-4 Purity 99% (Lot MKCL8411)	2,000.2 µg/mL +/- 15.8709 +/- 112.6692 +/- 115.2815	Gravimetric Unstressed Stressed





Solvent: R&T Methanol  
CAS # 67-56-1  
Purity 99%

Column: 60m x 0.25mm x 1.4µm  
Rx-502.2 (cat.#10916)  
Carrier Gas: helium-constant flow 2.0 mL/min.  
Temp. Program: 40°C (hold 6 min.) to 100°C  
@ 6°C/min.  
Inj. Temp: 200°C  
Det. Temp: 250°C  
Det. Type: MSD



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Tom Suckal - Mix Technician  
*[Signature]*  
Marina Cowan - Operations Tech I  
*[Signature]*

Date Mixed: 27-Oct-2021  
Balance: B707717271  
Date Passed: 02-Nov-2021

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
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0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days
-20°C or colder (Deep Freezer)		

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Manufacturing Notes:

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Catalog No.: 30042  
Description: 502.2 Calibration Mix #1  
502.2 Calibration Mix #1 2,000µg/mL, P&T Methanol, 1mL/ampul  
Container Size: 2 mL  
Expiration Date: June 30, 2028  
Lot No.: A0177872  
Pkg Amt: > 1 mL  
Storage: 0°C or colder  
Ship: Ambient

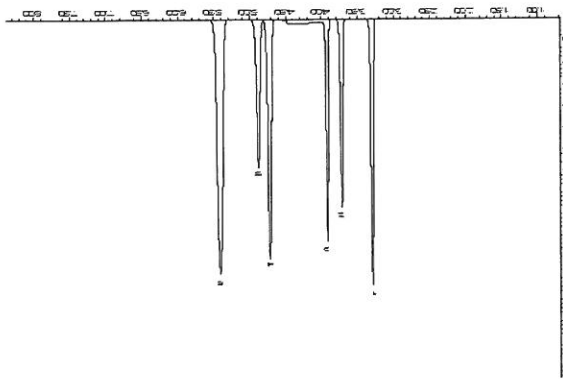
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6	Trichlorofluoromethane (CFC-11) CAS # 75-69-4 Purity 99% (Lot MKCL8411)	2,000.2 µg/mL +/- 15.8709 +/- 112.6692 +/- 115.2815	Gravimetric Unstressed Stressed



Solvent: R&T Methanol  
CAS # 67-56-1  
Purity 99%

Column: 60m x 0.25mm x 1.4µm  
Rx-502.2 (cat.#10916)  
Carrier Gas: helium-constant flow 2.0 mL/min.  
Temp. Program: 40°C (hold 6 min.) to 100°C  
@ 6°C/min.  
Inj. Temp: 200°C  
Det. Temp: 250°C  
Det. Type: MSD



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Tom Suckal - Mix Technician  
*[Signature]*

Date Mixed: 27-Oct-2021  
Date Passed: 02-Nov-2021

Balance: B707717271

Marlina Cowan - Operations Tech I  
*[Signature]*

Manufactured under Restek's ISO 9001:2015  
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Certificate #FM 80397

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-20°C or colder (Deep Freezer)		

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# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

**Catalog No. :** 30006 **Lot No.:** A0179406

**Description :** VOA Calibration Mix #1

VOA Calibration Mix #1 5,000µg/mL, P&T Methanol/Water(90:10), 1mL/ampul

**Container Size :** 2 mL **Pkg Amt:** > 1 mL

**Expiration Date :** March 31, 2025 **Storage:** 0°C or colder

**Ship:** Ambient

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Acetone CAS # 67-64-1 (Lot SHBN3661) Purity 99%	5,037.5 µg/mL	+/- 29.2885 µg/mL Gravimetric +/- 303.9347 µg/mL Unstressed +/- 304.6563 µg/mL Stressed
2	2-Butanone (MEK) CAS # 78-93-3 (Lot SHBL5543) Purity 99%	5,034.3 µg/mL	+/- 29.2700 µg/mL Gravimetric +/- 303.7436 µg/mL Unstressed +/- 304.4648 µg/mL Stressed
3	4-Methyl-2-pentanone (MIBK) CAS # 108-10-1 (Lot SHBM7956) Purity 99%	5,032.2 µg/mL	+/- 29.2575 µg/mL Gravimetric +/- 303.6129 µg/mL Unstressed +/- 304.3337 µg/mL Stressed
4	2-Hexanone CAS # 591-78-6 (Lot MKCL1599) Purity 99%	5,033.7 µg/mL	+/- 29.2662 µg/mL Gravimetric +/- 303.7034 µg/mL Unstressed +/- 304.4245 µg/mL Stressed

**Solvent:** P&T Methanol/Water (90:10)  
CAS # 67-56-1/7732-18-5  
Purity 99%

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

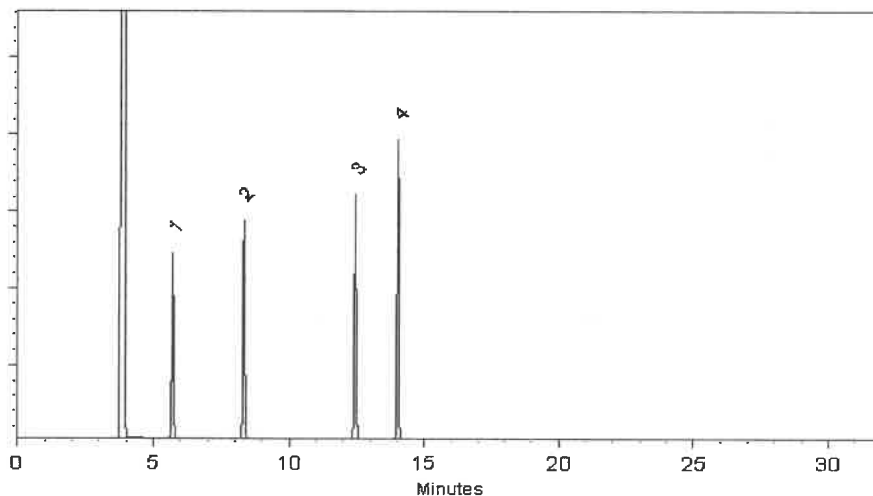
200°C

**Det. Temp:**

250°C

**Det. Type:**

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

*Sam Moodler*

Sam Moodler - Operations Tech I

Date Mixed: 09-Dec-2021

Balance: B707717271

*Clara Windle*

Clara Windle - Operations Technician I

Date Passed: 13-Dec-2021

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
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- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
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- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

$k$  is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.





110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

**Catalog No. :** 30006 **Lot No.:** A0179406

**Description :** VOA Calibration Mix #1

VOA Calibration Mix #1 5,000µg/mL, P&T Methanol/Water(90:10), 1mL/ampul

**Container Size :** 2 mL **Pkg Amt:** > 1 mL

**Expiration Date :** March 31, 2025 **Storage:** 0°C or colder

**Ship:** Ambient

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Acetone CAS # 67-64-1 (Lot SHBN3661) Purity 99%	5,037.5 µg/mL	+/- 29.2885 µg/mL Gravimetric +/- 303.9347 µg/mL Unstressed +/- 304.6563 µg/mL Stressed
2	2-Butanone (MEK) CAS # 78-93-3 (Lot SHBL5543) Purity 99%	5,034.3 µg/mL	+/- 29.2700 µg/mL Gravimetric +/- 303.7436 µg/mL Unstressed +/- 304.4648 µg/mL Stressed
3	4-Methyl-2-pentanone (MIBK) CAS # 108-10-1 (Lot SHBM7956) Purity 99%	5,032.2 µg/mL	+/- 29.2575 µg/mL Gravimetric +/- 303.6129 µg/mL Unstressed +/- 304.3337 µg/mL Stressed
4	2-Hexanone CAS # 591-78-6 (Lot MKCL1599) Purity 99%	5,033.7 µg/mL	+/- 29.2662 µg/mL Gravimetric +/- 303.7034 µg/mL Unstressed +/- 304.4245 µg/mL Stressed

**Solvent:** P&T Methanol/Water (90:10)  
CAS # 67-56-1/7732-18-5  
Purity 99%

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

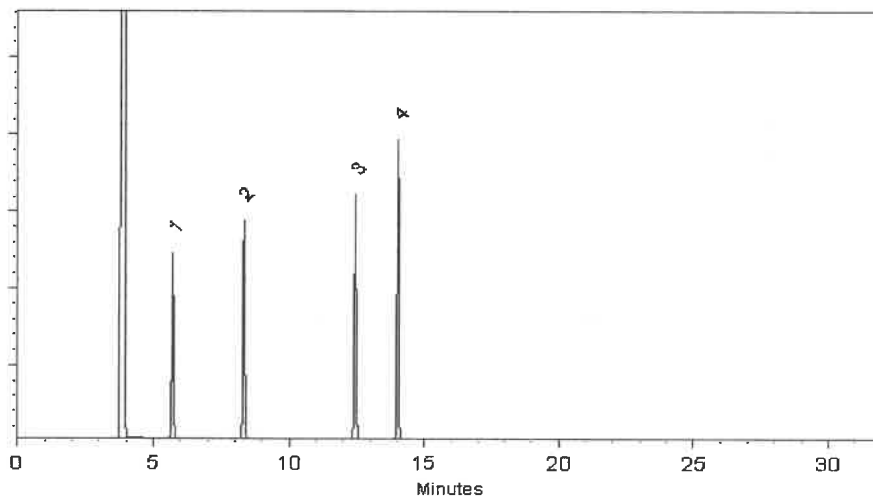
200°C

**Det. Temp:**

250°C

**Det. Type:**

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

*Sam Moodler*

Sam Moodler - Operations Tech I

Date Mixed: 09-Dec-2021

Balance: B707717271

*Clara Windle*

Clara Windle - Operations Technician I

Date Passed: 13-Dec-2021

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

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- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
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- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.







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# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

**Catalog No. :** 30006 **Lot No.:** A0179406

**Description :** VOA Calibration Mix #1

VOA Calibration Mix #1 5,000µg/mL, P&T Methanol/Water(90:10), 1mL/ampul

**Container Size :** 2 mL **Pkg Amt:** > 1 mL

**Expiration Date :** March 31, 2025 **Storage:** 0°C or colder

**Ship:** Ambient

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Acetone CAS # 67-64-1 (Lot SHBN3661) Purity 99%	5,037.5 µg/mL	+/- 29.2885 µg/mL Gravimetric +/- 303.9347 µg/mL Unstressed +/- 304.6563 µg/mL Stressed
2	2-Butanone (MEK) CAS # 78-93-3 (Lot SHBL5543) Purity 99%	5,034.3 µg/mL	+/- 29.2700 µg/mL Gravimetric +/- 303.7436 µg/mL Unstressed +/- 304.4648 µg/mL Stressed
3	4-Methyl-2-pentanone (MIBK) CAS # 108-10-1 (Lot SHBM7956) Purity 99%	5,032.2 µg/mL	+/- 29.2575 µg/mL Gravimetric +/- 303.6129 µg/mL Unstressed +/- 304.3337 µg/mL Stressed
4	2-Hexanone CAS # 591-78-6 (Lot MKCL1599) Purity 99%	5,033.7 µg/mL	+/- 29.2662 µg/mL Gravimetric +/- 303.7034 µg/mL Unstressed +/- 304.4245 µg/mL Stressed

**Solvent:** P&T Methanol/Water (90:10)  
CAS # 67-56-1/7732-18-5  
Purity 99%

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

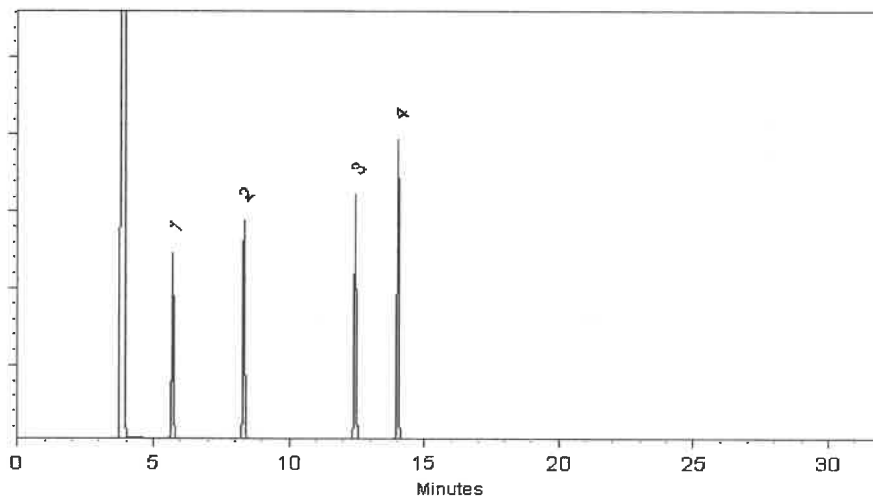
200°C

**Det. Temp:**

250°C

**Det. Type:**

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

*Sam Moodler*

Sam Moodler - Operations Tech I

Date Mixed: 09-Dec-2021

Balance: B707717271

*Clara Windle*

Clara Windle - Operations Technician I

Date Passed: 13-Dec-2021

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ $\mu$ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

$k$  is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.





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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

Catalog No. : 30225 Lot No.: A0183824  
Description : Bromochloromethane Standard  
Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul  
Container Size : 2 mL Pkg Amt: > 1 mL  
Expiration Date : April 30, 2027 Storage: 0°C or colder  
Ship: Ambient

#### CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	Bromochloromethane		2,000.0 µg/mL	+/- 11.8794	µg/mL	Gravimetric
	CAS #	74-97-5 (Lot 00008541)		+/- 112.1643	µg/mL	Unstressed
	Purity	99%		+/- 114.7876	µg/mL	Stressed

Solvent: P&T Methanol  
CAS # 67-56-1  
Purity 99%

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

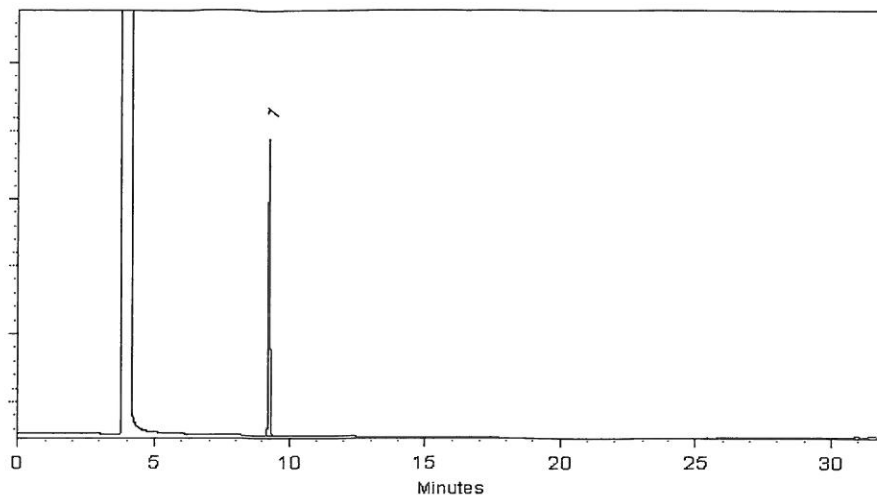
200°C

**Det. Temp:**

250°C

**Det. Type:**

FID

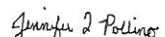


This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

  
Jess Hoy - Operations Tech I

Date Mixed: 07-Apr-2022

Balance: 1127510105

  
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 11-Apr-2022

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ $\mu$ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

$k$  is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
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0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

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## CERTIFIED REFERENCE MATERIAL

# Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

Catalog No. : 30225 Lot No.: A0183824  
Description : Bromochloromethane Standard  
Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul  
Container Size : 2 mL Pkg Amt: > 1 mL  
Expiration Date : April 30, 2027 Storage: 0°C or colder  
Ship: Ambient

### CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	Bromochloromethane		2,000.0    µg/mL	+/-	11.8794	µg/mL	Gravimetric
	CAS #	74-97-5		+/-	112.1643	µg/mL	Unstressed
	(Lot 00008541)			+/-	114.7876	µg/mL	Stressed
	Purity	99%					

Solvent: P&T Methanol  
CAS # 67-56-1  
Purity 99%

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

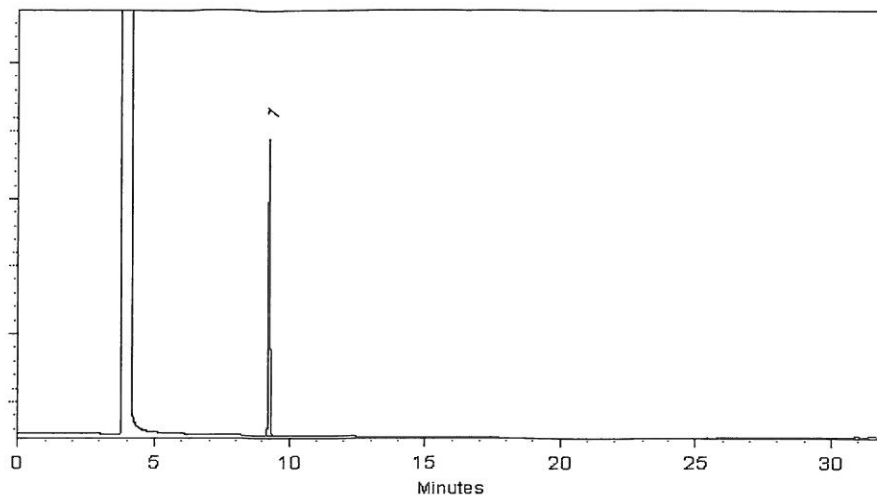
200°C

**Det. Temp:**

250°C

**Det. Type:**

FID

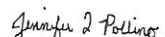


This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

  
Jess Hoy - Operations Tech I

Date Mixed: 07-Apr-2022

Balance: 1127510105

  
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 11-Apr-2022

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
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### Manufacturing Notes:

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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



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Catalog No. : 30225 Lot No.: A0183824  
Description : Bromochloromethane Standard  
Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul  
Container Size : 2 mL Pkg Amt: > 1 mL  
Expiration Date : April 30, 2027 Storage: 0°C or colder  
Ship: Ambient

#### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Bromochloromethane CAS # 74-97-5 Purity 99% (Lot 00008541)	2,000.0 µg/mL	+/- 11.8794 µg/mL Gravimetric +/- 112.1643 µg/mL Unstressed +/- 114.7876 µg/mL Stressed

Solvent: P&T Methanol  
CAS # 67-56-1  
Purity 99%

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

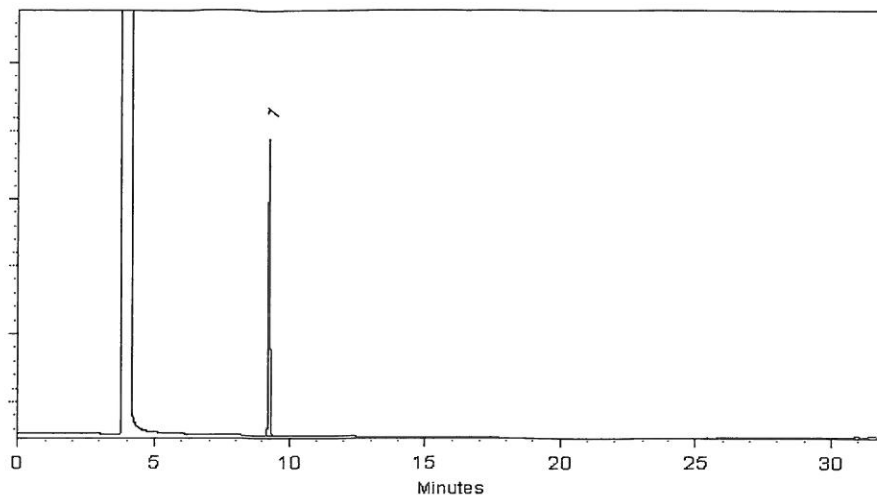
200°C

**Det. Temp:**

250°C

**Det. Type:**

FID

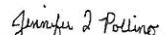


This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

  
Jess Hoy - Operations Tech I

Date Mixed: 07-Apr-2022

Balance: 1127510105

  
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 11-Apr-2022

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

$k$  is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.







110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

## CERTIFIED REFERENCE MATERIAL

# Certificate of Composition



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

**Catalog No. :** 555408-SL **Lot No.:** A0187421  
**Description :** Custom Vinyl Acetate Standard  
Custom Vinyl Acetate Standard 8,000µg/mL, P&T Methanol, 1mL/ampul  
**Container Size :** 2 mL **Pkg Amt:** > 1 mL  
**Expiration Date :** January 31, 2024 **Storage:** -20°C or colder  
**Handling:** This product is photosensitive. **Ship:** On Ice

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	Vinyl acetate CAS # 108-05-4 Purity 99%	8,078.0 µg/mL (Lot RD220630)	+/- 47.4062 µg/mL Gravimetric +/- 487.4241 µg/mL Unstressed +/- 488.5812 µg/mL Stressed

**Solvent:** P&T Methanol  
CAS # 67-56-1  
Purity 99%

#### Tech Tips:

Vinyl acetate is a volatile organic ester included in the target lists of several US EPA and other methods. Under acidic conditions, esters react with alcohols to form new esters (transesterification). Methanol-based mixes containing halogenated compounds are slightly acidic, so it is important to minimize exposure of vinyl acetate to mixes of halogenated compounds in methanol. For this reason, we offer vinyl acetate in individual solution, and suggest that it be introduced into the working level calibration solution immediately before use. This will minimize problems and ensure more consistent results.

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

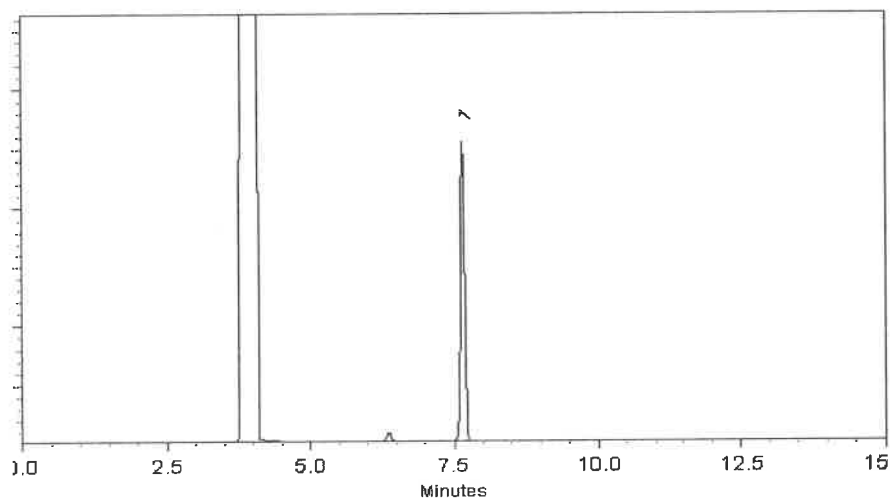
200°C

**Det. Temp:**

250°C

**Det. Type:**

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

  
Bethany Lowery - Operations Tech I

Date Mixed: 18-Jul-2022

Balance: B251644995

  
Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 26-Jul-2022



Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

## General Certified Reference Material Notes

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- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
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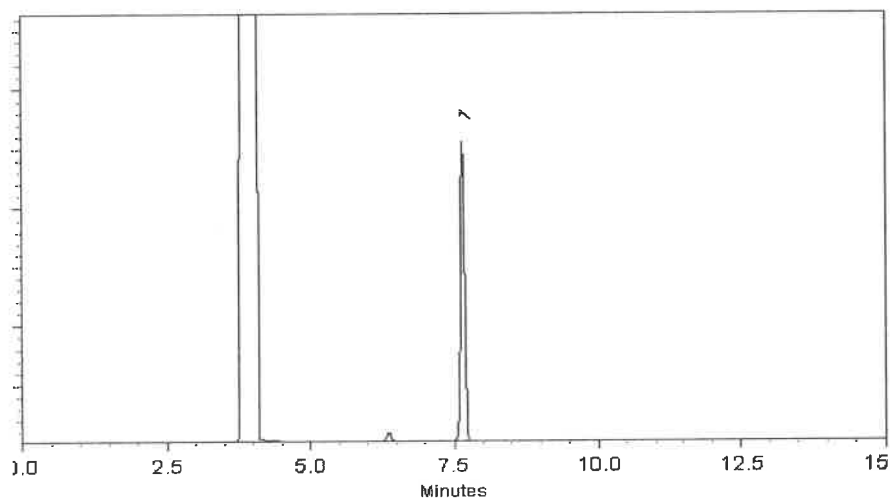
200°C

**Det. Temp:**

250°C

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FID



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Bethany Lowery - Operations Tech I

Date Mixed: 18-Jul-2022

Balance: B251644995

  
Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 26-Jul-2022



Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397

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Methanol  
ULTRA RESI-ANALYZED  
For Purge and Trap Analysis



Material No.: 9077-02  
Batch No.: 22C2362001  
Manufactured Date: 2022-02-15  
Expiration Date: 2025-02-14  
Revision No.: 0

## Certificate of Analysis

Test	Specification	Result
Assay (CH <sub>3</sub> OH) (by GC, corrected for water)	≥ 99.9 %	100.0 %
Residue after Evaporation	≤ 1.0 ppm	< 0.1 ppm
Titration Acid (μeq/g)	≤ 0.3	0.3
Titration Base (μeq/g)	≤ 0.10	0.03
Water (by KF, coulometric)	≤ 0.08 %	< 0.01 %
Volatile Organic Trace Analysis – Below EPA 8260B CRQL	Conforms	Conforms

For Laboratory, Research, or Manufacturing Use  
Performance Tested for Use in EPA Methods  
500 Series for Drinking Water  
600 Series for Wastewater  
846 for Solid Waste

Country of Origin: USA  
Packaging Site: Phillipsburg Mfg Ctr & DC

  
Jamie Ethier  
Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC  
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone 610.386.1700  
Page 1 of 1

Methanol  
ULTRA RESI-ANALYZED  
For Purge and Trap Analysis



Material No.: 9077-02  
Batch No.: 22C2362001  
Manufactured Date: 2022-02-15  
Expiration Date: 2025-02-14  
Revision No.: 0

## Certificate of Analysis

Test	Specification	Result
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Volatile Organic Trace Analysis – Below EPA 8260B CRQL	Conforms	Conforms

For Laboratory, Research, or Manufacturing Use  
Performance Tested for Use in EPA Methods  
500 Series for Drinking Water  
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Page 1 of 1

Methanol  
ULTRA RESI-ANALYZED  
For Purge and Trap Analysis

 **avantor**<sup>TM</sup>



Material No.: 9077-02

Batch No.: 0000288323

Manufactured Date: 2021-06-11

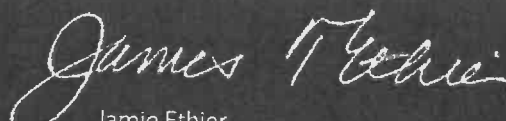
Expiration Date: 2024-06-10

Revision No.: 0

## Certificate of Analysis

Test	Specification	Result
Assay (CH <sub>3</sub> OH) (by GC, corrected for water)	≥ 99.9 %	< 0.1 %
Residue after Evaporation	≤ 1.0 ppm	< 0.1 ppm
Titration Acid (μeq/g)	≤ 0.3	< 0.1
Titration Base (μeq/g)	≤ 0.10	< 0.01
Water (by KF, coulometric)	≤ 0.08 %	< 0.01 %
Volatile Organic Trace Analysis - Below EPA 8260B CRQL	Conforms	Falls

For Laboratory, Research, or Manufacturing Use  
Performance Tested for Use in EPA Methods  
500 Series for Drinking Water  
600 Series for Wastewater  
846 for Solid Waste  
Country of Origin: USA  
Packaging Site: Phillipsburg Mfg Ctr & DC

  
Jamie Ethier  
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Avantor Performance Materials, LLC  
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone 610.386.1700



## CERTIFIED WEIGHT REPORT

Part Number: **95317**  
 Lot Number: **042921**  
 Description: **Universal VOA Megamix**  
 69 components

Expiration Date: 04/29/24

Recommended Storage: Freezer (0 °C)

Nominal Concentration (µg/mL): 2000

NIST Test ID#: 6UTB

5E-05 Balance Uncertainty

Solvent(s): **Lot#**  
 Methanol **DY186-USQ8**

Weight(s) shown below were combined and diluted to (mL): 100.0 0.012 Flask Uncertainty

<i>Eli Aliaga</i>		042921
Formulated By:	Eli Aliaga	DATE
<i>Pedro L. Rantas</i>		042921
Reviewed By:	Pedro L. Rantas	DATE

Compound	(RM#)	Lot	Div.	Initial	Initial	Nominal	Purity	Purity	Uncertainty	Target	Actual	Actual	Expanded	SDS information			
	Part Number	Number	Factor	Vol. (mL)	Conc.(µg/mL)	Conc (µg/mL)	(%)	Uncertainty	Pipette (mL)	Weight(g)	Weight(g)	Conc (µg/mL)	Uncertainty	(Solvent Safety Info. On Attached pg.)	CAS#	OSHA PEL (TWA)	LD50
1. Acetonitrile	(0324)	060812	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20041	2002.0	8.1	75-05-8	40 ppm (70mg/m3/8H)		ori-rat 2460mg/kg
2. Allyl chloride (3-Chloropropene)	(0325)	102396	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20233	2003.0	8.2	107-05-1	1 ppm (3mg/m3/8H)		ori-rat 700mg/kg
3. Carbon disulphide	(0600)	MKCD9804	NA	NA	NA	2000	100	0.2	NA	0.20001	0.20015	2001.4	8.1	75-15-0	4 ppm (12mg/m3) (skin)		ori-rat 1200mg/kg
4. cis-1,4-Dichloro-2-butene	(1196)	14718EF	NA	NA	NA	2000	95	0.2	NA	0.21054	0.21080	2000.6	8.5	1476-11-5	N/A		N/A
5. trans-1,4-Dichloro-2-butene	(0486)	MKBP6041V	NA	NA	NA	2000	96.5	0.2	NA	0.20728	0.20751	2002.4	8.4	110-57-6	N/A		N/A
6. Diethyl ether (Ethyl ether)	(0153)	SHBK1918	NA	NA	NA	2000	99.9	0.2	NA	0.20023	0.20046	2002.3	8.1	60-29-7	400ppm (1200mg/m3/8H)		ori-rat 1215mg/kg
7. Ethyl methacrylate	(0381)	06126PX	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20230	2002.7	8.2	97-63-2	N/A		ori-rat 14800mg/kg
8. Iodomethane	(0489)	SHBF8718V	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20130	2002.8	8.1	74-88-4	5 ppm(28mg/m3/8H)(skin)		ori-rat 70mg/kg
9. 2-Methyl-1-propanol	(0445)	15241EB	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20123	2002.1	8.1	78-83-1	50 ppm (150mg/m3/8H)		ori-rat 2480mg/kg
10. Methacrylonitrile	(0442)	00427ET	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20220	2001.7	8.2	128-98-7	1 ppm (3mg/m3/8H)(skin)		ori-rat 120mg/kg
11. Methyl acrylate	(1075)	SHBK0679	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20046	2002.5	8.1	96-33-3	10 ppm(35mg/m3/8H)(skin)		ori-rat 277mg/kg
12. Methyl methacrylate	(0404)	MKBW6137V	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20048	2002.7	8.1	80-62-6	100 ppm (410mg/m3/8H)		ori-rat 7872mg/kg
13. Nitrobenzene	(0228)	01213TV	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20218	2001.5	8.2	98-95-3	1 ppm (5mg/m3/8H)(skin)		ori-rat 780mg/kg
14. 2-Nitropropane	(0461)	14002JX	NA	NA	NA	2000	97.3	0.2	NA	0.20556	0.20566	2001.0	8.3	79-46-9	10 ppm (35mg/m3/8H)		ori-rat 720mg/kg
15. Pentachloroethane	(0450)	HGA01	NA	NA	NA	2000	98	0.2	NA	0.20409	0.20418	2000.9	8.2	76-01-7	N/A		N/A
16. 1,1,2-Trichlorotrifluoroethane	(0474)	18930	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20221	2001.8	8.2	76-13-1	1000 ppm (7600mg/m3/8H)		ori-rat 43g/kg
17. Bromodichloromethane	35171	100220	0.05	5.00	40018.8	2000	NA	NA	0.017	NA	NA	2000.8	18.4	75-27-4	N/A		ori-rat 916mg/kg
18. Dibromochloromethane	35171	100220	0.05	5.00	40007.7	2000	NA	NA	0.017	NA	NA	2000.3	18.4	124-48-1	N/A		ori-rat 848mg/kg
19. cis-1,2-Dichloroethane	35171	100220	0.05	5.00	40012.4	2000	NA	NA	0.017	NA	NA	2000.5	18.4	156-59-2	N/A		N/A
20. trans-1,2-Dichloroethane	35171	100220	0.05	5.00	40005.6	2000	NA	NA	0.017	NA	NA	2000.2	18.4	156-60-5	N/A		ori-rat 1235mg/kg
21. Methylene chloride	35171	100220	0.05	5.00	40013.9	2000	NA	NA	0.017	NA	NA	2000.6	18.4	75-09-2	500 ppm		ori-rat 820mg/kg
22. 1,1-Dichloroethane	32251	031821	0.10	10.00	20009.1	2000	NA	NA	0.042	NA	NA	2000.8	19.3	75-35-4	1 ppm (4mg/m3/8H)		ori-rat 200mg/kg
23. Bromoform	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	75-25-2	0.5 ppm (5mg/m3) (skin)		ori-rat 933mg/kg
24. Carbon tetrachloride	95321	010419	0.10	10.00	20001.3	2000	NA	NA	0.042	NA	NA	2000.0	19.2	56-23-5	2 ppm (12.6mg/m3/8H)		ori-rat 2350mg/kg
25. Chloroform	95321	010419	0.10	10.00	20001.8	2000	NA	NA	0.042	NA	NA	2000.1	19.2	67-66-3	50 ppm (240mg/m3) (CL)		ori-rat 908mg/kg
26. Dibromomethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	74-95-3	N/A		ori-rat 108mg/kg
27. 1,1-Dichloroethane	95321	010419	0.10	10.00	20000.8	2000	NA	NA	0.042	NA	NA	2000.0	19.3	75-34-3	100 ppm		ori-rat 725mg/kg
28. 2,2-Dichloropropane	95321	010419	0.10	10.00	20002.1	2000	NA	NA	0.042	NA	NA	2000.1	19.3	594-20-7	N/A		N/A
29. Tetrachloroethene	95321	010419	0.10	10.00	20002.2	2000	NA	NA	0.042	NA	NA	2000.1	19.3	127-18-4	25 ppm (170mg/m3/8H) (final)		ori-rat 2629mg/kg
30. 1,1,1-Trichloroethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	71-55-6	350 ppm (1900mg/m3/8H)		ori-rat 10300mg/kg
31. 1,2-Dibromo-3-chloropropane	35161	011421	0.05	5.00	40001.2	2000	NA	NA	0.017	NA	NA	2000.0	18.4	96-12-8	0.001 ppm		ori-rat 170mg/kg
32. 1,2-Dibromoethane	35161	011421	0.05	5.00	40003.9	2000	NA	NA	0.017	NA	NA	2000.1	18.4	106-93-4	20 ppm (8H)		ori-rat 108mg/kg
33. 1,2-Dichloroethane	35161	011421	0.05	5.00	40004.9	2000	NA	NA	0.017	NA	NA	2000.1	18.4	107-06-2	50 ppm (8H)		ori-rat 670mg/kg
34. 1,2-Dichloropropane	35161	011421	0.05	5.00	40002.2	2000	NA	NA	0.017	NA	NA	2000.0	18.4	78-87-5	75 ppm (350mg/m3/8H)		ori-rat 1947mg/kg
35. 1,3-Dichloropropane	35161	011421	0.05	5.00	40013.9	2000	NA	NA	0.017	NA	NA	2000.6	18.4	142-28-9	N/A		unr-mus 3800mg/kg
36. 1,1-Dichloropropene	35161	011421	0.05	5.00	40015.0	2000	NA	NA	0.017	NA	NA	2000.7	26.1	563-58-6	N/A		N/A
37. cis-1,3-Dichloropropene	35161	011421	0.05	5.00	40004.4	2000	NA	NA	0.017	NA	NA	2000.1	18.4	10081-01-5	N/A		N/A
38. trans-1,3-Dichloropropene	35161	011421	0.05	5.00	40009.1	2000	NA	NA	0.017	NA	NA	2000.4	18.5	10061-02-6	N/A		N/A
39. Hexachloro-1,3-butadiene	35161	011421	0.05	5.00	40003.5	2000	NA	NA	0.017	NA	NA	2000.1	26.4	87-68-3	0.02 ppm (0.24mg/m3/8H)		ori-rat 82mg/kg
40. 1,1,1,2-Tetrachloroethane	35161	011421	0.05	5.00	40011.9	2000	NA	NA	0.017	NA	NA	2000.5	18.4	830-20-6	N/A		ori-rat 670mg/kg
41. 1,1,2,2-Tetrachloroethane	35161	011421	0.05	5.00	40011.0	2000	NA	NA	0.017	NA	NA	2000.5	18.4	79-34-5	5 ppm (35mg/m3/8H) (skin)		ori-rat 800mg/kg
42. 1,1,2-Trichloroethane	35161	011421	0.05	5.00	40000.8	2000	NA	NA	0.017	NA	NA	1999.9	18.4	79-00-5	10 ppm (46mg/m3/8H) (skin)		ori-rat 838mg/kg
43. Trichloroethene	35161	011421	0.05	5.00	40003.2	2000	NA	NA	0.017	NA	NA	2000.1	18.4	79-01-6	50 ppm (270mg/m3/8H)		ori-mus 2402mg/kg
44. 1,2,3-Trichloropropane	35161	011421	0.05	5.00	40015.2	2000	NA	NA	0.017	NA	NA	2000.7	18.4	96-18-4	10 ppm (60mg/m3/8H)		ori-rat 149.6mg/kg
45. Benzene	35162	020821	0.05	5.00	40008.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	71-43-2	1 ppm		ori-rat 4894mg/kg
46. Bromobenzene	35162	020821	0.05	5.00	40019.0	2000	NA	NA	0.017	NA	NA	2000.9	18.4	108-86-1	N/A		ori-rat 2899mg/kg
47. n-Butyl benzene	35162	020821	0.05	5.00	40019.8	2000	NA	NA	0.017	NA	NA	2000.9	18.4	104-51-8	N/A		N/A
48. Ethyl benzene	35162	020821	0.05	5.00	40009.9	2000	NA	NA	0.017	NA	NA	1999.9	18.4	100-41-4	100 ppm (435mg/m3/8H)		ori-rat >2000mg/kg
49. p-Isopropyl toluene	35162	020821	0.05	5.00	40056.4	2000	NA	NA	0.017	NA	NA	2002.7	18.4	99-87-6	N/A		ori-rat 4750mg/kg
50. Naphthalene	35162	020821	0.05	5.00	40005.1	2000	NA	NA	0.017	NA	NA	2000.2	18.3	91-20-3	10 ppm (50mg/m3/8H)		ori-rat 490mg/kg
51. Styrene	35162	020821	0.05	5.00	40022.8	2000	NA	NA	0.017	NA	NA	2001.0	18.4	100-42-5	100 ppm		ori-rat 5000mg/kg
52. Toluene	35162	020821	0.05	5.00	40008.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	108-88-3	200 ppm		ori-rat 5000mg/kg
53. 1,2,3-Trichlorobenzene	35162	020821	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	87-61-6	N/A		lpr-mus 1390mg/kg
54. 1,2,4-Trichlorobenzene	35162	020821	0.05	5.00	40027.4	2000	NA	NA	0.017	NA	NA	2001.3	18.4	120-82-1	5 ppm (CL) (40mg/m3)		ori-rat 756mg/kg
55. 1,2,4-Trimethylbenzene	35162	020821	0.05	5.00	40012.4	2000	NA	NA	0.017	NA	NA	2000.5	18.4	95-63-6	N/A		ori-rat 5g/kg
56. 1,3,5-Trimethylbenzene	35162	020821	0.05	5.00	40011.5	2000	NA	NA	0.017	NA	NA	2000.5	18.5	108-67-8	N/A		ori-rat 5000mg/kg
57. m-Xylene	35162	020821	0.05	5.00	40021.8	2000	NA	NA	0.017	NA	NA	2001.0	18.4	108-38-3	100 ppm (435mg/m3/8H)		ori-rat 5g/kg
58. tert-Butyl benzene	35163	022521	0.05	5.00	40005.9	2000	NA	NA	0.017	NA	NA	2000.2	18.4	88-06-6	N/A		N/A
59. sec-Butyl benzene	35163	022521	0.05	5.00	40011.7	2000	NA	NA	0.017	NA	NA	2000.5	18.4	135-98-8	N/A		ori-rat 2240mg/kg
60. Chlorobenzene	35163	022521	0.05	5.00	40009.0	2000	NA	NA	0.017	NA	NA	2000.4	18.4	108-90-7	75 ppm (350mg/m3/8H)		ori-rat 2290mg/kg
61. 2-Chlorotoluene	35163	022521	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	95-49-8	50 ppm (250mg/m3/8H)		ori-rat 3900mg/kg
62. 4-Chlorotoluene	35163	022521	0.05	5.00	40000.4	2000	NA	NA	0.017	NA	NA	1999.9	18.4	106-43-4	N/A		ori-rat 2100mg/kg
63. 1,2-Dichlorobenzene	35163	022521	0.05	5.00	40004.0	2000	NA	NA	0.017	NA	NA	2000.1	18.4	95-50-1	50 ppm (300mg/m3) (CL)		



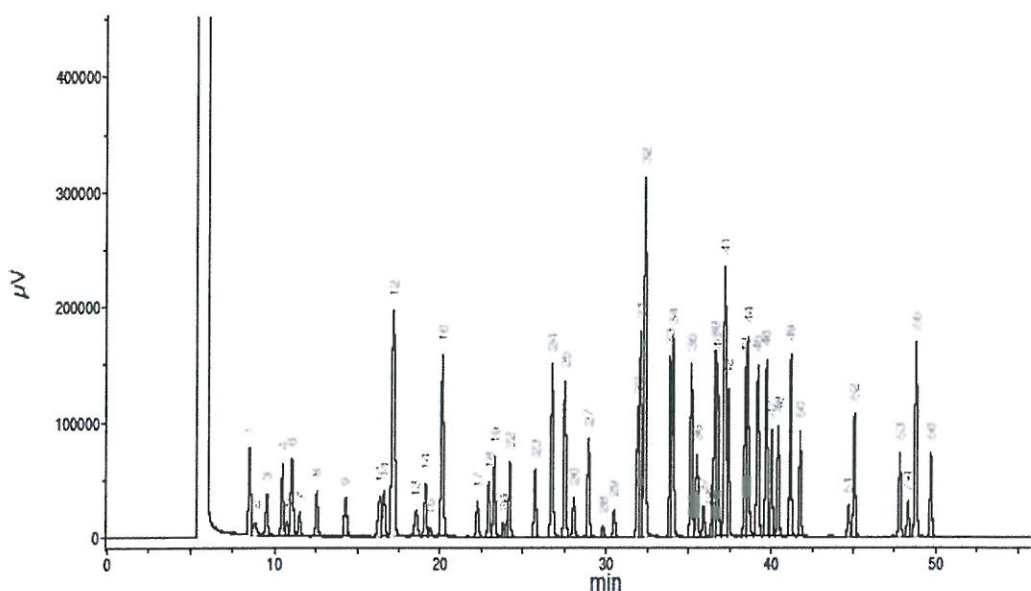


**Run 22, "P95317 L042921 [2000µg/mL in MeOH]"**

Run Length: 60.00 min, 35999 points at 10 points/second.  
Created: Thu, Apr 29, 2021 at 3:49:30 PM.  
Sampled: Sequence "042521-GC5M1", Method "GC5-M1".  
Analyzed using Method "GC5-M1".

**Comments**

GC5-M1 Analysis by Candice Warren  
Column ID SPB-Voccol 105 meter X 0.53mm X 3.0µm film thickness  
Flow rates: Total flow=290mL/min., Helium (carrier)=10mL/min.,  
Hydrogen(make-up)=40mL/min., Air(make-up)=230mL/min.  
Oven Profile: Temp. 1=35°C (Time 1=10 min.), Temp 2=200°C (Time 2=8.75 min.),  
Rate = 4°C/min., Total run time=60 min. Injector temp.=200°C, FID Temp.=200°C.  
FID Signal = Edaq Channel 1  
Standard injection = 0.5µL, Range=4



Peak #	Analyte	FID RT (min.)
1	Ether	8.48
2	1,1,2-Trichloro-1,2,2-trifluoroethane	8.80
3	1,1-Dichloroethane	9.51
4	Acetonitrile	10.44
5	Iodomethane	10.71
6	Aryl chloride	11.02
7	Carbon disulfide/Methylene chloride	11.51
8	trans-1,2-Dichloroethane	12.55
9	1,1-Dichloroethane	14.28
10	2,2-Dichloropropane	16.33
11	cis-1,2-Dichloroethane	16.59
12	Methacrylonitrile/Methyl acrylate/Chloroform	17.14
13	Isobutanol/1,1,1-Trichloroethane	18.52
14	1,1-Dichloropropane	19.08
15	Carbon tetrachloride	19.39
16	Benzene/1,2-Dichloroethane	20.10
17	Trichloroethane	22.23
18	1,2-Dichloropropane	22.92
19	Methyl methacrylate	23.26
20	Bromochloromethane	23.79
21	Dibromomethane	23.96
22	2-Nitropropane	24.18
23	cis-1,3-Dichloropropene	25.71
24	Thiurea	26.71
25	Ethyl methacrylate/trans-1,3-Dichloropropene	27.50
26	1,1,2-Trichloroethane	28.04
27	Tetrachloroethane/1,2-Dichloropropane	28.92
28	Dibromochloromethane	29.79
29	1,2-Dibromomethane	30.46
30	Chlorobenzene	31.89
31	Ethylbenzene/1,1,1,2-Tetrachloroethane	32.07
32	m-Xylene/p-Xylene	32.33
33	o-Xylene	33.87
34	Styrene	34.04
35	Isopropylbenzene/Bromofarm	35.14
36	cis-1,4-Dichloro-2-butene	35.49
37	1,1,2,2-Tetrachloroethane	35.90
38	1,2,3-Trichloropropane	36.34
39	n-Propylbenzene	36.50
40	trans-1,4-Dichloro-2-butene/Bromobenzene	36.73
41	1,2,5-Trimethylbenzene/2-Chlorotoluene	37.17
42	4-Chlorotoluene	37.38
43	tert-Butylbenzene	38.41
44	1,2,4-Trimethylbenzene/Pentachloroethane	38.55
45	sec-Butylbenzene	39.16
46	p-Isopropylbenzene	39.68
47	1,3-Dichlorobenzene	40.01
48	1,4-Dichlorobenzene	40.42
49	m-Butylbenzene	41.15
50	1,2-Dichlorobenzene	41.74
51	1,2-Dichloro-3-chloropropane	42.66
52	Nitrobenzene	43.04
53	1,2,4-Trichlorobenzene	47.80
54	Hexachlorocyclopentadiene	48.29
55	Asphaltene	48.76
56	1,2,3-Trichlorobenzene	49.66

## Safety Data Sheet (SDS)

GHS/OSHA Compliant

## Section I Product and Company Identification

## IDENTITY ANALYTICAL STANDARD DISSOLVED IN METHANOL

Manufacturer's Name	ABSOLUTE STANDARDS INC	Emergency Telephone USA & CANADA	1-800-535-5053
Address	44 Rossotto Dr. Hamden CT, 06514	Emergency Telephone International	1-352-323-3500
		Date Prepared/Revised	May 1, 2019

## Section II - Hazards Identification

## GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

H225	Highly Flammable Liquid and Vapor	H301, 311, 331	Toxic if swallowed, skin contact, inhaled
H370	Cause damage to organs	H351	Suspected of causing cancer
P271	Use in ventilated area	P280	Use gloves, eye protection/face shield
P302,332	If on skin, wash with soap and water	P305,351,338	If in eyes, remove contacts, rinse with water



Signal Word: DANGER

## Section III - Composition

Components (Specific Chemical Identity; Common Name(s))		% (optional)
Methanol	METHYL ALCOHOL	> 97

CAS#: 67-56-1

See Certified Weight Report For Other Analytes Present At Trace Quantities.

INTENDED USE: REFERENCE MATERIAL

## Section IV. FIRST AID MEASURES

General advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.
If inhaled	If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact	Wash with soap and water. Consult a physician.
In case of eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed	Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

## Section V. FIREFIGHTING MEASURES

Flammability	Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.
Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Protective equipment for fire	Wear self contained breathing apparatus for fire fighting if necessary.

## Section VI. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Clean up	Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

## Section VII. HANDLING AND STORAGE

Precautions for safe handling	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use ventilation. Keep away from sources of ignition. No smoking. Prevent the build up of electrostatic charge.
Storage Conditions	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

## Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Methanol	67-56-1 TWA 200 ppm
Skin notation	TWA 200 ppm
Potential for skin absorption, ingestion and inhalation.	
Personal protective equipment	Respiratory protection
Avoid contact with skin, eyes and clothing. Wash hands thoroughly after handling the product.	Handle with gloves. Gloves must be inspected prior to use. Eye protection.

## Section IX - Physical/Chemical Characteristics

Boiling Point	65°C	Specific Gravity (H2O = 1)	0.79
Vapor Pressure (mm Hg)	96	Melting Point	-98°C
Vapor Density (AIR = 1)	1.11	Evaporation rate (Butyl Acetate = 1)	4.6
Solubility in Water	COMPLETE		
Appearance and Odor	CLEAR, COLORLESS LIQUID WITH CHARACTERISTIC PUNGENT ODOR.		

**Section X. STABILITY AND REACTIVITY**

Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Vapours may form explosive mixture with air.
Conditions to avoid	Heat, flames, sparks, extreme temperature and sunlight.
Materials to avoid	Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids
Hazardous decomposition products formed under fire conditions.	- Carbon oxides

**Section XI. TOXICOLOGICAL INFORMATION**

LD50 Oral - rat - 5,628 mg/kg  
LC50 Inhalation - rat - 4 h - 64000 ppm  
LD50 Dermal - rabbit - 15,800 mg/kg  
Toxic if absorbed through skin. Causes skin irritation.  
Eye damage/eye irritation  
Toxic if inhaled. Causes respiratory tract irritation.  
Toxic if swallowed.

**Section XII. ECOLOGICAL INFORMATION FOR REPORTABLE QUANTITY OF 5000 lbs.**

LC50 15,400 mg/l - 96 h  
EC50 24,500.00 mg/l - 48 h  
EC100 10,000.00 mg/l - 24 h

**Section XIII. DISPOSAL CONSIDERATIONS**

Dispose with normal Laboratory Solvent Waste.

**Section XIV. TRANSPORT INFORMATION**

DOT (US)	IATA
UN number: 1230 Class: 3 Packing group: II	UN number: 1230 Class: 3 Packing group: II
Proper shipping name: Methanol	Proper shipping name: Methanol

**Section XV. REGULATORY INFORMATION**

OSHA Hazards Flammable liquid, Target Organ Effect, Toxic by inhalation., Toxic by ingestion, Toxic by skin absorption, Irritant  
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**Section XVI. Misc. INFORMATION**

The information in this Material Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and Global Harmonized System (GHS). This document is intended only as a guide to the appropriate precautionary handling of the material by trained personnel, or supervised by a person trained in chemical handling. The user is responsible for determining the precautions and dangers of this chemical for his or her particular application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, ABSOLUTE STANDARDS INC. cannot warn of all the potential dangers of use or interaction with other chemicals or substances. ABSOLUTE STANDARDS INC. warrants that the chemical meets the specifications set forth on the label. ABSOLUTE STANDARDS INC DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR APPLICATION. The user should recognize that this product can cause severe injury or death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION. As new documented general safety information becomes available, Absolute Standards Inc. will periodically revise this Safety Data Sheet. If you have any questions, please call Technical Service at 1-203-281-2917 for assistance.





## CERTIFIED WEIGHT REPORT

Part Number: **95317**  
 Lot Number: **042921**  
 Description: **Universal VOA Megamix**  
 69 components

Solvent(s): **Lot#**  
 Methanol **DY186-USQ8**

Expiration Date: 04/29/24

Recommended Storage: Freezer (0 °C)

Nominal Concentration (µg/mL): 2000

NIST Test ID#: 6UTB

5E-05 Balance Uncertainty

100.0 0.012 Flask Uncertainty

Weight(s) shown below were combined and diluted to (mL):

<i>Eli Aliaga</i>		042921
Formulated By:	Eli Aliaga	DATE
<i>Pedro L. Rantas</i>		042921
Reviewed By:	Pedro L. Rantas	DATE

Compound	(RM#)	Lot	DI	Initial	Initial	Nominal	Purity	Purity	Uncertainty	Target	Actual	Actual	Expanded	SDS information		
	Part Number	Number	Factor	Vol. (mL)	Conc.(ug/mL)	Conc (µg/mL)	(%)	Uncertainty	Pipette (mL)	Weight(g)	Weight(g)	Conc (µg/mL)	Uncertainty	(Solvent Safety Info. On Attached pg.)		
													(+/-) (µg/mL)	CAS#	OSHA PEL (TWA)	LD50
1. Acetonitrile	(0324)	060812	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20041	2002.0	8.1	75-05-8	40 ppm (70mg/m3/8H)	ori-rat 2460mg/kg
2. Allyl chloride (3-Chloropropene)	(0325)	102396	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20233	2003.0	8.2	107-05-1	1 ppm (3mg/m3/8H)	ori-rat 700mg/kg
3. Carbon disulphide	(0080)	MKCD9804	NA	NA	NA	2000	100	0.2	NA	0.20001	0.20015	2001.4	8.1	75-15-0	4 ppm (12mg/m3) (skin)	ori-rat 1200mg/kg
4. cis-1,4-Dichloro-2-butene	(1196)	14718EF	NA	NA	NA	2000	95	0.2	NA	0.21054	0.21080	2000.6	8.5	1476-11-5	N/A	N/A
5. trans-1,4-Dichloro-2-butene	(0486)	MKBP6041V	NA	NA	NA	2000	96.5	0.2	NA	0.20728	0.20751	2002.4	8.4	110-57-6	N/A	N/A
6. Diethyl ether (Ethyl ether)	(0153)	SHBK1918	NA	NA	NA	2000	99.9	0.2	NA	0.20023	0.20046	2002.3	8.1	60-29-7	400ppm (1200mg/m3/8H)	ori-rat 1215mg/kg
7. Ethyl methacrylate	(0381)	06126PX	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20230	2002.7	8.2	97-63-2	N/A	ori-rat 14800mg/kg
8. Iodomethane	(0489)	SHBF8718V	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20130	2002.8	8.1	74-88-4	5 ppm (28mg/m3/8H) (skin)	ori-rat 76mg/kg
9. 2-Methyl-1-propanol	(0445)	15241EB	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20123	2002.1	8.1	78-83-1	50 ppm (150mg/m3/8H)	ori-rat 2480mg/kg
10. Methacrylonitrile	(0442)	00427ET	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20220	2001.7	8.2	128-98-7	1 ppm (3mg/m3/8H) (skin)	ori-rat 120mg/kg
11. Methyl acrylate	(1075)	SHBK0679	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20046	2002.5	8.1	96-33-3	10 ppm (35mg/m3/8H) (skin)	ori-rat 277mg/kg
12. Methyl methacrylate	(0404)	MKBW6137V	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20048	2002.7	8.1	80-62-6	100 ppm (410mg/m3/8H)	ori-rat 7872mg/kg
13. Nitrobenzene	(0228)	01213TV	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20218	2001.5	8.2	98-95-3	1 ppm (5mg/m3/8H) (skin)	ori-rat 780mg/kg
14. 2-Nitropropane	(0461)	14002JX	NA	NA	NA	2000	97.3	0.2	NA	0.20556	0.20566	2001.0	8.3	79-46-9	10 ppm (35mg/m3/8H)	ori-rat 720mg/kg
15. Pentachloroethane	(0450)	HGA01	NA	NA	NA	2000	98	0.2	NA	0.20409	0.20418	2000.9	8.2	76-01-7	N/A	N/A
16. 1,1,2-Trichlorotrifluoroethane	(0474)	18930	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20221	2001.8	8.2	76-13-1	1000 ppm (7600mg/m3/8H)	ori-rat 43kg/kg
17. Bromodichloromethane	35171	100220	0.05	5.00	40018.8	2000	NA	NA	0.017	NA	NA	2000.8	18.4	75-27-4	N/A	ori-rat 916mg/kg
18. Dibromochloromethane	35171	100220	0.05	5.00	40007.7	2000	NA	NA	0.017	NA	NA	2000.3	18.4	124-48-1	N/A	ori-rat 848mg/kg
19. cis-1,2-Dichloroethane	35171	100220	0.05	5.00	40012.4	2000	NA	NA	0.017	NA	NA	2000.5	18.4	156-59-2	N/A	N/A
20. trans-1,2-Dichloroethane	35171	100220	0.05	5.00	40005.6	2000	NA	NA	0.017	NA	NA	2000.2	18.4	156-60-5	N/A	ori-rat 1235mg/kg
21. Methylene chloride	35171	100220	0.05	5.00	40013.9	2000	NA	NA	0.017	NA	NA	2000.6	18.4	75-09-2	500 ppm	ori-rat 820mg/kg
22. 1,1-Dichloroethane	32251	031821	0.10	10.00	20009.1	2000	NA	NA	0.042	NA	NA	2000.8	19.3	75-35-4	1 ppm (4mg/m3/8H)	ori-rat 200mg/kg
23. Bromoform	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	75-25-2	0.5 ppm (5mg/m3) (skin)	ori-rat 933mg/kg
24. Carbon tetrachloride	95321	010419	0.10	10.00	20001.3	2000	NA	NA	0.042	NA	NA	2000.0	19.2	56-23-5	2 ppm (12.6mg/m3/8H)	ori-rat 2350mg/kg
25. Chloroform	95321	010419	0.10	10.00	20001.8	2000	NA	NA	0.042	NA	NA	2000.1	19.2	67-66-3	50 ppm (240mg/m3) (CL)	ori-rat 908mg/kg
26. Dibromomethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	74-95-3	N/A	ori-rat 108mg/kg
27. 1,1-Dichloroethane	95321	010419	0.10	10.00	20000.8	2000	NA	NA	0.042	NA	NA	2000.0	19.3	75-34-3	100 ppm	ori-rat 725mg/kg
28. 2,2-Dichloropropane	95321	010419	0.10	10.00	20002.1	2000	NA	NA	0.042	NA	NA	2000.1	19.3	594-20-7	N/A	N/A
29. Tetrachloroethene	95321	010419	0.10	10.00	20002.2	2000	NA	NA	0.042	NA	NA	2000.1	19.3	127-18-4	25 ppm (170mg/m3/8H) (final)	ori-rat 2629mg/kg
30. 1,1,1-Trichloroethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	71-55-6	350 ppm (1900mg/m3/8H)	ori-rat 10300mg/kg
31. 1,2-Dibromo-3-chloropropane	35161	011421	0.05	5.00	40001.2	2000	NA	NA	0.017	NA	NA	2000.0	18.4	96-12-8	0.001 ppm	ori-rat 170mg/kg
32. 1,2-Dibromoethane	35161	011421	0.05	5.00	40003.9	2000	NA	NA	0.017	NA	NA	2000.1	18.4	106-93-4	20 ppm (8H)	ori-rat 108mg/kg
33. 1,2-Dichloroethane	35161	011421	0.05	5.00	40004.9	2000	NA	NA	0.017	NA	NA	2000.1	18.4	107-06-2	50 ppm (8H)	ori-rat 670mg/kg
34. 1,2-Dichloropropane	35161	011421	0.05	5.00	40002.2	2000	NA	NA	0.017	NA	NA	2000.0	18.4	78-87-5	75 ppm (350mg/m3/8H)	ori-rat 1947mg/kg
35. 1,3-Dichloropropane	35161	011421	0.05	5.00	40013.9	2000	NA	NA	0.017	NA	NA	2000.6	18.4	142-28-9	N/A	uni-mus 3800mg/kg
36. 1,1-Dichloropropene	35161	011421	0.05	5.00	40015.0	2000	NA	NA	0.017	NA	NA	2000.7	26.1	563-58-6	N/A	N/A
37. cis-1,3-Dichloropropene	35161	011421	0.05	5.00	40004.4	2000	NA	NA	0.017	NA	NA	2000.1	18.4	10061-01-5	N/A	N/A
38. trans-1,3-Dichloropropene	35161	011421	0.05	5.00	40009.1	2000	NA	NA	0.017	NA	NA	2000.4	18.5	10061-02-6	N/A	N/A
39. Hexachloro-1,3-butadiene	35161	011421	0.05	5.00	40003.5	2000	NA	NA	0.017	NA	NA	2000.1	26.4	87-68-3	0.02 ppm (0.24mg/m3/8H)	ori-rat 82mg/kg
40. 1,1,1,2-Tetrachloroethane	35161	011421	0.05	5.00	40011.9	2000	NA	NA	0.017	NA	NA	2000.5	18.4	830-20-6	N/A	ori-rat 670mg/kg
41. 1,1,2,2-Tetrachloroethane	35161	011421	0.05	5.00	40011.0	2000	NA	NA	0.017	NA	NA	2000.5	18.4	79-34-5	5 ppm (35mg/m3/8H) (skin)	ori-rat 800mg/kg
42. 1,1,2-Trichloroethane	35161	011421	0.05	5.00	40000.8	2000	NA	NA	0.017	NA	NA	1999.9	18.4	79-00-5	10 ppm (46mg/m3/8H) (skin)	ori-rat 838mg/kg
43. Trichloroethene	35161	011421	0.05	5.00	40003.2	2000	NA	NA	0.017	NA	NA	2000.1	18.4	79-01-6	50 ppm (270mg/m3/8H)	ori-mus 2402mg/kg
44. 1,2,3-Trichloropropane	35161	011421	0.05	5.00	40015.2	2000	NA	NA	0.017	NA	NA	2000.7	18.4	96-18-4	10 ppm (60mg/m3/8H)	ori-rat 149.6mg/kg
45. Benzene	35162	020821	0.05	5.00	40008.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	71-43-2	1 ppm	ori-rat 4894mg/kg
46. Bromobenzene	35162	020821	0.05	5.00	40019.0	2000	NA	NA	0.017	NA	NA	2000.9	18.4	108-86-1	N/A	ori-rat 2899mg/kg
47. n-Butyl benzene	35162	020821	0.05	5.00	40019.8	2000	NA	NA	0.017	NA	NA	2000.9	18.4	104-51-8	N/A	N/A
48. Ethyl benzene	35162	020821	0.05	5.00	40009.9	2000	NA	NA	0.017	NA	NA	1999.9	18.4	100-41-4	100 ppm (435mg/m3/8H)	ori-rat >2000mg/kg
49. p-Isopropyl toluene	35162	020821	0.05	5.00	40056.4	2000	NA	NA	0.017	NA	NA	2002.7	18.4	99-87-6	N/A	ori-rat 4750mg/kg
50. Naphthalene	35162	020821	0.05	5.00	40005.1	2000	NA	NA	0.017	NA	NA	2000.2	18.3	91-20-3	10 ppm (50mg/m3/8H)	ori-rat 490mg/kg
51. Styrene	35162	020821	0.05	5.00	40022.8	2000	NA	NA	0.017	NA	NA	2001.0	18.4	100-42-5	100 ppm	ori-rat 5000mg/kg
52. Toluene	35162	020821	0.05	5.00	40008.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	108-88-3	200 ppm	ori-rat 5000mg/kg
53. 1,2,3-Trichlorobenzene	35162	020821	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	87-61-6	N/A	lpr-mus 1390mg/kg
54. 1,2,4-Trichlorobenzene	35162	020821	0.05	5.00	40027.4	2000	NA	NA	0.017	NA	NA	2001.3	18.4	120-82-1	5 ppm (CL) (40mg/m3)	ori-rat 756mg/kg
55. 1,2,4-Trimethylbenzene	35162	020821	0.05	5.00	40012.4	2000	NA	NA	0.017	NA	NA	2000.5	18.4	95-63-6	N/A	ori-rat 5g/kg
56. 1,3,5-Trimethylbenzene	35162	020821	0.05	5.00	40011.5	2000	NA	NA	0.017	NA	NA	2000.5	18.5	108-67-8	N/A	ori-rat 5000mg/kg
57. m-Xylene	35162	020821	0.05	5.00	40021.8	2000	NA	NA	0.017	NA	NA	2001.0	18.4	108-38-3	100 ppm (435mg/m3/8H)	ori-rat 5g/kg
58. tert-Butyl benzene	35163	022521	0.05	5.00	40005.9	2000	NA	NA	0.017	NA	NA	2000.2	18.4	88-06-6	N/A	N/A
59. sec-Butyl benzene	35163	022521	0.05	5.00	40011.7	2000	NA	NA	0.017	NA	NA	2000.5	18.4	135-98-8	N/A	ori-rat 2240mg/kg
60. Chlorobenzene	35163	022521	0.05	5.00	40009.0	2000	NA	NA	0.017	NA	NA	2000.4	18.4	108-90-7	75 ppm (350mg/m3/8H)	ori-rat 2290mg/kg
61. 2-Chlorotoluene	35163	022521	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	95-49-8	50 ppm (250mg/m3/8H)	ori-rat 3900mg/kg
62. 4-Chlorotoluene	35163	022521	0.05	5.00	40000.4	2000	NA	NA	0.017	NA	NA	1999.9	18.4	106-43-4	N/A	ori-rat 2100mg/kg
63. 1,2-Dichlorobenzene	35163	022521	0.05	5.00	40004.0	2000	NA	NA	0.017	NA	NA	2000.1	18.4	95-50-1	50 ppm (300mg/m3) (CL)	ori-rat 800mg/kg
64. 1,3-Dichlorobenzene	35163	022521	0.05	5.00	40003.6	2000	NA	NA	0.017	NA	NA	2000.1	18.4	541-73-1	N/A	lpr-mus 1062mg/kg
65. 1,4-Dichlorobenzene	35163	022521</														



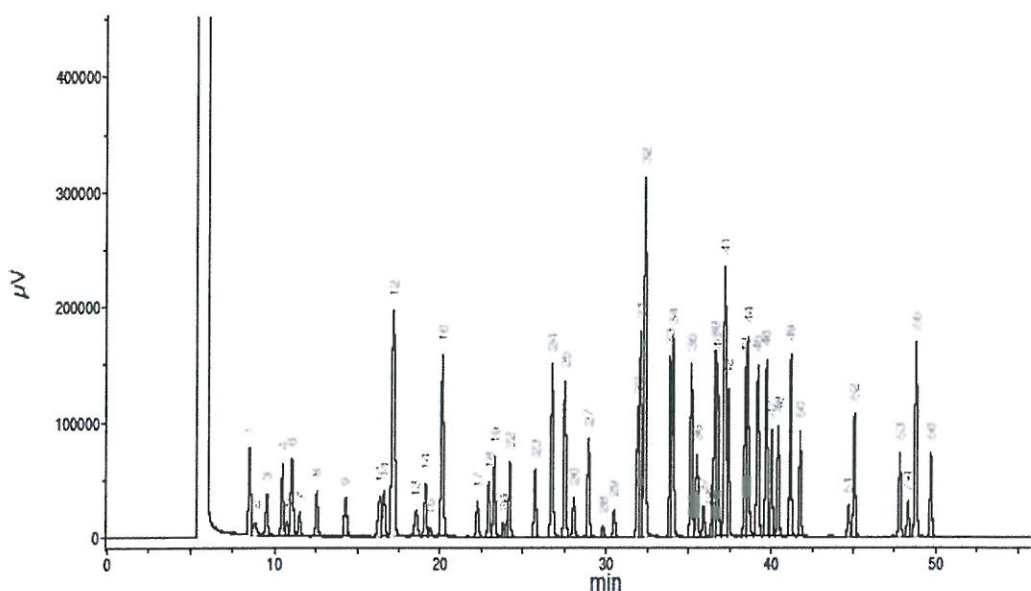


**Run 22, "P95317 L042921 [2000µg/mL in MeOH]"**

Run Length: 60.00 min, 35999 points at 10 points/second.  
Created: Thu, Apr 29, 2021 at 3:49:30 PM.  
Sampled: Sequence "042521-GC5M1", Method "GC5-M1".  
Analyzed using Method "GC5-M1".

**Comments**

GC5-M1 Analysis by Candice Warren  
Column ID SPB-Voccol 105 meter X 0.53mm X 3.0µm film thickness  
Flow rates: Total flow=290mL/min., Helium (carrier)=10mL/min.,  
Hydrogen(make-up)=40mL/min., Air(make-up)=230mL/min.  
Oven Profile: Temp. 1=35°C (Time 1=10 min.), Temp 2=200°C (Time 2=8.75 min.),  
Rate = 4°C/min., Total run time=60 min. Injector temp.=200°C, FID Temp.=200°C.  
FID Signal = Edaq Channel 1  
Standard injection = 0.5µL, Range=4



Peak #	Analyte	FID RT (min.)
1	Ether	8.48
2	1,1,2-Trichloro-1,2,2-trifluoroethane	8.80
3	1,1-Dichloroethane	9.51
4	Acetonitrile	10.44
5	Iodomethane	10.71
6	Aryl chloride	11.02
7	Carbon disulfide/Methylene chloride	11.51
8	trans-1,2-Dichloroethane	12.55
9	1,1-Dichloroethane	14.28
10	2,2-Dichloropropane	16.33
11	cis-1,2-Dichloroethane	16.59
12	Methacrylonitrile/Methyl acrylate/Chloroform	17.14
13	Isobutanol/1,1,1-Trichloroethane	18.52
14	1,1-Dichloropropane	19.08
15	Carbon tetrachloride	19.39
16	Benzene/1,2-Dichloroethane	20.10
17	Trichloroethane	22.23
18	1,2-Dichloropropane	22.92
19	Methyl methacrylate	23.26
20	Bromochloromethane	23.79
21	Dibromomethane	23.96
22	2-Nitropropane	24.18
23	cis-1,3-Dichloropropene	25.71
24	Thiurea	26.71
25	Ethyl methacrylate/trans-1,3-Dichloropropene	27.50
26	1,1,2-Trichloroethane	28.04
27	Tetrachloroethane/1,2-Dichloropropane	28.92
28	Dibromochloromethane	29.79
29	1,2-Dibromomethane	30.46
30	Chlorobenzene	31.89
31	Ethylbenzene/1,1,1,2-Tetrachloroethane	32.07
32	m-Xylene/p-Xylene	32.33
33	o-Xylene	33.87
34	Styrene	34.04
35	Isopropylbenzene/Bromofarm	35.14
36	cis-1,4-Dichloro-2-butene	35.49
37	1,1,2,2-Tetrachloroethane	35.90
38	1,2,3-Trichloropropane	36.34
39	n-Propylbenzene	36.50
40	trans-1,4-Dichloro-2-butene/Bromobenzene	36.73
41	1,3,5-Trimethylbenzene/2-Chlorotoluene	37.17
42	4-Chlorotoluene	37.38
43	tert-Butylbenzene	38.41
44	1,2,4-Trimethylbenzene/Pentachloroethane	38.55
45	sec-Butylbenzene	39.16
46	p-Isopropylbenzene	39.68
47	1,3-Dichlorobenzene	40.01
48	1,4-Dichlorobenzene	40.42
49	m-Butylbenzene	41.15
50	1,2-Dichlorobenzene	41.74
51	1,2-Dichloro-3-chloropropane	42.66
52	Nitrobenzene	43.04
53	1,2,4-Trichlorobenzene	47.80
54	Hexachlorocyclopentadiene	48.29
55	Asphaltene	48.76
56	1,2,3-Trichlorobenzene	49.66

## Safety Data Sheet (SDS)

GHS/OSHA Compliant

## Section I Product and Company Identification

## IDENTITY ANALYTICAL STANDARD DISSOLVED IN METHANOL

Manufacturer's Name	ABSOLUTE STANDARDS INC	Emergency Telephone USA & CANADA	1-800-535-5053
Address	44 Rossotto Dr. Hamden CT, 06514	Emergency Telephone International	1-352-323-3500
		Date Prepared/Revised	May 1, 2019

## Section II - Hazards Identification

## GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

H225	Highly Flammable Liquid and Vapor	H301, 311, 331	Toxic if swallowed, skin contact, inhaled
H370	Cause damage to organs	H351	Suspected of causing cancer
P271	Use in ventilated area	P280	Use gloves, eye protection/face shield
P302,332	If on skin, wash with soap and water	P305,351,338	If in eyes, remove contacts, rinse with water



Signal Word: DANGER

## Section III - Composition

Components (Specific Chemical Identity; Common Name(s))		% (optional)
Methanol	METHYL ALCOHOL	> 97
	CAS#: 67-56-1	

See Certified Weight Report For Other Analytes Present At Trace Quantities.

INTENDED USE: REFERENCE MATERIAL

## Section IV. FIRST AID MEASURES

General advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.
If inhaled	If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact	Wash with soap and water. Consult a physician.
In case of eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed	Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

## Section V. FIREFIGHTING MEASURES

Flammability	Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.
Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Protective equipment for fire	Wear self contained breathing apparatus for fire fighting if necessary.

## Section VI. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Clean up	Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

## Section VII. HANDLING AND STORAGE

Precautions for safe handling	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use ventilation. Keep away from sources of ignition. No smoking. Prevent the build up of electrostatic charge.
Storage Conditions	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

## Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Methanol	67-56-1 TWA 200 ppm
Skin notation	TWA 200 ppm
Potential for skin absorption, ingestion and inhalation.	
Personal protective equipment	Respiratory protection
Avoid contact with skin, eyes and clothing. Wash hands thoroughly after handling the product.	Handle with gloves. Gloves must be inspected prior to use. Eye protection.

## Section IX - Physical/Chemical Characteristics

Boiling Point	65°C	Specific Gravity (H2O = 1)	0.79
Vapor Pressure (mm Hg)	96	Melting Point	-98°C
Vapor Density (AIR = 1)	1.11	Evaporation rate (Butyl Acetate = 1)	4.6
Solubility in Water	COMPLETE		
Appearance and Odor	CLEAR, COLORLESS LIQUID WITH CHARACTERISTIC PUNGENT ODOR.		

**Section X. STABILITY AND REACTIVITY**

Chemical stability	Stable under recommended storage conditions.
Possibility of hazardous reactions	Vapours may form explosive mixture with air.
Conditions to avoid	Heat, flames, sparks, extreme temperature and sunlight.
Materials to avoid	Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids
Hazardous decomposition products formed under fire conditions.	- Carbon oxides

**Section XI. TOXICOLOGICAL INFORMATION**

LD50 Oral - rat - 5,628 mg/kg  
LC50 Inhalation - rat - 4 h - 64000 ppm  
LD50 Dermal - rabbit - 15,800 mg/kg  
Toxic if absorbed through skin. Causes skin irritation.  
Eye damage/eye irritation  
Toxic if inhaled. Causes respiratory tract irritation.  
Toxic if swallowed.

**Section XII. ECOLOGICAL INFORMATION FOR REPORTABLE QUANTITY OF 5000 lbs.**

LC50 15,400 mg/l - 96 h  
EC50 24,500.00 mg/l - 48 h  
EC100 10,000.00 mg/l - 24 h

**Section XIII. DISPOSAL CONSIDERATIONS**

Dispose with normal Laboratory Solvent Waste.

**Section XIV. TRANSPORT INFORMATION**

DOT (US)	IATA
UN number: 1230 Class: 3 Packing group: II	UN number: 1230 Class: 3 Packing group: II
Proper shipping name: Methanol	Proper shipping name: Methanol

**Section XV. REGULATORY INFORMATION**

OSHA Hazards Flammable liquid, Target Organ Effect, Toxic by inhalation., Toxic by ingestion, Toxic by skin absorption, Irritant  
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**Section XVI. Misc. INFORMATION**

The information in this Material Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and Global Harmonized System (GHS). This document is intended only as a guide to the appropriate precautionary handling of the material by trained personnel, or supervised by a person trained in chemical handling. The user is responsible for determining the precautions and dangers of this chemical for his or her particular application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, ABSOLUTE STANDARDS INC. cannot warn of all the potential dangers of use or interaction with other chemicals or substances. ABSOLUTE STANDARDS INC. warrants that the chemical meets the specifications set forth on the label. ABSOLUTE STANDARDS INC DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR APPLICATION. The user should recognize that this product can cause severe injury or death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION. As new documented general safety information becomes available, Absolute Standards Inc. will periodically revise this Safety Data Sheet. If you have any questions, please call Technical Service at 1-203-281-2917 for assistance.



110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

*This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.*

Catalog No. : 30067 Lot No.: A0147670

Description : 4-Bromofluorobenzene Standard

4-Bromofluorobenzene Standard 2,500µg/mL, P&T Methanol,  
1mL/ampul

Container Size : 2 mL Pkg Amt: > 1 mL

Expiration Date : April 30, 2024 Storage: 0°C or colder

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	1-Bromo-4-fluorobenzene (BFB)	2,511.0 µg/mL	+/-	14.7360	µg/mL	Gravimetric
	CAS # 460-00-4 (Lot 20401KO)		+/-	140.8035	µg/mL	Unstressed
	Purity 99%		+/-	144.0975	µg/mL	Stressed

Solvent: P&T Methanol  
CAS # 67-56-1  
Purity 99%

**Column:**

105m x 0.53mm x 3.0µm  
Rtx-502.2 (cat.#10910)

**Carrier Gas:**

hydrogen-constant pressure 11.0 psi.

**Temp. Program:**

40°C (hold 2 min.) to 240°C  
@ 8°C/min. (hold 5 min.)

**Inj. Temp:**

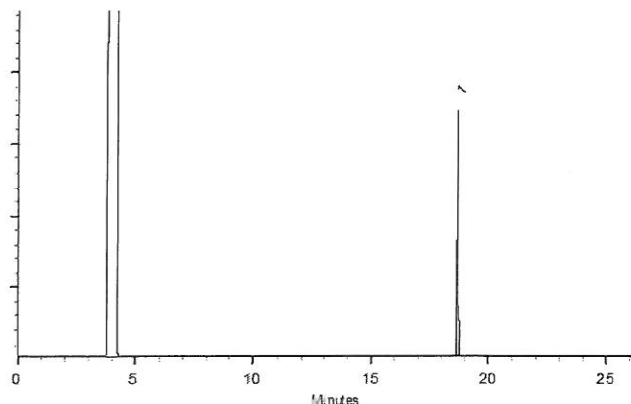
200°C

**Det. Temp:**

250°C

**Det. Type:**

FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

*Dustin J. Lidgett*

Dustin Lidgett - Mix Technician

Date Mixed: 01-Apr-2019

Balance: 1127510105

*Justin Albertson*  
Justin Albertson - Operations Tech-ARM QC

Date Passed: 04-Apr-2019

Manufactured under Restek's ISO 9001:2015  
Registered Quality System  
Certificate #FM 80397



## General Certified Reference Material Notes

### Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

### Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/ $\mu$ ECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value ( includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k \sqrt{U_{gravimetric}^2 + U_{homogeneity}^2 + U_{storage\ stability}^2 + U_{shipping\ stability}^2}$$

$k$  is a coverage factor of 2, which gives a level of confidence of approximately 95%.

- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at [www.restek.com/Contact-Us](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

### Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.







Certified Reference Material CRM



ANAB ISO 17034 Accredited  
AR-1539 Certificate Number  
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

Part Number: **91980**  
Lot Number: **112822**  
Description: **Acrolein**

Solvent(s):  
Water  
Lot#  
102422Q

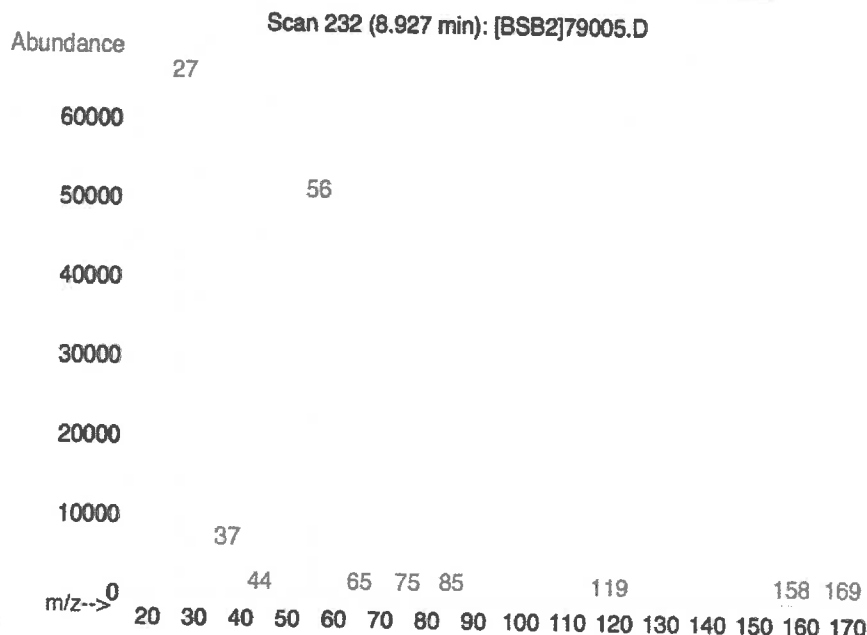
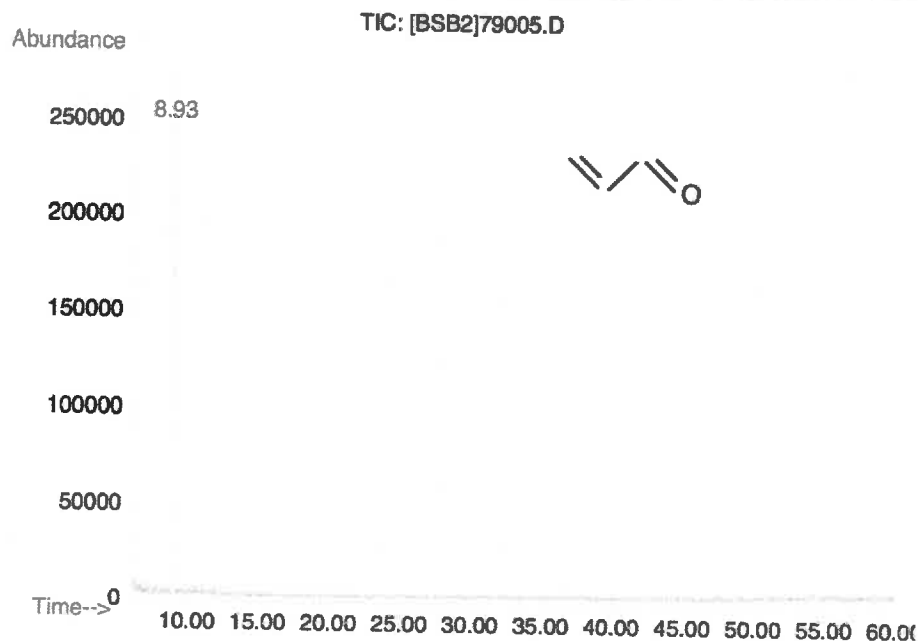
Expiration Date: **122822**  
Recommended Storage: **Refrigerate (4 °C)**  
Nominal Concentration (µg/mL): **5000**  
NIST Test ID#: **6UTB**

Weight(s) shown below were combined and diluted to (mL): **10.0**  
5E-05 Balance Uncertainty  
0.002 Flask Uncertainty

		112822
Formulated By:	Benson Chan	DATE
		112822
Reviewed By:	Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)		
										CAS#	OSHA PEL (TWA)	LD50
1. Acrolein	5	103755R09M	5000	97.1	0.5	0.05180	0.05167	5008.3	52.5	107-02-8	0.1 ppm	ort-rat 46mg/kg

Method: GC6MSD-1. Detector: Mass Selective Detector (Scan mode). Column: Vocol (60m X 0.25mm ID X 1.5µm film thickness). Oven Profile: Temp. 1 = 35°C (Time 1 = 10min.), Temp. 2=200°C (Time 2 = 8.75 min.). Rate = 4°C/min., Injector Temp. = 200°C, Detector Temp. = 220°C. Analyst: Pedro Rentas. NOTE: Due to the instability of acrolein in solution, all solutions of acrolein, and any dilutions thereof, should be used immediately. Long term storage is not recommended. Please contact our technical department if further information is required.



- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).



## Safety Data Sheet (SDS) GHS/OSHA Compliant

## Section I Product and Company Identification

<b>IDENTITY</b>	<b>ANALYTICAL STANDARD DISSOLVED IN WATER</b>
Manufacturer's Name	ABSOLUTE STANDARDS INC
Address	44 Rosotto Dr. Hamden CT, 06514
	Emergency Telephone USA & CANADA Emergency Telephone International Date Prepared/Revised
	1-800-535-5053 1-352-323-3500 May 1, 2022

## Section II - Hazards Identification

P271 Use in ventilated area  
P302,332 If on skin, wash with soap and water

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**  
H315 Causes skin and eye irritation.  
P280 Use gloves, eye protection/face shield  
P305,351,338 If in eyes, remove contacts, rinse with water



Signal Word: DANGER

## Section III - Composition

Components (Specific Chemical Identity; Common Name(s))  
WaterCAS#: 7732-18-5  
% (optional)  
> 97

## See Certified Weight Report For Other Analytes Present At Trace Quantities.

## INTENDED USE: REFERENCE MATERIAL

## Section IV. FIRST AID MEASURES

General advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.
If inhaled	If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact	Wash with soap and water. Consult a physician.
In case of eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed	Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

## Section V. FIREFIGHTING MEASURES

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Protective equipment for fire	Wear self contained breathing apparatus for fire fighting if necessary.
Hazardous Decomposition products	Carbon oxides

## Section VI. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Clean up	Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

## Section VII. HANDLING AND STORAGE

Precautions for safe handling	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use ventilation. Keep away from sources of ignition. No smoking. Prevent the build up of electrostatic charge.
Storage Conditions	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

## Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Water	CAS#: 7732-18-5	TWA: 500 ppm
Personal protective equipment	Respiratory protection	Handle with gloves. Gloves must be inspected prior to use. Eye protection.
Avoid contact with skin, eyes and clothing.	Wash hands thoroughly after handling the product.	

## Section IX - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point		Specific Gravity (H <sub>2</sub> O = 1)	
Vapor Pressure (mm Hg)	100°C	Melting Point	1

**Absolute Standards Inc.**

PO Box 5585  
Hamden, CT 06518-0585

Phone: 203-281-2917  
FAX: 203-281-2922

Vapor Density (AIR = 1)	NA	Evaporation rate (Butyl Acetate = 1)	0°C
Solubility in Water	NA		NA

Completely miscible

Appearance and Odor CLEAR, COLORLESS LIQUID WITH SLIGHT CHEMICAL ODOR.

**Section X. STABILITY AND REACTIVITY**

Chemical stability Stable under recommended storage conditions.  
Possibility of hazardous reactions NA  
Conditions to avoid NA  
Materials to avoid NA  
Hazardous decomposition products - No data available

**Section XI. TOXICOLOGICAL INFORMATION**

LD50 Oral - Rat NA  
LC50 Inhalation - Rat NA  
LD50 Dermal - Guinea pig NA  
Causes skin irritation.  
Eye irritation

**Section XII. ECOLOGICAL INFORMATION**

LC50 NA  
EC50 NA

**Section XIII. DISPOSAL CONSIDERATIONS**

Dispose with normal Laboratory Solvent Waste.

**Section XIV. TRANSPORT INFORMATION**

DOT (US)  
Not dangerous goods  
Proper shipping name: Water  
  
IATA  
Not dangerous goods  
Proper shipping name: Water

**Section XV. REGULATORY INFORMATION**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**Section XVI. Misc. INFORMATION**

The information in this Material Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated thereunder (29 CFR 1910.1200 et seq.) and Global Harmonized System (GHS). This document is intended only as a guide to the appropriate precautionary handling of the material by trained personnel, or supervised by a person trained in chemical handling. The user is responsible for determining the precautions and dangers of this chemical for his or her particular application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, ABSOLUTE STANDARDS INC. cannot warn of all the potential dangers of use or interaction with other chemicals or substances. ABSOLUTE STANDARDS INC. warrants that the chemical meets the specifications set forth on the label. ABSOLUTE STANDARDS INC DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR APPLICATION. The user should recognize that this product can cause severe injury or death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION. As new documented general safety information becomes available, Absolute Standards Inc. will periodically revise this Material Safety Data Sheet. If you have any questions, please call Technical Service at 1-203-281-2917 for assistance.



Certified Reference Material CRM



ANAB ISO 17034 Accredited  
AR-1539 Certificate Number  
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

Part Number: **91980**  
Lot Number: **112822**  
Description: **Acrolein**

Solvent(s):  
Water  
Lot#  
102422Q

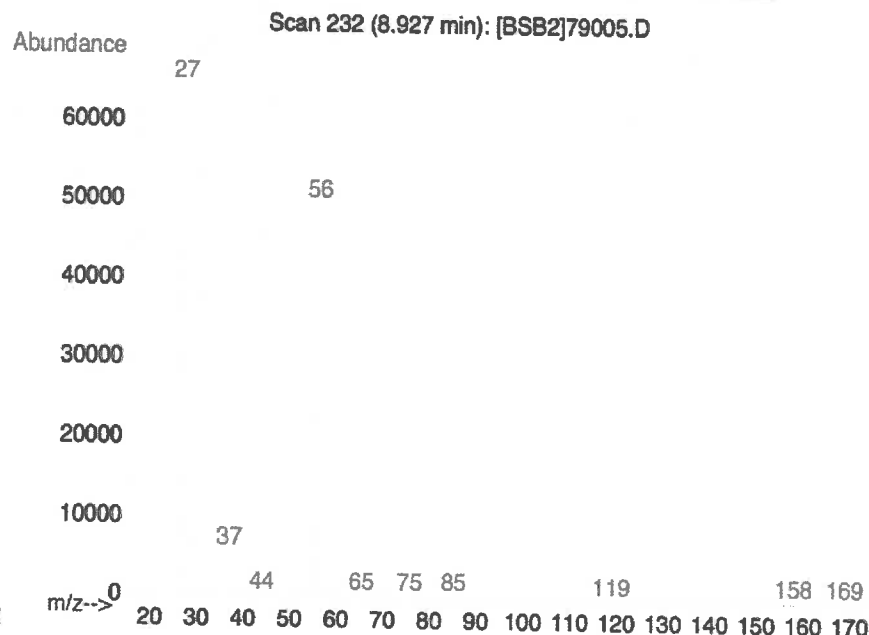
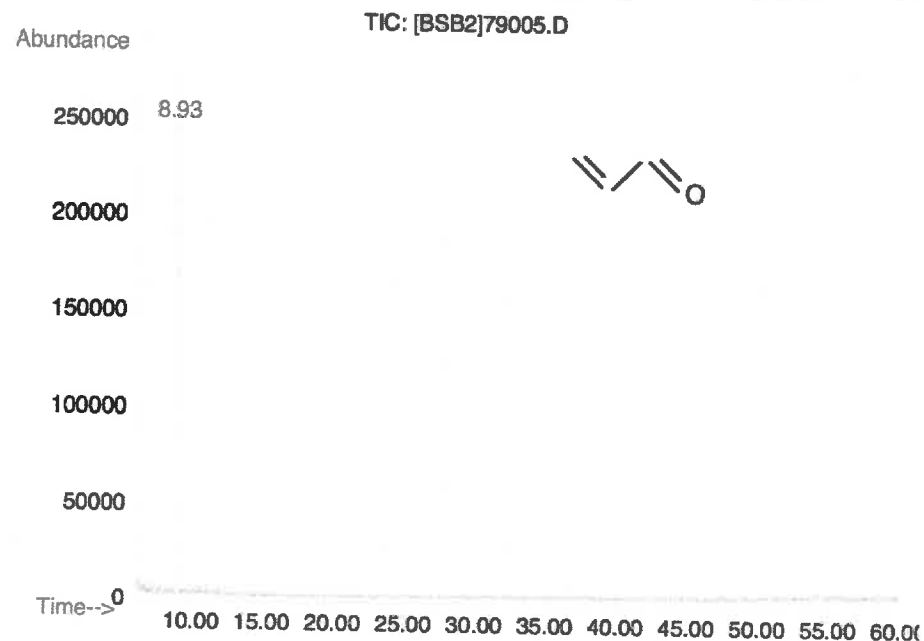
Expiration Date: **122822**  
Recommended Storage: **Refrigerate (4 °C)**  
Nominal Concentration (µg/mL): **5000**  
NIST Test ID#: **6UTB**

Weight(s) shown below were combined and diluted to (mL): **10.0**  
5E-05 Balance Uncertainty  
0.002 Flask Uncertainty

		112822
Formulated By:	Benson Chan	DATE
		112822
Reviewed By:	Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)		
										CAS#	OSHA PEL (TWA)	LD50
1. Acrolein	5	103755R09M	5000	97.1	0.5	0.05180	0.05167	5008.3	52.5	107-02-8	0.1 ppm	ort-rat 46mg/kg

Method: GC6MSD-1. Detector: Mass Selective Detector (Scan mode). Column: Vocol (60m X 0.25mm ID X 1.5µm film thickness). Oven Profile: Temp. 1 = 35°C (Time 1 = 10min.), Temp. 2=200°C (Time 2 = 8.75 min.). Rate = 4°C/min., Injector Temp. = 200°C, Detector Temp. = 220°C. Analyst: Pedro Rentas. NOTE: Due to the instability of acrolein in solution, all solutions of acrolein, and any dilutions thereof, should be used immediately. Long term storage is not recommended. Please contact our technical department if further information is required.



- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).



## Safety Data Sheet (SDS) GHS/OSHA Compliant

## Section I Product and Company Identification

<b>IDENTITY</b>	<b>ANALYTICAL STANDARD DISSOLVED IN WATER</b>
Manufacturer's Name	ABSOLUTE STANDARDS INC
Address	44 Rosotto Dr. Hamden CT, 06514
	Emergency Telephone USA & CANADA Emergency Telephone International Date Prepared/Revised
	1-800-535-5053 1-352-323-3500 May 1, 2022

## Section II - Hazards Identification

P271 Use in ventilated area  
P302,332 If on skin, wash with soap and water

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**  
H315 Causes skin and eye irritation.  
P280 Use gloves, eye protection/face shield  
P305,351,338 If in eyes, remove contacts, rinse with water



Signal Word: DANGER

## Section III - Composition

Components (Specific Chemical Identity; Common Name(s))  
WaterCAS#: 7732-18-5  
% (optional)  
> 97

## See Certified Weight Report For Other Analytes Present At Trace Quantities.

## INTENDED USE: REFERENCE MATERIAL

## Section IV. FIRST AID MEASURES

General advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.
If inhaled	If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact	Wash with soap and water. Consult a physician.
In case of eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed	Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

## Section V. FIREFIGHTING MEASURES

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Protective equipment for fire	Wear self contained breathing apparatus for fire fighting if necessary.
Hazardous Decomposition products	Carbon oxides

## Section VI. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Clean up	Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

## Section VII. HANDLING AND STORAGE

Precautions for safe handling	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use ventilation. Keep away from sources of ignition. No smoking. Prevent the build up of electrostatic charge.
Storage Conditions	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

## Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Water	CAS#: 7732-18-5	TWA: 500 ppm
Personal protective equipment	Respiratory protection	Handle with gloves. Gloves must be inspected prior to use. Eye protection.
Avoid contact with skin, eyes and clothing.	Wash hands thoroughly after handling the product.	

## Section IX - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point		Specific Gravity (H <sub>2</sub> O = 1)	
Vapor Pressure (mm Hg)	100°C	Melting Point	1

**Absolute Standards Inc.**

PO Box 5585  
Hamden, CT 06518-0585

Phone: 203-281-2917  
FAX: 203-281-2922

Vapor Density (AIR = 1)	NA	Evaporation rate (Butyl Acetate = 1)	0°C
Solubility in Water	NA		NA

Completely miscible

Appearance and Odor CLEAR, COLORLESS LIQUID WITH SLIGHT CHEMICAL ODOR.

**Section X. STABILITY AND REACTIVITY**

Chemical stability Stable under recommended storage conditions.  
Possibility of hazardous reactions NA  
Conditions to avoid NA  
Materials to avoid NA  
Hazardous decomposition products - No data available

**Section XI. TOXICOLOGICAL INFORMATION**

LD50 Oral - Rat NA  
LC50 Inhalation - Rat NA  
LD50 Dermal - Guinea pig NA  
Causes skin irritation.  
Eye irritation

**Section XII. ECOLOGICAL INFORMATION**

LC50 NA  
EC50 NA

**Section XIII. DISPOSAL CONSIDERATIONS**

Dispose with normal Laboratory Solvent Waste.

**Section XIV. TRANSPORT INFORMATION**

DOT (US)  
Not dangerous goods  
Proper shipping name: Water  
  
IATA  
Not dangerous goods  
Proper shipping name: Water

**Section XV. REGULATORY INFORMATION**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**Section XVI. Misc. INFORMATION**

The information in this Material Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated thereunder (29 CFR 1910.1200 et seq.) and Global Harmonized System (GHS). This document is intended only as a guide to the appropriate precautionary handling of the material by trained personnel, or supervised by a person trained in chemical handling. The user is responsible for determining the precautions and dangers of this chemical for his or her particular application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, ABSOLUTE STANDARDS INC. cannot warn of all the potential dangers of use or interaction with other chemicals or substances. ABSOLUTE STANDARDS INC. warrants that the chemical meets the specifications set forth on the label. ABSOLUTE STANDARDS INC DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR APPLICATION. The user should recognize that this product can cause severe injury or death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION. As new documented general safety information becomes available, Absolute Standards Inc. will periodically revise this Material Safety Data Sheet. If you have any questions, please call Technical Service at 1-203-281-2917 for assistance.





**CERTIFIED WEIGHT REPORT**

Part Number: **91980**  
Lot Number: **112822**  
Description: **Acrolein**

Solvent(s):  
Water  
Lot#  
102422Q

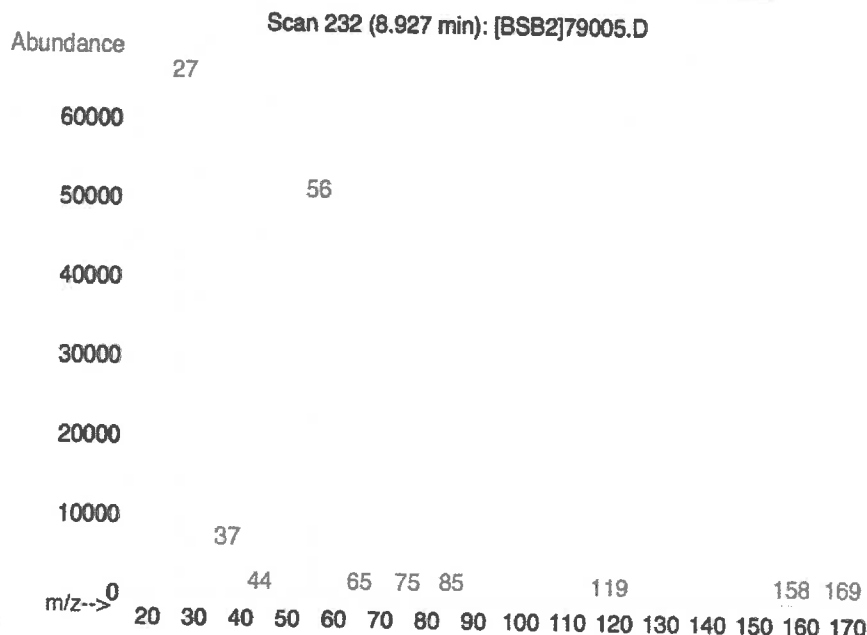
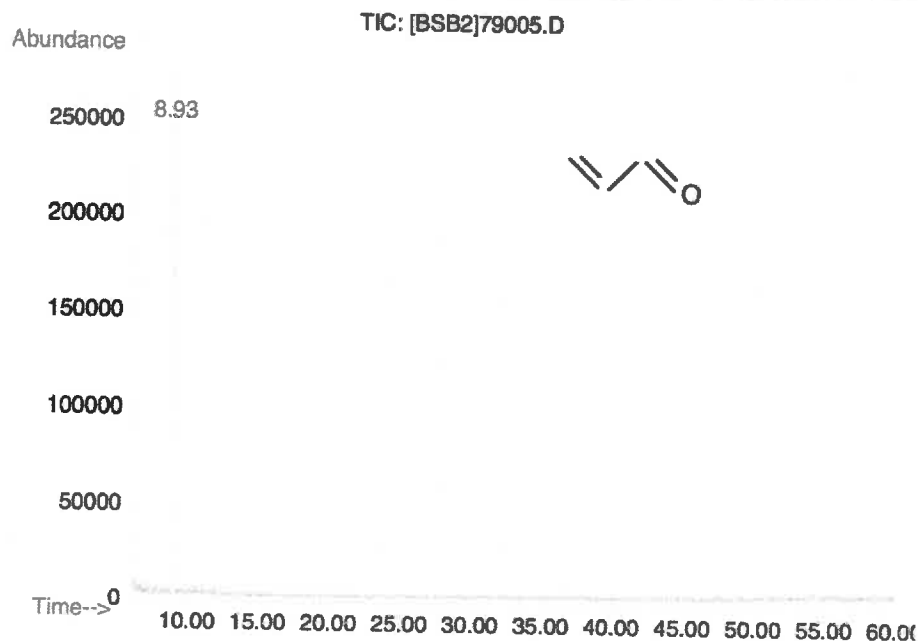
Expiration Date: **122822**  
Recommended Storage: **Refrigerate (4 °C)**  
Nominal Concentration (µg/mL): **5000**  
NIST Test ID#: **6UTB**

Weight(s) shown below were combined and diluted to (mL): **10.0**  
5E-05 Balance Uncertainty  
0.002 Flask Uncertainty

		112822
Formulated By:	Benson Chan	DATE
		112822
Reviewed By:	Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)		
										CAS#	OSHA PEL (TWA)	LD50
1. Acrolein	5	103755R09M	5000	97.1	0.5	0.05180	0.05167	5008.3	52.5	107-02-8	0.1 ppm	ort-rat 46mg/kg

Method: GC6MSD-1. Detector: Mass Selective Detector (Scan mode). Column: Vocol (60m X 0.25mm ID X 1.5µm film thickness). Oven Profile: Temp. 1 = 35°C (Time 1 = 10min.), Temp. 2=200°C (Time 2 = 8.75 min.). Rate = 4°C/min., Injector Temp. = 200°C, Detector Temp. = 220°C. Analyst: Pedro Rentas. NOTE: Due to the instability of acrolein in solution, all solutions of acrolein, and any dilutions thereof, should be used immediately. Long term storage is not recommended. Please contact our technical department if further information is required.



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## Safety Data Sheet (SDS) GHS/OSHA Compliant

## Section I Product and Company Identification

<b>IDENTITY</b>	<b>ANALYTICAL STANDARD DISSOLVED IN WATER</b>
Manufacturer's Name	ABSOLUTE STANDARDS INC
Address	44 Rosotto Dr. Hamden CT, 06514
	Emergency Telephone USA & CANADA Emergency Telephone International Date Prepared/Revised
	1-800-535-5053 1-352-323-3500 May 1, 2022

## Section II - Hazards Identification

P271 Use in ventilated area  
P302,332 If on skin, wash with soap and water

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**  
H315 Causes skin and eye irritation.  
P280 Use gloves, eye protection/face shield  
P305,351,338 If in eyes, remove contacts, rinse with water



Signal Word: DANGER

## Section III - Composition

Components (Specific Chemical Identity; Common Name(s))  
WaterCAS#: 7732-18-5  
% (optional)  
> 97

## See Certified Weight Report For Other Analytes Present At Trace Quantities.

## INTENDED USE: REFERENCE MATERIAL

## Section IV. FIRST AID MEASURES

General advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.
If inhaled	If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact	Wash with soap and water. Consult a physician.
In case of eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed	Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

## Section V. FIREFIGHTING MEASURES

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Protective equipment for fire	Wear self contained breathing apparatus for fire fighting if necessary.
Hazardous Decomposition products	Carbon oxides

## Section VI. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.
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Clean up	Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

## Section VII. HANDLING AND STORAGE

Precautions for safe handling	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use ventilation. Keep away from sources of ignition. No smoking. Prevent the build up of electrostatic charge.
Storage Conditions	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

## Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Water	CAS#: 7732-18-5	TWA: 500 ppm
Personal protective equipment	Respiratory protection	Handle with gloves. Gloves must be inspected prior to use. Eye protection.
Avoid contact with skin, eyes and clothing.	Wash hands thoroughly after handling the product.	

## Section IX - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point		Specific Gravity (H <sub>2</sub> O = 1)	
Vapor Pressure (mm Hg)	100°C	Melting Point	1

**Absolute Standards Inc.**

PO Box 5585  
Hamden, CT 06518-0585

Phone: 203-281-2917  
FAX: 203-281-2922

Vapor Density (AIR = 1)	NA	Evaporation rate (Butyl Acetate = 1)	0°C
Solubility in Water	NA		NA

Completely miscible

Appearance and Odor CLEAR, COLORLESS LIQUID WITH SLIGHT CHEMICAL ODOR.

**Section X. STABILITY AND REACTIVITY**

Chemical stability Stable under recommended storage conditions.  
Possibility of hazardous reactions NA  
Conditions to avoid NA  
Materials to avoid NA  
Hazardous decomposition products - No data available

**Section XI. TOXICOLOGICAL INFORMATION**

LD50 Oral - Rat NA  
LC50 Inhalation - Rat NA  
LD50 Dermal - Guinea pig NA  
Causes skin irritation.  
Eye irritation

**Section XII. ECOLOGICAL INFORMATION**

LC50 NA  
EC50 NA

**Section XIII. DISPOSAL CONSIDERATIONS**

Dispose with normal Laboratory Solvent Waste.

**Section XIV. TRANSPORT INFORMATION**

DOT (US)  
Not dangerous goods  
Proper shipping name: Water  
  
IATA  
Not dangerous goods  
Proper shipping name: Water

**Section XV. REGULATORY INFORMATION**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**Section XVI. Misc. INFORMATION**

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Certified Reference Material CRM



ANAB ISO 17034 Accredited  
AR-1539 Certificate Number  
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

Part Number: **91980**  
Lot Number: **112822**  
Description: **Acrolein**

Solvent(s):  
Water  
Lot#  
102422Q

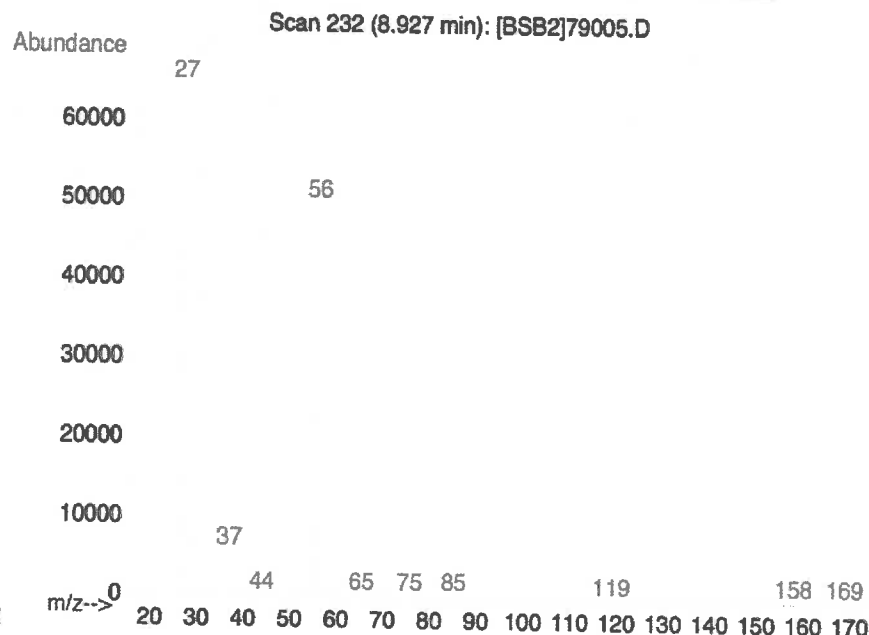
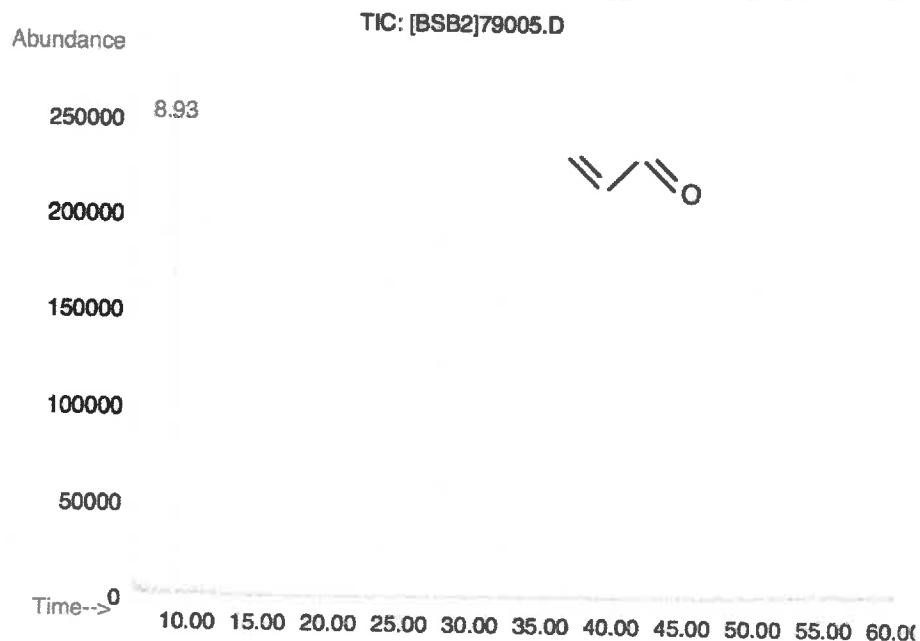
Expiration Date: **122822**  
Recommended Storage: **Refrigerate (4 °C)**  
Nominal Concentration (µg/mL): **5000**  
NIST Test ID#: **6UTB**

Weight(s) shown below were combined and diluted to (mL): **10.0**  
5E-05 Balance Uncertainty  
0.002 Flask Uncertainty

		112822
Formulated By:	Benson Chan	DATE
		112822
Reviewed By:	Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)		
										CAS#	OSHA PEL (TWA)	LD50
1. Acrolein	5	103755R09M	5000	97.1	0.5	0.05180	0.05167	5008.3	52.5	107-02-8	0.1 ppm	ort-rat 46mg/kg

Method: GC6MSD-1. Detector: Mass Selective Detector (Scan mode). Column: Vocol (60m X 0.25mm ID X 1.5µm film thickness). Oven Profile: Temp. 1 = 35°C (Time 1 = 10min.), Temp. 2=200°C (Time 2 = 8.75 min.). Rate = 4°C/min., Injector Temp. = 200°C, Detector Temp. = 220°C. Analyst: Pedro Rentas. NOTE: Due to the instability of acrolein in solution, all solutions of acrolein, and any dilutions thereof, should be used immediately. Long term storage is not recommended. Please contact our technical department if further information is required.



- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).



## Safety Data Sheet (SDS) GHS/OSHA Compliant

## Section I Product and Company Identification

<b>IDENTITY</b>	<b>ANALYTICAL STANDARD DISSOLVED IN WATER</b>
Manufacturer's Name	ABSOLUTE STANDARDS INC
Address	44 Rosotto Dr. Hamden CT, 06514
	Emergency Telephone USA & CANADA Emergency Telephone International Date Prepared/Revised
	1-800-535-5053 1-352-323-3500 May 1, 2022

## Section II - Hazards Identification

P271 Use in ventilated area  
P302,332 If on skin, wash with soap and water

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**  
H315 Causes skin and eye irritation.  
P280 Use gloves, eye protection/face shield  
P305,351,338 If in eyes, remove contacts, rinse with water



Signal Word: DANGER

## Section III - Composition

Components (Specific Chemical Identity; Common Name(s))  
WaterCAS#: 7732-18-5  
% (optional)  
> 97

## See Certified Weight Report For Other Analytes Present At Trace Quantities.

## INTENDED USE: REFERENCE MATERIAL

## Section IV. FIRST AID MEASURES

General advice	Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.
If inhaled	If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
In case of skin contact	Wash with soap and water. Consult a physician.
In case of eye contact	Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
If swallowed	Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

## Section V. FIREFIGHTING MEASURES

Suitable extinguishing media	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Protective equipment for fire	Wear self contained breathing apparatus for fire fighting if necessary.
Hazardous Decomposition products	Carbon oxides

## Section VI. ACCIDENTAL RELEASE MEASURES

Personal precautions	Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not let product enter drains.
Clean up	Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

## Section VII. HANDLING AND STORAGE

Precautions for safe handling	Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. Use ventilation. Keep away from sources of ignition. No smoking. Prevent the build up of electrostatic charge.
Storage Conditions	Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

## Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Water	CAS#: 7732-18-5	TWA: 500 ppm
Personal protective equipment	Respiratory protection	Handle with gloves. Gloves must be inspected prior to use. Eye protection.
Avoid contact with skin, eyes and clothing.	Wash hands thoroughly after handling the product.	

## Section IX - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point		Specific Gravity (H <sub>2</sub> O = 1)	
Vapor Pressure (mm Hg)	100°C	Melting Point	1

**Absolute Standards Inc.**

PO Box 5585  
Hamden, CT 06518-0585

Phone: 203-281-2917  
FAX: 203-281-2922

Vapor Density (AIR = 1)	NA	Evaporation rate (Butyl Acetate = 1)	0°C
Solubility in Water	NA		NA

Completely miscible

Appearance and Odor CLEAR, COLORLESS LIQUID WITH SLIGHT CHEMICAL ODOR.

**Section X. STABILITY AND REACTIVITY**

Chemical stability Stable under recommended storage conditions.  
Possibility of hazardous reactions NA  
Conditions to avoid NA  
Materials to avoid NA  
Hazardous decomposition products - No data available

**Section XI. TOXICOLOGICAL INFORMATION**

LD50 Oral - Rat NA  
LC50 Inhalation - Rat NA  
LD50 Dermal - Guinea pig NA  
Causes skin irritation.  
Eye irritation

**Section XII. ECOLOGICAL INFORMATION**

LC50 NA  
EC50 NA

**Section XIII. DISPOSAL CONSIDERATIONS**

Dispose with normal Laboratory Solvent Waste.

**Section XIV. TRANSPORT INFORMATION**

DOT (US)  
Not dangerous goods  
Proper shipping name: Water  
  
IATA  
Not dangerous goods  
Proper shipping name: Water

**Section XV. REGULATORY INFORMATION**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

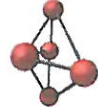
**Section XVI. Misc. INFORMATION**

The information in this Material Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated thereunder (29 CFR 1910.1200 et seq.) and Global Harmonized System (GHS). This document is intended only as a guide to the appropriate precautionary handling of the material by trained personnel, or supervised by a person trained in chemical handling. The user is responsible for determining the precautions and dangers of this chemical for his or her particular application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, ABSOLUTE STANDARDS INC. cannot warn of all the potential dangers of use or interaction with other chemicals or substances. ABSOLUTE STANDARDS INC. warrants that the chemical meets the specifications set forth on the label. ABSOLUTE STANDARDS INC DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR APPLICATION. The user should recognize that this product can cause severe injury or death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION. As new documented general safety information becomes available, Absolute Standards Inc. will periodically revise this Material Safety Data Sheet. If you have any questions, please call Technical Service at 1-203-281-2917 for assistance.





Certified Reference Material CRM



CERTIFIED WEIGHT REPORT

Part Number: 95319  
Lot Number: 031921  
Description: Revised Additions Mix  
11 components  
031924  
Expiration Date: Refrigerate (4 °C)  
Recommended Storage: Varied  
Nominal Concentration (µg/mL): 6UTB  
NIST Test ID#: 5E-05 Balance Uncertainty  
0.012 Flask Uncertainty

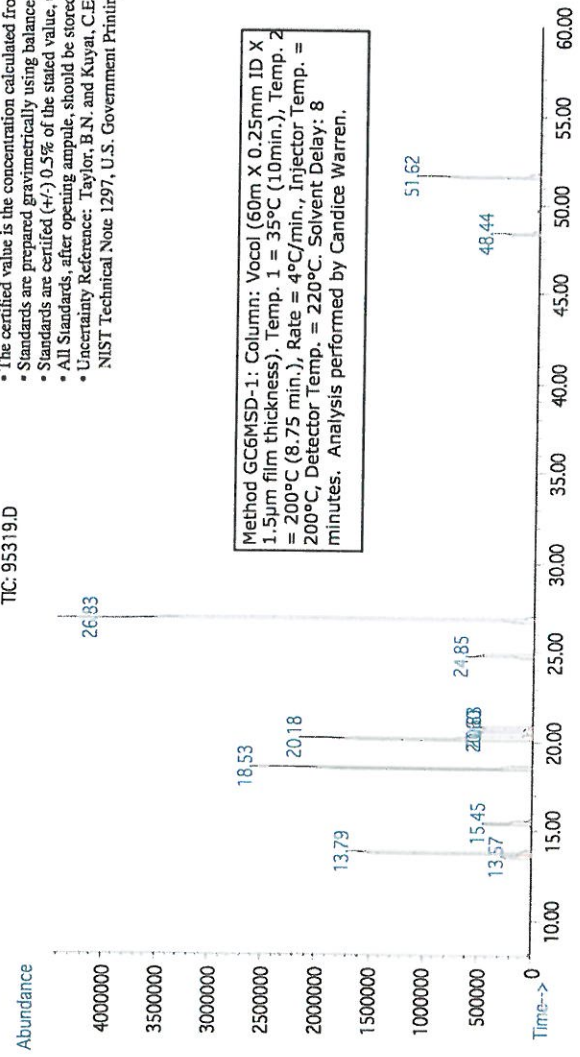
Solvent(s): Lot#  
Methanol DY186-US

Formulated By:	Prashant Chauhan	031921	DATE
Reviewed By:	Pedro L. Rentas	031921	DATE

Weight(s) shown below were combined and diluted to (mL): 100.0

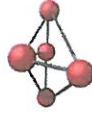
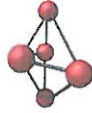
Compound		RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)	OSHA PEL (TWA)	LD50
1.	Acrylonitrile	7	4718CK	10000	99	0.2	1.01015	1.01040	10002.5	40.5	107-13-1	N/A	ori-rat 78 mg/kg
2.	1-Chlorobutane	1072	MKCM5711	2000	99.99	0.2	0.20003	0.20033	2003.0	8.1	109-69-3	N/A	ori-rat 2670mg/kg
3.	Cyclohexane	1023	SHBD2795V	2000	99.5	0.2	0.20101	0.20130	2002.8	8.1	110-82-7	300 ppm (1050mg/m3/8H)	ori-rat 12705mg/kg
4.	Di-isopropyl ether (DIPE)	987	00412MX	2000	99	0.2	0.20203	0.20220	2001.7	8.2	108-20-3	500 ppm (2100mg/m3/8H)	ori-rat 8470mg/kg
5.	1,4-Dioxane	373	03853KE	40000	99	0.2	4.04060	4.04110	40005.0	161.9	123-91-1	25 ppm (90mg/m3/8H)(skin)	ori-mus 5700mg/kg
6.	Hexachloroethane	199	12604HBV	2000	99	0.2	0.20203	0.20230	2002.7	8.2	67-72-1	1 ppm (10mg/m3/8H)(skin)	ori-gpp 4870mg/kg
7.	Methylcyclohexane	1627	08046KN	2000	99	0.2	0.20203	0.20235	2003.2	8.2	108-87-2	N/A	N/A
8.	Methyl tert-butyl ether (MTBE)	209	02197JJ	2000	99.8	0.2	0.20041	0.20080	2003.9	8.1	1634-04-4	N/A	ori-rat 4g/kg
9.	Propionitrile	349	1395468	20000	99	0.2	2.02030	2.02080	20005.0	81.0	107-12-0	N/A	ori-rat 39mg/kg
10.	Tetrahydrofuran	380	113886	10000	99.9	0.2	1.00105	1.00140	10003.5	40.1	109-99-9	20 ppm (590mg/m3/8H)	ori-rat 2500mg/kg
11.	1,2,3,4-Tetramethylbenzene	491	AP01	2000	93	0.2	0.21506	0.21536	2002.8	8.7	488-23-3	N/A	ori-rat 6408mg/kg

TIC: 95319.D



Method GC6MSD-1: Column: Vocol (60m X 0.25mm ID X 1.5µm film thickness), Temp. 1 = 35°C (10min.), Temp. 2 = 200°C (8.75 min.), Rate = 4°C/min., Injector Temp. = 200°C, Detector Temp. = 220°C. Solvent Delay: 8 minutes. Analysis performed by Candice Warren.

Name	MSD RT (min.)
Methyl tert-butyl ether (MTBE)	13.56
Acrylonitrile	13.79
Di-isopropyl ether	15.44
Propionitrile	18.53
Tetrahydrofuran	20.17
Cyclohexane	20.58
1-Chlorobutane	20.83
Methylcyclohexane	24.84
1,4-Dioxane	26.84
Hexachloroethane	48.44
1,2,3,4-Tetramethylbenzene	51.62



## Run 44, "P95319 L031921 [Varied in MeOH]"

Run Length: 60.00 min, 36000 points at 10 points/second.

Created: Sun, Mar 28, 2021 at 4:18:23 PM.

Sampled: Sequence "032421-GC13M1", Method "GC13-M1".

Analyzed using Method "GC13-M1".

### Comments

GC13-M1 Analysis by Candice Warren

Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness

Flow rates: Total flow=290mL/min., Helium (carrier)=10mL/min.,

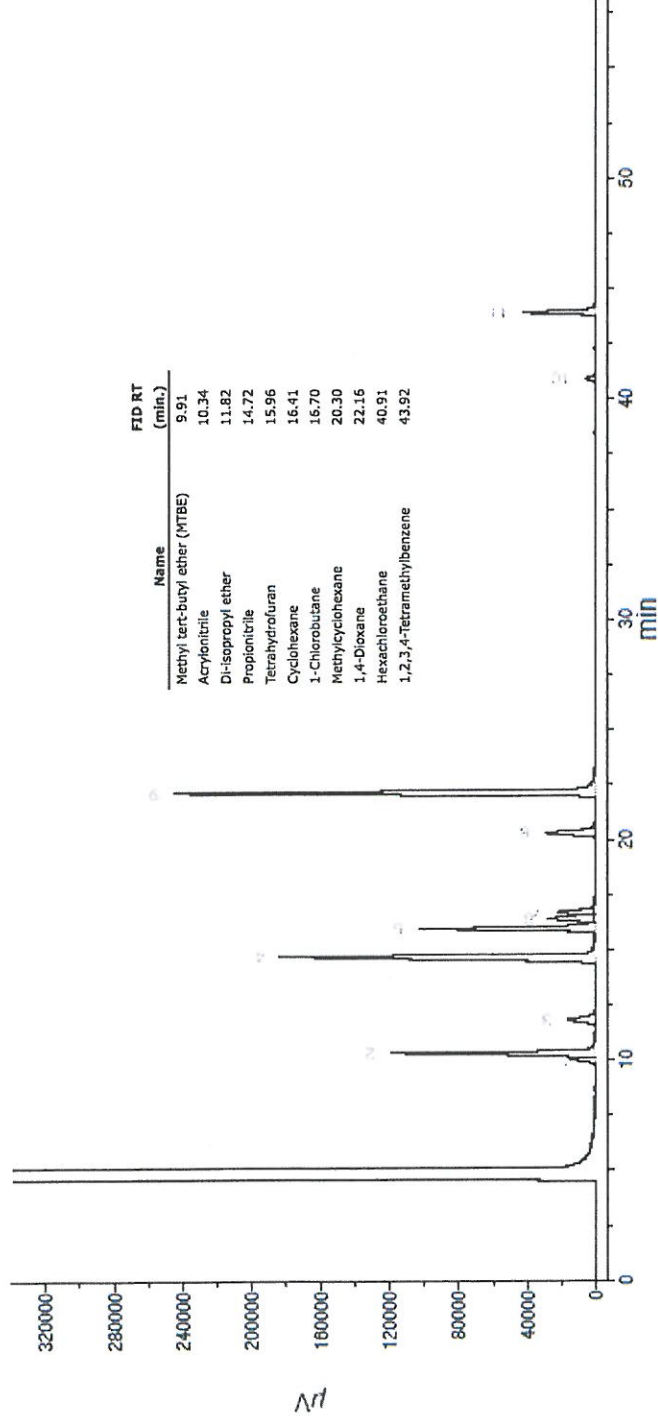
Helium(make-up)=10mL/min., Hydrogen(make-up)=40mL/min., Air(make-up)=230mL/min.

Oven Profile: Temp. 1=35°C (Time 1=10 min.), Temp 2=200°C (Time 2=8.75 min.),

Rate = 4°C/min., Total run time=60 min. Injector temp.=200°C, FID Temp.=200°C.

FID Signal = Edaq Channel 1

Standard injection = 0.5µL, Range=6





**Safety Data Sheet (SDS)**  
GHS/OSHA Compliant

**Section I Product and Company Identification**

**IDENTITY**  
**ANALYTICAL STANDARD DISSOLVED IN METHANOL**

**Manufacturer's Name** ABSOLUTE STANDARDS INC  
**Address** 44 Rossetto Dr.  
Hamden CT, 06514  
**Emergency Telephone USA & CANADA** 1-800-535-5053  
**Emergency Telephone International** 1-352-323-3500  
**Date Prepared/Revised** May 1, 2019

**Section II - Hazards Identification**

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

**H225** Highly Flammable Liquid and Vapor  
**H370** Cause damage to organs  
**P271** Use in ventilated area  
**P302,332** If on skin, wash with soap and water  
**H301, 311, 331** Toxic if swallowed, skin contact, inhaled  
**H351** Suspected of causing cancer  
**P280** Use gloves, eye protection/face shield  
**P305,351,338** If in eyes, remove contacts, rinse with water

**Signal Word: DANGER**



**Section III - Composition**

**Components (Specific Chemical Identity; Common Name(s))** METHYL ALCOHOL  
**CAS#: 67-56-1**  
**% (optional)** > 97

**See Certified Weight Report For Other Analytes Present At Trace Quantities.**  
**INTENDED USE: REFERENCE MATERIAL**

**Section IV. FIRST AID MEASURES**

**General advice** If inhaled Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.  
If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
**In case of skin contact** Wash with soap and water. Consult a physician.  
**In case of eye contact** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
**If swallowed** Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

**Section V. FIREFIGHTING MEASURES**

**Flammability** Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.  
**Protective extinguishing media** Suitable extinguishing media  
**Protective equipment for fire** Wear self contained breathing apparatus for fire fighting if necessary.  
**Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.**

**Section VI. ACCIDENTAL RELEASE MEASURES**

**Personal precautions** Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.  
**Environmental precautions** Prevent further leakage or spillage if safe to do so. Do not let product enter drains.  
**Clean up** Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

**Section VII. HANDLING AND STORAGE**

**Precautions for safe handling** Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.  
**Storage Conditions** Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.  
**Use ventilation** Keep away from sources of ignition. No smoking. Prevent the build up of electrostatic charge.

**Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Methanol** 67-56-1 TWA 200 ppm  
**Skin notation** TWA 200 ppm  
**Potential for skin absorption, ingestion and inhalation.** Personal protective equipment Respiratory protection  
**Avoid contact with skin, eyes and clothing.** Wash hands thoroughly after handling the product.  
**Eye protection.**

**Section IX - Physical/Chemical Characteristics**

The information in this Material Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and Global Harmonized System (GHS). This document is intended only as a guide to the appropriate precautionary handling of the material by trained personnel, or supervised by a person trained in chemical handling. The user is responsible for determining the precautions and dangers of this chemical for his or her particular application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, ABSOLUTE STANDARDS INC. cannot warn of all the potential dangers of use or interaction with other chemicals or substances. ABSOLUTE STANDARDS INC. warrants that the chemical meets the specifications set forth on the label. ABSOLUTE STANDARDS INC. DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR APPLICATION. The user should recognize that this product can cause severe injury or death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION. As new documented general safety information becomes available, Absolute Standards Inc. will periodically revise this Safety Data Sheet. If you have any questions, please call Technical Service at 1-203-281-2917 for assistance.

## Section XVI. Misc. INFORMATION

OSHA Hazards Flammable liquid, Target Organ Effect, Toxic by inhalation, Toxic by ingestion, Toxic by skin absorption, Irritant  
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

## Section XV. REGULATORY INFORMATION

DOT (US) UN number: 1230 Class: 3 Packing group: II Methanol  
Proper shipping name: Proper shipping name: Methanol  
IATA UN number: 1230 Class: 3 Packing group: II

## Section XIV. TRANSPORT INFORMATION

Dispose with normal Laboratory Solvent Waste.

## Section XIII. DISPOSAL CONSIDERATIONS

LC50 15,400 mg/l - 96 h  
EC50 24,500.00 mg/l - 48 h  
EC100 10,000.00 mg/l - 24 h

## Section XII. ECOLOGICAL INFORMATION FOR REPORTABLE QUANTITY OF 5000 lbs.

LD50 Oral - rat - 5,628 mg/kg  
LC50 Inhalation - rat - 4 h - 6400 ppm  
LD50 Dermal - rabbit - 15,800 mg/kg  
Toxic if absorbed through skin. Causes skin irritation.  
Eye damage/eye irritation  
Toxic if inhaled. Causes respiratory tract irritation.  
Toxic if swallowed.

## Section XI. TOXICOLOGICAL INFORMATION

Chemical stability Stable under recommended storage conditions.  
Possibility of hazardous reactions Vapours may form explosive mixture with air.  
Conditions to avoid Heat, flames, sparks, extreme temperature and sunlight.  
Materials to avoid Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids  
Hazardous decomposition products formed under fire conditions. - Carbon oxides

## Section X. STABILITY AND REACTIVITY

Appearance and Odor CLEAR, COLORLESS LIQUID WITH CHARACTERISTIC PUNGENT ODOR.

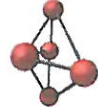
Solubility in Water			
COMPLETE			
Vapor Pressure (mm Hg)	65°C	96	1.11
Vapor Density (AIR = 1)		Evaporation rate	(Butyl Acetate = 1)
Boiling Point		Melting Point	
			0.79
			-98°C
			4.6

Specific Gravity (H2O = 1)





**Certified Reference Material CRM**



**CERTIFIED WEIGHT REPORT**

**Part Number:** 95319  
**Lot Number:** 031921  
**Description:** Revised Additions Mix  
11 components  
031924  
Refrigerate (4 °C)  
Varied  
6UTB  
NIST Test ID#:  
5E-05 Balance Uncertainty  
0.012 Flask Uncertainty

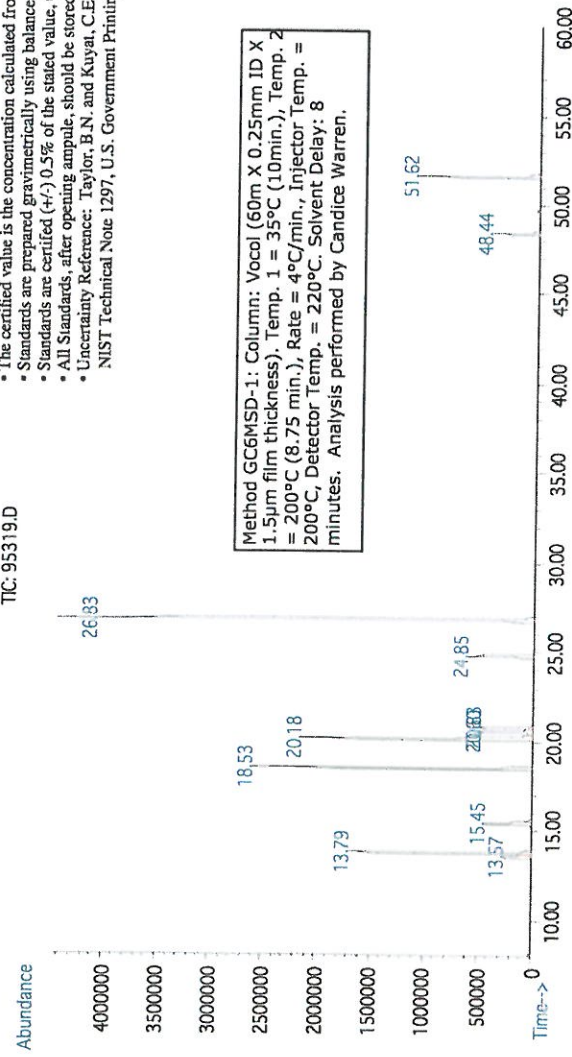
**Solvent(s):** Methanol  
**Lot#** DY186-US

Formulated By: Prashant Chauhan	031921
Reviewed By: Pedro L. Rentas	031921

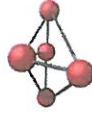
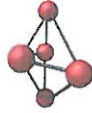
Weight(s) shown below were combined and diluted to (mL): 100.0

Compound		RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	(Solvent Safety Info. On Attached pg.)	OSHA PEL (TWA)	LD50
1.	Acrylonitrile	7	4718CK	10000	99	0.2	1.01015	1.01040	10002.5	40.5	107-13-1	N/A	ori-rat 78 mg/kg
2.	1-Chlorobutane	1072	MKCM5711	2000	99.99	0.2	0.20003	0.20033	2003.0	8.1	109-69-3	N/A	ori-rat 2670mg/kg
3.	Cyclohexane	1023	SHBD2795V	2000	99.5	0.2	0.20101	0.20130	2002.8	8.1	110-92-7	300 ppm (1050mg/m3/8H) ori-rat 12705mg/kg	
4.	Di-isopropyl ether (DIPE)	987	00412MX	2000	99	0.2	0.20203	0.20220	2001.7	8.2	108-20-3	500 ppm (2100mg/m3/8H) ori-rat 8470mg/kg	
5.	1,4-Dioxane	373	03853KE	40000	99	0.2	4.04060	4.04110	40005.0	161.9	123-91-1	25 ppm (90mg/m3/8H)(skin) ori-mus 5700mg/kg	
6.	Hexachloroethane	199	12604HBV	2000	99	0.2	0.20203	0.20230	2002.7	8.2	67-72-1	1 ppm (10mg/m3/8H)(skin) ori-gpp 4870mg/kg	
7.	Methylcyclohexane	1627	08046KN	2000	99	0.2	0.20203	0.20235	2003.2	8.2	108-87-2	N/A	N/A
8.	Methyl tert-butyl ether (MTBE)	209	02197JJ	2000	99.8	0.2	0.20041	0.20080	2003.9	8.1	1634-04-4	N/A	ori-rat 4g/kg
9.	Propionitrile	349	1395468	20000	99	0.2	2.02030	2.02080	20005.0	81.0	107-12-0	N/A	ori-rat 39mg/kg
10.	Tetrahydrofuran	380	113886	10000	99.9	0.2	1.00105	1.00140	10003.5	40.1	109-99-9	20 ppm (590mg/m3/8H) ori-rat 2500mg/kg	
11.	1,2,3,4-Tetramethylbenzene	491	AP01	2000	93	0.2	0.21506	0.21536	2002.8	8.7	488-23-3	N/A	ori-rat 6408mg/kg

TIC: 95319.D



Name	MSD RT (min.)
Methyl tert-butyl ether (MTBE)	13.56
Acrylonitrile	13.79
Di-isopropyl ether	15.44
Propionitrile	18.53
Tetrahydrofuran	20.17
Cyclohexane	20.58
1-Chlorobutane	20.83
Methylcyclohexane	24.84
1,4-Dioxane	26.84
Hexachloroethane	48.44
1,2,3,4-Tetramethylbenzene	51.62



## Run 44, "P95319 L031921 [Varied in MeOH]"

Run Length: 60.00 min, 36000 points at 10 points/second.

Created: Sun, Mar 28, 2021 at 4:18:23 PM.

Sampled: Sequence "032421-GC13M1", Method "GC13-M1".

Analyzed using Method "GC13-M1".

### Comments

GC13-M1 Analysis by Candice Warren

Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness

Flow rates: Total flow=290mL/min., Helium (carrier)=10mL/min.,

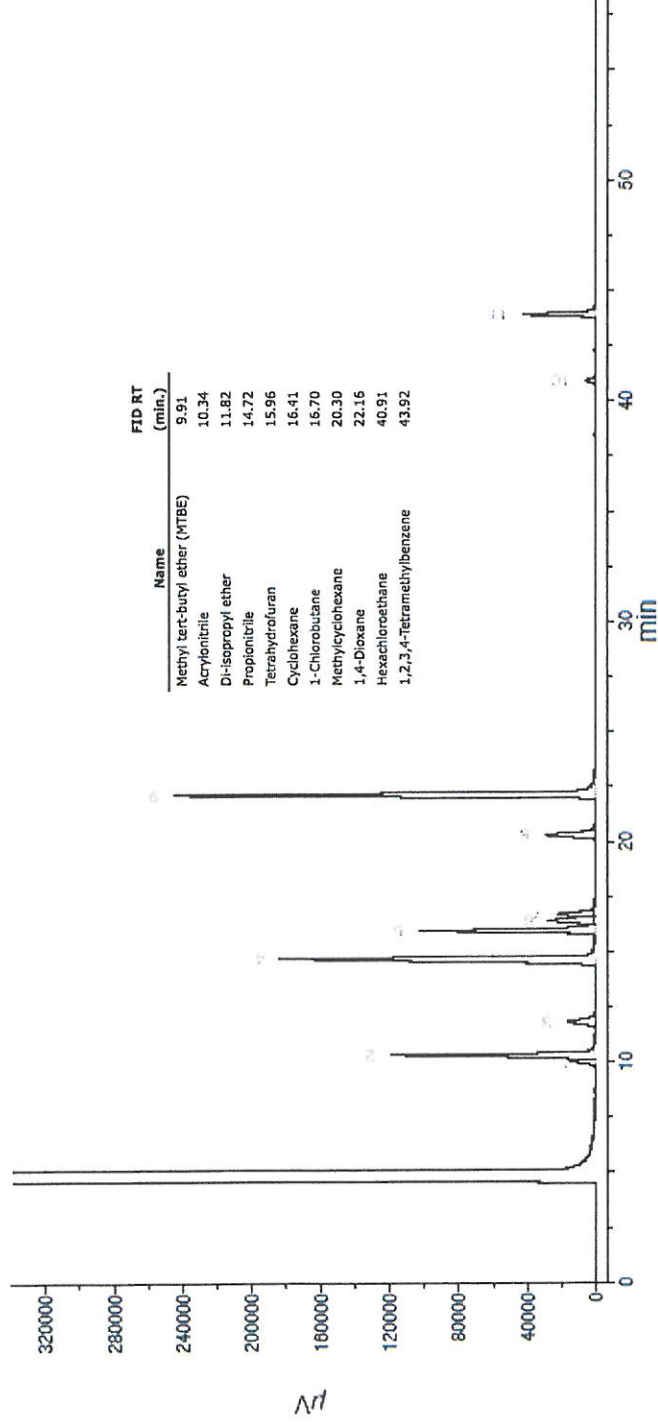
Helium(make-up)=10mL/min., Hydrogen(make-up)=40mL/min., Air(make-up)=230mL/min.

Oven Profile: Temp. 1=35°C (Time 1=10 min.), Temp 2=200°C (Time 2=8.75 min.),

Rate = 4°C/min., Total run time=60 min. Injector temp.=200°C, FID Temp.=200°C.

FID Signal = Edaq Channel 1

Standard injection = 0.5µL, Range=6





**Safety Data Sheet (SDS)**  
GHS/OSHA Compliant

**Section I Product and Company Identification**

**IDENTITY**  
**ANALYTICAL STANDARD DISSOLVED IN METHANOL**

**Manufacturer's Name** ABSOLUTE STANDARDS INC  
**Address** 44 Rossetto Dr.  
Hamden CT, 06514  
**Emergency Telephone USA & CANADA** 1-800-535-5053  
**Emergency Telephone International** 1-352-323-3500  
**Date Prepared/Revised** May 1, 2019

**Section II - Hazards Identification**

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)

**H225** Highly Flammable Liquid and Vapor  
**H370** Cause damage to organs  
**P271** Use in ventilated area  
**P302,332** If on skin, wash with soap and water  
**H301, 311, 331** Toxic if swallowed, skin contact, inhaled  
**H351** Suspected of causing cancer  
**P280** Use gloves, eye protection/face shield  
**P305,351,338** If in eyes, remove contacts, rinse with water

**Signal Word: DANGER**



**Section III - Composition**

**Components (Specific Chemical Identity; Common Name(s))** METHYL ALCOHOL  
**CAS#: 67-56-1**  
**% (optional)** > 97

**See Certified Weight Report For Other Analytes Present At Trace Quantities.**  
**INTENDED USE: REFERENCE MATERIAL**

**Section IV. FIRST AID MEASURES**

**General advice** If inhaled Consult a physician. Show this safety data sheet to the doctor in attendance. Move to safe area.  
If inhaled, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.  
**In case of skin contact** Wash with soap and water. Consult a physician.  
**In case of eye contact** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.  
**If swallowed** Do NOT induce vomiting. Rinse mouth with water. Consult a physician.

**Section V. FIREFIGHTING MEASURES**

**Flammability** Flammable in the presence of a source of ignition when the temperature is above the flash point. Keep away from heat/sparks/open flame/hot surface. No smoking.  
**Protective extinguishing media** Suitable extinguishing media  
**Protective equipment for fire** Wear self contained breathing apparatus for fire fighting if necessary.  
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

**Section VI. ACCIDENTAL RELEASE MEASURES**

**Personal precautions** Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Vapours accumulate to form explosive concentrations.  
**Environmental precautions** Prevent further leakage or spillage if safe to do so. Do not let product enter drains.  
**Clean up** Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

**Section VII. HANDLING AND STORAGE**

**Precautions for safe handling** Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.  
Use ventilation. Keep away from sources of ignition. No smoking. Prevent the build up of electrostatic charge.  
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

**Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Methanol** 67-56-1 TWA 200 ppm  
**Skin notation** TWA 200 ppm  
**Potential for skin absorption, ingestion and inhalation.** Personal protective equipment Respiratory protection  
**Avoid contact with skin, eyes and clothing. Wash hands thoroughly after handling the product.** Eye protection.

**Section IX - Physical/Chemical Characteristics**

The information in this Material Safety Data Sheet meets the requirements of the United States Occupational Safety and Health Act and regulations promulgated thereunder (29 CFR 1910.1200 et. seq.) and Global Harmonized System (GHS). This document is intended only as a guide to the appropriate precautionary handling of the material by trained personnel, or supervised by a person trained in chemical handling. The user is responsible for determining the precautions and dangers of this chemical for his or her particular application. Depending on usage, protective clothing including eye and face guards and respirators must be used to avoid contact with material or breathing chemical vapors/fumes. Exposure to this product may have serious adverse health effects. This chemical may interact with other substances. Since the potential uses are so varied, ABSOLUTE STANDARDS INC. cannot warn of all the potential dangers of use or interaction with other chemicals or substances. ABSOLUTE STANDARDS INC. warrants that the chemical meets the specifications set forth on the label. ABSOLUTE STANDARDS INC. DISCLAIMS ANY OTHER WARRANTIES, EXPRESSED OR IMPLIED WITH REGARD TO THE PRODUCT SUPPLIED HEREUNDER, ITS MERCHANTABILITY OR ITS FITNESS FOR A PARTICULAR APPLICATION. The user should recognize that this product can cause severe injury or death, especially if improperly handled or the known dangers of use are not heeded. READ ALL PRECAUTIONARY INFORMATION. As new documented general safety information becomes available, Absolute Standards Inc. will periodically revise this Safety Data Sheet. If you have any questions, please call Technical Service at 1-203-281-2917 for assistance.

## Section XVI. Misc. INFORMATION

OSHA Hazards Flammable liquid, Target Organ Effect, Toxic by inhalation, Toxic by ingestion, Toxic by skin absorption, Irritant  
SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

## Section XV. REGULATORY INFORMATION

DOT (US) UN number: 1230 Class: 3 Packing group: II Methanol  
Proper shipping name: Proper shipping name: UN number: 1230 Class: 3 Packing group: II Methanol  
ATA

## Section XIV. TRANSPORT INFORMATION

Dispose with normal Laboratory Solvent Waste.

## Section XIII. DISPOSAL CONSIDERATIONS

LC50 15,400 mg/l - 96 h  
EC50 24,500.00 mg/l - 48 h  
EC100 10,000.00 mg/l - 24 h

## Section XII. ECOLOGICAL INFORMATION FOR REPORTABLE QUANTITY OF 5000 lbs.

LD50 Oral - rat - 5,628 mg/kg  
LC50 Inhalation - rat - 4 h - 6400 ppm  
LD50 Dermal - rabbit - 15,800 mg/kg  
Toxic if absorbed through skin. Causes skin irritation.  
Eye damage/eye irritation  
Toxic if inhaled. Causes respiratory tract irritation.  
Toxic if swallowed.

## Section XI. TOXICOLOGICAL INFORMATION

Chemical stability Stable under recommended storage conditions.  
Possibility of hazardous reactions Vapours may form explosive mixture with air.  
Conditions to avoid Heat, flames, sparks, extreme temperature and sunlight.  
Materials to avoid Acid chlorides, Acid anhydrides, Oxidizing agents, Alkali metals, Reducing agents, Acids  
Hazardous decomposition products formed under fire conditions. - Carbon oxides

## Section X. STABILITY AND REACTIVITY

Appearance and Odor CLEAR, COLORLESS LIQUID WITH CHARACTERISTIC PUNGENT ODOR.

Solubility in Water			
COMPLETE			
Vapor Density (AIR = 1)	1.11	Evaporation rate (Butyl Acetate = 1)	4.6
Vapor Pressure (mm Hg)	96	Melting Point	-98°C
Boiling Point	65°C	Specific Gravity (H2O = 1)	0.79



Methanol  
ULTRA RESI-ANALYZED  
For Purge and Trap Analysis

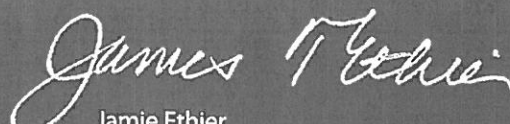


Material No.: 9077-02  
Batch No.: 0000288323  
Manufactured Date: 2021-06-11  
Expiration Date: 2024-06-10  
Revision No.: 1

## Certificate of Analysis

Test	Specification	Result
Assay (CH <sub>3</sub> OH) (by GC, corrected for water)	≥ 99.9 %	100.0 %
Residue after Evaporation	≤ 1.0 ppm	0.5 ppm
Titration Acid (μeq/g)	≤ 0.3	0.2
Titration Base (μeq/g)	≤ 0.10	0.05
Water (by KF, coulometric)	≤ 0.08 %	0.01 %
Volatile Organic Trace Analysis - Below EPA 8260B CRQL	Conforms	Fails

For Laboratory, Research, or Manufacturing Use  
Performance Tested for Use in EPA Methods  
500 Series for Drinking Water  
600 Series for Wastewater  
846 for Solid Waste  
Country of Origin: USA  
Packaging Site: Phillipsburg Mfg Ctr & DC

  
Jamie Ethier  
Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700  
Avantor Performance Materials, LLC  
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone 610.386.1700