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Prep Standard - Chemical Standard Summary

Order ID : Q1228

Test : VOC-TRACE-SFAM

Prepbatch ID :

Sequence ID/Qc Batch ID: VU020525,VU020625,VU020425

Standard ID :
VP131767,VP132476,VP132692,VP132711,VP132819,VP132870,VP132871,VP132872,VP132873,VP132874,VP132875,VP132877,VP132880,VP132894,VP132895,VP132896,VP132897,VP132898,VP132902,VP132903,VP132904,

Chemical ID :
V12993,V13178,V13238,V13391,V13440,V13587,V13604,V13809,V13845,V13858,V13917,V14081,V14154,V14224,V14308,V14352,V14454,V14554,V14605,V14607,V14610,V14611,V14624,V14627,V14726,V14753,W3112,

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
218	BFB, 25PPM	VP131767	11/22/2024	05/18/2025	Semsettin Yesilyurt	None	None	Mahesh Dadoda 11/27/2024

FROM 0.50000ml of V13391 + 49.50000ml of V14154 = Final Quantity: 50.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3421	SOMO2.4 TRACE ICV 25 PPM	VP132476	01/08/2025	02/22/2025	Semsettin Yesilyurt	None	None	Mahesh Dadoda 01/17/2025

FROM 0.06250ml of V12993 + 0.06250ml of V13178 + 0.06250ml of V13238 + 0.06250ml of V13587 + 0.06250ml of V13604 + 0.06250ml of V13809 + 0.06250ml of V14224 + 0.25000ml of V13917 + 4.30000ml of V14627 = Final Quantity: 5.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1896	Trace internal standard 50 ppm	VP132692	01/27/2025	03/01/2025	Semsettin Yesilyurt	None	None	Mahesh Dadoda 01/29/2025

FROM 0.20000ml of V14352 + 9.80000ml of V14624 = Final Quantity: 10.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1897	Trace surrogate mix 25 ppm	VP132711	01/27/2025	03/01/2025	Semsettin Yesilyurt	None	None	Mahesh Dadoda 01/29/2025

FROM 0.50000ml of V14454 + 0.50000ml of V14611 + 1.50000ml of V14605 + 1.50000ml of V14607 + 1.50000ml of V14610 + 4.50000ml of V14624 = Final Quantity: 10.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1721	SOM01.2 TRACE-Calibration Mix,25 PPM	VP132819	01/30/2025	03/08/2025	Semsettin Yesilyurt	None	None	Mahesh Dadoda 02/06/2025

FROM 0.12500ml of V13440 + 0.12500ml of V13845 + 0.12500ml of V13858 + 0.12500ml of V14081 + 0.12500ml of V14308 + 0.12500ml of V14554 + 0.12500ml of V14753 + 0.50000ml of V14726 + 8.62500ml of V14624 = Final Quantity: 10.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1722	0.5 PPB ICC SOM01.2 Trace	VP132870	02/04/2025	02/05/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.99000ml of W3112 + 0.00080ml of VP132711 + 0.00080ml of VP132819 + 0.00400ml of VP132692 = Final Quantity: 40.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1723	1 PPB ICC SOM01.2 Trace	VP132871	02/04/2025	02/05/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.99000ml of W3112 + 0.00160ml of VP132711 + 0.00160ml of VP132819 + 0.00400ml of VP132692 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1724	5 PPB ICC SOM01.2 Trace	VP132872	02/04/2025	02/05/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.98000ml of W3112 + 0.00400ml of VP132692 + 0.00800ml of VP132711 + 0.00800ml of VP132819 = Final Quantity: 40.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1725	10 PPB ICC SOM01.2 Trace	VP132873	02/04/2025	02/05/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.96000ml of W3112 + 0.00400ml of VP132692 + 0.01600ml of VP132711 + 0.01600ml of VP132819 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1726	20 PPB ICC SOM01.2 Trace	VP132874	02/04/2025	02/05/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.93000ml of W3112 + 0.00400ml of VP132692 + 0.03200ml of VP132711 + 0.03200ml of VP132819 = Final Quantity: 40.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3422	5 PPB ICV SOMO2.4 TRACE	VP132875	02/04/2025	02/05/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.98000ml of W3112 + 0.00400ml of VP132692 + 0.00800ml of VP132476 + 0.00800ml of VP132711 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1727	5 PPB CCC-CCV SOM01.2 Trace	VP132877	02/04/2025	02/05/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.98000ml of W3112 + 0.00400ml of VP132692 + 0.00800ml of VP132711 + 0.00800ml of VP132819 = Final Quantity: 40.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1734	BFB TUNE SOM01.2 TRACE	VP132880	02/04/2025	02/05/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.99990ml of W3112 + 0.00320ml of VP131767 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1727	5 PPB CCC-CCV SOM01.2 Trace	VP132894	02/05/2025	02/06/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.98000ml of W3112 + 0.00400ml of VP132692 + 0.00800ml of VP132711 + 0.00800ml of VP132819 = Final Quantity: 40.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1727	5 PPB CCC-CCV SOM01.2 Trace	VP132895	02/05/2025	02/06/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.98000ml of W3112 + 0.00400ml of VP132692 + 0.00800ml of VP132711 + 0.00800ml of VP132819 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1734	BFB TUNE SOM01.2 TRACE	VP132896	02/05/2025	02/06/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.99990ml of W3112 + 0.00320ml of VP131767 = Final Quantity: 40.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1727	5 PPB CCC-CCV SOM01.2 Trace	VP132897	02/05/2025	02/06/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.98000ml of W3112 + 0.00400ml of VP132692 + 0.00800ml of VP132711 + 0.00800ml of VP132819 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1727	5 PPB CCC-CCV SOM01.2 Trace	VP132898	02/05/2025	02/06/2025	Amit Patel	None	None	Semsettin Yesilyurt 02/06/2025

FROM 39.98000ml of W3112 + 0.00400ml of VP132692 + 0.00800ml of VP132711 + 0.00800ml of VP132819 = Final Quantity: 40.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1734	BFB TUNE SOM01.2 TRACE	VP132902	02/06/2025	02/07/2025	Amit Patel	None	None	Romaben Patel 02/12/2025

FROM 39.99990ml of W3112 + 0.00320ml of VP131767 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1727	5 PPB CCC-CCV SOM01.2 Trace	VP132903	02/06/2025	02/07/2025	Amit Patel	None	None	Romaben Patel 02/12/2025

FROM 39.98000ml of W3112 + 0.00400ml of VP132692 + 0.00800ml of VP132711 + 0.00800ml of VP132819 = Final Quantity: 40.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1727	5 PPB CCC-CCV SOM01.2 Trace	VP132904	02/06/2025	02/07/2025	Amit Patel	None	None	Romaben Patel 02/12/2025

FROM 39.98000ml of W3112 + 0.00400ml of VP132692 + 0.00800ml of VP132711 + 0.00800ml of VP132819 = Final Quantity: 40.000 ml

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	31491 / 1,2,4-Trimethylbenzene 2000ppm	063022	04/14/2025	10/14/2024 / SAM	07/06/2022 / SAM	V12993

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	90319 / 1,3,5-Trimethylbenzene-2000 ug/mL	063022	04/14/2025	10/14/2024 / SAM	07/06/2022 / SAM	V13178

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30492 / VOA Mix, OLC 03.2 VOA Mega Mix, 1mL, 2000ug/mL, P&TM	A0189417	03/03/2025	09/03/2024 / SAM	09/21/2022 / SAM	V13238

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30067 / BFB tuneing solution	A0191805	11/22/2025	11/22/2024 / SAM	01/13/2023 / SAM	V13391

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30429 / 1,2,3-Trichloropropane Standard, 2,000 ug/ml	A0188973	07/30/2025	01/30/2025 / SAM	01/23/2023 / SAM	V13440

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30429 / 1,2,3-Trichloropropane Standard, 2,000 ug/ml	A0194117	04/14/2025	10/14/2024 / SAM	02/06/2023 / SAM	V13587

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	90298 / Naphthalene, 2000 ug/ml	020223	07/08/2025	01/07/2025 / SAM	02/16/2023 / SAM	V13604

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	A0194279	10/31/2029	01/07/2025 / SAM	05/31/2023 / SAM	V13809

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	31491 / 1,2,4-Trimethylbenzene 2000ppm	040821	07/30/2025	01/30/2025 / SAM	06/22/2023 / SAM	V13845

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	90319 / 1,3,5-Trimethylbenzene-2000 ug/mL	061923	07/30/2025	01/30/2025 / SAM	06/22/2023 / SAM	V13858

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	A0193887	04/14/2025	10/14/2024 / SAM	07/24/2023 / SAM	V13917

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	94159 / CLP SOM01.1 Volatiles	012323	07/30/2025	01/30/2025 / SAM	12/21/2023 / SAM	V14081

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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)	22L0562016	05/18/2025	11/18/2024 / pedro	02/06/2024 / SAM	V14154

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	94559 / 1,3,5-Trichlorobenzene, 2000 ug/mL, in methanol	121923	04/14/2025	10/14/2024 / SAM	02/29/2024 / SAM	V14224

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	90298 / Naphthalene, 2000 ug/ml	020123	07/30/2025	01/30/2025 / SAM	04/17/2024 / SAM	V14308

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30091 / VOA Mix, CLP method L/C Internal Std 2500uq/ml, PT&M, 1ml/ampul	A0209905	04/14/2025	10/14/2024 / SAM	05/03/2024 / SAM	V14352

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30624 / VOA Stock Standard, OLC 3.2 VOA non-ketone, deuterated monitoring compounds, 1mL, 500ug/mL, Methanol-d	A0211457	07/27/2025	01/27/2025 / SAM	08/15/2024 / SAM	V14454

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	94559 / 1,3,5-Trichlorobenzene, 2000 ug/mL, in methanol	051421	07/30/2025	01/30/2025 / SAM	10/09/2024 / SAM	V14554

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30625 / VOA Stock Std, OLC 3.2 VOA Ketone Deuterated Monitoring Compounds, 1mL, 500ug/mL, d2O		07/13/2025	01/13/2025 / SAM	11/18/2024 / SAM	V14605

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30625 / VOA Stock Std, OLC 3.2 VOA Ketone Deuterated Monitoring Compounds, 1mL, 500ug/mL, d2O		07/13/2025	01/13/2025 / SAM	11/18/2024 / SAM	V14607

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30625 / VOA Stock Std, OLC 3.2 VOA Ketone Deuterated Monitoring Compounds, 1mL, 500ug/mL, d2O	A0219189	06/12/2025	12/12/2024 / SAM	11/22/2024 / SAM	V14610

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30625 / VOA Stock Std, OLC 3.2 VOA Ketone Deuterated Monitoring Compounds, 1mL, 500ug/mL, d2O	A0219189	06/12/2025	12/12/2024 / SAM	11/22/2024 / SAM	V14611

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)	23I0762004	07/13/2025	01/13/2025 / SAM	11/26/2024 / SAM	V14624

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)	23I0762004	07/06/2025	01/06/2025 / SAM	11/26/2024 / SAM	V14627

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CHEMICAL RECEIPT LOG BOOK

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	A02110618	07/30/2025	01/30/2025 / SAM	12/17/2024 / SAM	V14726

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	A0216826	07/30/2025	01/30/2025 / SAM	12/17/2024 / SAM	V14753

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	DIW / DI Water	Daily Lab-Certified	07/03/2029	07/03/2024 / Iwona	07/03/2024 / Iwona	W3112

Methanol
ULTRA RESI-ANALYZED
For Purge and Trap Analysis

avantor™ | J.T.Baker®

Material No.: 9077-02
Batch No.: 2310762004
Manufactured Date: 2023-08-11
Expiration Date: 2026-08-10
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (CH_3OH) (by GC, corrected for water)	≥ 99.9 %	100.0 %
Residue after Evaporation	≤ 1.0 ppm	0.5 ppm
Titrable Acid (µeq/g)	≤ 0.3	0.2
Titrable Base (µeq/g)	≤ 0.10	0.01
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

Ken Koehnlein
Sr. Manager, Quality Assurance

Methanol
ULTRA RESI-ANALYZED
For Purge and Trap Analysis

avantor™ | J.T.Baker®

Material No.: 9077-02
Batch No.: 2310762004
Manufactured Date: 2023-08-11
Expiration Date: 2026-08-10
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (CH_3OH) (by GC, corrected for water)	≥ 99.9 %	100.0 %
Residue after Evaporation	≤ 1.0 ppm	0.5 ppm
Titrable Acid (µeq/g)	≤ 0.3	0.2
Titrable Base (µeq/g)	≤ 0.10	0.01
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

Ken Koehnlein
Sr. Manager, Quality Assurance

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

10 ug/mL

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

CERTIFIED WEIGHT REPORT

Part Number: 94159
Lot Number: 012323
Description: CLP SOM 01.1 Volatiles
42 components
Expiration Date: 012326
Recommended Storage: Freezer (0 °C)
Nominal Concentration (µg/mL): Varied
NIST Test ID#: 6UTB

Solvent: Methanol **Lot#** EF282-USQ1

5E-05 Balance Uncertainty
Volume(s) shown below were combined and diluted to (mL): 100.0 0.012 Flask Uncertainty

Formulated By:	Prashant Chauhan	012323 DATE
Reviewed By:	Pedro L. Rentas	012323 DATE

Compound	Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Initial Conc.(ug/mL)	Final Conc.(ug/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Benzene	93831	060616	0.10	10.00	0.042	20006.6	2000.6	18.7	71-43-2	1 ppm	orl-rat 4894mg/kg
2. Toluene	93831	060616	0.10	10.00	0.042	20002.8	2000.2	18.7	108-88-3	200 ppm	orl-rat 5000mg/kg
3. Ethyl benzene	93831	060616	0.10	10.00	0.042	20002.5	2000.2	18.7	100-41-4	100 ppm (435mg/m3/8H)	orl-rat >2000mg/kg
4. o-Xylene	93831	060616	0.10	10.00	0.042	20003.8	2000.3	18.7	95-47-6	100 ppm (435mg/m3/8H)	ipr-mus 1364mg/kg
5. m-Xylene	93831	060616	0.10	10.00	0.042	10003.3	1000.3	9.4	108-38-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg
6. p-Xylene	93831	060616	0.10	10.00	0.042	10005.2	1000.5	9.4	106-42-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg
7. Bromodichloromethane	35171	100220	0.05	5.00	0.017	40018.8	2000.8	15.9	75-27-4	N/A	orl-rat 916mg/kg
8. Dibromochloromethane	35171	100220	0.05	5.00	0.017	40007.7	2000.3	15.9	124-48-1	N/A	orl-rat 848mg/kg
9. cis-1,2-Dichloroethene	35171	100220	0.05	5.00	0.017	40012.4	2000.5	15.8	156-59-2	N/A	N/A
10. trans-1,2-Dichloroethene	35171	100220	0.05	5.00	0.017	40005.6	2000.2	15.9	156-60-5	N/A	orl-rat 1235mg/kg
11. Methylene chloride	35171	100220	0.05	5.00	0.017	40013.9	2000.6	15.8	75-09-2	500 ppm	orl-rat 820mg/kg
12. 1,1-Dichloroethene	32251	031821	0.10	10.00	0.042	20009.1	2000.8	18.7	75-35-4	1 ppm (4mg/m3/8H)	orl-rat 200mg/kg
13. Bromochloromethane	94170	010616	0.10	10.00	0.042	20017.5	2001.7	18.7	74-97-5	200 ppm (1050mg/m3/8H)	orl-rat 5000mg/kg
14. Bromoform	94170	010616	0.10	10.00	0.042	20010.4	2000.9	18.7	75-25-2	0.5 ppm (5mg/m3) (skin)	orl-rat 933mg/kg
15. Carbon tetrachloride	94170	010616	0.10	10.00	0.042	20006.0	2000.5	18.7	56-23-5	2 ppm (12.6mg/m3/8H)	orl-rat 2350mg/kg
16. Chloroform	94170	010616	0.10	10.00	0.042	20019.5	2001.8	18.7	67-66-3	50 ppm (240mg/m3) (CL)	orl-rat 908mg/kg
17. 1,1-Dichloroethane	94170	010616	0.10	10.00	0.042	20007.6	2000.7	18.7	75-34-3	100 ppm	orl-rat 725mg/kg
18. Tetrachloroethene	94170	010616	0.10	10.00	0.042	20015.7	2001.5	18.7	127-18-4	25 ppm (170mg/m3/8H)(final)	orl-rat 2629mg/kg
19. 1,1,1-Trichloroethane	94170	010616	0.10	10.00	0.042	20007.4	2000.6	18.7	71-55-6	350 ppm (1900mg/m3/8H)	orl-rat 10300mg/kg
20. 1,2-Dibromo-3-chloropropane	94171	010616	0.10	10.00	0.042	20015.3	2001.4	18.7	96-12-8	0.001 ppm	orl-rat 170mg/kg
21. 1,2-Dibromoethane	94171	010616	0.10	10.00	0.042	20017.3	2001.6	18.7	106-93-4	20 ppm (8H)	orl-rat 108mg/kg
22. 1,2-Dichloroethane	94171	010616	0.10	10.00	0.042	20005.4	2000.4	18.7	107-06-2	50 ppm (8H)	orl-rat 670mg/kg
23. 1,2-Dichloropropane	94171	010616	0.10	10.00	0.042	20006.4	2000.5	18.7	78-87-5	75 ppm (350mg/m3/8H)	orl-rat 1947mg/kg
24. cis-1,3-Dichloropropene	94171	010616	0.10	10.00	0.042	20016.0	2001.5	18.7	10061-01-5	N/A	N/A
25. trans-1,3-Dichloropropene	94171	010616	0.10	10.00	0.042	20011.4	2001.0	18.7	10061-02-6	N/A	N/A
26. 1,1,2,2-Tetrachloroethane	94171	010616	0.10	10.00	0.042	20014.3	2001.3	18.7	79-34-5	5 ppm (35mg/m3/8H)(skin)	orl-rat 800mg/kg
27. 1,1,2-Trichloroethane	94171	010616	0.10	10.00	0.042	20024.9	2002.4	18.8	79-00-5	10 ppm (45mg/m3/8H)(skin)	orl-rat 836mg/kg
28. Trichloroethene	94171	010616	0.10	10.00	0.042	20012.9	2001.2	18.7	79-01-6	50 ppm (270mg/m3/8H)	orl-mus 2402mg/kg
29. Chlorobenzene	99783	091118	0.10	10.00	0.042	20001.9	2000.1	18.7	108-90-7	75 ppm (350mg/m3/8H)	orl-rat 2290mg/kg
30. 1,2-Dichlorobenzene	99783	091118	0.10	10.00	0.042	20002.9	2000.2	18.7	95-50-1	50 ppm (300mg/m3) (CL)	orl-rat 500mg/kg
31. 1,3-Dichlorobenzene	99783	091118	0.10	10.00	0.042	20003.7	2000.3	18.7	541-73-1	N/A	ipr-mus 1062mg/kg
32. 1,4-Dichlorobenzene	99783	091118	0.10	10.00	0.042	20005.9	2000.5	18.7	106-46-7	75 ppm (450mg/m3/8H)	orl-rat 500mg/kg
33. Isopropylbenzene	99783	091118	0.10	10.00	0.042	20391.8	2039.1	19.0	98-82-8	50 ppm (245mg/m3/8H)	orl-rat 1400mg/kg
34. 1,2,3-Trichlorobenzene	99783	091118	0.10	10.00	0.042	20003.7	2000.3	18.7	87-61-6	N/A	ipr-mus 1390mg/kg
35. 1,2,4-Trichlorobenzene	99783	091118	0.10	10.00	0.042	20084.7	2008.4	18.8	120-82-1	5 ppm (CL) (40mg/m3)	orl-rat 756mg/kg
36. Styrene	32381	052120	0.10	10.00	0.042	20041.4	2004.0	18.7	100-42-5	100 ppm	orl-rat 5000mg/kg
37. Carbon disulphide	94173	010716	0.10	10.00	0.042	20001.9	2000.1	18.7	75-15-0	4 ppm (12mg/m3) (skin)	orl-rat 1200mg/kg
38. Cyclohexane	94173	010716	0.10	10.00	0.042	20002.0	2000.1	18.7	110-82-7	300 ppm (1050mg/m3/8H)	orl-rat 12705mg/kg
39. Methyl acetate	94173	010716	0.10	10.00	0.042	20002.4	2000.1	18.7	79-20-9	200 ppm (610mg/m3/8H)	orl-rbt 3705mg/kg
40. Methylcyclohexane	94173	010716	0.10	10.00	0.042	20001.7	2000.1	18.7	108-87-2	N/A	orl-mus 2250mg/kg
41. Methyl tert-butyl ether (MTBE)	94173	010716	0.10	10.00	0.042	20001.2	2000.0	18.7	1634-04-4	N/A	orl-rat 4g/kg
42. 1,1,2-Trichloro-1,2,2-trifluoroethane	94173	010716	0.10	10.00	0.042	20001.9	2000.1	18.7	76-13-1	1000 ppm (7600mg/m3/8H)	orl-rat 43g/kg

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- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
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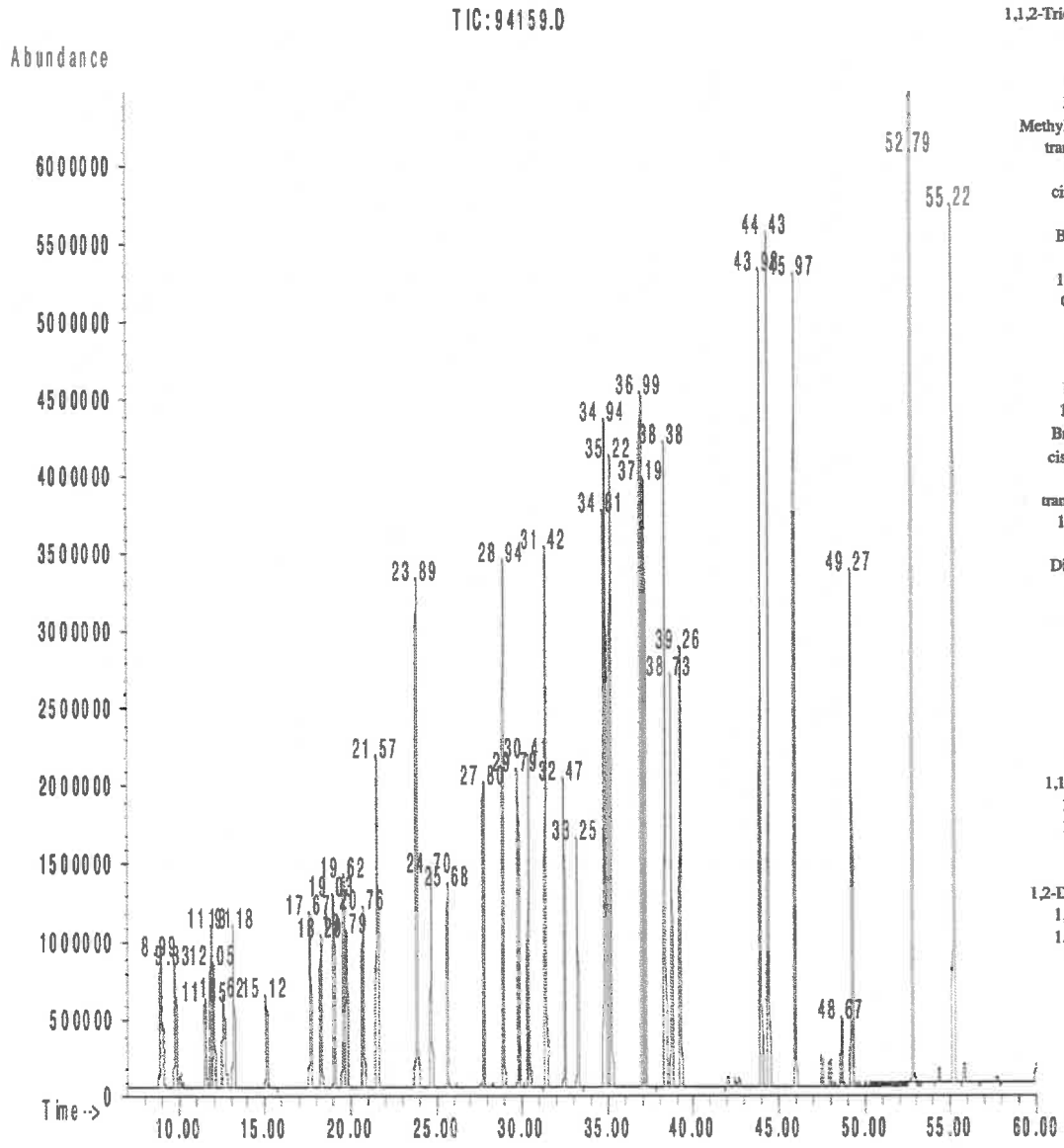
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).

Method: GC6MSD1. **Detector:** Mass Selective Detector. **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:** Gina McLane.



Retention Time (min.)	
1,1,2-Trichloro-1,2,2-trifluoroethane	8.99
1,1-Dichloroethene	9.83
Methyl acetate	11.55
Carbon disulphide	11.91
Methylene chloride	12.05
Methyl tert-butyl ether (MTBE)	12.62
trans-1,2-Dichloroethene	13.18
1,1-Dichloroethane	15.12
cis-1,2-Dichloroethene	17.67
Chloroform	18.29
Bromochloromethane	19.03
Cyclohexane	19.62
1,1,1-Trichloroethane	19.79
Carbon tetrachloride	20.76
Benzene	21.57
1,2-Dichloroethane	21.57
Trichloroethene	23.89
Methylcyclohexane	23.89
1,2-Dichloropropane	24.7
Bromodichloromethane	25.68
cis-1,3-Dichloropropene	27.8
Toluene	28.94
trans-1,3-Dichloropropene	29.79
1,1,2-Trichloroethane	30.41
Tetrachloroethene	31.42
Dibromochloromethane	32.47
1,2-Dibromoethane	33.25
Chlorobenzene	34.81
Ethylbenzene	34.94
m-Xylene	35.22
p-Xylene	35.22
o-Xylene	36.99
Styrene	37.19
Isopropylbenzene	38.38
Bromoform	38.73
1,1,2,2-Tetrachloroethane	39.26
1,3-Dichlorobenzene	43.98
1,4-Dichlorobenzene	44.43
1,2-Dichlorobenzene	45.97
impurity	48.67
1,2-Dibromo-3-chloropropane	49.27
1,2,4-Trichlorobenzene	52.79
1,2,3-Trichlorobenzene	55.22

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10

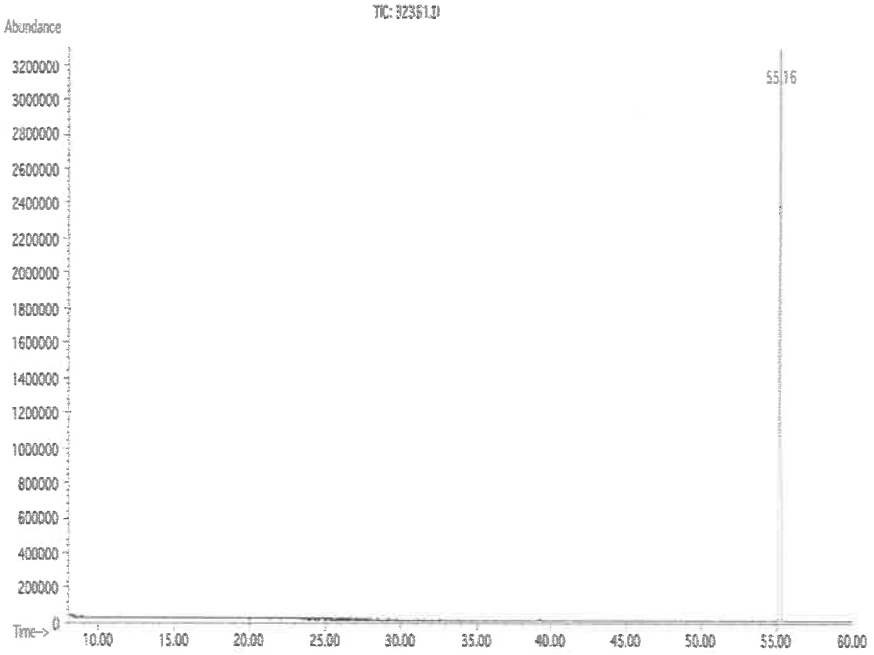
CERTIFIED WEIGHT REPORT

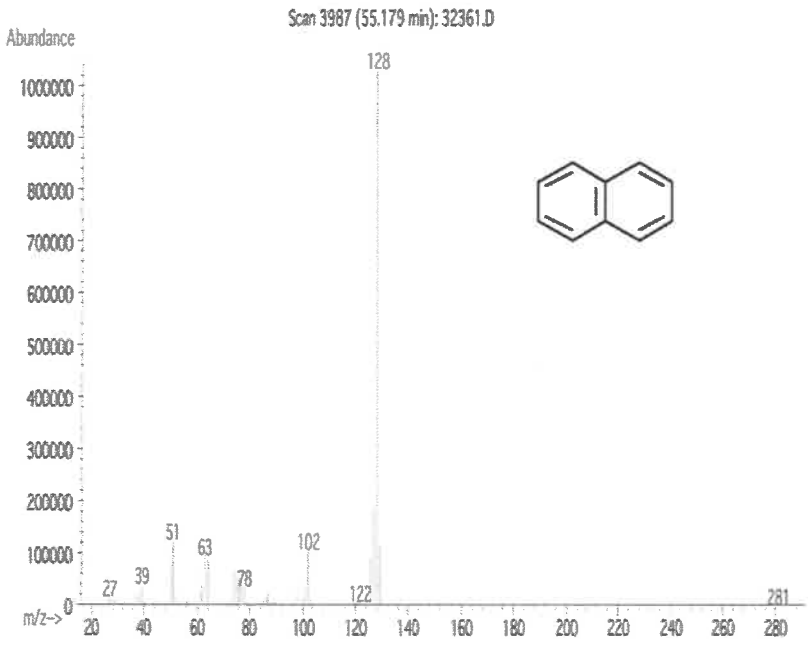
Part Number:	**90298**	**Solvent(s):**	**Lot#**	
Lot Number:	020123	Methanol	EF282-US	
Description:	Naphthalene			
Expiration Date:	020128			
Recommended Storage:	Refrigerate (4 °C)			
Nominal Concentration (µg/mL):	2000			
NIST Test ID#:	6UTB	5E-05	Balance Uncertainty	
Volume(s) shown below were combined and diluted to (mL):	100.0	0.012	Flask Uncertainty	

Justin Dippold		020123
Formulated By:	Justin Dippold	DATE
Pedro Rentas		020123
Reviewed By:	Pedro L. Rentas	DATE

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Initial Conc.(ug/mL)	Final Conc.(ug/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Naphthalene	32361	011623	0.10	10.00	0.042	20000.3	1999.9	18.7	91-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg

Method: GC6MSD-1. **Detector:** MSD (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:** Candice Warren.





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CERTIFIED WEIGHT REPORT

Part Number: 90298
Lot Number: 020223
Description: Naphthalene

Solvent(s): Methanol **Lot#** EF282-US

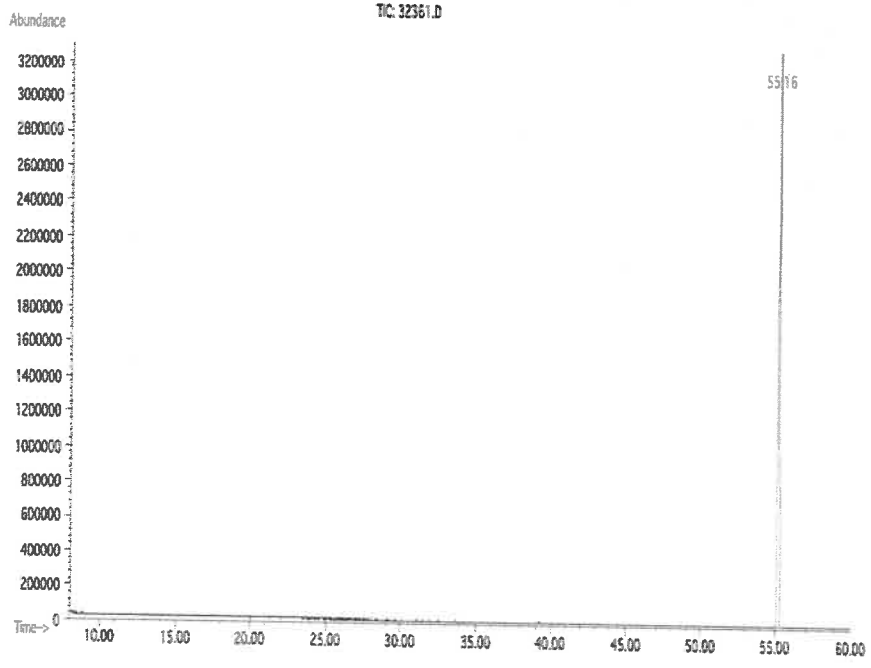
Expiration Date: 020228
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

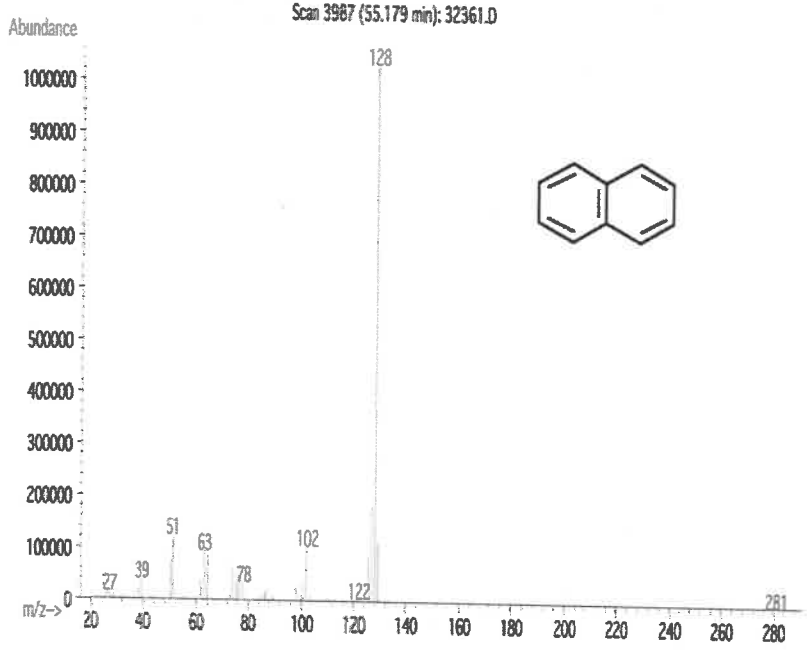
5E-05 Balance Uncertainty
Volume(s) shown below were combined and diluted to (mL): 100.0
0.012 Flask Uncertainty

Formulated By:	Prashant Chauhan	020223 DATE
Reviewed By:	Pedro L. Rentas	020223 DATE

Compound	Part Number	Lot Number	Dilution Factor	Initial Vol. (mL)	Uncertainty Pipette (mL)	Initial Conc.(ug/mL)	Final Conc.(ug/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Naphthalene	32361	011623	0.10	10.00	0.042	20000.3	1999.9	18.7	91-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg

Method: GC6MSD-1. **Detector:** MSD (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:** Candice Warren.





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CERTIFIED WEIGHT REPORT

Part Number: 31491
Lot Number: 040821
Description: 1,2,4-Trimethylbenzene

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

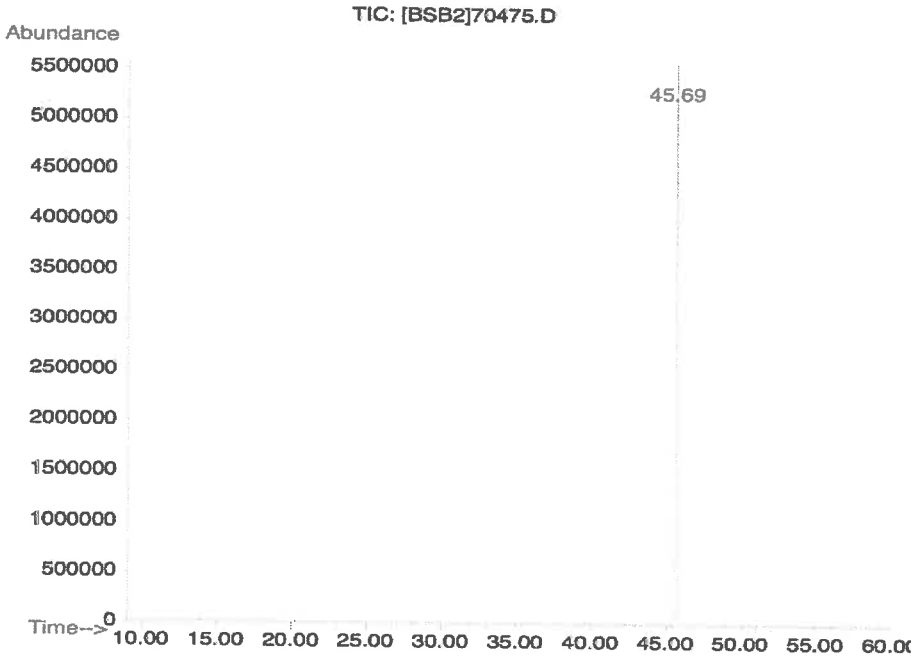
Expiration Date: 040826
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

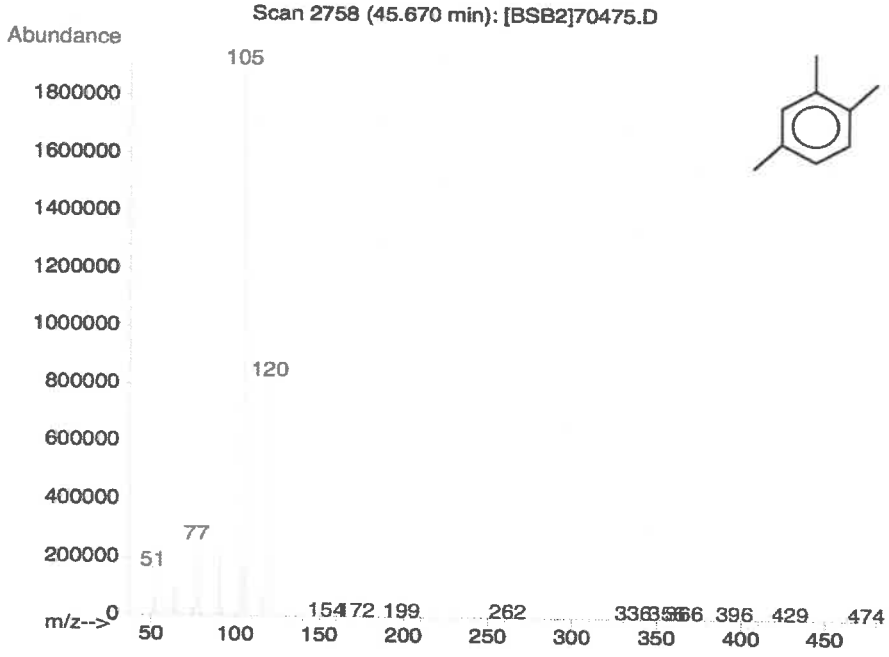
Weight(s) shown below were combined and diluted to (mL): 50.0 | 5E-05 Balance Uncertainty | 0.057 Flask Uncertainty

Formulated By:	Prashant Chauhan	040821 DATE
Reviewed By:	Pedro L. Rentas	040821 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. 1,2,4-Trimethylbenzene	475	WXBC9778V	2000	98.8	0.2	0.10127	0.10140	2002.5	9.5	95-63-6	N/A	orl-rat 5g/kg

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. Analysis performed by Candice Warren.





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CERTIFIED WEIGHT REPORT

Part Number: 94559
Lot Number: 051421
Description: 1,3,5-Trichlorobenzene

Expiration Date: 051426
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

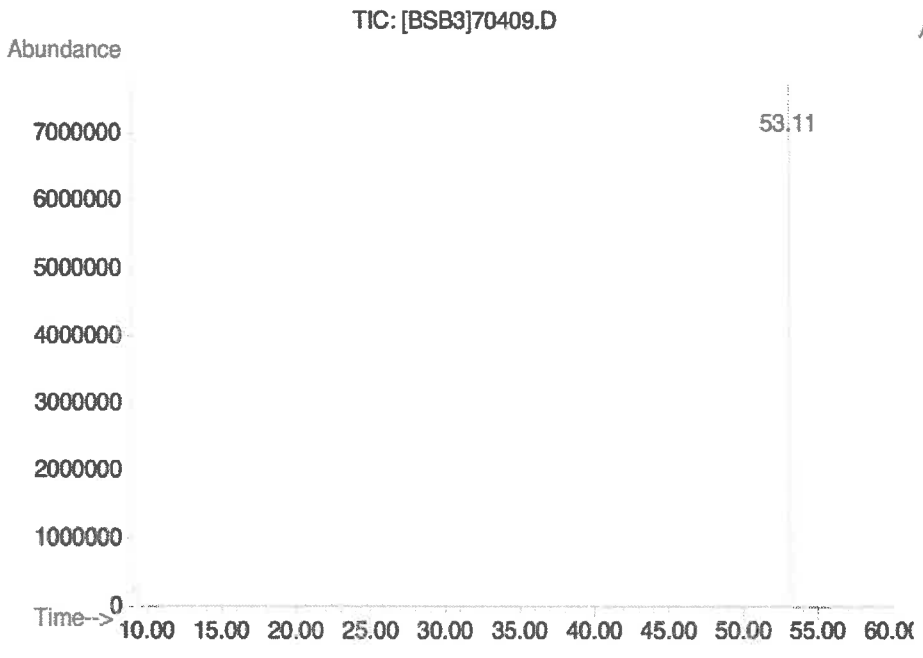
Solvent(s): **Lot#**
Methanol DY186-US

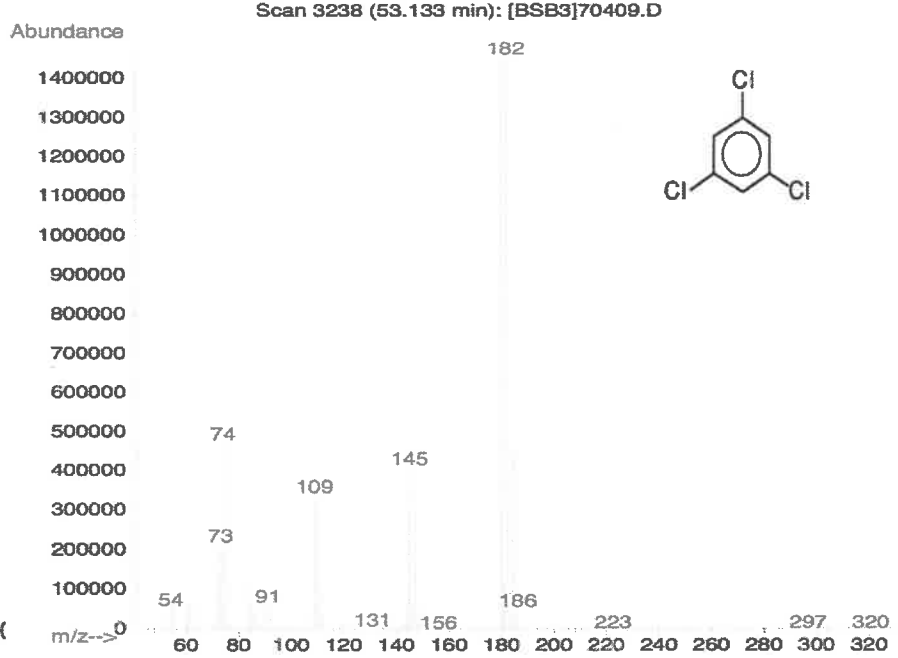
5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 100.0 0.012 Flask Uncertainty

		051421
Formulated By:	Benson Chan	DATE
		051421
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. 1,3,5-Trichlorobenzene	409	STBH8643	2000	99.9	0.2	0.20021	0.20084	2006.3	8.1	108-70-3	N/A	orl-rat 800mg/kg

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. Analysis performed by Candice Warren.





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Absolute Standards Inc.
PO Box 5585
Hamden, CT 06518-0585
Phone: 203-281-2917
FAX: 203-281-2922

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 Date Prepared/Revised	**1-352-323-3500** January 1, 2024

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 sheild**
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	CAS#: 67-56-1	> 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. 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 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.
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)
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 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.

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

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

CERTIFIED WEIGHT REPORT

Part Number: 90319
Lot Number: 061923
Description: 1,3,5-Trimethylbenzene [Mesitylene]
Expiration Date: 061928
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

Solvent: Methanol **Lot#** EF282-US

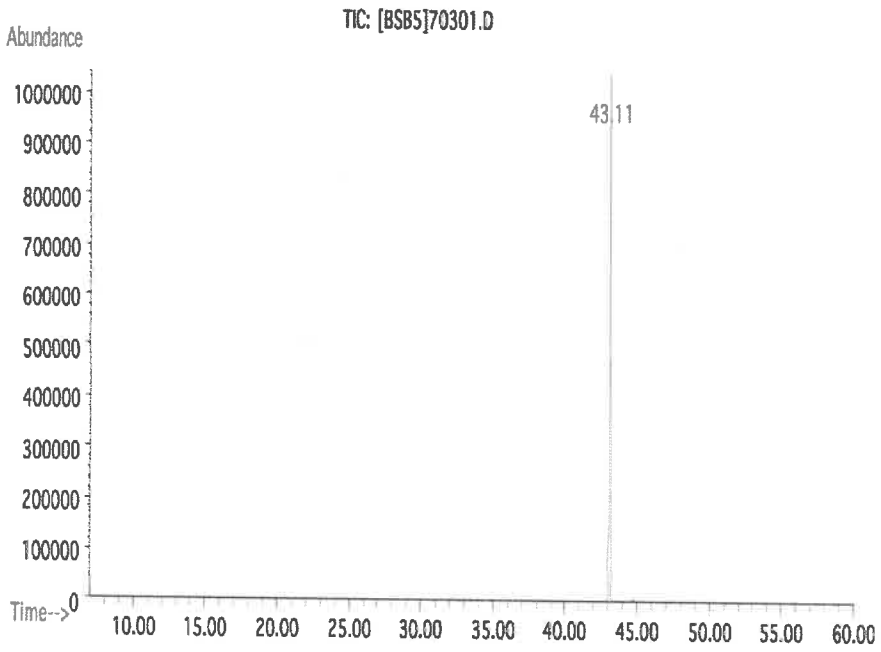
Weight(s) shown below were combined and diluted to (mL): 50.0 | 5E-05 Balance Uncertainty | 0.001 Flask Uncertainty

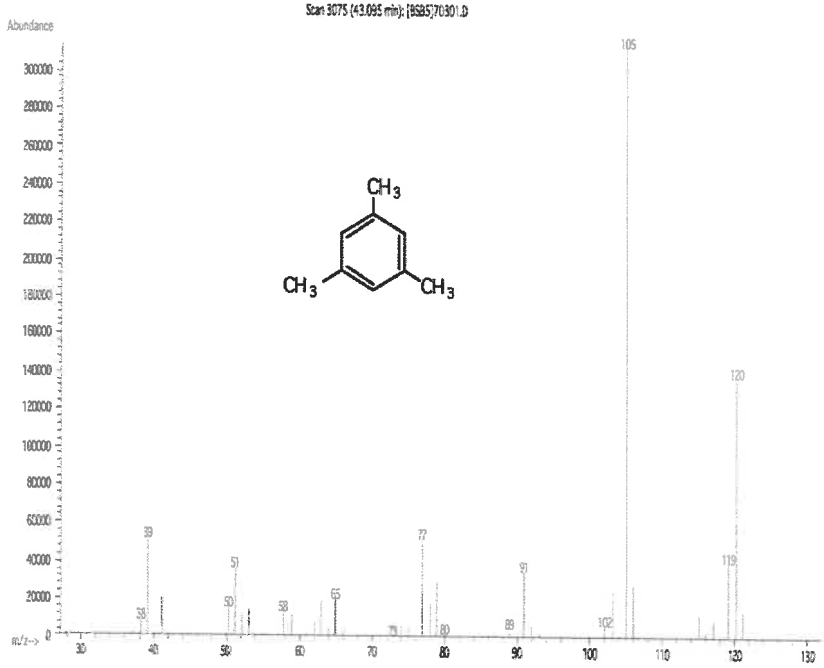
Gabriel Helland 061923
Formulated By: Gabriel Helland DATE

Pedro Rentas 061923
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. 1,3,5-Trimethylbenzene	301	TOOOF-IC	2000	97	0.2	0.10315	0.10341	2004.9	8.5	108-67-8	N/A	orl-rat 5000mg/kg

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. Analysis performed by 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).

Absolute Standards, Inc.
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Certified Reference Material CRM

6 vial 7-6

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

CERTIFIED WEIGHT REPORT

Part Number: 90319
Lot Number: 063022
Description: 1,3,5-Trimethylbenzene [Mesitylene]
Expiration Date: 063027
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

Solvent: Methanol **Lot#** EC592-US

V12978-983

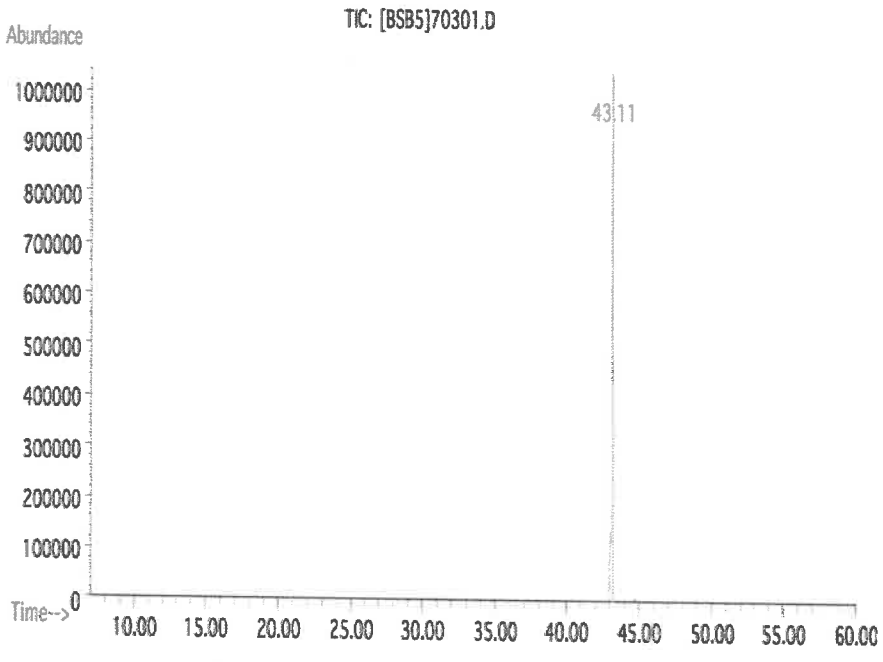
5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 30.0 0.0003 Flask Uncertainty

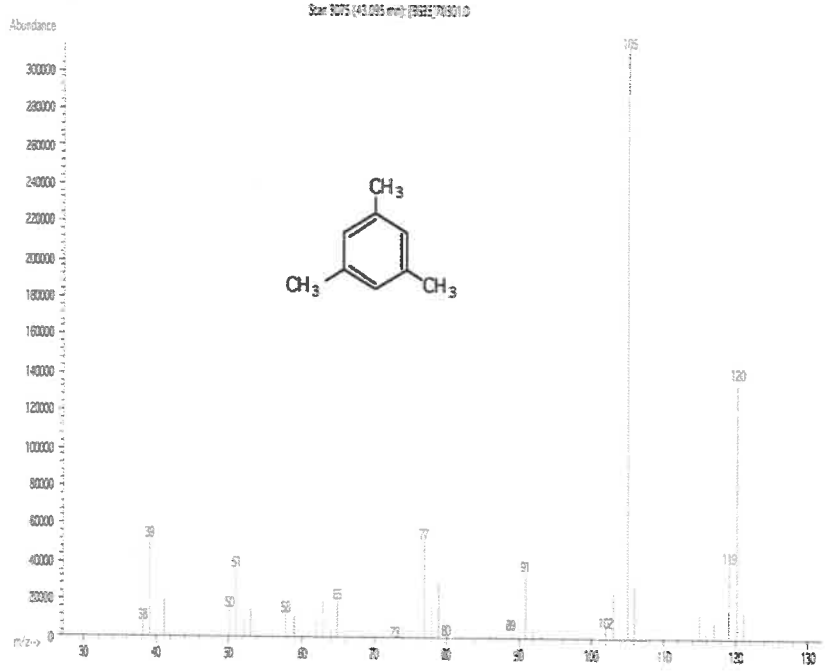
Gabriel Helland 063022
Formulated By: Gabriel Helland DATE

Pedro Rentas 063022
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.	1,3,5-Trimethylbenzene	301	8780.01-13	2000	99.5	0.2	0.06033	0.06070	2012.1	8.7	108-67-8	N/A	orl-rat 5000mg/kg

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. Analysis performed by 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 certifed (+/-) 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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Certified Reference Material CRM

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AR-1539 Certificate Number
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CERTIFIED WEIGHT REPORT

Part Number: 94559
Lot Number: 121923
Description: 1,3,5-Trichlorobenzene

Solvent(s): Methanol **Lot#** EH485-US

Expiration Date: 121928
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

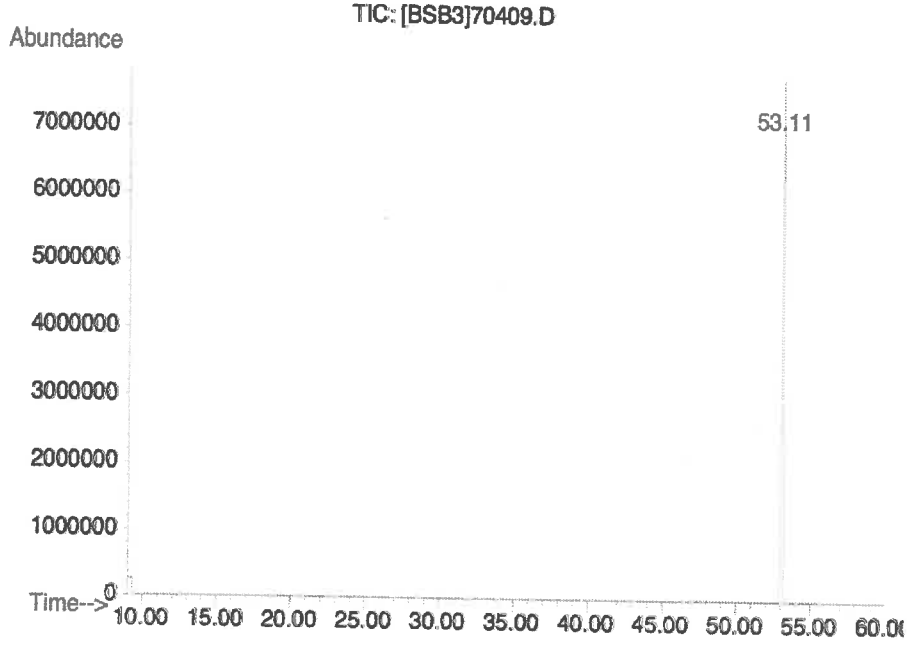
5E-05 Balance Uncertainty
0.021 Flask Uncertainty

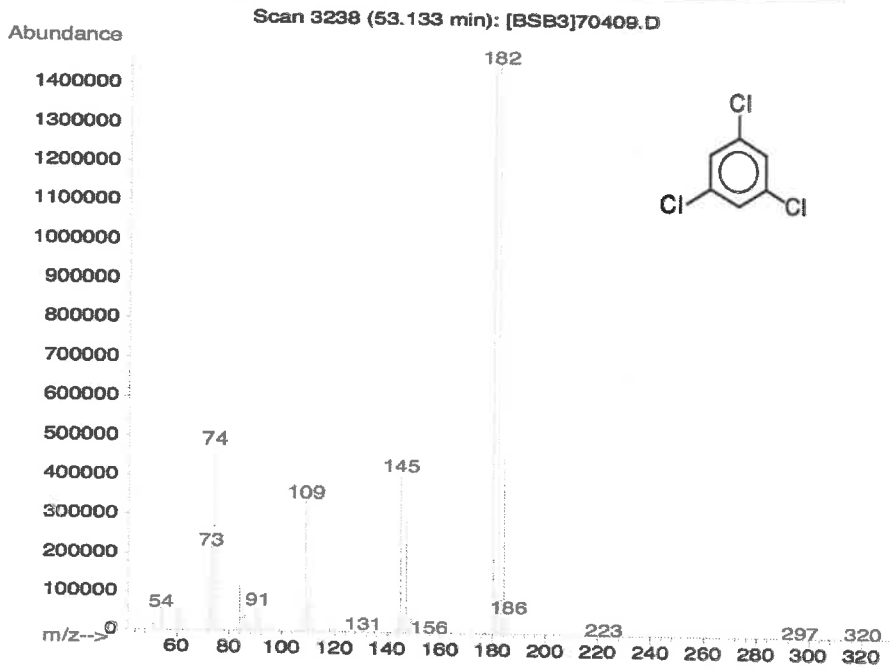
Weight(s) shown below were combined and diluted to (mL): 100.0

Formulated By: Anthony Mahoney	121923 DATE
Reviewed By: Pedro L. Rentas	121923 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. 1,3,5-Trichlorobenzene	409	STBH8643	2000	99.9	0.2	0.20025	0.20059	2003.4	8.1	108-70-3	N/A	orl-rat 800mg/kg

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. Analysis performed by 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.
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Absolute Standards Inc.

PO Box 5585
Hamden, CT 06518-0585

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

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 Date Prepared/Revised	**1-352-323-3500** January 1, 2023

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 sheild**
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:	CAS#:	LD50 Oral - Rat	OSHA PEL	% (optional)
Methanol	67-56-1	2,769 mg/kg	200 ppm	> 99

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 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.
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)
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 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.

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
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. : 30429 **Lot No.:** A0188973

Description : 1,2,3-Trichloropropane Standard

1,2,3-Trichloropropane 2000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : August 31, 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	1,2,3-Trichloropropane **CAS #** 96-18-4 (Lot 332900) **Purity** 99%	2,000.0 µg/mL	+/- 11.7371 µg/mL +/- 112.1494 µg/mL +/- 114.7730 µg/mL		Gravimetric Unstressed Stressed

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

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

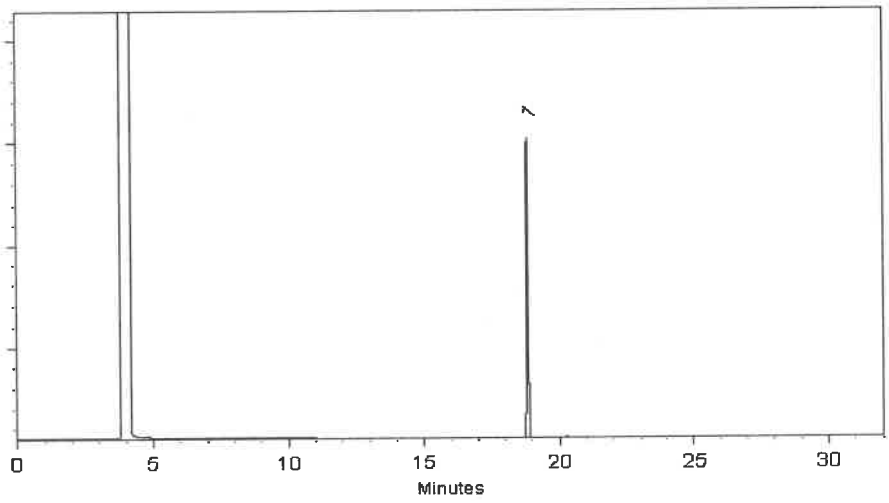
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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.

Daniel Wasson - Operations Tech I **Date Mixed:** 24-Aug-2022 **Balance:** 1127510105

Christie Mills - Operations Tech II - ARM QC **Date Passed:** 29-Aug-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:

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

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 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.
- 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.

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
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. : 30492 **Lot No.:** A0189417

Description : OLC 03.2 VOA Mega Mix

OLC 03.2 VOA Mega Mix 1,000-2,000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : September 30, 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	1,1,2-Trichlorotrifluoroethane (CFC-113) **CAS #** 76-13-1 (Lot 00016133) **Purity** 99%	2,007.0 µg/mL	+/- 11.7782 µg/mL +/- 121.1018 µg/mL +/- 121.3893 µg/mL	Gravimetric Unstressed Stressed
2	1,1-dichloroethene **CAS #** 75-35-4 (Lot SHBG8609V) **Purity** 99%	2,010.7 µg/mL	+/- 15.5022 µg/mL +/- 121.7394 µg/mL +/- 122.0264 µg/mL	Gravimetric Unstressed Stressed
3	Methyl acetate **CAS #** 79-20-9 (Lot SHBM1320) **Purity** 99%	2,012.5 µg/mL	+/- 11.8105 µg/mL +/- 121.4337 µg/mL +/- 121.7219 µg/mL	Gravimetric Unstressed Stressed
4	Methylene chloride (dichloromethane) **CAS #** 75-09-2 (Lot SHBP1417) **Purity** 99%	2,010.6 µg/mL	+/- 15.5019 µg/mL +/- 121.7364 µg/mL +/- 122.0234 µg/mL	Gravimetric Unstressed Stressed
5	Carbon disulfide **CAS #** 75-15-0 (Lot N28F701) **Purity** 99%	2,016.0 µg/mL	+/- 11.8310 µg/mL +/- 121.6448 µg/mL +/- 121.9336 µg/mL	Gravimetric Unstressed Stressed
6	Methyl-tert-butyl ether (MTBE) **CAS #** 1634-04-4 (Lot SHBN6497) **Purity** 99%	2,012.0 µg/mL	+/- 11.8075 µg/mL +/- 121.4035 µg/mL +/- 121.6917 µg/mL	Gravimetric Unstressed Stressed
7	trans-1,2-Dichloroethene **CAS #** 156-60-5 (Lot MKBH9850V) **Purity** 99%	2,013.3 µg/mL	+/- 15.5227 µg/mL +/- 121.8999 µg/mL +/- 122.1873 µg/mL	Gravimetric Unstressed Stressed

8	1,1-Dichloroethane **CAS #** 75-34-3 **Purity** 99%	(Lot 760200)	2,013.4	µg/mL	+/- 15.5229 +/- 121.9014 +/- 122.1888	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	cis-1,2-Dichloroethene **CAS #** 156-59-2 **Purity** 99%	(Lot MKCP7830)	2,009.0	µg/mL	+/- 11.7899 +/- 121.2225 +/- 121.5102	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	chloroform **CAS #** 67-66-3 **Purity** 99%	(Lot SHBN8469)	2,012.3	µg/mL	+/- 15.5146 +/- 121.8363 +/- 122.1235	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Bromochloromethane **CAS #** 74-97-5 **Purity** 99%	(Lot 00008541)	2,019.0	µg/mL	+/- 11.8486 +/- 121.8259 +/- 122.1150	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	1,1,1-trichloroethane **CAS #** 71-55-6 **Purity** 99%	(Lot RD220215)	2,012.5	µg/mL	+/- 15.5163 +/- 121.8499 +/- 122.1372	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	Cyclohexane **CAS #** 110-82-7 **Purity** 99%	(Lot EA003-US)	2,009.5	µg/mL	+/- 11.7929 +/- 121.2526 +/- 121.5405	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	carbon tetrachloride **CAS #** 56-23-5 **Purity** 99%	(Lot SHBL8097)	2,012.3	µg/mL	+/- 15.5146 +/- 121.8363 +/- 122.1235	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	1,2-Dichloroethane **CAS #** 107-06-2 **Purity** 99%	(Lot MKCN9758)	2,016.3	µg/mL	+/- 15.5454 +/- 122.0785 +/- 122.3663	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	Benzene **CAS #** 71-43-2 **Purity** 99%	(Lot MKCM9242)	2,018.0	µg/mL	+/- 11.8428 +/- 121.7655 +/- 122.0546	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	Trichloroethene **CAS #** 79-01-6 **Purity** 99%	(Lot SHBL5816)	2,009.0	µg/mL	+/- 15.4891 +/- 121.6365 +/- 121.9233	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	Methylcyclohexane **CAS #** 108-87-2 **Purity** 99%	(Lot SHBN1699)	2,009.5	µg/mL	+/- 11.7929 +/- 121.2526 +/- 121.5405	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	1,2-Dichloropropane **CAS #** 78-87-5 **Purity** 99%	(Lot BCBR0882V)	2,016.1	µg/mL	+/- 15.5439 +/- 122.0664 +/- 122.3541	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	bromodichloromethane **CAS #** 75-27-4 **Purity** 99%	(Lot MKCM7156)	2,011.4	µg/mL	+/- 15.5074 +/- 121.7803 +/- 122.0674	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
21	cis-1,3-Dichloropropene **CAS #** 10061-01-5 **Purity** 99%	(Lot RD220311)	2,011.3	µg/mL	+/- 15.5073 +/- 121.7788 +/- 122.0659	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
22	Toluene **CAS #** 108-88-3 **Purity** 99%	(Lot MKCQ2779)	2,014.0	µg/mL	+/- 11.8193 +/- 121.5242 +/- 121.8126	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
23	trans-1,3-Dichloropropene **CAS #** 10061-02-6 **Purity** 98%	(Lot RD220228A)	2,014.7	µg/mL	+/- 15.5331 +/- 121.9821 +/- 122.2697	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

24	1,1,2-Trichloroethane **CAS #** 79-00-5 **Purity** 99%	(Lot FGB01)	2,013.0	µg/mL	+/- 15.5200 +/- 121.8787 +/- 122.1660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
25	Tetrachloroethene **CAS #** 127-18-4 **Purity** 99%	(Lot SHBJ7422)	2,012.0	µg/mL	+/- 15.5126 +/- 121.8212 +/- 122.1084	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
26	dibromochloromethane **CAS #** 124-48-1 **Purity** 99%	(Lot MKCM8659)	2,015.6	µg/mL	+/- 15.5404 +/- 122.0391 +/- 122.3268	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
27	1,2-Dibromoethane (EDB) **CAS #** 106-93-4 **Purity** 99%	(Lot BCCF5058)	2,007.5	µg/mL	+/- 11.7811 +/- 121.1320 +/- 121.4195	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
28	Chlorobenzene **CAS #** 108-90-7 **Purity** 99%	(Lot SHBL8110)	2,016.5	µg/mL	+/- 15.5468 +/- 122.0891 +/- 122.3769	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
29	Ethylbenzene **CAS #** 100-41-4 **Purity** 99%	(Lot SHBM4308)	2,012.0	µg/mL	+/- 11.8075 +/- 121.4035 +/- 121.6917	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
30	m-Xylene **CAS #** 108-38-3 **Purity** 99%	(Lot Q13G020)	1,008.5	µg/mL	+/- 5.9184 +/- 60.8526 +/- 60.9970	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
31	p-Xylene **CAS #** 106-42-3 **Purity** 99%	(Lot 10234437)	1,004.0	µg/mL	+/- 5.8920 +/- 60.5811 +/- 60.7249	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
32	o-Xylene **CAS #** 95-47-6 **Purity** 98%	(Lot SHBN5105)	2,006.6	µg/mL	+/- 11.7756 +/- 121.0746 +/- 121.3620	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
33	Styrene **CAS #** 100-42-5 **Purity** 99%	(Lot MKCQ3390)	2,008.0	µg/mL	+/- 11.7841 +/- 121.1621 +/- 121.4497	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
34	Isopropylbenzene (cumene) **CAS #** 98-82-8 **Purity** 99%	(Lot Z20D022)	2,015.0	µg/mL	+/- 11.8251 +/- 121.5845 +/- 121.8731	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
35	bromoform **CAS #** 75-25-2 **Purity** 98%	(Lot SHBK4455)	2,015.3	µg/mL	+/- 15.5377 +/- 122.0177 +/- 122.3054	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
36	1,1,2,2-Tetrachloroethane **CAS #** 79-34-5 **Purity** 99%	(Lot CFA4D)	2,011.9	µg/mL	+/- 15.5119 +/- 121.8151 +/- 122.1023	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
37	1,3-Dichlorobenzene **CAS #** 541-73-1 **Purity** 99%	(Lot BCCD5315)	2,016.2	µg/mL	+/- 15.5445 +/- 122.0709 +/- 122.3587	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
38	1,4-Dichlorobenzene **CAS #** 106-46-7 **Purity** 99%	(Lot MKBS4401V)	2,019.0	µg/mL	+/- 15.5660 +/- 122.2404 +/- 122.5286	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
39	1,2-Dichlorobenzene **CAS #** 95-50-1 **Purity** 99%	(Lot SHBN3835)	2,011.9	µg/mL	+/- 15.5113 +/- 121.8106 +/- 122.0977	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

40	1,2-Dibromo-3-chloropropane **CAS #** 96-12-8 **Purity** 97%	(Lot HBMVB)	2,016.6	µg/mL	+/- 11.8347 +/- 121.6829 +/- 121.9717	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
41	1,2,4-Trichlorobenzene **CAS #** 120-82-1 **Purity** 99%	(Lot SHBM0526)	2,012.5	µg/mL	+/- 11.8105 +/- 121.4337 +/- 121.7219	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
42	1,2,3-Trichlorobenzene **CAS #** 87-61-6 **Purity** 99%	(Lot MKBX7627V)	2,012.0	µg/mL	+/- 11.8075 +/- 121.4035 +/- 121.6917	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

Column:
60m x 0.25mm x 1.4µm
Rtx-502.2 (cat.#10916)

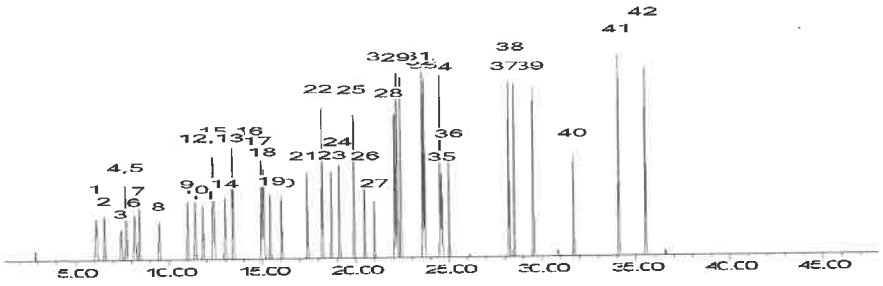
Carrier Gas:
helium-constant pressure 30 psi

Temp. Program:
40°C (hold 6 min.) to 240°C
@ 6°C/min. (hold 10 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 Suckar - Mix Technician

Date Mixed: 09-Sep-2022 **Balance:** B707717271

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Sep-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:

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

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 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.
- 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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Certificate of Analysis

chromatographic plus

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Reference Material Producer
Certificate #3222.01

ACCREDITED
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. : 30067 **Lot No.:** A0191805

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 : November 30, 2027 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1-Bromo-4-fluorobenzene (BFB)	460-00-4	184975	99%	2,483.9 µg/mL	+/- 139.5488

* Expanded Uncertainty displayed in same units as Grav. Conc.

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

Quality Confirmation Test

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.)

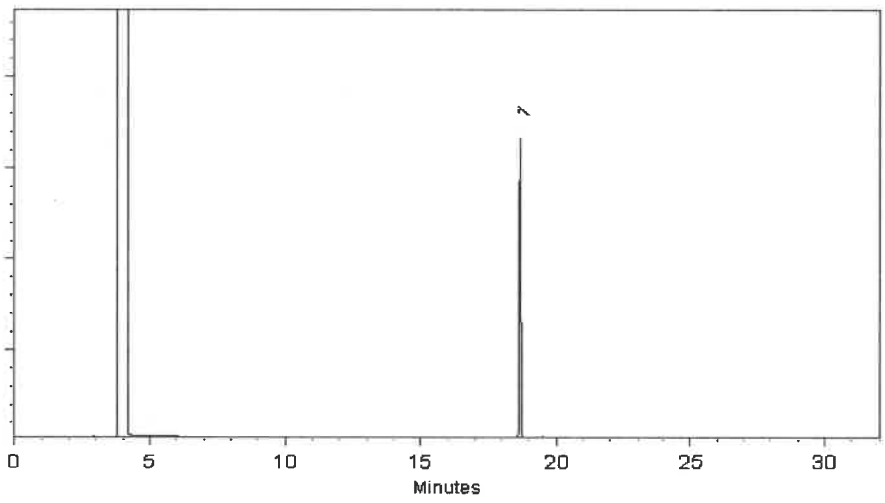
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID

Split Vent:
40 ml/min

Inj. Vol
1µl



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.

Alicia Leathers - Operation Technician I **Date Mixed:** 17-Nov-2022 **Balance Serial #** B251644995

Jennifer Pollino - Operations Tech III - ARM QC **Date Passed:** 21-Nov-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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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 ampuls. 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.

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ilac-MRA A2LA ACCREDITED 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. : 30006 **Lot No.:** A0193887

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 : April 30, 2026 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	Acetone	67-64-1	SHBP8774	99%	5,006.5 µg/mL	+/- 173.0015
2	2-Butanone (MEK)	78-93-3	SHBN9536	99%	5,008.5 µg/mL	+/- 173.0706
3	4-Methyl-2-pentanone (MIBK)	108-10-1	SHBP4724	99%	5,000.3 µg/mL	+/- 172.7884
4	2-Hexanone	591-78-6	MKCQ6663	99%	5,001.7 µg/mL	+/- 172.8345

* Expanded Uncertainty displayed in same units as Grav. Conc.

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

Quality Confirmation Test

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.)

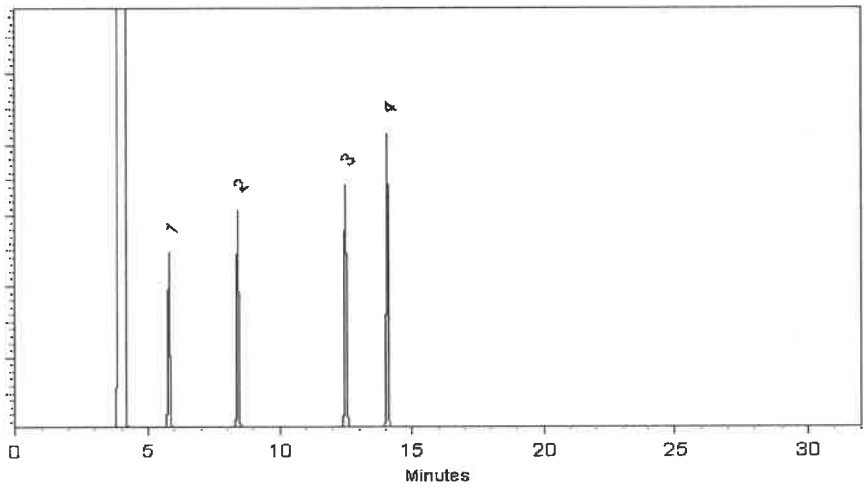
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID

Split Vent:
40 ml/min

Inj. Vol
1µl



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.

Josh McCloskey - Operations Technician I

Date Mixed: 24-Jan-2023 **Balance Serial #** B707717271

Christie Mills - Operations Tech II - ARM QC

Date Passed: 27-Jan-2023

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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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 ampuls. 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.

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CERTIFIED REFERENCE MATERIAL

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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. : 30429 **Lot No.:** A0194117

Description : 1,2,3-Trichloropropane Standard

1,2,3-Trichloropropane 2000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : January 31, 2028 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1,2,3-Trichloropropane	96-18-4	BCBH8722V	99%	2,013.8 µg/mL	+/- 113.1502

* Expanded Uncertainty displayed in same units as Grav. Conc.

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

Quality Confirmation Test

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.)

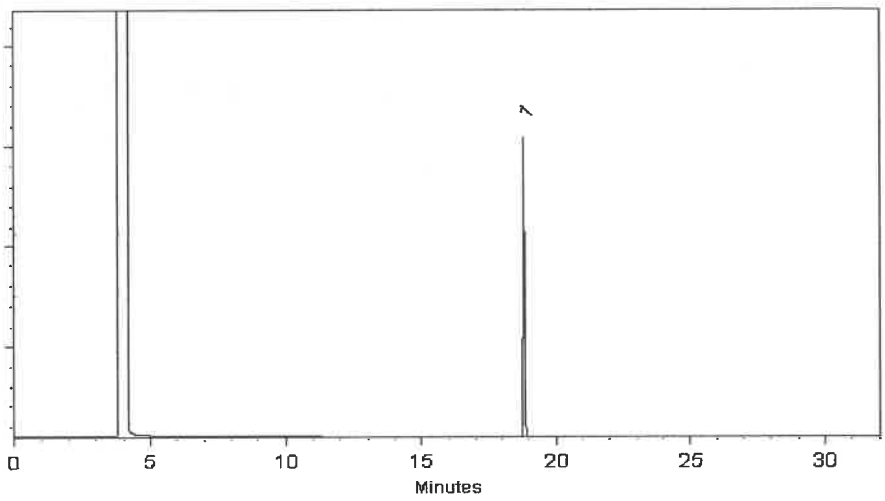
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID

Split Vent:
40 ml/min

Inj. Vol
1µl



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.

Daniel Wasson - Operations Tech I

Date Mixed: 30-Jan-2023 **Balance Serial #** B707717271

Christie Mills - Operations Tech II - ARM QC

Date Passed: 02-Feb-2023

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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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 ampuls. 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.

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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 **Lot No.:** A0194279

Description : 502.2 Calibration Mix #1

502.2 Calibration Mix #1 2,000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : October 31, 2029 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	Dichlorodifluoromethane (CFC-12)	75-71-8	00012554	99%	2,001.5 µg/mL	+/- 112.7231
2	Chloromethane (methyl chloride)	74-87-3	SHBK6571	99%	2,001.2 µg/mL	+/- 112.5863
3	Vinyl chloride	75-01-4	00015559	99%	2,001.4 µg/mL	+/- 112.6561
4	Bromomethane (methyl bromide)	74-83-9	101604	99%	2,006.4 µg/mL	+/- 112.8262
5	Chloroethane (ethyl chloride)	75-00-3	107-401039114-1	99%	2,001.9 µg/mL	+/- 112.5897
6	Trichlorofluoromethane (CFC-11)	75-69-4	MKCL8411	99%	2,000.8 µg/mL	+/- 112.6473

* Expanded Uncertainty displayed in same units as Grav. Conc.

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

Quality Confirmation Test

Column:
60m x 0.25mm x 1.4µm
Rtx-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.

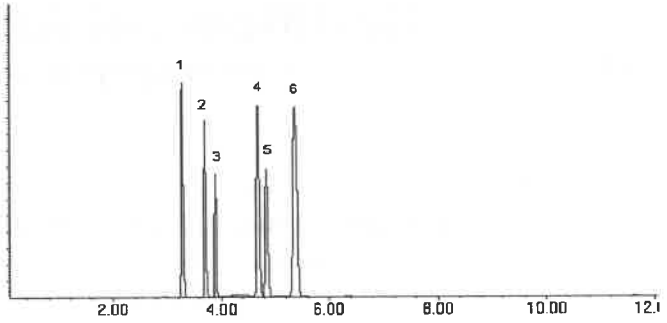
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
MSD

Split Vent:
Split ratio 10:1

Inj. Vol
1µl



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 Suckar - Mix Technician

Date Mixed: 03-Feb-2023 **Balance Serial #** B707717271

Christie Mills - Operations Tech II - ARM QC

Date Passed: 07-Feb-2023

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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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 ampuls. 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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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. : 30091 **Lot No.:** A0209905

Description : L/C VOA Internal Standard Mix

L/C Internal Std 2500µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : March 31, 2029 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1,4-Difluorobenzene	540-36-3	MKCS8657	99%	2,508.0 µg/mL	+/- 142.0596
2	Chlorobenzene-d5	3114-55-4	PR-31132	99%	2,512.0 µg/mL	+/- 142.2862
3	1,4-Dichlorobenzene-d4	3855-82-1	PR-30447	99%	2,512.0 µg/mL	+/- 142.2862

* Expanded Uncertainty displayed in same units as Grav. Conc.

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

Quality Confirmation Test

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.)

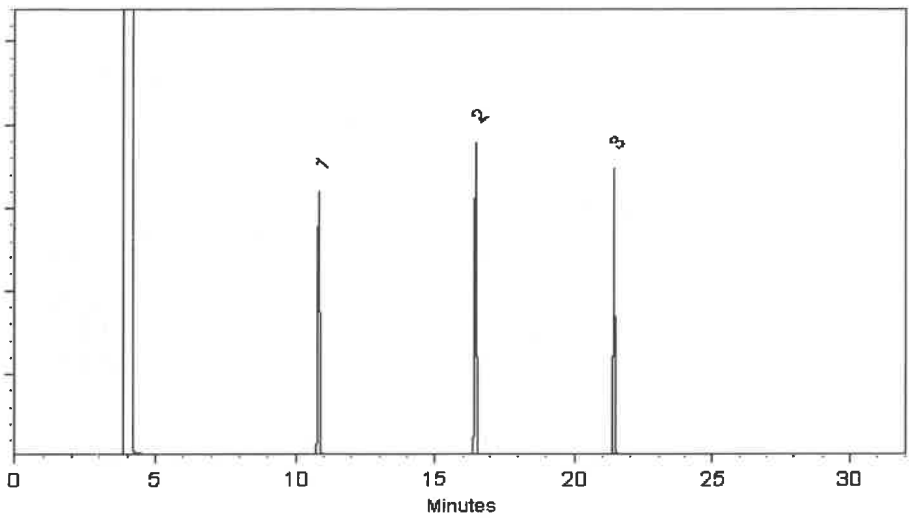
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID

Split Vent:
40 ml/min

Inj. Vol
1µl



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.

Ethan Winiarski - Operations Tech I

Date Mixed: 05-Apr-2024 **Balance Serial #** 1127510105

Dillan Murphy - Operations Technician I

Date Passed: 08-Apr-2024

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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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

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

- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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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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.:** A0210618

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 : July 31, 2027 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	Acetone	67-64-1	SHBQ8504	99%	5,014.8 µg/mL	+/- 173.2883
2	2-Butanone (MEK)	78-93-3	SHBQ4704	99%	5,012.4 µg/mL	+/- 173.2054
3	4-Methyl-2-pentanone (MIBK)	108-10-1	SHBP9200	99%	5,011.6 µg/mL	+/- 173.1777
4	2-Hexanone	591-78-6	MKCQ6663	99%	5,013.0 µg/mL	+/- 173.2261

* Expanded Uncertainty displayed in same units as Grav. Conc.

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

Quality Confirmation Test

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.)

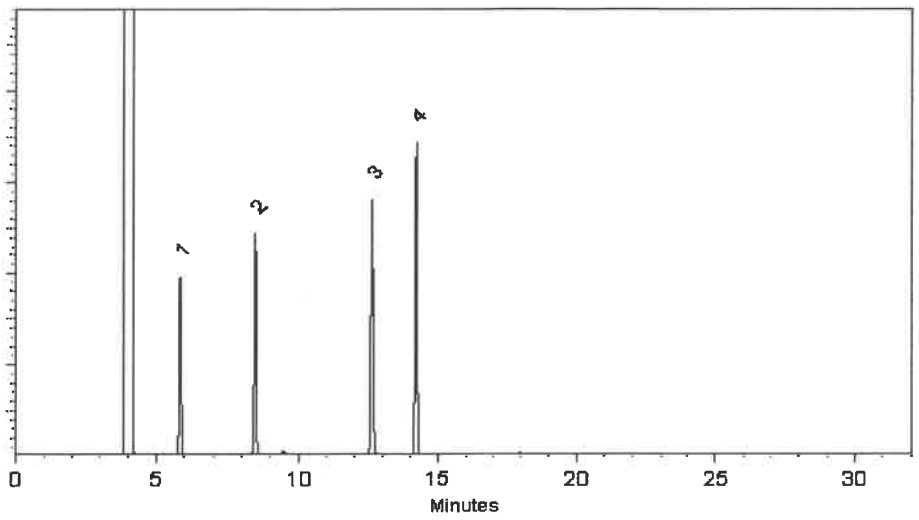
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID

Split Vent:
40 ml/min

Inj. Vol
1µl



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.

Dakota Parson - Operations Technician I

Date Mixed: 22-Apr-2024 **Balance Serial #** B707717271

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 24-Apr-2024

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.
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- 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:

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

- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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 ampuls. 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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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. : 30624 **Lot No.:** A0211457

Description : SOM 01.1 VOA DMC Non-Ketones Standard

SOM 01.1 VOA DMC Non-Ketones Standard 500µg/mL, Methanol-OD, 1mL/ampul

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

Expiration Date : May 31, 2027 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	Vinyl Chloride-d3	6745-35-3	PR-26294	99%	515.3 µg/mL	+/- 42.5161
2	Chloroethane-d5	19199-91-8	PR-19060	99%	498.2 µg/mL	+/- 40.0866
3	1,1-Dichloroethylene-d2	22280-73-5	PR-21050	99%	503.0 µg/mL	+/- 28.2630
4	Chloroform-d	865-49-6	A0219685001	99%	503.0 µg/mL	+/- 28.2630
5	1,2-Dichloroethane-d4	17060-07-0	PR-33313	99%	503.0 µg/mL	+/- 28.2630
6	Benzene-d6	1076-43-3	PR-33510	99%	501.0 µg/mL	+/- 28.1506
7	1,2-Dichloropropane-d6	93952-08-0	Z-322	99%	503.0 µg/mL	+/- 28.2630
8	1,3-Dichloropropene-d4 (cis/ trans mixture) 58% cis Isomer; 42% trans Isomer	202656-23-3	Z-181	99%	504.0 µg/mL	+/- 28.3192
9	Toluene-d8	2037-26-5	PR-34141	99%	503.0 µg/mL	+/- 28.2630
10	1,1,2,2-Tetrachloroethane-d2	33685-54-0	F465P1	99%	502.0 µg/mL	+/- 28.2068
11	1,2-Dichlorobenzene-d4	2199-69-1	PR-32597	99%	503.0 µg/mL	+/- 28.2630

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Methanol-OD
CAS # 1455-13-6
Purity 99%

Quality Confirmation Test

Column:
60m x 0.25mm x 1.4µm
Rtx-502.2 (cat.#10916)

Carrier Gas:
helium-constant pressure 30 psi

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

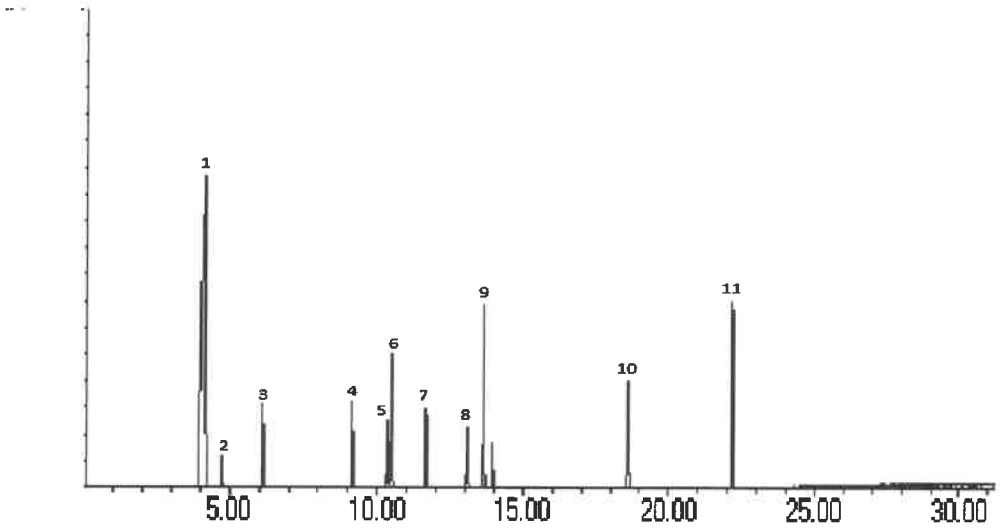
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
MSD

Split Vent:
25.0 ml/min.

Inj. Vol
1µl



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 Suckar - Mix Technician

Date Mixed: 15-May-2024 **Balance Serial #** 1128342314

Dillan Murphy - Operations Technician I

Date Passed: 17-May-2024

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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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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Catalog No. : 30625 **Lot No.:** A0216280

Description : OLC 3.2 VOA Deuterated Monitoring Compounds

OLC 3.2 VOA Ketone Deuterated Monitoring Compounds 500µg/mL, Deuterium Oxide, 1mL/ampul

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

Expiration Date : March 31, 2026 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	2-Butanone-d5	24313-50-6	M-276	99%	504.0 µg/mL	+/- 17.5357
2	2-Hexanone-d5	4840-82-8	GH-242	99%	502.0 µg/mL	+/- 17.4661

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Deuterium oxide

CAS # 7789-20-0

Purity 99%

Quality Confirmation Test

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.)

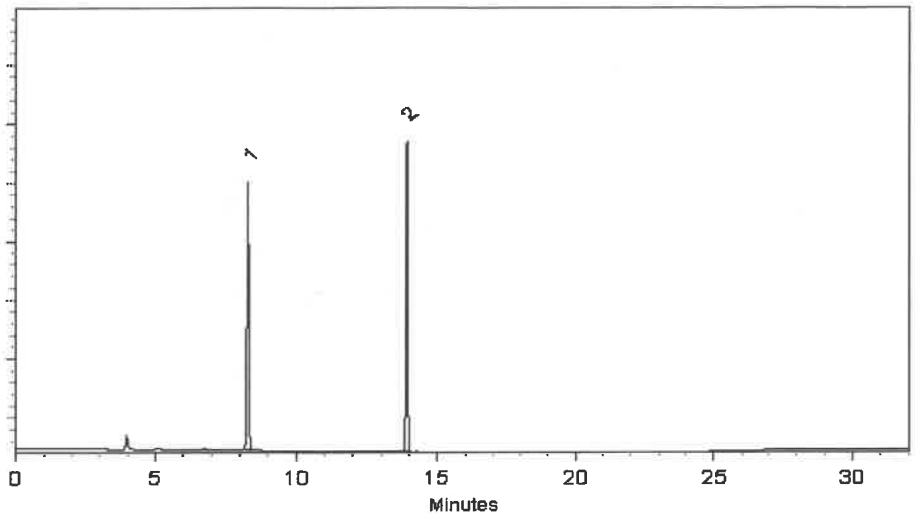
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID

Split Vent:
40 ml/min

Inj. Vol
1µl



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.

Richard Zimmerman - Operations Tech I

Date Mixed: 10-Sep-2024 **Balance Serial #** B251644995

Dillan Murphy - Operations Technician I

Date Passed: 12-Sep-2024

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:

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- 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:

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

- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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 ampuls. 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.

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Fax: 1-814-353-1309

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Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
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. : 30625 **Lot No.:** A0216280

Description : OLC 3.2 VOA Deuterated Monitoring Compounds

OLC 3.2 VOA Ketone Deuterated Monitoring Compounds 500µg/mL, Deuterium Oxide, 1mL/ampul

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

Expiration Date : March 31, 2026 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	2-Butanone-d5	24313-50-6	M-276	99%	504.0 µg/mL	+/- 17.5357
2	2-Hexanone-d5	4840-82-8	GH-242	99%	502.0 µg/mL	+/- 17.4661

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Deuterium oxide

CAS # 7789-20-0

Purity 99%

Quality Confirmation Test

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.)

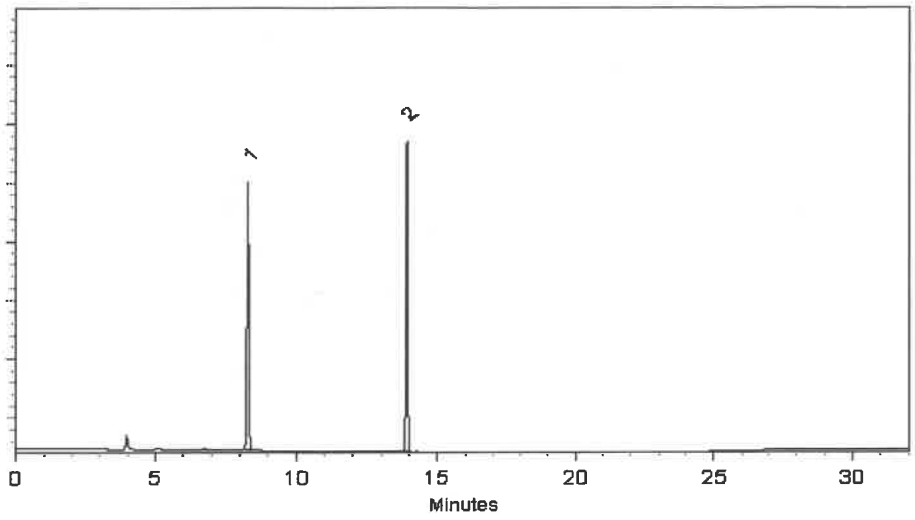
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID

Split Vent:
40 ml/min

Inj. Vol
1µl



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.

Richard Zimmerman - Operations Tech I

Date Mixed: 10-Sep-2024 **Balance Serial #** B251644995

Dillan Murphy - Operations Technician I

Date Passed: 12-Sep-2024

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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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

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

- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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 ampuls. 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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Rec 12/17/24

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30 Vial

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V14727 to
V14756

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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. : 30042 **Lot No.:** A0216826

Description : 502.2 Calibration Mix #1

502.2 Calibration Mix #1 2,000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : May 31, 2031 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	Dichlorodifluoromethane (CFC-12)	75-71-8	00022922	99%	2,000.9 µg/mL	+/- 112.4144
2	Chloromethane (methyl chloride)	74-87-3	00022694	99%	2,000.7 µg/mL	+/- 112.3998
3	Vinyl chloride	75-01-4	00015559	99%	2,000.3 µg/mL	+/- 112.3779
4	Bromomethane (methyl bromide)	74-83-9	00017022	99%	2,001.8 µg/mL	+/- 112.4650
5	Chloroethane (ethyl chloride)	75-00-3	107-401039114-1	99%	2,000.1 µg/mL	+/- 112.3700
6	Trichlorofluoromethane (CFC-11)	75-69-4	MKCJ8658	99%	2,000.7 µg/mL	+/- 112.3992

* Expanded Uncertainty displayed in same units as Grav. Conc.

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

Quality Confirmation Test

Column:
60m x 0.25mm x 1.4µm
Rtx-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.

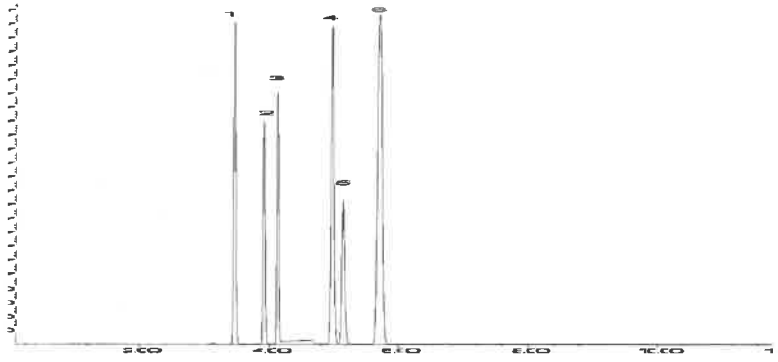
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
MSD

Split Vent:
Split ratio 10:1

Inj. Vol
1µl



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 Suckar - Mix Technician

Date Mixed: 23-Sep-2024 **Balance Serial #** B707717271

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 04-Oct-2024

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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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 ampuls. 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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ilac-MRA A2LA ACCREDITED 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. : 30625 **Lot No.:** A0219189

Description : OLC 3.2 VOA Deuterated Monitoring Compounds

OLC 3.2 VOA Ketone Deuterated Monitoring Compounds 500µg/mL, Deuterium Oxide, 1mL/ampul

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

Expiration Date : May 31, 2026 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	2-Butanone-d5	24313-50-6	HJ-279	99%	504.0 µg/mL	+/- 17.5357
2	2-Hexanone-d5	4840-82-8	I-500	99%	504.0 µg/mL	+/- 17.5357

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Deuterium oxide
CAS # 7789-20-0
Purity 99%

Quality Confirmation Test

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.)

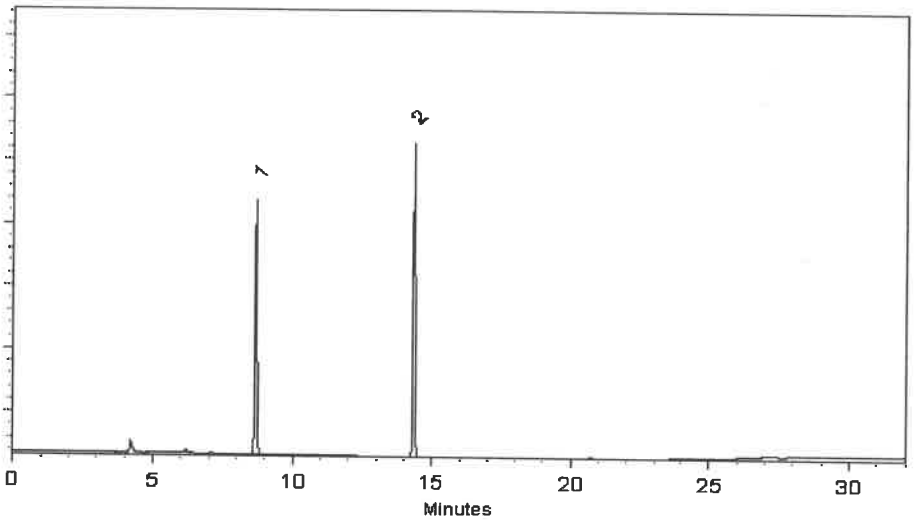
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID

Split Vent:
40 ml/min

Inj. Vol
1µl



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.

Aaron Enyart - Operations Tech I

Date Mixed: 15-Nov-2024 **Balance Serial #** B345965662

Dillan Murphy - Operations Technician I

Date Passed: 19-Nov-2024

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:

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- 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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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.

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Catalog No. : 30625 **Lot No.:** A0219189

Description : OLC 3.2 VOA Deuterated Monitoring Compounds

OLC 3.2 VOA Ketone Deuterated Monitoring Compounds 500µg/mL, Deuterium Oxide, 1mL/ampul

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

Expiration Date : May 31, 2026 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	2-Butanone-d5	24313-50-6	HJ-279	99%	504.0 µg/mL	+/- 17.5357
2	2-Hexanone-d5	4840-82-8	I-500	99%	504.0 µg/mL	+/- 17.5357

* Expanded Uncertainty displayed in same units as Grav. Conc.

Solvent: Deuterium oxide
CAS # 7789-20-0
Purity 99%

Quality Confirmation Test

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.)

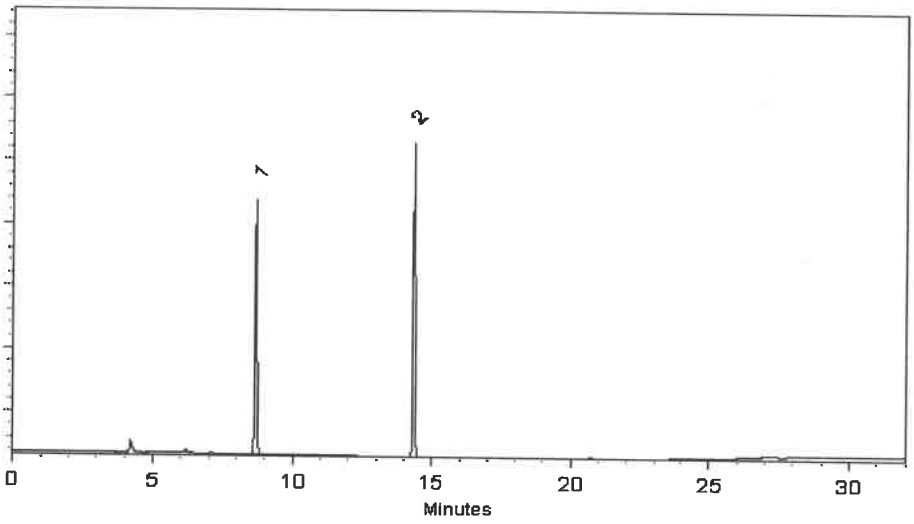
Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID

Split Vent:
40 ml/min

Inj. Vol
1µl



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Aaron Enyart - Operations Tech I

Date Mixed: 15-Nov-2024 **Balance Serial #** B345965662

Dillan Murphy - Operations Technician I

Date Passed: 19-Nov-2024

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.
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- 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 expanded uncertainty value includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls 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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Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

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

CERTIFIED WEIGHT REPORT

Part Number: 31491
Lot Number: 063022
Description: 1,2,4-Trimethylbenzene

Solvent(s): **Lot#**
Methanol EC592-US

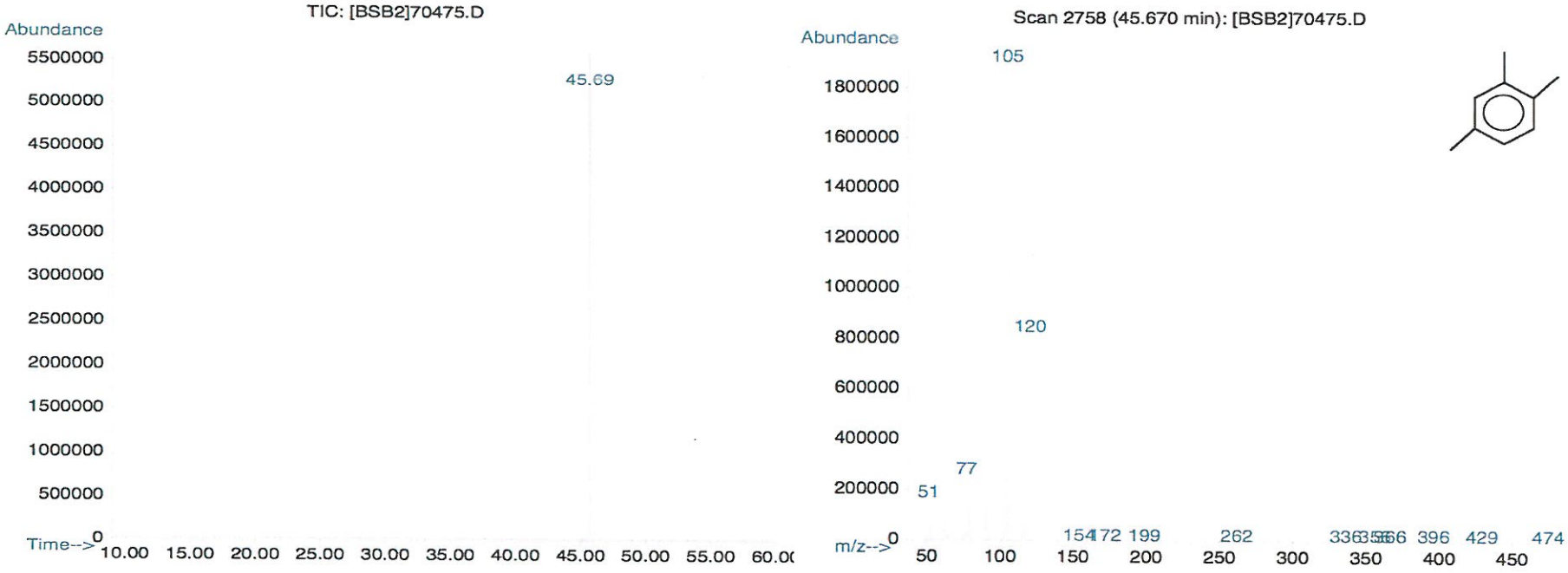
Expiration Date: 063027
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 50.0 0.001 Flask Uncertainty

Gabriel Helland	063022
Formulated By: Gabriel Helland	DATE
Pedro Rentas	063022
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. 1,2,4-Trimethylbenzene	475	WXBC9778V	2000	98.8	0.2	0.10129	0.10187	2011.5	8.4	95-63-6	N/A	orl-rat 5g/kg

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. Analysis performed by 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 certifed (+/-) 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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Material No.: 9077-02
Batch No.: 22L0562016
Manufactured Date: 2022-10-26
Expiration Date: 2025-10-25
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay (CH_3OH) (by GC, corrected for water)	≥ 99.9 %	100.0 %
Residue after Evaporation	≤ 1.0 ppm	0.2 ppm
Titrable Acid (µeq/g)	≤ 0.3	0.2
Titrable 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

James T Ethier
Jamie Ethier
Vice President Global Quality