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Prep Standard - Chemical Standard Summary

Order ID : O3645

Test : VOCMS Group1

Prepbatch ID :

Sequence ID/Qc Batch ID: VD071723,vd071823,vn071723,vn071823,

Standard ID :
VP118161,VP118162,VP118164,VP119199,VP119200,VP120190,VP120390,VP120540,VP121045,VP121351,VP121353
,VP121396,VP121532,VP121534,VP121535,VP121536,VP121538,VP121539,VP121541,VP121576,VP121616,VP1216
91,VP121778,VP121780,VP121785,VP121786,VP121788,VP121789,VP121790,VP121794,VP121804,VP121805,VP12
1817,VP121818,VP121819,VP121821,VP121824,VP121825,VP121827,

Chemical ID :
LOD-VP121793,LOQ-VP121828,MDL-VP121826,V10601,V12006,V12012,V12081,V12082,V12226,V12229,V12695,V12
761,V12764,V12765,V12767,V12768,V12783,V12784,V12785,V12786,V12787,V12788,V12789,V12963,V13088,V13089
,V13104,V13196,V13199,V13217,V13222,V13302,V13331,V13343,V13344,V13494,V13495,V13520,V13521,V13523,V1
3546,V13558,V13559,V13577,V13578,V13641,V13644,V13655,V13657,V13658,V13661,V13870,V13871,V13872,V1387
5,V13876,W2606,

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1810	8260 Working Std(2-CVE)-800ppm	VP118161	01/24/2023	07/24/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 01/25/2023

FROM 1.00000ml of V12783 + 1.00000ml of V12784 + 1.00000ml of V12785 + 1.00000ml of V12786 = Final Quantity: 50.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1811	8260 Working Std(2-CVE)-500ppm	VP118162	01/24/2023	07/24/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 01/25/2023

FROM 7.50000ml of V13217 + 12.50000ml of VP118161 = Final Quantity: 20.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1813	8260 Working Std(2-CVE)-50ppm	VP118164	01/24/2023	07/24/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 01/25/2023

FROM 9.37500ml of V13217 + 0.62500ml of VP118161 = Final Quantity: 10.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
252	8260 Working STD (BCM)-First source, 100PPM	VP119199	03/15/2023	09/10/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 03/17/2023

FROM 0.25000ml of V12765 + 1.00000ml of V12761 + 23.75000ml of V13222 = Final Quantity: 25.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
254	8260 Working STD (BCM)-First source, 10PPM	VP119200	03/15/2023	09/10/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 03/17/2023

FROM 0.05000ml of V12765 + 9.95000ml of V13222 = Final Quantity: 10.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
249	8260 Surrogate, 100PPM	VP120190	04/28/2023	09/15/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 05/02/2023

FROM 0.10000ml of V12006 + 24.90000ml of V13657 = Final Quantity: 25.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1917	8260 Internal standard 50 ppm	VP120390	05/05/2023	10/27/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 05/09/2023

FROM 0.05000ml of V12081 + 24.95000ml of V13657 = Final Quantity: 25.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
719	8260 Working STD (BCM)-First source, 400PPM	VP120540	05/16/2023	11/16/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 05/17/2023

FROM 1.00000ml of V12768 + 1.50000ml of V12764 + 1.50000ml of V12767 + 16.00000ml of V13658 = Final Quantity: 20.000 ml

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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	VP121045	06/08/2023	12/08/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 06/09/2023

FROM 0.50000ml of V10601 + 49.50000ml of V13655 = Final Quantity: 50.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
259	8260 Calibration Working STD Mix-Second source, 160PPM	VP121351	06/23/2023	08/05/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 06/28/2023

FROM 0.16000ml of V12229 + 0.80000ml of V12695 + 0.80000ml of V13104 + 0.80000ml of V13302 + 0.80000ml of V13331 + 0.80000ml of V13661 + 1.60000ml of V13546 + 4.24000ml of V13655 = 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
820	8260 Calibration Working STD Mix-Second source, 10PPM	VP121353	06/23/2023	08/05/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 06/28/2023

FROM 4.68750ml of V13655 + 0.31250ml of VP121351 = Final Quantity: 5.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
617	8260 Surrogate, 400PPM	VP121396	06/26/2023	12/26/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 06/28/2023

FROM 0.80000ml of V12012 + 49.20000ml of V13641 = Final Quantity: 50.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
263	8260 Working STD (Acrolein)-Second source, 800PPM	VP121532	07/05/2023	07/27/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/07/2023

FROM 0.60000ml of V13876 + 1.00000ml of V13875 + 8.40000ml of V13641 = Final Quantity: 10.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
826	8260 Working STD (Acrolein)-Second source, 50PPM	VP121534	07/05/2023	07/27/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/07/2023

FROM 4.68750ml of V13641 + 0.31250ml of VP121532 = 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
51	8260 Working STD (Acrolein) -first source, 800PPM	VP121535	07/05/2023	07/28/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/07/2023

FROM 1.00000ml of V13872 + 1.50000ml of V13870 + 1.50000ml of V13871 + 21.00000ml of V13641 = Final Quantity: 25.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
56	8260 Working STD (Acrolein) -first source, 500PPM	VP121536	07/05/2023	07/28/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/07/2023

FROM 7.50000ml of V13641 + 12.50000ml of VP121535 = Final Quantity: 20.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
181	8260 Working STD (Acrolein)-First source, 50PPM	VP121538	07/05/2023	07/28/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/07/2023

FROM 9.87500ml of V13641 + 0.62500ml of VP121535 = Final Quantity: 10.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1817	8260 Working Std(2-CVE)-SS, 800ppm	VP121539	07/05/2023	01/05/2024	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/07/2023

FROM 0.60000ml of V13578 + 1.00000ml of V13577 + 18.40000ml of V13644 = Final Quantity: 20.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1818	8260 Working Std(2-CVE)-SS, 50ppm	VP121541	07/05/2023	01/05/2024	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/07/2023

FROM 9.37500ml of V13644 + 0.62500ml of VP121539 = Final Quantity: 10.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
247	8260 Internal Standard, 250PPM	VP121576	07/07/2023	12/26/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/07/2023

FROM 0.25000ml of V12082 + 24.75000ml of V13644 = Final Quantity: 25.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
825	8260 Working STD (BCM)-Second source, 10PPM	VP121616	07/10/2023	01/05/2024	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/11/2023

FROM 0.05000ml of V12963 + 4.95000ml of V13644 = Final Quantity: 5.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1810	8260 Working Std(2-CVE)-800ppm	VP121691	07/13/2023	01/05/2024	Semsettin Yesilyurt	None	None	John Carlone 07/17/2023

FROM 0.20000ml of V12784 + 1.00000ml of V12787 + 1.00000ml of V12788 + 1.00000ml of V12789 + 36.80000ml of V13644 = 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
732	BFB TUNE CHECK - SOIL	VP121778	07/17/2023	07/18/2023	Mahesh Dadoda	None	None	John Carlone 07/20/2023

FROM 4.99800ml of W2606 + 0.00200ml of VP121045 = Final Quantity: 5.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
589	BFB TUNE CHECK	VP121780	07/17/2023	07/18/2023	John Carlone	None	None	Mahesh Dadoda 07/20/2023

FROM 39.98400ml of W2606 + 0.01600ml of VP121045 = 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
257	8260 Calibration Working STD Mix-First source, 160PPM	VP121785	07/17/2023	08/26/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/20/2023

FROM 0.40000ml of V12226 + 0.50000ml of V13089 + 0.50000ml of V13199 + 0.50000ml of V13344 + 0.50000ml of V13495 + 0.50000ml of V13559 + 1.00000ml of V13523 + 1.50000ml of V13088 + 1.50000ml of V13196 + 1.50000ml of V13343 + 1.50000ml of V13494 + 1.50000ml of V13520 + 1.50000ml of V13521 + 1.50000ml of V13558 + 10.60000ml of V13644 = Final Quantity: 25.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
244	8260 Calibration Working STD Mix-First source, 100PPM	VP121786	07/17/2023	08/26/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/20/2023

FROM 5.62500ml of V13644 + 9.37500ml of VP121785 = Final Quantity: 15.000 ml

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VOC STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
246	8260 Calibration Working STD Mix-First source, 10PPM	VP121788	07/17/2023	08/26/2023	Semsettin Yesilyurt	None	None	Mahesh Dadoda 07/20/2023

FROM 9.37500ml of V13644 + 0.62500ml of VP121785 = Final Quantity: 10.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
773	50 PPB CCC, 8260-SOIL	VP121789	07/17/2023	07/18/2023	Mahesh Dadoda	None	None	John Carlone 07/20/2023

FROM 4.98000ml of W2606 + 0.00250ml of VP118162 + 0.00250ml of VP119199 + 0.00250ml of VP120190 + 0.00250ml of VP121536 + 0.00250ml of VP121786 + 0.00500ml of VP120390 = 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
773	50 PPB CCC, 8260-SOIL	VP121790	07/17/2023	07/18/2023	Mahesh Dadoda	None	None	John Carlone 07/20/2023

FROM 4.98000ml of W2606 + 0.00250ml of VP118162 + 0.00250ml of VP119199 + 0.00250ml of VP120190 + 0.00250ml of VP121536 + 0.00250ml of VP121786 + 0.00500ml of VP120390 = Final Quantity: 5.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
833	2.5 PPB LOD, 8260-SOIL	VP121794	07/17/2023	07/18/2023	Mahesh Dadoda	None	None	John Carlone 07/20/2023

FROM 4.98000ml of W2606 + 0.00130ml of VP121353 + 0.00130ml of VP121534 + 0.00130ml of VP121541 + 0.00130ml of VP121616 + 0.00250ml of VP120190 + 0.00500ml of VP120390 = 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
620	50 PPB CCC, 8260-Water	VP121804	07/17/2023	07/18/2023	John Carlone	None	None	Mahesh Dadoda 07/20/2023

FROM 39.94450ml of W2606 + 0.00500ml of VP120540 + 0.00500ml of VP121396 + 0.00800ml of VP121576 + 0.01250ml of VP121535 + 0.01250ml of VP121691 + 0.01250ml of VP121785 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
620	50 PPB CCC, 8260-Water	VP121805	07/17/2023	07/18/2023	John Carlone	None	None	Mahesh Dadoda 07/20/2023

FROM 39.94450ml of W2606 + 0.00500ml of VP120540 + 0.00500ml of VP121396 + 0.00800ml of VP121576 + 0.01250ml of VP121535 + 0.01250ml of VP121691 + 0.01250ml of VP121785 = 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
589	BFB TUNE CHECK	VP121817	07/18/2023	07/19/2023	John Carlone	None	None	Mahesh Dadoda 07/20/2023

FROM 39.98400ml of W2606 + 0.01600ml of VP121045 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
620	50 PPB CCC, 8260-Water	VP121818	07/18/2023	07/19/2023	John Carlone	None	None	Mahesh Dadoda 07/20/2023

FROM 39.94450ml of W2606 + 0.00500ml of VP120540 + 0.00500ml of VP121396 + 0.00800ml of VP121576 + 0.01250ml of VP121535 + 0.01250ml of VP121691 + 0.01250ml of VP121785 = 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
620	50 PPB CCC, 8260-Water	VP121819	07/18/2023	07/19/2023	John Carlone	None	None	Mahesh Dadoda 07/20/2023

FROM 39.94450ml of W2606 + 0.00500ml of VP120540 + 0.00500ml of VP121396 + 0.00800ml of VP121576 + 0.01250ml of VP121535 + 0.01250ml of VP121691 + 0.01250ml of VP121785 = Final Quantity: 40.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
732	BFB TUNE CHECK - SOIL	VP121821	07/18/2023	07/19/2023	Mahesh Dadoda	None	None	John Carlone 07/20/2023

FROM 4.99800ml of W2606 + 0.00200ml of VP121045 = 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
773	50 PPB CCC, 8260-SOIL	VP121824	07/18/2023	07/19/2023	Mahesh Dadoda	None	None	John Carlone 07/20/2023

FROM 4.98000ml of W2606 + 0.00250ml of VP118162 + 0.00250ml of VP119199 + 0.00250ml of VP120190 + 0.00250ml of VP121536 + 0.00250ml of VP121786 + 0.00500ml of VP120390 = Final Quantity: 5.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
773	50 PPB CCC, 8260-SOIL	VP121825	07/18/2023	07/19/2023	Mahesh Dadoda	None	None	John Carlone 07/20/2023

FROM 4.98000ml of W2606 + 0.00250ml of VP118162 + 0.00250ml of VP119199 + 0.00250ml of VP120190 + 0.00250ml of VP121536 + 0.00250ml of VP121786 + 0.00500ml of VP120390 = 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
3763	4.0 PPB 8260 SOIL MDL	VP121827	07/18/2023	07/19/2023	Mahesh Dadoda	None	None	John Carlone 07/20/2023

FROM 4.98000ml of W2606 + 0.00200ml of VP118164 + 0.00200ml of VP119200 + 0.00200ml of VP121538 + 0.00200ml of VP121788 + 0.00250ml of VP120190 + 0.00500ml of VP120390 = Final Quantity: 5.000 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 #
Restek	30067 / BFB tuneing solution	A0147670	12/12/2023	12/12/2022 / SAM	01/09/2020 / sam	V10601

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555582 / Custom Mixture, 8260 A/B Surrogate Mix [CS 5179-2]	A0173020	09/15/2023	03/15/2023 / SAM	06/04/2021 / SAM	V12006

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555582 / Custom Mixture, 8260 A/B Surrogate Mix [CS 5179-2]	A0173020	12/26/2023	06/26/2023 / SAM	06/04/2021 / SAM	V12012

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555581 / Custom Standard, 8260 Internal Std [CS 5179-1]	A0173600	11/04/2023	05/04/2023 / SAM	06/22/2021 / SAM	V12081

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555581 / Custom Standard, 8260 Internal Std [CS 5179-1]	A0173600	12/26/2023	06/26/2023 / SAM	06/22/2021 / SAM	V12082

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30470 / VOA Stock Solution, tert-butanol std, 1mL, P&TM	A0168291	09/27/2023	03/27/2023 / SAM	10/15/2021 / SAM	V12226

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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	30470 / VOA Stock Solution, tert-butanol std, 1mL, P&TM	A0173797	08/28/2023	02/28/2023 / SAM	10/15/2021 / SAM	V12229

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	A0180020	11/18/2023	05/18/2023 / SAM	03/07/2022 / SAM	V12695

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0176219	09/15/2023	03/15/2023 / SAM	03/25/2022 / SAM	V12761

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0176219	11/16/2023	05/16/2023 / SAM	03/25/2022 / SAM	V12764

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0176219	09/15/2023	03/15/2023 / SAM	03/25/2022 / SAM	V12765

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0176219	11/16/2023	05/16/2023 / SAM	03/25/2022 / SAM	V12767

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30225 / VOA Mix, bromochloromethane, 2000ug/mL, P&TM, 1mL/ampul	A0176219	11/16/2023	05/16/2023 / SAM	03/25/2022 / SAM	V12768

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	121321	07/24/2023	01/24/2023 / SAM	03/30/2022 / SAM	V12783

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	121321	12/13/2024	01/24/2023 / SAM	03/30/2022 / SAM	V12784

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	121321	07/24/2023	01/24/2023 / SAM	03/30/2022 / SAM	V12785

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	121321	07/24/2023	01/24/2023 / SAM	03/30/2022 / SAM	V12786

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	121321	01/13/2024	07/13/2023 / SAM	03/30/2022 / SAM	V12787

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	121321	01/13/2024	07/13/2023 / SAM	03/30/2022 / SAM	V12788

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	121321	01/13/2024	07/13/2023 / SAM	03/30/2022 / SAM	V12789

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	70046 / Bromochloromethane Std. sol/methanol 1000ppm	070122	01/10/2024	07/10/2023 / SAM	07/06/2022 / SAM	V12963

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555408 / Custom Standard, Vinyl Acetate Standard w/ Grav [CS 5066-6] TWO SEPARATE LOTS	A0187424	12/26/2023	06/26/2023 / SAM	08/12/2022 / SAM	V13088

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555408 / Custom Standard, Vinyl Acetate Standard w/ Grav [CS 5066-6] TWO SEPARATE LOTS	A0187424	12/26/2023	06/26/2023 / SAM	08/12/2022 / SAM	V13089

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	555408 / Custom Standard, Vinyl Acetate Standard w/ Grav [CS 5066-6] TWO SEPARATE LOTS	A0187418	11/18/2023	05/18/2023 / SAM	08/12/2022 / SAM	V13104

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30489 / VOA Mix, 8260B Acetates Mix, P&TM, 1mL	A0186868	12/26/2023	06/26/2023 / SAM	09/01/2022 / SAM	V13196

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30489 / VOA Mix, 8260B Acetates Mix, P&TM, 1mL	A0186868	12/26/2023	06/26/2023 / SAM	09/01/2022 / SAM	V13199

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2362001	07/24/2023	01/24/2023 / SAM	09/13/2022 / SAM	V13217

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2362001	09/10/2023	03/10/2023 / SAM	09/13/2022 / SAM	V13222

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95317 / Universal VOA Mega Mix (Min order = 5)	112921	11/29/2024	05/18/2023 / SAM	11/16/2022 / SAM	V13302

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95319 / Revised Additions Mix (Min = 5)	031921	11/18/2023	05/18/2023 / SAM	11/18/2022 / SAM	V13331

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95319 / Revised Additions Mix (Min = 5)	032922	12/26/2023	06/26/2023 / SAM	11/18/2022 / SAM	V13343

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95319 / Revised Additions Mix (Min = 5)	032922	12/26/2023	06/26/2023 / SAM	11/18/2022 / SAM	V13344

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	A0188819	12/26/2023	06/26/2023 / SAM	01/27/2023 / SAM	V13494

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	A0188819	12/26/2023	06/26/2023 / SAM	01/27/2023 / SAM	V13495

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	A0190554	12/26/2023	06/26/2023 / SAM	01/27/2023 / SAM	V13520

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	A0190554	12/26/2023	06/26/2023 / SAM	01/27/2023 / SAM	V13521

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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	A0190554	12/26/2023	06/26/2023 / SAM	01/27/2023 / SAM	V13523

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	A0186767	09/30/2025	06/23/2023 / SAM	01/27/2023 / SAM	V13546

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95317 / Universal VOA Mega Mix (Min order = 5)	042921	12/26/2023	06/26/2023 / SAM	01/30/2023 / SAM	V13558

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95317 / Universal VOA Mega Mix (Min order = 5)	042921	12/26/2023	06/26/2023 / SAM	01/30/2023 / SAM	V13559

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	111722	01/05/2024	07/05/2023 / SAM	01/30/2023 / SAM	V13577

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95318 / 2-Chloroethyl Vinyl Ether (Min = 5)	111722	01/05/2024	07/05/2023 / SAM	01/30/2023 / SAM	V13578

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2862010	12/26/2023	06/26/2023 / SAM	02/23/2023 / SAM	V13641

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2862010	01/05/2024	07/05/2023 / SAM	02/23/2023 / SAM	V13644

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2862010	12/08/2023	06/08/2023 / SAM	02/23/2023 / SAM	V13655

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2862010	10/27/2023	04/27/2023 / SAM	02/23/2023 / SAM	V13657

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA9077-02 / Methanol, Purge/Trap (cs=6x1L)	22C2862010	11/16/2023	05/16/2023 / SAM	02/23/2023 / SAM	V13658

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30489 / VOA Mix, 8260B Acetates Mix, P&TM, 1mL	A0193195	11/18/2023	05/18/2023 / SAM	03/13/2023 / SAM	V13661

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	91980 / Acrolin Std (Min = 5)	062823	07/28/2023	07/05/2023 / SAM	06/29/2023 / SAM	V13870

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	91980 / Acrolin Std (Min = 5)	062823	07/28/2023	07/05/2023 / SAM	06/29/2023 / SAM	V13871

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	91980 / Acrolin Std (Min = 5)	062823	07/28/2023	07/05/2023 / SAM	06/29/2023 / SAM	V13872

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	91980 / Acrolin Std (Min = 5)	062723	07/27/2023	07/05/2023 / SAM	06/29/2023 / SAM	V13875

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	91980 / Acrolin Std (Min = 5)	062723	07/27/2023	07/05/2023 / SAM	06/29/2023 / SAM	V13876

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

Methanol
ULTRA RESI-ANALYZED
For Purge and Trap Analysis

avantor™ | J.T.Baker®

Material No.: 9077-02
Batch No.: 22C2862010
Manufactured Date: 2022-02-15
Expiration Date: 2025-02-14
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	0.3
Titrable Base (µeq/g)	≤ 0.10	< 0.02
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

Methanol
ULTRA RESI-ANALYZED
For Purge and Trap Analysis

avantor™ | J.T.Baker®

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

James T Ethier

Jamie Ethier
Vice President Global Quality

Methanol
ULTRA RESI-ANALYZED
For Purge and Trap Analysis

avantor™ | J.T.Baker®

Material No.: 9077-02
Batch No.: 22C2862010
Manufactured Date: 2022-02-15
Expiration Date: 2025-02-14
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
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Residue after Evaporation	≤ 1.0 ppm	0.2 ppm
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Titrable Base (µeq/g)	≤ 0.10	< 0.02
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Volatile Organic Trace Analysis – Below EPA 8260B CRQL	Conforms	Conforms

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

CERTIFIED WEIGHT REPORT

Part Number: 95317
Lot Number: 042921
Description: Universal VOA Megamix
69 components
Expiration Date: 042924
Recommended Storage: Freezer (0 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

Solvent(s): Lot#
Methanol DY186-USQ8

Formulated By: Eli Aliaga 042921 DATE

Reviewed By: Pedro L. Rentas 042921 DATE

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

	Compound	(RM#) Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Initial Conc.(ug/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette (mL)	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expended Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1.	Acetonitrile	(0324)	060812	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20041	2002.0	8.1	75-05-8	40 ppm (70mg/m3/8H)	orl-rat 2460mg/kg
2.	Allyl chloride (3-Chloropropene)	(0325)	102396	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20233	2003.0	8.2	107-05-1	1 ppm (3mg/m3/8H)	orl-rat 700mg/kg
3.	Carbon disulphide	(0060)	MKCD9604	NA	NA	NA	2000	100	0.2	NA	0.20001	0.20015	2001.4	8.1	75-15-0	4 ppm (12mg/m3) (skin)	orl-rat 1200mg/kg
4.	cis-1,4-Dichloro-2-butene	(1196)	14718EF	NA	NA	NA	2000	95	0.2	NA	0.21054	0.21060	2000.6	8.5	1476-11-5	N/A	N/A
5.	trans-1,4-Dichloro-2-butene	(0486)	MKBP6041V	NA	NA	NA	2000	96.5	0.2	NA	0.20726	0.20751	2002.4	8.4	110-57-6	N/A	N/A
6.	Diethyl ether (Ethyl ether)	(0153)	SHBK1918	NA	NA	NA	2000	99.9	0.2	NA	0.20023	0.20048	2002.3	8.1	60-29-7	400ppm (1200mg/m3/8H)	orl-rat 1215mg/kg
7.	Ethyl methacrylate	(0361)	06126PX	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20230	2002.7	8.2	97-63-2	N/A	orl-rat 14800mg/kg
8.	Iodomethane	(0488)	SHBF8718V	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20130	2002.8	8.1	74-88-4	5 ppm(28mg/m3/8H)(skin)	orl-rat 76mg/kg
9.	2-Methyl-1-propanol	(0445)	15241EB	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20123	2002.1	8.1	78-83-1	50 ppm (150mg/m3/8H)	orl-rat 2460mg/kg
10.	Methacrylonitrile	(0442)	00427ET	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20220	2001.7	8.2	126-98-7	1 ppm (3mg/m3/8H)(skin)	orl-rat 120mg/kg
11.	Methyl acrylate	(1075)	SHBK0679	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20046	2002.5	8.1	96-33-3	10 ppm(35mg/m3/8H)(skin)	orl-rat 277mg/kg
12.	Methyl methacrylate	(0404)	MKBW5137V	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20048	2002.7	8.1	80-62-6	100 ppm (410mg/m3/8H)	orl-rat 7872mg/kg
13.	Nitrobenzene	(0228)	01213TV	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20216	2001.5	8.2	98-95-3	1 ppm (5mg/m3/8H)(skin)	orl-rat 780mg/kg
14.	2-Nitropropane	(0481)	14002JX	NA	NA	NA	2000	97.3	0.2	NA	0.20556	0.20585	2001.0	8.3	79-46-9	10 ppm (35mg/m3/8H)	orl-rat 720mg/kg
15.	Pentachloroethane	(0450)	HGA01	NA	NA	NA	2000	98	0.2	NA	0.20409	0.20418	2000.9	8.2	76-01-7	N/A	N/A
16.	1,1,2-Trichlorotrifluoroethane	(0474)	18930	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20221	2001.8	8.2	76-13-1	1000 ppm (7600mg/m3/8H)	orl-rat 43g/kg
17.	Bromodichloromethane	35171	100220	0.05	5.00	40018.8	2000	NA	NA	0.017	NA	NA	2000.8	18.4	75-27-4	N/A	orl-rat 916mg/kg
18.	Dibromochloromethane	35171	100220	0.05	5.00	40007.7	2000	NA	NA	0.017	NA	NA	2000.3	18.4	124-48-1	N/A	orl-rat 846mg/kg
19.	cis-1,2-Dichloroethene	35171	100220	0.05	5.00	40012.4	2000	NA	NA	0.017	NA	NA	2000.5	18.4	156-59-2	N/A	N/A
20.	trans-1,2-Dichloroethene	35171	100220	0.05	5.00	40005.6	2000	NA	NA	0.017	NA	NA	2000.2	18.4	156-60-5	N/A	orl-rat 1235mg/kg
21.	Methylene chloride	35171	100220	0.05	5.00	40013.9	2000	NA	NA	0.017	NA	NA	2000.6	18.4	75-09-2	500 ppm	orl-rat 820mg/kg
22.	1,1-Dichloroethene	32251	031621	0.10	10.00	20009.1	2000	NA	NA	0.042	NA	NA	2000.8	19.3	75-35-4	1 ppm (4mg/m3/8H)	orl-rat 200mg/kg
23.	Bromoform	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	75-25-2	0.5 ppm (5mg/m3) (skin)	orl-rat 933mg/kg
24.	Carbon tetrachloride	95321	010419	0.10	10.00	20001.3	2000	NA	NA	0.042	NA	NA	2000.0	19.2	56-23-5	2 ppm (12.6mg/m3/8H)	orl-rat 2350mg/kg
25.	Chloroform	95321	010419	0.10	10.00	20001.8	2000	NA	NA	0.042	NA	NA	2000.1	19.2	67-66-3	50 ppm (240mg/m3) (CL)	orl-rat 908mg/kg
26.	Dibromomethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	74-95-3	N/A	orl-rat 108mg/kg
27.	1,1-Dichloroethane	95321	010419	0.10	10.00	20000.8	2000	NA	NA	0.042	NA	NA	2000.0	19.3	75-34-3	100 ppm	orl-rat 725mg/kg
28.	2,2-Dichloropropane	95321	010419	0.10	10.00	20002.1	2000	NA	NA	0.042	NA	NA	2000.1	19.3	594-20-7	N/A	N/A
29.	Tetrachloroethene	95321	010419	0.10	10.00	20002.2	2000	NA	NA	0.042	NA	NA	2000.1	19.3	127-18-4	25 ppm (170mg/m3/8H)(final)	orl-rat 2629mg/kg
30.	1,1,1-Trichloroethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	71-55-6	350 ppm (1900mg/m3/8H)	orl-rat 10300mg/kg
31.	1,2-Dibromo-3-chloropropane	35161	011421	0.05	5.00	40001.2	2000	NA	NA	0.017	NA	NA	2000.0	18.4	96-12-8	0.001 ppm	orl-rat 170mg/kg
32.	1,2-Dibromoethane	35161	011421	0.05	5.00	40003.9	2000	NA	NA	0.017	NA	NA	2000.1	18.4	106-93-4	20 ppm (8H)	orl-rat 108mg/kg
33.	1,2-Dichloroethane	35161	011421	0.05	5.00	40004.9	2000	NA	NA	0.017	NA	NA	2000.1	18.4	107-06-2	50 ppm (8H)	orl-rat 670mg/kg
34.	1,2-Dichloropropane	35161	011421	0.05	5.00	40002.2	2000	NA	NA	0.017	NA	NA	2000.0	18.4	78-87-5	75 ppm (350mg/m3/8H)	orl-rat 1947mg/kg
35.	1,3-Dichloropropane	35161	011421	0.05	5.00	40013.9	2000	NA	NA	0.017	NA	NA	2000.6	18.4	142-28-9	N/A	unr-mus 3600mg/kg
36.	1,1-Dichloropropene	35161	011421	0.05	5.00	40015.0	2000	NA	NA	0.017	NA	NA	2000.7	26.1	563-58-6	N/A	N/A
37.	cis-1,3-Dichloropropene	35161	011421	0.05	5.00	40004.4	2000	NA	NA	0.017	NA	NA	2000.1	18.4	10061-01-5	N/A	N/A
38.	trans-1,3-Dichloropropene	35161	011421	0.05	5.00	40009.1	2000	NA	NA	0.017	NA	NA	2000.4	18.5	10061-02-6	N/A	N/A
39.	Hexachloro-1,3-butadiene	35161	011421	0.05	5.00	40003.5	2000	NA	NA	0.017	NA	NA	2000.1	26.4	87-68-3	0.02 ppm (0.24mg/m3/8H)	orl-rat 82mg/kg
40.	1,1,1,2-Tetrachloroethane	35161	011421	0.05	5.00	40011.9	2000	NA	NA	0.017	NA	NA	2000.5	18.4	630-20-6	N/A	orl-rat 670mg/kg
41.	1,1,2,2-Tetrachloroethane	35161	011421	0.05	5.00	40011.0	2000	NA	NA	0.017	NA	NA	2000.5	18.4	79-34-5	5 ppm (35mg/m3/8H)(skin)	orl-rat 800mg/kg
42.	1,1,2-Trichloroethane	35161	011421	0.05	5.00	40000.8	2000	NA	NA	0.017	NA	NA	1999.9	18.4	79-00-5	10 ppm (45mg/m3/8H)(skin)	orl-rat 836mg/kg
43.	Trichloroethene	35161	011421	0.05	5.00	40003.2	2000	NA	NA	0.017	NA	NA	2000.1	18.4	79-01-6	50 ppm (270mg/m3/8H)	orl-mus 2402mg/kg
44.	1,2,3-Trichloropropane	35161	011421	0.05	5.00	40015.2	2000	NA	NA	0.017	NA	NA	2000.7	18.4	96-18-4	10 ppm (60mg/m3/8H)	orl-rat 149.6mg/kg
45.	Benzene	35162	020821	0.05	5.00	40008.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	71-43-2	1 ppm	orl-rat 4894mg/kg
46.	Bromobenzene	35162	020821	0.05	5.00	40019.0	2000	NA	NA	0.017	NA	NA	2000.9	18.4	108-86-1	N/A	orl-rat 2699mg/kg
47.	n-Butyl benzene	35162	020821	0.05	5.00	40019.8	2000	NA	NA	0.017	NA	NA	2000.9	18.4	104-51-8	N/A	N/A
48.	Ethyl benzene	35162	020821	0.05	5.00	40000.9	2000	NA	NA	0.017	NA	NA	1999.9	18.4	100-41-4	100 ppm (435mg/m3/8H)	orl-rat >2000mg/kg
49.	p-Isopropyl toluene	35162	020821	0.05	5.00	40056.4	2000	NA	NA	0.017	NA	NA	2002.7	18.4	99-87-6	N/A	orl-rat 4750mg/kg
50.	Naphthalene	35162	020821	0.05	5.00	40005.1	2000	NA	NA	0.017	NA	NA	2000.2	18.3	91-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg
51.	Styrene	35162	020821	0.05	5.00	40022.5	2000	NA	NA	0.017	NA	NA	2001.0	18.4	100-42-5	100 ppm	orl-rat 5000mg/kg
52.	Toluene	35162	020821	0.05	5.00	40008.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	108-88-3	200 ppm	orl-rat 5000mg/kg
53.	1,2,3-Trichlorobenzene	35162	020821	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	87-61-6	N/A	ipr-mus 1390mg/kg
54.	1,2,4-Trichlorobenzene	35162	020821	0.05	5.00	40027.4	2000	NA	NA	0.017	NA	NA	2001.3	18.4	120-82-1	5 ppm (CL) (40mg/m3)	orl-rat 756mg/kg
55.	1,2,4-Trimethylbenzene	35162	020821	0.05	5.00	40012.4	2000	NA	NA	0.017	NA	NA	2000.5	18.4	95-63-6	N/A	orl-rat 5g/kg
56.	1,3,5-Trimethylbenzene	35162	020821	0.05	5.00	40011.5	2000	NA	NA	0.017	NA	NA	2000.5	18.5	108-67-8	N/A	orl-rat 5000mg/kg
57.	m-Xylene	35162	020821	0.05	5.00	40021.8	2000	NA	NA	0.017	NA	NA	2001.0	18.4	108-38-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg
58.	tert-Butyl benzene	35163	022521	0.05	5.00	40005.9	2000	NA	NA	0.017	NA	NA	2000.2	18.4	98-06-6	N/A	N/A
59.	sec-Butyl benzene	35163	022521	0.05	5.00	40011.7	2000	NA	NA	0.017	NA	NA	2000.5	18.4	135-98-8	N/A	orl-rat 2240mg/kg
60.	Chlorobenzene	35163	022521	0.05	5.00	40009.0	2000	NA	NA	0.017	NA	NA	2000.4	18.4	108-90-7	75 ppm (350mg/m3/8H)	orl-rat 2290mg/kg
61.	2-Chlorotoluene	35163	022521	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	95-49-8	50 ppm (250mg/m3/8H)	orl-rat 3900mg/kg
62.	4-Chlorotoluene	35163	022521	0.05	5.00	40000.4	2000	NA	NA	0.017	NA	NA	1999.9	18.4	106-43-4	N/A	orl-rat 2100mg/kg
63.	1,2-Dichlorobenzene	35163	022521	0.05	5.00	40004.0	2000	NA	NA	0.017	NA	NA	2000.1	18.4	95-50-1	50 ppm (300mg/m3) (CL)	orl-rat 500mg/kg
64.	1,3-Dichlorobenzene	35163	022521	0.05	5.00	40003.6	2000	NA	NA	0.017	NA	NA	2000.1	18.4	541-73-1	N/A	ipr-mus 1062mg/kg
65.	1,4-Dichlorobenzene	35163	022521	0.05	5.00	40005.0	2000	NA	NA	0.017	NA	NA	2000.2	18.4	106-46-7	75 ppm (450mg/m3/8H)	orl-rat 500mg/kg
66.	Isopropylbenzene	35163	022521	0.05	5.00	40007.4	2000	NA	NA	0.017	NA	NA	2000.3	18.4	98-82-8	50 ppm (245mg/m3/8H)	orl-rat 1400mg/kg
67.	n-Propylbenzene	35163	022521	0.05	5.00	40004.6	2000	NA	NA	0.017	NA	NA	2000.1	18.4	103-65-1	N/A	orl-rat 6040mg/kg
68.	o-Xylene	35163	022521	0.05	5.00	40003.0	2000	NA	NA	0.017	NA	NA	2000.1	18.4	95-47-6	100 ppm (435mg/m3/8H)	ipr-mus 1364mg/kg
69.	p-Xylene	35163	022521	0.05	5.00	40005.0	2000	NA	NA	0.017	NA	NA	2000.2	18.4	106-42-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg

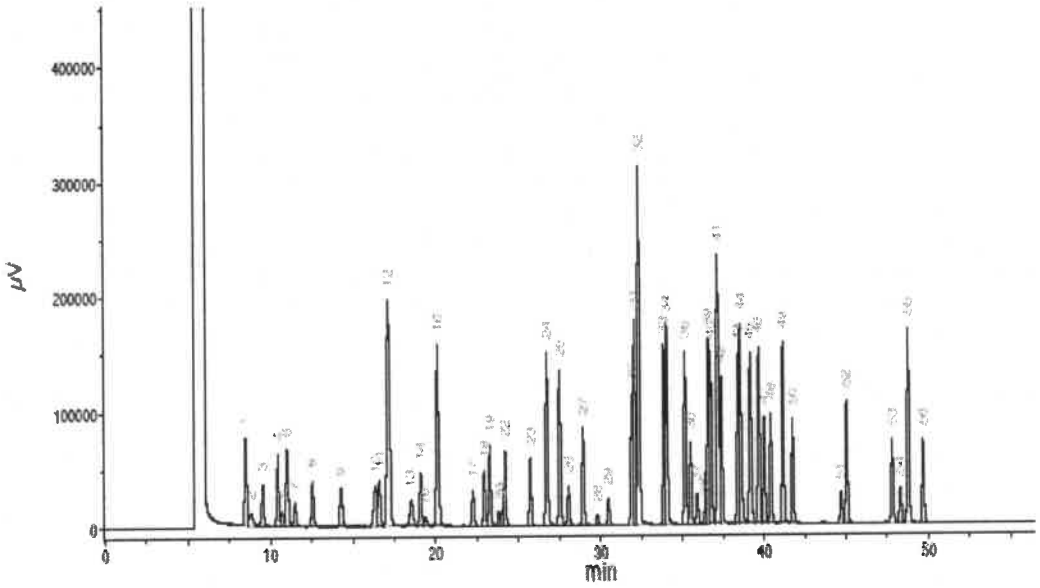
- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty References: 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).

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

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

Comments

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



Peak #	Analyte	FID RT (min.)
1	Ether	8.48
2	1,1,2-Trichloro-1,2,2-trifluoroethane	8.90
3	1,1-Dichloroethene	9.51
4	Acetonitrile	10.44
5	Iodoethane	10.71
6	Allyl chloride	11.02
7	**Carbon disulfide/Methylene chloride**	11.51
8	trans-1,2-Dichloroethene	12.55
9	1,1-Dichloroethane	14.28
10	2,2-Dichloropropane	16.33
11	cis-1,2-Dichloroethene	16.59
12	**Methacrylonitrile/Methyl acrylate/Chloroform**	17.14
13	**Isobutanol/1,1,1-Trichloroethane**	18.32
14	1,1-Dichloropropene	19.08
15	Carbon tetrachloride	19.39
16	**Benzene/1,2-Dichloroethane**	20.10
17	Trichloroethene	22.03
18	1,2-Dichloropropane	22.92
19	Methyl methacrylate	23.26
20	Bromodichloromethane	23.79
21	Dibromomethane	23.98
22	2-Nitropropane	24.18
23	cis-1,3-Dichloropropene	25.71
24	Toluene	26.71
25	**Ethyl methacrylate/trans-1,3-Dichloropropene**	27.90
26	1,1,2-Trichloroethane	28.04
27	**Tetrachloroethene/1,3-Dichloropropane**	28.92
28	Dibromochloromethane	29.79
29	1,2-Dibromoethane	30.46
30	Chlorobenzene	31.89
31	**Ethylbenzene/1,1,1,2-Tetrachloroethane**	32.07
32	**m-Xylene/p-Xylene**	32.33
33	o-Xylene	33.87
34	Styrene	34.04
35	**Isopropylbenzene/Bromoform**	35.14
36	cis-1,4-Dichloro-2-butene	35.49
37	1,1,2,2-Tetrachloroethane	35.90
38	**1,2,3-Trichloropropane**	36.34
39	**n-Propylbenzene**	36.58
40	**trans-1,4-Dichloro-2-butene/Bromobenzene**	36.73
41	**1,3,5-Trimethylbenzene/2-Chlorotoluene**	37.17
42	4-Chlorotoluene	37.38
43	tert-Butylbenzene	38.41
44	**1,2,4-Trimethylbenzene/Pentachloroethane**	38.55
45	sec-Butylbenzene	38.16
46	p-Isopropyltoluene	39.68
47	1,3-Dichlorobenzene	40.01
48	1,4-Dichlorobenzene	40.42
49	n-Butylbenzene	41.16
50	1,2-Dichlorobenzene	41.74
51	1,2-Dibromo-3-chloropropane	44.68
52	Nitrobenzene	45.04
53	1,2,4-Trichlorobenzene	47.80
54	Hexachlorobutadiene	48.29
55	Naphthalene	48.76
56	1,2,3-Trichlorobenzene	49.66

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	**1-352-323-3500**
		Date Prepared/Revised	January 1, 2022

Section II - Hazards Identification

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

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

Signal Word: DANGER

Section III - Composition

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

CERTIFIED WEIGHT REPORT

Part Number: 95317
Lot Number: 042921
Description: Universal VOA Megamix
69 components
Expiration Date: 042924
Recommended Storage: Freezer (0 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

Solvent(s): Lot#
Methanol DY186-USQ8

Formulated By: Eli Aliaga 042921 DATE

Reviewed By: Pedro L. Rentas 042921 DATE

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

	Compound	(RM#) Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Initial Conc.(ug/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette (mL)	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expended Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1.	Acetonitrile	(0324)	060812	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20041	2002.0	8.1	75-05-8	40 ppm (70mg/m3/8H)	orl-rat 2460mg/kg
2.	Allyl chloride (3-Chloropropene)	(0325)	102396	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20233	2003.0	8.2	107-05-1	1 ppm (3mg/m3/8H)	orl-rat 700mg/kg
3.	Carbon disulphide	(0060)	MKCD9604	NA	NA	NA	2000	100	0.2	NA	0.20001	0.20015	2001.4	8.1	75-15-0	4 ppm (12mg/m3) (skin)	orl-rat 1200mg/kg
4.	cis-1,4-Dichloro-2-butene	(1196)	14718EF	NA	NA	NA	2000	95	0.2	NA	0.21054	0.21060	2000.6	8.5	1476-11-5	N/A	N/A
5.	trans-1,4-Dichloro-2-butene	(0486)	MKBP6041V	NA	NA	NA	2000	96.5	0.2	NA	0.20726	0.20751	2002.4	8.4	110-57-6	N/A	N/A
6.	Diethyl ether (Ethyl ether)	(0153)	SHBK1918	NA	NA	NA	2000	99.9	0.2	NA	0.20023	0.20048	2002.3	8.1	60-29-7	400ppm (1200mg/m3/8H)	orl-rat 1215mg/kg
7.	Ethyl methacrylate	(0361)	06126PX	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20230	2002.7	8.2	97-63-2	N/A	orl-rat 14800mg/kg
8.	Iodomethane	(0488)	SHBF8718V	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20130	2002.8	8.1	74-88-4	5 ppm(28mg/m3/8H)(skin)	orl-rat 76mg/kg
9.	2-Methyl-1-propanol	(0445)	15241EB	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20123	2002.1	8.1	78-83-1	50 ppm (150mg/m3/8H)	orl-rat 2460mg/kg
10.	Methacrylonitrile	(0442)	00427ET	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20220	2001.7	8.2	126-98-7	1 ppm (3mg/m3/8H)(skin)	orl-rat 120mg/kg
11.	Methyl acrylate	(1075)	SHBK0679	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20046	2002.5	8.1	96-33-3	10 ppm(35mg/m3/8H)(skin)	orl-rat 277mg/kg
12.	Methyl methacrylate	(0404)	MKBW5137V	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20048	2002.7	8.1	80-62-6	100 ppm (410mg/m3/8H)	orl-rat 7872mg/kg
13.	Nitrobenzene	(0228)	01213TV	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20216	2001.5	8.2	98-95-3	1 ppm (5mg/m3/8H)(skin)	orl-rat 780mg/kg
14.	2-Nitropropane	(0481)	14002JX	NA	NA	NA	2000	97.3	0.2	NA	0.20556	0.20585	2001.0	8.3	79-46-9	10 ppm (35mg/m3/8H)	orl-rat 720mg/kg
15.	Pentachloroethane	(0450)	HGA01	NA	NA	NA	2000	98	0.2	NA	0.20409	0.20418	2000.9	8.2	76-01-7	N/A	N/A
16.	1,1,2-Trichlorotrifluoroethane	(0474)	18930	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20221	2001.8	8.2	76-13-1	1000 ppm (7600mg/m3/8H)	orl-rat 43g/kg
17.	Bromodichloromethane	35171	100220	0.05	5.00	40018.8	2000	NA	NA	0.017	NA	NA	2000.8	18.4	75-27-4	N/A	orl-rat 916mg/kg
18.	Dibromochloromethane	35171	100220	0.05	5.00	40007.7	2000	NA	NA	0.017	NA	NA	2000.3	18.4	124-48-1	N/A	orl-rat 846mg/kg
19.	cis-1,2-Dichloroethene	35171	100220	0.05	5.00	40012.4	2000	NA	NA	0.017	NA	NA	2000.5	18.4	156-59-2	N/A	N/A
20.	trans-1,2-Dichloroethene	35171	100220	0.05	5.00	40005.6	2000	NA	NA	0.017	NA	NA	2000.2	18.4	156-60-5	N/A	orl-rat 1235mg/kg
21.	Methylene chloride	35171	100220	0.05	5.00	40013.9	2000	NA	NA	0.017	NA	NA	2000.6	18.4	75-09-2	500 ppm	orl-rat 820mg/kg
22.	1,1-Dichloroethene	32251	031621	0.10	10.00	20009.1	2000	NA	NA	0.042	NA	NA	2000.8	19.3	75-35-4	1 ppm (4mg/m3/8H)	orl-rat 200mg/kg
23.	Bromoform	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	75-25-2	0.5 ppm (5mg/m3) (skin)	orl-rat 933mg/kg
24.	Carbon tetrachloride	95321	010419	0.10	10.00	20001.3	2000	NA	NA	0.042	NA	NA	2000.0	19.2	56-23-5	2 ppm (12.6mg/m3/8H)	orl-rat 2350mg/kg
25.	Chloroform	95321	010419	0.10	10.00	20001.8	2000	NA	NA	0.042	NA	NA	2000.1	19.2	67-66-3	50 ppm (240mg/m3) (CL)	orl-rat 908mg/kg
26.	Dibromomethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	74-95-3	N/A	orl-rat 108mg/kg
27.	1,1-Dichloroethane	95321	010419	0.10	10.00	20000.8	2000	NA	NA	0.042	NA	NA	2000.0	19.3	75-34-3	100 ppm	orl-rat 725mg/kg
28.	2,2-Dichloropropane	95321	010419	0.10	10.00	20002.1	2000	NA	NA	0.042	NA	NA	2000.1	19.3	594-20-7	N/A	N/A
29.	Tetrachloroethene	95321	010419	0.10	10.00	20002.2	2000	NA	NA	0.042	NA	NA	2000.1	19.3	127-18-4	25 ppm (170mg/m3/8H)(final)	orl-rat 2629mg/kg
30.	1,1,1-Trichloroethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	71-55-6	350 ppm (1900mg/m3/8H)	orl-rat 10300mg/kg
31.	1,2-Dibromo-3-chloropropane	35161	011421	0.05	5.00	40001.2	2000	NA	NA	0.017	NA	NA	2000.0	18.4	96-12-8	0.001 ppm	orl-rat 170mg/kg
32.	1,2-Dibromoethane	35161	011421	0.05	5.00	40003.9	2000	NA	NA	0.017	NA	NA	2000.1	18.4	106-93-4	20 ppm (8H)	orl-rat 108mg/kg
33.	1,2-Dichloroethane	35161	011421	0.05	5.00	40004.9	2000	NA	NA	0.017	NA	NA	2000.1	18.4	107-06-2	50 ppm (8H)	orl-rat 670mg/kg
34.	1,2-Dichloropropane	35161	011421	0.05	5.00	40002.2	2000	NA	NA	0.017	NA	NA	2000.0	18.4	78-87-5	75 ppm (350mg/m3/8H)	orl-rat 1947mg/kg
35.	1,3-Dichloropropane	35161	011421	0.05	5.00	40013.9	2000	NA	NA	0.017	NA	NA	2000.6	18.4	142-28-9	N/A	unr-mus 3600mg/kg
36.	1,1-Dichloropropene	35161	011421	0.05	5.00	40015.0	2000	NA	NA	0.017	NA	NA	2000.7	26.1	563-58-6	N/A	N/A
37.	cis-1,3-Dichloropropene	35161	011421	0.05	5.00	40004.4	2000	NA	NA	0.017	NA	NA	2000.1	18.4	10061-01-5	N/A	N/A
38.	trans-1,3-Dichloropropene	35161	011421	0.05	5.00	40009.1	2000	NA	NA	0.017	NA	NA	2000.4	18.5	10061-02-6	N/A	N/A
39.	Hexachloro-1,3-butadiene	35161	011421	0.05	5.00	40003.5	2000	NA	NA	0.017	NA	NA	2000.1	26.4	87-68-3	0.02 ppm (0.24mg/m3/8H)	orl-rat 82mg/kg
40.	1,1,1,2-Tetrachloroethane	35161	011421	0.05	5.00	40011.9	2000	NA	NA	0.017	NA	NA	2000.5	18.4	630-20-6	N/A	orl-rat 670mg/kg
41.	1,1,2,2-Tetrachloroethane	35161	011421	0.05	5.00	40011.0	2000	NA	NA	0.017	NA	NA	2000.5	18.4	79-34-5	5 ppm (35mg/m3/8H)(skin)	orl-rat 800mg/kg
42.	1,1,2-Trichloroethane	35161	011421	0.05	5.00	40000.8	2000	NA	NA	0.017	NA	NA	1999.9	18.4	79-00-5	10 ppm (45mg/m3/8H)(skin)	orl-rat 836mg/kg
43.	Trichloroethene	35161	011421	0.05	5.00	40003.2	2000	NA	NA	0.017	NA	NA	2000.1	18.4	79-01-6	50 ppm (270mg/m3/8H)	orl-mus 2402mg/kg
44.	1,2,3-Trichloropropane	35161	011421	0.05	5.00	40015.2	2000	NA	NA	0.017	NA	NA	2000.7	18.4	96-18-4	10 ppm (60mg/m3/8H)	orl-rat 149.6mg/kg
45.	Benzene	35162	020821	0.05	5.00	40008.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	71-43-2	1 ppm	orl-rat 4894mg/kg
46.	Bromobenzene	35162	020821	0.05	5.00	40019.0	2000	NA	NA	0.017	NA	NA	2000.9	18.4	108-86-1	N/A	orl-rat 2699mg/kg
47.	n-Butyl benzene	35162	020821	0.05	5.00	40019.8	2000	NA	NA	0.017	NA	NA	2000.9	18.4	104-51-8	N/A	N/A
48.	Ethyl benzene	35162	020821	0.05	5.00	40000.9	2000	NA	NA	0.017	NA	NA	1999.9	18.4	100-41-4	100 ppm (435mg/m3/8H)	orl-rat >2000mg/kg
49.	p-Isopropyl toluene	35162	020821	0.05	5.00	40056.4	2000	NA	NA	0.017	NA	NA	2002.7	18.4	99-87-6	N/A	orl-rat 4750mg/kg
50.	Naphthalene	35162	020821	0.05	5.00	40005.1	2000	NA	NA	0.017	NA	NA	2000.2	18.3	91-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg
51.	Styrene	35162	020821	0.05	5.00	40022.5	2000	NA	NA	0.017	NA	NA	2001.0	18.4	100-42-5	100 ppm	orl-rat 5000mg/kg
52.	Toluene	35162	020821	0.05	5.00	40008.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	108-88-3	200 ppm	orl-rat 5000mg/kg
53.	1,2,3-Trichlorobenzene	35162	020821	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	87-61-6	N/A	ipr-mus 1390mg/kg
54.	1,2,4-Trichlorobenzene	35162	020821	0.05	5.00	40027.4	2000	NA	NA	0.017	NA	NA	2001.3	18.4	120-82-1	5 ppm (CL) (40mg/m3)	orl-rat 756mg/kg
55.	1,2,4-Trimethylbenzene	35162	020821	0.05	5.00	40012.4	2000	NA	NA	0.017	NA	NA	2000.5	18.4	95-63-6	N/A	orl-rat 5g/kg
56.	1,3,5-Trimethylbenzene	35162	020821	0.05	5.00	40011.5	2000	NA	NA	0.017	NA	NA	2000.5	18.5	108-67-8	N/A	orl-rat 5000mg/kg
57.	m-Xylene	35162	020821	0.05	5.00	40021.8	2000	NA	NA	0.017	NA	NA	2001.0	18.4	108-38-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg
58.	tert-Butyl benzene	35163	022521	0.05	5.00	40005.9	2000	NA	NA	0.017	NA	NA	2000.2	18.4	98-06-6	N/A	N/A
59.	sec-Butyl benzene	35163	022521	0.05	5.00	40011.7	2000	NA	NA	0.017	NA	NA	2000.5	18.4	135-98-8	N/A	orl-rat 2240mg/kg
60.	Chlorobenzene	35163	022521	0.05	5.00	40009.0	2000	NA	NA	0.017	NA	NA	2000.4	18.4	108-90-7	75 ppm (350mg/m3/8H)	orl-rat 2290mg/kg
61.	2-Chlorotoluene	35163	022521	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	95-49-8	50 ppm (250mg/m3/8H)	orl-rat 3900mg/kg
62.	4-Chlorotoluene	35163	022521	0.05	5.00	40000.4	2000	NA	NA	0.017	NA	NA	1999.9	18.4	106-43-4	N/A	orl-rat 2100mg/kg
63.	1,2-Dichlorobenzene	35163	022521	0.05	5.00	40004.0	2000	NA	NA	0.017	NA	NA	2000.1	18.4	95-50-1	50 ppm (300mg/m3) (CL)	orl-rat 500mg/kg
64.	1,3-Dichlorobenzene	35163	022521	0.05	5.00	40003.6	2000	NA	NA	0.017	NA	NA	2000.1	18.4	541-73-1	N/A	ipr-mus 1062mg/kg
65.	1,4-Dichlorobenzene	35163	022521	0.05	5.00	40005.0	2000	NA	NA	0.017	NA	NA	2000.2	18.4	106-46-7	75 ppm (450mg/m3/8H)	orl-rat 500mg/kg
66.	Isopropylbenzene	35163	022521	0.05	5.00	40007.4	2000	NA	NA	0.017	NA	NA	2000.3	18.4	98-82-8	50 ppm (245mg/m3/8H)	orl-rat 1400mg/kg
67.	n-Propylbenzene	35163	022521	0.05	5.00	40004.6	2000	NA	NA	0.017	NA	NA	2000.1	18.4	103-65-1	N/A	orl-rat 6040mg/kg
68.	o-Xylene	35163	022521	0.05	5.00	40003.0	2000	NA	NA	0.017	NA	NA	2000.1	18.4	95-47-6	100 ppm (435mg/m3/8H)	ipr-mus 1364mg/kg
69.	p-Xylene	35163	022521	0.05	5.00	40005.0	2000	NA	NA	0.017	NA	NA	2000.2	18.4	106-42-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg

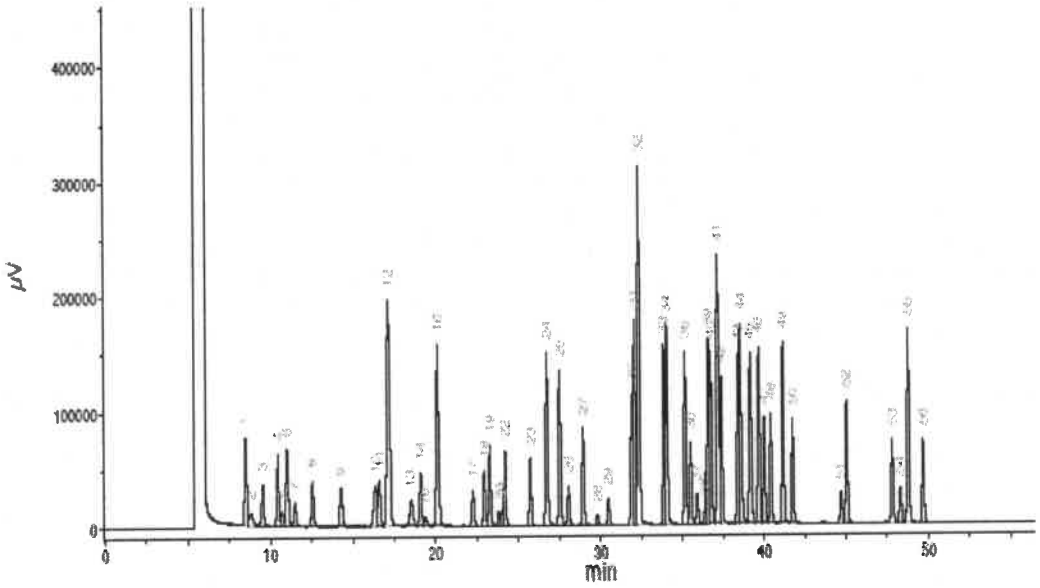
- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty References: 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).

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

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

Comments

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



Peak #	Analyte	FID RT (min.)
1	Ether	8.48
2	1,1,2-Trichloro-1,2,2-trifluoroethane	8.90
3	1,1-Dichloroethene	9.51
4	Acetonitrile	10.44
5	Iodoethane	10.71
6	Allyl chloride	11.02
7	**Carbon disulfide/Methylene chloride**	11.51
8	trans-1,2-Dichloroethene	12.55
9	1,1-Dichloroethane	14.28
10	2,2-Dichloropropane	16.33
11	cis-1,2-Dichloroethene	16.59
12	**Methacrylonitrile/Methyl acrylate/Chloroform**	17.14
13	**Isobutanol/1,1,1-Trichloroethane**	18.32
14	1,1-Dichloropropene	19.08
15	Carbon tetrachloride	19.39
16	**Benzene/1,2-Dichloroethane**	20.10
17	Trichloroethene	22.03
18	1,2-Dichloropropane	22.92
19	Methyl methacrylate	23.26
20	Bromodichloromethane	23.79
21	Dibromomethane	23.98
22	2-Nitropropane	24.18
23	cis-1,3-Dichloropropene	25.71
24	Toluene	26.71
25	**Ethyl methacrylate/trans-1,3-Dichloropropene**	27.90
26	1,1,2-Trichloroethane	28.04
27	**Tetrachloroethene/1,3-Dichloropropane**	28.92
28	Dibromochloromethane	29.79
29	1,2-Dibromoethane	30.46
30	Chlorobenzene	31.89
31	**Ethylbenzene/1,1,1,2-Tetrachloroethane**	32.07
32	**m-Xylene/p-Xylene**	32.33
33	o-Xylene	33.87
34	Styrene	34.04
35	**Isopropylbenzene/Bromoform**	35.14
36	cis-1,4-Dichloro-2-butene	35.49
37	1,1,2,2-Tetrachloroethane	35.90
38	**1,2,3-Trichloropropane**	36.34
39	**n-Propylbenzene**	36.58
40	**trans-1,4-Dichloro-2-butene/Bromobenzene**	36.73
41	**1,3,5-Trimethylbenzene/2-Chlorotoluene**	37.17
42	4-Chlorotoluene	37.38
43	tert-Butylbenzene	38.41
44	**1,2,4-Trimethylbenzene/Pentachloroethane**	38.55
45	sec-Butylbenzene	38.16
46	p-Isopropyltoluene	39.68
47	1,3-Dichlorobenzene	40.01
48	1,4-Dichlorobenzene	40.42
49	n-Butylbenzene	41.16
50	1,2-Dichlorobenzene	41.74
51	1,2-Dibromo-3-chloropropane	44.68
52	Nitrobenzene	45.04
53	1,2,4-Trichlorobenzene	47.80
54	Hexachlorobutadiene	48.29
55	Naphthalene	48.76
56	1,2,3-Trichlorobenzene	49.66

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	**1-352-323-3500**
		Date Prepared/Revised	January 1, 2022

Section II - Hazards Identification

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

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

Signal Word: DANGER

Section III - Composition

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

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Certified Reference Material CRM

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AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

Part Number: 91980
Lot Number: 062723
Description: Acrolein

Solvent(s): Water **Lot#** 102422Q

Expiration Date: 072723
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 5000
NIST Test ID#: 6UTB

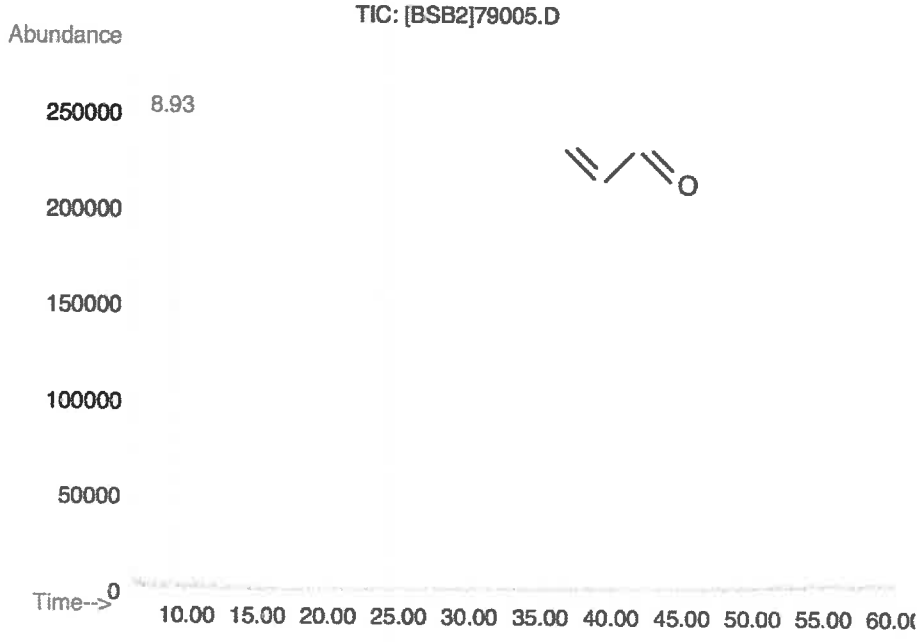
5E-05 Balance Uncertainty
0.001 Flask Uncertainty

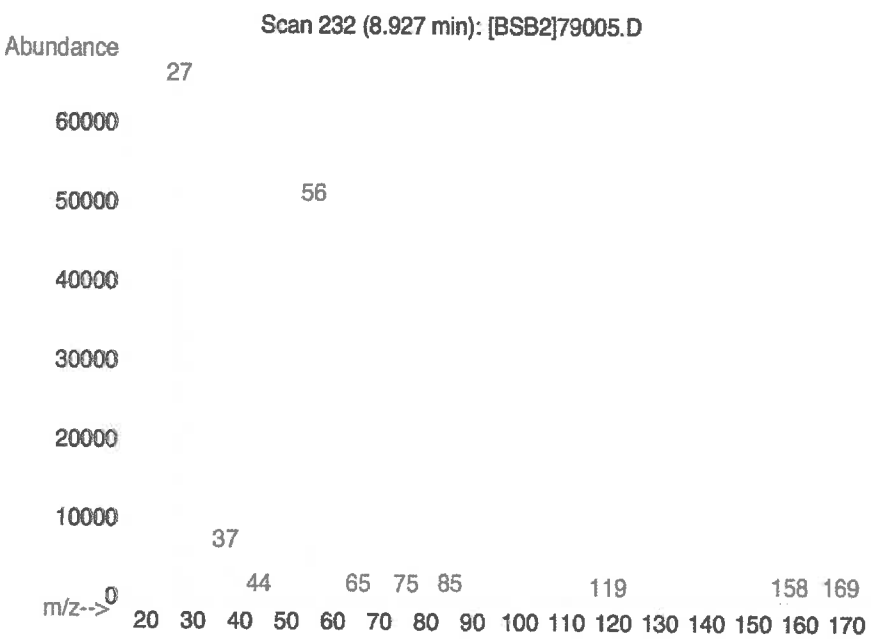
Weight(s) shown below were combined and diluted to (mL): 10.0

Justin Dippold	062723
Formulated By: Justin Dippold	DATE
Pedro Rentas	062723
Reviewed By: Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Acrolein	5	103755R02D	5000	97.1	0.5	0.05160	0.05165	5004.4	52.5	107-02-8	0.1 ppm	orl-rat 46mg/kg

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





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- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
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- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
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Certified Reference Material CRM

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CERTIFIED WEIGHT REPORT

Part Number: 91980
Lot Number: 062723
Description: Acrolein

Solvent(s): Water **Lot#** 102422Q

Expiration Date: 072723
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 5000
NIST Test ID#: 6UTB

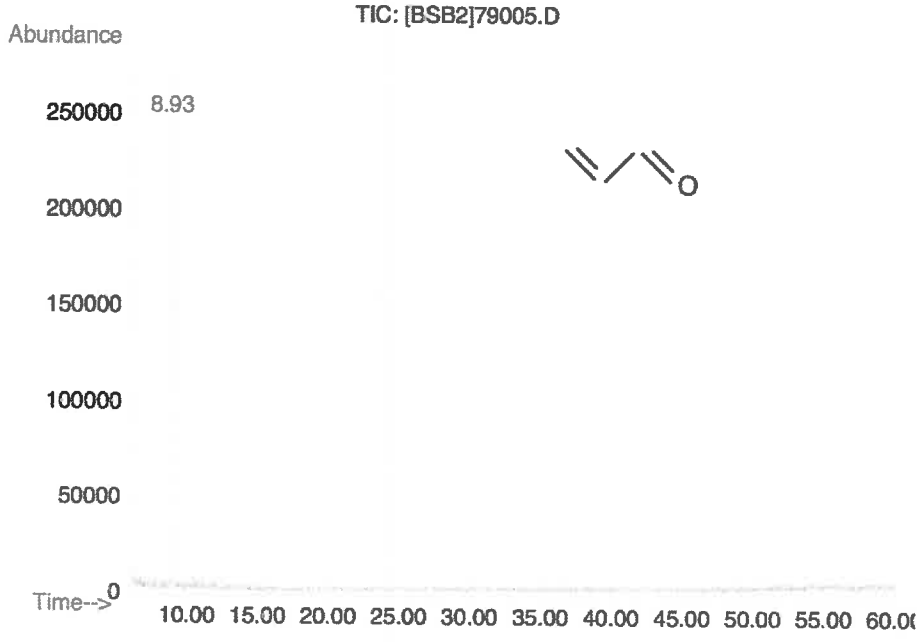
5E-05 Balance Uncertainty
0.001 Flask Uncertainty

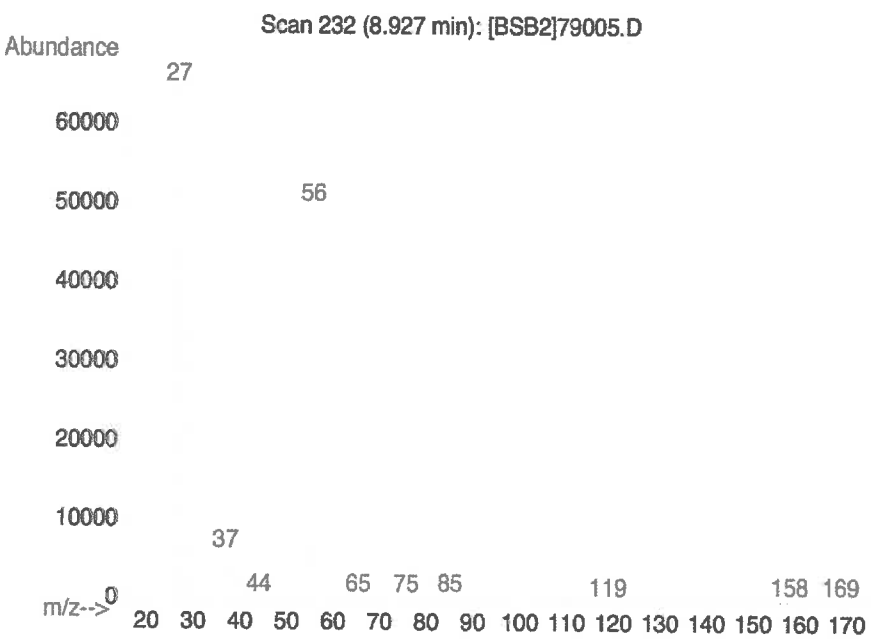
Weight(s) shown below were combined and diluted to (mL): 10.0

Justin Dippold	062723
Formulated By: Justin Dippold	DATE
Pedro Rentas	062723
Reviewed By: Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Acrolein	5	103755R02D	5000	97.1	0.5	0.05160	0.05165	5004.4	52.5	107-02-8	0.1 ppm	orl-rat 46mg/kg

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





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CERTIFIED WEIGHT REPORT

Part Number: 91980
Lot Number: 062823
Description: Acrolein

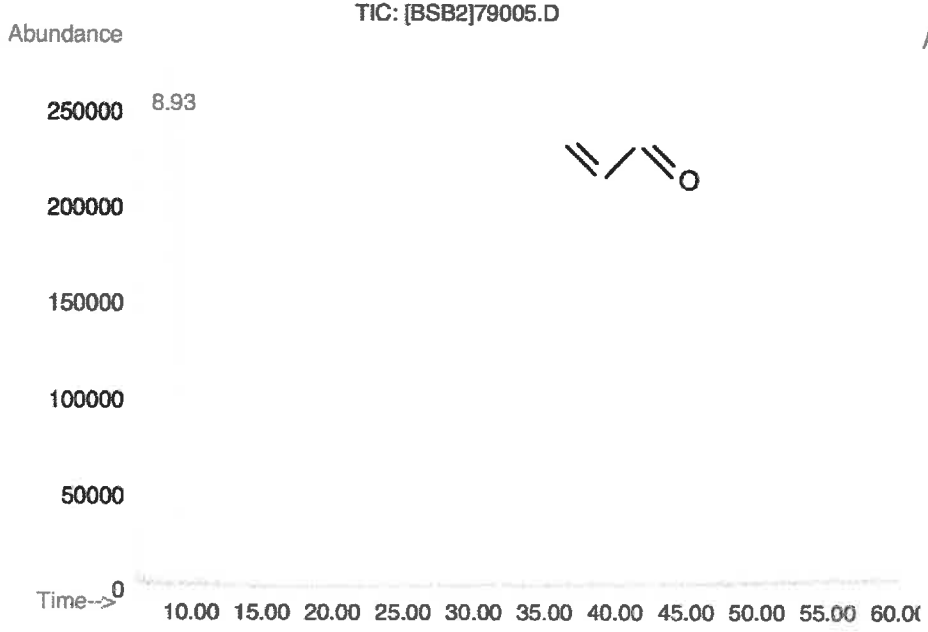
Solvent(s): Water **Lot#** 102422Q

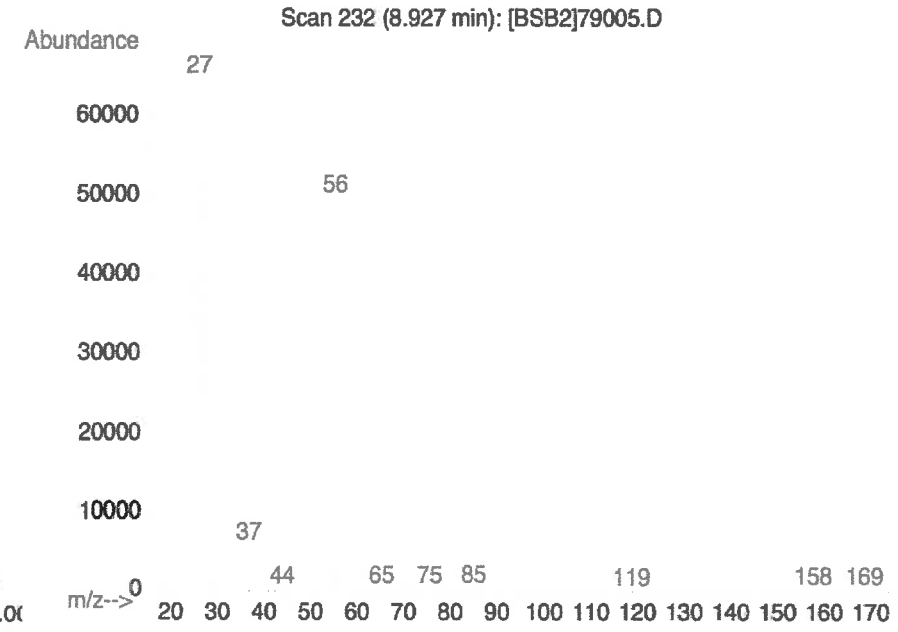
Expiration Date: 072823
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 5000
NIST Test ID#: 6UTB 5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 10.0 0.001 Flask Uncertainty

Gabriel Helland	062823
Formulated By: Gabriel Helland	DATE
Pedro Rentas	062823
Reviewed By: Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Acrolein	5	103755R09M	5000	97.1	0.5	0.05160	0.05165	5004.4	52.5	107-02-8	0.1 ppm	orl-rat 46mg/kg

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





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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 WATER**

Manufacturer's Name	ABSOLUTE STANDARDS INC	Emergency Telephone USA & CANADA	**1-800-535-5053**
Address	44 Rossotto Dr.	Emergency Telephone International	**1-352-323-3500**
	Hamden CT, 06514	Date Prepared/Revised	May 1, 2022

Section II - Hazards Identification

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

P271	**Use in ventilated area**	**H315**	**Causes skin and eye irritation.**
P302,332	**If on skin, wash with soap and water**	**P280**	**Use gloves, eye protection/face sheild**
		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)
Water	CAS#: 7732-18-5	> 97

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

INTENDED USE: REFERENCE MATERIAL

Section IV. FIRST AID MEASURES

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

Section V. FIREFIGHTING MEASURES

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

Section VI. ACCIDENTAL RELEASE MEASURES

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

Section VII. HANDLING AND STORAGE

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

Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Water CAS#: 7732-18-5 TWA: 500 ppm

Personal protective equipment Respiratory protection Handle with gloves. Gloves must be inspected prior to use. Eye protection.
Avoid contact with skin, eyes and clothing. Wash hands thoroughly after handling the product.

Section IX - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	100°C	Specific Gravity (H2O = 1)	1
Vapor Pressure (mm Hg)		Melting Point	

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

Solubility in Water Completely miscible

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

Section X. STABILITY AND REACTIVITY

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

Section XI. TOXICOLOGICAL INFORMATION

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

Section XII. ECOLOGICAL INFORMATION

LC50 NA
EC50 NA

Section XIII. DISPOSAL CONSIDERATIONS

Dispose with normal Laboratory Solvent Waste.

Section XIV. TRANSPORT INFORMATION

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

IATA
Not dangerous goods
Proper shipping name: Water

Section XV. REGULATORY INFORMATION

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

Section XVI. Misc. INFORMATION

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

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CERTIFIED WEIGHT REPORT

Part Number: 91980
Lot Number: 062823
Description: Acrolein

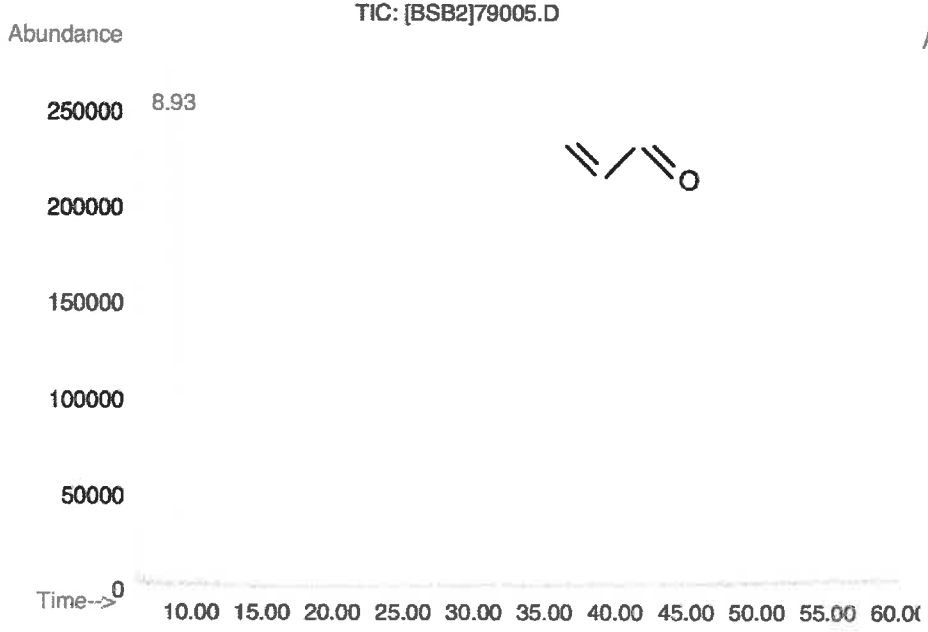
Solvent(s): Water **Lot#** 102422Q

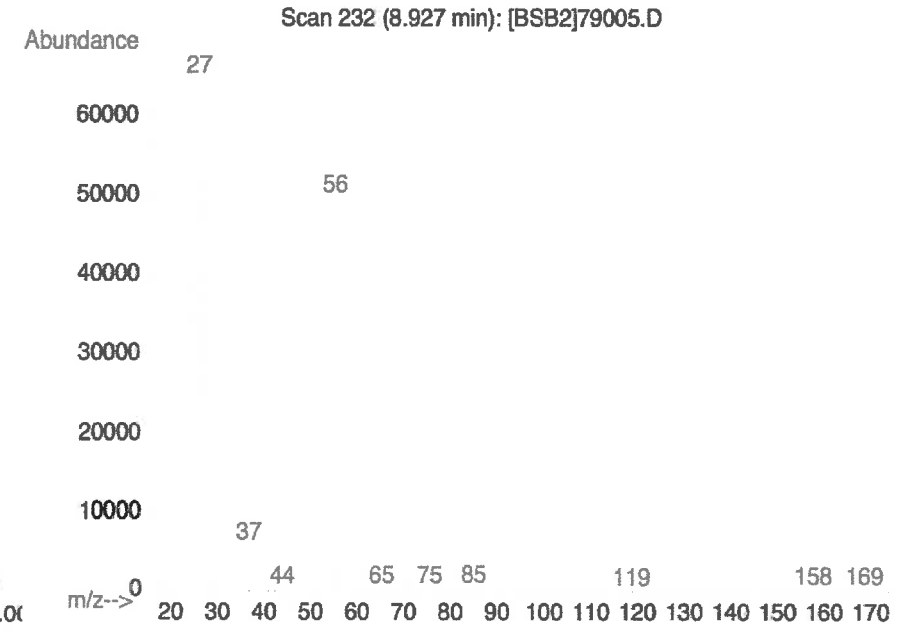
Expiration Date: 072823
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 5000
NIST Test ID#: 6UTB 5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 10.0 0.001 Flask Uncertainty

Gabriel Helland	062823
Formulated By: Gabriel Helland	DATE
Pedro Rentas	062823
Reviewed By: Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Acrolein	5	103755R09M	5000	97.1	0.5	0.05160	0.05165	5004.4	52.5	107-02-8	0.1 ppm	orl-rat 46mg/kg

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





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Safety Data Sheet (SDS) GHS/OSHA Compliant

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Address	44 Rossotto Dr.	Emergency Telephone International	**1-352-323-3500**
	Hamden CT, 06514	Date Prepared/Revised	May 1, 2022

Section II - Hazards Identification

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

P271	**Use in ventilated area**	**H315**	**Causes skin and eye irritation.**
P302,332	**If on skin, wash with soap and water**	**P280**	**Use gloves, eye protection/face sheild**
		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)
Water	CAS#: 7732-18-5	> 97

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

INTENDED USE: REFERENCE MATERIAL

Section IV. FIRST AID MEASURES

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

Section V. FIREFIGHTING MEASURES

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

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Clean up	Contain spillage, and then collect and place in container for disposal according to local regulations (see section 13).

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

Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Water CAS#: 7732-18-5 TWA: 500 ppm

Personal protective equipment Respiratory protection Handle with gloves. Gloves must be inspected prior to use. Eye protection.
Avoid contact with skin, eyes and clothing. Wash hands thoroughly after handling the product.

Section IX - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	100°C	Specific Gravity (H2O = 1)	1
Vapor Pressure (mm Hg)		Melting Point	

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

Solubility in Water Completely miscible

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

Section X. STABILITY AND REACTIVITY

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

Section XI. TOXICOLOGICAL INFORMATION

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

Section XII. ECOLOGICAL INFORMATION

LC50 NA
EC50 NA

Section XIII. DISPOSAL CONSIDERATIONS

Dispose with normal Laboratory Solvent Waste.

Section XIV. TRANSPORT INFORMATION

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

IATA
Not dangerous goods
Proper shipping name: Water

Section XV. REGULATORY INFORMATION

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

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CERTIFIED WEIGHT REPORT

Part Number: 91980
Lot Number: 062823
Description: Acrolein

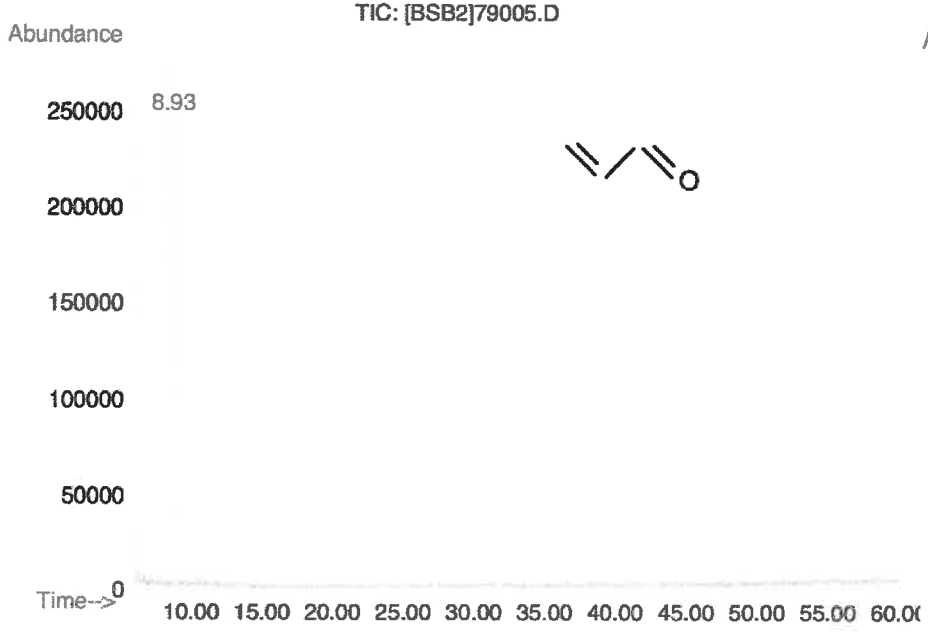
Solvent(s): Water **Lot#** 102422Q

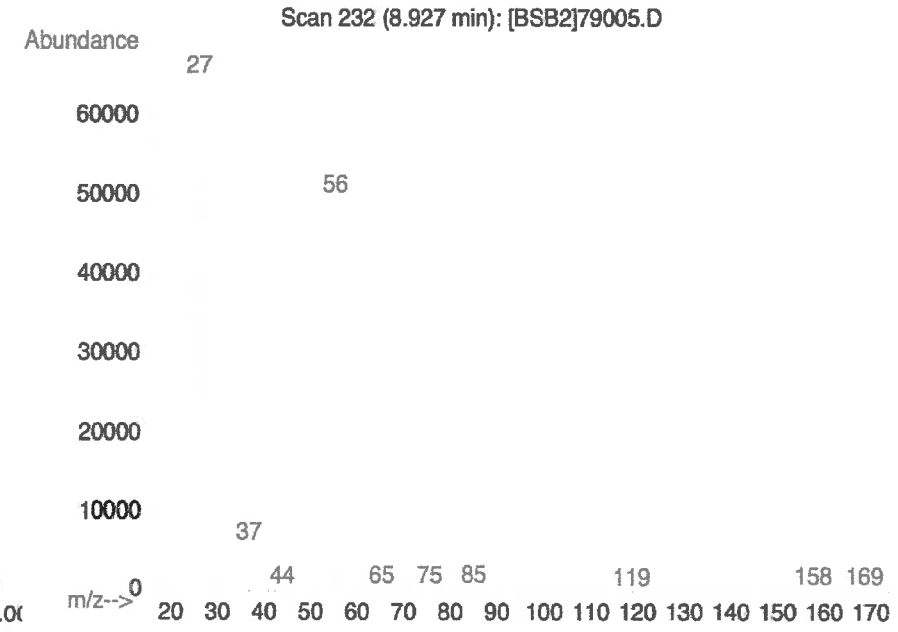
Expiration Date: 072823
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 5000
NIST Test ID#: 6UTB 5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 10.0 0.001 Flask Uncertainty

Gabriel Helland	062823
Formulated By: Gabriel Helland	DATE
Pedro Rentas	062823
Reviewed By: Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Acrolein	5	103755R09M	5000	97.1	0.5	0.05160	0.05165	5004.4	52.5	107-02-8	0.1 ppm	orl-rat 46mg/kg

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





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- **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).**

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 WATER**

Manufacturer's Name	ABSOLUTE STANDARDS INC	Emergency Telephone USA & CANADA	**1-800-535-5053**
Address	44 Rossotto Dr.	Emergency Telephone International	**1-352-323-3500**
	Hamden CT, 06514	Date Prepared/Revised	May 1, 2022

Section II - Hazards Identification

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

P271	**Use in ventilated area**	**H315**	**Causes skin and eye irritation.**
P302,332	**If on skin, wash with soap and water**	**P280**	**Use gloves, eye protection/face sheild**
		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)
Water	CAS#: 7732-18-5	> 97

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

INTENDED USE: REFERENCE MATERIAL

Section IV. FIRST AID MEASURES

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

Section V. FIREFIGHTING MEASURES

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

Section VI. ACCIDENTAL RELEASE MEASURES

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

Section VII. HANDLING AND STORAGE

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

Section VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

Water CAS#: 7732-18-5 TWA: 500 ppm

Personal protective equipment Respiratory protection Handle with gloves. Gloves must be inspected prior to use. Eye protection.
Avoid contact with skin, eyes and clothing. Wash hands thoroughly after handling the product.

Section IX - PHYSICAL/CHEMICAL CHARACTERISTICS

Boiling Point	100°C	Specific Gravity (H2O = 1)	1
Vapor Pressure (mm Hg)		Melting Point	

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

Solubility in Water Completely miscible

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

Section X. STABILITY AND REACTIVITY

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

Section XI. TOXICOLOGICAL INFORMATION

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

Section XII. ECOLOGICAL INFORMATION

LC50 NA
EC50 NA

Section XIII. DISPOSAL CONSIDERATIONS

Dispose with normal Laboratory Solvent Waste.

Section XIV. TRANSPORT INFORMATION

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

IATA
Not dangerous goods
Proper shipping name: Water

Section XV. REGULATORY INFORMATION

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

Section XVI. Misc. INFORMATION

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

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CERTIFIED WEIGHT REPORT

Part Number: 95318
Lot Number: 111722
Description: 2-Chloroethyl vinyl ether

Solvent(s): Methanol **Lot#** EB679-US

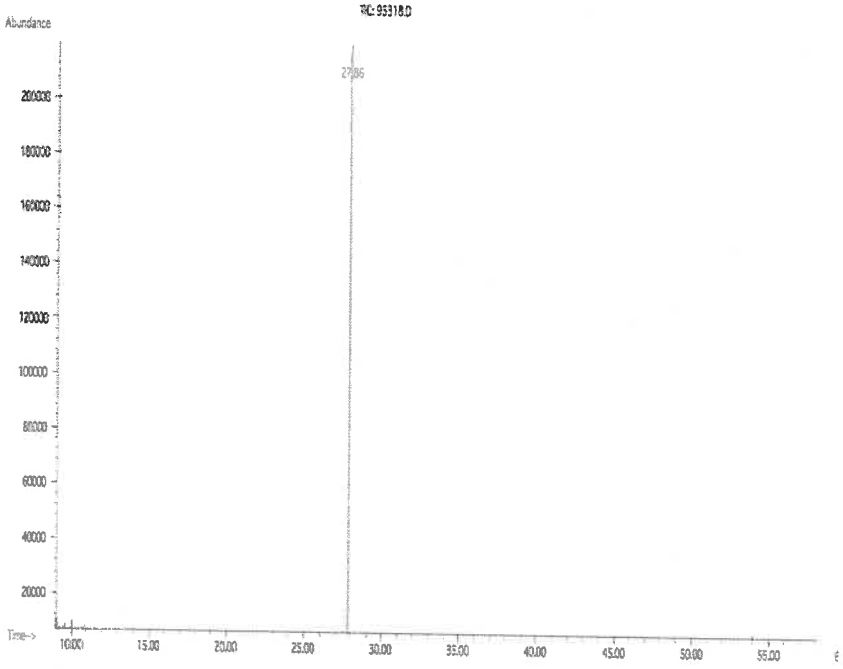
Expiration Date: 111725
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 10000
NIST Test ID#: 6UTB

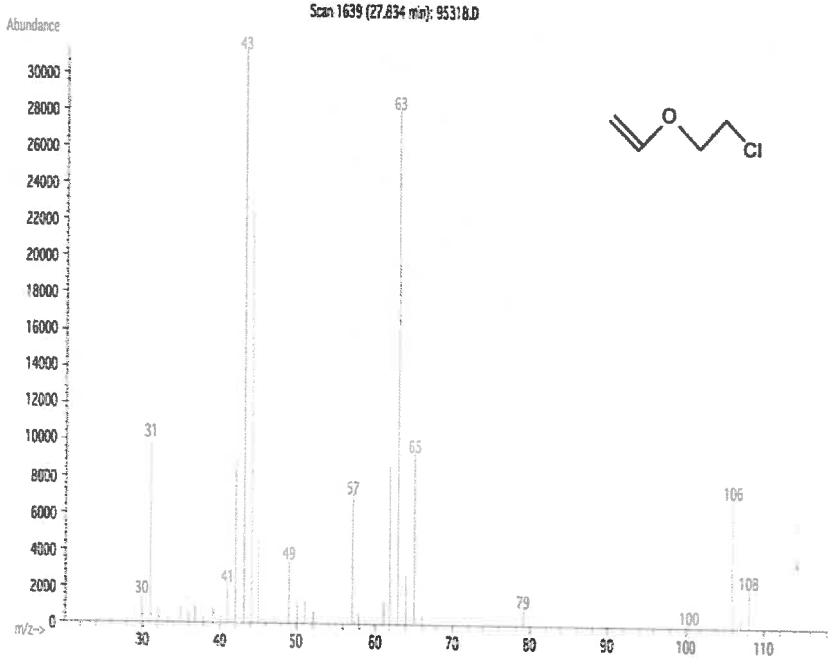
Weight(s) shown below were combined and diluted to (mL): 50.0 | 5E-05 Balance Uncertainty | 0.001 Flask Uncertainty

Formulated By:	Eli Aliaga	111722 DATE
Reviewed By:	Pedro L. Rentas	111722 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. 2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.50541	0.50551	10001.9	40.5	110-75-8	N/A	orl-rat 250mg/kg

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





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CERTIFIED WEIGHT REPORT

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Description: 2-Chloroethyl vinyl ether

Solvent(s): Methanol **Lot#** EB679-US

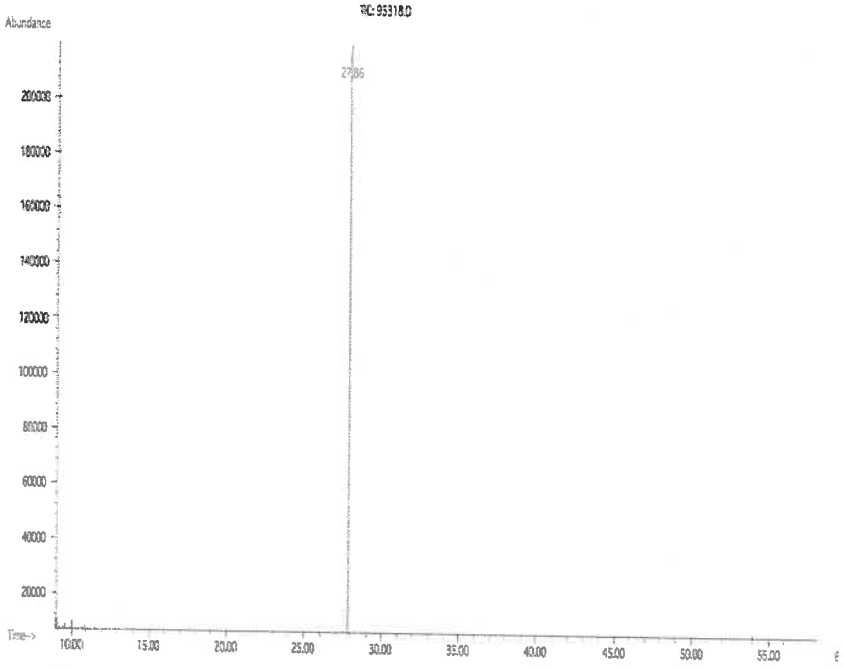
Expiration Date: 111725
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 10000
NIST Test ID#: 6UTB

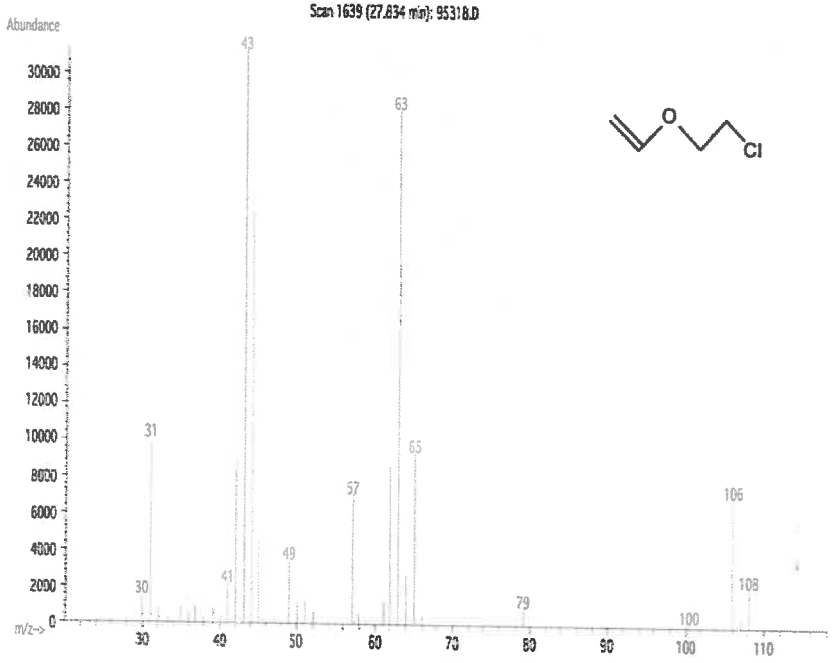
Weight(s) shown below were combined and diluted to (mL): 50.0 | 5E-05 Balance Uncertainty | 0.001 Flask Uncertainty

Formulated By:	Eli Aliaga	111722 DATE
Reviewed By:	Pedro L. Rentas	111722 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. 2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.50541	0.50551	10001.9	40.5	110-75-8	N/A	orl-rat 250mg/kg

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





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CERTIFIED WEIGHT REPORT

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

Expiration Date: 121324
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 10000
NIST Test ID#: 6UTB

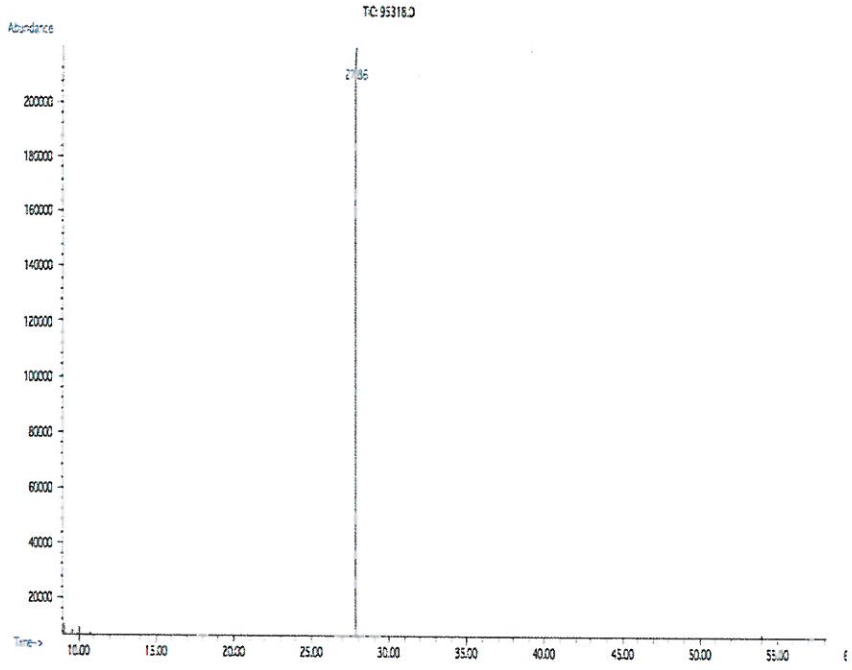
Solvent(s): **Lot#**
Methanol EA899-US

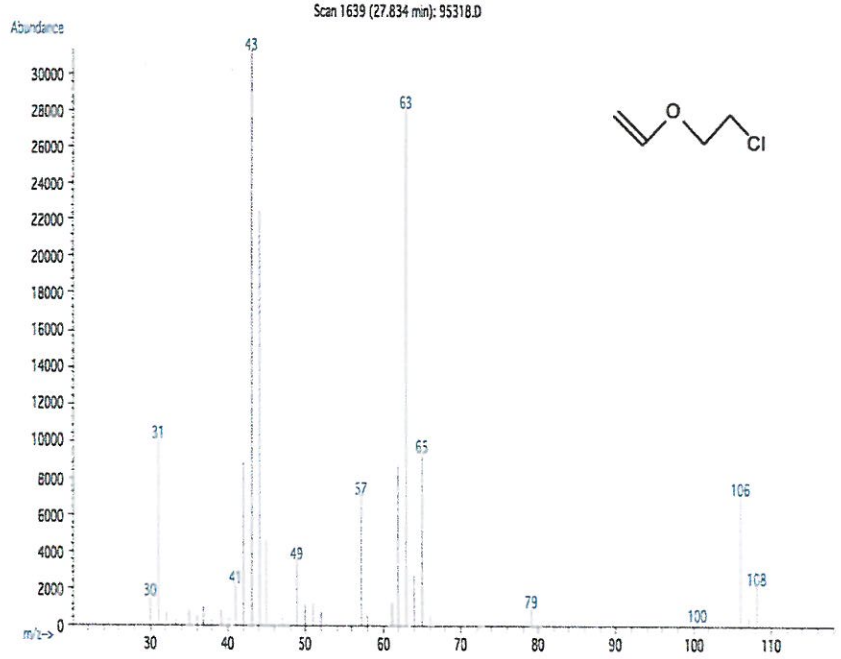
5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 30.0 0.0003 Flask Uncertainty

		121321
Formulated By:	Benson Chan	DATE
		121321
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. 2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.30320	0.30411	10030.2	40.7	110-75-8	N/A	orl-rat 250mg/kg

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





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CERTIFIED WEIGHT REPORT

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

Expiration Date: 121324
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 10000
NIST Test ID#: 6UTB

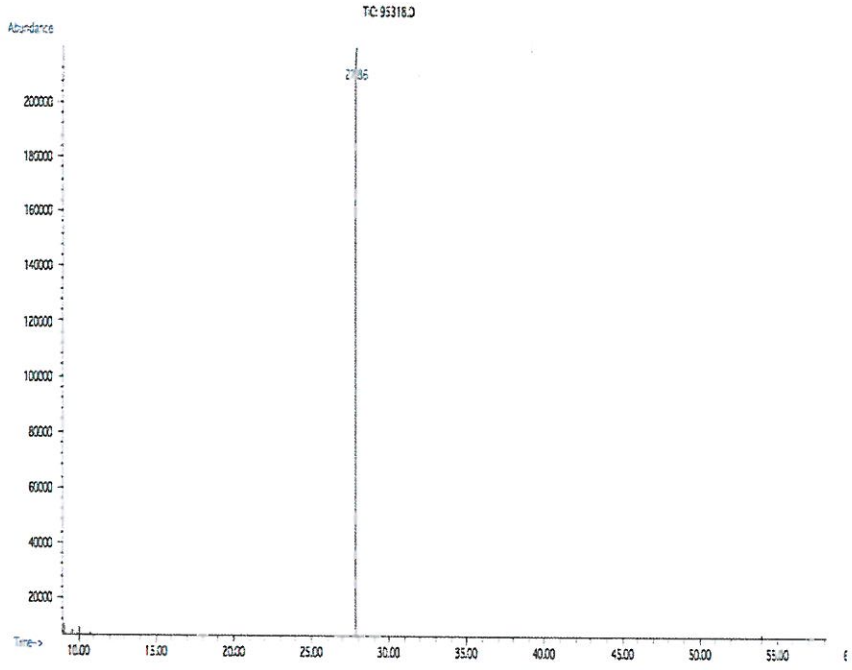
Solvent(s): **Lot#**
Methanol EA899-US

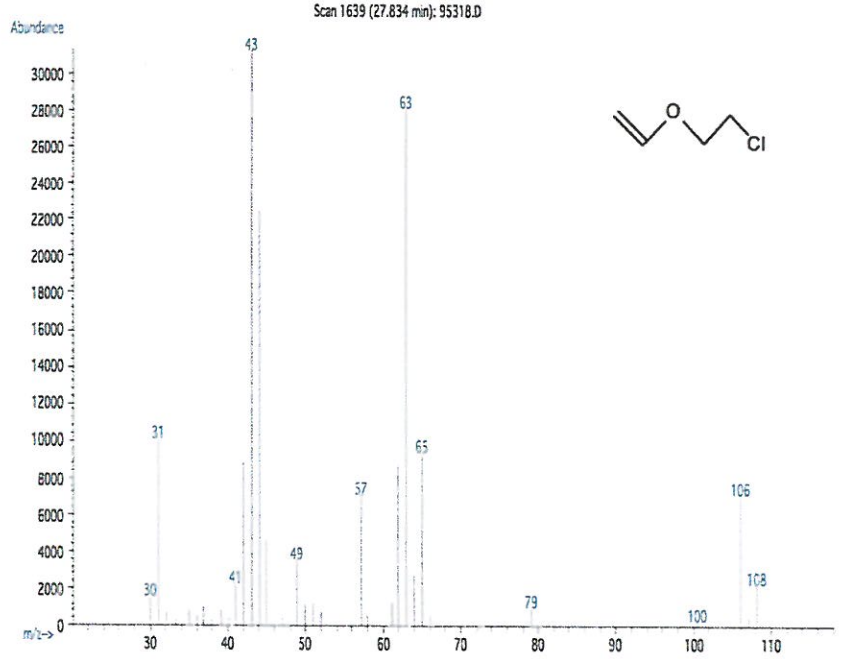
5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 30.0 0.0003 Flask Uncertainty

		121321
Formulated By:	Benson Chan	DATE
		121321
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. 2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.30320	0.30411	10030.2	40.7	110-75-8	N/A	orl-rat 250mg/kg

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





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CERTIFIED WEIGHT REPORT

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

Expiration Date: 121324
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 10000
NIST Test ID#: 6UTB

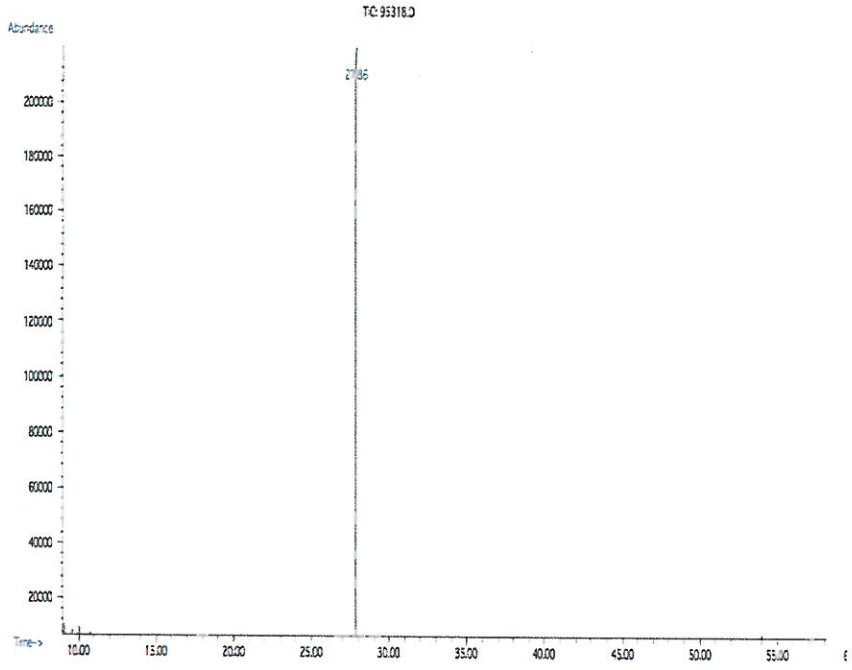
Solvent(s): **Lot#**
Methanol EA899-US

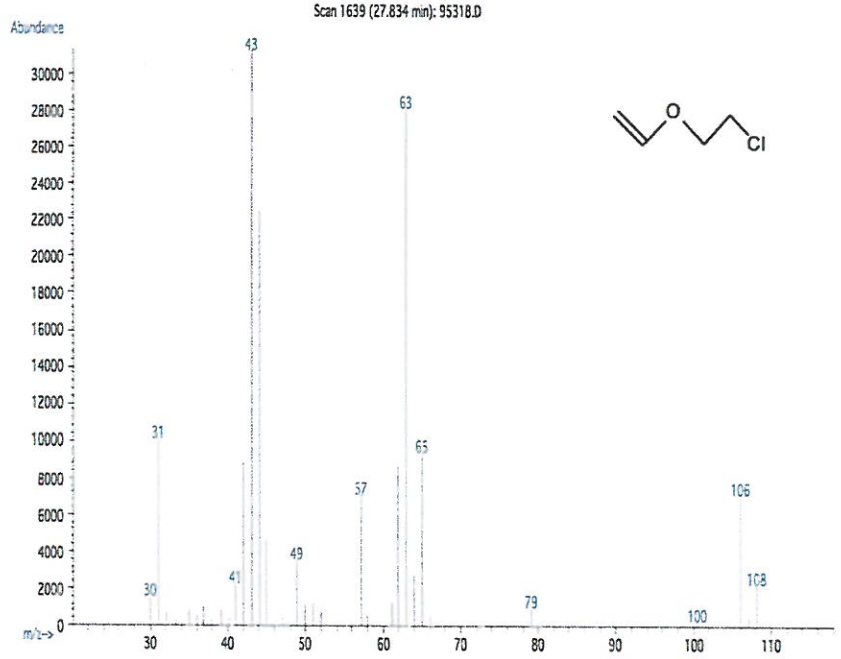
5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 30.0 0.0003 Flask Uncertainty

		121321
Formulated By:	Benson Chan	DATE
		121321
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. 2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.30320	0.30411	10030.2	40.7	110-75-8	N/A	orl-rat 250mg/kg

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





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CERTIFIED WEIGHT REPORT

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

Expiration Date: 121324
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 10000
NIST Test ID#: 6UTB

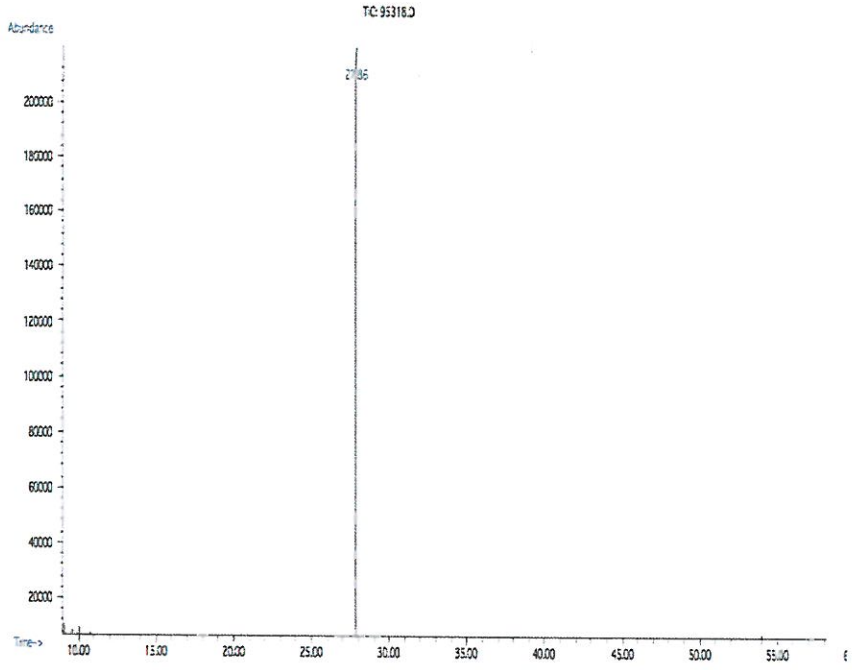
Solvent(s): **Lot#**
Methanol EA899-US

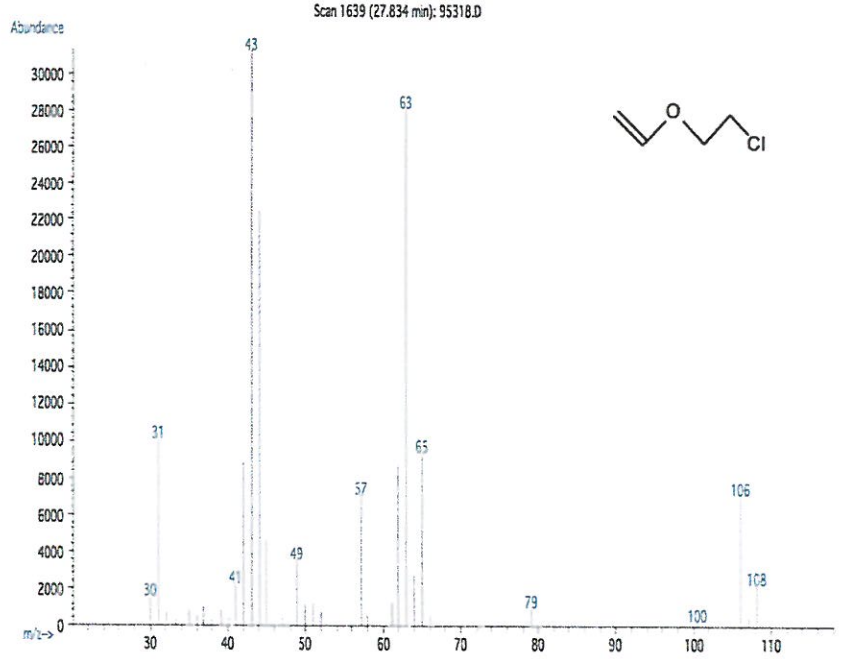
5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 30.0 0.0003 Flask Uncertainty

		121321
Formulated By:	Benson Chan	DATE
		121321
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. 2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.30320	0.30411	10030.2	40.7	110-75-8	N/A	orl-rat 250mg/kg

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





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CERTIFIED WEIGHT REPORT

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

Expiration Date: 121324
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 10000
NIST Test ID#: 6UTB

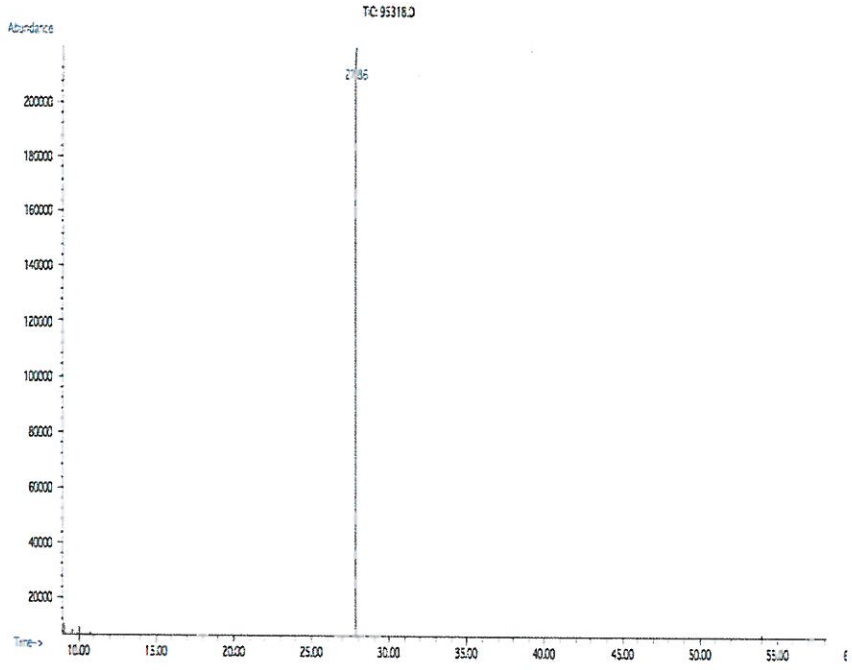
Solvent(s): **Lot#**
Methanol EA899-US

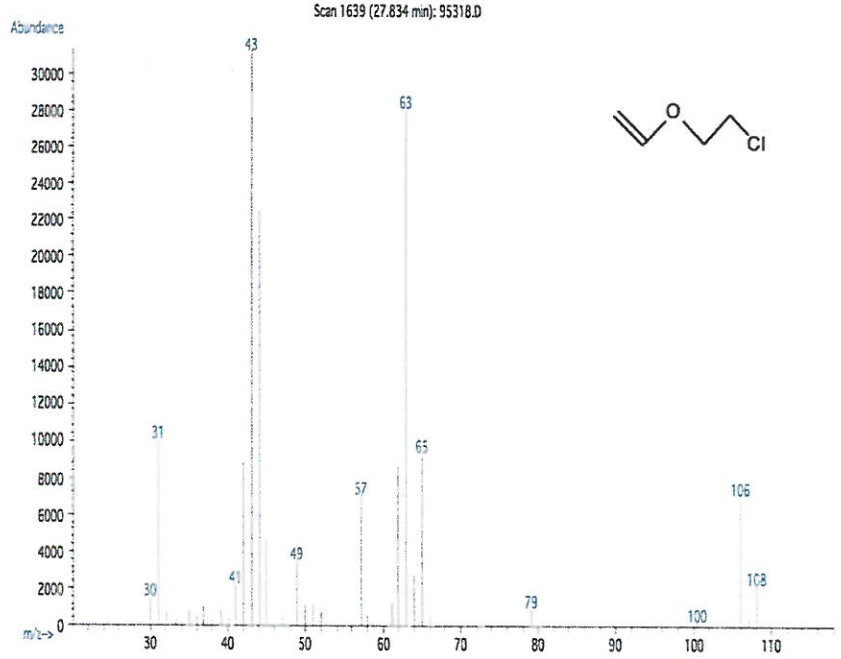
5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 30.0 0.0003 Flask Uncertainty

		121321
Formulated By:	Benson Chan	DATE
		121321
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. 2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.30320	0.30411	10030.2	40.7	110-75-8	N/A	orl-rat 250mg/kg

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





- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and 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.
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: 95318
Lot Number: 121321
Description: 2-Chloroethyl vinyl ether

Expiration Date: 121324
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 10000
NIST Test ID#: 6UTB

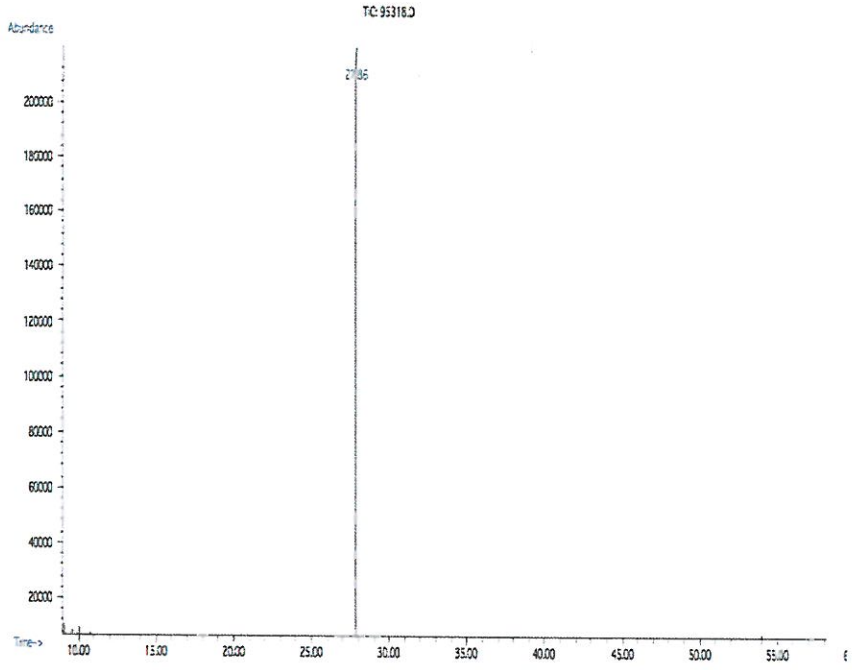
Solvent(s): **Lot#**
Methanol EA899-US

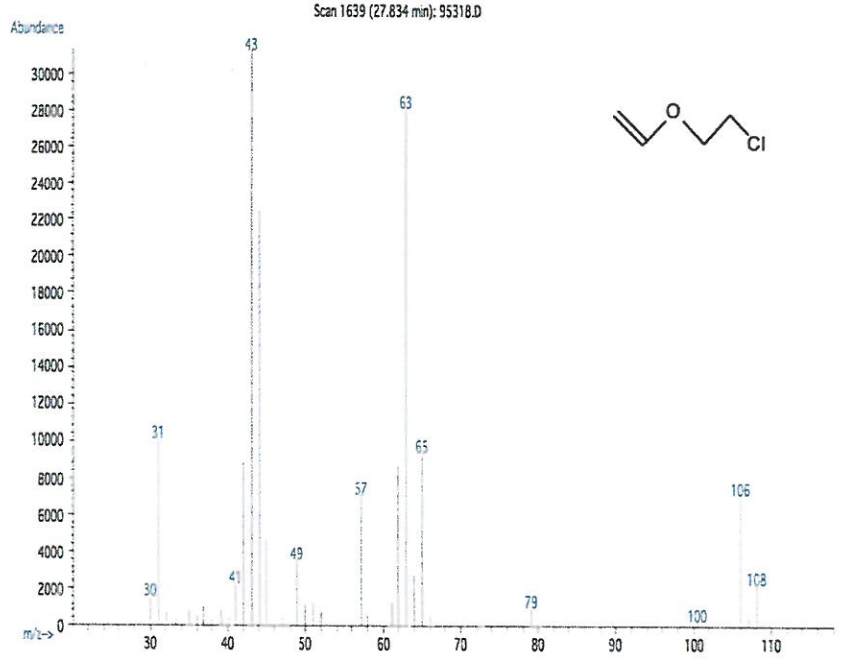
5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 30.0 0.0003 Flask Uncertainty

		121321
Formulated By:	Benson Chan	DATE
		121321
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. 2-Chloroethyl vinyl ether	74	MKCD0033	10000	99	0.2	0.30320	0.30411	10030.2	40.7	110-75-8	N/A	orl-rat 250mg/kg

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





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CERTIFIED WEIGHT REPORT

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

Expiration Date: 121324
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 10000
NIST Test ID#: 6UTB

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

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

		121321
Formulated By:	Benson Chan	DATE
		121321
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
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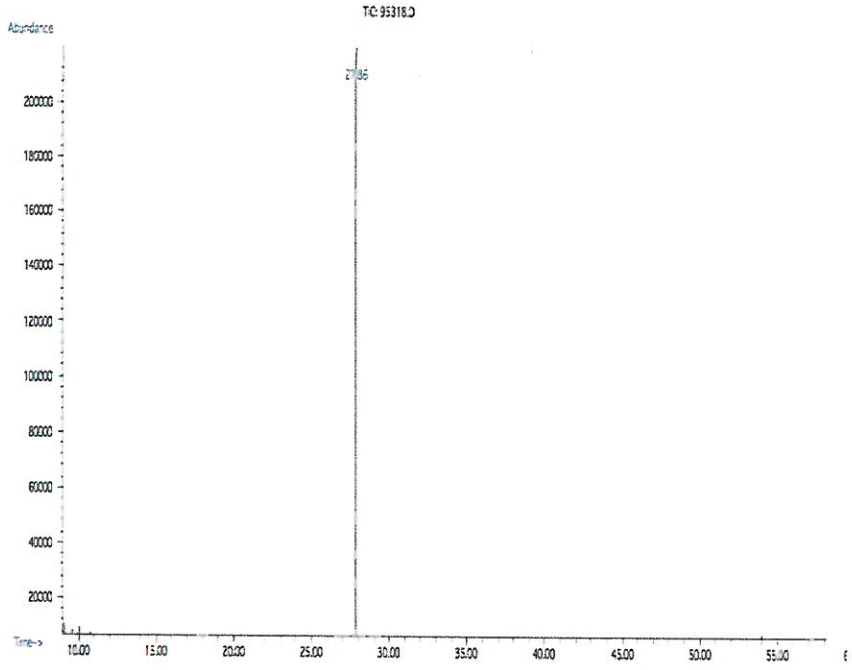
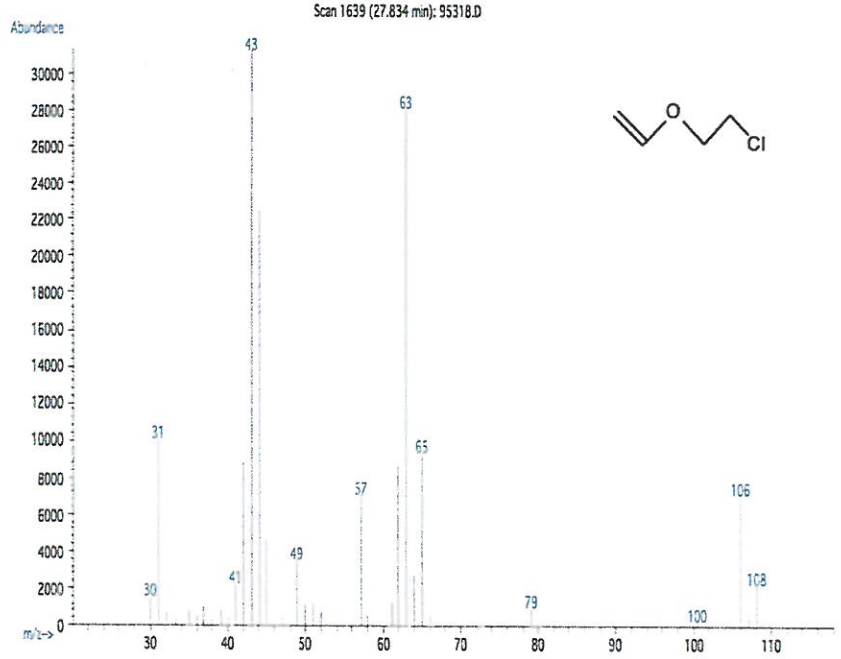
Method: GC6MSD-1.M. **Detector:** MSD. **Column:** (60m X 0.25mm X 1.5 µm). **Oven Profile:** Temp 1 = 35°C (Time 1=10min.), Temp 2 = 200°C (Time 2=8.75 min.), Rate = 4°C/min., Injector B Temp.= 200°C, Detector B Temp. = 220°C. **Analyst:** Candice Warren.





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www.restek.com

CERTIFIED REFERENCE MATERIAL

Gravimetric Certificate

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. : 555582 **Lot No.:** A0173020

Description : Custom 8260A/B Surrogate Mix

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

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

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

Ship: Ambient

CERTIFIED VALUES

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

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

Lane Kibe - Mix Technician

Date Mixed: 03-Jun-2021 **Balance:** B251644995

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

Safety Data Sheet

Revision Date: 05/24/21
www.restek.com

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

1. IDENTIFICATION

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

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 1 Flammable Liquid Category 2 Acute Toxicity - Dermal Category 3 Acute Toxicity - Oral Category 3
GHS Signal Word:	Danger
GHS Hazard:	Highly flammable liquid and vapour. Toxic if swallowed or in contact with skin. Causes damage to organs.
GHS Precautions:	
Safety Precautions:	Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilation and lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe dust/fume/gas/mist/vapours/spray. Wash hands and skin thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF SWALLOWED: Immediately call a POISON CENTER/doctor/.... IF ON SKIN: Wash with plenty of soap and water. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF exposed: Call a POISON CENTER or doctor/physician. Call a POISON CENTER or doctor/physician if you feel unwell. Specific treatment see section 4. Rinse mouth. Take off immediately all contaminated clothing and wash it before reuse. In case of fire: Use extinguishing media in section 5 for extinction.

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

3. COMPOSITION / INFORMATION ON INGREDIENT

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

4. FIRST-AID MEASURES

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

5. FIRE- FIGHTING MEASURES

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

6. ACCIDENTAL RELEASE MEASURES

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

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

7. HANDLING AND STORAGE

Handling Technical Measures and Precautions: Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Use spark-proof tools and explosion-proof equipment

Storage Technical Measures and Conditions: Store in a cool dry ventilated location. Isolate from incompatible materials and conditions. Keep container(s) closed. Keep away from sources of ignition

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

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

Personal Protection:

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

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

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

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

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

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

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

Immediate (Acute) Health Effects by Route of Exposure:

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

Long-Term (Chronic) Health Effects:

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

Component Toxicological Data:
NIOSH:

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

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.
No data available	

ACGIH:

Chemical Name	CAS No.
No data available	

NIOSH:

Chemical Name	CAS No.
No data available	

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.

12. ECOLOGICAL INFORMATION

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

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

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

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

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

The following chemicals are listed on CA Prop 65:

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

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California

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

16. OTHER INFORMATION

Prior Version Date: 07/20/18

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

References: No data available

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

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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. : 555582 **Lot No.:** A0173020

Description : Custom 8260A/B Surrogate Mix

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

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

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

Ship: Ambient

CERTIFIED VALUES

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

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

Lane Kibe - Mix Technician

Date Mixed: 03-Jun-2021 **Balance:** B251644995

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

Safety Data Sheet

Revision Date: 05/24/21
www.restek.com

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

1. IDENTIFICATION

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

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 1 Flammable Liquid Category 2 Acute Toxicity - Dermal Category 3 Acute Toxicity - Oral Category 3
GHS Signal Word:	Danger
GHS Hazard:	Highly flammable liquid and vapour. Toxic if swallowed or in contact with skin. Causes damage to organs.
GHS Precautions:	
Safety Precautions:	Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilation and lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe dust/fume/gas/mist/vapours/spray. Wash hands and skin thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF SWALLOWED: Immediately call a POISON CENTER/doctor/.... IF ON SKIN: Wash with plenty of soap and water. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF exposed: Call a POISON CENTER or doctor/physician. Call a POISON CENTER or doctor/physician if you feel unwell. Specific treatment see section 4. Rinse mouth. Take off immediately all contaminated clothing and wash it before reuse. In case of fire: Use extinguishing media in section 5 for extinction.

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

3. COMPOSITION / INFORMATION ON INGREDIENT

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

4. FIRST-AID MEASURES

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

5. FIRE- FIGHTING MEASURES

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

6. ACCIDENTAL RELEASE MEASURES

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

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

7. HANDLING AND STORAGE

Handling Technical Measures and Precautions: Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Use spark-proof tools and explosion-proof equipment

Storage Technical Measures and Conditions: Store in a cool dry ventilated location. Isolate from incompatible materials and conditions. Keep container(s) closed. Keep away from sources of ignition

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

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

Personal Protection:

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

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

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

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

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

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

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

Immediate (Acute) Health Effects by Route of Exposure:

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

Long-Term (Chronic) Health Effects:

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

Component Toxicological Data:
NIOSH:

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

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.
No data available	

ACGIH:

Chemical Name	CAS No.
No data available	

NIOSH:

Chemical Name	CAS No.
No data available	

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.

12. ECOLOGICAL INFORMATION

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

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

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

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

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

The following chemicals are listed on CA Prop 65:

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

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California

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

16. OTHER INFORMATION

Prior Version Date: 07/20/18

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

References: No data available

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Gravimetric Certificate

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. : 555581 **Lot No.:** A0173600

Description : Custom 8260 Internal Standard Mix

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

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

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

Ship: Ambient

CERTIFIED VALUES

Component #	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,4-Dichlorobenzene-d4 **CAS #** 3855-82-1 (Lot PR-30447) **Purity** 99%	25,040.0 µg/mL	+/- 231.7249 µg/mL +/- 1,415.4955 µg/mL +/- 1,448.0851 µg/mL	Gravimetric Unstressed Stressed
2	1,4-Difluorobenzene **CAS #** 540-36-3 (Lot MKBN8571V) **Purity** 99%	25,216.0 µg/mL	+/- 233.3536 µg/mL +/- 1,425.4447 µg/mL +/- 1,458.2633 µg/mL	Gravimetric Unstressed Stressed
3	Chlorobenzene-d5 **CAS #** 3114-55-4 (Lot PR-29571) **Purity** 99%	25,120.0 µg/mL	+/- 232.4652 µg/mL +/- 1,420.0178 µg/mL +/- 1,452.7116 µg/mL	Gravimetric Unstressed Stressed
4	Pentafluorobenzene **CAS #** 363-72-4 (Lot MKCK2250) **Purity** 99%	25,092.0 µg/mL	+/- 232.2061 µg/mL +/- 1,418.4350 µg/mL +/- 1,451.0923 µg/mL	Gravimetric Unstressed Stressed

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

Walker Workman - Operations Technician I

Date Mixed: 18-Jun-2021 Balance: 1128360905

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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
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0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- 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

Safety Data Sheet

Revision Date: 05/24/21
www.restek.com

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

1. IDENTIFICATION

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

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 1 Flammable Liquid Category 2 Acute Toxicity - Dermal Category 3 Acute Toxicity - Oral Category 3
GHS Signal Word:	Danger
GHS Hazard:	Highly flammable liquid and vapour. Toxic if swallowed or in contact with skin. Causes damage to organs.
GHS Precautions:	
Safety Precautions:	Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilation and lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe dust/fume/gas/mist/vapours/spray. Wash hands and skin thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF SWALLOWED: Immediately call a POISON CENTER/doctor/.... IF ON SKIN: Wash with plenty of soap and water. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF exposed: Call a POISON CENTER or doctor/physician. Call a POISON CENTER or doctor/physician if you feel unwell. Specific treatment see section 4. Rinse mouth. Take off immediately all contaminated clothing and wash it before reuse. In case of fire: Use extinguishing media in section 5 for extinction.

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

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

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

Repeated Exposure Target Organs: No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

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

4. FIRST-AID MEASURES

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

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

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

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

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical extinguishing agents. Water may be ineffective but water spray can be used extinguish a fire if swept across the base of the flames. Water can absorb heat and keep exposed material from being damaged by fire. Use alcohol resistant foam, carbon dioxide, dry chemical, or water spray when fighting fires. Water or foam may cause frothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the fire. Do not direct a water stream directly into the hot burning liquid.

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

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

Hazardous Combustion Products: Carbon dioxide, Carbon monoxide

6. ACCIDENTAL RELEASE MEASURES

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

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

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

7. HANDLING AND STORAGE

Handling Technical Measures and Precautions: Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Use spark-proof tools and explosion-proof equipment

Storage Technical Measures and Conditions: Store in a cool dry ventilated location. Isolate from incompatible materials and conditions. Keep container(s) closed. Keep away from sources of ignition

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
P&T Methanol	67-56-1	6000 ppm IDLH	250 ppm STEL	200 ppm TWA	200 ppm TWA; 260 mg/m3 TWA
1,4-difluorobenzene	540-36-3	Not established	None Known	Not established	No data available
pentafluorobenzene	363-72-4	Not established	None Known	Not established	No data available
1,4-dichlorobenzene-d4	3855-82-1	Not established	None Known	Not established	No data available
chlorobenzene-d5	3114-55-4	Not established	None Known	Not established	No data available

Personal Protection:

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

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

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

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

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

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

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

Immediate (Acute) Health Effects by Route of Exposure:

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

Long-Term (Chronic) Health Effects:

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

Component Toxicological Data:
NIOSH:

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

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.
No data available	

ACGIH:

Chemical Name	CAS No.
No data available	

NIOSH:

Chemical Name	CAS No.
No data available	

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.

12. ECOLOGICAL INFORMATION

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

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

United States:

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

International:

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

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

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

The following chemicals are listed on CA Prop 65:

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

State Right To Know Listing:

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

16. OTHER INFORMATION

Prior Version Date: 12/15/16

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

References: No data available

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

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Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Gravimetric Certificate

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. : 555581 **Lot No.:** A0173600

Description : Custom 8260 Internal Standard Mix

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

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

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

Ship: Ambient

CERTIFIED VALUES

Component #	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,4-Dichlorobenzene-d4 **CAS #** 3855-82-1 (Lot PR-30447) **Purity** 99%	25,040.0 µg/mL	+/- 231.7249 µg/mL +/- 1,415.4955 µg/mL +/- 1,448.0851 µg/mL	Gravimetric Unstressed Stressed
2	1,4-Difluorobenzene **CAS #** 540-36-3 (Lot MKBN8571V) **Purity** 99%	25,216.0 µg/mL	+/- 233.3536 µg/mL +/- 1,425.4447 µg/mL +/- 1,458.2633 µg/mL	Gravimetric Unstressed Stressed
3	Chlorobenzene-d5 **CAS #** 3114-55-4 (Lot PR-29571) **Purity** 99%	25,120.0 µg/mL	+/- 232.4652 µg/mL +/- 1,420.0178 µg/mL +/- 1,452.7116 µg/mL	Gravimetric Unstressed Stressed
4	Pentafluorobenzene **CAS #** 363-72-4 (Lot MKCK2250) **Purity** 99%	25,092.0 µg/mL	+/- 232.2061 µg/mL +/- 1,418.4350 µg/mL +/- 1,451.0923 µg/mL	Gravimetric Unstressed Stressed

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

Walker Workman - Operations Technician I

Date Mixed: 18-Jun-2021 Balance: 1128360905

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

Safety Data Sheet

Revision Date: 05/24/21
www.restek.com

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

1. IDENTIFICATION

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

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Specific Target Organ Systemic Toxicity (STOT) - Single Exposure Category 1 Flammable Liquid Category 2 Acute Toxicity - Dermal Category 3 Acute Toxicity - Oral Category 3
GHS Signal Word:	Danger
GHS Hazard:	Highly flammable liquid and vapour. Toxic if swallowed or in contact with skin. Causes damage to organs.
GHS Precautions:	
Safety Precautions:	Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Keep container tightly closed. Ground/bond container and receiving equipment. Use explosion-proof electrical/ventilation and lighting equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Do not breathe dust/fume/gas/mist/vapours/spray. Wash hands and skin thoroughly after handling. Do not eat, drink or smoke when using this product. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF SWALLOWED: Immediately call a POISON CENTER/doctor/.... IF ON SKIN: Wash with plenty of soap and water. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF exposed: Call a POISON CENTER or doctor/physician. Call a POISON CENTER or doctor/physician if you feel unwell. Specific treatment see section 4. Rinse mouth. Take off immediately all contaminated clothing and wash it before reuse. In case of fire: Use extinguishing media in section 5 for extinction.

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

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

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

Repeated Exposure Target Organs: No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

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

4. FIRST-AID MEASURES

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

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

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

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

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical extinguishing agents. Water may be ineffective but water spray can be used extinguish a fire if swept across the base of the flames. Water can absorb heat and keep exposed material from being damaged by fire. Use alcohol resistant foam, carbon dioxide, dry chemical, or water spray when fighting fires. Water or foam may cause frothing if liquid is burning but it still may be a useful extinguishing agent if carefully applied to the fire. Do not direct a water stream directly into the hot burning liquid.

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

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

Hazardous Combustion Products: Carbon dioxide, Carbon monoxide

6. ACCIDENTAL RELEASE MEASURES

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

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

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

7. HANDLING AND STORAGE

Handling Technical Measures and Precautions: Toxic or severely irritating material. Avoid contacting and avoid breathing the material. Use only in a well ventilated area. Use spark-proof tools and explosion-proof equipment

Storage Technical Measures and Conditions: Store in a cool dry ventilated location. Isolate from incompatible materials and conditions. Keep container(s) closed. Keep away from sources of ignition

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
P&T Methanol	67-56-1	6000 ppm IDLH	250 ppm STEL	200 ppm TWA	200 ppm TWA; 260 mg/m3 TWA
1,4-difluorobenzene	540-36-3	Not established	None Known	Not established	No data available
pentafluorobenzene	363-72-4	Not established	None Known	Not established	No data available
1,4-dichlorobenzene-d4	3855-82-1	Not established	None Known	Not established	No data available
chlorobenzene-d5	3114-55-4	Not established	None Known	Not established	No data available

Personal Protection:

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

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

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

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

9. PHYSICAL AND CHEMICAL PROPERTIES

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

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

10. STABILITY AND REACTIVITY

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

11. TOXICOLOGICAL INFORMATION

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

Immediate (Acute) Health Effects by Route of Exposure:

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

Long-Term (Chronic) Health Effects:

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

Component Toxicological Data:
NIOSH:

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

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.
No data available	

ACGIH:

Chemical Name	CAS No.
No data available	

NIOSH:

Chemical Name	CAS No.
No data available	

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.

12. ECOLOGICAL INFORMATION

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

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

United States:

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

International:

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

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

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

The following chemicals are listed on CA Prop 65:

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

State Right To Know Listing:

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

16. OTHER INFORMATION

Prior Version Date: 12/15/16

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

References: No data available

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

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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. : 30470 **Lot No.:** A0173797

Description : tert-Butanol Standard

tert-Butanol Std 50,000µg/mL, P&T Methanol, 1mL/ampul

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

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

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	tert-Butanol (TBA) **CAS #** 75-65-0 (Lot SHBM7694) **Purity** 99%	50,012.0 µg/mL	+/- 292.8313 µg/mL +/- 1,071.3233 µg/mL +/- 1,102.4365 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)

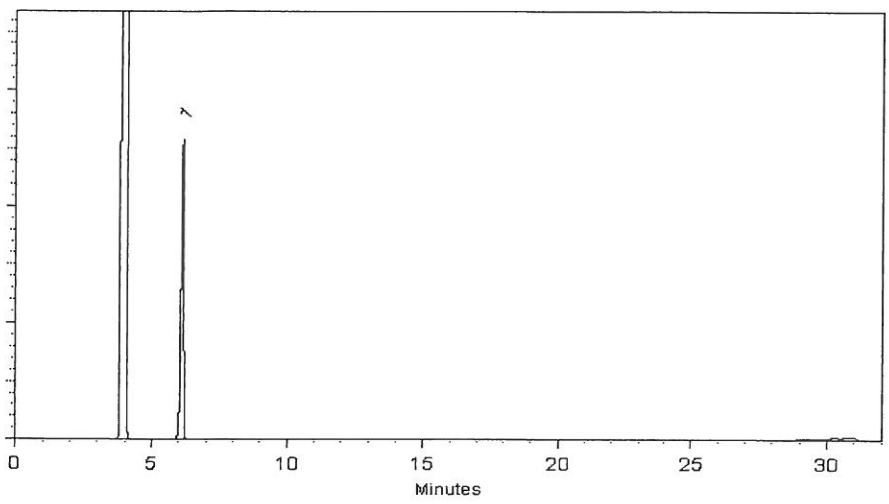
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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.

Michael J Maye

Date Mixed: 24-Jun-2021 **Balance:** 1127510105

Jennifer J Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 25-Jun-2021

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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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FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30225 **Lot No.:** A0176219

Description : Bromochloromethane Standard

Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : September 30, 2026 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

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

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

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

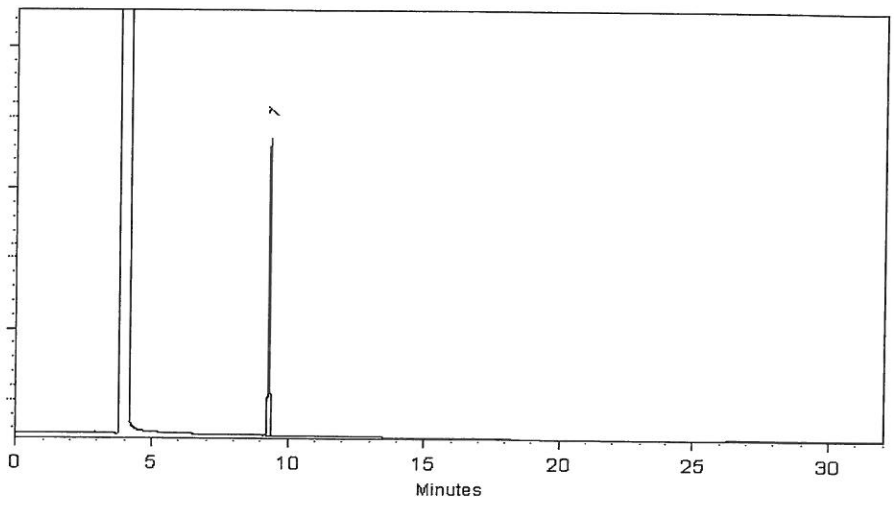
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Dalton Stover - Operations Technician I

Date Mixed: 08-Sep-2021 **Balance:** 1128353505

Marlina Cowan - Operations Tech I

Date Passed: 10-Sep-2021

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/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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This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 30225 **Lot No.:** A0176219

Description : Bromochloromethane Standard

Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : September 30, 2026 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

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

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

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

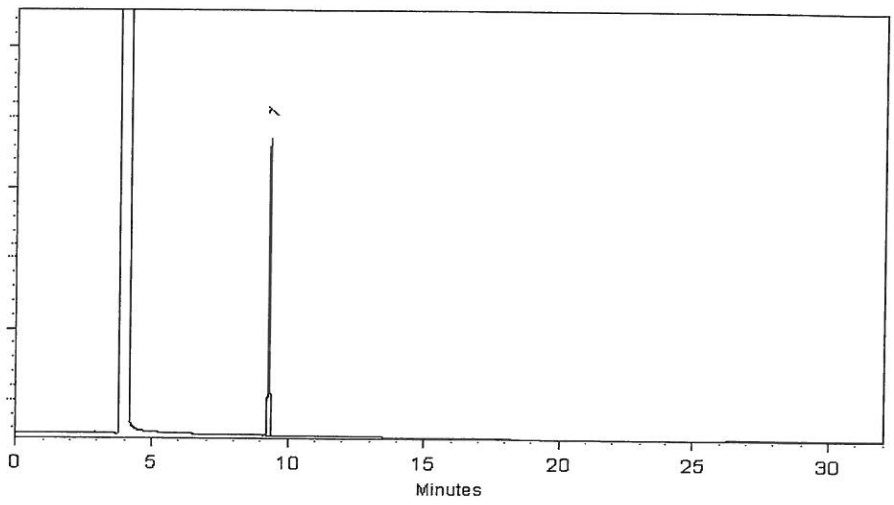
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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Dalton Stover - Operations Technician I

Date Mixed: 08-Sep-2021 **Balance:** 1128353505

Marlina Cowan - Operations Tech I

Date Passed: 10-Sep-2021

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/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:

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

Catalog No. : 30225 **Lot No.:** A0176219

Description : Bromochloromethane Standard

Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : September 30, 2026 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

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

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

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

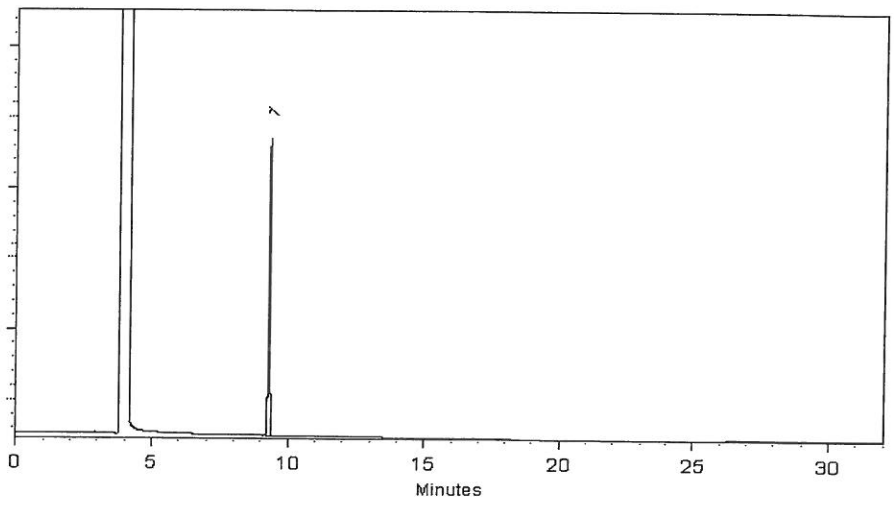
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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Dalton Stover - Operations Technician I

Date Mixed: 08-Sep-2021 **Balance:** 1128353505

Marlina Cowan - Operations Tech I

Date Passed: 10-Sep-2021

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/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:

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Manufacturing Notes:

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Handling Notes:

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Catalog No. : 30225 **Lot No.:** A0176219

Description : Bromochloromethane Standard

Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : September 30, 2026 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

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

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

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

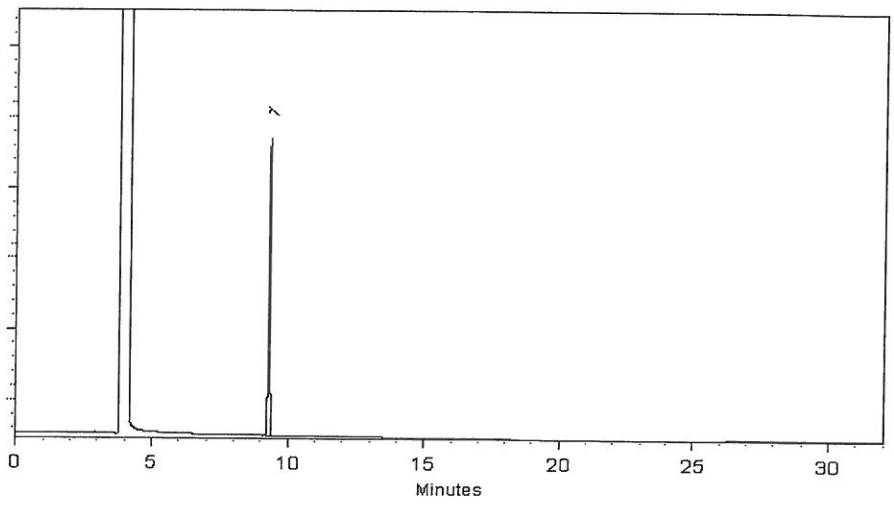
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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Dalton Stover - Operations Technician I

Date Mixed: 08-Sep-2021 **Balance:** 1128353505

Marlina Cowan - Operations Tech I

Date Passed: 10-Sep-2021

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

General Certified Reference Material Notes

Expiration Notes:

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

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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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FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30225 **Lot No.:** A0176219

Description : Bromochloromethane Standard

Bromochloromethane 2000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : September 30, 2026 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

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

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

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

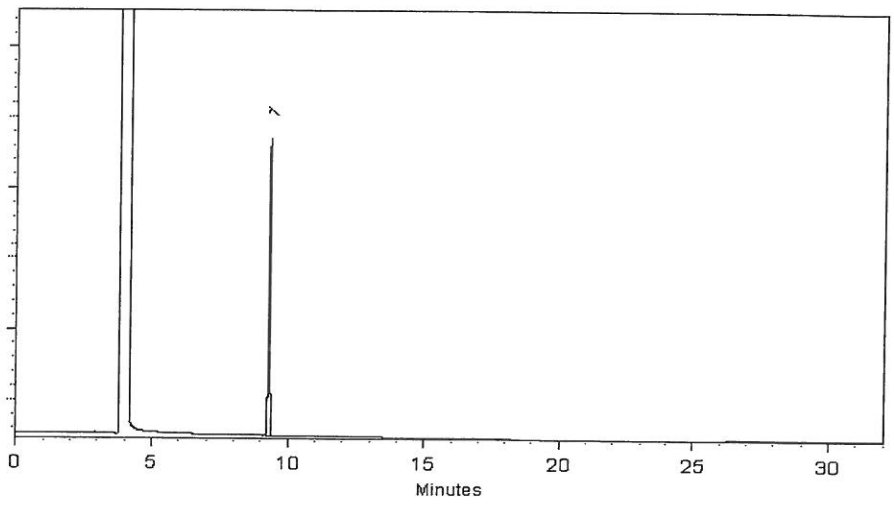
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Dalton Stover - Operations Technician I

Date Mixed: 08-Sep-2021 **Balance:** 1128353505

Marlina Cowan - Operations Tech I

Date Passed: 10-Sep-2021

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/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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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.:** A0180020

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 : August 31, 2028 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Dichlorodifluoromethane (CFC-12) **CAS #** 75-71-8 (Lot 00012554) **Purity** 99%	2,000.3 µg/mL	+/- 15.3069 µg/mL +/- 112.5944 µg/mL +/- 115.2086 µg/mL	Gravimetric Unstressed Stressed
2	Chloromethane (methyl chloride) **CAS #** 74-87-3 (Lot SHBK6571) **Purity** 99%	2,000.2 µg/mL	+/- 16.0159 µg/mL +/- 112.6902 µg/mL +/- 115.3022 µg/mL	Gravimetric Unstressed Stressed
3	Vinyl chloride **CAS #** 75-01-4 (Lot 00015559) **Purity** 99%	2,000.2 µg/mL	+/- 15.3606 µg/mL +/- 112.5946 µg/mL +/- 115.2084 µg/mL	Gravimetric Unstressed Stressed
4	Bromomethane (methyl bromide) **CAS #** 74-83-9 (Lot 101604) **Purity** 99%	2,000.0 µg/mL	+/- 16.4530 µg/mL +/- 112.7388 µg/mL +/- 115.3490 µg/mL	Gravimetric Unstressed Stressed
5	Chloroethane (ethyl chloride) **CAS #** 75-00-3 (Lot 107-401039114-1) **Purity** 99%	2,000.0 µg/mL	+/- 14.9791 µg/mL +/- 112.5343 µg/mL +/- 115.1491 µg/mL	Gravimetric Unstressed Stressed
6	Trichlorofluoromethane (CFC-11) **CAS #** 75-69-4 (Lot MKCL8411) **Purity** 99%	2,000.4 µg/mL	+/- 16.7677 µg/mL +/- 112.8062 µg/mL +/- 115.4158 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)

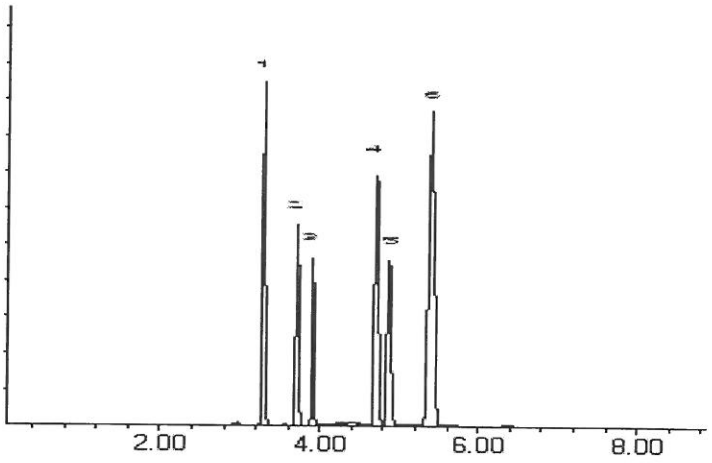
Carrier Gas:
helium-constant flow 2.0 mL/min.

Temp. Program:
40°C (hold 6 min.) to 100°C
@ 6°C/min.

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
MSD



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

Cathleen Soltis - Mix Technician

Date Mixed: 27-Dec-2021 **Balance:** B707717271

Clara Windle - Operations Technician I

Date Passed: 06-Jan-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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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.:** A0186767

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 : 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	Acetone **CAS #** 67-64-1 (Lot MKCQ7914) **Purity** 99%	5,046.8 µg/mL	+/- 29.3427 µg/mL +/- 304.4978 µg/mL +/- 305.2207 µg/mL	Gravimetric Unstressed Stressed
2	2-Butanone (MEK) **CAS #** 78-93-3 (Lot SHBN2844) **Purity** 99%	5,048.8 µg/mL	+/- 29.3544 µg/mL +/- 304.6185 µg/mL +/- 305.3417 µg/mL	Gravimetric Unstressed Stressed
3	4-Methyl-2-pentanone (MIBK) **CAS #** 108-10-1 (Lot SHBN3601) **Purity** 99%	5,045.0 µg/mL	+/- 29.3321 µg/mL +/- 304.3872 µg/mL +/- 305.1099 µg/mL	Gravimetric Unstressed Stressed
4	2-Hexanone **CAS #** 591-78-6 (Lot MKCQ6663) **Purity** 99%	5,045.3 µg/mL	+/- 29.3340 µg/mL +/- 304.4073 µg/mL +/- 305.1300 µg/mL	Gravimetric Unstressed Stressed

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

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

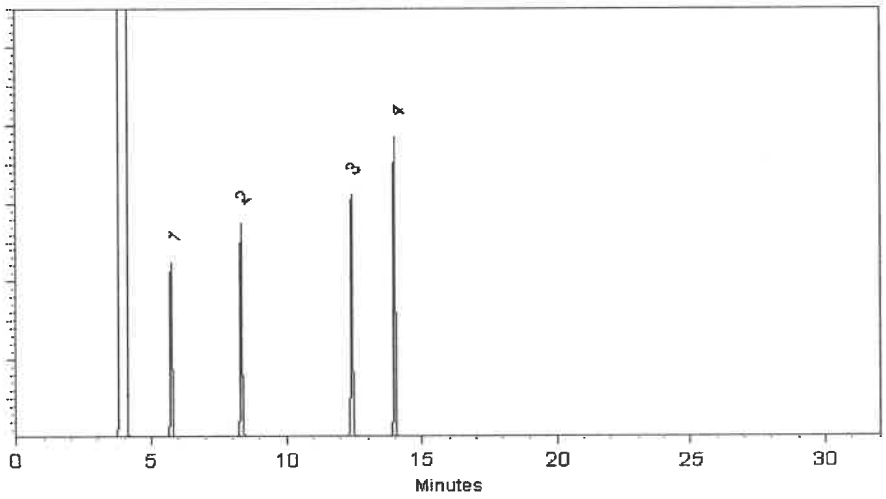
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Bethany Lowery - Operations Tech I

Date Mixed: 28-Jun-2022 **Balance:** B251644995

Christie Mills - Operations Tech II - ARM QC

Date Passed: 30-Jun-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 Composition

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 555408-FL **Lot No.:** A0187418

Description : Custom Vinyl Acetate Standard

Custom Vinyl Acetate Standard 8,000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : January 31, 2024 **Storage:** -20°C or colder

Handling: This product is photosensitive. **Ship:** On Ice

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	Vinyl acetate	8,008.0 µg/mL	+/- 46.9954	µg/mL	Gravimetric
	CAS # 108-05-4 (Lot RD220630)		+/- 483.2004	µg/mL	Unstressed
	Purity 99%		+/- 484.3474	µg/mL	Stressed

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

Tech Tips:

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

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

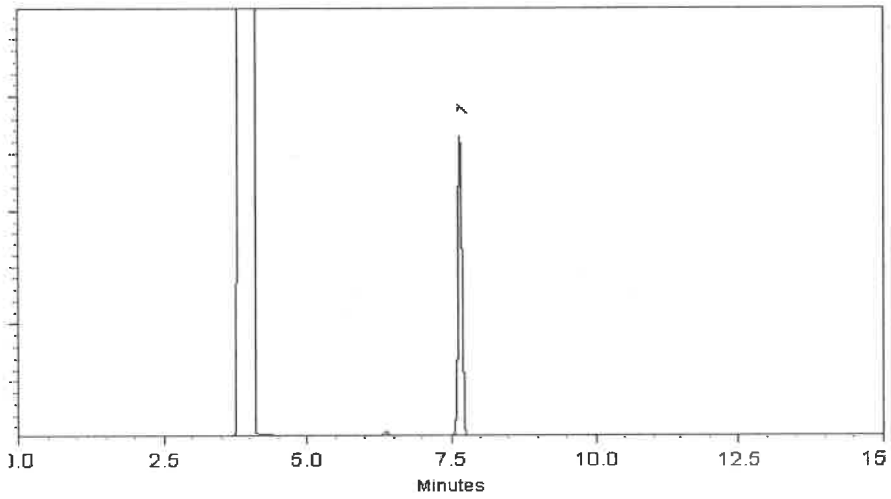
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Brandon Reish - Operations Technician II **Date Mixed:** 18-Jul-2022 **Balance:** 1127510105

Fang-Yun Weaver - Operations Lead Tech - ARM QC **Date Passed:** 26-Jul-2022

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

General Certified Reference Material Notes

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 #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. : 555408-SL **Lot No.:** A0187421

Description : Custom Vinyl Acetate Standard

Custom Vinyl Acetate Standard 8,000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : January 31, 2024 **Storage:** -20°C or colder

Handling: This product is photosensitive. **Ship:** On Ice

CERTIFIED VALUES

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

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

Tech Tips:

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

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

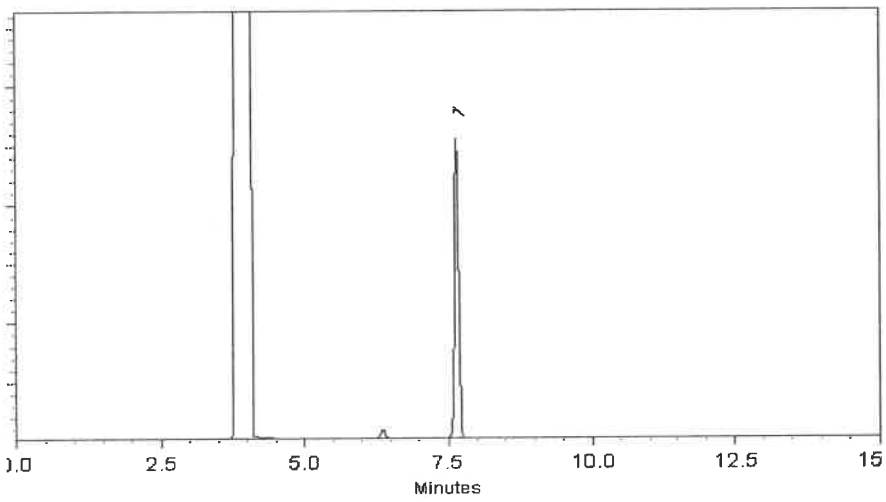
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Bethany Lowery - Operations Tech I

Date Mixed: 18-Jul-2022 **Balance:** B251644995

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 26-Jul-2022

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

General Certified Reference Material Notes

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 #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. : 555408-SL **Lot No.:** A0187421

Description : Custom Vinyl Acetate Standard

Custom Vinyl Acetate Standard 8,000µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : January 31, 2024 **Storage:** -20°C or colder

Handling: This product is photosensitive. **Ship:** On Ice

CERTIFIED VALUES

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

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

Tech Tips:

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

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

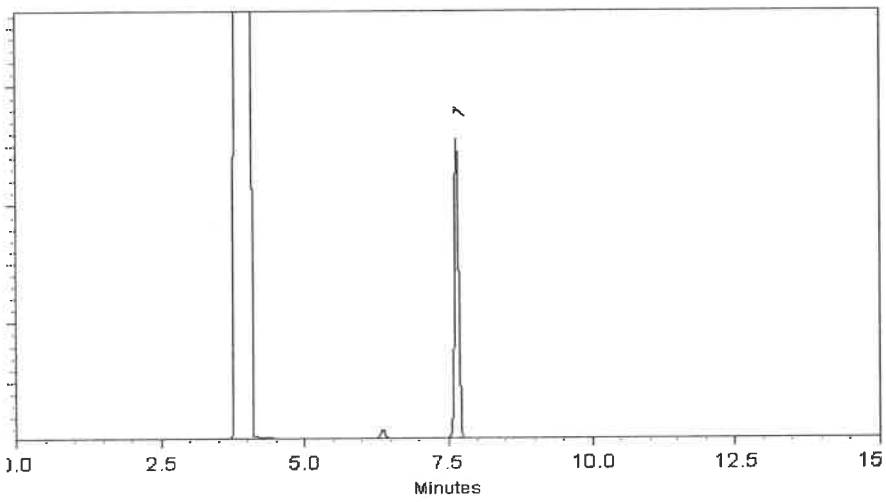
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Bethany Lowery - Operations Tech I

Date Mixed: 18-Jul-2022 **Balance:** B251644995

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 26-Jul-2022

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

General Certified Reference Material Notes

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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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.:** A0188819

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 : April 30, 2029 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Dichlorodifluoromethane (CFC-12) **CAS #** 75-71-8 (Lot 00012554) **Purity** 99%	2,019.1 µg/mL	+/- 13.7336 µg/mL +/- 113.4320 µg/mL +/- 116.0758 µg/mL	Gravimetric Unstressed Stressed
2	Chloromethane (methyl chloride) **CAS #** 74-87-3 (Lot SHBK6571) **Purity** 99%	2,019.1 µg/mL	+/- 14.0370 µg/mL +/- 113.4702 µg/mL +/- 116.1132 µg/mL	Gravimetric Unstressed Stressed
3	Vinyl chloride **CAS #** 75-01-4 (Lot 00015559) **Purity** 99%	2,018.0 µg/mL	+/- 14.5590 µg/mL +/- 113.4768 µg/mL +/- 116.1169 µg/mL	Gravimetric Unstressed Stressed
4	Bromomethane (methyl bromide) **CAS #** 74-83-9 (Lot 101604) **Purity** 99%	2,017.0 µg/mL	+/- 13.2023 µg/mL +/- 113.2515 µg/mL +/- 115.8939 µg/mL	Gravimetric Unstressed Stressed
5	Chloroethane (ethyl chloride) **CAS #** 75-00-3 (Lot 107-401039114-1) **Purity** 99%	2,019.0 µg/mL	+/- 14.2283 µg/mL +/- 113.4891 µg/mL +/- 116.1314 µg/mL	Gravimetric Unstressed Stressed
6	Trichlorofluoromethane (CFC-11) **CAS #** 75-69-4 (Lot MKCL8411) **Purity** 99%	2,018.8 µg/mL	+/- 16.3342 µg/mL +/- 113.7612 µg/mL +/- 116.3969 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)

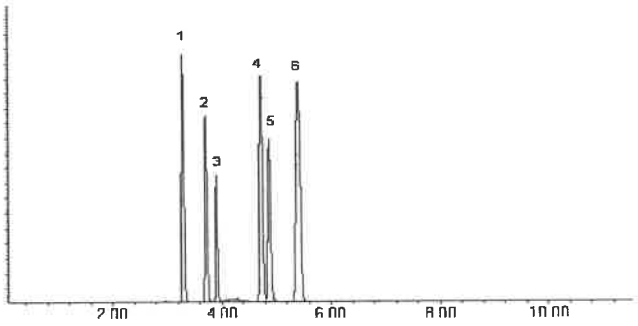
Carrier Gas:
helium-constant flow 2.0 mL/min.

Temp. Program:
40°C (hold 6 min.) to 100°C
@ 6°C/min.

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
MSD



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

Miranda Kline
Miranda Kline - Operations Technician I

Date Mixed: 22-Aug-2022 **Balance:** B251644995

Christie Mills - Operations Tech II - ARM QC

Date Passed: 25-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:

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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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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.:** A0188819

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 : April 30, 2029 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Dichlorodifluoromethane (CFC-12) **CAS #** 75-71-8 (Lot 00012554) **Purity** 99%	2,019.1 µg/mL	+/- 13.7336 µg/mL +/- 113.4320 µg/mL +/- 116.0758 µg/mL	Gravimetric Unstressed Stressed
2	Chloromethane (methyl chloride) **CAS #** 74-87-3 (Lot SHBK6571) **Purity** 99%	2,019.1 µg/mL	+/- 14.0370 µg/mL +/- 113.4702 µg/mL +/- 116.1132 µg/mL	Gravimetric Unstressed Stressed
3	Vinyl chloride **CAS #** 75-01-4 (Lot 00015559) **Purity** 99%	2,018.0 µg/mL	+/- 14.5590 µg/mL +/- 113.4768 µg/mL +/- 116.1169 µg/mL	Gravimetric Unstressed Stressed
4	Bromomethane (methyl bromide) **CAS #** 74-83-9 (Lot 101604) **Purity** 99%	2,017.0 µg/mL	+/- 13.2023 µg/mL +/- 113.2515 µg/mL +/- 115.8939 µg/mL	Gravimetric Unstressed Stressed
5	Chloroethane (ethyl chloride) **CAS #** 75-00-3 (Lot 107-401039114-1) **Purity** 99%	2,019.0 µg/mL	+/- 14.2283 µg/mL +/- 113.4891 µg/mL +/- 116.1314 µg/mL	Gravimetric Unstressed Stressed
6	Trichlorofluoromethane (CFC-11) **CAS #** 75-69-4 (Lot MKCL8411) **Purity** 99%	2,018.8 µg/mL	+/- 16.3342 µg/mL +/- 113.7612 µg/mL +/- 116.3969 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)

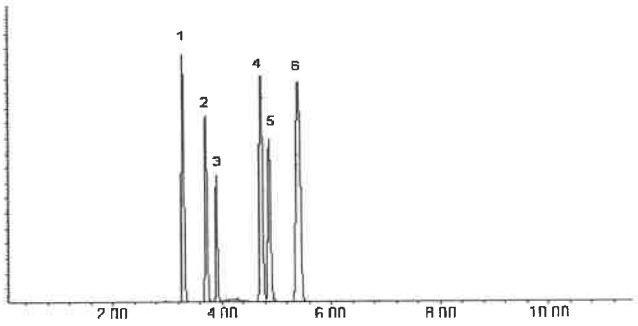
Carrier Gas:
helium-constant flow 2.0 mL/min.

Temp. Program:
40°C (hold 6 min.) to 100°C
@ 6°C/min.

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
MSD



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

Miranda Kline
Miranda Kline - Operations Technician I

Date Mixed: 22-Aug-2022 **Balance:** B251644995

Christie Mills - Operations Tech II - ARM QC

Date Passed: 25-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.
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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 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:

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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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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30006 **Lot No.:** A0190554

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 : January 31, 2026 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Acetone **CAS #** 67-64-1 **Purity** 99% (Lot 103138L01T)	5,006.0 µg/mL	+/- 29.1053 µg/mL +/- 302.0342 µg/mL +/- 302.7512 µg/mL	Gravimetric Unstressed Stressed
2	2-Butanone (MEK) **CAS #** 78-93-3 **Purity** 99% (Lot SHBN2844)	5,002.3 µg/mL	+/- 29.0840 µg/mL +/- 301.8129 µg/mL +/- 302.5295 µg/mL	Gravimetric Unstressed Stressed
3	4-Methyl-2-pentanone (MIBK) **CAS #** 108-10-1 **Purity** 99% (Lot SHBP4724)	5,001.7 µg/mL	+/- 29.0801 µg/mL +/- 301.7727 µg/mL +/- 302.4892 µg/mL	Gravimetric Unstressed Stressed
4	2-Hexanone **CAS #** 591-78-6 **Purity** 99% (Lot MKCQ6663)	5,000.8 µg/mL	+/- 29.0753 µg/mL +/- 301.7224 µg/mL +/- 302.4388 µg/mL	Gravimetric Unstressed Stressed

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

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

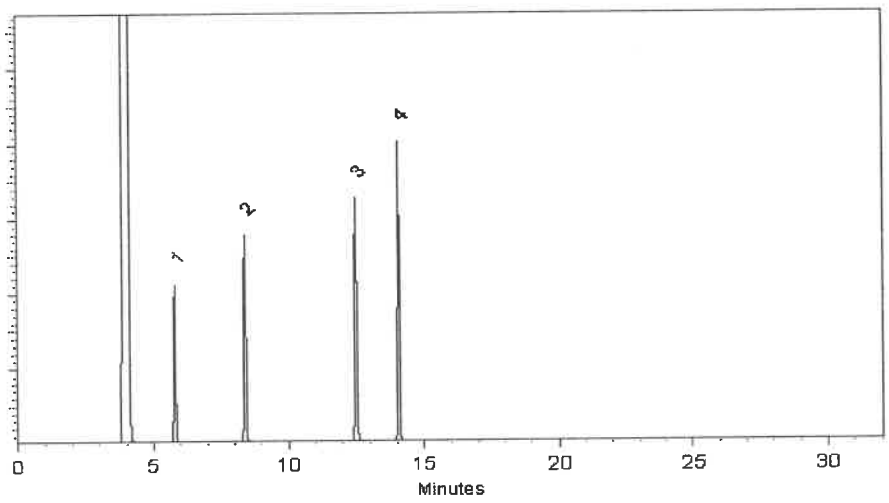
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Josh McCloskey - Operations Technician I

Date Mixed: 13-Oct-2022 **Balance:** B707717271

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 17-Oct-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
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Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30006 **Lot No.:** A0190554

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 : January 31, 2026 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Acetone **CAS #** 67-64-1 **Purity** 99% (Lot 103138L01T)	5,006.0 µg/mL	+/- 29.1053 µg/mL +/- 302.0342 µg/mL +/- 302.7512 µg/mL	Gravimetric Unstressed Stressed
2	2-Butanone (MEK) **CAS #** 78-93-3 **Purity** 99% (Lot SHBN2844)	5,002.3 µg/mL	+/- 29.0840 µg/mL +/- 301.8129 µg/mL +/- 302.5295 µg/mL	Gravimetric Unstressed Stressed
3	4-Methyl-2-pentanone (MIBK) **CAS #** 108-10-1 **Purity** 99% (Lot SHBP4724)	5,001.7 µg/mL	+/- 29.0801 µg/mL +/- 301.7727 µg/mL +/- 302.4892 µg/mL	Gravimetric Unstressed Stressed
4	2-Hexanone **CAS #** 591-78-6 **Purity** 99% (Lot MKCQ6663)	5,000.8 µg/mL	+/- 29.0753 µg/mL +/- 301.7224 µg/mL +/- 302.4388 µg/mL	Gravimetric Unstressed Stressed

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

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

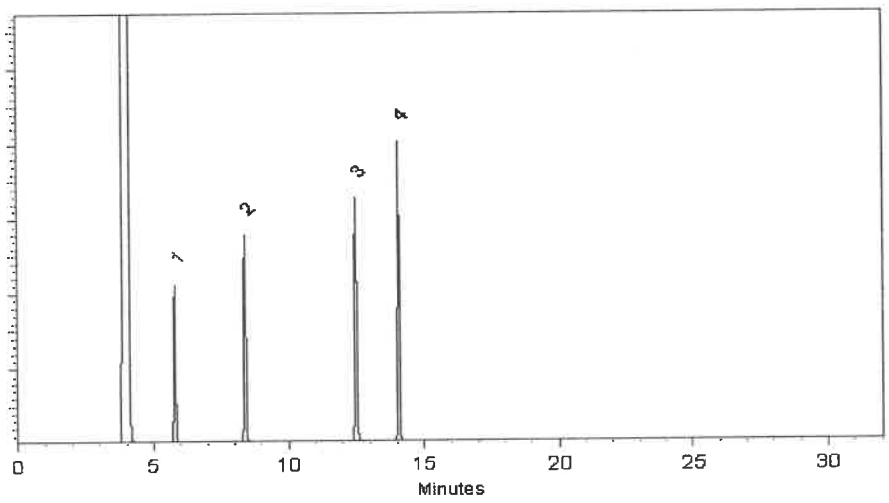
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Josh McCloskey - Operations Technician I

Date Mixed: 13-Oct-2022 **Balance:** B707717271

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 17-Oct-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:

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

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

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- 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.

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0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

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

Manufacturing Notes:

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

Handling Notes:

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30006 **Lot No.:** A0190554

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 : January 31, 2026 **Storage:** 0°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	Acetone **CAS #** 67-64-1 **Purity** 99% (Lot 103138L01T)	5,006.0 µg/mL	+/- 29.1053 µg/mL +/- 302.0342 µg/mL +/- 302.7512 µg/mL	Gravimetric Unstressed Stressed
2	2-Butanone (MEK) **CAS #** 78-93-3 **Purity** 99% (Lot SHBN2844)	5,002.3 µg/mL	+/- 29.0840 µg/mL +/- 301.8129 µg/mL +/- 302.5295 µg/mL	Gravimetric Unstressed Stressed
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4	2-Hexanone **CAS #** 591-78-6 **Purity** 99% (Lot MKCQ6663)	5,000.8 µg/mL	+/- 29.0753 µg/mL +/- 301.7224 µg/mL +/- 302.4388 µg/mL	Gravimetric Unstressed Stressed

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

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

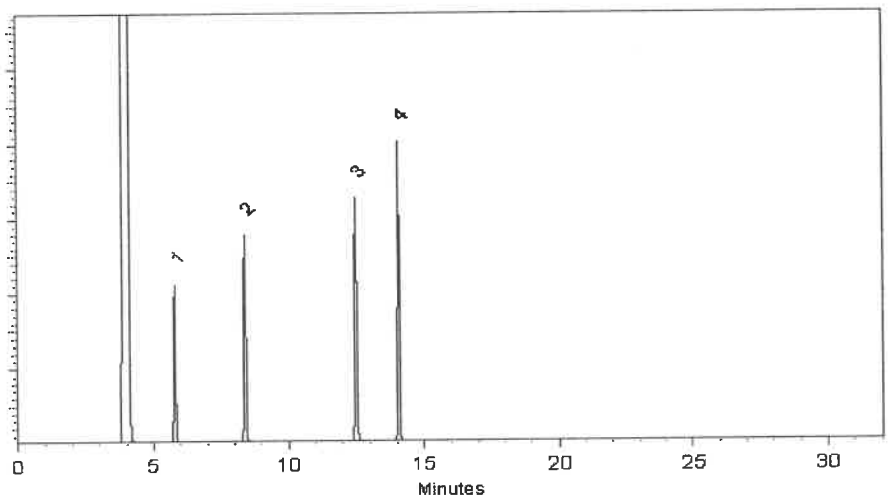
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Josh McCloskey - Operations Technician I

Date Mixed: 13-Oct-2022 **Balance:** B707717271

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 17-Oct-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.
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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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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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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ilac-MRA A2LA ACCREDITED ISO 17034 Accredited Reference Material Producer Certificate #3222.01

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. : 30489 **Lot No.:** A0193195

Description : 8260B Acetates Mix

8260B Acetates Mix 2,000 µg/mL, P&T Methanol, 1mL/ampul

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

Expiration Date : July 31, 2024 **Storage:** -20°C or colder

Handling: This product is photosensitive. **Ship:** On Ice

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	Methyl acetate	79-20-9	SHBP3100	99%	2,019.7 µg/mL	+/- 69.8089
2	Vinyl acetate	108-05-4	RD220630	99%	2,008.3 µg/mL	+/- 69.4172
3	Ethyl acetate	141-78-6	SHBP9289	99%	2,008.3 µg/mL	+/- 69.4172
4	Isopropyl acetate	108-21-4	BCCG7069	99%	2,009.0 µg/mL	+/- 69.4402
5	Propyl acetate	109-60-4	TFFKL	99%	2,019.0 µg/mL	+/- 69.7859
6	Butyl acetate	123-86-4	SHBP6314	99%	2,018.3 µg/mL	+/- 69.7628
7	Amyl acetate	628-63-7	41325/1	97%	2,012.4 µg/mL	+/- 69.5587

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

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

Tech Tips:

Vinyl acetate is a volatile organic ester included in the target lists of several US EPA and other methods. Under acidic conditions, esters react with alcohols to form new esters (transesterification). Methanol-based mixes containing halogenated compounds are slightly acidic, so it is important to minimize exposure of vinyl acetate to mixes of halogenated compounds in methanol. For this

reason, we offer vinyl acetate in individual solution, and suggest that it be introduced into the working level calibration solution immediately before use. This will minimize problems and ensure more consistent results.

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.)

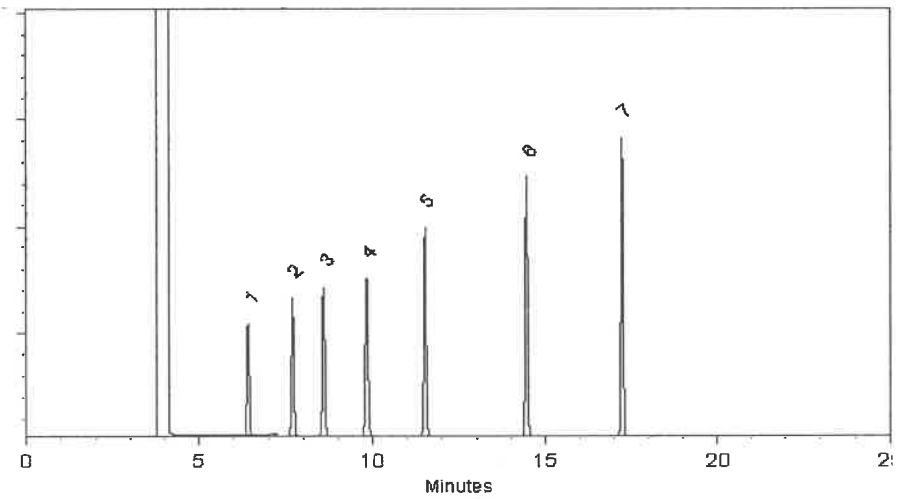
Inj. Temp:
200°C

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.

Bethany Lowery - Operations Tech I

Date Mixed: 04-Jan-2023 **Balance Serial #** B251644995

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 06-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:

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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.

Methanol
ULTRA RESI-ANALYZED
For Purge and Trap Analysis

avantor™ | J.T.Baker®

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

Certificate of Analysis

Test	Specification	Result
Assay (CH_3OH) (by GC, corrected for water)	≥ 99.9 %	100.0 %
Residue after Evaporation	≤ 1.0 ppm	< 0.1 ppm
Titrable Acid (µeq/g)	≤ 0.3	0.3
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

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

Methanol
ULTRA RESI-ANALYZED
For Purge and Trap Analysis

avantor™ | J.T.Baker®

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

Certificate of Analysis

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Residue after Evaporation	≤ 1.0 ppm	< 0.1 ppm
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Volatile Organic Trace Analysis – Below EPA 8260B CRQL	Conforms	Conforms

For Laboratory,Research,or Manufacturing Use
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Jamie Ethier
Vice President Global Quality

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

RESTEK®
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Tel: (800)356-1688
Fax: (814)353-1309

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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. : 30067 **Lot No.:** A0147670

Description : 4-Bromofluorobenzene Standard

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

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

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

CERTIFIED VALUES

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

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

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

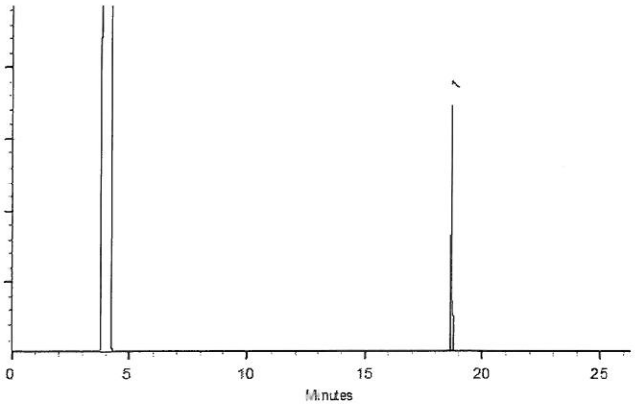
Carrier Gas:
hydrogen-constant pressure 11.0 psi.

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

Inj. Temp:
200°C

Det. Temp:
250°C

Det. Type:
FID



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

Dustin J. Lidgett

Dustin Lidgett - Mix Technician

Date Mixed: 01-Apr-2019 **Balance:** 1127510105

Justine Albertson - Operations Tech-ARM QC

Date Passed: 04-Apr-2019

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

General Certified Reference Material Notes

Expiration Notes:

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- 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)	< 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.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

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

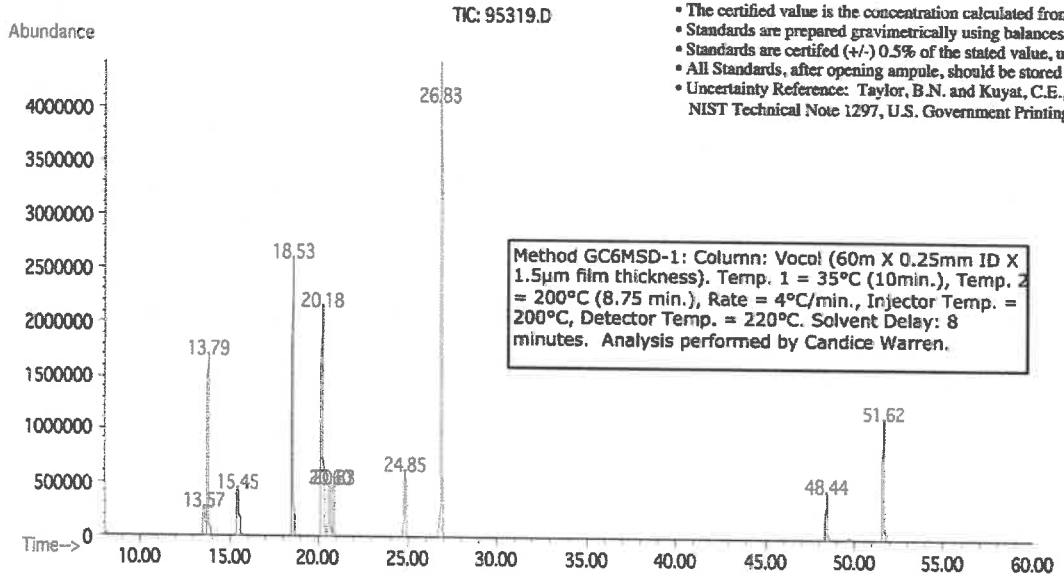
Part Number: 95319
Lot Number: 031921
Description: Revised Additions Mix
11 components
Expiration Date: 031924
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): Varied
NIST Test ID#: 6UTB

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

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

Formulated By:	Prashant Chauhan	031921 DATE
Reviewed By:	Pedro L. Rentas	031921 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. Acrylonitrile	7	4718CK	10000	99	0.2	1.01015	1.01040	10002.5	40.5	107-13-1	N/A	orl-rat 78 mg/kg
2. 1-Chlorobutane	1072	MKCM5711	2000	99.99	0.2	0.20003	0.20033	2003.0	8.1	109-69-3	N/A	orl-rat 2670mg/kg
3. Cyclohexane	1023	SHBD2795V	2000	99.5	0.2	0.20101	0.20130	2002.8	8.1	110-82-7	300 ppm (1050mg/m3/8H)	orl-rat 12705mg/kg
4. Di-isopropyl ether (DIPE)	987	00412MX	2000	99	0.2	0.20203	0.20220	2001.7	8.2	108-20-3	500 ppm (2100mg/m3/8H)	orl-rat 8470mg/kg
5. 1,4-Dioxane	373	03853KE	40000	99	0.2	4.04060	4.04110	40005.0	161.9	123-91-1	25 ppm (90mg/m3/8H)(skin)	orl-mus 5700mg/kg
6. Hexachloroethane	199	12604HBV	2000	99	0.2	0.20203	0.20230	2002.7	8.2	67-72-1	1 ppm (10mg/m3/8H)(skin)	orl-gpg 4970mg/kg
7. Methylcyclohexane	1627	08046KN	2000	99	0.2	0.20203	0.20235	2003.2	8.2	108-87-2	N/A	N/A
8. Methyl tert-butyl ether (MTBE)	209	02197JJ	2000	99.8	0.2	0.20041	0.20080	2003.9	8.1	1634-04-4	N/A	orl-rat 4g/kg
9. Propionitrile	349	1395468	20000	99	0.2	2.02030	2.02080	20005.0	81.0	107-12-0	N/A	orl-rat 39mg/kg
10. Tetrahydrofuran	380	113886	10000	99.9	0.2	1.00105	1.00140	10003.5	40.1	109-99-9	20 ppm (590mg/m3/8H)	orl-rat 2500mg/kg
11. 1,2,3,4-Tetramethylbenzene	491	AP01	2000	93	0.2	0.21506	0.21536	2002.8	8.7	488-23-3	N/A	orl-rat 6408mg/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. Solvent Delay: 8 minutes. 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.
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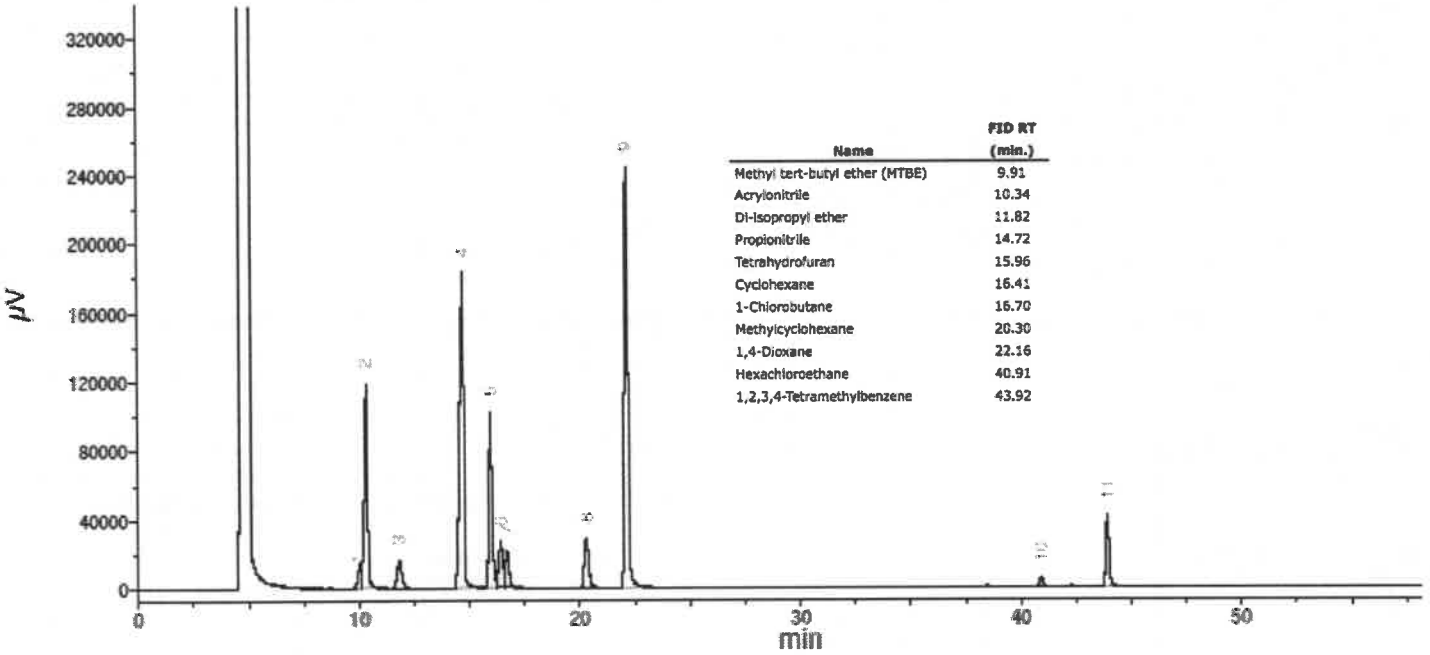
Name	MSD RT (min.)
Methyl tert-butyl ether (MTBE)	13.56
Acrylonitrile	13.79
Di-isopropyl ether	15.44
Propionitrile	18.53
Tetrahydrofuran	20.17
Cyclohexane	20.58
1-Chlorobutane	20.83
Methylcyclohexane	24.84
1,4-Dioxane	26.84
Hexachloroethane	48.44
1,2,3,4-Tetramethylbenzene	51.62

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

Run Length: 60.00 min, 36000 points at 10 points/second.
Created: Sun, Mar 28, 2021 at 4:18:23 PM.
Sampled: Sequence "032421-GC13M1", Method "GC13-M1".
Analyzed using Method "GC13-M1".

Comments

GC13-M1 Analysis by Candice Warren
Column ID SPB-Vocol 105 meter X 0.53mm X 3.0µm film thickness
Flow rates: Total flow=290mL/min., Helium (carrier)=10mL/min.,
Helium(make-up)=10mL/min., Hydogen(make-up)=40mL/min., Air(make-up)=230mL/min.
Oven Profile: Temp. 1=35°C (Time 1=10 min.), Temp 2=200°C (Time 2=8.75 min.),
Rate = 4°C/min., Total run time=60 min. Injector temp.=200°C, FID Temp.=200°C.
FID Signal = Edaq Channel 1
Standard injection = 0.5µL, Range=6



Name	FID RT (min.)
Methyl tert-butyl ether (MTBE)	9.91
Acrylonitrile	10.34
Di-isopropyl ether	11.82
Propionitrile	14.72
Tetrahydrofuran	15.96
Cyclohexane	16.41
1-Chlorobutane	16.70
Methylcyclohexane	20.30
1,4-Dioxane	22.16
Hexachloroethane	40.91
1,2,3,4-Tetramethylbenzene	43.92

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Certified Reference Material CRM

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CERTIFIED WEIGHT REPORT

Part Number: 95319
Lot Number: 032922
Description: Revised Additions Mix
11 components
Expiration Date: 032925
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): Varied
NIST Test ID#: 6UTB

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

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

Formulated By:	Prashant Chauhan	032922 DATE
Reviewed By:	Pedro L. Rentas	032922 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
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2.	1-Chlorobutane	1072	MKCM5711	2000	99.99	0.2	0.20003	0.20020	2001.7	8.1	109-69-3	N/A	orl-rat 2670mg/kg
3.	Cyclohexane	1023	28930	2000	99	0.2	0.20203	0.20215	2001.2	8.2	110-82-7	300 ppm (1050mg/m3/8H)	orl-rat 12705mg/kg
4.	Di-isopropyl ether (DIPE)	987	00412MX	2000	99	0.2	0.20203	0.20215	2001.2	8.2	108-20-3	500 ppm (2100mg/m3/8H)	orl-rat 8470mg/kg
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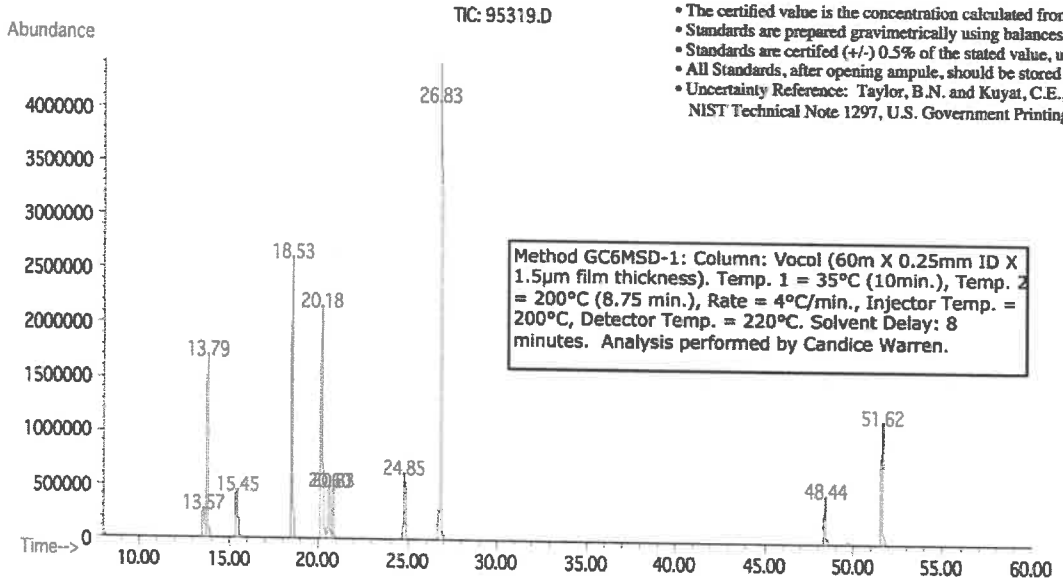
6.	Hexachloroethane	199	12604HBV	2000	99	0.2	0.20203	0.20213	2001.0	8.2	67-72-1	1 ppm (10mg/m3/8H)(skin)	orl-gpg 4970mg/kg
7.	Methylcyclohexane	1627	08046KN	2000	99	0.2	0.20203	0.20215	2001.2	8.2	108-87-2	N/A	N/A
8.	Methyl tert-butyl ether (MTBE)	209	02197JJ	2000	99.8	0.2	0.20041	0.20055	2001.4	8.1	1634-04-4	N/A	orl-rat 4g/kg
9.	Propionitrile	349	1395468	20000	99	0.2	2.02030	2.02045	20001.5	81.0	107-12-0	N/A	orl-rat 39mg/kg
10.	Tetrahydrofuran	380	SHBH8330	10000	99.9	0.2	1.00105	1.00120	10001.5	40.1	109-99-9	20 ppm (590mg/m3/8H)	orl-rat 1650mg/kg
11.	1,2,3,4-Tetramethylbenzene	491	AP01	2000	93	0.2	0.21506	0.21520	2001.3	8.7	488-23-3	N/A	orl-rat 6408mg/kg



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Name	MSD RT (min.)
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Methylcyclohexane	24.84
1,4-Dioxane	26.84
Hexachloroethane	48.44
1,2,3,4-Tetramethylbenzene	51.62

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, 2022

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.

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Certified Reference Material CRM

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CERTIFIED WEIGHT REPORT

Part Number: 95319
Lot Number: 032922
Description: Revised Additions Mix
11 components
Expiration Date: 032925
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): Varied
NIST Test ID#: 6UTB

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

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

Formulated By:	Prashant Chauhan	032922 DATE
Reviewed By:	Pedro L. Rentas	032922 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
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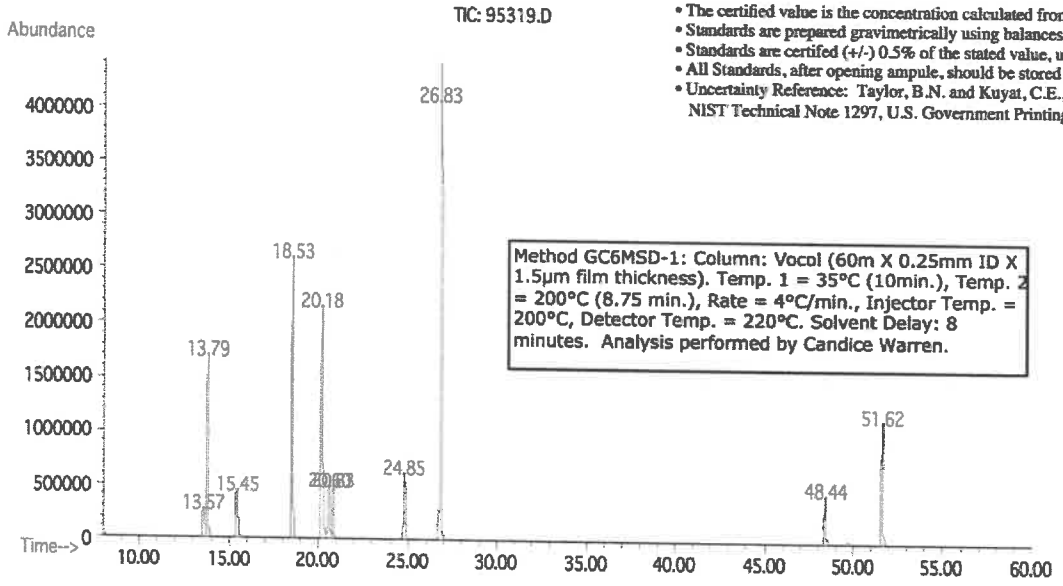

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Safety Data Sheet (SDS) GHS/OSHA Compliant

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, 2022

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.

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: 70046
Lot Number: 070122
Description: Bromochloromethane

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

Expiration Date: 070127
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 6UTB

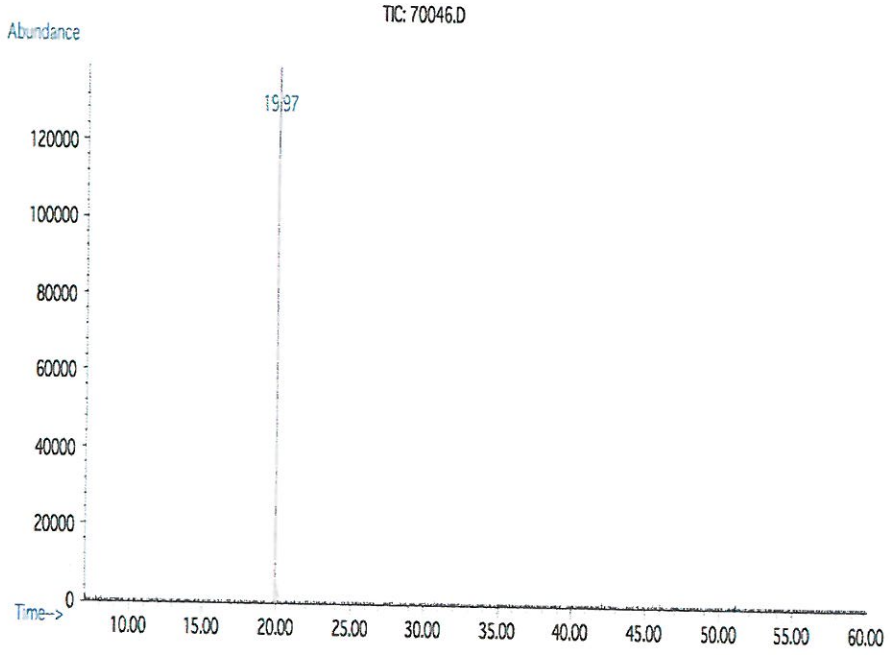
Weight(s) shown below were combined and diluted to (mL): 25.0

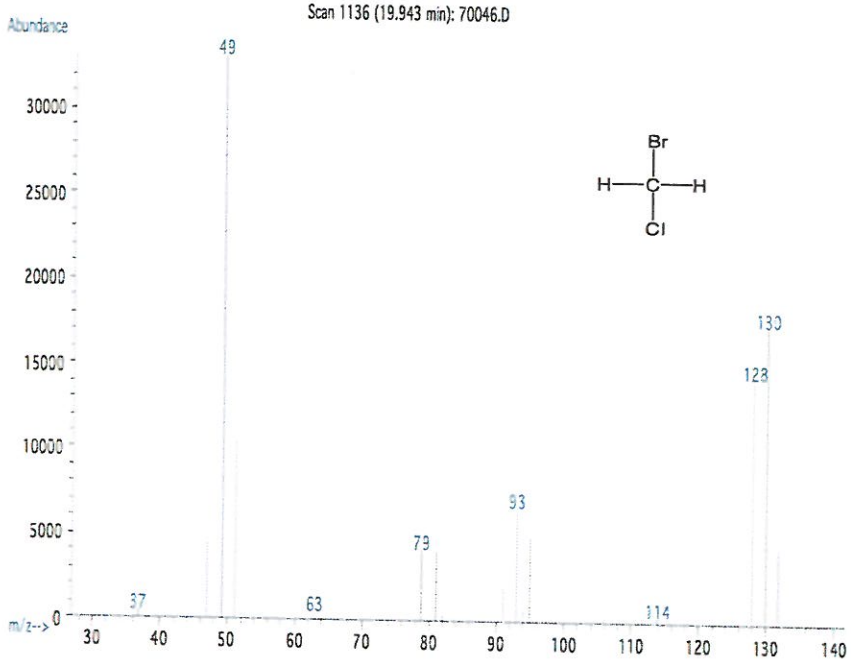
5E-05 Balance Uncertainty
0.0002 Flask Uncertainty

Gabriel Helland		070122
Formulated By:	Gabriel Helland	DATE
Pedro Rentas		070122
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. Bromochloromethane	46	AY01	1000	99	0.2	0.02530	0.02540	1004.1	5.7	74-97-5	200 ppm (1050mg/m3/8H)	orl-rat 5000mg/kg

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





- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are 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).

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: 95317
Lot Number: 112921
Description: Universal VOA Megamix
69 components
Expiration Date: 112924
Recommended Storage: Freezer (0 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB
Weight(s) shown below were combined and diluted to (mL): 100.0

Solvent(s): Methanol
Lot# EA899-USQ2

5E-05 Balance Uncertainty
0.012 Flask Uncertainty

Formulated By: Prashant Chauhan 112921 DATE

Reviewed By: Pedro L. Rentas 112921 DATE

Compound	(RM#) Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Initial Conc.(ug/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette (mL)	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. Acetonitrile	(0324)	060812	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20032	2001.1	8.1	75-05-8	40 ppm (70mg/m3/8H)	orl-rat 2460mg/kg
2. Allyl chloride (3-Chloropropene)	(0326)	102396	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20222	2001.9	8.2	107-05-1	1 ppm (3mg/m3/8H)	orl-rat 700mg/kg
3. Carbon disulphide	(0060)	MKCD9604	NA	NA	NA	2000	100	0.2	NA	0.20001	0.20015	2001.4	8.1	75-15-0	4 ppm (12mg/m3) (skin)	orl-rat 1200mg/kg
4. cis-1,4-Dichloro-2-butene	(1196)	14716EF	NA	NA	NA	2000	95	0.2	NA	0.21054	0.21060	2000.6	8.5	1476-11-5	N/A	N/A
5. trans-1,4-Dichloro-2-butene	(0488)	MKBP6041V	NA	NA	NA	2000	96.5	0.2	NA	0.20726	0.20736	2000.8	8.4	110-57-6	N/A	N/A
6. Diethyl ether (Ethyl ether)	(0153)	SHBK1918	NA	NA	NA	2000	99.9	0.2	NA	0.20023	0.20025	2000.2	8.1	60-29-7	400ppm (1200mg/m3/8H)	orl-rat 1215mg/kg
7. Ethyl methacrylate	(0381)	06126PX	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20208	2000.5	8.2	97-63-2	N/A	orl-rat 14800mg/kg
8. Iodomethane	(0489)	SHBF6716V	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20110	2000.8	8.1	74-88-4	5 ppm(28mg/m3/8H)(skin)	orl-rat 76mg/kg
9. 2-Methyl-1-propanol	(0445)	15241EB	NA	NA	NA	2000	99.5	0.2	NA	0.20101	0.20122	2002.0	8.1	78-83-1	50 ppm (150mg/m3/8H)	orl-rat 2460mg/kg
10. Methacrylonitrile	(0442)	00427ET	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20211	2000.8	8.2	126-98-7	1 ppm (3mg/m3/8H)(skin)	orl-rat 120mg/kg
11. Methyl acrylate	(1075)	SHBK0679	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20026	2000.5	8.1	96-33-3	10 ppm(35mg/m3/8H)(skin)	orl-rat 277mg/kg
12. Methyl methacrylate	(0404)	MKBW5137V	NA	NA	NA	2000	99.9	0.2	NA	0.20021	0.20045	2002.4	8.1	80-62-6	100 ppm (410mg/m3/8H)	orl-rat 7872mg/kg
13. Nitrobenzene	(0228)	01213TV	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20231	2002.8	8.2	98-95-3	1 ppm (5mg/m3/8H)(skin)	orl-rat 780mg/kg
14. 2-Nitropropane	(0461)	14002JX	NA	NA	NA	2000	97.3	0.2	NA	0.20556	0.20562	2000.6	8.3	79-46-9	10 ppm (35mg/m3/8H)	orl-rat 720mg/kg
15. Pentachloroethane	(0450)	HGA01	NA	NA	NA	2000	98	0.2	NA	0.20409	0.20412	2000.3	8.2	76-01-7	N/A	N/A
16. 1,1,2-Trichlorotrifluoroethane	(0474)	18930	NA	NA	NA	2000	99	0.2	NA	0.20203	0.20213	2001.0	8.2	76-13-1	1000 ppm (7600mg/m3/8H)	orl-rat 43g/kg
17. Bromodichloromethane	35171	051121	0.05	5.00	40015.4	2000	NA	NA	0.017	NA	NA	2000.7	18.4	75-27-4	N/A	orl-rat 916mg/kg
18. Dibromochloromethane	35171	051121	0.05	5.00	40042.8	2000	NA	NA	0.017	NA	NA	2002.0	18.4	124-48-1	N/A	orl-rat 848mg/kg
19. cis-1,2-Dichloroethene	35171	051121	0.05	5.00	40003.1	2000	NA	NA	0.017	NA	NA	2000.1	18.4	156-59-2	N/A	N/A
20. trans-1,2-Dichloroethene	35171	051121	0.05	5.00	40006.5	2000	NA	NA	0.017	NA	NA	2000.3	18.4	156-60-5	N/A	orl-rat 1235mg/kg
21. Methylene chloride	35171	051121	0.05	5.00	40021.1	2000	NA	NA	0.017	NA	NA	2001.0	18.4	75-09-2	500 ppm	orl-rat 820mg/kg
22. 1,1-Dichloroethene	32251	070721	0.10	10.00	20014.9	2000	NA	NA	0.042	NA	NA	2001.4	19.3	75-35-4	1 ppm (4mg/m3/8H)	orl-rat 200mg/kg
23. Bromoform	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	75-25-2	0.5 ppm (5mg/m3) (skin)	orl-rat 933mg/kg
24. Carbon tetrachloride	95321	010419	0.10	10.00	20001.3	2000	NA	NA	0.042	NA	NA	2000.0	19.2	56-23-5	2 ppm (12.6mg/m3/8H)	orl-rat 2350mg/kg
25. Chloroform	95321	010419	0.10	10.00	20001.8	2000	NA	NA	0.042	NA	NA	2000.1	19.2	67-66-3	50 ppm (240mg/m3) (CL)	orl-rat 908mg/kg
26. Dibromomethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	74-95-3	N/A	orl-rat 108mg/kg
27. 1,1-Dichloroethane	95321	010419	0.10	10.00	20000.8	2000	NA	NA	0.042	NA	NA	2000.0	19.3	75-34-3	100 ppm	orl-rat 725mg/kg
28. 2,2-Dichloropropane	95321	010419	0.10	10.00	20002.1	2000	NA	NA	0.042	NA	NA	2000.1	19.3	594-20-7	N/A	N/A
29. Tetrachloroethene	95321	010419	0.10	10.00	20002.2	2000	NA	NA	0.042	NA	NA	2000.1	19.3	127-18-4	25 ppm (170mg/m3/8H)(final)	orl-rat 2629mg/kg
30. 1,1,1-Trichloroethane	95321	010419	0.10	10.00	20001.7	2000	NA	NA	0.042	NA	NA	2000.1	19.3	71-55-6	350 ppm (1900mg/m3/8H)	orl-rat 10300mg/kg
31. 1,2-Dibromo-3-chloropropane	35161	102821	0.05	5.00	40006.0	2000	NA	NA	0.017	NA	NA	2000.2	18.4	96-12-8	0.001 ppm	orl-rat 170mg/kg
32. 1,2-Dibromoethane	35161	102821	0.05	5.00	40011.9	2000	NA	NA	0.017	NA	NA	2000.5	18.4	106-93-4	20 ppm (8H)	orl-rat 108mg/kg
33. 1,2-Dichloroethane	35161	102821	0.05	5.00	40004.0	2000	NA	NA	0.017	NA	NA	2000.1	18.4	107-06-2	50 ppm (8H)	orl-rat 670mg/kg
34. 1,2-Dichloropropane	35161	102821	0.05	5.00	40016.9	2000	NA	NA	0.017	NA	NA	2000.7	18.4	78-87-5	75 ppm (350mg/m3/8H)	orl-rat 1947mg/kg
35. 1,3-Dichloropropane	35161	102821	0.05	5.00	40003.9	2000	NA	NA	0.017	NA	NA	2000.1	18.4	142-28-9	N/A	unr-mus 3600mg/kg
36. 1,1-Dichloropropene	35161	102821	0.05	5.00	40005.9	2000	NA	NA	0.017	NA	NA	2000.2	26.1	563-58-6	N/A	N/A
37. cis-1,3-Dichloropropene	35161	102821	0.05	5.00	40013.7	2000	NA	NA	0.017	NA	NA	2000.6	18.4	10061-01-5	N/A	N/A
38. trans-1,3-Dichloropropene	35161	102821	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.5	10061-02-6	N/A	N/A
39. Hexachloro-1,3-butadiene	35161	102821	0.05	5.00	40014.0	2000	NA	NA	0.017	NA	NA	2000.6	28.4	87-68-3	0.02 ppm (0.24mg/m3/8H)	orl-rat 82mg/kg
40. 1,1,1,2-Tetrachloroethane	35161	102821	0.05	5.00	40010.9	2000	NA	NA	0.017	NA	NA	2000.4	18.4	630-20-6	N/A	orl-rat 670mg/kg
41. 1,1,2,2-Tetrachloroethane	35161	102821	0.05	5.00	40015.0	2000	NA	NA	0.017	NA	NA	2000.7	18.4	79-34-5	5 ppm (35mg/m3/8H)(skin)	orl-rat 800mg/kg
42. 1,1,2-Trichloroethane	35161	102821	0.05	5.00	40011.7	2000	NA	NA	0.017	NA	NA	2000.5	18.4	79-00-5	10 ppm (45mg/m3/8H)(skin)	orl-rat 836mg/kg
43. Trichloroethene	35161	102821	0.05	5.00	40003.3	2000	NA	NA	0.017	NA	NA	2000.1	18.4	79-01-6	50 ppm (270mg/m3/8H)	orl-mus 2402mg/kg
44. 1,2,3-Trichloropropane	35161	102821	0.05	5.00	40005.2	2000	NA	NA	0.017	NA	NA	2000.2	18.4	96-18-4	10 ppm (60mg/m3/8H)	orl-rat 149.6mg/kg
45. Benzene	35162	020821	0.05	5.00	40006.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	71-43-2	1 ppm	orl-rat 4894mg/kg
46. Bromobenzene	35162	020821	0.05	5.00	40019.0	2000	NA	NA	0.017	NA	NA	2000.9	18.4	108-86-1	N/A	orl-rat 2699mg/kg
47. n-Butyl benzene	35162	020821	0.05	5.00	40019.8	2000	NA	NA	0.017	NA	NA	2000.9	18.4	104-51-8	N/A	N/A
48. Ethyl benzene	35162	020821	0.05	5.00	40000.9	2000	NA	NA	0.017	NA	NA	1999.9	18.4	100-41-4	100 ppm (435mg/m3/8H)	orl-rat >2000mg/kg
49. p-Isopropyl toluene	35162	020821	0.05	5.00	40056.4	2000	NA	NA	0.017	NA	NA	2002.7	18.4	99-87-6	N/A	orl-rat 4750mg/kg
50. Naphthalene	35162	020821	0.05	5.00	40005.1	2000	NA	NA	0.017	NA	NA	2000.2	18.3	91-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg
51. Styrene	35162	020821	0.05	5.00	40022.8	2000	NA	NA	0.017	NA	NA	2001.0	18.4	100-42-5	100 ppm	orl-rat 5000mg/kg
52. Toluene	35162	020821	0.05	5.00	40008.9	2000	NA	NA	0.017	NA	NA	2000.3	18.4	108-88-3	200 ppm	orl-rat 5000mg/kg
53. 1,2,3-Trichlorobenzene	35162	020821	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	87-61-6	N/A	ipr-mus 1390mg/kg
54. 1,2,4-Trichlorobenzene	35162	020821	0.05	5.00	40027.4	2000	NA	NA	0.017	NA	NA	2001.3	18.4	120-82-1	5 ppm (CL) (40mg/m3)	orl-rat 756mg/kg
55. 1,2,4-Trimethylbenzene	35162	020821	0.05	5.00	40012.4	2000	NA	NA	0.017	NA	NA	2000.5	18.4	95-63-6	N/A	orl-rat 5g/kg
56. 1,3,5-Trimethylbenzene	35162	020821	0.05	5.00	40011.5	2000	NA	NA	0.017	NA	NA	2000.5	18.5	108-67-8	N/A	orl-rat 5000mg/kg
57. m-Xylene	35162	020821	0.05	5.00	40021.8	2000	NA	NA	0.017	NA	NA	2001.0	18.4	108-38-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg
58. tert-Butyl benzene	35163	022521	0.05	5.00	40005.9	2000	NA	NA	0.017	NA	NA	2000.2	18.4	98-06-6	N/A	N/A
59. sec-Butyl benzene	35163	022521	0.05	5.00	40011.7	2000	NA	NA	0.017	NA	NA	2000.5	18.4	135-98-8	N/A	orl-rat 2240mg/kg
60. Chlorobenzene	35163	022521	0.05	5.00	40009.0	2000	NA	NA	0.017	NA	NA	2000.4	18.4	108-90-7	75 ppm (350mg/m3/8H)	orl-rat 2290mg/kg
61. 2-Chlorotoluene	35163	022521	0.05	5.00	40002.0	2000	NA	NA	0.017	NA	NA	2000.0	18.4	95-49-8	50 ppm (250mg/m3/8H)	orl-rat 3900mg/kg
62. 4-Chlorotoluene	35163	022521	0.05	5.00	40000.4	2000	NA	NA	0.017	NA	NA	1999.9	18.4	106-43-4	N/A	orl-rat 2100mg/kg
63. 1,2-Dichlorobenzene	35163	022521	0.05	5.00	40004.0	2000	NA	NA	0.017	NA	NA	2000.1	18.4	95-50-1	50 ppm (300mg/m3) (CL)	orl-rat 500mg/kg
64. 1,3-Dichlorobenzene	35163	022521	0.05	5.00	40003.8	2000	NA	NA	0.017	NA	NA	2000.1	18.4	541-73-1	N/A	ipr-mus 1062mg/kg
65. 1,4-Dichlorobenzene	35163	022521	0.05	5.00	40005.0	2000	NA	NA	0.017	NA	NA	2000.2	18.4	106-46-7	75 ppm (450mg/m3/8H)	orl-rat 500mg/kg
66. Isopropylbenzene	35163	022521	0.05	5.00	40007.4	2000	NA	NA	0.017	NA	NA	2000.3	18.4	98-82-8	50 ppm (245mg/m3/8H)	orl-rat 1400mg/kg
67. n-Propylbenzene	35163	022521	0.05	5.00	40004.6	2000	NA	NA	0.017	NA	NA	2000.1	18.4	103-65-1	N/A	orl-rat 6040mg/kg
68. o-Xylene	35163	022521	0.05	5.00	40003.0	2000	NA	NA	0.017	NA	NA	2000.1	18.4	95-47-6	100 ppm (435mg/m3/8H)	ipr-mus 1364mg/kg
69. p-Xylene	35163	022521	0.05	5.00	40005.0	2000	NA	NA	0.017	NA	NA	2000.2	18.4	106-42-3	100 ppm (435mg/m3/8H)	orl-rat 5g/kg

- 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 References 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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Phone: 203-281-2917
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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, 2022

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.