CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

Prep Standard - Chemical Standard Summary

Order ID : O5252

Test : EPH

Prepbatch ID : PB156949,

Sequence ID/Qc Batch ID: FC110723AL,FC110823AL,FD110723AR,

Standard ID :
EP2392,EP2408,PP22493,PP22494,PP22495,PP22496,PP22497,PP22498,PP22499,PP22595,PP22596,PP22597,PP22598,PP22599,PP22600,PP22601,PP22637,PP22640,PP22659,

Chemical ID :
E2865,E3412,E3480,E3557,E3572,E3575,E3584,E3585,E3591,P10257,P11134,P11135,P11831,P12381,P12382,P12383,P12384,P12385,P12556,P12578,P12583,P12584,P12585,P12586,P12587,P12588,P12670,P12683,P12684,P12721,P12722,P12723,P12724,P12725,P12726,P12727,P12728,P12729,P12730,P12755,P12786,P12787,P12826,P12827,P12828,P12829,P12830,P12831,P12832,P12833,P12834,P9291,

CHEMTECH

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

Extractions STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2017	1:1 ACETONE/METHYLENE CHLORIDE	EP2392	09/28/2023	03/25/2024	Rajesh Parikh	None	None	RUPESHKUMAR SHAH 09/28/2023

FROM 8000.00000ml of E3572 + 8000.00000ml of E3575 = Final Quantity: 16000.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3923	Baked Sodium Sulfate	EP2408	11/06/2023	04/10/2024	Rajesh Parikh	Extraction_SCALE_2 (EX-SC-2)	None	RUPESHKUMAR SHAH 11/06/2023

FROM 4000.00000gram of E3412 = Final Quantity: 4000.000 gram

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
782	100 PPM Aromatic HC Working STD	PP22493	08/18/2023	02/10/2024	Ankita Jodhani	None	None	Yogesh Patel 08/18/2023

FROM 0.25000ml of P12578 + 0.62500ml of P12670 + 1.25000ml of P10257 + 22.87500ml of E3557 = Final Quantity: 25.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
787	50 PPM Aromatic HC STD	PP22494	08/18/2023	02/10/2024	Ankita Jodhani	None	None	Yogesh Patel 08/18/2023

FROM 0.50000ml of E3557 + 0.50000ml of PP22493 = Final Quantity: 1.000 ml

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
788	20 PPM Aromatic HC STD	PP22495	08/18/2023	02/10/2024	Ankita Jodhani	None	None	Yogesh Patel 08/18/2023

FROM 0.80000ml of E3557 + 0.20000ml of PP22493 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
789	10 PPM Aromatic HC STD	PP22496	08/18/2023	02/10/2024	Ankita Jodhani	None	None	Yogesh Patel 08/18/2023

FROM 0.90000ml of E3557 + 0.10000ml of PP22493 = Final Quantity: 1.000 ml

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
790	5 PPM Aromatic HC STD	PP22497	08/18/2023	02/10/2024	Ankita Jodhani	None	None	Yogesh Patel 08/18/2023

FROM 0.90000ml of E3557 + 0.10000ml of PP22494 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2945	100 PPM Aromatic HC Working STD (Absolute)	PP22498	08/18/2023	02/10/2024	Ankita Jodhani	None	None	Yogesh Patel 08/18/2023

FROM 0.25000ml of P12578 + 0.62500ml of P12670 + 1.25000ml of P9291 + 22.87500ml of E3557 = Final Quantity: 25.000 ml

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2946	20 PPM Aromatic HC STD ICV (Absolute)	PP22499	08/18/2023	02/10/2024	Ankita Jodhani	None	None	Yogesh Patel 08/18/2023

FROM 0.80000ml of E3557 + 0.20000ml of PP22498 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
781	100 PPM Aliphatic HC Working STD (Restek)	PP22595	10/06/2023	04/09/2024	Yogesh Patel	None	None	Ankita Jodhani 10/11/2023

FROM 0.25000ml of P12382 + 0.25000ml of P12584 + 1.25000ml of P11831 + 23.25000ml of E3585 = Final Quantity: 25.000 ml

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2900	100 PPM Aliphatic HC STD (Absolute)	PP22596	10/06/2023	04/09/2024	Yogesh Patel	None	None	Ankita Jodhani 10/11/2023

FROM 0.25000ml of P12381 + 0.25000ml of P12583 + 1.25000ml of P11134 + 1.25000ml of P11135 + 22.00000ml of E3585 = Final Quantity: 25.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
783	50 PPM Aliphatic HC STD	PP22597	10/06/2023	04/09/2024	Yogesh Patel	None	None	Ankita Jodhani 10/11/2023

FROM 0.50000ml of E3585 + 0.50000ml of PP22595 = Final Quantity: 1.000 ml

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
784	20 PPM Aliphatic HC STD	PP22598	10/06/2023	04/09/2024	Yogesh Patel	None	None	Ankita Jodhani 10/11/2023

FROM 0.80000ml of E3585 + 0.20000ml of PP22595 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
785	10 PPM Aliphatic HC STD	PP22599	10/06/2023	04/09/2024	Yogesh Patel	None	None	Ankita Jodhani 10/11/2023

FROM 0.90000ml of E3585 + 0.10000ml of PP22595 = Final Quantity: 1.000 ml

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
786	5 PPM Aliphatic HC STD	PP22600	10/06/2023	04/09/2024	Yogesh Patel	None	None	Ankita Jodhani 10/11/2023

FROM 0.90000ml of E3585 + 0.10000ml of PP22597 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2901	20 PPM Aliphaitic HC STD ICV (Absolute)	PP22601	10/06/2023	04/09/2024	Yogesh Patel	None	None	Ankita Jodhani 10/11/2023

FROM 0.80000ml of E3585 + 0.20000ml of PP22596 = Final Quantity: 1.000 ml

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1331	100 PPM NJEPH Fractionating Surrogate	PP22637	10/13/2023	04/09/2024	Yogesh Patel	None	None	Ankita Jodhani 10/17/2023

FROM 1.25000ml of P12683 + 1.25000ml of P12684 + 1.25000ml of P12786 + 1.25000ml of P12787 + 195.00000ml of E3585 = Final Quantity: 200.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1339	100 PPM NJEPH Surrogate Spike	PP22640	10/16/2023	04/11/2024	Yogesh Patel	None	None	Ankita Jodhani 10/17/2023

FROM 1.25000ml of P12383 + 1.25000ml of P12384 + 1.25000ml of P12385 + 1.25000ml of P12556 + 1.25000ml of P12585 + 1.25000ml of P12586 + 1.25000ml of P12587 + 1.25000ml of P12588 + 490.00000ml of E3584 = Final Quantity: 500.000 ml

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1330	100 PPM NJEPH Spike Solution	PP22659	10/31/2023	04/30/2024	Yogesh Patel	None	None	Ankita Jodhani 11/06/2023

FROM 5.00000ml of P12721 + 5.00000ml of P12722 + 5.00000ml of P12723 + 5.00000ml of P12724 + 5.00000ml of P12725 + 5.00000ml of P12726 + 5.00000ml of P12727 + 5.00000ml of P12728 + 5.00000ml of P12729 + 5.00000ml of P12730 + 5.00000ml of P12755 + 5.00000ml of P12826 + 5.00000ml of P12827 + 5.00000ml of P12828 + 5.00000ml of P12829 + 5.00000ml of P12830 + 5.00000ml of P12831 + 5.00000ml of P12832 + 5.00000ml of P12833 + 5.00000ml of P12834 = Final Quantity: 100.000 ml

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-3382-05 / Sand, Purified (cs/4x2.5kg)	0000243821	12/31/2024	04/30/2020 / RAJESH	04/28/2020 / RAJESH	E2865

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	PC19631-100 / SODIUM SULFATE, ANHYDROUS, PEST GRADE, 1	139404	04/10/2024	10/18/2022 / Rajesh	10/13/2022 / Rajesh	E3412

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
phenomenex	SI500025-30 / Cleanert SPE Silica, 5000 mg/25 ml	YO119-QJ	12/10/2023	05/11/2023 / Rajesh	02/24/2023 / Rajesh	E3480

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9644-A4 / Methylene Chloride,U-Resi, Cycle-Tainer (215L)	23F0862004	02/10/2024	08/10/2023 / Rajesh	07/14/2023 / Rajesh	E3557

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9644-A4 / Methylene Chloride,U-Resi, Cycle-Tainer (215L)	23H2962015	03/25/2024	09/25/2023 / Rajesh	09/25/2023 / Rajesh	E3572

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9254-03 / Acetone, Ultra Resi (cs/4x4L)	23H1462005	03/28/2024	09/28/2023 / Rajesh	09/28/2023 / Rajesh	E3575

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9254-03 / Acetone, Ultra Resi (cs/4x4L)	23H1462005	05/08/2024	10/11/2023 / Rajesh	10/05/2023 / Rajesh	E3584

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9262-03 / Hexane, Ultra-Resi (cs/4x4L)	23C2462011	04/09/2024	10/09/2023 / Rajesh	10/05/2023 / Rajesh	E3585

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9262-03 / Hexane, Ultra-Resi (cs/4x4L)	23C2462011	04/27/2024	10/27/2023 / Rajesh	10/25/2023 / Rajesh	E3591

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30541 / Custom NJEPH Aromatics Calibration Standard	A0165529	02/18/2024	08/18/2023 / Ankita	01/26/2021 / dhaval	P10257

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95899 / NJ EPH Aliphatic n-Hydrocarbons-Revised, 1000 PPM	09282109	10/20/2023	04/20/2023 / yogesh	10/29/2021 / Abdul	P11134

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95899 / NJ EPH Aliphatic n-Hydrocarbons-Revised, 1000 PPM	09282109	04/10/2024	10/10/2023 / yogesh	10/29/2021 / Abdul	P11135

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30540 / Custom NJEPH Aliphatics Calibration Standard	A0184811	04/10/2024	10/10/2023 / yogesh	06/17/2022 / Ankita	P11831

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0190428	04/10/2024	10/10/2023 / yogesh	03/16/2023 / Yogesh	P12381

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0190428	04/10/2024	10/10/2023 / yogesh	03/16/2023 / Yogesh	P12382

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0190428	04/16/2024	10/16/2023 / yogesh	03/16/2023 / Yogesh	P12383

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0190428	04/16/2024	10/16/2023 / yogesh	03/16/2023 / Yogesh	P12384

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0190428	04/16/2024	10/16/2023 / yogesh	03/16/2023 / Yogesh	P12385

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0196745	04/16/2024	10/16/2023 / yogesh	06/30/2023 / Yogesh	P12556

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0197729	02/18/2024	08/18/2023 / Ankita	06/30/2023 / Yogesh	P12578

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0197729	04/10/2024	10/10/2023 / yogesh	06/30/2023 / Yogesh	P12583

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0197729	04/10/2024	10/10/2023 / yogesh	06/30/2023 / Yogesh	P12584

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0197729	04/16/2024	10/16/2023 / yogesh	06/30/2023 / Yogesh	P12585

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0197729	04/16/2024	10/16/2023 / yogesh	06/30/2023 / Yogesh	P12586

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0197729	04/16/2024	10/16/2023 / yogesh	06/30/2023 / Yogesh	P12587

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0197729	04/16/2024	10/16/2023 / yogesh	06/30/2023 / Yogesh	P12588

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0196246	02/18/2024	08/18/2023 / Ankita	07/19/2023 / yogesh	P12670

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0196246	04/13/2024	10/13/2023 / yogesh	07/19/2023 / yogesh	P12683

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0196246	04/13/2024	10/13/2023 / yogesh	07/19/2023 / yogesh	P12684

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12721

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12722

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12723

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12724

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12725

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12726

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12727

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12728

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12729

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0195645	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12730

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0182204	04/30/2024	10/31/2023 / yogesh	08/28/2023 / Yogesh	P12755

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0201395	04/13/2024	10/13/2023 / yogesh	09/25/2023 / Yogesh	P12786

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0201395	04/13/2024	10/13/2023 / yogesh	09/25/2023 / Yogesh	P12787

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0188761	04/30/2024	10/31/2023 / yogesh	10/17/2023 / Yogesh	P12826

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0188761	04/30/2024	10/31/2023 / yogesh	10/17/2023 / Yogesh	P12827

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0200091	04/30/2024	10/31/2023 / yogesh	10/17/2023 / Yogesh	P12828

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0200091	04/30/2024	10/31/2023 / yogesh	10/17/2023 / Yogesh	P12829

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0200091	04/30/2024	10/31/2023 / yogesh	10/17/2023 / Yogesh	P12830

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0200091	04/30/2024	10/31/2023 / yogesh	10/17/2023 / Yogesh	P12831

CHEMTECH 284 Sheffield Street, Mountainside, NJ 07092 Phone: 908 789 8900 Fax: 908 789 8922

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0200091	04/30/2024	10/31/2023 / yogesh	10/17/2023 / Yogesh	P12832

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0200091	04/30/2024	10/31/2023 / yogesh	10/17/2023 / Yogesh	P12833

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0200091	04/30/2024	10/31/2023 / yogesh	10/17/2023 / Yogesh	P12834

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95709 / NJ EPH Aromatic Hydrocarbons, 2000 PPM	051519	02/18/2024	08/18/2023 / Ankita	01/10/2020 / DHAVAL	P9291

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

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.

DD
06/17/2021

Catalog No. : 30541 **Lot No.:** A0172403

Description : NJEPH Aromatics Calibration Standard

NJEPH Aromatics Calibration Standard 2,000µg/mL, Methylene Chloride, 1mL/ampul

P10758 to P10762 -(5)

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

Expiration Date : April 30, 2027 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 (Lot 8776.10-36) **Purity** 98%	2,010.0 µg/mL	+/- 11.7957 µg/mL +/- 90.5449 µg/mL +/- 100.4678 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 (Lot MKBZ8680V) **Purity** 99%	2,006.0 µg/mL	+/- 11.7723 µg/mL +/- 90.3656 µg/mL +/- 100.2689 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 (Lot STBG8884) **Purity** 99%	2,008.0 µg/mL	+/- 11.7841 µg/mL +/- 90.4557 µg/mL +/- 100.3688 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 (Lot N19U) **Purity** 95%	2,002.6 µg/mL	+/- 11.7524 µg/mL +/- 90.2125 µg/mL +/- 100.0989 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 (Lot MKCN0610) **Purity** 99%	2,000.0 µg/mL	+/- 11.7371 µg/mL +/- 90.0953 µg/mL +/- 99.9689 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 (Lot 10217947) **Purity** 99%	2,016.0 µg/mL	+/- 11.8310 µg/mL +/- 90.8161 µg/mL +/- 100.7687 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 (Lot MKCL7390) **Purity** 99%	2,012.0 µg/mL	+/- 11.8075 µg/mL +/- 90.6359 µg/mL +/- 100.5688 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene		2,002.0	µg/mL	+/-	11.7489	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCM0015)			+/-	90.1854	µg/mL	Unstressed
	Purity 99%				+/-	100.0689	µg/mL	Stressed
9	Fluoranthene		2,003.0	µg/mL	+/-	11.7547	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCF7378)			+/-	90.2305	µg/mL	Unstressed
	Purity 99%				+/-	100.1189	µg/mL	Stressed
10	Pyrene		2,011.0	µg/mL	+/-	11.8017	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCB9880)			+/-	90.5909	µg/mL	Unstressed
	Purity 99%				+/-	100.5188	µg/mL	Stressed
11	Benz(a)anthracene		2,011.0	µg/mL	+/-	11.8014	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot P0022018-0505)			+/-	90.5890	µg/mL	Unstressed
	Purity 98%				+/-	100.5168	µg/mL	Stressed
12	Chrysene		2,000.0	µg/mL	+/-	11.7371	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot STBJ8094)			+/-	90.0953	µg/mL	Unstressed
	Purity 99%				+/-	99.9689	µg/mL	Stressed
13	Benzo(b)fluoranthene		2,006.0	µg/mL	+/-	11.7721	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012012B)			+/-	90.3638	µg/mL	Unstressed
	Purity 97%				+/-	100.2669	µg/mL	Stressed
14	Benzo(k)fluoranthene		2,010.0	µg/mL	+/-	11.7958	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012019K)			+/-	90.5458	µg/mL	Unstressed
	Purity 99%				+/-	100.4688	µg/mL	Stressed
15	Benzo(a)pyrene		2,004.0	µg/mL	+/-	11.7606	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot RP210113)			+/-	90.2755	µg/mL	Unstressed
	Purity 99%				+/-	100.1689	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		2,010.0	µg/mL	+/-	11.7958	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 1-RAK-33-4)			+/-	90.5458	µg/mL	Unstressed
	Purity 99%				+/-	100.4688	µg/mL	Stressed
17	Dibenz(a,h)anthracene		2,017.0	µg/mL	+/-	11.8369	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	90.8611	µg/mL	Unstressed
	Purity 99%				+/-	100.8187	µg/mL	Stressed
18	Benzo(g,h,i)perylene		2,003.0	µg/mL	+/-	11.7547	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot 8GFYJ)			+/-	90.2305	µg/mL	Unstressed
	Purity 99%				+/-	100.1189	µg/mL	Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

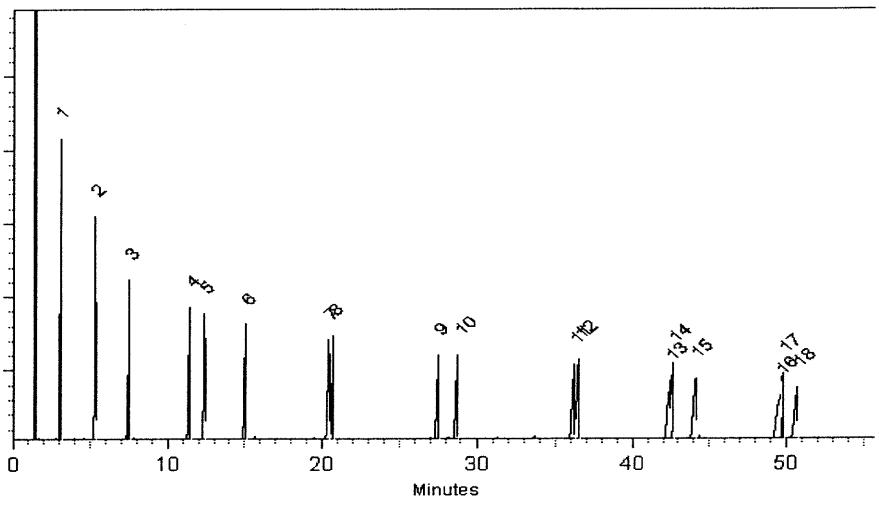
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Lane Kibe - Mix Technician **Date Mixed:** 14-May-2021 **Balance:** B345965662

Alexis Shelow - Operations Tech I **Date Passed:** 18-May-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.

Sand
Purified
Washed and Ignited

avantor™ | J.T.Baker®

Material No.: 3382-05
Batch No.: 0000243821
Manufactured Date: 2018/04/09
Retest Date: 2025/04/07
Revision No: 1

Certificate of Analysis

Test	Specification	Result
Substances Soluble in HCl	<= 0.16 %	0.01

For Laboratory, Research or Manufacturing Use
Meets Reagent Specifications for testing USP/NF monographs

Country of Origin: US
Packaging Site: Paris Mfg Ctr & DC

E 2865

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

PRODUCTOS QUIMICOS MONTERREY, S.A. DE C.V.

ALLAN CHEMICAL CORPORATION
235 MARGARET KING AVENUE
RINGWOOD, NEW JERSEY, 07456
(973) 962-6016 • INFO@ALLANCHEM.COM
WWW.ALLANCHEM.COM

MIRADOR 201, COL. MIRADOR
MONTERREY, N.L. MÉXICO
CP 64070
TEL +52 81 13 52 57 57
www.pqm.com.mx

CERTIFICATE OF ANALYSIS

PRODUCT :	**SODIUM SULFATE CRYSTALS ANHYDROUS**		
QUALITY :	**ACS (CODE RMB3375)**	**FORMULA :**	**Na_2SO_4**
SPECIFICATION NUMBER :	**6399**	**RELEASE DATE:**	**OCT/28/2021**
LOT NUMBER :	**139404**		

TEST	SPECIFICATIONS	LOT VALUES
Assay (Na_2SO_4)	Min. 99.0%	99.8 %
pH of a 5% solution at 25ºC	5.2 - 9.2	6.0
Insoluble matter	Max. 0.01%	0.005 %
Loss on ignition	Max. 0.5%	0.1 %
Chloride (Cl)	Max. 0.001%	<0.001 %
Nitrogen compounds (as N)	Max. 5 ppm	<5 ppm
Phosphate (PO_4)	Max. 0.001%	<0.001 %
Heavy metals (as Pb)	Max. 5 ppm	<5 ppm
Iron (Fe)	Max. 0.001%	<0.001 %
Calcium (Ca)	Max. 0.01%	0.002 %
Magnesium (Mg)	Max. 0.005%	0.001 %
Potassium (K)	Max. 0.008%	0.002 %
Extraction-concentration suitability	Passes test	Passes test
Appearance	Passes test	Passes test
Identification	Passes test	Passes test
Solubility and foreing matter	Passes test	Passes test
Retained on US Standard No. 10 sieve	Max. 1%	0.2 %
Retained on US Standard No. 60 sieve	Min. 94%	97.6 %
Through US Standard No. 60 sieve	Max. 5%	2.1 %
Through US Standard No. 100 sieve	Max. 10%	0.2 %

COMMENTS

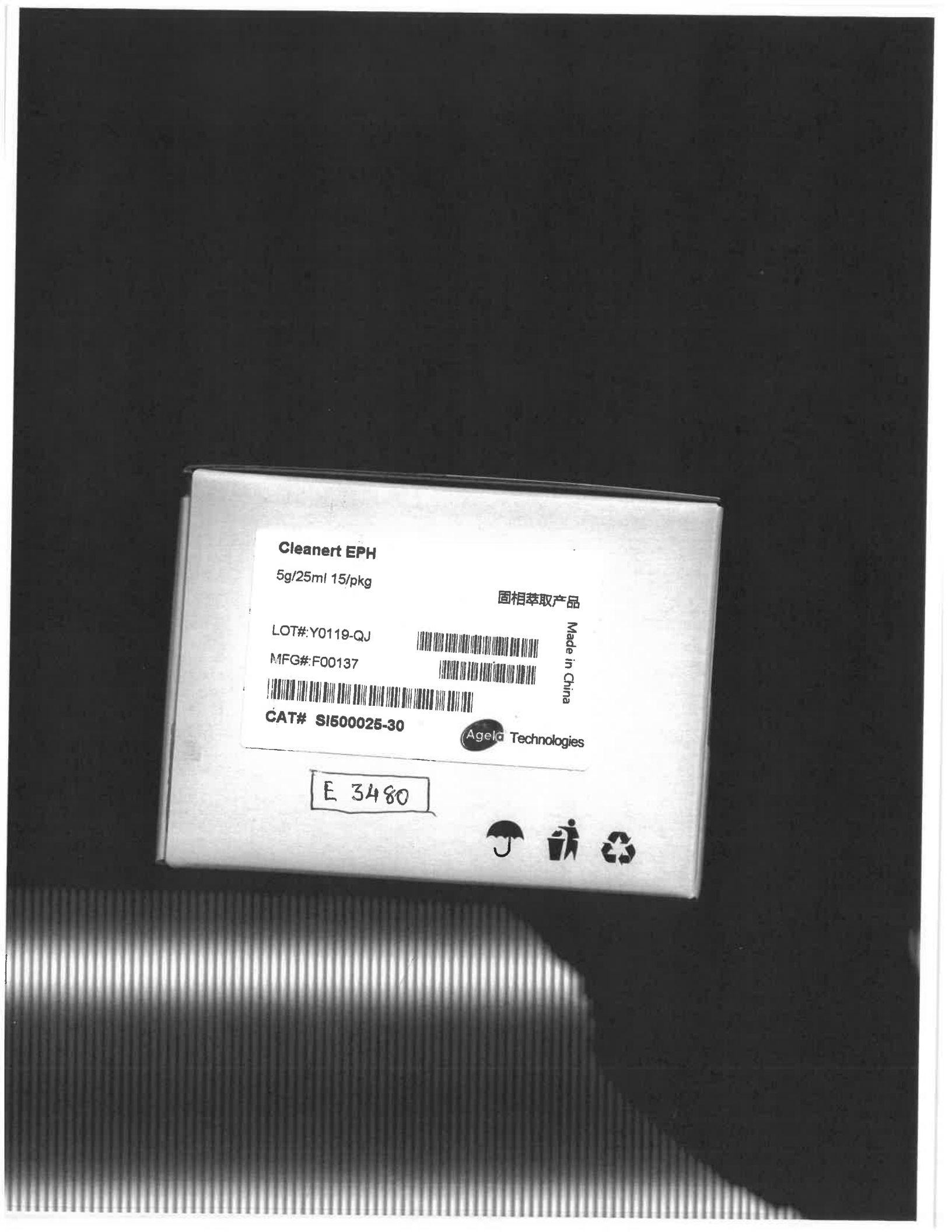
QC: PhC Irma Belmares

If you need further details, please call our factory or contact our local distributor.

RE-02-01, Ed. 3

E 3412

Recd. by RP on 10/13/22


Cleanert EPH
5g/25ml 15/pkg
固相萃取产品
LOT#:Y0119-QJ
MFG#:F00137
CAT# SI500025-30
Made in China
Agela Technologies
E 3480

Methylene Chloride
ULTRA RESI-ANALYZED
For Organic Residue Analysis
(dichloromethane)

avantor™ | J.T.Baker®

Material No.: 9266-A4
Batch No.: 23F0862004
Manufactured Date: 2023-05-16
Expiration Date: 2024-08-14
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	< 1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	4
Assay (CH_2Cl_2) (by GC, exclusive of preservative, corrected for water)	≥ 99.8 %	100.0 %
Color (APHA)	≤ 10	10
Residue after Evaporation	≤ 1.0 ppm	0.4 ppm
Titrable Acid (µeq/g)	≤ 0.3	< 0.1
Chloride (Cl)	≤ 10 ppm	< 5 ppm
Water (by KF, coulometric)	≤ 0.02 %	< 0.01 %

For Laboratory,Research,or Manufacturing Use
MEETS SPECIFICATIONS WITHIN THE EXPIRATION PERIOD

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC
Manufacturer source batch: MG23E16942

E3557

Ken Koehnlein
Sr. Manager, Quality Assurance

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

Methylene Chloride
ULTRA RESI-ANALYZED
For Organic Residue Analysis
(dichloromethane)

avantor™ | J.T.Baker®

Material No.: 9266-A4
Batch No.: 23H2962015
Manufactured Date: 2023-08-08
Expiration Date: 2024-11-06
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	3
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	7
Assay (CH_2Cl_2) (by GC, exclusive of preservative, corrected for water)	≥ 99.8 %	100.0 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	0.1 ppm
Titrable Acid (µeq/g)	≤ 0.3	< 0.1
Chloride (Cl)	≤ 10 ppm	< 5 ppm
Water (by KF, coulometric)	≤ 0.02 %	< 0.01 %

For Laboratory,Research,or Manufacturing Use
MEETS SPECIFICATIONS WITHIN THE EXPIRATION PERIOD

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC
Manufacturer source batch: MG23H08469

E 3572

Ken Koehnlein
Sr. Manager, Quality Assurance

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

Acetone
BAKER RESI-ANALYZED® Reagent
For Organic Residue Analysis

avantor™ | J.T.Baker®

Material No.: 9254-03
Batch No.: 23H1462005
Manufactured Date: 2023-07-26
Expiration Date: 2026-07-25
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay ($(CH_3)_2CO$) (by GC, corrected for water)	≥ 99.4 %	99.7 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	0.3 ppm
Substances Reducing Permanganate	Passes Test	Passes Test
Titrable Acid (µeq/g)	≤ 0.3	0.1
Titrable Base (µeq/g)	≤ 0.6	< 0.1
Water (H_2O)	≤ 0.5 %	0.3 %
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	< 1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	1

For Laboratory,Research,or Manufacturing Use
MEETS SPECIFICATIONS WITHIN THE EXPIRATION PERIOD

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

Recd. by RP On 9/28/23

E 3575

Ken Koehnlein
Sr. Manager, Quality Assurance

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

Acetone
BAKER RESI-ANALYZED® Reagent
For Organic Residue Analysis

avantor™ | J.T.Baker®

Material No.: 9254-03
Batch No.: 23H1462005
Manufactured Date: 2023-07-26
Expiration Date: 2026-07-25
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay ($(CH_3)_2CO$) (by GC, corrected for water)	≥ 99.4 %	99.7 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	0.3 ppm
Substances Reducing Permanganate	Passes Test	Passes Test
Titrable Acid (µeq/g)	≤ 0.3	0.1
Titrable Base (µeq/g)	≤ 0.6	< 0.1
Water (H_2O)	≤ 0.5 %	0.3 %
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	< 1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	1

For Laboratory,Research,or Manufacturing Use
MEETS SPECIFICATIONS WITHIN THE EXPIRATION PERIOD

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

Recd by RP on 10/5/23

E 3584

Ken Koehnlein
Sr. Manager, Quality Assurance

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

Hexanes (95% n-hexane)
BAKER RESI-ANALYZED® Reagent

avantor™ | J.T.Baker®

Material No.: 9262-03
Batch No.: 23C2462011
Manufactured Date: 2023-03-10
Expiration Date: 2024-06-08
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	< 1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	1
ECD-Sensitive Impurities (as Ethylene Dibromide) - Single Impurity Peak (ng/mL)	≤ 5	< 1
Assay (Total Saturated C_6 Isomers) (by GC, corrected for water)	≥ 99.5 %	99.7 %
Assay (as n-Hexane) (by GC, corrected for water)	≥ 95 %	97 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	0.3 ppm
Substances Darkened by H_2SO_4	Passes Test	Passes Test
Water (by KF, coulometric)	≤ 0.05 %	< 0.01 %

For Laboratory,Research,or Manufacturing Use
MEETS SPECIFICATIONS WITHIN THE EXPIRATION PERIOD

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

Recd. by RP on 10/5/23

E 3585

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

Hexanes (95% n-hexane)
BAKER RESI-ANALYZED® Reagent

avantor™ | J.T.Baker®

Material No.: 9262-03
Batch No.: 23C2462011
Manufactured Date: 2023-03-10
Expiration Date: 2024-06-08
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	< 1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	1
ECD-Sensitive Impurities (as Ethylene Dibromide) - Single Impurity Peak (ng/mL)	≤ 5	< 1
Assay (Total Saturated C_6 Isomers) (by GC, corrected for water)	≥ 99.5 %	99.7 %
Assay (as n-Hexane) (by GC, corrected for water)	≥ 95 %	97 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	0.3 ppm
Substances Darkened by H_2SO_4	Passes Test	Passes Test
Water (by KF, coulometric)	≤ 0.05 %	< 0.01 %

For Laboratory,Research,or Manufacturing Use
MEETS SPECIFICATIONS WITHIN THE EXPIRATION PERIOD

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

Recd. by RP on 10/25/23

E 3591

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

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: 95899
Lot Number: 092821
Description: NJ EPH Aliphatic n-Hydrocarbons - Revised
20 components
Expiration Date: 092831
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 6UTB

Solvent(s):	Lot#
Cyclohexane	28930

Formulated By:	Benson Chan	092821 DATE
Reviewed By:	Pedro L. Rentas	092821 DATE

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 25.0 0.005 Flask Uncertainty
CAUTION: Sonicate Before Use

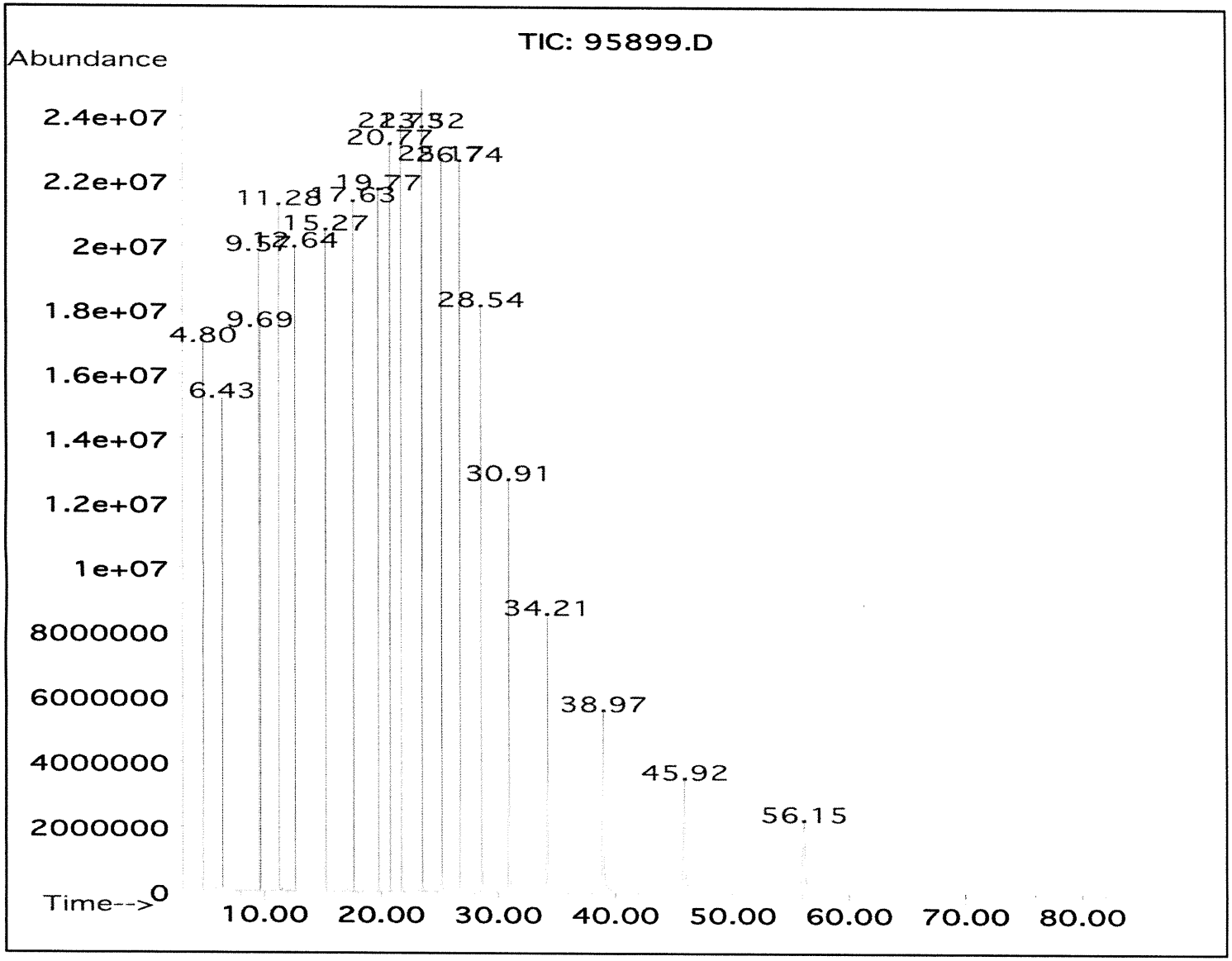
	Compound	(RM#) Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Initial Conc.(ug/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1.	2-Methylnaphthalene	(0214)	MKBF3783V	NA	NA	NA	1000	97	0.2	NA	0.02577	0.02581	1001.6	5.7	91-57-6	N/A	orl-rat 1630mg/kg
2.	Naphthalene	(0222)	MKBZ8680V	NA	NA	NA	1000	100	0.2	NA	0.02500	0.02506	1002.6	5.7	91-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg
3.	n-Nonane	95708	081621	1.00	25.00	1000.8	1000	NA	NA	0.013	NA	NA	1000.9	4.2	111-84-2	200 ppm (1050mg/m3/8H)	ivn-mus 218mg/kg
4.	n-Decane	95708	081621	1.00	25.00	1000.9	1000	NA	NA	0.013	NA	NA	1001.1	4.2	124-18-5	N/A	N/A
5.	n-Dodecane	95708	081621	1.00	25.00	1001.2	1000	NA	NA	0.013	NA	NA	1001.3	4.2	112-40-3	N/A	ivn-mus 3494mg/kg
6.	n-Tetradecane	95708	081621	1.00	25.00	1002.0	1000	NA	NA	0.013	NA	NA	1002.2	4.2	629-59-4	N/A	N/A
7.	n-Hexadecane	95708	081621	1.00	25.00	1001.9	1000	NA	NA	0.013	NA	NA	1002.0	4.2	544-76-3	N/A	N/A
8.	n-Octadecane	95708	081621	1.00	25.00	1011.8	1000	NA	NA	0.013	NA	NA	1012.0	4.2	593-45-3	N/A	N/A
9.	n-Eicosane	95708	081621	1.00	25.00	1000.5	1000	NA	NA	0.013	NA	NA	1000.7	4.2	112-95-8	N/A	N/A
10.	n-Heneicosane	95708	081621	1.00	25.00	1001.2	1000	NA	NA	0.013	NA	NA	1001.4	4.2	629-94-7	N/A	N/A
11.	n-Docosane	95708	081621	1.00	25.00	1001.6	1000	NA	NA	0.013	NA	NA	1001.7	4.2	629-97-0	N/A	N/A
12.	n-Tetracosane	95708	081621	1.00	25.00	1001.3	1000	NA	NA	0.013	NA	NA	1001.4	4.2	646-31-1	N/A	N/A
13.	n-Hexacosane	95708	081621	1.00	25.00	1000.4	1000	NA	NA	0.013	NA	NA	1000.5	4.2	630-01-3	N/A	N/A
14.	n-Octacosane	95708	081621	1.00	25.00	1001.7	1000	NA	NA	0.013	NA	NA	1001.9	4.2	630-02-4	N/A	N/A
15.	n-Triacontane	95708	081621	1.00	25.00	1001.0	1000	NA	NA	0.013	NA	NA	1001.2	4.2	638-68-6	N/A	N/A
16.	n-Dotriacontane	95708	081621	1.00	25.00	1000.7	1000	NA	NA	0.013	NA	NA	1000.9	4.3	544-85-4	N/A	ivn-mus 100mg/kg
17.	n-Tetratriacontane	95708	081621	1.00	25.00	1000.8	1000	NA	NA	0.013	NA	NA	1000.9	4.2	14167-59-0	N/A	N/A
18.	n-Hexatriacontane	95708	081621	1.00	25.00	1000.9	1000	NA	NA	0.013	NA	NA	1001.1	4.2	630-06-8	N/A	N/A
19.	n-Octatriacontane	95708	081621	1.00	25.00	1000.8	1000	NA	NA	0.013	NA	NA	1000.9	4.3	7194-85-6	N/A	N/A
20.	n-Tetracontane	95708	081621	1.00	25.00	1000.5	1000	NA	NA	0.013	NA	NA	1000.6	4.3	4181-95-7	N/A	N/A

- 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).

P11132
↓
P11136

AR 11/02/21

Method GC8HOT.M: Column: SPB-5 (30m X 0.25mm ID X 0.25µm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 320°C (20 min.), Rate = 30°C/min., Injector B= 250°C, Detector B = 300°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by Melissa Stonier.



Peak No.	Name	MSD RT (min.)
1	n-Nonane	4.80
2	n-Decane	6.43
3	Naphthalene	9.57
4	n-Dodecane	9.69
5	2-Methylnaphthalene	11.28
6	n-Tetradecane	12.64
7	n-Hexadecane	15.27
8	n-Octadecane	17.93
9	n-Eicosane	19.77
10	n-Heneicosane	20.77
11	n-Docosane	21.73
12	n-Tetracosane	23.52
13	n-Hexacosane	25.18
14	n-Octacosane	26.74
15	n-Triacontane	28.54
16	n-Dotriacontane	30.91
17	n-Tetratriacontane	34.21
18	n-Hexatriacontane	38.97
19	n-Octatriacontane	45.92
20	n-Tetracontane	56.15

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: 95899
Lot Number: 092821
Description: NJ EPH Aliphatic n-Hydrocarbons - Revised
20 components
Expiration Date: 092831
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 6UTB

Solvent(s):	Lot#
Cyclohexane	28930

Formulated By:	Benson Chan	092821 DATE
Reviewed By:	Pedro L. Rentas	092821 DATE

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 25.0 0.005 Flask Uncertainty
CAUTION: Sonicate Before Use

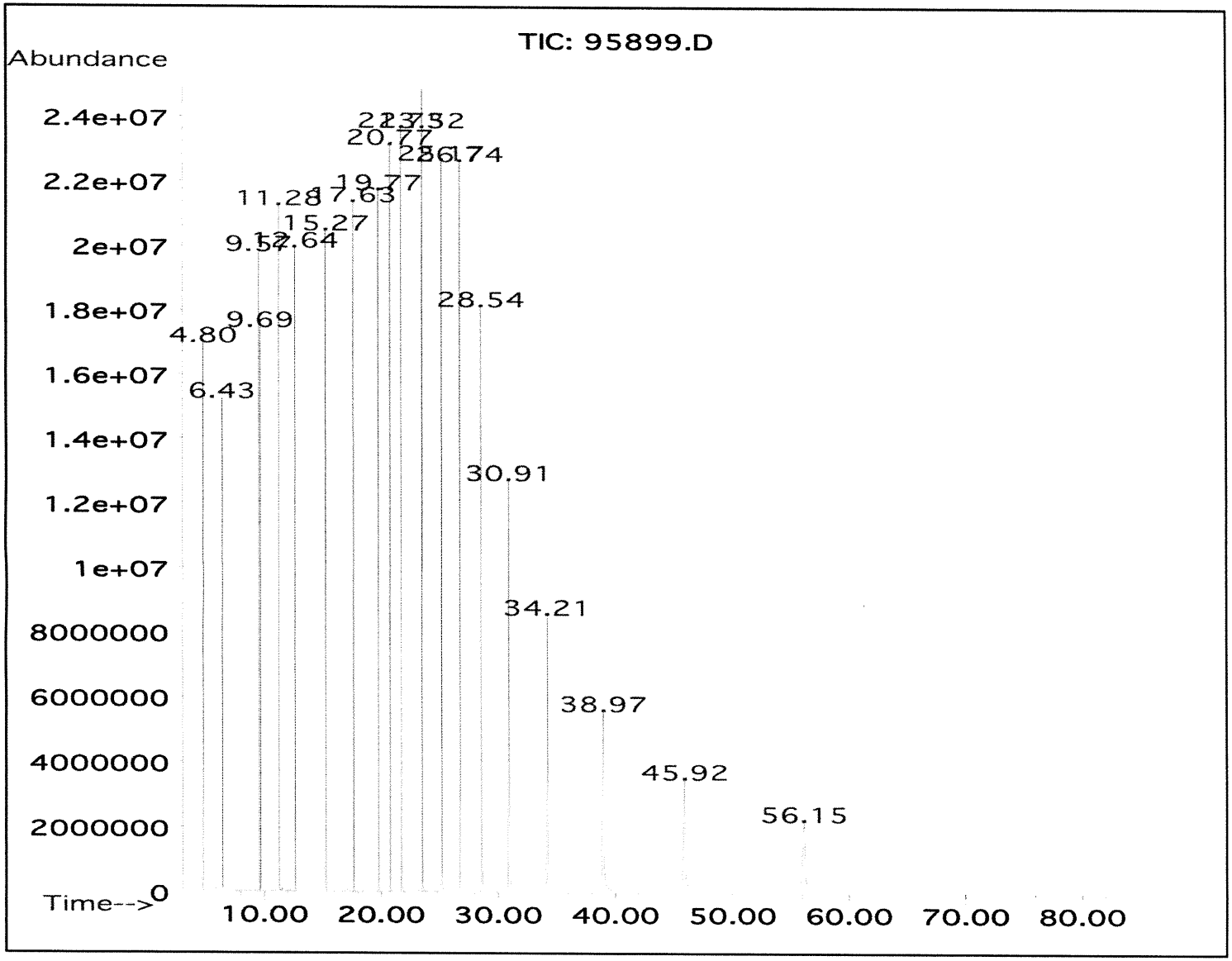
	Compound	(RM#) Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Initial Conc.(ug/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1.	2-Methylnaphthalene	(0214)	MKBF3783V	NA	NA	NA	1000	97	0.2	NA	0.02577	0.02581	1001.6	5.7	91-57-6	N/A	orl-rat 1630mg/kg
2.	Naphthalene	(0222)	MKBZ8680V	NA	NA	NA	1000	100	0.2	NA	0.02500	0.02506	1002.6	5.7	91-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg
3.	n-Nonane	95708	081621	1.00	25.00	1000.8	1000	NA	NA	0.013	NA	NA	1000.9	4.2	111-84-2	200 ppm (1050mg/m3/8H)	ivn-mus 218mg/kg
4.	n-Decane	95708	081621	1.00	25.00	1000.9	1000	NA	NA	0.013	NA	NA	1001.1	4.2	124-18-5	N/A	N/A
5.	n-Dodecane	95708	081621	1.00	25.00	1001.2	1000	NA	NA	0.013	NA	NA	1001.3	4.2	112-40-3	N/A	ivn-mus 3494mg/kg
6.	n-Tetradecane	95708	081621	1.00	25.00	1002.0	1000	NA	NA	0.013	NA	NA	1002.2	4.2	629-59-4	N/A	N/A
7.	n-Hexadecane	95708	081621	1.00	25.00	1001.9	1000	NA	NA	0.013	NA	NA	1002.0	4.2	544-76-3	N/A	N/A
8.	n-Octadecane	95708	081621	1.00	25.00	1011.8	1000	NA	NA	0.013	NA	NA	1012.0	4.2	593-45-3	N/A	N/A
9.	n-Eicosane	95708	081621	1.00	25.00	1000.5	1000	NA	NA	0.013	NA	NA	1000.7	4.2	112-95-8	N/A	N/A
10.	n-Heneicosane	95708	081621	1.00	25.00	1001.2	1000	NA	NA	0.013	NA	NA	1001.4	4.2	629-94-7	N/A	N/A
11.	n-Docosane	95708	081621	1.00	25.00	1001.6	1000	NA	NA	0.013	NA	NA	1001.7	4.2	629-97-0	N/A	N/A
12.	n-Tetracosane	95708	081621	1.00	25.00	1001.3	1000	NA	NA	0.013	NA	NA	1001.4	4.2	646-31-1	N/A	N/A
13.	n-Hexacosane	95708	081621	1.00	25.00	1000.4	1000	NA	NA	0.013	NA	NA	1000.5	4.2	630-01-3	N/A	N/A
14.	n-Octacosane	95708	081621	1.00	25.00	1001.7	1000	NA	NA	0.013	NA	NA	1001.9	4.2	630-02-4	N/A	N/A
15.	n-Triacontane	95708	081621	1.00	25.00	1001.0	1000	NA	NA	0.013	NA	NA	1001.2	4.2	638-68-6	N/A	N/A
16.	n-Dotriacontane	95708	081621	1.00	25.00	1000.7	1000	NA	NA	0.013	NA	NA	1000.9	4.3	544-85-4	N/A	ivn-mus 100mg/kg
17.	n-Tetratriacontane	95708	081621	1.00	25.00	1000.8	1000	NA	NA	0.013	NA	NA	1000.9	4.2	14167-59-0	N/A	N/A
18.	n-Hexatriacontane	95708	081621	1.00	25.00	1000.9	1000	NA	NA	0.013	NA	NA	1001.1	4.2	630-06-8	N/A	N/A
19.	n-Octatriacontane	95708	081621	1.00	25.00	1000.8	1000	NA	NA	0.013	NA	NA	1000.9	4.3	7194-85-6	N/A	N/A
20.	n-Tetracontane	95708	081621	1.00	25.00	1000.5	1000	NA	NA	0.013	NA	NA	1000.6	4.3	4181-95-7	N/A	N/A

- 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).

P11132
↓
P11136

AR 11/02/21

Method GC8HOT.M: Column: SPB-5 (30m X 0.25mm ID X 0.25µm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 320°C (20 min.), Rate = 30°C/min., Injector B= 250°C, Detector B = 300°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by Melissa Stonier.



Peak No.	Name	MSD RT (min.)
1	n-Nonane	4.80
2	n-Decane	6.43
3	Naphthalene	9.57
4	n-Dodecane	9.69
5	2-Methylnaphthalene	11.28
6	n-Tetradecane	12.64
7	n-Hexadecane	15.27
8	n-Octadecane	17.93
9	n-Eicosane	19.77
10	n-Heneicosane	20.77
11	n-Docosane	21.73
12	n-Tetracosane	23.52
13	n-Hexacosane	25.18
14	n-Octacosane	26.74
15	n-Triacontane	28.54
16	n-Dotriacontane	30.91
17	n-Tetratriacontane	34.21
18	n-Hexatriacontane	38.97
19	n-Octatriacontane	45.92
20	n-Tetracontane	56.15

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P11827 ↓ P11831 AJ 06/14/22

Catalog No. : 30540 **Lot No.:** A0184811

Description : NJEPH Aliphatics Calibration Standard

Aliphatics Calibration Standard 2000µg/mL, Hexane/Carbon Disulfide (80:20), 1mL/ampul

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

Expiration Date : June 30, 2029 **Storage:** 25°C nominal

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	n-Nonane (C9) **CAS #** 111-84-2 **Purity** 99%	(Lot SHBN5361)	2,015.3 µg/mL	+/- 11.8271 µg/mL +/- 50.0358 µg/mL +/- 59.9888 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 **Purity** 99%	(Lot SHBN8619)	2,010.7 µg/mL	+/- 11.7997 µg/mL +/- 49.9200 µg/mL +/- 59.8498 µg/mL	Gravimetric Unstressed Stressed
3	Naphthalene **CAS #** 91-20-3 **Purity** 99%	(Lot MKCH0219)	2,013.3 µg/mL	+/- 11.8154 µg/mL +/- 49.9862 µg/mL +/- 59.9292 µg/mL	Gravimetric Unstressed Stressed
4	n-Dodecane (C12) **CAS #** 112-40-3 **Purity** 99%	(Lot SHBK0925)	2,007.3 µg/mL	+/- 11.7802 µg/mL +/- 49.8372 µg/mL +/- 59.7506 µg/mL	Gravimetric Unstressed Stressed
5	2-Methylnaphthalene **CAS #** 91-57-6 **Purity** 96%	(Lot STBK0259)	2,010.2 µg/mL	+/- 11.7972 µg/mL +/- 49.9094 µg/mL +/- 59.8371 µg/mL	Gravimetric Unstressed Stressed
6	n-Tetradecane (C14) **CAS #** 629-59-4 **Purity** 99%	(Lot STBK2282)	2,010.0 µg/mL	+/- 11.7958 µg/mL +/- 49.9034 µg/mL +/- 59.8300 µg/mL	Gravimetric Unstressed Stressed
7	n-Hexadecane (C16) **CAS #** 544-76-3 **Purity** 98%	(Lot SHBM4146)	2,012.9 µg/mL	+/- 11.8129 µg/mL +/- 49.9759 µg/mL +/- 59.9169 µg/mL	Gravimetric Unstressed Stressed

8	n-Octadecane (C18) **CAS #** 593-45-3 **Purity** 98%	(Lot UE5NG)	2,019.5	µg/mL	+/- 11.8513 +/- 50.1381 +/- 60.1114	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Eicosane (C20) **CAS #** 112-95-8 **Purity** 99%	(Lot MKCF7888)	2,008.7	µg/mL	+/- 11.7880 +/- 49.8703 +/- 59.7903	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	2,015.3	µg/mL	+/- 11.8271 +/- 50.0358 +/- 59.9888	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	2,012.7	µg/mL	+/- 11.8115 +/- 49.9696 +/- 59.9094	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	2,018.0	µg/mL	+/- 11.8428 +/- 50.1020 +/- 60.0681	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	2,009.3	µg/mL	+/- 11.7919 +/- 49.8869 +/- 59.8102	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	2,020.0	µg/mL	+/- 11.8545 +/- 50.1517 +/- 60.1277	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	2,018.7	µg/mL	+/- 11.8467 +/- 50.1186 +/- 60.0880	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	2,017.3	µg/mL	+/- 11.8388 +/- 50.0855 +/- 60.0483	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	2,014.0	µg/mL	+/- 11.8193 +/- 50.0027 +/- 59.9491	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	2,019.3	µg/mL	+/- 11.8506 +/- 50.1351 +/- 60.1078	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
19	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	2,017.0	µg/mL	+/- 11.8366 +/- 50.0761 +/- 60.0370	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
20	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 98%	(Lot PADGI)	2,014.2	µg/mL	+/- 11.8206 +/- 50.0084 +/- 59.9558	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Solvent: Hexane/Carbon disulfide (80:20)
CAS # 110-54-3/75-15-0
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

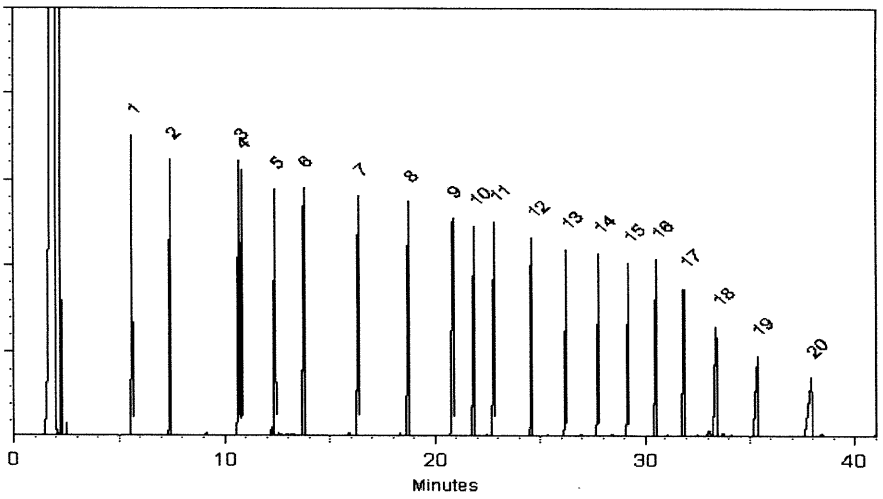
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Brittany Federinko - Operations Tech I

Date Mixed: 03-May-2022 **Balance:** 1128360905

Christie Mills - Operations Technician II

Date Passed: 06-May-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

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.

P12371 ↓ P12385 } Y.P 03/16/23

Catalog No. : 31098 **Lot No.:** A0190428

Description : 1-Chlorooctadecane Standard

1-Chlorooctadecane Standard 10,000µg/mL, Methylene Chloride, 1mL/ampul

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

Expiration Date : November 30, 2029 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L., k=2)	
1	1-Chlorooctadecane **CAS #** 3386-33-2 (Lot 13661500) **Purity** 99%	10,066.3 µg/mL	+/- 58.5260 µg/mL +/- 564.4046 µg/mL +/- 577.6110 µg/mL	Gravimetric Unstressed Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

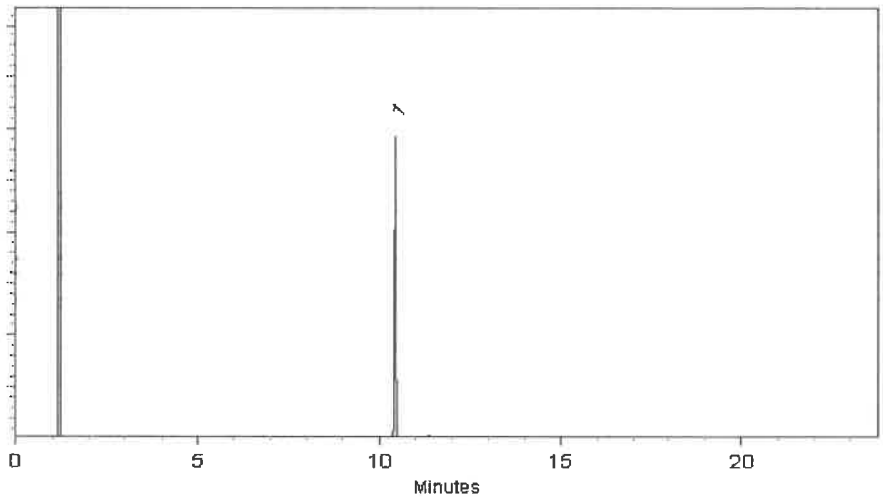
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Malina Homan - Operations Technician I **Date Mixed:** 10-Oct-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC **Date Passed:** 13-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®
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12371 ↓ P12385 } Y.P 03/16/23

Catalog No. : 31098 **Lot No.:** A0190428

Description : 1-Chlorooctadecane Standard

1-Chlorooctadecane Standard 10,000µg/mL, Methylene Chloride, 1mL/ampul

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

Expiration Date : November 30, 2029 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L., k=2)	
1	1-Chlorooctadecane **CAS #** 3386-33-2 (Lot 13661500) **Purity** 99%	10,066.3 µg/mL	+/- 58.5260 µg/mL +/- 564.4046 µg/mL +/- 577.6110 µg/mL	Gravimetric Unstressed Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

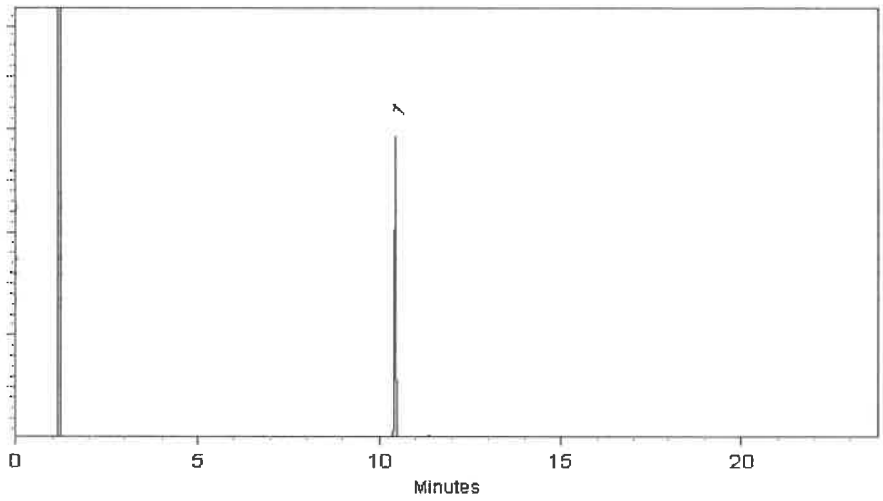
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Malina Homan - Operations Technician I **Date Mixed:** 10-Oct-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC **Date Passed:** 13-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®
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12371 ↓ P12385 } Y.P 03/16/23

Catalog No. : 31098 **Lot No.:** A0190428

Description : 1-Chlorooctadecane Standard

1-Chlorooctadecane Standard 10,000µg/mL, Methylene Chloride, 1mL/ampul

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

Expiration Date : November 30, 2029 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L., k=2)	
1	1-Chlorooctadecane **CAS #** 3386-33-2 (Lot 13661500) **Purity** 99%	10,066.3 µg/mL	+/- 58.5260 µg/mL +/- 564.4046 µg/mL +/- 577.6110 µg/mL	Gravimetric Unstressed Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

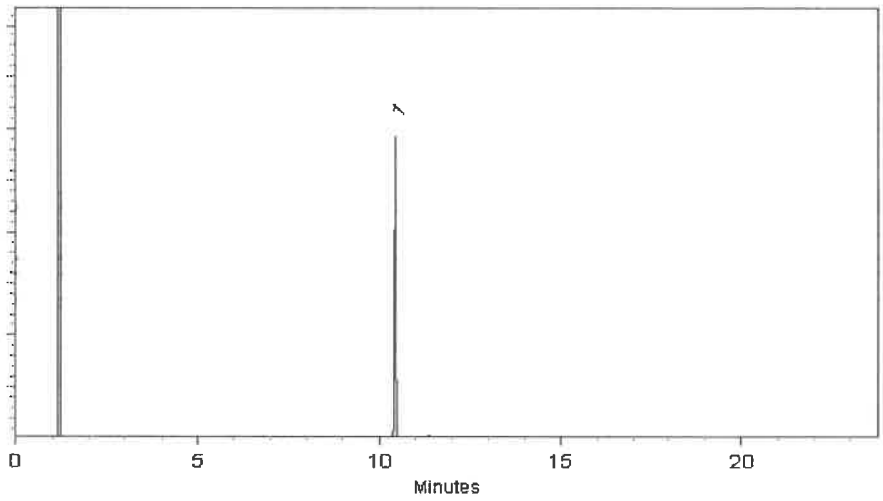
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Malina Homan - Operations Technician I **Date Mixed:** 10-Oct-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC **Date Passed:** 13-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®
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12371 ↓ P12385 } Y.P 03/16/23

Catalog No. : 31098 **Lot No.:** A0190428

Description : 1-Chlorooctadecane Standard

1-Chlorooctadecane Standard 10,000µg/mL, Methylene Chloride, 1mL/ampul

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

Expiration Date : November 30, 2029 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L., k=2)	
1	1-Chlorooctadecane **CAS #** 3386-33-2 (Lot 13661500) **Purity** 99%	10,066.3 µg/mL	+/- 58.5260 µg/mL +/- 564.4046 µg/mL +/- 577.6110 µg/mL	Gravimetric Unstressed Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

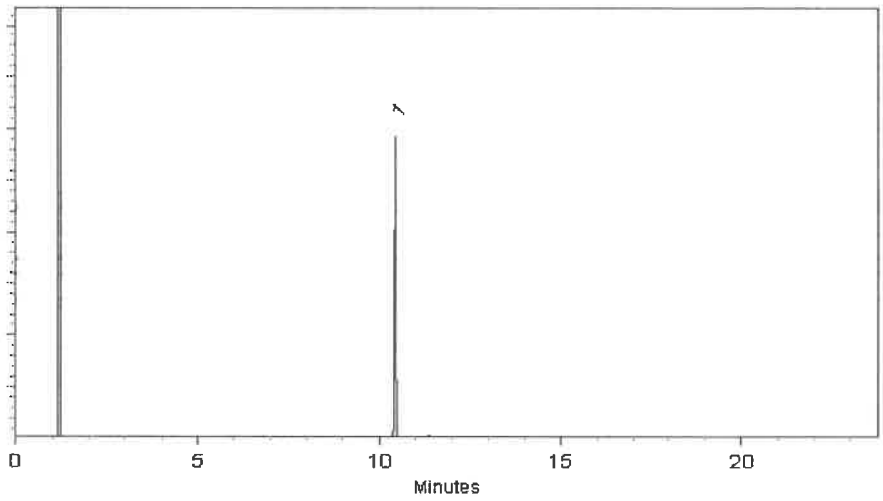
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Malina Homan - Operations Technician I **Date Mixed:** 10-Oct-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC **Date Passed:** 13-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®
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12371 ↓ P12385 } Y.P 03/16/23

Catalog No. : 31098 **Lot No.:** A0190428

Description : 1-Chlorooctadecane Standard

1-Chlorooctadecane Standard 10,000µg/mL, Methylene Chloride, 1mL/ampul

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

Expiration Date : November 30, 2029 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L., k=2)	
1	1-Chlorooctadecane **CAS #** 3386-33-2 (Lot 13661500) **Purity** 99%	10,066.3 µg/mL	+/- 58.5260 µg/mL +/- 564.4046 µg/mL +/- 577.6110 µg/mL	Gravimetric Unstressed Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

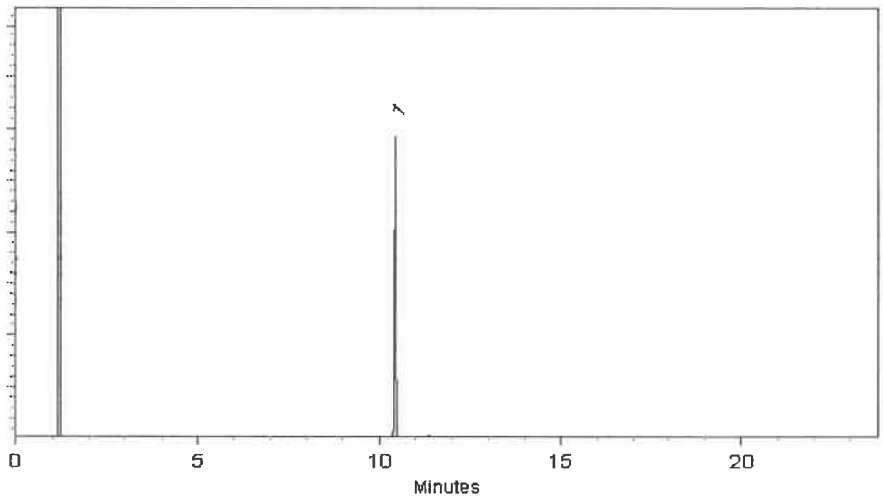
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Malina Homan - Operations Technician I **Date Mixed:** 10-Oct-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC **Date Passed:** 13-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
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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.

P12556 → P12575 Y.P. 06/30/23

Catalog No. : 31098 **Lot No.:** A0196745

Description : 1-Chlorooctadecane Standard

1-Chlorooctadecane Standard 10,000µg/mL, Methylene Chloride, 1mL/ampul

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

Expiration Date : May 31, 2030 **Storage:** 10°C or colder

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1-Chlorooctadecane	3386-33-2	13199700	99%	10,058.6 µg/mL	+/- 565.0485

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

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

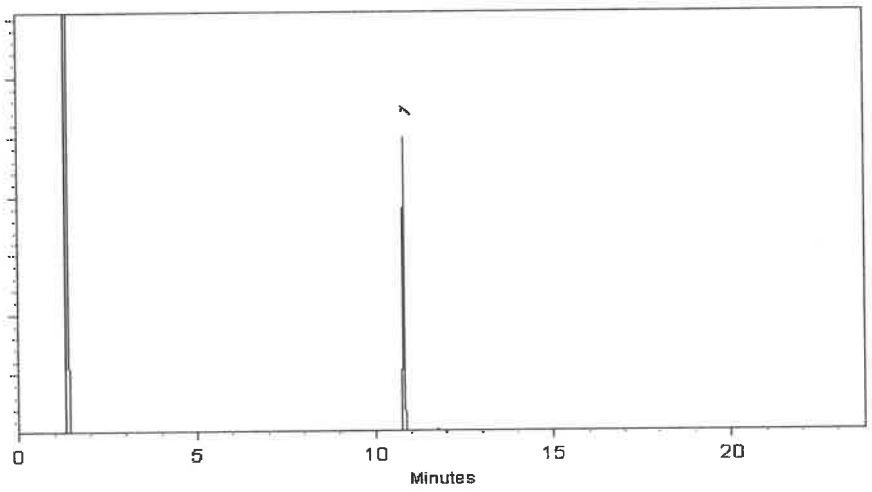
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
10 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.

Jess Hoy - Operations Tech I

Date Mixed: 06-Apr-2023 **Balance Serial #** 1128353505

Christie Mills - Operations Tech II - ARM QC

Date Passed: 12-Apr-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

Safety Data Sheet

Revision Date: 05/01/23
www.restek.com

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

1. IDENTIFICATION

Catalog Number / Product Name:	**31098 / 1-Chlorooctadecane Standard**
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:	15
Intended use:	For Laboratory use only. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Carcinogenicity Category 2
GHS Signal Word:	Warning
GHS Hazard:	Suspected of causing cancer.
GHS Precautions:	
Safety Precautions:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF exposed or concerned: Get medical advice/attention.
Storage:	Store locked up.
Disposal:	Dispose of contents/container according to section 13 of the SDS.
Single Exposure Target Organs:	No data available
Repeated Exposure Target Organs:	No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
Methylene chloride (dichloromethane)	75-09-2	200-838-9	99
1-chlorooctadecane	3386-33-2	222-207-7	1

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: Immediately 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 and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical attention

Skin Contact: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard contaminated leather goods. Get medical attention immediately.

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. Never give anything by mouth to an unconscious person

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical 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 surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire.

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.

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. As with all chemicals, good industrial hygiene practices should be followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials. Keep container closed when not in use

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
Methylene chloride (dichloromethane)	75-09-2	2300 ppm IDLH	None Known	50 ppm TWA	25 ppm TWA; 125 ppm STEL (15 min. TWA)

1-chlorooctadecane	3386-33-2	Not established	None Known	Not established	No data available

Personal Protection:

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

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.

Eye Protection: Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. 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.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory disease including asthma and bronchitis

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color:	Colorless
Odor:	Strong
Physical State:	No data available
pH:	Not applicable
Vapor Pressure:	No data available
Vapor Density:	2.93 (air = 1)
Boiling Point (°C):	40 °C at 1013 hPa (ECHA_API)
Melting Point (°C):	-96.7 °C
Flash Point (°F):	228
Flammability:	Combustible at elevated temperatures
Upper Flammable/Explosive Limit, % in air:	No data available
Lower Flammable/Explosive Limit, % in air:	No data available
Autoignition Temperature (°C):	556 deg C
Decomposition Temperature (°C):	No data available
Specific Gravity:	1.3254 - 1.3258 g/cm3 at 20 °C
Evaporation Rate:	No data available
Odor Threshold:	ND
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available
VOC % by weight:	99
Molecular Weight:	No data available

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	None known.Contamination High temperatures
Materials to Avoid / Chemical Incompatiability:	Strong oxidizing agents Caustics (bases)
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation Absorption Ingestion Skin contact Eye contact
Target Organs Potentially Affected By Exposure:	Skin, Cardiovascular System, Eyes, Liver
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)Inhalation may cause severe central nervous system depression (including unconsciousness).

Skin Contact: Contact causes severe skin irritation and possible burns.

Skin Absorption:	Harmful if absorbed through the skin. May cause severe irritation and systemic damage.
Eye Contact:	Contact with the eyes may cause moderate to severe eye injury. Eye contact may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.
Ingestion Irritation:	Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.
Ingestion Toxicity:	Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

Carcinogenicity:	Contains a probable or known human carcinogen.
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 Absorption:	Upon prolonged or repeated exposure, harmful if absorbed through the skin. May cause severe irritation and systemic damage

Component Toxicological Data:

NIOSH:

Chemical Name	CAS No.	LD50/LC50
Dichloromethane	75-09-2	Dermal LD50 Rat >2000 mg/kg; Inhalation LC50 Rat 53 mg/L 6 h; Oral LD50 Rat 1600 mg/kg

Component Carcinogenic Data:

OSHA:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	25 ppm TWA (8 hr.); 125 ppm STEL (15 min.); 12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910 Specifically Regulate

ACGIH:

Chemical Name	CAS No.	
Dichloromethane	75-09-2	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

NIOSH:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	potential occupational carcinogen

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.
Monograph 110 [2017]; Monograph 71 [1999]	75-09-2	Group 2A

12. ECOLOGICAL INFORMATION

Overview:	Moderate ecological hazard. This product may be dangerous to plants and/or wildlife. Keep out of waterways.
Mobility:	No data
Persistence:	No data
Bioaccumulation:	No data

Degradability: No data
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: Incinerate spent or discarded material a permitted hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial Environmental Regulations.

14. TRANSPORTATION INFORMATION

United States:

DOT Proper Shipping Name: Dichloromethane
UN Number: UN1593
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Dichloromethane
UN Number: UN1593
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
Methylene chloride (dichloromethane)	75-09-2	X	X	-	X
1-chlorooctadecane	3386-33-2	-	-	-	X

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Dichloromethane Dichloromethane (Methylene chloride)	75-09-2	Prop 65 Cancer

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
Methylene chloride (dichloromethane)	75-09-2	X	X	X	X
1-chlorooctadecane	3386-33-2	-	-	-	-

16. OTHER INFORMATION

Prior Version Date: 04/27/23
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
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0197729

Description : o-Terphenyl Standard

o-Terphenyl Standard 10,000 µg/mL, Methylene Chloride, 1mL/ampul

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

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

Handling: Sonicate prior to use. **Ship:** Ambient

P1271
2
P12595 Y.P. 06130

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	o-Terphenyl	84-15-1	MKCH4487	99%	10,007.5 µg/mL	+/- 450.7438

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

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

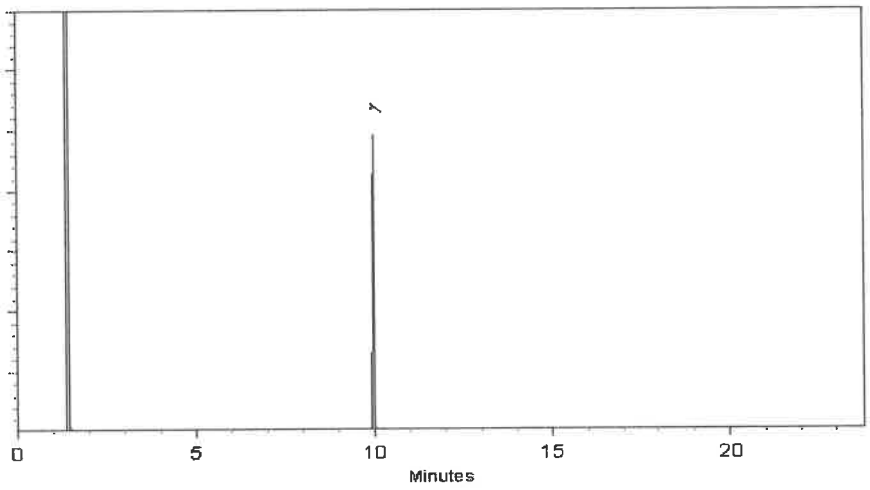
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
10 ml/min.

Inj. Vol
1µl



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

Alicia Leathers - Operation Technician I

Date Mixed: 03-May-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 08-May-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK

Safety Data Sheet

Revision Date: 05/04/23
www.restek.com

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

1. IDENTIFICATION

Catalog Number / Product Name:	**31097 / o-Terphenyl Standard**
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:	15
Intended use:	For Laboratory use only. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Carcinogenicity Category 2
GHS Signal Word:	Warning
GHS Hazard:	Suspected of causing cancer.
GHS Precautions:	
Safety Precautions:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF exposed or concerned: Get medical advice/attention.
Storage:	Store locked up.
Disposal:	Dispose of contents/container according to section 13 of the SDS.
Single Exposure Target Organs:	No data available
Repeated Exposure Target Organs:	No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
Methylene chloride (dichloromethane)	75-09-2	200-838-9	99
o-terphenyl	84-15-1	201-517-6	1

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: Immediately 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 and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical attention

Skin Contact: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard contaminated leather goods. Get medical attention immediately.

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. Never give anything by mouth to an unconscious person

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical 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 surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire.

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.

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. As with all chemicals, good industrial hygiene practices should be followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials. Keep container closed when not in use

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
Methylene chloride (dichloromethane)	75-09-2	2300 ppm IDLH	None Known	50 ppm TWA	25 ppm TWA; 125 ppm STEL (15 min. TWA)

o-terphenyl	84-15-1	500 mg/m3 IDLH	None Known	Not established	No data available

Personal Protection:

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

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.

Eye Protection: Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. 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.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory disease including asthma and bronchitis

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color:	Colorless
Odor:	Strong
Physical State:	No data available
pH:	Not applicable
Vapor Pressure:	No data available
Vapor Density:	2.93 (air = 1)
Boiling Point (°C):	40 °C at 1013 hPa (ECHA_API)
Melting Point (°C):	-96.7 °C .
Flash Point (°F):	230
Flammability:	Combustible at elevated temperatures
Upper Flammable/Explosive Limit, % in air:	No data available
Lower Flammable/Explosive Limit, % in air:	No data available
Autoignition Temperature (°C):	556 deg C
Decomposition Temperature (°C):	No data available
Specific Gravity:	1.3254 - 1.3258 g/cm3 at 20 °C
Evaporation Rate:	No data available
Odor Threshold:	ND
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available
VOC % by weight:	99
Molecular Weight:	No data available

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition.Contamination High temperatures
Materials to Avoid / Chemical Incompatiability:	Strong oxidizing agents Caustics (bases)
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation Absorption Ingestion Skin contact Eye contact
Target Organs Potentially Affected By Exposure:	Skin, Cardiovascular System, Eyes, Liver, 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)Inhalation may cause severe central nervous system depression (including unconsciousness).
Skin Contact:	Contact causes severe skin irritation and possible burns.
Skin Absorption:	Harmful if absorbed through the skin. May cause severe irritation and systemic damage.
Eye Contact:	Contact with the eyes may cause moderate to severe eye injury. Eye contact may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.
Ingestion Irritation:	Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.
Ingestion Toxicity:	Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

Carcinogenicity:	Contains a probable or known human carcinogen.
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 Absorption:	Upon prolonged or repeated exposure, harmful if absorbed through the skin. May cause severe irritation and systemic damage

Component Toxicological Data:
NIOSH:

Chemical Name	CAS No.	LD50/LC50
o-Terphenyl	84-15-1	Oral LD50 Rat 1900 mg/kg
Dichloromethane	75-09-2	Dermal LD50 Rat >2000 mg/kg; Inhalation LC50 Rat 53 mg/L 6 h; Oral LD50 Rat 1600 mg/kg

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	25 ppm TWA (8 hr.); 125 ppm STEL (15 min.); 12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910 Specifically Regulate

ACGIH:

Chemical Name	CAS No.	
Dichloromethane	75-09-2	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

NIOSH:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	potential occupational carcinogen

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.
Monograph 110 [2017]; Monograph 71 [1999]	75-09-2	Group 2A

12. ECOLOGICAL INFORMATION

Overview:	Moderate ecological hazard. This product may be dangerous

to plants and/or wildlife. Keep out of waterways.

Mobility: No data
Persistence: No data
Bioaccumulation: No data
Degradability: No data
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: Incinerate spent or discarded material a permitted hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial Environmental Regulations.

14. TRANSPORTATION INFORMATION

United States:

DOT Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
Methylene chloride (dichloromethane)	75-09-2	X	X	-	X
o-terphenyl	84-15-1	-	-	-	X

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Dichloromethane Dichloromethane (Methylene chloride)	75-09-2	Prop 65 Cancer

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
Methylene chloride (dichloromethane)	75-09-2	X	X	X	X
o-terphenyl	84-15-1	-	X	-	-

16. OTHER INFORMATION

Prior Version Date:	04/27/23
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
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0197729

Description : o-Terphenyl Standard

o-Terphenyl Standard 10,000 µg/mL, Methylene Chloride, 1mL/ampul

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

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

Handling: Sonicate prior to use. **Ship:** Ambient

P1271
2
P12595 Y.P. 06130

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	o-Terphenyl	84-15-1	MKCH4487	99%	10,007.5 µg/mL	+/- 450.7438

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

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

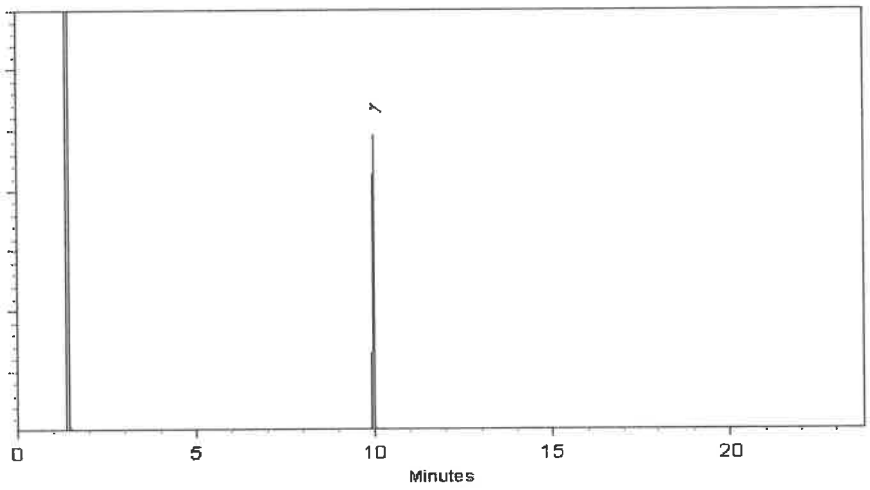
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
10 ml/min.

Inj. Vol
1µl



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

Alicia Leathers - Operation Technician I

Date Mixed: 03-May-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 08-May-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK

Safety Data Sheet

Revision Date: 05/04/23
www.restek.com

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

1. IDENTIFICATION

Catalog Number / Product Name:	**31097 / o-Terphenyl Standard**
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:	15
Intended use:	For Laboratory use only. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Carcinogenicity Category 2
GHS Signal Word:	Warning
GHS Hazard:	Suspected of causing cancer.
GHS Precautions:	
Safety Precautions:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF exposed or concerned: Get medical advice/attention.
Storage:	Store locked up.
Disposal:	Dispose of contents/container according to section 13 of the SDS.
Single Exposure Target Organs:	No data available
Repeated Exposure Target Organs:	No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
Methylene chloride (dichloromethane)	75-09-2	200-838-9	99
o-terphenyl	84-15-1	201-517-6	1

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: Immediately 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 and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical attention

Skin Contact: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard contaminated leather goods. Get medical attention immediately.

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. Never give anything by mouth to an unconscious person

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical 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 surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire.

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.

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. As with all chemicals, good industrial hygiene practices should be followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials. Keep container closed when not in use

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
Methylene chloride (dichloromethane)	75-09-2	2300 ppm IDLH	None Known	50 ppm TWA	25 ppm TWA; 125 ppm STEL (15 min. TWA)

o-terphenyl	84-15-1	500 mg/m3 IDLH	None Known	Not established	No data available

Personal Protection:

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

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.

Eye Protection: Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. 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.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory disease including asthma and bronchitis

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color:	Colorless
Odor:	Strong
Physical State:	No data available
pH:	Not applicable
Vapor Pressure:	No data available
Vapor Density:	2.93 (air = 1)
Boiling Point (°C):	40 °C at 1013 hPa (ECHA_API)
Melting Point (°C):	-96.7 °C .
Flash Point (°F):	230
Flammability:	Combustible at elevated temperatures
Upper Flammable/Explosive Limit, % in air:	No data available
Lower Flammable/Explosive Limit, % in air:	No data available
Autoignition Temperature (°C):	556 deg C
Decomposition Temperature (°C):	No data available
Specific Gravity:	1.3254 - 1.3258 g/cm3 at 20 °C
Evaporation Rate:	No data available
Odor Threshold:	ND
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available
VOC % by weight:	99
Molecular Weight:	No data available

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition.Contamination High temperatures
Materials to Avoid / Chemical Incompatiability:	Strong oxidizing agents Caustics (bases)
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation Absorption Ingestion Skin contact Eye contact
Target Organs Potentially Affected By Exposure:	Skin, Cardiovascular System, Eyes, Liver, 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)Inhalation may cause severe central nervous system depression (including unconsciousness).
Skin Contact:	Contact causes severe skin irritation and possible burns.
Skin Absorption:	Harmful if absorbed through the skin. May cause severe irritation and systemic damage.
Eye Contact:	Contact with the eyes may cause moderate to severe eye injury. Eye contact may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.
Ingestion Irritation:	Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.
Ingestion Toxicity:	Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

Carcinogenicity:	Contains a probable or known human carcinogen.
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 Absorption:	Upon prolonged or repeated exposure, harmful if absorbed through the skin. May cause severe irritation and systemic damage

Component Toxicological Data:
NIOSH:

Chemical Name	CAS No.	LD50/LC50
o-Terphenyl	84-15-1	Oral LD50 Rat 1900 mg/kg
Dichloromethane	75-09-2	Dermal LD50 Rat >2000 mg/kg; Inhalation LC50 Rat 53 mg/L 6 h; Oral LD50 Rat 1600 mg/kg

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	25 ppm TWA (8 hr.); 125 ppm STEL (15 min.); 12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910 Specifically Regulate

ACGIH:

Chemical Name	CAS No.	
Dichloromethane	75-09-2	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

NIOSH:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	potential occupational carcinogen

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.
Monograph 110 [2017]; Monograph 71 [1999]	75-09-2	Group 2A

12. ECOLOGICAL INFORMATION

Overview:	Moderate ecological hazard. This product may be dangerous

to plants and/or wildlife. Keep out of waterways.

Mobility: No data
Persistence: No data
Bioaccumulation: No data
Degradability: No data
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: Incinerate spent or discarded material a permitted hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial Environmental Regulations.

14. TRANSPORTATION INFORMATION

United States:

DOT Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
Methylene chloride (dichloromethane)	75-09-2	X	X	-	X
o-terphenyl	84-15-1	-	-	-	X

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Dichloromethane Dichloromethane (Methylene chloride)	75-09-2	Prop 65 Cancer

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
Methylene chloride (dichloromethane)	75-09-2	X	X	X	X
o-terphenyl	84-15-1	-	X	-	-

16. OTHER INFORMATION

Prior Version Date:	04/27/23
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
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0197729

Description : o-Terphenyl Standard

o-Terphenyl Standard 10,000 µg/mL, Methylene Chloride, 1mL/ampul

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

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

Handling: Sonicate prior to use. **Ship:** Ambient

P1271
2
P12595 Y.P. 06130

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	o-Terphenyl	84-15-1	MKCH4487	99%	10,007.5 µg/mL	+/- 450.7438

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

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

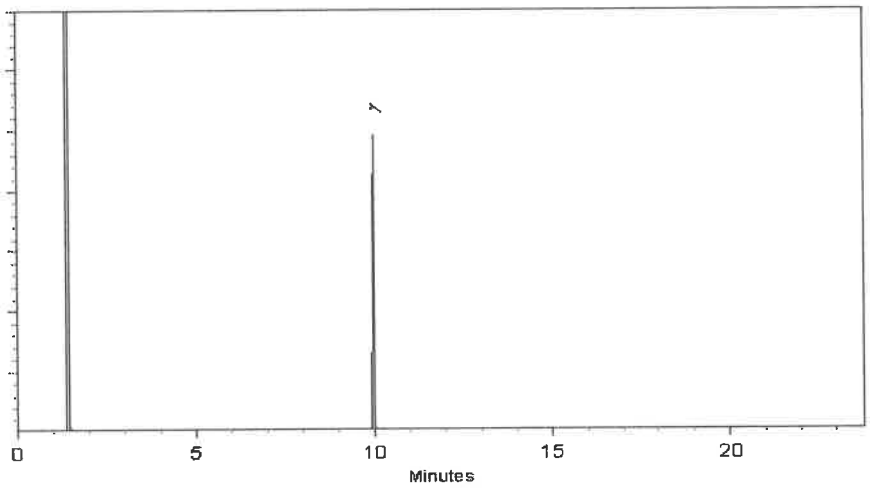
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
10 ml/min.

Inj. Vol
1µl



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

Alicia Leathers - Operation Technician I

Date Mixed: 03-May-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 08-May-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK

Safety Data Sheet

Revision Date: 05/04/23
www.restek.com

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

1. IDENTIFICATION

Catalog Number / Product Name:	**31097 / o-Terphenyl Standard**
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:	15
Intended use:	For Laboratory use only. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Carcinogenicity Category 2
GHS Signal Word:	Warning
GHS Hazard:	Suspected of causing cancer.
GHS Precautions:	
Safety Precautions:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF exposed or concerned: Get medical advice/attention.
Storage:	Store locked up.
Disposal:	Dispose of contents/container according to section 13 of the SDS.
Single Exposure Target Organs:	No data available
Repeated Exposure Target Organs:	No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
Methylene chloride (dichloromethane)	75-09-2	200-838-9	99
o-terphenyl	84-15-1	201-517-6	1

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: Immediately 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 and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical attention

Skin Contact: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard contaminated leather goods. Get medical attention immediately.

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. Never give anything by mouth to an unconscious person

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical 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 surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire.

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.

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. As with all chemicals, good industrial hygiene practices should be followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials. Keep container closed when not in use

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
Methylene chloride (dichloromethane)	75-09-2	2300 ppm IDLH	None Known	50 ppm TWA	25 ppm TWA; 125 ppm STEL (15 min. TWA)

o-terphenyl	84-15-1	500 mg/m3 IDLH	None Known	Not established	No data available

Personal Protection:

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

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.

Eye Protection: Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. 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.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory disease including asthma and bronchitis

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color:	Colorless
Odor:	Strong
Physical State:	No data available
pH:	Not applicable
Vapor Pressure:	No data available
Vapor Density:	2.93 (air = 1)
Boiling Point (°C):	40 °C at 1013 hPa (ECHA_API)
Melting Point (°C):	-96.7 °C .
Flash Point (°F):	230
Flammability:	Combustible at elevated temperatures
Upper Flammable/Explosive Limit, % in air:	No data available
Lower Flammable/Explosive Limit, % in air:	No data available
Autoignition Temperature (°C):	556 deg C
Decomposition Temperature (°C):	No data available
Specific Gravity:	1.3254 - 1.3258 g/cm3 at 20 °C
Evaporation Rate:	No data available
Odor Threshold:	ND
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available
VOC % by weight:	99
Molecular Weight:	No data available

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition.Contamination High temperatures
Materials to Avoid / Chemical Incompatiability:	Strong oxidizing agents Caustics (bases)
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation Absorption Ingestion Skin contact Eye contact
Target Organs Potentially Affected By Exposure:	Skin, Cardiovascular System, Eyes, Liver, 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)Inhalation may cause severe central nervous system depression (including unconsciousness).
Skin Contact:	Contact causes severe skin irritation and possible burns.
Skin Absorption:	Harmful if absorbed through the skin. May cause severe irritation and systemic damage.
Eye Contact:	Contact with the eyes may cause moderate to severe eye injury. Eye contact may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.
Ingestion Irritation:	Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.
Ingestion Toxicity:	Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

Carcinogenicity:	Contains a probable or known human carcinogen.
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 Absorption:	Upon prolonged or repeated exposure, harmful if absorbed through the skin. May cause severe irritation and systemic damage

Component Toxicological Data:
NIOSH:

Chemical Name	CAS No.	LD50/LC50
o-Terphenyl	84-15-1	Oral LD50 Rat 1900 mg/kg
Dichloromethane	75-09-2	Dermal LD50 Rat >2000 mg/kg; Inhalation LC50 Rat 53 mg/L 6 h; Oral LD50 Rat 1600 mg/kg

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	25 ppm TWA (8 hr.); 125 ppm STEL (15 min.); 12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910 Specifically Regulate

ACGIH:

Chemical Name	CAS No.	
Dichloromethane	75-09-2	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

NIOSH:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	potential occupational carcinogen

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.
Monograph 110 [2017]; Monograph 71 [1999]	75-09-2	Group 2A

12. ECOLOGICAL INFORMATION

Overview:	Moderate ecological hazard. This product may be dangerous

to plants and/or wildlife. Keep out of waterways.

Mobility: No data
Persistence: No data
Bioaccumulation: No data
Degradability: No data
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: Incinerate spent or discarded material a permitted hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial Environmental Regulations.

14. TRANSPORTATION INFORMATION

United States:

DOT Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
Methylene chloride (dichloromethane)	75-09-2	X	X	-	X
o-terphenyl	84-15-1	-	-	-	X

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Dichloromethane Dichloromethane (Methylene chloride)	75-09-2	Prop 65 Cancer

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
Methylene chloride (dichloromethane)	75-09-2	X	X	X	X
o-terphenyl	84-15-1	-	X	-	-

16. OTHER INFORMATION

Prior Version Date:	04/27/23
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
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0197729

Description : o-Terphenyl Standard

o-Terphenyl Standard 10,000 µg/mL, Methylene Chloride, 1mL/ampul

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

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

Handling: Sonicate prior to use. **Ship:** Ambient

P1271
2
P12595 Y.P. 06130

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	o-Terphenyl	84-15-1	MKCH4487	99%	10,007.5 µg/mL	+/- 450.7438

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

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

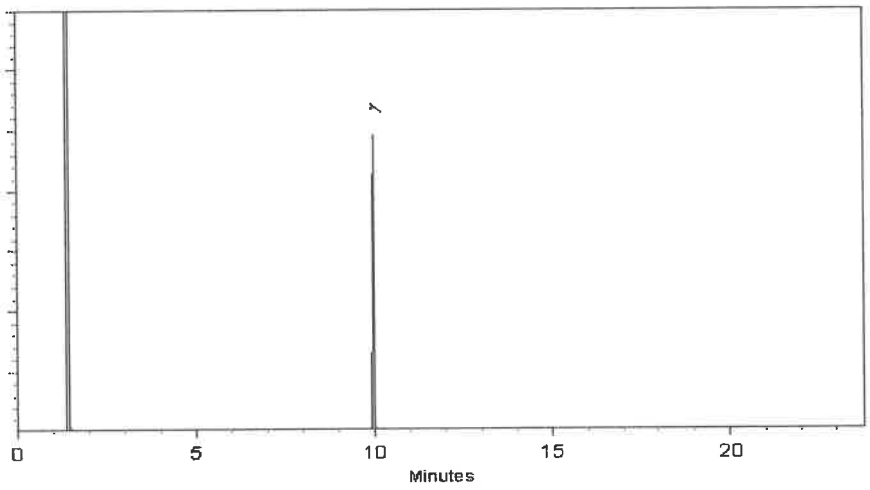
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
10 ml/min.

Inj. Vol
1µl



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

Alicia Leathers - Operation Technician I

Date Mixed: 03-May-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 08-May-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK

Safety Data Sheet

Revision Date: 05/04/23
www.restek.com

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

1. IDENTIFICATION

Catalog Number / Product Name:	**31097 / o-Terphenyl Standard**
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:	15
Intended use:	For Laboratory use only. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Carcinogenicity Category 2
GHS Signal Word:	Warning
GHS Hazard:	Suspected of causing cancer.
GHS Precautions:	
Safety Precautions:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF exposed or concerned: Get medical advice/attention.
Storage:	Store locked up.
Disposal:	Dispose of contents/container according to section 13 of the SDS.
Single Exposure Target Organs:	No data available
Repeated Exposure Target Organs:	No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
Methylene chloride (dichloromethane)	75-09-2	200-838-9	99
o-terphenyl	84-15-1	201-517-6	1

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: Immediately 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 and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical attention

Skin Contact: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard contaminated leather goods. Get medical attention immediately.

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. Never give anything by mouth to an unconscious person

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical 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 surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire.

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.

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. As with all chemicals, good industrial hygiene practices should be followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials. Keep container closed when not in use

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
Methylene chloride (dichloromethane)	75-09-2	2300 ppm IDLH	None Known	50 ppm TWA	25 ppm TWA; 125 ppm STEL (15 min. TWA)

o-terphenyl	84-15-1	500 mg/m3 IDLH	None Known	Not established	No data available

Personal Protection:

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

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.

Eye Protection: Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. 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.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory disease including asthma and bronchitis

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color:	Colorless
Odor:	Strong
Physical State:	No data available
pH:	Not applicable
Vapor Pressure:	No data available
Vapor Density:	2.93 (air = 1)
Boiling Point (°C):	40 °C at 1013 hPa (ECHA_API)
Melting Point (°C):	-96.7 °C .
Flash Point (°F):	230
Flammability:	Combustible at elevated temperatures
Upper Flammable/Explosive Limit, % in air:	No data available
Lower Flammable/Explosive Limit, % in air:	No data available
Autoignition Temperature (°C):	556 deg C
Decomposition Temperature (°C):	No data available
Specific Gravity:	1.3254 - 1.3258 g/cm3 at 20 °C
Evaporation Rate:	No data available
Odor Threshold:	ND
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available
VOC % by weight:	99
Molecular Weight:	No data available

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition.Contamination High temperatures
Materials to Avoid / Chemical Incompatiability:	Strong oxidizing agents Caustics (bases)
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation Absorption Ingestion Skin contact Eye contact
Target Organs Potentially Affected By Exposure:	Skin, Cardiovascular System, Eyes, Liver, 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)Inhalation may cause severe central nervous system depression (including unconsciousness).
Skin Contact:	Contact causes severe skin irritation and possible burns.
Skin Absorption:	Harmful if absorbed through the skin. May cause severe irritation and systemic damage.
Eye Contact:	Contact with the eyes may cause moderate to severe eye injury. Eye contact may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.
Ingestion Irritation:	Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.
Ingestion Toxicity:	Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

Carcinogenicity:	Contains a probable or known human carcinogen.
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 Absorption:	Upon prolonged or repeated exposure, harmful if absorbed through the skin. May cause severe irritation and systemic damage

Component Toxicological Data:
NIOSH:

Chemical Name	CAS No.	LD50/LC50
o-Terphenyl	84-15-1	Oral LD50 Rat 1900 mg/kg
Dichloromethane	75-09-2	Dermal LD50 Rat >2000 mg/kg; Inhalation LC50 Rat 53 mg/L 6 h; Oral LD50 Rat 1600 mg/kg

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	25 ppm TWA (8 hr.); 125 ppm STEL (15 min.); 12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910 Specifically Regulate

ACGIH:

Chemical Name	CAS No.	
Dichloromethane	75-09-2	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

NIOSH:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	potential occupational carcinogen

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.
Monograph 110 [2017]; Monograph 71 [1999]	75-09-2	Group 2A

12. ECOLOGICAL INFORMATION

Overview:	Moderate ecological hazard. This product may be dangerous

to plants and/or wildlife. Keep out of waterways.

Mobility: No data
Persistence: No data
Bioaccumulation: No data
Degradability: No data
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: Incinerate spent or discarded material a permitted hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial Environmental Regulations.

14. TRANSPORTATION INFORMATION

United States:

DOT Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
Methylene chloride (dichloromethane)	75-09-2	X	X	-	X
o-terphenyl	84-15-1	-	-	-	X

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Dichloromethane Dichloromethane (Methylene chloride)	75-09-2	Prop 65 Cancer

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
Methylene chloride (dichloromethane)	75-09-2	X	X	X	X
o-terphenyl	84-15-1	-	X	-	-

16. OTHER INFORMATION

Prior Version Date:	04/27/23
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
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0197729

Description : o-Terphenyl Standard

o-Terphenyl Standard 10,000 µg/mL, Methylene Chloride, 1mL/ampul

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

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

Handling: Sonicate prior to use. **Ship:** Ambient

P1271
2
P12595 Y.P. 06130

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	o-Terphenyl	84-15-1	MKCH4487	99%	10,007.5 µg/mL	+/- 450.7438

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

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

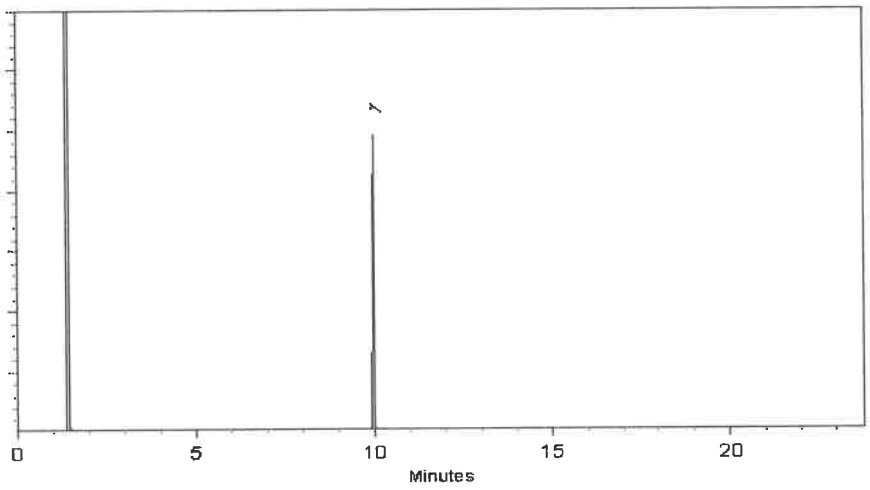
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
10 ml/min.

Inj. Vol
1µl



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

Alicia Leathers - Operation Technician I

Date Mixed: 03-May-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 08-May-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK

Safety Data Sheet

Revision Date: 05/04/23
www.restek.com

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

1. IDENTIFICATION

Catalog Number / Product Name:	**31097 / o-Terphenyl Standard**
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:	15
Intended use:	For Laboratory use only. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Carcinogenicity Category 2
GHS Signal Word:	Warning
GHS Hazard:	Suspected of causing cancer.
GHS Precautions:	
Safety Precautions:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF exposed or concerned: Get medical advice/attention.
Storage:	Store locked up.
Disposal:	Dispose of contents/container according to section 13 of the SDS.
Single Exposure Target Organs:	No data available
Repeated Exposure Target Organs:	No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
Methylene chloride (dichloromethane)	75-09-2	200-838-9	99
o-terphenyl	84-15-1	201-517-6	1

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: Immediately 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 and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical attention

Skin Contact: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard contaminated leather goods. Get medical attention immediately.

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. Never give anything by mouth to an unconscious person

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical 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 surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire.

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.

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. As with all chemicals, good industrial hygiene practices should be followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials. Keep container closed when not in use

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
Methylene chloride (dichloromethane)	75-09-2	2300 ppm IDLH	None Known	50 ppm TWA	25 ppm TWA; 125 ppm STEL (15 min. TWA)

o-terphenyl	84-15-1	500 mg/m3 IDLH	None Known	Not established	No data available

Personal Protection:

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

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.

Eye Protection: Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. 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.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory disease including asthma and bronchitis

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color:	Colorless
Odor:	Strong
Physical State:	No data available
pH:	Not applicable
Vapor Pressure:	No data available
Vapor Density:	2.93 (air = 1)
Boiling Point (°C):	40 °C at 1013 hPa (ECHA_API)
Melting Point (°C):	-96.7 °C .
Flash Point (°F):	230
Flammability:	Combustible at elevated temperatures
Upper Flammable/Explosive Limit, % in air:	No data available
Lower Flammable/Explosive Limit, % in air:	No data available
Autoignition Temperature (°C):	556 deg C
Decomposition Temperature (°C):	No data available
Specific Gravity:	1.3254 - 1.3258 g/cm3 at 20 °C
Evaporation Rate:	No data available
Odor Threshold:	ND
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available
VOC % by weight:	99
Molecular Weight:	No data available

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition.Contamination High temperatures
Materials to Avoid / Chemical Incompatiability:	Strong oxidizing agents Caustics (bases)
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation Absorption Ingestion Skin contact Eye contact
Target Organs Potentially Affected By Exposure:	Skin, Cardiovascular System, Eyes, Liver, 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)Inhalation may cause severe central nervous system depression (including unconsciousness).
Skin Contact:	Contact causes severe skin irritation and possible burns.
Skin Absorption:	Harmful if absorbed through the skin. May cause severe irritation and systemic damage.
Eye Contact:	Contact with the eyes may cause moderate to severe eye injury. Eye contact may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.
Ingestion Irritation:	Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.
Ingestion Toxicity:	Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

Carcinogenicity:	Contains a probable or known human carcinogen.
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 Absorption:	Upon prolonged or repeated exposure, harmful if absorbed through the skin. May cause severe irritation and systemic damage

Component Toxicological Data:
NIOSH:

Chemical Name	CAS No.	LD50/LC50
o-Terphenyl	84-15-1	Oral LD50 Rat 1900 mg/kg
Dichloromethane	75-09-2	Dermal LD50 Rat >2000 mg/kg; Inhalation LC50 Rat 53 mg/L 6 h; Oral LD50 Rat 1600 mg/kg

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	25 ppm TWA (8 hr.); 125 ppm STEL (15 min.); 12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910 Specifically Regulate

ACGIH:

Chemical Name	CAS No.	
Dichloromethane	75-09-2	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

NIOSH:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	potential occupational carcinogen

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.
Monograph 110 [2017]; Monograph 71 [1999]	75-09-2	Group 2A

12. ECOLOGICAL INFORMATION

Overview:	Moderate ecological hazard. This product may be dangerous

to plants and/or wildlife. Keep out of waterways.

Mobility: No data
Persistence: No data
Bioaccumulation: No data
Degradability: No data
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: Incinerate spent or discarded material a permitted hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial Environmental Regulations.

14. TRANSPORTATION INFORMATION

United States:

DOT Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
Methylene chloride (dichloromethane)	75-09-2	X	X	-	X
o-terphenyl	84-15-1	-	-	-	X

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Dichloromethane Dichloromethane (Methylene chloride)	75-09-2	Prop 65 Cancer

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
Methylene chloride (dichloromethane)	75-09-2	X	X	X	X
o-terphenyl	84-15-1	-	X	-	-

16. OTHER INFORMATION

Prior Version Date:	04/27/23
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
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0197729

Description : o-Terphenyl Standard

o-Terphenyl Standard 10,000 µg/mL, Methylene Chloride, 1mL/ampul

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

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

Handling: Sonicate prior to use. **Ship:** Ambient

P1271
2
P12595 Y.P. 06130

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	o-Terphenyl	84-15-1	MKCH4487	99%	10,007.5 µg/mL	+/- 450.7438

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

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

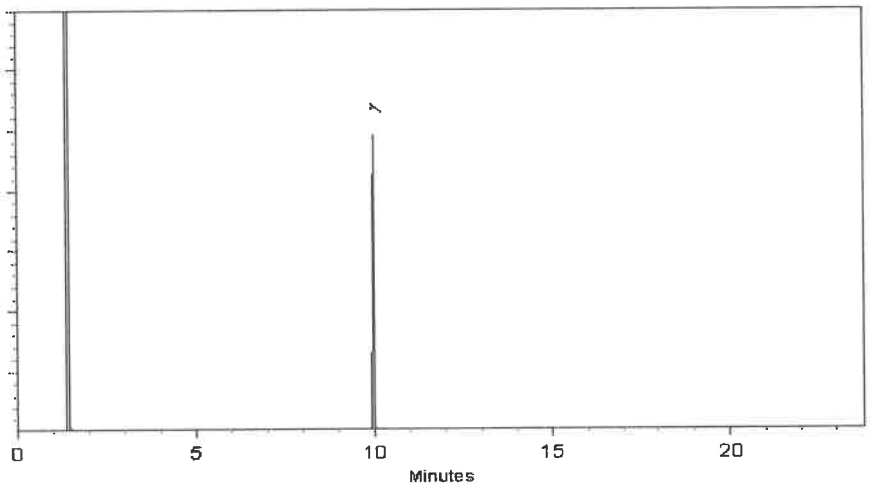
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
10 ml/min.

Inj. Vol
1µl



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

Alicia Leathers - Operation Technician I

Date Mixed: 03-May-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 08-May-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK

Safety Data Sheet

Revision Date: 05/04/23
www.restek.com

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

1. IDENTIFICATION

Catalog Number / Product Name:	**31097 / o-Terphenyl Standard**
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:	15
Intended use:	For Laboratory use only. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Carcinogenicity Category 2
GHS Signal Word:	Warning
GHS Hazard:	Suspected of causing cancer.
GHS Precautions:	
Safety Precautions:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF exposed or concerned: Get medical advice/attention.
Storage:	Store locked up.
Disposal:	Dispose of contents/container according to section 13 of the SDS.
Single Exposure Target Organs:	No data available
Repeated Exposure Target Organs:	No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
Methylene chloride (dichloromethane)	75-09-2	200-838-9	99
o-terphenyl	84-15-1	201-517-6	1

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: Immediately 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 and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical attention

Skin Contact: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard contaminated leather goods. Get medical attention immediately.

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. Never give anything by mouth to an unconscious person

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical 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 surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire.

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.

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. As with all chemicals, good industrial hygiene practices should be followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials. Keep container closed when not in use

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
Methylene chloride (dichloromethane)	75-09-2	2300 ppm IDLH	None Known	50 ppm TWA	25 ppm TWA; 125 ppm STEL (15 min. TWA)

o-terphenyl	84-15-1	500 mg/m3 IDLH	None Known	Not established	No data available

Personal Protection:

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

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.

Eye Protection: Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. 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.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory disease including asthma and bronchitis

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color:	Colorless
Odor:	Strong
Physical State:	No data available
pH:	Not applicable
Vapor Pressure:	No data available
Vapor Density:	2.93 (air = 1)
Boiling Point (°C):	40 °C at 1013 hPa (ECHA_API)
Melting Point (°C):	-96.7 °C .
Flash Point (°F):	230
Flammability:	Combustible at elevated temperatures
Upper Flammable/Explosive Limit, % in air:	No data available
Lower Flammable/Explosive Limit, % in air:	No data available
Autoignition Temperature (°C):	556 deg C
Decomposition Temperature (°C):	No data available
Specific Gravity:	1.3254 - 1.3258 g/cm3 at 20 °C
Evaporation Rate:	No data available
Odor Threshold:	ND
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available
VOC % by weight:	99
Molecular Weight:	No data available

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition.Contamination High temperatures
Materials to Avoid / Chemical Incompatiability:	Strong oxidizing agents Caustics (bases)
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation Absorption Ingestion Skin contact Eye contact
Target Organs Potentially Affected By Exposure:	Skin, Cardiovascular System, Eyes, Liver, 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)Inhalation may cause severe central nervous system depression (including unconsciousness).
Skin Contact:	Contact causes severe skin irritation and possible burns.
Skin Absorption:	Harmful if absorbed through the skin. May cause severe irritation and systemic damage.
Eye Contact:	Contact with the eyes may cause moderate to severe eye injury. Eye contact may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.
Ingestion Irritation:	Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.
Ingestion Toxicity:	Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

Carcinogenicity:	Contains a probable or known human carcinogen.
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 Absorption:	Upon prolonged or repeated exposure, harmful if absorbed through the skin. May cause severe irritation and systemic damage

Component Toxicological Data:
NIOSH:

Chemical Name	CAS No.	LD50/LC50
o-Terphenyl	84-15-1	Oral LD50 Rat 1900 mg/kg
Dichloromethane	75-09-2	Dermal LD50 Rat >2000 mg/kg; Inhalation LC50 Rat 53 mg/L 6 h; Oral LD50 Rat 1600 mg/kg

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	25 ppm TWA (8 hr.); 125 ppm STEL (15 min.); 12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910 Specifically Regulate

ACGIH:

Chemical Name	CAS No.	
Dichloromethane	75-09-2	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

NIOSH:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	potential occupational carcinogen

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.
Monograph 110 [2017]; Monograph 71 [1999]	75-09-2	Group 2A

12. ECOLOGICAL INFORMATION

Overview:	Moderate ecological hazard. This product may be dangerous

to plants and/or wildlife. Keep out of waterways.

Mobility: No data
Persistence: No data
Bioaccumulation: No data
Degradability: No data
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: Incinerate spent or discarded material a permitted hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial Environmental Regulations.

14. TRANSPORTATION INFORMATION

United States:

DOT Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
Methylene chloride (dichloromethane)	75-09-2	X	X	-	X
o-terphenyl	84-15-1	-	-	-	X

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Dichloromethane Dichloromethane (Methylene chloride)	75-09-2	Prop 65 Cancer

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
Methylene chloride (dichloromethane)	75-09-2	X	X	X	X
o-terphenyl	84-15-1	-	X	-	-

16. OTHER INFORMATION

Prior Version Date:	04/27/23
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
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0197729

Description : o-Terphenyl Standard

o-Terphenyl Standard 10,000 µg/mL, Methylene Chloride, 1mL/ampul

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

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

Handling: Sonicate prior to use. **Ship:** Ambient

P1271
2
P12595 Y.P. 06130

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	o-Terphenyl	84-15-1	MKCH4487	99%	10,007.5 µg/mL	+/- 450.7438

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

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

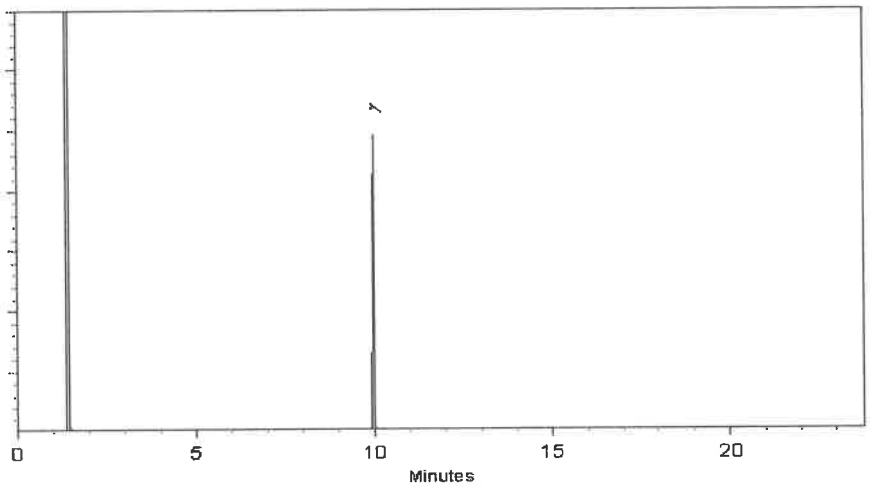
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
10 ml/min.

Inj. Vol
1µl



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

Alicia Leathers - Operation Technician I

Date Mixed: 03-May-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 08-May-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK

Safety Data Sheet

Revision Date: 05/04/23
www.restek.com

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

1. IDENTIFICATION

Catalog Number / Product Name:	**31097 / o-Terphenyl Standard**
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:	15
Intended use:	For Laboratory use only. This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

2. HAZARD(S)IDENTIFICATION

Emergency Overview:

GHS Hazard Symbols:

GHS Classification:	Carcinogenicity Category 2
GHS Signal Word:	Warning
GHS Hazard:	Suspected of causing cancer.
GHS Precautions:	
Safety Precautions:	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
First Aid Measures:	IF exposed or concerned: Get medical advice/attention.
Storage:	Store locked up.
Disposal:	Dispose of contents/container according to section 13 of the SDS.
Single Exposure Target Organs:	No data available
Repeated Exposure Target Organs:	No data available

3. COMPOSITION / INFORMATION ON INGREDIENT

Chemical Name	CAS #	EINEC #	% Composition
Methylene chloride (dichloromethane)	75-09-2	200-838-9	99
o-terphenyl	84-15-1	201-517-6	1

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: Immediately 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 and monitor the eye daily as advised by your physician. Serious harm (damage) may result if treatment is delayed. Continue to flush eyes while awaiting medical attention

Skin Contact: Wash with soap and water. Remove contaminated clothing, launder immediately, and discard contaminated leather goods. Get medical attention immediately.

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. Never give anything by mouth to an unconscious person

5. FIRE- FIGHTING MEASURES

Extinguishing Media: Use alcohol resistant foam, carbon dioxide, or dry chemical 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 surface of the fire. Do Not direct a stream of water into the hot burning liquid. Use methods suitable to fight surrounding fire.

Fire and/or Explosion Hazards: Material may be ignited only if preheated to temperatures above the high flash point, for example in a fire.

Fire Fighting Methods and Protection: Do not enter fire area without proper protection including self- contained breathing apparatus and full protective equipment.

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. As with all chemicals, good industrial hygiene practices should be followed when handling this material.

Storage Technical Measures and Conditions: Store in a cool dry place. Isolate from incompatible materials. Keep container closed when not in use

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

United States:

Chemical Name	CAS No.	IDLH	ACGIH STEL	ACGIH TLV-TWA	OSHA Exposure Limit
Methylene chloride (dichloromethane)	75-09-2	2300 ppm IDLH	None Known	50 ppm TWA	25 ppm TWA; 125 ppm STEL (15 min. TWA)

o-terphenyl	84-15-1	500 mg/m3 IDLH	None Known	Not established	No data available

Personal Protection:

Engineering Measures: Local exhaust ventilation or other engineering controls are normally required when handling or using this product to avoid overexposure.

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.

Eye Protection: Wear chemically resistant safety glasses with side shields when handling this product. Wear additional eye protection such as chemical splash goggles and/or face shield when the possibility exists for eye contact with splashing or spraying liquid, or airborne material. Do not wear contact lenses. Have an eye wash station available.

Skin Protection: Avoid skin contact by wearing chemically resistant gloves, an apron and other protective equipment depending upon conditions of use. 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.

Medical Conditions Aggravated By Exposure: Eye disease Skin disease including eczema and sensitization Respiratory disease including asthma and bronchitis

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance, color:	Colorless
Odor:	Strong
Physical State:	No data available
pH:	Not applicable
Vapor Pressure:	No data available
Vapor Density:	2.93 (air = 1)
Boiling Point (°C):	40 °C at 1013 hPa (ECHA_API)
Melting Point (°C):	-96.7 °C .
Flash Point (°F):	230
Flammability:	Combustible at elevated temperatures
Upper Flammable/Explosive Limit, % in air:	No data available
Lower Flammable/Explosive Limit, % in air:	No data available
Autoignition Temperature (°C):	556 deg C
Decomposition Temperature (°C):	No data available
Specific Gravity:	1.3254 - 1.3258 g/cm3 at 20 °C
Evaporation Rate:	No data available
Odor Threshold:	ND
Solubility:	Moderate; 50-99%
Partition Coefficient: n-octanol in water:	No data available
VOC % by weight:	99
Molecular Weight:	No data available

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions.
Conditions to Avoid:	Temperatures above the high flash point of this combustible material in combination with sparks, open flames, or other sources of ignition.Contamination High temperatures
Materials to Avoid / Chemical Incompatiability:	Strong oxidizing agents Caustics (bases)
Hazardous Decomposition Products:	Carbon dioxide Carbon monoxide

11. TOXICOLOGICAL INFORMATION

Routes of Entry:	Inhalation Absorption Ingestion Skin contact Eye contact
Target Organs Potentially Affected By Exposure:	Skin, Cardiovascular System, Eyes, Liver, 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)Inhalation may cause severe central nervous system depression (including unconsciousness).
Skin Contact:	Contact causes severe skin irritation and possible burns.
Skin Absorption:	Harmful if absorbed through the skin. May cause severe irritation and systemic damage.
Eye Contact:	Contact with the eyes may cause moderate to severe eye injury. Eye contact may result in tearing and reddening, but not likely to permanently injure eye tissue. Temporary vision impairment (cloudy or blurred vision) is possible.
Ingestion Irritation:	Irritating to mouth, throat, and stomach. Can cause abdominal discomfort, nausea, vomiting and diarrhea.
Ingestion Toxicity:	Harmful if swallowed. May cause systemic poisoning.

Long-Term (Chronic) Health Effects:

Carcinogenicity:	Contains a probable or known human carcinogen.
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 Absorption:	Upon prolonged or repeated exposure, harmful if absorbed through the skin. May cause severe irritation and systemic damage

Component Toxicological Data:
NIOSH:

Chemical Name	CAS No.	LD50/LC50
o-Terphenyl	84-15-1	Oral LD50 Rat 1900 mg/kg
Dichloromethane	75-09-2	Dermal LD50 Rat >2000 mg/kg; Inhalation LC50 Rat 53 mg/L 6 h; Oral LD50 Rat 1600 mg/kg

Component Carcinogenic Data:
OSHA:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	25 ppm TWA (8 hr.); 125 ppm STEL (15 min.); 12.5 ppm Action Level (see 29 CFR 1910.1051); effective date for respiratory protection for certain employers to acheive the 8-hour TWA PEL is August 31, 1998; the start up date to install engineering controls is December 10, 1998.; {OSHA - 29 CFR 1910 Specifically Regulate

ACGIH:

Chemical Name	CAS No.	
Dichloromethane	75-09-2	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans

NIOSH:

Chemical Name	CAS No.	
Methylene chloride	75-09-2	potential occupational carcinogen

NTP:

Chemical Name	CAS No.
No data available	

IARC:

Chemical Name	CAS No.	Group No.
Monograph 110 [2017]; Monograph 71 [1999]	75-09-2	Group 2A

12. ECOLOGICAL INFORMATION

Overview:	Moderate ecological hazard. This product may be dangerous

to plants and/or wildlife. Keep out of waterways.

Mobility: No data
Persistence: No data
Bioaccumulation: No data
Degradability: No data
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: Incinerate spent or discarded material a permitted hazardous waste facility.

Waste Disposal of Packaging: Comply with all Local, State, Federal, and Provincial Environmental Regulations.

14. TRANSPORTATION INFORMATION

United States:

DOT Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

International:

IATA Proper Shipping Name: Toxic, liquids, organic, n.o.s. (Dichloromethane, o-Terphenyl)
UN Number: UN2810
Hazard Class: 6.1
Packing Group: III

Marine Pollutant: No

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

15. REGULATORY INFORMATION

United States:

This chemical/product is not and cannot be distributed in commerce (as defined in TSCA section 3(5)) or processed (as defined in TSCA section 3(13)) for consumer paint or coating removal.

Chemical Name	CAS#	CERCLA	SARA 313	SARA EHS 313	TSCA
Methylene chloride (dichloromethane)	75-09-2	X	X	-	X
o-terphenyl	84-15-1	-	-	-	X

The following chemicals are listed on CA Prop 65:

Chemical Name	CAS #	Regulation
Dichloromethane Dichloromethane (Methylene chloride)	75-09-2	Prop 65 Cancer

State Right To Know Listing:

Chemical Name	CAS#	New Jersey	Massachusetts	Pennsylvania	California
Methylene chloride (dichloromethane)	75-09-2	X	X	X	X
o-terphenyl	84-15-1	-	X	-	-

16. OTHER INFORMATION

Prior Version Date:	04/27/23
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
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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.

P12665 ↓ P12684 } Y.P. 07/19/23

Catalog No. : 31480 **Lot No.:** A0196246

Description : MA Fractionation Surrogate Spike Mix

MA Fractionation Surrogate Spike Mix 4000µg/mL, Hexane, 1mL/ampul

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

Expiration Date : February 28, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	2-Fluorobiphenyl	321-60-8	00021384	99%	4,025.1 µg/mL	+/- 181.3135
2	2-Bromonaphthalene	580-13-2	STBC5362V	99%	4,021.1 µg/mL	+/- 181.1342

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

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

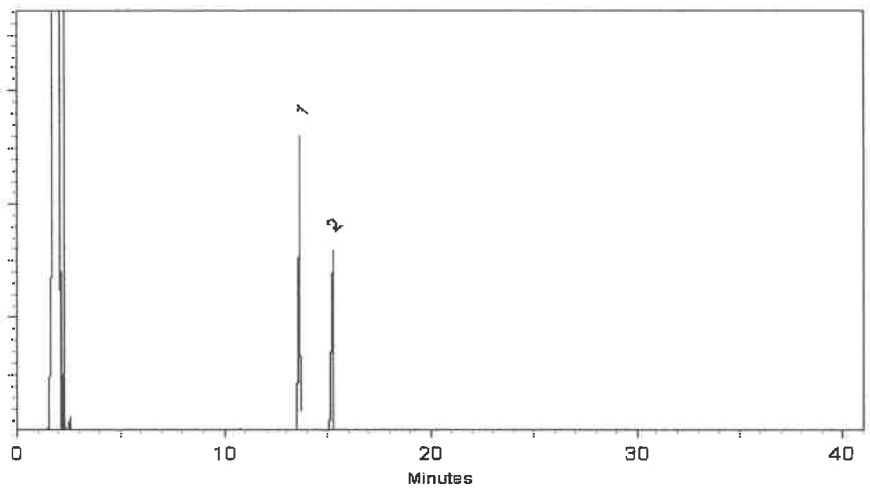
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Stacey Wanner - Operations Technician I

Date Mixed: 24-Mar-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 28-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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.

P12665 ↓ P12684 } Y.P. 07/19/23

Catalog No. : 31480 **Lot No.:** A0196246

Description : MA Fractionation Surrogate Spike Mix

MA Fractionation Surrogate Spike Mix 4000µg/mL, Hexane, 1mL/ampul

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

Expiration Date : February 28, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	2-Fluorobiphenyl	321-60-8	00021384	99%	4,025.1 µg/mL	+/- 181.3135
2	2-Bromonaphthalene	580-13-2	STBC5362V	99%	4,021.1 µg/mL	+/- 181.1342

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

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

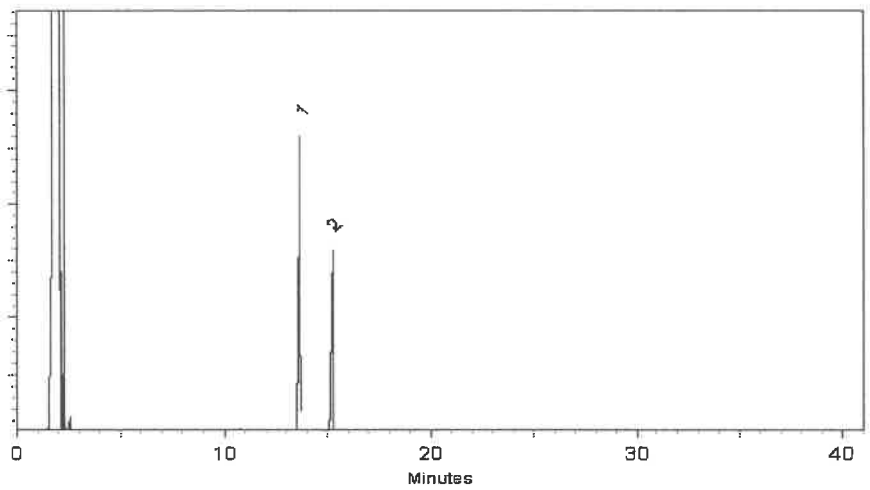
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Stacey Wanner - Operations Technician I

Date Mixed: 24-Mar-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 28-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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.

P12665 ↓ P12684 } Y.P. 07/19/23

Catalog No. : 31480 **Lot No.:** A0196246

Description : MA Fractionation Surrogate Spike Mix

MA Fractionation Surrogate Spike Mix 4000µg/mL, Hexane, 1mL/ampul

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

Expiration Date : February 28, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	2-Fluorobiphenyl	321-60-8	00021384	99%	4,025.1 µg/mL	+/- 181.3135
2	2-Bromonaphthalene	580-13-2	STBC5362V	99%	4,021.1 µg/mL	+/- 181.1342

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

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

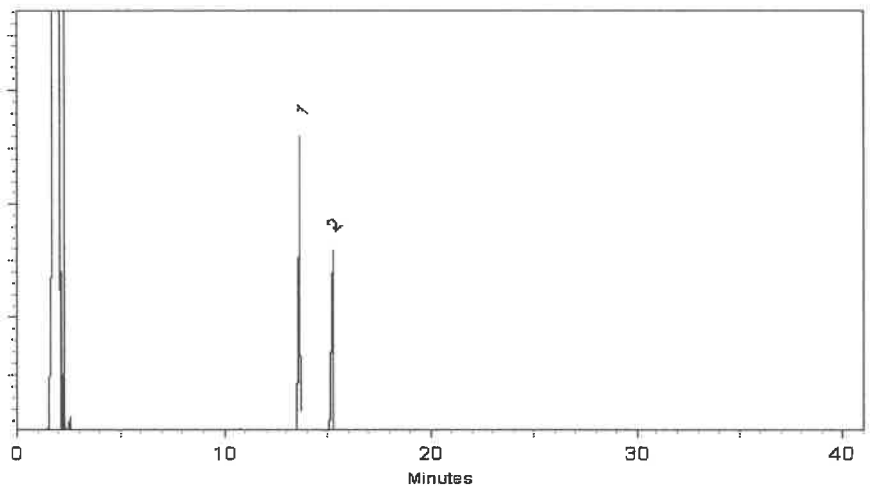
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Stacey Wanner - Operations Technician I

Date Mixed: 24-Mar-2023 **Balance Serial #** 1128360905

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 28-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

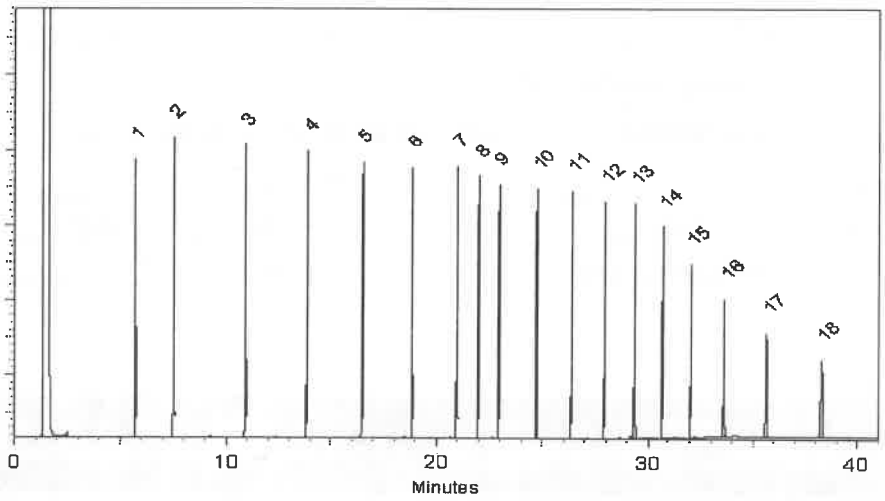
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

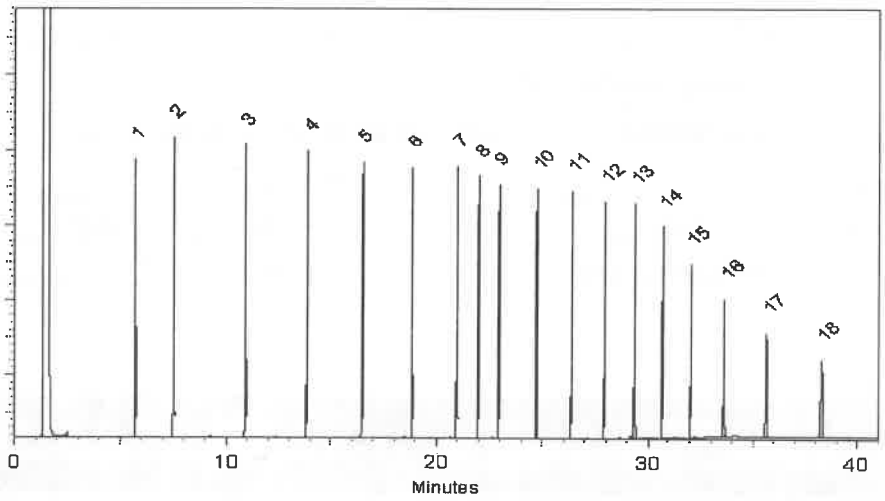
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

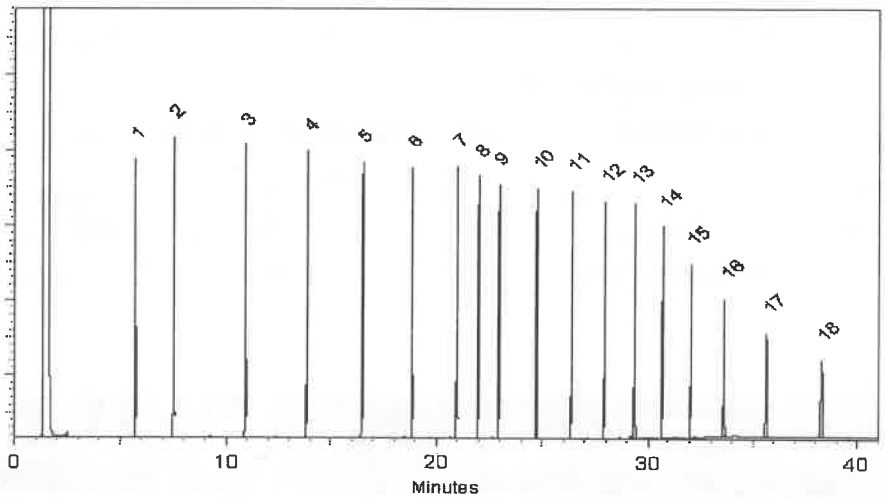
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

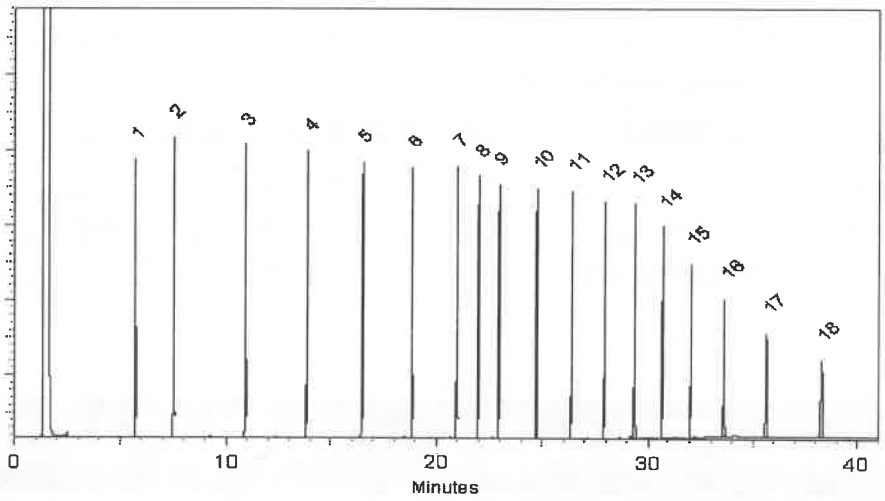
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

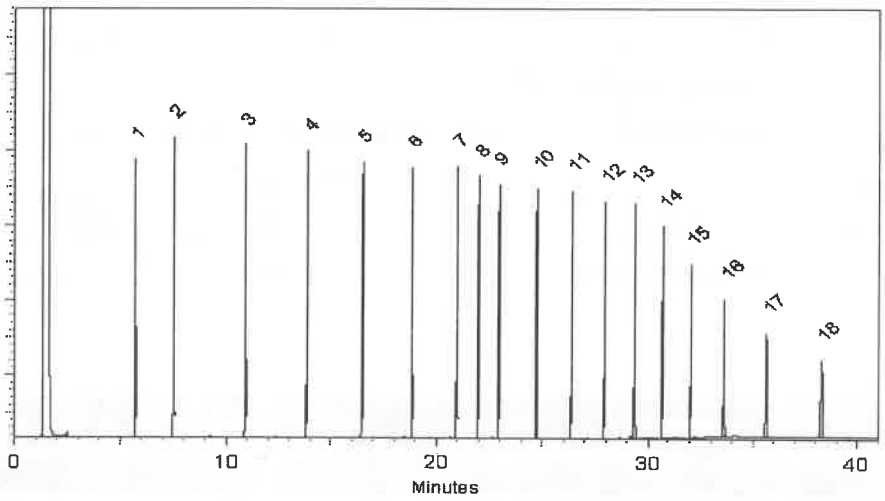
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

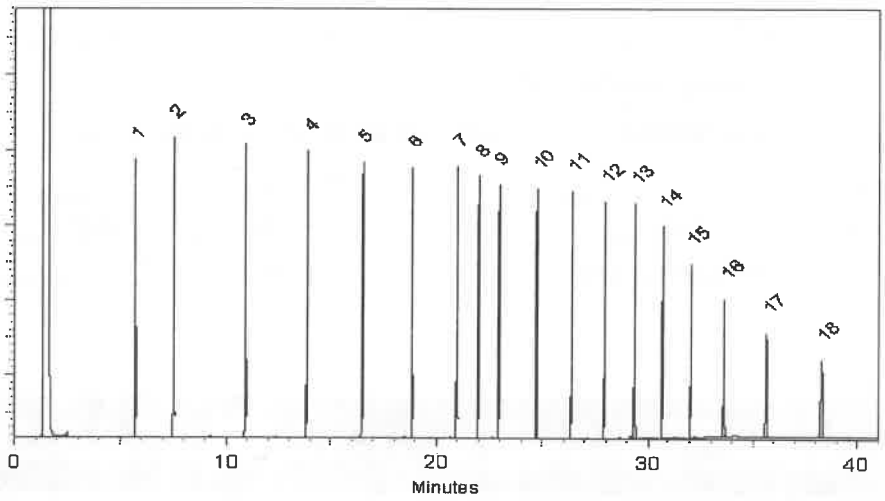
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

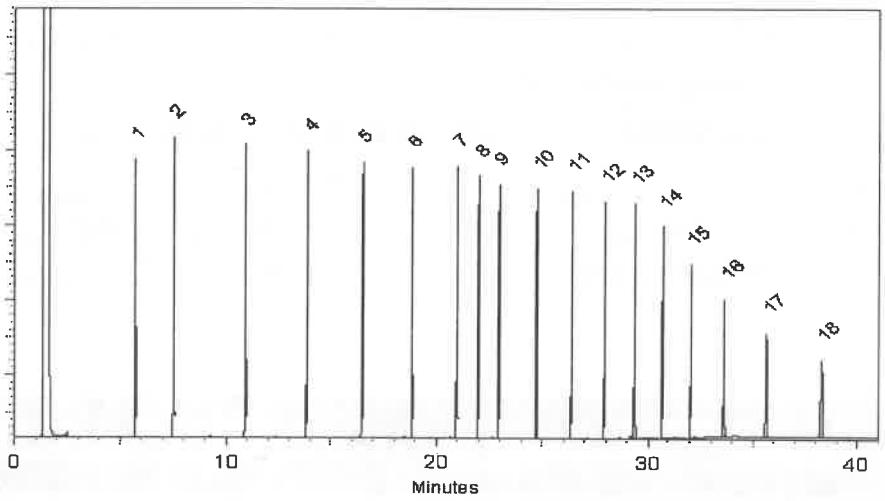
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

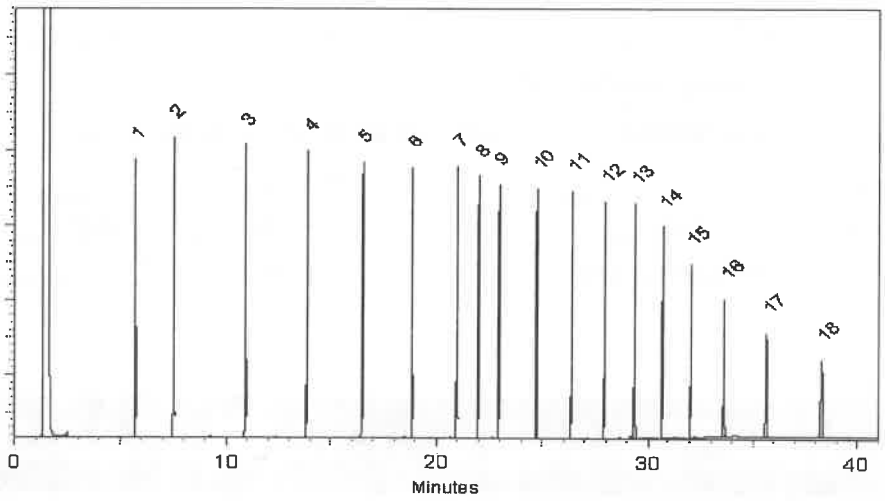
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

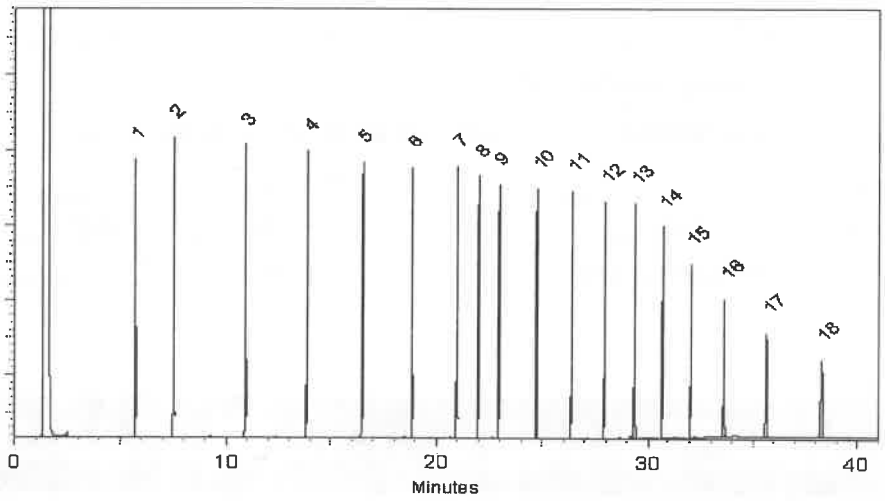
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

chromatographic plus

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.

P12716 ↓ P12730 } Y,P, 08/28/23

Catalog No. : 30542 **Lot No.:** A0195645

Description : NJEPH Aliphatics Matrix Spike Mix

NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : April 30, 2030 **Storage:** 10°C or colder

Handling: Sonicate prior to use. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	n-Nonane (C9)	111-84-2	SHBN5361	99%	202.0 µg/mL	+/- 5.2184
2	n-Decane (C10)	124-18-5	SHBN8619	99%	201.3 µg/mL	+/- 5.2012
3	n-Dodecane (C12)	112-40-3	SHBP7054	99%	202.0 µg/mL	+/- 5.2184
4	n-Tetradecane (C14)	629-59-4	STBK5437	99%	201.7 µg/mL	+/- 5.2098
5	n-Hexadecane (C16)	544-76-3	SHBQ0897	99%	201.3 µg/mL	+/- 5.2012
6	n-Octadecane (C18)	593-45-3	UE5NG	98%	201.6 µg/mL	+/- 5.2068
7	n-Eicosane (C20)	112-95-8	MKCN8767	97%	200.8 µg/mL	+/- 5.1871
8	n-Heneicosane (C21)	629-94-7	MKCL3226	99%	201.0 µg/mL	+/- 5.1926
9	n-Docosane (C22)	629-97-0	MKCL8918	99%	200.7 µg/mL	+/- 5.1839
10	n-Tetracosane (C24)	646-31-1	MKCQ8345	99%	201.3 µg/mL	+/- 5.2012
11	n-Hexacosane (C26)	630-01-3	MKCD4540	99%	201.0 µg/mL	+/- 5.1926
12	n-Octacosane (C28)	630-02-4	BCBS1577V	99%	201.7 µg/mL	+/- 5.2098
13	n-Triacontane (C30)	638-68-6	MKCQ9436	97%	200.8 µg/mL	+/- 5.1871
14	n-Dotriacontane (C32)	544-85-4	BCBW0661	99%	200.3 µg/mL	+/- 5.1753
15	n-Tetratriacontane (C34)	14167-59-0	D3MZN	99%	200.3 µg/mL	+/- 5.1753
16	n-Hexatriacontane (C36)	630-06-8	Z27H018	99%	200.3 µg/mL	+/- 5.1753
17	n-Octatriacontane (C38)	7194-85-6	0000145137	96%	201.6 µg/mL	+/- 5.2081

18	n-Tetracontane (C40)	4181-95-7	BSBME	99%	201.3 µg/mL	+/- 5.2012

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

Solvent: n-Pentane
CAS # 109-66-0
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

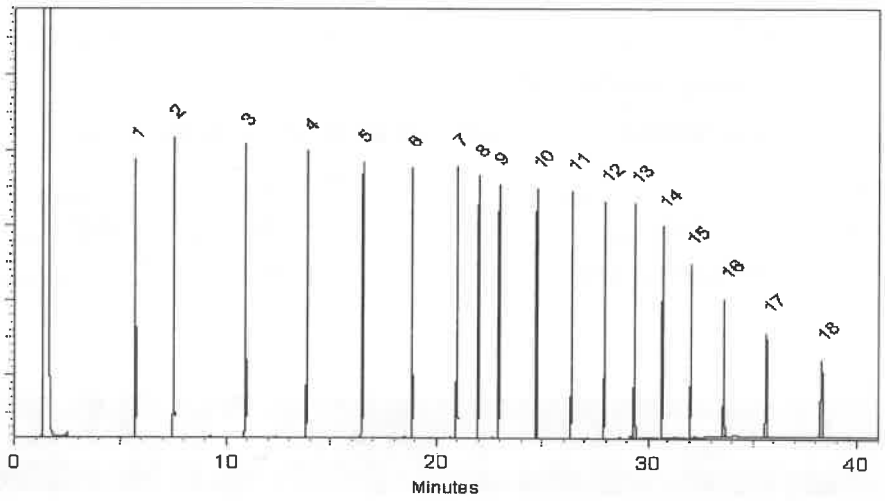
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 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.

Morgan Craighead - Mix Technician

Date Mixed: 08-Mar-2023 **Balance Serial #** B442140311

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 10-Mar-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30543 **Lot No.:** A0182204

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : January 31, 2028 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

P12750
↓
P12755

Y.P.
08/28/23

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 (Lot 8776.10-36) **Purity** 98%	200.1 µg/mL	+/- 1.1804 µg/mL +/- 9.0145 µg/mL +/- 10.0022 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 (Lot MKCH0219) **Purity** 99%	200.3 µg/mL	+/- 1.1813 µg/mL +/- 9.0216 µg/mL +/- 10.0101 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 (Lot STBK0259) **Purity** 96%	200.5 µg/mL	+/- 1.1828 µg/mL +/- 9.0327 µg/mL +/- 10.0224 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 (Lot P06V) **Purity** 98%	200.4 µg/mL	+/- 1.1820 µg/mL +/- 9.0266 µg/mL +/- 10.0157 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 (Lot MKCN0610) **Purity** 99%	200.1 µg/mL	+/- 1.1806 µg/mL +/- 9.0160 µg/mL +/- 10.0039 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 (Lot 094650L18G) **Purity** 99%	200.2 µg/mL	+/- 1.1807 µg/mL +/- 9.0171 µg/mL +/- 10.0051 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 (Lot MKCL7390) **Purity** 99%	200.3 µg/mL	+/- 1.1813 µg/mL +/- 9.0216 µg/mL +/- 10.0101 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene		200.2	µg/mL	+/-	1.1810	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCN0922)			+/-	9.0193	µg/mL	Unstressed
	Purity 99%				+/-	10.0076	µg/mL	Stressed
9	Fluoranthene		200.2	µg/mL	+/-	1.1807	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0171	µg/mL	Unstressed
	Purity 99%				+/-	10.0051	µg/mL	Stressed
10	Pyrene		200.2	µg/mL	+/-	1.1807	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG2258)			+/-	9.0171	µg/mL	Unstressed
	Purity 99%				+/-	10.0051	µg/mL	Stressed
11	Benz(a)anthracene		200.1	µg/mL	+/-	1.1806	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP210928)			+/-	9.0165	µg/mL	Unstressed
	Purity 96%				+/-	10.0044	µg/mL	Stressed
12	Chrysene		200.2	µg/mL	+/-	1.1810	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot STBK5205)			+/-	9.0193	µg/mL	Unstressed
	Purity 99%				+/-	10.0076	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.2	µg/mL	+/-	1.1807	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012021)			+/-	9.0171	µg/mL	Unstressed
	Purity 99%				+/-	10.0051	µg/mL	Stressed
14	Benzo(k)fluoranthene		200.1	µg/mL	+/-	1.1806	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012019K)			+/-	9.0160	µg/mL	Unstressed
	Purity 99%				+/-	10.0039	µg/mL	Stressed
15	Benzo(a)pyrene		200.2	µg/mL	+/-	1.1812	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0205	µg/mL	Unstressed
	Purity 99%				+/-	10.0089	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.1	µg/mL	+/-	1.1804	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot RP220125)			+/-	9.0148	µg/mL	Unstressed
	Purity 99%				+/-	10.0026	µg/mL	Stressed
17	Dibenz(a,h)anthracene		200.1	µg/mL	+/-	1.1806	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0160	µg/mL	Unstressed
	Purity 99%				+/-	10.0039	µg/mL	Stressed
18	Benzo(g,h,i)perylene		200.3	µg/mL	+/-	1.1814	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0222	µg/mL	Unstressed
	Purity 98%				+/-	10.0108	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

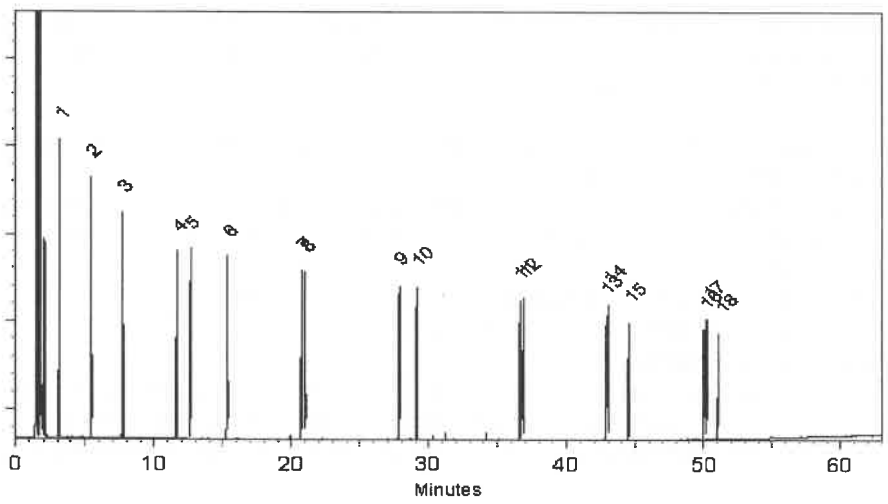
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Penelope Riglin - Operations Tech I

Date Mixed: 24-Feb-2022 **Balance:** 1128360905

Clara Windle - Operations Technician I

Date Passed: 01-Mar-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

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

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

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P/2786 ↓ P/2805 } Y.P. 09/25/23

Catalog No. : 31480 **Lot No.:** A0201395

Description : MA Fractionation Surrogate Spike Mix

MA Fractionation Surrogate Spike Mix 4000µg/mL, Hexane, 1mL/ampul

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

Expiration Date : July 31, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	2-Fluorobiphenyl	321-60-8	00021384	99%	4,039.5 µg/mL	+/- 181.9700
2	2-Bromonaphthalene	580-13-2	STBC5362V	99%	4,039.0 µg/mL	+/- 181.9475

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

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

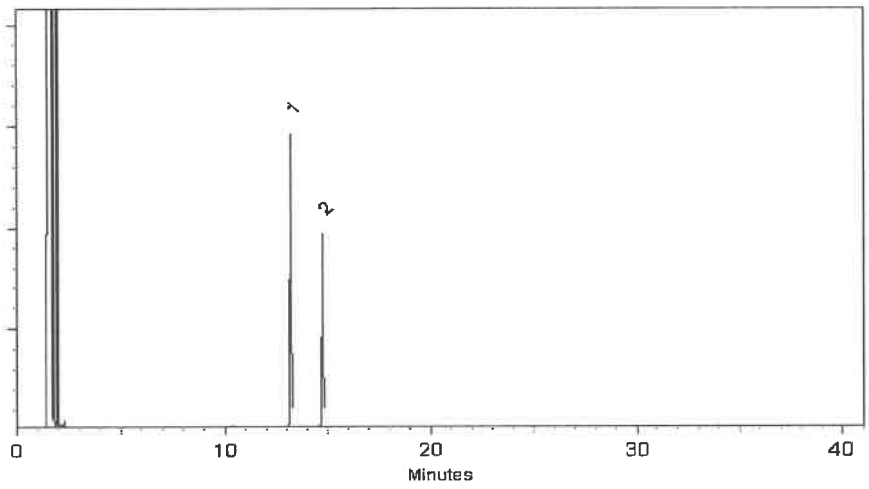
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 ml/min.

Inj. Vol
1µl



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

Dakota Parson - Operations Technician I

Date Mixed: 25-Aug-2023 **Balance Serial #** 1128353505

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 29-Aug-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P/2786 ↓ P/2805 } Y.P. 09/25/23

Catalog No. : 31480 **Lot No.:** A0201395

Description : MA Fractionation Surrogate Spike Mix

MA Fractionation Surrogate Spike Mix 4000µg/mL, Hexane, 1mL/ampul

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

Expiration Date : July 31, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	2-Fluorobiphenyl	321-60-8	00021384	99%	4,039.5 µg/mL	+/- 181.9700
2	2-Bromonaphthalene	580-13-2	STBC5362V	99%	4,039.0 µg/mL	+/- 181.9475

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

Solvent: Hexane
CAS # 110-54-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

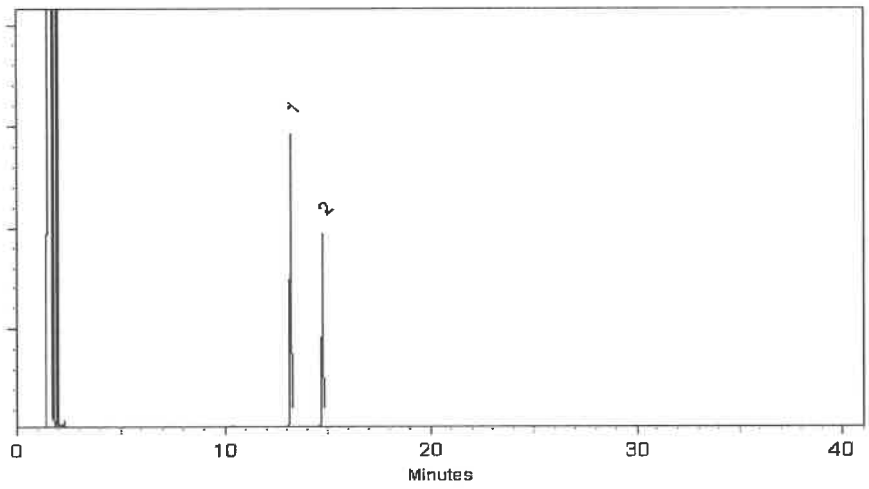
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 ml/min.

Inj. Vol
1µl



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

Dakota Parson - Operations Technician I

Date Mixed: 25-Aug-2023 **Balance Serial #** 1128353505

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 29-Aug-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ilac-MRA

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.

P12826 → P12827 Y.P. 10/17/23

Catalog No. : 30543 **Lot No.:** A0188761

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : July 31, 2028 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 (Lot 8776.10-36) **Purity** 98%	201.1 µg/mL	+/- 1.1944 µg/mL +/- 9.0608 µg/mL +/- 10.0534 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 (Lot MKCH0219) **Purity** 99%	200.8 µg/mL	+/- 1.1927 µg/mL +/- 9.0474 µg/mL +/- 10.0386 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 (Lot STBK0259) **Purity** 96%	200.1 µg/mL	+/- 1.1883 µg/mL +/- 9.0143 µg/mL +/- 10.0018 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 (Lot Q24W) **Purity** 96%	200.4 µg/mL	+/- 1.1906 µg/mL +/- 9.0316 µg/mL +/- 10.0210 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 (Lot MKCQ4733) **Purity** 99%	200.0 µg/mL	+/- 1.1879 µg/mL +/- 9.0114 µg/mL +/- 9.9986 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 (Lot 10236068) **Purity** 99%	202.0 µg/mL	+/- 1.1998 µg/mL +/- 9.1015 µg/mL +/- 10.0986 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 (Lot MKCQ2033) **Purity** 99%	201.6 µg/mL	+/- 1.1974 µg/mL +/- 9.0835 µg/mL +/- 10.0786 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene **CAS #** 120-12-7 **Purity** 99%	(Lot MKCP3968)	200.0 µg/mL	+/- 1.1879 +/- 9.0114 +/- 9.9986	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	Fluoranthene **CAS #** 206-44-0 **Purity** 99%	(Lot MKCQ4728)	202.0 µg/mL	+/- 1.1998 +/- 9.1015 +/- 10.0986	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene **CAS #** 129-00-0 **Purity** 99%	(Lot BCCG7845)	200.4 µg/mL	+/- 1.1903 +/- 9.0294 +/- 10.0186	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benz(a)anthracene **CAS #** 56-55-3 **Purity** 98%	(Lot RP220616)	201.5 µg/mL	+/- 1.1968 +/- 9.0784 +/- 10.0730	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	Chrysene **CAS #** 218-01-9 **Purity** 99%	(Lot STBK5205)	201.6 µg/mL	+/- 1.1974 +/- 9.0835 +/- 10.0786	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	Benzo(b)fluoranthene **CAS #** 205-99-2 **Purity** 99%	(Lot 012012B)	201.2 µg/mL	+/- 1.1951 +/- 9.0655 +/- 10.0586	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	Benzo(k)fluoranthene **CAS #** 207-08-9 **Purity** 99%	(Lot 012012K)	200.4 µg/mL	+/- 1.1903 +/- 9.0294 +/- 10.0186	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Benzo(a)pyrene **CAS #** 50-32-8 **Purity** 99%	(Lot Z8BKF)	201.6 µg/mL	+/- 1.1974 +/- 9.0835 +/- 10.0786	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	Indeno(1,2,3-cd)pyrene **CAS #** 193-39-5 **Purity** 99%	(Lot 12-JKL-118-9)	200.8 µg/mL	+/- 1.1927 +/- 9.0474 +/- 10.0386	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	Dibenz(a,h)anthracene **CAS #** 53-70-3 **Purity** 99%	(Lot ER032211-01)	200.4 µg/mL	+/- 1.1903 +/- 9.0294 +/- 10.0186	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	Benzo(g,h,i)perylene **CAS #** 191-24-2 **Purity** 99%	(Lot 8GFYJ)	200.0 µg/mL	+/- 1.1879 +/- 9.0114 +/- 9.9986	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

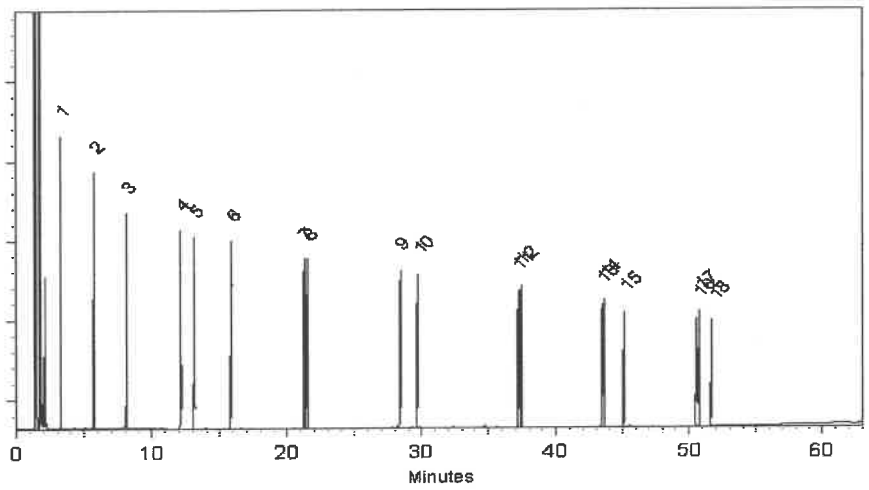
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 23-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ilac-MRA

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.

P12826 → P12827 Y.P. 10/17/23

Catalog No. : 30543 **Lot No.:** A0188761

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : July 31, 2028 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 (Lot 8776.10-36) **Purity** 98%	201.1 µg/mL	+/- 1.1944 µg/mL +/- 9.0608 µg/mL +/- 10.0534 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 (Lot MKCH0219) **Purity** 99%	200.8 µg/mL	+/- 1.1927 µg/mL +/- 9.0474 µg/mL +/- 10.0386 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 (Lot STBK0259) **Purity** 96%	200.1 µg/mL	+/- 1.1883 µg/mL +/- 9.0143 µg/mL +/- 10.0018 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 (Lot Q24W) **Purity** 96%	200.4 µg/mL	+/- 1.1906 µg/mL +/- 9.0316 µg/mL +/- 10.0210 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 (Lot MKCQ4733) **Purity** 99%	200.0 µg/mL	+/- 1.1879 µg/mL +/- 9.0114 µg/mL +/- 9.9986 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 (Lot 10236068) **Purity** 99%	202.0 µg/mL	+/- 1.1998 µg/mL +/- 9.1015 µg/mL +/- 10.0986 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 (Lot MKCQ2033) **Purity** 99%	201.6 µg/mL	+/- 1.1974 µg/mL +/- 9.0835 µg/mL +/- 10.0786 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene **CAS #** 120-12-7 **Purity** 99%	(Lot MKCP3968)	200.0 µg/mL	+/- 1.1879 +/- 9.0114 +/- 9.9986	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	Fluoranthene **CAS #** 206-44-0 **Purity** 99%	(Lot MKCQ4728)	202.0 µg/mL	+/- 1.1998 +/- 9.1015 +/- 10.0986	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene **CAS #** 129-00-0 **Purity** 99%	(Lot BCCG7845)	200.4 µg/mL	+/- 1.1903 +/- 9.0294 +/- 10.0186	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benz(a)anthracene **CAS #** 56-55-3 **Purity** 98%	(Lot RP220616)	201.5 µg/mL	+/- 1.1968 +/- 9.0784 +/- 10.0730	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	Chrysene **CAS #** 218-01-9 **Purity** 99%	(Lot STBK5205)	201.6 µg/mL	+/- 1.1974 +/- 9.0835 +/- 10.0786	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	Benzo(b)fluoranthene **CAS #** 205-99-2 **Purity** 99%	(Lot 012012B)	201.2 µg/mL	+/- 1.1951 +/- 9.0655 +/- 10.0586	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	Benzo(k)fluoranthene **CAS #** 207-08-9 **Purity** 99%	(Lot 012012K)	200.4 µg/mL	+/- 1.1903 +/- 9.0294 +/- 10.0186	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Benzo(a)pyrene **CAS #** 50-32-8 **Purity** 99%	(Lot Z8BKF)	201.6 µg/mL	+/- 1.1974 +/- 9.0835 +/- 10.0786	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	Indeno(1,2,3-cd)pyrene **CAS #** 193-39-5 **Purity** 99%	(Lot 12-JKL-118-9)	200.8 µg/mL	+/- 1.1927 +/- 9.0474 +/- 10.0386	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	Dibenz(a,h)anthracene **CAS #** 53-70-3 **Purity** 99%	(Lot ER032211-01)	200.4 µg/mL	+/- 1.1903 +/- 9.0294 +/- 10.0186	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	Benzo(g,h,i)perylene **CAS #** 191-24-2 **Purity** 99%	(Lot 8GFYJ)	200.0 µg/mL	+/- 1.1879 +/- 9.0114 +/- 9.9986	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

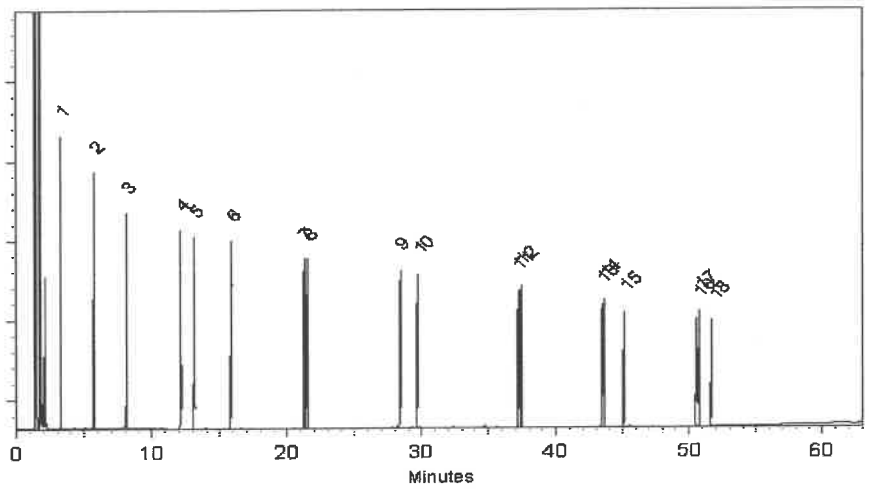
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

Inj. Temp:
250°C

Det. Temp:
330°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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 23-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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. : 30543 **Lot No.:** A0200091

P12828 ↓ P12855 } Y.P. 10/17/23

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : June 30, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene	526-73-8	8776.10-36	98%	200.7 µg/mL	+/- 9.0431
2	Naphthalene	91-20-3	MKCH0219	99%	200.8 µg/mL	+/- 9.0474
3	2-Methylnaphthalene	91-57-6	STBK0259	96%	200.8 µg/mL	+/- 9.0489
4	Acenaphthylene	208-96-8	L10L	95%	201.0 µg/mL	+/- 9.0574
5	Acenaphthene	83-32-9	MKCR7169	99%	201.0 µg/mL	+/- 9.0565
6	Fluorene	86-73-7	10236068	99%	201.0 µg/mL	+/- 9.0547
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.8 µg/mL	+/- 9.0492
8	Anthracene	120-12-7	MKCR0570	99%	201.1 µg/mL	+/- 9.0601
9	Fluoranthene	206-44-0	MKCF7378	99%	201.0 µg/mL	+/- 9.0583
10	Pyrene	129-00-0	BCCG8479	98%	201.0 µg/mL	+/- 9.0572
11	Benz(a)anthracene	56-55-3	0012022BAA	99%	201.0 µg/mL	+/- 9.0583
12	Chrysene	218-01-9	RP230512B	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	022013B	99%	200.8 µg/mL	+/- 9.0492
14	Benzo(k)fluoranthene	207-08-9	022022K	99%	200.9 µg/mL	+/- 9.0510
15	Benzo(a)pyrene	50-32-8	RP230525	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	97%	200.9 µg/mL	+/- 9.0522

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	200.8	µg/mL	+/- 9.0474
18	Benzo(g,h,i)perylene	191-24-2	RP230511B	98%	200.9	µg/mL	+/- 9.0519

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

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

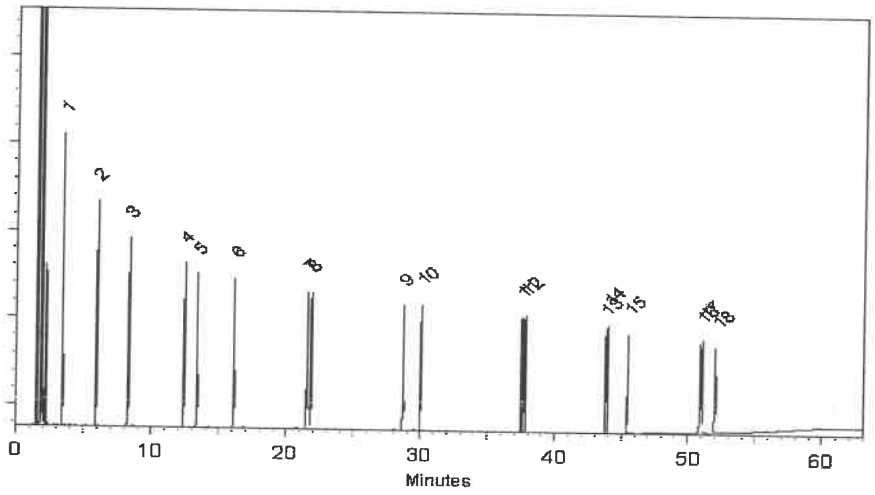
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 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.

Nick Yaw - Operations Tech I

Christie Mills - Operations Lead Tech - ARM QC

Date Mixed: 19-Jul-2023 **Balance Serial #** 1128353505

Date Passed: 25-Jul-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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. : 30543 **Lot No.:** A0200091

P12828 ↓ P12855 } Y.P. 10/17/23

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : June 30, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene	526-73-8	8776.10-36	98%	200.7 µg/mL	+/- 9.0431
2	Naphthalene	91-20-3	MKCH0219	99%	200.8 µg/mL	+/- 9.0474
3	2-Methylnaphthalene	91-57-6	STBK0259	96%	200.8 µg/mL	+/- 9.0489
4	Acenaphthylene	208-96-8	L10L	95%	201.0 µg/mL	+/- 9.0574
5	Acenaphthene	83-32-9	MKCR7169	99%	201.0 µg/mL	+/- 9.0565
6	Fluorene	86-73-7	10236068	99%	201.0 µg/mL	+/- 9.0547
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.8 µg/mL	+/- 9.0492
8	Anthracene	120-12-7	MKCR0570	99%	201.1 µg/mL	+/- 9.0601
9	Fluoranthene	206-44-0	MKCF7378	99%	201.0 µg/mL	+/- 9.0583
10	Pyrene	129-00-0	BCCG8479	98%	201.0 µg/mL	+/- 9.0572
11	Benz(a)anthracene	56-55-3	0012022BAA	99%	201.0 µg/mL	+/- 9.0583
12	Chrysene	218-01-9	RP230512B	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	022013B	99%	200.8 µg/mL	+/- 9.0492
14	Benzo(k)fluoranthene	207-08-9	022022K	99%	200.9 µg/mL	+/- 9.0510
15	Benzo(a)pyrene	50-32-8	RP230525	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	97%	200.9 µg/mL	+/- 9.0522

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	200.8	µg/mL	+/- 9.0474
18	Benzo(g,h,i)perylene	191-24-2	RP230511B	98%	200.9	µg/mL	+/- 9.0519

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

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

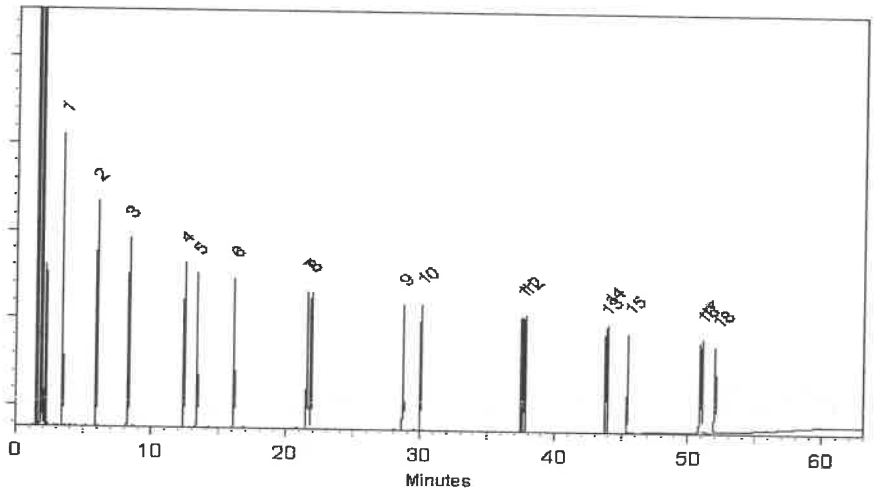
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 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.

Nick Yaw - Operations Tech I

Christie Mills - Operations Lead Tech - ARM QC

Date Mixed: 19-Jul-2023 **Balance Serial #** 1128353505

Date Passed: 25-Jul-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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. : 30543 **Lot No.:** A0200091

P12828 ↓ P12855 } Y.P. 10/17/23

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : June 30, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene	526-73-8	8776.10-36	98%	200.7 µg/mL	+/- 9.0431
2	Naphthalene	91-20-3	MKCH0219	99%	200.8 µg/mL	+/- 9.0474
3	2-Methylnaphthalene	91-57-6	STBK0259	96%	200.8 µg/mL	+/- 9.0489
4	Acenaphthylene	208-96-8	L10L	95%	201.0 µg/mL	+/- 9.0574
5	Acenaphthene	83-32-9	MKCR7169	99%	201.0 µg/mL	+/- 9.0565
6	Fluorene	86-73-7	10236068	99%	201.0 µg/mL	+/- 9.0547
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.8 µg/mL	+/- 9.0492
8	Anthracene	120-12-7	MKCR0570	99%	201.1 µg/mL	+/- 9.0601
9	Fluoranthene	206-44-0	MKCF7378	99%	201.0 µg/mL	+/- 9.0583
10	Pyrene	129-00-0	BCCG8479	98%	201.0 µg/mL	+/- 9.0572
11	Benz(a)anthracene	56-55-3	0012022BAA	99%	201.0 µg/mL	+/- 9.0583
12	Chrysene	218-01-9	RP230512B	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	022013B	99%	200.8 µg/mL	+/- 9.0492
14	Benzo(k)fluoranthene	207-08-9	022022K	99%	200.9 µg/mL	+/- 9.0510
15	Benzo(a)pyrene	50-32-8	RP230525	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	97%	200.9 µg/mL	+/- 9.0522

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	200.8	µg/mL	+/- 9.0474
18	Benzo(g,h,i)perylene	191-24-2	RP230511B	98%	200.9	µg/mL	+/- 9.0519

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

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

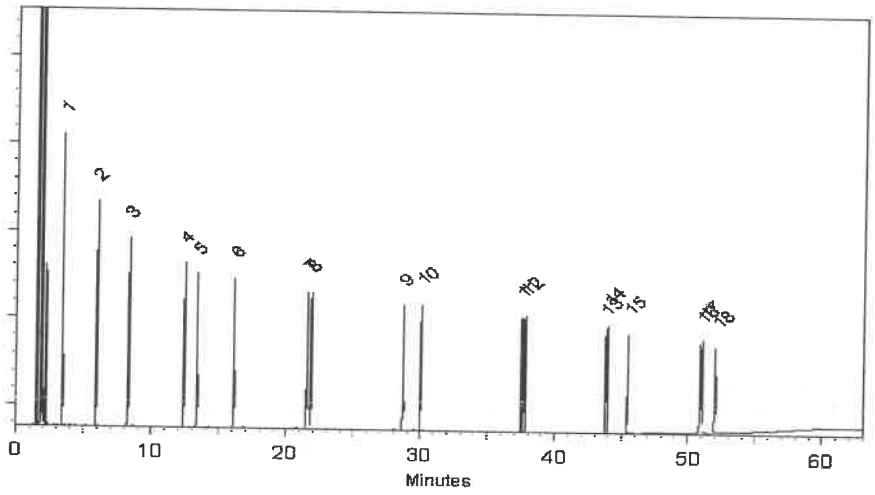
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 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.

Nick Yaw - Operations Tech I

Christie Mills - Operations Lead Tech - ARM QC

Date Mixed: 19-Jul-2023 **Balance Serial #** 1128353505

Date Passed: 25-Jul-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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. : 30543 **Lot No.:** A0200091

P12828 ↓ P12855 } Y.P. 10/17/23

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : June 30, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene	526-73-8	8776.10-36	98%	200.7 µg/mL	+/- 9.0431
2	Naphthalene	91-20-3	MKCH0219	99%	200.8 µg/mL	+/- 9.0474
3	2-Methylnaphthalene	91-57-6	STBK0259	96%	200.8 µg/mL	+/- 9.0489
4	Acenaphthylene	208-96-8	L10L	95%	201.0 µg/mL	+/- 9.0574
5	Acenaphthene	83-32-9	MKCR7169	99%	201.0 µg/mL	+/- 9.0565
6	Fluorene	86-73-7	10236068	99%	201.0 µg/mL	+/- 9.0547
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.8 µg/mL	+/- 9.0492
8	Anthracene	120-12-7	MKCR0570	99%	201.1 µg/mL	+/- 9.0601
9	Fluoranthene	206-44-0	MKCF7378	99%	201.0 µg/mL	+/- 9.0583
10	Pyrene	129-00-0	BCCG8479	98%	201.0 µg/mL	+/- 9.0572
11	Benz(a)anthracene	56-55-3	0012022BAA	99%	201.0 µg/mL	+/- 9.0583
12	Chrysene	218-01-9	RP230512B	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	022013B	99%	200.8 µg/mL	+/- 9.0492
14	Benzo(k)fluoranthene	207-08-9	022022K	99%	200.9 µg/mL	+/- 9.0510
15	Benzo(a)pyrene	50-32-8	RP230525	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	97%	200.9 µg/mL	+/- 9.0522

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	200.8	µg/mL	+/- 9.0474
18	Benzo(g,h,i)perylene	191-24-2	RP230511B	98%	200.9	µg/mL	+/- 9.0519

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

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

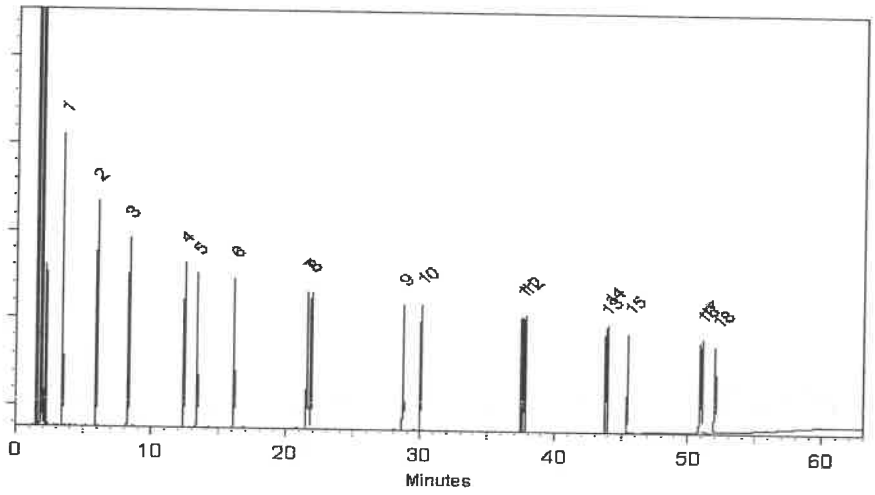
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 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.

Nick Yaw - Operations Tech I

Christie Mills - Operations Lead Tech - ARM QC

Date Mixed: 19-Jul-2023 **Balance Serial #** 1128353505

Date Passed: 25-Jul-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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. : 30543 **Lot No.:** A0200091

P12828 ↓ P12855 } Y.P. 10/17/23

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : June 30, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene	526-73-8	8776.10-36	98%	200.7 µg/mL	+/- 9.0431
2	Naphthalene	91-20-3	MKCH0219	99%	200.8 µg/mL	+/- 9.0474
3	2-Methylnaphthalene	91-57-6	STBK0259	96%	200.8 µg/mL	+/- 9.0489
4	Acenaphthylene	208-96-8	L10L	95%	201.0 µg/mL	+/- 9.0574
5	Acenaphthene	83-32-9	MKCR7169	99%	201.0 µg/mL	+/- 9.0565
6	Fluorene	86-73-7	10236068	99%	201.0 µg/mL	+/- 9.0547
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.8 µg/mL	+/- 9.0492
8	Anthracene	120-12-7	MKCR0570	99%	201.1 µg/mL	+/- 9.0601
9	Fluoranthene	206-44-0	MKCF7378	99%	201.0 µg/mL	+/- 9.0583
10	Pyrene	129-00-0	BCCG8479	98%	201.0 µg/mL	+/- 9.0572
11	Benz(a)anthracene	56-55-3	0012022BAA	99%	201.0 µg/mL	+/- 9.0583
12	Chrysene	218-01-9	RP230512B	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	022013B	99%	200.8 µg/mL	+/- 9.0492
14	Benzo(k)fluoranthene	207-08-9	022022K	99%	200.9 µg/mL	+/- 9.0510
15	Benzo(a)pyrene	50-32-8	RP230525	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	97%	200.9 µg/mL	+/- 9.0522

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	200.8	µg/mL	+/- 9.0474
18	Benzo(g,h,i)perylene	191-24-2	RP230511B	98%	200.9	µg/mL	+/- 9.0519

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

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

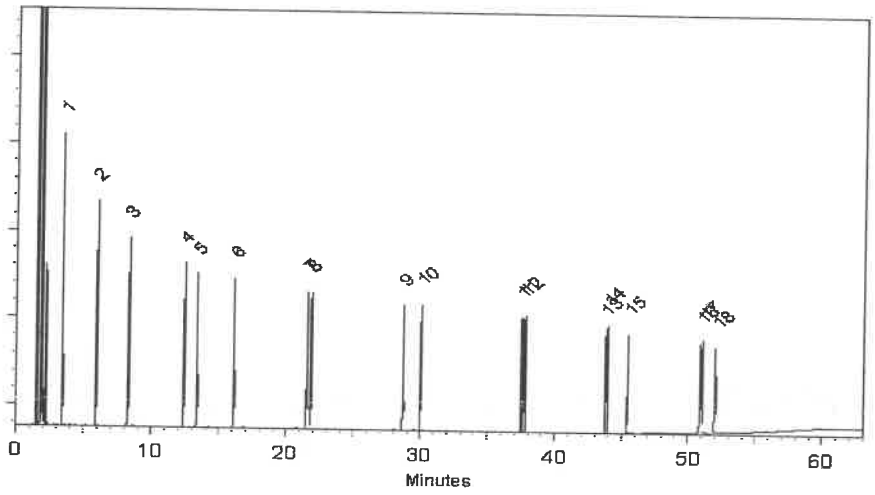
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 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.

Nick Yaw - Operations Tech I

Christie Mills - Operations Lead Tech - ARM QC

Date Mixed: 19-Jul-2023 **Balance Serial #** 1128353505

Date Passed: 25-Jul-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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. : 30543 **Lot No.:** A0200091

P12828 ↓ P12855 } Y.P. 10/17/23

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : June 30, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene	526-73-8	8776.10-36	98%	200.7 µg/mL	+/- 9.0431
2	Naphthalene	91-20-3	MKCH0219	99%	200.8 µg/mL	+/- 9.0474
3	2-Methylnaphthalene	91-57-6	STBK0259	96%	200.8 µg/mL	+/- 9.0489
4	Acenaphthylene	208-96-8	L10L	95%	201.0 µg/mL	+/- 9.0574
5	Acenaphthene	83-32-9	MKCR7169	99%	201.0 µg/mL	+/- 9.0565
6	Fluorene	86-73-7	10236068	99%	201.0 µg/mL	+/- 9.0547
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.8 µg/mL	+/- 9.0492
8	Anthracene	120-12-7	MKCR0570	99%	201.1 µg/mL	+/- 9.0601
9	Fluoranthene	206-44-0	MKCF7378	99%	201.0 µg/mL	+/- 9.0583
10	Pyrene	129-00-0	BCCG8479	98%	201.0 µg/mL	+/- 9.0572
11	Benz(a)anthracene	56-55-3	0012022BAA	99%	201.0 µg/mL	+/- 9.0583
12	Chrysene	218-01-9	RP230512B	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	022013B	99%	200.8 µg/mL	+/- 9.0492
14	Benzo(k)fluoranthene	207-08-9	022022K	99%	200.9 µg/mL	+/- 9.0510
15	Benzo(a)pyrene	50-32-8	RP230525	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	97%	200.9 µg/mL	+/- 9.0522

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	200.8	µg/mL	+/- 9.0474
18	Benzo(g,h,i)perylene	191-24-2	RP230511B	98%	200.9	µg/mL	+/- 9.0519

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

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

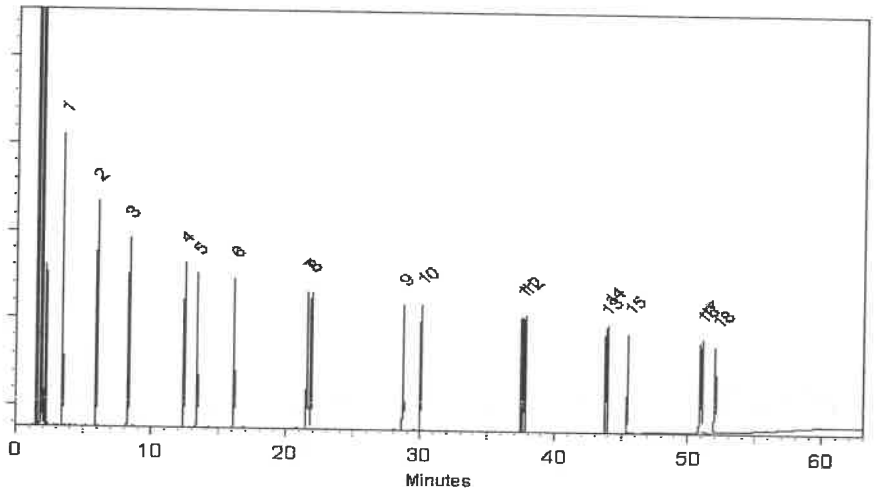
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 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.

Nick Yaw - Operations Tech I

Christie Mills - Operations Lead Tech - ARM QC

Date Mixed: 19-Jul-2023 **Balance Serial #** 1128353505

Date Passed: 25-Jul-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

RESTEK
110 Benner Circle
Bellefonte, PA 16823-8812
Tel: 1-814-353-1300
Fax: 1-814-353-1309

www.restek.com

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. : 30543 **Lot No.:** A0200091

P12828 ↓ P12855 } Y.P. 10/17/23

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

Container Size : 5 mL **Pkg Amt:** > 5 mL

Expiration Date : June 30, 2029 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive. **Ship:** Ambient

CERTIFIED VALUES

Elution Order	Compound	CAS #	Lot #	Purity	Grav. Conc. (weight/volume)	Expanded Uncertainty * (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene	526-73-8	8776.10-36	98%	200.7 µg/mL	+/- 9.0431
2	Naphthalene	91-20-3	MKCH0219	99%	200.8 µg/mL	+/- 9.0474
3	2-Methylnaphthalene	91-57-6	STBK0259	96%	200.8 µg/mL	+/- 9.0489
4	Acenaphthylene	208-96-8	L10L	95%	201.0 µg/mL	+/- 9.0574
5	Acenaphthene	83-32-9	MKCR7169	99%	201.0 µg/mL	+/- 9.0565
6	Fluorene	86-73-7	10236068	99%	201.0 µg/mL	+/- 9.0547
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.8 µg/mL	+/- 9.0492
8	Anthracene	120-12-7	MKCR0570	99%	201.1 µg/mL	+/- 9.0601
9	Fluoranthene	206-44-0	MKCF7378	99%	201.0 µg/mL	+/- 9.0583
10	Pyrene	129-00-0	BCCG8479	98%	201.0 µg/mL	+/- 9.0572
11	Benz(a)anthracene	56-55-3	0012022BAA	99%	201.0 µg/mL	+/- 9.0583
12	Chrysene	218-01-9	RP230512B	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	022013B	99%	200.8 µg/mL	+/- 9.0492
14	Benzo(k)fluoranthene	207-08-9	022022K	99%	200.9 µg/mL	+/- 9.0510
15	Benzo(a)pyrene	50-32-8	RP230525	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	97%	200.9 µg/mL	+/- 9.0522

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	200.8	µg/mL	+/- 9.0474
18	Benzo(g,h,i)perylene	191-24-2	RP230511B	98%	200.9	µg/mL	+/- 9.0519

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

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

Quality Confirmation Test

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
100°C (hold 1 min.) to 330°C
@ 4°C/min. (hold 5 min.)

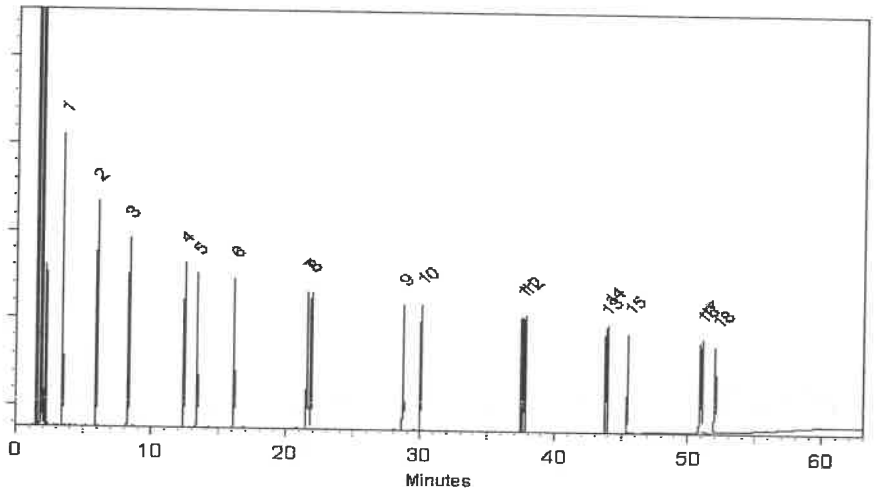
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 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.

Nick Yaw - Operations Tech I

Christie Mills - Operations Lead Tech - ARM QC

Date Mixed: 19-Jul-2023 **Balance Serial #** 1128353505

Date Passed: 25-Jul-2023

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampuls are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

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: 95709
Lot Number: 051519
Description: NJ EPH Aromatic Hydrocarbons
18 components
Expiration Date: 051524
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

Solvent(s):	Lot#
Methylene chloride	102968

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 500.0 0.058 Flask Uncertainty

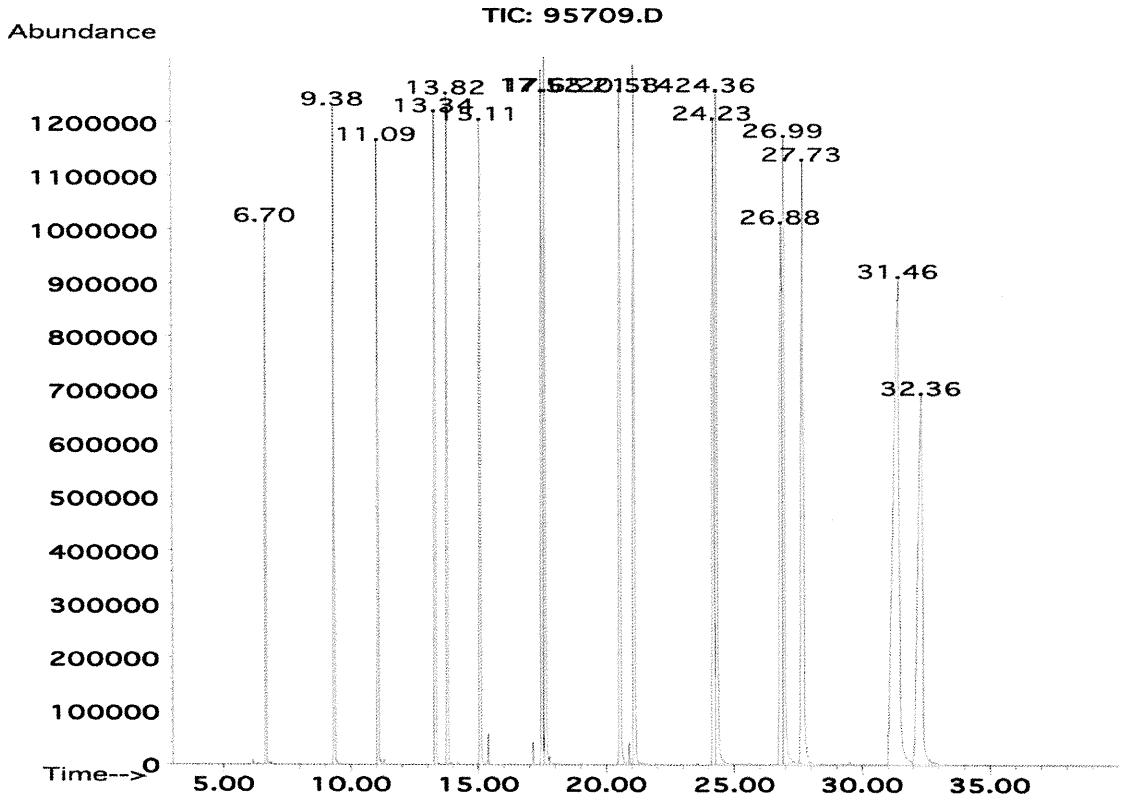
Received by DD on 01/10/2020
10 Bottles
P9283 To P9287

Formulated By: Prashant Chauhan	051519 DATE
Reviewed By: Pedro L. Rentas	051519 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. Acenaphthene	1	MKBJ4871V	2000	99	0.2	1.01003	1.01033	2000.6	8.1	83-32-9	N/A	ipr-rat 600mg/kg
2. Acenaphthylene	3	012014	2000	98	0.2	1.02033	1.02053	2000.4	8.2	208-96-8	N/A	N/A
3. Anthracene	13	A0210580	2000	99	0.2	1.01003	1.01035	2000.6	8.1	120-12-7	0.2mg/m3 (8H)	ipr-mus 430mg/kg
4. Benzo(a)anthracene	28	012018	2000	99	0.2	1.01003	1.01035	2000.6	8.1	56-55-3	N/A	N/A
5. Benzo(a)pyrene	30	012012	2000	99.5	0.2	1.00495	1.00525	2000.6	8.1	50-32-8	0.2mg/m3 (8H)	scu-rat 50mg/kg
6. Benzo(b)fluoranthene	31	012012b	2000	99	0.2	1.01003	1.01035	2000.6	8.1	205-99-2	N/A	N/A
7. Benzo(k)fluoranthene	33	012012k	2000	99	0.2	1.01003	1.01035	2000.6	8.1	207-08-9	N/A	N/A
8. Benzo(g,h,i)perylene	32	012018	2000	99	0.2	1.01003	1.01035	2000.6	8.1	191-24-2	N/A	N/A
9. Chrysene	91	012015	2000	98	0.2	1.02033	1.02055	2000.4	8.2	218-01-9	0.2mg/m3	N/A
10. Dibenzo(a,h)anthracene	112	012014	2000	98	0.2	1.02033	1.02055	2000.4	8.2	53-70-3	0.2mg/m3	N/A
11. Fluoranthene	183	04221PV	2000	98	0.2	1.02033	1.02055	2000.4	8.2	206-44-0	N/A	orl-rat 2000mg/kg
12. Fluorene	184	07211MV	2000	98	0.2	1.02033	1.02055	2000.4	8.2	86-73-7	N/A	ipr-mus 2 g/kg
13. Indeno(1,2,3-cd)pyrene	202	022015	2000	98	0.2	1.02033	1.02055	2000.4	8.2	193-39-5	N/A	N/A
14. 2-Methylnaphthalene	214	MKBF3783V	2000	97	0.2	1.03085	1.03120	2000.7	8.3	91-57-6	N/A	orl-rat 1630mg/kg
15. Naphthalene	222	09424LC	2000	99	0.2	1.01003	1.01033	2000.6	8.1	91-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg
16. Phenanthrene	248	03410PV	2000	99	0.2	1.01003	1.01033	2000.6	8.1	85-01-8	0.2mg/m3/8H	orl-mus 700mg/kg
17. Pyrene	259	010197	2000	98	0.2	1.02033	1.02055	2000.4	8.2	129-00-0	0.2mg/m3/8H	orl-rat 2700mg/kg
18. 1,2,3-Trimethylbenzene	944	031097	2000	99	0.2	1.01003	1.01035	2000.6	8.1	526-73-8	N/A	N/A

- **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).**

Method GC8MSD-2.M: Column:SPB-5 (30m X 0.25mm ID X 0.25μm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (14min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Melissa Stonier.



Peak No.	Name	MSD RT (min.)
1	1,2,3-Trimethylbenzene	6.70
2	Naphthalene	9.38
3	2-Methylnaphthalene	11.09
4	Acenaphthylene	13.34
5	Acenaphthene	13.82
6	Fluorene	15.11
7	Phenanthrene	17.52
8	Anthracene	17.65
9	Fluoranthene	20.58
10	Pyrene	21.14
11	Chrysene	24.23
12	Benzo(a)anthracene	24.36
13	Benzo(b)fluoranthene/Benzo(k)fluoranthene	26.98
14	Benzo(a)pyrene	27.73
15	Indeno(1,2,3-cd)pyrene/Dibenzo(a,h)anthracene	31.46
16	Benzo(g,h,i)perylene	32.36

Run 27, "P95709 L051519 [2000µg/mL in MeCl2]"

Run Length: 40.00 min, 23999 points at 10 points/second.
Created: Tue, May 21, 2019 at 10:50:43 AM.
Sampled: Sequence "052019-GC9M2", Method "GC9-M2".
Analyzed using Method "GC9-M2".

Comments

GC9-M2 Analysis by Melissa Stonier
Column ID SPB-5 30 meter x 0.53mm x 1.5um Film Thickness.
Flow rates; Total Flow = 300 ml/min, Helium (carrier) = 6.5 mL, Helium (make-up) = 25 mL.
Hydrogen (detector) = 30 mL, Air (detector) =360 mLOven Temp 1 = 50°C (1 min).
Rate = 10°C/min, Oven Temp 2 = 300°C (14 min), Total Run Time = 40 Minutes. Injector Temp = 250°C.
FID Temp = 300°C, FID Signal = eDaq Channel 1.
Gas Chromatograph = HP 5890, Auto Sampler = HP 7673, Standard Injection = 0.5 uL, Range = 3

Peak No.	Name	FID RT (min.)
1	1,2,3-Trimethylbenzene	8.12
2	Naphthalene	10.68
3	2-Methylnaphthalene	12.25
4	Acenaphthylene	14.35
5	Acenaphthene	14.78
6	Fluorene	15.96
7	Phenanthrene	18.21
8	Anthracene	18.32
9	Fluoranthene	21.04
10	Pyrene	21.56
11	Chrysene	24.43
12	Benzo(a)anthracene	24.53
13	Benzo(b)fluoranthene/Benzo(k)fluoranthene	26.99
14	Benzo(a)pyrene	27.74
15	Indeno(1,2,3-cd)pyrene/Dibenzo(a,h)anthracene	31.59
16	Benzo(g,h,i)perylene	32.54