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Prep Standard - Chemical Standard Summary

Order ID : O3572

Test : EPH

Prepbatch ID : PB154616,

Sequence ID/Qc Batch ID: FG081023AL,

Standard ID :
EP2333,EP2372,PP21954,PP21955,PP21956,PP21957,PP21958,PP21959,PP21960,PP22386,PP22390,PP22391,PP22439,

Chemical ID :
E3412,E3480,E3495,E3546,E3547,E3548,E3550,M5452,P11134,P11263,P11735,P11829,P12171,P12184,P12185,P12371,P12372,P12395,P12396,P12397,P12398,P12450,P12451,P12452,P12453,P12454,P12455,P12476,P12477,P12478,P12479,P12480,P12494,P12495,P12501,P12502,P12503,P12504,P12516,P12517,P12518,P12519,P12520,P12521,P12522,P12523,P12524,W2606,

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Extractions STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3319	6N HCL	EP2333	05/02/2023	09/07/2023	Rajesh Parikh	None	None	RUPESHKUMAR SHAH 05/02/2023

FROM 219.00000ml of M5452 + 781.00000ml of W2606 = Final Quantity: 1000.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3923	Baked Sodium Sulfate	EP2372	08/02/2023	10/23/2023	Rajesh Parikh	Extraction_SCALE_2 (EX-SC-2)	None	RUPESHKUMAR SHAH 08/02/2023

FROM 4000.00000gram of E3412 = Final Quantity: 4000.000 gram

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
781	100 PPM Aliphatic HC Working STD (Restek)	PP21954	04/20/2023	10/19/2023	Yogesh Patel	None	None	Ankita Jodhani 04/24/2023

FROM 0.25000ml of P11735 + 0.25000ml of P12171 + 1.25000ml of P11829 + 23.25000ml of E3495 = Final Quantity: 25.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2900	100 PPM Aliphatic HC STD (Absolute)	PP21955	04/20/2023	10/19/2023	Yogesh Patel	None	None	Ankita Jodhani 04/24/2023

FROM 0.25000ml of P11735 + 0.25000ml of P12171 + 2.50000ml of P11134 + 22.00000ml of E3495 = Final Quantity: 25.000 ml

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
783	50 PPM Aliphatic HC STD	PP21956	04/20/2023	10/19/2023	Yogesh Patel	None	None	Ankita Jodhani 04/24/2023

FROM 0.50000ml of E3495 + 0.50000ml of PP21954 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
784	20 PPM Aliphatic HC STD	PP21957	04/20/2023	10/19/2023	Yogesh Patel	None	None	Ankita Jodhani 04/24/2023

FROM 0.80000ml of E3495 + 0.20000ml of PP21954 = Final Quantity: 1.000 ml

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
785	10 PPM Aliphatic HC STD	PP21958	04/20/2023	10/19/2023	Yogesh Patel	None	None	Ankita Jodhani 04/24/2023

FROM 0.90000ml of E3495 + 0.10000ml of PP21954 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
786	5 PPM Aliphatic HC STD	PP21959	04/20/2023	10/19/2023	Yogesh Patel	None	None	Ankita Jodhani 04/24/2023

FROM 0.90000ml of E3495 + 0.10000ml of PP21956 = Final Quantity: 1.000 ml

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2901	20 PPM Aliphaitic HC STD ICV (Absolute)	PP21960	04/20/2023	10/19/2023	Yogesh Patel	None	None	Ankita Jodhani 04/24/2023

FROM 0.80000ml of E3495 + 0.20000ml of PP21955 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1330	100 PPM NJEPH Spike Solution	PP22386	07/17/2023	01/17/2024	Yogesh Patel	None	None	Ankita Jodhani 07/18/2023

FROM 5.00000ml of P12450 + 5.00000ml of P12451 + 5.00000ml of P12452 + 5.00000ml of P12453 + 5.00000ml of P12454 + 5.00000ml of P12455 + 5.00000ml of P12476 + 5.00000ml of P12477 + 5.00000ml of P12478 + 5.00000ml of P12479 + 5.00000ml of P12494 + 5.00000ml of P12495 + 5.00000ml of P12516 + 5.00000ml of P12517 + 5.00000ml of P12518 + 5.00000ml of P12519 + 5.00000ml of P12520 + 5.00000ml of P12521 + 5.00000ml of P12522 + 5.00000ml of P12523 = Final Quantity: 100.000 ml

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1339	100 PPM NJEPH Surrogate Spike	PP22390	07/24/2023	01/12/2024	Yogesh Patel	None	None	Ankita Jodhani 07/25/2023

FROM 1.25000ml of P12184 + 1.25000ml of P12185 + 1.25000ml of P12371 + 1.25000ml of P12372 + 1.25000ml of P12395 + 1.25000ml of P12396 + 1.25000ml of P12397 + 1.25000ml of P12398 + 490.00000ml of E3546 = Final Quantity: 500.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2589	20 PPM NJ EPH SPIKE for LOD-LOQ	PP22391	07/24/2023	01/24/2024	Yogesh Patel	None	None	Ankita Jodhani 07/25/2023

FROM 1.00000ml of P12480 + 1.00000ml of P12524 + 8.00000ml of P11263 = Final Quantity: 10.000 ml

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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	PP22439	07/27/2023	01/22/2024	Abdul Mirza	None	None	Ankita Jodhani 08/01/2023

FROM 1.25000ml of P12501 + 1.25000ml of P12502 + 1.25000ml of P12503 + 1.25000ml of P12504 + 195.00000ml of E3547 = Final Quantity: 200.000 ml

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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	10/23/2023	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-9262-03 / Hexane, Ultra-Resi (cs/4x4L)	23A2662017	12/09/2023	04/19/2023 / rajesh	04/13/2023 / Rajesh	E3495

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)	22L2862006	02/29/2024	07/21/2023 / Rajesh	07/20/2023 / Rajesh	E3546

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	01/22/2024	07/22/2023 / Rajesh	07/20/2023 / Rajesh	E3547

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)	23F1262016	01/22/2024	07/22/2023 / Rajesh	07/12/2023 / Rajesh	E3548

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9262-03 / Hexane, Ultra-Resi (cs/4x4L)	23C2462011	01/27/2024	07/27/2023 / Rajesh	07/27/2023 / Rajesh	E3550

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9530-33 / Hydrochloric Acid, Instra-Analyzed (cs/6x2.5L)	22D1462006	09/07/2023	03/26/2023 / Al-Terek	02/24/2022 / Al-Terek	M5452

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 #
Seidler Chemical	HP782 / Pentane, 1L	21080835	11/13/2024	12/16/2021 / Ankita	12/16/2021 / Ankita	P11263

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	10/20/2023	04/20/2023 / yogesh	05/27/2022 / Sohil	P11735

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30540 / Custom NJEPH Aliphatics Calibration Standard	A0184811	10/20/2023	04/20/2023 / yogesh	06/17/2022 / Ankita	P11829

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	10/20/2023	04/20/2023 / yogesh	11/10/2022 / Yogesh	P12171

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	01/12/2024	07/12/2023 / yogesh	11/10/2022 / Yogesh	P12184

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0190428	01/12/2024	07/12/2023 / yogesh	11/10/2022 / Yogesh	P12185

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0190428	01/12/2024	07/12/2023 / yogesh	03/16/2023 / Yogesh	P12371

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0190428	01/12/2024	07/12/2023 / yogesh	03/16/2023 / Yogesh	P12372

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0192658	01/12/2024	07/12/2023 / yogesh	03/16/2023 / Yogesh	P12395

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0192658	01/12/2024	07/12/2023 / yogesh	03/16/2023 / Yogesh	P12396

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0192658	01/12/2024	07/12/2023 / yogesh	03/16/2023 / Yogesh	P12397

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0192658	01/12/2024	07/12/2023 / yogesh	03/16/2023 / Yogesh	P12398

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	01/17/2024	07/17/2023 / yogesh	04/21/2023 / Yogesh	P12450

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	01/17/2024	07/17/2023 / yogesh	04/21/2023 / Yogesh	P12451

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	01/17/2024	07/17/2023 / yogesh	04/21/2023 / Yogesh	P12452

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	01/17/2024	07/17/2023 / yogesh	04/21/2023 / Yogesh	P12453

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	01/17/2024	07/17/2023 / yogesh	04/21/2023 / Yogesh	P12454

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	01/17/2024	07/17/2023 / yogesh	04/21/2023 / Yogesh	P12455

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	01/17/2024	07/17/2023 / yogesh	05/23/2023 / Yogesh	P12476

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	01/17/2024	07/17/2023 / yogesh	05/23/2023 / Yogesh	P12477

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	01/17/2024	07/17/2023 / yogesh	05/23/2023 / Yogesh	P12478

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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	01/17/2024	07/17/2023 / yogesh	05/23/2023 / Yogesh	P12479

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	01/24/2024	07/24/2023 / yogesh	05/23/2023 / Yogesh	P12480

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	05/23/2023 / Yogesh	P12494

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	05/23/2023 / Yogesh	P12495

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0196246	01/27/2024	07/27/2023 / Abdul	05/26/2023 / Yogesh	P12501

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0196246	01/27/2024	07/27/2023 / Abdul	05/26/2023 / Yogesh	P12502

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0196246	01/27/2024	07/27/2023 / Abdul	05/26/2023 / Yogesh	P12503

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0196246	01/27/2024	07/27/2023 / Abdul	05/26/2023 / Yogesh	P12504

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	06/30/2023 / Yogesh	P12516

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	06/30/2023 / Yogesh	P12517

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	06/30/2023 / Yogesh	P12518

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	06/30/2023 / Yogesh	P12519

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	06/30/2023 / Yogesh	P12520

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	06/30/2023 / Yogesh	P12521

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	06/30/2023 / Yogesh	P12522

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/17/2024	07/17/2023 / yogesh	06/30/2023 / Yogesh	P12523

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0195695	01/24/2024	07/24/2023 / yogesh	06/30/2023 / Yogesh	P12524

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

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

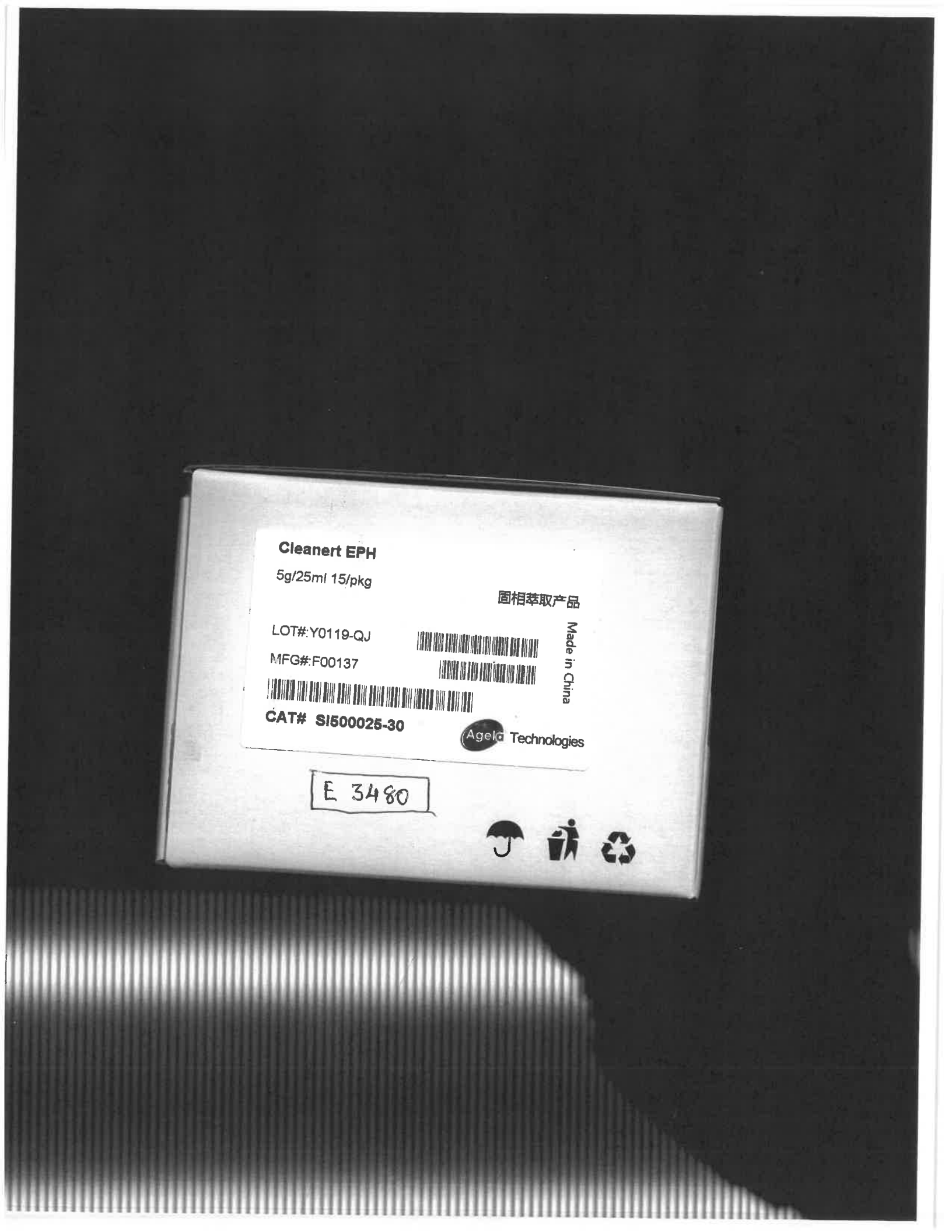
QC: PhC Irma Belmares

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

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

avantor™ | J.T.Baker®

Material No.: 9262-03
Batch No.: 23A2662017
Manufactured Date: 2023-01-10
Expiration Date: 2024-04-10
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	0.1 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 4/13/23

E3495

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

Acetone
BAKER RESI-ANALYZED® Reagent
For Organic Residue Analysis

avantor™ | J.T.Baker®

Material No.: 9254-03
Batch No.: 22L2862006
Manufactured Date: 2022-12-19
Expiration Date: 2025-12-18
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	0.2 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	4

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 4/20/23

E3546

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 4/20/23

E3547

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

PO: 230629-01 PRODUCT CODE: SHIP DATE: 7/12/2023

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

avantor™ | J.T.Baker®

Material No.: 9266-A4
Batch No.: 23F1262016
Manufactured Date: 2023-05-17
Expiration Date: 2024-08-15
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	5
Residue after Evaporation	≤ 1.0 ppm	< 1.0 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: MG23E17953

E 3548

Ken Koehnlein
Sr. Manager, Quality Assurance

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 7/27/23

E3550

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

Hydrochloric Acid, 36.5-38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

M5449 M5450 M5451
M5452 M5453 M5454

Material No.: 9530-33
Batch No.: 22D1462006
Manufactured Date: 2022-02-24
Retest Date: 2027-02-23
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
ACS - Assay (as HCl) (by acid-base titrn)	36.5 - 38.0 %	37.6 %
ACS - Color (APHA)	≤ 10	5
ACS - Residue after Ignition	≤ 3 ppm	< 1 ppm
ACS - Specific Gravity at 60°/60°F	1.185 - 1.192	1.190
ACS - Bromide (Br)	≤ 0.005 %	< 0.005 %
ACS - Extractable Organic Substances	≤ 5 ppm	< 1 ppm
ACS - Free Chlorine (as Cl_2)	≤ 0.5 ppm	< 0.5 ppm
Phosphate (PO_4)	≤ 0.05 ppm	< 0.03 ppm
Sulfate (SO_4)	≤ 0.5 ppm	< 0.5 ppm
Sulfite (SO_3)	≤ 0.8 ppm	0.3 ppm
Ammonium (NH_4)	≤ 3 ppm	< 1 ppm
Trace Impurities - Arsenic (As)	≤ 0.010 ppm	< 0.003 ppm
Trace Impurities - Aluminum (Al)	≤ 10.0 ppb	0.2 ppb
Arsenic and Antimony (as As)	≤ 5.0 ppb	< 3.0 ppb
Trace Impurities - Barium (Ba)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities - Beryllium (Be)	≤ 1.0 ppb	< 1.0 ppb
Trace Impurities - Bismuth (Bi)	≤ 10.0 ppb	< 1.0 ppb
Trace Impurities - Boron (B)	≤ 20.0 ppb	1.4 ppb
Trace Impurities - Cadmium (Cd)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities - Calcium (Ca)	≤ 50.0 ppb	48.0 ppb
Trace Impurities - Chromium (Cr)	≤ 1.0 ppb	< 0.4 ppb
Trace Impurities - Cobalt (Co)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities - Copper (Cu)	≤ 1.0 ppb	< 0.1 ppb
Trace Impurities - Gallium (Ga)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities - Germanium (Ge)	≤ 3.0 ppb	< 2.0 ppb
Trace Impurities - Gold (Au)	≤ 4.0 ppb	0.2 ppb
Heavy Metals (as Pb)	≤ 100 ppb	< 50 ppb
Trace Impurities - Iron (Fe)	≤ 15 ppb	2 ppb

>>> Continued on page 2 >>>

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

Hydrochloric Acid, 36.5-38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

Material No.: 9530-33
Batch No.: 22D1462006

Test	Specification	Result
Trace Impurities - Lead (Pb)	≤ 1.0 ppb	< 0.5 ppb
Trace Impurities - Lithium (Li)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities - Magnesium (Mg)	≤ 10.0 ppb	0.7 ppb
Trace Impurities - Manganese (Mn)	≤ 1.0 ppb	< 0.4 ppb
Trace Impurities - Mercury (Hg)	≤ 0.5 ppb	< 0.1 ppb
Trace Impurities - Molybdenum (Mo)	≤ 10.0 ppb	< 5.0 ppb
Trace Impurities - Nickel (Ni)	≤ 4.0 ppb	< 0.3 ppb
Trace Impurities - Niobium (Nb)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities - Potassium (K)	≤ 9.0 ppb	< 2.0 ppb
Trace Impurities - Selenium (Se), For Information Only		< 1.0 ppb
Trace Impurities - Silicon (Si)	≤ 100.0 ppb	< 10.0 ppb
Trace Impurities - Silver (Ag)	≤ 1.0 ppb	< 0.3 ppb
Trace Impurities - Sodium (Na)	≤ 100.0 ppb	< 5.0 ppb
Trace Impurities - Strontium (Sr)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities - Tantalum (Ta)	≤ 1.0 ppb	< 0.9 ppb
Trace Impurities - Thallium (Tl)	≤ 5.0 ppb	< 0.9 ppb
Trace Impurities - Tin (Sn)	≤ 5.0 ppb	< 0.8 ppb
Trace Impurities - Titanium (Ti)	≤ 1.0 ppb	0.3 ppb
Trace Impurities - Vanadium (V)	≤ 1.0 ppb	< 0.2 ppb
Trace Impurities - Zinc (Zn)	≤ 5.0 ppb	0.5 ppb
Trace Impurities - Zirconium (Zr)	≤ 1.0 ppb	< 0.1 ppb

>>> Continued on page 3 >>>

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

Hydrochloric Acid, 36.5-38.0%
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis

Material No.: 9530-33
Batch No.: 22D1462006

Test	Specification	Result

For Laboratory,Research,or Manufacturing Use
Product Information (not specifications):
Appearance (clear, fuming liquid)
Meets ACS Specifications
Storage Condition: Store below 25 °C.

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

Jamie Ethier
Vice President Global Quality

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

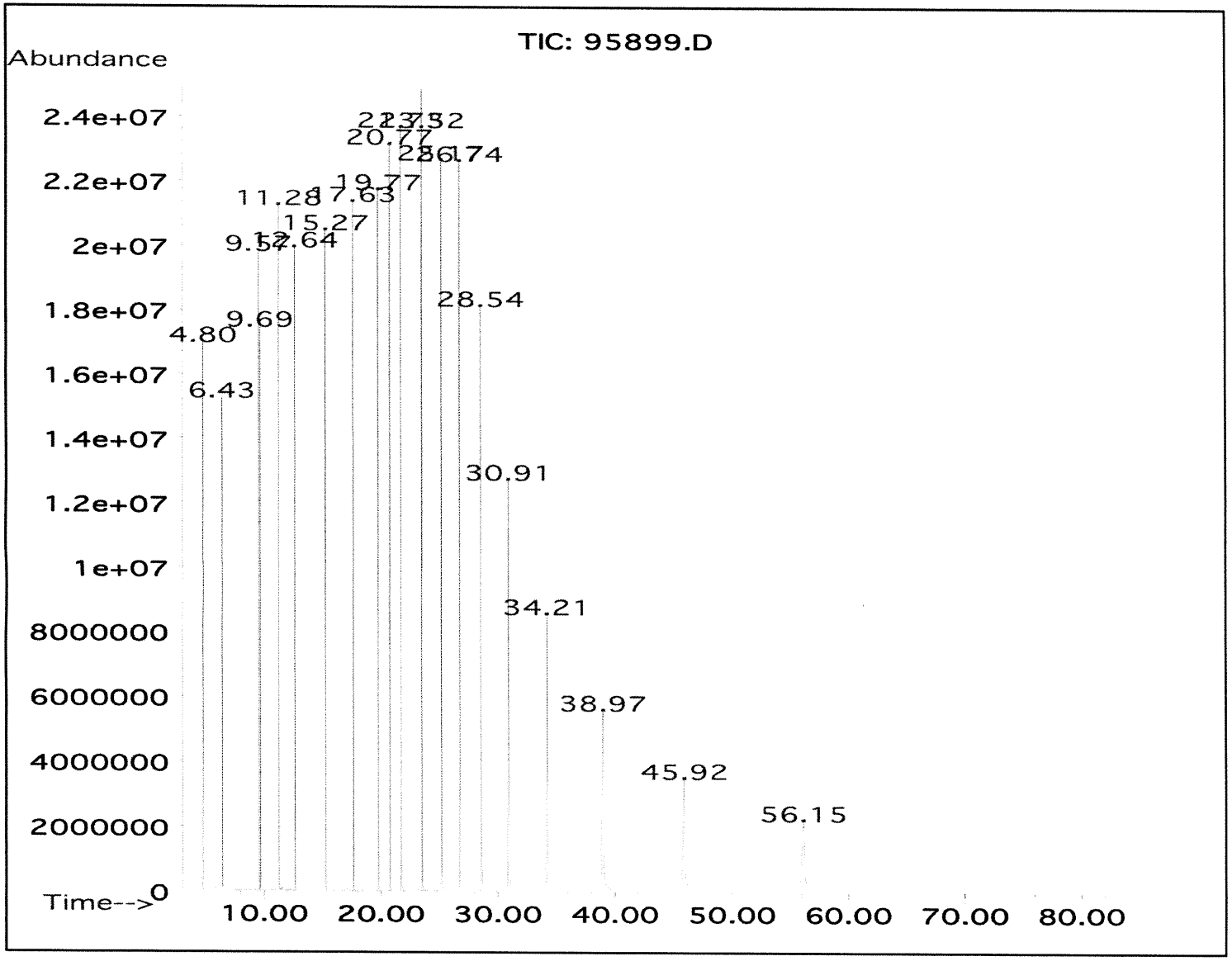
	Compound	(RM#) Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Initial Conc.(ug/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) 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

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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

P11719 to P11736

Received by SJ : 5/27/2022

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.:** A0183688

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 : November 30, 2025 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	o-Terphenyl	10,006.9 µg/mL	+/- 58.1808	µg/mL	Gravimetric
	CAS # 84-15-1 (Lot MKCH4487)		+/- 450.7156	µg/mL	Unstressed
	Purity 99%		+/- 500.1247	µg/mL	Stressed

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

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

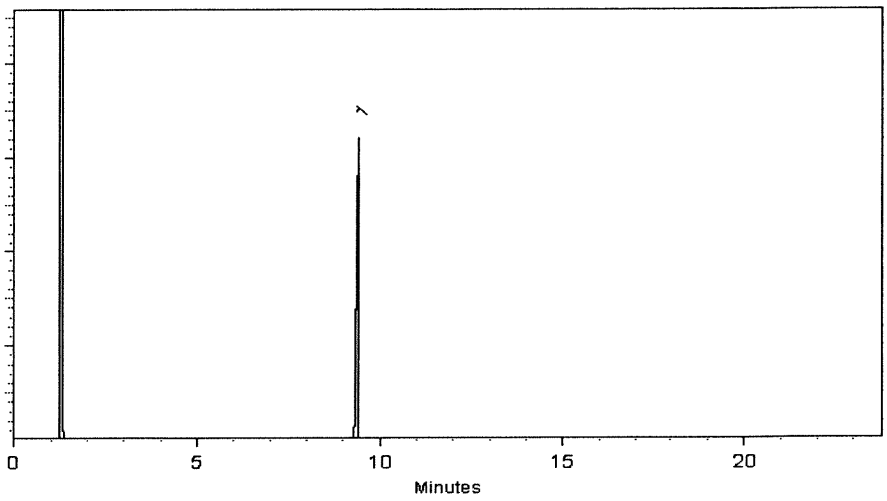
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
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.

Nick Yaw - Operations Tech I

Date Mixed: 05-Apr-2022 **Balance:** 1128360905

Clara Windle - Operations Technician I

Date Passed: 07-Apr-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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)

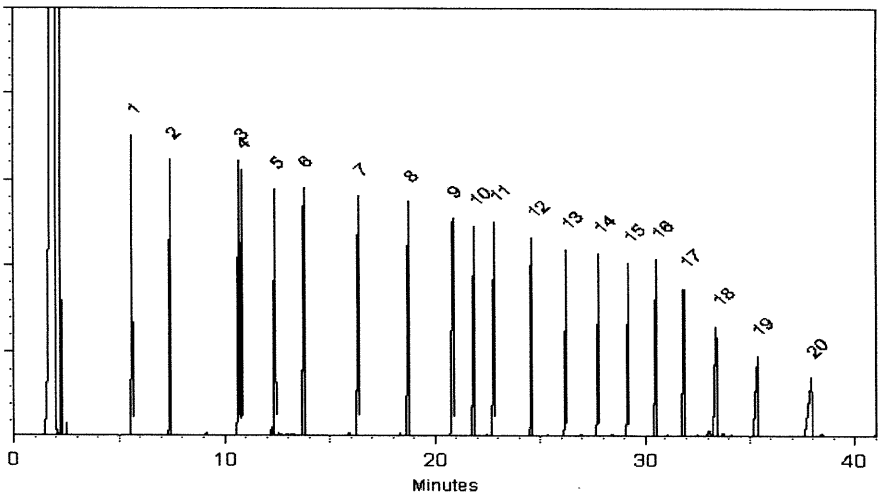
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

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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 +/- 564.4046 +/- 577.6110	µg/mL µg/mL 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)

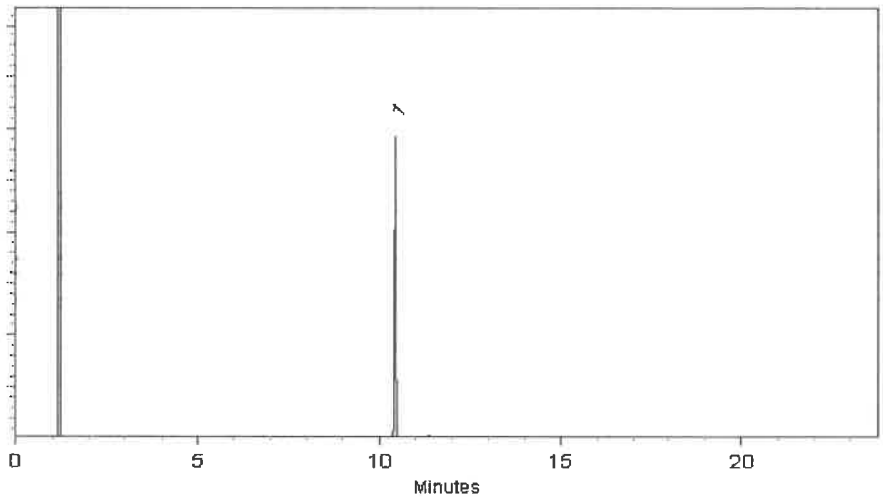
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

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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 +/- 564.4046 +/- 577.6110	µg/mL µg/mL 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)

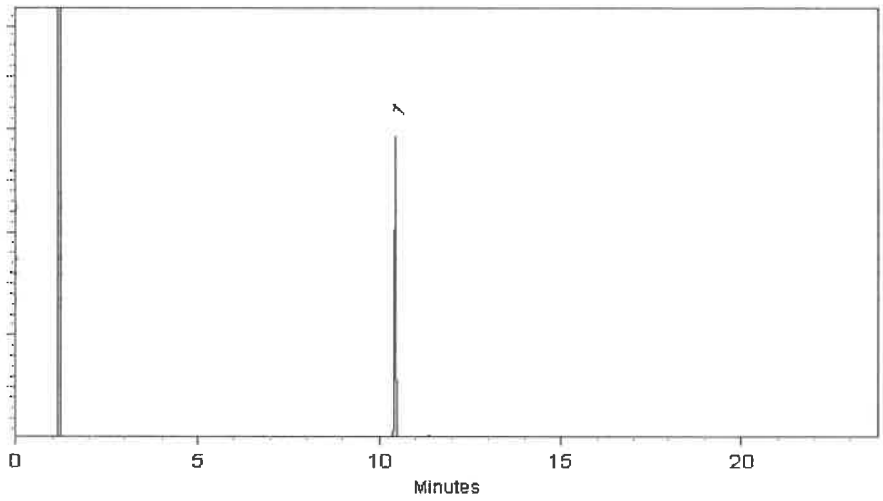
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

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

P12386
2
P123400

Catalog No. : 31097 **Lot No.:** A0192658

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 : July 31, 2026 **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	o-Terphenyl	84-15-1	WA57L	99%	10,063.1 µg/mL	+/- 453.2492

* 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.)

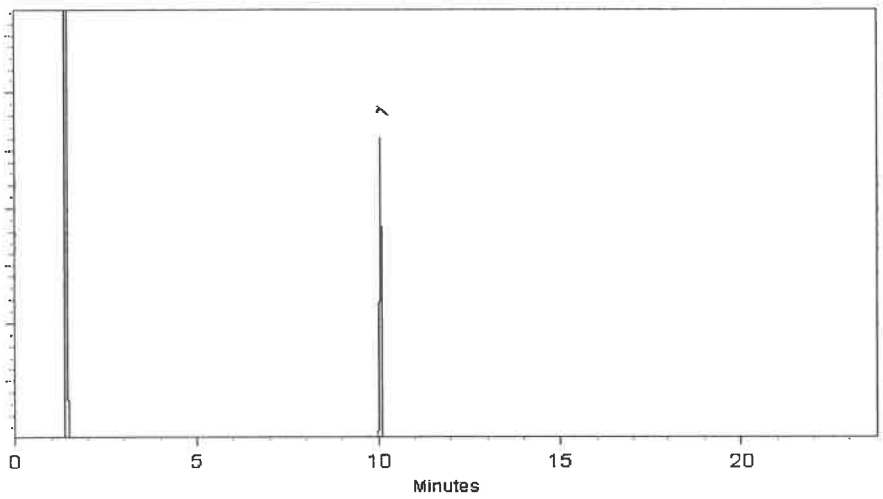
Inj. Temp:
250°C

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.

Malina Homan - Operations Technician I **Date Mixed:** 14-Dec-2022 **Balance Serial #** B345965662

Jennifer Pollino - Operations Tech III - ARM QC **Date Passed:** 19-Dec-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate #3222.02

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

P12386
2
P123400

Catalog No. : 31097 **Lot No.:** A0192658

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 : July 31, 2026 **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	o-Terphenyl	84-15-1	WA57L	99%	10,063.1 µg/mL	+/- 453.2492

* 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.)

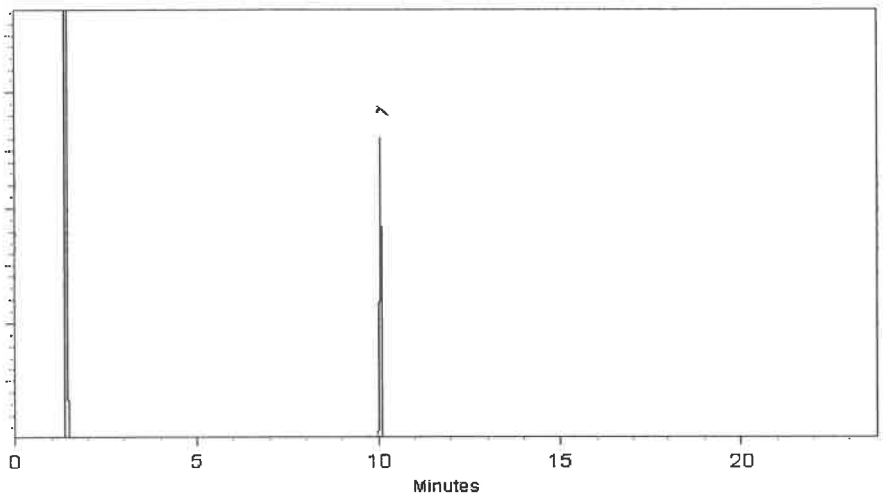
Inj. Temp:
250°C

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.

Malina Homan - Operations Technician I **Date Mixed:** 14-Dec-2022 **Balance Serial #** B345965662

Jennifer Pollino - Operations Tech III - ARM QC **Date Passed:** 19-Dec-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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P12386
2
P123400

Catalog No. : 31097 **Lot No.:** A0192658

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 : July 31, 2026 **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	o-Terphenyl	84-15-1	WA57L	99%	10,063.1 µg/mL	+/- 453.2492

* 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.)

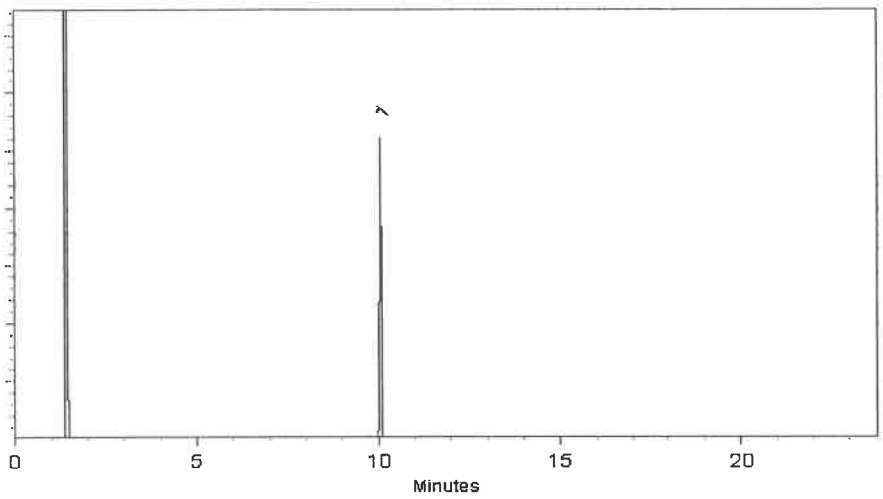
Inj. Temp:
250°C

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.

Malina Homan - Operations Technician I **Date Mixed:** 14-Dec-2022 **Balance Serial #** B345965662

Jennifer Pollino - Operations Tech III - ARM QC **Date Passed:** 19-Dec-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

Manufacturing Notes:

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

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampuls. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
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P12386
2
P123400

Catalog No. : 31097 **Lot No.:** A0192658

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 : July 31, 2026 **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	o-Terphenyl	84-15-1	WA57L	99%	10,063.1 µg/mL	+/- 453.2492

* 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.)

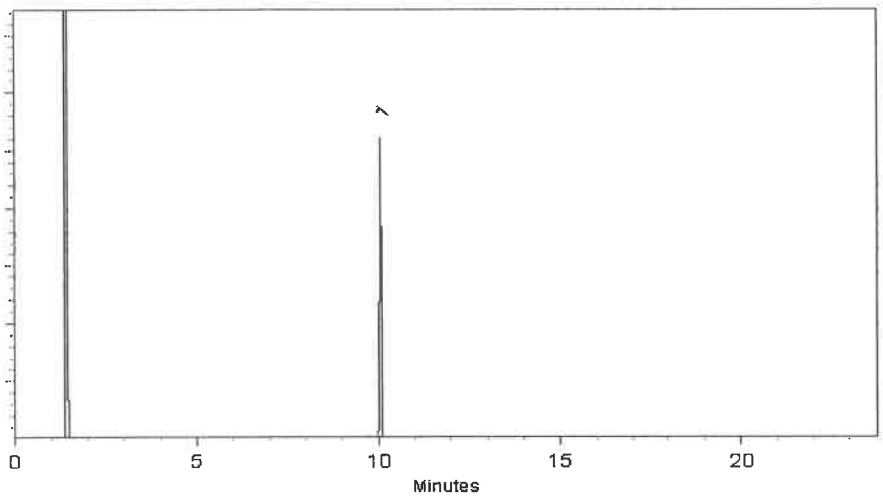
Inj. Temp:
250°C

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.

Malina Homan - Operations Technician I **Date Mixed:** 14-Dec-2022 **Balance Serial #** B345965662

Jennifer Pollino - Operations Tech III - ARM QC **Date Passed:** 19-Dec-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
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- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

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

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

Manufacturing Notes:

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

Handling Notes:

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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. : 30542 **Lot No.:** A0191475

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 : December 31, 2029 **Storage:** 10°C or colder

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

P12h36 ↓ P12h5h. Y.P. 04/21/23

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	n-Nonane (C9) **CAS #** 111-84-2 (Lot SHBN5361) **Purity** 99%	201.6 µg/mL	+/- 1.1972 µg/mL +/- 5.0078 µg/mL +/- 6.0027 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBP4427) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBP7054) **Purity** 99%	200.3 µg/mL	+/- 1.1899 µg/mL +/- 4.9772 µg/mL +/- 5.9660 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.9 µg/mL	+/- 1.1933 µg/mL +/- 4.9913 µg/mL +/- 5.9829 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot UE5NG) **Purity** 98%	201.9 µg/mL	+/- 1.1993 µg/mL +/- 5.0164 µg/mL +/- 6.0130 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCN8767) **Purity** 97%	201.8 µg/mL	+/- 1.1986 µg/mL +/- 5.0134 µg/mL +/- 6.0094 µg/mL	Gravimetric Unstressed Stressed

8	n-Heneicosane (C21)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 629-94-7	(Lot MKCL3226)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
9	n-Docosane (C22)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
10	n-Tetracosane (C24)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCN2863)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
11	n-Hexacosane (C26)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
12	n-Octacosane (C28)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
13	n-Triacontane (C30)		201.1	µg/mL	+/-	1.1946	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCQ9436)			+/-	4.9966	µg/mL	Unstressed
	Purity 97%				+/-	5.9892	µg/mL	Stressed
14	n-Dotriacontane (C32)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
15	n-Tetratriacontane (C34)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
16	n-Hexatriacontane (C36)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot Z27H018)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
17	n-Octatriacontane (C38)		201.6	µg/mL	+/-	1.1974	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000145137)			+/-	5.0086	µg/mL	Unstressed
	Purity 96%				+/-	6.0037	µg/mL	Stressed
18	n-Tetracontane (C40)		200.9	µg/mL	+/-	1.1933	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	4.9913	µg/mL	Unstressed
	Purity 98%				+/-	5.9829	µg/mL	Stressed

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

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

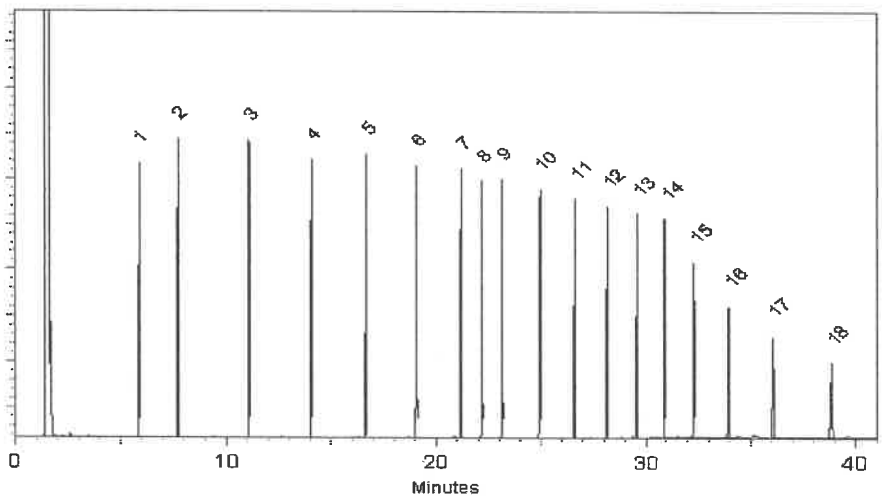
Carrier Gas:
hydrogen-constant pressure 10 psi.

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



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John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 **Balance:** 1128353505

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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

Catalog No. : 30542 **Lot No.:** A0191475

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 : December 31, 2029 **Storage:** 10°C or colder

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

P12h36 ↓ P12h5h. Y.P. 04/21/23

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	n-Nonane (C9) **CAS #** 111-84-2 (Lot SHBN5361) **Purity** 99%	201.6 µg/mL	+/- 1.1972 µg/mL +/- 5.0078 µg/mL +/- 6.0027 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBP4427) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBP7054) **Purity** 99%	200.3 µg/mL	+/- 1.1899 µg/mL +/- 4.9772 µg/mL +/- 5.9660 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.9 µg/mL	+/- 1.1933 µg/mL +/- 4.9913 µg/mL +/- 5.9829 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot UE5NG) **Purity** 98%	201.9 µg/mL	+/- 1.1993 µg/mL +/- 5.0164 µg/mL +/- 6.0130 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCN8767) **Purity** 97%	201.8 µg/mL	+/- 1.1986 µg/mL +/- 5.0134 µg/mL +/- 6.0094 µg/mL	Gravimetric Unstressed Stressed

8	n-Heneicosane (C21)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 629-94-7	(Lot MKCL3226)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
9	n-Docosane (C22)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
10	n-Tetracosane (C24)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCN2863)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
11	n-Hexacosane (C26)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
12	n-Octacosane (C28)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
13	n-Triacontane (C30)		201.1	µg/mL	+/-	1.1946	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCQ9436)			+/-	4.9966	µg/mL	Unstressed
	Purity 97%				+/-	5.9892	µg/mL	Stressed
14	n-Dotriacontane (C32)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
15	n-Tetratriacontane (C34)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
16	n-Hexatriacontane (C36)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot Z27H018)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
17	n-Octatriacontane (C38)		201.6	µg/mL	+/-	1.1974	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000145137)			+/-	5.0086	µg/mL	Unstressed
	Purity 96%				+/-	6.0037	µg/mL	Stressed
18	n-Tetracontane (C40)		200.9	µg/mL	+/-	1.1933	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	4.9913	µg/mL	Unstressed
	Purity 98%				+/-	5.9829	µg/mL	Stressed

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

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

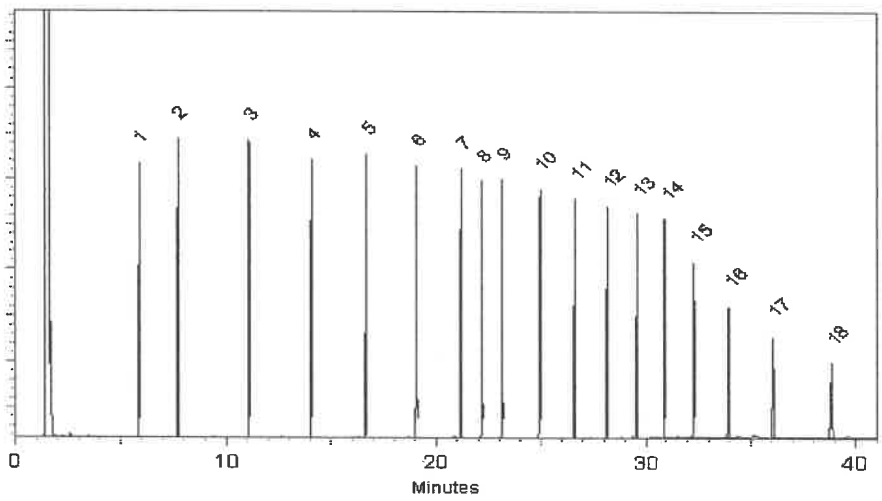
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 **Balance:** 1128353505

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30542 **Lot No.:** A0191475

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 : December 31, 2029 **Storage:** 10°C or colder

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

P12h36 ↓ P12h5h. Y.P. 04/21/23

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	n-Nonane (C9) **CAS #** 111-84-2 (Lot SHBN5361) **Purity** 99%	201.6 µg/mL	+/- 1.1972 µg/mL +/- 5.0078 µg/mL +/- 6.0027 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBP4427) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBP7054) **Purity** 99%	200.3 µg/mL	+/- 1.1899 µg/mL +/- 4.9772 µg/mL +/- 5.9660 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.9 µg/mL	+/- 1.1933 µg/mL +/- 4.9913 µg/mL +/- 5.9829 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot UE5NG) **Purity** 98%	201.9 µg/mL	+/- 1.1993 µg/mL +/- 5.0164 µg/mL +/- 6.0130 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCN8767) **Purity** 97%	201.8 µg/mL	+/- 1.1986 µg/mL +/- 5.0134 µg/mL +/- 6.0094 µg/mL	Gravimetric Unstressed Stressed

8	n-Heneicosane (C21)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 629-94-7	(Lot MKCL3226)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
9	n-Docosane (C22)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
10	n-Tetracosane (C24)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCN2863)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
11	n-Hexacosane (C26)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
12	n-Octacosane (C28)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
13	n-Triacontane (C30)		201.1	µg/mL	+/-	1.1946	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCQ9436)			+/-	4.9966	µg/mL	Unstressed
	Purity 97%				+/-	5.9892	µg/mL	Stressed
14	n-Dotriacontane (C32)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
15	n-Tetratriacontane (C34)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
16	n-Hexatriacontane (C36)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot Z27H018)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
17	n-Octatriacontane (C38)		201.6	µg/mL	+/-	1.1974	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000145137)			+/-	5.0086	µg/mL	Unstressed
	Purity 96%				+/-	6.0037	µg/mL	Stressed
18	n-Tetracontane (C40)		200.9	µg/mL	+/-	1.1933	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	4.9913	µg/mL	Unstressed
	Purity 98%				+/-	5.9829	µg/mL	Stressed

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

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

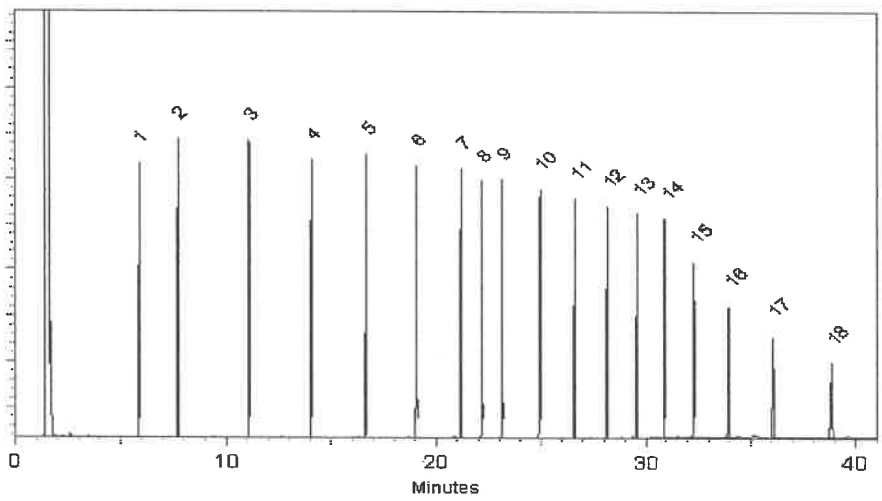
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 **Balance:** 1128353505

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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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. : 30542 **Lot No.:** A0191475

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 : December 31, 2029 **Storage:** 10°C or colder

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

P12h36 ↓ P12h5h. Y.P. 04/21/23

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	n-Nonane (C9) **CAS #** 111-84-2 (Lot SHBN5361) **Purity** 99%	201.6 µg/mL	+/- 1.1972 µg/mL +/- 5.0078 µg/mL +/- 6.0027 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBP4427) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBP7054) **Purity** 99%	200.3 µg/mL	+/- 1.1899 µg/mL +/- 4.9772 µg/mL +/- 5.9660 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.9 µg/mL	+/- 1.1933 µg/mL +/- 4.9913 µg/mL +/- 5.9829 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot UE5NG) **Purity** 98%	201.9 µg/mL	+/- 1.1993 µg/mL +/- 5.0164 µg/mL +/- 6.0130 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCN8767) **Purity** 97%	201.8 µg/mL	+/- 1.1986 µg/mL +/- 5.0134 µg/mL +/- 6.0094 µg/mL	Gravimetric Unstressed Stressed

8	n-Heneicosane (C21)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 629-94-7	(Lot MKCL3226)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
9	n-Docosane (C22)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
10	n-Tetracosane (C24)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCN2863)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
11	n-Hexacosane (C26)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
12	n-Octacosane (C28)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
13	n-Triacontane (C30)		201.1	µg/mL	+/-	1.1946	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCQ9436)			+/-	4.9966	µg/mL	Unstressed
	Purity 97%				+/-	5.9892	µg/mL	Stressed
14	n-Dotriacontane (C32)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
15	n-Tetratriacontane (C34)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
16	n-Hexatriacontane (C36)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot Z27H018)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
17	n-Octatriacontane (C38)		201.6	µg/mL	+/-	1.1974	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000145137)			+/-	5.0086	µg/mL	Unstressed
	Purity 96%				+/-	6.0037	µg/mL	Stressed
18	n-Tetracontane (C40)		200.9	µg/mL	+/-	1.1933	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	4.9913	µg/mL	Unstressed
	Purity 98%				+/-	5.9829	µg/mL	Stressed

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

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

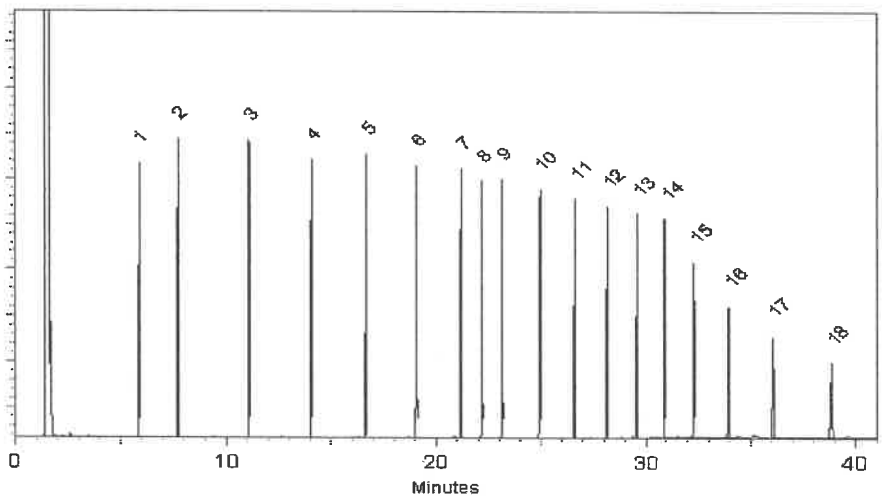
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 **Balance:** 1128353505

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30542 **Lot No.:** A0191475

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 : December 31, 2029 **Storage:** 10°C or colder

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

P12h36 ↓ P12h5h. Y.P. 04/21/23

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	n-Nonane (C9) **CAS #** 111-84-2 (Lot SHBN5361) **Purity** 99%	201.6 µg/mL	+/- 1.1972 µg/mL +/- 5.0078 µg/mL +/- 6.0027 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBP4427) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBP7054) **Purity** 99%	200.3 µg/mL	+/- 1.1899 µg/mL +/- 4.9772 µg/mL +/- 5.9660 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.9 µg/mL	+/- 1.1933 µg/mL +/- 4.9913 µg/mL +/- 5.9829 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot UE5NG) **Purity** 98%	201.9 µg/mL	+/- 1.1993 µg/mL +/- 5.0164 µg/mL +/- 6.0130 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCN8767) **Purity** 97%	201.8 µg/mL	+/- 1.1986 µg/mL +/- 5.0134 µg/mL +/- 6.0094 µg/mL	Gravimetric Unstressed Stressed

8	n-Heneicosane (C21)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 629-94-7	(Lot MKCL3226)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
9	n-Docosane (C22)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
10	n-Tetracosane (C24)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCN2863)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
11	n-Hexacosane (C26)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
12	n-Octacosane (C28)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
13	n-Triacontane (C30)		201.1	µg/mL	+/-	1.1946	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCQ9436)			+/-	4.9966	µg/mL	Unstressed
	Purity 97%				+/-	5.9892	µg/mL	Stressed
14	n-Dotriacontane (C32)		200.7	µg/mL	+/-	1.1919	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	4.9855	µg/mL	Unstressed
	Purity 99%				+/-	5.9759	µg/mL	Stressed
15	n-Tetratriacontane (C34)		201.3	µg/mL	+/-	1.1959	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	5.0020	µg/mL	Unstressed
	Purity 99%				+/-	5.9958	µg/mL	Stressed
16	n-Hexatriacontane (C36)		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot Z27H018)			+/-	4.9937	µg/mL	Unstressed
	Purity 99%				+/-	5.9858	µg/mL	Stressed
17	n-Octatriacontane (C38)		201.6	µg/mL	+/-	1.1974	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000145137)			+/-	5.0086	µg/mL	Unstressed
	Purity 96%				+/-	6.0037	µg/mL	Stressed
18	n-Tetracontane (C40)		200.9	µg/mL	+/-	1.1933	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	4.9913	µg/mL	Unstressed
	Purity 98%				+/-	5.9829	µg/mL	Stressed

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

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

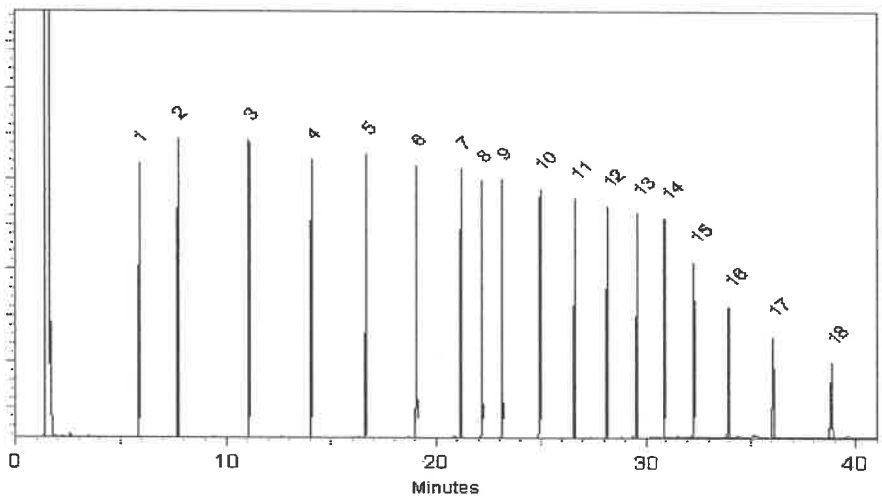
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 **Balance:** 1128353505

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

chromatographic plus

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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. : 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

Y.P. 04/21/23 P12455

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.)

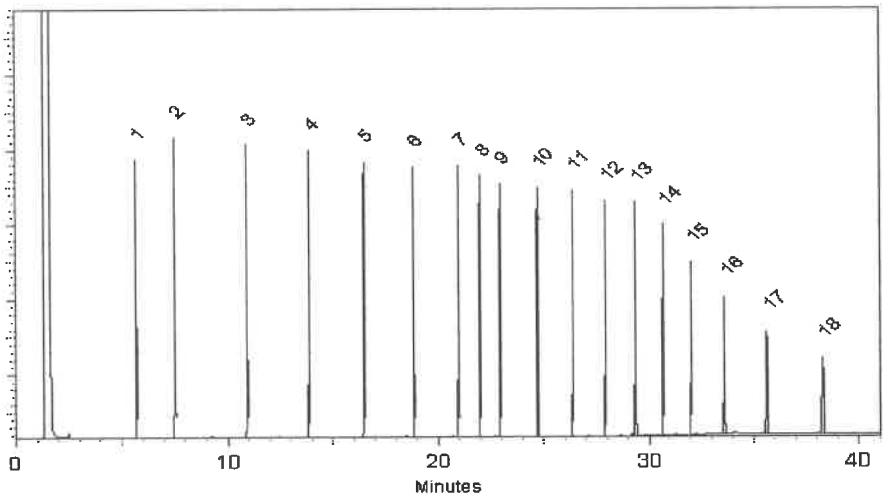
Inj. Temp:
250°C

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:

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- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

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

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

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

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Handling Notes:

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

RESTEK
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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

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P12476 Y.F. 05/23/23
↓
P12485

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.)

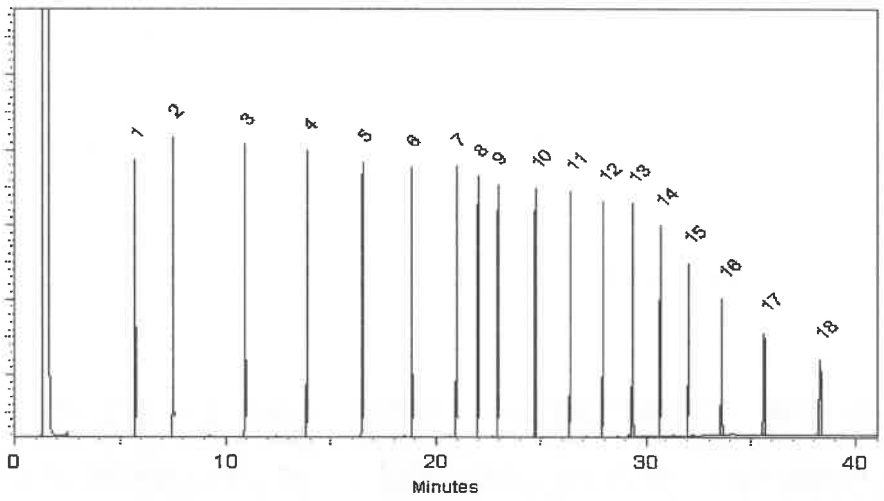
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 ml/min.

Inj. Vol
1µl



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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

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

Handling Notes:

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

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Bellefonte, PA 16823-8812
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Fax: 1-814-353-1309

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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.

P12476 Y.F. 05/23/23
↓
P12485

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.)

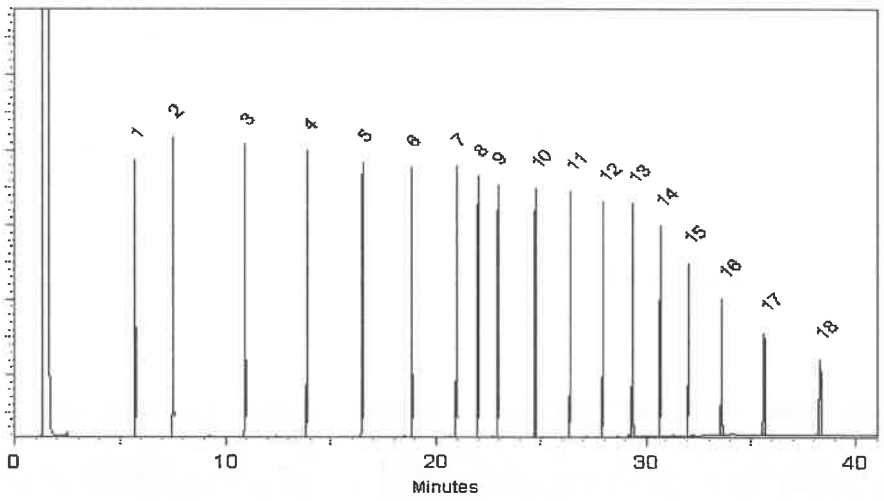
Inj. Temp:
250°C

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.
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P12476 Y.F. 05/23/23
↓
P12485

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.)

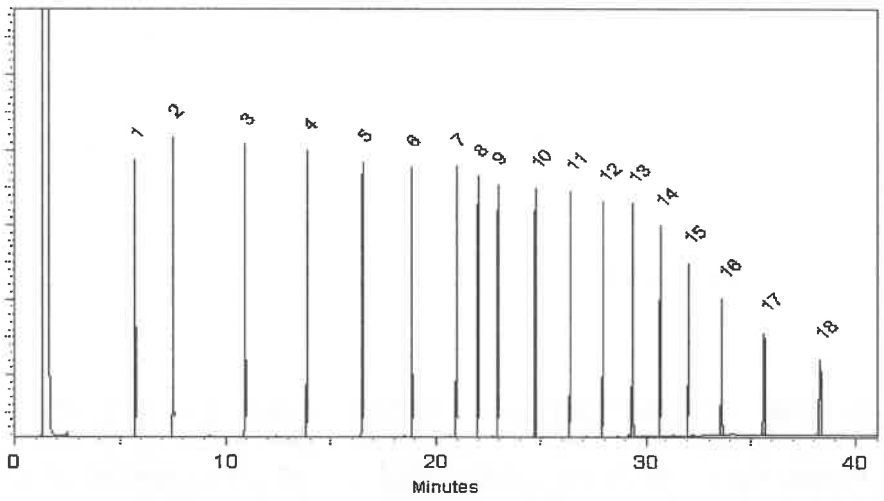
Inj. Temp:
250°C

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:

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- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

Manufacturing Notes:

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

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampuls. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
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P12476 Y.F. 05/23/23
↓
P12485

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.)

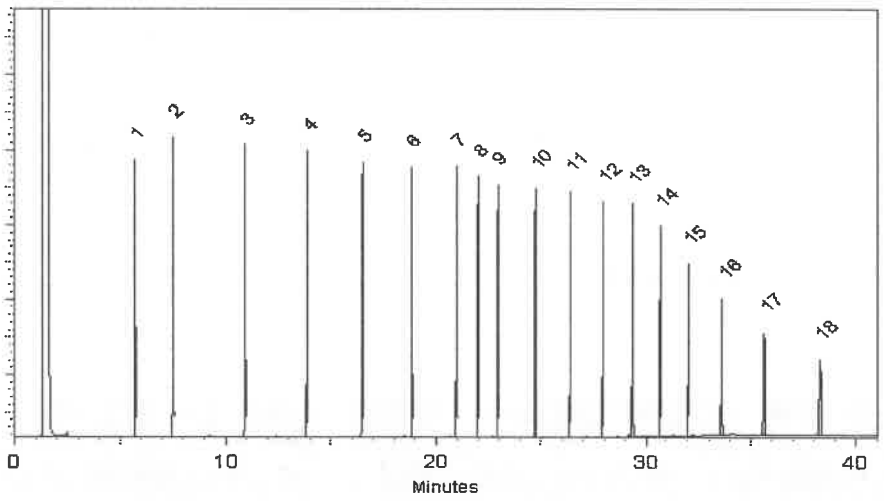
Inj. Temp:
250°C

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.
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P12476 Y.F. 05/23/23
↓
P12485

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.)

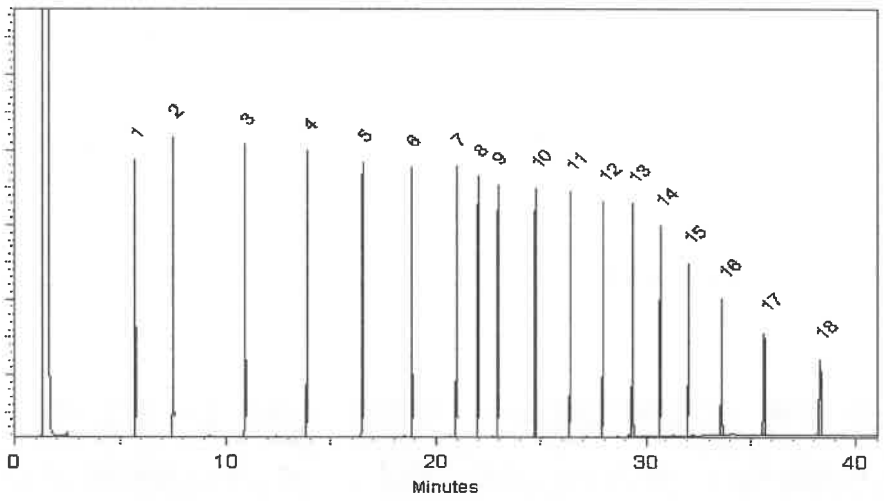
Inj. Temp:
250°C

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.

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ilac-MRA A2LA ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12486 ↓ P12495 } Y.F. 05/23/23

Catalog No. : 30543 **Lot No.:** A0195695

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 : 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	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%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
6	Fluorene	86-73-7	10236068	99%	201.2 µg/mL	+/- 9.0655
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.4 µg/mL	+/- 9.0294
8	Anthracene	120-12-7	MKCP3968	99%	200.0 µg/mL	+/- 9.0114
9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
10	Pyrene	129-00-0	BCCG7845	99%	200.4 µg/mL	+/- 9.0294
11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
12	Chrysene	218-01-9	468677R16R	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
14	Benzo(k)fluoranthene	207-08-9	012022K	99%	200.8 µg/mL	+/- 9.0474
15	Benzo(a)pyrene	50-32-8	J6IUE-00	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

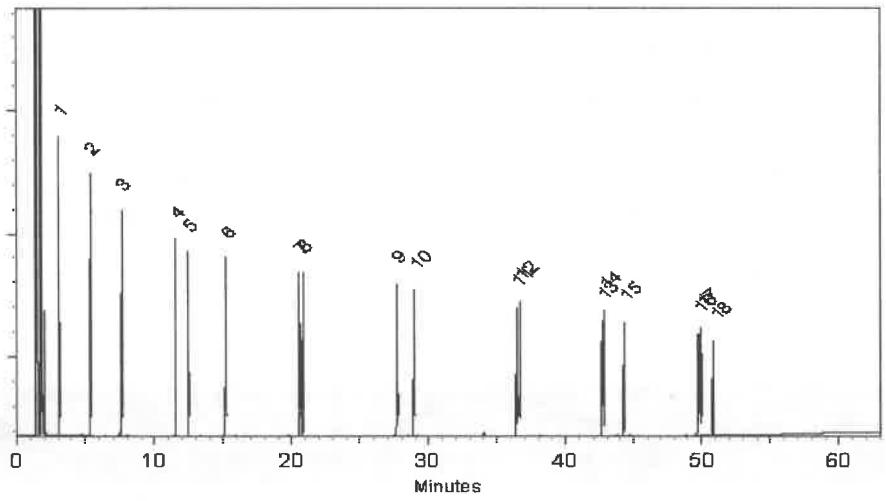
Inj. Temp:
250°C

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.

Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Marlina Cowan – Operations Tech II ARM QC

Date Passed: 15-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:

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- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

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

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

Manufacturing Notes:

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

Handling Notes:

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P12486 ↓ P12495 } Y.F. 05/23/23

Catalog No. : 30543 **Lot No.:** A0195695

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 : 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	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%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
6	Fluorene	86-73-7	10236068	99%	201.2 µg/mL	+/- 9.0655
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9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
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11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
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13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
14	Benzo(k)fluoranthene	207-08-9	012022K	99%	200.8 µg/mL	+/- 9.0474
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16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

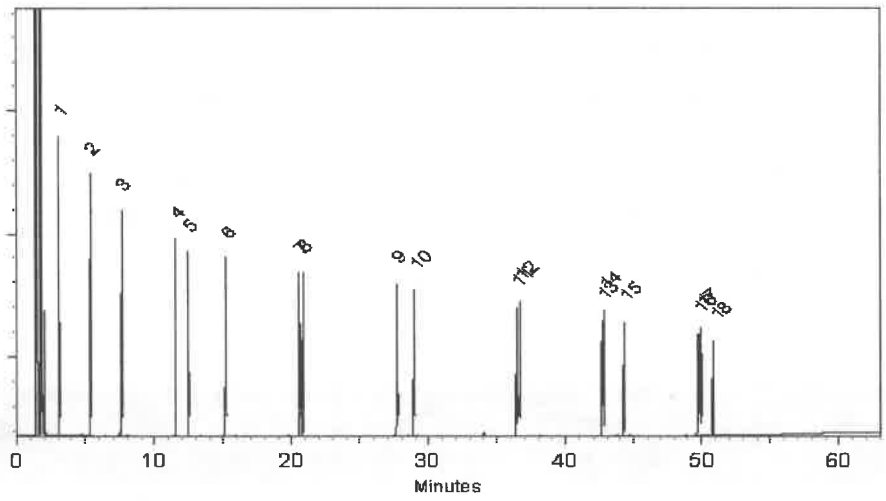
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 ml/min.

Inj. Vol
1µl



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Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Marlina Cowan – Operations Tech II ARM QC

Date Passed: 15-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:

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

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

Manufacturing Notes:

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Handling Notes:

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Certificate #3222.02

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P12496
1
P12515
Y.S.
05/26/2

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.)

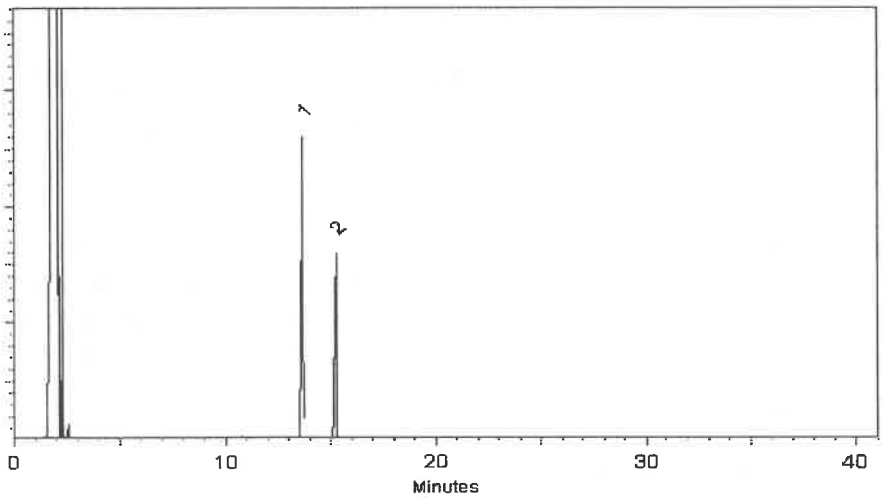
Inj. Temp:
250°C

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:

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Handling Notes:

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P12496
1
P12515
Y.S.
05/26/2

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.)

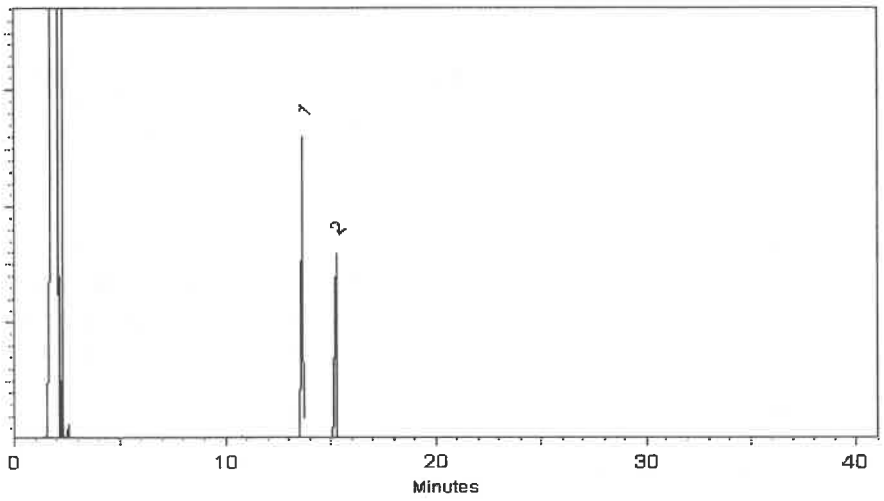
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
2 ml/min.

Inj. Vol
1µl



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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:

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Certified Uncertainty Value Notes:

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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.)

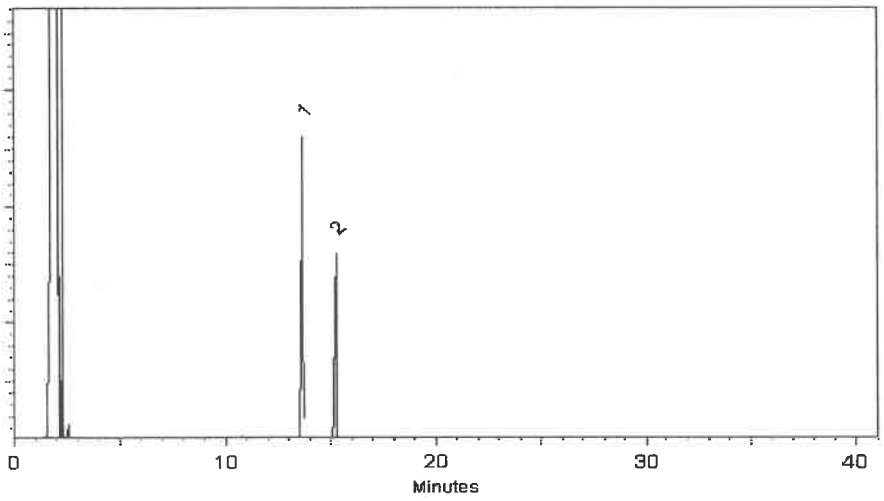
Inj. Temp:
250°C

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.

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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.

P12496
1
P12515
Y.S.
05/26/2

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.)

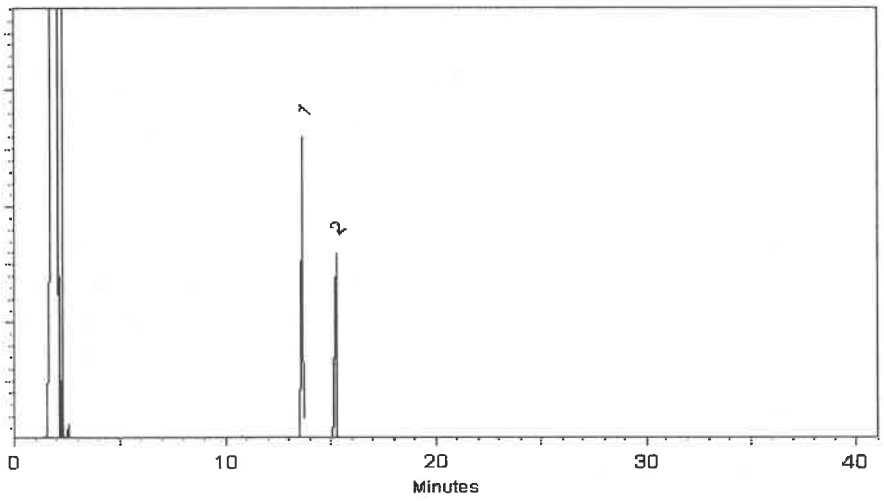
Inj. Temp:
250°C

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.
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ilac-MRA A2LA ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30543 **Lot No.:** A0195695

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

P12516 & P12535 } Y.P. 06/30/23

Container Size : 5 mL **Pkg Amt:** > 5 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	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%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
6	Fluorene	86-73-7	10236068	99%	201.2 µg/mL	+/- 9.0655
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.4 µg/mL	+/- 9.0294
8	Anthracene	120-12-7	MKCP3968	99%	200.0 µg/mL	+/- 9.0114
9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
10	Pyrene	129-00-0	BCCG7845	99%	200.4 µg/mL	+/- 9.0294
11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
12	Chrysene	218-01-9	468677R16R	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
14	Benzo(k)fluoranthene	207-08-9	012022K	99%	200.8 µg/mL	+/- 9.0474
15	Benzo(a)pyrene	50-32-8	J6IUE-00	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

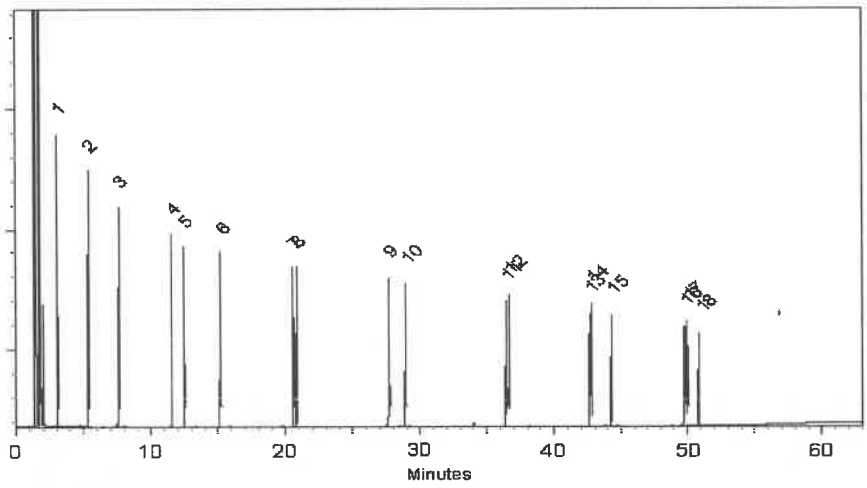
Inj. Temp:
250°C

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.

Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Martina Cowan – Operations Tech II ARM QC

Date Passed: 15-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:

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

Manufacturing Notes:

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

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampuls. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
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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.:** A0195695

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

P12516 & P12535 } Y.P. 06/30/23

Container Size : 5 mL **Pkg Amt:** > 5 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	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%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
6	Fluorene	86-73-7	10236068	99%	201.2 µg/mL	+/- 9.0655
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.4 µg/mL	+/- 9.0294
8	Anthracene	120-12-7	MKCP3968	99%	200.0 µg/mL	+/- 9.0114
9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
10	Pyrene	129-00-0	BCCG7845	99%	200.4 µg/mL	+/- 9.0294
11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
12	Chrysene	218-01-9	468677R16R	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
14	Benzo(k)fluoranthene	207-08-9	012022K	99%	200.8 µg/mL	+/- 9.0474
15	Benzo(a)pyrene	50-32-8	J6IUE-00	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

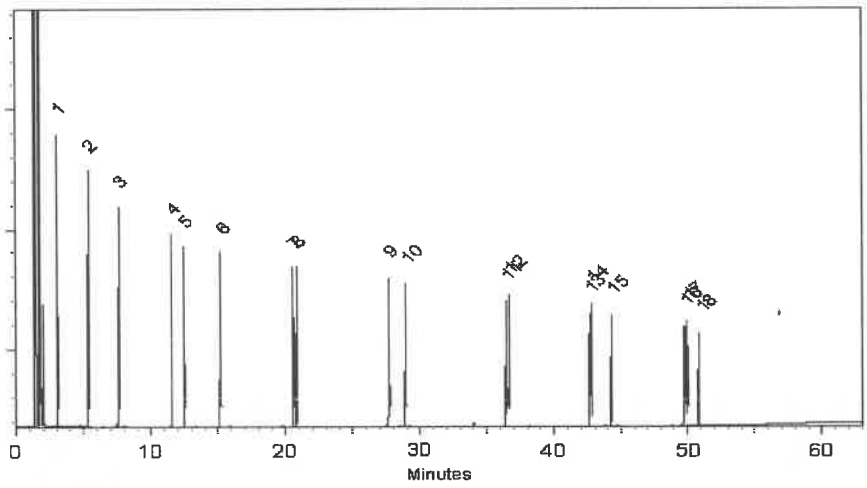
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 ml/min.

Inj. Vol
1µl



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Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Martina Cowan – Operations Tech II ARM QC

Date Passed: 15-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.
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Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

Manufacturing Notes:

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

Handling Notes:

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Catalog No. : 30543 **Lot No.:** A0195695

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

P12516 & P12535 } Y.P. 06/30/23

Container Size : 5 mL **Pkg Amt:** > 5 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	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%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
6	Fluorene	86-73-7	10236068	99%	201.2 µg/mL	+/- 9.0655
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.4 µg/mL	+/- 9.0294
8	Anthracene	120-12-7	MKCP3968	99%	200.0 µg/mL	+/- 9.0114
9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
10	Pyrene	129-00-0	BCCG7845	99%	200.4 µg/mL	+/- 9.0294
11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
12	Chrysene	218-01-9	468677R16R	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
14	Benzo(k)fluoranthene	207-08-9	012022K	99%	200.8 µg/mL	+/- 9.0474
15	Benzo(a)pyrene	50-32-8	J6IUE-00	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

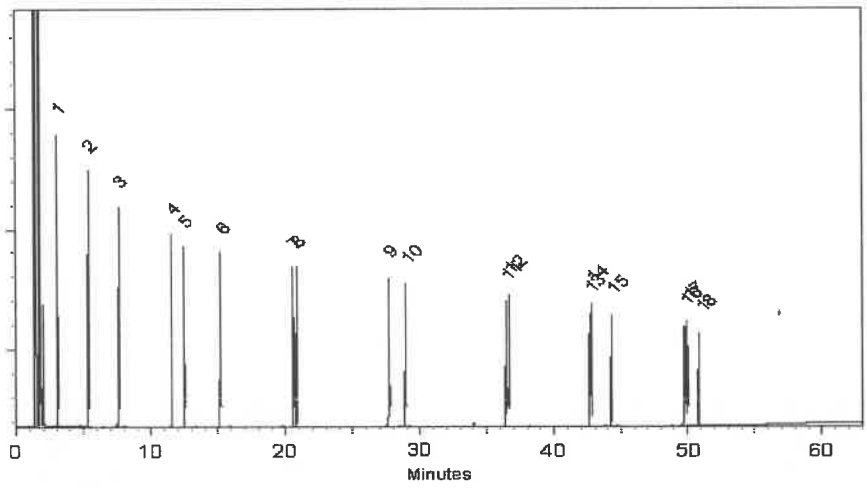
Inj. Temp:
250°C

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.

Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Martina Cowan – Operations Tech II ARM QC

Date Passed: 15-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.
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Certificate of Analysis

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ilac-MRA A2LA ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30543 **Lot No.:** A0195695

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

P12516 & P12535 } Y.P. 06/30/23

Container Size : 5 mL **Pkg Amt:** > 5 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	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%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
6	Fluorene	86-73-7	10236068	99%	201.2 µg/mL	+/- 9.0655
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.4 µg/mL	+/- 9.0294
8	Anthracene	120-12-7	MKCP3968	99%	200.0 µg/mL	+/- 9.0114
9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
10	Pyrene	129-00-0	BCCG7845	99%	200.4 µg/mL	+/- 9.0294
11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
12	Chrysene	218-01-9	468677R16R	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
14	Benzo(k)fluoranthene	207-08-9	012022K	99%	200.8 µg/mL	+/- 9.0474
15	Benzo(a)pyrene	50-32-8	J6IUE-00	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

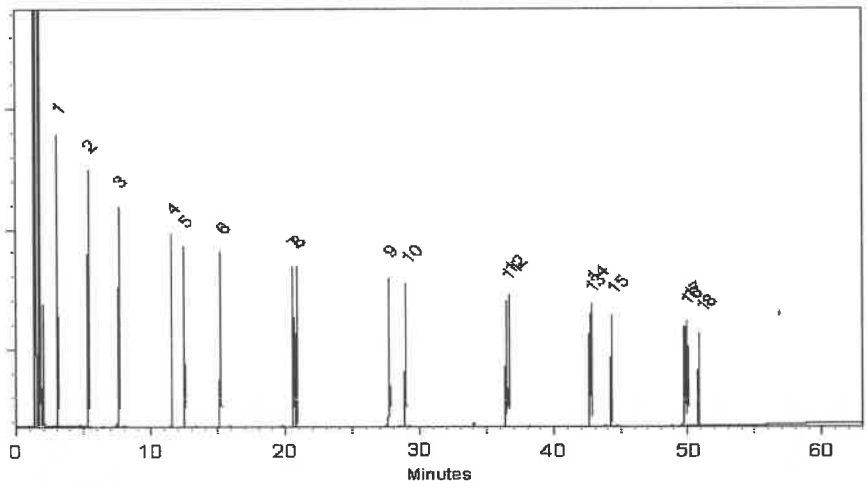
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 ml/min.

Inj. Vol
1µl



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Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Martina Cowan – Operations Tech II ARM QC

Date Passed: 15-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.
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Purity Notes:

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Certified Uncertainty Value Notes:

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

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Handling Notes:

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

Catalog No. : 30543 **Lot No.:** A0195695

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

P12516 & P12535 } Y.P. 06/30/23

Container Size : 5 mL **Pkg Amt:** > 5 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	1,2,3-Trimethylbenzene	526-73-8	8776.10-36	98%	200.7 µg/mL	+/- 9.0431
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3	2-Methylnaphthalene	91-57-6	STBK0259	96%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
6	Fluorene	86-73-7	10236068	99%	201.2 µg/mL	+/- 9.0655
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.4 µg/mL	+/- 9.0294
8	Anthracene	120-12-7	MKCP3968	99%	200.0 µg/mL	+/- 9.0114
9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
10	Pyrene	129-00-0	BCCG7845	99%	200.4 µg/mL	+/- 9.0294
11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
12	Chrysene	218-01-9	468677R16R	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
14	Benzo(k)fluoranthene	207-08-9	012022K	99%	200.8 µg/mL	+/- 9.0474
15	Benzo(a)pyrene	50-32-8	J6IUE-00	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

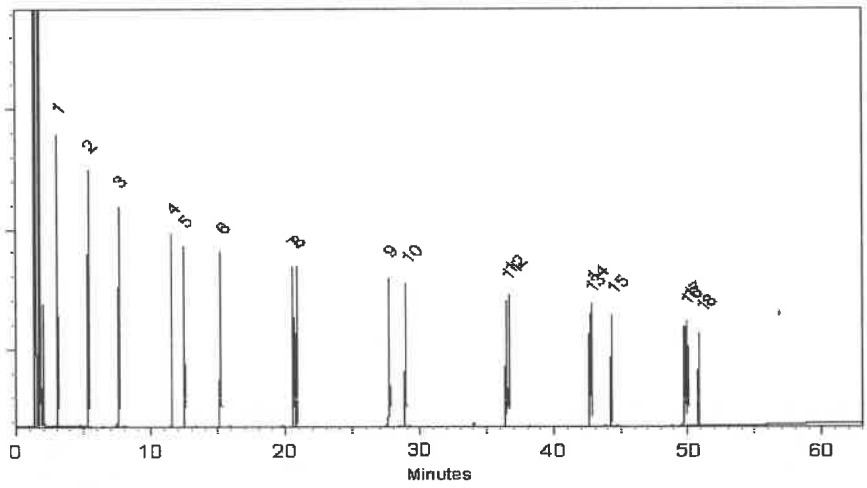
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 ml/min.

Inj. Vol
1µl



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Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Martina Cowan – Operations Tech II ARM QC

Date Passed: 15-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.
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Certified Uncertainty Value Notes:

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

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Manufacturing Notes:

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Handling Notes:

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Catalog No. : 30543 **Lot No.:** A0195695

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

P12516 & P12535 } Y.P. 06/30/23

Container Size : 5 mL **Pkg Amt:** > 5 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)
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2	Naphthalene	91-20-3	MKCH0219	99%	200.8 µg/mL	+/- 9.0474
3	2-Methylnaphthalene	91-57-6	STBK0259	96%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
6	Fluorene	86-73-7	10236068	99%	201.2 µg/mL	+/- 9.0655
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9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
10	Pyrene	129-00-0	BCCG7845	99%	200.4 µg/mL	+/- 9.0294
11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
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13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
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* 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.)

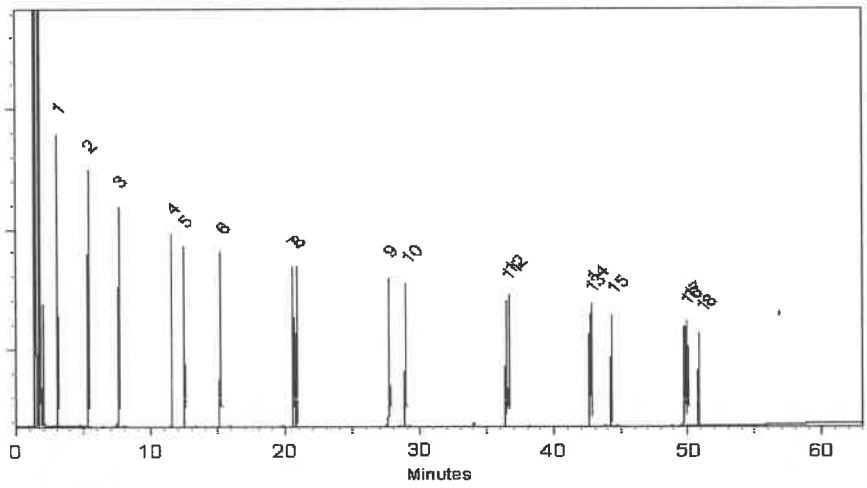
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 ml/min.

Inj. Vol
1µl



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Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Martina Cowan – Operations Tech II ARM QC

Date Passed: 15-Mar-2023

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

General Certified Reference Material Notes

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

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

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

CERTIFIED VALUES

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4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
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16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

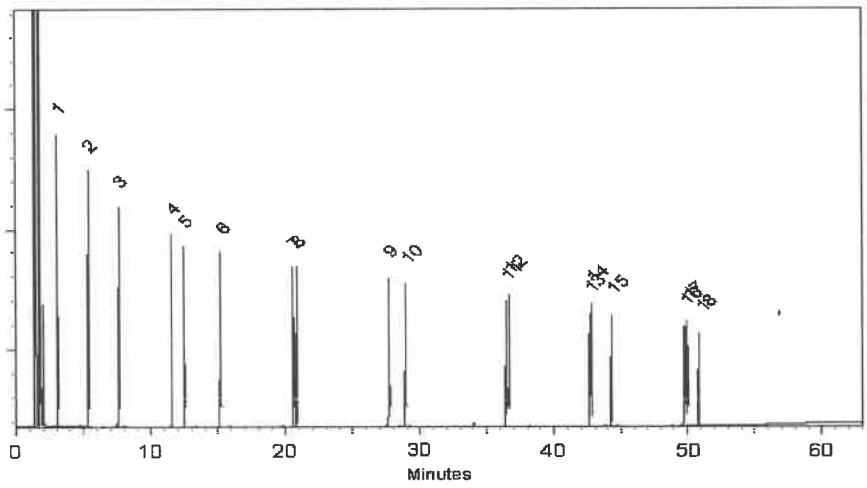
Inj. Temp:
250°C

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.

Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Martina Cowan – Operations Tech II ARM QC

Date Passed: 15-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.

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ilac-MRA A2LA ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30543 **Lot No.:** A0195695

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

P12516 & P12535 } Y.P. 06/30/23

Container Size : 5 mL **Pkg Amt:** > 5 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	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%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
6	Fluorene	86-73-7	10236068	99%	201.2 µg/mL	+/- 9.0655
7	Phenanthrene	85-01-8	MKCQ2033	99%	200.4 µg/mL	+/- 9.0294
8	Anthracene	120-12-7	MKCP3968	99%	200.0 µg/mL	+/- 9.0114
9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
10	Pyrene	129-00-0	BCCG7845	99%	200.4 µg/mL	+/- 9.0294
11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
12	Chrysene	218-01-9	468677R16R	99%	200.8 µg/mL	+/- 9.0474
13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
14	Benzo(k)fluoranthene	207-08-9	012022K	99%	200.8 µg/mL	+/- 9.0474
15	Benzo(a)pyrene	50-32-8	J6IUE-00	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

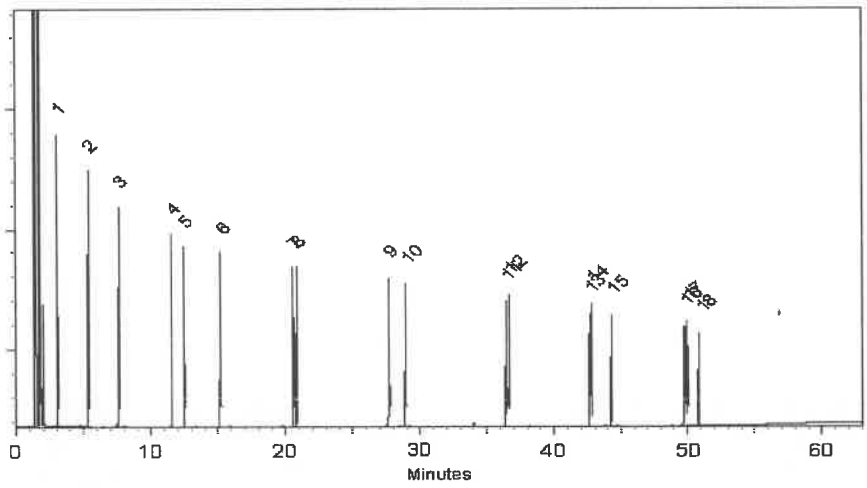
Inj. Temp:
250°C

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.

Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Martina Cowan – Operations Tech II ARM QC

Date Passed: 15-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.

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ilac-MRA A2LA ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30543 **Lot No.:** A0195695

Description : NJEPH Aromatics Matrix Spike Mix

NJEPH Aromatics Matrix Spike Mix 200µg/mL, Acetone/Toluene (50:50), 5mL/ampul

P12516 & P12535 } Y.P. 06/30/23

Container Size : 5 mL **Pkg Amt:** > 5 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	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%	200.1 µg/mL	+/- 9.0143
4	Acenaphthylene	208-96-8	L10L	95%	199.9 µg/mL	+/- 9.0060
5	Acenaphthene	83-32-9	MKCR7169	99%	200.0 µg/mL	+/- 9.0114
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7	Phenanthrene	85-01-8	MKCQ2033	99%	200.4 µg/mL	+/- 9.0294
8	Anthracene	120-12-7	MKCP3968	99%	200.0 µg/mL	+/- 9.0114
9	Fluoranthene	206-44-0	MKCF7378	99%	200.0 µg/mL	+/- 9.0114
10	Pyrene	129-00-0	BCCG7845	99%	200.4 µg/mL	+/- 9.0294
11	Benz(a)anthracene	56-55-3	RP230103RSRA	97%	200.1 µg/mL	+/- 9.0173
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13	Benzo(b)fluoranthene	205-99-2	012013B	99%	200.7 µg/mL	+/- 9.0420
14	Benzo(k)fluoranthene	207-08-9	012022K	99%	200.8 µg/mL	+/- 9.0474
15	Benzo(a)pyrene	50-32-8	J6IUE-00	99%	200.8 µg/mL	+/- 9.0474
16	Indeno(1,2,3-cd)pyrene	193-39-5	12-JKL-118-9	99%	201.6 µg/mL	+/- 9.0835

17	Dibenz(a,h)anthracene	53-70-3	ER032211-01	99%	201.2	µg/mL	+/- 9.0655
18	Benzo(g,h,i)perylene	191-24-2	PMEVE	98%	200.1	µg/mL	+/- 9.0149

* 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.)

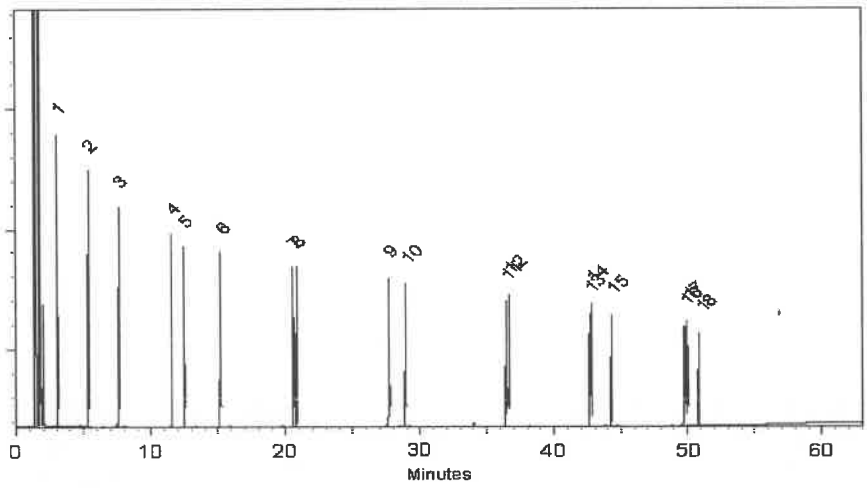
Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID

Split Vent:
20 ml/min.

Inj. Vol
1µl



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Morgan Craighead - Mix Technician

Date Mixed: 09-Mar-2023 **Balance Serial #** 1128360905

Martina Cowan – Operations Tech II ARM QC

Date Passed: 15-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.

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Certificate #3222.01

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ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

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

P2166 & P2184 Y.P. 11/14/22

Catalog No. : 31098 **Lot No.:** A0183404

Description : 1-Chlorooctadecane Standard

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

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

Expiration Date : April 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	10,051.0 µg/mL	+/- 58.4374	µg/mL	Gravimetric
	CAS # 3386-33-2 (Lot 12882200)		+/- 563.5496	µg/mL	Unstressed
	Purity 99%		+/- 576.7359	µg/mL	Stressed

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

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

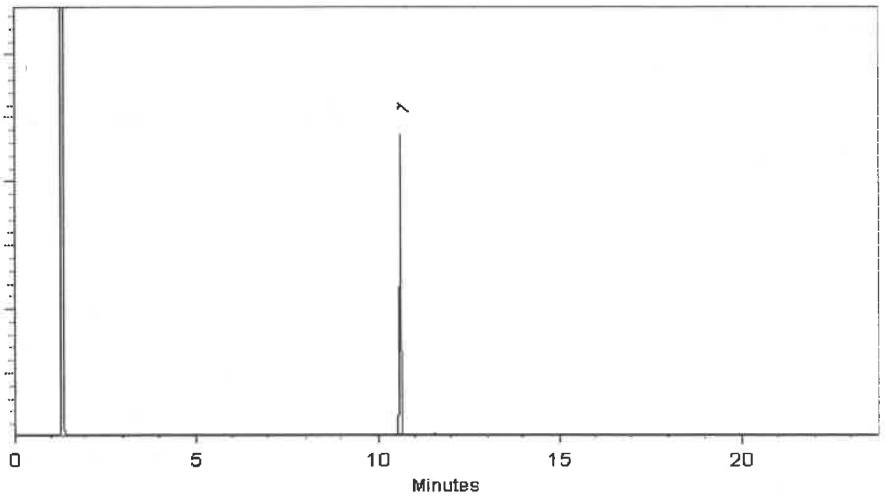
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
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.

Brittany Federinko - Operations Tech I

Date Mixed: 28-Mar-2022 **Balance:** 1128353505

Marlina Cowan - Operations Tech I

Date Passed: 31-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.

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P2166 & P2184 Y.P. 11/14/22

Catalog No. : 31098 **Lot No.:** A0183404

Description : 1-Chlorooctadecane Standard

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

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

Expiration Date : April 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	10,051.0 µg/mL	+/- 58.4374	µg/mL	Gravimetric
	CAS # 3386-33-2 (Lot 12882200)		+/- 563.5496	µg/mL	Unstressed
	Purity 99%		+/- 576.7359	µg/mL	Stressed

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

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

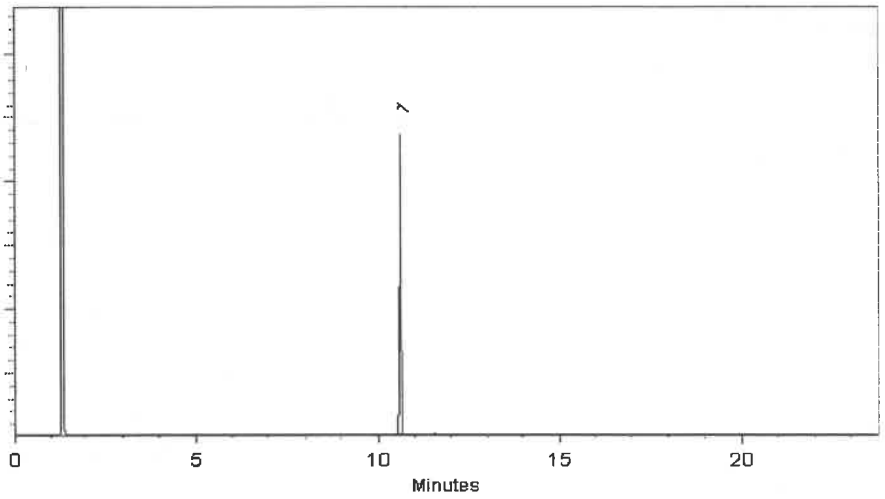
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
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.

Brittany Federinko - Operations Tech I

Date Mixed: 28-Mar-2022 **Balance:** 1128353505

Marlina Cowan - Operations Tech I

Date Passed: 31-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.
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Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
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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.

P2185 YP. 11/14/22

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	10,066.3 µg/mL	+/- 58.5260	µg/mL	Gravimetric
	CAS # 3386-33-2 (Lot 13661500)		+/- 564.4046	µg/mL	Unstressed
	Purity 99%		+/- 577.6110	µg/mL	Stressed

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

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

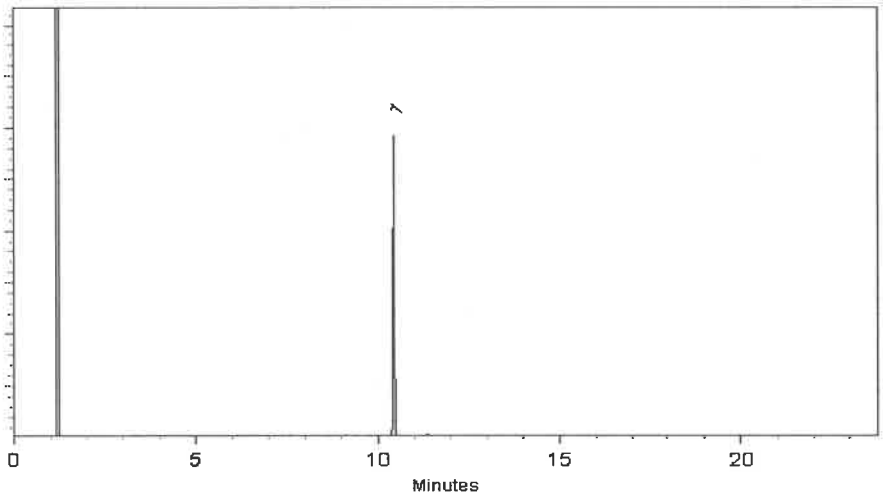
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
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%.

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- 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.
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Handling Notes:

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