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Prep Standard - Chemical Standard Summary

Order ID : O2213

Test : EPH

Prepbatch ID : PB151925,

Sequence ID/Qc Batch ID: FG061223AL,

Standard ID :
EP2318,EP2321,PP21562,PP21780,PP21814,PP21845,PP21954,PP21955,PP21956,PP21957,PP21958,PP21959,PP21960,

Chemical ID :
E2865,E3412,E3481,E3482,E3486,E3487,E3488,E3495,P11134,P11263,P11676,P11677,P11678,P11727,P11728,P11729,P11730,P11735,P11829,P12129,P12166,P12171,P12200,P12220,P12221,P12222,P12223,P12224,P12225,P12226,P12227,P12228,P12229,P12243,P12254,P12255,P12256,P12257,P12258,P12331,P12332,P12333,P12334,P12335,P12336,P12337,P12338,

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Extractions STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2017	1:1 ACETONE/METHYLENE CHLORIDE	EP2318	03/30/2023	09/22/2023	Rajesh Parikh	None	None	RUPESHKUMAR SHAH 03/30/2023

FROM 8000.00000ml of E3486 + 8000.00000ml of E3487 = Final Quantity: 16000.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3923	Baked Sodium Sulfate	EP2321	03/31/2023	09/30/2023	RUPESHKUMAR SHAH	None	None	Rajesh Parikh 03/31/2023

FROM 1.00000gram 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
2589	20 PPM NJ EPH SPIKE for LOD-LOQ	PP21562	01/26/2023	07/26/2023	Yogesh Patel	None	None	Sohil Jodhani 01/26/2023

FROM 1.00000ml of P12129 + 1.00000ml of P12243 + 8.00000ml of P11263 = Final Quantity: 10.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1339	100 PPM NJEPH Surrogate Spike	PP21780	03/09/2023	09/09/2023	Yogesh Patel	None	None	Ankita Jodhani 03/10/2023

FROM 1.25000ml of P11676 + 1.25000ml of P11677 + 1.25000ml of P11678 + 1.25000ml of P11727 + 1.25000ml of P11728 + 1.25000ml of P11729 + 1.25000ml of P11730 + 1.25000ml of P12166 + 490.00000ml of E3481 = Final Quantity: 500.000 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	PP21814	03/14/2023	09/08/2023	Yogesh Patel	None	None	Ankita Jodhani 03/15/2023

FROM 1.25000ml of P12200 + 1.25000ml of P12256 + 1.25000ml of P12257 + 1.25000ml of P12258 + 195.00000ml of E3482 = Final Quantity: 200.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1330	100 PPM NJEPH Spike Solution	PP21845	03/21/2023	09/21/2023	Yogesh Patel	None	None	Ankita Jodhani 03/23/2023

FROM 5.00000ml of P12220 + 5.00000ml of P12221 + 5.00000ml of P12222 + 5.00000ml of P12223 + 5.00000ml of P12224 + 5.00000ml of P12225 + 5.00000ml of P12226 + 5.00000ml of P12227 + 5.00000ml of P12228 + 5.00000ml of P12229 + 5.00000ml of P12254 + 5.00000ml of P12255 + 5.00000ml of P12331 + 5.00000ml of P12332 + 5.00000ml of P12333 + 5.00000ml of P12334 + 5.00000ml of P12335 + 5.00000ml of P12336 + 5.00000ml of P12337 + 5.00000ml of P12338 = 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
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

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	PC19631-100 / SODIUM SULFATE, ANHYDROUS, PEST GRADE, 1	139404	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 #
Seidler Chemical	BA-9254-03 / Acetone, Ultra Resi (cs/4x4L)	22L2862006	11/08/2023	03/08/2023 / Rajesh	03/08/2023 / Rajesh	E3481

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)	22G0362002	09/08/2023	03/10/2023 / Rajesh	03/08/2023 / Rajesh	E3482

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)	23A0362012	09/22/2023	03/22/2023 / Rajesh	02/28/2023 / Rajesh	E3486

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	09/27/2023	03/27/2023 / Rajesh	03/22/2023 / Rajesh	E3487

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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)	22G0362002	09/30/2023	03/30/2023 / Rajesh	03/22/2023 / Rajesh	E3488

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 #
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	31098 / 1-Chlorooctadecane Standard	A0183404	09/09/2023	03/09/2023 / yogesh	05/27/2022 / Sohil	P11676

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	09/09/2023	03/09/2023 / yogesh	05/27/2022 / Sohil	P11677

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	09/09/2023	03/09/2023 / yogesh	05/27/2022 / Sohil	P11678

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	09/09/2023	03/09/2023 / yogesh	05/27/2022 / Sohil	P11727

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	09/09/2023	03/09/2023 / yogesh	05/27/2022 / Sohil	P11728

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	09/09/2023	03/09/2023 / yogesh	05/27/2022 / Sohil	P11729

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	09/09/2023	03/09/2023 / yogesh	05/27/2022 / Sohil	P11730

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

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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	30540 / Custom NJEPH Aliphatics Calibration Standard	A0184811	10/20/2023	04/20/2023 / yogesh	06/17/2022 / Ankita	P11829

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	07/26/2023	01/26/2023 / yogesh	10/28/2022 / Yogesh	P12129

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	09/09/2023	03/09/2023 / yogesh	11/10/2022 / Yogesh	P12166

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	31480 / MA Fractionation Surrogate Spike Mix	A0187866	09/14/2023	03/14/2023 / yogesh	11/10/2022 / Yogesh	P12200

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12220

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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	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12221

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12222

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12223

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12224

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12225

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12226

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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	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12227

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12228

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12229

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0188761	07/26/2023	01/26/2023 / yogesh	12/30/2022 / Yogesh	P12243

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12254

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	09/21/2023	03/21/2023 / yogesh	12/30/2022 / Yogesh	P12255

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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	A0187866	09/14/2023	03/14/2023 / yogesh	01/27/2023 / Yogesh	P12256

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	09/14/2023	03/14/2023 / yogesh	01/27/2023 / Yogesh	P12257

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	09/14/2023	03/14/2023 / yogesh	01/27/2023 / Yogesh	P12258

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	09/21/2023	03/21/2023 / yogesh	02/22/2023 / Yogesh	P12331

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	09/21/2023	03/21/2023 / yogesh	02/22/2023 / Yogesh	P12332

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	09/21/2023	03/21/2023 / yogesh	02/22/2023 / Yogesh	P12333

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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	A0191469	09/21/2023	03/21/2023 / yogesh	02/22/2023 / Yogesh	P12334

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	09/21/2023	03/21/2023 / yogesh	02/22/2023 / Yogesh	P12335

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	09/21/2023	03/21/2023 / yogesh	02/22/2023 / Yogesh	P12336

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	09/21/2023	03/21/2023 / yogesh	02/22/2023 / Yogesh	P12337

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	09/21/2023	03/21/2023 / yogesh	02/22/2023 / Yogesh	P12338

Sand
Purified
Washed and Ignited

avantor™ | J.T.Baker®

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

Certificate of Analysis

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

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

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

E 2865

James T Ethier

Jamie Ethier
Vice President Global Quality

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

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

ALLAN CHEMICAL CORPORATION
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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

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 3/8/23

E 3481

James 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.: 22G0362002
Manufactured Date: 2022-06-17
Expiration Date: 2023-09-16
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	2
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	2
ECD-Sensitive Impurities (as Ethylene Dibromide) - Single Impurity Peak (ng/mL)	≤ 5	2
Assay (Total Saturated C_6 Isomers) (by GC, corrected for water)	≥ 99.5 %	99.5 %
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 3/8/23

E 3482

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

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

avantor™ | J.T.Baker®

Material No.: 9266-A4
Batch No.: 23A0362012
Manufactured Date: 2022-11-23
Expiration Date: 2024-02-22
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	2
Assay (CH_2Cl_2) (by GC, exclusive of preservative, corrected for water)	≥ 99.8 %	100.0 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	< 0.1 ppm
Titrable Acid (µeq/g)	≤ 0.3	< 0.1
Chloride (Cl)	≤ 10 ppm	< 5 ppm
Water (by KF, coulometric)	≤ 0.02 %	< 0.01 %

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

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

E 3486

James 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 3/22/23

E 3487

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.: 22G0362002
Manufactured Date: 2022-06-17
Expiration Date: 2023-09-16
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	2
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	2
ECD-Sensitive Impurities (as Ethylene Dibromide) - Single Impurity Peak (ng/mL)	≤ 5	2
Assay (Total Saturated C_6 Isomers) (by GC, corrected for water)	≥ 99.5 %	99.5 %
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 3/22/23

E3488

James 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.: 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

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

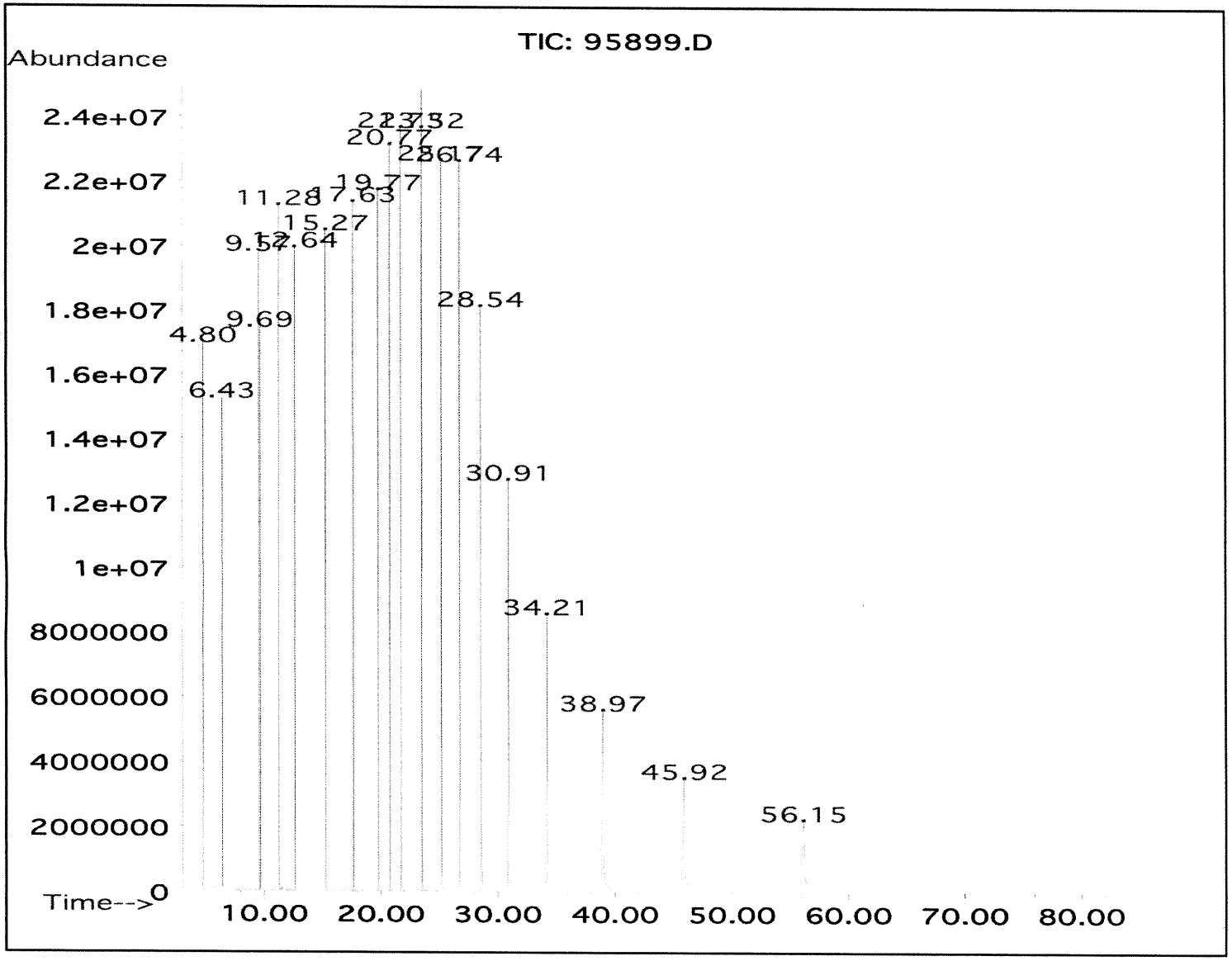
	Compound	(RM#) Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Initial Conc.(ug/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)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

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ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

P11639 to P11678

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. : 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)

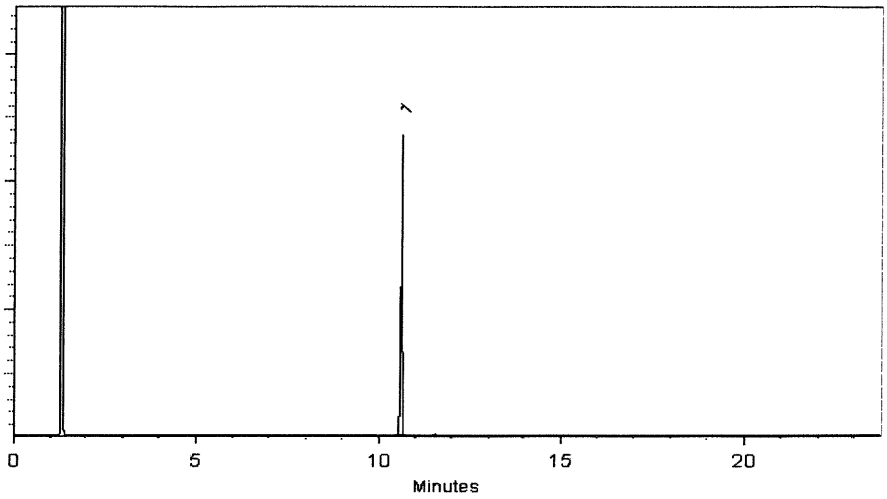
Carrier Gas:
hydrogen-constant pressure 10 psi.

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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Fax: (814)353-1309

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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

P11639 to P11678

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. : 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)

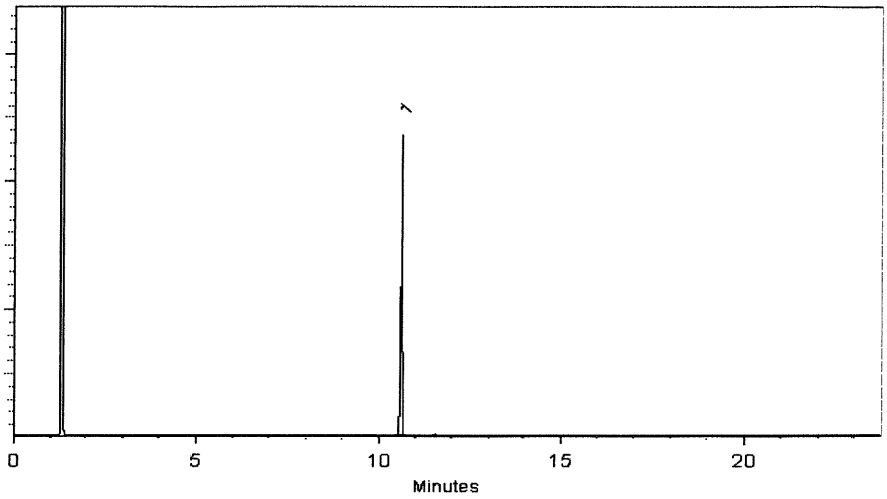
Carrier Gas:
hydrogen-constant pressure 10 psi.

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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Certificate of Analysis

P11639 to P11678

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. : 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)

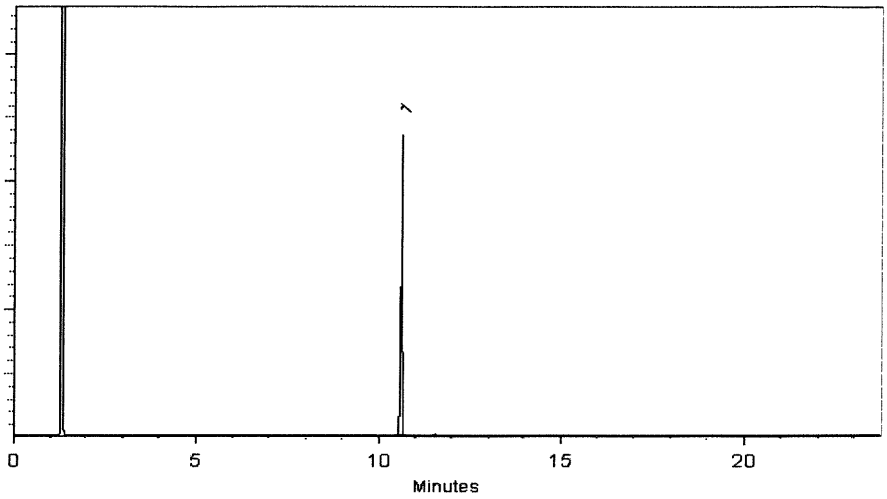
Carrier Gas:
hydrogen-constant pressure 10 psi.

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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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)

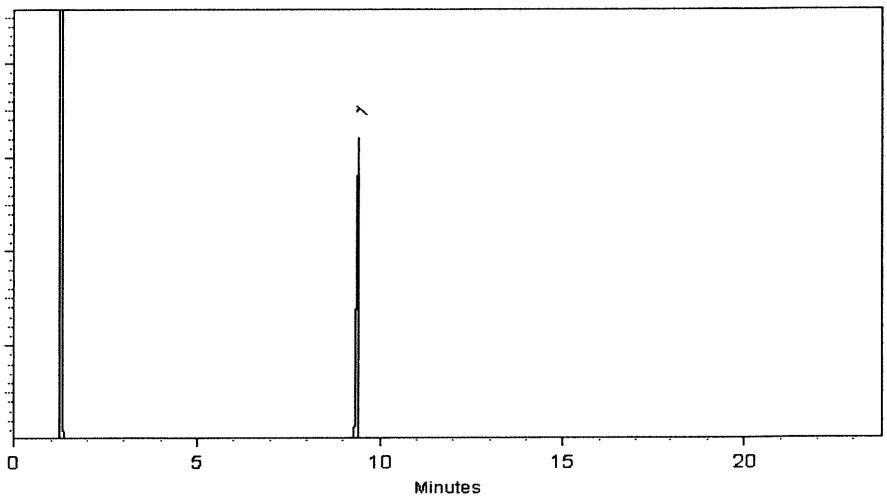
Carrier Gas:
hydrogen-constant pressure 10 psi.

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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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)

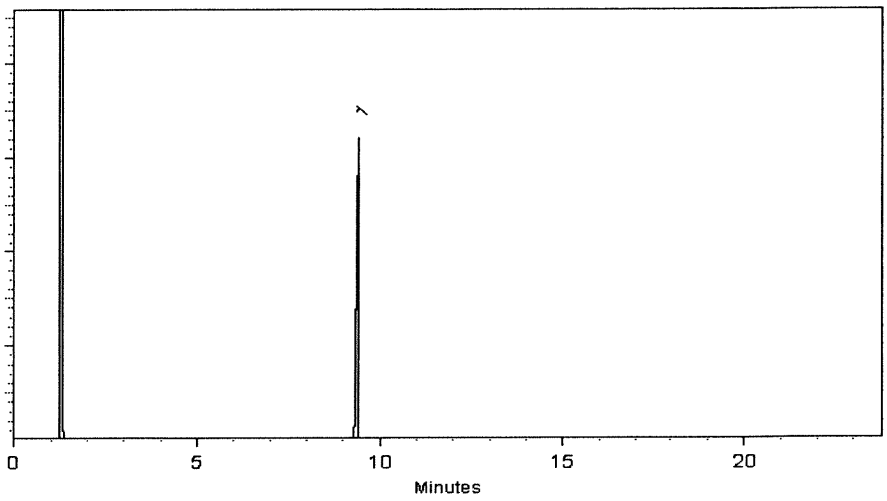
Carrier Gas:
hydrogen-constant pressure 10 psi.

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:

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

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- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

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

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

Manufacturing Notes:

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

Handling Notes:

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

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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)

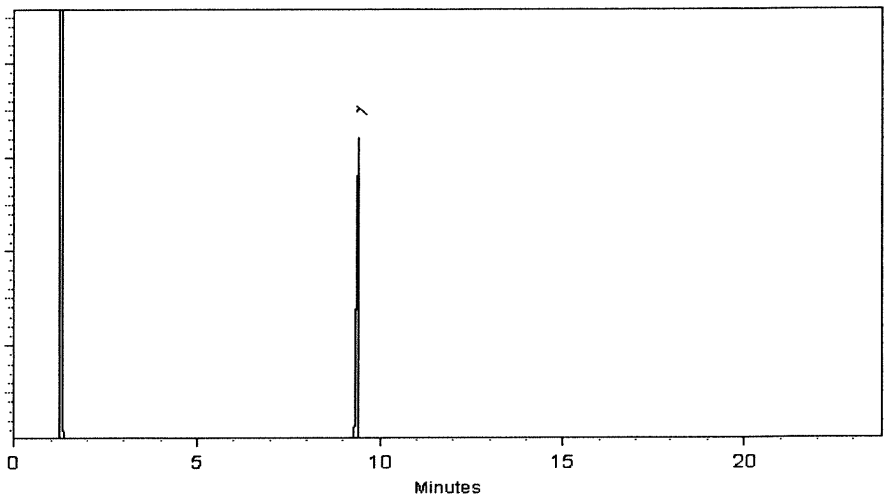
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.
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Label Conditions	Standard Conditions	Non-Standard Conditions
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10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
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Manufacturing Notes:

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Handling Notes:

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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)

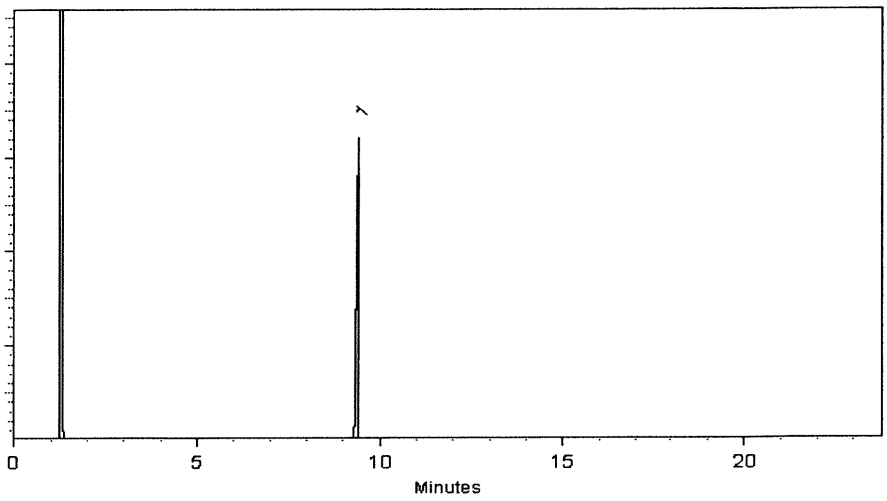
Carrier Gas:
hydrogen-constant pressure 10 psi.

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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Reference Material Producer
Certificate #3222.01

ACCREDITED
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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)

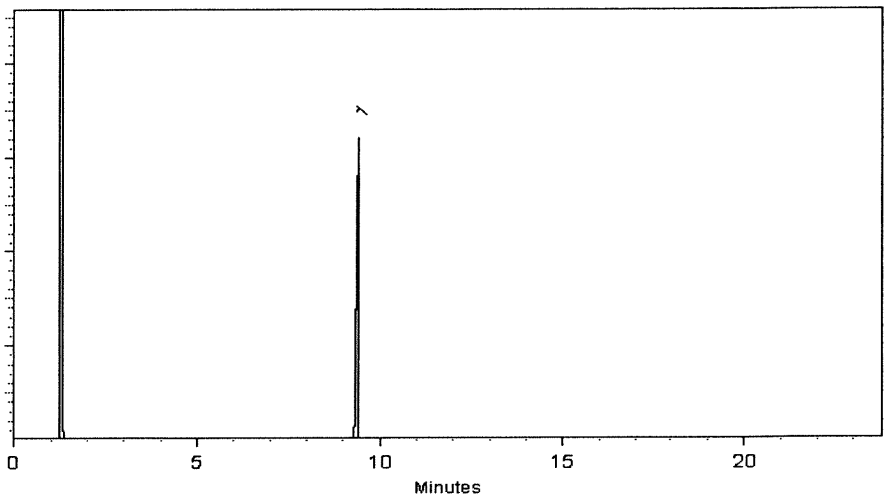
Carrier Gas:
hydrogen-constant pressure 10 psi.

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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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

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Reference Material Producer
Certificate #3222.01

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ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P11827 ↓ P11831 AJ 06/14/22

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

Description : NJEPH Aliphatics Calibration Standard

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

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

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

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

CERTIFIED VALUES

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

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

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

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

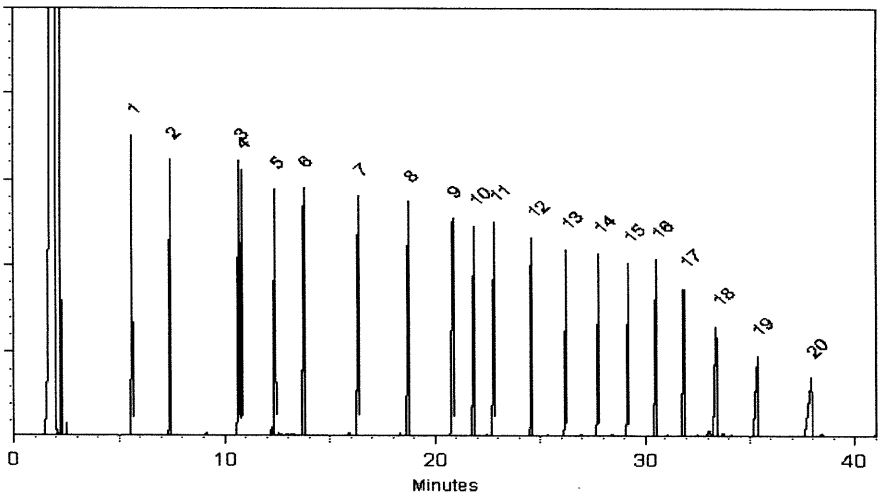
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Brittany Federinko - Operations Tech I

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

Christie Mills - Operations Technician II

Date Passed: 06-May-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED ISO 17034 Accredited Reference Material Producer Certificate #3222.01

ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **Storage:** 10°C or colder

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

P12108 ↓ P12135 } Y.P. 10/31/22.

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%	201.0 µg/mL	+/- 1.1939 µg/mL +/- 4.9937 µg/mL +/- 5.9858 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBN8619) **Purity** 99%	200.0 µg/mL	+/- 1.1879 µg/mL +/- 4.9689 µg/mL +/- 5.9561 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBK0925) **Purity** 99%	200.0 µg/mL	+/- 1.1879 µg/mL +/- 4.9689 µg/mL +/- 5.9561 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	201.3 µg/mL	+/- 1.1959 µg/mL +/- 5.0020 µg/mL +/- 5.9958 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.6 µg/mL	+/- 1.1913 µg/mL +/- 4.9831 µg/mL +/- 5.9731 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot VZKOJ) **Purity** 97%	199.8 µg/mL	+/- 1.1869 µg/mL +/- 4.9644 µg/mL +/- 5.9507 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCF7888) **Purity** 99%	200.0 µg/mL	+/- 1.1879 µg/mL +/- 4.9689 µg/mL +/- 5.9561 µg/mL	Gravimetric Unstressed Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

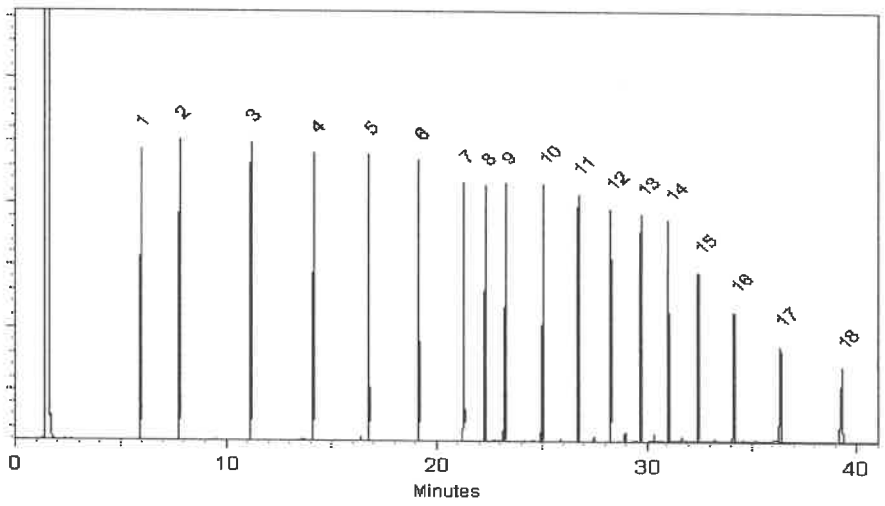
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED ISO 17034 Accredited Reference Material Producer Certificate #3222.01

ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12216
P12231
Y.P. 12/30/22

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **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	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

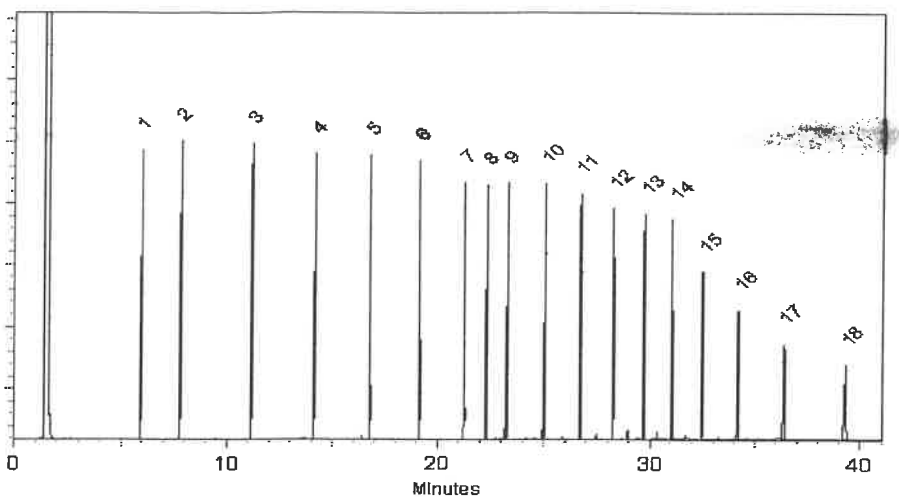
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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P12216
P12231
Y.P. 12/30/22

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **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	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

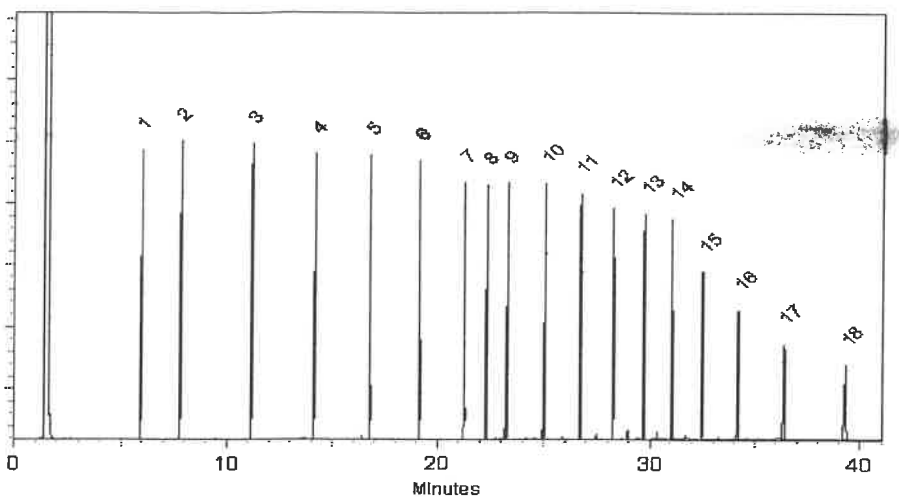
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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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.
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Handling Notes:

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P12216
P12231
Y.P. 12/30/22

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **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)		
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	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

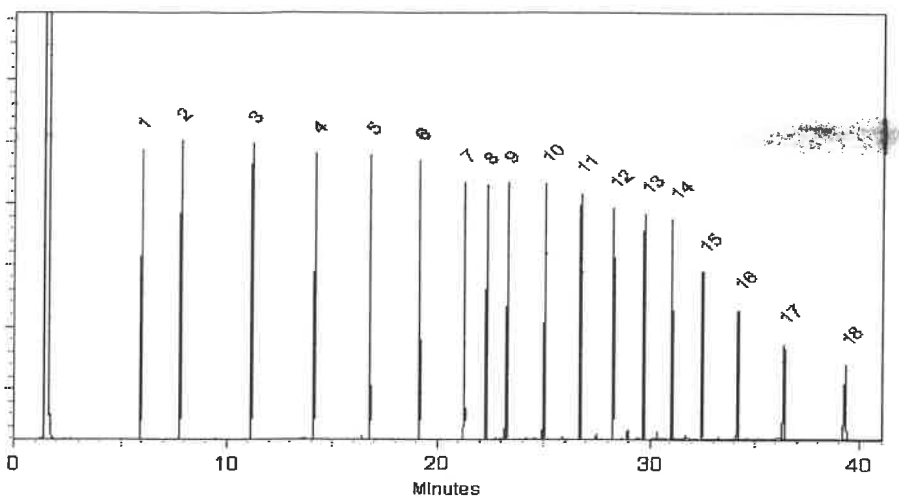
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED ISO 17034 Accredited Reference Material Producer Certificate #3222.01

ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12216
P12231
Y.P. 12/30/22

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **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	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

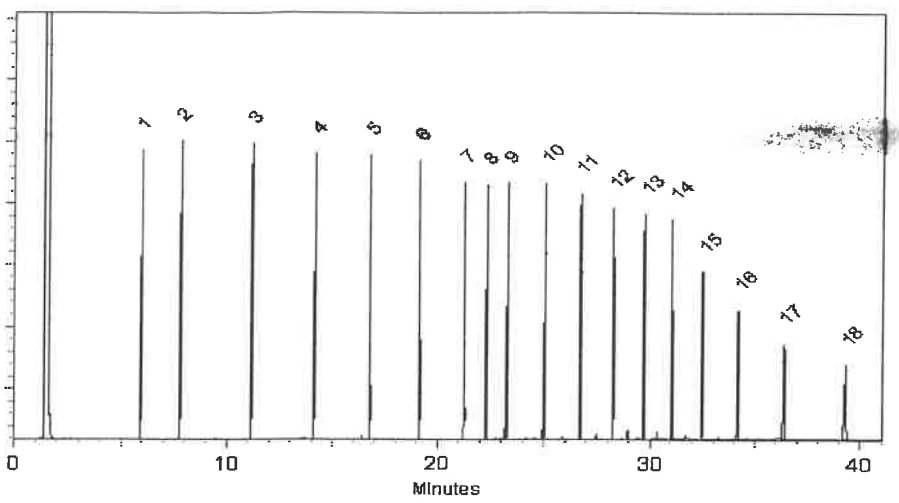
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

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.

P12216
P12231
Y.P. 12/30/22

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **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	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

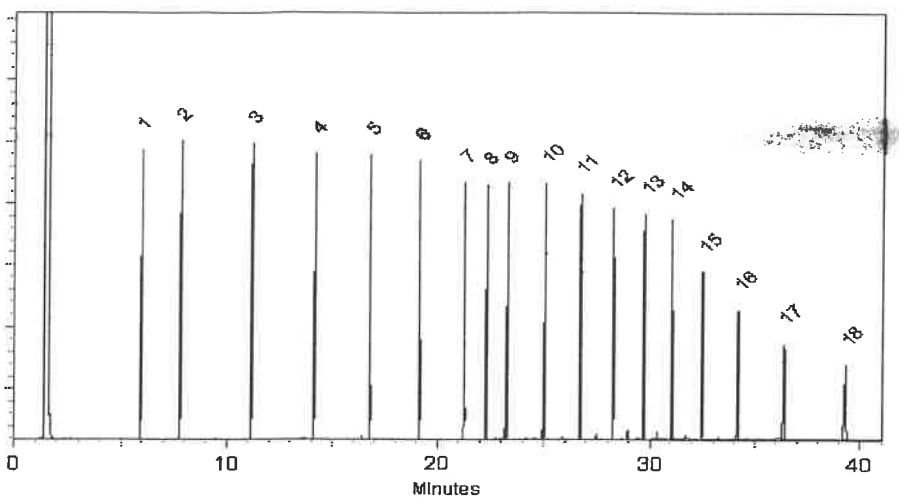
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

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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 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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- 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:

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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.

P12216
P12231
Y.P. 12/30/22

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **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	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

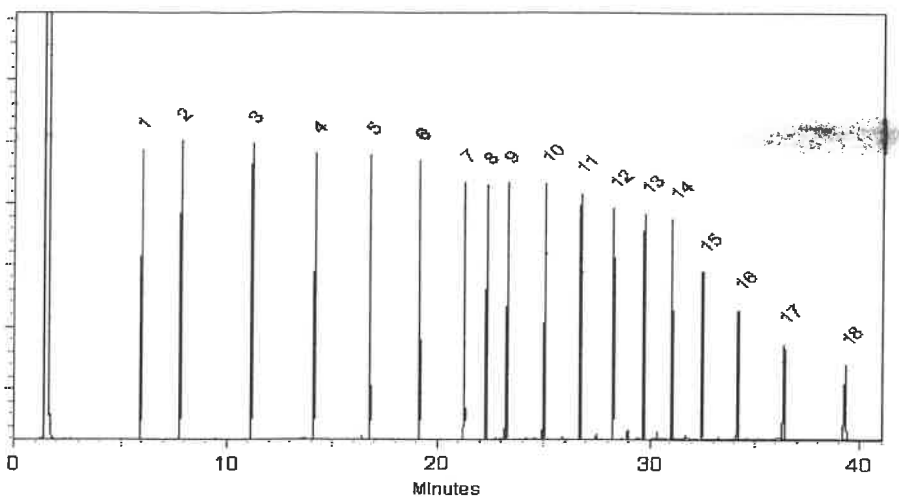
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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P12216
P12231
Y.P. 12/30/22

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **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	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed 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:
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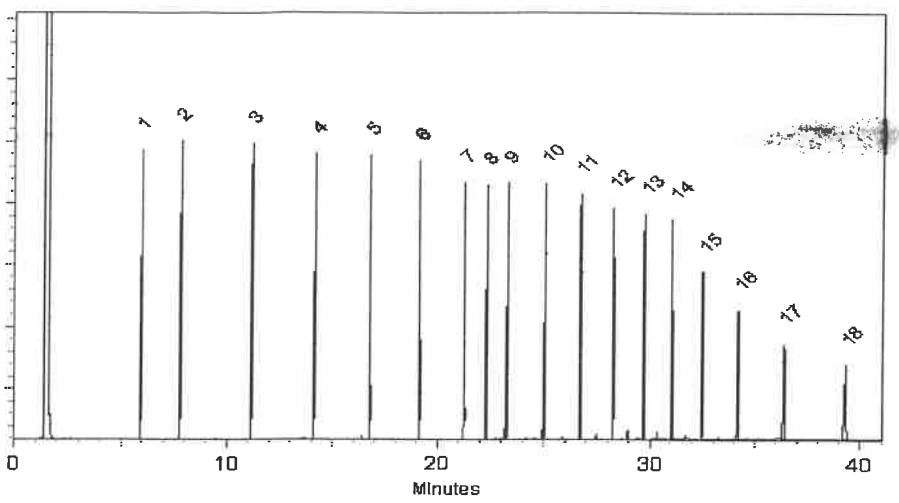
Det. Temp:
330°C

Det. Type:
FID



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Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

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Y.P. 12/30/22

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	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
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	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
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	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
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8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

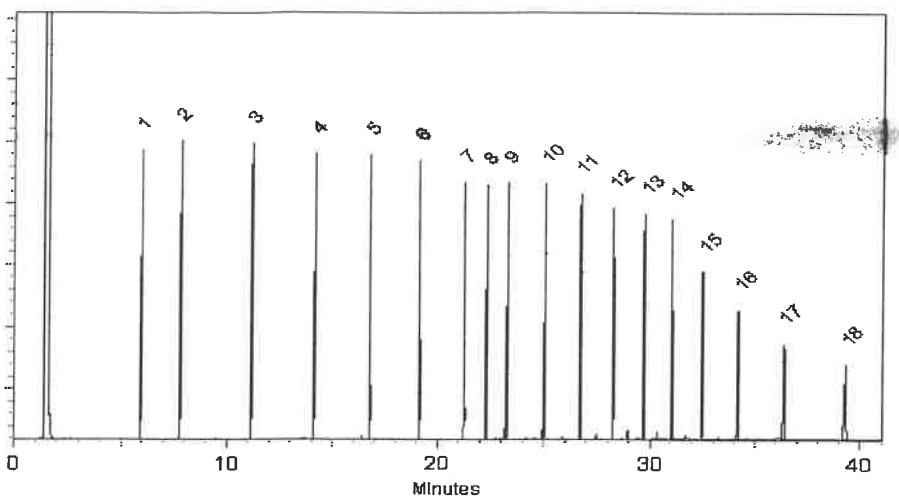
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED ISO 17034 Accredited Reference Material Producer Certificate #3222.01

ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12216
P12231
Y.P. 12/30/22

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **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	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

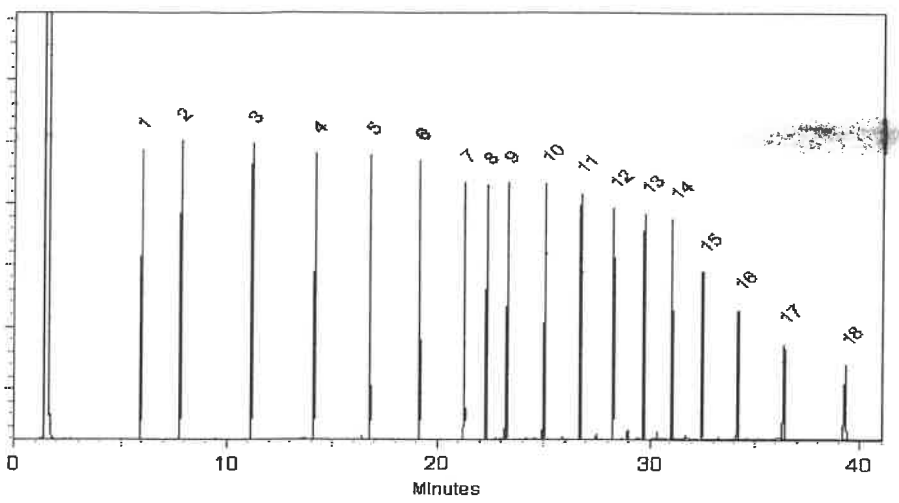
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

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ACCREDITED 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.

P12216
P12231
Y.P. 12/30/22

Catalog No. : 30542 **Lot No.:** A0188769

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 : September 30, 2029 **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	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

8	n-Heneicosane (C21) **CAS #** 629-94-7 **Purity** 99%	(Lot MKCL3226)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 99%	(Lot MKCN9321)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	200.3 µg/mL	+/- 1.1899 +/- 4.9772 +/- 5.9660	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	200.0 µg/mL	+/- 1.1879 +/- 4.9689 +/- 5.9561	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	200.1 µg/mL	+/- 1.1888 +/- 4.9725 +/- 5.9603	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 99%	(Lot BSBME)	201.7 µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

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

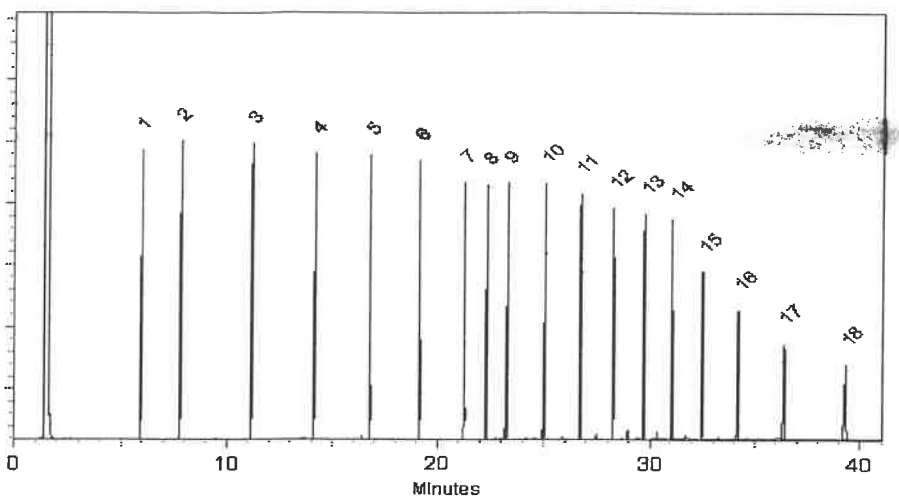
Carrier Gas:
hydrogen-constant pressure 10 psi.

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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Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

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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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Manufacturing Notes:

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Handling Notes:

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

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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.

P12236 ↓ P12251 } Y.P. 12/30/22

Catalog No. : 30543 **Lot No.:** A0188761

Description : NJEPH Aromatics Matrix Spike Mix

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

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

Expiration Date : July 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	1,2,3-Trimethylbenzene	201.1 µg/mL	+/- 1.1944	µg/mL	Gravimetric
	CAS # 526-73-8 (Lot 8776.10-36)		+/- 9.0608	µg/mL	Unstressed
	Purity 98%		+/- 10.0534	µg/mL	Stressed
2	Naphthalene	200.8 µg/mL	+/- 1.1927	µg/mL	Gravimetric
	CAS # 91-20-3 (Lot MKCH0219)		+/- 9.0474	µg/mL	Unstressed
	Purity 99%		+/- 10.0386	µg/mL	Stressed
3	2-Methylnaphthalene	200.1 µg/mL	+/- 1.1883	µg/mL	Gravimetric
	CAS # 91-57-6 (Lot STBK0259)		+/- 9.0143	µg/mL	Unstressed
	Purity 96%		+/- 10.0018	µg/mL	Stressed
4	Acenaphthylene	200.4 µg/mL	+/- 1.1906	µg/mL	Gravimetric
	CAS # 208-96-8 (Lot Q24W)		+/- 9.0316	µg/mL	Unstressed
	Purity 96%		+/- 10.0210	µg/mL	Stressed
5	Acenaphthene	200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 83-32-9 (Lot MKCQ4733)		+/- 9.0114	µg/mL	Unstressed
	Purity 99%		+/- 9.9986	µg/mL	Stressed
6	Fluorene	202.0 µg/mL	+/- 1.1998	µg/mL	Gravimetric
	CAS # 86-73-7 (Lot 10236068)		+/- 9.1015	µg/mL	Unstressed
	Purity 99%		+/- 10.0986	µg/mL	Stressed
7	Phenanthrene	201.6 µg/mL	+/- 1.1974	µg/mL	Gravimetric
	CAS # 85-01-8 (Lot MKCQ2033)		+/- 9.0835	µg/mL	Unstressed
	Purity 99%		+/- 10.0786	µg/mL	Stressed

8	Anthracene		200.0	µg/mL	+/-	1.1879	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0114	µg/mL	Unstressed
	Purity 99%				+/-	9.9986	µg/mL	Stressed
9	Fluoranthene		202.0	µg/mL	+/-	1.1998	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.1015	µg/mL	Unstressed
	Purity 99%				+/-	10.0986	µg/mL	Stressed
10	Pyrene		200.4	µg/mL	+/-	1.1903	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0294	µg/mL	Unstressed
	Purity 99%				+/-	10.0186	µg/mL	Stressed
11	Benz(a)anthracene		201.5	µg/mL	+/-	1.1968	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220616)			+/-	9.0784	µg/mL	Unstressed
	Purity 98%				+/-	10.0730	µg/mL	Stressed
12	Chrysene		201.6	µg/mL	+/-	1.1974	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot STBK5205)			+/-	9.0835	µg/mL	Unstressed
	Purity 99%				+/-	10.0786	µg/mL	Stressed
13	Benzo(b)fluoranthene		201.2	µg/mL	+/-	1.1951	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012012B)			+/-	9.0655	µg/mL	Unstressed
	Purity 99%				+/-	10.0586	µg/mL	Stressed
14	Benzo(k)fluoranthene		200.4	µg/mL	+/-	1.1903	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012012K)			+/-	9.0294	µg/mL	Unstressed
	Purity 99%				+/-	10.0186	µg/mL	Stressed
15	Benzo(a)pyrene		201.6	µg/mL	+/-	1.1974	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0835	µg/mL	Unstressed
	Purity 99%				+/-	10.0786	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 12-JKL-118-9)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		200.4	µg/mL	+/-	1.1903	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0294	µg/mL	Unstressed
	Purity 99%				+/-	10.0186	µg/mL	Stressed
18	Benzo(g,h,i)perylene		200.0	µg/mL	+/-	1.1879	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot 8GFYJ)			+/-	9.0114	µg/mL	Unstressed
	Purity 99%				+/-	9.9986	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

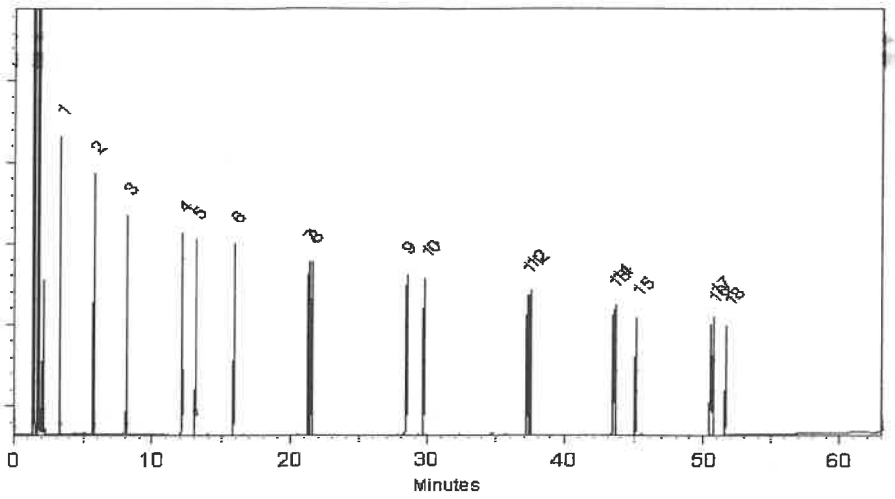
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Morgan Craighead - Mix Technician

Date Mixed: 19-Aug-2022 **Balance:** B442140311

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 23-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

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

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

Manufacturing Notes:

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

Handling Notes:

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

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.

P12252 & P12255 } Y.P. 12/30/22

Catalog No. : 30543 **Lot No.:** A0191469

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 : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)		Expanded Uncertainty (95% C.L.; K=2)		
1	1,2,3-Trimethylbenzene		201.1	µg/mL	+/- 1.1942	µg/mL	Gravimetric
	CAS # 526-73-8	(Lot 8776.10-36)			+/- 9.0590	µg/mL	Unstressed
	Purity 98%				+/- 10.0514	µg/mL	Stressed
2	Naphthalene		201.7	µg/mL	+/- 1.1982	µg/mL	Gravimetric
	CAS # 91-20-3	(Lot MKCH0219)			+/- 9.0889	µg/mL	Unstressed
	Purity 99%				+/- 10.0846	µg/mL	Stressed
3	2-Methylnaphthalene		200.2	µg/mL	+/- 1.1892	µg/mL	Gravimetric
	CAS # 91-57-6	(Lot STBK0259)			+/- 9.0212	µg/mL	Unstressed
	Purity 96%				+/- 10.0095	µg/mL	Stressed
4	Acenaphthylene		201.3	µg/mL	+/- 1.1954	µg/mL	Gravimetric
	CAS # 208-96-8	(Lot Q24W)			+/- 9.0679	µg/mL	Unstressed
	Purity 96%				+/- 10.0613	µg/mL	Stressed
5	Acenaphthene		201.3	µg/mL	+/- 1.1955	µg/mL	Gravimetric
	CAS # 83-32-9	(Lot MKCQ4733)			+/- 9.0691	µg/mL	Unstressed
	Purity 99%				+/- 10.0626	µg/mL	Stressed
6	Fluorene		201.0	µg/mL	+/- 1.1941	µg/mL	Gravimetric
	CAS # 86-73-7	(Lot 10236068)			+/- 9.0583	µg/mL	Unstressed
	Purity 99%				+/- 10.0506	µg/mL	Stressed
7	Phenanthrene		201.2	µg/mL	+/- 1.1951	µg/mL	Gravimetric
	CAS # 85-01-8	(Lot MKCQ2033)			+/- 9.0655	µg/mL	Unstressed
	Purity 99%				+/- 10.0586	µg/mL	Stressed

8	Anthracene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
18	Benzo(g,h,i)perylene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0696	µg/mL	Unstressed
	Purity 98%				+/-	10.0632	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

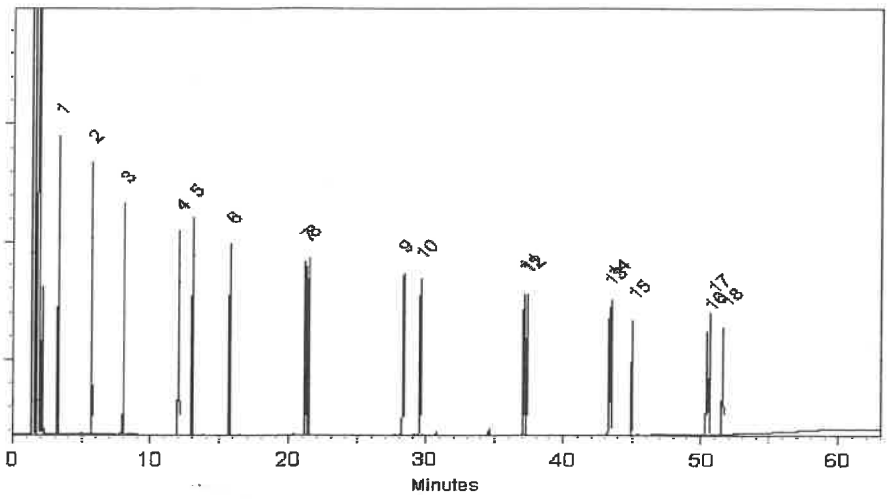
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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
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Fax: (814)353-1309

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12252 & P12255 } Y.P. 12/30/22

Catalog No. : 30543 **Lot No.:** A0191469

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 : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)		Expanded Uncertainty (95% C.L.; K=2)		
1	1,2,3-Trimethylbenzene		201.1	µg/mL	+/- 1.1942	µg/mL	Gravimetric
	CAS # 526-73-8	(Lot 8776.10-36)			+/- 9.0590	µg/mL	Unstressed
	Purity 98%				+/- 10.0514	µg/mL	Stressed
2	Naphthalene		201.7	µg/mL	+/- 1.1982	µg/mL	Gravimetric
	CAS # 91-20-3	(Lot MKCH0219)			+/- 9.0889	µg/mL	Unstressed
	Purity 99%				+/- 10.0846	µg/mL	Stressed
3	2-Methylnaphthalene		200.2	µg/mL	+/- 1.1892	µg/mL	Gravimetric
	CAS # 91-57-6	(Lot STBK0259)			+/- 9.0212	µg/mL	Unstressed
	Purity 96%				+/- 10.0095	µg/mL	Stressed
4	Acenaphthylene		201.3	µg/mL	+/- 1.1954	µg/mL	Gravimetric
	CAS # 208-96-8	(Lot Q24W)			+/- 9.0679	µg/mL	Unstressed
	Purity 96%				+/- 10.0613	µg/mL	Stressed
5	Acenaphthene		201.3	µg/mL	+/- 1.1955	µg/mL	Gravimetric
	CAS # 83-32-9	(Lot MKCQ4733)			+/- 9.0691	µg/mL	Unstressed
	Purity 99%				+/- 10.0626	µg/mL	Stressed
6	Fluorene		201.0	µg/mL	+/- 1.1941	µg/mL	Gravimetric
	CAS # 86-73-7	(Lot 10236068)			+/- 9.0583	µg/mL	Unstressed
	Purity 99%				+/- 10.0506	µg/mL	Stressed
7	Phenanthrene		201.2	µg/mL	+/- 1.1951	µg/mL	Gravimetric
	CAS # 85-01-8	(Lot MKCQ2033)			+/- 9.0655	µg/mL	Unstressed
	Purity 99%				+/- 10.0586	µg/mL	Stressed

8	Anthracene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
18	Benzo(g,h,i)perylene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0696	µg/mL	Unstressed
	Purity 98%				+/-	10.0632	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

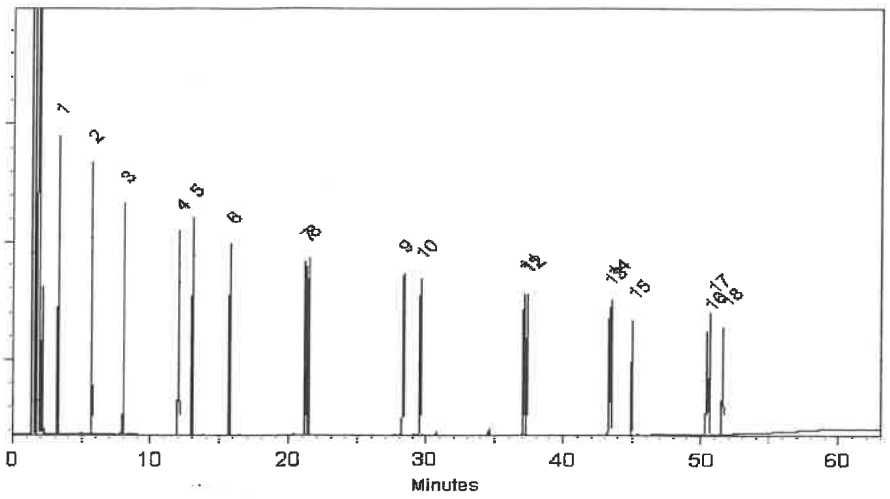
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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.

P12256 → P12271 Y.P. 01/27/23

Catalog No. : 31480 **Lot No.:** A0187866

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 : June 30, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	2-Fluorobiphenyl **CAS #** 321-60-8 (Lot 00021384) **Purity** 99%	4,007.9 µg/mL	+/- 23.4669 µg/mL +/- 180.5381 µg/mL +/- 200.3248 µg/mL	Gravimetric Unstressed Stressed
2	2-Bromonaphthalene **CAS #** 580-13-2 (Lot STBC5362V) **Purity** 99%	4,006.0 µg/mL	+/- 23.4560 µg/mL +/- 180.4540 µg/mL +/- 200.2315 µg/mL	Gravimetric Unstressed Stressed

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

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

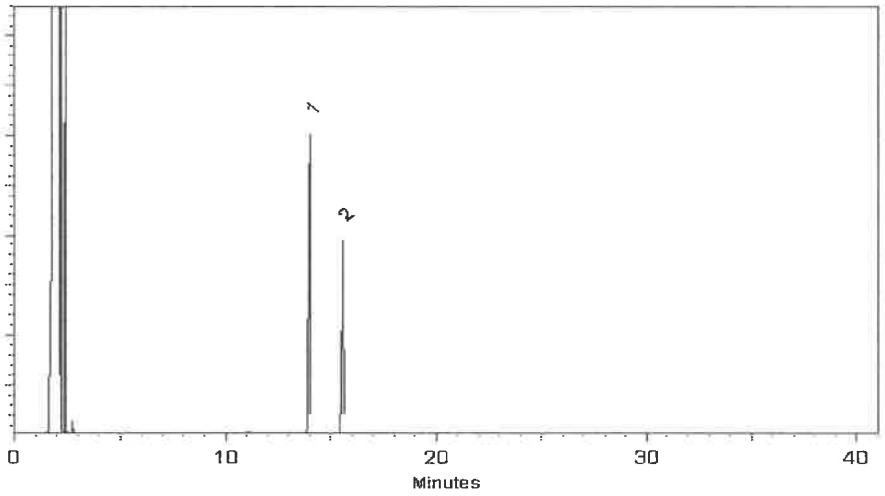
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Nick Yaw - Operations Tech I

Date Mixed: 27-Jul-2022 **Balance:** 1128360905

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 01-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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P12256 → P12271 Y.P. 01/27/23

Catalog No. : 31480 **Lot No.:** A0187866

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 : June 30, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	2-Fluorobiphenyl **CAS #** 321-60-8 (Lot 00021384) **Purity** 99%	4,007.9 µg/mL	+/- 23.4669 µg/mL +/- 180.5381 µg/mL +/- 200.3248 µg/mL	Gravimetric Unstressed Stressed
2	2-Bromonaphthalene **CAS #** 580-13-2 (Lot STBC5362V) **Purity** 99%	4,006.0 µg/mL	+/- 23.4560 µg/mL +/- 180.4540 µg/mL +/- 200.2315 µg/mL	Gravimetric Unstressed Stressed

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

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

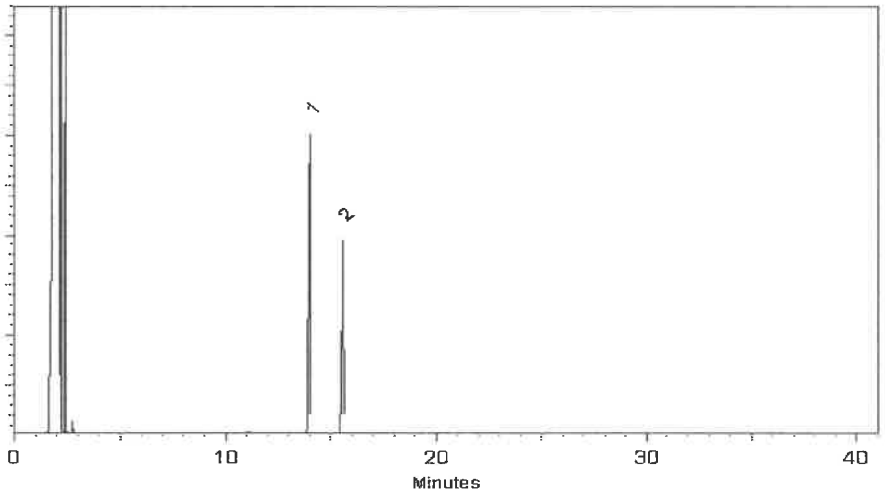
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Nick Yaw - Operations Tech I

Date Mixed: 27-Jul-2022 **Balance:** 1128360905

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 01-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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P12256 → P12271 Y.P. 01/27/23

Catalog No. : 31480 **Lot No.:** A0187866

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 : June 30, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	2-Fluorobiphenyl **CAS #** 321-60-8 (Lot 00021384) **Purity** 99%	4,007.9 µg/mL	+/- 23.4669 µg/mL +/- 180.5381 µg/mL +/- 200.3248 µg/mL	Gravimetric Unstressed Stressed
2	2-Bromonaphthalene **CAS #** 580-13-2 (Lot STBC5362V) **Purity** 99%	4,006.0 µg/mL	+/- 23.4560 µg/mL +/- 180.4540 µg/mL +/- 200.2315 µg/mL	Gravimetric Unstressed Stressed

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

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

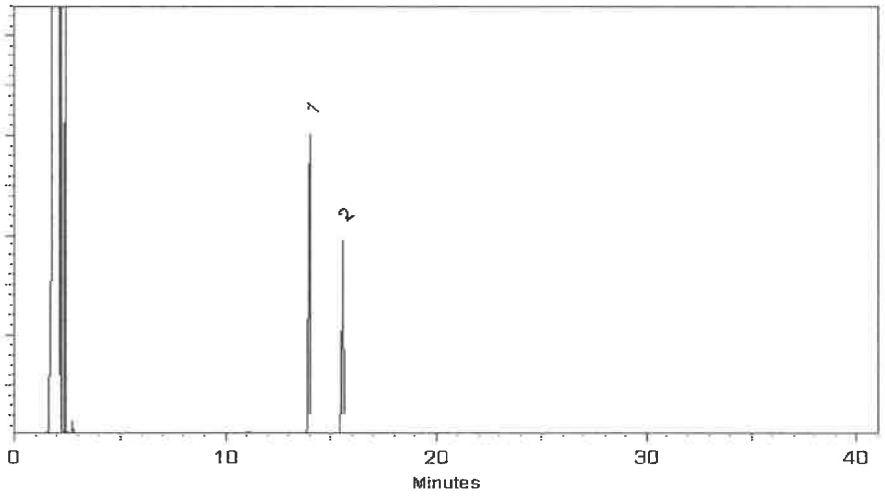
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Nick Yaw - Operations Tech I

Date Mixed: 27-Jul-2022 **Balance:** 1128360905

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 01-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

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

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

Manufacturing Notes:

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

Handling Notes:

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Catalog No. : 30543 **Lot No.:** A0191469

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

Expiration Date : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 **Purity** 98%	(Lot 8776.10-36)	201.1 µg/mL	+/- 1.1942 µg/mL +/- 9.0590 µg/mL +/- 10.0514 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 **Purity** 99%	(Lot MKCH0219)	201.7 µg/mL	+/- 1.1982 µg/mL +/- 9.0889 µg/mL +/- 10.0846 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 **Purity** 96%	(Lot STBK0259)	200.2 µg/mL	+/- 1.1892 µg/mL +/- 9.0212 µg/mL +/- 10.0095 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 **Purity** 96%	(Lot Q24W)	201.3 µg/mL	+/- 1.1954 µg/mL +/- 9.0679 µg/mL +/- 10.0613 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 **Purity** 99%	(Lot MKCQ4733)	201.3 µg/mL	+/- 1.1955 µg/mL +/- 9.0691 µg/mL +/- 10.0626 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 **Purity** 99%	(Lot 10236068)	201.0 µg/mL	+/- 1.1941 µg/mL +/- 9.0583 µg/mL +/- 10.0506 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 **Purity** 99%	(Lot MKCQ2033)	201.2 µg/mL	+/- 1.1951 µg/mL +/- 9.0655 µg/mL +/- 10.0586 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
18	Benzo(g,h,i)perylene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0696	µg/mL	Unstressed
	Purity 98%				+/-	10.0632	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

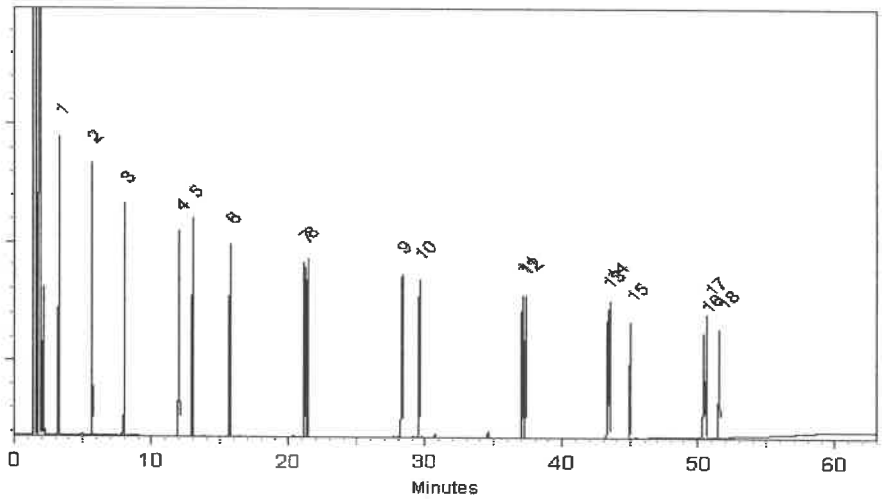
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30543 **Lot No.:** A0191469

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

Expiration Date : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 **Purity** 98%	(Lot 8776.10-36)	201.1 µg/mL	+/- 1.1942 µg/mL +/- 9.0590 µg/mL +/- 10.0514 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 **Purity** 99%	(Lot MKCH0219)	201.7 µg/mL	+/- 1.1982 µg/mL +/- 9.0889 µg/mL +/- 10.0846 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 **Purity** 96%	(Lot STBK0259)	200.2 µg/mL	+/- 1.1892 µg/mL +/- 9.0212 µg/mL +/- 10.0095 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 **Purity** 96%	(Lot Q24W)	201.3 µg/mL	+/- 1.1954 µg/mL +/- 9.0679 µg/mL +/- 10.0613 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 **Purity** 99%	(Lot MKCQ4733)	201.3 µg/mL	+/- 1.1955 µg/mL +/- 9.0691 µg/mL +/- 10.0626 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 **Purity** 99%	(Lot 10236068)	201.0 µg/mL	+/- 1.1941 µg/mL +/- 9.0583 µg/mL +/- 10.0506 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 **Purity** 99%	(Lot MKCQ2033)	201.2 µg/mL	+/- 1.1951 µg/mL +/- 9.0655 µg/mL +/- 10.0586 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
18	Benzo(g,h,i)perylene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0696	µg/mL	Unstressed
	Purity 98%				+/-	10.0632	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

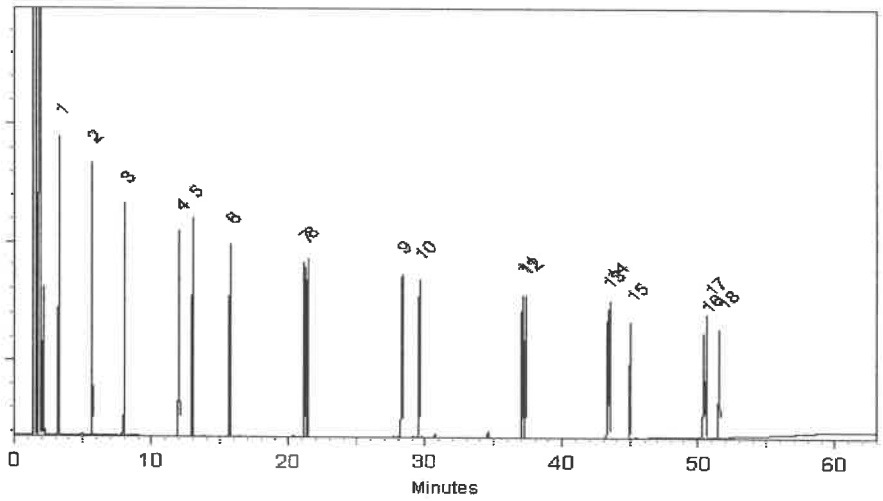
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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

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Manufacturing Notes:

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Catalog No. : 30543 **Lot No.:** A0191469

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

Expiration Date : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 **Purity** 98%	(Lot 8776.10-36)	201.1 µg/mL	+/- 1.1942 µg/mL +/- 9.0590 µg/mL +/- 10.0514 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 **Purity** 99%	(Lot MKCH0219)	201.7 µg/mL	+/- 1.1982 µg/mL +/- 9.0889 µg/mL +/- 10.0846 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 **Purity** 96%	(Lot STBK0259)	200.2 µg/mL	+/- 1.1892 µg/mL +/- 9.0212 µg/mL +/- 10.0095 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 **Purity** 96%	(Lot Q24W)	201.3 µg/mL	+/- 1.1954 µg/mL +/- 9.0679 µg/mL +/- 10.0613 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 **Purity** 99%	(Lot MKCQ4733)	201.3 µg/mL	+/- 1.1955 µg/mL +/- 9.0691 µg/mL +/- 10.0626 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 **Purity** 99%	(Lot 10236068)	201.0 µg/mL	+/- 1.1941 µg/mL +/- 9.0583 µg/mL +/- 10.0506 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 **Purity** 99%	(Lot MKCQ2033)	201.2 µg/mL	+/- 1.1951 µg/mL +/- 9.0655 µg/mL +/- 10.0586 µg/mL	Gravimetric Unstressed Stressed

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	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
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	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
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Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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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:
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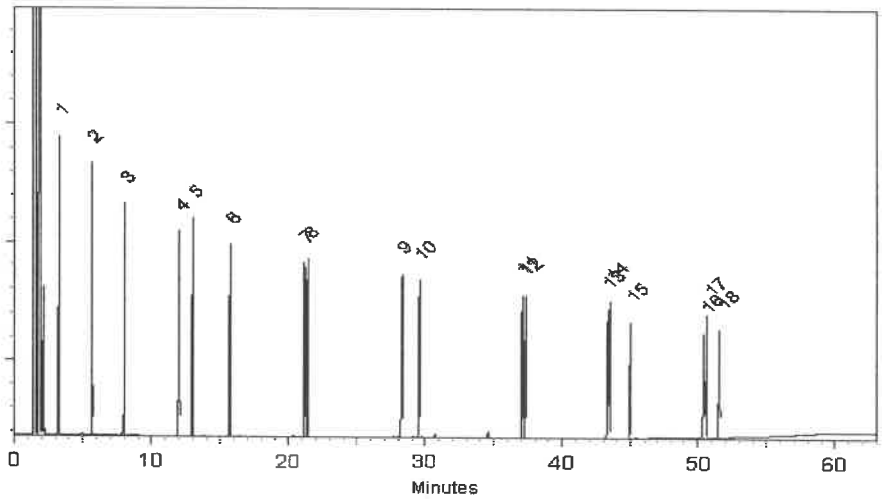
Det. Temp:
330°C

Det. Type:
FID



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Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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

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P 12331 ↓ P 12350 Y.P. 02/22/23

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

Expiration Date : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

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	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
18	Benzo(g,h,i)perylene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0696	µg/mL	Unstressed
	Purity 98%				+/-	10.0632	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

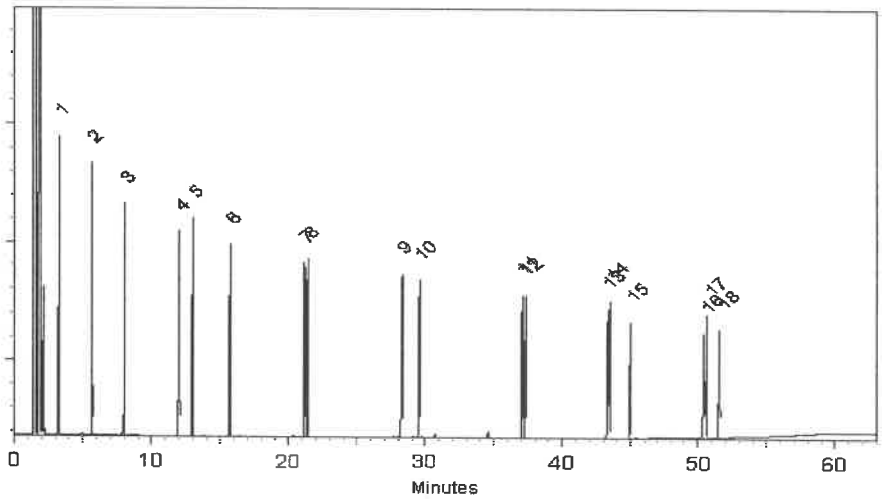
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30543 **Lot No.:** A0191469

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

Expiration Date : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 **Purity** 98%	(Lot 8776.10-36)	201.1 µg/mL	+/- 1.1942 µg/mL +/- 9.0590 µg/mL +/- 10.0514 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 **Purity** 99%	(Lot MKCH0219)	201.7 µg/mL	+/- 1.1982 µg/mL +/- 9.0889 µg/mL +/- 10.0846 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 **Purity** 96%	(Lot STBK0259)	200.2 µg/mL	+/- 1.1892 µg/mL +/- 9.0212 µg/mL +/- 10.0095 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 **Purity** 96%	(Lot Q24W)	201.3 µg/mL	+/- 1.1954 µg/mL +/- 9.0679 µg/mL +/- 10.0613 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 **Purity** 99%	(Lot MKCQ4733)	201.3 µg/mL	+/- 1.1955 µg/mL +/- 9.0691 µg/mL +/- 10.0626 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 **Purity** 99%	(Lot 10236068)	201.0 µg/mL	+/- 1.1941 µg/mL +/- 9.0583 µg/mL +/- 10.0506 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 **Purity** 99%	(Lot MKCQ2033)	201.2 µg/mL	+/- 1.1951 µg/mL +/- 9.0655 µg/mL +/- 10.0586 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
18	Benzo(g,h,i)perylene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0696	µg/mL	Unstressed
	Purity 98%				+/-	10.0632	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

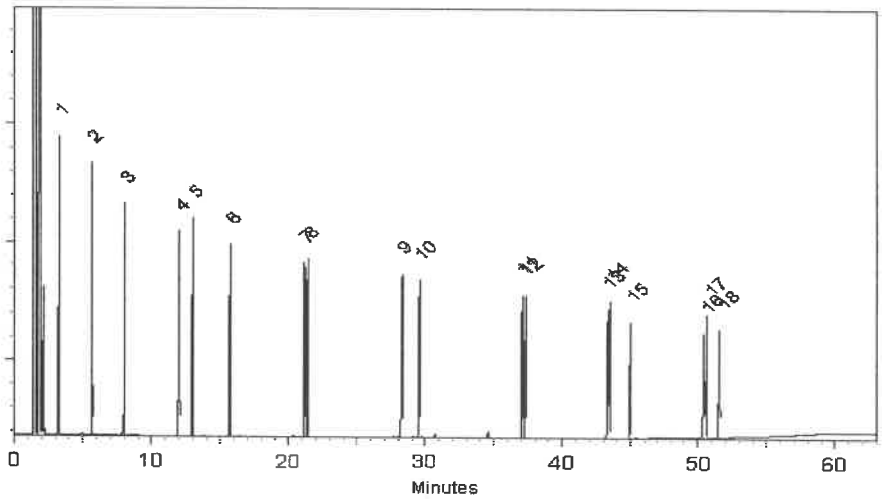
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30543 **Lot No.:** A0191469

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

Expiration Date : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 **Purity** 98%	(Lot 8776.10-36)	201.1 µg/mL	+/- 1.1942 µg/mL +/- 9.0590 µg/mL +/- 10.0514 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 **Purity** 99%	(Lot MKCH0219)	201.7 µg/mL	+/- 1.1982 µg/mL +/- 9.0889 µg/mL +/- 10.0846 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 **Purity** 96%	(Lot STBK0259)	200.2 µg/mL	+/- 1.1892 µg/mL +/- 9.0212 µg/mL +/- 10.0095 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 **Purity** 96%	(Lot Q24W)	201.3 µg/mL	+/- 1.1954 µg/mL +/- 9.0679 µg/mL +/- 10.0613 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 **Purity** 99%	(Lot MKCQ4733)	201.3 µg/mL	+/- 1.1955 µg/mL +/- 9.0691 µg/mL +/- 10.0626 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 **Purity** 99%	(Lot 10236068)	201.0 µg/mL	+/- 1.1941 µg/mL +/- 9.0583 µg/mL +/- 10.0506 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 **Purity** 99%	(Lot MKCQ2033)	201.2 µg/mL	+/- 1.1951 µg/mL +/- 9.0655 µg/mL +/- 10.0586 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
18	Benzo(g,h,i)perylene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0696	µg/mL	Unstressed
	Purity 98%				+/-	10.0632	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

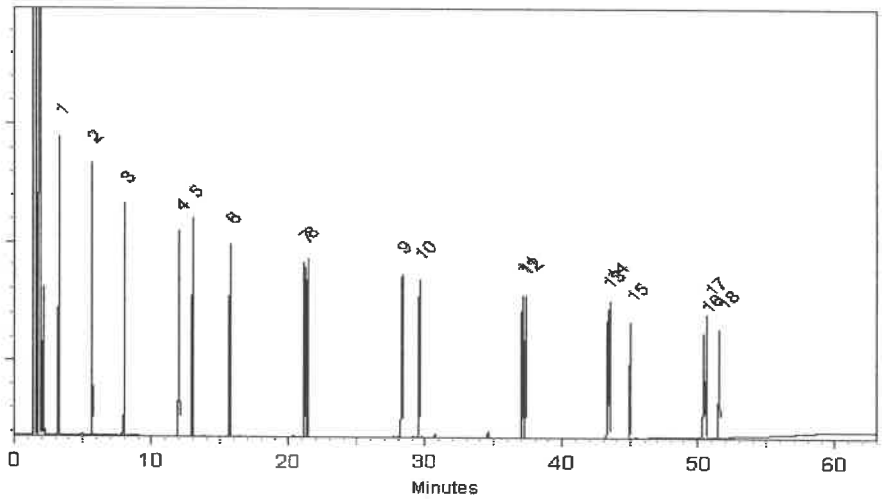
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

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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.:** A0191469

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

Expiration Date : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 **Purity** 98%	(Lot 8776.10-36)	201.1 µg/mL	+/- 1.1942 µg/mL +/- 9.0590 µg/mL +/- 10.0514 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 **Purity** 99%	(Lot MKCH0219)	201.7 µg/mL	+/- 1.1982 µg/mL +/- 9.0889 µg/mL +/- 10.0846 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 **Purity** 96%	(Lot STBK0259)	200.2 µg/mL	+/- 1.1892 µg/mL +/- 9.0212 µg/mL +/- 10.0095 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 **Purity** 96%	(Lot Q24W)	201.3 µg/mL	+/- 1.1954 µg/mL +/- 9.0679 µg/mL +/- 10.0613 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 **Purity** 99%	(Lot MKCQ4733)	201.3 µg/mL	+/- 1.1955 µg/mL +/- 9.0691 µg/mL +/- 10.0626 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 **Purity** 99%	(Lot 10236068)	201.0 µg/mL	+/- 1.1941 µg/mL +/- 9.0583 µg/mL +/- 10.0506 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 **Purity** 99%	(Lot MKCQ2033)	201.2 µg/mL	+/- 1.1951 µg/mL +/- 9.0655 µg/mL +/- 10.0586 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
18	Benzo(g,h,i)perylene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0696	µg/mL	Unstressed
	Purity 98%				+/-	10.0632	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

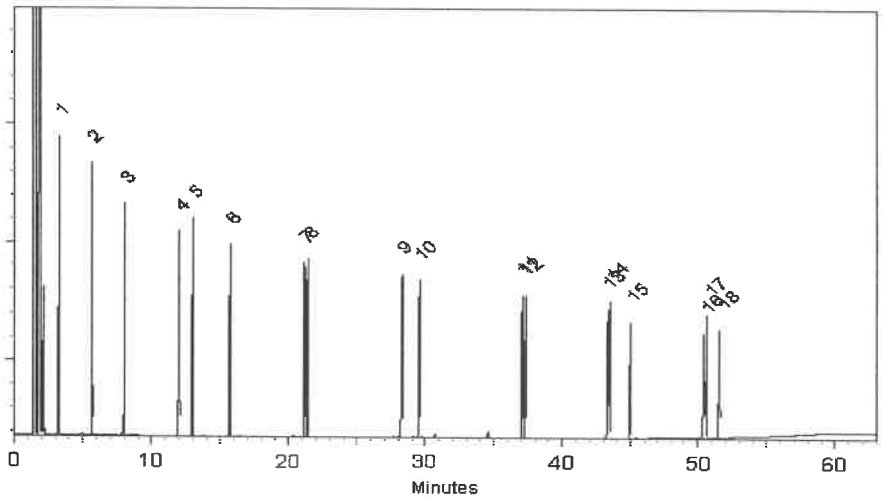
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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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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.:** A0191469

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

Expiration Date : October 31, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1,2,3-Trimethylbenzene **CAS #** 526-73-8 **Purity** 98%	(Lot 8776.10-36)	201.1 µg/mL	+/- 1.1942 µg/mL +/- 9.0590 µg/mL +/- 10.0514 µg/mL	Gravimetric Unstressed Stressed
2	Naphthalene **CAS #** 91-20-3 **Purity** 99%	(Lot MKCH0219)	201.7 µg/mL	+/- 1.1982 µg/mL +/- 9.0889 µg/mL +/- 10.0846 µg/mL	Gravimetric Unstressed Stressed
3	2-Methylnaphthalene **CAS #** 91-57-6 **Purity** 96%	(Lot STBK0259)	200.2 µg/mL	+/- 1.1892 µg/mL +/- 9.0212 µg/mL +/- 10.0095 µg/mL	Gravimetric Unstressed Stressed
4	Acenaphthylene **CAS #** 208-96-8 **Purity** 96%	(Lot Q24W)	201.3 µg/mL	+/- 1.1954 µg/mL +/- 9.0679 µg/mL +/- 10.0613 µg/mL	Gravimetric Unstressed Stressed
5	Acenaphthene **CAS #** 83-32-9 **Purity** 99%	(Lot MKCQ4733)	201.3 µg/mL	+/- 1.1955 µg/mL +/- 9.0691 µg/mL +/- 10.0626 µg/mL	Gravimetric Unstressed Stressed
6	Fluorene **CAS #** 86-73-7 **Purity** 99%	(Lot 10236068)	201.0 µg/mL	+/- 1.1941 µg/mL +/- 9.0583 µg/mL +/- 10.0506 µg/mL	Gravimetric Unstressed Stressed
7	Phenanthrene **CAS #** 85-01-8 **Purity** 99%	(Lot MKCQ2033)	201.2 µg/mL	+/- 1.1951 µg/mL +/- 9.0655 µg/mL +/- 10.0586 µg/mL	Gravimetric Unstressed Stressed

8	Anthracene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCP3968)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCCG7845)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
11	Benz(a)anthracene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot RP220209)			+/-	9.0696	µg/mL	Unstressed
	Purity 96%				+/-	10.0632	µg/mL	Stressed
12	Chrysene		201.0	µg/mL	+/-	1.1939	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 468677L08C)			+/-	9.0565	µg/mL	Unstressed
	Purity 99%				+/-	10.0486	µg/mL	Stressed
13	Benzo(b)fluoranthene		200.6	µg/mL	+/-	1.1915	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012013B)			+/-	9.0384	µg/mL	Unstressed
	Purity 99%				+/-	10.0286	µg/mL	Stressed
14	Benzo(k)fluoranthene		201.0	µg/mL	+/-	1.1941	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012022K)			+/-	9.0583	µg/mL	Unstressed
	Purity 99%				+/-	10.0506	µg/mL	Stressed
15	Benzo(a)pyrene		201.5	µg/mL	+/-	1.1967	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot Z8BKF)			+/-	9.0781	µg/mL	Unstressed
	Purity 99%				+/-	10.0726	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		200.8	µg/mL	+/-	1.1927	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot 8-URV-39-3)			+/-	9.0474	µg/mL	Unstressed
	Purity 99%				+/-	10.0386	µg/mL	Stressed
17	Dibenz(a,h)anthracene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	9.0727	µg/mL	Unstressed
	Purity 99%				+/-	10.0666	µg/mL	Stressed
18	Benzo(g,h,i)perylene		201.3	µg/mL	+/-	1.1956	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot AVUAD)			+/-	9.0696	µg/mL	Unstressed
	Purity 98%				+/-	10.0632	µg/mL	Stressed

Solvent: Acetone/Toluene (50:50)
CAS # 67-64-1/108-88-3
Purity 99%

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

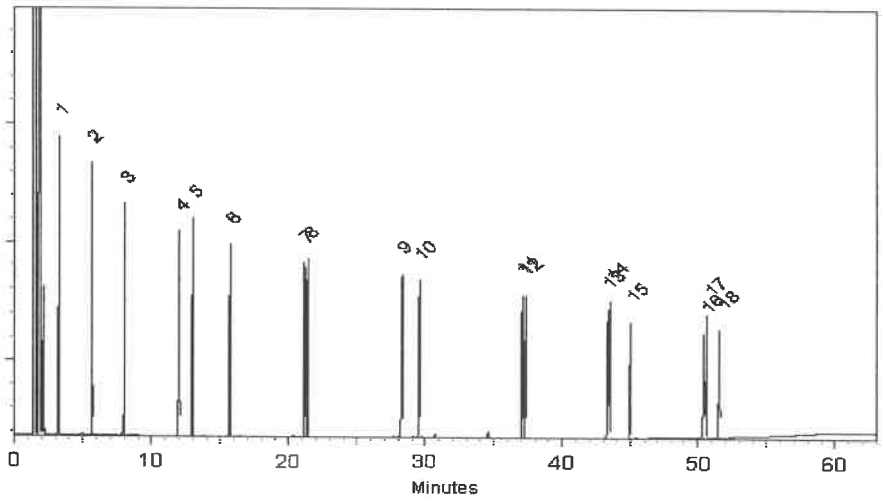
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

Date Mixed: 08-Nov-2022 **Balance:** 1128360905

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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ACCREDITED
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Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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)

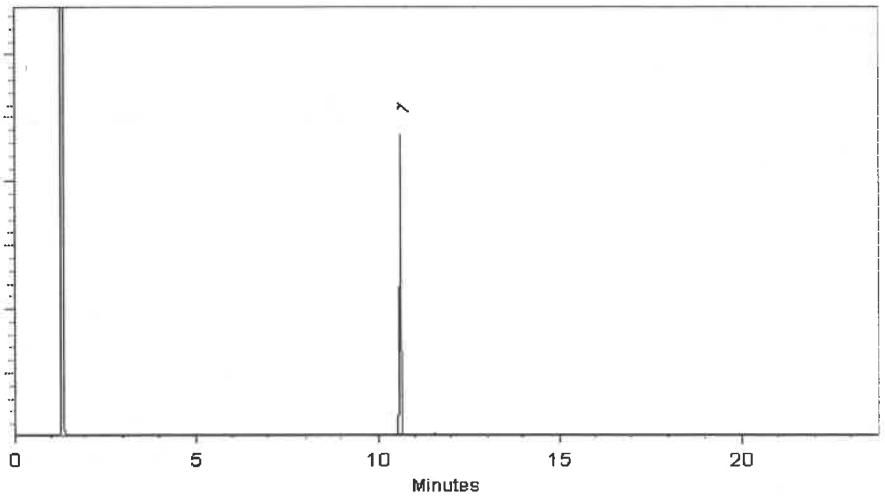
Carrier Gas:
hydrogen-constant pressure 10 psi.

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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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.

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)

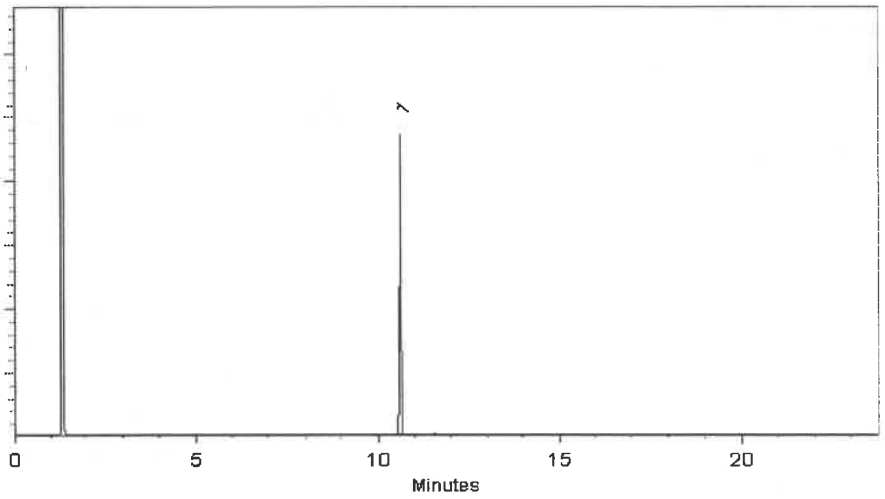
Carrier Gas:
hydrogen-constant pressure 10 psi.

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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P2186
P2200

Catalog No. : 31480 **Lot No.:** A0187866

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 : June 30, 2028 **Storage:** 10°C or colder

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

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	2-Fluorobiphenyl **CAS #** 321-60-8 **Purity** 99% (Lot 00021384)	4,007.9 µg/mL	+/- 23.4669 µg/mL +/- 180.5381 µg/mL +/- 200.3248 µg/mL	Gravimetric Unstressed Stressed
2	2-Bromonaphthalene **CAS #** 580-13-2 **Purity** 99% (Lot STBC5362V)	4,006.0 µg/mL	+/- 23.4560 µg/mL +/- 180.4540 µg/mL +/- 200.2315 µg/mL	Gravimetric Unstressed Stressed

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

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

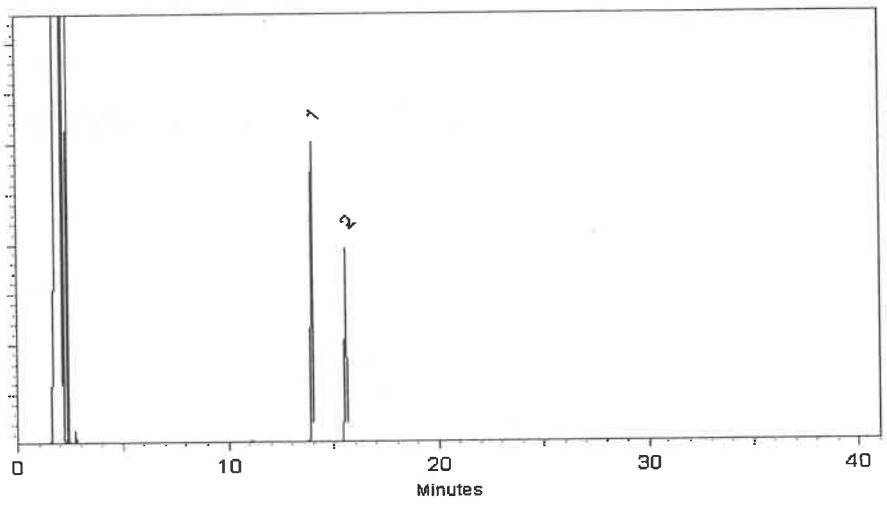
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Nick Yaw - Operations Tech I

Date Mixed: 27-Jul-2022 **Balance:** 1128360905

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 01-Aug-2022

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