



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

## Prep Standard - Chemical Standard Summary

**Order ID :** O2509

**Test :** EPH\_NF

**Prepbatch ID :** PB152444,

**Sequence ID/Qc Batch ID:** FC042723AL,FC050123AL,FE042723AL,

**Standard ID :**

EP2318,EP2327,PP21064,PP21065,PP21195,PP21829,PP21830,PP21831,PP21832,PP21833,PP21868,PP21946,PP21948,PP21954,PP21955,PP21956,PP21957,PP21958,PP21959,PP21960,

**Chemical ID :**

E2865,E3412,E3424,E3431,E3482,E3484,E3486,E3487,E3495,E3497,P11132,P11134,P11658,P11659,P11663,P11707,P11712,P11731,P11732,P11733,P11734,P11735,P11828,P11829,P12167,P12168,P12169,P12170,P12171,P12230,P12231,P12232,P12233,P12234,P12235,P12259,P12260,P12261,P12262,P12311,P12312,P12313,P12314,P12339,P12340,P12341,P12342,P12343,P12344,P12345,P12346,P12347,P12348,

# CHEMTECH

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## Extractions STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2017	1:1 ACETONE/METHYLENE CHLORIDE	<a href="#">EP2318</a>	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

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3923	Baked Sodium Sulfate	<a href="#">EP2327</a>	04/24/2023	10/23/2023	Rajesh Parikh	Extraction_SC ALE_2 (EX-SC-2)	None	RUPESHKUMAR SHAH 04/24/2023

**FROM** 4000.00000gram of E3412 = Final Quantity: 4000.000 gram

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## Pest/Pcb STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
781	100 PPM Aliphatic HC Working STD (Restek)	<a href="#">PP21064</a>	11/03/2022	05/03/2023	Yogesh Patel	None	None	Ankita Jodhani
11/03/2022								

**FROM** 0.25000ml of P11658 + 0.25000ml of P11707 + 1.25000ml of P11828 + 23.25000ml of E3424 = Final Quantity: 25.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2900	100 PPM Aliphatic HC STD (Absolute)	<a href="#">PP21065</a>	11/03/2022	05/03/2023	Yogesh Patel	None	None	Ankita Jodhani
11/03/2022								

**FROM** 0.25000ml of P11659 + 0.25000ml of P11707 + 2.50000ml of P11132 + 22.00000ml of E3424 = Final Quantity: 25.000 ml

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## Pest/Pcb STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
781	100 PPM Aliphatic HC Working STD (Restek)	<a href="#">PP21195</a>	11/28/2022	05/03/2023	Yogesh Patel	None	None	Ankita Jodhani
11/28/2022								

**FROM** 0.25000ml of P11663 + 0.25000ml of P11712 + 1.25000ml of P11828 + 23.25000ml of E3431 = Final Quantity: 25.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
783	50 PPM Aliphatic HC STD	<a href="#">PP21829</a>	03/15/2023	05/03/2023	Yogesh Patel	None	None	Ankita Jodhani
03/16/2023								

**FROM** 0.50000ml of E3482 + 0.50000ml of PP21195 = Final Quantity: 1.000 ml



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784	20 PPM Aliphatic HC STD	<a href="#">PP21830</a>	03/15/2023	05/03/2023	Yogesh Patel	None	None	Ankita Jodhani
03/16/2023								

**FROM** 0.80000ml of E3482 + 0.20000ml of PP21195 = Final Quantity: 1.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
785	10 PPM Aliphatic HC STD	<a href="#">PP21831</a>	03/15/2023	05/03/2023	Yogesh Patel	None	None	Ankita Jodhani
03/16/2023								

**FROM** 0.90000ml of E3482 + 0.10000ml of PP21195 = Final Quantity: 1.000 ml

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## Pest/Pcb STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
786	5 PPM Aliphatic HC STD	<a href="#">PP21832</a>	03/15/2023	05/03/2023	Yogesh Patel	None	None	Ankita Jodhani
03/16/2023								

**FROM** 0.90000ml of E3482 + 0.10000ml of PP21829 = Final Quantity: 1.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2901	20 PPM Aliphatic HC STD ICV (Absolute)	<a href="#">PP21833</a>	03/15/2023	05/03/2023	Yogesh Patel	None	None	Ankita Jodhani
03/16/2023								

**FROM** 0.80000ml of E3482 + 0.20000ml of PP21065 = Final Quantity: 1.000 ml

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<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1331	100 PPM NJEPH Fractionating Surrogate	<a href="#">PP21868</a>	03/28/2023	09/22/2023	Yogesh Patel	None	None	Ankita Jodhani 03/28/2023
<b><u>FROM</u></b> 1.25000ml of P12259 + 1.25000ml of P12260 + 1.25000ml of P12261 + 1.25000ml of P12262 + 195.00000ml of E3484 = Final Quantity: 200.000 ml								

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1339	100 PPM NJEPH Surrogate Spike	<a href="#">PP21946</a>	04/18/2023	09/27/2023	Yogesh Patel	None	None	Ankita Jodhani 04/18/2023
<b><u>FROM</u></b> 1.25000ml of P11731 + 1.25000ml of P11732 + 1.25000ml of P11733 + 1.25000ml of P11734 + 1.25000ml of P12167 + 1.25000ml of P12168 + 1.25000ml of P12169 + 1.25000ml of P12170 + 490.00000ml of E3487 = Final Quantity: 500.000 ml								

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<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
1330	100 PPM NJEPH Spike Solution	<a href="#">PP21948</a>	04/18/2023	10/18/2023	Yogesh Patel	None	None	Ankita Jodhani 04/18/2023
<u>FROM</u>	5.00000ml of P12230 + 5.00000ml of P12231 + 5.00000ml of P12232 + 5.00000ml of P12233 + 5.00000ml of P12234 + 5.00000ml of P12235 + 5.00000ml of P12311 + 5.00000ml of P12312 + 5.00000ml of P12313 + 5.00000ml of P12314 + 5.00000ml of P12339 + 5.00000ml of P12340 + 5.00000ml of P12341 + 5.00000ml of P12342 + 5.00000ml of P12343 + 5.00000ml of P12344 + 5.00000ml of P12345 + 5.00000ml of P12346 + 5.00000ml of P12347 + 5.00000ml of P12348 = Final Quantity: 100.000 ml							

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
781	100 PPM Aliphatic HC Working STD (Restek)	<a href="#">PP21954</a>	04/20/2023	10/19/2023	Yogesh Patel	None	None	Ankita Jodhani 04/24/2023
<b><u>FROM</u></b> 0.25000ml of P11735 + 0.25000ml of P12171 + 1.25000ml of P11829 + 23.25000ml of E3495 = Final Quantity: 25.000 ml								

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## Pest/Pcb STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2900	100 PPM Aliphatic HC STD (Absolute)	<a href="#">PP21955</a>	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

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
783	50 PPM Aliphatic HC STD	<a href="#">PP21956</a>	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

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## Pest/Pcb STANDARD PREPARATION LOG

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784	20 PPM Aliphatic HC STD	<a href="#">PP21957</a>	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

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
785	10 PPM Aliphatic HC STD	<a href="#">PP21958</a>	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

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786	5 PPM Aliphatic HC STD	<a href="#">PP21959</a>	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

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2901	20 PPM Aliphatic HC STD ICV (Absolute)	<a href="#">PP21960</a>	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

**CHEMICAL RECEIPT LOG BOOK**

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	PC19631-100 / SODIUM SULFATE, ANHYDROUS, PEST GRADE, 1	139404	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-9262-03 / Hexane, Ultra-Resi (cs/4x4L)	22G0362002	04/30/2023	10/31/2022 / Rajesh	10/31/2022 / Rajesh	E3424

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	05/18/2023	11/18/2022 / Rajesh	11/16/2022 / Rajesh	E3431

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-9262-03 / Hexane, Ultra-Resi (cs/4x4L)	23A2662017	09/22/2023	03/22/2023 / Rajesh	03/15/2023 / Rajesh	E3484



**CHEMICAL RECEIPT LOG BOOK**

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

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	11/02/2023	04/19/2023 / rajesh	04/13/2023 / Rajesh	E3495

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9262-03 / Hexane, Ultra-Resi (cs/4x4L)	22G0362002	09/16/2023	04/26/2023 / Rajesh	04/19/2023 / Rajesh	E3497

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	05/03/2023	11/03/2022 / yogesh	10/29/2021 / Abdul	P11132

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

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	05/03/2023	11/03/2022 / yogesh	05/27/2022 / Sohil	P11658

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	05/03/2023	11/03/2022 / yogesh	05/27/2022 / Sohil	P11659

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	05/09/2023	11/09/2022 / Abdul	05/27/2022 / Sohil	P11663

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0182937	05/03/2023	11/03/2022 / yogesh	05/27/2022 / Sohil	P11707

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0182937	05/09/2023	11/09/2022 / Abdul	05/27/2022 / Sohil	P11712

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	10/18/2023	04/18/2023 / yogesh	05/27/2022 / Sohil	P11731

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	10/18/2023	04/18/2023 / yogesh	05/27/2022 / Sohil	P11732

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	10/18/2023	04/18/2023 / yogesh	05/27/2022 / Sohil	P11733

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	10/18/2023	04/18/2023 / yogesh	05/27/2022 / Sohil	P11734

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30540 / Custom NJEPH Aliphatics Calibration Standard	A0184811	05/03/2023	11/03/2022 / yogesh	06/17/2022 / Ankita	P11828

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

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	10/18/2023	04/18/2023 / yogesh	11/10/2022 / Yogesh	P12167

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	10/18/2023	04/18/2023 / yogesh	11/10/2022 / Yogesh	P12168

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	10/18/2023	04/18/2023 / yogesh	11/10/2022 / Yogesh	P12169

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	10/18/2023	04/18/2023 / yogesh	11/10/2022 / Yogesh	P12170

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	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0188769	10/18/2023	04/18/2023 / yogesh	12/30/2022 / Yogesh	P12230

**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	10/18/2023	04/18/2023 / yogesh	12/30/2022 / Yogesh	P12231

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	10/18/2023	04/18/2023 / yogesh	12/30/2022 / Yogesh	P12232

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	10/18/2023	04/18/2023 / yogesh	12/30/2022 / Yogesh	P12233

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	10/18/2023	04/18/2023 / yogesh	12/30/2022 / Yogesh	P12234

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	10/18/2023	04/18/2023 / yogesh	12/30/2022 / Yogesh	P12235

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	09/28/2023	03/28/2023 / yogesh	01/27/2023 / Yogesh	P12259

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	09/28/2023	03/28/2023 / yogesh	01/27/2023 / Yogesh	P12260

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	09/28/2023	03/28/2023 / yogesh	01/27/2023 / Yogesh	P12261

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	09/28/2023	03/28/2023 / yogesh	01/27/2023 / Yogesh	P12262

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12311

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12312

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12313

**CHEMICAL RECEIPT LOG BOOK**

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	A0191475	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12314

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	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12339

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	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12340

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	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12341

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	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12342

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	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12343



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

### CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12344

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	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12345

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	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12346

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	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12347

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	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12348



Sand  
Purified  
Washed and Ignited



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	$\leq 0.16\%$	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

  
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  
QUÍMICOS  
MONTERREY, S.A. DE C.V.**



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

## CERTIFICATE OF ANALYSIS

PRODUCT :	SODIUM SULFATE CRYSTALS ANHYDROUS		
QUALITY :	ACS (CODE RMB3375)	FORMULA :	Na <sub>2</sub> SO <sub>4</sub>
SPECIFICATION NUMBER :	6399	RELEASE DATE:	OCT/28/2021
LOT NUMBER :	139404		

TEST	SPECIFICATIONS	LOT VALUES
Assay (Na <sub>2</sub> SO <sub>4</sub> )	Min. 99.0%	99.8 %
pH of a 5% solution at 25°C	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 <sub>4</sub> )	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 foreign 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.

E 3412

Recd. by RP on 10/13/22

RE-02-01, Ed. 3

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 <sub>6</sub> 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 <sub>2</sub> SO <sub>4</sub>	Passes Test	Passes Test
Water (by KF, coulometric)	≤ 0.05 %	< 0.01 %

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

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

Recd. by RP on 10/31/22

E3424

  
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

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Page 1 of 1

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



Material No.: 9262-03  
Batch No.: 22G0362002  
Manufactured Date: 2022-06-17  
Expiration Date: 2023-09-16  
Revision No.: 0

## Certificate of Analysis

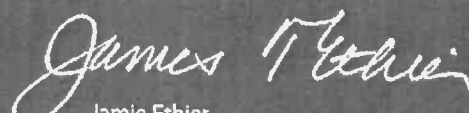
Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	2
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	2
ECD-Sensitive Impurities (as Ethylene Dibromide) - Single Impurity Peak (ng/mL)	≤ 5	2
Assay (Total Saturated C <sub>6</sub> 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 <sub>2</sub> SO <sub>4</sub>	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 11/16/22

E3431

  
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

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Page 1 of 1

Material No.: 9262-03  
Batch No.: 22G0362002  
Manufactured Date: 2022-06-17  
Expiration Date: 2023-09-16  
Revision No.: 0

## Certificate of Analysis

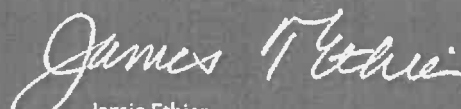
Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	2
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	2
ECD-Sensitive Impurities (as Ethylene Dibromide) - Single Impurity Peak (ng/mL)	≤ 5	2
Assay (Total Saturated C <sub>6</sub> 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 <sub>2</sub> SO <sub>4</sub>	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

  
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

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 <sub>6</sub> 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 <sub>2</sub> SO <sub>4</sub>	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 3/15/23

E 3484

  
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

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Page 1 of 1

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



Material No.: 9266-A4  
Batch No.: 23A0362012  
Manufactured Date: 2022-11-23  
Expiration Date: 2024-02-22  
Revision No.: 0

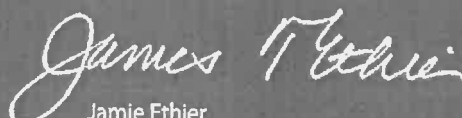
## Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	$\leq 5$	< 1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	$\leq 10$	2
Assay ( $\text{CH}_2\text{Cl}_2$ ) (by GC, exclusive of preservative, corrected for water)	$\geq 99.8 \%$	100.0 %
Color (APHA)	$\leq 10$	5
Residue after Evaporation	$\leq 1.0 \text{ ppm}$	< 0.1 ppm
Titration Acid ( $\mu\text{eq/g}$ )	$\leq 0.3$	< 0.1
Chloride (Cl)	$\leq 10 \text{ ppm}$	< 5 ppm
Water (by KF, coulometric)	$\leq 0.02 \%$	< 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

  
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

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Page 1 of 1

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 <sub>3</sub> ) <sub>2</sub> CO) (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
Titration Acid (μeq/g)	≤ 0.3	0.1
Titration Base (μeq/g)	≤ 0.6	< 0.1
Water (H <sub>2</sub> O)	≤ 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

  
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

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Page 1 of 1



Material No.: 9262-03  
Batch No.: 23A2662017  
Manufactured Date: 2023-01-10  
Expiration Date: 2024-04-10  
Revision No.: 0

## Certificate of Analysis

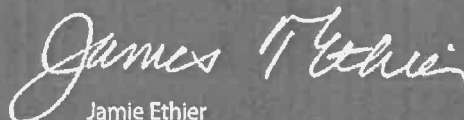
Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	< 1
ECD-Sensitive Impurities (as Ethylene Dibromide) - Single Impurity Peak (ng/mL)	≤ 5	< 1
Assay (Total Saturated C <sub>6</sub> 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 <sub>2</sub> SO <sub>4</sub>	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

E34951

  
Jamie Ethier  
Vice President Global Quality

Material No.: 9262-03  
Batch No.: 22G0362002  
Manufactured Date: 2022-06-17  
Expiration Date: 2023-09-16  
Revision No.: 0

## Certificate of Analysis

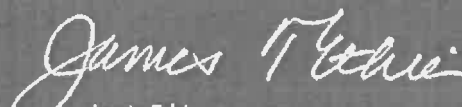
Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	2
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	2
ECD-Sensitive Impurities (as Ethylene Dibromide) - Single Impurity Peak (ng/mL)	≤ 5	2
Assay (Total Saturated C <sub>6</sub> 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 <sub>2</sub> SO <sub>4</sub>	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 4/19/23

E 3497

  
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

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Page 1 of 1



**Certified Reference Material CRM**



**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#: **8LUTB**

SE-05 Balance Uncertainty  
0.005 Peak Uncertainty

Weight(s) shown below were combined and diluted to (mL): **25.0**  
**CAUTION: Sonicate Before Use**

Solvent(s): **Cyclohexane**  
Lot# **28930**

Formulated By: <i>[Signature]</i>	Benson Chan	092821
Reviewed By: <i>[Signature]</i>	Pedro L. Renterias	092821
		DATE

Compound	(R#)	Lot Number	DIL Factor	Initial Vol (mL)	Initial Conc (µg/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette	Target Weight (g)	Actual Weight (g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	CAS#	SDS Information		LD50
															(Solvent Safety Info. On Attached pg.)		
1. 2-Methylnaphthalene	(0214)	MKB3783V	NA	NA	NA	1000	97	0.2	NA	0.02577	0.02581	1001.6	5.7	91-57-6	N/A	or:at 1650mg/kg	
2. Naphthalene	(0222)	MKB28680V	NA	NA	NA	1000	100	0.2	NA	0.02500	0.02506	1002.6	5.7	91-20-3	10 ppm (50mg/mL)	or:at 490mg/kg	
3. n-Nonane	95708	081621	1.00	25.00	1000.8	1000	NA	0.013	NA	NA	NA	1000.9	4.2	111-84-2	200 ppm (1050mg/mL)	or:at 216mg/kg	
4. n-Decane	95708	081621	1.00	25.00	1000.9	1000	NA	0.013	NA	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	0.013	NA	NA	NA	1001.3	4.2	112-40-3	N/A	N/A	
6. n-Tetradecane	95708	081621	1.00	25.00	1002.0	1000	NA	0.013	NA	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	0.013	NA	NA	NA	1002.0	4.2	544-78-3	N/A	N/A	
8. n-Octadecane	95708	081621	1.00	25.00	1011.8	1000	NA	0.013	NA	NA	NA	1012.0	4.2	583-45-3	N/A	N/A	
9. n-Eicosane	95708	081621	1.00	25.00	1000.5	1000	NA	0.013	NA	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	0.013	NA	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	0.013	NA	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	0.013	NA	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	0.013	NA	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	0.013	NA	NA	NA	1001.2	4.2	638-68-6	N/A	N/A	
15. n-Triacontane	95708	081621	1.00	25.00	1001.0	1000	NA	0.013	NA	NA	NA	1000.9	4.2	544-85-4	N/A	N/A	
16. n-Dotriacontane	95708	081621	1.00	25.00	1000.7	1000	NA	0.013	NA	NA	NA	1000.9	4.2	14167-59-0	N/A	N/A	
17. n-Tetracontane	95708	081621	1.00	25.00	1000.8	1000	NA	0.013	NA	NA	NA	1000.9	4.2	630-06-8	N/A	N/A	
18. n-Hexatriacontane	95708	081621	1.00	25.00	1000.9	1000	NA	0.013	NA	NA	NA	1001.1	4.2	7194-95-6	N/A	N/A	
19. n-Octatriacontane	95708	081621	1.00	25.00	1000.8	1000	NA	0.013	NA	NA	NA	1000.6	4.3	4181-95-7	N/A	N/A	
20. n-Tetracontane	95708	081621	1.00	25.00	1000.5	1000	NA	0.013	NA	NA	NA	1000.6	4.3			N/A	

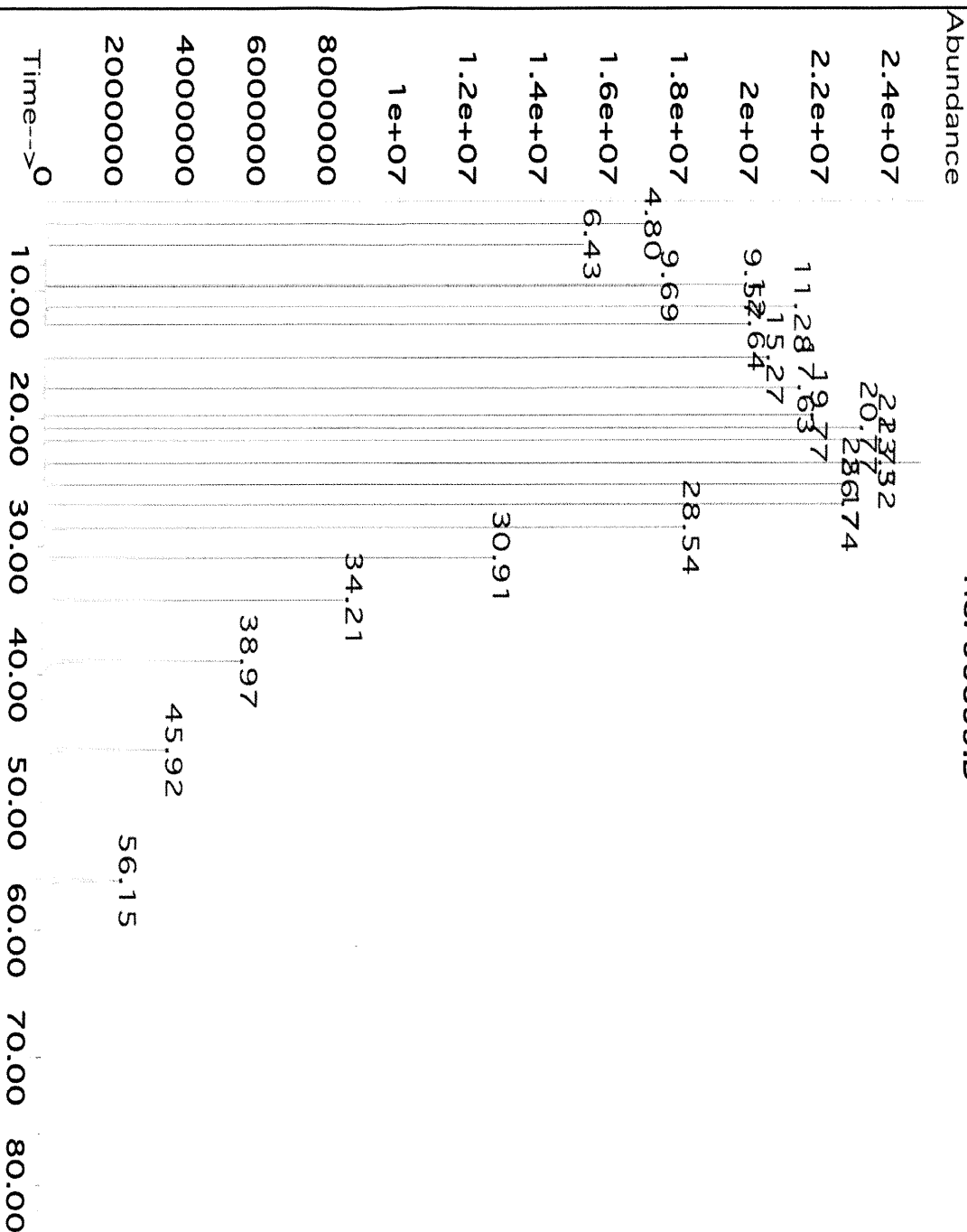
\* The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.  
\* Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).  
\* Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.  
\* All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.  
\* Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).

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11/11/21



Method GC8H01.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.

TIC: 95899.D



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



**Certified Reference Material CRM**



**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#: **8LUTB**

SE-05 Balance Uncertainty  
0.005 Peak Uncertainty

Weight(s) shown below were combined and diluted to (mL): **25.0**  
**CAUTION: Sonicate Before Use**

Solvent(s): **Cyclohexane**  
Lot# **28930**

Formulated By: <i>[Signature]</i>	Benson Chan	092821
Reviewed By: <i>[Signature]</i>	Pedro L. Renterias	092821
		DATE

Compound	(R#)	Lot Number	DIL Factor	Initial Vol (mL)	Initial Conc (µg/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette	Target Weight (g)	Actual Weight (g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	CAS#	SDS Information		LD50
															(Solvent Safety Info. On Attached pg.)		
1. 2-Methylnaphthalene	(0214)	MKB3783V	NA	NA	NA	1000	97	0.2	NA	0.02577	0.02581	1001.6	5.7	91-57-6	N/A	or:at 1650mg/kg	
2. Naphthalene	(0222)	MKB28680V	NA	NA	NA	1000	100	0.2	NA	0.02500	0.02506	1002.6	5.7	91-20-3	10 ppm (50mg/mL)	or:at 490mg/kg	
3. n-Nonane	95708	081621	1.00	25.00	1000.8	1000	NA	0.013	NA	NA	NA	1000.9	4.2	111-84-2	200 ppm (1050mg/mL)	or:at 216mg/kg	
4. n-Decane	95708	081621	1.00	25.00	1000.9	1000	NA	0.013	NA	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	0.013	NA	NA	NA	1001.3	4.2	112-40-3	N/A	N/A	
6. n-Tetradecane	95708	081621	1.00	25.00	1002.0	1000	NA	0.013	NA	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	0.013	NA	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	0.013	NA	NA	NA	1012.0	4.2	583-45-3	N/A	N/A	
9. n-Eicosane	95708	081621	1.00	25.00	1000.5	1000	NA	0.013	NA	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	0.013	NA	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	0.013	NA	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	0.013	NA	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	0.013	NA	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	0.013	NA	NA	NA	1001.2	4.2	638-68-6	N/A	N/A	
15. n-Triacontane	95708	081621	1.00	25.00	1001.0	1000	NA	0.013	NA	NA	NA	1000.9	4.2	544-85-4	N/A	N/A	
16. n-Dotriacontane	95708	081621	1.00	25.00	1000.7	1000	NA	0.013	NA	NA	NA	1000.9	4.2	14167-59-0	N/A	N/A	
17. n-Tetracontane	95708	081621	1.00	25.00	1000.8	1000	NA	0.013	NA	NA	NA	1000.9	4.2	630-06-8	N/A	N/A	
18. n-Hexatriacontane	95708	081621	1.00	25.00	1000.9	1000	NA	0.013	NA	NA	NA	1001.1	4.2	7194-95-6	N/A	N/A	
19. n-Octatriacontane	95708	081621	1.00	25.00	1000.8	1000	NA	0.013	NA	NA	NA	1000.6	4.3	4181-95-7	N/A	N/A	
20. n-Tetracontane	95708	081621	1.00	25.00	1000.5	1000	NA	0.013	NA	NA	NA	1000.6	4.3			N/A	

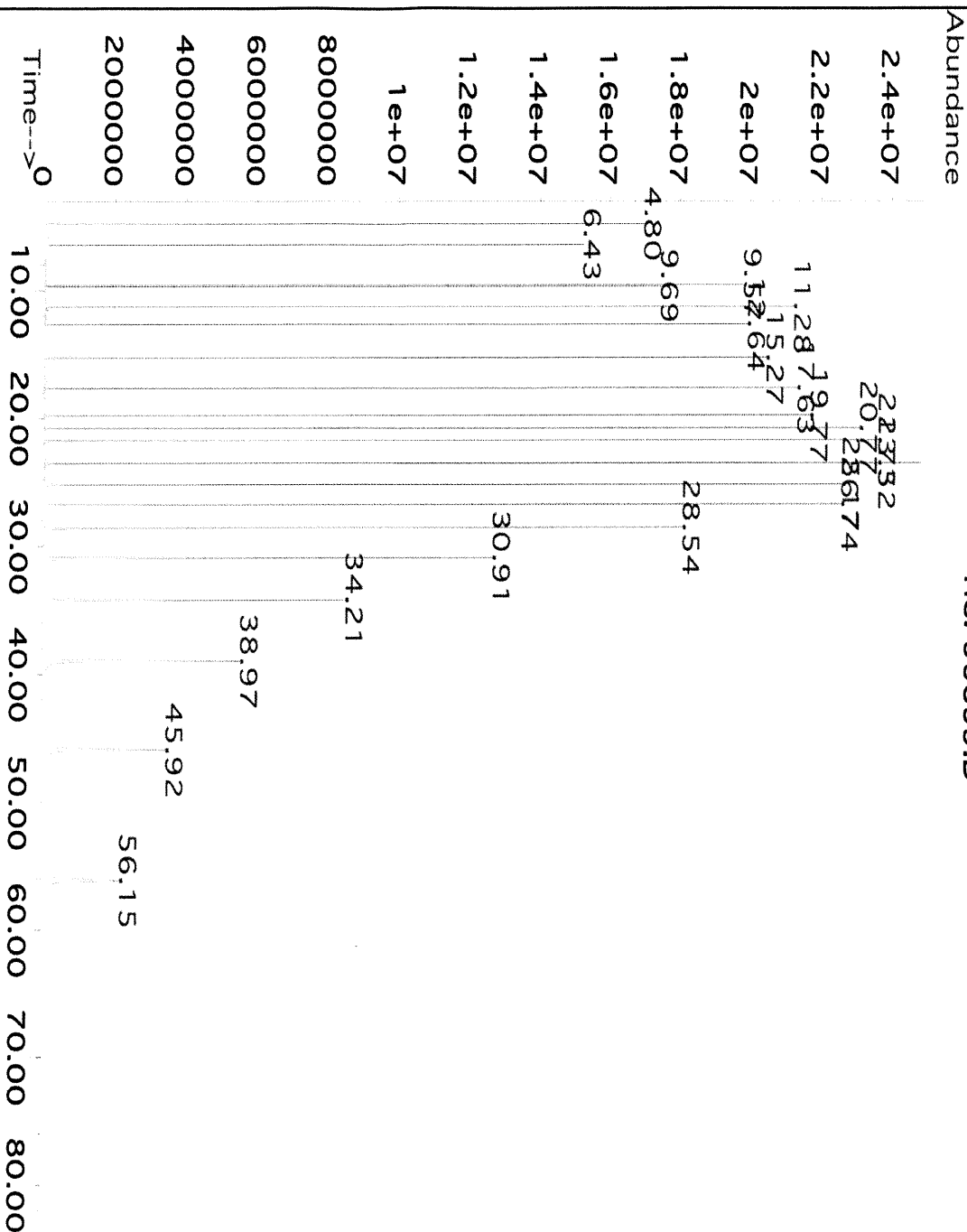
\* The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.  
\* Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).  
\* Standards are certified (+/-) 0.5% of the stated value, unless otherwise stated.  
\* All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.  
\* Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, D.C. (1994).

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11/11/21



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.

TIC: 95899.D





# CERTIFIED REFERENCE MATERIAL

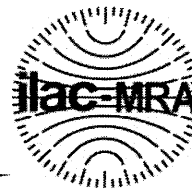
110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

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

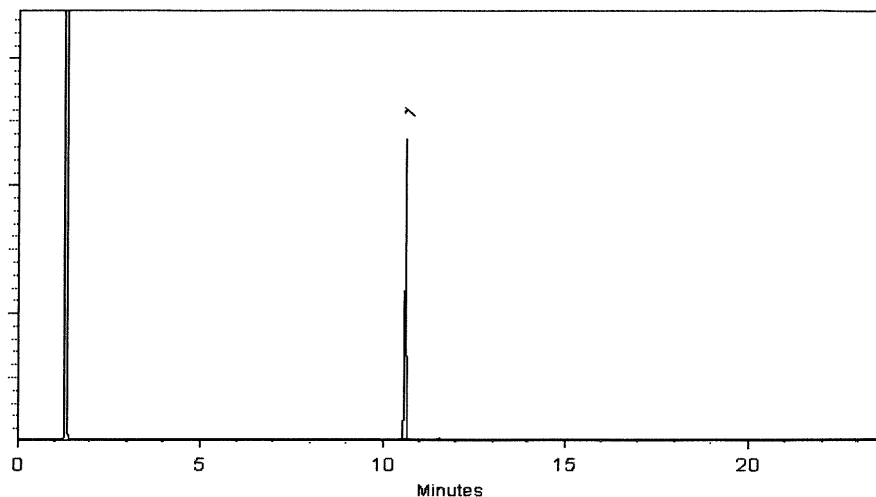
250°C

**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/ $\mu$ ECD, 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:

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

$k$  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](http://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](http://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.



# CERTIFIED REFERENCE MATERIAL

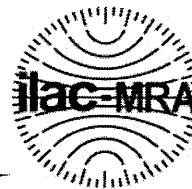
110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

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

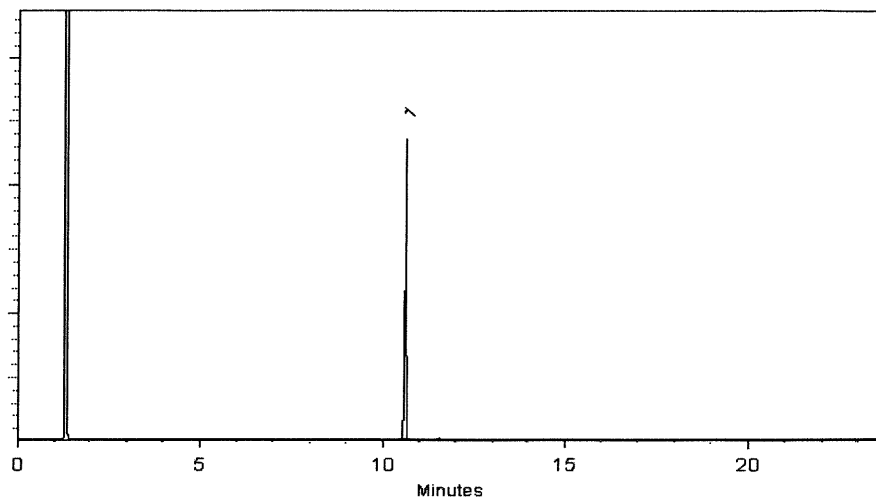
250°C

**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:

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

$k$  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](http://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
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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](http://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.



# CERTIFIED REFERENCE MATERIAL

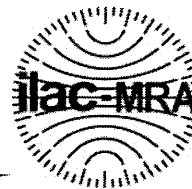
110 Benner Circle  
Bellefonte, PA 16823-8812  
Tel: (800)356-1688  
Fax: (814)353-1309

www.restek.com

## Certificate of Analysis

P11639 to P11678

Received by SJ 5/27/2022



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

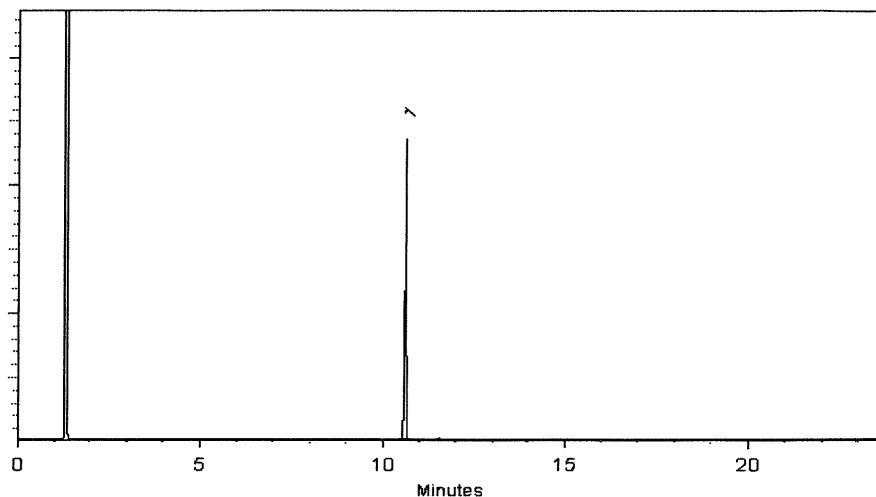
250°C

**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

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- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

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

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

$k$  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](http://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](http://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.



# CERTIFIED REFERENCE MATERIAL

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

www.restek.com

## Certificate of Analysis

P11679 to P11718

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.: A0182937  
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 : October 31, 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 CAS # 84-15-1 Purity 99% (Lot MKCH4487)	10,036.7 µg/mL	+/- 58.7669 µg/mL Gravimetric +/- 452.1110 µg/mL Unstressed +/- 501.6618 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:**

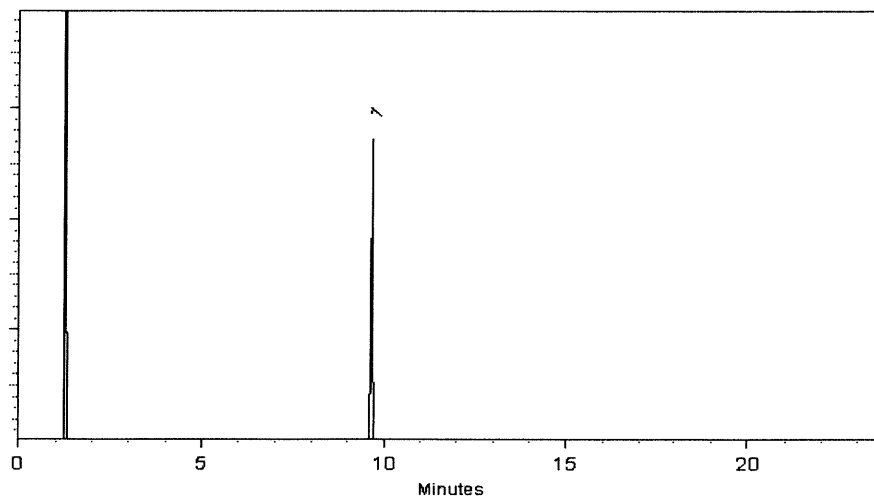
250°C

**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.

Jeremy Johnson - Mfg. Supervisor

**Date Mixed:** 16-Mar-2022

**Balance:** 1128360905

Marlene Cowan - Operations Tech I

**Date Passed:** 21-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:

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

$k$  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](http://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](http://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.



# CERTIFIED REFERENCE MATERIAL

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## Certificate of Analysis

P11679 to P11718

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.: A0182937  
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 : October 31, 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 CAS # 84-15-1 Purity 99% (Lot MKCH4487)	10,036.7 µg/mL	+/- 58.7669 µg/mL Gravimetric +/- 452.1110 µg/mL Unstressed +/- 501.6618 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:**

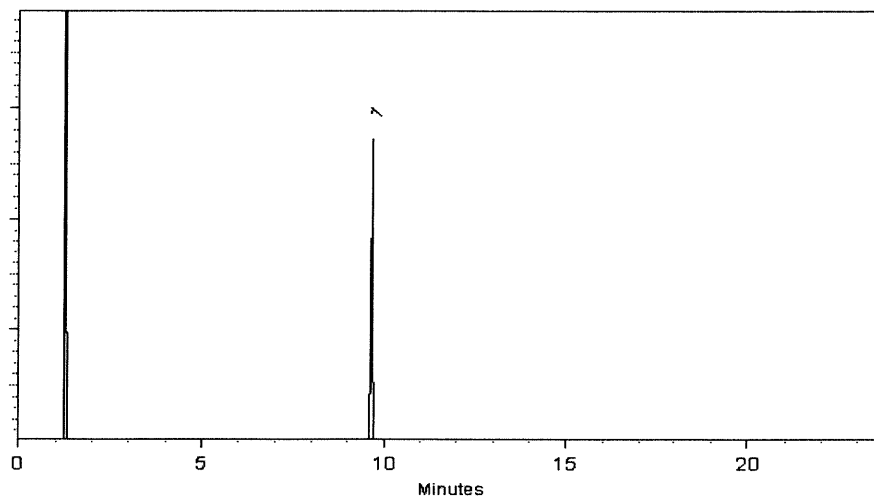
250°C

**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.

Jeremy Johnson - Mfg. Supervisor

**Date Mixed:** 16-Mar-2022

**Balance:** 1128360905

Marlene Cowan - Operations Tech I

**Date Passed:** 21-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:

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

$k$  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](http://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](http://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.



# CERTIFIED REFERENCE MATERIAL

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www.restek.com

## Certificate of Analysis

P11719 to P11738

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 CAS # 84-15-1 Purity 99% (Lot MKCH4487)	10,006.9 µg/mL	+/- 58.1808 µg/mL Gravimetric +/- 450.7156 µg/mL Unstressed +/- 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:**

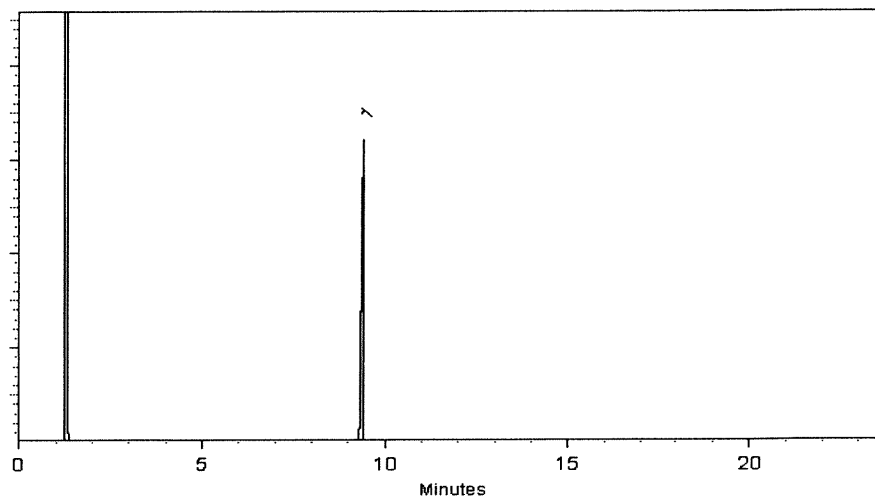
250°C

**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*  
**Nick Yaw - Operations Tech I**

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

**Balance:** 1128360905

*Clara Windle*  
**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:

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

$k$  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](http://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](http://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.





# CERTIFIED REFERENCE MATERIAL

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Fax: (814)353-1309

www.restek.com

## Certificate of Analysis

P11719 to P11738

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 CAS # 84-15-1 Purity 99% (Lot MKCH4487)	10,006.9 µg/mL	+/- 58.1808 µg/mL Gravimetric +/- 450.7156 µg/mL Unstressed +/- 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:**

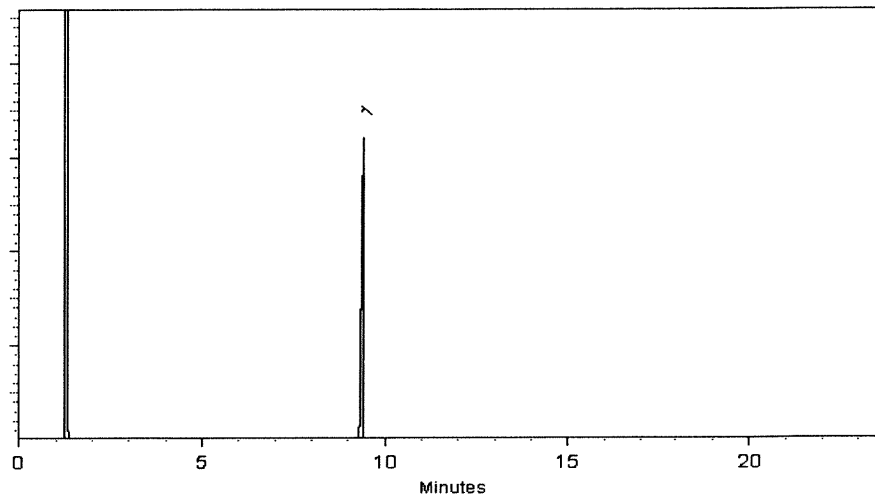
250°C

**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*  
**Nick Yaw - Operations Tech I**

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

**Balance:** 1128360905

*Clara Windle*  
**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:

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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
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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](http://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.



# CERTIFIED REFERENCE MATERIAL

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Fax: (814)353-1309

www.restek.com

## Certificate of Analysis

P11719 to P11738

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 CAS # 84-15-1 Purity 99% (Lot MKCH4487)	10,006.9 µg/mL	+/- 58.1808 µg/mL Gravimetric +/- 450.7156 µg/mL Unstressed +/- 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:**

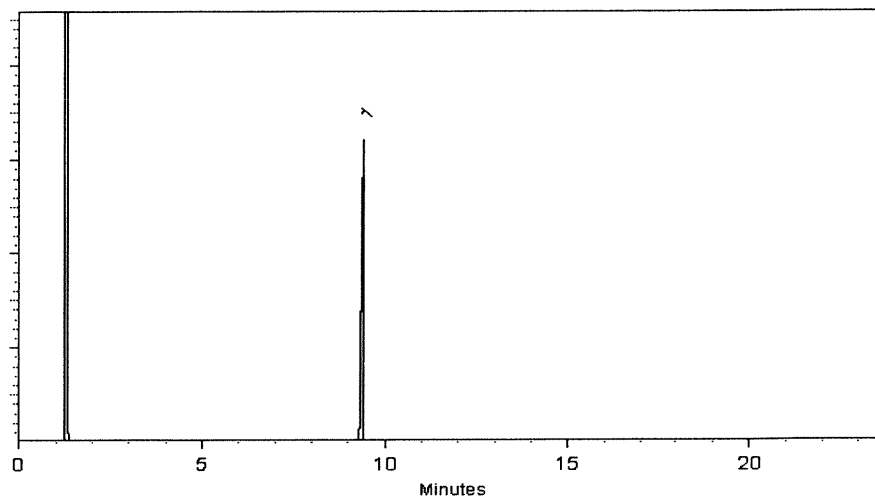
250°C

**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*  
**Nick Yaw - Operations Tech I**

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

**Balance:** 1128360905

*Clara Windle*  
**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.
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### Certified Uncertainty Value Notes:

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

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

$k$  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](http://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](http://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.



# CERTIFIED REFERENCE MATERIAL

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

www.restek.com

## Certificate of Analysis

P11719 to P11738

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 CAS # 84-15-1 Purity 99% (Lot MKCH4487)	10,006.9 µg/mL	+/- 58.1808 µg/mL Gravimetric +/- 450.7156 µg/mL Unstressed +/- 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:**

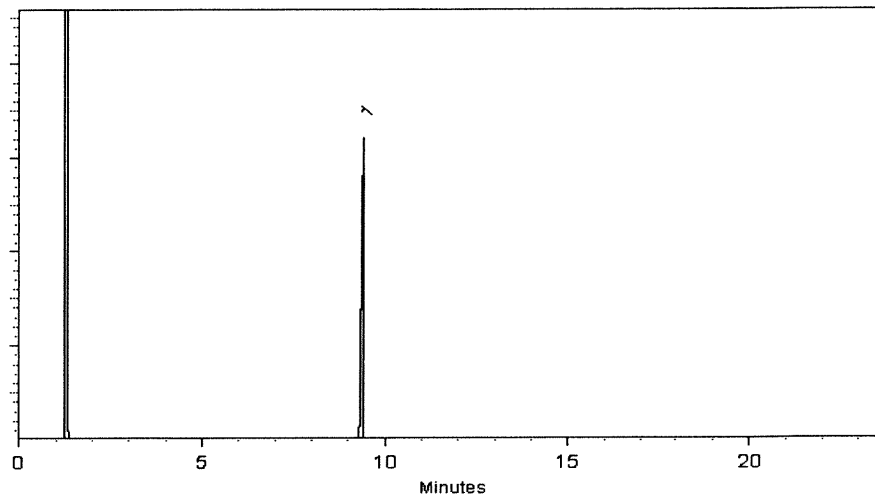
250°C

**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*  
**Nick Yaw - Operations Tech I**

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

**Balance:** 1128360905

*Clara Windle*  
**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:

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

$k$  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](http://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](http://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.



# CERTIFIED REFERENCE MATERIAL

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Fax: (814)353-1309

www.restek.com

## Certificate of Analysis

P11719 to P11738

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 CAS # 84-15-1 Purity 99% (Lot MKCH4487)	10,006.9 µg/mL	+/- 58.1808 µg/mL Gravimetric +/- 450.7156 µg/mL Unstressed +/- 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:**

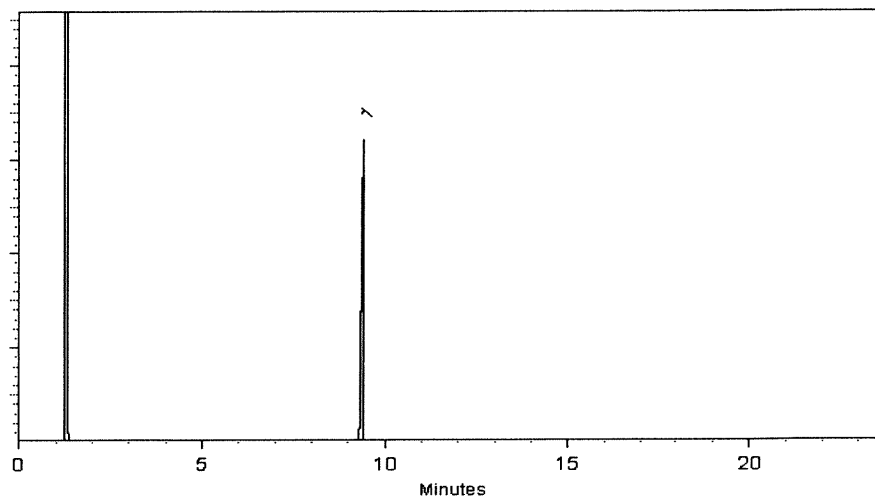
250°C

**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*  
**Nick Yaw - Operations Tech I**

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

**Balance:** 1128360905

*Clara Windle*  
**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:

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

$k$  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](http://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](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

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

### Handling Notes:

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

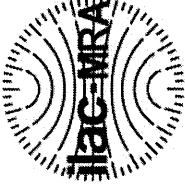


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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

**Catalog No.:** 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

p11827  
AJ  
06/14/22  
p11831

#### 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%	2,015.3 µg/mL (Lot SHBN5361)	+/- 11.8271 µg/mL Gravimetric +/- 50.0358 µg/mL Unstressed +/- 59.9888 µg/mL Stressed
2	n-Decane (C10) CAS # 124-18-5 Purity 99%	2,010.7 µg/mL (Lot SHBN8619)	+/- 11.7997 µg/mL Gravimetric +/- 49.9200 µg/mL Unstressed +/- 59.8498 µg/mL Stressed
3	Naphthalene CAS # 91-20-3 Purity 99%	2,013.3 µg/mL (Lot MKCH0219)	+/- 11.8154 µg/mL Gravimetric +/- 49.9862 µg/mL Unstressed +/- 59.9292 µg/mL Stressed
4	n-Dodecane (C12) CAS # 112-40-3 Purity 99%	2,007.3 µg/mL (Lot SHBK0925)	+/- 11.7802 µg/mL Gravimetric +/- 49.8372 µg/mL Unstressed +/- 59.7506 µg/mL Stressed
5	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	2,010.2 µg/mL (Lot STBK0259)	+/- 11.7972 µg/mL Gravimetric +/- 49.9094 µg/mL Unstressed +/- 59.8371 µg/mL Stressed
6	n-Tetradecane (C14) CAS # 629-59-4 Purity 99%	2,010.0 µg/mL (Lot STBK2282)	+/- 11.7958 µg/mL Gravimetric +/- 49.9034 µg/mL Unstressed +/- 59.8300 µg/mL Stressed
7	n-Hexadecane (C16) CAS # 544-76-3 Purity 98%	2,012.9 µg/mL (Lot SHBM4146)	+/- 11.8129 µg/mL Gravimetric +/- 49.9759 µg/mL Unstressed +/- 59.9169 µg/mL 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-Tetatriacontane (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  
Rx-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:**

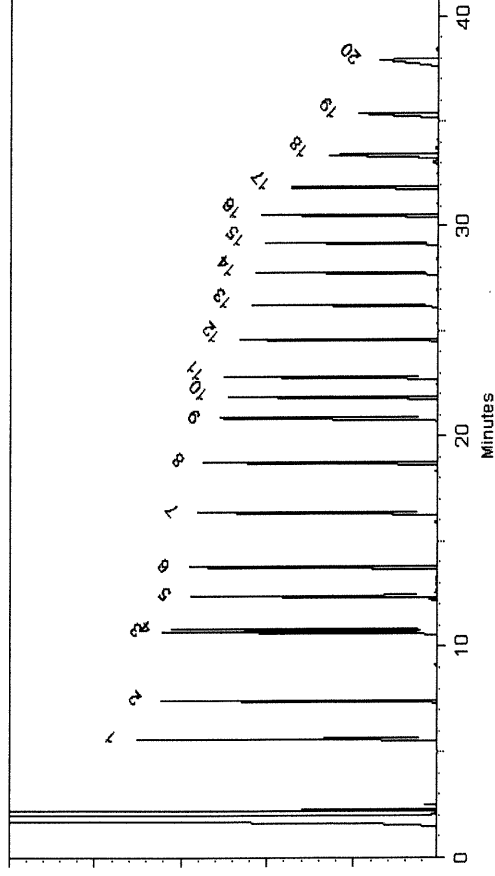
250°C

**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:

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

$k$  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](http://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](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

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

### Handling Notes:

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



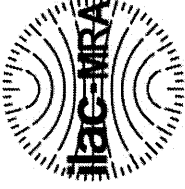


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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

**Catalog No.:** 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

p11827  
AJ  
06/14/22  
p11831

#### 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%	2,015.3 µg/mL (Lot SHBN5361)	+/- 11.8271 µg/mL Gravimetric +/- 50.0358 µg/mL Unstressed +/- 59.9888 µg/mL Stressed
2	n-Decane (C10) CAS # 124-18-5 Purity 99%	2,010.7 µg/mL (Lot SHBN8619)	+/- 11.7997 µg/mL Gravimetric +/- 49.9200 µg/mL Unstressed +/- 59.8498 µg/mL Stressed
3	Naphthalene CAS # 91-20-3 Purity 99%	2,013.3 µg/mL (Lot MKCH0219)	+/- 11.8154 µg/mL Gravimetric +/- 49.9862 µg/mL Unstressed +/- 59.9292 µg/mL Stressed
4	n-Dodecane (C12) CAS # 112-40-3 Purity 99%	2,007.3 µg/mL (Lot SHBK0925)	+/- 11.7802 µg/mL Gravimetric +/- 49.8372 µg/mL Unstressed +/- 59.7506 µg/mL Stressed
5	2-Methylnaphthalene CAS # 91-57-6 Purity 96%	2,010.2 µg/mL (Lot STBK0259)	+/- 11.7972 µg/mL Gravimetric +/- 49.9094 µg/mL Unstressed +/- 59.8371 µg/mL Stressed
6	n-Tetradecane (C14) CAS # 629-59-4 Purity 99%	2,010.0 µg/mL (Lot STBK2282)	+/- 11.7958 µg/mL Gravimetric +/- 49.9034 µg/mL Unstressed +/- 59.8300 µg/mL Stressed
7	n-Hexadecane (C16) CAS # 544-76-3 Purity 98%	2,012.9 µg/mL (Lot SHBM4146)	+/- 11.8129 µg/mL Gravimetric +/- 49.9759 µg/mL Unstressed +/- 59.9169 µg/mL 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-Tetatriacontane (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  
Rx-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:**

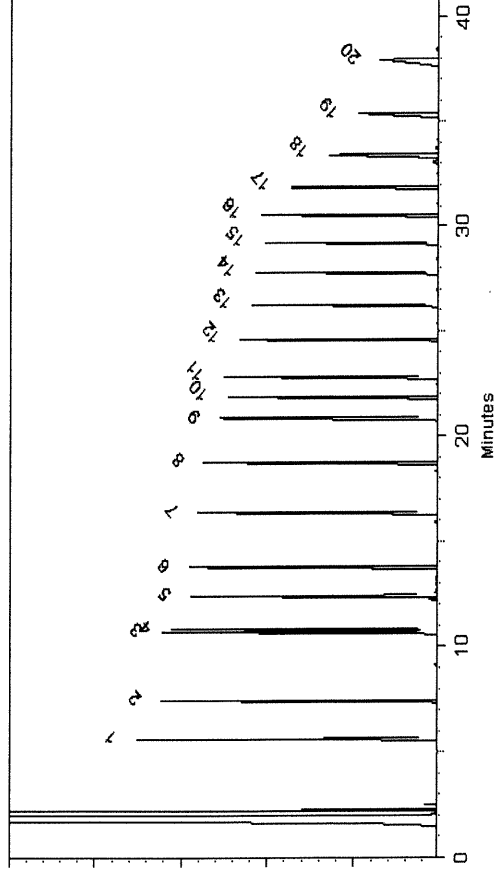
250°C

**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:** 11.28360905

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:

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

$k$  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](http://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](http://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.



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

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# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

**Catalog No. :** 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

P12216  
↓  
P12231 } Y.P.  
12/30/22

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

8	n-Heneicosane (C21) <b>CAS #</b> 629-94-7 <b>Purity</b> 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) <b>CAS #</b> 629-97-0 <b>Purity</b> 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) <b>CAS #</b> 646-31-1 <b>Purity</b> 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) <b>CAS #</b> 630-01-3 <b>Purity</b> 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) <b>CAS #</b> 630-02-4 <b>Purity</b> 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) <b>CAS #</b> 638-68-6 <b>Purity</b> 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) <b>CAS #</b> 544-85-4 <b>Purity</b> 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) <b>CAS #</b> 14167-59-0 <b>Purity</b> 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) <b>CAS #</b> 630-06-8 <b>Purity</b> 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) <b>CAS #</b> 7194-85-6 <b>Purity</b> 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) <b>CAS #</b> 4181-95-7 <b>Purity</b> 99%	(Lot BSBME)	201.7	µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b> n-Pentane <b>CAS #</b> 109-66-0 <b>Purity</b> 99%							

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

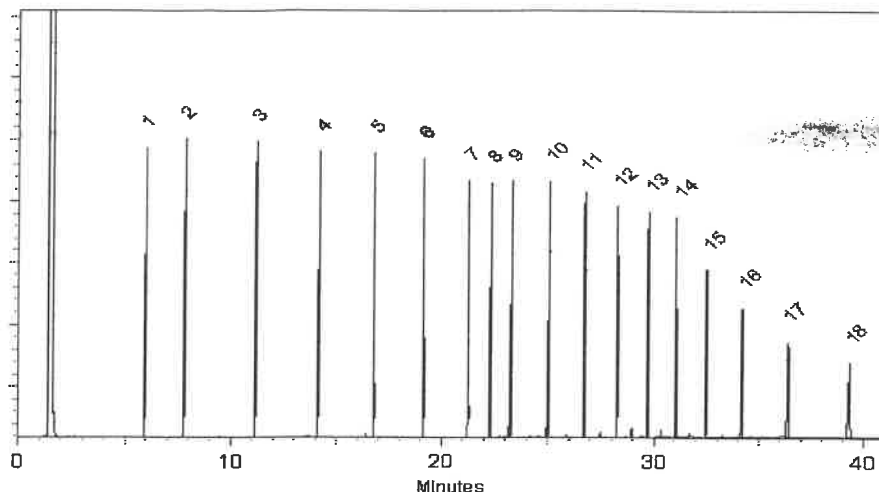
**Carrier Gas:**  
hydrogen-constant pressure 10 psi.

**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, RT, 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:

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

*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](http://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](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

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

### Handling Notes:

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





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# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

**Catalog No. :** 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

P12216  
↓  
P12231 } Y.P.  
12/30/22

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

8	n-Heneicosane (C21) <b>CAS #</b> 629-94-7 <b>Purity</b> 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) <b>CAS #</b> 629-97-0 <b>Purity</b> 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) <b>CAS #</b> 646-31-1 <b>Purity</b> 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) <b>CAS #</b> 630-01-3 <b>Purity</b> 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) <b>CAS #</b> 630-02-4 <b>Purity</b> 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) <b>CAS #</b> 638-68-6 <b>Purity</b> 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) <b>CAS #</b> 544-85-4 <b>Purity</b> 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) <b>CAS #</b> 14167-59-0 <b>Purity</b> 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) <b>CAS #</b> 630-06-8 <b>Purity</b> 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) <b>CAS #</b> 7194-85-6 <b>Purity</b> 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) <b>CAS #</b> 4181-95-7 <b>Purity</b> 99%	(Lot BSBME)	201.7	µg/mL	+/- 1.1978 +/- 5.0103 +/- 6.0057	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b> n-Pentane <b>CAS #</b> 109-66-0 <b>Purity</b> 99%							

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

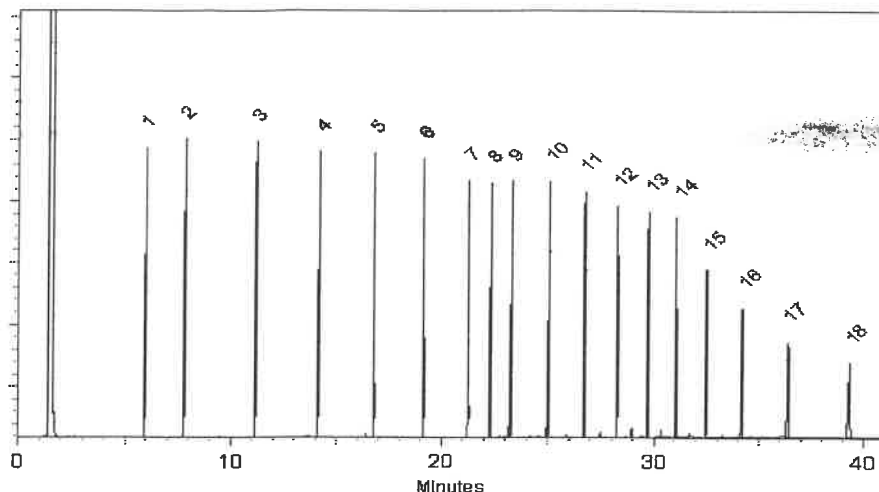
**Carrier Gas:**  
hydrogen-constant pressure 10 psi.

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

### Certified Uncertainty Value Notes:

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*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](http://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](http://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.



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

www.restek.com

# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

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

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

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

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

P12232  
↓  
P12235 } Y.P.  
12/30/22

### 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%	201.6 µg/mL +/- 5.0078 +/- 6.0027	µg/mL Gravimetric Unstressed µg/mL Stressed
2	n-Decane (C10) CAS # 124-18-5 (Lot SHBP4427) Purity 99%	200.7 µg/mL +/- 4.9855 +/- 5.9759	µg/mL Gravimetric Unstressed µg/mL Stressed
3	n-Dodecane (C12) CAS # 112-40-3 (Lot SHBP7054) Purity 99%	200.3 µg/mL +/- 4.9772 +/- 5.9660	µg/mL Gravimetric Unstressed µg/mL Stressed
4	n-Tetradecane (C14) CAS # 629-59-4 (Lot STBK2282) Purity 99%	200.7 µg/mL +/- 4.9855 +/- 5.9759	µg/mL Gravimetric Unstressed µg/mL Stressed
5	n-Hexadecane (C16) CAS # 544-76-3 (Lot SHBM4146) Purity 98%	200.9 µg/mL +/- 4.9913 +/- 5.9829	µg/mL Gravimetric Unstressed µg/mL Stressed
6	n-Octadecane (C18) CAS # 593-45-3 (Lot UESNG) Purity 98%	201.9 µg/mL +/- 5.0164 +/- 6.0130	µg/mL Gravimetric Unstressed µg/mL Stressed
7	n-Eicosane (C20) CAS # 112-95-8 (Lot MKCN8767) Purity 97%	201.8 µg/mL +/- 5.0134 +/- 6.0094	µg/mL Gravimetric Unstressed µg/mL Stressed

8	n-Heneicosane (C21) CAS # 629-94-7 Purity 99%	(Lot MKCL3226)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) CAS # 629-97-0 Purity 99%	(Lot MKCL8918)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	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)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) CAS # 630-02-4 Purity 99%	(Lot BCCG0084)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) CAS # 638-68-6 Purity 97%	(Lot MKCQ9436)	201.1 µg/mL	+/- 1.1946 +/- 4.9966 +/- 5.9892	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) CAS # 544-85-4 Purity 99%	(Lot BCBW0661)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) CAS # 14167-59-0 Purity 99%	(Lot OML4N)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) CAS # 630-06-8 Purity 99%	(Lot Z27H018)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) CAS # 7194-85-6 Purity 96%	(Lot 0000145137)	201.6 µg/mL	+/- 1.1974 +/- 5.0086 +/- 6.0037	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) CAS # 4181-95-7 Purity 98%	(Lot PADGI)	200.9 µg/mL	+/- 1.1933 +/- 4.9913 +/- 5.9829	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b> n-Pentane CAS # 109-66-0 Purity 99%						

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

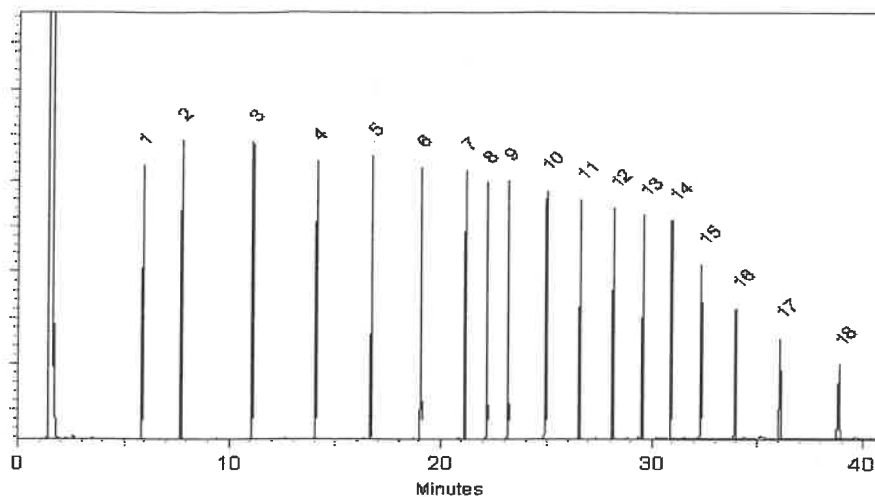
**Carrier Gas:**  
hydrogen-constant pressure 10 psi.

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

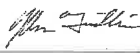
**Inj. Temp:**  
250°C

**Det. Temp:**  
330°C

**Det. Type:**  
FID



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

  
John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 Balance: 1128353505

  
Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

## General Certified Reference Material Notes

### Expiration Notes:

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

### Purity Notes:

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

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

$k$  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](http://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](http://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:

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### Handling Notes:

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

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

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

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

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

P12232  
↓  
P12235 } Y.P.  
12/30/22

### 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%	201.6 µg/mL	+/- 1.1972 µg/mL Gravimetric +/- 5.0078 µg/mL Unstressed +/- 6.0027 µg/mL Stressed
2	n-Decane (C10) CAS # 124-18-5 (Lot SHBP4427) Purity 99%	200.7 µg/mL	+/- 1.1919 µg/mL Gravimetric +/- 4.9855 µg/mL Unstressed +/- 5.9759 µg/mL Stressed
3	n-Dodecane (C12) CAS # 112-40-3 (Lot SHBP7054) Purity 99%	200.3 µg/mL	+/- 1.1899 µg/mL Gravimetric +/- 4.9772 µg/mL Unstressed +/- 5.9660 µg/mL Stressed
4	n-Tetradecane (C14) CAS # 629-59-4 (Lot STBK2282) Purity 99%	200.7 µg/mL	+/- 1.1919 µg/mL Gravimetric +/- 4.9855 µg/mL Unstressed +/- 5.9759 µg/mL Stressed
5	n-Hexadecane (C16) CAS # 544-76-3 (Lot SHBM4146) Purity 98%	200.9 µg/mL	+/- 1.1933 µg/mL Gravimetric +/- 4.9913 µg/mL Unstressed +/- 5.9829 µg/mL Stressed
6	n-Octadecane (C18) CAS # 593-45-3 (Lot UESNG) Purity 98%	201.9 µg/mL	+/- 1.1993 µg/mL Gravimetric +/- 5.0164 µg/mL Unstressed +/- 6.0130 µg/mL Stressed
7	n-Eicosane (C20) CAS # 112-95-8 (Lot MKCN8767) Purity 97%	201.8 µg/mL	+/- 1.1986 µg/mL Gravimetric +/- 5.0134 µg/mL Unstressed +/- 6.0094 µg/mL Stressed

8	n-Heneicosane (C21) CAS # 629-94-7 Purity 99%	(Lot MKCL3226)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) CAS # 629-97-0 Purity 99%	(Lot MKCL8918)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	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)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) CAS # 630-02-4 Purity 99%	(Lot BCCG0084)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) CAS # 638-68-6 Purity 97%	(Lot MKCQ9436)	201.1 µg/mL	+/- 1.1946 +/- 4.9966 +/- 5.9892	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) CAS # 544-85-4 Purity 99%	(Lot BCBW0661)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
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<b>Solvent:</b> n-Pentane CAS # 109-66-0 Purity 99%						

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

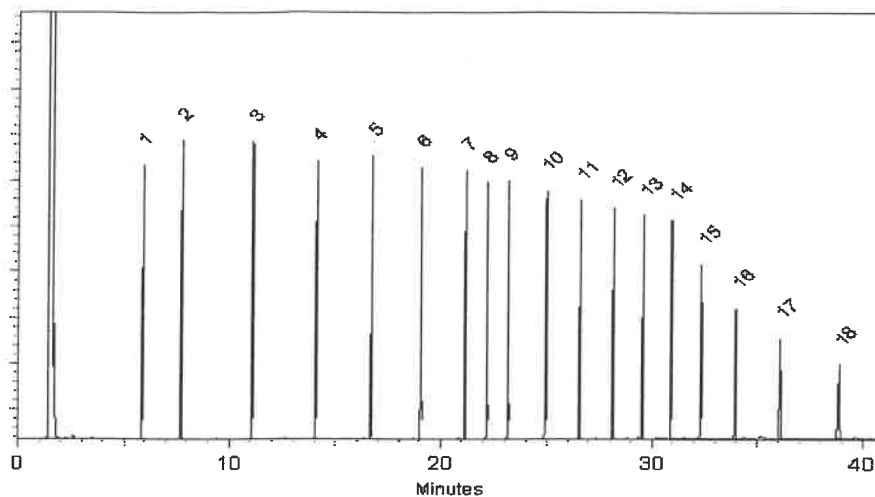
**Carrier Gas:**  
hydrogen-constant pressure 10 psi.

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

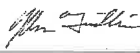
**Inj. Temp:**  
250°C

**Det. Temp:**  
330°C

**Det. Type:**  
FID



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John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 Balance: 1128353505

  
Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

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

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

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

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P12232  
↓  
P12235 } Y.P.  
12/30/22

### CERTIFIED VALUES

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6	n-Octadecane (C18) CAS # 593-45-3 (Lot UESNG) Purity 98%	201.9 µg/mL	+/- 1.1993 µg/mL Gravimetric +/- 5.0164 µg/mL Unstressed +/- 6.0130 µg/mL Stressed
7	n-Eicosane (C20) CAS # 112-95-8 (Lot MKCN8767) Purity 97%	201.8 µg/mL	+/- 1.1986 µg/mL Gravimetric +/- 5.0134 µg/mL Unstressed +/- 6.0094 µg/mL Stressed

8	n-Heneicosane (C21) CAS # 629-94-7 Purity 99%	(Lot MKCL3226)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) CAS # 629-97-0 Purity 99%	(Lot MKCL8918)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	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)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) CAS # 630-02-4 Purity 99%	(Lot BCCG0084)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) CAS # 638-68-6 Purity 97%	(Lot MKCQ9436)	201.1 µg/mL	+/- 1.1946 +/- 4.9966 +/- 5.9892	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
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15	n-Tetratriacontane (C34) CAS # 14167-59-0 Purity 99%	(Lot OML4N)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) CAS # 630-06-8 Purity 99%	(Lot Z27H018)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) CAS # 7194-85-6 Purity 96%	(Lot 0000145137)	201.6 µg/mL	+/- 1.1974 +/- 5.0086 +/- 6.0037	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) CAS # 4181-95-7 Purity 98%	(Lot PADGI)	200.9 µg/mL	+/- 1.1933 +/- 4.9913 +/- 5.9829	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b> n-Pentane CAS # 109-66-0 Purity 99%						

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

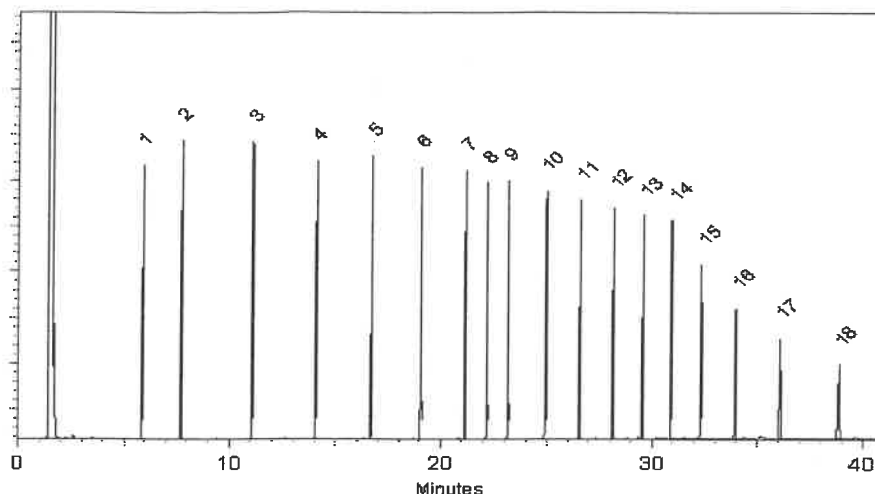
**Carrier Gas:**  
hydrogen-constant pressure 10 psi.

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

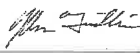
**Inj. Temp:**  
250°C

**Det. Temp:**  
330°C

**Det. Type:**  
FID



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John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 Balance: 1128353505

  
Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

## General Certified Reference Material Notes

### Expiration Notes:

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

### Purity Notes:

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

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

$k$  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](http://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](http://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.

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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



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

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

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

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

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

P12232  
↓  
P12235 } Y.P.  
12/30/22

### 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%	201.6 µg/mL	+/- 1.1972 µg/mL Gravimetric +/- 5.0078 µg/mL Unstressed +/- 6.0027 µg/mL Stressed
2	n-Decane (C10) CAS # 124-18-5 (Lot SHBP4427) Purity 99%	200.7 µg/mL	+/- 1.1919 µg/mL Gravimetric +/- 4.9855 µg/mL Unstressed +/- 5.9759 µg/mL Stressed
3	n-Dodecane (C12) CAS # 112-40-3 (Lot SHBP7054) Purity 99%	200.3 µg/mL	+/- 1.1899 µg/mL Gravimetric +/- 4.9772 µg/mL Unstressed +/- 5.9660 µg/mL Stressed
4	n-Tetradecane (C14) CAS # 629-59-4 (Lot STBK2282) Purity 99%	200.7 µg/mL	+/- 1.1919 µg/mL Gravimetric +/- 4.9855 µg/mL Unstressed +/- 5.9759 µg/mL Stressed
5	n-Hexadecane (C16) CAS # 544-76-3 (Lot SHBM4146) Purity 98%	200.9 µg/mL	+/- 1.1933 µg/mL Gravimetric +/- 4.9913 µg/mL Unstressed +/- 5.9829 µg/mL Stressed
6	n-Octadecane (C18) CAS # 593-45-3 (Lot UESNG) Purity 98%	201.9 µg/mL	+/- 1.1993 µg/mL Gravimetric +/- 5.0164 µg/mL Unstressed +/- 6.0130 µg/mL Stressed
7	n-Eicosane (C20) CAS # 112-95-8 (Lot MKCN8767) Purity 97%	201.8 µg/mL	+/- 1.1986 µg/mL Gravimetric +/- 5.0134 µg/mL Unstressed +/- 6.0094 µg/mL Stressed

8	n-Heneicosane (C21) CAS # 629-94-7 Purity 99%	(Lot MKCL3226)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) CAS # 629-97-0 Purity 99%	(Lot MKCL8918)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	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)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) CAS # 630-02-4 Purity 99%	(Lot BCCG0084)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) CAS # 638-68-6 Purity 97%	(Lot MKCQ9436)	201.1 µg/mL	+/- 1.1946 +/- 4.9966 +/- 5.9892	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) CAS # 544-85-4 Purity 99%	(Lot BCBW0661)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetratriacontane (C34) CAS # 14167-59-0 Purity 99%	(Lot OML4N)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) CAS # 630-06-8 Purity 99%	(Lot Z27H018)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) CAS # 7194-85-6 Purity 96%	(Lot 0000145137)	201.6 µg/mL	+/- 1.1974 +/- 5.0086 +/- 6.0037	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) CAS # 4181-95-7 Purity 98%	(Lot PADGI)	200.9 µg/mL	+/- 1.1933 +/- 4.9913 +/- 5.9829	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b> n-Pentane CAS # 109-66-0 Purity 99%						

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

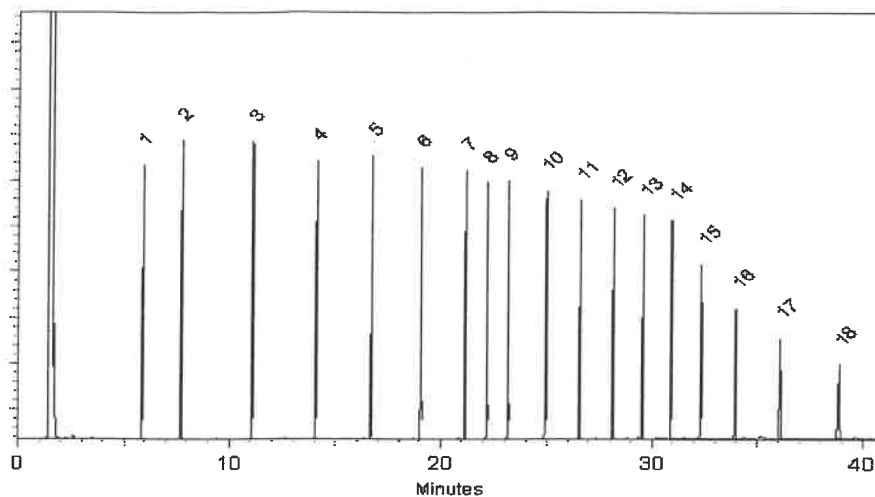
**Carrier Gas:**  
hydrogen-constant pressure 10 psi.

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

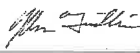
**Inj. Temp:**  
250°C

**Det. Temp:**  
330°C

**Det. Type:**  
FID



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

  
John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 Balance: 1128353505

  
Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

## General Certified Reference Material Notes

### Expiration Notes:

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- 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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$k$  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](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
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### 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



ISO 17034 Accredited  
Reference Material Producer  
Certificate #3222.01



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. :** 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

P12256  
↓  
P12271 } Y.P.  
01/27/23

### 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 Gravimetric +/- 180.5381 µg/mL Unstressed +/- 200.3248 µg/mL Stressed
2	2-Bromonaphthalene CAS # 580-13-2 Purity 99% (Lot STBC5362V)	4,006.0 µg/mL	+/- 23.4560 µg/mL Gravimetric +/- 180.4540 µg/mL Unstressed +/- 200.2315 µg/mL 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:**

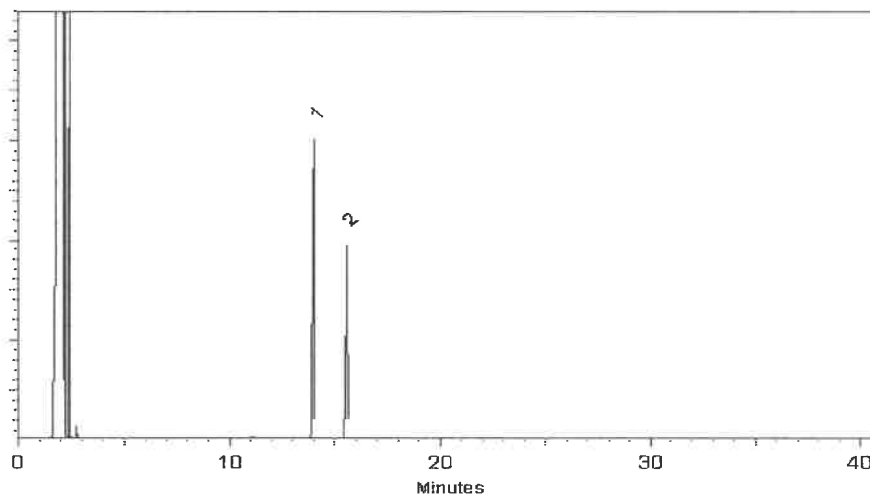
250°C

**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:

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

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### Manufacturing Notes:

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### Handling Notes:

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# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

**Catalog No. :** 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

P12256  
↓  
P12271 } Y.P.  
01/27/23

### 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 Gravimetric +/- 180.5381 µg/mL Unstressed +/- 200.3248 µg/mL Stressed
2	2-Bromonaphthalene CAS # 580-13-2 Purity 99% (Lot STBC5362V)	4,006.0 µg/mL	+/- 23.4560 µg/mL Gravimetric +/- 180.4540 µg/mL Unstressed +/- 200.2315 µg/mL 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:**

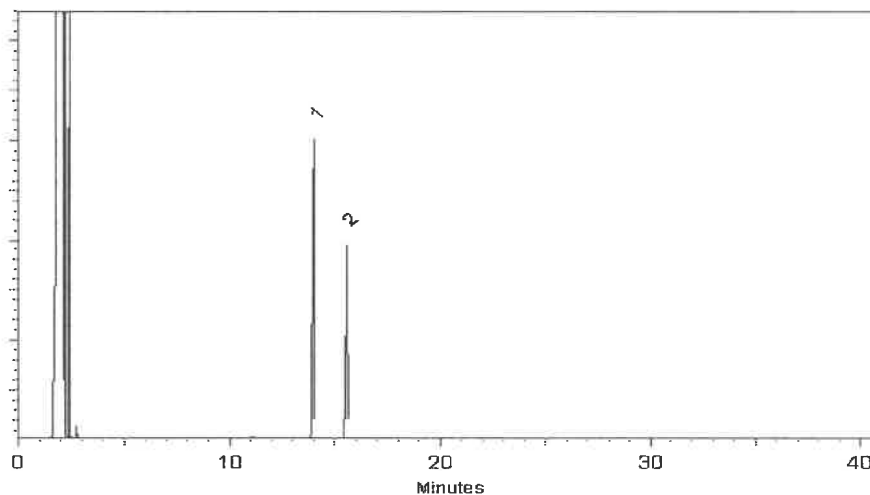
250°C

**Det. Temp:**

330°C

**Det. Type:**

FID



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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  
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P12256  
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P12271 } Y.P.  
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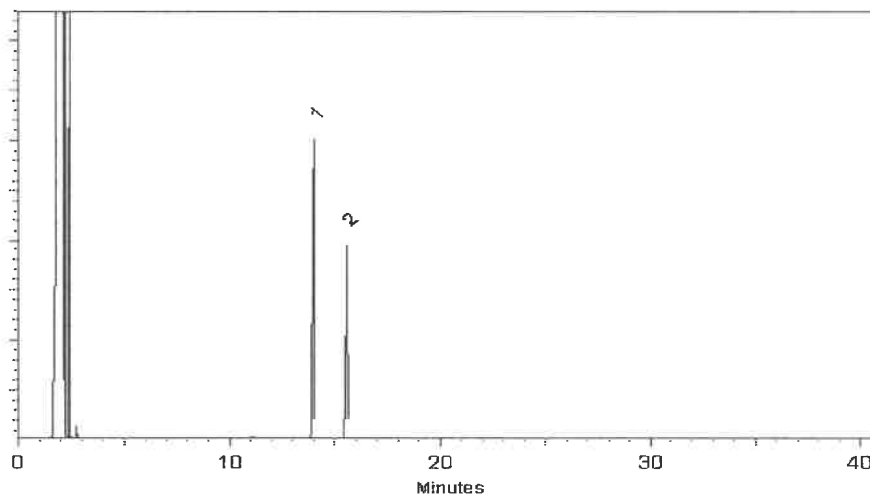
250°C

**Det. Temp:**

330°C

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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/ $\mu$ ECD, 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:

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

$k$  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](http://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](http://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.







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

www.restek.com

# CERTIFIED REFERENCE MATERIAL

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

**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

P12256  
↓  
P12271 } Y.P.  
01/27/23

### 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:**

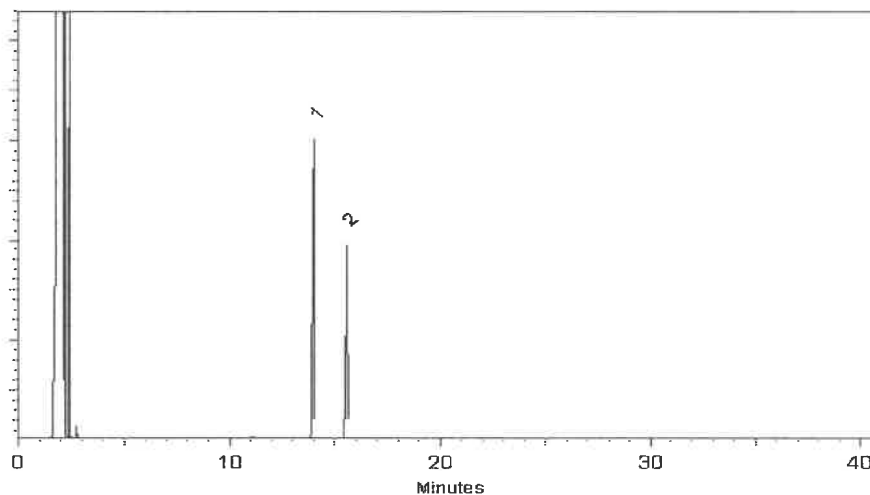
250°C

**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

## General Certified Reference Material Notes

### Expiration Notes:

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- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
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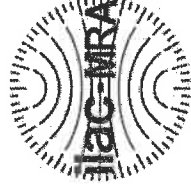


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### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 30542 Lot No.: A0191475  
Description: NJEPH Aliphatics Matrix Spike Mix  
NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul  
Container Size: 5 mL Pkg Amt: > 5 mL  
Expiration Date: December 31, 2029 Storage: 10°C or colder  
Handling: Sonicate prior to use. Ship: Ambient

12311 } Y.P.  
12330 } 02/22/23

#### CERTIFIED VALUES

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

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

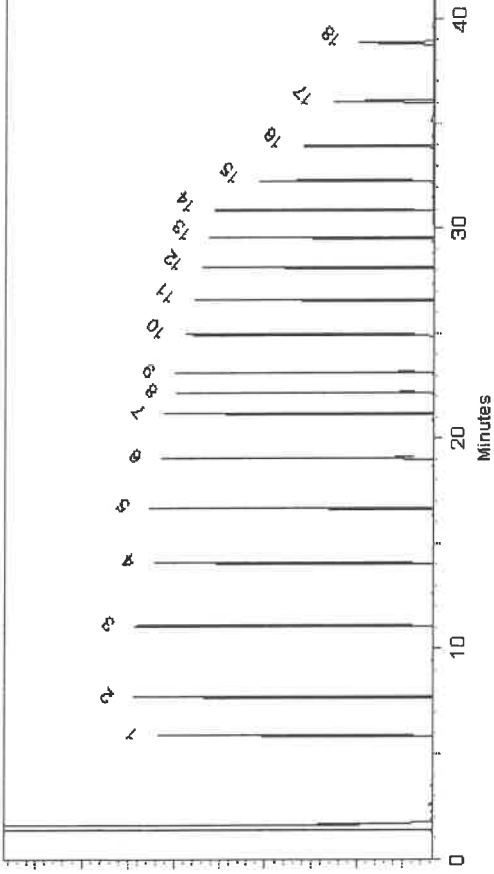
250°C

**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.

*John Friedline*

John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 Balance: 1128353505

*Jermiter Pollino*

Jermiter Pollino - Operations Tech III - ARN 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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### Handling Notes:

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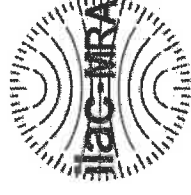


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NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul  
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Expiration Date: December 31, 2029 Storage: 10°C or colder  
Handling: Sonicate prior to use. Ship: Ambient

12311 } Y.P.  
12330 } 02/22/23

#### CERTIFIED VALUES

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4	n-Tetradecane (C14) CAS # 629-59-4 Purity 99%	200.7 µg/mL (Lot STBK2282)	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL Gravimetric Unstressed Stressed
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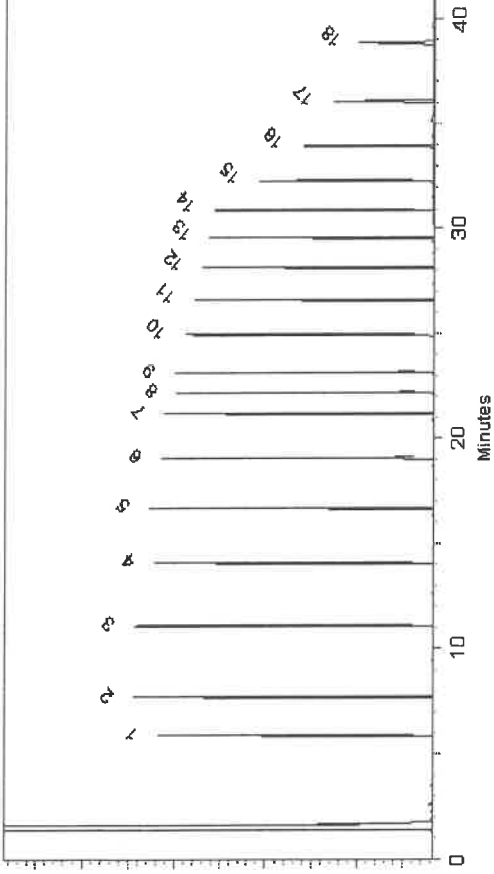
250°C

**Det. Temp:**

330°C

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*John Friedline*

John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 Balance: 1128353505

*Jerimier Pollino*

Jerimier Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

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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
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](http://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.

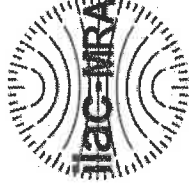


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Fax: (814)353-1309

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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 30542 Lot No.: A0191475  
Description: NJEPH Aliphatics Matrix Spike Mix  
NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul  
Container Size: 5 mL Pkg Amt: > 5 mL  
Expiration Date: December 31, 2029 Storage: 10°C or colder  
Handling: Sonicate prior to use. Ship: Ambient

12311 } Y.P.  
12330 } 02/22/23

#### CERTIFIED VALUES

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

8	n-Hencicosane (C21) CAS # 629-94-7 Purity 99%	(Lot MKCL3226)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) CAS # 629-97-0 Purity 99%	(Lot MKCL8918)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	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)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) CAS # 630-02-4 Purity 99%	(Lot BCCG0084)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) CAS # 638-68-6 Purity 97%	(Lot MKCQ9436)	201.1 µg/mL	+/- 1.1946 +/- 4.9966 +/- 5.9892	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) CAS # 544-85-4 Purity 99%	(Lot BCBW0661)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetatriacontane (C34) CAS # 14167-59-0 Purity 99%	(Lot OML4N)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) CAS # 630-06-8 Purity 99%	(Lot Z27H018)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) CAS # 7194-85-6 Purity 96%	(Lot 0000145137)	201.6 µg/mL	+/- 1.1974 +/- 5.0086 +/- 6.0037	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) CAS # 4181-95-7 Purity 98%	(Lot PADGI)	200.9 µg/mL	+/- 1.1933 +/- 4.9913 +/- 5.9829	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b>						
n-Pentane						
CAS # 109-66-0						
Purity 99%						

**Column:**

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

**Carrier Gas:**

hydrogen-constant pressure 10 psi.

**Temp. Program:**

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

**Inj. Temp:**

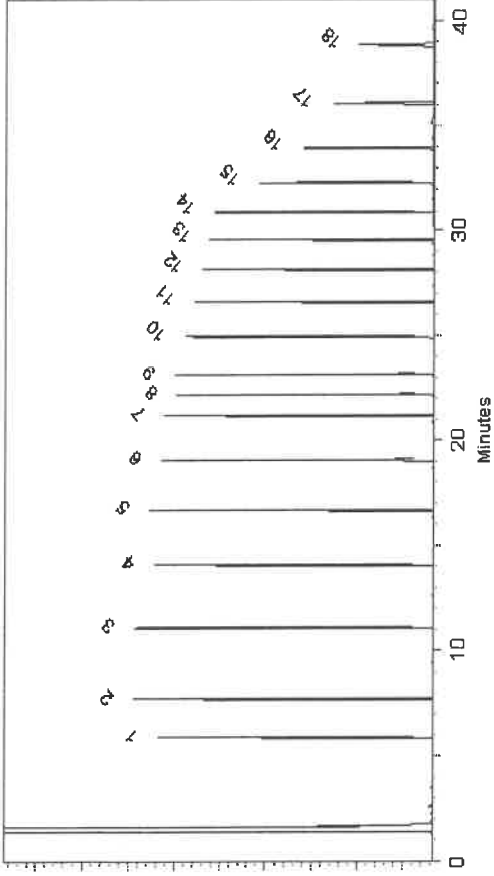
250°C

**Det. Temp:**

330°C

**Det. Type:**

FID



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

*John Friedline*

John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 Balance: 1128353505

*Jermiter Pollino*

Jermiter 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:

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

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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](http://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:

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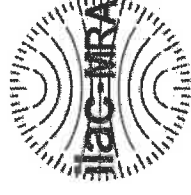


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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 30542 Lot No.: A0191475  
Description: NJEPH Aliphatics Matrix Spike Mix  
NJEPH Aliphatics Matrix Spike Mix 200 µg/mL, n-Pentane, 5mL/ampul  
Container Size: 5 mL Pkg Amt: > 5 mL  
Expiration Date: December 31, 2029 Storage: 10°C or colder  
Handling: Sonicate prior to use. Ship: Ambient

12311 } Y.P.  
12330 } 02/22/23

#### CERTIFIED VALUES

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

8	n-Hencicosane (C21) CAS # 629-94-7 Purity 99%	(Lot MKCL3226)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Docosane (C22) CAS # 629-97-0 Purity 99%	(Lot MKCL8918)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	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)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Octacosane (C28) CAS # 630-02-4 Purity 99%	(Lot BCCG0084)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Triacontane (C30) CAS # 638-68-6 Purity 97%	(Lot MKCQ9436)	201.1 µg/mL	+/- 1.1946 +/- 4.9966 +/- 5.9892	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Dotriacontane (C32) CAS # 544-85-4 Purity 99%	(Lot BCBW0661)	200.7 µg/mL	+/- 1.1919 +/- 4.9855 +/- 5.9759	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Tetatriacontane (C34) CAS # 14167-59-0 Purity 99%	(Lot OML4N)	201.3 µg/mL	+/- 1.1959 +/- 5.0020 +/- 5.9958	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Hexatriacontane (C36) CAS # 630-06-8 Purity 99%	(Lot Z27H018)	201.0 µg/mL	+/- 1.1939 +/- 4.9937 +/- 5.9858	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Octatriacontane (C38) CAS # 7194-85-6 Purity 96%	(Lot 0000145137)	201.6 µg/mL	+/- 1.1974 +/- 5.0086 +/- 6.0037	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	n-Tetracontane (C40) CAS # 4181-95-7 Purity 98%	(Lot PADGI)	200.9 µg/mL	+/- 1.1933 +/- 4.9913 +/- 5.9829	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b>						
n-Pentane						
CAS # 109-66-0						
Purity 99%						

**Column:**

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

**Carrier Gas:**

hydrogen-constant pressure 10 psi.

**Temp. Program:**

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

**Inj. Temp:**

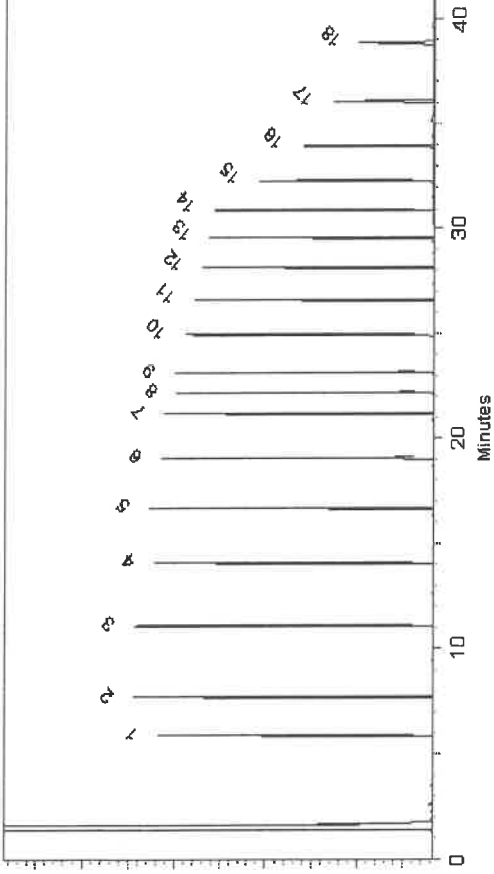
250°C

**Det. Temp:**

330°C

**Det. Type:**

FID



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

*John Friedline*

John Friedline - Operations Technician I

Date Mixed: 08-Nov-2022 Balance: 1128353505

*Jerimier Pollino*

Jerimier 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.
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- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

### Certified Uncertainty Value Notes:

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

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

$k$  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](http://www.restek.com/Contact-Us) for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature 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](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

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

### Handling Notes:

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



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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

**Catalog No.:** 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

P12331 } Y.P.  
↓  
P12350 } 02/22/23

#### CERTIFIED VALUES

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

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

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

**Column:**

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

**Carrier Gas:**

hydrogen-constant pressure 10 psi.

**Temp. Program:**

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

**Inj. Temp:**

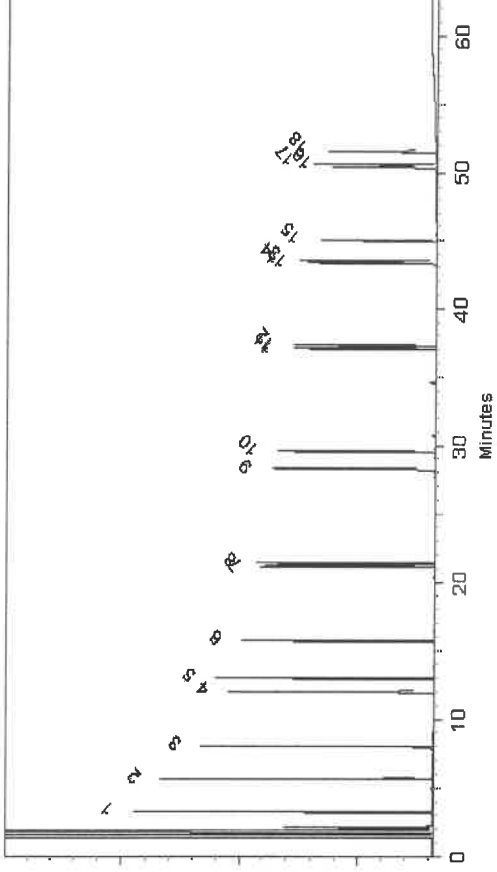
250°C

**Det. Temp:**

330°C

**Det. Type:**

FID



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

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:

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

### Purity Notes:

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

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

*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](http://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](http://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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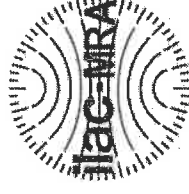


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[www.restek.com](http://www.restek.com)

## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 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

P12331 } Y.P.  
↓  
P12350 } 02/22/23

#### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene CAS # 526-73-8 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 CAS # 120-12-7 Purity 99%	(Lot MKCP3968)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	Fluoranthene CAS # 206-44-0 Purity 99%	(Lot MKCQ4728)	201.2 µg/mL	+/- 1.1948 +/- 9.0637 +/- 10.0566	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCCG7845)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot RP220209)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	Chrysene CAS # 218-01-9 Purity 99%	(Lot 468677L08C)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012013B)	200.6 µg/mL	+/- 1.1915 +/- 9.0384 +/- 10.0286	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012022K)	201.0 µg/mL	+/- 1.1941 +/- 9.0583 +/- 10.0506	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot Z8BKF)	201.5 µg/mL	+/- 1.1967 +/- 9.0781 +/- 10.0726	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot 8-URV-39-3)	200.8 µg/mL	+/- 1.1927 +/- 9.0474 +/- 10.0386	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	Benzo(g,h,i)perylene CAS # 191-24-2 Purity 98%	(Lot AVUAD)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b> 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)

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hydrogen-constant pressure 10 psi.

**Temp. Program:**

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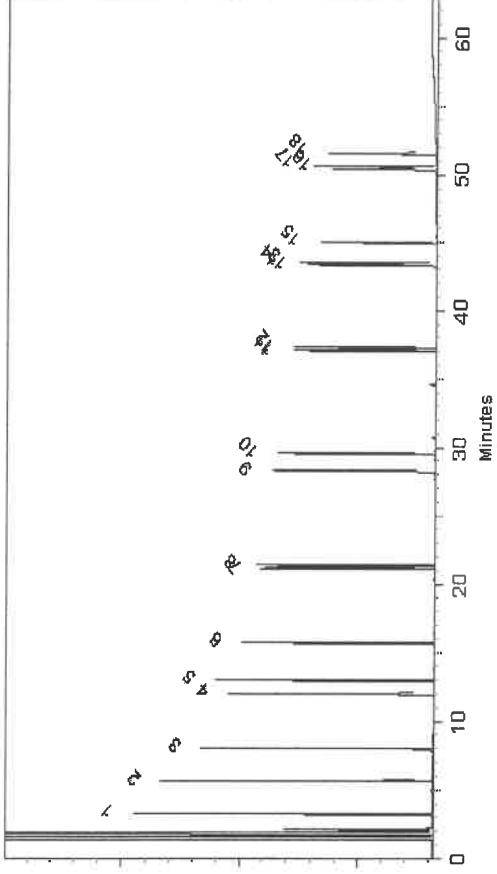
250°C

**Det. Temp:**

330°C

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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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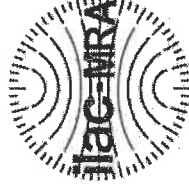


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### Certificate of Analysis



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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  
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

P12331 } Y.P.  
↓  
P12350 } 02/22/23

#### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
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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
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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
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9	Fluoranthene CAS # 206-44-0 Purity 99%	(Lot MKCQ4728)	201.2 µg/mL	+/- 1.1948 +/- 9.0637 +/- 10.0566	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCCG7845)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
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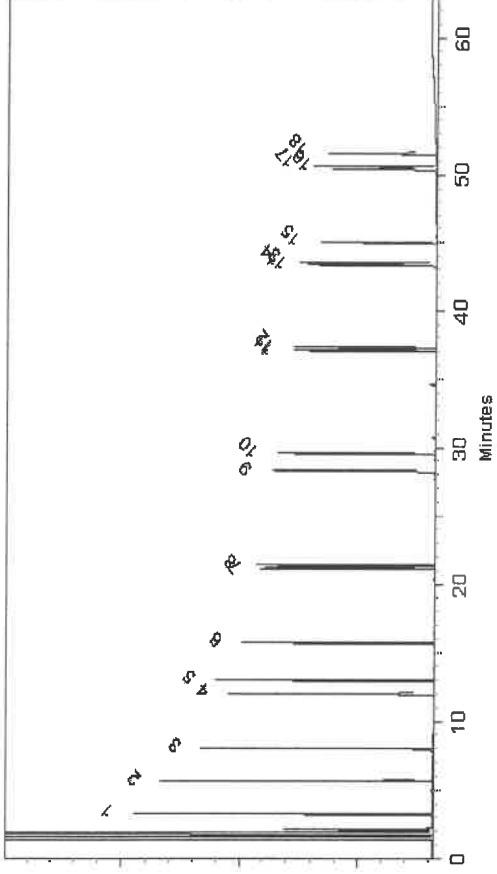
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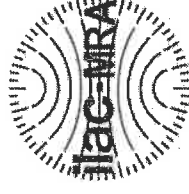


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9	Fluoranthene CAS # 206-44-0 Purity 99%	(Lot MKCQ4728)	201.2 µg/mL	+/- 1.1948 +/- 9.0637 +/- 10.0566	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCCG7845)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666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

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

**Column:**

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

**Carrier Gas:**

hydrogen-constant pressure 10 psi.

**Temp. Program:**

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

**Inj. Temp:**

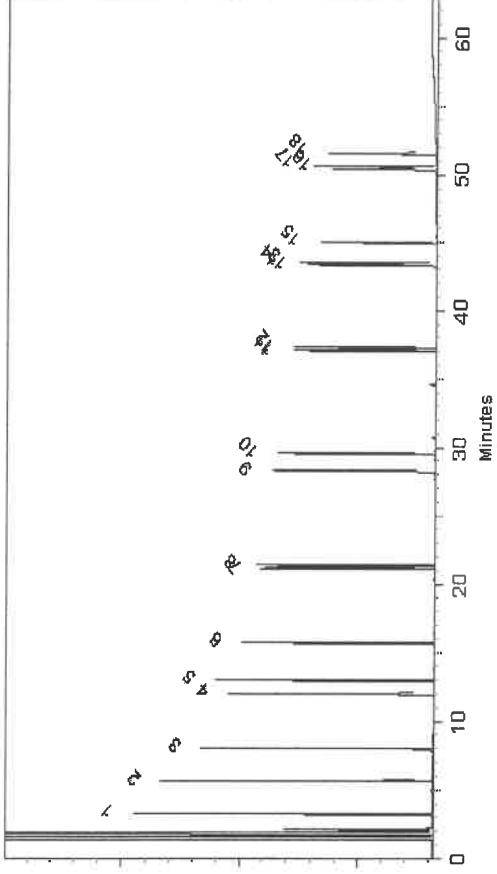
250°C

**Det. Temp:**

330°C

**Det. Type:**

FID



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

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:

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

*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](http://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](http://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

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 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

P12331 } Y.P.  
↓  
P12350 } 02/22/23

#### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene CAS # 526-73-8 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 CAS # 120-12-7 Purity 99%	(Lot MKCP3968)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	Fluoranthene CAS # 206-44-0 Purity 99%	(Lot MKCQ4728)	201.2 µg/mL	+/- 1.1948 +/- 9.0637 +/- 10.0566	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCCG7845)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot RP220209)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	Chrysene CAS # 218-01-9 Purity 99%	(Lot 468677L08C)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012013B)	200.6 µg/mL	+/- 1.1915 +/- 9.0384 +/- 10.0286	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012022K)	201.0 µg/mL	+/- 1.1941 +/- 9.0583 +/- 10.0506	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot Z8BKF)	201.5 µg/mL	+/- 1.1967 +/- 9.0781 +/- 10.0726	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot 8-URV-39-3)	200.8 µg/mL	+/- 1.1927 +/- 9.0474 +/- 10.0386	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	Benzo(g,h,i)perylene CAS # 191-24-2 Purity 98%	(Lot AVUAD)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b> 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:**

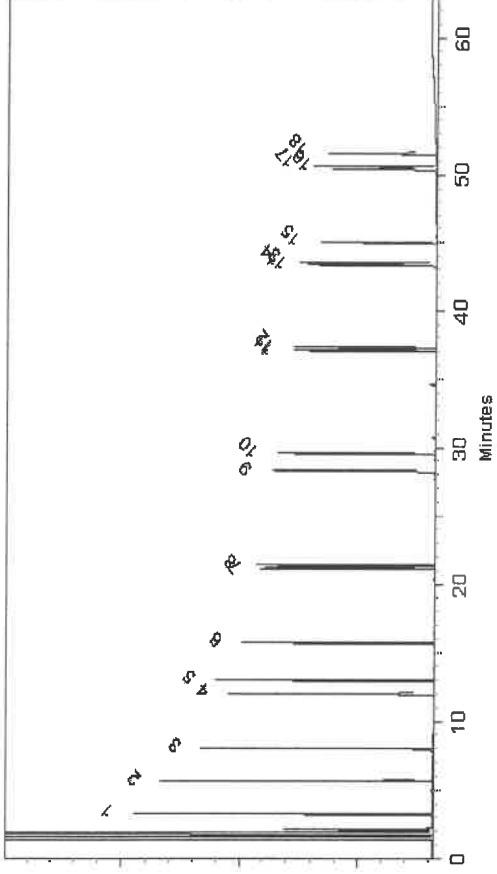
250°C

**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.
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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](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

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

### Handling Notes:

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



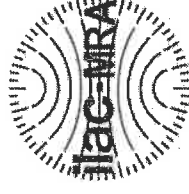


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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 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

P12331 } Y.P.  
↓  
P12350 } 02/22/23

#### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene CAS # 526-73-8 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 CAS # 120-12-7 Purity 99%	(Lot MKCP3968)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	Fluoranthene CAS # 206-44-0 Purity 99%	(Lot MKCQ4728)	201.2 µg/mL	+/- 1.1948 +/- 9.0637 +/- 10.0566	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCCG7845)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot RP220209)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	Chrysene CAS # 218-01-9 Purity 99%	(Lot 468677L08C)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012013B)	200.6 µg/mL	+/- 1.1915 +/- 9.0384 +/- 10.0286	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012022K)	201.0 µg/mL	+/- 1.1941 +/- 9.0583 +/- 10.0506	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot Z8BKF)	201.5 µg/mL	+/- 1.1967 +/- 9.0781 +/- 10.0726	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot 8-URV-39-3)	200.8 µg/mL	+/- 1.1927 +/- 9.0474 +/- 10.0386	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
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**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:**

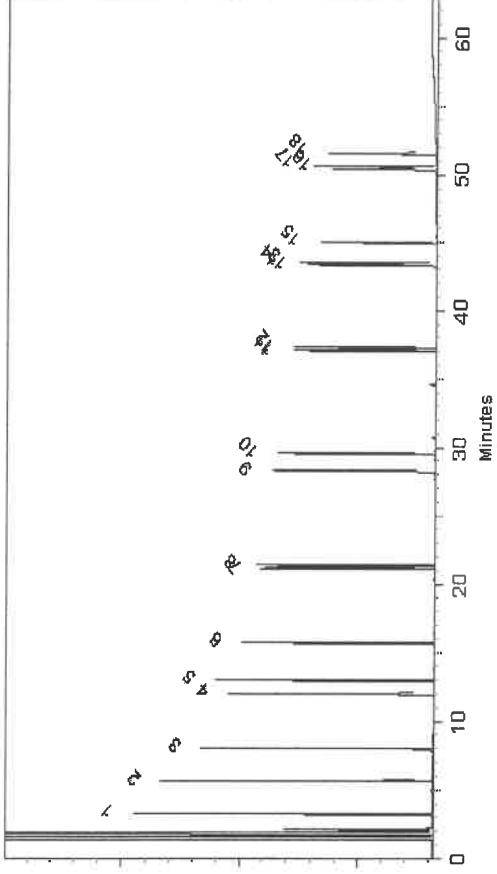
250°C

**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:

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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 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

P12331 } Y.P.  
↓  
P12350 } 02/22/23

#### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene CAS # 526-73-8 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 CAS # 120-12-7 Purity 99%	(Lot MKCP3968)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	Fluoranthene CAS # 206-44-0 Purity 99%	(Lot MKCQ4728)	201.2 µg/mL	+/- 1.1948 +/- 9.0637 +/- 10.0566	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCCG7845)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot RP220209)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	Chrysene CAS # 218-01-9 Purity 99%	(Lot 468677L08C)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012013B)	200.6 µg/mL	+/- 1.1915 +/- 9.0384 +/- 10.0286	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012022K)	201.0 µg/mL	+/- 1.1941 +/- 9.0583 +/- 10.0506	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot Z8BKF)	201.5 µg/mL	+/- 1.1967 +/- 9.0781 +/- 10.0726	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot 8-URV-39-3)	200.8 µg/mL	+/- 1.1927 +/- 9.0474 +/- 10.0386	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	Benzo(g,h,i)perylene CAS # 191-24-2 Purity 98%	(Lot AVUAD)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
<b>Solvent:</b> 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:**

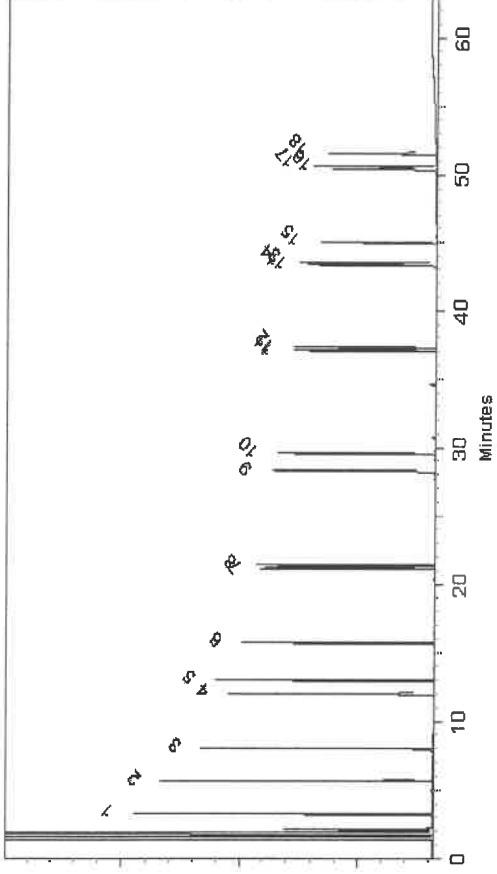
250°C

**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:

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

*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](http://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](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

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

### Handling Notes:

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



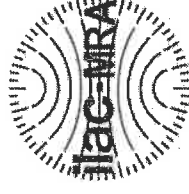


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[www.restek.com](http://www.restek.com)

## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 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

P12331 } Y.P.  
↓  
P12350 } 02/22/23

#### CERTIFIED VALUES

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

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

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

**Column:**

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

**Carrier Gas:**

hydrogen-constant pressure 10 psi.

**Temp. Program:**

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

**Inj. Temp:**

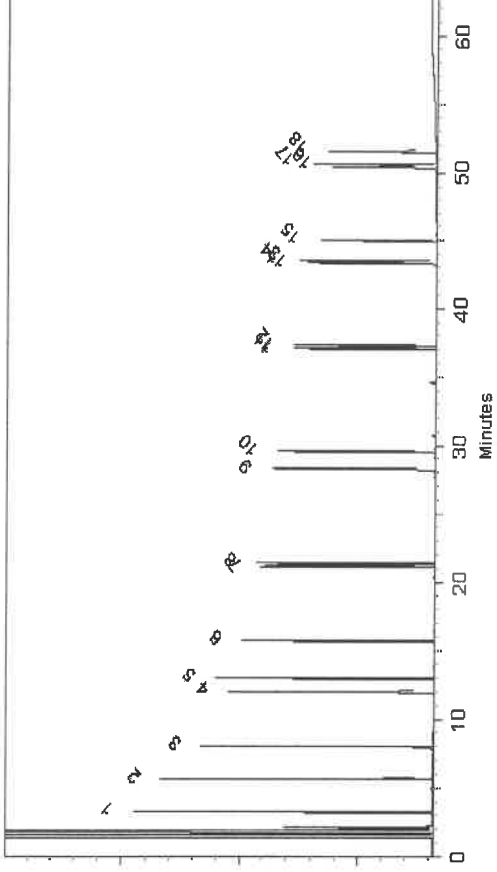
250°C

**Det. Temp:**

330°C

**Det. Type:**

FID



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

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:

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

*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](http://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](http://www.restek.com/Contact-Us).
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

### Manufacturing Notes:

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

### Handling Notes:

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

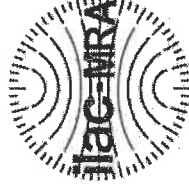


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## CERTIFIED REFERENCE MATERIAL

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 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

P12331 } Y.P.  
↓  
P12350 } 02/22/23

#### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene CAS # 526-73-8 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 CAS # 120-12-7 Purity 99%	(Lot MKCP3968)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	Fluoranthene CAS # 206-44-0 Purity 99%	(Lot MKCQ4728)	201.2 µg/mL	+/- 1.1948 +/- 9.0637 +/- 10.0566	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCCG7845)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot RP220209)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
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13	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012013B)	200.6 µg/mL	+/- 1.1915 +/- 9.0384 +/- 10.0286	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012022K)	201.0 µg/mL	+/- 1.1941 +/- 9.0583 +/- 10.0506	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
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17	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
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**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:**

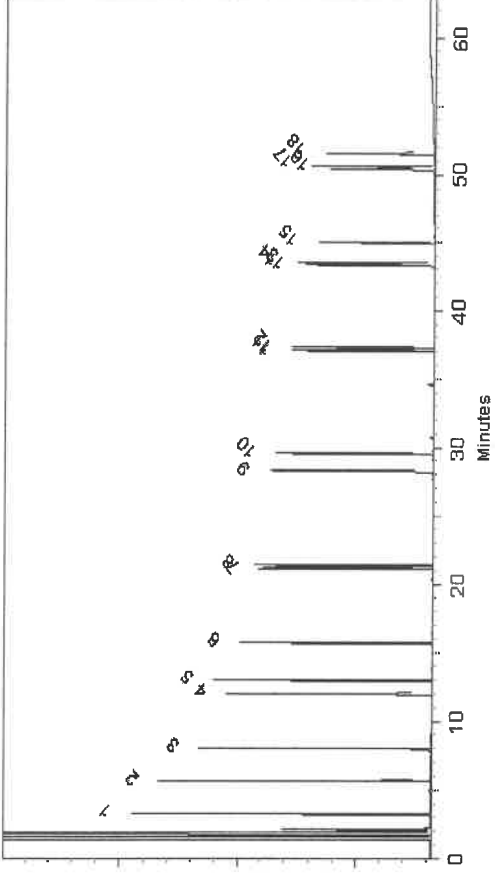
250°C

**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.
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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](http://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

### Certificate of Analysis



#### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No.: 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

P12331 } Y.P.  
↓  
P12350 } 02/22/23

#### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)
1	1,2,3-Trimethylbenzene CAS # 526-73-8 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 CAS # 120-12-7 Purity 99%	(Lot MKCP3968)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	Fluoranthene CAS # 206-44-0 Purity 99%	(Lot MKCQ4728)	201.2 µg/mL	+/- 1.1948 +/- 9.0637 +/- 10.0566	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	Pyrene CAS # 129-00-0 Purity 99%	(Lot BCCG7845)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	Benz(a)anthracene CAS # 56-55-3 Purity 96%	(Lot RP220209)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	Chrysene CAS # 218-01-9 Purity 99%	(Lot 468677L08C)	201.0 µg/mL	+/- 1.1939 +/- 9.0565 +/- 10.0486	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	Benzo(b)fluoranthene CAS # 205-99-2 Purity 99%	(Lot 012013B)	200.6 µg/mL	+/- 1.1915 +/- 9.0384 +/- 10.0286	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	Benzo(k)fluoranthene CAS # 207-08-9 Purity 99%	(Lot 012022K)	201.0 µg/mL	+/- 1.1941 +/- 9.0583 +/- 10.0506	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	Benzo(a)pyrene CAS # 50-32-8 Purity 99%	(Lot Z8BKF)	201.5 µg/mL	+/- 1.1967 +/- 9.0781 +/- 10.0726	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	Indeno(1,2,3-cd)pyrene CAS # 193-39-5 Purity 99%	(Lot 8-URV-39-3)	200.8 µg/mL	+/- 1.1927 +/- 9.0474 +/- 10.0386	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	Dibenz(a,h)anthracene CAS # 53-70-3 Purity 99%	(Lot ER032211-01)	201.4 µg/mL	+/- 1.1960 +/- 9.0727 +/- 10.0666	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
18	Benzo(g,h,i)perylene CAS # 191-24-2 Purity 98%	(Lot AVUAD)	201.3 µg/mL	+/- 1.1956 +/- 9.0696 +/- 10.0632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

**Column:**

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

**Carrier Gas:**

hydrogen-constant pressure 10 psi.

**Temp. Program:**

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

**Inj. Temp:**

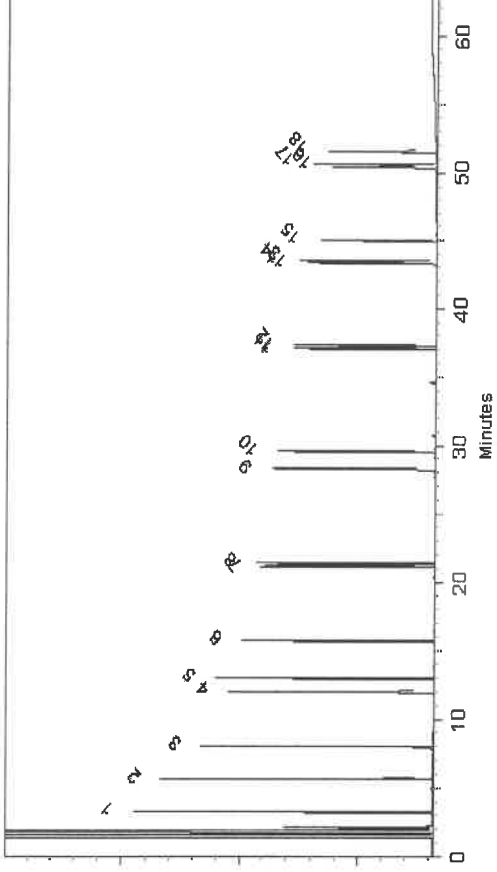
250°C

**Det. Temp:**

330°C

**Det. Type:**

FID



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

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:

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

$k$  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](http://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](http://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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## CERTIFIED REFERENCE MATERIAL

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## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 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

42166  
✓ Y.P.  
P2166 11/14/22

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	1-Chlorooctadecane CAS # 3386-33-2 Purity 99%	(Lot 12882200)  10,051.0 µg/mL	+/- 58.4374 +/- 563.5496 +/- 576.7359	µg/mL µg/mL µg/mL  Gravimetric Unstressed Stressed

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

**Column:**

30m x 0.25mm x 0.25µm  
Rx-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:**

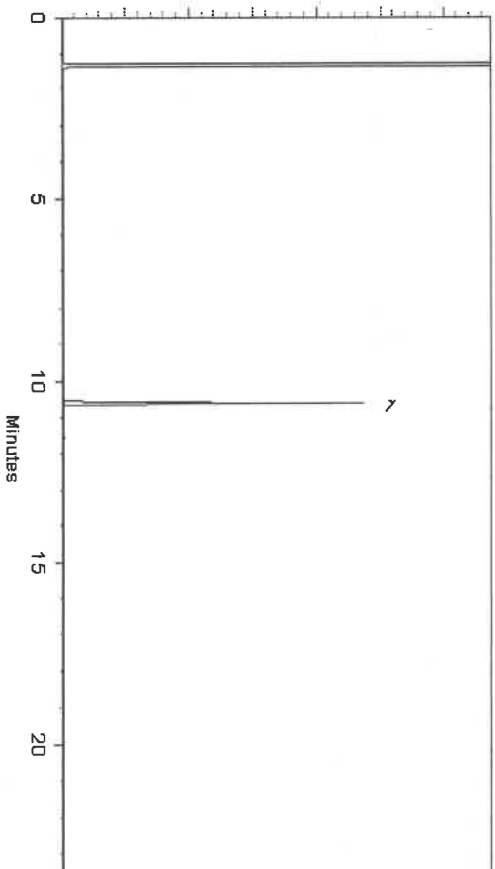
250°C

**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 Federin*  
**Brittany Federin** - Operations Tech I

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

**Balance:** 1128353505

*Marilene Cowan*  
**Marilene 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:

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

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](http://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](http://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.







# CERTIFIED REFERENCE MATERIAL

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Fax: (814)353-1309

www.restek.com

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 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

42166  
✓ Y.P.  
P2166 11/14/22

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	µg/mL	Gravimetric
1	1-Chlorooctadecane CAS # 3386-33-2 Purity 99%	(Lot 12882200)  10,051.0 µg/mL	+/- 58.4374 +/- 563.5496 +/- 576.7359	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

**Column:**

30m x 0.25mm x 0.25µm  
Rx-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:**

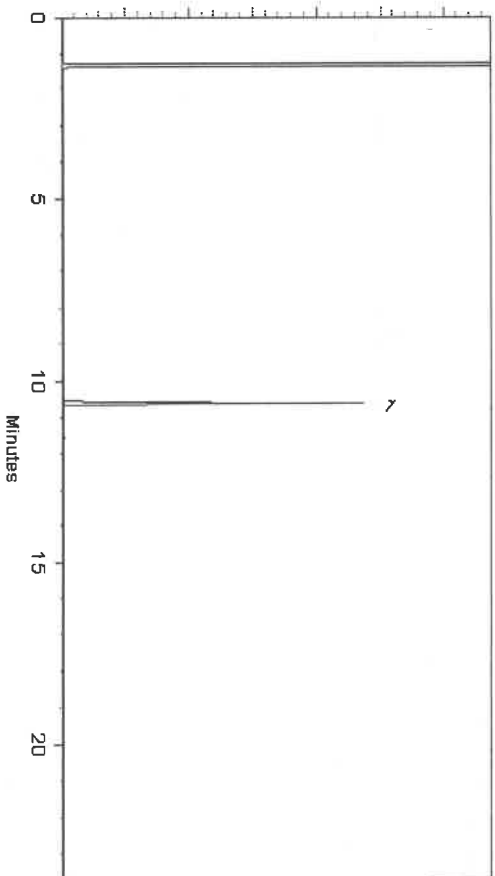
250°C

**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 Federin*  
**Brittany Federin** - Operations Tech I

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

**Balance:** 1128353505

*Marilene Cowan*  
**Marilene 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:

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

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

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

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

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## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 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

42166  
✓ Y.P.  
P2166 11/14/22

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	µg/mL	Gravimetric
1	1-Chlorooctadecane	10,051.0 µg/mL	+/- 58.4374	µg/mL	Gravimetric
	CAS # 3386-33-2		+/- 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  
Rx-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:**

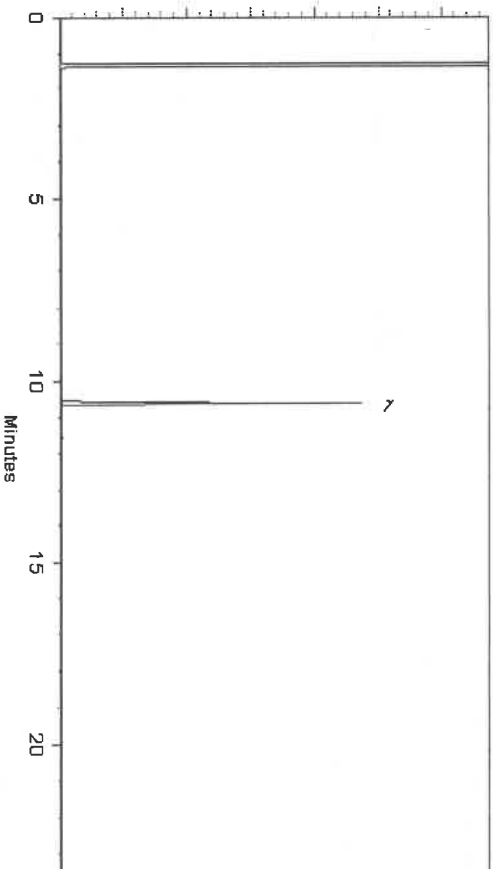
250°C

**Det. Temp:**

330°C

**Det. Type:**

FID



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*Brittany Federin*  
**Brittany Federin** - Operations Tech I

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

**Balance:** 1128353505

*Marilene Cowan*  
**Marilene 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:

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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.
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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

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

Manufacturing Notes:

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Handling Notes:

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Fax: (814)353-1309

[www.restek.com](http://www.restek.com)

## Certificate of Analysis



### FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 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

42166  
✓ Y.P.  
P2166 11/14/22

### CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	µg/mL	Gravimetric
1	1-Chlorooctadecane CAS # 3386-33-2 Purity 99%	(Lot 12882200) 10,051.0 µg/mL	+/- 58.4374 +/- 563.5496 +/- 576.7359	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

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

**Column:**

30m x 0.25mm x 0.25µm  
Rx-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:**

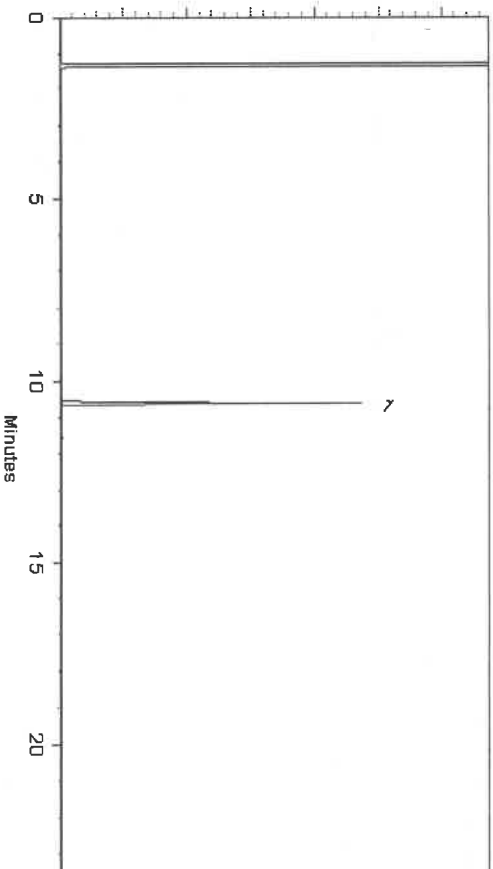
250°C

**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 Federenko*  
**Brittany Federenko - Operations Tech I**

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

**Balance:** 1128353505

*Marilene Cowan*  
**Marilene 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:

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

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](http://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](http://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.





## CERTIFIED REFERENCE MATERIAL

110 Benner Circle

Bellefonte, PA 16823-8812

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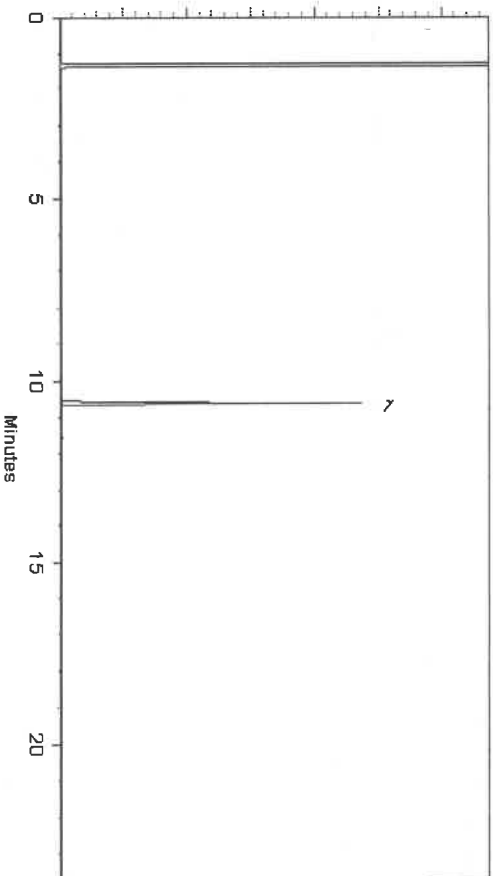
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