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Prep Standard - Chemical Standard Summary

Order ID : O2505

Test : EPH

Prepbatch ID : PB152543,

Sequence ID/Qc Batch ID: FC050323AL,FC050423AL,FD050323AR,FD050423AR,

Standard ID :
EP2318,EP2328,PP21759,PP21760,PP21762,PP21858,PP21859,PP21860,PP21861,PP21862,PP21946,PP21948,PP21954,PP21955,PP21956,PP21957,PP21958,PP21959,PP21960,PP21965,

Chemical ID :
E2865,E3412,E3470,E3486,E3487,E3495,E3500,E3501,P10256,P11134,P11725,P11726,P11731,P11732,P11733,P11734,P11735,P11829,P12167,P12168,P12169,P12170,P12171,P12198,P12199,P12230,P12231,P12232,P12233,P12234,P12235,P12263,P12264,P12265,P12266,P12311,P12312,P12313,P12314,P12339,P12340,P12341,P12342,P12343,P12344,P12345,P12346,P12347,P12348,P9289,P9290,P9322,

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Extractions STANDARD PREPARATION LOG

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

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

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3923	Baked Sodium Sulfate	EP2328	04/28/2023	10/23/2023	Rajesh Parikh	Extraction_SCALE_2 (EX-SC-2)	None	RUPESHKUMAR SHAH 04/28/2023

FROM 4000.00000gram of E3412 = Final Quantity: 4000.000 gram

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
782	100 PPM Aromatic HC Working STD	PP21759	03/01/2023	08/22/2023	Yogesh Patel	None	None	Ankita Jodhani 03/02/2023

FROM 0.25000ml of P10256 + 0.25000ml of P11725 + 0.62500ml of P12198 + 1.00000ml of P9322 + 22.87500ml of E3470 = Final Quantity: 25.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2945	100 PPM Aromatic HC Working STD (Absolute)	PP21760	03/01/2023	08/22/2023	Yogesh Patel	None	None	Ankita Jodhani 03/02/2023

FROM 0.25000ml of P11726 + 0.25000ml of P9290 + 0.62500ml of P12199 + 1.00000ml of P9289 + 22.87500ml of E3470 = Final Quantity: 25.000 ml

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
788	20 PPM Aromatic HC STD	PP21762	03/01/2023	08/22/2023	Yogesh Patel	None	None	Ankita Jodhani 03/02/2023

FROM 0.80000ml of E3470 + 0.20000ml of PP21759 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
787	50 PPM Aromatic HC STD	PP21858	03/27/2023	08/22/2023	Yogesh Patel	None	None	Ankita Jodhani 03/28/2023

FROM 0.50000ml of E3486 + 0.50000ml of PP21759 = Final Quantity: 1.000 ml

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
788	20 PPM Aromatic HC STD	PP21859	03/27/2023	08/22/2023	Yogesh Patel	None	None	Ankita Jodhani 03/28/2023

FROM 0.80000ml of E3486 + 0.20000ml of PP21759 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
789	10 PPM Aromatic HC STD	PP21860	03/27/2023	08/22/2023	Yogesh Patel	None	None	Ankita Jodhani 03/28/2023

FROM 0.90000ml of E3486 + 0.10000ml of PP21759 = Final Quantity: 1.000 ml

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
790	5 PPM Aromatic HC STD	PP21861	03/27/2023	08/22/2023	Yogesh Patel	None	None	Ankita Jodhani 03/28/2023

FROM 0.90000ml of E3486 + 0.10000ml of PP21858 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2946	20 PPM Aromatic HC STD ICV (Absolute)	PP21862	03/27/2023	08/22/2023	Yogesh Patel	None	None	Ankita Jodhani 03/28/2023

FROM 0.80000ml of E3486 + 0.20000ml of PP21760 = Final Quantity: 1.000 ml

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1339	100 PPM NJEPH Surrogate Spike	PP21946	04/18/2023	09/27/2023	Yogesh Patel	None	None	Ankita Jodhani 04/18/2023

FROM 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

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1330	100 PPM NJEPH Spike Solution	PP21948	04/18/2023	10/18/2023	Yogesh Patel	None	None	Ankita Jodhani 04/18/2023

FROM 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

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Pest/Pcb STANDARD PREPARATION LOG

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

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

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

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

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Pest/Pcb STANDARD PREPARATION LOG

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

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

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

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

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Pest/Pcb STANDARD PREPARATION LOG

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

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

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

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

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Pest/Pcb STANDARD PREPARATION LOG

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

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

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1331	100 PPM NJEPH Fractionating Surrogate	PP21965	04/25/2023	10/19/2023	Yogesh Patel	None	None	Ankita Jodhani 04/26/2023

FROM 1.25000ml of P12263 + 1.25000ml of P12264 + 1.25000ml of P12265 + 1.25000ml of P12266 + 195.00000ml of E3495 = Final Quantity: 200.000 ml

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
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-9644-A4 / Methylene Chloride,U-Resi, Cycle-Tainer (215L)	22L0562002	08/22/2023	02/22/2023 / Rajesh	01/24/2023 / Rajesh	E3470

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	11/08/2023	04/19/2023 / rajesh	04/13/2023 / Rajesh	E3495

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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	05/02/2023 / Rajesh	04/28/2023 / Rajesh	E3500

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)	23C2062004	10/28/2023	04/28/2023 / Rajesh	04/28/2023 / Rajesh	E3501

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30541 / Custom NJEPH Aromatics Calibration Standard	A0165529	09/01/2023	03/01/2023 / yogesh	01/26/2021 / dhaval	P10256

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

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	09/01/2023	03/01/2023 / yogesh	05/27/2022 / Sohil	P11725

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31097 / o-Terphenyl Standard	A0183688	09/01/2023	03/01/2023 / yogesh	05/27/2022 / Sohil	P11726

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CHEMICAL RECEIPT LOG BOOK

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

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	10/20/2023	04/20/2023 / yogesh	06/17/2022 / Ankita	P11829

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31098 / 1-Chlorooctadecane Standard	A0183404	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	31480 / MA Fractionation Surrogate Spike Mix	A0187866	09/01/2023	03/01/2023 / yogesh	11/10/2022 / Yogesh	P12198

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	09/01/2023	03/01/2023 / yogesh	11/10/2022 / Yogesh	P12199

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

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

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	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	10/25/2023	04/25/2023 / yogesh	01/27/2023 / Yogesh	P12263

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	10/25/2023	04/25/2023 / yogesh	01/27/2023 / Yogesh	P12264

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	10/25/2023	04/25/2023 / yogesh	01/27/2023 / Yogesh	P12265

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31480 / MA Fractionation Surrogate Spike Mix	A0187866	10/25/2023	04/25/2023 / yogesh	01/27/2023 / Yogesh	P12266

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

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Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30542 / Custom NJEPH Aliphatics Matrix Spike Mix	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

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

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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

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

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

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30543 / Custom NJEPH Aromatics Matrix Spike Mix	A0191469	10/18/2023	04/18/2023 / yogesh	02/22/2023 / Yogesh	P12348

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95709 / NJ EPH Aromatic Hydrocarbons, 2000 PPM	051519	09/01/2023	03/01/2023 / yogesh	01/10/2020 / DHAVAL	P9289

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	95709 / NJ EPH Aromatic Hydrocarbons, 2000 PPM	051519	09/01/2023	03/01/2023 / yogesh	01/10/2020 / DHAVAL	P9290

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	30541 / Custom NJEPH Aromatics Calibration Standard	A0151358	09/01/2023	03/01/2023 / yogesh	01/09/2020 / DHAVAL	P9322

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

DD
06/17/2021

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

Description : NJEPH Aromatics Calibration Standard

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

P10758 to P10762 -(5)

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

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

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

CERTIFIED VALUES

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

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

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

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

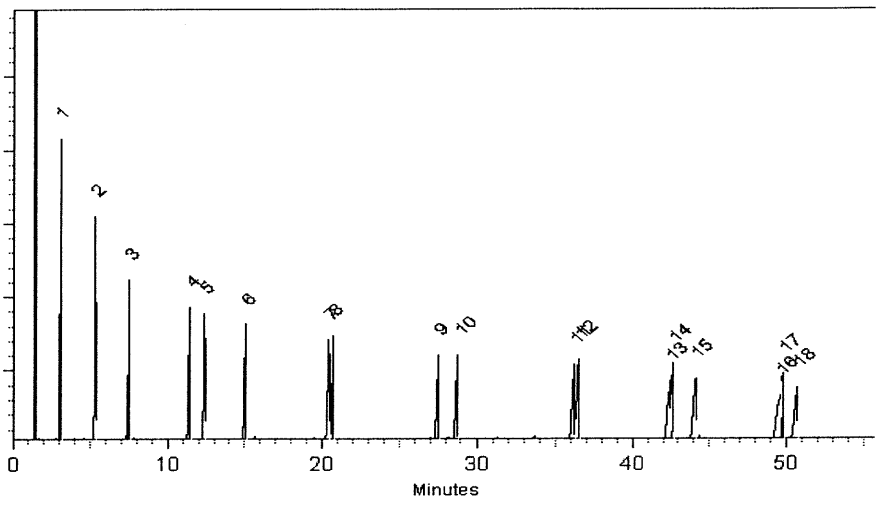
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Lane Kibe - Mix Technician

Date Mixed: 14-May-2021 **Balance:** B345965662

Alexis Shelow - Operations Tech I

Date Passed: 18-May-2021

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

Sand
Purified
Washed and Ignited

avantor™ | J.T.Baker®

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

Certificate of Analysis

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

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

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

E 2865

James T Ethier

Jamie Ethier
Vice President Global Quality

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

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

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

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

CERTIFICATE OF ANALYSIS

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

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

COMMENTS

QC: PhC Irma Belmares

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

RE-02-01, Ed. 3

E 3412

Recd. by RP on 10/13/22

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

avantor™ | J.T.Baker®

Material No.: 9266-A4
Batch No.: 22L0562002
Manufactured Date: 2022-10-20
Expiration Date: 2024-01-19
Revision No.: 0

Certificate of Analysis

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

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

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

E 3470

James T Ethier
Jamie Ethier
Vice President Global Quality

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

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

avantor™ | J.T.Baker®

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

Certificate of Analysis

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

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

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

E 3486

James Ethier
Jamie Ethier
Vice President Global Quality

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

Acetone
BAKER RESI-ANALYZED® Reagent
For Organic Residue Analysis

avantor™ | J.T.Baker®

Material No.: 9254-03
Batch No.: 22L2862006
Manufactured Date: 2022-12-19
Expiration Date: 2025-12-18
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
Assay ($(CH_3)_2CO$) (by GC, corrected for water)	≥ 99.4 %	99.7 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	0.2 ppm
Substances Reducing Permanganate	Passes Test	Passes Test
Titrable Acid (µeq/g)	≤ 0.3	0.1
Titrable Base (µeq/g)	≤ 0.6	< 0.1
Water (H_2O)	≤ 0.5 %	0.3 %
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	4

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

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

Recd. by RP on 3/22/23

E 3487

James T Ethier
Jamie Ethier
Vice President Global Quality

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

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

avantor™ | J.T.Baker®

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

Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	< 1
ECD-Sensitive Impurities (as Ethylene Dibromide) – Single Impurity Peak (ng/mL)	≤ 5	< 1
Assay (Total Saturated C_6 Isomers) (by GC, corrected for water)	≥ 99.5 %	99.7 %
Assay (as n-Hexane) (by GC, corrected for water)	≥ 95 %	97 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	0.1 ppm
Substances Darkened by H_2SO_4	Passes Test	Passes Test
Water (by KF, coulometric)	≤ 0.05 %	< 0.01 %

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

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

Recd. by RP on 4/13/23

E3495

James T Ethier
Jamie Ethier
Vice President Global Quality

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

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

avantor™ | J.T.Baker®

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

Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	< 1
ECD-Sensitive Impurities (as Ethylene Dibromide) – Single Impurity Peak (ng/mL)	≤ 5	< 1
Assay (Total Saturated C_6 Isomers) (by GC, corrected for water)	≥ 99.5 %	99.7 %
Assay (as n-Hexane) (by GC, corrected for water)	≥ 95 %	97 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	0.1 ppm
Substances Darkened by H_2SO_4	Passes Test	Passes Test
Water (by KF, coulometric)	≤ 0.05 %	< 0.01 %

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

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

Recd by RP on 4/28/23

E3500

James T Ethier
Jamie Ethier
Vice President Global Quality

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

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

avantor™ | J.T.Baker®

Material No.: 9266-A4
Batch No.: 23C2062004
Manufactured Date: 2023-01-26
Expiration Date: 2024-04-26
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	5
Assay (CH_2Cl_2) (by GC, exclusive of preservative, corrected for water)	≥ 99.8 %	100.0 %
Color (APHA)	≤ 10	5
Residue after Evaporation	≤ 1.0 ppm	0.9 ppm
Titrable Acid (µeq/g)	≤ 0.3	< 0.1
Chloride (Cl)	≤ 10 ppm	< 5 ppm
Water (by KF, coulometric)	≤ 0.02 %	< 0.01 %

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

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

E 3501

James T Ethier
Jamie Ethier
Vice President Global Quality

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

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

ANAB ISO 17034 Accredited
AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

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

Solvent(s):	Lot#
Cyclohexane	28930

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

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

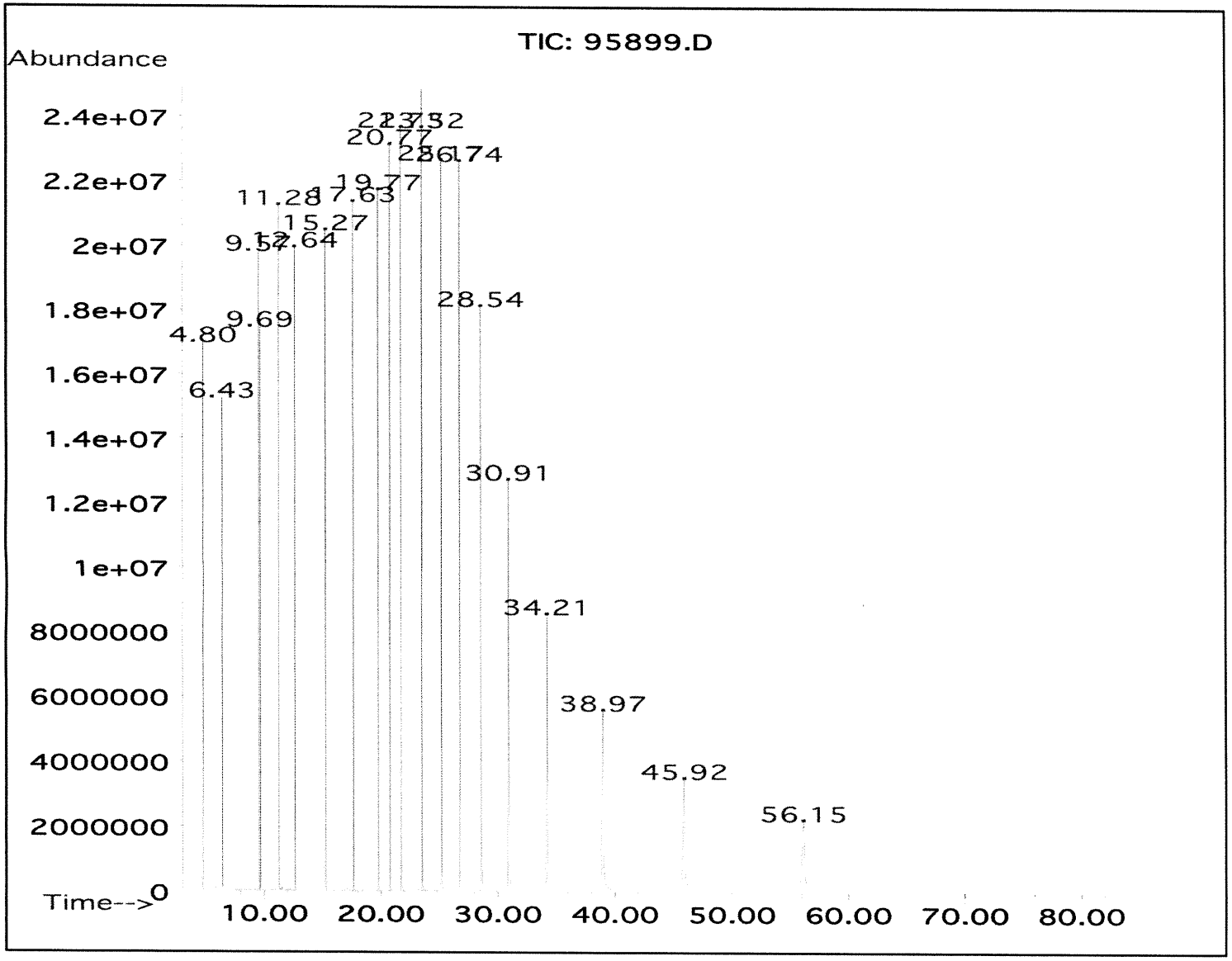
	Compound	(RM#) Part Number	Lot Number	Dil. Factor	Initial Vol. (mL)	Initial Conc.(ug/mL)	Nominal Conc (µg/mL)	Purity (%)	Purity Uncertainty	Uncertainty Pipette	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)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

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

P11132
↓
P11136

AR 11/02/21

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



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

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Certificate of Analysis

P11719 to P11736

Received by SJ : 5/27/2022

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0183688

Description : o-Terphenyl Standard

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

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

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

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

CERTIFIED VALUES

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

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

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

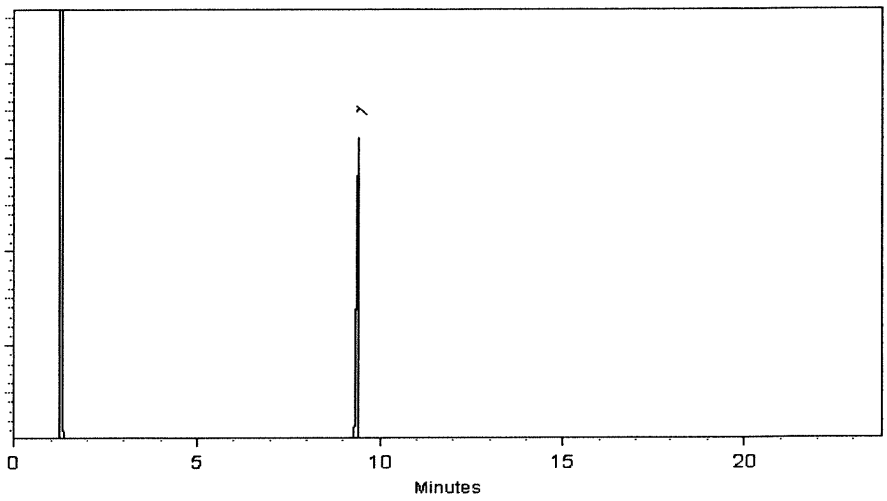
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Nick Yaw - Operations Tech I

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

Clara Windle - Operations Technician I

Date Passed: 07-Apr-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate of Analysis

P11719 to P11736

Received by SJ : 5/27/2022

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0183688

Description : o-Terphenyl Standard

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

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

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

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

CERTIFIED VALUES

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

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

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

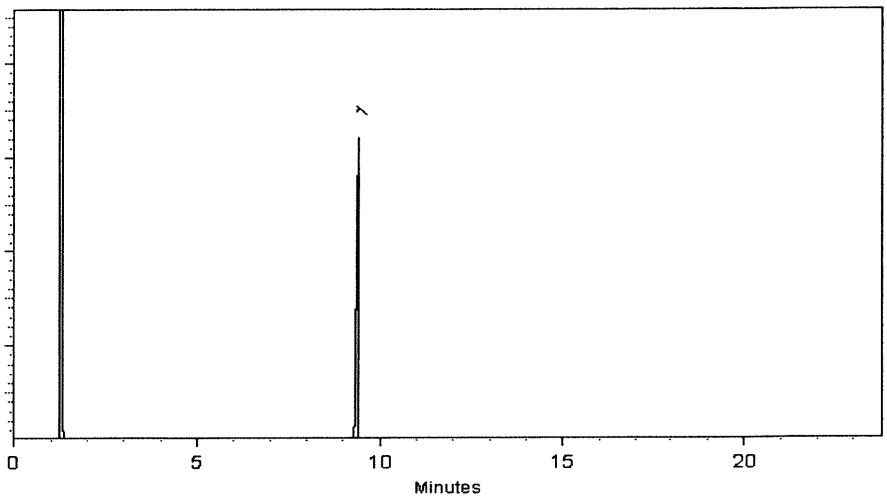
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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Nick Yaw - Operations Tech I

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

Clara Windle - Operations Technician I

Date Passed: 07-Apr-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate of Analysis

P11719 to P11736

Received by SJ : 5/27/2022

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Catalog No. : 31097 **Lot No.:** A0183688

Description : o-Terphenyl Standard

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

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

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

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

CERTIFIED VALUES

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

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

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

Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
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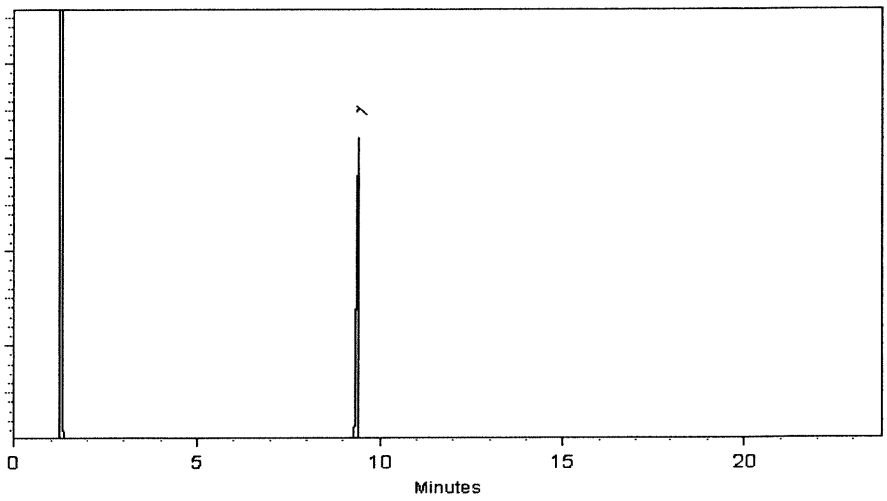
Det. Temp:
330°C

Det. Type:
FID



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

Nick Yaw - Operations Tech I

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

Clara Windle - Operations Technician I

Date Passed: 07-Apr-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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Manufacturing Notes:

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Handling Notes:

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Certificate of Analysis

P11719 to P11736

Received by SJ : 5/27/2022

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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

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CERTIFIED VALUES

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	Purity 99%		+/- 500.1247	µg/mL	Stressed

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

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

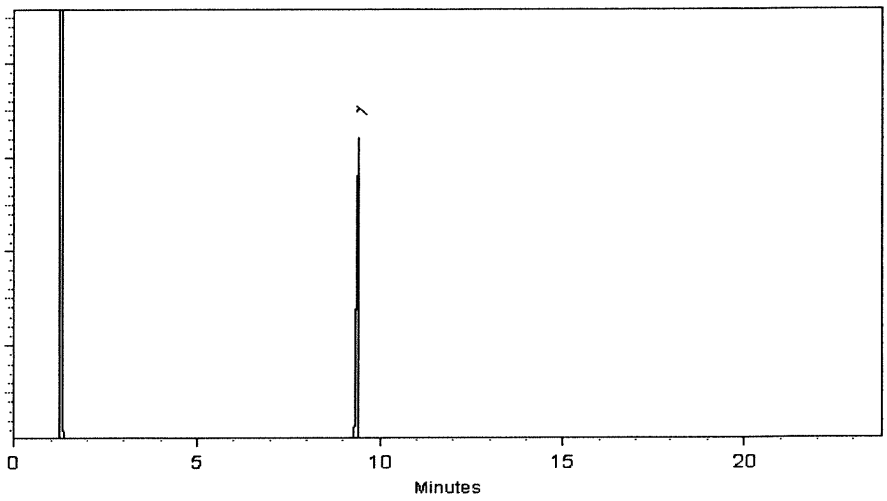
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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Nick Yaw - Operations Tech I

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

Clara Windle - Operations Technician I

Date Passed: 07-Apr-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate of Analysis

P11719 to P11736

Received by SJ : 5/27/2022

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0183688

Description : o-Terphenyl Standard

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

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

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

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

CERTIFIED VALUES

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

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

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

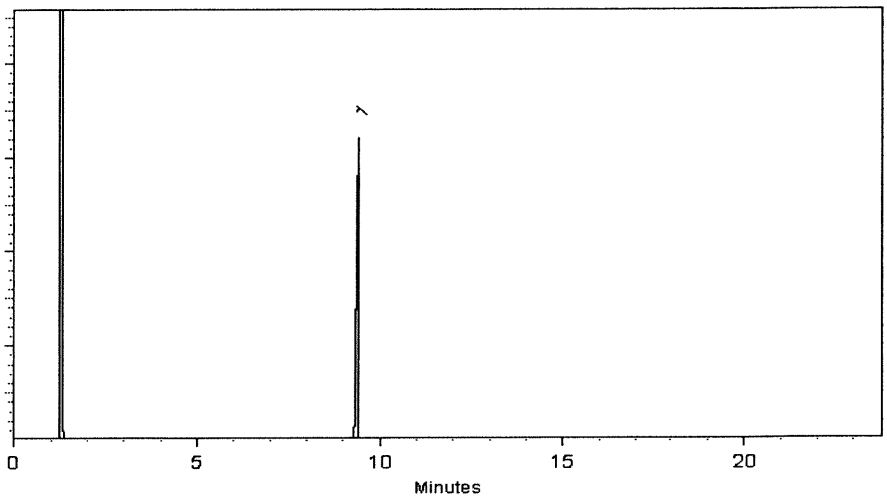
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Nick Yaw - Operations Tech I

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

Clara Windle - Operations Technician I

Date Passed: 07-Apr-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
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$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate of Analysis

P11719 to P11736

Received by SJ : 5/27/2022

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31097 **Lot No.:** A0183688

Description : o-Terphenyl Standard

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

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

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

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

CERTIFIED VALUES

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

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

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

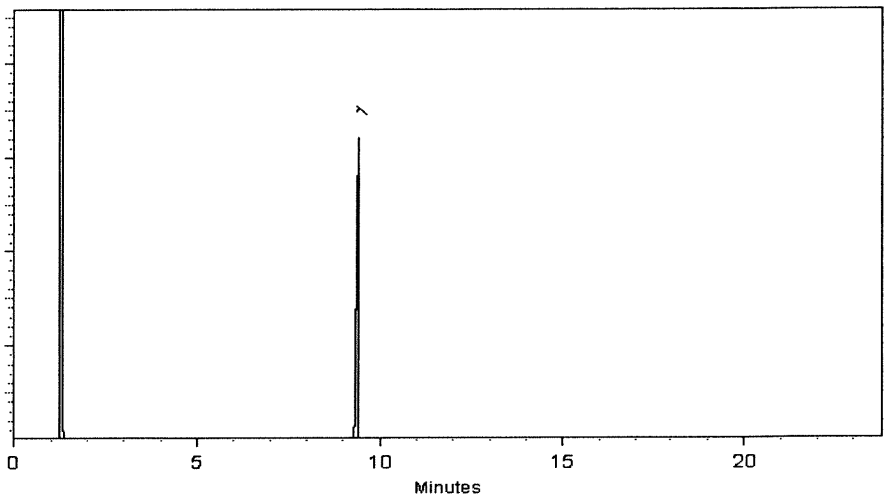
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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Nick Yaw - Operations Tech I

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

Clara Windle - Operations Technician I

Date Passed: 07-Apr-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
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0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

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Certificate of Analysis

P11719 to P11736

Received by SJ : 5/27/2022

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Catalog No. : 31097 **Lot No.:** A0183688

Description : o-Terphenyl Standard

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

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

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

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

CERTIFIED VALUES

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

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

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

Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
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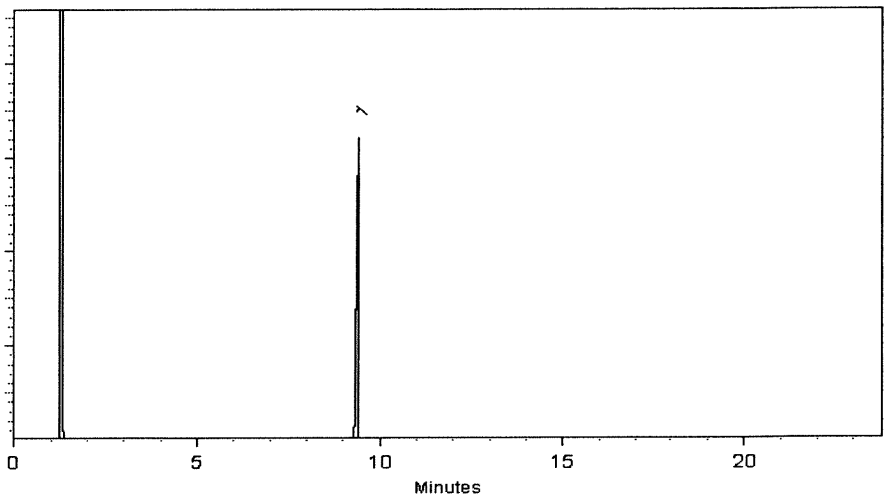
@ 20°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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Nick Yaw - Operations Tech I

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

Clara Windle - Operations Technician I

Date Passed: 07-Apr-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

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Manufacturing Notes:

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P11827 ↓ P11831 AJ 06/14/22

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

Description : NJEPH Aliphatics Calibration Standard

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

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

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

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

CERTIFIED VALUES

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

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

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

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

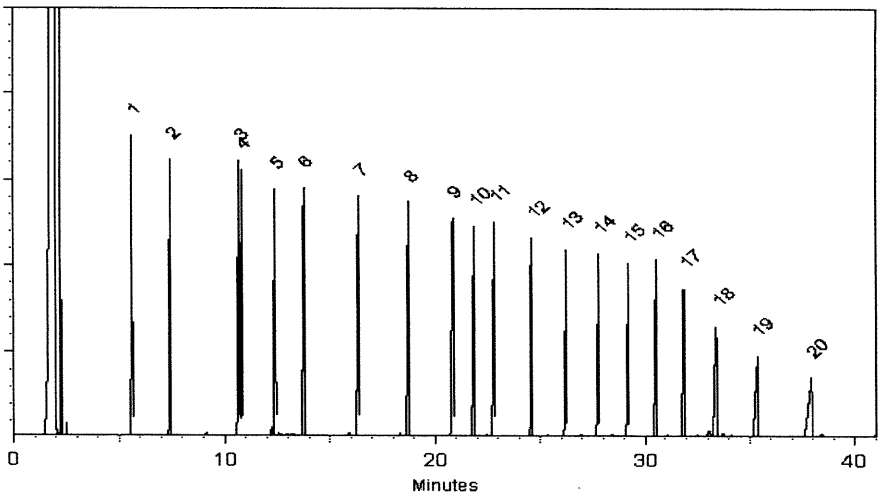
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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Brittany Federinko - Operations Tech I

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

Christie Mills - Operations Technician II

Date Passed: 06-May-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED ISO 17034 Accredited Reference Material Producer Certificate #3222.01

ACCREDITED ISO/IEC 17025 Accredited Testing Laboratory Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12216
P12231
Y.P. 12/30/22

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

Description : NJEPH Aliphatics Matrix Spike Mix

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

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

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

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)		Expanded Uncertainty (95% C.L.; K=2)		
1	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

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

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

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

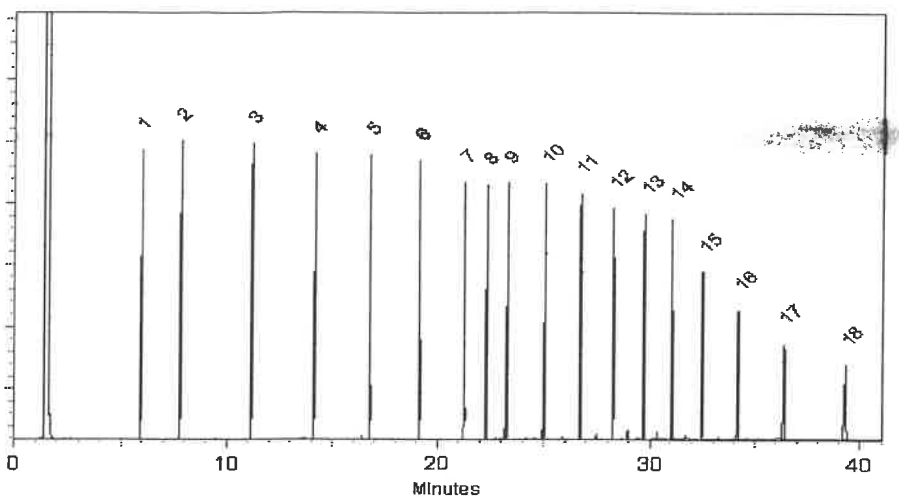
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Morgan Craighead - Mix Technician

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

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
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- Purity of isomeric compounds is reported as the sum of the isomers.
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$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

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

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

Manufacturing Notes:

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

Handling Notes:

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

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P12216
P12231
Y.P. 12/30/22

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

Description : NJEPH Aliphatics Matrix Spike Mix

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

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

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

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

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)		Expanded Uncertainty (95% C.L.; K=2)		
1	n-Nonane (C9)		201.0 µg/mL	+/- 1.1939	µg/mL	Gravimetric
	CAS # 111-84-2	(Lot SHBN5361)		+/- 4.9937	µg/mL	Unstressed
	Purity 99%			+/- 5.9858	µg/mL	Stressed
2	n-Decane (C10)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBN8619)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
3	n-Dodecane (C12)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed
4	n-Tetradecane (C14)		201.3 µg/mL	+/- 1.1959	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 5.0020	µg/mL	Unstressed
	Purity 99%			+/- 5.9958	µg/mL	Stressed
5	n-Hexadecane (C16)		200.6 µg/mL	+/- 1.1913	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 4.9831	µg/mL	Unstressed
	Purity 98%			+/- 5.9731	µg/mL	Stressed
6	n-Octadecane (C18)		199.8 µg/mL	+/- 1.1869	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot VZKOJ)		+/- 4.9644	µg/mL	Unstressed
	Purity 97%			+/- 5.9507	µg/mL	Stressed
7	n-Eicosane (C20)		200.0 µg/mL	+/- 1.1879	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 4.9689	µg/mL	Unstressed
	Purity 99%			+/- 5.9561	µg/mL	Stressed

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

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

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

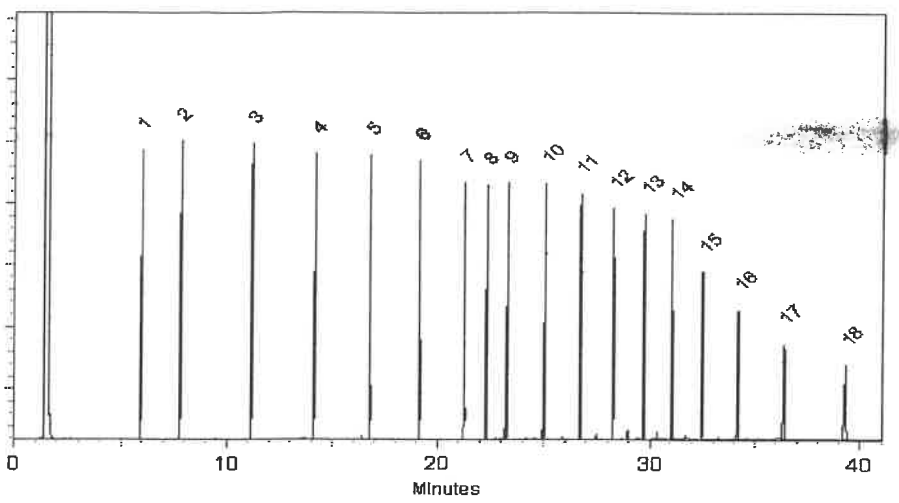
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Morgan Craighead - Mix Technician

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

Christie Mills - Operations Tech II - ARM QC

Date Passed: 29-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/μECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
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- 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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Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
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0°C or colder (Freezer) -20°C or colder (Deep Freezer)	< 25°C	≥ 25°C up to 7 days

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

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ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 30542 **Lot No.:** 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)	201.6 µg/mL	+/- 1.1972	µg/mL	Gravimetric
	CAS # 111-84-2 (Lot SHBN5361)		+/- 5.0078	µg/mL	Unstressed
	Purity 99%		+/- 6.0027	µg/mL	Stressed
2	n-Decane (C10)	200.7 µg/mL	+/- 1.1919	µg/mL	Gravimetric
	CAS # 124-18-5 (Lot SHBP4427)		+/- 4.9855	µg/mL	Unstressed
	Purity 99%		+/- 5.9759	µg/mL	Stressed
3	n-Dodecane (C12)	200.3 µg/mL	+/- 1.1899	µg/mL	Gravimetric
	CAS # 112-40-3 (Lot SHBP7054)		+/- 4.9772	µg/mL	Unstressed
	Purity 99%		+/- 5.9660	µg/mL	Stressed
4	n-Tetradecane (C14)	200.7 µg/mL	+/- 1.1919	µg/mL	Gravimetric
	CAS # 629-59-4 (Lot STBK2282)		+/- 4.9855	µg/mL	Unstressed
	Purity 99%		+/- 5.9759	µg/mL	Stressed
5	n-Hexadecane (C16)	200.9 µg/mL	+/- 1.1933	µg/mL	Gravimetric
	CAS # 544-76-3 (Lot SHBM4146)		+/- 4.9913	µg/mL	Unstressed
	Purity 98%		+/- 5.9829	µg/mL	Stressed
6	n-Octadecane (C18)	201.9 µg/mL	+/- 1.1993	µg/mL	Gravimetric
	CAS # 593-45-3 (Lot UE5NG)		+/- 5.0164	µg/mL	Unstressed
	Purity 98%		+/- 6.0130	µg/mL	Stressed
7	n-Eicosane (C20)	201.8 µg/mL	+/- 1.1986	µg/mL	Gravimetric
	CAS # 112-95-8 (Lot MKCN8767)		+/- 5.0134	µg/mL	Unstressed
	Purity 97%		+/- 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

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

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

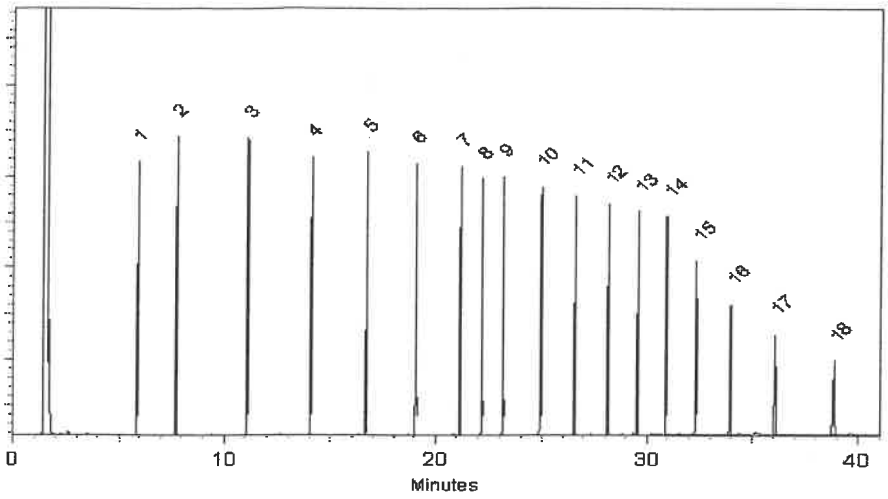
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

John Friedline - Operations Technician I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Fax: (814)353-1309

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 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)	201.6 µg/mL	+/- 1.1972	µg/mL	Gravimetric
	CAS # 111-84-2 (Lot SHBN5361)		+/- 5.0078	µg/mL	Unstressed
	Purity 99%		+/- 6.0027	µg/mL	Stressed
2	n-Decane (C10)	200.7 µg/mL	+/- 1.1919	µg/mL	Gravimetric
	CAS # 124-18-5 (Lot SHBP4427)		+/- 4.9855	µg/mL	Unstressed
	Purity 99%		+/- 5.9759	µg/mL	Stressed
3	n-Dodecane (C12)	200.3 µg/mL	+/- 1.1899	µg/mL	Gravimetric
	CAS # 112-40-3 (Lot SHBP7054)		+/- 4.9772	µg/mL	Unstressed
	Purity 99%		+/- 5.9660	µg/mL	Stressed
4	n-Tetradecane (C14)	200.7 µg/mL	+/- 1.1919	µg/mL	Gravimetric
	CAS # 629-59-4 (Lot STBK2282)		+/- 4.9855	µg/mL	Unstressed
	Purity 99%		+/- 5.9759	µg/mL	Stressed
5	n-Hexadecane (C16)	200.9 µg/mL	+/- 1.1933	µg/mL	Gravimetric
	CAS # 544-76-3 (Lot SHBM4146)		+/- 4.9913	µg/mL	Unstressed
	Purity 98%		+/- 5.9829	µg/mL	Stressed
6	n-Octadecane (C18)	201.9 µg/mL	+/- 1.1993	µg/mL	Gravimetric
	CAS # 593-45-3 (Lot UE5NG)		+/- 5.0164	µg/mL	Unstressed
	Purity 98%		+/- 6.0130	µg/mL	Stressed
7	n-Eicosane (C20)	201.8 µg/mL	+/- 1.1986	µg/mL	Gravimetric
	CAS # 112-95-8 (Lot MKCN8767)		+/- 5.0134	µg/mL	Unstressed
	Purity 97%		+/- 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

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

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

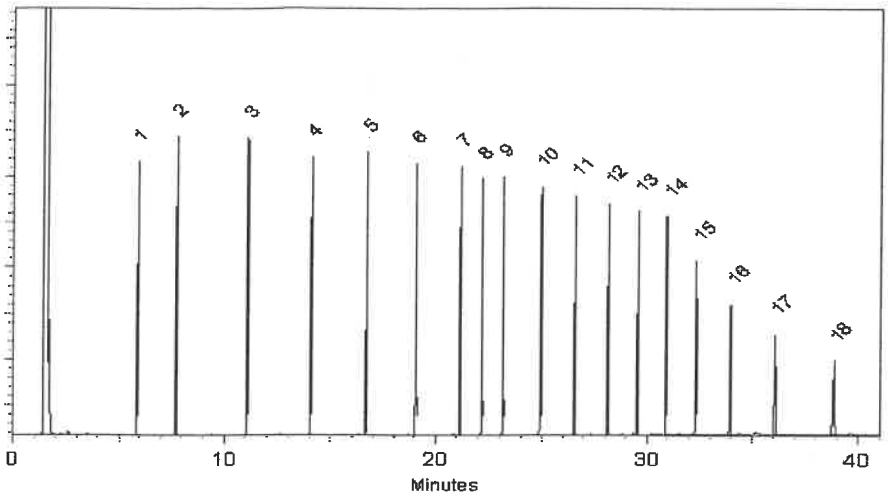
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

John Friedline - Operations Technician I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aliphatics Matrix Spike Mix

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

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

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

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

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

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

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

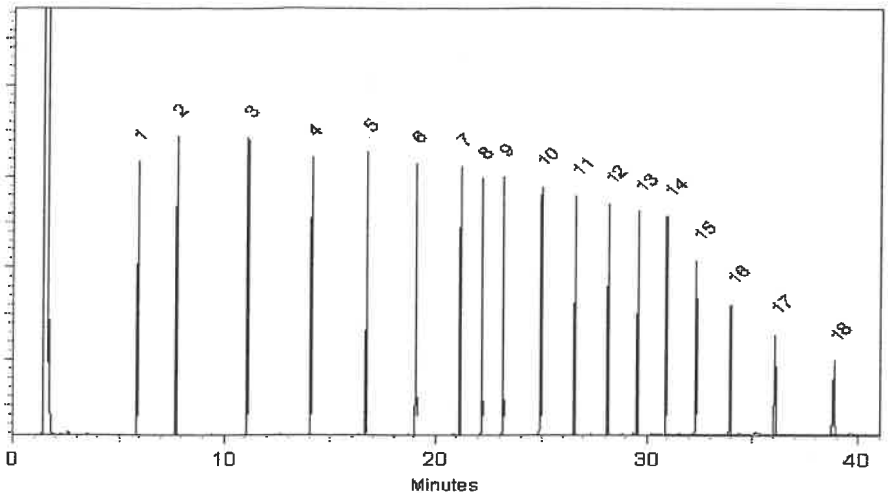
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

John Friedline - Operations Technician I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

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ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

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ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 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)	201.6 µg/mL	+/- 1.1972	µg/mL	Gravimetric
	CAS # 111-84-2 (Lot SHBN5361)		+/- 5.0078	µg/mL	Unstressed
	Purity 99%		+/- 6.0027	µg/mL	Stressed
2	n-Decane (C10)	200.7 µg/mL	+/- 1.1919	µg/mL	Gravimetric
	CAS # 124-18-5 (Lot SHBP4427)		+/- 4.9855	µg/mL	Unstressed
	Purity 99%		+/- 5.9759	µg/mL	Stressed
3	n-Dodecane (C12)	200.3 µg/mL	+/- 1.1899	µg/mL	Gravimetric
	CAS # 112-40-3 (Lot SHBP7054)		+/- 4.9772	µg/mL	Unstressed
	Purity 99%		+/- 5.9660	µg/mL	Stressed
4	n-Tetradecane (C14)	200.7 µg/mL	+/- 1.1919	µg/mL	Gravimetric
	CAS # 629-59-4 (Lot STBK2282)		+/- 4.9855	µg/mL	Unstressed
	Purity 99%		+/- 5.9759	µg/mL	Stressed
5	n-Hexadecane (C16)	200.9 µg/mL	+/- 1.1933	µg/mL	Gravimetric
	CAS # 544-76-3 (Lot SHBM4146)		+/- 4.9913	µg/mL	Unstressed
	Purity 98%		+/- 5.9829	µg/mL	Stressed
6	n-Octadecane (C18)	201.9 µg/mL	+/- 1.1993	µg/mL	Gravimetric
	CAS # 593-45-3 (Lot UE5NG)		+/- 5.0164	µg/mL	Unstressed
	Purity 98%		+/- 6.0130	µg/mL	Stressed
7	n-Eicosane (C20)	201.8 µg/mL	+/- 1.1986	µg/mL	Gravimetric
	CAS # 112-95-8 (Lot MKCN8767)		+/- 5.0134	µg/mL	Unstressed
	Purity 97%		+/- 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

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

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

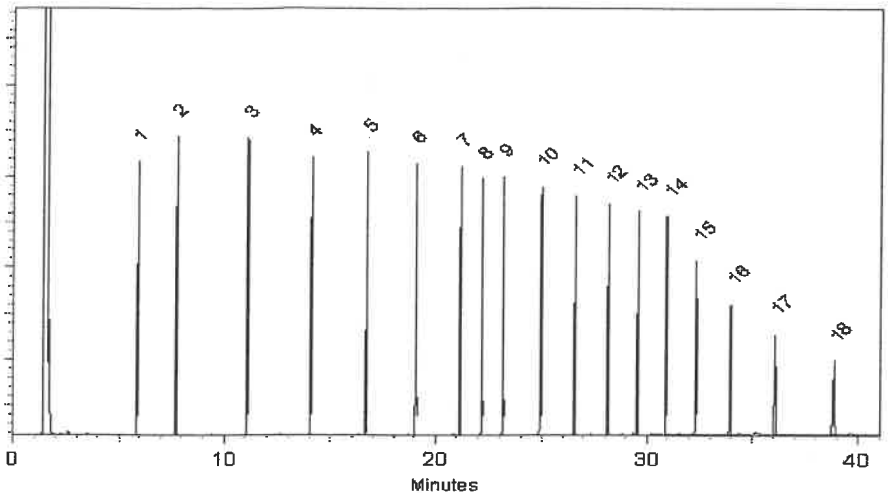
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

John Friedline - Operations Technician I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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P12256 → P12271 Y.P. 01/27/23

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

Description : MA Fractionation Surrogate Spike Mix

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

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

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

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

CERTIFIED VALUES

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

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

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

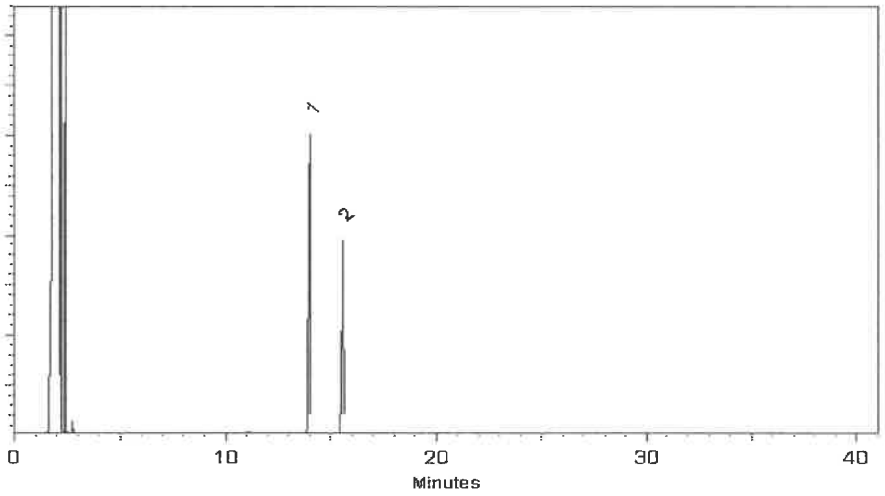
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Nick Yaw - Operations Tech I

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

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 01-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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P12256 → P12271 Y.P. 01/27/23

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

Description : MA Fractionation Surrogate Spike Mix

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

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

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

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

CERTIFIED VALUES

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

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

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

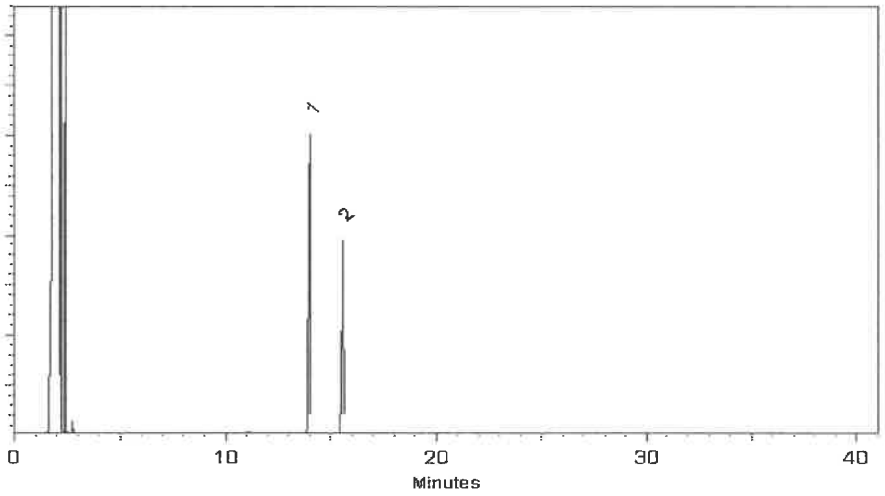
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Nick Yaw - Operations Tech I

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

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 01-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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P12256 → P12271 Y.P. 01/27/23

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

Description : MA Fractionation Surrogate Spike Mix

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

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

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

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

CERTIFIED VALUES

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

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

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

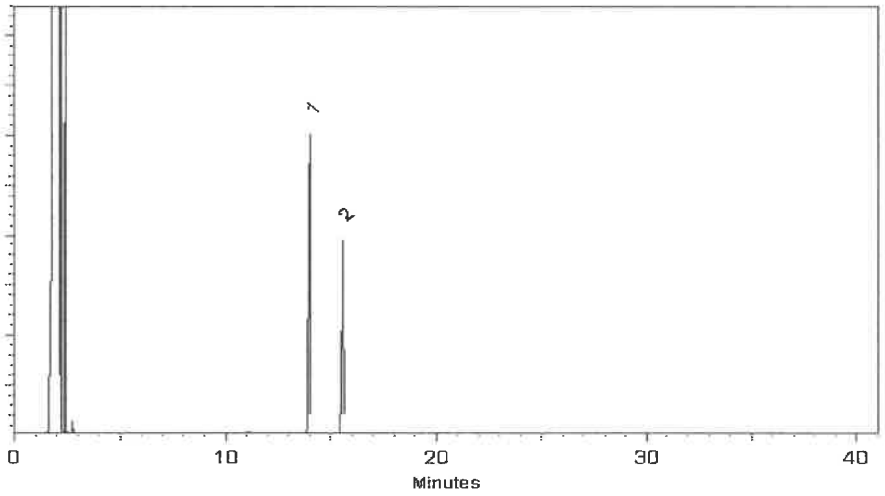
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Nick Yaw - Operations Tech I

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

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 01-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
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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.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

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

Handling Notes:

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

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Certificate of Analysis

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Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

P12256 → P12271 Y.P. 01/27/23

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

Description : MA Fractionation Surrogate Spike Mix

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

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

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

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

CERTIFIED VALUES

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

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

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

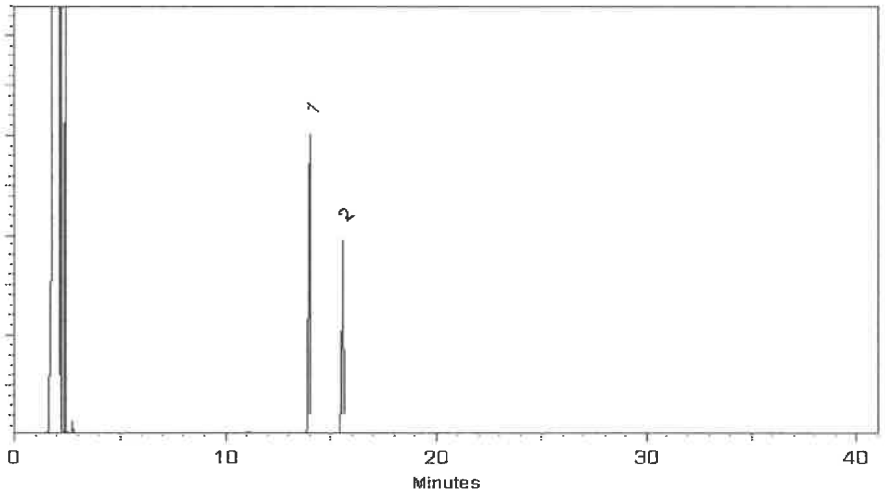
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Nick Yaw - Operations Tech I

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

Fang-Yun Weaver - Operations Lead Tech - ARM QC

Date Passed: 01-Aug-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aliphatics Matrix Spike Mix

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

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

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

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

P12311
2
P12330
Y. P.
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 (Lot SHBN5361) **Purity** 99%	201.6 µg/mL	+/- 1.1972 µg/mL +/- 5.0078 µg/mL +/- 6.0027 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBP4427) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBP7054) **Purity** 99%	200.3 µg/mL	+/- 1.1899 µg/mL +/- 4.9772 µg/mL +/- 5.9660 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.9 µg/mL	+/- 1.1933 µg/mL +/- 4.9913 µg/mL +/- 5.9829 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot UE5NG) **Purity** 98%	201.9 µg/mL	+/- 1.1993 µg/mL +/- 5.0164 µg/mL +/- 6.0130 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCN8767) **Purity** 97%	201.8 µg/mL	+/- 1.1986 µg/mL +/- 5.0134 µg/mL +/- 6.0094 µg/mL	Gravimetric Unstressed Stressed

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

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

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

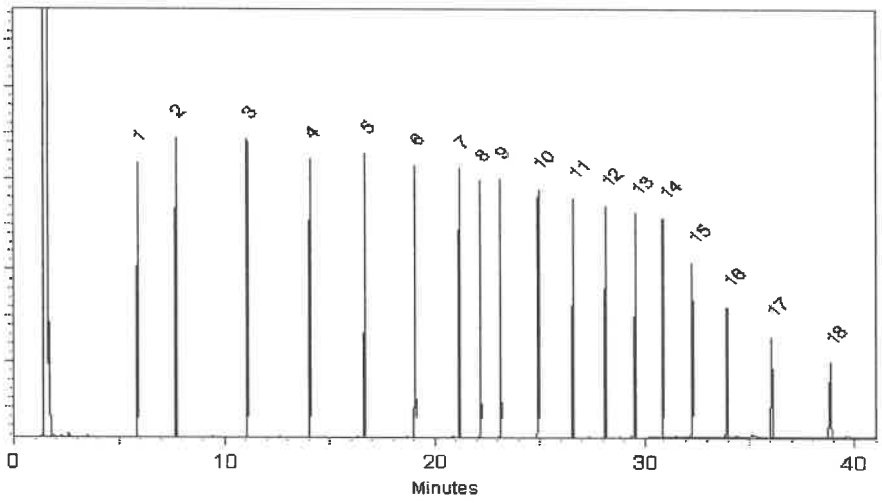
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

John Friedline - Operations Technician I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate #3222.02

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

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

P12311
2
P12330
Y. P.
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 (Lot SHBN5361) **Purity** 99%	201.6 µg/mL	+/- 1.1972 µg/mL +/- 5.0078 µg/mL +/- 6.0027 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBP4427) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBP7054) **Purity** 99%	200.3 µg/mL	+/- 1.1899 µg/mL +/- 4.9772 µg/mL +/- 5.9660 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.9 µg/mL	+/- 1.1933 µg/mL +/- 4.9913 µg/mL +/- 5.9829 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot UE5NG) **Purity** 98%	201.9 µg/mL	+/- 1.1993 µg/mL +/- 5.0164 µg/mL +/- 6.0130 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCN8767) **Purity** 97%	201.8 µg/mL	+/- 1.1986 µg/mL +/- 5.0134 µg/mL +/- 6.0094 µg/mL	Gravimetric Unstressed Stressed

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

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

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

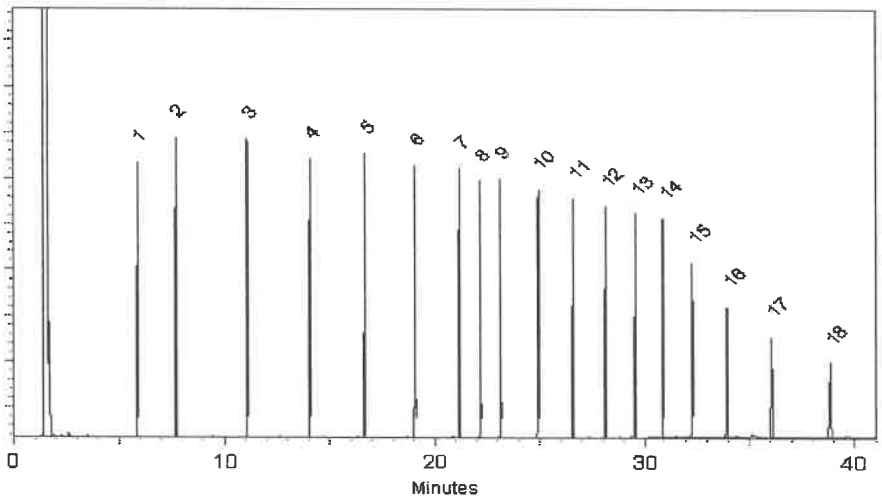
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

John Friedline - Operations Technician I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aliphatics Matrix Spike Mix

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

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

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

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

P12311
2
P12330
Y. P.
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 (Lot SHBN5361) **Purity** 99%	201.6 µg/mL	+/- 1.1972 µg/mL +/- 5.0078 µg/mL +/- 6.0027 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBP4427) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBP7054) **Purity** 99%	200.3 µg/mL	+/- 1.1899 µg/mL +/- 4.9772 µg/mL +/- 5.9660 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.9 µg/mL	+/- 1.1933 µg/mL +/- 4.9913 µg/mL +/- 5.9829 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot UE5NG) **Purity** 98%	201.9 µg/mL	+/- 1.1993 µg/mL +/- 5.0164 µg/mL +/- 6.0130 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCN8767) **Purity** 97%	201.8 µg/mL	+/- 1.1986 µg/mL +/- 5.0134 µg/mL +/- 6.0094 µg/mL	Gravimetric Unstressed Stressed

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

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

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

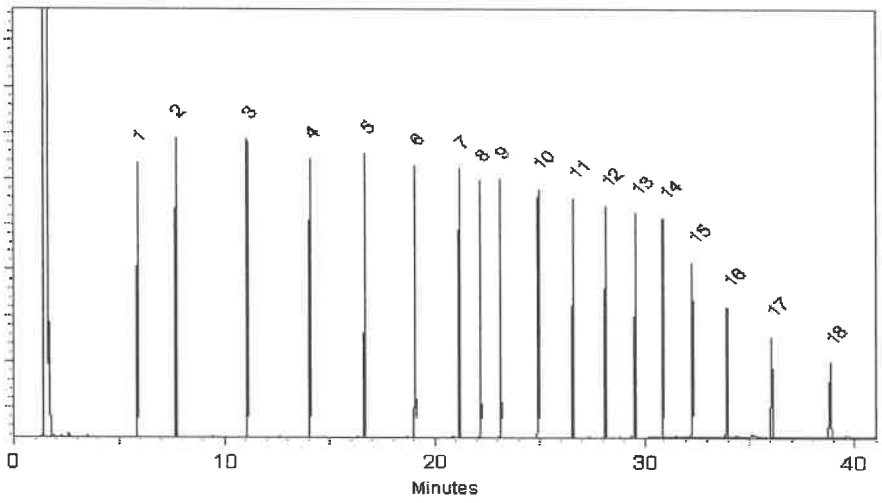
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

John Friedline - Operations Technician I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aliphatics Matrix Spike Mix

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

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

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

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

P12311
2
P12330
Y. P.
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 (Lot SHBN5361) **Purity** 99%	201.6 µg/mL	+/- 1.1972 µg/mL +/- 5.0078 µg/mL +/- 6.0027 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 (Lot SHBP4427) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 (Lot SHBP7054) **Purity** 99%	200.3 µg/mL	+/- 1.1899 µg/mL +/- 4.9772 µg/mL +/- 5.9660 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 (Lot STBK2282) **Purity** 99%	200.7 µg/mL	+/- 1.1919 µg/mL +/- 4.9855 µg/mL +/- 5.9759 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 (Lot SHBM4146) **Purity** 98%	200.9 µg/mL	+/- 1.1933 µg/mL +/- 4.9913 µg/mL +/- 5.9829 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 (Lot UE5NG) **Purity** 98%	201.9 µg/mL	+/- 1.1993 µg/mL +/- 5.0164 µg/mL +/- 6.0130 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 (Lot MKCN8767) **Purity** 97%	201.8 µg/mL	+/- 1.1986 µg/mL +/- 5.0134 µg/mL +/- 6.0094 µg/mL	Gravimetric Unstressed Stressed

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

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

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

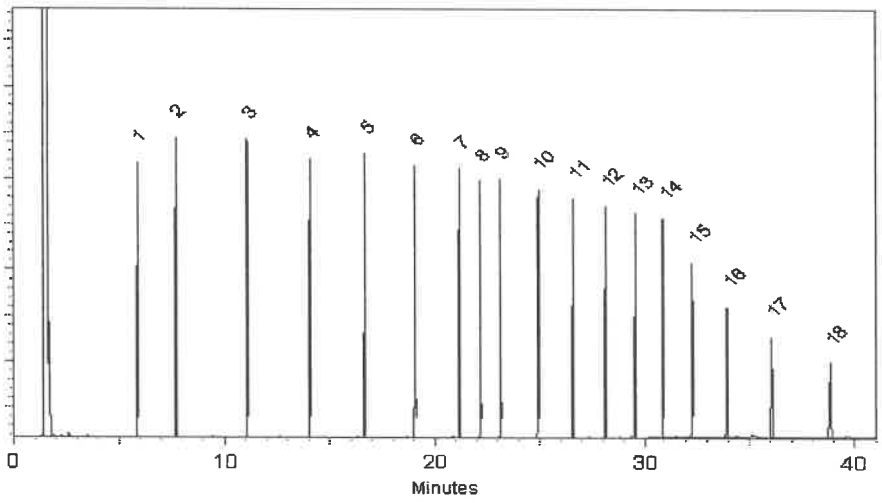
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

John Friedline - Operations Technician I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

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

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

CERTIFIED VALUES

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

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

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

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

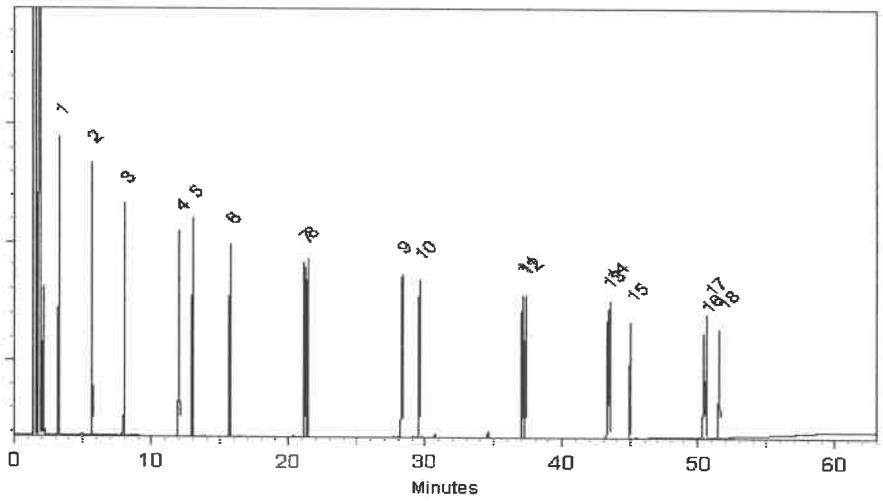
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate #3222.01

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Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

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

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

CERTIFIED VALUES

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

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

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

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

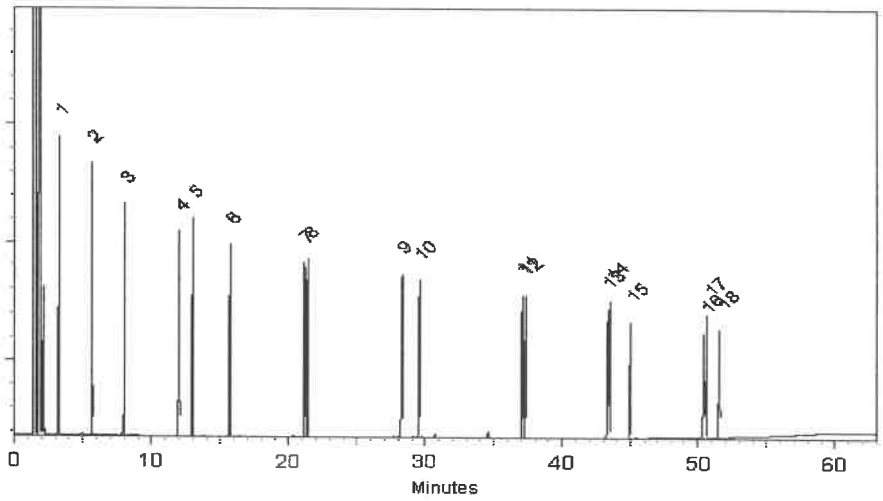
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

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

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

CERTIFIED VALUES

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

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

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

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

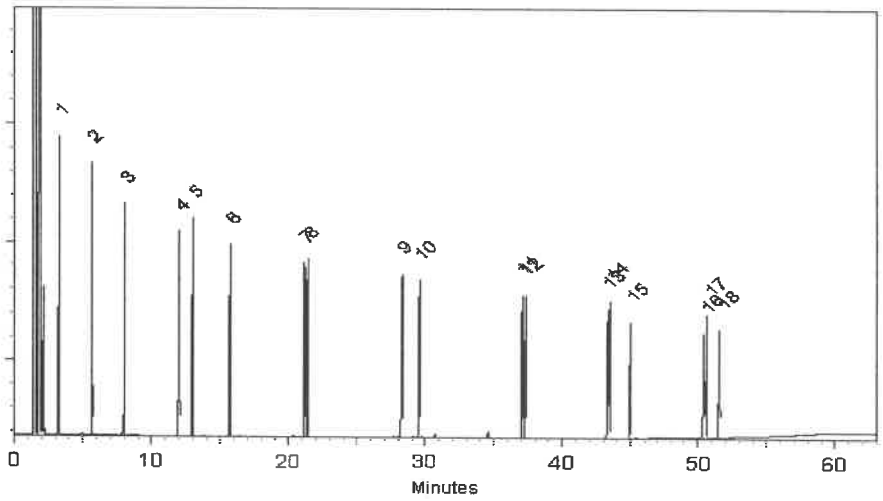
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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Jess Hoy - Operations Tech I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

Label Conditions	Standard Conditions	Non-Standard Conditions
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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

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

Manufacturing Notes:

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

Handling Notes:

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

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

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

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

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

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

CERTIFIED VALUES

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

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

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

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

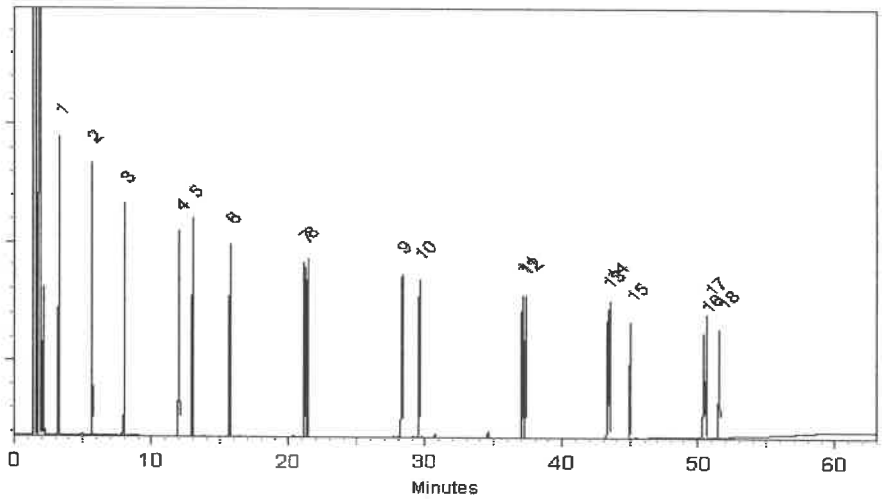
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

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

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

CERTIFIED VALUES

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

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

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

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

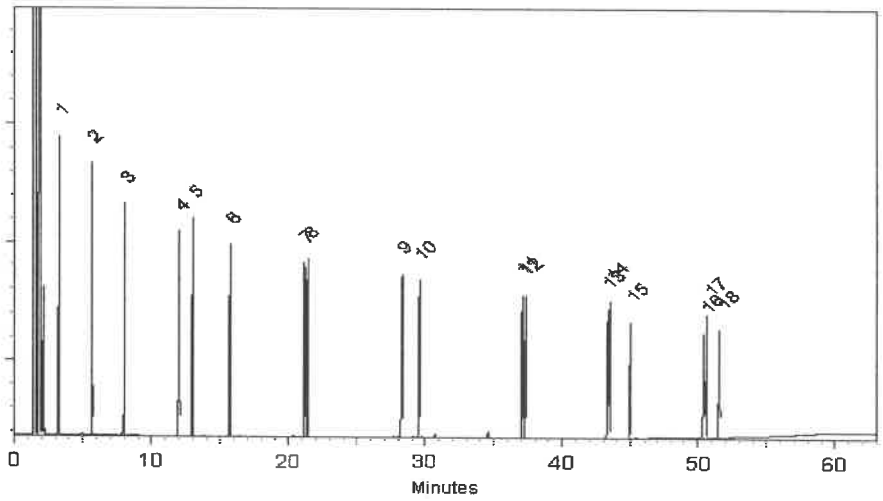
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

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

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

CERTIFIED VALUES

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

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

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

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

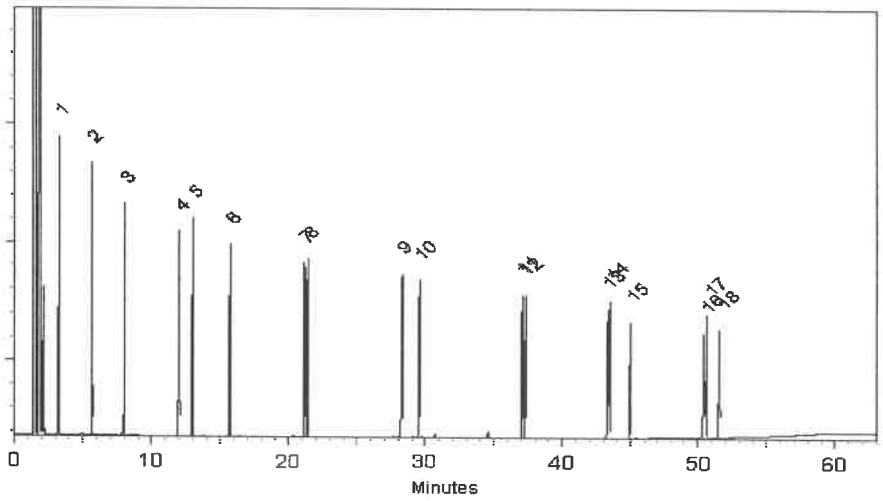
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

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Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

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

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

CERTIFIED VALUES

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

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

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

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

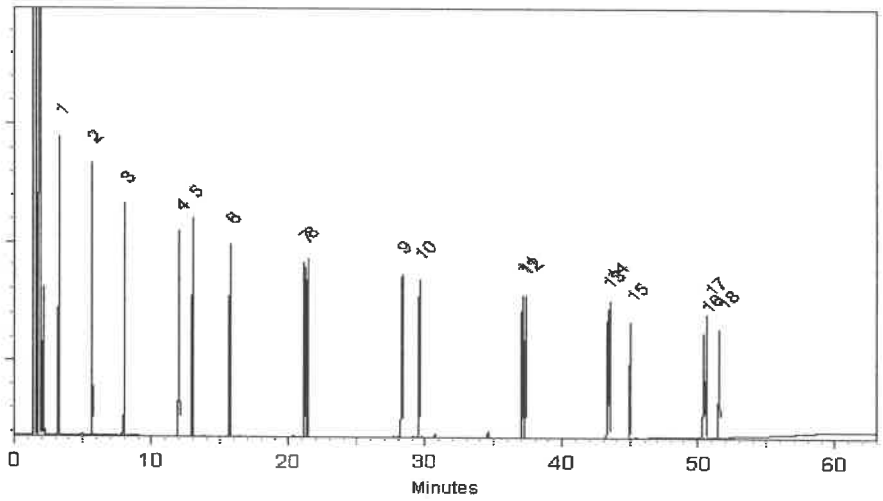
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

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P 12331 ↓ P 12350 Y.P. 02/22/23

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

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CERTIFIED VALUES

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Det. Type:
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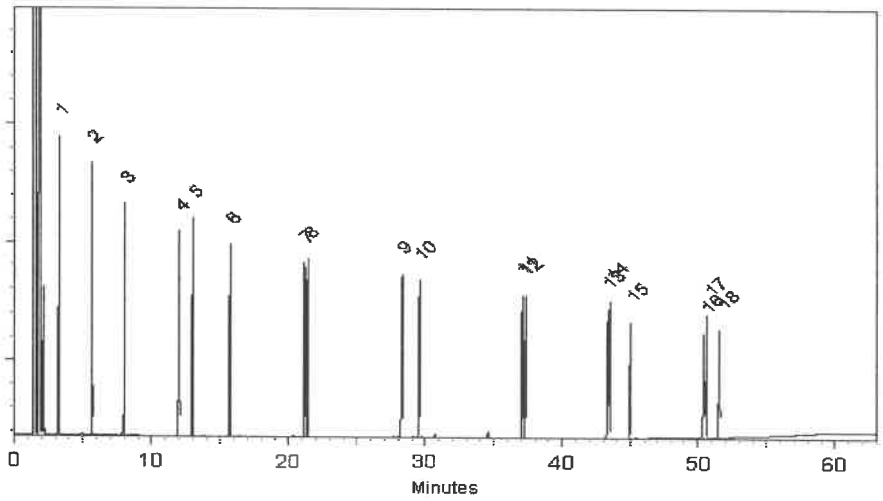

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	Purity 99%				+/-	10.0486	µg/mL	Stressed
9	Fluoranthene		201.2	µg/mL	+/-	1.1948	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKCQ4728)			+/-	9.0637	µg/mL	Unstressed
	Purity 99%				+/-	10.0566	µg/mL	Stressed
10	Pyrene		201.4	µg/mL	+/-	1.1960	µg/mL	Gravimetric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

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

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

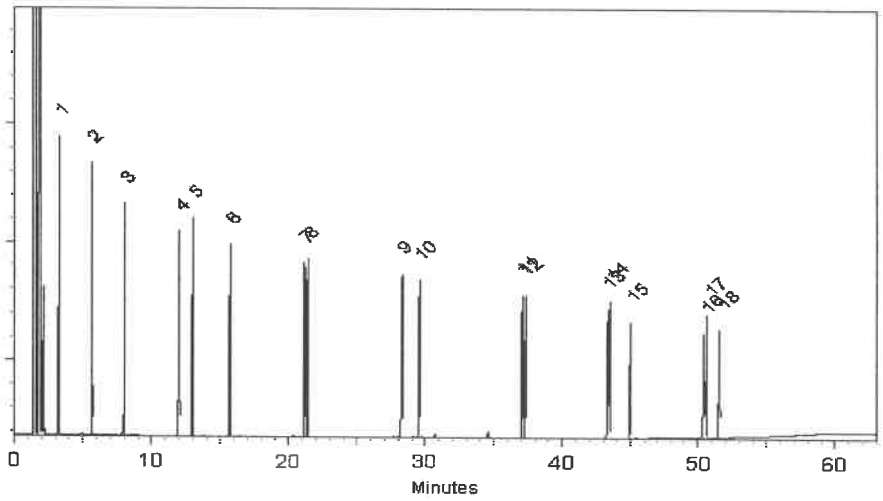
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

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

Description : NJEPH Aromatics Matrix Spike Mix

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

P 12331 ↓ P 12350 Y.P. 02/22/23

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

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

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

CERTIFIED VALUES

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

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

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

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

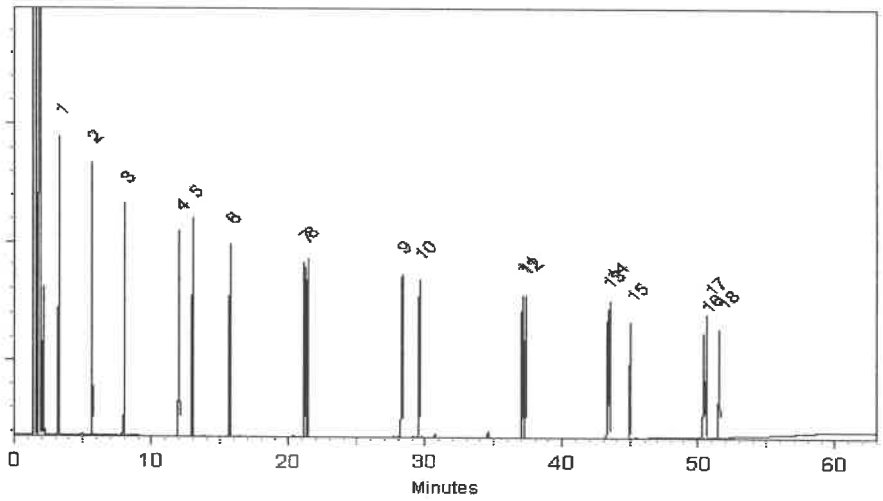
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Jess Hoy - Operations Tech I

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

Jennifer Pollino - Operations Tech III - ARM QC

Date Passed: 14-Nov-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate #3222.01

ACCREDITED
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Certificate #3222.02

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

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

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

Description : 1-Chlorooctadecane Standard

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

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

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

Ship: Ambient

CERTIFIED VALUES

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

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

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

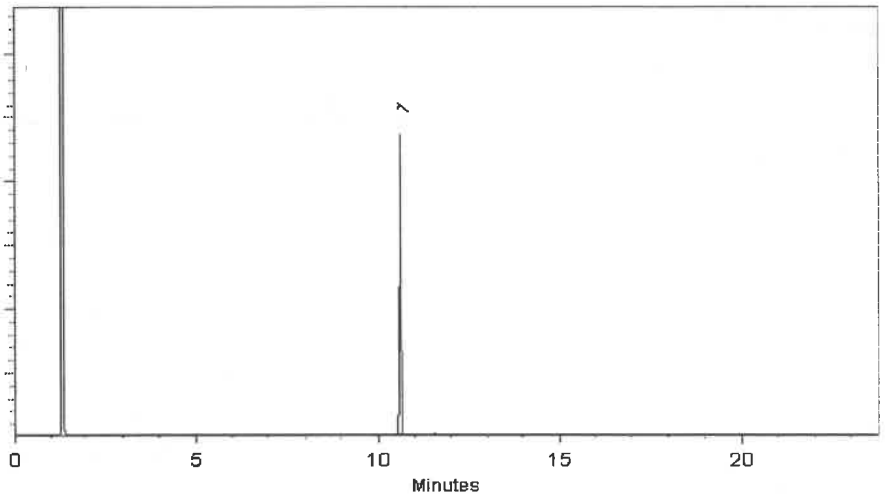
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Brittany Federinko - Operations Tech I

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

Marlina Cowan - Operations Tech I

Date Passed: 31-Mar-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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

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

Description : 1-Chlorooctadecane Standard

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

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

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

Ship: Ambient

CERTIFIED VALUES

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

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

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

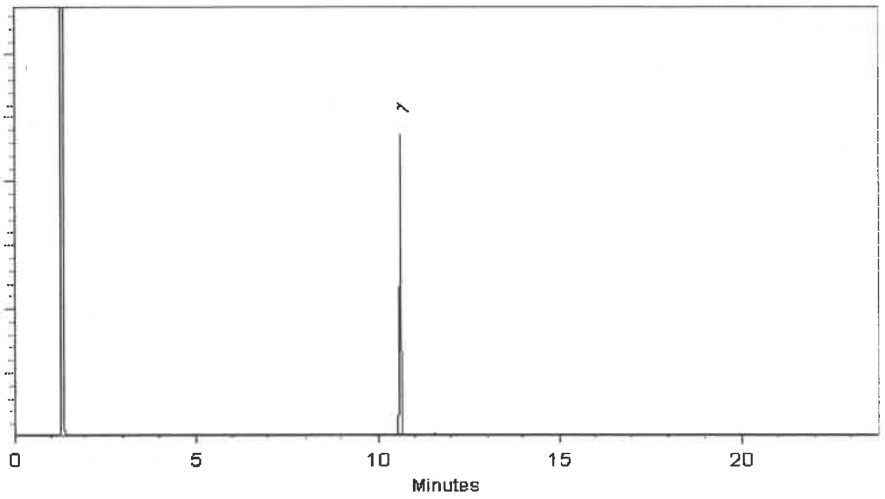
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Brittany Federinko - Operations Tech I

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

Marlina Cowan - Operations Tech I

Date Passed: 31-Mar-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Certificate #3222.02

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

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

Description : 1-Chlorooctadecane Standard

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

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

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

Ship: Ambient

CERTIFIED VALUES

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

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

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

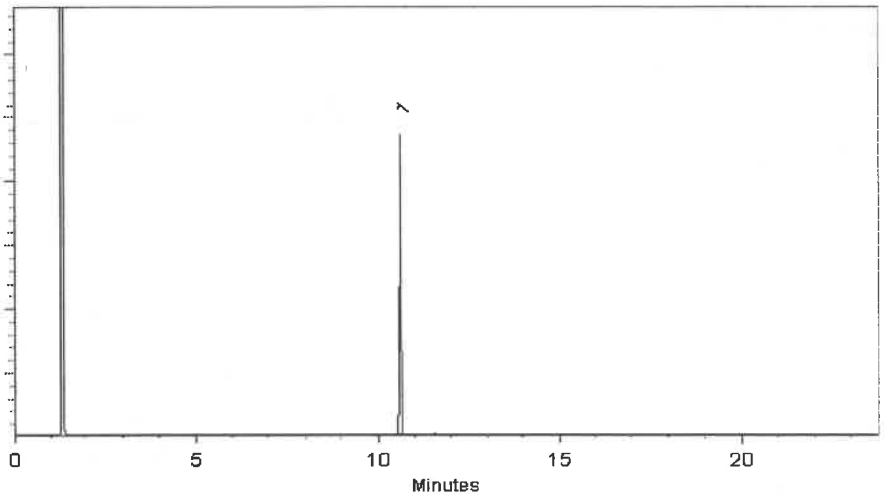
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Brittany Federinko - Operations Tech I

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

Marlina Cowan - Operations Tech I

Date Passed: 31-Mar-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

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

Description : 1-Chlorooctadecane Standard

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

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

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

Ship: Ambient

CERTIFIED VALUES

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

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

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

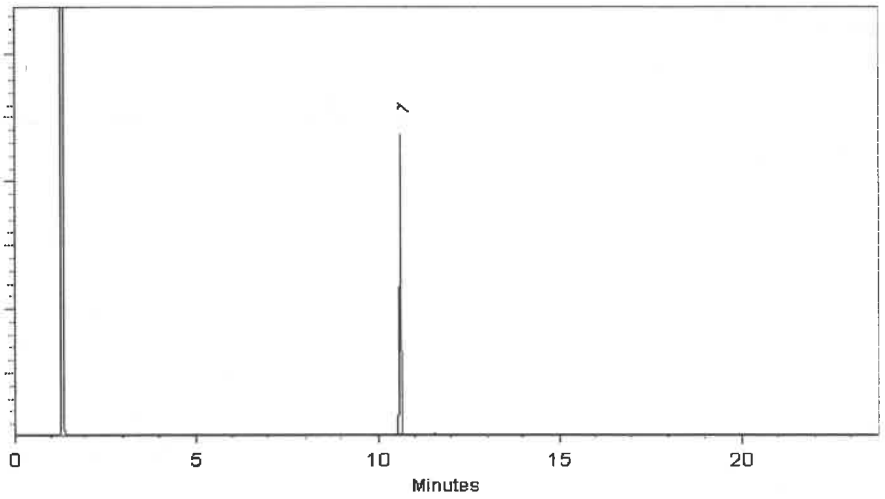
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Brittany Federinko - Operations Tech I

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

Marlina Cowan - Operations Tech I

Date Passed: 31-Mar-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

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Handling Notes:

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

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

Description : 1-Chlorooctadecane Standard

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

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

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

Ship: Ambient

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	1-Chlorooctadecane	10,051.0 µg/mL	+/- 58.4374	µg/mL	Gravimetric
	CAS # 3386-33-2 (Lot 12882200)		+/- 563.5496	µg/mL	Unstressed
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Solvent: Methylene chloride
CAS # 75-09-2
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Column:
30m x 0.25mm x 0.25µm
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Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
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Inj. Temp:
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Det. Temp:
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Det. Type:
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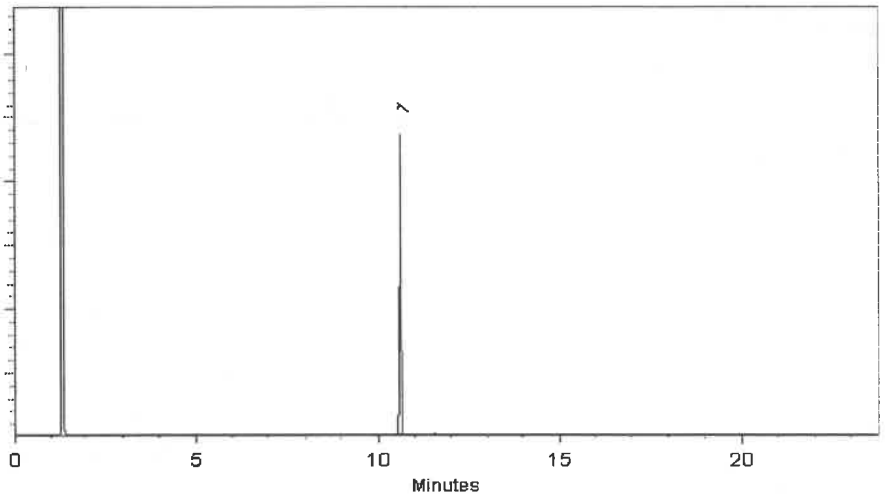

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Brittany Federinko - Operations Tech I

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:

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Manufacturing Notes:

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P2186
P2200

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

Description : MA Fractionation Surrogate Spike Mix

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

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

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

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

CERTIFIED VALUES

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

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

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

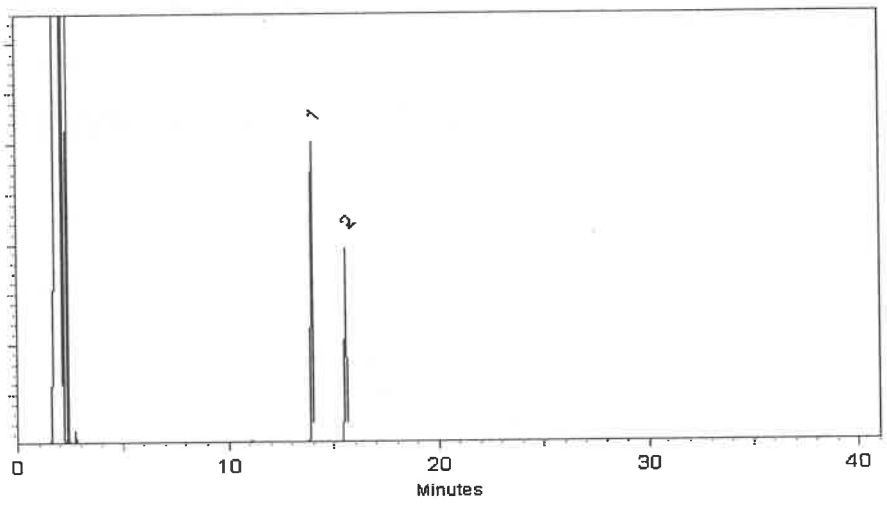
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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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

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CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
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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:
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Temp. Program:
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Det. Temp:
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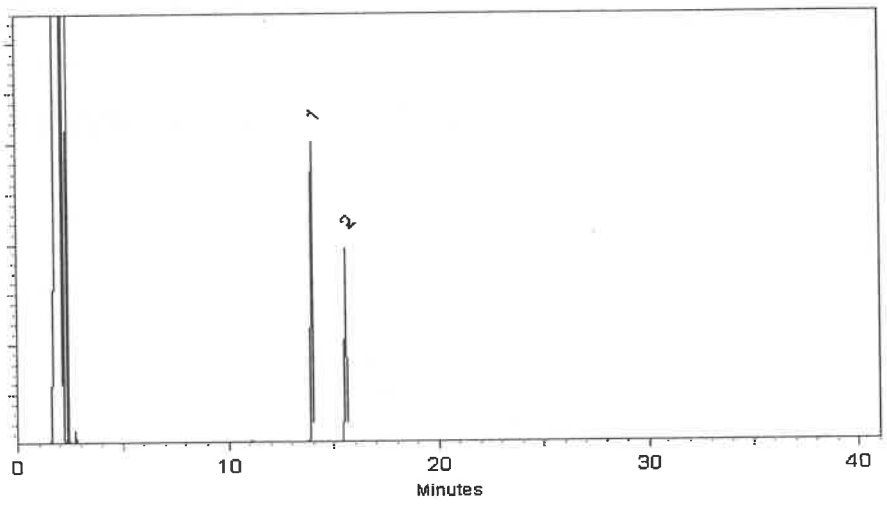
Det. Type:
FID



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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 Registered Quality System Certificate #FM 80397

Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

ANAB ISO 17034 Accredited
AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

Part Number: 95709
Lot Number: 051519
Description: NJ EPH Aromatic Hydrocarbons
18 components
Expiration Date: 051524
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

Solvent(s):	Lot#
Methylene chloride	102968

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 500.0 0.058 Flask Uncertainty

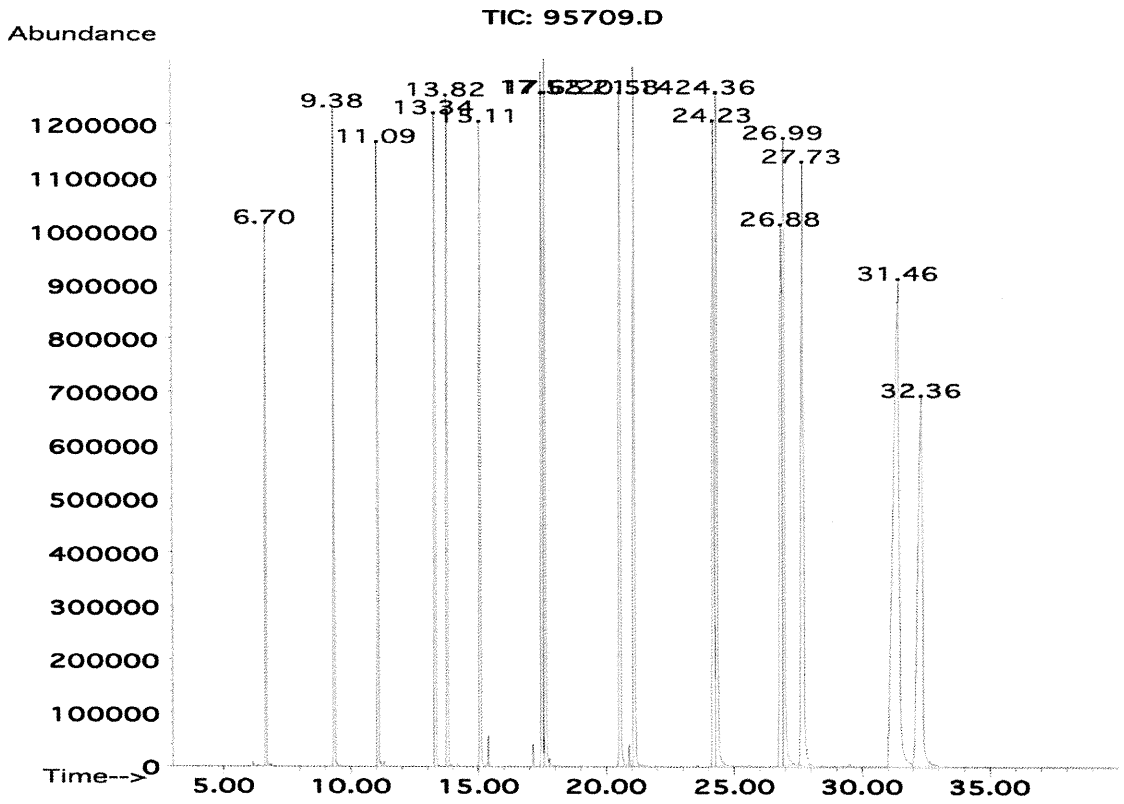
Received by DD on 01/10/2020
10 Bottles
P9283 TO P9287

Formulated By: Prashant Chauhan	051519 DATE
Reviewed By: Pedro L. Rentas	051519 DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Acenaphthene	1	MKBJ4871V	2000	99	0.2	1.01003	1.01033	2000.6	8.1	83-32-9	N/A	ipr-rat 600mg/kg
2. Acenaphthylene	3	012014	2000	98	0.2	1.02033	1.02053	2000.4	8.2	208-96-8	N/A	N/A
3. Anthracene	13	A0210580	2000	99	0.2	1.01003	1.01035	2000.6	8.1	120-12-7	0.2mg/m3 (8H)	ipr-mus 430mg/kg
4. Benzo(a)anthracene	28	012018	2000	99	0.2	1.01003	1.01035	2000.6	8.1	56-55-3	N/A	N/A
5. Benzo(a)pyrene	30	012012	2000	99.5	0.2	1.00495	1.00525	2000.6	8.1	50-32-8	0.2mg/m3 (8H)	scu-rat 50mg/kg
6. Benzo(b)fluoranthene	31	012012b	2000	99	0.2	1.01003	1.01035	2000.6	8.1	205-99-2	N/A	N/A
7. Benzo(k)fluoranthene	33	012012k	2000	99	0.2	1.01003	1.01035	2000.6	8.1	207-08-9	N/A	N/A
8. Benzo(g,h,i)perylene	32	012018	2000	99	0.2	1.01003	1.01035	2000.6	8.1	191-24-2	N/A	N/A
9. Chrysene	91	012015	2000	98	0.2	1.02033	1.02055	2000.4	8.2	218-01-9	0.2mg/m3	N/A
10. Dibenzo(a,h)anthracene	112	012014	2000	98	0.2	1.02033	1.02055	2000.4	8.2	53-70-3	0.2mg/m3	N/A
11. Fluoranthene	183	04221PV	2000	98	0.2	1.02033	1.02055	2000.4	8.2	206-44-0	N/A	orl-rat 2000mg/kg
12. Fluorene	184	07211MV	2000	98	0.2	1.02033	1.02055	2000.4	8.2	86-73-7	N/A	ipr-mus 2 g/kg
13. Indeno(1,2,3-cd)pyrene	202	022015	2000	98	0.2	1.02033	1.02055	2000.4	8.2	193-39-5	N/A	N/A
14. 2-Methylnaphthalene	214	MKBF3783V	2000	97	0.2	1.03085	1.03120	2000.7	8.3	91-57-6	N/A	orl-rat 1630mg/kg
15. Naphthalene	222	09424LC	2000	99	0.2	1.01003	1.01033	2000.6	8.1	91-20-3	10 ppm (50mg/m3/8H)	orl-rat 490mg/kg
16. Phenanthrene	248	03410PV	2000	99	0.2	1.01003	1.01033	2000.6	8.1	85-01-8	0.2mg/m3/8H	orl-mus 700mg/kg
17. Pyrene	259	010197	2000	98	0.2	1.02033	1.02055	2000.4	8.2	129-00-0	0.2mg/m3/8H	orl-rat 2700mg/kg
18. 1,2,3-Trimethylbenzene	944	031097	2000	99	0.2	1.01003	1.01035	2000.6	8.1	526-73-8	N/A	N/A

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

Method GC8MSD-2.M: Column:SPB-5 (30m X 0.25mm ID X 0.25μm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (14min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Melissa Stonier.



Peak No.	Name	MSD RT (min.)
1	1,2,3-Trimethylbenzene	6.70
2	Naphthalene	9.38
3	2-Methylnaphthalene	11.09
4	Acenaphthylene	13.34
5	Acenaphthene	13.82
6	Fluorene	15.11
7	Phenanthrene	17.52
8	Anthracene	17.65
9	Fluoranthene	20.58
10	Pyrene	21.14
11	Chrysene	24.23
12	Benzo(a)anthracene	24.36
13	Benzo(b)fluoranthene/Benzo(k)fluoranthene	26.98
14	Benzo(a)pyrene	27.73
15	Indeno(1,2,3-cd)pyrene/Dibenzo(a,h)anthracene	31.46
16	Benzo(g,h,i)perylene	32.36

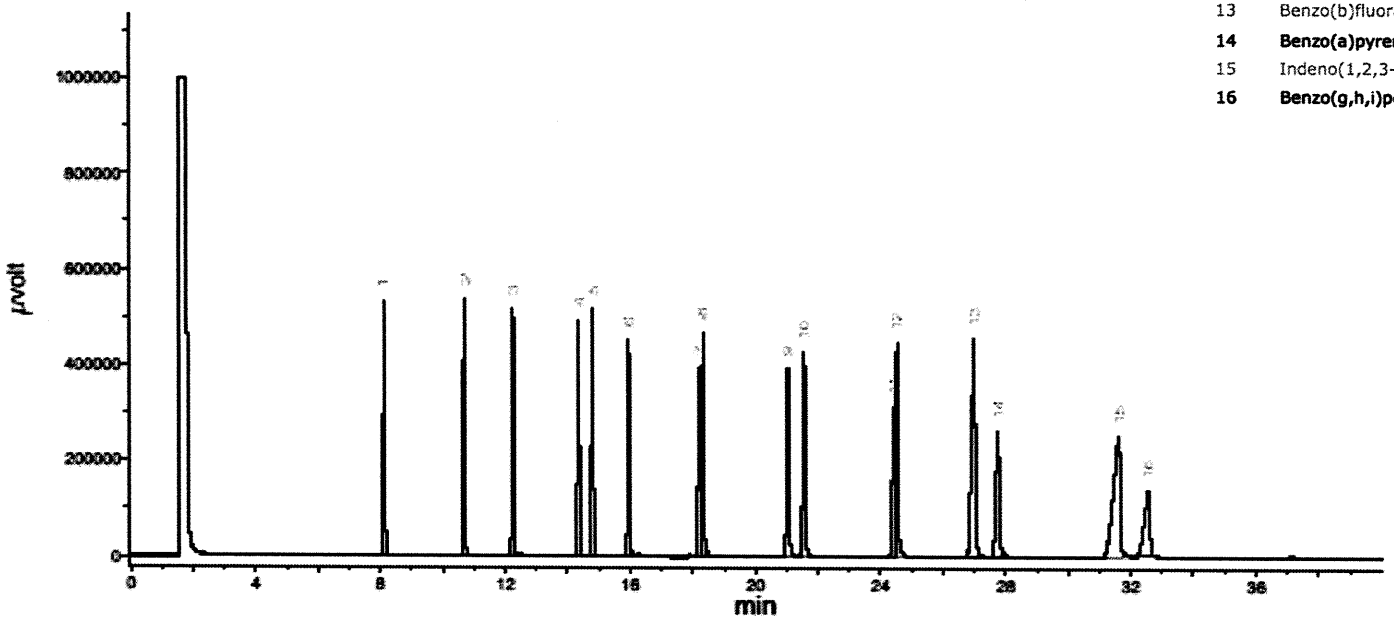
Run 27, "P95709 L051519 [2000µg/mL in MeCl2]"

Run Length: 40.00 min, 23999 points at 10 points/second.
Created: Tue, May 21, 2019 at 10:50:43 AM.
Sampled: Sequence "052019-GC9M2", Method "GC9-M2".
Analyzed using Method "GC9-M2".

Comments

GC9-M2 Analysis by Melissa Stonier
Column ID SPB-5 30 meter x 0.53mm x 1.5um Film Thickness.
Flow rates; Total Flow = 300 ml/min, Helium (carrier) = 6.5 mL, Helium (make-up) = 25 mL.
Hydrogen (detector) = 30 mL, Air (detector) =360 mLOven Temp 1 = 50°C (1 min).
Rate = 10°C/min, Oven Temp 2 = 300°C (14 min), Total Run Time = 40 Minutes. Injector Temp = 250°C.
FID Temp = 300°C, FID Signal = eDaq Channel 1.
Gas Chromatograph = HP 5890, Auto Sampler = HP 7673, Standard Injection = 0.5 uL, Range = 3

Peak No.	Name	FID RT (min.)
1	1,2,3-Trimethylbenzene	8.12
2	Naphthalene	10.68
3	2-Methylnaphthalene	12.25
4	Acenaphthylene	14.35
5	Acenaphthene	14.78
6	Fluorene	15.96
7	Phenanthrene	18.21
8	Anthracene	18.32
9	Fluoranthene	21.04
10	Pyrene	21.56
11	Chrysene	24.43
12	Benzo(a)anthracene	24.53
13	Benzo(b)fluoranthene/Benzo(k)fluoranthene	26.99
14	Benzo(a)pyrene	27.74
15	Indeno(1,2,3-cd)pyrene/Dibenzo(a,h)anthracene	31.59
16	Benzo(g,h,i)perylene	32.54



Absolute Standards, Inc.
800-368-1131
www.absolutestandards.com

Certified Reference Material CRM

ANAB ISO 17034 Accredited
AR-1539 Certificate Number
https://Absolutestandards.com

CERTIFIED WEIGHT REPORT

Part Number: 95709
Lot Number: 051519
Description: NJ EPH Aromatic Hydrocarbons
18 components
Expiration Date: 051524
Recommended Storage: Refrigerate (4 °C)
Nominal Concentration (µg/mL): 2000
NIST Test ID#: 6UTB

Solvent(s):	Lot#
Methylene chloride	102968

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 500.0 0.058 Flask Uncertainty

Received by DD on 01/10/2020
10 Bottles
P9283 TO P9287

Formulated By: Prashant Chauhan	051519 DATE
Reviewed By: Pedro L. Rentas	051519 DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.) CAS#	OSHA PEL (TWA)	LD50
1. Acenaphthene	1	MKBJ4871V	2000	99	0.2	1.01003	1.01033	2000.6	8.1	83-32-9	N/A	ipr-rat 600mg/kg
2. Acenaphthylene	3	012014	2000	98	0.2	1.02033	1.02053	2000.4	8.2	208-96-8	N/A	N/A
3. Anthracene	13	A0210580	2000	99	0.2	1.01003	1.01035	2000.6	8.1	120-12-7	0.2mg/m3 (8H)	ipr-mus 430mg/kg
4. Benzo(a)anthracene	28	012018	2000	99	0.2	1.01003	1.01035	2000.6	8.1	56-55-3	N/A	N/A
5. Benzo(a)pyrene	30	012012	2000	99.5	0.2	1.00495	1.00525	2000.6	8.1	50-32-8	0.2mg/m3 (8H)	scu-rat 50mg/kg
6. Benzo(b)fluoranthene	31	012012b	2000	99	0.2	1.01003	1.01035	2000.6	8.1	205-99-2	N/A	N/A
7. Benzo(k)fluoranthene	33	012012k	2000	99	0.2	1.01003	1.01035	2000.6	8.1	207-08-9	N/A	N/A
8. Benzo(g,h,i)perylene	32	012018	2000	99	0.2	1.01003	1.01035	2000.6	8.1	191-24-2	N/A	N/A
9. Chrysene	91	012015	2000	98	0.2	1.02033	1.02055	2000.4	8.2	218-01-9	0.2mg/m3	N/A
10. Dibenzo(a,h)anthracene	112	012014	2000	98	0.2	1.02033	1.02055	2000.4	8.2	53-70-3	0.2mg/m3	N/A
11. Fluoranthene	183	04221PV	2000	98	0.2	1.02033	1.02055	2000.4	8.2	206-44-0	N/A	orl-rat 2000mg/kg
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13. Indeno(1,2,3-cd)pyrene	202	022015	2000	98	0.2	1.02033	1.02055	2000.4	8.2	193-39-5	N/A	N/A
14. 2-Methylnaphthalene	214	MKBF3783V	2000	97	0.2	1.03085	1.03120	2000.7	8.3	91-57-6	N/A	orl-rat 1630mg/kg
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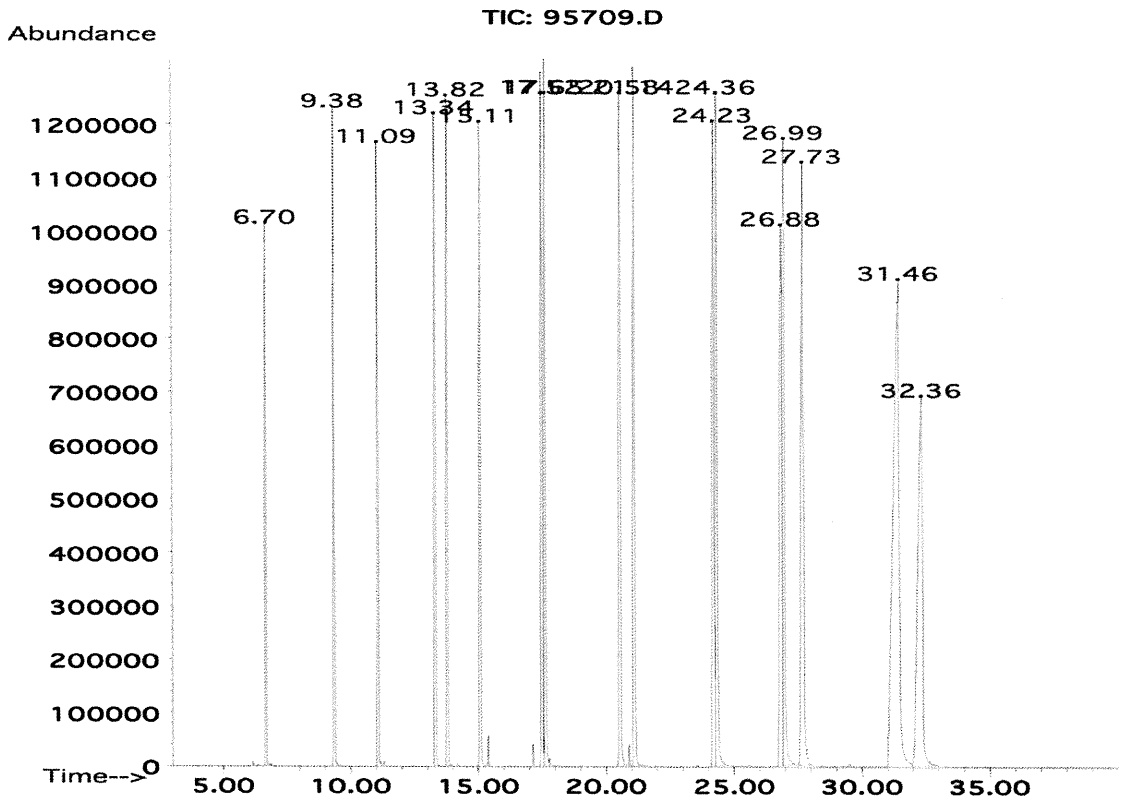
Method GC8MSD-2.M: Column:SPB-5 (30m X 0.25mm ID X 0.25μm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (14min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Melissa Stonier.



Peak No.	Name	MSD RT (min.)
1	1,2,3-Trimethylbenzene	6.70
2	Naphthalene	9.38
3	2-Methylnaphthalene	11.09
4	Acenaphthylene	13.34
5	Acenaphthene	13.82
6	Fluorene	15.11
7	Phenanthrene	17.52
8	Anthracene	17.65
9	Fluoranthene	20.58
10	Pyrene	21.14
11	Chrysene	24.23
12	Benzo(a)anthracene	24.36
13	Benzo(b)fluoranthene/Benzo(k)fluoranthene	26.98
14	Benzo(a)pyrene	27.73
15	Indeno(1,2,3-cd)pyrene/Dibenzo(a,h)anthracene	31.46
16	Benzo(g,h,i)perylene	32.36

Run 27, "P95709 L051519 [2000µg/mL in MeCl2]"

Run Length: 40.00 min, 23999 points at 10 points/second.
Created: Tue, May 21, 2019 at 10:50:43 AM.
Sampled: Sequence "052019-GC9M2", Method "GC9-M2".
Analyzed using Method "GC9-M2".

Comments

GC9-M2 Analysis by Melissa Stonier
Column ID SPB-5 30 meter x 0.53mm x 1.5um Film Thickness.
Flow rates; Total Flow = 300 ml/min, Helium (carrier) = 6.5 mL, Helium (make-up) = 25 mL.
Hydrogen (detector) = 30 mL, Air (detector) =360 mLOven Temp 1 = 50°C (1 min).
Rate = 10°C/min, Oven Temp 2 = 300°C (14 min), Total Run Time = 40 Minutes. Injector Temp = 250°C.
FID Temp = 300°C, FID Signal = eDaq Channel 1.
Gas Chromatograph = HP 5890, Auto Sampler = HP 7673, Standard Injection = 0.5 uL, Range = 3

Peak No.	Name	FID RT (min.)
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8	Anthracene	18.32
9	Fluoranthene	21.04
10	Pyrene	21.56
11	Chrysene	24.43
12	Benzo(a)anthracene	24.53
13	Benzo(b)fluoranthene/Benzo(k)fluoranthene	26.99
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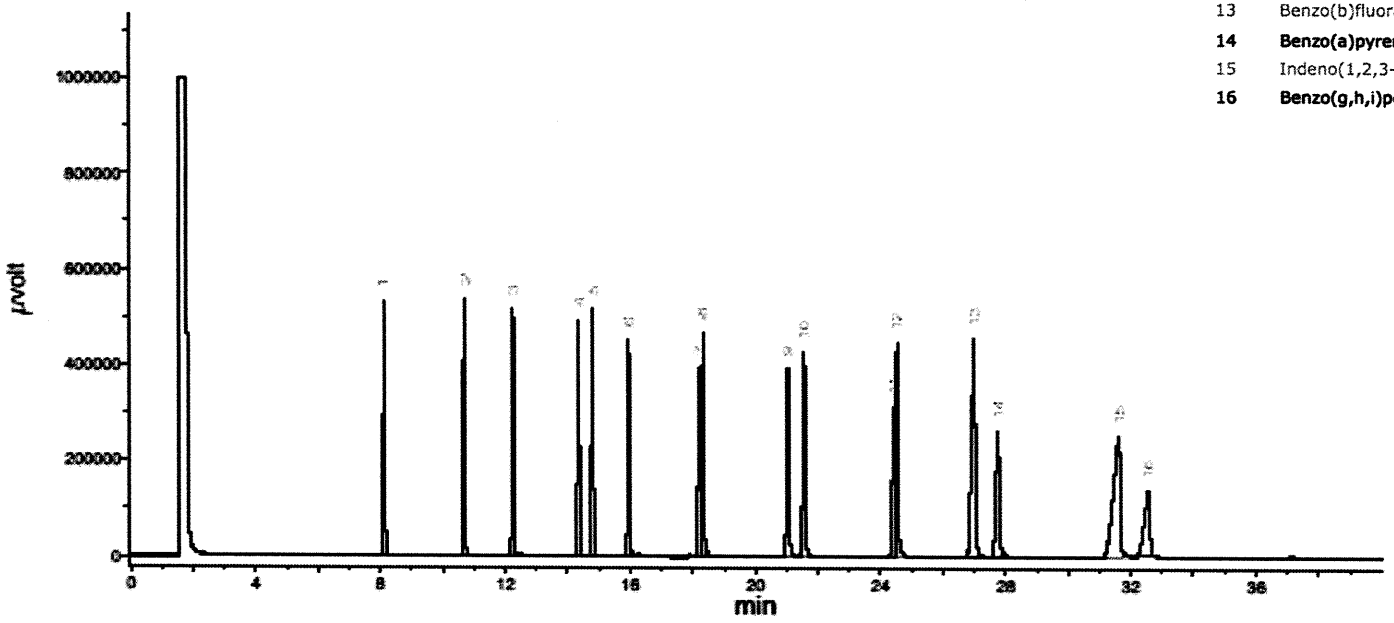
16	Benzo(g,h,i)perylene	32.54



RESTEK®
110 Benner Circle
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Tel: (800)356-1688
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www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

DP
01/10/2020
5 Bottles
P9318
To
P9322

Catalog No. : 30541 **Lot No.:** A0151358

Description : NJEPH Aromatics Calibration Standard

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

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

Expiration Date : June 30, 2025 **Storage:** 10°C or colder

Handling: Sonication required. Mix is photosensitive.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	1,2,3-Trimethylbenzene		2,012.4 µg/mL	+/- 11.8101	µg/mL	Gravimetric
	CAS # 526-73-8	(Lot 877605-12)		+/- 90.6553	µg/mL	Unstressed
	Purity 98%			+/- 100.5903	µg/mL	Stressed
2	Naphthalene		2,008.0 µg/mL	+/- 11.7841	µg/mL	Gravimetric
	CAS # 91-20-3	(Lot MKBZ8680V)		+/- 90.4557	µg/mL	Unstressed
	Purity 99%			+/- 100.3688	µg/mL	Stressed
3	2-Methylnaphthalene		2,007.8 µg/mL	+/- 11.7831	µg/mL	Gravimetric
	CAS # 91-57-6	(Lot STBF0201V)		+/- 90.4485	µg/mL	Unstressed
	Purity 96%			+/- 100.3608	µg/mL	Stressed
4	Acenaphthylene		2,006.1 µg/mL	+/- 11.7727	µg/mL	Gravimetric
	CAS # 208-96-8	(Lot N25T)		+/- 90.3683	µg/mL	Unstressed
	Purity 98%			+/- 100.2719	µg/mL	Stressed
5	Acenaphthene		2,009.0 µg/mL	+/- 11.7899	µg/mL	Gravimetric
	CAS # 83-32-9	(Lot MKCG4614)		+/- 90.5008	µg/mL	Unstressed
	Purity 99%			+/- 100.4188	µg/mL	Stressed
6	Fluorene		2,007.0 µg/mL	+/- 11.7782	µg/mL	Gravimetric
	CAS # 86-73-7	(Lot 10215869)		+/- 90.4107	µg/mL	Unstressed
	Purity 99%			+/- 100.3188	µg/mL	Stressed
7	Phenanthrene		2,005.5 µg/mL	+/- 11.7694	µg/mL	Gravimetric
	CAS # 85-01-8	(Lot MKCD3760)		+/- 90.3431	µg/mL	Unstressed
	Purity 99%			+/- 100.2439	µg/mL	Stressed

8	Anthracene		2,007.0	µg/mL	+/-	11.7782	µg/mL	Gravimetric
	CAS # 120-12-7	(Lot MKCC7378)			+/-	90.4107	µg/mL	Unstressed
	Purity 99%				+/-	100.3188	µg/mL	Stressed
9	Fluoranthene		2,006.6	µg/mL	+/-	11.7756	µg/mL	Gravimetric
	CAS # 206-44-0	(Lot MKBQ6360V)			+/-	90.3904	µg/mL	Unstressed
	Purity 98%				+/-	100.2963	µg/mL	Stressed
10	Pyrene		2,008.0	µg/mL	+/-	11.7841	µg/mL	Gravimetric
	CAS # 129-00-0	(Lot BCBW7698)			+/-	90.4557	µg/mL	Unstressed
	Purity 99%				+/-	100.3688	µg/mL	Stressed
11	Benz(a)anthracene		1,998.2	µg/mL	+/-	11.7268	µg/mL	Gravimetric
	CAS # 56-55-3	(Lot 0022018)			+/-	90.0160	µg/mL	Unstressed
	Purity 96%				+/-	99.8810	µg/mL	Stressed
12	Chrysene		2,011.5	µg/mL	+/-	11.8046	µg/mL	Gravimetric
	CAS # 218-01-9	(Lot 012015)			+/-	90.6134	µg/mL	Unstressed
	Purity 99%				+/-	100.5438	µg/mL	Stressed
13	Benzo(b)fluoranthene		2,003.5	µg/mL	+/-	11.7577	µg/mL	Gravimetric
	CAS # 205-99-2	(Lot 012012B)			+/-	90.2530	µg/mL	Unstressed
	Purity 99%				+/-	100.1439	µg/mL	Stressed
14	Benzo(k)fluoranthene		2,004.0	µg/mL	+/-	11.7606	µg/mL	Gravimetric
	CAS # 207-08-9	(Lot 012017K)			+/-	90.2755	µg/mL	Unstressed
	Purity 99%				+/-	100.1689	µg/mL	Stressed
15	Benzo(a)pyrene		2,005.0	µg/mL	+/-	11.7665	µg/mL	Gravimetric
	CAS # 50-32-8	(Lot ER071309-02)			+/-	90.3206	µg/mL	Unstressed
	Purity 99%				+/-	100.2189	µg/mL	Stressed
16	Indeno(1,2,3-cd)pyrene		2,002.0	µg/mL	+/-	11.7489	µg/mL	Gravimetric
	CAS # 193-39-5	(Lot ER082107-02)			+/-	90.1854	µg/mL	Unstressed
	Purity 99%				+/-	100.0689	µg/mL	Stressed
17	Dibenz(a,h)anthracene		2,011.5	µg/mL	+/-	11.8046	µg/mL	Gravimetric
	CAS # 53-70-3	(Lot ER032211-01)			+/-	90.6134	µg/mL	Unstressed
	Purity 99%				+/-	100.5438	µg/mL	Stressed
18	Benzo(g,h,i)perylene		2,007.0	µg/mL	+/-	11.7782	µg/mL	Gravimetric
	CAS # 191-24-2	(Lot ER05121401)			+/-	90.4107	µg/mL	Unstressed
	Purity 99%				+/-	100.3188	µg/mL	Stressed

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

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

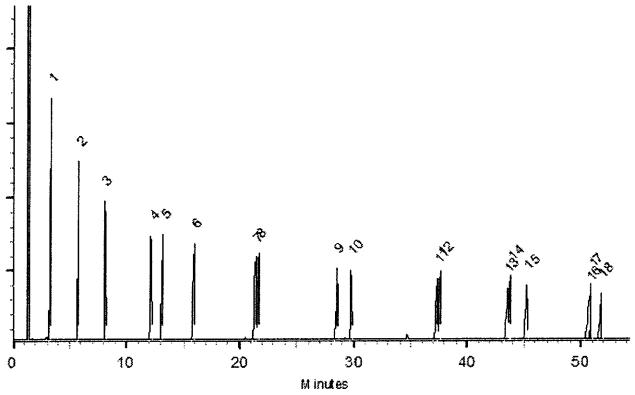
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Clara Windle - Operations Technician I

Date Mixed: 29-Jul-2019 **Balance:** B442140311

Justine Albertson - Operations Tech-ARM QC

Date Passed: 01-Aug-2019

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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