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

Prep Standard - Chemical Standard Summary

Order ID : O2213

Test : Diesel Range Organics

Prepbatch ID : PB151916,

Sequence ID/Qc Batch ID: FG040623,

Standard ID :
EP2318,EP2321,PP21568,PP21569,PP21661,PP21703,PP21824,PP21825,PP21826,PP21827,PP21828,

Chemical ID :
E2865,E3412,E3459,E3464,E3470,E3483,E3486,E3487,P11170,P11171,P11172,P11173,P11174,P11175,P11176,P11475,P11476,P11754,P11755,P11756,P11757,P11758,P11852,

CHEMTECH

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

Extractions STANDARD PREPARATION LOG

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

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

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

FROM 1.00000gram of E3412 = Final Quantity: 4000.000 gram

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
433	100/100 PPM DRO (Restek)	PP21568	01/27/2023	07/19/2023	Yogesh Patel	None	None	Ankita Jodhani 01/30/2023

FROM 1.25000ml of P11170 + 1.25000ml of P11171 + 1.25000ml of P11754 + 1.25000ml of P11755 + 1.25000ml of P11756 + 1.25000ml of P11757 + 17.50000ml of E3459 = Final Quantity: 25.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3796	100/100 PPM DRO STD (CPI)	PP21569	01/27/2023	07/19/2023	Yogesh Patel	None	None	Ankita Jodhani 01/30/2023

FROM 1.00000ml of P11172 + 1.00000ml of P11475 + 1.00000ml of P11476 + 7.00000ml of E3459 = Final Quantity: 10.000 ml

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
147	20 PPM DRO Surrogate Spike Solution	PP21661	02/16/2023	08/02/2023	Abdul Mirza	None	None	Sohil Jodhani 02/16/2023

FROM 1.00000ml of P11173 + 1.00000ml of P11174 + 1.00000ml of P11175 + 1.00000ml of P11176 + 196.00000ml of E3464 = Final Quantity: 200.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3609	20 PPM DRO SPIKE SOLUTION (RESTEK)	PP21703	02/23/2023	08/22/2023	Yogesh Patel	None	None	Ankita Jodhani 02/24/2023

FROM 1.00000ml of P11758 + 1.00000ml of P11852 + 48.00000ml of E3470 = Final Quantity: 50.000 ml

CHEMTECH

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
435	50 PPM ICC DRO STD (Restek)	PP21824	03/15/2023	07/19/2023	Yogesh Patel	None	None	Ankita Jodhani 03/16/2023

FROM 0.50000ml of E3483 + 0.50000ml of PP21568 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
437	20 PPM ICC DRO STD (Restek)	PP21825	03/15/2023	07/19/2023	Yogesh Patel	None	None	Ankita Jodhani 03/16/2023

FROM 0.80000ml of E3483 + 0.20000ml of PP21568 = Final Quantity: 1.000 ml

CHEMTECH

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

Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
438	10 PPM ICC DRO STD (Restek)	PP21826	03/15/2023	07/19/2023	Yogesh Patel	None	None	Ankita Jodhani 03/16/2023

FROM 0.90000ml of E3483 + 0.10000ml of PP21568 = Final Quantity: 1.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
439	5 PPM ICC DRO STD (Restek)	PP21827	03/15/2023	07/19/2023	Yogesh Patel	None	None	Ankita Jodhani 03/16/2023

FROM 0.90000ml of E3483 + 0.10000ml of PP21824 = Final Quantity: 1.000 ml

CHEMTECH

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Pest/Pcb STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3797	50 PPM DRO ICV STD (CPI)	PP21828	03/15/2023	07/19/2023	Yogesh Patel	None	None	Ankita Jodhani 03/16/2023

FROM 0.50000ml of E3483 + 0.50000ml of PP21569 = Final Quantity: 1.000 ml

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-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)	22J1962006	07/19/2023	01/19/2023 / Rajesh	12/19/2022 / Rajesh	E3459

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	08/02/2023	02/02/2023 / Rajesh	01/24/2023 / Rajesh	E3464

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	11/08/2023	03/08/2023 / Rajesh	02/28/2023 / Rajesh	E3483

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

CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-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 #
Absolute Standards, Inc.	72072 / n-Tetracosane-d50, 1000 ug/ml	091120	07/27/2023	01/27/2023 / yogesh	10/29/2021 / Abdul	P11170

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	72072 / n-Tetracosane-d50, 1000 ug/ml	091120	07/27/2023	01/27/2023 / yogesh	10/29/2021 / Abdul	P11171

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	72072 / n-Tetracosane-d50, 1000 ug/ml	091120	07/27/2023	01/27/2023 / yogesh	10/29/2021 / Abdul	P11172

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	72072 / n-Tetracosane-d50, 1000 ug/ml	091120	08/16/2023	02/16/2023 / Abdul	10/29/2021 / Abdul	P11173

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	72072 / n-Tetracosane-d50, 1000 ug/ml	091120	08/16/2023	02/16/2023 / Abdul	10/29/2021 / Abdul	P11174

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	72072 / n-Tetracosane-d50, 1000 ug/ml	091120	08/16/2023	02/16/2023 / Abdul	10/29/2021 / Abdul	P11175

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Absolute Standards, Inc.	72072 / n-Tetracosane-d50, 1000 ug/ml	091120	08/16/2023	02/16/2023 / Abdul	10/29/2021 / Abdul	P11176

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
CPI International	Z-110400-05-01 / TRPH Standard (C8-C40), 500 mg/L, 1 ml	472647	07/27/2023	01/27/2023 / yogesh	02/10/2022 / Yogesh	P11475

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
CPI International	Z-110400-05-01 / TRPH Standard (C8-C40), 500 mg/L, 1 ml	472647	07/27/2023	01/27/2023 / yogesh	02/10/2022 / Yogesh	P11476

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31266 / Florida TRPH Standard	A0181886	07/27/2023	01/27/2023 / yogesh	05/27/2022 / Sohil	P11754

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	31266 / Florida TRPH Standard	A0181886	07/27/2023	01/27/2023 / yogesh	05/27/2022 / Sohil	P11755

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31266 / Florida TRPH Standard	A0181886	07/27/2023	01/27/2023 / yogesh	05/27/2022 / Sohil	P11756

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31266 / Florida TRPH Standard	A0181886	07/27/2023	01/27/2023 / yogesh	05/27/2022 / Sohil	P11757

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31266 / Florida TRPH Standard	A0181886	08/23/2023	02/23/2023 / yogesh	05/27/2022 / Sohil	P11758

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31266 / Florida TRPH Standard	A0184585	08/23/2023	02/23/2023 / yogesh	06/17/2022 / Yogesh	P11852

CPI INTERNATIONAL

5580 Skylane Blvd
Santa Rosa, CA 95403

(707)525-5788
(800)878-7654 Toll Free
(707)545-7901 Fax

Manufacturer's Quality System
Audited & Registered
by TUV USA to ISO 9001:2015

Date Received:_____

Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
Z-110400 -05-01 -10PAK	472647	≤ -10 °C	Hexane	11/18/2023	TRPH Standard (C8-C40), 500 mg/L, 10 x 1 ml

Compound	CAS No.	Purity (%)	Compound Lot No.	Concentration, mg/L
decane (C10)	124-18-5	99.5	415.7.1P	500.2 ± 2.29
docosane (C22)	629-97-0	99	420.1.1P	502.4 ± 5.5
dodecane (C12)	112-40-3	99.2	416.7.1P	500.7 ± 2.29
dotriacontane (C32)	544-85-4	98	425.29.2P	499.8 ± 5.47
eicosane (C20)	112-95-8	98.9	419.29.1P	505.1 ± 2.31
hexacosane (C26)	630-01-3	99.3	422.7.2P	500 ± 2.29
hexatriacontane (C36)	630-06-8	98	427.29.1P	500.3 ± 5.48
n-hexadecane (C16)	544-76-3	99.45	368.271.1P	499.6 ± 2.23
octacosane (C28)	630-02-4	98.7	423.400.1P	498.3 ± 5.45
n-octadecane (C18)	593-45-3	99.5	418.29.1P	501.9 ± 2.24
octane (C8)	111-65-9	99.5	385.9.1P	499.8 ± 2.23
octatriacontane (C38)	7194-85-6	99	428.7.1P	499.8 ± 2.29
tetracontane (C40)	4181-95-7	100	429.7.1P	504.1 ± 5.52
n-tetradecane (C14)	629-59-4	99	417.29.4P	500.4 ± 5.48
tetratriacontane (C34)	14167-59-0	98.1	426.7.2P	499.6 ± 2.28
triacontane (C30)	638-68-6	99.5	424.7.1.1P	499.9 ± 2.29
tetracosane (C24)	646-31-1	99	421.1.1P	500.1 ± 5.47

P11489 & P11488 Y.P. 02/20/22

Let the standard warm to room temperature and sonicate before opening.

*Not a certified value

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.

Certified By: _____

Jarrett Howard
Chemist

CPI INTERNATIONAL

5580 Skylane Blvd
Santa Rosa, CA 95403

(707)525-5788
(800)878-7654 Toll Free
(707)545-7901 Fax

Manufacturer's Quality System
Audited & Registered
by TUV USA to ISO 9001:2015

Date Received:_____

Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
Z-110400 -05-01 -10PAK	472647	≤ -10 °C	Hexane	11/18/2023	TRPH Standard (C8-C40), 500 mg/L, 10 x 1 ml

Compound	CAS No.	Purity (%)	Compound Lot No.	Concentration, mg/L
decane (C10)	124-18-5	99.5	415.7.1P	500.2 ± 2.29
docosane (C22)	629-97-0	99	420.1.1P	502.4 ± 5.5
dodecane (C12)	112-40-3	99.2	416.7.1P	500.7 ± 2.29
dotriacontane (C32)	544-85-4	98	425.29.2P	499.8 ± 5.47
eicosane (C20)	112-95-8	98.9	419.29.1P	505.1 ± 2.31
hexacosane (C26)	630-01-3	99.3	422.7.2P	500 ± 2.29
hexatriacontane (C36)	630-06-8	98	427.29.1P	500.3 ± 5.48
n-hexadecane (C16)	544-76-3	99.45	368.271.1P	499.6 ± 2.23
octacosane (C28)	630-02-4	98.7	423.400.1P	498.3 ± 5.45
n-octadecane (C18)	593-45-3	99.5	418.29.1P	501.9 ± 2.24
octane (C8)	111-65-9	99.5	385.9.1P	499.8 ± 2.23
octatriacontane (C38)	7194-85-6	99	428.7.1P	499.8 ± 2.29
tetracontane (C40)	4181-95-7	100	429.7.1P	504.1 ± 5.52
n-tetradecane (C14)	629-59-4	99	417.29.4P	500.4 ± 5.48
tetratriacontane (C34)	14167-59-0	98.1	426.7.2P	499.6 ± 2.28
triacontane (C30)	638-68-6	99.5	424.7.1.1P	499.9 ± 2.29
tetracosane (C24)	646-31-1	99	421.1.1P	500.1 ± 5.47

P11489 & P11488 Y.P. 02/20/22

Let the standard warm to room temperature and sonicate before opening.

*Not a certified value

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.

Certified By: _____

Jarrett Howard
Chemist

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.: 22J1962006
Manufactured Date: 2022-09-23
Expiration Date: 2023-12-23
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	≤ 5	3
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	≤ 10	6
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 3459

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.: 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 34 64

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.: 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 3483

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
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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

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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
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CERTIFIED WEIGHT REPORT

Part Number: 72072
Lot Number: 091120
Description: n-Tetracosane-d50

Expiration Date: 091130
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 23060

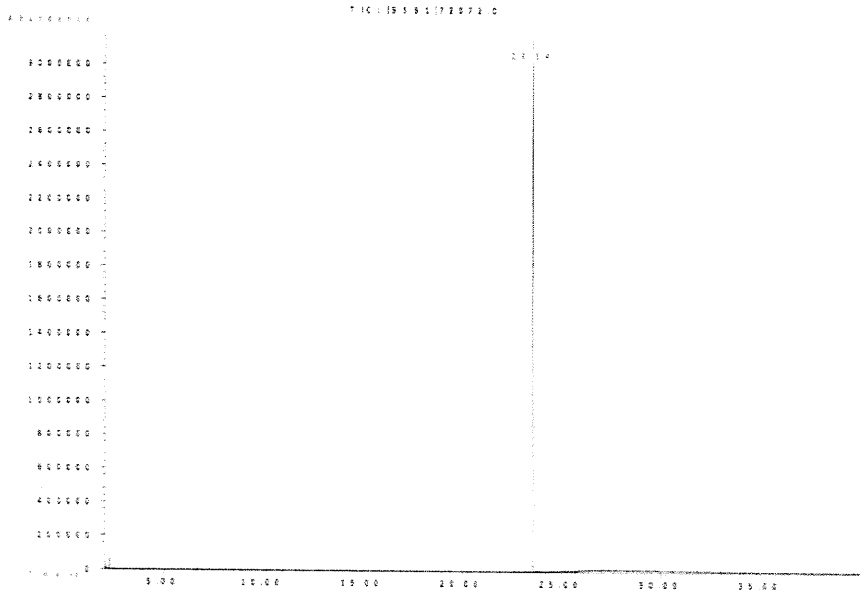
Solvent(s): **Lot#**
Methylene chloride 104929

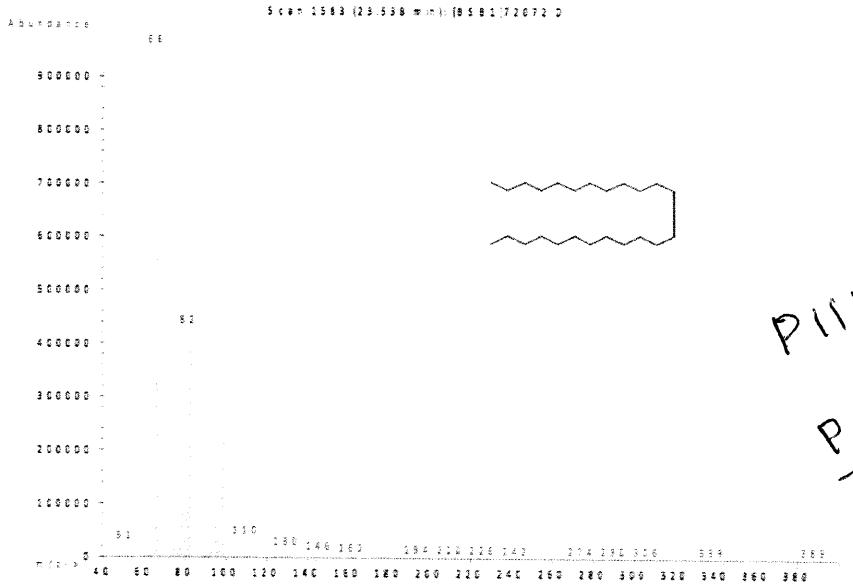
Formulated By:	Benson Chan	091120 DATE
Reviewed By:	Pedro L. Rentas	091120 DATE

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 200.0 0.058 Flask Uncertainty

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Assay (%D)	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. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20481	1000.5	4.1	16416-32-3	N/A	N/A

Method GC8MSD-3.M: Column:SPB-5 (30m X 0.25mm ID X 0.25µm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (9min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Candice Warren.





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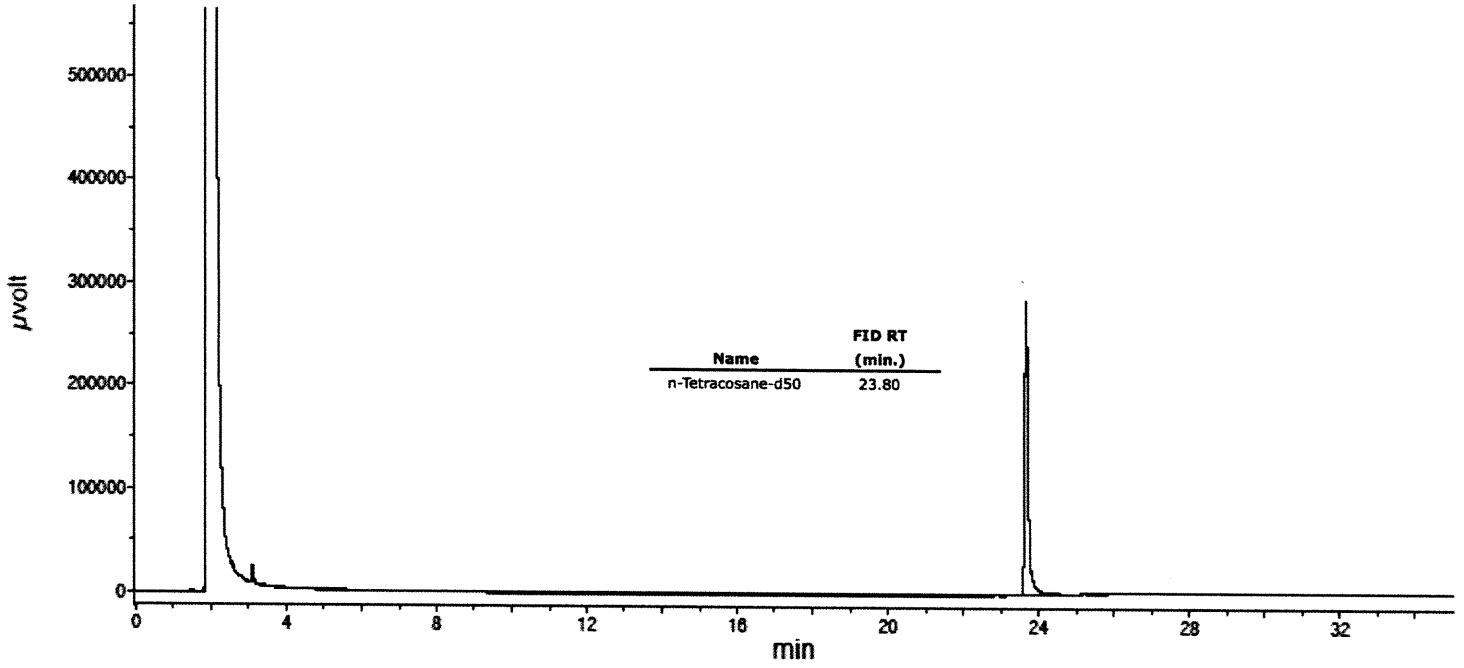
- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certifed (+/-) 0.5% of the stated value, 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).

Run 75, "P72072 L091120 [1000µg/mL in MeCl2]"

Run Length: 35.00 min, 20999 points at 10 points/second.
Created: Thu, Sep 17, 2020 at 9:46:03 AM.
Sampled: Sequence "091420-GC4M2", Method "GC4-M1".
Analyzed using Method "GC4-M1".

Comments

GC4-M1 Analysis by Candice Warren
Column ID SPB5 L#60062-01A : 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 mL
Oven Temp 1 = 50°C (1 min), Rate = 10°C/min, Oven Temp 2 = 300°C (9 min), Total Run Time = 35 Minutes.
Injector Temp = 200°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



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CERTIFIED WEIGHT REPORT

Part Number: 72072
Lot Number: 091120
Description: n-Tetracosane-d50

Expiration Date: 091130
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 23060

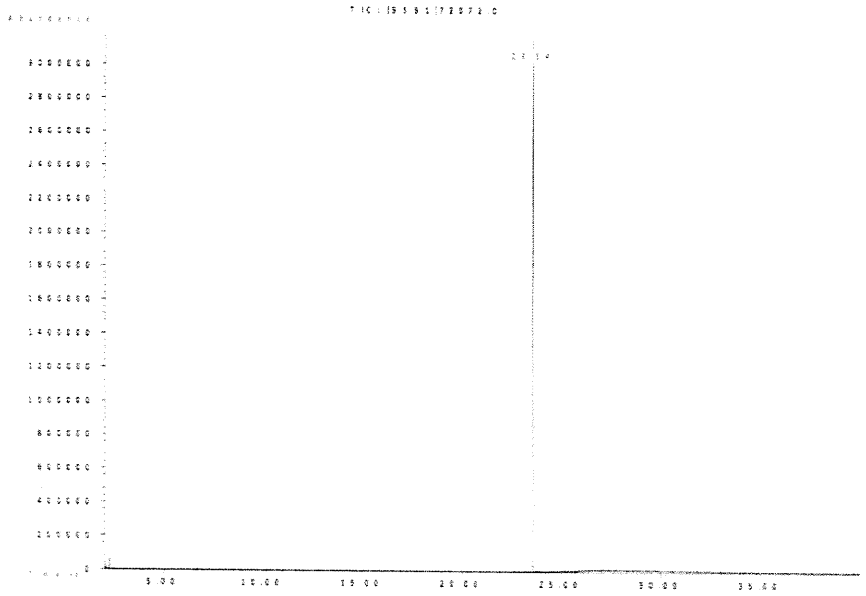
Solvent(s): **Lot#**
Methylene chloride 104929

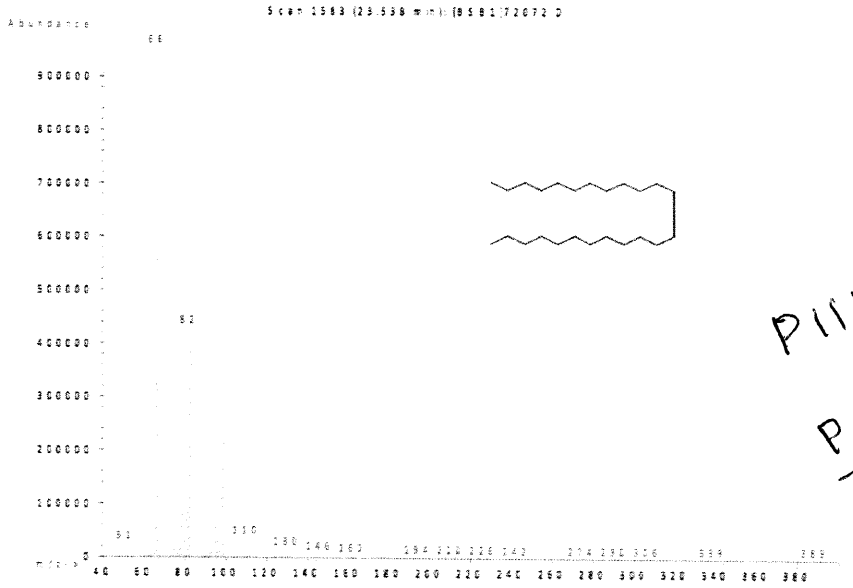
Formulated By:	Benson Chan	091120 DATE
Reviewed By:	Pedro L. Rentas	091120 DATE

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 200.0 0.058 Flask Uncertainty

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Assay (%D)	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. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20481	1000.5	4.1	16416-32-3	N/A	N/A

Method GC8MSD-3.M: Column:SPB-5 (30m X 0.25mm ID X 0.25µm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (9min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Candice Warren.





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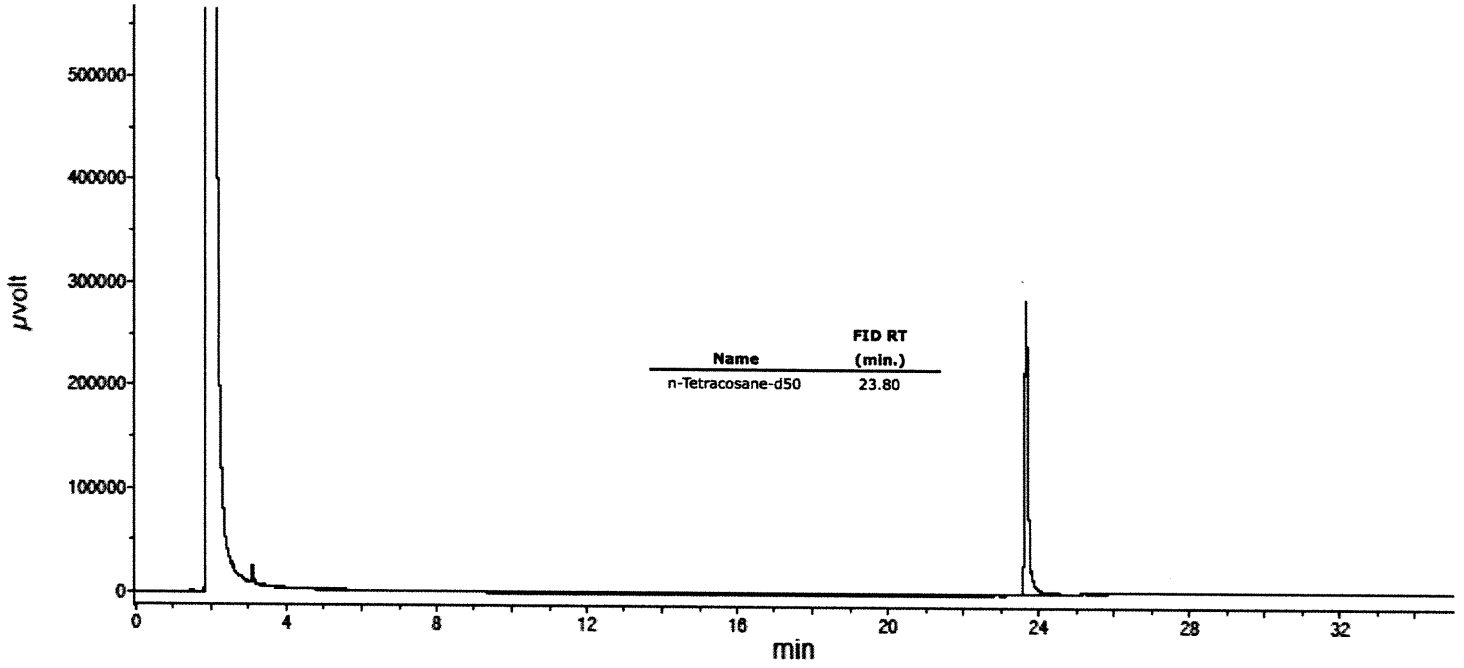
- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certifed (+/-) 0.5% of the stated value, 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).

Run 75, "P72072 L091120 [1000µg/mL in MeCl2]"

Run Length: 35.00 min, 20999 points at 10 points/second.
Created: Thu, Sep 17, 2020 at 9:46:03 AM.
Sampled: Sequence "091420-GC4M2", Method "GC4-M1".
Analyzed using Method "GC4-M1".

Comments

GC4-M1 Analysis by Candice Warren
Column ID SPB5 L#60062-01A : 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 mL
Oven Temp 1 = 50°C (1 min), Rate = 10°C/min, Oven Temp 2 = 300°C (9 min), Total Run Time = 35 Minutes.
Injector Temp = 200°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



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CERTIFIED WEIGHT REPORT

Part Number: 72072
Lot Number: 091120
Description: n-Tetracosane-d50

Expiration Date: 091130
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 23060

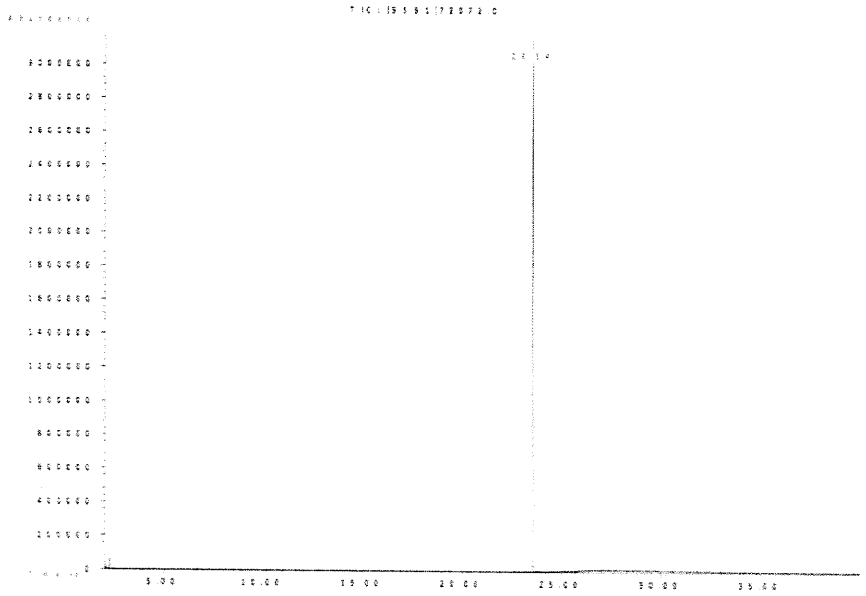
Solvent(s): **Lot#**
Methylene chloride 104929

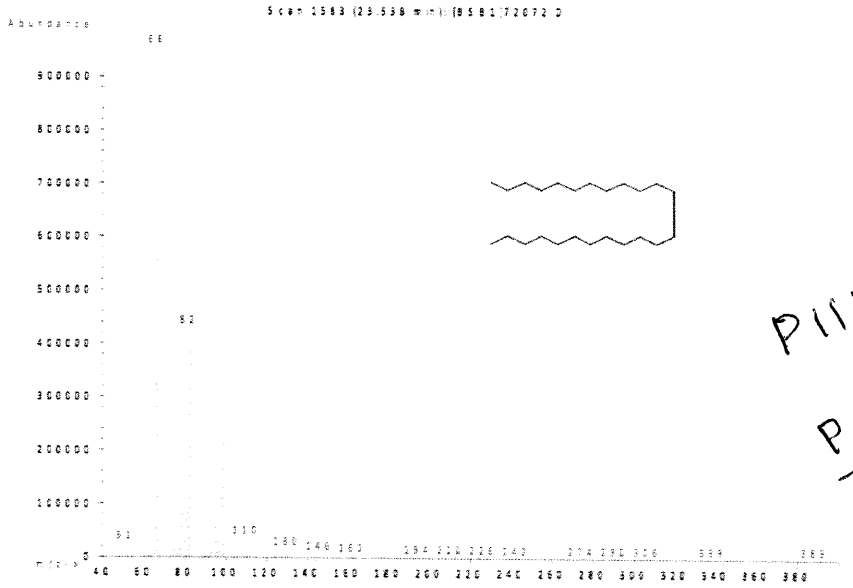
Formulated By:	Benson Chan	091120 DATE
Reviewed By:	Pedro L. Rentas	091120 DATE

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 200.0 0.058 Flask Uncertainty

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Assay (%D)	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. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20481	1000.5	4.1	16416-32-3	N/A	N/A

Method GC8MSD-3.M: Column:SPB-5 (30m X 0.25mm ID X 0.25µm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (9min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Candice Warren.





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- 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).
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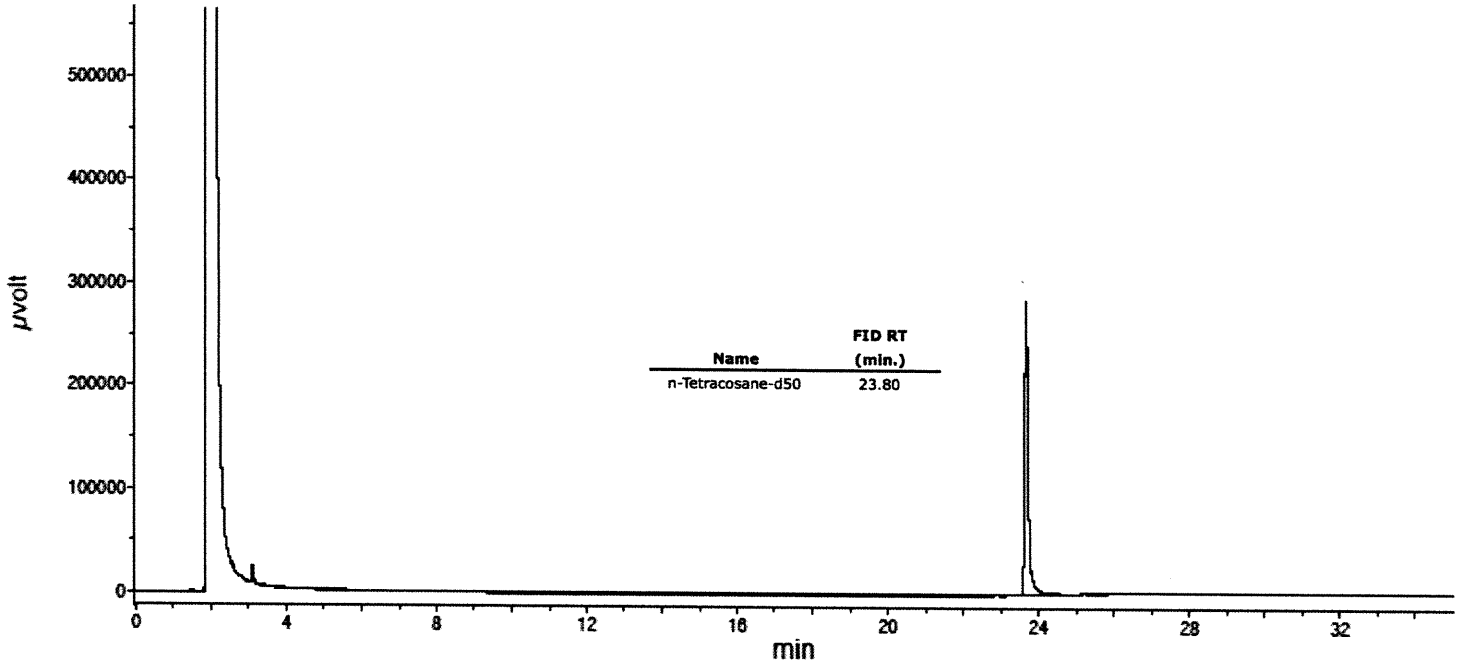
- All Standards, after opening ampule, should be stored with caps tight and under appropriate laboratory conditions.
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).

Run 75, "P72072 L091120 [1000µg/mL in MeCl2]"

Run Length: 35.00 min, 20999 points at 10 points/second.
Created: Thu, Sep 17, 2020 at 9:46:03 AM.
Sampled: Sequence "091420-GC4M2", Method "GC4-M1".
Analyzed using Method "GC4-M1".

Comments

GC4-M1 Analysis by Candice Warren
Column ID SPB5 L#60062-01A : 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 mL
Oven Temp 1 = 50°C (1 min), Rate = 10°C/min, Oven Temp 2 = 300°C (9 min), Total Run Time = 35 Minutes.
Injector Temp = 200°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



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CERTIFIED WEIGHT REPORT

Part Number: 72072
Lot Number: 091120
Description: n-Tetracosane-d50

Expiration Date: 091130
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 23060

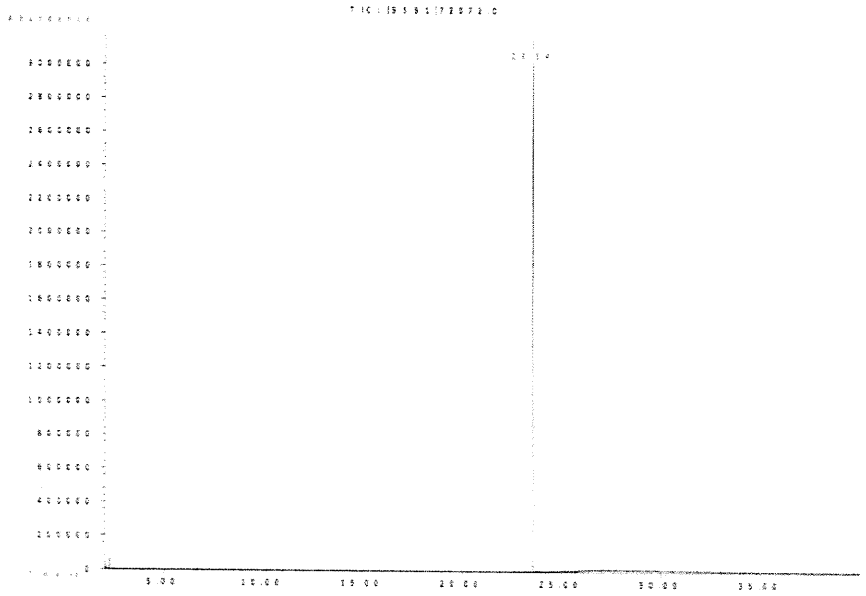
Solvent(s): **Lot#**
Methylene chloride 104929

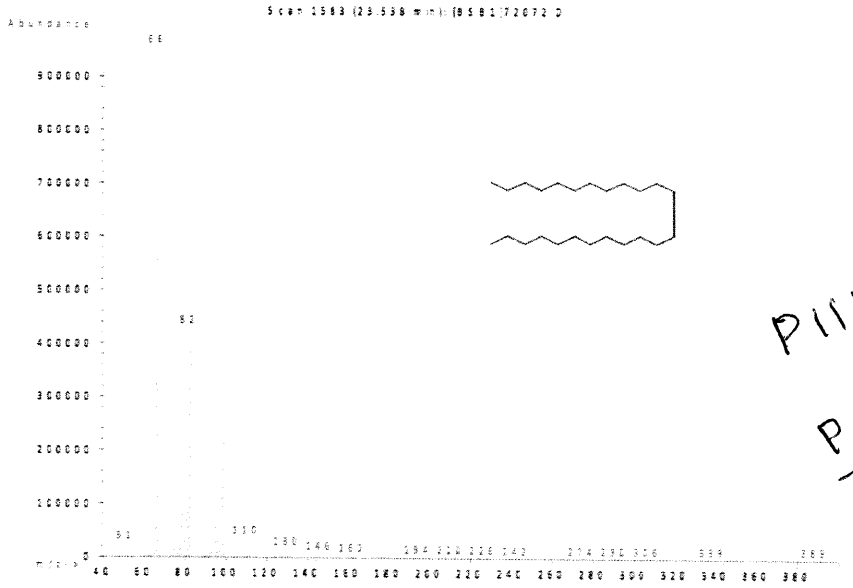
Formulated By:	Benson Chan	091120 DATE
Reviewed By:	Pedro L. Rentas	091120 DATE

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 200.0 0.058 Flask Uncertainty

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Assay (%D)	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. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20481	1000.5	4.1	16416-32-3	N/A	N/A

Method GC8MSD-3.M: Column:SPB-5 (30m X 0.25mm ID X 0.25µm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (9min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Candice Warren.





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- 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).
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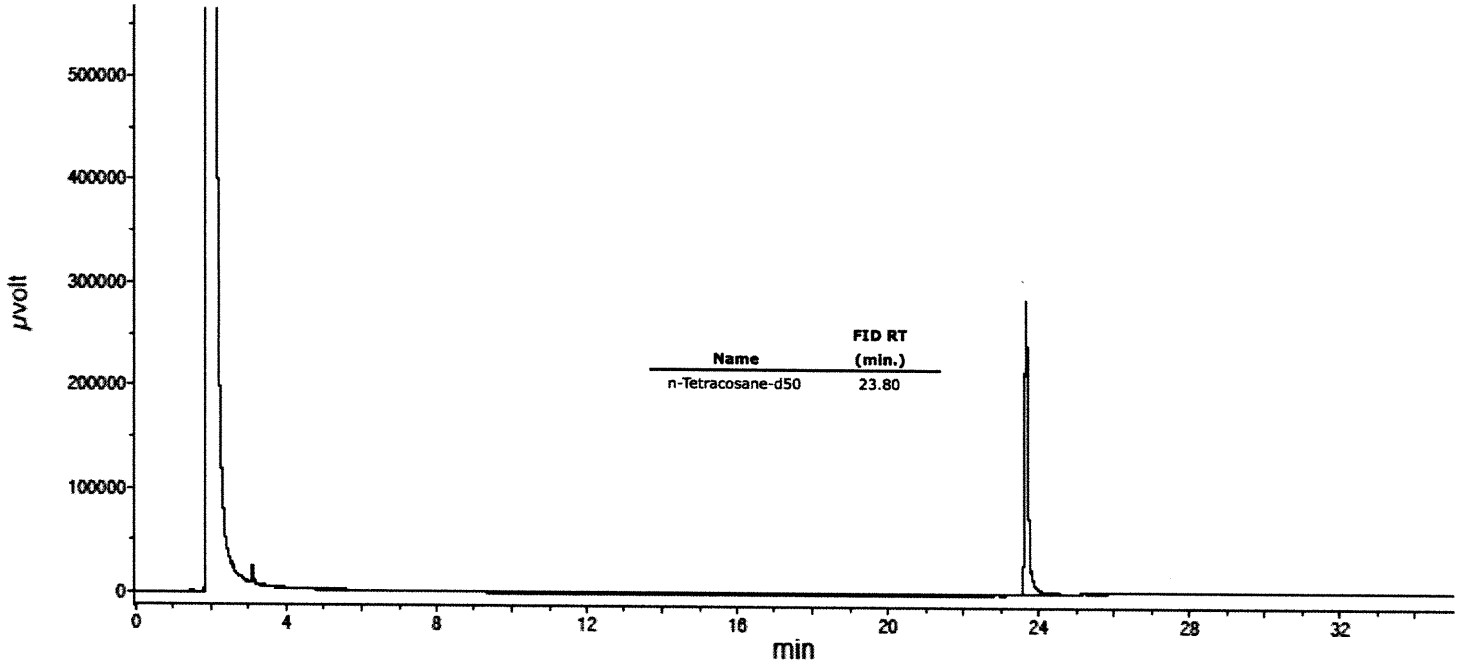
- Uncertainty Reference: Taylor, B.N. and Kuyat, C.E., "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Result," NIST Technical Note 1297, U.S. Government Printing Office, Washington, DC, (1994).

Run 75, "P72072 L091120 [1000µg/mL in MeCl2]"

Run Length: 35.00 min, 20999 points at 10 points/second.
Created: Thu, Sep 17, 2020 at 9:46:03 AM.
Sampled: Sequence "091420-GC4M2", Method "GC4-M1".
Analyzed using Method "GC4-M1".

Comments

GC4-M1 Analysis by Candice Warren
Column ID SPB5 L#60062-01A : 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 mL
Oven Temp 1 = 50°C (1 min), Rate = 10°C/min, Oven Temp 2 = 300°C (9 min), Total Run Time = 35 Minutes.
Injector Temp = 200°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



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CERTIFIED WEIGHT REPORT

Part Number: 72072
Lot Number: 091120
Description: n-Tetracosane-d50

Expiration Date: 091130
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 23060

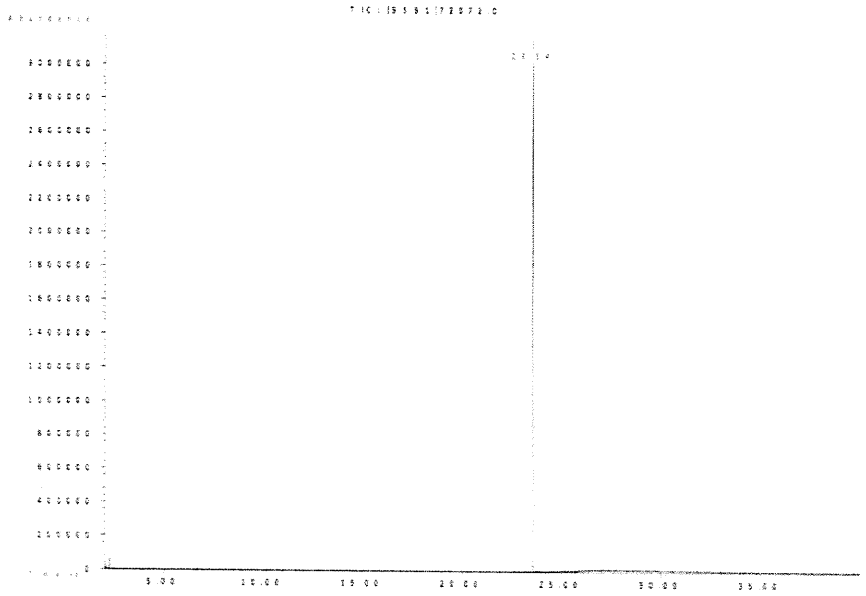
Solvent(s): **Lot#**
Methylene chloride 104929

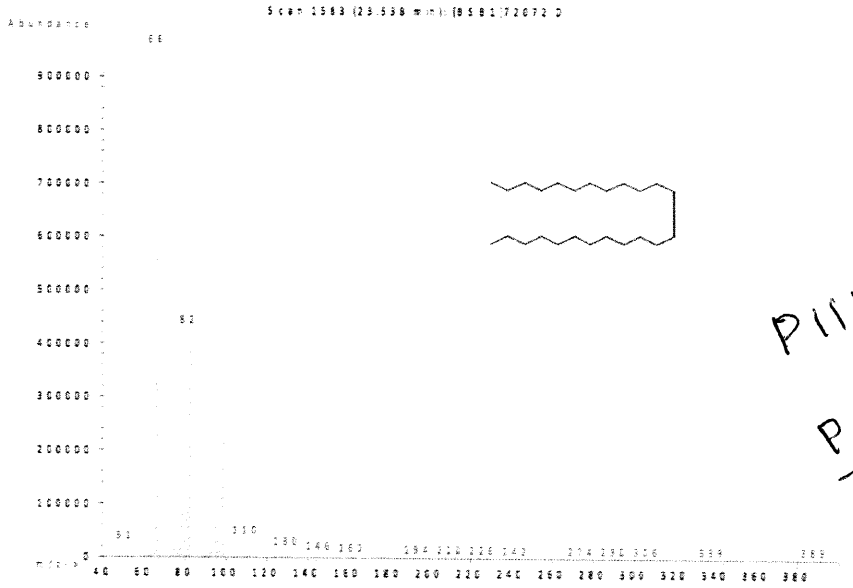
Formulated By:	Benson Chan	091120 DATE
Reviewed By:	Pedro L. Rentas	091120 DATE

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 200.0 0.058 Flask Uncertainty

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Assay (%D)	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. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20481	1000.5	4.1	16416-32-3	N/A	N/A

Method GC8MSD-3.M: Column:SPB-5 (30m X 0.25mm ID X 0.25µm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (9min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Candice Warren.





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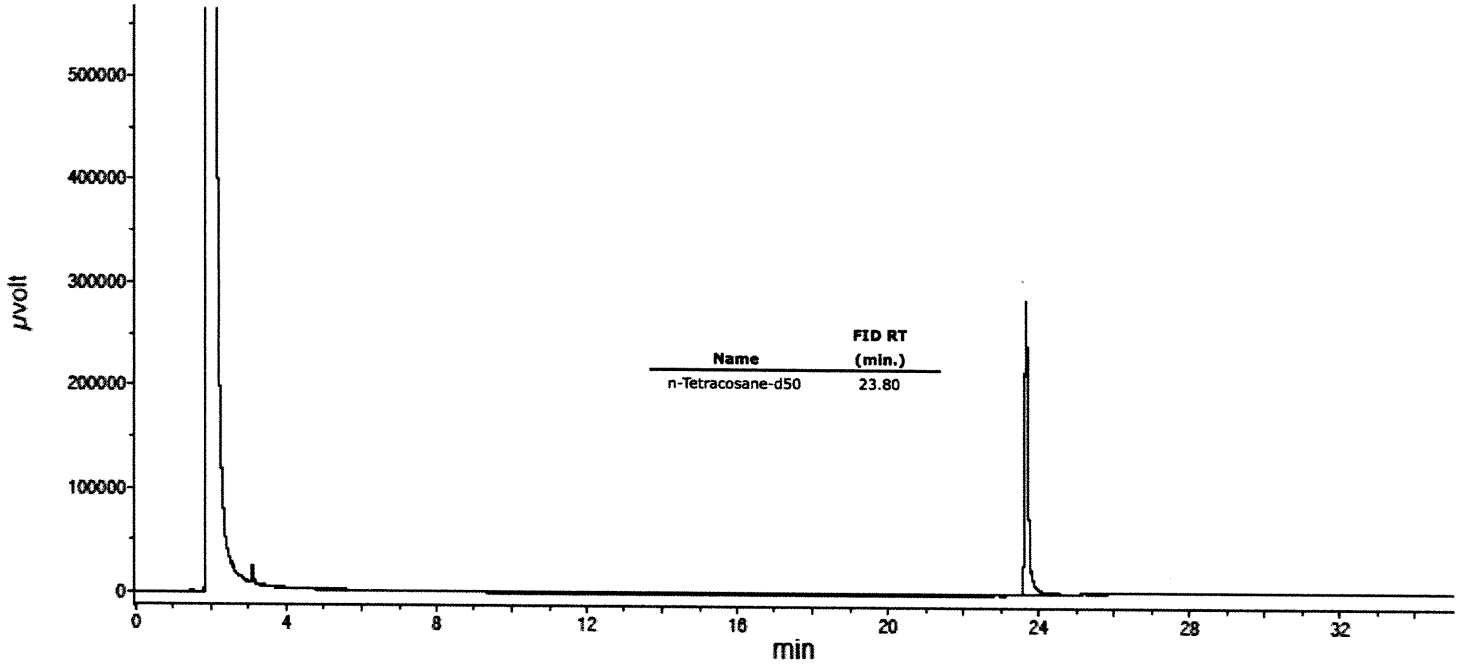
- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certifed (+/-) 0.5% of the stated value, 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).

Run 75, "P72072 L091120 [1000µg/mL in MeCl2]"

Run Length: 35.00 min, 20999 points at 10 points/second.
Created: Thu, Sep 17, 2020 at 9:46:03 AM.
Sampled: Sequence "091420-GC4M2", Method "GC4-M1".
Analyzed using Method "GC4-M1".

Comments

GC4-M1 Analysis by Candice Warren
Column ID SPB5 L#60062-01A : 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 mL
Oven Temp 1 = 50°C (1 min), Rate = 10°C/min, Oven Temp 2 = 300°C (9 min), Total Run Time = 35 Minutes.
Injector Temp = 200°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



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11/02/21

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: 72072
Lot Number: 091120
Description: n-Tetracosane-d50

Expiration Date: 091130
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 23060

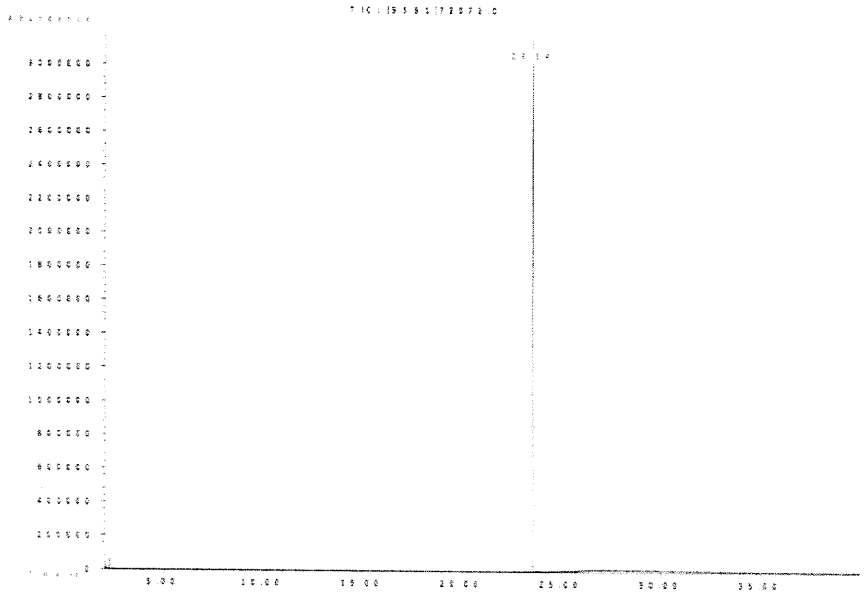
Solvent(s): **Lot#**
Methylene chloride 104929

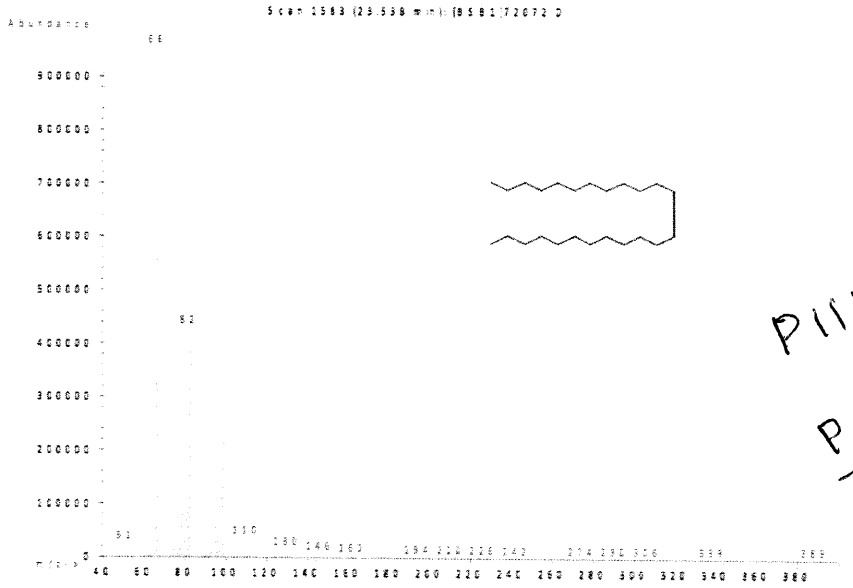
Formulated By:	Benson Chan	091120 DATE
Reviewed By:	Pedro L. Rentas	091120 DATE

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 200.0 0.058 Flask Uncertainty

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Assay (%D)	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. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20481	1000.5	4.1	16416-32-3	N/A	N/A

Method GC8MSD-3.M: Column:SPB-5 (30m X 0.25mm ID X 0.25µm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (9min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Candice Warren.





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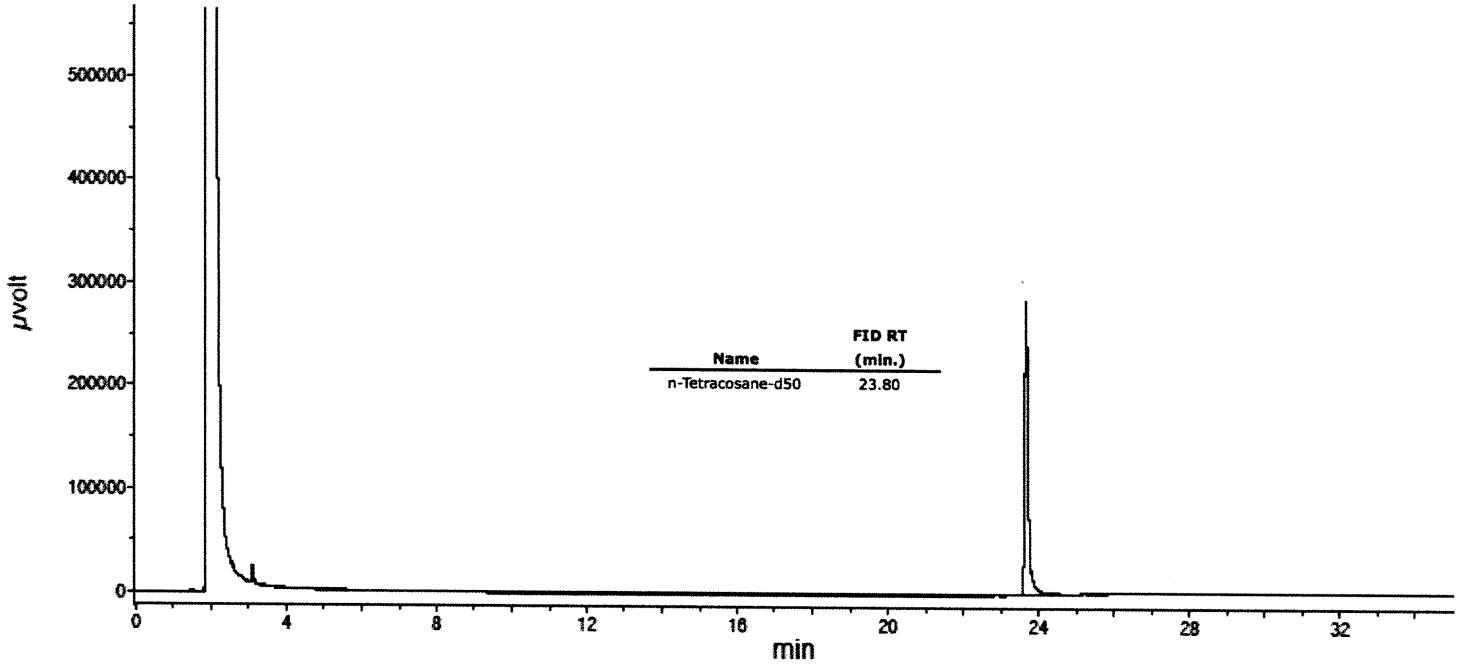
- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certifed (+/-) 0.5% of the stated value, 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).

Run 75, "P72072 L091120 [1000µg/mL in MeCl2]"

Run Length: 35.00 min, 20999 points at 10 points/second.
Created: Thu, Sep 17, 2020 at 9:46:03 AM.
Sampled: Sequence "091420-GC4M2", Method "GC4-M1".
Analyzed using Method "GC4-M1".

Comments

GC4-M1 Analysis by Candice Warren
Column ID SPB5 L#60062-01A : 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 mL
Oven Temp 1 = 50°C (1 min), Rate = 10°C/min, Oven Temp 2 = 300°C (9 min), Total Run Time = 35 Minutes.
Injector Temp = 200°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



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Certified Reference Material CRM

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

CERTIFIED WEIGHT REPORT

Part Number: 72072
Lot Number: 091120
Description: n-Tetracosane-d50

Expiration Date: 091130
Recommended Storage: Ambient (20 °C)
Nominal Concentration (µg/mL): 1000
NIST Test ID#: 23060

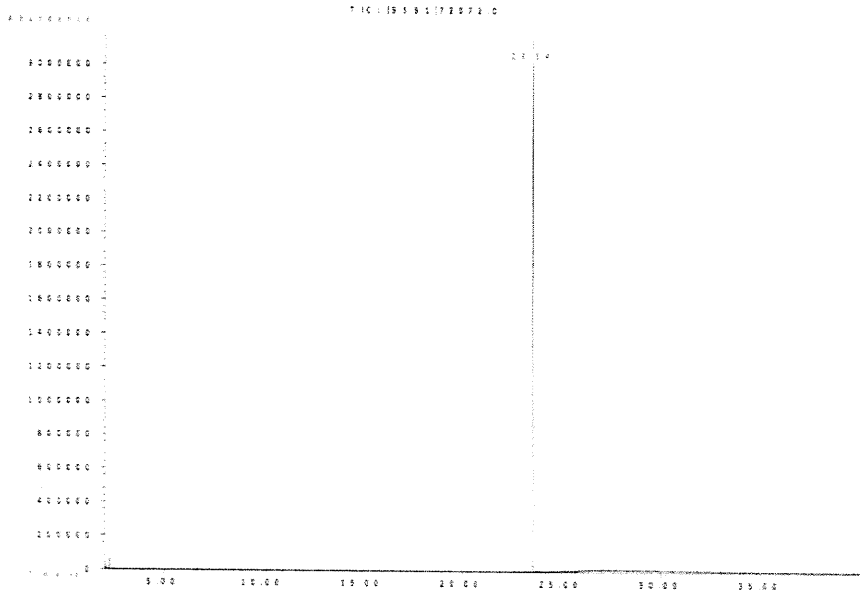
Solvent(s): **Lot#**
Methylene chloride 104929

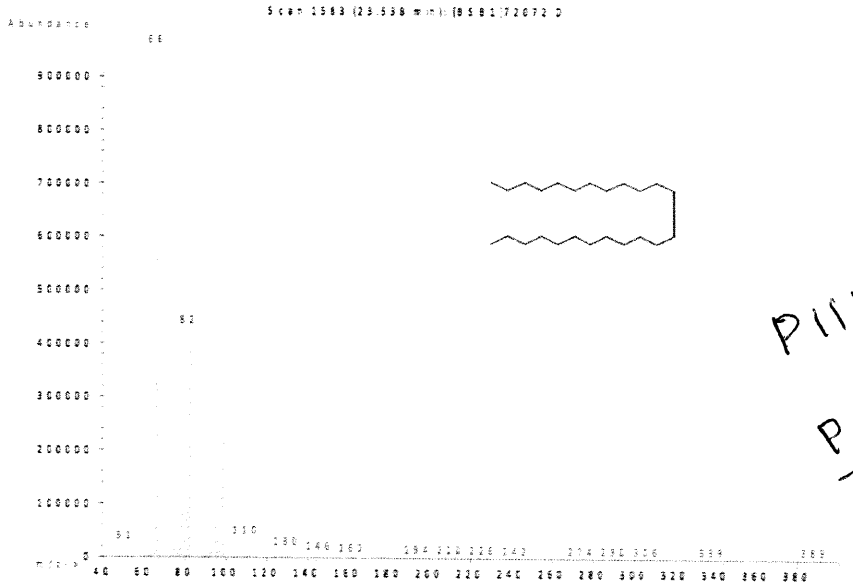
Formulated By:	Benson Chan	091120 DATE
Reviewed By:	Pedro L. Rentas	091120 DATE

5E-05 Balance Uncertainty
Weight(s) shown below were combined and diluted to (mL): 200.0 0.058 Flask Uncertainty

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Assay (%D)	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. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20481	1000.5	4.1	16416-32-3	N/A	N/A

Method GC8MSD-3.M: Column:SPB-5 (30m X 0.25mm ID X 0.25µm film thickness) Temp 1 = 50°C (1min.), Temp 2 = 300°C (9min.), Rate = 10°C/min., Injector B= 250°C, Detector B = 275°C, Split Ratio = 100:1, Scan Rate = 2. Analysis performed by: Candice Warren.





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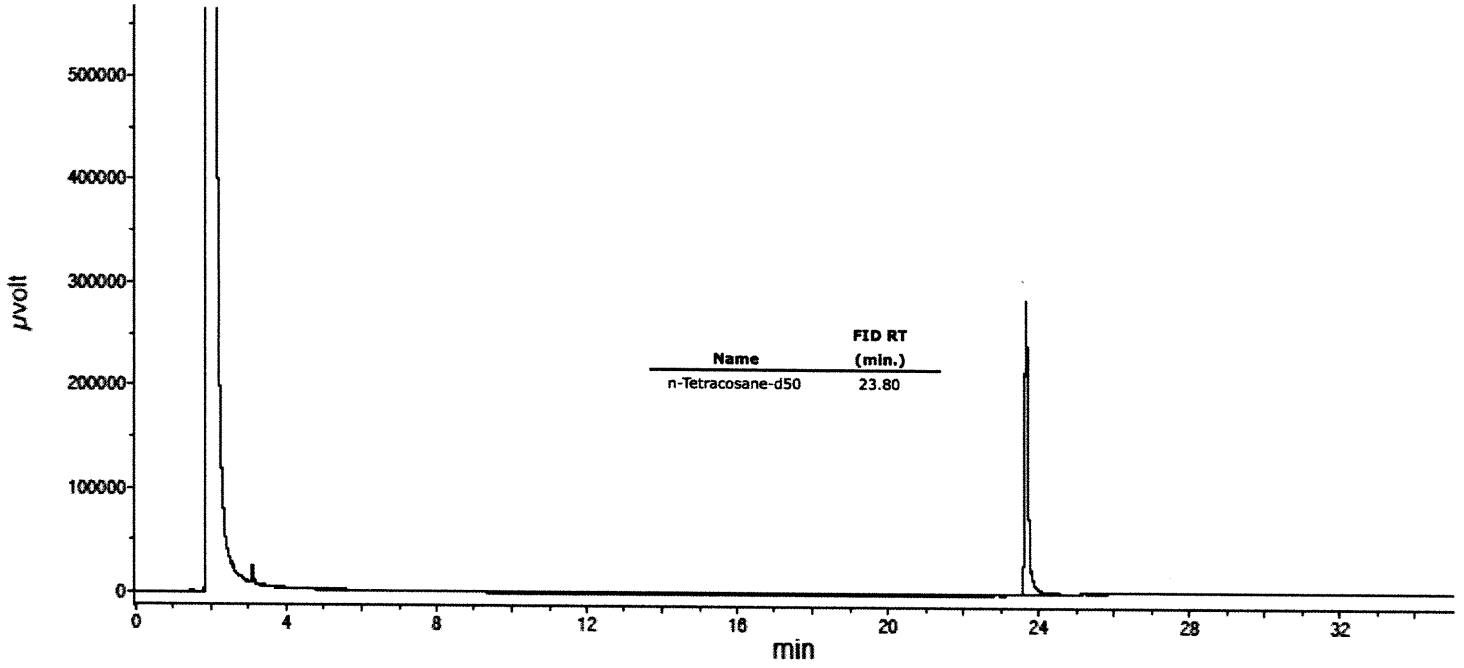
- The certified value is the concentration calculated from gravimetric and volumetric measurements unless otherwise stated.
- Standards are prepared gravimetrically using balances that are calibrated with weights traceable to NIST (see above).
- Standards are certifed (+/-) 0.5% of the stated value, 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).

Run 75, "P72072 L091120 [1000µg/mL in MeCl2]"

Run Length: 35.00 min, 20999 points at 10 points/second.
Created: Thu, Sep 17, 2020 at 9:46:03 AM.
Sampled: Sequence "091420-GC4M2", Method "GC4-M1".
Analyzed using Method "GC4-M1".

Comments

GC4-M1 Analysis by Candice Warren
Column ID SPB5 L#60062-01A : 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 mL
Oven Temp 1 = 50°C (1 min), Rate = 10°C/min, Oven Temp 2 = 300°C (9 min), Total Run Time = 35 Minutes.
Injector Temp = 200°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



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Reference Material Producer
Certificate #3222.01

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ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

P11749 to P11758

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. : 31266 **Lot No.:** A0181886

Description : Florida TRPH Standard

Florida TRPH Standard 500µg/mL, Hexane, 1mL/ampul

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

Expiration Date : March 31, 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-Octane (C8)		501.6 µg/mL	+/- 2.9794	µg/mL	Gravimetric
	CAS # 111-65-9	(Lot SHBM4827)		+/- 12.4620	µg/mL	Unstressed
	Purity 99%			+/- 14.9378	µg/mL	Stressed
2	n-Decane (C10)		501.8 µg/mL	+/- 2.9802	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBM1113)		+/- 12.4657	µg/mL	Unstressed
	Purity 99%			+/- 14.9423	µg/mL	Stressed
3	n-Dodecane (C12)		500.9 µg/mL	+/- 2.9752	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 12.4446	µg/mL	Unstressed
	Purity 99%			+/- 14.9169	µg/mL	Stressed
4	n-Tetradecane (C14)		500.7 µg/mL	+/- 2.9740	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 12.4396	µg/mL	Unstressed
	Purity 99%			+/- 14.9110	µg/mL	Stressed
5	n-Hexadecane (C16)		500.5 µg/mL	+/- 2.9727	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 12.4343	µg/mL	Unstressed
	Purity 98%			+/- 14.9046	µg/mL	Stressed
6	n-Octadecane (C18)		500.5 µg/mL	+/- 2.9730	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot UE5NG)		+/- 12.4355	µg/mL	Unstressed
	Purity 98%			+/- 14.9061	µg/mL	Stressed
7	n-Eicosane (C20)		500.6 µg/mL	+/- 2.9731	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 12.4359	µg/mL	Unstressed
	Purity 99%			+/- 14.9065	µg/mL	Stressed

8	n-Docosane (C22)		501.5	µg/mL	+/-	2.9785	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	12.4583	µg/mL	Unstressed
	Purity 99%				+/-	14.9333	µg/mL	Stressed
9	n-Tetracosane (C24)		500.6	µg/mL	+/-	2.9731	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCJ8741)			+/-	12.4359	µg/mL	Unstressed
	Purity 99%				+/-	14.9065	µg/mL	Stressed
10	n-Hexacosane (C26)		500.5	µg/mL	+/-	2.9728	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	12.4347	µg/mL	Unstressed
	Purity 99%				+/-	14.9050	µg/mL	Stressed
11	n-Octacosane (C28)		500.6	µg/mL	+/-	2.9734	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	12.4371	µg/mL	Unstressed
	Purity 99%				+/-	14.9080	µg/mL	Stressed
12	n-Triacontane (C30)		501.7	µg/mL	+/-	2.9799	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCN9321)			+/-	12.4645	µg/mL	Unstressed
	Purity 99%				+/-	14.9408	µg/mL	Stressed
13	n-Dotriacontane (C32)		501.8	µg/mL	+/-	2.9805	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	12.4670	µg/mL	Unstressed
	Purity 99%				+/-	14.9437	µg/mL	Stressed
14	n-Tetratriacontane (C34)		501.3	µg/mL	+/-	2.9773	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	12.4533	µg/mL	Unstressed
	Purity 99%				+/-	14.9274	µg/mL	Stressed
15	n-Hexatriacontane (C36)		502.4	µg/mL	+/-	2.9841	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot U25B014)			+/-	12.4819	µg/mL	Unstressed
	Purity 99%				+/-	14.9616	µg/mL	Stressed
16	n-Octatriacontane (C38)		501.7	µg/mL	+/-	2.9801	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000127235)			+/-	12.4653	µg/mL	Unstressed
	Purity 97%				+/-	14.9417	µg/mL	Stressed
17	n-Tetracontane (C40)		500.2	µg/mL	+/-	2.9713	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	12.4282	µg/mL	Unstressed
	Purity 98%				+/-	14.8973	µg/mL	Stressed

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

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

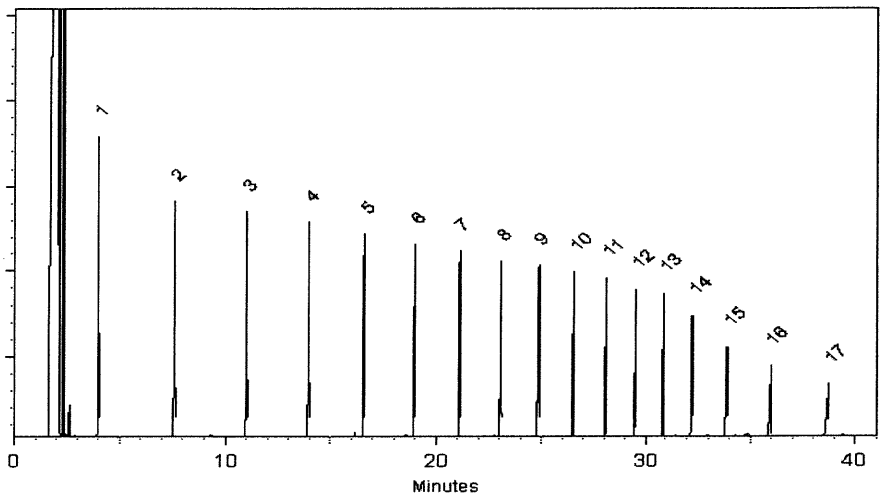
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Penelope Riglin - Operations Tech I

Date Mixed: 16-Feb-2022 **Balance:** 1128360905

Clara Windle - Operations Technician I

Date Passed: 21-Feb-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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110 Benner Circle
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CERTIFIED REFERENCE MATERIAL

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

P11749 to P11758

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. : 31266 **Lot No.:** A0181886

Description : Florida TRPH Standard

Florida TRPH Standard 500µg/mL, Hexane, 1mL/ampul

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

Expiration Date : March 31, 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-Octane (C8)		501.6 µg/mL	+/- 2.9794	µg/mL	Gravimetric
	CAS # 111-65-9	(Lot SHBM4827)		+/- 12.4620	µg/mL	Unstressed
	Purity 99%			+/- 14.9378	µg/mL	Stressed
2	n-Decane (C10)		501.8 µg/mL	+/- 2.9802	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBM1113)		+/- 12.4657	µg/mL	Unstressed
	Purity 99%			+/- 14.9423	µg/mL	Stressed
3	n-Dodecane (C12)		500.9 µg/mL	+/- 2.9752	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 12.4446	µg/mL	Unstressed
	Purity 99%			+/- 14.9169	µg/mL	Stressed
4	n-Tetradecane (C14)		500.7 µg/mL	+/- 2.9740	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 12.4396	µg/mL	Unstressed
	Purity 99%			+/- 14.9110	µg/mL	Stressed
5	n-Hexadecane (C16)		500.5 µg/mL	+/- 2.9727	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 12.4343	µg/mL	Unstressed
	Purity 98%			+/- 14.9046	µg/mL	Stressed
6	n-Octadecane (C18)		500.5 µg/mL	+/- 2.9730	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot UE5NG)		+/- 12.4355	µg/mL	Unstressed
	Purity 98%			+/- 14.9061	µg/mL	Stressed
7	n-Eicosane (C20)		500.6 µg/mL	+/- 2.9731	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 12.4359	µg/mL	Unstressed
	Purity 99%			+/- 14.9065	µg/mL	Stressed

8	n-Docosane (C22)		501.5	µg/mL	+/-	2.9785	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	12.4583	µg/mL	Unstressed
	Purity 99%				+/-	14.9333	µg/mL	Stressed
9	n-Tetracosane (C24)		500.6	µg/mL	+/-	2.9731	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCJ8741)			+/-	12.4359	µg/mL	Unstressed
	Purity 99%				+/-	14.9065	µg/mL	Stressed
10	n-Hexacosane (C26)		500.5	µg/mL	+/-	2.9728	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	12.4347	µg/mL	Unstressed
	Purity 99%				+/-	14.9050	µg/mL	Stressed
11	n-Octacosane (C28)		500.6	µg/mL	+/-	2.9734	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	12.4371	µg/mL	Unstressed
	Purity 99%				+/-	14.9080	µg/mL	Stressed
12	n-Triacontane (C30)		501.7	µg/mL	+/-	2.9799	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCN9321)			+/-	12.4645	µg/mL	Unstressed
	Purity 99%				+/-	14.9408	µg/mL	Stressed
13	n-Dotriacontane (C32)		501.8	µg/mL	+/-	2.9805	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	12.4670	µg/mL	Unstressed
	Purity 99%				+/-	14.9437	µg/mL	Stressed
14	n-Tetratriacontane (C34)		501.3	µg/mL	+/-	2.9773	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	12.4533	µg/mL	Unstressed
	Purity 99%				+/-	14.9274	µg/mL	Stressed
15	n-Hexatriacontane (C36)		502.4	µg/mL	+/-	2.9841	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot U25B014)			+/-	12.4819	µg/mL	Unstressed
	Purity 99%				+/-	14.9616	µg/mL	Stressed
16	n-Octatriacontane (C38)		501.7	µg/mL	+/-	2.9801	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000127235)			+/-	12.4653	µg/mL	Unstressed
	Purity 97%				+/-	14.9417	µg/mL	Stressed
17	n-Tetracontane (C40)		500.2	µg/mL	+/-	2.9713	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	12.4282	µg/mL	Unstressed
	Purity 98%				+/-	14.8973	µg/mL	Stressed

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

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

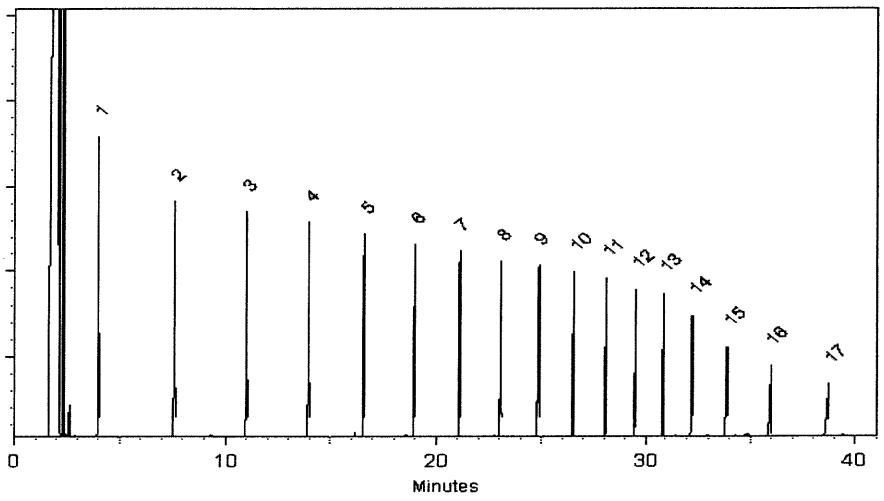
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Penelope Riglin - Operations Tech I

Date Mixed: 16-Feb-2022 **Balance:** 1128360905

Clara Windle - Operations Technician I

Date Passed: 21-Feb-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 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

P11749 to P11758

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. : 31266 **Lot No.:** A0181886

Description : Florida TRPH Standard

Florida TRPH Standard 500µg/mL, Hexane, 1mL/ampul

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

Expiration Date : March 31, 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-Octane (C8)		501.6 µg/mL	+/- 2.9794	µg/mL	Gravimetric
	CAS # 111-65-9	(Lot SHBM4827)		+/- 12.4620	µg/mL	Unstressed
	Purity 99%			+/- 14.9378	µg/mL	Stressed
2	n-Decane (C10)		501.8 µg/mL	+/- 2.9802	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBM1113)		+/- 12.4657	µg/mL	Unstressed
	Purity 99%			+/- 14.9423	µg/mL	Stressed
3	n-Dodecane (C12)		500.9 µg/mL	+/- 2.9752	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 12.4446	µg/mL	Unstressed
	Purity 99%			+/- 14.9169	µg/mL	Stressed
4	n-Tetradecane (C14)		500.7 µg/mL	+/- 2.9740	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 12.4396	µg/mL	Unstressed
	Purity 99%			+/- 14.9110	µg/mL	Stressed
5	n-Hexadecane (C16)		500.5 µg/mL	+/- 2.9727	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 12.4343	µg/mL	Unstressed
	Purity 98%			+/- 14.9046	µg/mL	Stressed
6	n-Octadecane (C18)		500.5 µg/mL	+/- 2.9730	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot UE5NG)		+/- 12.4355	µg/mL	Unstressed
	Purity 98%			+/- 14.9061	µg/mL	Stressed
7	n-Eicosane (C20)		500.6 µg/mL	+/- 2.9731	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 12.4359	µg/mL	Unstressed
	Purity 99%			+/- 14.9065	µg/mL	Stressed

8	n-Docosane (C22)		501.5	µg/mL	+/-	2.9785	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	12.4583	µg/mL	Unstressed
	Purity 99%				+/-	14.9333	µg/mL	Stressed
9	n-Tetracosane (C24)		500.6	µg/mL	+/-	2.9731	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCJ8741)			+/-	12.4359	µg/mL	Unstressed
	Purity 99%				+/-	14.9065	µg/mL	Stressed
10	n-Hexacosane (C26)		500.5	µg/mL	+/-	2.9728	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	12.4347	µg/mL	Unstressed
	Purity 99%				+/-	14.9050	µg/mL	Stressed
11	n-Octacosane (C28)		500.6	µg/mL	+/-	2.9734	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	12.4371	µg/mL	Unstressed
	Purity 99%				+/-	14.9080	µg/mL	Stressed
12	n-Triacontane (C30)		501.7	µg/mL	+/-	2.9799	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCN9321)			+/-	12.4645	µg/mL	Unstressed
	Purity 99%				+/-	14.9408	µg/mL	Stressed
13	n-Dotriacontane (C32)		501.8	µg/mL	+/-	2.9805	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	12.4670	µg/mL	Unstressed
	Purity 99%				+/-	14.9437	µg/mL	Stressed
14	n-Tetratriacontane (C34)		501.3	µg/mL	+/-	2.9773	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	12.4533	µg/mL	Unstressed
	Purity 99%				+/-	14.9274	µg/mL	Stressed
15	n-Hexatriacontane (C36)		502.4	µg/mL	+/-	2.9841	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot U25B014)			+/-	12.4819	µg/mL	Unstressed
	Purity 99%				+/-	14.9616	µg/mL	Stressed
16	n-Octatriacontane (C38)		501.7	µg/mL	+/-	2.9801	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000127235)			+/-	12.4653	µg/mL	Unstressed
	Purity 97%				+/-	14.9417	µg/mL	Stressed
17	n-Tetracontane (C40)		500.2	µg/mL	+/-	2.9713	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	12.4282	µg/mL	Unstressed
	Purity 98%				+/-	14.8973	µg/mL	Stressed

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

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

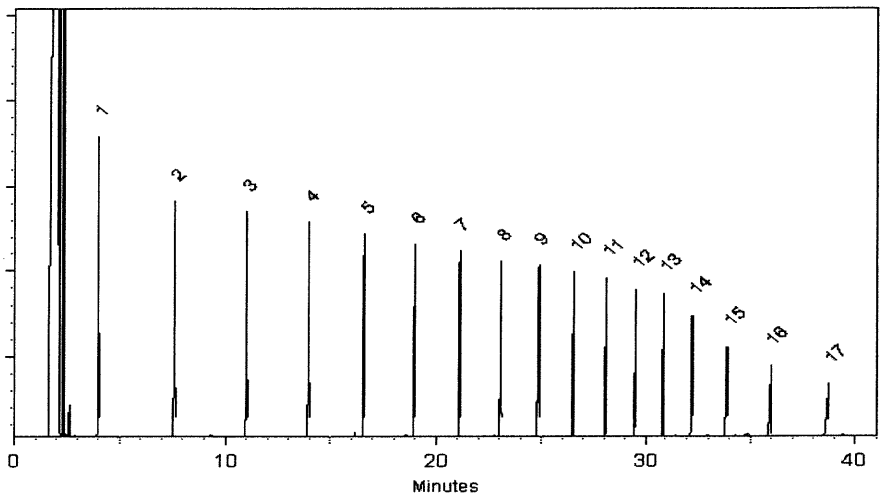
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Penelope Riglin - Operations Tech I

Date Mixed: 16-Feb-2022 **Balance:** 1128360905

Clara Windle - Operations Technician I

Date Passed: 21-Feb-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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ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

P11749 to P11758

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. : 31266 **Lot No.:** A0181886

Description : Florida TRPH Standard

Florida TRPH Standard 500µg/mL, Hexane, 1mL/ampul

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

Expiration Date : March 31, 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-Octane (C8)		501.6 µg/mL	+/- 2.9794	µg/mL	Gravimetric
	CAS # 111-65-9	(Lot SHBM4827)		+/- 12.4620	µg/mL	Unstressed
	Purity 99%			+/- 14.9378	µg/mL	Stressed
2	n-Decane (C10)		501.8 µg/mL	+/- 2.9802	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBM1113)		+/- 12.4657	µg/mL	Unstressed
	Purity 99%			+/- 14.9423	µg/mL	Stressed
3	n-Dodecane (C12)		500.9 µg/mL	+/- 2.9752	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 12.4446	µg/mL	Unstressed
	Purity 99%			+/- 14.9169	µg/mL	Stressed
4	n-Tetradecane (C14)		500.7 µg/mL	+/- 2.9740	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 12.4396	µg/mL	Unstressed
	Purity 99%			+/- 14.9110	µg/mL	Stressed
5	n-Hexadecane (C16)		500.5 µg/mL	+/- 2.9727	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 12.4343	µg/mL	Unstressed
	Purity 98%			+/- 14.9046	µg/mL	Stressed
6	n-Octadecane (C18)		500.5 µg/mL	+/- 2.9730	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot UE5NG)		+/- 12.4355	µg/mL	Unstressed
	Purity 98%			+/- 14.9061	µg/mL	Stressed
7	n-Eicosane (C20)		500.6 µg/mL	+/- 2.9731	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 12.4359	µg/mL	Unstressed
	Purity 99%			+/- 14.9065	µg/mL	Stressed

8	n-Docosane (C22)		501.5	µg/mL	+/-	2.9785	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	12.4583	µg/mL	Unstressed
	Purity 99%				+/-	14.9333	µg/mL	Stressed
9	n-Tetracosane (C24)		500.6	µg/mL	+/-	2.9731	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCJ8741)			+/-	12.4359	µg/mL	Unstressed
	Purity 99%				+/-	14.9065	µg/mL	Stressed
10	n-Hexacosane (C26)		500.5	µg/mL	+/-	2.9728	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	12.4347	µg/mL	Unstressed
	Purity 99%				+/-	14.9050	µg/mL	Stressed
11	n-Octacosane (C28)		500.6	µg/mL	+/-	2.9734	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	12.4371	µg/mL	Unstressed
	Purity 99%				+/-	14.9080	µg/mL	Stressed
12	n-Triacontane (C30)		501.7	µg/mL	+/-	2.9799	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCN9321)			+/-	12.4645	µg/mL	Unstressed
	Purity 99%				+/-	14.9408	µg/mL	Stressed
13	n-Dotriacontane (C32)		501.8	µg/mL	+/-	2.9805	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	12.4670	µg/mL	Unstressed
	Purity 99%				+/-	14.9437	µg/mL	Stressed
14	n-Tetratriacontane (C34)		501.3	µg/mL	+/-	2.9773	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	12.4533	µg/mL	Unstressed
	Purity 99%				+/-	14.9274	µg/mL	Stressed
15	n-Hexatriacontane (C36)		502.4	µg/mL	+/-	2.9841	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot U25B014)			+/-	12.4819	µg/mL	Unstressed
	Purity 99%				+/-	14.9616	µg/mL	Stressed
16	n-Octatriacontane (C38)		501.7	µg/mL	+/-	2.9801	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000127235)			+/-	12.4653	µg/mL	Unstressed
	Purity 97%				+/-	14.9417	µg/mL	Stressed
17	n-Tetracontane (C40)		500.2	µg/mL	+/-	2.9713	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	12.4282	µg/mL	Unstressed
	Purity 98%				+/-	14.8973	µg/mL	Stressed

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

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

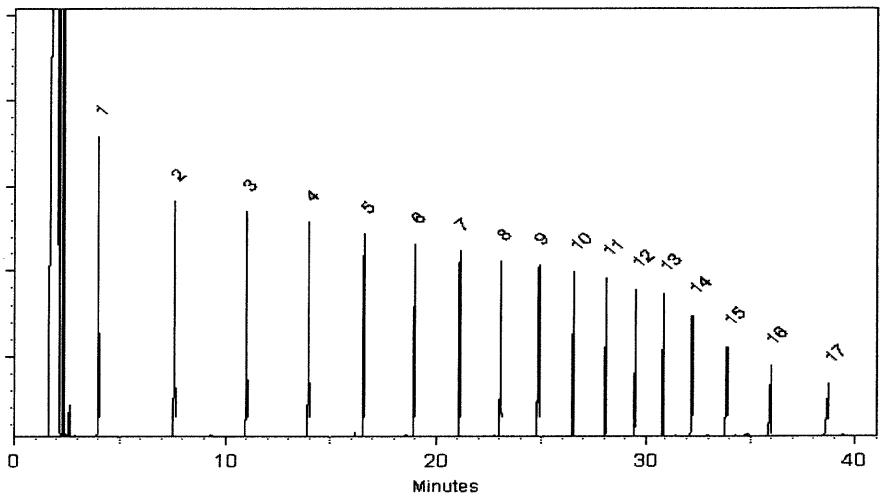
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Penelope Riglin - Operations Tech I

Date Mixed: 16-Feb-2022 **Balance:** 1128360905

Clara Windle - Operations Technician I

Date Passed: 21-Feb-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

P11749 to P11758

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. : 31266 **Lot No.:** A0181886

Description : Florida TRPH Standard

Florida TRPH Standard 500µg/mL, Hexane, 1mL/ampul

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

Expiration Date : March 31, 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-Octane (C8)		501.6 µg/mL	+/- 2.9794	µg/mL	Gravimetric
	CAS # 111-65-9	(Lot SHBM4827)		+/- 12.4620	µg/mL	Unstressed
	Purity 99%			+/- 14.9378	µg/mL	Stressed
2	n-Decane (C10)		501.8 µg/mL	+/- 2.9802	µg/mL	Gravimetric
	CAS # 124-18-5	(Lot SHBM1113)		+/- 12.4657	µg/mL	Unstressed
	Purity 99%			+/- 14.9423	µg/mL	Stressed
3	n-Dodecane (C12)		500.9 µg/mL	+/- 2.9752	µg/mL	Gravimetric
	CAS # 112-40-3	(Lot SHBK0925)		+/- 12.4446	µg/mL	Unstressed
	Purity 99%			+/- 14.9169	µg/mL	Stressed
4	n-Tetradecane (C14)		500.7 µg/mL	+/- 2.9740	µg/mL	Gravimetric
	CAS # 629-59-4	(Lot STBK2282)		+/- 12.4396	µg/mL	Unstressed
	Purity 99%			+/- 14.9110	µg/mL	Stressed
5	n-Hexadecane (C16)		500.5 µg/mL	+/- 2.9727	µg/mL	Gravimetric
	CAS # 544-76-3	(Lot SHBM4146)		+/- 12.4343	µg/mL	Unstressed
	Purity 98%			+/- 14.9046	µg/mL	Stressed
6	n-Octadecane (C18)		500.5 µg/mL	+/- 2.9730	µg/mL	Gravimetric
	CAS # 593-45-3	(Lot UE5NG)		+/- 12.4355	µg/mL	Unstressed
	Purity 98%			+/- 14.9061	µg/mL	Stressed
7	n-Eicosane (C20)		500.6 µg/mL	+/- 2.9731	µg/mL	Gravimetric
	CAS # 112-95-8	(Lot MKCF7888)		+/- 12.4359	µg/mL	Unstressed
	Purity 99%			+/- 14.9065	µg/mL	Stressed

8	n-Docosane (C22)		501.5	µg/mL	+/-	2.9785	µg/mL	Gravimetric
	CAS # 629-97-0	(Lot MKCL8918)			+/-	12.4583	µg/mL	Unstressed
	Purity 99%				+/-	14.9333	µg/mL	Stressed
9	n-Tetracosane (C24)		500.6	µg/mL	+/-	2.9731	µg/mL	Gravimetric
	CAS # 646-31-1	(Lot MKCJ8741)			+/-	12.4359	µg/mL	Unstressed
	Purity 99%				+/-	14.9065	µg/mL	Stressed
10	n-Hexacosane (C26)		500.5	µg/mL	+/-	2.9728	µg/mL	Gravimetric
	CAS # 630-01-3	(Lot MKCD4540)			+/-	12.4347	µg/mL	Unstressed
	Purity 99%				+/-	14.9050	µg/mL	Stressed
11	n-Octacosane (C28)		500.6	µg/mL	+/-	2.9734	µg/mL	Gravimetric
	CAS # 630-02-4	(Lot BCCG0084)			+/-	12.4371	µg/mL	Unstressed
	Purity 99%				+/-	14.9080	µg/mL	Stressed
12	n-Triacontane (C30)		501.7	µg/mL	+/-	2.9799	µg/mL	Gravimetric
	CAS # 638-68-6	(Lot MKCN9321)			+/-	12.4645	µg/mL	Unstressed
	Purity 99%				+/-	14.9408	µg/mL	Stressed
13	n-Dotriacontane (C32)		501.8	µg/mL	+/-	2.9805	µg/mL	Gravimetric
	CAS # 544-85-4	(Lot BCBW0661)			+/-	12.4670	µg/mL	Unstressed
	Purity 99%				+/-	14.9437	µg/mL	Stressed
14	n-Tetratriacontane (C34)		501.3	µg/mL	+/-	2.9773	µg/mL	Gravimetric
	CAS # 14167-59-0	(Lot OML4N)			+/-	12.4533	µg/mL	Unstressed
	Purity 99%				+/-	14.9274	µg/mL	Stressed
15	n-Hexatriacontane (C36)		502.4	µg/mL	+/-	2.9841	µg/mL	Gravimetric
	CAS # 630-06-8	(Lot U25B014)			+/-	12.4819	µg/mL	Unstressed
	Purity 99%				+/-	14.9616	µg/mL	Stressed
16	n-Octatriacontane (C38)		501.7	µg/mL	+/-	2.9801	µg/mL	Gravimetric
	CAS # 7194-85-6	(Lot 0000127235)			+/-	12.4653	µg/mL	Unstressed
	Purity 97%				+/-	14.9417	µg/mL	Stressed
17	n-Tetracontane (C40)		500.2	µg/mL	+/-	2.9713	µg/mL	Gravimetric
	CAS # 4181-95-7	(Lot PADGI)			+/-	12.4282	µg/mL	Unstressed
	Purity 98%				+/-	14.8973	µg/mL	Stressed

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

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

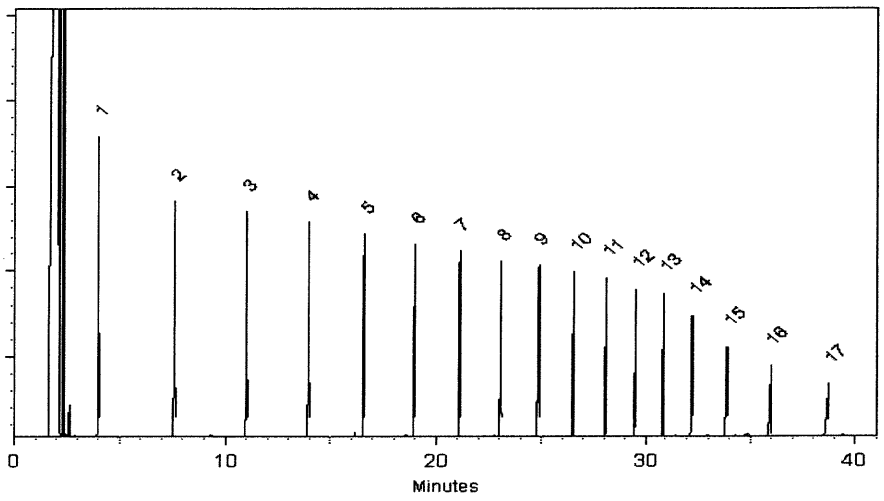
Carrier Gas:
hydrogen-constant pressure 10 psi.

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

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



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

Penelope Riglin - Operations Tech I

Date Mixed: 16-Feb-2022 **Balance:** 1128360905

Clara Windle - Operations Technician I

Date Passed: 21-Feb-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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

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

www.restek.com

CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 31266 **Lot No.:** A0184585

Description : Florida TRPH Standard

Florida TRPH Standard 500µg/mL, Hexane, 1mL/ampul

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

Expiration Date : May 31, 2029 **Storage:** 25°C nominal

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

P11852
↓
P1866
Y.P
06/17

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	n-Octane (C8) **CAS #** 111-65-9 **Purity** 99%	(Lot SHBN3807)	500.3 µg/mL	+/- 2.9718 µg/mL +/- 12.4305 µg/mL +/- 14.9001 µg/mL		Gravimetric Unstressed Stressed
2	n-Decane (C10) **CAS #** 124-18-5 **Purity** 99%	(Lot SHBN8619)	501.7 µg/mL	+/- 2.9797 µg/mL +/- 12.4637 µg/mL +/- 14.9398 µg/mL		Gravimetric Unstressed Stressed
3	n-Dodecane (C12) **CAS #** 112-40-3 **Purity** 99%	(Lot SHBN7174)	504.7 µg/mL	+/- 2.9976 µg/mL +/- 12.5382 µg/mL +/- 15.0291 µg/mL		Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) **CAS #** 629-59-4 **Purity** 99%	(Lot STBJ3715)	503.7 µg/mL	+/- 2.9916 µg/mL +/- 12.5133 µg/mL +/- 14.9993 µg/mL		Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) **CAS #** 544-76-3 **Purity** 98%	(Lot SHBM4146)	502.7 µg/mL	+/- 2.9861 µg/mL +/- 12.4903 µg/mL +/- 14.9717 µg/mL		Gravimetric Unstressed Stressed
6	n-Octadecane (C18) **CAS #** 593-45-3 **Purity** 98%	(Lot UE5NG)	502.7 µg/mL	+/- 2.9861 µg/mL +/- 12.4903 µg/mL +/- 14.9717 µg/mL		Gravimetric Unstressed Stressed
7	n-Eicosane (C20) **CAS #** 112-95-8 **Purity** 97%	(Lot MKCN8767)	500.5 µg/mL	+/- 2.9729 µg/mL +/- 12.4352 µg/mL +/- 14.9056 µg/mL		Gravimetric Unstressed Stressed

8	n-Docosane (C22) **CAS #** 629-97-0 **Purity** 99%	(Lot MKCL8918)	501.3	µg/mL	+/- +/- +/-	2.9778 12.4554 14.9298	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Tetracosane (C24) **CAS #** 646-31-1 **Purity** 99%	(Lot MKCN2863)	502.3	µg/mL	+/- +/- +/-	2.9837 12.4802 14.9596	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Hexacosane (C26) **CAS #** 630-01-3 **Purity** 99%	(Lot MKCD4540)	501.0	µg/mL	+/- +/- +/-	2.9758 12.4471 14.9199	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Octacosane (C28) **CAS #** 630-02-4 **Purity** 99%	(Lot BCCG0084)	502.3	µg/mL	+/- +/- +/-	2.9837 12.4802 14.9596	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Triacontane (C30) **CAS #** 638-68-6 **Purity** 98%	(Lot MKCJ4572)	500.8	µg/mL	+/- +/- +/-	2.9745 12.4416 14.9134	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Dotriacontane (C32) **CAS #** 544-85-4 **Purity** 99%	(Lot BCBW0661)	501.0	µg/mL	+/- +/- +/-	2.9758 12.4471 14.9199	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Tetratriacontane (C34) **CAS #** 14167-59-0 **Purity** 99%	(Lot OML4N)	503.0	µg/mL	+/- +/- +/-	2.9877 12.4968 14.9795	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Hexatriacontane (C36) **CAS #** 630-06-8 **Purity** 99%	(Lot U25B014)	503.0	µg/mL	+/- +/- +/-	2.9877 12.4968 14.9795	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Octatriacontane (C38) **CAS #** 7194-85-6 **Purity** 97%	(Lot 0000127235)	501.5	µg/mL	+/- +/- +/-	2.9787 12.4593 14.9345	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Tetracontane (C40) **CAS #** 4181-95-7 **Purity** 98%	(Lot PADGI)	504.7	µg/mL	+/- +/- +/-	2.9978 12.5390 15.0301	µg/mL µg/mL 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)

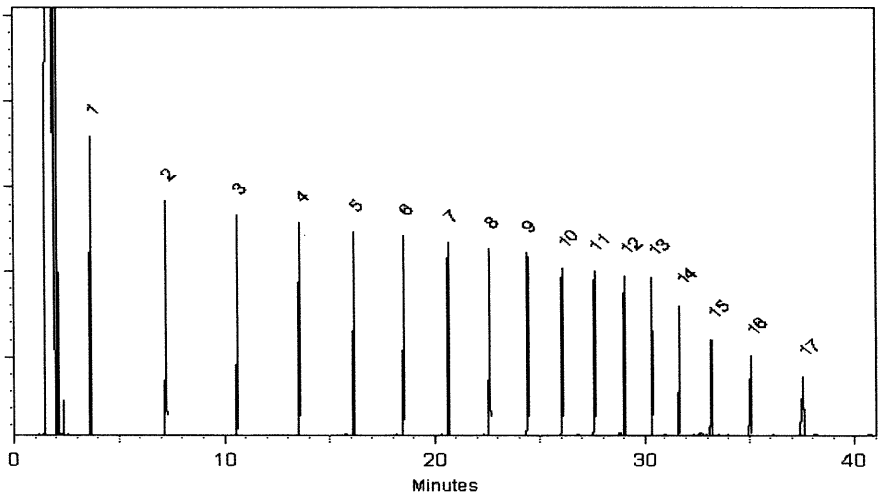
Carrier Gas:
hydrogen-constant pressure 10 psi.

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.

Lane Kibe - Mix Technician

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

Feng-Yun Lo - QC Analyst

Date Passed: 29-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.
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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.