

## Prep Standard - Chemical Standard Summary

**Order ID :** Q1478

**Test :** Diesel Range Organics

**Prepbatch ID :** PB167008,PB167017,

**Sequence ID/Qc Batch ID:** FF030625,FG030625,

**Standard ID :**

EP2590,EP2591,PP23961,PP23962,PP23963,PP23964,PP23965,PP23966,PP23967,PP24162,PP24180,

**Chemical ID :**

E2865,E3551,E3828,E3874,E3876,E3878,P11955,P11956,P11958,P11959,P13213,P13218,P13219,P13487,P13488,P13489,P13490,

## Extractions STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3923	Baked Sodium Sulfate	<a href="#">EP2590</a>	02/26/2025	07/01/2025	RUPESHKUMAR SHAH	Extraction_SC ALE_2 (EX-SC-2)	None	Riteshkumar Patel  02/26/2025

**FROM** 4000.00000gram of E3551 = Final Quantity: 4000.000 gram

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
2017	1:1 ACETONE/METHYLENE CHLORIDE	<a href="#">EP2591</a>	02/26/2025	08/14/2025	RUPESHKUMAR SHAH	None	None	Riteshkumar Patel  02/26/2025

**FROM** 8000.00000ml of E3876 + 8000.00000ml of E3878 = Final Quantity: 16000.000 ml



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
433	100/100 PPM DRO (Restek)	<a href="#">PP23961</a>	11/13/2024	05/09/2025	Yogesh Patel	None	None	Ankita Jodhani 11/13/2024

FROM	
1.00000ml of P11958 + 1.00000ml of P11959 + 1.00000ml of P13213 + 7.00000ml of E3828	= Final Quantity: 10.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3796	100/100 PPM DRO STD (CPI)	<a href="#">PP23962</a>	11/13/2024	05/09/2025	Yogesh Patel	None	None	Ankita Jodhani 11/13/2024

<b>FROM</b>	1.00000ml of P13213 + 1.00000ml of P13218 + 1.00000ml of P13219 + 7.00000ml of E3828 = Final Quantity: 10.000 ml
-------------	--

## Pest/Pcb STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
435	50 PPM ICC DRO STD (Restek)	<a href="#">PP23963</a>	11/13/2024	05/09/2025	Yogesh Patel	None	None	Ankita Jodhani
								11/13/2024

**FROM** 0.50000ml of E3828 + 0.50000ml of PP23961 = Final Quantity: 1.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
437	20 PPM ICC DRO STD (Restek)	<a href="#">PP23964</a>	11/13/2024	05/09/2025	Yogesh Patel	None	None	Ankita Jodhani
								11/13/2024

**FROM** 0.80000ml of E3828 + 0.20000ml of PP23961 = Final Quantity: 1.000 ml

## Pest/Pcb STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
438	10 PPM ICC DRO STD (Restek)	<a href="#">PP23965</a>	11/13/2024	05/09/2025	Yogesh Patel	None	None	Ankita Jodhani
								11/13/2024

**FROM** 0.90000ml of E3828 + 0.10000ml of PP23961 = Final Quantity: 1.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
439	5 PPM ICC DRO STD (Restek)	<a href="#">PP23966</a>	11/13/2024	05/09/2025	Yogesh Patel	None	None	Ankita Jodhani
								11/13/2024

**FROM** 0.90000ml of E3828 + 0.10000ml of PP23963 = Final Quantity: 1.000 ml

## Pest/Pcb STANDARD PREPARATION LOG

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3797	50 PPM DRO ICV STD (CPI)	<a href="#">PP23967</a>	11/13/2024	05/09/2025	Yogesh Patel	None	None	Ankita Jodhani
								11/13/2024

**FROM** 0.80000ml of E3828 + 0.50000ml of PP23962 = Final Quantity: 1.000 ml

<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
3609	20 PPM DRO SPIKE SOLUTION (RESTEK)	<a href="#">PP24162</a>	01/31/2025	07/30/2025	Yogesh Patel	None	None	Ankita Jodhani
								01/31/2025

**FROM** 1.00000ml of P11955 + 1.00000ml of P11956 + 48.00000ml of E3874 = Final Quantity: 50.000 ml



<u>Recipe ID</u>	<u>NAME</u>	<u>NO.</u>	<u>Prep Date</u>	<u>Expiration Date</u>	<u>Prepared By</u>	<u>ScaleID</u>	<u>PipetteID</u>	<u>Supervised By</u>
147	20 PPM DRO Surrogate Spike Solution	<a href="#">PP24180</a>	02/03/2025	07/30/2025	Yogesh Patel	None	None	Ankita Jodhani 02/03/2025
<b><u>FROM</u></b> 1.00000ml of P13487 + 1.00000ml of P13488 + 1.00000ml of P13489 + 1.00000ml of P13490 + 196.00000ml of E3874 = Final Quantity: 200.000 ml								

## CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-3382-05 / Sand, Purified (cs/4x2.5kg)	0000243821	06/30/2025	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	313201	07/01/2025	01/03/2024 / Rajesh	07/20/2023 / Rajesh	E3551

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)	24G0862003	05/09/2025	11/09/2024 / Rajesh	11/04/2024 / Rajesh	E3828

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)	25A0262002	07/30/2025	01/30/2025 / Rajesh	01/20/2025 / Rajesh	E3874

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)	24H2762008	08/25/2025	02/25/2025 /	02/12/2025 / Rajesh	E3876

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)	24K1762005	08/14/2025	02/14/2025 / Rajesh	12/27/2024 / Rajesh	E3878



## 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	A0186840	07/31/2025	01/31/2025 / yogesh	07/11/2022 / Yogesh	P11955

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31266 / Florida TRPH Standard	A0186840	07/31/2025	01/31/2025 / yogesh	07/11/2022 / Yogesh	P11956

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31266 / Florida TRPH Standard	A0186840	05/13/2025	11/13/2024 / yogesh	07/11/2022 / Yogesh	P11958

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Restek	31266 / Florida TRPH Standard	A0186840	05/13/2025	11/13/2024 / yogesh	07/11/2022 / Yogesh	P11959

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	101122	05/13/2025	11/13/2024 / yogesh	01/17/2024 / Ankita	P13213

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	514983	02/14/2025	08/14/2024 / yogesh	01/31/2024 / Ankita	P13218

## CHEMICAL RECEIPT LOG BOOK

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	514983	05/13/2025	11/13/2024 / yogesh	01/31/2024 / Ankita	P13219

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	101122	08/03/2025	02/03/2025 / yogesh	07/24/2024 / yogesh	P13487

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	101122	08/03/2025	02/03/2025 / yogesh	07/24/2024 / yogesh	P13488

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	101122	08/03/2025	02/03/2025 / yogesh	07/24/2024 / yogesh	P13489

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	101122	08/03/2025	02/03/2025 / yogesh	07/24/2024 / yogesh	P13490

Sand  
Purified  
Washed and Ignited



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

## Certificate of Analysis

Test	Specification	Result
Substances Soluble in HCl	$\leq 0.16\%$	0.01

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

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

E 2865

  
Jamie Ethier  
Vice President Global Quality

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC  
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700



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

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

## CERTIFICATE OF ANALYSIS

PRODUCT :	SODIUM SULFATE CRYSTALS ANHYDROUS		
QUALITY :	ACS (CODE RMB3375)	FORMULA :	Na <sub>2</sub> SO <sub>4</sub>
SPECIFICATION NUMBER :	6399	RELEASE DATE:	ABR/21/2023
LOT NUMBER :	313201		

TEST	SPECIFICATIONS	LOT VALUES
Assay (Na <sub>2</sub> SO <sub>4</sub> )	Min. 99.0%	99.7 %
pH of a 5% solution at 25°C	5.2 - 9.2	6.1
Insoluble matter	Max. 0.01%	0.005 %
Loss on ignition	Max. 0.5%	0.1 %
Chloride (Cl)	Max. 0.001%	<0.001 %
Nitrogen compounds (as N)	Max. 5 ppm	<5 ppm
Phosphate (PO <sub>4</sub> )	Max. 0.001%	<0.001 %
Heavy metals (as Pb)	Max. 5 ppm	<5 ppm
Iron (Fe)	Max. 0.001%	<0.001 %
Calcium (Ca)	Max. 0.01%	0.002 %
Magnesium (Mg)	Max. 0.005%	0.001 %
Potassium (K)	Max. 0.008%	0.003 %
Extraction-concentration suitability	Passes test	Passes test
Appearance	Passes test	Passes test
Identification	Passes test	Passes test
Solubility and foreign matter	Passes test	Passes test
Retained on US Standard No. 10 sieve	Max. 1%	0.1 %
Retained on US Standard No. 60 sieve	Min. 94%	97.3 %
Through US Standard No. 60 sieve	Max. 5%	2.5 %
Through US Standard No. 100 sieve	Max. 10%	0.1 %

### COMMENTS

QC: PhC Irma Belmares

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

Recd. by R3 on 7/24/23 E 3551

RC-02-01, Ed. 3

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

avantor™



Material No.: 9266-A4

Batch No.: 24J0862003

Manufactured Date: 2024-09-12

Expiration Date: 2025-12-12

Revision No.: 0

## Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	$\leq 5$	2
ECD Sensitive Impurities (as HeptachlorEpoxide) Single Peak (pg/mL)	$\leq 10$	1
Assay ( $\text{CH}_2\text{Cl}_2$ ) (by GC, exclusive of preservative, corrected for water)	$\geq 99.8 \%$	100.0 %
Color (APHA)	$\leq 10$	5
Residue after Evaporation	$\leq 1.0 \text{ ppm}$	0.2 ppm
Titration Acid ( $\mu\text{eq/g}$ )	$\leq 0.3$	$< 0.1$
Chloride (Cl)	$\leq 10 \text{ ppm}$	$< 5 \text{ ppm}$
Water (by KF, coulometric)	$\leq 0.02 \%$	$< 0.01 \%$

For Laboratory, Research, or Manufacturing Use

MEETS SPECIFICATIONS WITHIN THE EXPIRATION PERIOD

Country of Origin: United States

Packaging Site: Phillipsburg Mfg Ctr & DC

E 3828

Jamie Croak  
Director Quality Operations, Bioscience Production

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials LLC

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



Material No.: 9266-A4  
Batch No.: 25A0262002  
Manufactured Date: 2024-11-21  
Expiration Date: 2026-02-20  
Revision No.: 0

## Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	$\leq 5$	1
ECD Sensitive Impurities (as HeptachlorEpoxide) Single Peak (pg/mL)	$\leq 10$	4
Assay ( $\text{CH}_2\text{Cl}_2$ ) (by GC, exclusive of preservative, corrected for water)	$\geq 99.8\%$	99.9%
Color (APHA)	$\leq 10$	10
Residue after Evaporation	$\leq 1.0$ ppm	0.8 ppm
Titration Acid ( $\mu\text{eq/g}$ )	$\leq 0.3$	$< 0.1$
Chloride (Cl)	$\leq 10$ ppm	$< 5$ ppm
Water (by KF, coulometric)	$\leq 0.02\%$	$< 0.01\%$

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

Country of Origin: United States  
Packaging Site: Phillipsburg Mfg Ctr & DC

E 3874

Jamie Croak  
Director Quality Operations, Bioscience Production

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials, LLC

100 Matsonford Rd, Suite 200, Radnor, PA, 19087, U.S.A. Phone 610.386.1700

Acetone  
BAKER RESI-ANALYZED® Reagent  
For Organic Residue Analysis

 **avantors**™



Material No.: 9254-03

Batch No.: 24H2762008

Manufactured Date: 2024-04-18

Expiration Date: 2027-04-18

Revision No.: 0

## Certificate of Analysis

Test	Specification	Result
Assay ((CH <sub>3</sub> ) <sub>2</sub> CO) (by GC, corrected for water)	>= 99.4 %	100.0 %
Color (APHA)	<= 10	5
Residue after Evaporation	<= 1.0 ppm	0.0 ppm
Substances Reducing Permanganate	Passes Test	Passes Test
Titration Acid (μeq/g)	<= 0.3	0.2
Titration Base (μeq/g)	<= 0.6	<0.1
Water (H <sub>2</sub> O)	<= 0.5 %	<0.1 %
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	<= 5	1
ECD Sensitive Impurities (as Heptachlor Epoxide) Single Peak (pg/mL)	<= 10	1

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

Country of Origin: United States  
Packaging Site: Phillipsburg Mfg Ctr & DC

Recd. by RP on 2/12/25

E 3876



Jamie Croak  
Director Quality Operations, Bioscience Production

For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700

Avantor Performance Materials LLC

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



Material No.: 9266-A4  
Batch No.: 24K1762005  
Manufactured Date: 2024-10-08  
Expiration Date: 2026-01-07  
Revision No.: 0

## Certificate of Analysis

Test	Specification	Result
FID-Sensitive Impurities (as 2-Octanol) Single Impurity Peak (ng/mL)	$\leq 5$	1
ECD Sensitive Impurities (as HeptachlorEpoxide) Single Peak (pg/mL)	$\leq 10$	2
Assay ( $\text{CH}_2\text{Cl}_2$ ) (by GC, exclusive of preservative, corrected for water)	$\geq 99.8 \%$	100.0 %
Color (APHA)	$\leq 10$	5
Residue after Evaporation	$\leq 1.0 \text{ ppm}$	0.5 ppm
Titration Acid ( $\mu\text{eq/g}$ )	$\leq 0.3$	0.0
Chloride (Cl)	$\leq 10 \text{ ppm}$	$< 5 \text{ ppm}$
Water (by KF, coulometric)	$\leq 0.02 \%$	0.01 %

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

Country of Origin: United States  
Packaging Site: Phillipsburg Mfg Ctr & DC

E 3878

Jamie Croak  
Director Quality Operations, Bioscience Production

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





# CERTIFIED REFERENCE MATERIAL

110 Benner Circle

Bellefonte, PA 16823-8812

Tel: (800)356-1688

Fax: (814)353-1309

www.restek.com

## Certificate of Analysis



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

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

Catalog No. : 31266

Lot No.: A0186840

Description : Florida TRPH Standard

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

Container Size : 2 mL

Pkg Amt: > 1 mL

Expiration Date : July 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) CAS # 111-65-9 Purity 99%	505.0 µg/mL	+/- 2.9995 µg/mL +/- 12.5465 µg/mL +/- 15.0390 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) CAS # 124-18-5 Purity 99%	503.0 µg/mL	+/- 2.9877 µg/mL +/- 12.4968 µg/mL +/- 14.9795 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) CAS # 112-40-3 Purity 99%	503.5 µg/mL	+/- 2.9906 µg/mL +/- 12.5092 µg/mL +/- 14.9944 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) CAS # 629-59-4 Purity 99%	505.0 µg/mL	+/- 2.9995 µg/mL +/- 12.5465 µg/mL +/- 15.0390 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) CAS # 544-76-3 Purity 98%	504.7 µg/mL	+/- 2.9978 µg/mL +/- 12.5390 µg/mL +/- 15.0301 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) CAS # 593-45-3 Purity 97%	504.4 µg/mL	+/- 2.9960 µg/mL +/- 12.5316 µg/mL +/- 15.0212 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) CAS # 112-95-8 Purity 99%	503.5 µg/mL	+/- 2.9906 µg/mL +/- 12.5092 µg/mL +/- 14.9944 µg/mL	Gravimetric Unstressed Stressed

P11948 } 7.8  
P11962 } 07/11/16

8	n-Docosane (C22) <b>CAS #</b> 629-97-0 <b>Purity</b> 99%	(Lot MKCL8918)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Tetracosane (C24) <b>CAS #</b> 646-31-1 <b>Purity</b> 99%	(Lot MKCN2863)	503.5 µg/mL	+/- 2.9906 +/- 12.5092 +/- 14.9944	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Hexacosane (C26) <b>CAS #</b> 630-01-3 <b>Purity</b> 99%	(Lot MKCD4540)	504.0 µg/mL	+/- 2.9936 +/- 12.5216 +/- 15.0093	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Octacosane (C28) <b>CAS #</b> 630-02-4 <b>Purity</b> 99%	(Lot BCCG0084)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Triacontane (C30) <b>CAS #</b> 638-68-6 <b>Purity</b> 99%	(Lot MKCN9321)	505.0 µg/mL	+/- 2.9995 +/- 12.5465 +/- 15.0390	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Dotriacontane (C32) <b>CAS #</b> 544-85-4 <b>Purity</b> 99%	(Lot BCBW0661)	505.0 µg/mL	+/- 2.9995 +/- 12.5465 +/- 15.0390	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Tetratriacontane (C34) <b>CAS #</b> 14167-59-0 <b>Purity</b> 99%	(Lot OML4N)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Hexatriacontane (C36) <b>CAS #</b> 630-06-8 <b>Purity</b> 99%	(Lot U25B014)	504.0 µg/mL	+/- 2.9936 +/- 12.5216 +/- 15.0093	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Octatriacontane (C38) <b>CAS #</b> 7194-85-6 <b>Purity</b> 97%	(Lot 0000127235)	504.4 µg/mL	+/- 2.9960 +/- 12.5316 +/- 15.0212	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Tetracontane (C40) <b>CAS #</b> 4181-95-7 <b>Purity</b> 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:**

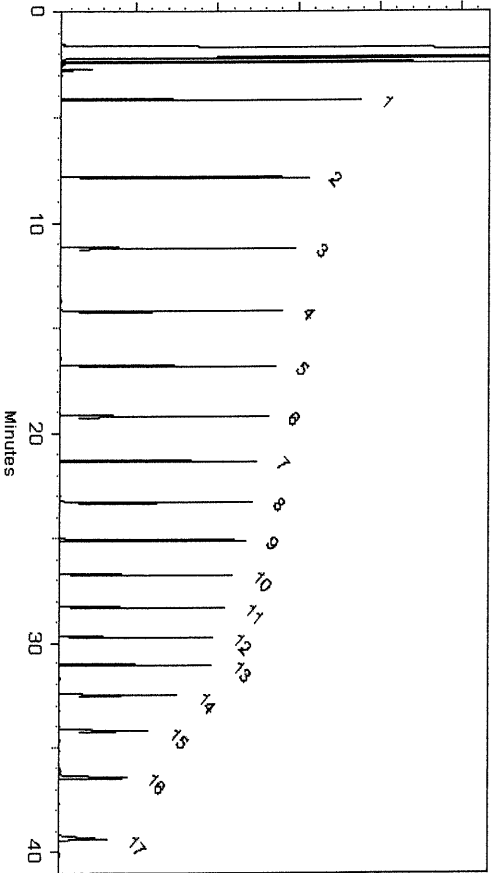
250°C

**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.

*Brittany Federinko*

Brittany Federinko - Operations Tech I

Date Mixed: 29-Jun-2022

Balance: 1128360905

*Christie Mills*

Christie Mills - Operations Tech II - ARM QC

Date Passed: 01-Jul-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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



# CERTIFIED REFERENCE MATERIAL

110 Benner Circle

Bellefonte, PA 16823-8812

Tel: (800)356-1688

Fax: (814)353-1309

www.restek.com

## Certificate of Analysis



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

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

Catalog No. : 31266

Lot No.: A0186840

Description : Florida TRPH Standard

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

Container Size : 2 mL

Pkg Amt: > 1 mL

Expiration Date : July 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) CAS # 111-65-9 Purity 99%	505.0 µg/mL	+/- 2.9995 µg/mL +/- 12.5465 µg/mL +/- 15.0390 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) CAS # 124-18-5 Purity 99%	503.0 µg/mL	+/- 2.9877 µg/mL +/- 12.4968 µg/mL +/- 14.9795 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) CAS # 112-40-3 Purity 99%	503.5 µg/mL	+/- 2.9906 µg/mL +/- 12.5092 µg/mL +/- 14.9944 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) CAS # 629-59-4 Purity 99%	505.0 µg/mL	+/- 2.9995 µg/mL +/- 12.5465 µg/mL +/- 15.0390 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) CAS # 544-76-3 Purity 98%	504.7 µg/mL	+/- 2.9978 µg/mL +/- 12.5390 µg/mL +/- 15.0301 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) CAS # 593-45-3 Purity 97%	504.4 µg/mL	+/- 2.9960 µg/mL +/- 12.5316 µg/mL +/- 15.0212 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) CAS # 112-95-8 Purity 99%	503.5 µg/mL	+/- 2.9906 µg/mL +/- 12.5092 µg/mL +/- 14.9944 µg/mL	Gravimetric Unstressed Stressed

P11948 } 7.8  
P11962 } 07/11/16

8	n-Docosane (C22) <b>CAS #</b> 629-97-0 <b>Purity</b> 99%	(Lot MKCL8918)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Tetracosane (C24) <b>CAS #</b> 646-31-1 <b>Purity</b> 99%	(Lot MKCN2863)	503.5 µg/mL	+/- 2.9906 +/- 12.5092 +/- 14.9944	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Hexacosane (C26) <b>CAS #</b> 630-01-3 <b>Purity</b> 99%	(Lot MKCD4540)	504.0 µg/mL	+/- 2.9936 +/- 12.5216 +/- 15.0093	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Octacosane (C28) <b>CAS #</b> 630-02-4 <b>Purity</b> 99%	(Lot BCCG0084)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Triacontane (C30) <b>CAS #</b> 638-68-6 <b>Purity</b> 99%	(Lot MKCN9321)	505.0 µg/mL	+/- 2.9995 +/- 12.5465 +/- 15.0390	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Dotriacontane (C32) <b>CAS #</b> 544-85-4 <b>Purity</b> 99%	(Lot BCBW0661)	505.0 µg/mL	+/- 2.9995 +/- 12.5465 +/- 15.0390	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Tetratriacontane (C34) <b>CAS #</b> 14167-59-0 <b>Purity</b> 99%	(Lot OML4N)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Hexatriacontane (C36) <b>CAS #</b> 630-06-8 <b>Purity</b> 99%	(Lot U25B014)	504.0 µg/mL	+/- 2.9936 +/- 12.5216 +/- 15.0093	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Octatriacontane (C38) <b>CAS #</b> 7194-85-6 <b>Purity</b> 97%	(Lot 0000127235)	504.4 µg/mL	+/- 2.9960 +/- 12.5316 +/- 15.0212	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Tetracontane (C40) <b>CAS #</b> 4181-95-7 <b>Purity</b> 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:**

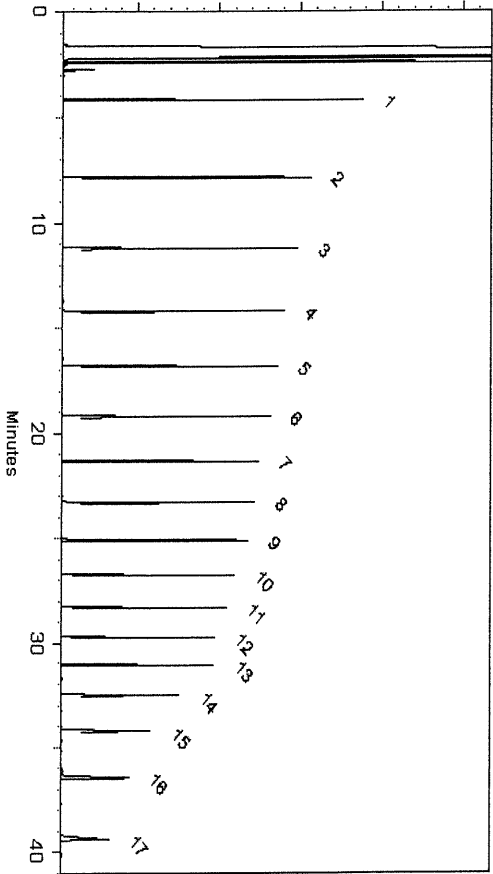
250°C

**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.

*Brittany Federinko*

Brittany Federinko - Operations Tech I

Date Mixed: 29-Jun-2022

Balance: 1128360905

*Christie Mills*

Christie Mills - Operations Tech II - ARM QC

Date Passed: 01-Jul-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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





# CERTIFIED REFERENCE MATERIAL

110 Benner Circle

Bellefonte, PA 16823-8812

Tel: (800)356-1688

Fax: (814)353-1309

www.restek.com

## Certificate of Analysis



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

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

Catalog No. : 31266

Lot No.: A0186840

Description : Florida TRPH Standard

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

Container Size : 2 mL

Pkg Amt: > 1 mL

Expiration Date : July 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) CAS # 111-65-9 Purity 99%	505.0 µg/mL	+/- 2.9995 µg/mL +/- 12.5465 µg/mL +/- 15.0390 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) CAS # 124-18-5 Purity 99%	503.0 µg/mL	+/- 2.9877 µg/mL +/- 12.4968 µg/mL +/- 14.9795 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) CAS # 112-40-3 Purity 99%	503.5 µg/mL	+/- 2.9906 µg/mL +/- 12.5092 µg/mL +/- 14.9944 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) CAS # 629-59-4 Purity 99%	505.0 µg/mL	+/- 2.9995 µg/mL +/- 12.5465 µg/mL +/- 15.0390 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) CAS # 544-76-3 Purity 98%	504.7 µg/mL	+/- 2.9978 µg/mL +/- 12.5390 µg/mL +/- 15.0301 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) CAS # 593-45-3 Purity 97%	504.4 µg/mL	+/- 2.9960 µg/mL +/- 12.5316 µg/mL +/- 15.0212 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) CAS # 112-95-8 Purity 99%	503.5 µg/mL	+/- 2.9906 µg/mL +/- 12.5092 µg/mL +/- 14.9944 µg/mL	Gravimetric Unstressed Stressed

P11948 } 7.8  
P11962 } 07/11/16

8	n-Docosane (C22) <b>CAS #</b> 629-97-0 <b>Purity</b> 99%	(Lot MKCL8918)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Tetracosane (C24) <b>CAS #</b> 646-31-1 <b>Purity</b> 99%	(Lot MKCN2863)	503.5 µg/mL	+/- 2.9906 +/- 12.5092 +/- 14.9944	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Hexacosane (C26) <b>CAS #</b> 630-01-3 <b>Purity</b> 99%	(Lot MKCD4540)	504.0 µg/mL	+/- 2.9936 +/- 12.5216 +/- 15.0093	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Octacosane (C28) <b>CAS #</b> 630-02-4 <b>Purity</b> 99%	(Lot BCCG0084)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Triacontane (C30) <b>CAS #</b> 638-68-6 <b>Purity</b> 99%	(Lot MKCN9321)	505.0 µg/mL	+/- 2.9995 +/- 12.5465 +/- 15.0390	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Dotriacontane (C32) <b>CAS #</b> 544-85-4 <b>Purity</b> 99%	(Lot BCBW0661)	505.0 µg/mL	+/- 2.9995 +/- 12.5465 +/- 15.0390	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Tetratriacontane (C34) <b>CAS #</b> 14167-59-0 <b>Purity</b> 99%	(Lot OML4N)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Hexatriacontane (C36) <b>CAS #</b> 630-06-8 <b>Purity</b> 99%	(Lot U25B014)	504.0 µg/mL	+/- 2.9936 +/- 12.5216 +/- 15.0093	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Octatriacontane (C38) <b>CAS #</b> 7194-85-6 <b>Purity</b> 97%	(Lot 0000127235)	504.4 µg/mL	+/- 2.9960 +/- 12.5316 +/- 15.0212	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Tetracontane (C40) <b>CAS #</b> 4181-95-7 <b>Purity</b> 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:**

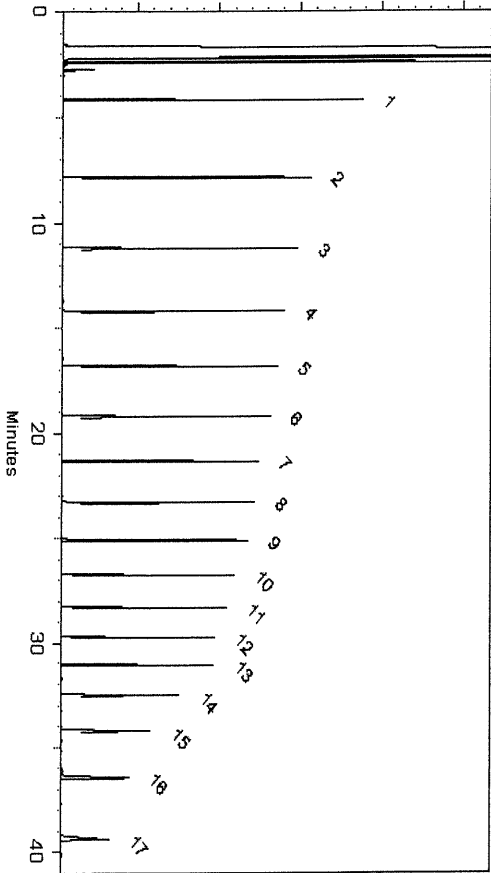
250°C

**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.

*Brittany Federinko*

Brittany Federinko - Operations Tech I

Date Mixed: 29-Jun-2022

Balance: 1128360905

*Christie Mills*

Christie Mills - Operations Tech II - ARM QC

Date Passed: 01-Jul-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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



# CERTIFIED REFERENCE MATERIAL

110 Benner Circle

Bellefonte, PA 16823-8812

Tel: (800)356-1688

Fax: (814)353-1309

www.restek.com

## Certificate of Analysis



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

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

Catalog No. : 31266

Lot No.: A0186840

Description : Florida TRPH Standard

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

Container Size : 2 mL

Pkg Amt: > 1 mL

Expiration Date : July 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) CAS # 111-65-9 Purity 99%	505.0 µg/mL	+/- 2.9995 µg/mL +/- 12.5465 µg/mL +/- 15.0390 µg/mL	Gravimetric Unstressed Stressed
2	n-Decane (C10) CAS # 124-18-5 Purity 99%	503.0 µg/mL	+/- 2.9877 µg/mL +/- 12.4968 µg/mL +/- 14.9795 µg/mL	Gravimetric Unstressed Stressed
3	n-Dodecane (C12) CAS # 112-40-3 Purity 99%	503.5 µg/mL	+/- 2.9906 µg/mL +/- 12.5092 µg/mL +/- 14.9944 µg/mL	Gravimetric Unstressed Stressed
4	n-Tetradecane (C14) CAS # 629-59-4 Purity 99%	505.0 µg/mL	+/- 2.9995 µg/mL +/- 12.5465 µg/mL +/- 15.0390 µg/mL	Gravimetric Unstressed Stressed
5	n-Hexadecane (C16) CAS # 544-76-3 Purity 98%	504.7 µg/mL	+/- 2.9978 µg/mL +/- 12.5390 µg/mL +/- 15.0301 µg/mL	Gravimetric Unstressed Stressed
6	n-Octadecane (C18) CAS # 593-45-3 Purity 97%	504.4 µg/mL	+/- 2.9960 µg/mL +/- 12.5316 µg/mL +/- 15.0212 µg/mL	Gravimetric Unstressed Stressed
7	n-Eicosane (C20) CAS # 112-95-8 Purity 99%	503.5 µg/mL	+/- 2.9906 µg/mL +/- 12.5092 µg/mL +/- 14.9944 µg/mL	Gravimetric Unstressed Stressed

P11948 } 7.8  
P11962 } 07/11/16

8	n-Docosane (C22) <b>CAS #</b> 629-97-0 <b>Purity</b> 99%	(Lot MKCL8918)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
9	n-Tetracosane (C24) <b>CAS #</b> 646-31-1 <b>Purity</b> 99%	(Lot MKCN2863)	503.5 µg/mL	+/- 2.9906 +/- 12.5092 +/- 14.9944	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
10	n-Hexacosane (C26) <b>CAS #</b> 630-01-3 <b>Purity</b> 99%	(Lot MKCD4540)	504.0 µg/mL	+/- 2.9936 +/- 12.5216 +/- 15.0093	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
11	n-Octacosane (C28) <b>CAS #</b> 630-02-4 <b>Purity</b> 99%	(Lot BCCG0084)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
12	n-Triacontane (C30) <b>CAS #</b> 638-68-6 <b>Purity</b> 99%	(Lot MKCN9321)	505.0 µg/mL	+/- 2.9995 +/- 12.5465 +/- 15.0390	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
13	n-Dotriacontane (C32) <b>CAS #</b> 544-85-4 <b>Purity</b> 99%	(Lot BCBW0661)	505.0 µg/mL	+/- 2.9995 +/- 12.5465 +/- 15.0390	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
14	n-Tetratriacontane (C34) <b>CAS #</b> 14167-59-0 <b>Purity</b> 99%	(Lot OML4N)	504.5 µg/mL	+/- 2.9966 +/- 12.5340 +/- 15.0241	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
15	n-Hexatriacontane (C36) <b>CAS #</b> 630-06-8 <b>Purity</b> 99%	(Lot U25B014)	504.0 µg/mL	+/- 2.9936 +/- 12.5216 +/- 15.0093	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
16	n-Octatriacontane (C38) <b>CAS #</b> 7194-85-6 <b>Purity</b> 97%	(Lot 0000127235)	504.4 µg/mL	+/- 2.9960 +/- 12.5316 +/- 15.0212	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
17	n-Tetracontane (C40) <b>CAS #</b> 4181-95-7 <b>Purity</b> 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:**

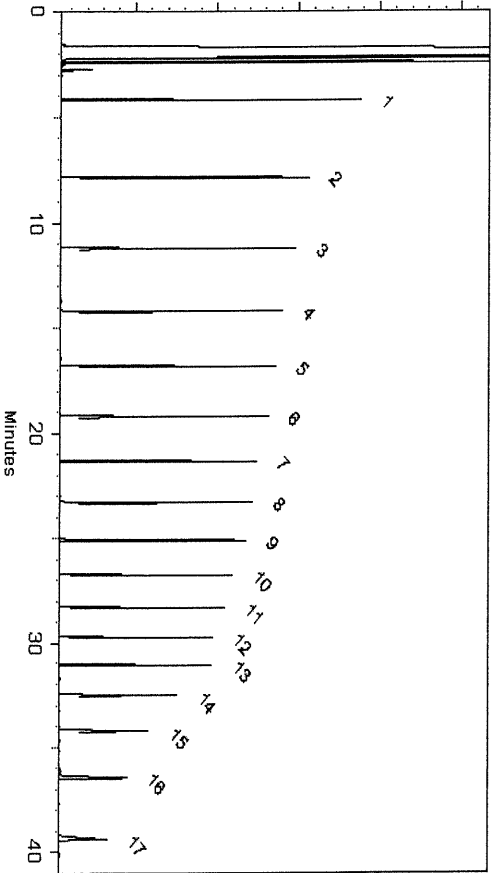
250°C

**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.

*Brittany Federinko*

Brittany Federinko - Operations Tech I

Date Mixed: 29-Jun-2022

Balance: 1128360905

*Christie Mills*

Christie Mills - Operations Tech II - ARM QC

Date Passed: 01-Jul-2022

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

General Certified Reference Material Notes

Expiration Notes:

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

Purity Notes:

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

Certified Uncertainty Value Notes:

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

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

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

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



CERTIFIED WEIGHT REPORT

Part Number:  
Lot Number:  
Description:

72072  
101122  
n-Tetracosane-d50

Solvent(s):  
Methylene chloride

Lot#  
105345

Expiration Date:  
Recommended Storage:  
Nominal Concentration (µg/mL):  
NIST Test ID#:

101132  
Ambient (20 °C)  
1000  
6UTB

5E-05 Balance Uncertainty  
0.058 Flask Uncertainty

Weight(s) shown below were combined and diluted to (mL): 200.0

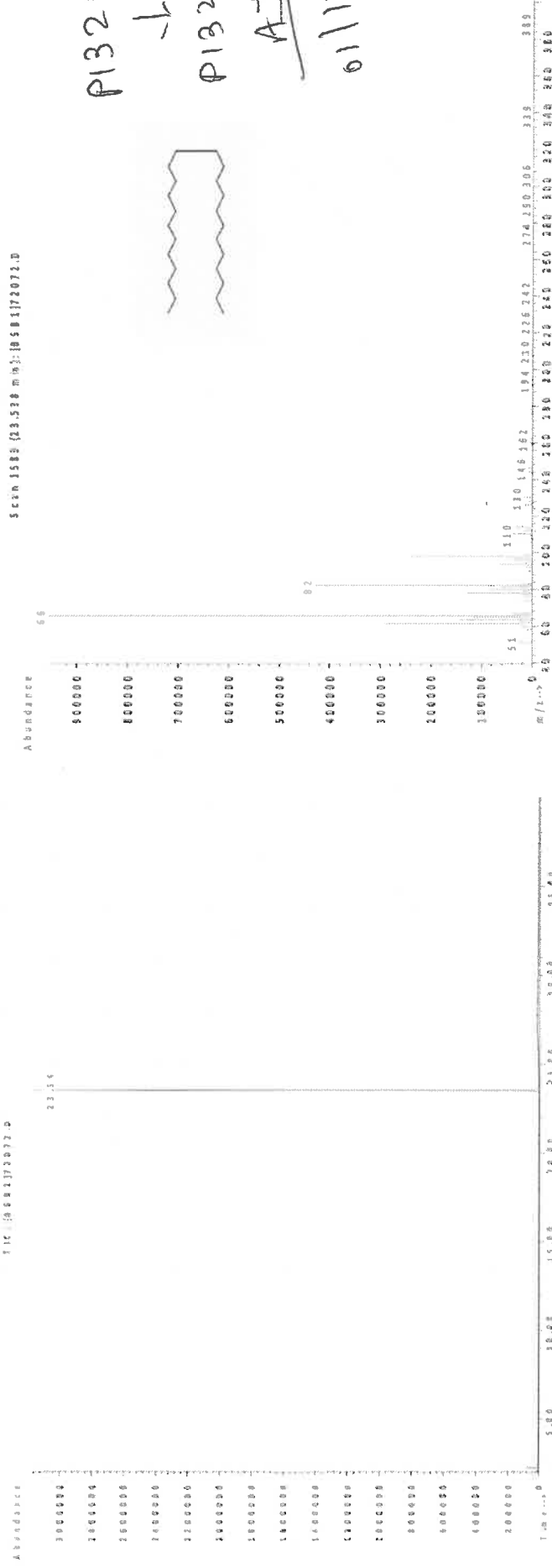
Formulated By:	Prashant Chauhan	101122	DATE
Reviewed By:	Pedro L. Renteria	101122	DATE

SDS Information

Expanded  
Uncertainty  
(Solute Safety Info. On Attached pg.)  
CAS# OSHA PEL (TWA) LD50

Compound	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20482	1000.6	4.1	16416-32-3	N/A
----------	------	----------	------	------	-----	------	---------	---------	--------	-----	------------	-----

1. n-Tetracosane-d50  
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.



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



5580 Skylane Blvd  
Santa Rosa, CA 95403

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

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

Date Received: \_\_\_\_\_

## Certificate of Analysis

Page 1 of 1

Catalog No.: Lot No.: Storage:

Z-110400-05 514983 ≤ -10 Degrees C

Solvent:

Hexane

Exp. Date:

11/20/2028

Description:

TRPH Standard (C8-C40), 500 mg/L, 1 ml

-01

### Compound

CAS No.

Purity (%)

Compound Lot No.

Concentration, mg/L

decane (C10)

124-18-5

99.7

415.7.2P

498.5 ± 6.92

docosane (C22)

629-97-0

98.8

420.9.1P

499.4 ± 6.93

dodecane (C12)

112-40-3

99.7

416.9.3P

502 ± 6.97

dotriacontane (C32)

544-85-4

97

425.9.2.2P

499.6 ± 8.53

eicosane (C20)

112-95-8

99.8

419.7.1P

501 ± 6.95

hexacosane (C26)

630-01-3

99.3

422.7.2.1P

501 ± 6.95

hexatriacontane (C36)

630-06-8

98

427.29.1.1P

499.3 ± 8.53

n-hexadecane (C16)

544-76-3

99.45

368.27.1.1P

498.7 ± 6.91

octacosane (C28)

630-02-4

99.1

423.24.1P

500.5 ± 6.95

n-octadecane (C18)

593-45-3

99.5

418.29.1P

499.5 ± 6.92

octane (C8)

111-65-9

99.4

385.7.2.1P

498.5 ± 6.92

octatriacontane (C38)

7194-85-6

95

428.1.2P

500.2 ± 6.94

tetracontane (C40)

4181-95-7

97

429.7.2P

499.6 ± 6.93

n-tetracosane (C24)

646-31-1

99.5

421.7.1P

499.5 ± 6.93

n-tetradecane (C14)

629-59-4

99.3

417.9.1P

500 ± 6.94

tetatriacontane (C34)

14167-59-0

96.1

426.7.2.2P

499.7 ± 8.53

triacontane (C30)

638-68-6

99.5

424.7.1.1P

500 ± 6.94

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

P13215

↓

P13224

AJ  
01/31/24

\*Not a certified value

*Andrea Schaible*

Andrea Schaible  
Chemist

Certified By: \_\_\_\_\_

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 gravimetrically.



5580 Skylane Blvd  
Santa Rosa, CA 95403

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

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

Date Received: \_\_\_\_\_

## Certificate of Analysis

Page 1 of 1

Catalog No.: Lot No.: Storage:

Z-110400-05 514983 ≤ -10 Degrees C

Solvent:

Hexane

Exp. Date:

11/20/2028

Description:

TRPH Standard (C8-C40), 500 mg/L, 1 ml

-01

### Compound

CAS No.

Purity (%)

Compound Lot No.

Concentration, mg/L

decane (C10)

124-18-5

99.7

415.7.2P

498.5 ± 6.92

docosane (C22)

629-97-0

98.8

420.9.1P

499.4 ± 6.93

dodecane (C12)

112-40-3

99.7

416.9.3P

502 ± 6.97

dotriacontane (C32)

544-85-4

97

425.9.2.2P

499.6 ± 8.53

eicosane (C20)

112-95-8

99.8

419.7.1P

501 ± 6.95

hexacosane (C26)

630-01-3

99.3

422.7.2.1P

501 ± 6.95

hexatriacontane (C36)

630-06-8

98

427.29.1.1P

499.3 ± 8.53

n-hexadecane (C16)

544-76-3

99.45

368.27.1.1P

498.7 ± 6.91

octacosane (C28)

630-02-4

99.1

423.24.1P

500.5 ± 6.95

n-octadecane (C18)

593-45-3

99.5

418.29.1P

499.5 ± 6.92

octane (C8)

111-65-9

99.4

385.7.2.1P

498.5 ± 6.92

octatriacontane (C38)

7194-85-6

95

428.1.2P

500.2 ± 6.94

tetracontane (C40)

4181-95-7

97

429.7.2P

499.6 ± 6.93

n-tetracosane (C24)

646-31-1

99.5

421.7.1P

499.5 ± 6.93

n-tetradecane (C14)

629-59-4

99.3

417.9.1P

500 ± 6.94

tetatriacontane (C34)

14167-59-0

96.1

426.7.2.2P

499.7 ± 8.53

triacontane (C30)

638-68-6

99.5

424.7.1.1P

500 ± 6.94

P13215

↓

P13224

AJ  
01131124

\*Not a certified value

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

*Andrea Schaible*

Andrea Schaible  
Chemist

Certified By: \_\_\_\_\_

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 gravimetrically.

# ABSOLUTE STANDARDS, INC.

ISO - 17034



## Certificate of Analysis



### Certified Reference Material (CRM)

**Conformance:** The "Certificate of Analysis" is applicable for CRM's, fulfilling the requirements in the current version of: ISO 17034.

**Health & Safety:** See the attached SDS & Certified Weight Report before use.

**Intended Use:** This Certified Reference Material (CRM) is intended primarily for use in the characterization of unknowns and the establishment of analyzer or instrument response factors by qualified personnel. Typical instrumental organic assays include: GC & LC, and inorganic assays include: ICP & AA. This product is for laboratory use only.

**Characterization Values:** In production, gravimetric/volumetric readings are certified to be within  $\pm 0.5\%$  of the stated value & are valid between 18 °C & 30 °C. The measured characterization of uncertainty can be found on the Certified Weight Report. All product weighings are performed on an analytical balance that is calibrated to NIST Traceable standard weights & certified by the manufacturer. The volumetric glassware used is Class "A" type & conforms to ASTM E-288 unless otherwise stated. The solvents & compounds used are of the highest practical purity & typically meet or exceed ACS Reagent Grade & ACS Standards Grade specifications. The expanded uncertainty field on Certified Wt. Report represents CRM uncertainty as described in ISO 17034.

**Homogeneity:** Uncertainties that are due to the analytical procedure(s) are within  $\pm 5\%$  unless specifically stated on the Certified Wt. Report.

**Verification:** Uncertainties that are due to the analytical procedure(s) are within  $\pm 5\%$  unless specifically stated on the Certified Wt. Report.

**Stability:** Uncertainties for short-term stability are determined in accordance with ISO 17034. Long-term stability is determined in accordance with ISO 17034. The shelf life is limited by the stated expiration for each product. Expiration dates and additional technical information can be found on the Certified Weight Report and on the product label.

**Uncertainty:** UCRM is the expanded uncertainty which utilizes a  $K = 2$  (coverage factor of 2), in accordance with ISO 17034 as listed above (Characterization, Homogeneity, Verification, and Stability).

**Purity & Identity:** Organic solutions are typically formulated from neat materials whose purity & identity have been characterized by GC-MSD & LC-PDA techniques with comparison to a NIST Traceable library of mass spectra when available. Additional characterization techniques may include but are not limited to: refractive index measurements of liquids, melting point measurements of solids, & GC-FID, ECD, PID, ELCD, LC-PDA measurements for purity. Inorganic solutions & neats are typically formulated from materials whose purity & identity have been characterized by ICPMS with comparison to a NIST SRM® when available. Additional characterization techniques may include but are not limited to: titrimetry, and densitometry.

**Storage:** Sealed ampules and other containers should be stored in the dark and at temperatures indicated on the Certified Weight Report or product label. Certification by Absolute Standards, Inc. is typically valid for 3 years from the date of manufacture. Each product will show its own expiration date as the limit of certification. Certified values are not applicable to opened ampules or for any materials stored in re-sealable containers. Please see the "Certified Weight Report" for specific values and any exceptions.

**Usage:** Ampules & bottles should be brought to room temperature (18 to 30 °C) before opening. Sonication may be required for high concentration solutions or solutions that may precipitate during storage. After opening, care should be exercised to avoid concentration changes owing to evaporation of the solvent or essential components. We recommend that a suitable re-sealable container be available before opening an ampule to decant the standard for short-term storage and use.

**Minimum Sample Size:** 0.5 uL for analytical applications.

**Legal Notice:** Warranty of products are as described when shipped. No warranty as to fitness for any particular application is expressed or implied. Errant shipments and/or quality claims must be made within 10 days of receipt. Liability is limited solely to the replacement of the product or refund of purchase price.

**Certifying Officer:** Stephen J. Arpie, M.S., Director General

Page 1 of 2



Absolute Standards, Inc. • 44 Rossotto Drive • Hamden, CT 06514  
Voice: 800-368-1131 • Fax: 800-410-2577 • eMail: StephenArpie@AbsoluteStandards.com  
Document Identification: Certificate of Analysis Rev 14, Date Issued: 05/30/2019



# ABSOLUTE STANDARDS, INC.

ISO - 17034

## Understanding the Certified Weight Report

Each Certified Reference Material (CRM) is supported by a Certified Weight Report. Assigned values for concentrations and associated uncertainties are based upon NIST traceable masses & volumes used in production.

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

**Certified Reference Material CRM**

ISO 17034 Accredited  
Scope: http://AbsoluteStandards.com

**CERTIFIED WEIGHT REPORT**

Part # 10009R  
Lot # 070716  
Description: CLP Priority Pollutant Internal Standards  
GC/MS Calibration - 6 components  
070721  
Expiration Date: Ambient (20 °C)  
Recommended Storage: 4000  
Nominal Concentration (µg/mL): 822-275872-11  
NIST Test ID#: 5E-05 Balance Uncertainty  
0.058 Mass Uncertainty

Solvent(s): Methylene chloride  
Lot# 78782

Formulated By: Paul Barron  
Reviewed By: Pedro L. Rentes

070716  
070716

Weight(s) shown below were combined and diluted to (mL): 500.0

Compound	SMW	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty (%)	Target Weight (µg)	Actual Weight (µg)	Actual Conc (µg/mL)	Expanded Uncertainty (µg/mL)	CAS#	OSHA PEL (TWA)	LD50
1. 1,4-Dichlorobenzene-d4	118	PR-1845M07287CB1	4000	98	0.2	2.04093	2.04335	4004.7	15.4	2055-02-1	N/A	or-rat 500mg/kg
2. Naphthalene-d8	223	PR-2339M031612HP1	4000	99	0.2	2.02032	2.02084	4001.0	15.2	1146-85-2	10 ppm (50mg/m3/8h)	or-rat 400mg/kg
3. Acenaphthene-d10	2	PR-25444	4000	99	0.2	2.02032	2.02245	4004.2	15.2	15067-28-2	N/A	or-rat 500mg/kg
4. Phenanthrene-d10	248	PR-2305M081711PM1	4000	98	0.2	2.04093	2.04135	4000.8	15.4	1517-25-2	N/A	N/A
5. Chrysene-d12	92	I-19290	4000	98	0.2	2.04093	2.04150	4001.3	15.4	1719-03-5	N/A	N/A
6. Perylene-d12	247	PR-24113	4000	98	0.2	2.04093	2.04155	4001.2	15.4	1503-58-3	N/A	N/A

Run 35, "P10009R L070716 [4000µg/mL in MeCl2]"  
Run Length: 40.00 min, 23900 points at 10 points/second.  
Created: Sat, Jul 9, 2016 at 1:54:53 PM.  
Sampled: Sequence "070716-GC/MS", Method "GC-MS".  
Analyzed using Method "GC-MS".

Comments:  
GC-MS Analysis by Melissa Siciric  
Column ID SPB-5 30 meter x 0.53mm x 1.5um Film Thickness.  
Flow rates: Total Flow = 300 mL/min, Helium (carrier) = 0.5 mL, Helium (make-up) = 25 mL.  
Hydrogen (detector) = 30 mL, Air (detector) = 300 mL, Oven Temp 1 = 50°C (1 min).  
Rise = 10°C/min, Oven Temp 2 = 300°C (14 min), Total Run Time = 40 Minutes, Injector Temp = 250°C.  
FID Temp = 300°C, FID Signal = aDaq Channel 1.  
Gas Chromatograph = HP 5890, Auto Sampler = HP 7673, Standard Injection = 0.5 µL, Range = 4

Peak No. Name FID RT (min)

1	1,4-Dichlorobenzene-d4	8.34
2	Naphthalene-d8	8.98
3	Acenaphthene-d10	12.97
4	Phenanthrene-d10	16.37
5	Chrysene-d12	22.62
6	Perylene-d12	25.75

Printed: 5/8/2019, 12:55:50 PM

Part # 10009R Lot # 041219 1 of 2

Formulator  
Reviewer

Actual  
Concentration

Uncertainty  
Values

Health &  
Safety

3rd Party  
Comparison

For More Information, Contact:

StephenArpie@AbsoluteStandards.com

Page 2 of 2



CERTIFIED WEIGHT REPORT

Part Number: **72072**  
Lot Number: **101122**  
Description: **n-Tetracosane-d50**

Solvent(s):  
Methylene chloride

Lot#  
105345

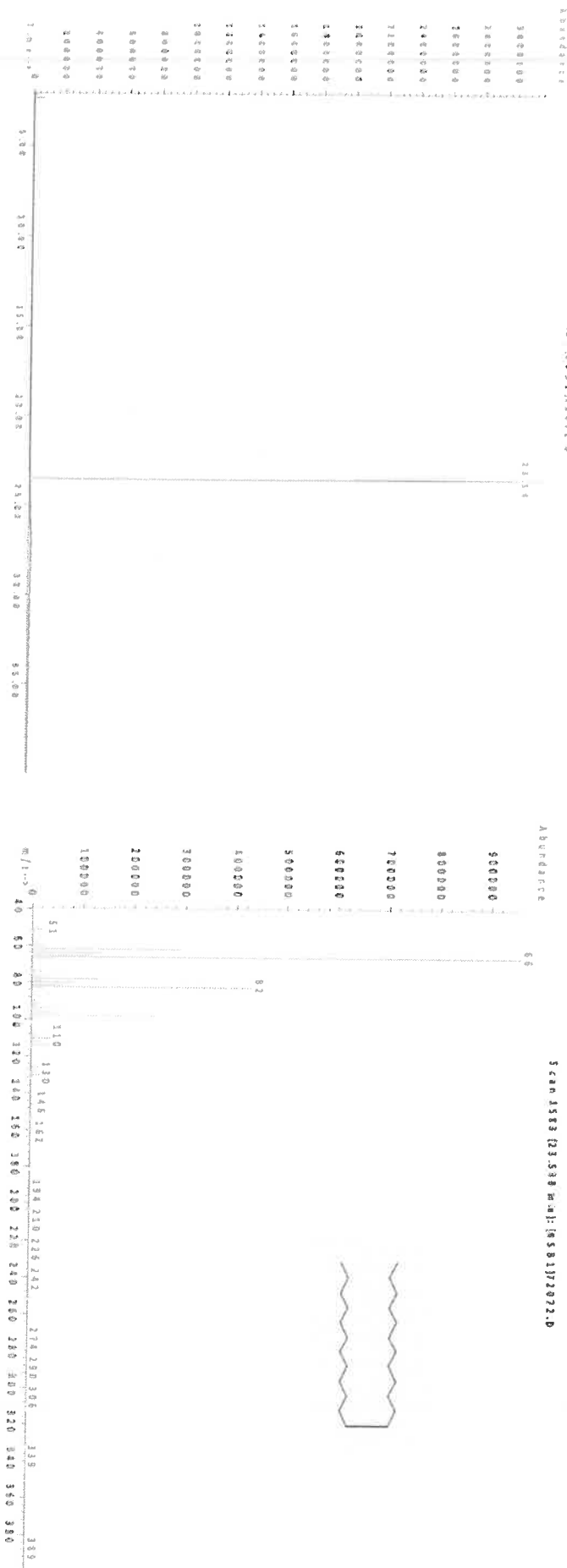
Expiration Date: **101132**  
Recommended Storage: **Ambient (20 °C)**  
Nominal Concentration (µg/mL): **1000**  
NIST Test ID#: **6UB3**  
Weight(s) shown below were combined and diluted to (mL): **200.0**  
**5E-05 Balance Uncertainty**  
**0.058 Flask Uncertainty**

**P13437**  
**13436**  
**07/24/24**  
**X.F.**

Formulated By:	<i>Prashant Chauhan</i>	101122
Reviewed By:	<i>Pedro L. Rentas</i>	101122
	Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)	LD50
----------	-----	------------	----------------------	------------	------------------------	-----------	------------------	------------------	---------------------	------------------------------------	--	------

1. n-Tetracosane-d50 2072 PR-26606 1000 98.7 0.2 99.0 0.20471 0.20482 1000.6 4.1 16416-32-3 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.



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



# ABSOLUTE STANDARDS, INC.

ISO - 17034



## Certificate of Analysis



### Certified Reference Material (CRM)

**Conformance:** The "Certificate of Analysis" is applicable for CRM's, fulfilling the requirements in the current version of: ISO 17034.

**Health & Safety:** See the attached SDS & Certified Weight Report before use.

**Intended Use:** This Certified Reference Material (CRM) is intended primarily for use in the characterization of unknowns and the establishment of analyzer or instrument response factors by qualified personnel. Typical instrumental organic assays include: GC & LC, and inorganic assays include: ICP & AA. This product is for laboratory use only.

**Characterization Values:** In production, gravimetric/volumetric readings are certified to be within  $\pm 0.5\%$  of the stated value & are valid between 18 °C & 30 °C. The measured characterization of uncertainty can be found on the Certified Weight Report. All product weighings are performed on an analytical balance that is calibrated to NIST Traceable standard weights & certified by the manufacturer. The volumetric glassware used is Class "A" type & conforms to ASTM E-288 unless otherwise stated. The solvents & compounds used are of the highest practical purity & typically meet or exceed ACS Reagent Grade & ACS Standards Grade specifications. The expanded uncertainty field on Certified Wt. Report represents CRM uncertainty as described in ISO 17034.

**Homogeneity:** Uncertainties that are due to the analytical procedure(s) are within  $\pm 5\%$  unless specifically stated on the Certified Wt. Report.

**Verification:** Uncertainties that are due to the analytical procedure(s) are within  $\pm 5\%$  unless specifically stated on the Certified Wt. Report.

**Stability:** Uncertainties for short-term stability are determined in accordance with ISO 17034. Long-term stability is determined in accordance with ISO 17034. The shelf life is limited by the stated expiration for each product. Expiration dates and additional technical information can be found on the Certified Weight Report and on the product label.

**Uncertainty:** UCRM is the expanded uncertainty which utilizes a  $K = 2$  (coverage factor of 2), in accordance with ISO 17034 as listed above (Characterization, Homogeneity, Verification, and Stability).

**Purity & Identity:** Organic solutions are typically formulated from neat materials whose purity & identity have been characterized by GC-MSD & LC-PDA techniques with comparison to a NIST Traceable library of mass spectra when available. Additional characterization techniques may include but are not limited to: refractive index measurements of liquids, melting point measurements of solids, & GC-FID, ECD, PID, ELCD, LC-PDA measurements for purity. Inorganic solutions & neats are typically formulated from materials whose purity & identity have been characterized by ICPMS with comparison to a NIST SRM® when available. Additional characterization techniques may include but are not limited to: titrimetry, and densitometry.

**Storage:** Sealed ampules and other containers should be stored in the dark and at temperatures indicated on the Certified Weight Report or product label. Certification by Absolute Standards, Inc. is typically valid for 3 years from the date of manufacture. Each product will show its own expiration date as the limit of certification. Certified values are not applicable to opened ampules or for any materials stored in re-sealable containers. Please see the "Certified Weight Report" for specific values and any exceptions.

**Usage:** Ampules & bottles should be brought to room temperature (18 to 30 °C) before opening. Sonication may be required for high concentration solutions or solutions that may precipitate during storage. After opening, care should be exercised to avoid concentration changes owing to evaporation of the solvent or essential components. We recommend that a suitable re-sealable container be available before opening an ampule to decant the standard for short-term storage and use.

**Minimum Sample Size:** 0.5 uL for analytical applications.

**Legal Notice:** Warranty of products are as described when shipped. No warranty as to fitness for any particular application is expressed or implied. Errant shipments and/or quality claims must be made within 10 days of receipt. Liability is limited solely to the replacement of the product or refund of purchase price.

**Certifying Officer:** Stephen J. Arpie, M.S., Director General

Page 1 of 2



Absolute Standards, Inc. • 44 Rossotto Drive • Hamden, CT 06514  
Voice: 800-368-1131 • Fax: 800-410-2577 • eMail: StephenArpie@AbsoluteStandards.com  
Document Identification: Certificate of Analysis Rev 14, Date Issued: 05/30/2019





# ABSOLUTE STANDARDS, INC.

ISO - 17034



## Understanding the Certified Weight Report



Each Certified Reference Material (CRM) is supported by a Certified Weight Report. Assigned values for concentrations and associated uncertainties are based upon NIST traceable masses & volumes used in production.

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

**Certified Reference Material CRM**

ISO 17034 Accredited  
Scope: http://AbsoluteStandards.com

**CERTIFIED WEIGHT REPORT**

Part # 10009R  
Lot # 070716  
Shelf Life 070716

Part Number: 10009R  
Lot Number: 070716  
Description: CLP Priority Pollutant Internal Standards  
GC/MS Calibration - 6 components  
070716  
Expiration Date: Ambient (20 °C)  
Recommended Storage: 4000  
Nominal Concentration (µg/mL): 822-275872-11  
NIST Test ID#: 5E-05 Balance Uncertainty  
0.058 Mass Uncertainty

Solvent(s): Methylene chloride  
Lot# 78782

Formulated By: Paul Barron  
Reviewed By: Pedro L. Rentes

070716  
070716

Weight(s) shown below were combined and diluted to (mL): 500.0

Compound	SMW	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty (%)	Target Weight (µg)	Actual Weight (µg)	Actual Conc (µg/mL)	Expanded Uncertainty (µg/mL)	CAS#	OSHA PEL (TWA)	LD50
1. 1,4-Dichlorobenzene-d4	118	PR-1845M07287CB1	4000	98	0.2	2.04093	2.04335	4004.7	15.4	2055-02-1	N/A	or-rat 500mg/kg
2. Naphthalene-d8	223	PR-2339M031612HP1	4000	99	0.2	2.02032	2.02084	4001.0	15.2	1146-85-2	10 ppm (50mg/m3/8h)	or-rat 400mg/kg
3. Acenaphthene-d10	2	PR-25444	4000	99	0.2	2.02032	2.02245	4004.2	15.2	15067-28-2	N/A	or-rat 500mg/kg
4. Phenanthrene-d10	248	PR-2305M081711PM1	4000	98	0.2	2.04093	2.04135	4000.8	15.4	1517-25-2	N/A	N/A
5. Chrysene-d12	92	I-19290	4000	98	0.2	2.04093	2.04159	4001.3	15.4	1719-03-5	N/A	N/A
6. Perylene-d12	247	PR-24113	4000	98	0.2	2.04093	2.04158	4001.2	15.4	1503-58-3	N/A	N/A

Run 35, "P10009R L070716 [4000µg/mL in MeCl2]"  
Run Length: 40.00 min, 23900 points at 10 points/second.  
Created: Sat, Jul 9, 2016 at 1:54:53 PM.  
Sampled: Sequence "070716-GC/MS", Method "GC-MS".  
Analyzed using Method "GC-MS".

Comments:  
GC-MS Analysis by Melissa Siciric  
Column ID SPB-5 30 meter x 0.53mm x 1.5um Film Thickness.  
Flow rates: Total Flow = 300 mL/min, Helium (carrier) = 0.5 mL, Helium (make-up) = 25 mL.  
Hydrogen (detector) = 30 mL, Air (detector) = 300 mL, Oven Temp 1 = 50°C (1 min).  
Rise = 10°C/min, Oven Temp 2 = 300°C (14 min), Total Run Time = 40 Minutes, Injector Temp = 250°C.  
FID Temp = 300°C, FID Signal = sData Channel 1.  
Gas Chromatograph = HP 5890, Auto Sampler = HP 7673, Standard Injection = 0.5 µL, Range = 4

Peak No. Name FID RT (min)

1	1,4-Dichlorobenzene-d4	8.34
2	Naphthalene-d8	8.98
3	Acenaphthene-d10	12.97
4	Phenanthrene-d10	16.37
5	Chrysene-d12	22.62
6	Perylene-d12	25.75

Printed: 5/8/2019, 12:55:50 PM

Formulator  
Reviewer

Actual  
Concentration  
Uncertainty  
Values

Health &  
Safety

3rd Party  
Comparison

For More Information, Contact:

StephenArpie@AbsoluteStandards.com

Page 2 of 2



CERTIFIED WEIGHT REPORT

Part Number: **72072**  
Lot Number: **101122**  
Description: **n-Tetracosane-d50**

Solvent(s):  
Methylene chloride  
Lot# **105345**

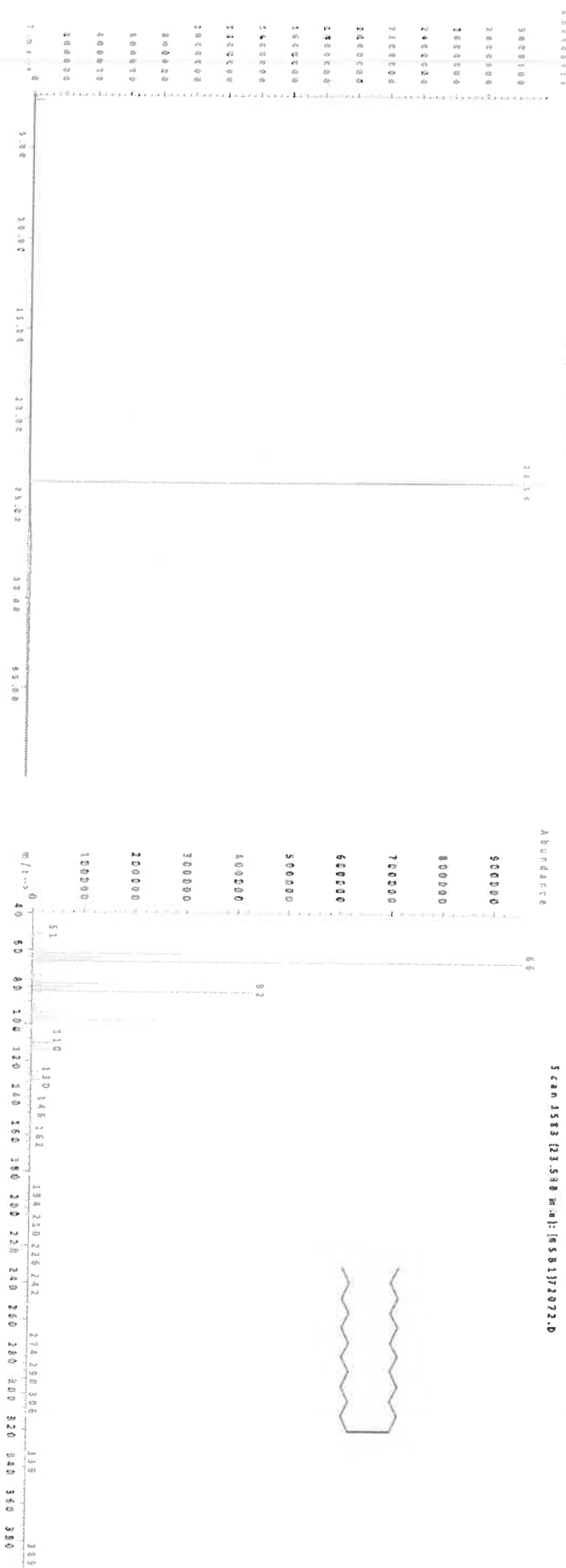
Expiration Date: **101132**  
Recommended Storage: **Ambient (20 °C)**  
Nominal Concentration (µg/mL): **1000**  
NIST Test ID#: **6UB3**  
Weight(s) shown below were combined and diluted to (mL): **200.0**  
**5E-05 Balance Uncertainty**  
**0.058 Flask Uncertainty**

**P13437**  
**13436**  
**07/24/24**  
**X.F.**

Formulated By:	<i>Prashant Chauhan</i>	101122
Reviewed By:	<i>Pedro L. Rentas</i>	101122
DATE		DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)	LD50
1. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20482	1000.6	4.1	16416-32-3	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.



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



# ABSOLUTE STANDARDS, INC.

ISO - 17034



## Certificate of Analysis



### Certified Reference Material (CRM)

**Conformance:** The "Certificate of Analysis" is applicable for CRM's, fulfilling the requirements in the current version of: ISO 17034.

**Health & Safety:** See the attached SDS & Certified Weight Report before use.

**Intended Use:** This Certified Reference Material (CRM) is intended primarily for use in the characterization of unknowns and the establishment of analyzer or instrument response factors by qualified personnel. Typical instrumental organic assays include: GC & LC, and inorganic assays include: ICP & AA. This product is for laboratory use only.

**Characterization Values:** In production, gravimetric/volumetric readings are certified to be within  $\pm 0.5\%$  of the stated value & are valid between 18 °C & 30 °C. The measured characterization of uncertainty can be found on the Certified Weight Report. All product weighings are performed on an analytical balance that is calibrated to NIST Traceable standard weights & certified by the manufacturer. The volumetric glassware used is Class "A" type & conforms to ASTM E-288 unless otherwise stated. The solvents & compounds used are of the highest practical purity & typically meet or exceed ACS Reagent Grade & ACS Standards Grade specifications. The expanded uncertainty field on Certified Wt. Report represents CRM uncertainty as described in ISO 17034.

**Homogeneity:** Uncertainties that are due to the analytical procedure(s) are within  $\pm 5\%$  unless specifically stated on the Certified Wt. Report.

**Verification:** Uncertainties that are due to the analytical procedure(s) are within  $\pm 5\%$  unless specifically stated on the Certified Wt. Report.

**Stability:** Uncertainties for short-term stability are determined in accordance with ISO 17034. Long-term stability is determined in accordance with ISO 17034. The shelf life is limited by the stated expiration for each product. Expiration dates and additional technical information can be found on the Certified Weight Report and on the product label.

**Uncertainty:** UCRM is the expanded uncertainty which utilizes a  $K = 2$  (coverage factor of 2), in accordance with ISO 17034 as listed above (Characterization, Homogeneity, Verification, and Stability).

**Purity & Identity:** Organic solutions are typically formulated from neat materials whose purity & identity have been characterized by GC-MSD & LC-PDA techniques with comparison to a NIST Traceable library of mass spectra when available. Additional characterization techniques may include but are not limited to: refractive index measurements of liquids, melting point measurements of solids, & GC-FID, ECD, PID, ELCD, LC-PDA measurements for purity. Inorganic solutions & neats are typically formulated from materials whose purity & identity have been characterized by ICPMS with comparison to a NIST SRM® when available. Additional characterization techniques may include but are not limited to: titrimetry, and densitometry.

**Storage:** Sealed ampules and other containers should be stored in the dark and at temperatures indicated on the Certified Weight Report or product label. Certification by Absolute Standards, Inc. is typically valid for 3 years from the date of manufacture. Each product will show its own expiration date as the limit of certification. Certified values are not applicable to opened ampules or for any materials stored in re-sealable containers. Please see the "Certified Weight Report" for specific values and any exceptions.

**Usage:** Ampules & bottles should be brought to room temperature (18 to 30 °C) before opening. Sonication may be required for high concentration solutions or solutions that may precipitate during storage. After opening, care should be exercised to avoid concentration changes owing to evaporation of the solvent or essential components. We recommend that a suitable re-sealable container be available before opening an ampule to decant the standard for short-term storage and use.

**Minimum Sample Size:** 0.5 uL for analytical applications.

**Legal Notice:** Warranty of products are as described when shipped. No warranty as to fitness for any particular application is expressed or implied. Errant shipments and/or quality claims must be made within 10 days of receipt. Liability is limited solely to the replacement of the product or refund of purchase price.

**Certifying Officer:** Stephen J. Arpie, M.S., Director General

Page 1 of 2



Absolute Standards, Inc. • 44 Rossotto Drive • Hamden, CT 06514  
Voice: 800-368-1131 • Fax: 800-410-2577 • eMail: StephenArpie@AbsoluteStandards.com  
Document Identification: Certificate of Analysis Rev 14, Date Issued: 05/30/2019



# ABSOLUTE STANDARDS, INC.

ISO - 17034



## Understanding the Certified Weight Report



Each Certified Reference Material (CRM) is supported by a Certified Weight Report. Assigned values for concentrations and associated uncertainties are based upon NIST traceable masses & volumes used in production.

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

**Certified Reference Material CRM**

ISO 17034 Accredited  
Scope: http://AbsoluteStandards.com

**CERTIFIED WEIGHT REPORT**

Part # 10009R  
Lot # 070716  
Description: CLP Priority Pollutant Internal Standards  
GC/MS Calibration - 6 components  
070721  
Expiration Date:  
Recommended Storage: Ambient (20 °C)  
Nominal Concentration (µg/mL): 4000  
NIST Test ID#: 822-275872-11  
Weight(s) shown below were combined and diluted to (mL): 500.0  
Balance Uncertainty: 0.058  
Peak 1 uncertainty

Solvent(s): Methylene chloride  
Lot# 78782

Formulated By: Paul Barron  
Reviewed By: Pedro L. Rentes

DATE: 070716  
DATE: 070716

**MSDS Information**  
(Solvent Safety info. On Attached pg.)

Compound	SMW	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty (%)	Target Weight (µg)	Actual Weight (µg)	Actual Conc (µg/mL)	Expanded Uncertainty (µg/mL)	CAS#	OSHA PEL (TWA)	LD50
1. 1,4-Dichlorobenzene-d4	118	PR-1845M07287CB1	4000	98	0.2	2.04093	2.04335	4004.7	15.4	2055-02-1	N/A	or-rat 500mg/kg
2. Naphthalene-d8	223	PR-2339M031612HP1	4000	99	0.2	2.02032	2.02084	4001.0	15.2	1146-85-2	10 ppm (50mg/m3/8h)	or-rat 400mg/kg
3. Acenaphthene-d10	2	PR-25444	4000	99	0.2	2.02032	2.02245	4004.2	15.2	15067-28-2	N/A	or-rat 500mg/kg
4. Phenanthrene-d10	248	PR-2305M081711PM1	4000	98	0.2	2.04093	2.04136	4000.8	15.4	1517-25-2	N/A	N/A
5. Chrysene-d12	92	I-19290	4000	98	0.2	2.04093	2.04159	4001.3	15.4	1719-03-5	N/A	N/A
6. Perylene-d12	247	PR-24113	4000	98	0.2	2.04093	2.04156	4001.2	15.4	1503-58-3	N/A	N/A

Run 35, "P10009R L070716 [4000µg/mL in MeCl2]"  
Run Length: 40.00 min, 23900 points at 10 points/second.  
Created: Sat, Jul 9, 2016 at 1:54:53 PM.  
Sampled: Sequence "070716-GC/MS", Method "GC-MS".  
Analyzed using Method "GC-MS".

**Comments:**  
GC-MS Analysis by Melissa Siciric  
Column ID SPB-5 30 meter x 0.53mm x 1.5um Film Thickness.  
Flow rates: Total Flow = 300 mL/min, Helium (carrier) = 0.5 mL, Helium (make-up) = 25 mL.  
Hydrogen (detector) = 30 mL, Air (detector) = 300 mL, Oven Temp 1 = 50°C (1 min).  
Rise = 10°C/min, Oven Temp 2 = 300°C (14 min), Total Run Time = 40 Minutes, Injector Temp = 250°C.  
FID Temp = 300°C, FID Signal = sData Channel 1.  
Gas Chromatograph = HP 5890, Auto Sampler = HP 7673, Standard Injection = 0.5 µL, Range = 4

**Peak Data:**

Peak No.	Name	FID RT (min)
1	1,4-Dichlorobenzene-d4	6.34
2	Naphthalene-d8	8.98
3	Acenaphthene-d10	12.97
4	Phenanthrene-d10	16.37
5	Chrysene-d12	22.62
6	Perylene-d12	25.75

**Qualitative Quantitative**

**3rd Party Comparison**

Analyte	Sup/Abs Dev (%)
1,4-Dichlorobenzene-d4	2.55
Naphthalene-d8	2.43
Acenaphthene-d10	2.74
Phenanthrene-d10	0.65
Chrysene-d12	1.93
Perylene-d12	-1.72
Total	-0.56

Printed: 5/8/2019, 12:55:50 PM

For More Information, Contact:

StephenArpie@AbsoluteStandards.com

Page 2 of 2



Absolute Standards, Inc. • 44 Rossotto Drive • Hamden, CT 06514  
Voice: 800-368-1131 • Fax: 800-410-2577 • eMail: StephenArpie@AbsoluteStandards.com  
Document Identification: Certificate of Analysis Rev 14, Date Issued: 05/30/2019





CERTIFIED WEIGHT REPORT

Part Number: **72072**  
Lot Number: **101122**  
Description: **n-Tetracosane-d50**

Solvent(s):  
Methylene chloride  
Lot#  
105345

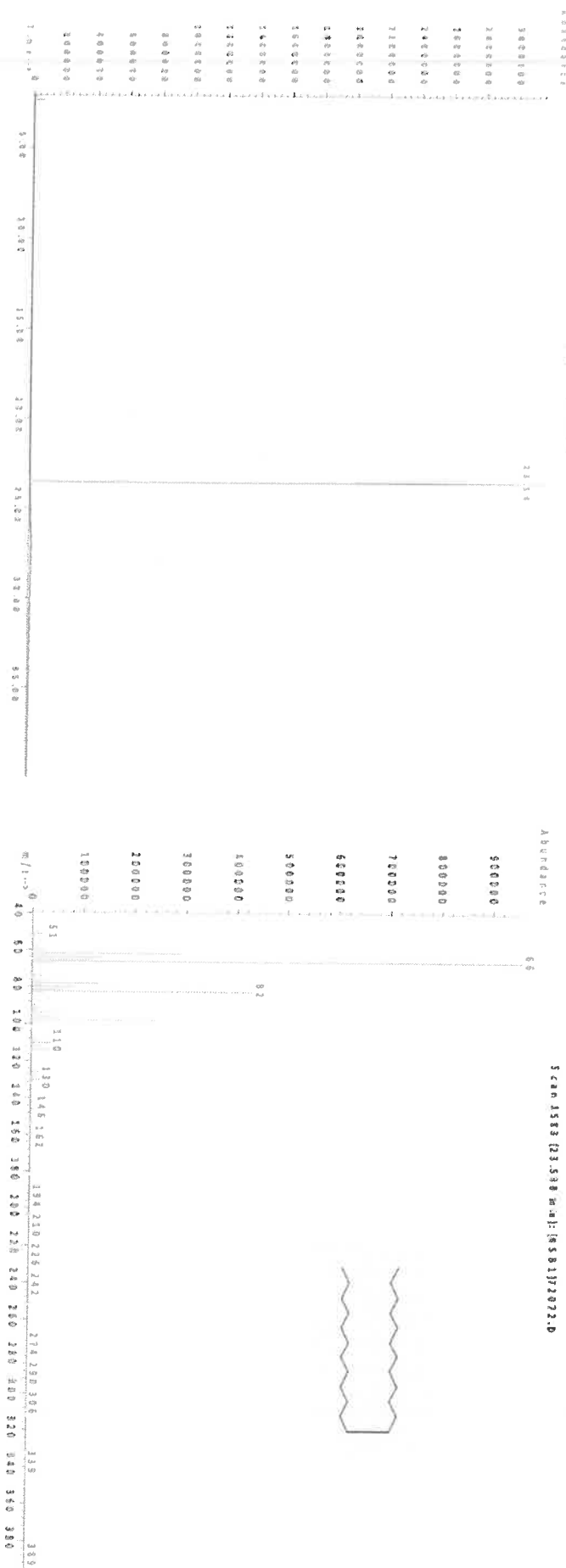
Expiration Date: **101132**  
Recommended Storage: **Ambient (20 °C)**  
Nominal Concentration (µg/mL): **1000**  
NIST Test ID#: **6UB3**  
Weight(s) shown below were combined and diluted to (mL): **200.0**  
**5E-05 Balance Uncertainty**  
**0.058 Flask Uncertainty**

**P13437**  
**13496**  
**07/24/24**  
**X.F.**

Formulated By:	<i>Prashant Chauhan</i>	101122
Reviewed By:	<i>Pedro L. Rentas</i>	101122
DATE		

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.)	LD50
1. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20482	1000.6	4.1	16416-32-3	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.



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



# ABSOLUTE STANDARDS, INC.

ISO - 17034



## Certificate of Analysis



### Certified Reference Material (CRM)

**Conformance:** The "Certificate of Analysis" is applicable for CRM's, fulfilling the requirements in the current version of: ISO 17034.

**Health & Safety:** See the attached SDS & Certified Weight Report before use.

**Intended Use:** This Certified Reference Material (CRM) is intended primarily for use in the characterization of unknowns and the establishment of analyzer or instrument response factors by qualified personnel. Typical instrumental organic assays include: GC & LC, and inorganic assays include: ICP & AA. This product is for laboratory use only.

**Characterization Values:** In production, gravimetric/volumetric readings are certified to be within  $\pm 0.5\%$  of the stated value & are valid between 18 °C & 30 °C. The measured characterization of uncertainty can be found on the Certified Weight Report. All product weighings are performed on an analytical balance that is calibrated to NIST Traceable standard weights & certified by the manufacturer. The volumetric glassware used is Class "A" type & conforms to ASTM E-288 unless otherwise stated. The solvents & compounds used are of the highest practical purity & typically meet or exceed ACS Reagent Grade & ACS Standards Grade specifications. The expanded uncertainty field on Certified Wt. Report represents CRM uncertainty as described in ISO 17034.

**Homogeneity:** Uncertainties that are due to the analytical procedure(s) are within  $\pm 5\%$  unless specifically stated on the Certified Wt. Report.

**Verification:** Uncertainties that are due to the analytical procedure(s) are within  $\pm 5\%$  unless specifically stated on the Certified Wt. Report.

**Stability:** Uncertainties for short-term stability are determined in accordance with ISO 17034. Long-term stability is determined in accordance with ISO 17034. The shelf life is limited by the stated expiration for each product. Expiration dates and additional technical information can be found on the Certified Weight Report and on the product label.

**Uncertainty:** UCRM is the expanded uncertainty which utilizes a  $K = 2$  (coverage factor of 2), in accordance with ISO 17034 as listed above (Characterization, Homogeneity, Verification, and Stability).

**Purity & Identity:** Organic solutions are typically formulated from neat materials whose purity & identity have been characterized by GC-MSD & LC-PDA techniques with comparison to a NIST Traceable library of mass spectra when available. Additional characterization techniques may include but are not limited to: refractive index measurements of liquids, melting point measurements of solids, & GC-FID, ECD, PID, ELCD, LC-PDA measurements for purity. Inorganic solutions & neats are typically formulated from materials whose purity & identity have been characterized by ICPMS with comparison to a NIST SRM® when available. Additional characterization techniques may include but are not limited to: titrimetry, and densitometry.

**Storage:** Sealed ampules and other containers should be stored in the dark and at temperatures indicated on the Certified Weight Report or product label. Certification by Absolute Standards, Inc. is typically valid for 3 years from the date of manufacture. Each product will show its own expiration date as the limit of certification. Certified values are not applicable to opened ampules or for any materials stored in re-sealable containers. Please see the "Certified Weight Report" for specific values and any exceptions.

**Usage:** Ampules & bottles should be brought to room temperature (18 to 30 °C) before opening. Sonication may be required for high concentration solutions or solutions that may precipitate during storage. After opening, care should be exercised to avoid concentration changes owing to evaporation of the solvent or essential components. We recommend that a suitable re-sealable container be available before opening an ampule to decant the standard for short-term storage and use.

**Minimum Sample Size:** 0.5 uL for analytical applications.

**Legal Notice:** Warranty of products are as described when shipped. No warranty as to fitness for any particular application is expressed or implied. Errant shipments and/or quality claims must be made within 10 days of receipt. Liability is limited solely to the replacement of the product or refund of purchase price.

**Certifying Officer:** Stephen J. Arpie, M.S., Director General

Page 1 of 2



Absolute Standards, Inc. • 44 Rossotto Drive • Hamden, CT 06514  
Voice: 800-368-1131 • Fax: 800-410-2577 • eMail: StephenArpie@AbsoluteStandards.com  
Document Identification: Certificate of Analysis Rev 14, Date Issued: 05/30/2019





# ABSOLUTE STANDARDS, INC.

ISO - 17034

## Understanding the Certified Weight Report

Each Certified Reference Material (CRM) is supported by a Certified Weight Report. Assigned values for concentrations and associated uncertainties are based upon NIST traceable masses & volumes used in production.

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

**Certified Reference Material CRM**

ISO 17034 Accredited  
Scope: http://AbsoluteStandards.com

**CERTIFIED WEIGHT REPORT**

Part # 10009R  
Lot # 070716  
Shelf Life Description: CLP Priority Pollutant Internal Standards  
GC/MS Calibration - 6 components  
070721  
Expiration Date: Ambient (20 °C)  
Recommended Storage: 4000  
Nominal Concentration (µg/mL): 822-275872-11  
NIST Test ID#: 5E-05 Balance Uncertainty  
0.058 Mass Uncertainty

Solvent(s): Methylene chloride  
Lot# 78782

Formulated By: Paul Barron  
Reviewed By: Pedro L. Rentes

070716  
070716

Weight(s) shown below were combined and diluted to (mL): 500.0

Compound	SMW	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity	Target Weight (µg)	Actual Weight (µg)	Actual Conc (µg/mL)	Expanded Uncertainty (µg/mL)	CAS#	MSDS Information (Solvent Safety Info. On Attached pg.)	OSHA PEL (TWA)	LD50
1. 1,4-Dichlorobenzene-d4	118	PR-1845M07287CB1	4000	98	0.2	2.04093	2.04335	4004.7	15.4	2055-02-1	N/A	N/A	or-rat 500mg/kg
2. Naphthalene-d8	223	PR-2339M031612HP1	4000	99	0.2	2.02032	2.02084	4001.0	15.2	1146-85-2	10 ppm (50mg/m3/8h)	N/A	or-rat 400mg/kg
3. Acenaphthene-d10	2	PR-25444	4000	99	0.2	2.02032	2.02245	4004.2	15.2	15067-28-2	N/A	N/A	or-rat 500mg/kg
4. Phenanthrene-d10	248	PR-2305M081711PM1	4000	98	0.2	2.04093	2.04135	4000.8	15.4	1517-25-2	N/A	N/A	N/A
5. Chrysene-d12	92	I-19290	4000	98	0.2	2.04093	2.04150	4001.3	15.4	1719-03-5	N/A	N/A	N/A
6. Perylene-d12	247	PR-24113	4000	98	0.2	2.04093	2.04155	4001.2	15.4	1503-58-3	N/A	N/A	N/A

Run 35, "P10009R L070716 [4000µg/mL in MeCl2]"  
Run Length: 40.00 min, 23900 points at 10 points/second.  
Created: Sat, Jul 9, 2016 at 1:54:53 PM.  
Sampled: Sequence "070716-GC/MS2", Method "GC-MS2".  
Analyzed using Method "GC-MS2".

Comments:  
GC-MS2 Analysis by Melissa Siciric  
Column ID SPB-5 30 meter x 0.53mm x 1.5um Film Thickness.  
Flow rates: Total Flow = 300 mL/min, Helium (carrier) = 0.5 mL, Helium (make-up) = 25 mL.  
Hydrogen (detector) = 30 mL, Air (detector) = 300 mL, Oven Temp 1 = 50°C (1 min).  
Rise = 10°C/min, Oven Temp 2 = 300°C (14 min), Total Run Time = 40 Minutes, Injector Temp = 250°C.  
FID Temp = 300°C, FID Signal = sData Channel 1.  
Gas Chromatograph = HP 5890, Auto Sampler = HP 7673, Standard Injection = 0.5 µL, Range = 4

Peak No. Name FID RT (min)

1	1,4-Dichlorobenzene-d4	8.34
2	Naphthalene-d8	8.98
3	Acenaphthene-d10	12.97
4	Phenanthrene-d10	16.37
5	Chrysene-d12	22.62
6	Perylene-d12	25.75

Printed: 5/8/2019, 12:55:50 PM

Formulator  
Reviewer

Actual  
Concentration

Uncertainty  
Values

Health &  
Safety

3rd Party  
Comparison

For More Information, Contact:

StephenArpie@AbsoluteStandards.com

Page 2 of 2



CERTIFIED WEIGHT REPORT

Part Number: **72072**  
Lot Number: **101122**  
Description: **n-Tetracosane-d50**

Solvent(s):  
Methylene chloride  
Lot#  
105345

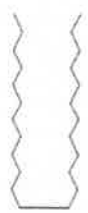
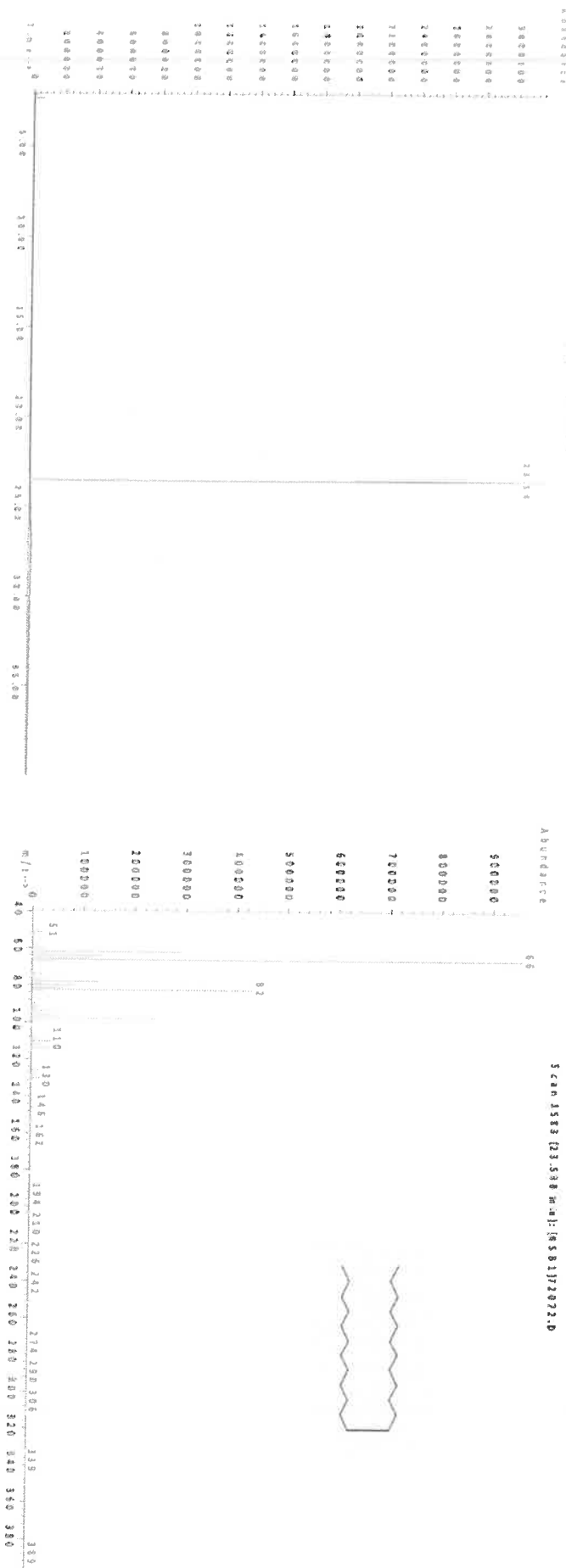
Expiration Date: **101132**  
Recommended Storage: **Ambient (20 °C)**  
Nominal Concentration (µg/mL): **1000**  
NIST Test ID#: **6UB3**  
Weight(s) shown below were combined and diluted to (mL): **200.0**  
**5E-05 Balance Uncertainty**  
**0.058 Flask Uncertainty**

**P13437**  
**13496**  
**07/24/24**  
**X.F.**

Formulated By:	<i>Prashant Chauhan</i>	101122
Reviewed By:	<i>Pedro L. Rentas</i>	101122
	Pedro L. Rentas	DATE

Compound	RM#	Lot Number	Nominal Conc (µg/mL)	Purity (%)	Uncertainty Purity (%)	Assay (%)	Target Weight(g)	Actual Weight(g)	Actual Conc (µg/mL)	Expanded Uncertainty (+/-) (µg/mL)	SDS Information (Solvent Safety Info. On Attached pg.)	LD50
1. n-Tetracosane-d50	2072	PR-26606	1000	98.7	0.2	99.0	0.20471	0.20482	1000.6	4.1	16416-32-3	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.



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

