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Date manufactured: 29-Mar-2018
Original issue date: 29-Mar-2018

Certificate of Analysis

Date Received: _____
Page 1 of 5 Rev 0

Catalog No.	Lot No.	Storage	Solvent	Expiration Date	Description
DRE- GA09000397 DI	340533	≤ -10 °C	Methylene Chloride	27-Jun-2018	SVOA Calibration Mixture, Method 8270, 50 mg/l, 5 ml (RM, ISO 17034)

Certified Values

The certified value is based on gravimetric and volumetric preparation of this CRM. This CRM has been confirmed by gas chromatography (GC), gas chromatography/mass spectrometry (GC/MS), or High Performance Liquid Chromatography (HPLC) using an internally developed method against an independent source. The uncertainty value is calculated for a 95% confidence interval with a *k* value of 2.

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration, mg/L
acenaphthene	83-32-9	99	13.1.4P	50.39 +/-2.6
acenaphthylene	208-96-8	96.4	14.282.4P	50.03 +/-2.6
aniline	62-53-3	99.9	64.7.1P	50.08 +/-2.7
anthracene	120-12-7	99.2	15.29.1.1P	50.59 +/-2.6
azobenzene	103-33-3	99.9	252.7.1P	50.05 +/-2.6
benzidine	92-87-5	98.2	124.1.2P	50.1 +/-2.7
benzo[a]anthracene	56-55-3	99	16.7.2.3P	50.09 +/-2.6
benzo[b]fluoranthene	205-99-2	99.9	17.282.1.1P	49.95 +/-2.6
benzo[k]fluoranthene	207-08-9	99.4	18.282.2.3P	49.9 +/-2.6
benzoic acid	65-85-0	100	123.9.2.1P	50.06 +/-2.7
benzo[ghi]perylene	191-24-2	99.6	19.4.5.8P	50.2 +/-2.6
benzo[a]pyrene	50-32-8	99.5	20.282.3P	50.35 +/-2.6
benzyl alcohol	100-51-6	99.9	65.18.1P	50.1 +/-2.6
bis(2-chloroethoxy)methane	111-91-1	97	31.226.1P	49.32 +/-2.7
bis(2-chloroethyl)ether	111-44-4	99.8	32.7.1P	49.72 +/-2.6
bis(2-chloro-1-methylethyl) ether	108-60-1	99	34.3.9P	49.71 +/-2.6
bis(2-ethylhexyl)phthalate	117-81-7	99.4	33.29.1P	50.01 +/-2.7
4-bromophenyl phenyl ether	101-55-3	99.4	35.29.3P	50.68 +/-2.7
butyl benzyl phthalate	85-68-7	98	36.1.5P	50.03 +/-2.7
carbazole	86-74-8	99	239.1.1.1P	50.85 +/-2.6
4-chloroaniline	106-47-8	99.9	66.9.1.1P	50.03 +/-2.7

Certificate of Analysis

Catalog No.: DRE-GA09000397DI

Lot No.: 340533

Expiration Date: 27-Jun-2018

4-chlorophenylphenyl ether	7005-72-3	99	37.158.1P	49.72 +/-2.7
4-chloro-3-methylphenol	59-50-7	99.9	102.7.1P	49.84 +/-2.6
2-chloronaphthalene	91-58-7	99.8	42.7.5.1P	50.81 +/-2.7
2-chlorophenol	95-57-8	99.6	103.9.1P	49.54 +/-2.7
chrysene	218-01-9	99.9	21.1.2P	49.95 +/-2.6
dibenz[a,h]anthracene	53-70-3	99.4	22.4.6.10P	50.5 +/-2.6
dibenzofuran	132-64-9	100	67.7.1P	50.06 +/-2.8
di-n-butyl phthalate	84-74-2	99.8	40.9.2P	50.04 +/-2.7
1,2-dichlorobenzene	95-50-1	99.5	43.1.2P	50.25 +/-2.7
1,3-dichlorobenzene	541-73-1	99.9	44.9.2P	50.13 +/-2.7
1,4-dichlorobenzene	106-46-7	99.9	45.29.1P	50.13 +/-2.7
3,3'-dichlorobenzidine	91-94-1	99.2	74.3.25P	50.06 +/-2.7
2,4-dichlorophenol	120-83-2	99.5	104.1.2P	49.81 +/-2.7
diethyl phthalate	84-66-2	99.8	38.9.1P	50.34 +/-2.7
2,4-dimethylphenol	105-67-9	99	105.9.1.1P	49.42 +/-2.6
dimethyl phthalate	131-11-3	99.9	39.9.2P	50.02 +/-2.6
2,4-dinitrophenol	51-28-5	99.9	106.1.6DP	50.01 +/-2.6
2,4-dinitrotoluene	121-14-2	100	87.7.2.1P	50.28 +/-2.7
2,6-dinitrotoluene	606-20-2	100	88.7.1.1P	50.28 +/-2.7
di-n-octyl phthalate	117-84-0	99.2	41.7.3P	50.02 +/-2.6
fluoranthene	206-44-0	99.5	23.7.2P	49.95 +/-2.6
fluorene	86-73-7	99.8	24.1.4P	50.5 +/-2.6
2-fluorobiphenyl	321-60-8	99.7	8.7.1P	50.07 +/-2.7
2-fluorophenol	367-12-4	99.9	10.9.2P	50.25 +/-2.8
hexachlorobenzene	118-74-1	99	46.158.2P	50.16 +/-2.8
hexachlorobutadiene	87-68-3	98	47.158.1P	50.05 +/-2.7
hexachlorocyclopentadiene	77-47-4	96.5	48.2.1P	50.36 +/-2.8
hexachloroethane	67-72-1	100	49.1.2P	50.13 +/-2.7
indeno[1,2,3-cd]pyrene	193-39-5	99	25.282.2.3P	50.69 +/-2.6

Certificate of Analysis

Catalog No.: DRE-GA09000397DI

Lot No.: 340533

Expiration Date: 27-Jun-2018

isophorone	78-59-1	98.8	90.1.2P	50.13 +/-2.7
2-methyl-4,6-dinitrophenol	534-52-1	98	107.7.1DP	49.64 +/-2.7
2-methylnaphthalene	91-57-6	99.1	68.8.1.1P	50.26 +/-2.8
2-methylphenol	95-48-7	99.6	114.1.2P	50.1 +/-2.7
4-methylphenol	106-44-5	99	116.1.3P	49.97 +/-2.7
naphthalene	91-20-3	99.9	26.29.1P	50.35 +/-2.6
2-nitroaniline	88-74-4	99.5	69.9.1P	50.01 +/-2.7
3-nitroaniline	99-09-2	99.9	70.7.1P	50.56 +/-2.7
4-nitroaniline	100-01-6	99.7	71.29.1P	50.15 +/-2.7
nitrobenzene	98-95-3	99.9	94.29.2P	50.65 +/-2.7
nitrobenzene-d ₅	4165-60-0	99.9	7.120.1P	50.12 +/-2.7
2-nitrophenol	88-75-5	99.1	108.29.1P	50.92 +/-2.7
4-nitrophenol	100-02-7	100	109.7.1P	49.05 +/-2.6
N-nitrosodimethylamine	62-75-9	99.5	57.3.13P	50.03 +/-2.6
N-nitrosodi-n-propylamine	621-64-7	99.9	59.7.3.1P	49.99 +/-2.6
n-nitrosodiphenylamine	86-30-6	99.7	58.7.3P	50.21 +/-2.6
pentachlorophenol	87-86-5	99.9	110.1.6P	49.57 +/-2.7
phenanthrene	85-01-8	98.9	27.1.3P	50.24 +/-2.6
phenol	108-95-2	99.9	112.9.5P	49.54 +/-2.6
phenol-d ₅	4165-62-2	99	11.120.7P	49.79 +/-2.7
pyrene	129-00-0	97.5	28.29.2P	50.51 +/-2.6
pyridine	110-86-1	99.9	101.9.3P	50.41 +/-2.7
p-terphenyl-d ₁₄	1718-51-0	100	9.12.8.1P	50 +/-2.7
2,4,6-tribromophenol	118-79-6	99.8	12.1.5P	50.03 +/-2.7
1,2,4-trichlorobenzene	120-82-1	99.6	54.29.1P	50.06 +/-2.7
2,4,5-trichlorophenol	95-95-4	99.4	121.1.2.1P	50.52 +/-2.8
2,4,6-trichlorophenol	88-06-2	99.2	113.1.2P	49.83 +/-2.7

Intended Uses

This Certified Reference material (CRM) is intended for use as a calibration standard or a quality control standard for

Certificate of Analysis

Page 4 of 5

Catalog No.: DRE-GA09000397DI

Lot No.: 340533

Expiration Date: 27-Jun-2018

Chromatography Equipment such as GC, GC/MS, HPLC, and HPLC/MS. It may also be used for various EN, ISO, EPA, and ASTM methods.

This Certified Reference material (CRM) is intended for use as a calibration standard or a quality control standard for Chromatography Equipment such as GC, GC/MS, HPLC, and HPLC/MS. It may also be used for various EN, ISO, EPA, and ASTM methods.

Recommended storage container for ampuled products after opening is a 12mmx32mm amber vial with screw cap Teflon lined silicon septum. The modeled % change per day can be calculated using the following:

$$\% \text{ Change} = (-0.018 \ln(x+31) + 0.1157) + 636.54y^{-3.202}$$

where x = boiling point of the most volatile analyte in the mix
y = boiling point of the solvent

This model assumes the container is stored at -10 °C and is unopened during storage. The user should determine what the acceptable error for their process is and calculate the maximum number of days the opened ampule should be stored.

Method of Preparation

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.

Packaging and Storage

The solution should be stored according to the following storage requirements: ≤ -10 °C

Once the product is opened, it should be transferred to a vial with minimum head space if the product was in a sealed ampoule. Once opened, the expiration is determined by user specifications.

Glassware Calibration

Only Class A glassware is used in the manufacture and quality control of Standards. All glassware is calibrated using NIST traceable weights.

Weights and Balance Calibration

Weights used to perform daily checks on balances are calibrated annually within a calibration laboratory recognized by NIST as Echelon I. Balances are checked daily in accordance to in house procedures. Balances are calibrated annually by an ISO/IEC 17025:2005 and ISO Guide 34:2009 accredited metrology service.

Homogeneity

Random replicate samples of the final packaged CRM have been analyzed to prove homogeneity in accordance with internal procedures. This is consistent with the intended use of this CRM. The homogeneity of this product has been confirmed by procedures consistent with ISO/IEC guide 17025:2005 and ISO guide 34:2009.

Hazardous Information

Refer to MSDS

Calculation of Uncertainty

The following equations are used to calculate the value of the expanded uncertainty: $U = k u_c$: U=Expanded

Uncertainty, k= the coverage factor at the 95% confidence level, k=2, $u_c = \sqrt{\sum u_i^2}$
where u_i are the individual uncertainty components for characterization, transportation, homogeneity, and shelf life.

Expiration Information

The stability of this product is based upon rigorous short term and long term testing of the solution for the certified value. These tests include the effect of temperature and packaging on the product. This standard is guaranteed until the following date: 27-Jun-2018

Certificate of Analysis

Catalog No.: DRE-GA09000397DI

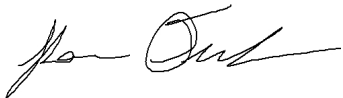
Lot No.: 340533

Expiration Date: 27-Jun-2018

Accreditation

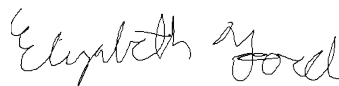
This standard was manufactured by an ISO 17025 Chemical Testing Lab (Certificate number 3031.01) and ISO 17034:2016 Reference Material Producer (RMP) Certificate number 3031.02 accredited by The American Association of Laboratory Accreditation (A2LA). Manufacturer's Quality System audited and registered by NSF-ISR to ISO 9001:2008 (Certificate number IZ391-IS4).

Manufactured By:



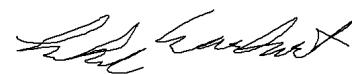
Shane Overcash
Technician I

Certified By:



Elizabeth Ford
Chemist I

Released By:



Lukas Earhart
Chemist I