o2si
smart solutions

Ap. 22/7/19
Se. 22/7/20

(4)

REPORT OF ANALYSIS

Multi-Element Aqueous RM

Product #: 160110-01-01

Quality Control Standard #19

Lot #: 988897-8

Matrix: 5% HNO_3/tr. HF

Element	Certified Concentration	Element	Certified Concentration	Element	Certified Concentration
As	100 µg/mL	Fe	100 µg/mL	Se	100 µg/mL
Be	100 µg/mL	Mg	100 µg/mL	Ti	100 µg/mL
Ca	100 µg/mL	Mn	100 µg/mL	Tl	100 µg/mL
Cd	100 µg/mL	Mo	100 µg/mL	V	100 µg/mL
Co	100 µg/mL	Ni	100 µg/mL	Zn	100 µg/mL
Cr	100 µg/mL	Pb	100 µg/mL		
Cu	100 µg/mL	Sb	100 µg/mL		

Intended Use: This solution is intended for use as a reference material (RM) or calibration standard for inductively coupled plasma optical emission spectroscopy (ICP-OES), inductively coupled plasma mass spectrometry (ICP-MS), flame or furnace atomic absorption spectroscopy (AA or GFAA), and other techniques for elemental analysis.

Certification & Traceability: This RM was manufactured, processed, and/or certified under a quality management system that is registered/accredited to **ISO 9001**, **ISO Guide 34**, and **ISO/IEC 17025**. This RM was prepared to the certified concentrations shown above by gravimetric methods using single-element concentrates, and was stabilized using high purity nitric acid (HNO_3), trace hydrofluoric acid (HF) and diluted with filtered (0.22 µm), 18 M-ohm deionized water. The balances used in the preparation of this RM are calibrated regularly with traceability to NIST, using a calibration provider that is accredited to ISO/IEC 17025 by a mutually recognized accreditation body. All volumetric dilutions are performed in Class A calibrated glassware. The certified concentrations were determined based upon gravimetric procedures. Secondary verification of the certified concentrations was performed using ICP-OES that was calibrated and/or referenced against **NIST SRMs (see reverse side)**. The uncertainty associated with the certified concentration is ±0.5% relative, which is the sum of the estimated errors due to the purity of the raw materials, the gravimetric preparation of the solution, and transpiration through the container. This represents the expanded uncertainty at the 95% confidence level using a coverage factor of k=2.

Instructions for Use: We recommend that the solution be thoroughly mixed by repeated shaking or swirling of the bottle immediately prior to use. To achieve the highest accuracy, the analyst should: (1) use only pre-cleaned containers and transferware, (2) not pipette directly from the RM's original container, (3) never pour used product back into the original container, (4) make dilutions using calibrated balances or certified class A volumetric flasks and pipettes, (5) use a minimum sub-sample size of 500 µL, and (6) dilute with the same matrix as the original RM or other chemically suitable matrix. The solution should be kept tightly capped and stored under normal laboratory conditions. Do not freeze, heat, or immerse the bottle or its contents, and avoid exposure to direct sunlight or moisture.

Period of Validity: O2Si ensures the accuracy of this solution for **18 months** from the certification date shown below, provided the instructions for use are followed. During the period of validity, the purchaser will be notified if this product is recalled due to any significant changes in the stability of the solution.

Chuck Goudreau

Chuck Goudreau, Certifying Officer

Se. 03/01/2021

July 3, 2019
Certification Date

O2Si waives all responsibility for any damages resulting from the usage and/or implementation of the products/data described herein.

ARPA umbria
Data 22/7/19
Identif. 28 ULRT
Approvato da

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Cert. No. 3031.01

Date Received: _____

Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
132520-02	332958	≤ -10 °C	Acetonitrile	9-Jan-2020	Carbonyl DNPH Derivatives Mix, Various Concentrations 500, 1,000, & 1,500 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
:taldehyde-DNPH	1019-57-4	99.5	1878.3.3P	982.9 +/- 5.31	mg/L
:tone-DNPH	1567-89-1	99	1879.286.1.1P	496.2 +/- 6.98	mg/L
'olein-DNPH	888-54-0	95	1880.7.1.1P	494.6 +/- 4.73	mg/L
nzaldehyde-DNPH	1157-84-2	99.5	1881.3.4P	484.2 +/- 4.96	mg/L
tanal-DNPH	1527-98-6	99.9	1882.7.1P	515.3 +/- 4.99	mg/L
'maldehyde 2,4-dinitro-phenylhydrazone	1081-15-8	99.5	1876.3.5.1P	1467 +/- 9.26	mg/L
)pionaldehyde-DNPH	725-00-8	97	1883.286.1P	490.9 +/- 6.88	mg/L

ARPA umbria
Data 19/01/2018
Identif. 152 MRT
Approvato da _____

Certified By: Elizabeth Ford

Elizabeth Ford
Manufacture Date 9-Jan-2018

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

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Date Received: _____

Certificate of Analysis

Rev 0 Page 1

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
132571-01 -4PAK	270755	≤ -10 °C	Acetonitrile	17-Feb-2017	Custom DNPH as Aldehydes Mix, 11-2571, 200 mg/l 4 x 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acetaldehyde-DNPH as acetaldehyde	1019-57-4	99	4102.115.5P	199.4 +/- 2.25	mg/l
acetone-DNPH as acetone	1567-89-1	99.5	3804.3.4P	199.3 +/- 2.36	mg/l
acrolein-DNPH as acrolein	888-54-0	95	4103.7.1P	196.5 +/- 1.18	mg/l
benzaldehyde-DNPH as benzaldehyde	1157-84-2	99.5	4150.3.2P	200.9 +/- 2.74	mg/l
butanal-DNPH as butanal	1527-98-6	99.5	4104.3.1P	200 +/- 1.47	mg/l
formaldehyde-DNPH as formaldehyde	1081-15-8	98.4	3786.115.4.1P	198.4 +/- .82	mg/l
gluteraldehyde-DNPH as gluteraldehyde	5085-07-4	98	3601.4.1P	199.5 +/- 1.12	mg/l
hexanal-DNPH as hexanal	1527-97-5	99	4152.52.1P	197.5 +/- 2.65	mg/l
isovaleraldehyde-DNPH as isovaleraldehyde	2256-01-1	98.5	4153.3.1P	198.8 +/- 2.56	mg/l
propionaldehyde-DNPH as propionaldehyde	725-00-8	97.6	4107.115.4P	196.7 +/- 2.32	mg/l
valeraldehyde-DNPH as valeraldehyde	2057-84-3	99.3	4156.115.1.1P	203.6 +/- 2.61	mg/l

ARPA umbria
Data 09/02/2016
Identif. 297MRT
Approvato da _____

Certified By: _____
Nicholas Collins
Manufacture Date 29-Jan-2016

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

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Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
120340-01	361655	≤ -10 °C	P/T Methanol	18-Jun-2021	Custom Volatile Mix, 8-7, 1,000 mg/L, 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
benzene	71-43-2	99.99	146.1.9P	1002 +/- 25.38	mg/L
ethylbenzene	100-41-4	99.9	174.8.2P	999.8 +/- 27.23	mg/L
methyl t-butyl ether	1634-04-4	.9998	208.24.3P	1004 +/- 25.36	mg/L
styrene	100-42-5	99.9	180.1.7P	1000 +/- 27.24	mg/L
toluene	108-88-3	100	184.24.4P	1002 +/- 25.38	mg/L
m-xylene	108-38-3	99.7	193.7.1.2P	1000 +/- 25.35	mg/L
o-xylene	95-47-6	99.2	192.29.2P	1001 +/- 25.38	mg/L
p-xylene	106-42-3	99.9	194.7.1P	1000 +/- 25.35	mg/L

ARPA Umbria
DATA 22.10.2018
IDENTIF. MRP 760
APPROVATO DA

Certified By: Susan Mathews

Susan Mathews
Manufacture Date 14-Jun-2018

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025

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

The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

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Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
120020-02	363325	≤ -10 °C	P/T Methanol	15-Jul-2021	BTEX Solution, 2,000 mg/L, 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
benzene	71-43-2	100	146.1.7P	2005 +/- 26.31	mg/L
ethylbenzene	100-41-4	99.9	174.8.1P	2002 +/- 33.03	mg/L
toluene	108-88-3	99.9	184.9.1P	2002 +/- 33.03	mg/L
m-xylene	108-38-3	99.7	193.7.1P	2014 +/- 26.5	mg/L
o-xylene	95-47-6	99.2	192.29.2P	1997 +/- 26.28	mg/L
p-xylene	106-42-3	99	194.24.1.1P	2003 +/- 28.13	mg/L

ARPA umbria
Data 12/12/18
Identif. 1537RT
Approvato da MG

Ap. il 19-07-19

Kayla Coleman

Certified By: _____

Kayla Coleman

Manufacture Date 11-Jul-2017

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.

This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025

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

The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

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Date Received: _____

Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
126016-03	363538	≤ -10 Degrees C	P/T Methanol	4-Dec-2019	Custom VOC Mix, 3-2, 100 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
2-chlorotoluene	95-49-8	99.5	157.7.1P	100.5 +/- 1.64	mg/L
3-chlorotoluene	108-41-8	100	1354.1.1P	100.5 +/- 2.28	mg/L
4-chlorotoluene	106-43-4	99.5	158.1.2P	100.9 +/- 1.64	mg/L

ARPA Umbria
DATA 12-12-2019 (2)
DIRETTORE .....
.....
APPROVATO DA .....

Certified By: Amanda Frazier

Amanda Frazier
Manufacture Date 4-Dec-2018

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025

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

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Date Received: _____

Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
120255-01	378639	≤ -10 °C	P/T Methanol	3-Jun-2021	Custom Volatile Mix, 12-255, 1000 mg/L, 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
benzene	71-43-2	99.99	146.1.9P	999.9 +/- 10.39	mg/L
bromodichloromethane	75-27-4	99.5	149.1.9P	992.5 +/- 10.36	mg/L
bromoform	75-25-2	99.3	150.7.2P	994.7 +/- 10.38	mg/L
carbon tetrachloride	56-23-5	100	154.9.1P	1014 +/- 10.58	mg/L
chloroform	67-66-3	99.8	156.29.2P	990.7 +/- 10.34	mg/L
dibromochloromethane	124-48-1	97.5	159.29.2P	1009 +/- 10.48	mg/L
1,2-dichloroethane	107-06-2	99.9	164.29.1P	1005 +/- 10.49	mg/L
ethylbenzene	100-41-4	99.9	174.8.2P	1016 +/- 14.65	mg/L
tetrachloroethylene	127-18-4	100	183.1.2P	1012 +/- 10.51	mg/L
toluene	108-88-3	100	184.24.4P	1011 +/- 10.5	mg/L
trichloroethylene	79-01-6	98.1	188.29.1P	1001 +/- 14.43	mg/L
vinyl chloride	75-01-4	99	143.158.4P	998.2 +/- 10.56	mg/L

ARPA Umbria
DATA 26/09/2019
IDENTIF. NRP 789
APPROVATO DA

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

Certified By: Amanda Frazier

Amanda Frazier
Manufacture Date 4-Jun-2019

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.

The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

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Date Received: _____

Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
111159-03 -05	337000	≤ -10 °C	Methanol	15-Feb-2020	Custom Phenol Mix, 7-156, 100 mg/L, 5 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
:(rophenol	95-57-8	99.6	103.9.1P	101.2 +/- 1.47	mg/
3-chlorophenol	108-43-0	97.7	1145.9.1P	100.4 +/- 2.26	mg/
4-chlorophenol	106-48-9	99.9	1146.9.1P	101.2 +/- 2.28	mg/
2,4-dichlorophenol	120-83-2	99.5	104.1.2P	101.7 +/- 1.48	mg/
pentachlorophenol	87-86-5	99.9	110.1.6P	99.5 +/- 1.48	mg/
2,4,5-trichlorophenol	95-95-4	99.4	121.1.2.1P	99.4 +/- 1.44	mg/
2,4,6-trichlorophenol	88-06-2	98	113.9.1.1P	99.18 +/- 1.48	mg/

ARPA U
DATA 06/03/2018
IDENTIF. MRP 957
AP... TO DA CR

Certified By: _____
Kara Catron
Manufacture Date 15-Feb-2018

Follow all storage requirements, keep tightly closed when not in use and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certifi under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.
The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

HRP 816

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Date Received: _____

Certificate of Analysis

Rev 0 Page 1 of 1

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
116040-01	344542	≤ 6 °C	Methanol	8-May-2020	Custom Phenol Solution, 9-2, 100 mg/L, 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
2-chlorophenol	95-57-8	99.6	103.9.1P	99.4 +/- 1.44	mg/L
4-chlorophenol	106-48-9	99.9	1146.9.1P	101.2 +/- 2.28	mg/L
2,4-dichlorophenol	120-83-2	99.5	104.1.2P	99.5 +/- 1.44	mg/L
2-methylphenol	95-48-7	99.9	114.7.1.1P	100.5 +/- 1.46	mg/L
3-methylphenol	108-39-4	99.5	115.7.2P	99.7 +/- 1.05	mg/L
4-methylphenol	106-44-5	99	116.1.3P	100.4 +/- 1.46	mg/L
pentachlorophenol	87-86-5	99.9	110.1.6P	99.7 +/- 1.45	mg/L
phenol	108-95-2	100	112.9.4P	100.2 +/- 1.45	mg/L
2,4,6-trichlorophenol	88-06-2	99.2	113.1.2P	99.6 +/- 1.45	mg/L

ARPA Umbria
DATA 8-7-18
IDENTIF. HRP 816
APPROVATO DA

Certified By: Kayla Coleman

Kayla Coleman

Manufacture Date 9-May-2018

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

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.
The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

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Date Received: _____

Certificate of Analysis

Rev 0 **Page 1**

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
110615-02	270144	≤ -10 °C	Methanol	25-Jan-2018	Custom Semi-Volatile Mix, 4-615, 2000 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
phenol	108-95-2	99.9	112.1.3P	1979 +/- 10.66	mg/L
2-methylphenol	95-48-7	99.6	114.1.2P	1982 +/- 22.4	mg/L
3-methylphenol	108-39-4	99.2	115.7.1P	2013 +/- 22.67	mg/L
4-methylphenol	106-44-5	99	116.1.3P	2038 +/- 22.89	mg/L

ARPA umbria
Data 05/02/2016
Identif. 27 LTMRT
Approvato da MG

Certified By: Katelynn Hardee

Katelynn Hardee
Manufacture Date 26-Jan-2016

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

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Date Received: _____

Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
12683-09-5PAK	340635	≤ -10 °C	Methanol	26-Apr-2019	Custom Mix, 33-4849, 4 mg/L, 5 x 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentra
acenaphthene	83-32-9	99	13.1.4P	4.004 +/- .05
acenaphthene-d_{10}	15067-26-2	99	1.12.3.3P	4 +/- .05
acenaphthylene	208-96-8	98	14.282.4P	4 +/- .06
acenaphthylene-d_8	93951-97-4	99.1	1975.12.5P	4.059 +/- .05
anthracene	120-12-7	99.2	15.29.1.1P	4.016 +/- .06
benzo[a]anthracene	56-55-3	99	16.7.2.4P	4.006 +/- .05
benzo[a]anthracene-d_{12}	1718-53-2	99.9	1270.12.2P	3.996 +/- .05
benzo(a)pyrene-d_{12}	63466-71-7	98.6	1973.12.4P	4.023 +/- .05
benzo[b]fluoranthene	205-99-2	99.5	17.282.1.2P	4.002 +/- .06
benzo(j)fluoranthene	205-82-3	99	1766.421.1P	4.004 +/- .1
benzo[k]fluoranthene	207-08-9	99.5	18.282.3P	4.007 +/- .06
benzo[ghi]perylene	191-24-2	96	19.286.1P	4.001 +/- .06
benzo[a]pyrene	50-32-8	99.5	20.282.3P	4.002 +/- .06
benzo[e]pyrene	192-97-2	99.5	619.282.4P	4.02 +/- .05
chrysene	218-01-9	98	21.286.1P	4.003 +/- .06
chrysene-d_{12}	1719-03-5	99	2.120.5P	4.005 +/- .06
dibenz[a,h]anthracene	53-70-3	99.5	22.286.1P	4.001 +/- .06
dibenzo(a,h)anthracene-d_{14}	13250-98-1	99	1974.12.4P	4 +/- .05
dibenzo(a,e)pyrene	192-65-4	99.6	930.1.3P	4.032 +/- .04
dibenzo(a,h)pyrene	189-64-0	98	1517.7.4.4P	3.998 +/- .05
dibenzo(a,i)pyrene-d_{14}	158776-07-9	99	2028.120.8.3P	4 +/- .05

Follow all storage requirements, keep tightly closed when no
and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/o
under a quality management system that is accredited to ISO
and ISO/IEC 17025.

Certified By: Jarrett Howard

Jarrett Howard
Manufacture Date 6-Apr-2018

ARPA umbria
Data 16/5/18
Identif. 329 MRT
Approvato da _____

All weights are traceable through N. I. S. T. Test No. 822/264157-00
Concentration (correct for purity) and uncertainty (95% confidence)
listed are determined gravimetricly.
The stated uncertainty is the expanded uncertainty with a coverage fa
two to give a 95% confidence level.

Certificate of Analysis

14-2

Catalog No.: 112683-09

Lot No.: 340635

Expiration Date: 26-Apr-2019

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Conc
dibenzo(a,i)pyrene	189-55-9	99	1478.282.2.3P	4.008 +/- .0
dibenzo(a,l)pyrene	191-30-0	99.5	1516.4.2.13P	3.996 +/- .0
fluoranthene	206-44-0	99.5	23.7.2P	4.002 +/- .05
fluoranthene-d_{10}	93951-69-0	98.9	1458.12.2P	3.996 +/- .05
fluorene	86-73-7	99.8	24.1.4P	4.001 +/- .06
indeno[1,2,3-cd]pyrene	193-39-5	99	25.282.4.4P	4.001 +/- .06
indeno(1,2,3-cd)pyrene-d_{12}	203578-33-0	94	1787.286.1P	4.023 +/- .06
naphthalene	91-20-3	99.9	26.29.3P	4.002 +/- .06
perylene	198-55-0	98	939.286.1P	3.991 +/- .06
phenanthrene	85-01-8	99.5	27.1.4P	4 +/- .05
phenanthrene-d_{10}	1517-22-2	99.3	6.12.5P	4.051 +/- .05
pyrene	129-00-0	98.4	28.29.3P	4.002 +/- .05

1 op. 20/05/2018

2 op. 24/09/2018

Certified By: Jarrett Howard

Jarrett Howard

Manufacture Date 6-Apr-2018

Follow all storage requirements, keep tightly closed when not
and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or
under a quality management system that is accredited to ISO 1
and ISO/IEC 17025.

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listed are determined gravimetricly.
The stated uncertainty is the expanded uncertainty with a coverage fact
two to give a 95% confidence level.

8/1/20

(15)

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Rev 0 Page 1 of 1

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
115461-01 -5PAK	395482	≤ -10 °C	Toluene	25-Dec-2020	Custom PAH Internal Standard, 3-5461, 2 mg/L, 5 x 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acenaphthylene-d_8	93951-97-4	98.2	1975.421.1P	1.976 +/- .04	mg/L
benzo[e]pyrene-d_{12}	205440-82-0	99.5	2560.3.1P	2.033 +/- .02	mg/L
p-terphenyl-d_{14}	1718-51-0	99.6	9.12.9P	1.988 +/- .02	mg/L

C.u 4767

08/01/2020
HRP 972
APPROVED BY BB

Erica Castiglione

Certified By: _____

Erica Castiglione

Manufacture Date 6-Dec-2019

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.

This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

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

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Rev 0 **Page 1 of 1**

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
116664-10	365176	≤ -10 °C	Toluene	4-Jan-2021	Custom Deuterated PAH Mix, 3-3, 200 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acenaphthylene-d_8	93951-97-4	99.1	1975.12.5P	202.2 +/- 3.26	mg/
chrysene-d_{12}	1719-03-5	98	2.12.7P	200.7 +/- 3.26	mg/
indeno(1,2,3-cd)pyrene-d_{12}	203578-33-0	99	1787.12.1.2P	202 +/- 3.26	mg/

ARPA umbria
Data 28/11/2018
Identif. 1444RT
Approvato da

Aperto 11-07-2019

Jarrett Howard

Certified By: _____

Jarrett Howard
Manufacture Date 5-Jan-2019

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
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All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.

The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

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Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
116663-10	348236	≤ -10 °C	Methylene Chloride	14-Jun-2020	Custom Deuterated PAH Mix, 7-3, 200 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acenaphthene-d_{10}	15067-26-2	99	1.12.3.3P	200 +/- 2.1	mg/
benzo[a]anthracene-d_{12}	1718-53-2	99.9	1270.12.2P	199.8 +/- 2.12	mg/
benzo(a)pyrene-d_{12}	63466-71-7	98.6	1973.12.4P	201.1 +/- 2.1	mg/
dibenzo(a,h)anthracene-d_{14}	13250-98-1	99	1974.12.4P	200 +/- 2.1	mg/
dibenzo(a,i)pyrene-d_{14}	158776-07-9	99	2028.120.8.3P	200 +/- 2.1	mg/
fluoranthene-d_{10}	93951-69-0	98.9	1458.12.2P	199.8 +/- 2.1	mg/
phenanthrene-d_{10}	1517-22-2	99.3	6.12.5P	202.6 +/- 2.11	mg/

AP
15-06-2019

ARPA umbria
Data 15/01/2019
Identif. 1/15 MRT
Approvato da MG

Amanda Frazier

Certified By: _____

Amanda Frazier
Manufacture Date 15-Jun-2018

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
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All weights are traceable through N. I. S. T. Test No. 822/264157-00.
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HRP910

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Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
116310-01	314219	≤-10 °C	Methylene Chloride	26-Jul-2020	Custom PAH Solution, 22-1, 200 mg/L, 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acenaphthene	83-32-9	99	13.1.4P	199.3 +/- 2.74	mg/L
acenaphthylene	208-96-8	98	14.282.4P	199.1 +/- 3.24	mg/L
anthracene	120-12-7	99.2	15.29.1.1P	200.1 +/- 3.25	mg/L
benzo[a]anthracene	56-55-3	99	16.7.2.3P	200.2 +/- 2.57	mg/L
benzo[b]fluoranthene	205-99-2	99.9	17.282.1.1P	199.8 +/- 3.25	mg/L
benzo[k]fluoranthene	207-08-9	99.5	18.282.3P	199.3 +/- 3.24	mg/L
benzo[ghi]perylene	191-24-2	96	19.286.1P	200 +/- 3.25	mg/L
benzo[a]pyrene	50-32-8	99.5	20.282.3.3P	199.6 +/- 2.57	mg/L
benzo[e]pyrene	192-97-2	99.5	619.282.3.3P	199.5 +/- 2.62	mg/L
chrysene	218-01-9	99.9	21.1.2P	200.4 +/- 2.58	mg/L
dibenz[a,h]anthracene	53-70-3	99.4	22.4.6.10P	199.3 +/- 2.56	mg/L
dibenzo(a,e)pyrene	192-65-4	99	930.282.2.2P	200.1 +/- 2.25	mg/L
dibenzo(a,h)pyrene	189-64-0	98	1517 7.4.4P	199.4 +/- 1.06	mg/L
dibenzo(a,i)pyrene	189-55-9	99	1478.282.2.3P	200.2 +/- 2.26	mg/L
dibenzo(a,l)pyrene	191-30-0	99.5	1516.4.2.13P	199.5 +/- 1.07	mg/L
fluoranthene	206-44-0	99.5	23.7.2P	200.6 +/- 2.58	mg/L
fluorene	86-73-7	99	24.271.1.1P	200.5 +/- 2.76	mg/L
indeno[1,2,3-cd]pyrene	193-39-5	99.9	25.282.4.3P	200 +/- 2.57	mg/L
naphthalene	91-20-3	99.6	26.29.2.1P	201.7 +/- 2.62	mg/L
perylene	198-55-0	98	939.286.1P	200.3 +/- 2.15	mg/L

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

Certified By: _____
Katrina Emelianoff

Manufacture Date 22-Jul-2017

APPROVED
DATA 28/03/19
IDENT HRP910
APPROVED BY

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
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Date Received: _____

Certificate of Analysis

Rev 0 Page 1

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
110345-05	283514	≤ -10 Degrees C	Acetone	20-Jul-2019	525.2 Internal Standard Solution, 500 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
rysene-d_{12}	1719-03-5	99.5	2.120.4P	502.3 +/- 7	mg/l
phenanthrene-d_{10}	1517-22-2	99.1	6.12.4.3P	495.5 +/- 4.89	mg/l
acenaphthene-d_{10}	15067-26-2	98.7	1.12.3P	498.2 +/- 4.87	mg/l

ARPA Umbria
DATA 28/07/2016
IDENTIF. NRP 903
APPROVATO DA

Certified By: Susan Mathews

Susan Mathews
Manufacture Date 15-Jul-2016

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

MRP 850

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Rev 0 Page 1 of 2 NATIVI

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
130110-01	343103	≤ -10 °C	Isooctane	30-Apr-2021	PCB Congener Solution 28-1, 100 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
2',3,3',4',5,6-heptachlorobiphenyl (BZ# 177)	52663-70-4	100	833.5.2.6P	99.6 +/- 1.33	mg/L
2',3,3',4,4',5-heptachlorobiphenyl (BZ# 170)	35065-30-6	99	526.4.2.1P	100.3 +/- 1.67	mg/L
2',3,4',5,5',6-heptachlorobiphenyl (BZ# 187)	52663-68-0	98.8	542.4.2P	99.83 +/- 1.33	mg/L
2',3,4,4',5',6-heptachlorobiphenyl (BZ# 183)	52663-69-1	99	664.5.5.6P	99 +/- 5.12	mg/L
2',3,4,4',5,5'-heptachlorobiphenyl (BZ# 180)	35065-29-3	99.2	527.257.1P	100.4 +/- 1.34	mg/L
3,3',4,4',5,5'-heptachlorobiphenyl (BZ# 189)	39635-31-9	100	656.5.4.2P	100.4 +/- 1.34	mg/L
2',3,4',5',6-hexachlorobiphenyl (BZ# 149)	38380-04-0	99.9	811.5.5.3P	99.46 +/- 1.72	mg/L
2',3,4',5,5'-hexachlorobiphenyl (BZ# 146)	51908-16-8	99	808.421.1P	98.18 +/- 1.78	mg/L
2',3,4,4',5'-hexachlorobiphenyl (BZ# 138)	35065-28-2	99.4	541.421.1P	100.6 +/- 1.68	mg/L
2',3,5,5',6-hexachlorobiphenyl (BZ# 151)	52663-63-5	99.6	813.5.3.3P	100.6 +/- 5.2	mg/L
2',4,4',5,5'-hexachlorobiphenyl (BZ# 153)	35065-27-1	99.5	525.421.1P	99.9 +/- 1.16	mg/L
3',4,4',5,5'-hexachlorobiphenyl (BZ# 167)	52663-72-6	98.2	655.3.3P	99.42 +/- 1.33	mg/L
3,3',4,4',5-hexachlorobiphenyl (BZ# 156)	38380-08-4	99	659.421.1P	100.2 +/- 1.43	mg/L
3,3',4,4',5'-hexachlorobiphenyl (BZ# 157)	69782-90-7	99	654.421.1.1P	100.2 +/- 1.34	mg/L
3',4,4',5,5'-hexachlorobiphenyl (BZ# 169)	32774-16-6	99	660.421.1.1P	100.1 +/- 1.43	mg/L
3,4,4',5-pentachlorobiphenyl (BZ# 123)	65510-44-3	99.3	658.421.1P	100.1 +/- 1.67	mg/L
2',3,5',6-pentachlorobiphenyl (BZ# 95)	38379-99-6	97	767.421.2.1P	100 +/- 1.66	mg/L
2',4,4',5-pentachlorobiphenyl (BZ# 99)	38380-01-7	99.5	771.257.1.1P	99.62 +/- 1.34	mg/L
2',4,5,5'-pentachlorobiphenyl (BZ# 101)	37680-73-2	99.3	520.257.1P	100.5 +/- 1.06	mg/L
3,3',4,4'-pentachlorobiphenyl (BZ# 105)	32598-14-4	99	521.5.9P	99.79 +/- 1.34	mg/L

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.

This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

Certified By: _____

Shane Overcash

Manufacture Date 26-Apr-2018

ARPA Umbria
DATA 20/02/19
IDENTIF. MRP 850
APPROVATO DA

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

The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

Table B: WM48-CVS; HRGC/HRMS Calibration and RRF Summary

				RRF Calibration Summary					
Name	Mean	Std. Dev.	%RSD	WM48-CS1	WM48-CS2	WM48-CS3	WM48-CS4	WM48-CS5	WM48-CS6
				RRF1	RRF2	RRF3	RRF4	RRF5	RRF6
WHO Native PCB Congeners									
PCB #77	0.89	0.084	9.4	0.77	0.80	0.90	0.94	0.93	0.99
PCB #81	0.96	0.084	8.8	0.84	0.88	0.94	1.01	1.01	1.06
PCB #123	0.96	0.074	7.7	1.02	0.84	0.91	0.98	0.98	1.04
PCB #118	1.01	0.073	7.2	0.91	0.94	1.03	1.03	1.05	1.11
PCB #114	1.18	0.070	5.9	1.20	1.07	1.15	1.19	1.21	1.27
PCB #105	1.00	0.056	5.6	0.98	0.94	0.95	1.02	0.99	1.10
PCB #126	1.00	0.064	6.4	0.94	0.94	0.96	1.03	1.02	1.10
PCB #167	1.04	0.098	9.5	0.90	0.97	1.01	1.11	1.08	1.17
PCB #156	1.02	0.078	7.6	0.93	0.93	1.02	1.07	1.08	1.11
PCB #157	0.98	0.093	9.5	0.84	0.92	0.99	1.02	1.04	1.10
PCB #169	1.01	0.055	5.5	1.02	0.96	0.95	1.00	1.01	1.11
PCB #189	1.05	0.036	3.5	1.06	1.04	0.99	1.05	1.07	1.09
Native Marker PCB Congeners									
PCB #28	0.98	0.071	7.2	0.88	0.93	1.02	1.00	0.99	1.08
PCB #52	1.04	0.072	6.9	0.93	0.99	1.06	1.07	1.07	1.14
PCB #101	1.07	0.069	6.4	0.96	1.01	1.09	1.08	1.11	1.15
PCB #138	1.08	0.066	6.1	1.00	1.00	1.08	1.12	1.08	1.16
PCB #153	1.13	0.061	5.4	1.04	1.10	1.13	1.12	1.14	1.23
PCB #180	1.10	0.085	7.8	1.00	1.02	1.08	1.13	1.10	1.24
WHO PCB Extraction Spike									
13C-PCB #77	0.93	0.012	1.3	0.92	0.93	0.94	0.95	0.93	0.94
13C-PCB #81	0.91	0.019	2.1	0.91	0.89	0.91	0.93	0.93	0.89
13C-PCB #123	0.99	0.016	1.6	0.97	0.97	1.00	0.98	0.99	1.01
13C-PCB #118	1.00	0.026	2.6	0.98	0.98	1.01	0.99	1.03	1.04
13C-PCB #114	0.92	0.024	2.6	0.91	0.90	0.90	0.92	0.94	0.96
13C-PCB #105	0.94	0.024	2.5	0.92	0.93	0.94	0.93	0.99	0.95
13C-PCB #126	0.90	0.026	2.9	0.88	0.87	0.90	0.90	0.93	0.93
13C-PCB #167	1.71	0.039	2.3	1.74	1.75	1.68	1.68	1.73	1.66
13C-PCB #156	1.70	0.028	1.7	1.72	1.72	1.65	1.69	1.70	1.71
13C-PCB #157	1.69	0.026	1.5	1.69	1.73	1.68	1.70	1.70	1.65
13C-PCB #169	1.68	0.025	1.5	1.68	1.69	1.66	1.67	1.72	1.64
13C-PCB #189	1.41	0.025	1.7	1.40	1.42	1.39	1.40	1.41	1.46
Marker PCB Extraction Spike									
13C-PCB #28	1.22	0.039	3.2	1.23	1.21	1.28	1.21	1.24	1.17
13C-PCB #52	0.74	0.010	1.4	0.75	0.75	0.75	0.73	0.74	0.73
13C-PCB #101	0.80	0.023	2.9	0.80	0.78	0.79	0.79	0.80	0.85
13C-PCB #138	1.25	0.020	1.6	1.26	1.25	1.23	1.23	1.28	1.24
13C-PCB #153	1.42	0.021	1.5	1.43	1.43	1.39	1.44	1.43	1.40
13C-PCB #180	1.16	0.024	2.1	1.15	1.19	1.14	1.15	1.18	1.13
Sampling Spike									
13C-PCB #60	0.94	0.013	1.4	0.92	0.94	0.95	0.94	0.95	0.94
13C-PCB #127	0.96	0.017	1.7	0.95	0.94	0.96	0.98	0.98	0.98
13C-PCB #159	1.50	0.048	3.2	1.53	1.51	1.48	1.56	1.50	1.42
Recovery Spike									
13C-PCB #70	1.00	0.000	0.0	1.00	1.00	1.00	1.00	1.00	1.00
13C-PCB #111	1.00	0.000	0.0	1.00	1.00	1.00	1.00	1.00	1.00
13C-PCB #170	1.00	0.000	0.0	1.00	1.00	1.00	1.00	1.00	1.00

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Table A: **WM48-CVS; Components and Concentrations (pg/µl, ± 5% in nonane)**

IUPAC #	Chlorobiphenyl	CAS #	WM48-CS1	WM48-CS2	WM48-CS3	WM48-CS4	WM48-CS5	WM48-CS6
77	3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	0.1	0.5	2.0	10	40	200
81	3,4,4',5-Tetrachlorobiphenyl	70362-50-4	0.1	0.5	2.0	10	40	200
105	2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	0.1	0.5	2.0	10	40	200
114	2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	0.1	0.5	2.0	10	40	200
118	2,3',4,4',5-Pentachlorobiphenyl	31508-00-6	0.5	2.5	10	50	200	1000
123	2',3,4,4',5-Pentachlorobiphenyl	65510-44-3	0.1	0.5	2.0	10	40	200
126	3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	0.1	0.5	2.0	10	40	200
156	2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	0.1	0.5	2.0	10	40	200
157	2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	0.1	0.5	2.0	10	40	200
167	2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	0.1	0.5	2.0	10	40	200
169	3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	0.1	0.5	2.0	10	40	200
189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	0.1	0.5	2.0	10	40	200
28	2,4,4'-Trichlorobiphenyl	7012-37-5	0.5	2.5	10	50	200	1000
52	2,2',5,5'-Tetrachlorobiphenyl	35693-99-3	0.5	2.5	10	50	200	1000
101	2,2',4,5,5'-Pentachlorobiphenyl	37680-73-2	0.5	2.5	10	50	200	1000
138	2,2',3,4,4',5'-Hexachlorobiphenyl	35065-28-2	0.5	2.5	10	50	200	1000
153	2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	0.5	2.5	10	50	200	1000
180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	0.5	2.5	10	50	200	1000
	Sampling Spike; P48-SS							
60L	2,3,4,4'-Tetrachloro[$^{13}C_{12}$]biphenyl	-	10	10	10	10	10	10
127L	3,3',4,5,5'-Pentachloro[$^{13}C_{12}$]biphenyl	-	10	10	10	10	10	10
159L	2,3,3',4,5,5'-Hexachloro[$^{13}C_{12}$]biphenyl	-	10	10	10	10	10	10
	Extraction Spike; P48-W-ES							
77L	3,3',4,4'-Tetrachloro[$^{13}C_{12}$]biphenyl	105600-23-5	10	10	10	10	10	10
81L	3,4,4',5-Tetrachloro[$^{13}C_{12}$]biphenyl	208461-24-9	10	10	10	10	10	10
105L	2,3,3',4,4'-Pentachloro[$^{13}C_{12}$]biphenyl	208263-62-1	10	10	10	10	10	10
114L	2,3,4,4',5-Pentachloro[$^{13}C_{12}$]biphenyl	208263-63-2	10	10	10	10	10	10
118L	2,3',4,4',5-Pentachloro[$^{13}C_{12}$]biphenyl	104130-40-7	10	10	10	10	10	10
123L	2',3,4,4',5-Pentachloro[$^{13}C_{12}$]biphenyl	208263-64-3	10	10	10	10	10	10
126L	3,3',4,4',5-Pentachloro[$^{13}C_{12}$]biphenyl	208263-65-4	10	10	10	10	10	10
156L	2,3,3',4,4',5-Hexachloro[$^{13}C_{12}$]biphenyl	208263-68-7	10	10	10	10	10	10
157L	2,3,3',4,4',5'-Hexachloro[$^{13}C_{12}$]biphenyl	235416-30-5	10	10	10	10	10	10
167L	2,3',4,4',5,5'-Hexachloro[$^{13}C_{12}$]biphenyl	208263-69-8	10	10	10	10	10	10
169L	3,3',4,4',5,5'-Hexachloro[$^{13}C_{12}$]biphenyl	208263-70-1	10	10	10	10	10	10
189L	2,3,3',4,4',5,5'-Heptachloro[$^{13}C_{12}$]biphenyl	208263-73-4	10	10	10	10	10	10
	Extraction Spike; P48-M-ES							
28L	2,4,4'-Trichloro[$^{13}C_{12}$]biphenyl	208263-76-7	10	10	10	10	10	10
52L	2,2',5,5'-Tetrachloro[$^{13}C_{12}$]biphenyl	208263-80-3	10	10	10	10	10	10
101L	2,2',4,5,5'-Pentachloro[$^{13}C_{12}$]biphenyl	104130-39-4	10	10	10	10	10	10
138L	2,2',3,4,4',5'-Hexachloro[$^{13}C_{12}$]biphenyl	208263-66-5	10	10	10	10	10	10
153L	2,2',4,4',5,5'-Hexachloro[$^{13}C_{12}$]biphenyl	-	10	10	10	10	10	10
180L	2,2',3,4,4',5,5'-Heptachloro[$^{13}C_{12}$]biphenyl	160901-82-6	10	10	10	10	10	10
	Recovery Spike; P48-RS							
70L	2,3',4',5-Tetrachloro[$^{13}C_{12}$]biphenyl	-	10	10	10	10	10	10
111L	2,3,3',5,5'-Pentachloro[$^{13}C_{12}$]biphenyl	235416-29-2	10	10	10	10	10	10
170L	2,2',3,3',4,4',5-Heptachloro[$^{13}C_{12}$]biphenyl	160901-80-4	10	10	10	10	10	10

Table A: **BP-CP81; Components and Concentrations (µg/ml, ± 5% in nonane)**

PCB	IUPAC #	CAS #	Concentration (µg/ml)
3,3',4,4'-Tetrachlorobiphenyl	77	32598-13-3	10
3,4,4',5-Tetrachlorobiphenyl	81	70362-50-4	10
3,3',4,4',5-Pentachlorobiphenyl	126	57465-28-8	10
3,3',4,4',5,5'-Hexachlorobiphenyl	169	32774-16-6	10

Certified By: B.G. Chittim **Date:** 10/29/2015 (mm/dd/yyyy)

Table A: **P48-M-ES; Components and Concentrations (pg/µl, ± 5% in nonane)**

IUPAC #	13C-PCB	CAS #	Concentration (pg/µl)
28L	2,4,4'-Trichloro[$^{13}C_{12}$]biphenyl	208263-76-7	1000
52L	2,2',5,5'-Tetrachloro[$^{13}C_{12}$]biphenyl	208263-80-3	1000
101L	2,2',4,5,5'-Pentachloro[$^{13}C_{12}$]biphenyl	104130-39-4	1000
138L	2,2',3,4,4',5'-Hexachloro[$^{13}C_{12}$]biphenyl	208263-66-5	1000
153L	2,2',4,4',5,5'-Hexachloro[$^{13}C_{12}$]biphenyl	-	1000
180L	2,2',3,4,4',5,5'-Heptachloro[$^{13}C_{12}$]biphenyl	160901-82-6	1000

Certified By: _____ **Date:** 10/22/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Table A: **P48-RS-STK; Components and Concentrations (pg/µl, ± 5% in nonane)**

IUPAC #	13C-PCB	CAS #	Concentration (pg/µl)
70L	2,3',4',5-Tetrachloro[$^{13}C_{12}$]biphenyl	-	1000
111L	2,3,3',5,5'-Pentachloro[$^{13}C_{12}$]biphenyl	235416-29-2	1000
170L	2,2',3,3',4,4',5-Heptachloro[$^{13}C_{12}$]biphenyl	160901-80-4	1000

Certified By: B.G. Chittim **Date:** 09/24/2014 (mm/dd/yyyy)

Table A: **P48-SS-STK; Components and Concentrations (pg/µl, ± 5% in nonane)**

IUPAC #	13C-PCB	CAS #	Concentration (pg/µl)
60L	2,3,4,4'-Tetrachloro[$^{13}C_{12}$]biphenyl	-	1000
127L	3,3',4,5,5'-Pentachloro[$^{13}C_{12}$]biphenyl	-	1000
159L	2,3,3',4,5,5'-Hexachloro[$^{13}C_{12}$]biphenyl	-	1000

Certified By: B.G. Chittim **Date:** 11/03/2015 (mm/dd/yyyy)

Table A: **P48-W-ES-STK; Components and Concentrations (pg/µl, ± 5% in nonane/2.4% toluene)**

IUPAC #	13C-PCB	CAS #	Concentration (pg/µl)
77L	3,3',4,4'-Tetrachloro[$^{13}C_{12}$]biphenyl	105600-23-5	1000
81L	3,4,4',5-Tetrachloro[$^{13}C_{12}$]biphenyl	208461-24-9	1000
105L	2,3,3',4,4'-Pentachloro[$^{13}C_{12}$]biphenyl	208263-62-1	1000
114L	2,3,4,4',5-Pentachloro[$^{13}C_{12}$]biphenyl	208263-63-2	1000
118L	2,3',4,4',5-Pentachloro[$^{13}C_{12}$]biphenyl	104130-40-7	1000
123L	2',3,4,4',5-Pentachloro[$^{13}C_{12}$]biphenyl	208263-64-3	1000
126L	3,3',4,4',5-Pentachloro[$^{13}C_{12}$]biphenyl	208263-65-4	1000
156L	2,3,3',4,4',5-Hexachloro[$^{13}C_{12}$]biphenyl	208263-68-7	1000
157L	2,3,3',4,4',5'-Hexachloro[$^{13}C_{12}$]biphenyl	235416-30-5	1000
167L	2,3',4,4',5,5'-Hexachloro[$^{13}C_{12}$]biphenyl	208263-69-8	1000
169L	3,3',4,4',5,5'-Hexachloro[$^{13}C_{12}$]biphenyl	208263-70-1	1000
189L	2,3,3',4,4',5,5'-Heptachloro[$^{13}C_{12}$]biphenyl	208263-73-4	1000

Certified By: _____ **Date:** 10/15/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Table A: **BP-MO; Components and Concentrations (µg/ml, ± 5% in nonane/ 3.5% toluene)**

PCB	IUPAC #	CAS #	Concentration (µg/ml)
2,3,3',4,4'-Pentachlorobiphenyl	105	32598-14-4	10.0
2,3,4,4',5-Pentachlorobiphenyl	114	74472-37-0	10.0
2,3',4,4',5-Pentachlorobiphenyl	118	31508-00-6	10.0
2',3,4,4',5-Pentachlorobiphenyl	123	65510-44-3	10.0
2,3,3',4,4',5-Hexachlorobiphenyl	156	38380-08-4	10.0
2,3,3',4,4',5'-Hexachlorobiphenyl	157	69782-90-7	10.0
2,3',4,4',5,5'-Hexachlorobiphenyl	167	52663-72-6	10.0
2,3,3',4,4',5,5'-Heptachlorobiphenyl	189	39635-31-9	10.0

Certified By: B.G. Chittim **Date:** 10/29/2015 (mm/dd/yyyy)

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Date Received: _____

Certificate of Analysis

Rev 0 Page 1 of 2

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
130307-01	306333	≤-10 °C	Isooctane	1-May-2020	PCB Congener Solution 32-2, 10 mg/L, 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
2,2',3,3',4',5,6-heptachlorobiphenyl (BZ# 177)	52663-70-4	100	833.5.2.6P	9.96 +/- .13	mg/L
2,2',3,3',4,4',5-heptachlorobiphenyl (BZ# 170)	35065-30-6	99	526.4.2P	9.9 +/- .27	mg/L
2,2',3,4',5,5',6-heptachlorobiphenyl (BZ# 187)	52663-68-0	98.8	542.4.2P	10.15 +/- .22	mg/L
2,2',3,4,4',5',6-heptachlorobiphenyl (BZ# 183)	52663-69-1	99	664.5.5.5P	10.05 +/- .25	mg/L
2,2',3,4,4',5,5'-heptachlorobiphenyl (BZ# 180)	35065-29-3	99	527.4.2P	10.04 +/- .22	mg/L
2,3,3',4,4',5,5'-heptachlorobiphenyl (BZ# 189)	39635-31-9	100	656.5.4.1P	10.1 +/- .14	mg/L
2,2',3,3',4,4'-hexachlorobiphenyl (BZ# 128)	38380-07-3	99	523.4.1P	9.999 +/- .15	mg/L
2,2',3,4',5',6-hexachlorobiphenyl (BZ# 149)	38380-04-0	99.9	811.5.5.3P	9.946 +/- .17	mg/L
2,2',3,4',5,5'-hexachlorobiphenyl (BZ# 146)	51908-16-8	99	808.421.2.1P	10.03 +/- .24	mg/L
2,2',3,4,4',5'-hexachlorobiphenyl (BZ# 138)	35065-28-2	99.5	541.3.1.1S	10.09 +/- .25	mg/L
2,2',3,5,5',6-hexachlorobiphenyl (BZ# 151)	52663-63-5	99.6	813.5.3.3P	10.06 +/- .52	mg/L
2,2',4,4',5,5'-hexachlorobiphenyl (BZ# 153)	35065-27-1	97	525.257.1P	9.959 +/- .15	mg/L
2,3',4,4',5,5'-hexachlorobiphenyl (BZ# 167)	52663-72-6	99.4	655.5.4P	9.909 +/- .19	mg/L
2,3,3',4,4',5-hexachlorobiphenyl (BZ# 156)	38380-08-4	99	659.5.1.2P	10.02 +/- .3	mg/L
2,3,3',4,4',5'-hexachlorobiphenyl (BZ# 157)	69782-90-7	99	654.421.1.1P	10.04 +/- .21	mg/L
3,3',4,4',5,5'-hexachlorobiphenyl (BZ# 169)	32774-16-6	99	660.5.5.1P	10.01 +/- .22	mg/L
2',3,4,4',5-pentachlorobiphenyl (BZ# 123)	65510-44-3	99.3	658.5.4P	9.99 +/- .25	mg/L
2,2',3,5',6-pentachlorobiphenyl (BZ# 95)	38379-99-6	97	767.421.2.1P	10 +/- .16	mg/L
2,2',4,4',5-pentachlorobiphenyl (BZ# 99)	38380-01-7	99.5	771.257.1.1P	10.09 +/- .24	mg/L
2,2',4,5,5'-pentachlorobiphenyl (BZ# 101)	37680-73-2	99	520.421.4P	9.9 +/- .17	mg/L

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.

This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

Certified By: _____

Katrina Emelianoff

Manufacture Date 27-Apr-2017

ACCEPTANCE
DATE 16/04/19
HRP 8/9
APPROVED BY BS

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.

The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

Table A: EPA-8290STN; Components and Concentrations (µg/ml, ± 5% in nonane/30.7% toluene)

PCDDs	Concentration (µg/ml)	PCDFs	Concentration (µg/ml)
2378-TCDD	1.0	2378-TCDF	1.0
12378-PeCDD	2.5	12378-PeCDF	2.5
123478-HxCDD	2.5	23478-PeCDF	2.5
123678-HxCDD	2.5	123478-HxCDF	2.5
123789-HxCDD	2.5	123678-HxCDF	2.5
1234678-HpCDD	2.5	123789-HxCDF	2.5
OCDD	5.0	234678-HxCDF	2.5
		1234678-HpCDF	2.5
		1234789-HpCDF	2.5
		OCDF	5.0

Certified By: B.G. Chittim Date: 02/24/2016 (mm/dd/yyyy)

Table A: **EN-1948STK; Components and Concentrations (µg/ml, ± 5% in nonane/13.5% toluene)**

PCDDs	Concentration (µg/ml)	PCDFs	Concentration (µg/ml)
2,3,7,8-TCDD	0.50	2,3,7,8-TCDF	0.50
1,2,3,7,8-PeCDD	1.0	1,2,3,7,8-PeCDF	1.0
1,2,3,4,7,8-HxCDD	1.0	2,3,4,7,8-PeCDF	1.0
1,2,3,6,7,8-HxCDD	1.0	1,2,3,4,7,8-HxCDF	1.0
1,2,3,7,8,9-HxCDD	1.0	1,2,3,6,7,8-HxCDF	1.0
1,2,3,4,6,7,8-HpCDD	2.0	1,2,3,7,8,9-HxCDF	1.0
OCDD	2.0	2,3,4,6,7,8-HxCDF	1.0
		1,2,3,4,6,7,8-HpCDF	2.0
		1,2,3,4,7,8,9-HpCDF	2.0
		OCDF	2.0

Certified By: B.G. Chittim **Date:** 02/24/2017 (mm/dd/yyyy)

Table A: **DF-LCS-C200; Components and Concentrations (ng/ml, ± 5% in nonane/7.6% toluene)**

$^{13}C_{12}$-PCDDs	Concentration (ng/ml)	$^{13}C_{12}$-PCDFs	Concentration (ng/ml)
$^{13}C_{12}$-2,3,7,8-TCDD	200	$^{13}C_{12}$-2,3,7,8-TCDF	200
$^{13}C_{12}$-1,2,3,7,8-PeCDD	200	$^{13}C_{12}$-1,2,3,7,8-PeCDF	200
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	200	$^{13}C_{12}$-2,3,4,7,8-PeCDF	200
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	200	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	200
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	200	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	200
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	200	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	200
$^{13}C_{12}$-OCDD	400	$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	200
		$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	200
		$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	200
		$^{13}C_{12}$-OCDF	400

Certified By: _____ **Date:** 07/11/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

Table A: **EN-1948ES; Components and Concentrations (pg/µl, ± 5% in nonane/6.8% toluene)**

$^{13}C_{12}$-PCDDs	Concentration (pg/µl)	$^{13}C_{12}$-PCDFs	Concentration (pg/µl)
$^{13}C_{12}$-2,3,7,8-TCDD	200	$^{13}C_{12}$-2,3,7,8-TCDF	200
$^{13}C_{12}$-1,2,3,7,8-PeCDD	200	$^{13}C_{12}$-2,3,4,7,8-PeCDF	200
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	200	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	200
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	200	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	200
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	400	$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	200
$^{13}C_{12}$-OCDD	400	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	400
		$^{13}C_{12}$-OCDF	400

Certified By: _____ **Date:** 04/04/2018 (mm/dd/yyyy)

B.G. Chittim, General Manager

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WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

EN-1948IS

Ap 2/0 1/2018

Syringe Standard Solution
for European Standard Method EN 1948-4

PRODUCT CODE:	EN-1948IS
LOT NUMBER:	EN480905IS
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	09/14/2005
LAST TESTED: (mm/dd/yyyy)	08/22/2013 (HRGC/LRMS)
EXPIRY DATE: (mm/dd/yyyy)	04/01/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

ARPA umbria
Data 12/04/18
Identif. 1380RT
Approvato da

DESCRIPTION:

EN-1948IS is a solution/mixture of two $^{13}C_{12}$-labelled chlorinated dibenzo-p-dioxins ($^{13}C_{12}$-PCDDs). The components and their concentrations are given in Table A.

EN-1948IS was designed for, and prepared to be used according to, the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dixoin-like PCBs" (EN 1948-4:2010).

The individual $^{13}C_{12}$-PCDDs both have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

Table A: **EN-1948IS; Components and Concentrations (pg/µl, ± 5% in nonane/1.6% toluene)**

$^{13}C_{12}$-PCDDs	Concentration (pg/µl)
$^{13}C_{12}$-1,2,3,4-TCDD	800
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	800

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Certified By: B.G. Chittim **Date:** 11/27/2015 (mm/dd/yyyy)

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Table A: **EN-1948SS; Components and Concentrations (pg/µl, ± 5% in nonane/1.6% toluene)**

$^{13}C_{12}$-PCDFs	Concentration (pg/µl)
$^{13}C_{12}$-1,2,3,7,8-PeCDF	200
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	200
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	400

Certified By: B.G. Chittim **Date:** 07/24/2013 (mm/dd/yyyy)

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WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

DF-IS-J

Mass-Labelled PCDD
Internal Standard Solution

ARPA umbria
Data 21/11/17
Identif. 305 MRT
Approvato da

PRODUCT CODE:	DF-IS-J
LOT NUMBER:	DFISJ0110
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	01/25/2010
LAST TESTED: (mm/dd/yyyy)	02/27/2015
EXPIRY DATE: (mm/dd/yyyy)	01/01/2022
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

DF-IS-J is a solution/mixture of ^{13}C-labelled chlorinated dibenzo-p-dioxins ($^{13}C_{12}$-PCDDs). The components and their concentrations are given in Table A.

The individual $^{13}C_{12}$-PCDDs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data for a dilution of DF-IS-J (DF-IS-J20)
(SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
136203-01 -5PAK	369656	≤ -10 °C	Methanol	2-Apr-2020	Custom Semivolatile Mix, 22-6203, 10 mg/L, 5 x 1 m

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
aclonifen	74070-46-5	99	2859.286.1P	9.998 +/- .17	mg/l
Benfluralin (Benefin)	1861-40-1	99	553.3.2P	10.19 +/- .15	mg/l
carbaryl	63-25-2	98	1653.286.1.3P	10.03 +/- .14	mg/l
chlorpyrifos-methyl	5598-13-0	99.1	1080.3.4P	9.91 +/- .15	mg/l
chlorpyrifos	2921-88-2	99.5	543.3.6P	9.95 +/- .12	mg/l
Demeton O	298-03-3	95	2493.494.1P	10.17 +/- .18	mg/l
dichlorvos	62-73-7	97.7	572.421.2P	9.856 +/- .2	mg/l
dimethoate	60-51-5	99	283.286.1.2P	10.02 +/- .14	mg/l
fenhexamid	126833-17-8	99.5	1830.3.3P	9.95 +/- .19	mg/l
fenitrothion	122-14-5	96.3	1019.286.1P	10.11 +/- .17	mg/l
fenthion	55-38-9	94.5	1561.286.1P	9.918 +/- .17	mg/l
Guthion®	86-50-0	99.61	574.421.1P	9.874 +/- .18	mg/l
Guthion Ethyl	2642-71-9	99.2	1621.18.1.1P	9.833 +/- .18	mg/l
methamidophos	10265-92-6	99	479.421.4.1P	10.05 +/- .16	mg/l
methyl parathion	298-00-0	99.33	284.421.1P	9.846 +/- .21	mg/l
metribuzin	21087-64-9	99.4	1004.3.5P	9.965 +/- .24	mg/l
omethoate	1113-02-6	99.5	1614.3.10P	10.12 +/- .19	mg/l
oxadiazon	19666-30-9	99.5	561.286.1.1P	9.95 +/- .17	mg/l
oxydemeton-methyl (demeton-s-methyl sulfoxide)	301-12-2	97	2310.421.1P	9.87 +/- .26	mg/l
oxyfluorfen	42874-03-3	98.8	562.3.3P	10.08 +/- .15	mg/l

Erica Castiglione

Certified By: _____

Erica Castiglione

Manufacture Date 27-Feb-2019

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.

This Reference Material was manufactured, produced, and/or certifie under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

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MKP 9+6. TQS 39

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Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
136202-01 -5PAK	369353	≤ -10 °C	Acetonitrile	25-Mar-2020	Custom Semivolatile Mix, 24-6202, 10 mg/L, 5 x 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
alachlor	15972-60-8	97.3	552.421.2P	10.12 +/- .17	mg/L
ametryne	834-12-8	98.07	913.421.1P	9.905 +/- .15	mg/L
atrazine	1912-24-9	99.5	337.7.3P	9.95 +/- .14	mg/L
atrazine desisopropyl	1007-28-9	99	1054.421.3P	9.9 +/- .17	mg/L
azoxystrobin	131860-33-8	99.23	1802.421.1P	10.02 +/- .15	mg/L
chlorotoluron	15545-48-9	99.9	1369.8.1P	10.19 +/- .17	mg/L
cloquintocet-mexyl	99607-70-2	99.8	4328.7.1P	9.88 +/- .14	mg/L
Command (clomazone)	81777-89-1	98.5	1052.3.6P	9.949 +/- .15	mg/L
cymoxanil	57966-95-7	99.6	1858.7.1P	9.96 +/- .14	mg/L
dimethomorph	110488-70-5	99.78	1860.421.2P	10.18 +/- .14	mg/L
diuron	330-54-1	98.8	330.421.2P	9.88 +/- .51	mg/L
ethoprophos (prophos)	13194-48-4	98.24	478.421.1P	10.12 +/- .14	mg/L
fluazinam	79622-59-6	99.7	2397.7.1P	10.07 +/- .14	mg/L
fludioxonil	131341-86-1	99.82	1816.421.1P	9.882 +/- .15	mg/L
fluopicolide	239110-15-7	99.31	2938.421.1P	9.931 +/- .14	mg/L
fluopyram	658066-35-4	99.2	4587.3.1P	10.02 +/- .15	mg/L
Guthion®	86-50-0	99.61	574.421.1P	9.861 +/- .14	mg/L
Guthion Ethyl	2642-71-9	99.2	1621.18.1.1P	9.92 +/- .14	mg/L
imidacloprid	138261-41-3	99	1533.286.1P	9.9 +/- .17	mg/L
iprovalicarb	140923-17-7	99	1821.421.1P	9.999 +/- .15	mg/L

Erica Castiglione

Certified By: _____

Erica Castiglione

Manufacture Date 6-Mar-2019

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.

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Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
136200-01 -5PAK	369359	≤ -10 °C	Acetonitrile	5-Sep-2020	Custom Semivolatile Mix, 30-6200, 10 mg/L, 5 x 1 m

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
cyprodinil	121552-61-2	99.5	1807.3.2P	9.95 +/- .15	mg/
metalaxyl-m	70630-17-0	97	1058.3.6P	9.991 +/- .15	mg/
metazachlor	67129-08-2	99.5	1584.3.4P	10.05 +/- .19	mg/
metobromuron	3060-89-7	99.5	1365.421.1P	10.05 +/- .16	mg/
S-metolachlor	87392-12-9	98.4	2804.8.2P	9.938 +/- .16	mg/
metrafenone	220899-03-6	99.58	2922.421.2P	10 +/- .24	mg/
metribuzin	21087-64-9	99.4	1004.3.6P	10.04 +/- .16	mg/
napropamide	15299-99-7	98.5	1173.286.1P	9.949 +/- .21	mg/
oxadiazon	19666-30-9	99.5	561.286.1P	10.05 +/- .16	mg/
oxyfluorfen	42874-03-3	98.8	562.3.4P	9.979 +/- .16	mg/
penconazol	66246-88-6	98.85	1657.421.3P	9.984 +/- .16	mg/
pendimethalin	40487-42-1	99.5	1254.7.1P	10.05 +/- .19	mg/
picoxystrobin	117428-22-5	99.9	3765.8.2P	9.99 +/- .14	mg/
Pirimicarb	23103-98-2	99	1636.421.1P	10.06 +/- .2	mg/
Pirimiphos-ethyl	23505-41-1	99.9	1654.18.1P	10.09 +/- .19	mg/
prochloraz	67747-09-5	99.8	1652.7.1P	10.08 +/- .19	mg/
propamocarb	24579-73-5	98.21	2298.421.1P	10.01 +/- .21	mg/
Propiconazol (mixture of isomers)	60207-90-1	97.7	1064.286.1.1P	9.965 +/- .17	mg/
propyzamide (pronamide)	23950-58-5	99	296.421.1P	9.999 +/- .16	mg/
pyraclostrobin	175013-18-0	99	1920.286.1P	10.01 +/- .22	mg/

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.

This Reference Material was manufactured, produced, and/or certifi under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

Brendan M Shumberger

Certified By: _____

Brendan Shumberger

Manufacture Date 5-Mar-2019

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Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
136518-01 -5PAK	383952	≤ -10 °C	Acetonitrile	15-Jul-2021	Custom Semivolatile Mix, 5-6518, 10 mg/L, 5 x 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
bentazon	25057-89-0	99.77	1405.421.1P	9.877 +/- .16	mg/
2,4-dichlorophenoxyacetic acid (2,4-D)	94-75-7	99.5	126.3.2P	10.05 +/- .19	mg/
MCPA acid	94-74-6	95.6	865.7.2P	9.942 +/- .16	mg/
MCPP (Mecoprop)	93-65-2	98	2571.286.1P	9.898 +/- .17	mg/
2,4,5-trichlorophenoxyacetic acid	93-76-5	99.1	127.1.3.1P	10.01 +/- .16	mg/

ARPA Umbria
DATA 07/08/2019
IDENTIF. MRP 981
APPROVATO DA

Erica Castiglione

Certified By: _____

Erica Castiglione

Manufacture Date 16-Jul-2019

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Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
134717-01 -5PAK	381580	≤ -10 °C	Acetone w/ 0.1% Formic Acid	29-Jul-2020	Custom Pesticide Mix, 30-4685, 10 mg/L, 5 x 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
aldrin	309-00-2	97.9	258.3.8P	9.966 +/- .18	mg
a-BHC	319-84-6	98	237.421.1P	10.01 +/- .17	mg
b-BHC	319-85-7	98.4	259.421.2.1P	10.07 +/- .17	mg
g-BHC	58-89-9	99	238.286.1P	9.979 +/- .2	mg
bifenox	42576-02-3	99.43	2860.421.1P	9.989 +/- .16	mg
chlordane (Mix of Isomers)	57-74-9	99	263.3.5P	9.9 +/- .16	mg
chlorfenvinphos (mixture of z and e isomers)	470-90-6	95	925.286.1.2P	9.957 +/- .15	mg
cypermethrin (mix of isomers)	52315-07-8	99.6	1624.9.1P	10.01 +/- .16	mg
o,p'-DDD	53-19-0	98.1	235.286.1P	10.01 +/- .2	mg
p,p'-DDD	72-54-8	97	234.1.1P	10.01 +/- .23	mg
o,p'-DDE	3424-82-6	99	396.286.1.2P	10.2 +/- .19	mg
p,p'-DDE	72-55-9	99.9	236.7.1.3P	9.95 +/- .18	mg
o,p'-DDT	789-02-6	98.4	395.421.3P	10.04 +/- .19	mg
p,p'-DDT	50-29-3	97.8	233.1.2P	9.976 +/- .18	mg
deltamethrin	52918-63-5	98	1622.286.1P	10.04 +/- .19	mg
dieldrin	60-57-1	91.8	240.1.1P	10.04 +/- .2	mg
endosulfan (alpha + beta)	115-29-7	99.5	2476.3.1P	10.05 +/- .16	mg
endrin	72-20-8	98.6	255.3.16P	9.919 +/- .18	mg
Folpet	133-07-3	98.5	871.3.1P	9.949 +/- .12	mg
heptachlor	76-44-8	96.5	261.115.1.1P	9.978 +/- .25	mg

Katherine M Clark

Certified By: _____

Katherine Clark

Manufacture Date 10-Jul-2019

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Rev 0 Page 1 of 1

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
123088-01 -5PAK	363072	≤ -10 °C	Methanol	2-Dec-2020	Custom Volatile Mix, 2-3088, 100 mg/L, 5 x 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
1,2,3-trichlorobenzene	87-61-6	99	185.1.1.6P	99 +/- 1.12	mg/
1,3,5-trichlorobenzene	108-70-3	99.9	985.29.1.1P	99.9 +/- 1.42	mg/

ARPA Umbria
DATA 12-12-2018 (1)
IDENTIF.
APPROVATO

Jennifer Hasty

Certified By: _____

Jennifer Hasty

Manufacture Date 3-Dec-2018

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Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
121507-01 -4PAK	361659	≤ -10 °C	P/T Methanol	12-Nov-2020	Halogenated Volatiles Mix, 36-254, 100 mg/L, 4 x 1 r

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
allyl chloride	107-05-1	98	227.8.1.1P	100.6 +/- 1.45	mg/l
bromodichloromethane	75-27-4	99.5	149.1.9P	100.2 +/- 1.04	mg/l
bromoform	75-25-2	99.3	150.7.2P	100 +/- 1.04	mg/l
bromomethane	74-83-9	99	139.1.5P	100.7 +/- 2.03	mg/l
carbon tetrachloride	56-23-5	100	154.9.1P	100.4 +/- 1.04	mg/l
chlorobenzene	108-90-7	99.9	155.29.1P	100.2 +/- 1.04	mg/l
chloroethane	75-00-3	99.5	141.2.1P	99.6 +/- 2.01	mg/l
chloroform	67-66-3	99.8	156.29.2P	100.1 +/- 1.04	mg/l
chloromethane	74-87-3	99	140.158.2.1P	98.9 +/- 2.23	mg/l
cis-1,2-dichloroethylene	156-59-2	99.7	166.286.1P	100 +/- 1.44	mg/l
dibromochloromethane	124-48-1	97.5	159.29.2P	100.5 +/- 1.04	mg/l
1,2-dibromo-3-chloropropane	96-12-8	98	160.7.2P	101.8 +/- 1.06	mg/l
1,2-dibromoethane	106-93-4	99.9	161.9.1P	100.6 +/- 1.05	mg/l
dibromomethane	74-95-3	99.9	162.8.1.1P	100.1 +/- 1.44	mg/l
1,2-dichlorobenzene	95-50-1	99.8	43.7.1P	99.94 +/- 1.04	mg/l
1,3-dichlorobenzene	541-73-1	99.9	44.9.2P	100.3 +/- 1.04	mg/l
1,4-dichlorobenzene	106-46-7	99.9	45.29.1P	100.1 +/- 1.04	mg/l
trans-1,4-dichloro-2-butene	110-57-6	95.5	201.1.16P	100.3 +/- 1.04	mg/l
dichlorodifluoromethane	75-71-8	99	142.158.4P	101.2 +/- 2.28	mg/l
1,1-dichloroethane	75-34-3	99.1	163.8.3P	100.5 +/- 1.04	mg/l

Kara J Catron

Certified By: _____

Kara Catron

Manufacture Date 13-Nov-2018

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Rev 0 Page 1

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
122351-01 -4PAK	303136	≤ -10 °C	P/T Methanol	12-Apr-2018	Custom Volatile Mix, 7-2351, 100 mg/L, 4 x 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
line	110-86-1	99.9	101.9.2P	100.5 +/- 1.05	m
acetonitrile	75-05-8	99.5	204.10.4P	100.2 +/- 2.02	m
2-nitropropane	79-46-9	99.4	219.8.1P	100.4 +/- 1.44	m
acrylonitrile	107-13-1	99	210.1.7P	100.1 +/- 1.15	m
methyl acrylonitrile	126-98-7	99.8	212.8.1.1P	100.1 +/- 2.25	m
nitrobenzene	98-95-3	100	94.9.2.1P	100.1 +/- 1.44	m
propionitrile	107-12-0	99.5	218.1.3P	99.78 +/- 2.01	m

ARPA Umbria
DATA 12/04/2017
IDENTIF. MRP 949
APPROVATO DA

Certified By: Madeline Luby

Madeline Luby

Manufacture Date 23-Mar-2017

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

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Rev 0 **Page 1 of 1**

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
116611-06	381576	≤ -10 °C	Acetone	8-Jul-2021	Mineral Oil Mixture, 10,000 mg/L, 2 x 5 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
composite diesel fuel #2	68334-30-5	100	1598.52.7.1P	10170 +/- 23.08	mg/l
Transformer Oil	8012-95-1	99	1877.52.1P	9857 +/- 53.22	mg/l

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da

Certified By: Joanna Radu

Joanna Radu
Manufacture Date 9-Jul-2019

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