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CERTIFIED REFERENCE MATERIAL

Certificate of Analysis

ACCREDITED
ISO Guide 34 Accredited
Reference Material Producer
Certificate #3222.01

ilac-MRA

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

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

Catalog No. : 32094 **Lot No.:** A0119163

Description : 508.1 Calibration Mix #1

508.1 Calibration Std #1 500µg/mL, Ethyl Acetate, 1mL/ampul

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

Expiration Date : May 31, 2020 **Storage:** 10°C or colder

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	alpha-BHC	501.5 µg/mL	+/- 2.9788 µg/mL	Gravimetric
	CAS # 319-84-6 (Lot 0911942)		+/- 22.8476 µg/mL	Unstressed
	Purity 99%		+/- 32.9853 µg/mL	Stressed
2	gamma-BHC (Lindane)	503.0 µg/mL	+/- 2.9877 µg/mL	Gravimetric
	CAS # 58-89-9 (Lot 4181800)		+/- 22.9159 µg/mL	Unstressed
	Purity 99%		+/- 33.0840 µg/mL	Stressed
3	beta-BHC	504.7 µg/mL	+/- 2.9978 µg/mL	Gravimetric
	CAS # 319-85-7 (Lot SZBD116XV)		+/- 22.9933 µg/mL	Unstressed
	Purity 98%		+/- 33.1958 µg/mL	Stressed
4	delta-BHC	504.7 µg/mL	+/- 2.9978 µg/mL	Gravimetric
	CAS # 319-86-8 (Lot ER02101401)		+/- 22.9933 µg/mL	Unstressed
	Purity 98%		+/- 33.1958 µg/mL	Stressed
5	Heptachlor	504.0 µg/mL	+/- 2.9936 µg/mL	Gravimetric
	CAS # 76-44-8 (Lot NT053097)		+/- 22.9615 µg/mL	Unstressed
	Purity 99%		+/- 33.1497 µg/mL	Stressed
6	Aldrin	504.0 µg/mL	+/- 2.9936 µg/mL	Gravimetric
	CAS # 309-00-2 (Lot 4658200)		+/- 22.9615 µg/mL	Unstressed
	Purity 99%		+/- 33.1497 µg/mL	Stressed
7	Heptachlor epoxide (isomer B)	501.5 µg/mL	+/- 2.9788 µg/mL	Gravimetric
	CAS # 1024-57-3 (Lot ER121511-01)		+/- 22.8476 µg/mL	Unstressed
	Purity 99%		+/- 32.9853 µg/mL	Stressed

8	4,4'-DDE		502.0	µg/mL	+/-	2.9817	µg/mL	Gravimetric
	CAS # 72-55-9	(Lot ER011106-01)			+/-	22.8703	µg/mL	Unstressed
	Purity 99%				+/-	33.0182	µg/mL	Stressed
9	Endosulfan I		504.2	µg/mL	+/-	2.9949	µg/mL	Gravimetric
	CAS # 959-98-8	(Lot ER012105-02)			+/-	22.9710	µg/mL	Unstressed
	Purity 98%				+/-	33.1636	µg/mL	Stressed
10	Dieldrin		504.7	µg/mL	+/-	2.9978	µg/mL	Gravimetric
	CAS # 60-57-1	(Lot ER030105-03)			+/-	22.9933	µg/mL	Unstressed
	Purity 98%				+/-	33.1958	µg/mL	Stressed
11	Endrin		504.7	µg/mL	+/-	2.9978	µg/mL	Gravimetric
	CAS # 72-20-8	(Lot SZBD119XV)			+/-	22.9933	µg/mL	Unstressed
	Purity 98%				+/-	33.1958	µg/mL	Stressed
12	4,4'-DDD		504.4	µg/mL	+/-	2.9960	µg/mL	Gravimetric
	CAS # 72-54-8	(Lot ER061207-01)			+/-	22.9797	µg/mL	Unstressed
	Purity 97%				+/-	33.1760	µg/mL	Stressed
13	Endosulfan II		503.5	µg/mL	+/-	2.9906	µg/mL	Gravimetric
	CAS # 33213-65-9	(Lot ER102407-02)			+/-	22.9387	µg/mL	Unstressed
	Purity 99%				+/-	33.1169	µg/mL	Stressed
14	4,4'-DDT		502.7	µg/mL	+/-	2.9861	µg/mL	Gravimetric
	CAS # 50-29-3	(Lot ER012306-03)			+/-	22.9041	µg/mL	Unstressed
	Purity 98%				+/-	33.0669	µg/mL	Stressed
15	Endrin aldehyde		504.7	µg/mL	+/-	2.9978	µg/mL	Gravimetric
	CAS # 7421-93-4	(Lot ER082306-01)			+/-	22.9933	µg/mL	Unstressed
	Purity 98%				+/-	33.1958	µg/mL	Stressed
16	Methoxychlor		503.5	µg/mL	+/-	2.9906	µg/mL	Gravimetric
	CAS # 72-43-5	(Lot 4881400)			+/-	22.9387	µg/mL	Unstressed
	Purity 99%				+/-	33.1169	µg/mL	Stressed
17	Endosulfan sulfate		500.6	µg/mL	+/-	2.9736	µg/mL	Gravimetric
	CAS # 1031-07-8	(Lot SZBC213XV)			+/-	22.8084	µg/mL	Unstressed
	Purity 96%				+/-	32.9287	µg/mL	Stressed

Solvent: Ethyl Acetate
CAS # 141-78-6
Purity 99%

Column:
30m x .25mm x .2um
Rtx-CLP II (cat.# 11323)

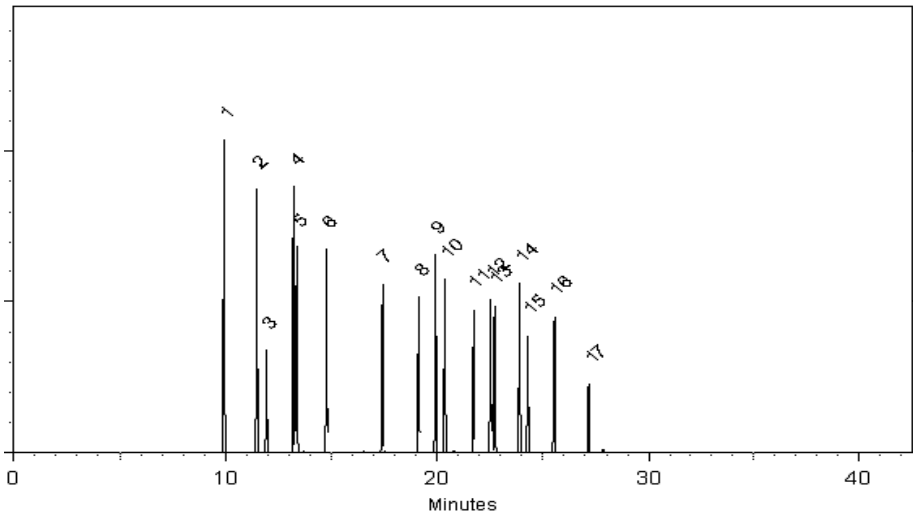
Carrier Gas:
helium-constant pressure 20 psi.

Temp. Program:
150°C to 300°C
@ 4°C/min. (hold 5 min.)

Inj. Temp:
200°C

Det. Temp:
300°C

Det. Type:
ECD



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.

Isaiah Harrison - Mix Technician

Date Mixed: 09-May-2016 **Balance:** 1128353505

Jennifer L. Pollino - QC Analyst

Date Passed: 11-May-2016

Manufactured under Restek's ISO 9001:2008 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 Guides 34 and 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

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

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

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

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

Manufacturing Notes:

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

Handling Notes:

- Samples should be transferred into deactivated vials for handling and storage. Restek supplies deactivated vials along with most standards packed in 2 mL ampules. Due to space constraints, Restek does not supply vials for larger volume ampules. Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions. Restek will also deactivate larger volume vials from our inventory as a custom ordered item. Contact your Restek sales or customer service representative for details.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.