Dr. Ehrenstorfer

Reference Materials for Residue Analysis

# Gravimetric Certificate

**ISO Guide 34 Reference Material**

**Product Identification**

**Article Code:** DRE-LA20034100IO
**Article Name:** PCB-Mix 41
**Formula:**
**Mol. Weight:**
**CAS No.:**

**Lot Number:** G127802IO
**Expiry Date:** 28.02.2022
**Storage Temperature:** 20°C ± 4°C

Storage and handling: The RM should be stored in the original sealed bottle at the temperatur given above. After use the bottle should be tightly closed and protected from moisture and light. The expiry date is valid for original sealed bottles under recommended storage conditions only.

**Gravimetric Data**

| Compound Name: | CAS: | Conc. (mg/l): | Expanded Uncertainty U (mg/l): | Lot. No.: | Purity (%): | Weight (mg): | RT (min): |
|---|---|---|---|---|---|---|---|
| PCB 81 (3,4,4',5-Tetrachlorobiphenyl) | 70362-50-4 | 10.00 | 0.21 | 40128 | 98.0 | 3.571 | 46.94 |
| PCB 77 (3,3',4,4'-Tetrachlorobiphenyl) | 32598-13-3 | 10.00 | 0.21 | 108585 | 99.8 | 3.507 | 47.78 |
| PCB 123 (2',3,4,4',5-Pentachlorobiphenyl) | 65510-44-3 | 10.01 | 0.23 | 51130 | 99.3 | 3.527 | 49.96 |
| PCB 118 (2,3',4,4',5-Pentachlorobiphenyl) | 31508-00-6 | 10.00 | 0.21 | 31119 | 99.0 | 3.537 | 50.18 |
| PCB 114 (2,3,4,4',5-Pentachlorobiphenyl) | 74472-37-0 | 10.00 | 0.21 | 50912 | 99.0 | 3.536 | 51.07 |
| PCB 105 (2,3,3',4,4'-Pentachlorobiphenyl) | 32598-14-4 | 10.00 | 0.21 | 40313 | 97.0 | 3.609 | 52.36 |
| PCB 126 (3,3',4,4',5-Pentachlorobiphenyl) | 57465-28-8 | 10.01 | 0.21 | 30919 | 98.5 | 3.556 | 55.19 |
| PCB 167 (2,3',4,4',5,5'-Hexachlorobiphenyl) | 52663-72-6 | 10.00 | 0.23 | 10915 | 99.0 | 3.535 | 56.98 |
| PCB 156 (2,3,3',4,4',5-Hexachlorobiphenyl) | 38380-08-4 | 10.01 | 0.21 | 50603 | 99.0 | 3.538 | 58.81 |
| PCB 157 (2,3,3',4,4',5'-Hexachlorobiphenyl) | 69782-90-7 | 10.00 | 0.21 | 60622 | 99.0 | 3.536 | 59.26 |
| PCB 169 (3,3',4,4',5,5'-Hexachlorobiphenyl) | 32774-16-6 | 10.01 | 0.21 | 30907 | 99.0 | 3.538 | 61.98 |
| PCB 189 (2,3,3',4,4',5,5'-Heptachlorobiphenyl) | 39635-31-9 | 10.01 | 0.23 | 123325 | 99.3 | 3.527 | 65.10 |

| Solvent: | Solvent Lot: | Exact Quantity (ml): |
|---|---|---|
| Iso-octane | F131A26 | 350.00 |

The uncertainty of this standard is calculated in accordance with the ISO Guide 34 and EURACHEM/CITAC Guide - Quantifying Uncertainty in Analytical Measurement, Second Edition. The expanded uncertainty is U(exp) = u(RM) x k, where k is the coverage factor at the 95% confidence level (k=2). Uncertainty u(RM) is based on the combination of the uncertainties associated with each individual operation involved in the analysis of the product: $u(RM) = \sqrt{u(char)^2 + u(bb)^2 + u(lts)^2 + u(sts)^2}$ ; u(char) is the uncertainty of characterisation; u(bb) uncertainty of homogeneity test; u(lts) uncertainty of stability test long-term; u(sts) uncertainty of stability test short-term. u(lts) and u(sts) are not included in the calculation as the stability statement is based on real evidence opposed to simulation.
Minimum sample: 1 ml is recommended as the minimal sample amount. If less material is used, it is recommended to increase the certified uncertainty by a factor of two for half sample and a factor of four for a quarter of sample.
Intended use: Use this RM as calibrant for chromatography or any other analytical technique.

**Analytical Data**

Traceability of chromatography: To the International System of Units (SI).

| | | | |
|---|---|---|---|
| Intrument: | GC/ECD | Injector: | 320°C |
| Detection: | ECD | Initial Temp: | 120°C for 4 min |
| Column: | Optima-5MS, 0.25 µm, 0.25 mm | End Temp: | 320°C for 16 min |
| Inj.-Vol.: | 0.2 µl | Gradient: | 2°C/min |
| Flow: | 1.0 ml/min | | |

**Comment**
Traceability: The balances used are calibrated with weights traceable to the national standards (DKD).
Calibrated class A glassware is used for volumetric measurements.
Certificate Revision 1

Certified on: 28.02.2017
Certified by: M. Beck

M. Beck

The LGC Labor GmbH, accreditated by DAkkS as indicated by the accreditation number D-RM-19883-01 & D-PL-19883-01, has shown competence based on ISO Guide 34:2009 with relevant parts of DIN EN ISO/IEC 17025:2005 for production of certified reference materials in form of organic pure substances and in form of single and multi-component solutions of organic pure substances.

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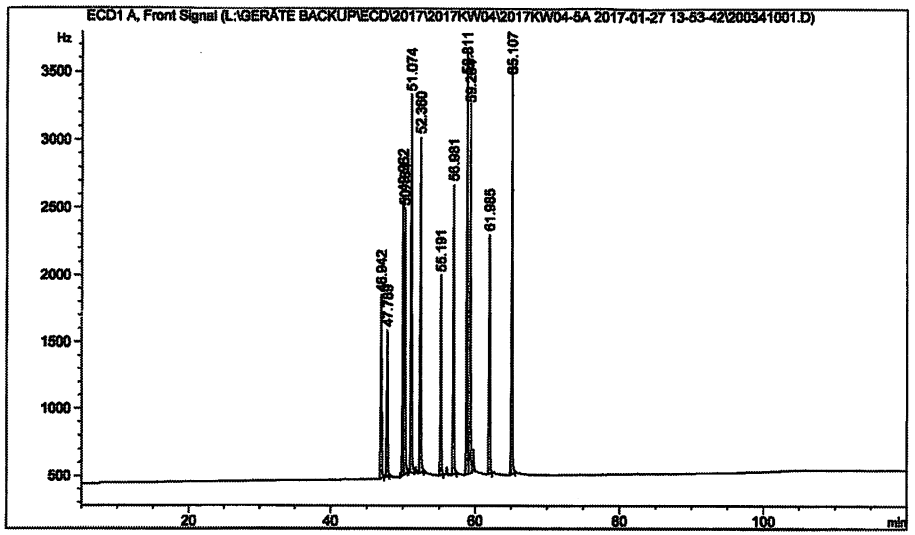
Data File L:\GERÄTE BACKUP\ECD\2017\2017KW04\2017KW04-5A 2017-01-27 13-53-42\200341001.D
Sample Name: G127802IO

Acq. Operator : ECD Seq. Line : 51
Acq. Instrument : GC-ECD-1 Location : Vial 61
Injection Date : 29.01.2017 09:51:22 Inj : 1
Inj Volume : 0.200 µl
Acq. Method : C:\CHEM32\1\DATA\2017KW04\2017KW04-5A 2017-01-27 13-53-42\PAH_L.M
Last changed : 07.11.2016 07:47:20 by ECD
Analysis Method : L:\GERÄTE BACKUP\ECD\NEUE METHODEN\PAH_L.M
Last changed : 16.02.2017 08:17:13
(modified after loading)
Method Info : pah_L

Sample Info : PCB-Mix 41




Area Percent Report

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ECD1 A, Front Signal

| Peak # | RetTime [min] | Type | Width [min] | Area [Hz*s] | Height [Hz] | Area % |
|---|---|---|---|---|---|---|
| 1 | 46.942 | BB | 0.1065 | 1.08111e4 | 1363.77039 | 5.0183 |
| 2 | 47.789 | VB | 0.1159 | 8505.28809 | 1091.43359 | 3.9480 |
| 3 | 49.962 | BV | 0.1133 | 1.63565e4 | 2089.29468 | 7.5923 |
| 4 | 50.184 | VB | 0.1052 | 1.69883e4 | 1977.94287 | 7.8856 |
| 5 | 51.074 | BB | 0.1067 | 2.32598e4 | 2806.63110 | 10.7967 |
| 6 | 52.360 | VB | 0.1245 | 2.08305e4 | 2491.75635 | 9.6690 |



Data File L:\GERÄTE BACKUP\ECD\2017\2017KW04\2017KW04-5A 2017-01-27 13-53-42\200341001.D
Sample Name: G127802IO

| Peak # | RetTime [min] | Type | Width [min] | Area [Hz*s] | Height [Hz] | Area % |
|---|---|---|---|---|---|---|
| 7 | 55.191 | BB | 0.1287 | 1.21076e4 | 1490.82751 | 5.6201 |
| 8 | 56.981 | BB | 0.1286 | 1.78846e4 | 2160.57544 | 8.3016 |
| 9 | 58.811 | BV | 0.1213 | 2.48584e4 | 3106.87158 | 11.5387 |
| 10 | 59.264 | VV | 0.1256 | 2.28265e4 | 2727.84033 | 10.5955 |
| 11 | 61.985 | BB | 0.1314 | 1.48939e4 | 1783.86121 | 6.9134 |
| 12 | 65.107 | BB | 0.1343 | 2.61125e4 | 3038.85083 | 12.1208 |
| Totals : | | | | 2.15435e5 | 2.61297e4 | |

*** End of Report ***