LCSQA

Laboratoire Central de Surveillance de la Qualité de l'Air

Interlaboratory comparison for the analysis of PAH in ambient air (2018) – Preliminary results

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LABORATOIRE NATIONAL DE MÉTROLOGIE ET D'ESSAIS LNE

IMT Lille Douai
École Mines-Télécom
IMT-Université de Lille

"L'expertise au service de la qualité de l'air"

French reference laboratory for air quality monitoring

INTERLABORATORY COMPARISON FOR THE ANALYSIS OF PAH IN AMBIENT AIR (2018) - PRELIMINARY RESULTS

INERIS

June 2018

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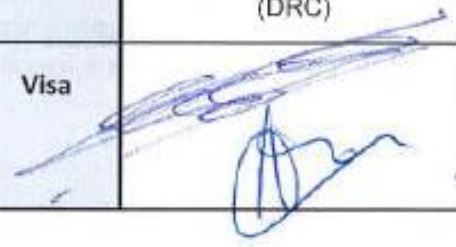
Visa			

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Le Laboratoire Central de Surveillance de la Qualité de l'Air est constitué des laboratoires de l'IMT Lille Douai, de l'INERIS et du LNE. Il mène depuis 1991 des études et des recherches à la demande du Ministère chargé de l'environnement, et en concertation avec les Associations Agréées de Surveillance de la Qualité de l'Air (AASQA). Ces travaux en matière de pollution atmosphérique ont été financés par la Direction Générale de l'Énergie et du Climat (bureau de la qualité de l'air) du Ministère chargé de l'Environnement. Ils sont réalisés avec le souci constant d'améliorer le dispositif de surveillance de la qualité de l'air en France en apportant un appui scientifique et technique au ministère et aux AASQA.

L'objectif principal du LCSQA est de participer à l'amélioration de la qualité des mesures effectuées dans l'air ambiant, depuis le prélèvement des échantillons jusqu'au traitement des données issues des mesures. Cette action est menée dans le cadre des réglementations nationales et européennes mais aussi dans un cadre plus prospectif destiné à fournir aux AASQA de nouveaux outils permettant d'anticiper les évolutions futures.

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1. CAUTION

This document is a synthesis of the results submitted by the participants during the interlaboratory comparison (ILC) for the analysis of polycyclic aromatic hydrocarbons (PAH) in ambient air organized in 2018 by the LCSQA. This report does not contain any comment or discussion on the submitted data (values higher or lower than a factor of 10 from the participant average results were excluded). It can be subject to modification especially in the calculations of the reference values and z-scores. The data is thus temporary. The final results and discussions will be available in the final version of the report and sent to all participants.

2. PARTICIPANTS

17 participants submitted their results. The names of the laboratories are listed below:

Laboratory	Country
ALPA CHIMIES	France
CARSO - LSEHL	France
Conseil Départemental de la Réunion	France
EUROFINS	France
Health Institute Carlos III	Spain
Hygiene Publique En Hainaut Asbl	Belgium
IANESCO Chimie	France
INERIS	France
ITGA - PRYSM	France
LCME	France
LD31	France
LNE	France
Micropolluants Technologie	France
SGS France EHS	France
SynAirGIE	France
TNO-EMSA	Netherlands
Vlaamse Milieumaatschappij (VMM)	Belgium

The instrumentation used by the participants as well as the analytical procedures applied and the results obtained are presented in this report anonymously. A confidential code was assigned to each participant when they registered on-line for their participation to the ILC.

3. DESCRIPTION OF THE TEST MATERIALS

All the test materials sent are presented below. Participants had to use their own routine measurement method for the analysis of the targeted compounds. They had to perform the number of injections specified below.

Matrices	References	Number	Number of measurements
"Natural" aerosol samples (Filter punch, ∅ = 37 mm).	18/172774-F-Blanc 18/172774-F1 18/172774-F2	2 field samples and 1 lab blank filter	4 injections of each sample extract
Certified Reference Material (CRM, solid powder) with certified concentration values.	18/172774-MRC1 18/172774-MRC2	2 (both CRM were the same)	4 injections of one sample extract
Standard solutions (in acetonitrile) with certified concentration values	18/172774-S1 18/172774-S2 18/172774-S3	3 (S1 and S2 solutions were the same)	4 injections of each certified standard solution

Quality control on dispatched materials has been performed during all the ILC period and included the check of the stability of the test materials. Results obtained from the stability experiments showed that **the test materials can be considered as stable for the entire period of the ILC.**

4. PRELIMINARY RESULTS OF THE INTERLABORATORY COMPARISON

In the following sections, the results obtained after statistical analysis are presented for each test material: averages, standard deviations for repeatability and reproducibility and performance of each laboratory (Z-score). This report does not contain any comment or discussion on the submitted data (values higher or lower than a factor of 10 from the participant average results were excluded). It can be subject to modification especially in the calculations of the reference values and z-scores. The data is thus temporary. The final results and discussions will be available in the final version of the report and sent to all participants

The following legend is used:

x^*	Robust average obtained using algorithm A of ISO 13528
X_{CRM}	Certified reference value
x_{pt}	Assigned value to assess the aptitude of the participants equal to x* or x_{CRM}
σ_{pt}	Standard deviation to assess the aptitude of the participant σ_{pt} = s* (robust standard deviation using the algorithm A of ISO 13528)
x	Participant's average
s_r	Participant's repeatability standard deviation
S_L	Interlaboratory standard deviation
S_r	Repeatability standard deviation
S_R	Reproducibility standard deviation
Score z	Performance criteria available for each participant indicating the relative deviation to the assigned value.
NA	Not analysed
1,4	$\lvert Z_i \rvert$ < 2: Satisfactory score
2,3	2 ≤ $\lvert Z_i \rvert$ < 3: Score requiring monitoring or preventive action
3,56	$\lvert Z_i \rvert$ ≥ 3 Unsatisfactory score requiring corrective action (the analytical results are not acceptable)
	Results discarded from the statistical analysis by the expert [values <LQ (limit of quantification) or obvious errors (values higher or larger than 10 times form the participant average results) or equal to 0]

4.1 Lab blank filter F blanc

These results are given for information. No statistical test has been applied and the scores z have not been calculated for this material. Table 1 shows the average values, standard deviations of repeatability for each laboratory for the laboratory blank filter (18/172774_F-Blanc).

Table 1: Average values, standard deviations of the laboratories for the laboratory blank filter (18/172774_F-Blanc).

Id Lab.	Benzo[a]anthracene			Benzo[a]pyrene			Benzo[b]fluoranthene			Benzo[g,h,i]perylene			Benzo[j]fluoranthene		
	x	s_r	s_r	x	s_r	s_r	x	s_r	s_r	x	s_r	s_r	x	s_r	s_r
	(ng/filter)	(ng/filter)	%	(ng/filter)	(ng/filter)	%	(ng/filter)	(ng/filter)	%	(ng/filter)	(ng/filter)	%	(ng/filter)	(ng/filter)	%
180402	<2.500	0.000	0.00%	<5.000	0.000	0.00%	<5.000	0.000	0.00%	<5.000	0.000	0.00%	<5.000	0.000	0.00%
180405	<5.000	0.000	0.00%	<1.000	0.000	0.00%	<5.000	0.000	0.00%	<5.000	0.000	0.00%	NA	NA	NA
180415	<1.000	0.000	0.00%	<1.000	0.000	0.00%	<1.000	0.000	0.00%	<1.000	0.000	0.00%	0.000	0.000	Not calculable
180429	NA	NA	NA	<5.000	0.000	0.00%	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	<12.060	0.000	0.00%	<14.520	0.000	0.00%	NA	NA	NA	<10.830	0.000	0.00%	NA	NA	NA
180437	<2.000	0.000	0.00%	<1.000	0.000	0.00%	<2.000	0.000	0.00%	<2.000	0.000	0.00%	<2.000	0.000	0.00%
180441	<4.000	0.000	0.00%	<8.000	0.000	0.00%	<8.000	0.000	0.00%	<9.000	0.000	0.00%	<8.000	0.000	0.00%
180453	<10.000	0.000	0.00%	<3.000	0.000	0.00%	<10.000	0.000	0.00%	<10.000	0.000	0.00%	<10.000	0.000	0.00%
180458	28.000	56.000	200.00%	28.750	55.518	193.11%	0.000	0.000	Not calculable	0.000	0.000	Not calculable	0.000	0.000	Not calculable
180470	<2.000	0.000	0.00%	<1.000	0.000	0.00%	<5.000	0.000	0.00%	<5.000	0.000	0.00%	97.000	5.715	5.89%
180471	0.148	0.033	22.40%	0.163	0.013	7.74%	0.205	0.075	36.61%	0.900	0.136	15.15%	NA	NA	NA
180476	<25.000	0.000	0.00%	<25.000	0.000	0.00%	<25.000	0.000	0.00%	<25.000	0.000	0.00%	<25.000	0.000	0.00%
180477	<20.000	0.000	0.00%	<20.000	0.000	0.00%	<20.000	0.000	0.00%	<20.000	0.000	0.00%	<20.000	0.000	0.00%
180479	<2.000	0.000	0.00%	<2.000	0.000	0.00%	<2.000	0.000	0.00%	<2.000	0.000	0.00%	NA	NA	NA
180481	<5.000	0.000	0.00%	<5.000	0.000	0.00%	30.000	0.000	0.00%	<10.000	0.000	0.00%	<10.000	0.000	0.00%
180486	<1.000	0.000	0.00%	<1.000	0.000	0.00%	1.000	0.000	0.00%	<1.000	0.000	0.00%	<1.000	0.000	0.00%
180496	0.420	0.000	0.00%	<0.710	0.000	0.00%	0.530	0.000	0.00%	<0.480	0.000	0.00%	NA	NA	NA
	Benzo[k]fluoranthene			**Dibenzo[a,h]anthracene**			**Fluoranthene**			**Indeno[1,2,3-c,d]pyrene**			**Phenanthrene**		
Id Lab.	x	s_r	s_r	x	s_r	s_r	x	s_r	s_r	x	s_r	s_r	x	s_r	s_r
	(ng/filter)	(ng/filter)	%	(ng/filter)	(ng/filter)	%	(ng/filter)	(ng/filter)	%	(ng/filter)	(ng/filter)	%	(ng/filter)	(ng/filter)	%
180402	<5.000	0.000	0.00%	<2.000	0.000	0.00%	<2.500	0.000	0.00%	<5.000	0.000	0.00%	<2.500	0.000	0.00%
180405	<5.000	0.000	0.00%	<5.000	0.000	0.00%	<5.000	0.000	0.00%	<5.000	0.000	0.00%	<5.000	0.000	0.00%
180415	<1.000	0.000	0.00%	<1.000	0.000	0.00%	<1.000	0.000	0.00%	<1.000	0.000	0.00%	<1.000	0.000	0.00%
180429	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	<13.890	0.000	0.00%	<10.620	0.000	0.00%	<22.680	0.000	0.00%	<12.600	0.000	0.00%	<10.680	0.000	0.00%
180437	<2.000	0.000	0.00%	NA	NA	NA	<2.000	0.000	0.00%	<2.000	0.000	0.00%	<2.000	0.000	0.00%
180441	<8.000	0.000	0.00%	<9.000	0.000	0.00%	<4.000	0.000	0.00%	<10.000	0.000	0.00%	<8.000	0.000	0.00%
180453	<10.000	0.000	0.00%	<3.000	0.000	0.00%	<10.000	0.000	0.00%	<10.000	0.000	0.00%	<10.000	0.000	0.00%
180458	0.000	0.000	Not calculable	0.000	0.000	Not calculable	38.750	77.500	200.00%	10.000	20.000	200.00%	81.500	95.378	117.03%
180470	<1.000	0.000	0.00%	<5.000	0.000	0.00%	<15.000	0.000	0.00%	<5.000	0.000	0.00%	<25.000	0.000	0.00%
180471	0.110	0.022	19.64%	<0.030	0.000	0.00%	0.183	0.043	23.83%	<0.130	0.000	0.00%	0.628	0.120	19.14%
180476	<25.000	0.000	0.00%	<25.000	0.000	0.00%	<25.000	0.000	0.00%	<25.000	0.000	0.00%	<25.000	0.000	0.00%
180477	<20.000	0.000	0.00%	<20.000	0.000	0.00%	<20.000	0.000	0.00%	<20.000	0.000	0.00%	<20.000	0.000	0.00%
180479	<2.000	0.000	0.00%	<2.000	0.000	0.00%	2.453	0.458	18.67%	<2.000	0.000	0.00%	3.830	2.474	64.59%
180481	<10.000	0.000	0.00%	<10.000	0.000	0.00%	<10.000	0.000	0.00%	<10.000	0.000	0.00%	<5.000	0.000	0.00%
180486	<1.000	0.000	0.00%	<1.000	0.000	0.00%	<1.000	0.000	0.00%	<1.000	0.000	0.00%	<1.000	0.000	0.00%
180496	<0.650	0.000	0.00%	<0.770	0.000	0.00%	<0.460	0.000	0.00%	<0.220	0.000	0.00%	NA	NA	NA

4.2 Filter field sample F1

Table 2 indicates the values after statistical analysis. Table 3 shows the average values, standard deviations of repeatability, and z scores for each laboratory for the filter field sample 1 (18/172774_F1).

Table 2: Values obtained after statistical analysis for the filter field sample 1 (18/172774_F1).

Parameters	x_{pt} (x^*) *ng/filter*	σ_{pt} absolute *ng/filter*	σ_{pt} relative *%*	S_L *ng/filter*	S_R *ng/filter*	S_r *ng/filter*
B[a]A	333.110	90.567	27.19%	90.481	90.827	7.923
B[a]P	359.513	52.770	14.68%	52.600	53.275	8.454
B[b]F	406.107	136.362	33.58%	129.692	130.006	9.030
B[g,h,i]P	273.282	69.459	25.42%	69.296	69.925	9.356
B[j]F	251.412	113.063	44.97%	104.340	104.441	4.574
B[k]F	167.989	32.808	19.53%	32.777	32.902	2.863
D[a,h]A	38.085	15.224	39.97%	14.460	14.567	1.760
Flt	218.603	63.598	29.09%	63.552	63.738	4.864
Ind	279.325	72.129	25.82%	71.900	72.813	11.494
Phen	101.861	41.635	40.87%	39.284	39.500	4.122

Table 3: Average values, standard deviations of repeatability, and z scores for each laboratory for the filter field sample 1 (18/172774_F1).

	Benzo[a]anthracene				Benzo[a]pyrene				Benzo[b]fluoranthene				Benzo[g,h,i]perylene				Benzo[j]fluoranthene			
Id Lab.	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z
	(ng/filter)	(ng/filter)	%		(ng/filter)	(ng/filter)	%		(ng/filter)	(ng/filter)	%		(ng/filter)	(ng/filter)	%		(ng/filter)	(ng/filter)	%	
180402	202.590	0.622	0.31%	-1.44	216.443	3.260	1.51%	-2.71	248.208	5.994	2.41%	-1.16	140.660	3.588	2.55%	-1.91	145.435	2.453	1.69%	-0.94
180405	299.800	1.551	0.52%	-0.37	308.975	0.974	0.32%	-0.96	304.150	2.452	0.81%	-0.75	203.550	1.863	0.92%	-1.00	NA	NA	NA	NA
180415	310.760	0.938	0.30%	-0.25	354.618	1.530	0.43%	-0.09	358.483	1.445	0.40%	-0.35	301.875	0.518	0.17%	0.41	0.000	0.000	Not calculable	Not calculated
180429	NA	NA	NA	NA	369.925	9.525	2.57%	0.20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	489.390	15.278	3.12%	1.73	422.883	20.122	4.76%	1.20	NA	NA	NA	NA	250.270	36.730	14.68%	-0.33	NA	NA	NA	NA
180437	327.000	2.000	0.61%	-0.07	361.250	1.500	0.42%	0.03	367.750	4.924	1.34%	-0.28	260.250	13.574	5.22%	-0.19	196.750	2.062	1.05%	-0.48
180441	363.610	5.695	1.57%	0.34	427.908	6.576	1.54%	1.30	440.908	1.302	0.30%	0.26	340.880	2.892	0.85%	0.97	273.673	1.953	0.71%	0.20
180453	352.045	1.864	0.53%	0.21	394.725	0.806	0.20%	0.67	474.113	1.638	0.35%	0.50	325.075	1.424	0.44%	0.75	392.105	1.426	0.36%	1.24
180458	1 474.750	378.796	25.69%	12.61	1 391.500	101.877	7.32%	19.56	1 548.325	369.563	23.87%	8.38	821.700	170.978	20.81%	7.90	0.000	0.000	Not calculable	Not calculated
180470	312.250	7.932	2.54%	-0.23	366.250	4.992	1.36%	0.13	368.500	20.793	5.64%	-0.28	312.500	8.347	2.67%	0.56	232.500	14.799	6.37%	-0.17
180471	346.958	5.432	1.57%	0.15	335.870	5.136	1.53%	-0.45	356.863	8.995	2.52%	-0.36	303.360	5.127	1.69%	0.43	NA	NA	NA	NA
180476	457.708	19.142	4.18%	1.38	380.025	2.858	0.75%	0.39	457.188	5.187	1.13%	0.37	313.390	5.844	1.86%	0.58	460.783	5.107	1.11%	1.85
180477	302.353	2.424	0.80%	-0.34	326.473	4.410	1.35%	-0.63	361.153	2.742	0.76%	-0.33	264.685	2.003	0.76%	-0.12	NA	NA	NA	NA
180479	315.455	17.777	5.64%	-0.19	330.103	18.350	5.56%	-0.56	570.713	39.413	6.91%	1.21	267.933	20.308	7.58%	-0.08	NA	NA	NA	NA
180481	174.750	0.957	0.55%	-1.75	196.500	14.059	7.15%	-3.09	240.500	6.028	2.51%	-1.21	204.750	9.639	4.71%	-0.99	239.500	6.658	2.78%	-0.11
180486	324.375	2.597	0.80%	-0.10	375.150	2.007	0.54%	0.30	350.550	11.095	3.17%	-0.41	86.575	3.762	4.34%	-2.69	182.500	3.592	1.97%	-0.61
180496	279.675	2.397	0.86%	-0.59	358.185	1.544	0.43%	-0.03	591.765	2.654	0.45%	1.36	308.335	0.935	0.30%	0.50	192.285	0.665	0.35%	-0.52
	Benzo[k]fluoranthene				Dibenzo[a,h]anthracene				Fluoranthene				Indeno[1,2,3-c,d]pyrene				Phenanthrene			
Id Lab.	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z
	(ng/filter)	(ng/filter)	%		(ng/filter)	(ng/filter)	%		(ng/filter)	(ng/filter)	%		(ng/filter)	(ng/filter)	%		(ng/filter)	(ng/filter)	%	
180402	100.565	1.693	1.68%	-2.06	36.645	1.117	3.05%	-0.09	150.510	2.144	1.42%	-1.07	186.215	4.203	2.26%	-1.29	64.573	0.280	0.43%	-0.90
180405	180.425	1.605	0.89%	0.38	34.650	0.926	2.67%	-0.23	148.550	0.551	0.37%	-1.10	219.050	2.838	1.30%	-0.84	73.450	0.904	1.23%	-0.68
180415	168.973	2.163	1.28%	0.03	42.270	1.177	2.78%	0.27	200.198	1.003	0.50%	-0.29	250.475	0.716	0.29%	-0.40	98.280	0.249	0.25%	-0.09
180429	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	1 017.720	25.604	2.52%	25.90	48.970	5.670	11.58%	0.72	266.460	7.701	2.89%	0.75	305.190	36.064	11.82%	0.36	119.285	5.887	4.94%	0.42
180437	168.750	0.500	0.30%	0.02	NA	NA	NA	NA	172.250	0.957	0.56%	-0.73	280.750	8.461	3.01%	0.02	232.750	7.365	3.16%	3.14
180441	202.888	1.469	0.72%	1.06	43.075	1.059	2.46%	0.33	233.673	1.402	0.60%	0.24	325.188	4.412	1.36%	0.64	95.990	2.887	3.01%	-0.14
180453	165.595	0.302	0.18%	-0.07	19.605	1.618	8.25%	-1.21	200.135	1.274	0.64%	-0.29	329.178	1.306	0.40%	0.69	146.420	0.926	0.63%	1.07
180458	514.865	155.912	30.28%	10.57	1 048.350	1 190.273	113.54%	66.36	972.150	178.029	18.31%	11.85	1 002.400	118.029	11.77%	10.02	2 098.000	188.154	8.97%	47.94
180470	161.500	3.697	2.29%	-0.20	17.700	0.898	5.07%	-1.34	318.250	6.238	1.96%	1.57	290.000	13.089	4.51%	0.15	NA	NA	NA	NA
180471	138.418	1.365	0.99%	-0.90	20.753	0.796	3.84%	-1.14	178.075	2.571	1.44%	-0.64	232.303	6.205	2.67%	-0.65	158.435	4.742	2.99%	1.36
180476	174.720	1.549	0.89%	0.21	48.180	1.993	4.14%	0.66	202.228	3.216	1.59%	-0.26	345.758	8.179	2.37%	0.92	97.743	1.743	1.78%	-0.10
180477	164.380	2.090	1.27%	-0.11	37.560	0.599	1.59%	-0.03	212.943	3.267	1.53%	-0.09	212.180	2.145	1.01%	-0.93	94.338	1.317	1.40%	-0.18
180479	147.540	6.174	4.18%	-0.62	52.590	2.509	4.77%	0.95	199.535	14.297	7.16%	-0.30	226.210	15.724	6.95%	-0.74	80.993	7.317	9.03%	-0.50
180481	87.725	0.785	0.89%	-2.45	24.025	0.403	1.68%	-0.92	333.500	3.512	1.05%	1.81	210.000	5.944	2.83%	-0.96	55.250	0.370	0.67%	-1.12
180486	165.300	1.894	1.15%	-0.08	46.425	1.500	3.23%	0.55	224.000	5.746	2.57%	0.08	617.450	19.626	3.18%	4.69	78.575	4.410	5.61%	-0.56
180496	177.380	1.827	1.03%	0.29	39.008	0.389	1.00%	0.06	167.095	2.210	1.32%	-0.81	281.670	1.102	0.39%	0.03	NA	NA	NA	NA

4.3 Filter field sample F2

Table 4 indicates the values after statistical analysis. Table 5 shows the average values, standard deviations of repeatability, and z scores for each laboratory for the filter field sample 2 (18/172774_F2).

Table 4: Values obtained after statistical analysis for the filter field sample 2 (18/172774_F2).

Parameters	x_{pt} (x^*) *ng/filter*	σ_{pt} absolute *ng/filter*	σ_{pt} relative *%*	S_L *ng/filter*	S_R *ng/filter*	S_r *ng/filter*
B[a]A	184.731	55.711	30.16%	55.620	55.985	6.383
B[a]P	268.781	59.506	22.14%	59.424	59.750	6.233
B[b]F	312.075	97.741	31.32%	92.922	93.294	8.322
B[g,h,i]P	221.114	59.937	27.11%	59.869	60.132	5.613
B[j]F	212.106	96.702	45.59%	89.252	89.295	2.771
B[k]F	133.990	36.640	27.35%	36.583	36.811	4.090
D[a,h]A	31.364	10.669	34.02%	10.098	10.182	1.304
Flt	135.341	38.256	28.27%	38.192	38.448	4.425
Ind	235.803	68.860	29.20%	68.752	69.169	7.586
Phen	65.488	24.911	38.04%	23.575	23.782	3.129

Table 5: Average values, standard deviations of repeatability, and z scores for each laboratory for the filter field sample 2 (18/172774_F2).

Id Lab.	Benzo[a]anthracene				Benzo[a]pyrene				Benzo[b]fluoranthene				Benzo[g,h,i]perylene				Benzo[j]fluoranthene			
	x (ng/filter)	s_r (ng/filter)	s_r %	score z	x (ng/filter)	s_r (ng/filter)	s_r %	score z	x (ng/filter)	s_r (ng/filter)	s_r %	score z	x (ng/filter)	s_r (ng/filter)	s_r %	score z	x (ng/filter)	s_r (ng/filter)	s_r %	score z
180402	202.590	0.622	0.31%	-1.44	216.443	3.260	1.51%	-2.71	248.208	5.994	2.41%	-1.16	140.660	3.588	2.55%	-1.91	145.435	2.453	1.69%	-0.94
180405	299.800	1.551	0.52%	-0.37	308.975	0.974	0.32%	-0.96	304.150	2.452	0.81%	-0.75	203.550	1.863	0.92%	-1.00	NA	NA	NA	NA
180415	310.760	0.938	0.30%	-0.25	354.618	1.530	0.43%	-0.09	358.483	1.445	0.40%	-0.35	301.875	0.518	0.17%	0.41	0.000	0.000	Not calculable	Not calculated
180429	NA	NA	NA	NA	369.925	9.525	2.57%	0.20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	489.390	15.278	3.12%	1.73	422.883	20.122	4.76%	1.20	NA	NA	NA	NA	250.270	36.730	14.68%	-0.33	NA	NA	NA	NA
180437	327.000	2.000	0.61%	-0.07	361.250	1.500	0.42%	0.03	367.750	4.924	1.34%	-0.28	260.250	13.574	5.22%	-0.19	196.750	2.062	1.05%	-0.48
180441	363.610	5.695	1.57%	0.34	427.908	6.576	1.54%	1.30	440.908	1.302	0.30%	0.26	340.880	2.892	0.85%	0.97	273.673	1.953	0.71%	0.20
180453	352.045	1.864	0.53%	0.21	394.725	0.806	0.20%	0.67	474.113	1.638	0.35%	0.50	325.075	1.424	0.44%	0.75	392.105	1.426	0.36%	1.24
180458	1 474.750	378.796	25.69%	12.61	1 391.500	101.877	7.32%	19.56	1 548.325	369.563	23.87%	8.38	821.700	170.978	20.81%	7.90	0.000	0.000	Not calculable	Not calculated
180470	312.250	7.932	2.54%	-0.23	366.250	4.992	1.36%	0.13	368.500	20.793	5.64%	-0.28	312.500	8.347	2.67%	0.56	232.500	14.799	6.37%	-0.17
180471	346.958	5.432	1.57%	0.15	335.870	5.136	1.53%	-0.45	356.863	8.995	2.52%	-0.36	303.360	5.127	1.69%	0.43	NA	NA	NA	NA
180476	457.708	19.142	4.18%	1.38	380.025	2.858	0.75%	0.39	457.188	5.187	1.13%	0.37	313.390	5.844	1.86%	0.58	460.783	5.107	1.11%	1.85
180477	302.353	2.424	0.80%	-0.34	326.473	4.410	1.35%	-0.63	361.153	2.742	0.76%	-0.33	264.685	2.003	0.76%	-0.12	NA	NA	NA	NA
180479	315.455	17.777	5.64%	-0.19	330.103	18.350	5.56%	-0.56	570.713	39.413	6.91%	1.21	267.933	20.308	7.58%	-0.08	NA	NA	NA	NA
180481	174.750	0.957	0.55%	-1.75	196.500	14.059	7.15%	-3.09	240.500	6.028	2.51%	-1.21	204.750	9.639	4.71%	-0.99	239.500	6.658	2.78%	-0.11
180486	324.375	2.597	0.80%	-0.10	375.150	2.007	0.54%	0.30	350.550	11.095	3.17%	-0.41	86.575	3.762	4.34%	-2.69	182.500	3.592	1.97%	-0.61
180496	279.675	2.397	0.86%	-0.59	358.185	1.544	0.43%	-0.03	591.765	2.654	0.45%	1.36	308.335	0.935	0.30%	0.50	192.285	0.665	0.35%	-0.52

Id Lab.	Benzo[k]fluoranthene				Dibenzo[a,h]anthracene				Fluoranthene				Indeno[1,2,3-c,d]pyrene				Phenanthrene			
	x (ng/filter)	s_r (ng/filter)	s_r %	score z	x (ng/filter)	s_r (ng/filter)	s_r %	score z	x (ng/filter)	s_r (ng/filter)	s_r %	score z	x (ng/filter)	s_r (ng/filter)	s_r %	score z	x (ng/filter)	s_r (ng/filter)	s_r %	score z
180402	100.565	1.693	1.68%	-2.06	36.645	1.117	3.05%	-0.09	150.510	2.144	1.42%	-1.07	186.215	4.203	2.26%	-1.29	64.573	0.280	0.43%	-0.90
180405	180.425	1.605	0.89%	0.38	34.650	0.926	2.67%	-0.23	148.550	0.551	0.37%	-1.10	219.050	2.838	1.30%	-0.84	73.450	0.904	1.23%	-0.68
180415	168.973	2.163	1.28%	0.03	42.270	1.177	2.78%	0.27	200.198	1.003	0.50%	-0.29	250.475	0.716	0.29%	-0.40	98.280	0.249	0.25%	-0.09
180429	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	1 017.720	25.604	2.52%	25.90	48.970	5.670	11.58%	0.72	266.460	7.701	2.89%	0.75	305.190	36.064	11.82%	0.36	119.285	5.887	4.94%	0.42
180437	168.750	0.500	0.30%	0.02	NA	NA	NA	NA	172.250	0.957	0.56%	-0.73	280.750	8.461	3.01%	0.02	232.750	7.365	3.16%	3.14
180441	202.888	1.469	0.72%	1.06	43.075	1.059	2.46%	0.33	233.673	1.402	0.60%	0.24	325.188	4.412	1.36%	0.64	95.990	2.887	3.01%	-0.14
180453	165.595	0.302	0.18%	-0.07	19.605	1.618	8.25%	-1.21	200.135	1.274	0.64%	-0.29	329.178	1.306	0.40%	0.69	146.420	0.926	0.63%	1.07
180458	514.865	155.912	30.28%	10.57	1 048.350	1 190.273	113.54%	66.36	972.150	178.029	18.31%	11.85	1 002.400	118.029	11.77%	10.02	2 098.000	188.154	8.97%	47.94
180470	161.500	3.697	2.29%	-0.20	17.700	0.898	5.07%	-1.34	318.250	6.238	1.96%	1.57	290.000	13.089	4.51%	0.15	NA	NA	NA	NA
180471	138.418	1.365	0.99%	-0.90	20.753	0.796	3.84%	-1.14	178.075	2.571	1.44%	-0.64	232.303	6.205	2.67%	-0.65	158.435	4.742	2.99%	1.36
180476	174.720	1.549	0.89%	0.21	48.180	1.993	4.14%	0.66	202.228	3.216	1.59%	-0.26	345.758	8.179	2.37%	0.92	97.743	1.743	1.78%	-0.10
180477	164.380	2.090	1.27%	-0.11	37.560	0.599	1.59%	-0.03	212.943	3.267	1.53%	-0.09	212.180	2.145	1.01%	-0.93	94.338	1.317	1.40%	-0.18
180479	147.540	6.174	4.18%	-0.62	52.590	2.509	4.77%	0.95	199.535	14.297	7.16%	-0.30	226.210	15.724	6.95%	-0.74	80.993	7.317	9.03%	-0.50
180481	87.725	0.785	0.89%	-2.45	24.025	0.403	1.68%	-0.92	333.500	3.512	1.05%	1.81	210.000	5.944	2.83%	-0.96	55.250	0.370	0.67%	-1.12
180486	165.300	1.894	1.15%	-0.08	46.425	1.500	3.23%	0.55	224.000	5.746	2.57%	0.08	617.450	19.626	3.18%	4.69	78.575	4.410	5.61%	-0.56
180496	177.380	1.827	1.03%	0.29	39.008	0.389	1.00%	0.06	167.095	2.210	1.32%	-0.81	281.670	1.102	0.39%	0.03	NA	NA	NA	NA

4.4 Certified reference material MRC1

Table 6 indicates the values after statistical analysis. Table 7 shows the average values, standard deviations of repeatability, and z scores for each laboratory for the certified reference material 1 (18/172774_MRC1).

Table 6: Values obtained after statistical analysis for the certified reference material 1 (18/172774_MRC1).

Parameters	x_{pt} (x_{mrc}) *µg/g*	σ_{pt} absolute *µg/g*	σ_{pt} relative *%*	S_L *µg/g*	S_R *µg/g*	S_r *µg/g*
B[a]A	0.91	0.284	31.17%	0.283	0.284	0.024
B[a]P	0.72	0.182	25.28%	0.181	0.184	0.030
B[b]F	1.42	0.437	30.78%	0.436	0.441	0.064
B[g,h,i]P	1.76	0.496	28.16%	0.470	0.471	0.030
B[j]F	0.75	0.307	40.93%	0.307	0.308	0.027
B[k]F	0.67	0.095	14.19%	0.095	0.097	0.021
D[a,h]A	0.18	0.115	64.16%	0.101	0.101	0.006
Flt	4.67	0.745	15.95%	0.706	0.708	0.062
Ind	1.07	0.291	27.21%	0.291	0.292	0.032
Phen	2.23	0.509	22.82%	0.480	0.483	0.052

Table 7: Average values, standard deviations of repeatability, and z scores for each laboratory for the certified reference material 1 (18/172774_MRC1).

Id Lab.	Benzo[a]anthracene				Benzo[a]pyrene				Benzo[b]fluoranthene				Benzo[g,h,i]perylene				Benzo[j]fluoranthene			
	x (µg/g)	s_r (µg/g)	s_r %	score z		s_r (µg/g)	s_r %	score z	x (µg/g)	s_r (µg/g)	s_r %	score z	x (µg/g)	s_r (µg/g)	s_r %	score z	x (µg/g)	s_r (µg/g)	s_r %	score z
180402	0.563	0.005	0.89%	-1.23	0.430	0.000	0.00%	-1.59	1.018	0.010	0.94%	-0.92	0.885	0.017	1.96%	-1.77	0.410	0.008	1.99%	-1.11
180405	1.140	0.000	0.00%	0.81	0.818	0.005	0.61%	0.54	1.828	0.019	1.04%	0.93	1.500	0.018	1.22%	-0.52	NA	NA	NA	NA
180415	0.813	0.010	1.18%	-0.34	0.663	0.029	4.34%	-0.32	1.455	0.006	0.40%	0.08	1.728	0.019	1.10%	-0.07	0.000	0.000	Not calculable	Not calculated
180429	NA	NA	NA	NA	1.028	0.060	5.81%	1.69	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	0.360	0.012	3.21%	-1.94	0.150	0.008	5.44%	-3.13	NA	NA	NA	NA	0.150	0.000	0.00%	-3.25	NA	NA	NA	NA
180437	0.890	0.012	1.30%	-0.07	0.625	0.019	3.06%	-0.52	1.405	0.010	0.71%	-0.03	1.375	0.038	2.75%	-0.78	0.630	0.058	9.26%	-0.39
180441	1.035	0.006	0.56%	0.44	0.818	0.005	0.61%	0.54	1.738	0.013	0.72%	0.73	1.843	0.005	0.27%	0.17	0.835	0.019	2.29%	0.28
180453	1.185	0.031	2.62%	0.97	0.873	0.010	1.10%	0.84	2.163	0.015	0.69%	1.70	2.125	0.035	1.65%	0.74	1.000	0.008	0.82%	0.81
180458	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180470	0.990	0.024	2.47%	0.28	0.600	0.037	6.24%	-0.66	1.343	0.124	9.23%	-0.18	1.718	0.040	2.35%	-0.09	0.668	0.042	6.28%	-0.27
180471	1.213	0.147	12.09%	1.07	0.548	0.036	6.56%	-0.95	1.628	0.172	10.55%	0.47	1.545	0.079	5.08%	-0.43	NA	NA	NA	NA
180476	1.755	0.051	2.89%	2.98	0.828	0.047	5.70%	0.59	1.790	0.066	3.68%	0.85	1.628	0.022	1.36%	-0.27	1.670	0.022	1.29%	3.00
180477	0.715	0.013	1.81%	-0.69	0.553	0.005	0.90%	-0.92	1.293	0.010	0.74%	-0.29	1.338	0.010	0.72%	-0.85	NA	NA	NA	NA
180479	0.960	0.154	16.00%	0.18	0.733	0.055	7.51%	0.07	2.363	0.099	4.20%	2.16	1.855	0.042	2.27%	0.19	NA	NA	NA	NA
180481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180486	0.740	0.008	1.10%	-0.60	0.598	0.017	2.86%	-0.67	1.138	0.079	6.94%	-0.65	0.345	0.019	5.55%	-2.85	0.413	0.010	2.32%	-1.10
180496	0.813	0.010	1.18%	-0.34	0.688	0.005	0.73%	-0.18	1.970	0.027	1.37%	1.26	1.553	0.017	1.10%	-0.42	0.658	0.005	0.76%	-0.30

Id Lab.	Benzo[k]fluoranthene				Dibenzo[a,h]anthracene				Fluoranthene				Indeno[1,2,3-c,d]pyrene				Phenanthrene			
	x (µg/g)	s_r (µg/g)	s_r %	score z	x (µg/g)	s_r (µg/g)	s_r %	score z	x (µg/g)	s_r (µg/g)	s_r %	score z	x (µg/g)	s_r (µg/g)	s_r %	score z	x (µg/g)	s_r (µg/g)	s_r %	score z
180402	0.403	0.005	1.24%	-2.81	0.185	0.006	3.12%	0.05	3.373	0.033	0.98%	-1.74	0.783	0.010	1.22%	-0.99	1.295	0.017	1.34%	-1.84
180405	0.763	0.010	1.26%	0.97	0.270	0.000	0.00%	0.89	3.950	0.008	0.21%	-0.97	1.265	0.006	0.46%	0.67	1.820	0.008	0.45%	-0.81
180415	0.718	0.088	12.33%	0.50	0.208	0.010	4.61%	0.27	4.340	0.014	0.33%	-0.44	1.003	0.039	3.94%	-0.23	1.960	0.014	0.72%	-0.53
180429	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	0.625	0.054	8.71%	-0.47	0.020	0.000	0.00%	-1.58	1.160	0.018	1.57%	-4.71	0.133	0.005	3.77%	-3.22	0.473	0.049	10.28%	-3.45
180437	0.603	0.005	0.83%	-0.71	NA	NA	NA	NA	4.100	0.045	1.11%	-0.77	0.890	0.024	2.75%	-0.62	1.915	0.019	1.00%	-0.62
180441	0.750	0.028	3.77%	0.84	0.175	0.006	3.30%	-0.05	5.083	0.080	1.57%	0.55	1.208	0.022	1.84%	0.47	2.355	0.006	0.25%	0.25
180453	0.755	0.006	0.76%	0.89	0.185	0.006	3.12%	0.05	5.138	0.024	0.46%	0.63	1.385	0.031	2.24%	1.08	2.648	0.010	0.36%	0.82
180458	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180470	0.630	0.026	4.10%	-0.42	<0.200	0.000	0.00%	Not calculated	4.670	0.078	1.67%	0.00	1.185	0.061	5.18%	0.39	2.430	0.307	12.65%	0.39
180471	0.540	0.020	3.70%	-1.37	0.033	0.005	15.38%	-1.46	4.105	0.190	4.63%	-0.76	0.778	0.021	2.65%	-1.00	2.248	0.127	5.67%	0.03
180476	0.645	0.006	0.90%	-0.26	<0.500	0.000	0.00%	Not calculated	4.540	0.071	1.56%	-0.17	1.293	0.019	1.46%	0.76	2.163	0.067	3.08%	-0.13
180477	0.610	0.000	0.00%	-0.63	0.270	0.000	0.00%	0.89	4.325	0.030	0.69%	-0.46	0.740	0.008	1.10%	-1.13	1.770	0.008	0.46%	-0.90
180479	0.700	0.022	3.09%	0.32	0.310	0.014	4.56%	1.28	4.805	0.311	6.48%	0.18	1.018	0.056	5.46%	-0.18	1.853	0.186	10.03%	-0.74
180481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180486	0.540	0.012	2.14%	-1.37	0.158	0.005	3.17%	-0.22	3.300	0.036	1.08%	-1.84	1.400	0.042	3.03%	1.13	1.598	0.017	1.07%	-1.24
180496	0.663	0.015	2.26%	-0.08	0.155	0.006	3.72%	-0.25	4.420	0.014	0.32%	-0.34	0.988	0.017	1.73%	-0.28	NA	NA	NA	NA

4.5 Certified reference material MRC2

Table 8 indicates the values after statistical analysis. Table 9 shows the average values, standard deviations of repeatability, and z scores for each laboratory for the certified reference material 2 (18/172774_MR2).

Table 8: Values obtained after statistical analysis for the certified reference material 2 (18/172774_MRC2).

Parameters	x_{pt} (x_{mrc}) *µg/g*	σ_{pt} absolute *µg/g*	σ_{pt} relative *%*	S_L *µg/g*	S_R *µg/g*	S_r *µg/g*
B[a]A	0.91	0.308	33.85%	0.308	0.309	0.021
B[a]P	0.72	0.145	20.13%	0.145	0.146	0.017
B[b]F	1.42	0.399	28.13%	0.398	0.404	0.068
B[g,h,i]P	1.76	0.514	29.18%	0.487	0.488	0.033
B[j]F	0.75	0.305	40.73%	0.305	0.307	0.036
B[k]F	0.67	0.067	10.05%	0.066	0.070	0.022
D[a,h]A	0.18	0.088	49.06%	0.088	0.088	0.006
Flt	4.67	0.728	15.59%	0.689	0.694	0.076
Ind	1.07	0.227	21.21%	0.226	0.228	0.027
Phen	2.23	0.643	28.83%	0.607	0.608	0.035

Table 9: Average values, standard deviations of repeatability, and z scores for each laboratory for the certified reference material 2 (18/172774_MRC2).

	Benzo[a]anthracene				Benzo[a]pyrene				Benzo[b]fluoranthene				Benzo[g,h,i]perylene				Benzo[j]fluoranthene			
Id Lab.	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z
	(µg/g)	(µg/g)	%		(µg/g)	(µg/g)	%		(µg/g)	(µg/g)	%		(µg/g)	(µg/g)	%		(µg/g)	(µg/g)	%	
180402	0.580	0.000	0.00%	-1.07	0.450	0.000	0.00%	-1.86	1.048	0.010	0.91%	-0.93	0.878	0.005	0.57%	-1.72	0.418	0.005	1.20%	-1.09
180405	1.058	0.005	0.47%	0.48	0.743	0.010	1.29%	0.16	1.388	0.010	0.69%	-0.08	1.265	0.006	0.46%	-0.96	NA	NA	NA	NA
180415	0.775	0.010	1.29%	-0.44	0.648	0.017	2.64%	-0.50	1.470	0.014	0.96%	0.13	1.698	0.021	1.21%	-0.12	0.000	0.000	Not calculable	Not calculated
180429	NA	NA	NA	NA	0.890	0.076	8.56%	1.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	0.340	0.008	2.40%	-1.85	0.153	0.005	3.28%	-3.92	NA	NA	NA	NA	0.130	0.000	0.00%	-3.17	NA	NA	NA	NA
180437	0.970	0.000	0.00%	0.19	0.680	0.012	1.70%	-0.28	1.535	0.010	0.65%	0.29	1.545	0.089	5.75%	-0.42	0.710	0.037	5.14%	-0.13
180441	1.100	0.012	1.05%	0.62	0.863	0.005	0.58%	0.98	1.840	0.012	0.63%	1.05	1.995	0.006	0.29%	0.46	0.873	0.021	2.36%	0.40
180453	1.070	0.018	1.71%	0.52	0.820	0.008	1.00%	0.69	1.965	0.006	0.29%	1.36	1.890	0.037	1.98%	0.25	0.968	0.005	0.52%	0.71
180458	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180470	1.070	0.029	2.75%	0.52	0.695	0.039	5.57%	-0.17	1.533	0.084	5.47%	0.28	1.848	0.030	1.62%	0.17	0.705	0.081	11.44%	-0.15
180471	1.903	0.088	4.61%	3.22	0.725	0.019	2.64%	0.03	1.998	0.159	7.94%	1.45	1.770	0.056	3.16%	0.02	NA	NA	NA	NA
180476	1.803	0.037	2.04%	2.90	0.855	0.013	1.51%	0.93	1.765	0.097	5.52%	0.86	1.715	0.025	1.47%	-0.09	1.713	0.051	2.95%	3.15
180477	0.725	0.006	0.80%	-0.60	0.563	0.010	1.70%	-1.09	1.303	0.005	0.38%	-0.29	1.343	0.017	1.27%	-0.81	NA	NA	NA	NA
180479	0.945	0.144	15.22%	0.11	0.738	0.042	5.69%	0.12	2.395	0.182	7.61%	2.44	1.918	0.046	2.42%	0.31	NA	NA	NA	NA
180481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180486	0.770	0.014	1.84%	-0.45	0.618	0.005	0.81%	-0.71	1.255	0.090	7.14%	-0.41	0.340	0.032	9.30%	-2.76	0.400	0.029	7.36%	-1.15
180496	0.820	0.008	1.00%	-0.29	0.688	0.005	0.73%	-0.22	1.978	0.013	0.64%	1.40	1.558	0.013	0.81%	-0.39	0.660	0.000	0.00%	-0.29
	Benzo[k]fluoranthene				Dibenzo[a,h]anthracene				Fluoranthene				Indeno[1,2,3-c,d]pyrene				Phenanthrene			
Id Lab.	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z
	(µg/g)	(µg/g)	%		(µg/g)	(µg/g)	%		(µg/g)	(µg/g)	%		(µg/g)	(µg/g)	%		(µg/g)	(µg/g)	%	
180402	0.415	0.006	1.39%	-3.79	0.185	0.006	3.12%	0.06	3.965	0.035	0.89%	-0.97	0.793	0.010	1.21%	-1.22	1.400	0.036	2.54%	-1.29
180405	0.628	0.015	2.39%	-0.63	0.185	0.006	3.12%	0.06	3.925	0.010	0.25%	-1.02	0.993	0.015	1.51%	-0.34	1.805	0.006	0.32%	-0.66
180415	0.665	0.048	7.21%	-0.07	0.198	0.017	8.65%	0.20	4.405	0.010	0.23%	-0.36	0.978	0.017	1.75%	-0.41	1.998	0.005	0.25%	-0.36
180429	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	0.618	0.022	3.59%	-0.78	0.020	0.000	0.00%	-1.81	1.118	0.010	0.86%	-4.88	0.110	0.000	0.00%	-4.23	0.448	0.015	3.35%	-2.77
180437	0.655	0.010	1.53%	-0.22	NA	NA	NA	NA	4.398	0.100	2.28%	-0.37	1.035	0.010	0.97%	-0.15	2.000	0.037	1.83%	-0.36
180441	0.798	0.032	4.01%	1.89	0.180	0.000	0.00%	0.00	5.425	0.021	0.38%	1.04	1.333	0.026	1.97%	1.16	2.590	0.008	0.32%	0.56
180453	0.700	0.000	0.00%	0.45	0.183	0.005	2.74%	0.03	4.723	0.015	0.32%	0.07	1.253	0.013	1.00%	0.80	2.425	0.006	0.24%	0.30
180458	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180470	0.678	0.021	3.04%	0.11	<0.200	0.000	0.00%	Not calculated	4.735	0.104	2.20%	0.09	1.180	0.054	4.54%	0.48	2.828	0.175	6.18%	0.93
180471	0.730	0.038	5.25%	0.89	0.050	0.000	0.00%	-1.47	6.133	0.264	4.30%	2.01	0.965	0.024	2.47%	-0.46	3.688	0.173	4.69%	2.27
180476	0.678	0.010	1.41%	0.11	<0.500	0.000	0.00%	Not calculated	4.778	0.102	2.14%	0.15	1.323	0.029	2.17%	1.11	2.075	0.010	0.48%	-0.24
180477	0.605	0.013	2.13%	-0.97	0.270	0.000	0.00%	1.02	4.278	0.046	1.07%	-0.54	0.740	0.008	1.10%	-1.45	1.775	0.013	0.73%	-0.71
180479	0.705	0.017	2.46%	0.52	0.328	0.017	5.21%	1.67	4.575	0.813	17.76%	-0.13	1.078	0.043	4.04%	0.03	2.140	0.203	9.48%	-0.14
180481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180486	0.530	0.008	1.54%	-2.08	0.168	0.005	2.99%	-0.14	3.498	0.024	0.68%	-1.61	1.060	0.148	13.93%	-0.04	1.630	0.018	1.12%	-0.93
180496	0.668	0.010	1.43%	-0.04	0.153	0.005	3.28%	-0.31	4.433	0.017	0.39%	-0.33	0.980	0.000	0.00%	-0.40	NA	NA	NA	NA

4.6 Certified standard solution S1

Table 10 indicates the values after statistical analysis. Table 11 shows the average values, standard deviations of repeatability, and z scores for each laboratory for the certified standard solution 1 (18/172774_S1).

Table 10: Values obtained after statistical analysis for the certified standard solution 1 (18/172774_S1).

Parameters	x_{pt} (x_{mrc}) *µg/L*	σ_{pt} absolute *µg/L*	σ_{pt} relative *%*	S_L *µg/L*	S_R *µg/L*	S_r *µg/L*
B[a]A	290.75	41.885	14.41%	41.837	42.027	3.989
B[a]P	399.39	61.486	15.39%	61.346	61.905	8.300
B[b]F	551.94	97.481	17.66%	97.412	97.690	7.364
B[g,h,i]P	399.25	87.581	21.94%	87.500	87.820	7.498
B[j]F	266.55	137.691	51.66%	137.678	137.731	3.825
B[k]F	281.43	73.067	25.96%	72.989	73.301	6.755
D[a,h]A	89.28	22.237	24.91%	22.221	22.285	1.679
Flt	769.37	59.867	7.78%	59.696	60.379	9.057
Ind	722.46	132.209	18.30%	132.016	132.788	14.303
Phen	1517.12	208.920	13.77%	208.476	210.246	27.225

Table 11: Average values, standard deviations of repeatability, and z scores for each laboratory for the certified standard solution 1 (18/172774_S1).

Id Lab.	Benzo[a]anthracene				Benzo[a]pyrene				Benzo[b]fluoranthene				Benzo[g,h,i]perylene				Benzo[j]fluoranthene			
	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z
	(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%	
180402	319.400	2.811	0.88%	0.68	429.475	11.916	2.77%	0.49	635.075	2.207	0.35%	0.85	712.550	12.920	1.81%	3.58	394.225	3.884	0.99%	0.93
180405	259.600	1.339	0.52%	-0.74	332.175	2.869	0.86%	-1.09	432.425	9.344	2.16%	-1.23	355.675	1.891	0.53%	-0.50	NA	NA	NA	NA
180415	295.750	0.957	0.32%	0.12	458.000	3.367	0.74%	0.95	621.500	5.972	0.96%	0.71	408.000	0.816	0.20%	0.10	0.000	0.000	Not calculable	Not calculated
180429	NA	NA	NA	NA	302.550	9.680	3.20%	-1.57	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	307.918	25.314	8.22%	0.41	345.543	11.603	3.36%	-0.88	NA	NA	NA	NA	202.025	5.473	2.71%	-2.25	NA	NA	NA	NA
180437	292.750	0.500	0.17%	0.05	399.500	1.000	0.25%	0.00	545.000	5.774	1.06%	-0.07	395.250	0.500	0.13%	-0.05	288.500	3.416	1.18%	0.16
180441	317.575	0.967	0.30%	0.64	415.548	1.282	0.31%	0.26	560.905	5.184	0.92%	0.09	398.748	1.000	0.25%	-0.01	288.935	5.791	2.00%	0.16
180453	279.790	0.615	0.22%	-0.26	379.520	1.307	0.34%	-0.32	547.775	1.733	0.32%	-0.04	432.188	1.114	0.26%	0.38	269.520	0.813	0.30%	0.02
180458	262.500	8.869	3.38%	-0.67	1 941.180	979.064	50.44%	25.08	4 197.800	738.878	17.60%	37.40	2 820.640	4 251.552	150.73%	27.65	0.000	0.000	Not calculable	Not calculated
180470	284.693	5.053	1.77%	-0.14	406.928	3.509	0.86%	0.12	545.540	6.093	1.12%	-0.07	439.278	7.898	1.80%	0.46	274.563	7.350	2.68%	0.06
180471	175.390	3.660	2.09%	-2.75	376.625	17.166	4.56%	-0.37	517.530	8.959	1.73%	-0.35	415.228	24.507	5.90%	0.18	NA	NA	NA	NA
180476	<5.000	0.000	0.00%	Not calculated	402.273	1.729	0.43%	0.05	566.093	0.894	0.16%	0.15	405.885	5.303	1.31%	0.08	564.150	1.214	0.22%	2.16
180477	267.238	1.788	0.67%	-0.56	363.358	2.440	0.67%	-0.59	524.000	2.572	0.49%	-0.29	386.080	2.066	0.54%	-0.15	NA	NA	NA	NA
180479	327.178	22.824	6.98%	0.87	431.300	12.594	2.92%	0.52	893.628	17.231	1.93%	3.51	449.118	14.546	3.24%	0.57	NA	NA	NA	NA
180481	223.500	2.380	1.07%	-1.61	301.000	4.082	1.36%	-1.60	431.250	4.924	1.14%	-1.24	286.250	1.708	0.60%	-1.29	462.500	2.082	0.45%	1.42
180486	282.275	1.841	0.65%	-0.20	375.600	1.663	0.44%	-0.39	524.575	2.249	0.43%	-0.28	388.800	1.954	0.50%	-0.12	201.575	1.352	0.67%	-0.47
180496	154.223	2.420	1.57%	-3.26	200.135	2.635	1.32%	-3.24	419.575	6.105	1.46%	-1.36	219.600	0.901	0.41%	-2.05	145.573	1.115	0.77%	-0.88

Id Lab.	Benzo[k]fluoranthene				Dibenzo[a,h]anthracene				Fluoranthene				Indeno[1,2,3-c,d]pyrene				Phenanthrene			
	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z
	(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%	
180402	436.025	12.003	2.75%	2.12	116.125	0.873	0.75%	1.21	752.875	3.974	0.53%	-0.28	1 306.425	18.841	1.44%	4.42	1 780.900	24.905	1.40%	1.26
180405	343.275	6.997	2.04%	0.85	71.375	0.685	0.96%	-0.81	632.600	1.030	0.16%	-2.28	619.550	4.814	0.78%	-0.78	1 102.825	20.245	1.84%	-1.98
180415	267.250	1.500	0.56%	-0.19	109.500	0.577	0.53%	0.91	789.750	1.500	0.19%	0.34	663.750	3.862	0.58%	-0.44	1 547.250	3.304	0.21%	0.14
180429	NA	NA	NA	NA	NA	NA	NA	(Non analysé	NA	NA	NA	(Non analysé	NA	NA	NA	NA	NA	NA	NA	NA
180430	565.988	7.415	1.31%	3.89	53.290	2.892	5.43%	-1.62	768.500	13.330	1.73%	-0.01	423.170	15.616	3.69%	-2.26	1 014.505	38.771	3.82%	-2.41
180437	283.000	0.816	0.29%	0.02	99.250	0.957	0.96%	0.45	745.000	5.774	0.77%	-0.41	702.500	9.574	1.36%	-0.15	1 532.500	5.000	0.33%	0.07
180441	286.360	9.706	3.39%	0.07	92.105	1.404	1.52%	0.13	773.435	9.178	1.19%	0.07	723.490	9.339	1.29%	0.01	1 529.563	3.927	0.26%	0.06
180453	279.090	0.525	0.19%	-0.03	89.180	0.218	0.24%	0.00	731.558	2.253	0.31%	-0.63	720.700	2.223	0.31%	-0.01	1 537.510	1.112	0.07%	0.10
180458	1 607.950	275.015	17.10%	18.15	1 807.950	777.954	43.03%	77.29	3 714.000	2 028.188	54.61%	49.19	2 721.450	2 409.339	88.53%	15.12	5 366.050	3 439.453	64.10%	18.42
180470	276.958	3.257	1.18%	-0.06	83.873	3.784	4.51%	-0.24	753.230	9.476	1.26%	-0.27	691.033	9.817	1.42%	-0.24	1 489.790	19.901	1.34%	-0.13
180471	250.708	3.551	1.42%	-0.42	90.455	2.265	2.50%	0.05	736.965	3.701	0.50%	-0.54	686.413	28.880	4.21%	-0.27	1 658.830	52.580	3.17%	0.68
180476	298.345	0.704	0.24%	0.23	92.785	0.281	0.30%	0.16	777.933	1.994	0.26%	0.14	724.865	3.110	0.43%	0.02	1 576.795	7.977	0.51%	0.29
180477	272.848	2.271	0.83%	-0.12	97.400	1.118	1.15%	0.37	726.348	6.129	0.84%	-0.72	556.753	3.414	0.61%	-1.25	1 449.700	7.409	0.51%	-0.32
180479	312.170	29.051	9.31%	0.42	118.183	4.640	3.93%	1.30	795.550	56.292	7.08%	0.44	634.515	22.119	3.49%	-0.67	1 530.678	180.276	11.78%	0.06
180481	219.000	0.816	0.37%	-0.85	65.700	0.258	0.39%	-1.06	598.000	13.166	2.20%	-2.86	531.000	2.582	0.49%	-1.45	1 246.000	1.633	0.13%	-1.30
180486	279.375	0.793	0.28%	-0.03	91.150	0.597	0.66%	0.08	720.775	2.901	0.40%	-0.81	617.900	13.311	2.15%	-0.79	1 490.400	10.900	0.73%	-0.13
180496	162.708	2.181	1.34%	-1.62	47.243	0.944	2.00%	-1.89	404.073	0.714	0.18%	-6.10	377.295	1.205	0.32%	-2.61	NA	NA	NA	NA

4.7 Certified standard solution S2

Table 12 indicates the values after statistical analysis. Table 13 shows the average values, standard deviations of repeatability, and z scores for each laboratory for the certified standard solution 2 (18/172774_S2).

Table 12: Values obtained after statistical analysis for the certified standard solution 2 (18/172774_S2).

Parameters	x_{pt} (x_{mrc}) *µg/L*	σ_{pt} absolute *µg/L*	σ_{pt} relative *%*	S_L *µg/L*	S_R *µg/L*	S_r *µg/L*
B[a]A	290.75	48.978	16.85%	48.940	49.092	3.859
B[a]P	399.39	77.370	19.37%	77.329	77.494	5.056
B[b]F	551.94	116.709	21.15%	116.642	116.910	7.903
B[g,h,i]P	399.25	61.166	15.32%	61.076	61.423	6.519
B[j]F	266.55	149.604	56.13%	149.576	149.688	5.794
B[k]F	281.43	59.823	21.26%	59.786	59.936	4.236
D[a,h]A	89.28	20.815	23.31%	20.743	21.030	3.463
Flt	769.37	57.295	7.45%	56.932	58.372	12.888
Ind	722.46	118.992	16.47%	118.872	119.352	10.692
Phen	1517.12	191.212	12.60%	191.073	191.628	14.574

Table 13: Average values, standard deviations of repeatability, and z scores for each laboratory for the certified standard solution 2 (18/172774_S2).

Id Lab.	Benzo[a]anthracene				Benzo[a]pyrene				Benzo[b]fluoranthene				Benzo[g,h,i]perylene				Benzo[j]fluoranthene			
	x (µg/litre)	s_r (µg/litre)	s_r %	score z	x (µg/litre)	s_r (µg/litre)	s_r %	score z	x (µg/litre)	s_r (µg/litre)	s_r %	score z	x (µg/litre)	s_r (µg/litre)	s_r %	score z	x (µg/litre)	s_r (µg/litre)	s_r %	score z
180402	306.650	1.808	0.59%	0.32	419.325	8.745	2.09%	0.26	655.550	5.059	0.77%	0.89	675.325	25.010	3.70%	4.51	371.475	3.363	0.91%	0.70
180405	251.450	1.537	0.61%	-0.80	316.725	1.723	0.54%	-1.07	408.250	11.553	2.83%	-1.23	342.675	6.450	1.88%	-0.92	NA	NA	NA	NA
180415	285.500	2.082	0.73%	-0.11	484.000	3.559	0.74%	1.09	673.000	5.354	0.80%	1.04	411.000	1.414	0.34%	0.19	0.000	0.000	Not calculable	Not calculated
180429	NA	NA	NA	NA	257.875	6.607	2.56%	-1.83	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	<40.200	0.000	0.00%	Not calculated	<48.400	0.000	0.00%	Not calculated	NA	NA	NA	NA	<36.100	0.000	0.00%	Not calculated	NA	NA	NA	NA
180437	304.500	1.000	0.33%	0.28	397.500	5.000	1.26%	-0.02	537.500	5.000	0.93%	-0.12	392.500	5.000	1.27%	-0.11	305.000	4.082	1.34%	0.26
180441	312.765	3.301	1.06%	0.45	410.268	7.406	1.81%	0.14	561.343	3.775	0.67%	0.08	400.755	0.997	0.25%	0.02	281.400	10.759	3.82%	0.10
180453	281.573	0.844	0.30%	-0.19	383.455	1.372	0.36%	-0.21	545.695	2.641	0.48%	-0.05	434.915	0.499	0.11%	0.58	274.190	1.317	0.48%	0.05
180458	1 863.265	245.378	13.17%	32.11	2 175.410	551.789	25.36%	22.95	3 582.640	559.655	15.62%	25.97	2 890.900	3 634.105	125.71%	40.74	0.000	0.000	Not calculable	Not calculated
180470	284.575	4.430	1.56%	-0.13	407.333	0.415	0.10%	0.10	548.845	5.589	1.02%	-0.03	439.613	4.646	1.06%	0.66	275.418	6.046	2.20%	0.06
180471	171.700	1.534	0.89%	-2.43	364.720	2.637	0.72%	-0.45	514.730	3.672	0.71%	-0.32	395.625	1.479	0.37%	-0.06	NA	NA	NA	NA
180476	<5.000	0.000	0.00%	Not calculated	400.205	1.289	0.32%	0.01	560.738	2.083	0.37%	0.08	402.105	7.256	1.80%	0.05	559.473	1.462	0.26%	1.96
180477	265.830	1.307	0.49%	-0.51	366.260	2.332	0.64%	-0.43	527.108	1.964	0.37%	-0.21	390.735	3.539	0.91%	-0.14	NA	NA	NA	NA
180479	322.403	11.191	3.47%	0.65	417.233	4.439	1.06%	0.23	864.088	19.913	2.30%	2.67	415.190	8.439	2.03%	0.26	NA	NA	NA	NA
180481	230.500	6.856	2.97%	-1.23	289.750	2.217	0.77%	-1.42	449.500	10.408	2.32%	-0.88	293.500	7.141	2.43%	-1.73	499.500	13.279	2.66%	1.56
180486	275.475	1.159	0.42%	-0.31	365.875	4.404	1.20%	-0.43	510.175	3.892	0.76%	-0.36	378.350	4.310	1.14%	-0.34	198.050	0.603	0.30%	-0.46
180496	147.695	2.190	1.48%	-2.92	188.433	1.510	0.80%	-2.73	400.263	5.495	1.37%	-1.30	205.963	0.368	0.18%	-3.16	138.643	0.808	0.58%	-0.85

Id Lab.	Benzo[k]fluoranthene				Dibenzo[a,h]anthracene				Fluoranthene				Indeno[1,2,3-c,d]pyrene				Phenanthrene			
	x (µg/litre)	s_r (µg/litre)	s_r %	score z	x (µg/litre)	s_r (µg/litre)	s_r %	score z	x (µg/litre)	s_r (µg/litre)	s_r %	score z	x (µg/litre)	s_r (µg/litre)	s_r %	score z	x (µg/litre)	s_r (µg/litre)	s_r %	score z
180402	402.900	1.669	0.41%	2.03	105.375	4.819	4.57%	0.77	733.275	2.906	0.40%	-0.63	1 225.175	32.526	2.65%	4.22	1 714.025	9.462	0.55%	1.03
180405	368.125	11.667	3.17%	1.45	69.325	0.846	1.22%	-0.96	614.475	5.878	0.96%	-2.70	588.500	1.817	0.31%	-1.13	1 177.600	10.379	0.88%	-1.78
180415	252.000	2.708	1.07%	-0.49	119.500	11.091	9.28%	1.45	751.000	3.742	0.50%	-0.32	777.500	60.236	7.75%	0.46	1 504.500	10.214	0.68%	-0.07
180429	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	<46.300	0.000	0.00%	Not calculated	<35.400	0.000	0.00%	Not calculated	75.600	0.000	0.00%	Not calculated	<42.000	0.000	0.00%	Not calculated	76.113	5.295	6.96%	-7.54
180437	295.000	0.816	0.28%	0.23	99.750	3.304	3.31%	0.50	730.000	8.165	1.12%	-0.69	695.000	10.000	1.44%	-0.23	1 517.500	17.078	1.13%	0.00
180441	273.203	14.595	5.34%	-0.14	92.403	1.065	1.15%	0.15	776.208	18.442	2.38%	0.12	721.835	2.979	0.41%	-0.01	1 546.580	3.734	0.24%	0.15
180453	281.848	0.986	0.35%	0.01	90.358	0.456	0.50%	0.05	730.403	2.978	0.41%	-0.68	720.795	1.767	0.25%	-0.01	1 535.013	3.282	0.21%	0.09
180458	1 434.245	164.504	11.47%	19.27	1 068.595	446.611	41.79%	47.05	4 209.070	425.393	10.11%	60.03	5 511.200	2 698.061	48.96%	40.24	7 810.790	2 738.998	35.07%	32.91
180470	275.663	1.075	0.39%	-0.10	83.243	3.409	4.10%	-0.29	750.055	17.354	2.31%	-0.34	702.970	7.467	1.06%	-0.16	1 505.303	5.711	0.38%	-0.06
180471	250.203	2.246	0.90%	-0.52	88.630	1.063	1.20%	-0.03	739.383	3.800	0.51%	-0.52	668.998	4.506	0.67%	-0.45	1 619.708	13.444	0.83%	0.54
180476	295.495	1.136	0.38%	0.24	91.728	0.655	0.71%	0.12	770.910	2.396	0.31%	0.03	717.233	3.428	0.48%	-0.04	1 562.608	10.667	0.68%	0.24
180477	276.338	1.761	0.64%	-0.09	97.598	1.282	1.31%	0.40	726.378	10.664	1.47%	-0.75	564.228	6.482	1.15%	-1.33	1 457.678	1.557	0.11%	-0.31
180479	290.450	6.199	2.13%	0.15	110.818	7.382	6.66%	1.03	751.043	71.987	9.58%	-0.32	595.133	12.709	2.14%	-1.07	1 451.028	163.040	11.24%	-0.35
180481	217.000	0.816	0.38%	-1.08	64.200	0.804	1.25%	-1.20	600.250	14.705	2.45%	-2.95	562.500	4.203	0.75%	-1.34	1 228.750	8.539	0.69%	-1.51
180486	270.625	3.290	1.22%	-0.18	88.650	0.661	0.75%	-0.03	715.850	6.620	0.92%	-0.93	643.125	7.438	1.16%	-0.67	1 485.825	21.202	1.43%	-0.16
180496	154.308	2.406	1.56%	-2.12	44.763	0.249	0.56%	-2.14	381.823	1.925	0.50%	-6.76	353.720	4.167	1.18%	-3.10	NA	NA	NA	NA

4.8 Certified standard solution S3

Table 14 indicates the values after statistical analysis. Table 15 shows the average values, standard deviations of repeatability, and z scores for each laboratory for the certified standard solution 3 (18/172774_S3).

Table 14: Values obtained after statistical analysis for the certified standard solution 3 (18/172774_S3).

Parameters	x_{mrc} *µg/L*	σ_{pt} absolute *µg/L*	σ_{pt} relative *%*	S_L *µg/L*	S_R *µg/L*	S_r *µg/L*
B[a]A	8.140	2.003	24.61%	1.993	2.034	0.405
B[a]P	11.250	2.244	19.95%	2.186	2.411	1.015
B[b]F	15.530	2.639	17.00%	2.623	2.689	0.596
B[g,h,i]P	11.320	2.262	19.98%	2.226	2.363	0.795
B[j]F	7.780	7.047	90.58%	7.047	7.050	0.213
B[k]F	7.900	2.255	28.54%	2.234	2.315	0.605
D[a,h]A	2.470	0.902	36.54%	0.895	0.924	0.230
Flt	21.690	2.525	11.64%	2.511	2.568	0.540
Ind	21.550	2.935	13.62%	2.854	3.166	1.371
Phen	42.710	6.504	15.23%	6.432	6.716	1.933

Table 15: Average values, standard deviations of repeatability, and z scores for each laboratory for the certified standard solution 3 (18/172774_S3).

Id Lab.	Benzo[a]anthracene				Benzo[a]pyrene				Benzo[b]fluoranthene				Benzo[g,h,i]perylene				Benzo[j]fluoranthene			
	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z
	(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%	
180402	6.938	0.127	1.83%	-0.60	<10.000	0.000	0.00%	Not calculated	11.925	0.157	1.31%	-1.37	10.408	0.371	3.57%	-0.40	<10.000	0.000	0.00%	Not calculated
180405	7.625	0.050	0.66%	-0.26	9.575	0.472	4.93%	-0.75	10.600	0.572	5.39%	-1.87	9.875	0.126	1.27%	-0.64	NA	NA	NA	NA
180415	6.513	0.084	1.29%	-0.81	9.158	0.210	2.29%	-0.93	16.750	0.088	0.53%	0.46	10.103	0.186	1.84%	-0.54	0.000	0.000	Not calculable	Not calculated
180429	NA	NA	NA	NA	11.278	1.513	13.42%	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	277.640	17.033	6.14%	134.52	298.755	8.992	3.01%	128.09	NA	NA	NA	NA	192.055	6.467	3.37%	79.89	NA	NA	NA	NA
180437	9.000	0.000	0.00%	0.43	12.000	0.000	0.00%	0.33	16.250	0.500	3.08%	0.27	12.250	0.500	4.08%	0.41	5.250	0.500	9.52%	-0.36
180441	9.110	0.022	0.24%	0.48	11.930	0.000	0.00%	0.30	15.860	0.108	0.68%	0.13	11.508	0.010	0.08%	0.08	8.630	0.124	1.44%	0.12
180453	8.118	0.028	0.34%	-0.01	11.083	0.061	0.55%	-0.07	15.713	0.079	0.50%	0.07	12.078	0.108	0.90%	0.33	7.675	0.161	2.10%	-0.01
180458	10.753	1.134	10.54%	1.30	17.828	9.948	55.80%	2.93	18.220	1.426	7.83%	1.02	31.135	10.076	32.36%	8.76	0.000	0.000	Not calculable	Not calculated
180470	8.278	0.414	5.00%	0.07	11.738	0.833	7.10%	0.22	15.888	0.672	4.23%	0.14	13.020	0.833	6.40%	0.75	<40.000	0.000	0.00%	Not calculated
180471	5.135	0.541	10.53%	-1.50	10.490	1.107	10.55%	-0.34	14.665	1.820	12.41%	-0.33	11.893	1.233	10.37%	0.25	NA	NA	NA	NA
180476	<5.000	0.000	0.00%	Not calculated	11.540	0.045	0.39%	0.13	16.300	0.212	1.30%	0.29	11.283	0.118	1.04%	-0.02	16.395	0.173	1.06%	1.22
180477	<20.000	0.000	0.00%	Not calculated	<20.000	0.000	0.00%	Not calculated	<20.000	0.000	0.00%	Not calculated	<20.000	0.000	0.00%	Not calculated	<20.000	0.000	0.00%	Not calculated
180479	8.608	1.415	16.44%	0.23	11.980	2.406	20.08%	0.33	24.973	5.528	22.14%	3.58	12.125	2.187	18.04%	0.36	NA	NA	NA	NA
180481	6.428	0.087	1.35%	-0.85	6.925	0.021	0.30%	-1.93	15.625	0.250	1.60%	0.04	7.290	0.088	1.20%	-1.78	21.150	0.238	1.13%	1.90
180486	8.075	0.171	2.11%	-0.03	10.650	0.058	0.54%	-0.27	15.200	0.115	0.76%	-0.13	11.100	0.258	2.33%	-0.10	5.175	0.096	1.85%	-0.37
180496	5.210	0.230	4.42%	-1.46	6.023	0.086	1.43%	-2.33	11.580	0.228	1.97%	-1.50	6.103	0.069	1.14%	-2.31	4.133	0.062	1.51%	-0.52

Id Lab.	Benzo[k]fluoranthene				Dibenzo[a,h]anthracene				Fluoranthene				Indeno[1,2,3-c,d]pyrene				Phenanthrene			
	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z	x	s_r	s_r	score z
	(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%		(µg/litre)	(µg/litre)	%	
180402	<10.000	0.000	0.00%	Not calculated	<4.000	0.000	0.00%	Not calculated	18.953	0.135	0.71%	-1.08	18.053	0.408	2.26%	-1.19	43.645	0.638	1.46%	0.14
180405	10.700	0.294	2.75%	1.24	<5.000	0.000	0.00%	Not calculated	18.575	0.050	0.27%	-1.23	17.600	0.440	2.50%	-1.35	34.625	0.842	2.43%	-1.24
180415	6.855	0.303	4.41%	-0.46	2.575	0.083	3.24%	0.12	19.873	0.059	0.29%	-0.72	15.390	0.232	1.51%	-2.10	43.575	0.150	0.34%	0.13
180429	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
180430	568.493	12.291	2.16%	248.62	42.593	2.911	6.83%	44.46	834.520	26.723	3.20%	321.85	371.855	18.500	4.97%	119.35	1 104.723	48.110	4.35%	163.29
180437	9.000	0.000	0.00%	0.49	3.000	0.000	0.00%	0.59	21.250	0.500	2.35%	-0.17	21.500	0.577	2.69%	-0.02	44.750	0.500	1.12%	0.31
180441	8.350	0.241	2.89%	0.20	2.645	0.021	0.79%	0.19	22.370	0.252	1.13%	0.27	20.570	0.052	0.25%	-0.33	43.898	0.655	1.49%	0.18
180453	8.223	0.103	1.26%	0.14	2.583	0.013	0.49%	0.12	21.123	0.136	0.64%	-0.22	20.653	0.131	0.64%	-0.31	44.138	0.076	0.17%	0.22
180458	11.403	5.306	46.53%	1.55	39.685	20.250	51.03%	41.24	24.378	3.027	12.42%	1.06	18.408	2.571	13.97%	-1.07	52.193	7.806	14.96%	1.46
180470	7.835	0.514	6.57%	-0.03	<10.000	0.000	0.00%	Not calculated	<30.000	0.000	0.00%	Not calculated	20.710	0.810	3.91%	-0.29	<50.000	0.000	0.00%	Not calculated
180471	6.688	0.860	12.86%	-0.54	2.655	0.289	10.90%	0.20	21.448	2.737	12.76%	-0.10	19.038	2.381	12.51%	-0.86	44.260	6.512	14.71%	0.24
180476	8.560	0.104	1.21%	0.29	2.715	0.056	2.05%	0.27	22.480	0.255	1.13%	0.31	20.288	0.326	1.61%	-0.43	46.173	0.391	0.85%	0.53
180477	<20.000	0.000	0.00%	Not calculated	<20.000	0.000	0.00%	Not calculated	20.115	0.392	1.95%	-0.62	<20.000	0.000	0.00%	Not calculated	40.998	0.664	1.62%	-0.26
180479	8.760	2.222	25.36%	0.38	3.325	0.454	13.66%	0.95	18.648	0.787	4.22%	-1.20	17.270	2.863	16.58%	-1.46	34.460	8.684	25.20%	-1.27
180481	5.590	0.075	1.35%	-1.02	1.828	0.022	1.21%	-0.71	17.975	0.250	1.39%	-1.47	14.475	0.096	0.66%	-2.41	34.050	0.500	1.47%	-1.33
180486	7.850	0.058	0.74%	-0.02	2.600	0.000	0.00%	0.14	20.950	0.129	0.62%	-0.29	17.825	1.237	6.94%	-1.27	40.425	0.624	1.54%	-0.35
180496	4.950	0.143	2.89%	-1.31	1.265	0.079	6.27%	-1.34	11.078	0.036	0.32%	-4.20	10.180	0.180	1.77%	-3.87	NA	NA	NA	NA

5. LIST OF APPENDIXES

All the appendixes are available in a separate file (Interlaboratory comparison for the analysis of PAH in ambient air (2018) - Appendixes).

Appendixes	Title
Appendix 1	Summary of the Z scores obtained by each laboratory for all the compounds
Appendix 2	Data collected, averages and repeatability standard deviations for all the laboratories.

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