Supplementary Information for:

Concentrations of Halogenated Flame Retardants and Polychlorinated Biphenyls in house dust from Lagos, Nigeria

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Table S1a: GC oven temperature program for Brominated Flame Retardants (BFRs)

	Rate (°C / min)	Temperature (°C)	Hold time (min)	Run time (min)
Initial		80	2	2
Ramp 1	20	170	5.5	10
Ramp 2	25	320	10	16

Table S1b: GC oven temperature program for Polychlorinated Biphenyls **(**PCBs)

	Rate (°C / min)	Temperature (°C)	Hold time (min)	Run time (min)
Initial		65	0.75	0.75
Ramp 1	20	250	1	11
Ramp 2	5	250	0	13
Ramp 3	30	320	1	16

Table S2a: m/z ions monitored for target BFRs and PCBs

BDEs			**NBFRs**			**PCBs**		
BDE 28	405.8	407.8	**PBBz**	471.6	469.5	**PCB 11**	222	224
BDE 47	483.7	485.7	**PBT**	487.7	485.7	**PCB 28**	255.9	257.9
BDE 100	403.8	405.8	**PBEB**	499.7	501.7	**PCB 52**	289.9	291.9
BDE 99	403.8	405.8	**HBBz**	549.7	547.7	**PCB 101**	325.9	327.9
BDE 154	483.7	485.7	***Syn*-DP**	271.8	269.8	**PCB 118**	325.9	327.9
BDE 153	483.7	485.7	***Anti*-DP**	271.8	269.8	**PCB 153**	359.9	361.9
BDE 183	561.5	563.5	**DPDPE**	484.6	486.6	**PCB 138**	359.9	361.9
BDE 209	799.4	801.4				**PCB 180**	393.8	395.8

Table S2b: Precursor to product ion m/z transitions monitored for HBCDDs

Diastereomer	**Ion transition (m/z)**
α-, β-, γ-HBCDD	640.6 → 78.0
^{13}C α-, β-, γ-HBCDD	652.4 → 79.0
d_{18} γ-HBCDD	657.6 → 78.9

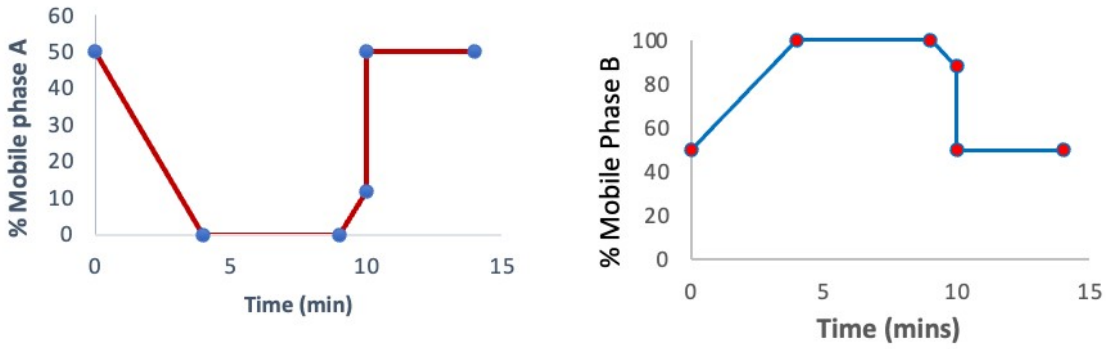

Figure S1: Mobile phase gradient for the analysis of HBCDDs

* Mobile phase A: methanol : water (1:1 v/v)
Mobile phase B: methanol

Table S3a: Concentration of PBDEs determined in SRM 2585 (*n=10*)

	Mean±Std	**Cert. value [a]**
BDE 28	35.9±4.9	46.9±4.4
BDE 47	508.0±30	498±46
BDE 99	1004.6±97	892±53
BDE 100	175.1±11	145±11
BDE 153	153.9±13	119±1
BDE 154	87.1±9.1	83.5±2.0
BDE 183	39.9±2.6	43.5±3.5
BDE 209	2228.8±310	2510±190

Table S3b: Concentration of PCBs determined in SRM 2585 (*n=10*)

Congener	**Mean±Std**	**Cert. value [a]**
PCB 28	12.3±0.9	13.4 ± 0.5
PCB 52	23.8±1.4	21.8 ± 1.9
PCB 101	26.6±1.4	29.8 ± 2.3
PCB 118	26.8±1.6	26.3 ± 1.7
PCB 153	38.0±1.7	40.2 ± 1.8
PCB 138	33.6±2.5	27.6 ± 2.1
PCB 180	17.7±3.2	18.4 ± 3.2

[a] **Stapleton et al., 2006**

Table S4a: Target BFRs and the corresponding Internal standards

BFRs	Internal Standard (IS) (Concentrations – 500 ng/mL)	Recovery Determination Standard (RDS) (Concentrations – 500 ng/mL)
BDE 28	BDE 77	^{13}C – BDE - 100
BDE 47		
BDE 99		
BDE 100		
PBBz		
HBBz		
PBT		
PBEB		
BDE 153	BDE 128	
BDE 154		
BDE 183		
Anti-DP		
Syn-DP		
BDE-209	^{13}C - BDE 209	
DPDPE		
α-HBCDD	^{13}C – α - HBCDD	d_{18} - γ-HBCDD
β-HBCDD	^{13}C – β - HBCDD	
γ-HBCDD	^{13}C – γ - HBCDD	

Table S4b: Target PCBs and the corresponding Internal standards

PCBs	Internal Standards (Concentrations – 200 ng/mL)	Recovery Determination Standard (Concentrations – 200 ng/mL)
PCB 11	PCB 14	PCB 29
PCB 28	PCB 34	
PCB 52	PCB 62	
PCB 101	PCB 119	PCB 129
PCB 118		
PCB 153	PCB 147	
PCB 138		
PCB 180	PCB 173	

Table S4c: Recoveries of Internal Standards

IS	Recoveries
BDE 77	110±11
BDE 128	71±21
^{13}C - BDE 209	72±23
α-HBCDD	76±16
β-HBCDD	68±12
γ-HBCDD	75±25
PCB 14	56±14
PCB 34	67±16
PCB 62	70±11
PCB 119	89±14
PCB 147	82±12
PCB 173	88±15

Table S5a: Limits of quantification for target PBDEs

PBDE	LOQ (ng/g)	Detection frequency (%)
BDE 28	0.78	0
BDE 47	0.74	93
BDE 100	0.21	67
BDE 99	0.19	87
BDE 154	0.26	100
BDE 153	0.45	100
BDE 183	0.49	100
BDE 209	16	93

Table S5b: Concentrations of target PBDEs

Sample #	Concentrations (ng/g)								
	BDE 28	**BDE 47**	**BDE 100**	**BDE 99**	**BDE 154**	**BDE 153**	**BDE 183**	**BDE 209**	**$\sum_7$BDEs**
1	< 0.78	<1.5	< 0.21	7.7	1.8	2.0	2.6	260	280
2	< 0.78	2.3	< 0.21	<0.19	0.64	1.5	4.5	290	300
3	< 0.78	4.8	1.5	7.7	1.8	2.5	3.4	300	320
4	< 0.78	1.6	1.6	4.3	1.1	2.0	3.1	540	550
5	< 0.78	6.4	< 0.21	<0.19	4.6	4.6	3.9	280	300
6	< 0.78	6.2	2.9	13	3.4	4.5	2.2	62	94
7	< 0.78	6.3	2.0	6.2	0.75	1	8.1	130	150
8	< 0.78	4.6	1.8	7.5	1.2	6.2	19	500	540
9	< 0.78	14	< 0.21	11	0.97	1.3	0.71	<16	43
10	< 0.78	5.5	1.8	6.9	1.7	1.9	3.7	130	150
11	< 0.78	3.8	< 0.21	5.4	0.89	1.5	3	160	170
12	< 0.78	2.7	1.4	7.0	1.4	2.1	4	310	330
13	< 0.78	2.2	1.1	5.4	1.2	1.8	3.1	430	450
14	< 0.78	5.6	1.5	5	0.89	1.3	4.5	170	190
15	< 0.78	20	3.1	12	1.2	1.5	2.0	770	810
Mean	**< 0.78**	**5.8**	**1.3**	**6.6**	**1.6**	**2.4**	**4.5**	**290**	**310**
Median	**< 0.78**	**4.8**	**1.5**	**6.9**	**1.2**	**1.9**	**3.4**	**280**	**300**
Range	**< 0.78**	**<1.5 - 20**	**<0.21 – 3.1**	**<0.19 – 13**	**0.64 – 4.6**	**1 – 6.2**	**0.71 - 19**	**<0.16 – 770**	**43 - 810**

Table S5c: % Composition of each target PBDE congener to $\sum_7$ BDEs

	BDE 47	BDE 100	BDE 99	BDE 154	BDE 153	BDE 183	BDE 209
Mean	4.1	0.6	4.4	0.8	1.2	1.8	87
Median	2.2	0.3	2.4	0.5	0.74	1.5	93
Range	0.3 - 32	0.05 - 3	0.06 – 25	0.2 – 3.6	0.2 – 4.8	0.2 – 5.4	35 – 98

Table S6a: Limits of quantification for target HBCDDs

Isomer	LOQ (ng/g)	Detection frequency (%)
α-HBCDD	5.3	13
β-HBCDD	11	0
γ-HBCDD	2.4	27

Table S6b: Concentrations of target HBCDDs

	Conc. (ng/g)		
Sample #	**α-HBCDD**	**β-HBCDD**	**γ-HBCDD**
1	<5.3	<11	7.7
2	<5.3	<11	<2.4
3	<5.3	<11	<2.4
4	37	<11	17
5	<5.3	<11	19
6	<5.3	<11	<2.4
7	<5.3	<11	<2.4
8	40	<11	26
9	<5.3	<11	<2.4
10	<5.3	<11	<2.4
11	<5.3	<11	<2.4
12	<5.3	<11	<2.4
13	<5.3	<11	<2.4
14	<5.3	<11	<2.4
15	<5.3	<11	<2.4
Mean	**5.7**	**<11**	**5.1**
Median	**<5.3**	**<11**	**<2.4**
Range	**<5.3-40**	**<11**	**<2.4-19**

Table S6c: $f_{\text{α-HBCDD}}$ in sample #s 4 and 8

Sample	$f_{\text{α-HBCDD}}$
4	0.69
8	0.61

Table S7a: Limits of quantitation for target alt-HFRs

	LOQ (ng/g)	Detection frequency (%)
PBBz	0.70	6.7
PBT	0.59	33
PBEB	0.71	53
HBBz	0.76	47
Syn-DP	0.10	93
Anti-DP	2.4	87
DBDPE	54	53

Table S7b: Concentrations of target alt-HFRs

Sample #	Concentrations (ng/g)							
	PBBz	**PBT**	**PBEB**	**HBBz**	***Syn*-DP**	***Anti*-DP**	**DBDPE**	**$\sum_7$NBFRs**
1	<0.7	< 0.59	0.9	0.76	6.2	25	1400	1400
2	<0.7	0.7	94	1.05	9.5	53	2400	2600
3	<0.7	2.2	97	1.4	5.9	< 2.4	< 54	140
4	<0.7	< 0.59	< 0.71	< 0.76	8.7	68	< 54	110
5	<0.7	2.5	0.18	< 0.76	18	28	1000	1000
6	<0.7	< 0.59	< 0.71	< 0.76	26	88	< 54	140
7	<0.7	< 0.59	< 0.71	< 0.76	0.83	3.2	< 54	34
8	<0.7	0.69	36	3.5	7.2	21	320	390
9	<0.7	< 0.59	< 0.71	< 0.76	< 0.1	< 2.4	< 54	32
10	<0.7	< 0.59	< 0.71	< 0.76	6.9	35	280	320
11	0.89	6.3	170	2.2	9.6	99	< 54	320
12	<0.7	< 0.59	1.4	1	8.7	22	610	640
13	<0.7	< 0.59	1.5	1.1	7	27	820	860
14	<0.7	< 0.59	< 0.71	< 0.76	11	42	180	230
15	<0.7	< 0.59	< 0.71	< 0.76	11	32	< 54	73
Mean	**0.10**	**0.96**	**27**	**0.93**	**9.1**	**36**	**480**	**560**
Median	**<0.7**	**< 0.59**	**< 0.71**	**< 0.76**	**8.7**	**28**	**180**	**320**
Range	**<0.7 – 0.89**	**< 0.59 – 6.3**	**< 0.71 – 170**	**< 0.76 – 3.5**	**< 0.1 – 26**	**< 2.4 - 99**	**< 54 - 2400**	**32 - 2600**

Table S7c: % Composition of each target NBFRs congener to $\sum_7$NBFRs

	PBBz	**PBT**	**PBEB**	**HBBz**	***Syn*-DP**	***Anti*-DP**	**DBDPE**
Mean	0.06	0.4	9.4	0.44	4.3	18	68
Median	0.02	0.18	0.31	0.25	2.1	6.5	85
Range	0.002 – 0.3	0.01 – 2.0	0.03 – 70	0.03 – 1.1	0.3 – 18	1.5 – 64	9.1 - 98

Table S8a: Limits of quantification for target PCBs

PCB #	LOQ (ng/g)	Detection frequency
PCB-11	0.19	0
PCB-28	0.31	0
PCB-52	0.49	87
PCB-101	0.32	53
PCB-118	0.29	80
PCB-153	0.46	93
PCB-138	0.57	100
PCB-180	0.27	100

Table S8b: Concentrations of target PCBs

Sample #	Concentration of PCB # (ng/g)								
	11	**28**	**52**	**101**	**118**	**153**	**138**	**180**	**∑PCBs**
1	<0.19	<0.31	1.8	<0.32	0.59	1.3	4.1	1.5	9.4
2	<0.19	<0.31	2.2	0.79	1.3	0.83	2.6	0.97	8.6
3	<0.19	<0.31	3.6	0.51	1.4	2.8	8.8	2.2	19
4	<0.19	<0.31	2.1	<0.32	<0.29	1.2	4.1	0.93	13
5	<0.19	<0.31	4.7	1.4	2.1	11	22	9.2	51
6	<0.19	<0.31	1.7	<0.32	<0.29	0.67	2.3	0.93	5.9
7	<0.19	<0.31	2.1	<0.32	0.39	1.6	3.4	1.7	9.4
8	<0.19	<0.31	1.6	1.2	4.2	4.4	18	5.8	35
9	<0.19	<0.31	3.8	<0.32	<0.29	2.5	5.5	1.7	14
10	<0.19	<0.31	0.58	0.68	1.2	< 0.46	0.82	0.27	4.0
11	<0.19	<0.31	<0.49	1.9	1.3	6.5	13	4.2	28
12	<0.19	<0.31	4.8	<0.32	0.62	5.5	15	6.2	32
13	<0.19	<0.31	3.9	<0.32	0.55	2.9	7.5	3.2	18
14	<0.19	<0.31	5.7	0.66	1.0	9.9	19	24	61
15	<0.19	<0.31	<0.49	0.63	0.47	4.3	7.7	4.8	18
Mean	**<0.19**	**<0.31**	**2.8**	**0.55**	**1.0**	**3.7**	**9.0**	**4.5**	**22**
Median	**<0.19**	**<0.31**	**2.1**	**0.51**	**0.62**	**2.8**	**7.5**	**2.2**	**18**
Range	**<0.19**	**<0.31**	**<0.49 – 7.6**	**<0.32 – 1.9**	**0.59 – 4.2**	**<0.46 - 11**	**0.82 - 22**	**0.27 - 24**	**3.8 – 61**

Table S8c: % Composition of each target PCB congener to ∑PCBs

PCB #	52	101	118	153	138	180
Mean	17	3.3	6.1	16	40	17
Median	19	2.1	4.1	16	42	17
Range	0 – 33	0 - 18	0 - 31	7.1 - 24	22 - 51	7.1 – 40

Reference

Stapleton, H. M., Harner, T., Shoeib, M., Keller, J. M., Schantz, M. M., Leigh, S. D., Wise, S. A., 2006. Determination of polybrominated diphenyl ethers in indoor dust standard reference materials. Analytical and Bioanalytical Chemistry 384, 791 – 800. https://doi.org/10.1007/s00216-005-0227-y.