

### Supplementary Materials

**Table S1a.** Summary of the Physicochemical parameters (mean of pH and Total Organic matter content) of the samples at the study locations. No standard deviation is given if n=1.

	Burning Sites		Dismantling Sites		Repair Sites		Control Sites	
	pH	TOC%	pH	TOC%	pH	TOC%	pH	TOC%
Soil	7.8 ± 0.43	20 ± 11	5.8 ± 3	7.4 ± 6.3	8.8	1.5	8.0 ± 0.4	3.2 ± 0.9
Roadside dust	-	-	8.3 ± 0.06	4.4 ± 2.6	8.1	1.5	8.3 ± 0.5	1.3 ± 0.3
Floor dust	-	-	8.4 ± 0.24	5 ± 1.0	8.4 ± 0.3	4.1 ± 4.2	8.8	5.3
Direct dust	-	-	-	-	9 ± 0.2	17.4 ± 6	-	-

**Table S1b.** Physicochemical parameters (pH and Total Organic Matter Content) of the samples at the study site.

E-Waste Activity Sites	Lagos				Ibadan				Aba				
	pH	Control pH	%TOC	Control %TOC	pH	Control pH	%TOC	Control %TOC	pH	Control pH	%TOC	Control %TOC	
Burning sites													
Soil(0–10cm)	Mean ± SD	7.7	7.9 ± 0.4	36.3	3.5 ± 1.2	8.2 ± 0.2	8.2 ± 0.24	16.8 ± 2.4	3.6 ± 1.6	7.5 ± 0.44	7.5 ± 0.62	16 ± 11.5	2.3 ± 0.7
	Minimum	7.7	7.41	36.3	2.4	8.03	8.1	15.1	2.5	7.21	7.10	7.98	1.8
	Maximum	7.7	8.22	36.3	5.15	8.4	8.4	18.45	4.7	7.84	7.97	24.24	2.8
Dismantling site													
Soil(0–10cm)	Mean ± SD	7.94 ± 0.23	7.9 ± 0.35	11 ± 11.4	3.5 ± 1.2	5 ± 2	8.2 ± 0.24	5.8 ± 2.5					
	Minimum	7.74	7.41	1.58	2.4	1.94	8.07	2.74					
	Maximum	8.2	8.22	23.69	5.15	9.0	8.41	10.3					
Floor dust	Mean ± SD	8.4 ± 0.24		4.9 ± 1									
	Minimum	8.14		3.71									
	Maximum	8.7		6.19									
Direct dust	Mean ± SD												
	Minimum												
	Maximum												
Roadside dust	Mean ± SD	8.3 ± 0.6	8.2 ± 0.6	4.4 ± 2.6	1.2 ± 0.3					8.06	8.15 ± 0.6	1.51	1.3 ± 0.35
	Minimum	8.25	7.6	2.61	0.98					8.06	7.1	1.51	0.6
	Maximum	8.34	8.7	6.24	1.6					8.06	9.0	1.51	1.7
Repair site													
Floor dust	Mean ± SD	8.4 ± 0.6		3.4 ± 0.95		8.6 ± 0.4	8.8 ± 8.8	8.3 ± 7.9	5.3 ± 5.3	8.2 ± 0.25		2.4 ± 0.83	
	Minimum	8		1.85		8.22	8.8	3.4	5.3	7.95		1.14	
	Maximum	9		5.01		8.96	8.8	22.33	5.3	8.8		3.86	
Direct dust	Mean ± SD					9 ± 0.2		17.4 ± 5.6					
	Minimum					8.8		10					
	Maximum					9.24		22.4					
Roadside dust	Mean ± SD									8.1	8.4 ± 0.5	1.5	1.4 ± 0.3
	Minimum									8.1	7.8	1.5	0.99
	Maximum									8.1	9.0	1.5	1.7

**Table S2.** PBDE median concentrations (ng/g dry weight) across various e-waste sites; and exceedance (Ex) of PBDE concentrations in soil and dusts across various e-waste sites compared to control sites in Lagos.

PBDE	Top Soil 0–10cm				Floor Dust (Control Soil)				Roadside Dust				
	Control	Burning Sites	Dismantling Sites	Repair Sites	Dismantling Sites	Repair Sites	Dismantling Sites	Repair Sites	Dismantling Sites	Ex			
Title	Median	Median	Ex	Median	Ex	Median	Ex	Median	Ex	Median	Ex		
BDE-28	0.01	40.54	4054	0.96	96.0	0.02	2.0	0.9	88.0	0.5	50.0	0.18	18.0
BDE-47	0.04	17.05	426	3.67	91.8	0.1	2.5	6.3	157.5	0.5	13.5	8.02	200.5
BDE-100	0.07	86.02	1229	1.4	20.0	0.31	4.4	4.1	58.6	0.4	5.7	4.44	63.4
BDE-99	0.22	158.11	719	10.83	49.2	0.53	2.4	15	68.6	1.8	8.2	19	86.4
BDE-154	0.06	80.25	1338	2.68	44.7	0.21	3.5	5.4	90.2	0.4	6.8	2.5	41.7
BDE-153	0.085	64.19	755	9.93	116.8	0.24	2.8	8.9	104.7	1.9	22.4	8.2	96.5
BDE-138	0.001	3.24	3240	0.14	140.0	0	0.0	0.82	820.0	0.1	120.0	0.29	290.0
BDE-183	0.08	153.73	1922	11.41	142.6	0.2	2.5	17.6	219.6	5.0	62.5	10.76	134.5
BDE-190	0.08	164.12	2052	4.31	53.9	0.19	2.4	3.3	41.3	0.4	5.5	1.19	14.9
BDE-208	0.14	497.38	3553	8.66	61.9	0.1	0.7	6.33	45.2	3.0	21.4	3.28	23.4
BDE-207	0.29	952.29	3284	21.03	72.5	0.17	0.6	18.8	64.7	5.7	19.7	9.37	32.3
BDE-206	0.15	626.79	4179	8.72	58.1	0.07	0.5	15	100.7	2.8	18.7	9.49	63.3
BDE-209	2.1	17587	8375	1491	710.0	0.85	0.4	3009	1432.9	432.7	206.1	961	457.6
$\Sigma_{13}$ PBDE	<b>3.3</b>	<b>20,431</b>	<b>6191</b>	<b>1568</b>	<b>475</b>	<b>3</b>	<b>0.9</b>	<b>3110</b>	<b>942.4</b>	<b>451.4</b>	<b>136.8</b>	<b>1051</b>	<b>318.5</b>
pH	<b>8.04</b>	<b>7.7</b>		<b>7.89</b>		<b>7.87</b>		<b>8.4</b>		<b>8.31</b>		<b>8.29</b>	
TOC	<b>3.13</b>	<b>36.3</b>		<b>7.83</b>		<b>1.51</b>		<b>4.9</b>		<b>3.35</b>		<b>4.43</b>	

**Table S3.** PBDE median concentrations (ng/g dry weight) across various e-waste sites; and exceedance (Ex) of PBDE concentrations in soil and dusts across various e-waste sites compared to control sites in Ibadan.

PBDE	Top Soil 0–10cm			Floor Dust (Control Soil)				Direct Dust			
	Control	Burning Sites		Dismantling Sites		Repair Sites		Dismantling Sites		Repair Sites	
	Median	Median	Ex	Median	Ex	Median	Ex	Median	Ex	Median	Ex
BDE-28	0.03	18.5	617	0.04	1.33	1.03	34.3	1.24	41.3	3.8	127
BDE-47	0.12	83	693	0.2	1.7	4.12	34.3	64.6	538.33	14.62	122
BDE-100	0.1	20	200	0.17	1.7	1.51	15.1	24.2	242	4.8	48
BDE-99	0.27	107	396.3	0.42	1.6	10.64	39.41	151.2	560	26	95.2
BDE-154	0.09	22.5	250	0.1	1.1	1.61	18	12.4	138	4.3	47.8
BDE-153	0.17	60	363.6	0.5	3.03	7.5	45.5	33.1	201	12.4	75.15
BDE-138	0	3.5	0	0		0.43		1.73		1.05	
BDE-183	0.07	38.7	553	1.2	17.14	14.5	206.57	16.7	238.6	15.5	221
BDE-190	0.03	32.4	1080	0.1	3.33	1.5	50	2.6	87	4.9	163.3
BDE-208	0.15	174	1157	1.2	8	25	164.7	14.2	94.5	25.3	168.3
BDE-207	0.27	367	1360	1.9	7.04	78.4	290.37	31.7	117.4	42	155.6
BDE-206	0.19	120	632	0.4	2.11	65	342	31.7	167	33.44	176
BDE-209	9	5850	650	13	1.44	8043	893.7	3181	353.	1464	162.7
∑ <sub>13</sub> PBDE	10.4	6895	660	18	1.7	8272	792	3566	342	1618	155
pH	<b>8.2</b>	<b>8.19</b>		<b>5</b>		<b>8.8</b>		-		<b>9</b>	
TOC	<b>3.6</b>	<b>16.78</b>		<b>5.8</b>		<b>5.29</b>		-		<b>18.56</b>	

**Table S4.** PBDE median concentrations (ng/g dry weight) across various e-waste sites; and exceedance (Ex) of PBDE concentrations in soil and dusts across various e-waste sites compared to control sites in Aba.

Top Soil 0–10cm (Control Roadside Dust)				Floor Dust (Control Roadside Dust)		Roadside Dust (Control Roadside Dust)		Title
PBDE	Control	Burning sites		Repair Sites		Repair Sites		Control
	Median	Median	Ex	Median	Ex	Median	Ex	
BDE-28	0.02	2.3	115	0.16	8	1.44	72.00	0.02
BDE-47	0.47	5.6	11.91	1.42	3.02	3.9	8.30	0.47
BDE-100	0.18	1.64	9.11	0.38	2.11	0.6	3.33	0.18
BDE-99	1.08	11.7	10.83	2.55	2.36	5.84	5.41	1.08
BDE-154	0.13	7.74	59.54	0.43	3.31	2.46	18.92	0.13
BDE-153	0.23	20.7	90.00	1.6	6.96	7.9	34.35	0.32
BDE-138	0.02	1.6	80.00	0.1	5.00	0.54	27.00	0.02
BDE-183	0.33	13.4	40.61	8.72	26.42	4.56	13.82	0.33
BDE-190	0.07	7.5	107.14	0.37	5.29	2.82	40.29	0.07
BDE-208	0.57	4.4	7.72	3.4	5.96	2.57	4.51	0.57
BDE-207	1.13	8.74	7.73	10	8.85	3.46	3.06	1.13
BDE-206	1.2	3.63	3.03	6	5.00	2.15	1.79	1.1
BDE-209	71.5	103.3	1.44	534	7.47	69	0.97	71.5
$\sum_{13}$ PBDE	77.5	192	2.5	553	7.1	106	1.4	77.5
pH		<b>7.52</b>		<b>8.11</b>		<b>8.1</b>		<b>8.17</b>
TOC		<b>16.11</b>		<b>2.46</b>		<b>1.5</b>		<b>1.44</b>

**Table S5.** F-values of the two-Way ANOVA for PBDE concentration in all sample types across the Activity sites (burning, dismantling, repair sites).

PBDEs	Soil	Floor Dust	Roadside Dust	Direct Dust
	F(df) = value Buring Dismantling and Control	T-value t(df) = value Dismantling and Repair Sites	T-value t(df) = value Dismantling and Control Sites	T-value t(df) = value Dismantling and Repair Sites
BDE-28	(3.17) = 1.122	(27) = 1.366	(10) = 0.327 ***	(4) = -0.694
BDE-47	(3.17) = 3.467 *	(27) = 3.728	(10) = 4.267 ***	(4) = 0.862
BDE-100	(3.17) = 3.529 *	(27) = 5.401	(10) = 5.260 ***	(4) = 2.886*
BDE-99	(3.17) = 4.318 *	(27) = 4.314	(10) = 4.390 ***	(4) = -1.217
BDE-154	(3.17) = 5.348 **	(27) = 4.886	(10) = 6.171 ***	(4) = 2.214
BDE-153	(3.17) = 5.130 **	(27) = 0.988	(10) = 6.565 ***	(4) = 0.394
BDE-138	(3.17) = 5.708 **	(27) = 3.058	(10) = 3.154 **	(4) = 0.830
BDE-183	(3.17) = 6.336 **	(27) = 0.525	(10) = 5.841 ***	(4) = -0.079
BDE-190	(3.17) = 4.910 *	(27) = 3.716	(10) = 6.017 ***	(4) = -0.373
BDE-208	(3.17) = 6.438 **	(27) = 0.617	(10) = 3.308 **	(4) = -0.565
BDE-207	(3.17) = 6.038 **	(27) = 0.380	(10) = 3.555 **	(4) = -0.445
BDE-206	(3.17) = 3.502 *	(27) = 0.195	(10) = 2.387 *	(4) = -0.405
BDE-209	(3.17) = 4.796 *	(27) = 0.159	(10) = 2.543 *	(4) = -0.137
$\Sigma_{13}$ PBDE				

\*\*\* =  $p < 0.001$ . \*\* =  $p < 0.01$ . \* =  $P < 0.05$ .

**Table S6.** F-values of the two-Way ANOVA for PBDE concentration in top soils across the locations(Lagos, Ibadan, Aba) and Activity sites (burning, dismantling, repair, and control sites).

PBDEs	Activity Sites ( $\eta$ )	Location ( $\eta$ )	Activity site # location ( $\eta$ )
BDE-28	21620.752 (1.000) ***	29885.907 (1.000) ***	29739.812 (1.000) ***
BDE-47	3.066 (0.414) *	0.361 (0.053)	0.871 (0.118)
BDE-100	5.026 (0.537) **	1.829 (0.220)	0.615 (0.086)
BDE-99	3.656 (0.458) *	0.197 (0.029)	0.625 (0.088)
BDE-154	6.676 (0.606) **	1.603 (0.198)	1.027 (0.136)
BDE-153	5.673 (0.567) **	0.827 (0.113)	1.230 (0.159)
BDE-138	4.764 (0.524) **	0.493 (0.070)	0.367 (0.053)
BDE-183	8.654 (0.666) ***	2.039 (0.239)	0.599 (0.084)
BDE-190	7.084 (0.620) **	2.520 (0.279)	0.989 (0.132)
BDE-208	11.822 (0.732) ***	4.062 (0.385) *	0.984 (0.131)
BDE-207	11.728 (0.730) ***	4.125 (0.388) *	1.180 (0.154)
BDE-206	5.706 (0.568) **	2.406 (0.270)	1.062 (0.140)
BDE-209	10.025 (0.698) ***	3.251 (0.333)	2.845 (0.304)
$\Sigma_{13}$ PBDE	9.886 (0.695) ***	3.160 (0.327)	2.539 (0.281)

\*\*\* =  $p < 0.001$ . \*\* =  $p < 0.01$ . \* =  $p < 0.05$ .  $\eta$  = partial Eta squared. # = interaction effect

**Table S7.** F-values of the two-Way ANOVA for PBDE concentration in floor dust across the locations (Lagos. Ibadan. Aba) and Activity sites (dismantling and repair sites).

PBDEs	Activity Sites ( $\eta$ )	Location ( $\eta$ )	Activity Site # Location ( $\eta$ )
BDE-28	0.501 (0.020)	2.855 (0.192)	0.009 (0.000)
BDE-47	24.776 (0.508) ***	8.215 (0.406) **	0.759 (0.031)
BDE-100	30.994 (0.564) ***	3.961 (0.248) *	2.165 (0.083)
BDE-99	27.732 (0.536) ***	7.135 (0.373) **	1.832 (0.071)
BDE-154	22.493 (0.484) ***	3.262 (0.214)	5.311 (0.181) *
BDE-153	0.642 (0.026)	1.344 (0.101)	0.154 (0.006)
BDE-138	6.639 (0.217) **	2.189 (0.154)	0.940 (0.038)
BDE-183	0.013 (0.001)	0.832 (0.065)	2.074 (0.080)
BDE-190	8.460 (0.261) **	1.401 (0.105)	4.462 (0.157)
BDE-208	0.004 (0.000)	1.853 (0.134)	2.982 (0.111)
BDE-207	0.027 (0.001)	1.680 (0.123)	3.319 (0.122)
BDE-206	0.015 (0.001)	1.742 (0.127)	2.430 (0.092)
BDE-209	0.673 (0.008)	0.284 (0.023)	2.642 (0.99)
$\Sigma_{13}$ PBDE	0.124 (0.005)	0.315 (0.026)	2.471 (0.093)

\*\*\* =  $p < 0.001$ . \*\* =  $p < 0.01$ . \* =  $p < 0.05$ .  $\eta$  = partial Eta squared. # = interaction effect



**Table S8.** Correlations between PBDEs congeners,  $\Sigma_{13}$ PBDE, pH and TOC (Top soils).

PBDE congeners	BDE28	BDE47	BDE100	BDE99	BDE154	BDE153	BDE138	BDE183	BDE190	BDE208	BDE207	BDE206	BDE209	pH	TOC
BDE28	1													0.261	0.528
BDE47	0.702	1												0.296	0.569
BDE100	0.659	0.914	1											0.234	0.685
BDE99	0.706	0.972	0.973	1										0.295	0.530
BDE154	0.722	0.909	0.957	0.959	1									0.225	0.665
BDE153	0.691	0.816	0.811	0.845	0.879	1								0.126	0.291
BDE138	0.758	0.907	0.867	0.914	0.919	0.825	1							0.372	0.524
BDE183	0.713	0.803	0.791	0.828	0.848	0.893	0.871	1						0.198	0.510
BDE190	0.720	0.853	0.875	0.884	0.933	0.805	0.879	0.833	1					0.295	0.650
BDE208	0.775	0.819	0.796	0.843	0.828	0.824	0.824	0.880	0.817	1				0.192	0.597
BDE207	0.757	0.813	0.780	0.832	0.822	0.847	0.824	0.910	0.813	0.993	1			0.207	0.559
BDE206	0.726	0.825	0.726	0.803	0.758	0.785	0.805	0.864	0.760	0.951	0.962	1		0.261	0.482
BDE209	0.687	0.757	0.668	0.744	0.705	0.794	0.772	0.868	0.706	0.913	0.939	0.953	1	0.319	0.347

TOC = Total Organic matter content; \*\* correlation is significant at the 0.01 level(2-tailed); \* correlation is significant at the 0.05 level(2-tailed)

