Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts

LEVELS AND DISTRIBUTION OF POLYBROMINATED DIPHENYL ETHERS IN SOIL, SEDIMENT AND DUST SAMPLES COLLECTED FROM VARIOUS ELECTRONIC WASTE RECYCLING SITES WITHIN GUIYU TOWN, SOUTHERN CHINA

Iryna Labunska, Stuart Harrad, David Santillo, Paul Johnston, and Kevin Brigden

Supplementary Information

4 tables, 7 pages

Table S1. Description of sampling sites within Guiyu e-waste recycling area, China.

Location	Code	Sample description
Longmen	AP01	soil/sediment from small pool connected to river adjacent to workshop 1
	AP02	soil from dry waste pit adjacent to workshop 1
	AP03	river sediment, upstream from workshop 1
	AP04	soil from 1 m deep waste pit A connected to river, workshop 2
	AP05	river sediment, downstream from workshop 2
	AP06	sediment from waste pit B connected to river, workshop 2
Liangjiang River, near crossing with road from Guiyu to Nanyang	AP07	soil from waste ground area washed with acidic wastewater, workshop 3
	AP08	soil from waste ground area washed with acidic wastewater, workshop 3
	AP09	sediment from small river further from waste channel, close to workshop 3
	AP10	sediment from small river near waste channel, close to workshop 3
	AP11	sediment from upper part of small river away from workshop 3
	AP12	sediment from Lianjiang River, near workshop 4
	AP13	soil from dry discharge channel to Lianjiang River, workshop 4
	AP14	sediment from Lianjiang River, near workshop 4, closer to discharge than point AP12
Hua Mei	AP15	sediment from stream surrounding acidic waste sumps, away from working area
	AP16	sediment from stream surrounding acidic waste sumps, close to wastewater entry from sumps
Longgang	OB01	ash & soil at the place of burning, waste dumpsite
	OB02	ash & burnt e-wastes brought to dumpsite from elsewhere, in piles on ground
	OB03	ash & burnt e-wastes brought to dumpsite from elsewhere, in piles on ground

	OB04	ash & burnt e-wastes brought to dumpsite from elsewhere, in sacks on ground
Longmen	OB05	ash & burnt e-wastes from pile that was still burning on dumpsite
Nanyang	PD01	dust from floor of printers dismantling workshop 5
	PD02	soil/sediment from shallow pool outside printers dismantling workshop 5
Beilin	SS01	dust from floor of separation & solder recovery workshop 6
	SS02	dust from container at separation & solder recovery workshop 6
	SS03	dust from floor of separation & solder recovery workshop 7
Longgang	SH01	street dust/soil, between two plastic shredding workshops 8 & 9
Liangjiang River, near crossing with road from Guiyu to Nanyang	SH02	sediment from wastewater gully from printed circuit boards shredding workshop 10
Liangjiang River, near crossing with road from Chendian to Guiyu	SH03	sediment from waste channel immediately before it enters Liangjiang River, 150m downstream from discharge from printed circuit boards shredding workshop 11
	SH04	sediment from waste channel at a point of discharge from printed circuit boards shredding workshop 11
	SH05	sediment from waste channel at a point of discharge from printed circuit boards shredding workshop 12

Table S2. Monitored ion fragments for native PBDEs and internal standards (IS).

PBDEs	**Ions monitored**
BDE-17& 28	78.9; 80.9; 326.8
BDE-47& 66	78.9; 80.9; 324.8
BDE-85 & 100	78.9; 80.9; 402.7
BDE-99	78.9; 80.9; 404.7
BDE-138	78.9; 80.9; 563.5
BDE-153, 154 & 183	78.9; 80.9; 561.5
BDE-197	408.6; 406.6
BDE-207 & 209	486.6; 484.6
ISs	**Ions monitored**
F-BDE-69	78.9; 80.9; 342.7
F-BDE-160	78.9; 80.9; 501.5
^{13}C-BDE-209	494.6; 496.6
PCB-209	495.7; 497.7

Table S3. Certified and average measured concentrations of PBDEs in SRM2585 (average ± standard deviation).

PBDEs in SRM 2585	Certified values, ng g^{-1}	Measured values, ng g^{-1} (n=5)
BDE-17	11.5 ± 1.2	18.0 ± 0.8
BDE-28	46.9 ± 4.4	50.6 ± 1.3
BDE-47	497 ± 46	547 ± 34
BDE-100	145 ± 11	199 ± 15
BDE-99	892 ± 53	958 ± 86
BDE-85	43.8 ± 1.6	43.9 ± 3.3
BDE-154	83.5 ± 2	112.4 ± 23
BDE-153	119 ± 1	145 ± 30
BDE-138	15.2 ± 2	16.9 ± 3.6
BDE-183	43 ± 3.5	67 ± 20
BDE-209	2510 ± 190	2555 ± 390

Table S4. Concentration of PBDEs (ng g^{-1} dry weight) in samples collected from e-waste recycling sites in Guiyu, China.

Code	BDE17	BDE28	BDE47	BDE66	BDE100	BDE99	BDE85	BDE154	BDE153	BDE138	BDE-183	BDE-197	BDE-207	BDE-209	∑PBDE excluding BDE-209	∑PBDE total
AP01	37	62	350	110	140	360	15	380	1400	240	2800	15000	6900	18000	28000	46000
AP02	<0.1	67	<16.3	<3.8	<29	110	<0.6	61	120	<1.1	380	3800	23000	150000	27000	170000
AP03	6	<3.8	<16.3	<3.8	<29	34	<0.6	<0.4	<13	<1.1	<6.8	4	28	260	72	330
AP04	<0.1	<3.8	<16.3	<3.8	<29	<8.9	<0.6	<0.4	<13	<1.1	19	26	820	12000	870	13000
AP05	1700	2600	15000	5300	1300	17000	1100	2500	9300	1200	1500	1900	2800	19000	63000	82000
AP06	9	<3.8	<16.3	<3.8	<29	<8.9	<0.6	<0.4	790	<1.1	1100	5500	1500	2600	8800	11000
AP07	23	36	170	72	<29	200	14	15	45	<1.1	45	28	130	1800	780	2600
AP08	20	23	<16.3	35	<29	97	3	21	48	18	48	31	110	1200	450	1600
AP09	2	<3.8	<16.3	<3.8	<29	<8.9	1	6	<13	<1.1	<6.8	22	17	96	48	140
AP10	<0.1	7	57	20	<29	60	<0.6	<0.4	22	<1.1	53	25	30	370	270	650
AP11	<0.1	11	38	14	<29	36	<0.6	<0.4	<13	<1.1	<6.8	<0.1	<1.6	<10	99	99
AP12	180	310	2000	710	180	2200	130	130	460	52	73	25	110	2700	6500	9200
AP13	<0.1	24	210	64	84	240	<0.6	9	59	<1.1	<6.8	26	94	530	820	1300
AP14	88	170	1300	390	<29	1500	73	77	260	28	34	13	110	1800	4100	5900
AP15	<0.1	<3.8	<16.3	<3.8	<29	<8.9	<0.6	<0.4	<13	<1.1	30	11	48	1100	89	1200
AP16	<0.1	<3.8	<16.3	<3.8	<29	36	<0.6	120	1100	<1.1	2900	17000	1600	8100	22000	30000

OB01	<0.1	20	62	48	<29	69	<0.6	6	25	<1.1	32	16	46	630	320	960
OB02	80	3200	220	79	<29	210	84	<0.4	52	<1.1	90	44	78	780	4100	4900
OB03	49	520	510	<3.8	210	760	47	200	640	170	1600	1600	890	8100	7200	15000
OB04	100	330	1000	230	200	500	29	170	1100	99	2600	6300	14000	31000	27000	57000
OB05	980	1600	9500	3100	1000	11000	360	1800	4600	1100	7100	4600	25000	320000	71000	390000
PD01	13	<3.8	670	<3.8	170	850	47	73	170	16	450	210	190	2000	2900	4900
PD02	110	<3.8	480	200	170	1700	65	160	420	46	490	230	490	8500	4500	13000
SS01	440	820	2800	970	550	3000	240	2100	8400	560	7300	13000	2000	25000	43000	68000
SS02	66	98	530	140	170	650	27	530	1700	480	4100	13000	3100	14000	25000	39000
SS03	140	250	1000	320	230	890	38	710	5300	230	6500	19000	5100	19000	40000	59000
SH01	3	<3.8	<16.3	<3.8	<29	33	<0.6	24	110	<1.1	540	310	1400	15000	2400	17000
SH02	7900	12000	21000	14000	5100	19000	7600	8500	20000	7100	8500	6700	25000	120000	160000	280000
SH03	3900	5700	20000	9900	2400	21000	2100	7600	26000	3700	7700	17000	6500	48000	130000	180000
SH04	5600	9200	38000	15000	3800	41000	3100	3700	13000	1600	1600	630	7800	120000	140000	270000
SH05	3300	5700	18000	7500	1200	17000	1100	1900	7500	890	1400	3400	14000	54000	8200	140000