

Online Supplement to:

Transfer of additive chemicals from marine plastic debris to the stomach oil of northern fulmars

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Online Supplement Table 1. Compounds included in Targeted Sim Analyses.

Given are the abbreviated names as used in the manuscript, the full name of each compound with according CAS numbers. Further details are the detection of the compounds in either the PTX001 plastic mixture or in PS foam, the match of the compound according to the NIST library, the ions detected ranked from the most abundant one and the RT (minutes).

nr	Compound abbreviation	Compound full name	CAS	Known uses	Found in	Match %	Ions (m/z)	RT (minutes)
1	Acetophenone	Acetophenone	98-86-2	Precursor to resins/copolymers used in coatings, inks and adhesives.	PS, PTX	95;97	105, 77, 120	± 12.18
2	<i>p</i> -Benzoquinone	2,5-Cyclohexadiene-1,4-dione, 2,6-bis(1,1-dimethylethyl)	719-22-2	Used in synthesis	PTX	± 97	177, 220	± 21.63
3	Dibutylphenol	2,4-Di-tert-butylphenol	96-76-4	Antioxidant	PTX	± 98	191, 106	± 22.48
4	Propanediylbis-benzene	Benzene, 1,1'-(1,3-propanediyl)bis-	1081-75-0		PS, PTX	95;96	92, 196	± 25.30
5	Phenyl benzoate	Benzoic acid, phenyl ester	93-99-2	Preservatives used in cosmetics, film, foods	PS	± 97	105, 77, 198	± 25.41
6	TCEP	Tri(2-chloroethyl) phosphate	115-96-8	Plasticizer, flame retardant, viscosity regulator	PTX	± 93	249, 63	± 27.30
7	TCPP (3:1)	2-Propanol, 1-chloro-, phosphate (3:1)	13674-84-5	Flame retardant	PTX	± 99	125, 99, 277	± 27.95
8	BCPP	Bis(1-chloro-2-propyl)(3-chloro-1-propyl)phosphate/Bis(3-chloro-1-propyl)(1-chloro-2-propyl)phosphate			PTX	± 98	99, 157, 125, 175, 277	± 28.19
9	7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione	7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione	82304-66-3	Antioxidant	PTX	± 92	205, 217, 232	± 29.96
10	DBP	Dibutyl phthalate	84-74-2	Plasticizer	PTX	± 97	149	± 30.63
11	TPhP	Triphenyl phosphate	115-86-6	Plasticizer, flame retardant	PTX	± 96	326, 77, 170	± 37.16
12	Triphenylbenzene	Cyclohexane, 1,3,5-triphenyl	28336-57-4	Packaging migration residue. Polystyrene impurity.	PS, PTX	91;92	91, 117, 207	± 37.77
13	DEHP	Bis(2-ethylhexyl) phthalate	117-81-7	Plasticizer	PTX	± 95	149, 167, 279	± 38.96
14	Bumetrizole	Bumetrizole	3896-11-5	UV stabilizer	PTX	± 94	300, 315, 272	± 39.11
15	Di-(2-ethylhexyl) terephthalate	1,4-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	6422-86-2	Plasticizer	PTX	± 98	149, 70, 112, 279, 261, 167	± 41.37

Online Supplement Table 2. Overview on leaching behavior

Leaching behavior of 15 additives identified for this study in three different experiments. For the definition of the three treatments please see OS 3. Leaching observations for the LTE have been split in 2 phases, 0-14 days and 14 to 90 days. During the LTR no 0 day measurement was analyzed, here the changes in relation to the controls are described. Terms used to describe the graphs are our subjective interpretations of sometimes highly complex patterns. We have attempted to make this as consistent as possible. To allow readers to form their own opinions all details are specified in the graphs, the associated tables and original data (OS Table 4).

'Leach'	-> increase in relation to earlier sampling points/control
'Increase'	-> increase in control in relation to earlier sampling points/control
'Decrease'	-> decrease in relation to earlier sampling points/control
'Stable'	-> no change in relation to earlier sampling points/control
'No effect'	-> no detectable change at all
'Stable but irregular'	-> in general stable but variation in individual measurements
'Irregular'	-> moderate variation in some individual measurements
'Chaotic'	-> high variation in measurements

Substance				LTE (LongTerm Experiment)				LTR (LT Replicate)				STD (ShortTerm Detail)	
nr	Substance abbreviation	compound identified in	oil leach behaviour from	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
1	Acetophenone	PS, PTX	PTX	leach	+	stable	0	no effect	0	no effect	0	moderate leach	+
			PS	leach	+	stable	0	no effect	0	no effect	0	strong leach	+
			CON	increase	+	stable	0			stable	0	stable but irregular	0
2	<i>p</i> -Benzoquinone	PTX	PTX	leach	++	decrease	--	leach	+	decrease	--	chaotic	?
			PS	no effect	0	decrease	-	no effect	0	decrease	-	chaotic	?
			CON	increase	+	stable	0			stable	0	chaotic	?
3	Dibutylphenol	PTX	PTX	leach	+	leach	+	leach	0	leach	+	leach, irregular pattern	+
			PS	leach	+	stable	0	leach	+	stable	0	leach, irregular pattern	+
			CON	stable	0	stable	0			stable	0	stable but irregular	0
4	Propanediylbisbenzene	PS, PTX	PTX	leach	+	decrease	--	no effect	0	decrease	-	no effect	0

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			PS	no effect	0	stable	0	no effect	0	stable	0	no effect	0
			CON	stable	0	stable	0			stable	0	stable but irregular	0
5	Phenyl benzoate	PS	PTX	moderate leach	+	decrease	-	leach	+	decrease	-	no effect	0
			PS	strong leach	++	decrease	--	strong leach	++	decrease	--	strong leach	++
			CON	stable	0	stable	0			stable	0	stable	0
6	TCEP	PTX	PTX	strong leach	++	stable	0	strong leach	++	stable	0	leach irregular pattern	+
			PS	no effect	0	no effect	0	no effect	0	no effect	0	no effect	0
			CON	stable	0	stable	0			stable	0	stable	0
7	TCPP (3:1)	PTX	PTX	leach	++	stable	0	leach	++	stable	0	chaotic	?
			PS	leach	+	decrease	-	leach	+	decrease	-	chaotic	?
			CON	stable	0	stable	0			stable	0	chaotic	?
8	BCPP	PTX	PTX	leach	++	stable	0	leach	++	stable	0	chaotic	?
			PS	leach	++	moderate decrease	-	leach	++	moderate decrease	-	chaotic	?
			CON	stable	0	stable	0			stable	0	chaotic	?
9	7,9-Di-tert-butyl-etc	PTX	PTX	no effect	0	no effect	0	no effect	0	no effect	0	chaotic	?
			PS	no effect	0	no effect	0	no effect	0	no effect	0	chaotic	?
			CON	stable	0	stable	0			stable	0	chaotic	?
10	DBP	PTX	PTX	moderate leach	+	stable	0	moderate leach	+	moderate leach	+	chaotic	?
			PS	no effect	0	no effect	0	no effect	0	no effect	0	chaotic	?
			CON	stable	0	stable	0			stable	0	chaotic	?
11	TPhP	PTX	PTX	strong leach	++	slow increase	+	strong leach	++	slow increase	+	no effect	0
			PS	no effect	0	no effect	0	no effect	0	no effect	0	no effect	0
			CON	stable	0	stable	0			increase	+	chaotic	?
12	Triphenylbenzene	PS, PTX	PTX	leach	+	decrease	--	no effect	0	no effect	0	no effect	0
			PS	no effect	0	no effect	0	no effect	0	no effect	0	no effect	0
			CON	stable	0	stable	0			stable	0	chaotic	?
13	DEHP	PTX	PTX	leach	+	leach	+	leach	+	leach	+	chaotic decrease	?
			PS	leach	+	decrease	-	leach	+	decrease	-	chaotic decrease	?
			CON	stable	0	stable	0			stable	0	chaotic decrease	?
14	Bumetrizole	PTX	PTX	strong leach	++	stable	0	strong leach	++	stable	0	very rapid strong leach	++
			PS	no effect	0	no effect	0	no effect	0	no effect	0	no effect	0

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			CON	stable	0	stable	0			stable	0	stable	0
15	Di-(2-ethylhexyl)terephthalate	PTX	PTX	moderate leach	+	stable	0	moderate leach	+	stable	0	chaotic decrease	?
			PS	moderate leach	+	moderate leach	+	moderate leach	+	stable	0	chaotic decrease	?
			CON	stable	0	stable	0			stable	0	chaotic decrease	?

Online Supplement 3. Detailed graphs of each compound

Each compound detected in the two plastic types (PTX001 and PS) are discussed in detail and graphs visualize the leaching processes. Stomach oil exposure were conducted in duplicate, two bottles contained the same type and amount of plastics. These two bottles are represented as two sampling points at the same sampling time. From each of those two bottles, 3 subsamples were retrieved, indicated by the error bars of each sampling point. The connections between the sampling points show linear trendlines.

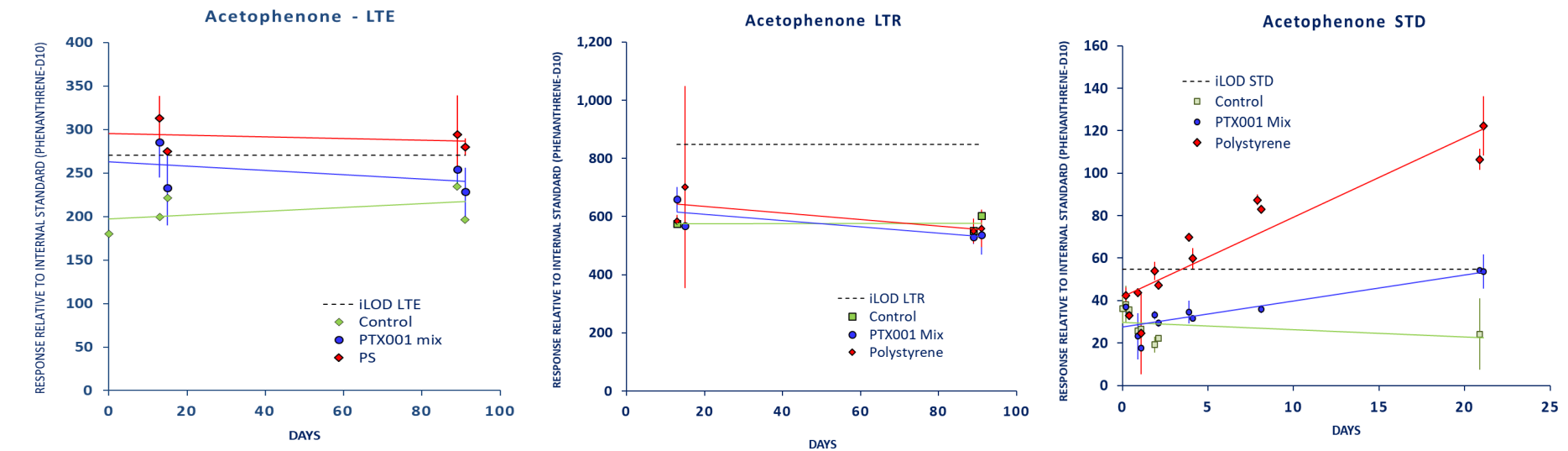
The 'long-term experiment (LTE)': Oil samples collected and analyzed on day 0 (control only), and next after 14 and 90 days, with controls repeated at both dates.

The 'short-term detailed experiment (STD)': Replicated the LTE setup, but with an adapted GC-MS analysis method (see below) and conducted over a shorter timescale. STD oil samples were taken on day 0 (control) and next after 8 hours and 1, 2, 4, 8, and 21 days. Controls were measured in the first three and last samples.

The 'long-term replicate experiment (LTR)': These analyses represented a check on the replicability of the initial and adapted GC-MS methods. The 14-day, 90-day and control samples from the LTE were re-analyzed with the adapted GC-MS method.

3.1. Acetophenone

Full name: Acetophenone
Known use: Precursor to resins/copolymers used in coatings, inks and adhesives



Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	leach	+	stable	0	no effect	0	no effect	0	moderate leach	+
PS	leach	+	stable	0	no effect	0	no effect	0	strong leach	++
Control	increase	+	stable	0			stable	0	stable but irregular	0

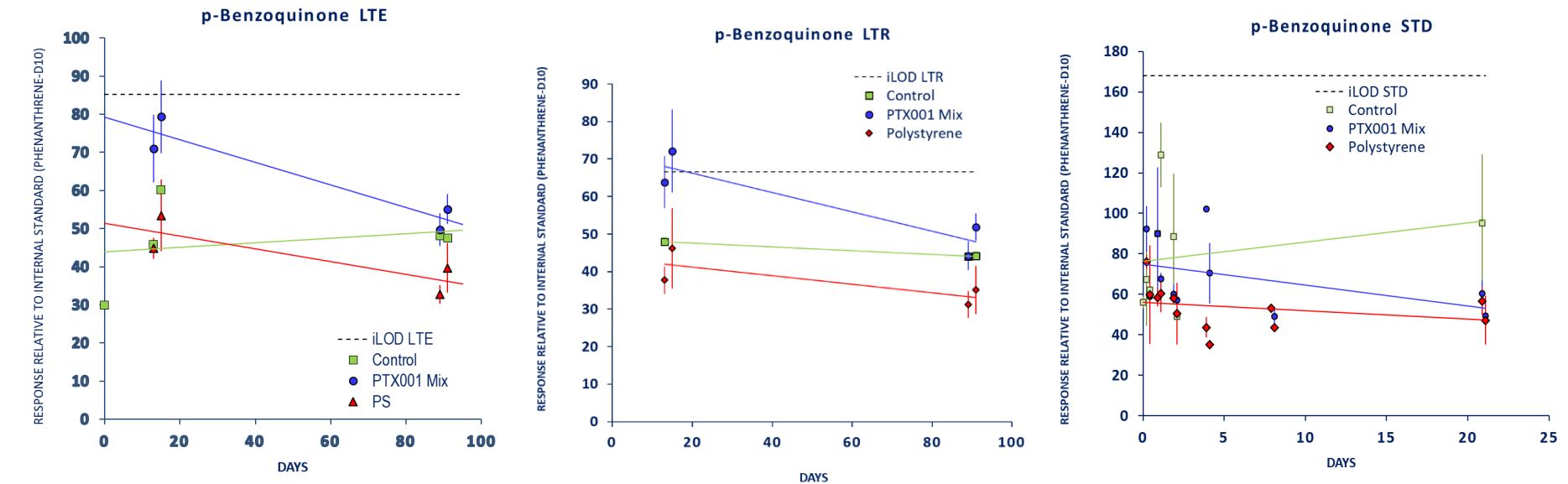
Conclusion

PTX: moderate leach in initial weeks, then stable or minor decrease (+)

PS: strong leach in initial weeks, then stable or minor decrease (++)

3.2. *p*-Benzoquinone

Full name: 2,5-Cyclohexadiene-1,4-dione, 2,6-bis(1,1-dimethylethyl)
Known use: used in polymer synthesis



Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	leach	++	decrease	--	leach	++	decrease	--	chaotic	?
PS	no effect	0	decrease	-	no effect	0	decrease	-	chaotic	?
Control	increase	+	stable	0			stable	0	chaotic	?

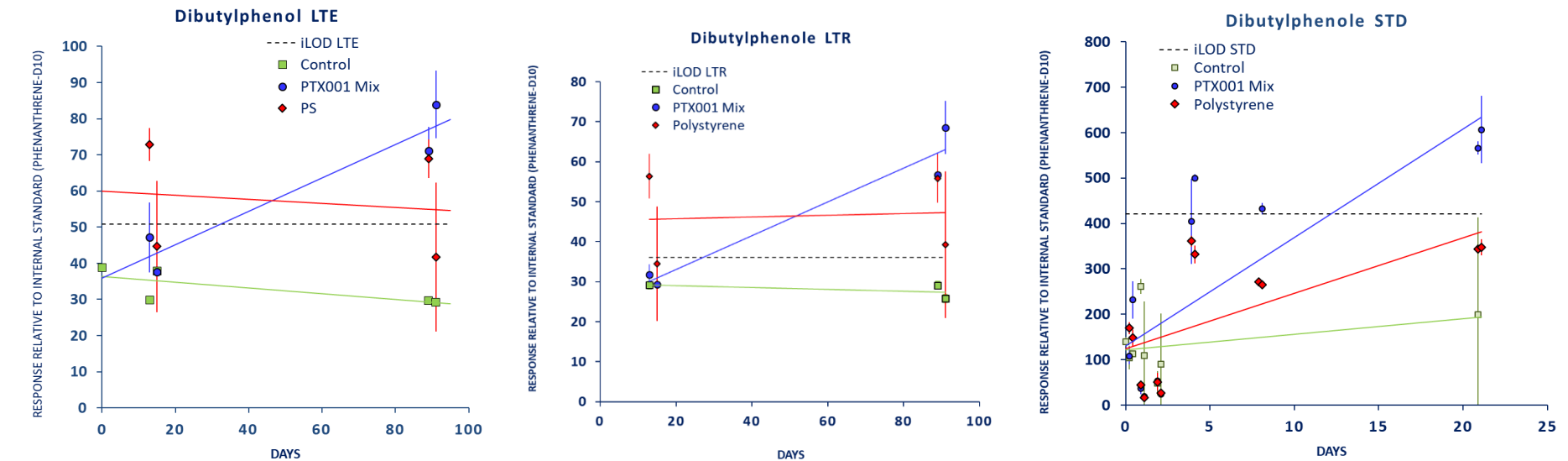
Conclusion

PTX: strong increase in initial weeks followed by disappearance at 90 days (++)

PS: no initial effect, and slightly decreasing on long term (0)

3.3. Dibutylphenol

Full name: 2,4-Di-tert-butylphenol
Known use: Antioxidant

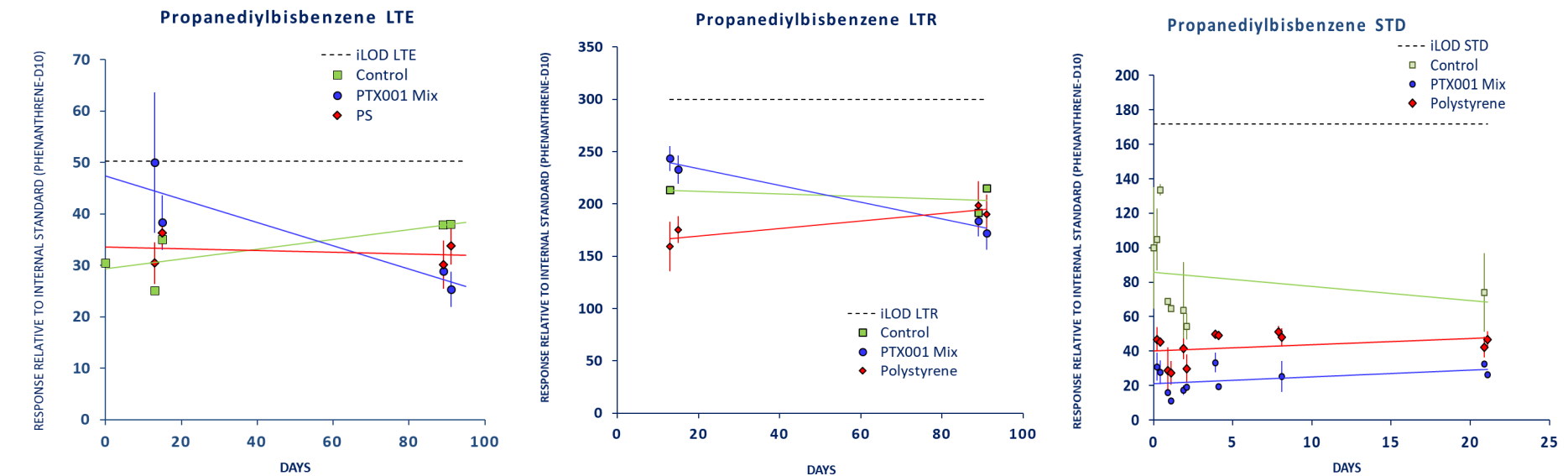


Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	leach	+	leach	++	leach	0	leach	++	leach, irregular pattern	++
PS	leach	+	stable	0	leach	+	stable	0	leach, irregular pattern	+
Control	stable	0	stable	0			stable	0	stable but irregular	0

Conclusion
PTX: persistent leaching to day 90 (++)
PS: initially leaching but not persisting on long term (+)

3.4. Propanediylbisbenzene

Full name: Benzene, 1,1'-(1,3-propanediyl)bis-
Known use: ?

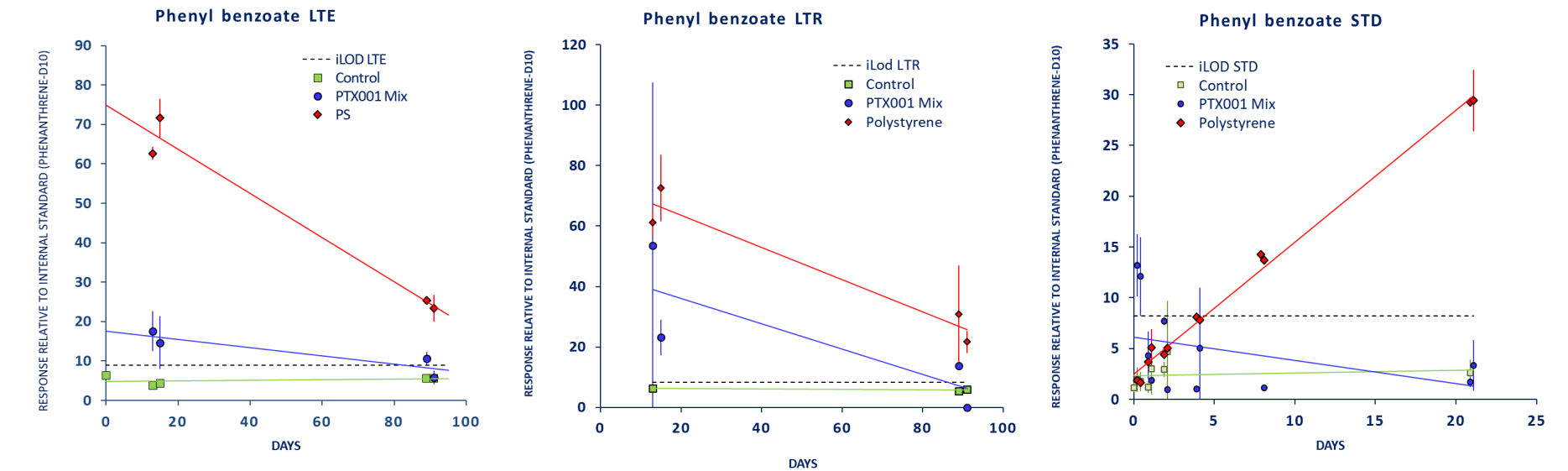


Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	leach	+	decrease	--	no effect	0	decrease	-	no effect	0
PS	no effect	0	stable	0	no effect	0	stable	0	no effect	0
Control	stable	0	stable	0			stable	0	stable but irregular	0

Conclusion
PTX: possibly light initial leach, but unclear pattern (0)
PS: no indications for leaching (0)

3.5. Phenyl benzoate

Full name: Benzoic acid, phenyl ester
Known use: Preservative used in cosmetics, films, foods

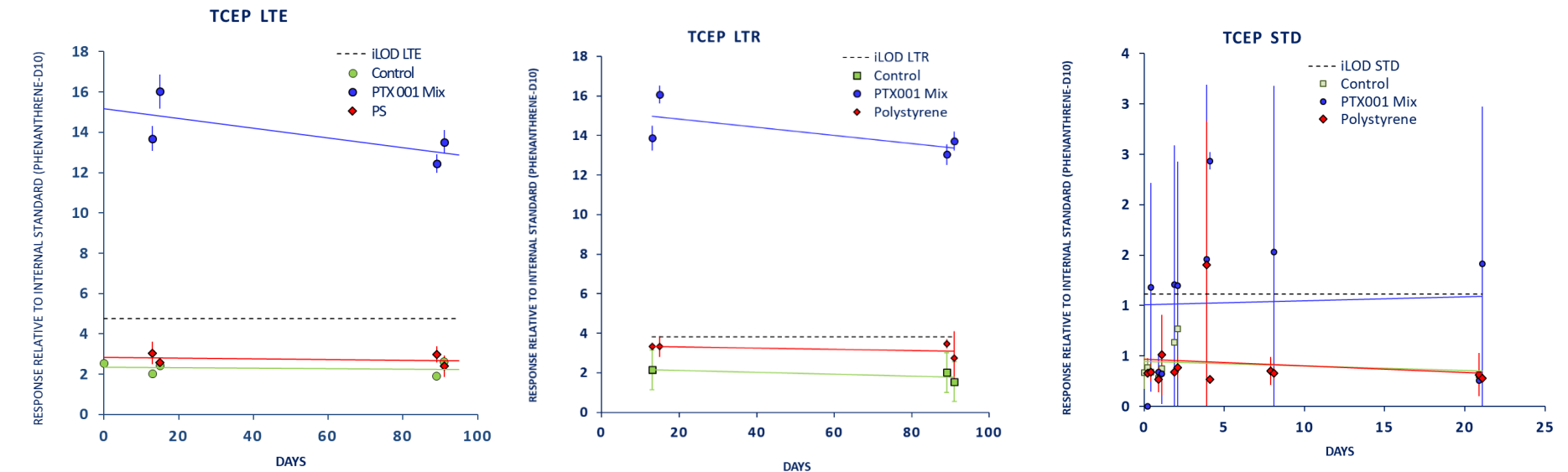


Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	moderate leach	+	decrease	-	leach	+	decrease	-	no effect	0
PS	strong leach	++	decrease	--	strong leach	++	decrease	--	strong leach	++
Control	stable	0	stable	0			stable	0	stable	0

Conclusion
PTX: possibly minor initial leach, but disappears afterwards (0)
PS: strong leaching in first few weeks, but compound then largely disappears (++)

3.6. TCEP

Full name: Tri(2-chloroethyl) phosphate
Known use: Plasticizer, flame retardant, viscosity regulator



Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	strong leach	++	stable	0	strong leach	++	stable	0	leach irregular pattern	+
PS	no effect	0	no effect	0	no effect	0	no effect	0	no effect	0
Control	stable	0	stable	0			stable	0	stable	0

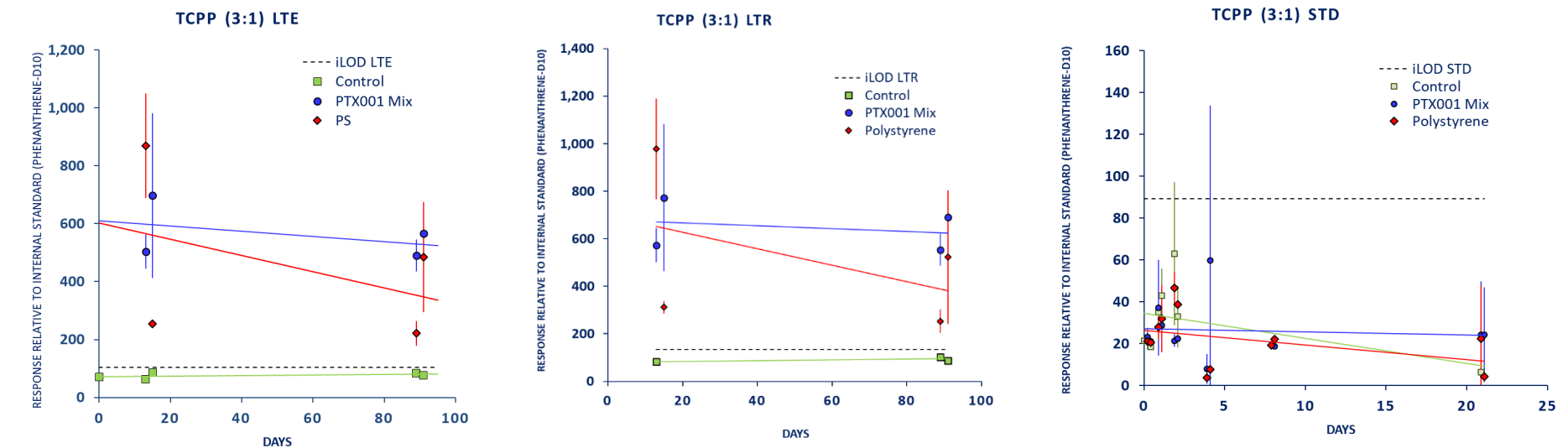
Conclusion

PTX: rapid initial leaching then more or less constant on longer term (++)

PS: no indications for leaching (0)

3.7. TCPP (3:1)

Full name: 2-Propanol, 1-chloro-, phosphate (3:1)
Known use: Flame retardant

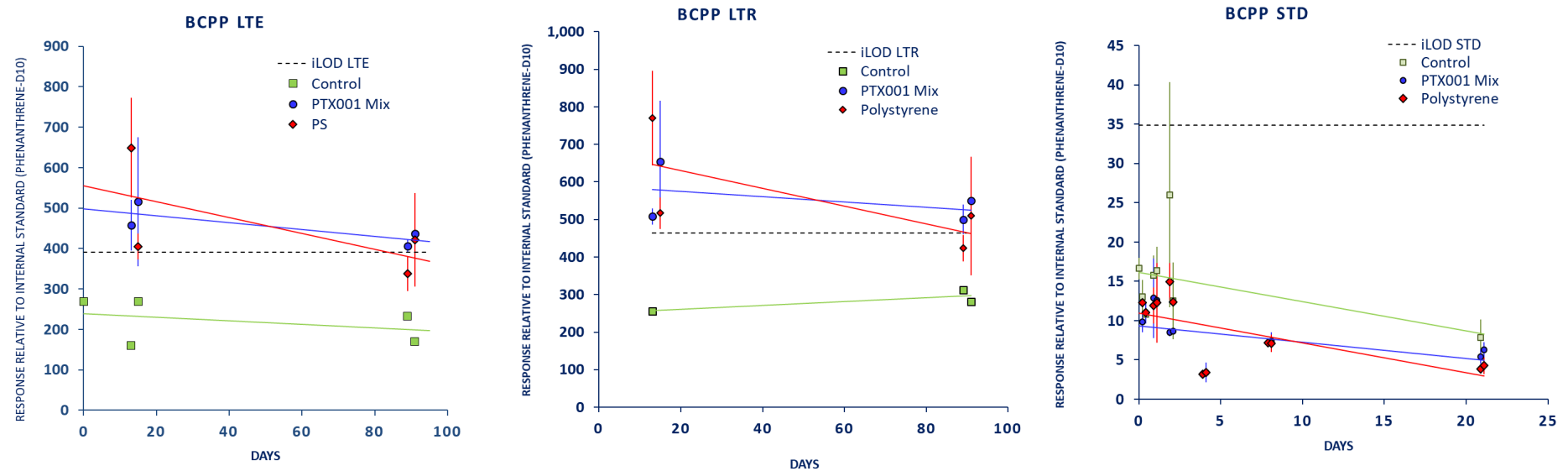


Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	leach	++	stable	0	leach	++	stable	0	chaotic	?
PS	leach	+	decrease	-	leach	+	decrease	-	chaotic	?
Control	stable	0	stable	0			stable	0	chaotic	?

Conclusion
PTX: initially leaches and remains constant on longer term (+)
PS: variable data, possibly slight initial leach but disappears (0)

3.8. BCPP

Full name: Bis(3-chloro-1-propyl)(1-chloro-2-propyl)phosphate
Known use: ?



Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	leach	++	stable	0	leach	++	stable	0	chaotic	?
PS	leach	++	moderate decrease	-	leach	++	moderate decrease	-	chaotic	?
Control	stable	0	stable	0			stable	0	chaotic	?

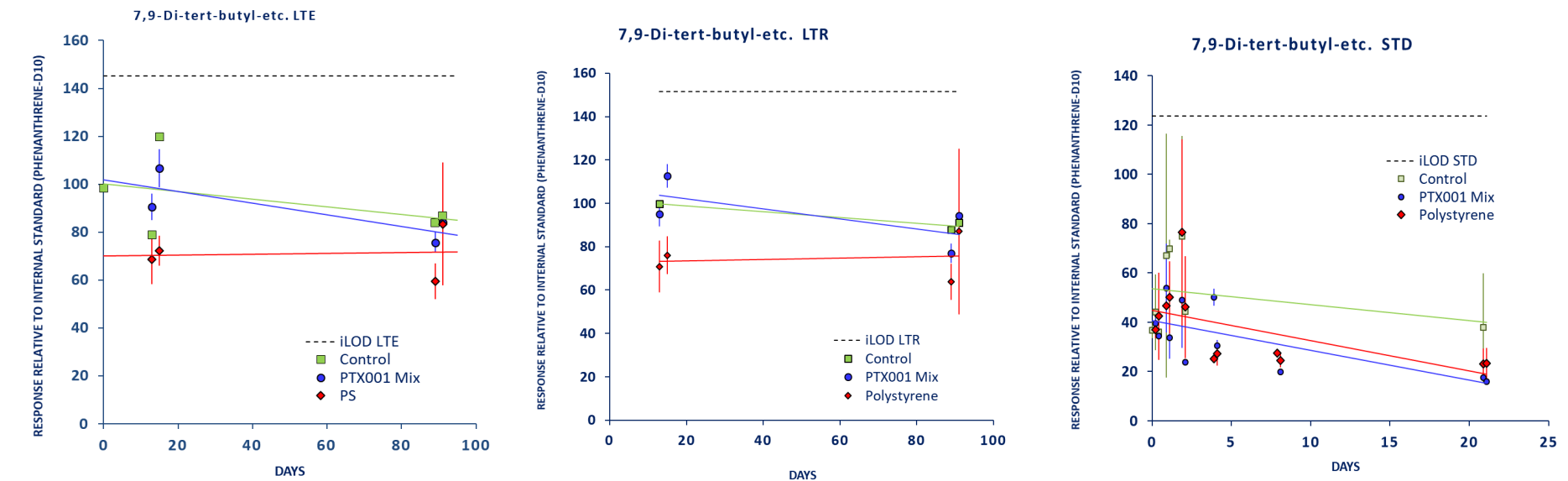
Conclusion

PTX: leaches in first weeks, but then stabilizes (++)

PS: leaches in first weeks, then slightly decreases (++)

3.9. 7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione

Full name: 7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione
Known use: anti-oxidant (degradation product)

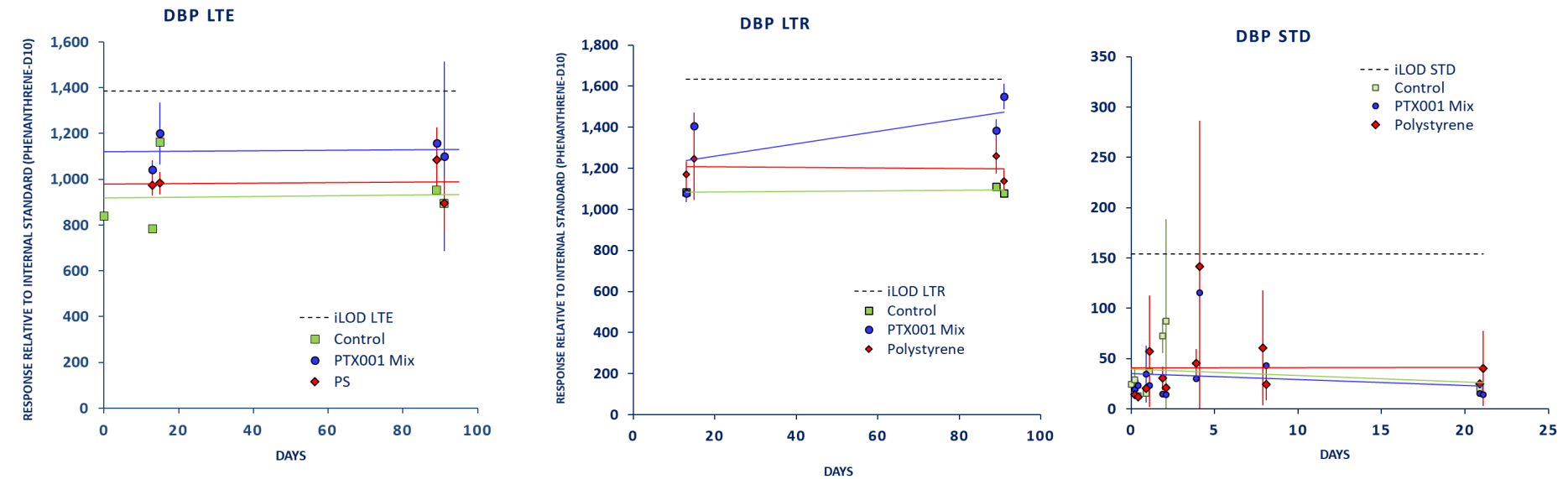


Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	no effect	0	no effect	0	no effect	0	no effect	0	chaotic	?
PS	no effect	0	no effect	0	no effect	0	no effect	0	chaotic	?
Control	stable	0	stable	0			stable	0	chaotic	?

Conclusion
PTX: no evidence for leaching (0)
PS: no evidence for leaching (0)

3.10. DBP

Full name: Dibutyl phthalate
Known use: Plasticizer

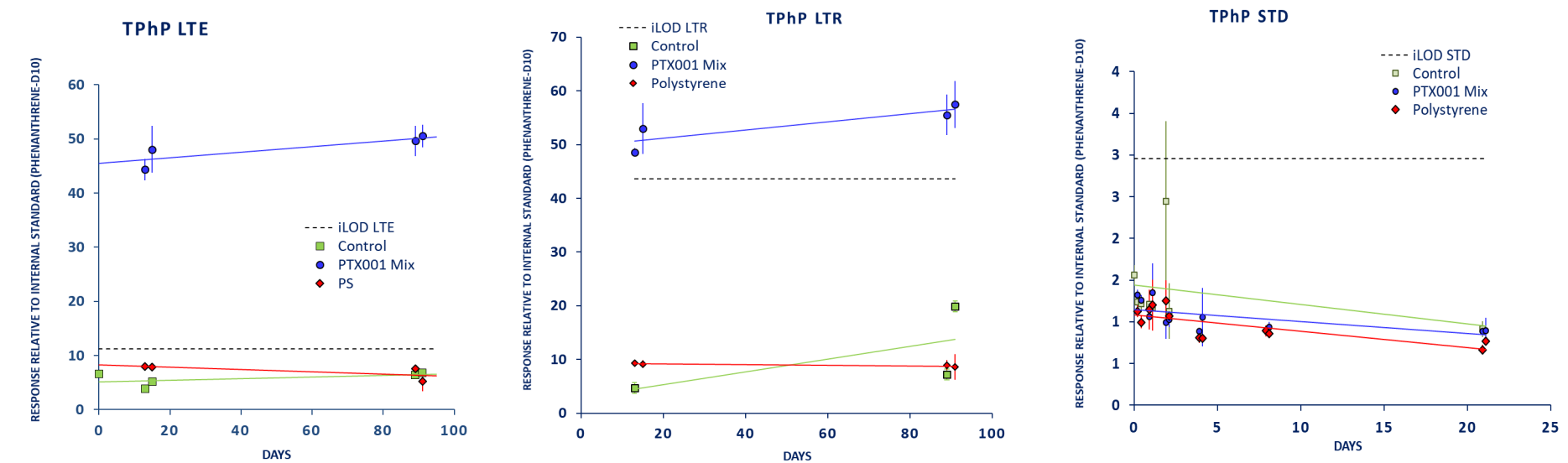


Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	moderate leach	+	stable	0	moderate leach	+	moderate leach	+	chaotic	?
PS	no effect	0	no effect	0	no effect	0	no effect	0	chaotic	?
Control	stable	0	stable	0			stable	0	chaotic	?

Conclusion
PTX: moderate leaching at most (+)
PS: no evidence of leaching (0)

3.11. TPhP

Full name: Triphenyl phosphate
Known use: Plasticizer and flame retardant



Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	strong leach	++	slow increase	+	strong leach	++	slow increase	+	no effect	0
PS	no effect	0	no effect	0	no effect	0	no effect	0	no effect	0
Control	stable	0	stable	0			increase	+	chaotic	?

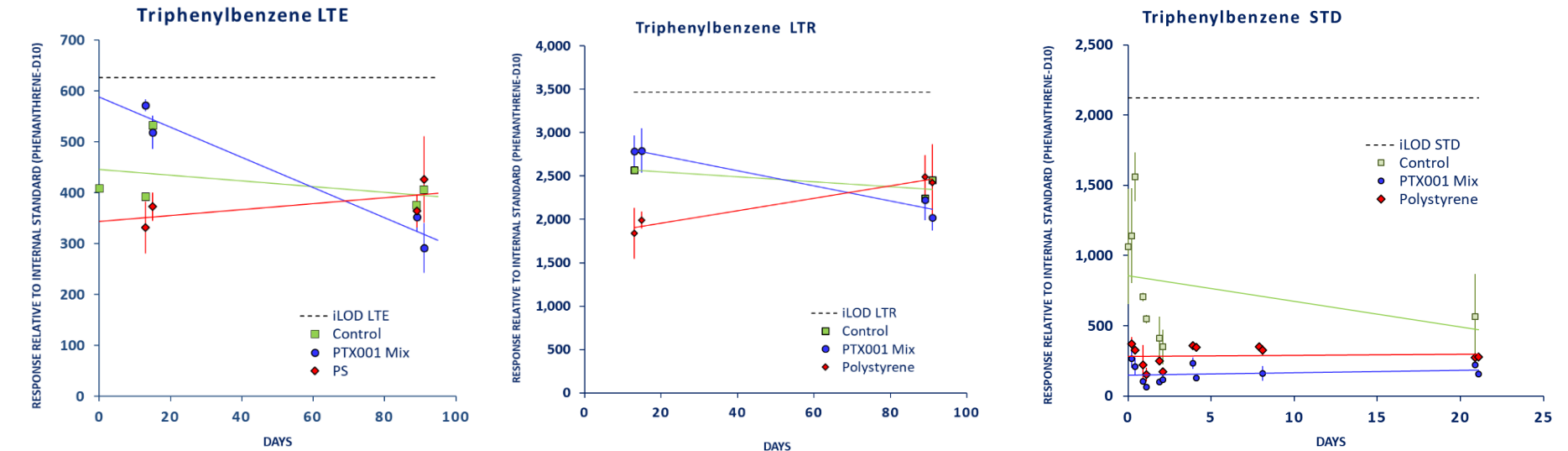
Conclusion

PTX: rapid initial leaching continues but slows down on long term (++)

PS: no evidence for leaching (0)

3.12. Triphenylbenzene

Full name: Cyclohexane, 1,3,5-triphenyl
Known use: packaging migration residue; Polystyrene impurity

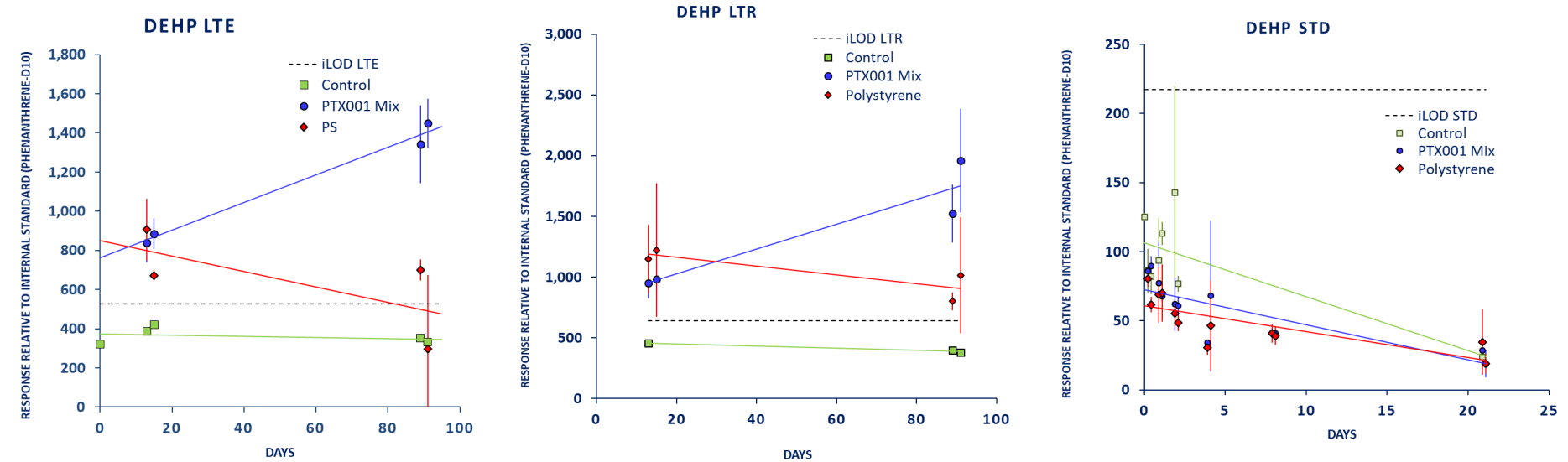


Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	leach	+	decrease	--	no effect	0	no effect	0	no effect	0
PS	no effect	0	no effect	0	no effect	0	no effect	0	no effect	0
Control	stable	0	stable	0			stable	0	chaotic	?

Conclusion
PTX: no evidence for leaching (0)
PS: no evidence for leaching (0)

3.13. DEHP

Full name: Bis(2-ethylhexyl) phthalate
Known use: Plasticizer

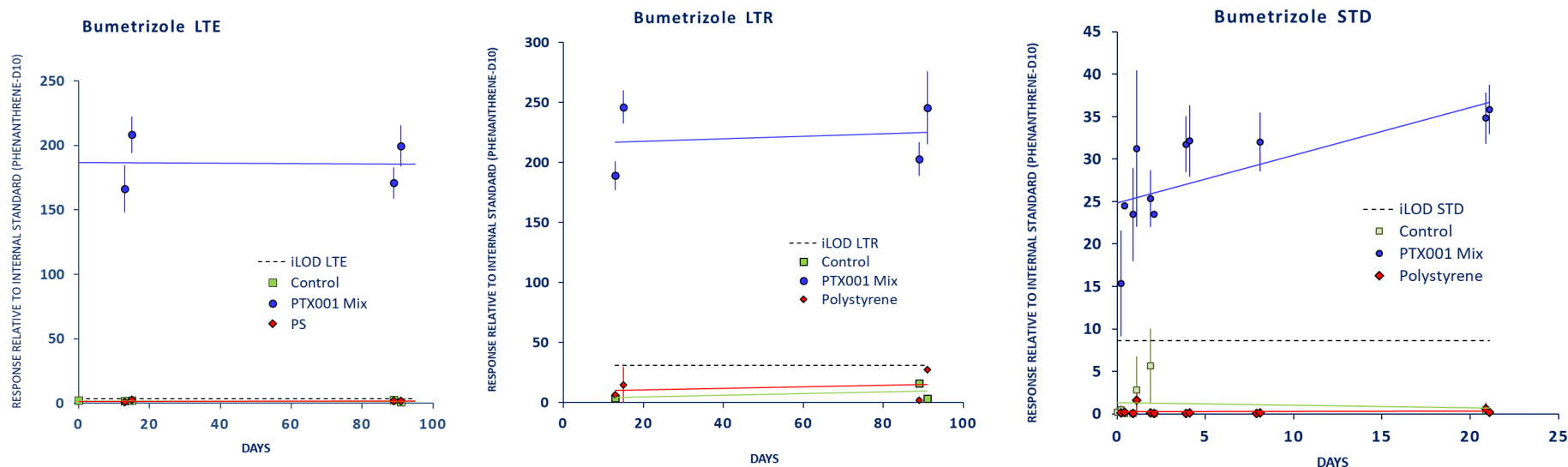


Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	leach	+	leach	+	leach	+	leach	+	chaotic decrease	?
PS	leach	+	decrease	-	leach	+	decrease	-	chaotic decrease	?
Control	stable	0	stable	0			stable	0	chaotic decrease	?

Conclusion
PTX: long term continued leaching (++)
PS: initial slight leaching, but reduces on longer term (+)

3.14. Bumetrizole

Full name: Bumetrizole
Known use: UV Stabilizer



Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	strong leach	++	stable	0	strong leach	++	stable	0	very rapid strong leach	++
PS	no effect	0	no effect	0	no effect	0	no effect	0	no effect	0
Control	stable	0	stable	0			stable	0	stable	0

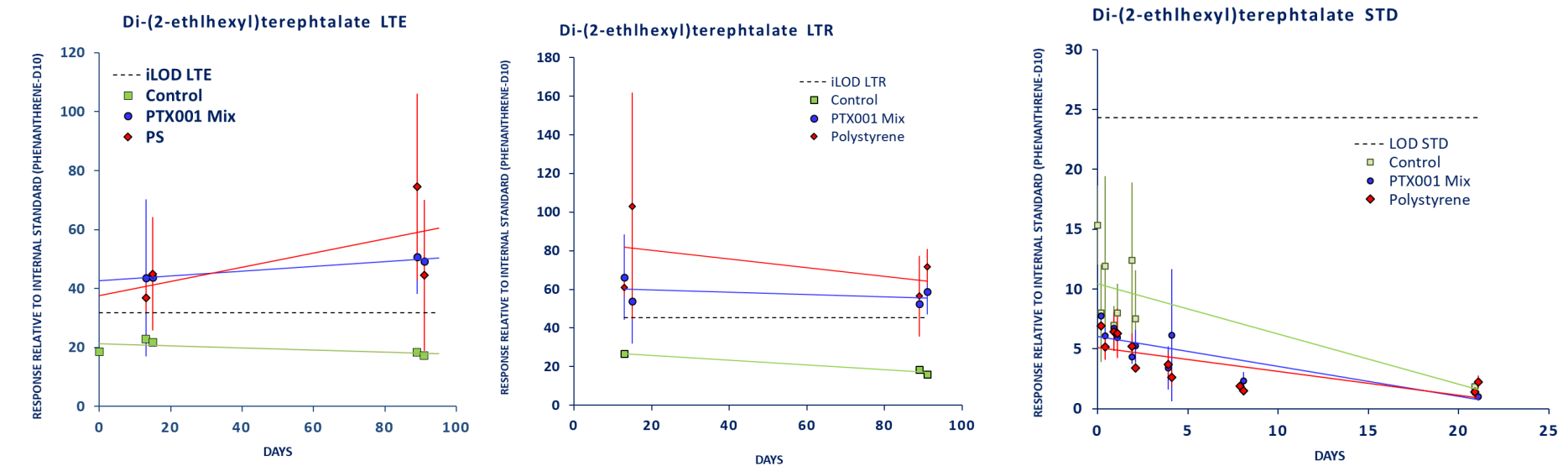
Conclusion

PTX: long term continued leaching (++)

PS: initial slight leaching, but reduces on longer term (+)

3.15. Di-(2-ethylhexyl)terephthalate

Full name: 1,4-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester
Known use: Plasticizer



Oil leach behaviour from:	LTE (Long-term Experiment)				LTR (LT Replicate)				STD (Short-term Detail)	
	0-14 day		14-90 day		14 day relative to control		14-90 day		0-21 day	
PTX	moderate leach	+	stable	0	moderate leach	+	stable	0	chaotic decrease	?
PS	moderate leach	+	moderate leach	+	moderate leach	+	stable	0	chaotic decrease	?
Control	stable	0	stable	0			stable	0	chaotic decrease	?

Conclusion

PTX: moderate leaching quickly stabilizes (+)

PS: moderate leaching unclear on longer term (+)

Online Supplement Table 4. Original data

Original data where the results and the graphs in the manuscript and the Online Supplement are based on. Replicates were sampled in parallel, therefore, sampling dates are spread over 2 days to enhance visualization. Averages (avg) and standard deviation (\pm sd) are derived from three subsamples.

1. Acetophenone

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	270	179.9					
13	270	199.2	2.91	285.3	40.71	312.7	25.56
15	270	221.2	2.19	232.9	43.41	274.7	1.72
89	270	234.5	13.78	254.0	14.55	294.5	44.78
91	270	196.3	12.81	228.3	27.79	279.8	10.06

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	848	574.9	36.70	659.0	42.29	583.6	19.98
15	848			567.4	104.16	701.1	346.11
89	848	550.9	126.23	530.1	24.26	550.3	42.01
91	848	602.8	166.85	536.3	67.49	559.3	62.56

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	55	36.2	7.03				
0.2	55	38.1	8.80	37.1	3.04	42.5	3.60
0.4	55	35.7	0.59	33.2	0.61	32.9	1.18
0.9	55	25.8	0.07	23.2	10.84	43.7	1.64
1.1	55	26.6	3.48	17.5	7.31	24.5	19.17
1.9	55	19.3	3.79	33.1	2.00	54.0	4.36
2.1	55	22.1	0.54	29.4	1.71	47.2	1.05
3.9	55			34.5	5.44	69.8	1.36
4.1	55			31.5	1.56	59.9	4.76
7.9	55					87.4	2.52
8.1	55			35.9	1.92	83.1	1.01
20.9	55	24.2	16.74	54.1	1.53	106.5	4.95
21.1	55			53.6	8.10	122.3	14.02

2. *p*-Benzoquinone

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	85	29.9	0.02				
13	85	45.9	0.00	71.0	8.91	44.9	2.73
15	85	60.3	0.01	79.3	9.50	53.5	9.40
89	85	48.1	0.00	49.8	4.26	32.7	2.51
91	85	47.5	0.00	55.1	3.93	39.7	6.55

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	67	48.0	11.18	63.8	6.99	37.7	3.58
15	67			72.1	11.11	46.2	10.61
89	67	44.0	1.83	44.2	3.89	31.2	3.55
91	67	44.2	3.27	51.9	3.58	35.1	6.32

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	168	56.0	3.03				
0.2	168	67.3	22.97	92.3	11.42	76.0	3.60
0.4	168	62.1	4.87	58.8	0.00	59.8	24.39
0.9	168	90.1	21.66	89.8	32.78	58.4	4.41
1.1	168	128.9	16.04	67.5	3.04	60.3	9.37
1.9	168	88.5	31.06	60.0	4.85	57.9	0.68
2.1	168	49.1	3.63	57.2	3.66	50.4	15.27
3.9	168			102.3	1.10	43.6	5.12
4.1	168			70.5	14.94	35.1	2.34
7.9	168					53.0	0.59
8.1	168			49.1	4.56	43.6	1.73
20.9	168	95.2	34.09	60.4	6.35	56.6	6.62
21.1	168			49.3	3.53	47.1	12.10

3. Dibutylphenol

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd

Online Supplement to: Transfer of marine plastic debris additives to the stomach oil of Northern Fulmars

0	51	38.8	0.01				
13	51	29.9	0.00	47.2	9.69	72.9	4.53
15	51	37.9	0.00	37.7	1.63	44.7	18.19
89	51	29.7	0.00	71.1	6.66	68.9	5.30
91	51	29.1	0.00	83.9	9.32	41.7	20.57

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	36	29.1	3.02	31.7	2.57	56.3	5.50
15	36			29.3	2.55	34.5	14.19
89	36	29.1	2.54	56.7	5.23	55.8	5.98
91	36	25.8	0.85	68.5	6.63	39.2	18.26

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	421	140.1	10.03				
0.2	421	104.3	25.68	108.4	17.99	169.8	13.21
0.4	421	112.7	3.22	231.6	40.92	148.2	18.28
0.9	421	261.2	16.09	36.3	12.17	44.0	1.89
1.1	421	109.6	118.20	18.9	1.22	16.0	0.11
1.9	421	48.2	26.31	52.9	15.28	51.2	19.32
2.1	421	90.0	111.36	23.9	4.33	26.0	6.18
3.9	421			404.8	93.68	361.2	12.31
4.1	421			500.2	8.56	332.2	19.64
7.9	421					271.6	5.42
8.1	421			433.0	12.90	264.9	5.62
20.9	421	199.3	214.86	566.4	14.68	343.3	2.89
21.1	421			606.8	74.40	347.3	17.96

4. Propanediylbisbenzene

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	50	30.4	0.08				

Online Supplement to: Transfer of marine plastic debris additives to the stomach oil of Northern Fulmars

13	50	25.1	0.00	50.0	13.64	30.4	4.07
15	50	35.0	0.00	38.3	5.29	36.3	2.69
89	50	37.9	0.00	28.8	2.27	30.2	4.69
91	50	37.9	0.00	25.4	3.42	33.8	3.60

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	300	213.3	48.44	243.6	11.92	159.1	23.37
15	300			232.9	13.49	175.4	12.54
89	300	191.6	12.12	183.8	15.01	198.7	22.60
91	300	214.9	9.72	171.8	15.84	189.9	18.79

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	172	99.9	35.11				
0.2	172	104.8	17.91	30.8	8.08	46.8	7.10
0.4	172	133.5	3.31	27.6	7.00	45.4	0.72
0.9	172	68.6	1.96	15.9	1.53	28.6	13.71
1.1	172	64.6	1.82	11.0	0.89	27.4	6.90
1.9	172	63.7	27.78	17.4	2.74	41.3	6.12
2.1	172	54.3	7.75	19.1	0.86	29.8	8.26
3.9	172			33.3	5.59	49.9	0.91
4.1	172			19.3	1.48	49.2	1.09
7.9	172					51.0	3.47
8.1	172			25.2	9.02	48.0	5.08
20.9	172	74.0	22.96	32.3	0.96	42.2	6.06
21.1	172			26.1	0.36	46.8	4.61

5. Phenyl benzoate

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	9	6.3	0.06				
13	9	3.7	0.00	17.5	5.10	62.6	1.64
15	9	4.3	0.00	14.6	6.71	71.6	4.92
89	9	5.7	0.00	10.6	1.80	25.4	0.64

91	9	5.6	0.00	5.8	1.69	23.4	3.40
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LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	8	6.2	0.79	53.6	54.01	61.2	4.39
15	8			23.1	5.91	72.6	10.91
89	8	5.4	1.10	13.8	0.00	30.7	16.00
91	8	6.0	0.54	0.0	0.00	21.7	3.54

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	8	1.2	0.49				
0.2	8	1.9	1.19	13.2	3.04	1.9	0.62
0.4	8	1.7	0.94	12.1	3.89	1.6	0.41
0.9	8	1.2	0.57	4.3	2.34	3.7	0.31
1.1	8	3.0	2.55	1.8	0.07	5.1	1.82
1.9	8	2.9	0.73	7.7	0.41	4.4	0.15
2.1	8	4.7	4.95	0.9	0.36	5.1	0.14
3.9	8			1.0	0.10	8.1	0.46
4.1	8			5.0	5.96	7.8	0.20
7.9	8					14.3	0.01
8.1	8			1.1	0.19	13.7	0.05
20.9	8	2.6	1.29	1.7	0.49	29.2	0.06
21.1	8			3.3	2.49	29.4	3.04

6. TCEP

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	5	2.5	0.00				
13	5	2.0	0.00	13.7	0.61	3.0	0.56
15	5	2.4	0.00	16.0	0.84	2.6	0.23
89	5	1.9	0.00	12.5	0.46	3.0	0.40
91	5	2.6	0.00	13.5	0.59	2.4	0.54

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	4	2.1	0.93	13.9	0.64	3.3	0.17
15	4			16.1	0.46	3.3	0.51
89	4	2.0	0.01	13.0	0.52	3.5	0.21
91	4	1.6	0.48	13.7	0.48	2.7	1.35

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	1	0.3	0.16				
0.2	1	0.4	0.10	0.0	0.00	0.3	0.00
0.4	1	0.3	0.04	1.2	1.04	0.3	0.09
0.9	1	0.3	0.02	0.3	0.17	0.3	0.13
1.1	1	0.4	0.08	0.3	0.30	0.5	0.40
1.9	1	0.6	0.08	1.2	1.38	0.3	0.04
2.1	1	0.8	0.54	1.2	1.23	0.4	0.11
3.9	1			1.5	1.73	1.4	1.43
4.1	1			2.4	0.09	0.3	0.01
7.9	1					0.3	0.14
8.1	1			1.5	1.65	0.3	0.05
20.9	1	0.3	0.06	0.3	0.11	0.3	0.21
21.1	1			1.4	1.56	0.3	0.00

7. TCPP

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	103	70.0	0.00				
13	103	62.9	0.00	502.9	58.94	869.4	180.45
15	103	85.5	0.00	697.0	285.09	253.9	13.58
89	103	84.2	0.00	490.8	55.47	221.1	42.47
91	103	76.0	0.00	565.7	72.63	484.0	190.43

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	135	82.2	19.99	573.5	72.32	978.7	210.42
15	135			772.6	310.19	312.2	24.98
89	135	102.9	5.86	553.9	67.82	253.3	48.43
91	135	87.4	0.24	689.6	53.28	523.3	278.43

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	89	21.4	1.98				
0.2	89	22.3	5.21	23.0	2.62	21.2	0.10
0.4	89	18.5	0.41	21.0	0.25	20.6	2.43
0.9	89	35.1	3.12	37.1	22.81	27.8	5.62
1.1	89	42.8	13.07	28.6	6.54	31.8	16.10
1.9	89	62.8	34.20	21.4	3.04	46.5	7.69
2.1	89	32.8	14.71	22.3	1.73	38.7	1.52
3.9	89			7.9	7.20	3.8	2.02
4.1	89			59.8	73.87	7.6	1.10
7.9	89					19.3	1.55
8.1	89			18.7	0.91	22.0	1.75
20.9	89	6.3	3.64	24.1	25.73	22.3	25.75
21.1	89			24.2	22.67	4.3	2.48

8. BCPP

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	390	269.0	0.06				
13	390	160.2	0.02	457.7	62.07	649.2	123.08
15	390	269.5	0.02	516.1	159.67	404.8	31.70
89	390	233.1	0.05	405.5	15.88	337.6	43.32
91	390	170.5	0.00	436.5	24.92	421.0	115.51

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd

13	464	256.6	96.64	508.1	21.73	769.7	124.92
15	464			653.9	161.68	517.0	40.99
89	464	312.5	18.63	499.9	39.43	423.3	34.16
91	464	280.7	3.87	550.0	5.35	509.3	156.35

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	35	16.6	1.37				
0.2	35	13.0	2.19	9.8	1.32	12.3	0.11
0.4	35	10.8	0.21	11.0	1.41	11.0	0.37
0.9	35	15.8	2.50	12.9	5.09	11.9	2.32
1.1	35	16.4	3.00	12.6	3.70	12.3	5.10
1.9	35	26.0	14.33	8.5	0.52	14.9	2.35
2.1	35	12.5	4.86	8.6	0.21	12.4	0.57
3.9	35			3.2	0.17	3.2	0.47
4.1	35			3.4	1.24	3.4	0.14
7.9	35					7.2	0.30
8.1	35			7.4	1.15	7.1	1.08
20.9	35	7.8	2.34	5.4	0.93	3.8	0.18
21.1	35			6.3	0.94	4.3	1.07

9. 7,9-Di-tert-butyl-1-oxaspiro(4,5)deca-6,9-diene-2,8-dione

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	145	98.3	0.00				
13	145	78.9	0.01	90.6	5.52	68.5	10.16
15	145	119.7	0.01	106.7	7.92	72.3	6.26
89	145	83.9	0.01	75.7	4.30	59.5	7.46
91	145	86.8	0.01	84.0	14.58	83.3	25.59

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	152	99.8	29.58	94.9	5.52	70.8	11.75
15	152			112.7	5.51	76.1	8.59
89	152	87.9	13.96	77.0	4.56	63.8	8.09
91	152	91.2	8.83	94.3	10.36	87.0	38.13

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	124	36.8	3.40				
0.2	124	44.0	15.42	39.6	1.95	37.0	3.39
0.4	124	36.0	3.64	34.4	3.51	42.4	17.74
0.9	124	67.0	49.44	53.8	18.08	46.7	0.49
1.1	124	69.8	3.75	33.8	8.70	50.1	14.68
1.9	124	74.9	40.63	49.1	19.53	76.4	37.74
2.1	124	44.3	11.58	23.9	1.21	46.1	20.61
3.9	124			50.1	3.45	25.2	0.11
4.1	124			30.5	2.37	27.2	4.75
7.9	124					27.4	0.43
8.1	124			19.9	0.63	24.4	2.58
20.9	124	37.8	22.14	17.5	1.09	23.2	6.16
21.1	124			16.0	0.14	23.3	6.32

10. DBP

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	1385	838.4	0.00				
13	1385	782.7	0.02	1042.1	39.23	975.1	45.63
15	1385	1161.0	0.06	1200.7	135.41	983.6	49.19
89	1385	951.3	0.11	1157.4	40.08	1085.5	141.38
91	1385	895.7	0.05	1099.4	413.94	895.4	121.65

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	1632	1084.6	297.84	1079.5	45.51	1171.4	60.53
15	1632			1407.1	63.37	1246.7	199.23
89	1632	1111.2	127.45	1385.4	53.49	1258.8	83.80
91	1632	1077.2	33.43	1549.4	61.23	1138.7	53.78

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd

0	154	24.1	0.79				
0.2	154	28.9	11.43	19.3	0.39	13.9	0.47
0.4	154	12.7	0.46	22.9	5.70	12.0	0.64
0.9	154	15.5	3.65	34.6	28.28	20.6	2.93
1.1	154	37.4	34.53	23.2	4.46	57.2	55.32
1.9	154	72.4	16.80	14.7	1.13	30.3	11.80
2.1	154	87.3	101.32	14.2	2.26	20.9	1.10
3.9	154			29.9	2.80	45.4	13.74
4.1	154			115.4	29.65	141.5	144.77
7.9	154					60.5	57.41
8.1	154			42.8	1.00	24.2	15.66
20.9	154	20.0	5.05	15.4	2.73	25.0	2.98
21.1	154			14.1	2.40	40.2	37.46

11. TPhP

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	11	6.6	0.00				
13	11	3.9	0.00	44.3	2.02	8.0	0.41
15	11	5.2	0.00	48.1	4.31	7.8	0.36
89	11	6.4	0.00	49.6	2.82	7.6	0.20
91	11	6.8	0.00	50.6	2.07	5.2	1.85

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	44	4.7	0.80	48.6	0.80	9.3	0.45
15	44			52.9	4.75	9.2	0.68
89	44	7.2	2.68	55.5	3.80	8.9	0.86
91	44	19.9	21.49	57.5	4.36	8.6	2.32

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	3	1.6	0.12				
0.2	3	1.2	0.05	1.3	0.07	1.1	0.07

0.4	3	1.2	0.10	1.3	0.06	1.0	0.07
0.9	3	1.2	0.09	1.1	0.04	1.1	0.24
1.1	3	1.2	0.18	1.3	0.35	1.2	0.31
1.9	3	2.4	0.96	1.0	0.19	1.3	0.24
2.1	3	1.1	0.33	1.0	0.09	1.1	0.03
3.9	3			0.9	0.00	0.8	0.07
4.1	3			1.1	0.35	0.8	0.02
7.9	3					0.9	0.07
8.1	3			0.9	0.06	0.9	0.05
20.9	3	0.9	0.10	0.9	0.04	0.7	0.06
21.1	3			0.9	0.15	0.8	0.01

12. Triphenylbenzene

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	626	407.9	0.56				
13	626	391.7	0.05	572.4	11.98	331.5	51.21
15	626	532.8	0.01	519.1	32.73	372.7	27.93
89	626	376.1	0.04	352.6	30.17	364.6	32.79
91	626	405.8	0.04	291.5	48.97	425.8	84.85

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	3464	2569.0	505.56	2783.8	183.96	1838.8	289.65
15	3464			2793.3	253.83	1992.4	93.00
89	3464	2242.8	203.55	2227.2	235.65	2489.8	244.30
91	3464	2451.2	127.41	2020.8	151.00	2422.2	440.42

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	2121	1063.3	409.95				
0.2	2121	1140.1	337.15	265.2	65.23	371.8	48.84
0.4	2121	1560.4	174.17	209.2	62.19	327.1	19.73

0.9	2121	704.5	28.98	102.6	23.30	221.8	139.28
1.1	2121	547.3	29.24	64.0	9.24	152.3	49.36
1.9	2121	410.6	155.36	98.7	14.37	247.4	19.40
2.1	2121	348.6	121.86	117.2	3.05	173.8	26.70
3.9	2121			232.8	42.09	358.6	8.71
4.1	2121			126.6	11.26	345.9	21.37
7.9	2121					352.2	11.81
8.1	2121			159.4	52.29	325.9	38.22
20.9	2121	563.4	306.54	218.9	1.71	272.1	16.72
21.1	2121			155.6	18.35	276.7	28.34

13. DEHP

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	528	319.9	0.48				
13	528	384.6	0.11	837.7	97.84	906.9	157.38
15	528	418.7	0.03	885.4	78.60	672.6	26.85
89	528	351.2	0.01	1342.1	199.26	700.0	54.72
91	528	330.7	0.00	1449.8	124.15	297.0	376.51

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	642	457.3	111.68	951.7	125.18	1149.9	279.43
15	642			984.0	92.98	1222.2	547.57
89	642	398.4	8.71	1522.5	236.57	801.0	70.58
91	642	380.1	11.91	1959.3	426.14	1015.3	473.53

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	217	125.1	2.96				
0.2	217	86.3	15.86	86.2	2.10	80.3	5.45
0.4	217	82.2	12.86	89.7	7.02	61.6	5.55
0.9	217	93.8	30.43	77.5	29.15	69.0	19.91
1.1	217	113.1	8.31	67.7	15.59	70.1	20.85
1.9	217	142.5	77.80	61.9	19.44	55.1	9.24
2.1	217	76.8	5.83	60.9	6.98	48.5	5.76

3.9	217			34.1	0.79	30.5	5.22
4.1	217			67.9	55.00	46.4	32.74
7.9	217					40.8	6.73
8.1	217			40.8	1.55	38.9	6.23
20.9	217	23.7	4.75	28.6	7.50	34.6	23.72
21.1	217			18.8	9.89	19.0	7.04

14. Bumetrizole

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	4	2.1	0.51				
13	4	1.4	0.00	166.2	18.29	0.9	0.14
15	4	1.9	0.00	208.2	14.28	2.8	1.14
89	4	2.3	0.00	170.8	12.26	1.8	0.52
91	4	0.7	0.00	199.7	16.08	1.9	1.76

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	31	4.0	1.96	188.9	11.86	6.3	0.97
15	31			246.0	13.87	14.6	15.32
89	31	16.0	12.51	202.7	13.99	2.2	1.27
91	31	3.2	1.50	245.5	30.40	27.4	2.19

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	9	0.2	0.18				
0.2	9	0.5	0.55	15.3	6.22	0.1	0.16
0.4	9	0.0	0.01	24.5	0.44	0.2	0.18
0.9	9	0.1	0.06	23.5	5.48	0.0	0.01
1.1	9	2.8	3.94	31.2	9.21	1.6	1.37
1.9	9	5.6	4.36	25.4	3.36	0.1	0.07
2.1	9	0.1	0.10	23.5	0.30	0.1	0.05
3.9	9			31.8	3.30	0.1	0.06

4.1	9			32.1	4.24	0.1	0.06
7.9	9					0.1	0.02
8.1	9			32.0	3.46	0.1	0.10
20.9	9	0.4	0.55	34.8	2.99	0.6	0.66
21.1	9			35.8	2.91	0.2	0.24

15. Di-(2-ethylhexyl)terephthalate

LTE

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	32	18.5	0.00				
13	32	22.9	0.00	43.6	26.63	36.8	5.05
15	32	21.7	0.00	43.9	14.10	44.9	19.24
89	32	18.3	0.01	50.7	12.58	74.5	31.64
91	32	17.2	0.00	49.2	8.43	44.5	25.64

LTR

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
13	45	26.6	6.01	66.3	21.98	61.0	4.01
15	45			53.7	21.89	102.9	58.68
89	45	18.4	12.60	52.4	11.03	56.5	20.82
91	45	15.9	0.95	58.8	11.84	71.7	9.05

STD

Days	iLOD	Control		PTX001 mix		PS foam	
		avg	±sd	avg	±sd	avg	±sd
0	24	15.3	3.30				
0.2	24	8.0	4.07	7.7	0.35	6.9	0.10
0.4	24	11.9	7.53	6.1	0.61	5.2	1.06
0.9	24	7.0	1.60	6.7	0.14	6.4	1.62
1.1	24	8.0	2.44	5.9	0.83	6.3	2.08
1.9	24	12.4	6.53	4.3	0.57	5.2	1.03
2.1	24	7.5	4.09	5.2	1.36	3.4	0.34
3.9	24			3.4	1.83	3.7	0.97
4.1	24			6.2	5.52	2.6	0.70
7.9	24					1.9	0.28
8.1	24			2.3	0.75	1.5	0.11

20.9	24	1.9	0.02	1.4	0.41	1.4	0.65
21.1	24			1.0	0.34	2.2	0.54

Online Supplement Table 5. Additives detected in PTX001 microplastic mixture during initial analysis (Kühn et al. 2018).

Reproduced from: Kühn S, van Oyen A, Booth AM, Meijboom A, van Franeker JA (2018) Marine microplastic: Preparation of relevant test materials for laboratory assessment of ecosystem impacts. Chemosphere 213: 103-113 doi <https://doi.org/10.1016/j.chemosphere.2018.09.032>

Compound Name	CAS No.	Common Name/Abbreviation	Percentage match (NIST)	Comments
1,2,4-trimethylbenzene	95-63-6	Pseudocumene	80	Possible source from printing inks
1-Pentene, 4,4-dimethyl-1,3-diphenyl-1-(trimethylsilyloxy)-	n/a	n/a	83	
1-(4-methylphenyl)pentan-1-one	1671-77-8	4'-methyl valerophenone	81	
1-(1'-pyrrolidinyl)-2-butanone	n/a	n/a	80	
2,4-Di-tert-butylphenol	96-76-4	2,6-DTBP	91	UV stabiliser and antioxidant
2,4-dimethyldecane	2801-84-5	n/a	84	Linked to production of tributylphosphate plasticiser
Tri(2-chloroethyl) phosphate	115-96-8	TCEP	84	Flame retardant, plasticiser and viscosity regulator
3,7-dimethylnonane	17302-32-8	n/a	81	
Tris(2-chloro-1-methylethyl) phosphate	13674-84-5	TCPP	93	Flame retardant
Bis(3-chloro-1-propyl)(1-chloro-2-propyl)phosphate	137888-35-8	n/a	86	Flame retardant
Dibutyl phthalate	84-74-2	DBP	94	Plasticiser or possible printing ink
Triphenyl phosphate	115-86-6	TPhP	87	Plasticiser and flame retardant
2-Ethylhexyl diphenyl phosphate	1241-94-7	Octicizer	80	Plasticiser and flame retardant
Phthalic acid, di(6-methylhept-2-yl) ester	n/a	n/a	80	Plasticiser
Dicyclohexyl phthalate	84-61-7	Morflex® 150	84	Plasticiser and UV stabiliser
Bis(2-ethylhexyl) phthalate	117-81-7	DEHP	96	High volume production plasticiser

Diisooctyl phthalate	27554-26-3	DIOP	93	High volume production plasticiser or possible printing ink. Also used as glue in PU- PVA-based colour binders
5-methyl-2-phenyl-1H-indole	13228-36-9	n/a	80	Indoline substances are used as colorants
2-tert-Butyl-6-(5-chloro-2H-benzotriazol-2-yl)-4-methylphenol	3896-11-5	Bumetrizole	86	Antioxidant used to slow the oxidation process of the polymer exposed to UV light.
1,4-Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	6422-86-2	Dioctyl terephthalate	92	Non-phthalate plasticiser used in PVC, PMMA and PS.
(Z)-9-Octadecenamide	301-02-0	Oleamide	80	Lubricant in PE and PP manufacture

Online Supplement Table 6. Additive properties

Chemical properties and estimated biodegradability, bioaccumulation and biotransformation rates according to BIOWIN.

nr	CAS number	Substance short name	Mw (g/mol)	log <i>K</i> _{ow}	Ready biodegrada- bility	BC (L/kg wet weight)	Biotrans- formation half-life (days)*
1	98-86-2	Acetophenone	120	1.58	Yes	1.33	0.1
2	719-22-2	<i>p</i> -Benzoquinone	220	4.42	No	383	0.9
3	96-76-4	Dibutylphenol	206	5.19	No	740	2
4	1081-75-0	Propanediylbisbenzene	196	3.43	No	85	0.2
5	93-99-2	Phenyl benzoate	198	3.59	Yes	107	0.08
6	115-96-8	TCEP	285	1.44	No	0.62	0.06
7	13674-84-5	TCPP (3:1)	327	2.59	No	3.6	0.1
8	137888-35-8	BCPP	327	2.96*	No	6.2	0.2
9	82304-66-3	7,9-Di- <i>tert</i> -butyl-1-oxaspiro(4,5) deca-6,9-diene-2,8-dione	276	3.55*	No	103	0.3
10	84-74-2	DBP	278	4.5	Yes	433	0.09
11	115-86-6	TPhP	326	4.59	No	74	0.2
12	28336-57-4	Triphenylbenzene	312	8.08*	No	3940	3
13	117-81-7	DEHP	390	7.6	Yes	1712	0.7
14	3896-11-5	Bumetrizole	315	5.55*	No	1283	3
15	6422-86-2	Di-(2-ethylhexyl)terephthalate	390	8.39*	Yes	701	1
*Estimates. Source: US EPA (2012) Estimation Programs Interface Suite™ for Microsoft®. Windows, v 4.11. United States Environmental Protection Agency, Washington, DC, USA							