

Experiment Number: Multiple

Test Type: TOX

Route: Oral Gavage

Species/Strain: Rat/Harlan Sprague Dawley

C Number:

Multiple

Study Gender:

Male

R07X: Hormone Summary

Test Compound: Flame Retardants

CAS Number: N/A

Date Report Requested: 04/17/2019

Time Report Requested: 08:52:54

Lab: NTP

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Thyroid Stimulating Hormone (ng/mL)

Treatment Groups (umol/kg)

Test Article	0	0.1	1	10	100	1000
PBDE-47	13.9 ± 1.9 (5)	18.5 ± 3.1 (6)	18.8 ± 2.4 (5)	19.3 ± 3.0 (6)	13.4 ± 1.5 (6)	18.1 ± 1.5 (6)
decaBDE	16.0 ± 0.8 (6)	23.5 ± 1.3 (6) *	18.1 ± 1.8 (6)	18.9 ± 2.0 (6)	16.7 ± 3.0 (5)	18.6 ± 3.3 (6)
HBCD	20.8 ± 4.0 (5)	21.4 ± 2.7 (6)	18.4 ± 4.4 (6)	20.3 ± 2.9 (6)	28.5 ± 5.8 (5)	26.3 ± 3.0 (5)
TBB	13.6 ± 1.7 (5) *	11.1 ± 0.8 (6)	19.3 ± 2.1 (6)	17.1 ± 1.9 (6)	13.4 ± 1.7 (6)	22.2 ± 3.3 (6)
TBPH	20.1 ± 2.9 (5)	21.0 ± 2.8 (6)	23.6 ± 2.3 (6)	25.5 ± 3.0 (6)	32.0 ± 3.4 (5)	21.3 ± 2.5 (6)
TBBPA-DBPE	30.7 ± 3.7 (6)	24.5 ± 2.8 (5)	22.6 ± 2.8 (6)	22.6 ± 2.1 (6)	25.4 ± 3.4 (6)	21.5 ± 2.1 (6)
BTBPE	18.7 ± 2.6 (6)	18.2 ± 2.2 (6)	18.0 ± 3.0 (6)	17.7 ± 2.3 (6)	19.3 ± 3.6 (6)	18.9 ± 2.5 (5)
DBDPE	20.2 ± 3.8 (6)	16.6 ± 2.0 (6)	17.0 ± 1.5 (6)	20.1 ± 3.2 (5)	25.3 ± 3.4 (6)	21.3 ± 5.3 (5)
HCDBCO	18.5 ± 3.3 (6) *	15.7 ± 1.3 (5)	19.9 ± 4.6 (6)	21.0 ± 4.4 (6)	26.3 ± 4.3 (6)	27.3 ± 3.5 (6)

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Triiodothyronine (ng/dL)

Treatment Groups (umol/kg)

Test Article	0	0.1	1	10	100
PBDE-47	135.833 ± 8.490 (6) **	120.083 ± 3.097 (6)	124.000 ± 9.076 (5)	125.917 ± 5.214 (6)	85.383 ± 7.547 (6) **
decaBDE	138.833 ± 11.871 (6)	128.333 ± 13.720 (6)	131.500 ± 6.707 (6)	113.567 ± 11.678 (6)	121.450 ± 9.219 (6)
HBCD	143.300 ± 8.876 (5)	119.933 ± 11.640 (6)	134.717 ± 11.725 (6)	137.983 ± 11.817 (6)	119.240 ± 15.161 (5)
TBB	124.920 ± 12.435 (5) **	131.083 ± 4.392 (6)	129.717 ± 14.276 (6)	128.617 ± 10.423 (6)	103.233 ± 9.201 (6)
TBPH	155.700 ± 8.408 (5)	136.500 ± 5.509 (6)	150.167 ± 8.711 (6)	156.583 ± 11.498 (6)	143.900 ± 11.596 (5)
TBBPA-DBPE	135.917 ± 3.857 (6)	146.400 ± 7.748 (5)	157.400 ± 7.412 (5)	160.000 ± 13.388 (6)	140.250 ± 6.612 (6)
BTBPE	148.417 ± 13.900 (6)	129.833 ± 5.986 (6)	138.683 ± 11.890 (6)	139.917 ± 7.532 (6)	139.833 ± 13.907 (6)
DBDPE	156.583 ± 4.997 (6)	155.333 ± 6.712 (6)	150.917 ± 8.371 (6)	147.583 ± 11.339 (6)	165.333 ± 5.510 (6)
HCDBCO	150.833 ± 8.444 (6)	145.400 ± 5.008 (5)	134.583 ± 9.805 (6)	149.917 ± 10.804 (6)	143.000 ± 8.531 (6)

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Triiodothyronine (ng/dL)

Treatment Groups (umol/kg)

Test Article	1000
PBDE-47	96.133 ± 4.413 (6) **
decaBDE	141.500 ± 6.269 (6)
HBCD	109.425 ± 11.178 (4)
TBB	72.017 ± 3.069 (6) **
TBPH	122.217 ± 6.395 (6)
TBBPA-DBPE	148.000 ± 8.779 (6)
BTBPE	146.740 ± 7.846 (5)
DBDPE	156.000 ± 6.907 (5)
HCDBCO	131.083 ± 7.237 (6)

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Free Thyroxine (ng/dL)						
Treatment Groups (umol/kg)						
Test Article	0	0.1	1	10	100	1000
PBDE-47	1.840 ± 0.261 (6) **	1.573 ± 0.133 (6)	1.320 ± 0.075 (6)	1.573 ± 0.082 (6)	0.365 ± 0.023 (6) **	0.315 ± 0.027 (6) **
decaBDE	2.253 ± 0.187 (6)	2.077 ± 0.164 (6)	2.075 ± 0.144 (6)	2.253 ± 0.205 (6)	2.365 ± 0.202 (6)	2.025 ± 0.184 (6)
HBCD	1.918 ± 0.352 (5)	1.682 ± 0.148 (6)	1.882 ± 0.065 (6)	1.913 ± 0.273 (6)	1.752 ± 0.123 (5)	1.543 ± 0.207 (6)
TBB	2.188 ± 0.289 (5)	1.545 ± 0.160 (6)	1.743 ± 0.067 (6)	2.350 ± 0.190 (6)	2.223 ± 0.172 (6)	0.743 ± 0.095 (6) **
TBPH	2.104 ± 0.217 (5)	1.822 ± 0.146 (6)	1.797 ± 0.071 (6)	2.048 ± 0.135 (6)	2.123 ± 0.208 (6)	1.932 ± 0.143 (6)
TBBPA-DBPE	2.143 ± 0.149 (6) **	2.057 ± 0.117 (6)	2.028 ± 0.125 (6)	2.027 ± 0.155 (6)	1.750 ± 0.185 (6)	1.575 ± 0.127 (6) *
BTBPE	1.387 ± 0.147 (6)	1.530 ± 0.108 (6)	1.788 ± 0.250 (6)	1.320 ± 0.090 (6)	1.377 ± 0.105 (6)	1.317 ± 0.151 (6)
DBDPE	1.667 ± 0.150 (6)	1.802 ± 0.211 (6)	1.685 ± 0.112 (6)	1.898 ± 0.170 (6)	1.758 ± 0.146 (6)	1.764 ± 0.143 (5)
HCDBCO	1.407 ± 0.082 (6)	1.544 ± 0.169 (5)	1.333 ± 0.134 (6)	1.623 ± 0.138 (6)	1.268 ± 0.049 (6)	1.322 ± 0.087 (6)

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Total Thyroxine (ug/dL)						
Treatment Groups (umol/kg)						
Test Article	0	0.1	1	10	100	1000
PBDE-47	5.77 ± 0.63 (6) **	5.77 ± 0.35 (6)	5.00 ± 0.27 (6)	5.94 ± 0.28 (5)	1.48 ± 0.10 (6) **	0.80 ± 0.08 (4) **
decaBDE	5.95 ± 0.31 (6)	6.04 ± 0.19 (5)	5.85 ± 0.44 (6)	6.37 ± 0.30 (6)	6.35 ± 0.28 (6)	5.74 ± 0.19 (5)
HBCD	5.80 ± 0.73 (5)	5.18 ± 0.26 (6)	5.70 ± 0.30 (6)	5.98 ± 0.63 (6)	5.67 ± 0.31 (6)	4.40 ± 0.34 (6)
TBB	5.80 ± 0.40 (5)	5.67 ± 0.28 (6)	5.83 ± 0.20 (6)	7.02 ± 0.71 (6)	6.52 ± 0.47 (5)	3.38 ± 0.34 (5)
TBPH	6.15 ± 0.38 (6)	6.23 ± 0.30 (6)	5.80 ± 0.35 (6)	6.00 ± 0.31 (6)	6.18 ± 0.40 (6)	5.45 ± 0.48 (6)
TBBPA-DBPE	7.10 ± 0.43 (6) **	6.18 ± 0.29 (6)	5.97 ± 0.30 (6)	5.77 ± 0.33 (6)	6.40 ± 0.58 (6)	5.23 ± 0.20 (6) **
BTBPE	5.67 ± 0.22 (6) **	6.40 ± 0.23 (6)	6.10 ± 0.43 (6)	5.68 ± 0.13 (6)	5.23 ± 0.29 (6)	5.02 ± 0.21 (6)
DBDPE	6.43 ± 0.37 (6)	6.62 ± 0.66 (6)	6.43 ± 0.38 (6)	6.67 ± 0.29 (6)	6.48 ± 0.24 (6)	6.58 ± 0.28 (6)
HCDBCO	5.17 ± 0.27 (6)	5.52 ± 0.50 (6)	4.93 ± 0.31 (6)	5.60 ± 0.33 (6)	5.05 ± 0.25 (6)	4.88 ± 0.18 (6)

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LEGEND

Data are displayed as mean \pm SEM (N) unless otherwise noted

Statistical analysis performed by Jonckheere (trend) and Shirley or Dunn (pairwise) tests

Statistical significance for the control group indicates a significant trend test

Statistical significance for a treatment group indicates a significant pairwise test compared to the vehicle control group

* Statistically significant at $P \leq 0.05$

** Statistically significant at $P \leq 0.01$

Legacy Flame Retardants: PBDE-47 = 2,2',4,4'-Tetrabromodiphenyl ether; decaBDE = Decabromodiphenyl ether; HBCD = 1,3,5,7,9,11-Hexabromocyclododecane

Emerging Flame Retardants: TBB = 2-Ethylhexyl-2,3,4,5-tetrabromobenzoate; TBPH = Bis(2-ethylhexyl) tetrabromophthalate; TBBPA-DBPE = Tetrabromobisphenol A-bis(2,3 dibromopropyl ether); BTBPE = 1,2-Bis(2,4,6-tribromophenoxy)ethane; DBDPE = 1,2-Bis(pentabromophenyl)ethane; HCDBCO = Hexachlorocyclopentadienyl-dibromocyclooctane

PBDE-47: One value for Total Thyroxine in the 10 $\mu\text{mol/kg}$ group was excluded. Two values for Total Thyroxine in the 1000 $\mu\text{mol/kg}$ group were excluded.

decaBDE: One value for Total Thyroxine in the 0.1 $\mu\text{mol/kg}$ group was excluded.

**** END OF REPORT ****