

Table 5-1 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Urinalysis (Week 4)

Sex	Dose mg/kg	No.	pH							1) Protein			2) Ketone body			3) Glucose											
			5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	-	+	++	+++	++++	-	+	++	+++	++++						
	0	12	0	0	0	0	0	0	5	7	0	3	7	2	0	0	0	9	3	0	0	0	12	0	0	0	0
Male	15	6	0	0	0	0	0	0	0	6	0	0	5	1	0	0	0	4	2	0	0	0	6	0	0	0	0
	60	6	0	0	0	0	0	1	1	4	0	4	2	0	0	0	0	6	0	0	0	0	6	0	0	0	0
	250	12	0	0	0	0	0	2	8	2	2	5	4	1	0	0	9	2	1	0	0	12	0	0	0	0	
	0	12	0	0	0	1	2	1	3	4	1	11	0	1	0	0	0	11	1	0	0	0	12	0	0	0	0
Female	15	6	0	0	0	0	1	0	0	4	1	4	2	0	0	0	0	5	1	0	0	0	6	0	0	0	0
	60	6	0	0	0	0	1	3	1	1	0	4	1	1	0	0	0	4	1	1	0	0	6	0	0	0	0
	250	12	0	0	0	1	0	1	3	5	2	8	3	1	0	0	0	10	2	0	0	0	12	0	0	0	0

1) - : <10 mg/dL
 +- : 10 - 25 mg/dL
 + : 26 - 85 mg/dL
 ++ : 86 - 250 mg/dL
 +++ : 251 - 600 mg/dL
 ++++ : >600 mg/dL
 2) - : <5 mg/dL
 +- : 5 - 7.5 mg/dL
 + : 7.6 - 30 mg/dL
 ++ : 31 - 70 mg/dL
 +++ : 71 - 125 mg/dL
 ++++ : >125 mg/dL
 3) - : <30 mg/dL
 +- : 30 - 60 mg/dL
 + : 61 - 125 mg/dL
 ++ : 126 - 250 mg/dL
 +++ : 251 - 750 mg/dL
 ++++ : >750 mg/dL

Table 5-2 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Urinalysis (Week 4)

Sex	Dose mg/kg	No.	4) Occult blood			5) Bilirubin			6) Urobilinogen			7) Color						
			-	+	++	+++	+	++	+++	++++	+-	+	++	+++	++++	LY	Y	DY
	0	12	12	0	0	0	0	0	0	12	0	0	0	0	0	12	0	
Male	15	6	6	0	0	0	0	0	0	6	0	0	0	0	0	6	0	
	60	6	6	0	0	0	0	0	0	6	0	0	0	0	0	6	0	
	250	12	12	0	0	0	0	0	0	12	0	0	0	0	0	0	3	9
	0	12	12	0	0	0	0	0	0	12	0	0	0	0	0	12	0	
Female	15	6	6	0	0	0	0	0	0	6	0	0	0	0	0	6	0	
	60	6	6	0	0	0	0	0	0	6	0	0	0	0	0	6	0	
	250	12	12	0	0	0	0	0	0	12	0	0	0	0	0	12	0	

4) - : <0.03 mg/dL
+ : 0.03 - 0.05 mg/dL
++ : 0.5 - 1.5 mg/dL
+++ : 2.0 - 3.5 mg/dL
++++ : >3.5 mg/dL
Y : Yellow
DY : Dark yellow

5) - : <0.5 mg/dL
+ : 0.5 - 1.5 mg/dL
++ : 1.6 - 5.0 mg/dL
+++ : 5.1 - 10.0 mg/dL
++++ : >10.0 mg/dL

6) - : <2.0 mg/dL
+ : 2.0 - 3.5 mg/dL
++ : 3.6 - 7.0 mg/dL
+++ : 7.1 - 12.0 mg/dL
++++ : >12.0 mg/dL

7) LY : Light yellow
Y : Yellow
DY : Dark yellow

Table 5-3 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Urinalysis (Week 4)

Sex	Dose mg/kg	No.	URINE SEDIMENT						CRYSTALLIZATION				
			RBC	WBC	SEC	SRBC	Cast	PS	CO				
Male	0	12	0	0	0	0	0	0	0	0	0	0	0
		6	0	0	0	0	0	0	0	0	0	0	0
	15	6	0	0	0	0	0	0	0	0	0	0	0
		6	0	0	0	0	0	0	0	0	0	0	0
	60	6	0	0	0	0	0	0	0	0	0	0	0
		12	0	0	0	0	0	0	0	0	0	0	0
Female	0	12	0	0	0	0	0	0	0	0	0	0	0
		6	0	0	0	0	0	0	0	0	0	0	0
	15	6	0	0	0	0	0	0	0	0	0	0	0
		6	0	0	0	0	0	0	0	0	0	0	0
	60	6	0	0	0	0	0	0	0	0	0	0	0
		12	0	0	0	0	0	0	0	0	0	0	0

SEC : Squamous Epithelial Cell
 SRBC : Small Round Epithelial Cell
 PS : Phosphate Salts
 CO : Calcium Oxalate

- : Negative
 +- : Slight
 + : Mild
 ++ : Moderate
 +++ : Severe

Table 5-4 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Water intake and urinalysis (Week 4)

Sex	Dose mg/kg	No.	Water intake mL/24h	Urine volume mL/24h	Osmolality mOsm/kg
Male	0	Mean	37	11.6	1871
		S.D.	6	3.8	286
	15	Mean	38	12.6	1784
		S.D.	5	6.4	307
60	Mean	40	13.7	1914	
	S.D.	7	3.9	391	
250	Mean	51**	14.0	1635	
	S.D.	12D	5.2	486	
Female	0	Mean	32	8.7	2142
		S.D.	15	6.7	786
	15	Mean	25	6.3	2056
		S.D.	4	1.6	288
60	Mean	28	4.8	2432	
	S.D.	6	1.5	456	
250	Mean	26	5.9	2010	
	S.D.	6	3.4	324	

** : p<0.01 (Significant difference from control group)
D : Dunnett's test

Table 5-5 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Urinalysis (Week 2 of recovery)

Sex	Dose mg/kg	No.	pH							1) Protein			2) Ketone body			3) Glucose												
			5.0	5.5	6.0	6.5	7.0	7.5	8.0	8.5	9.0	-	+	++	+++	++++	-	+	++	+++	++++							
Male	0	6	0	0	0	0	0	1	2	2	1	1	4	1	0	0	0	4	1	1	0	0	0	6	0	0	0	0
	250	6	0	0	0	0	0	0	3	2	1	1	3	2	0	0	0	4	1	1	0	0	0	6	0	0	0	0
Female	0	6	0	0	0	1	1	1	0	3	0	4	0	2	0	0	0	4	1	1	0	0	0	6	0	0	0	0
	250	6	0	0	0	1	0	0	2	2	1	0	4	2	0	0	0	1	4	1	0	0	0	6	0	0	0	0

1) - : <10 mg/dL +- : 10 - 25 mg/dL + : 26 - 85 mg/dL ++ : 86 - 250 mg/dL +++ : 251 - 600 mg/dL ++++ : >600 mg/dL
 2) - : <5 mg/dL +- : 5 - 7.5 mg/dL + : 7.6 - 30 mg/dL ++ : 31 - 70 mg/dL +++ : 71 - 125 mg/dL ++++ : >125 mg/dL
 3) - : <30 mg/dL +- : 30 - 60 mg/dL + : 61 - 125 mg/dL ++ : 126 - 250 mg/dL +++ : 251 - 750 mg/dL ++++ : >750 mg/dL

Table 5-6 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Urinalysis (Week 2 of recovery)

Sex	Dose mg/kg	No.	4) Occult blood			5) Bilirubin			6) Urobilinogen			7) Color						
			-	+	+++	-	+	+++	+	++	++++	LY	Y	DY				
Male	0	6	6	0	0	0	6	0	0	0	6	0	0	0	6	0		
	250	6	6	0	0	0	6	0	0	0	6	0	0	0	0	6	0	
Female	0	6	6	0	0	0	6	0	0	0	6	0	0	0	0	6	0	
	250	6	6	0	0	0	6	0	0	0	5	1	0	0	0	0	6	0

4) - : <0.03 mg/dL + : 0.03 - 0.05 mg/dL ++ : 0.06 - 0.15 mg/dL +++ : 0.16 - 0.75 mg/dL ++++ : >0.75 mg/dL
 5) - : <0.5 mg/dL + : 0.5 - 1.5 mg/dL ++ : 1.6 - 5.0 mg/dL +++ : 5.1 - 10.0 mg/dL ++++ : >10.0 mg/dL
 6) + : <2.0 mg/dL ++ : 2.0 - 3.5 mg/dL +++ : 3.6 - 7.0 mg/dL ++++ : 7.1 - 12.0 mg/dL
 7) LY : Light yellow Y : Yellow DY : Dark yellow

Table 5-7 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Urinalysis (Week 2 of recovery)

Sex	Dose mg/kg	No.	URINE SEDIMENT																							
			RBC		WBC		SEC		SREC		Cast		CRYSTALLIZATION													
			-	+	-	+	-	+	-	+	-	+	-	+	-	+										
Male	0	6	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0
	250	6	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0
Female	0	6	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0
	250	6	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0	6	0	0	0

SEC : Squamous Epithelial Cell
 SREC : Small Round Epithelial Cell
 PS : Phosphate Salts
 CO : Calcium Oxalate
 - : Negative
 +- : Slight
 + : Mild
 ++ : Moderate
 +++ : Severe

Table 5-8 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Water intake and urinalysis (Week 2 of recovery)

Sex	Dose mg/kg	No.	Water intake		Urine volume		Osmolality	
			mL/24h	Mean S.D.	mL/24h	Mean S.D.	mOsm/kg	Mean S.D.
Male	0	6	40	13.4	1910	13.4	1910	
			5	4.7	230	4.7	230	
	250	6	51	16.3	1644	16.3	1644	
			12	6.2	500	6.2	500	
Female	0	6	32	7.8	1862	7.8	1862	
			10	3.2	237	3.2	237	
	250	6	33	5.9	2254*	5.9	2254*	
			7	2.4	309T	2.4	309T	

* : p<0.05 (Significant difference from control group)

T : Student's t-test

Table 6-1 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Hematology (Day 28)

Sex	Dose mg/kg	No.	RBC		Hb	Ht	MCV	MCH	MCHC	Reticu- locyte	Plate- let	PT	APTT	Fibri- nogen
			$\times 10^6/\mu\text{L}$	g/dL	%	fL	pg	%	$\times 10^3/\mu\text{L}$	s	s	mg/dL		
Male	0	6	Mean	15.8	47	60.4	20.5	33.9	2.3	100.8	16.5	25.2	280	
			S.D.	0.7	2	0.8	0.4	0.7	0.4	4.3	2.4	2.5	31	
	15	6	Mean	16.1	47	61.0	20.8	34.2	2.0	106.3	16.3	25.2	319	
			S.D.	0.3	1	1.6	0.5	0.5	0.2	11.3	2.2	4.6	19	
60	6	Mean	15.8	46	59.7	20.6	34.4	2.2	111.5	18.5	26.8	321		
		S.D.	0.5	2	1.7	0.6	0.7	0.3	11.8	2.4	3.0	30		
250	6	Mean	15.8	46	58.9	20.3	34.5	2.4	120.6**	24.1**	36.7**	411**		
		S.D.	0.5	2	1.7	0.5	0.5	0.6	12.4D	2.2D	3.8D	31D		
Female	0	6	Mean	15.9	45	59.5	20.9	35.2	2.0	113.2	12.0	15.9	239	
			S.D.	0.5	2	0.6	0.3	0.5	0.3	6.5	0.7	2.3	18	
	15	6	Mean	16.0	45	58.7	20.7	35.2	2.0	117.7	12.0	18.9	240	
			S.D.	0.5	1	1.2	0.5	0.4	0.4	5.8	0.4	2.9	21	
60	6	Mean	15.6	45	59.0	20.8	35.1	1.9	119.3	11.7	18.0	253		
		S.D.	0.8	2	1.6	0.8	0.6	0.4	9.2	0.6	2.6	23		
250	6	Mean	15.4	44	58.1	20.4	35.1	2.0	127.3*	13.9	23.6**	308**		
		S.D.	0.9	2	0.9	0.3	0.3	0.5	10.5D	1.9	3.9D	29D		

* : p<0.05 ; ** : p<0.01 (Significant difference from control group)

D : Dunnett's test

Table 6-2 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Hematology (Day 28)

Sex	Dose mg/kg	No.	WBC X10 ³ /μL	Differential leukocyte counts (%)					Erythroblast counts (/200 leukocyte)		
				Lymph.	Stab	Seg.	Eosino.	Baso.		Mono.	Others
Male	0	Mean	93	83.1	0.3	15.0	0.6	0.0	1.0	0.0	0
		S.D.	22	7.2	0.4	7.2	0.5	0.0	0.6	0.0	0
	15	Mean	88	87.1	0.3	10.9	0.4	0.0	1.3	0.0	0
		S.D.	26	3.7	0.3	3.8	0.5	0.0	0.7	0.0	0
60	Mean	95	86.7	0.4	11.5	0.4	0.0	1.0	0.0	0	
	S.D.	27	3.8	0.2	3.9	0.5	0.0	0.5	0.0	0	
250	Mean	99	89.3	0.3	9.4	0.3	0.0	0.8	0.0	0	
	S.D.	35	4.1	0.3	4.1	0.4	0.0	0.5	0.0	0	
Female	0	Mean	76	86.3	0.4	12.1	0.7	0.0	0.6	0.0	0
		S.D.	8	6.3	0.4	5.8	0.7	0.0	0.6	0.0	0
	15	Mean	76	82.8	0.5	15.4	0.6	0.0	0.7	0.0	0
		S.D.	12	3.4	0.3	3.4	0.4	0.0	0.6	0.0	0
60	Mean	69	84.2	0.5	14.1	0.5	0.0	0.8	0.0	0	
	S.D.	19	2.9	0.3	2.4	0.6	0.0	0.7	0.0	0	
250	Mean	85	84.5	0.4	13.6	0.6	0.0	0.9	0.0	0	
	S.D.	16	7.6	0.6	6.7	0.7	0.0	0.4	0.0	0	

No significant difference in any treated groups from control group.

Table 6-3 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Hematology (Week 2 of recovery)

Sex	Dose mg/kg	No.	RBC $\times 10^6/\mu\text{L}$	Hb g/dL	Ht %	MCV fL	MCH pE	MCHC %	Reticu- loocyte %	Plate- let $\times 10^3/\mu\text{L}$	PT s	APTT s	Fibri- nogen mg/dL
Male	0	6	815	16.4	47	57.0	20.1	35.3	2.2	95.2	15.0	24.3	344
			23	0.3	1	1.1	0.5	0.6	0.4	4.4	1.7	1.6	32
	250	6	777*	16.0	45*	57.9	20.6	35.5	2.5	105.5**	16.5	22.6	311
			23T	0.5	1T	1.0	0.4	0.3	0.3	4.2T	3.8	2.7	38
Female	0	6	772	15.5	44	57.3	20.1	35.2	2.3	107.0	11.5	15.3	221
			19	0.4	1	1.0	0.4	0.5	0.4	7.7	0.4	1.6	30
	250	6	764	15.7	44	57.7	20.5	35.5	2.2	106.0	11.1	15.8	249
			27	0.2	1	1.8	0.7	0.3	0.5	8.6	0.7	2.7	43

* : $p < 0.05$; ** : $p < 0.01$ (Significant difference from control group)
T : Student's t-test

Table 6-4 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Hematology (Week 2 of recovery)

Sex	Dose mg/kg	No.	WBC $\times 10^3/\mu\text{L}$	Differential leukocyte counts (%)						Erythroblast counts (/200 leukocyte)	
				Lymph.	Stab	Seg.	Eosino.	Baso.	Mono.		Others
Male	0	6	Mean 105	87.8	0.2	11.0	0.5	0.0	0.6	0.0	0
			S.D. 18	5.5	0.3	5.3	0.3	0.0	0.5	0.0	0
	250	6	Mean 99	87.3	0.3	11.4	0.5	0.0	0.4	0.0	0
			S.D. 22	1.6	0.3	1.5	0.8	0.0	0.4	0.0	0
Female	0	6	Mean 87	84.2	0.3	14.3	0.8	0.0	0.5	0.0	0
			S.D. 19	6.1	0.3	5.8	0.6	0.0	0.6	0.0	0
	250	6	Mean 72	86.3	0.3	12.0	0.8	0.0	0.8	0.0	0
			S.D. 7	3.9	0.3	3.6	0.6	0.0	0.4	0.0	0

No significant difference between treated group and control group.

Table 7-1 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Blood chemistry (Day 28)

Sex	Dose mg/kg	No.	AST (GOT) IU/L	ALT (GPT) IU/L	LDH IU/L	γ -GTP IU/L	ALP IU/L	T.cho mg/dL	TG mg/dL	PL mg/dL	T.bili- rubin mg/dL	Glucose mg/dL
	0	6	Mean 67	27	62	1	685	47	40	94	0.0	134
			S.D. 6	4	9	0	96	11	19	17	0.0	11
Male	15	6	Mean 66	31	60	1	734	59	54	106	0.0	125
			S.D. 4	3	9	0	112	6	16	9	0.0	4
	60	6	Mean 68	31	57	1	754	59	37	101	0.0	131
			S.D. 8	6	5	0	82	9	14	14	0.0	20
	250	6	Mean 60	29	61	1	661	65*	29	107	0.0	120
			S.D. 2	4	11	0	147	17D	11	15	0.0	11
	0	6	Mean 70	27	62	2	419	61	10	112	0.0	95
			S.D. 11	2	7	1	29	13	3	15	0.0	9
Female	15	6	Mean 60	23	55	1	483	61	12	107	0.0	101
			S.D. 7	3	11	1	131	13	5	18	0.0	9
	60	6	Mean 62	22	56	2	413	73	10	118	0.0	89
			S.D. 7	1	15	1	59	7	5	5	0.0	4
	250	6	Mean 58*	27	52	2	362	97**	17	150**	0.0	98
			S.D. 7D	7	4	1	41	23D	5	25D	0.0	7

* : p<0.05 ; ** : p<0.01 (Significant difference from control group)
D : Dunnett's test

Table 7-2 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Blood chemistry (Day 28)

Sex	Dose mg/kg	No.	BUN mg/dL	Crea- tinine mg/dL	Na mmol/L	K mmol/L	Cl mmol/L	Ca mg/dL	P mg/dL	TP g/dL	Albumin g/dL	A/G
Male	0	6	Mean	0.24	143	4.8	107	9.8	8.1	5.9	2.7	0.87
		2	S.D.	0.03	1	0.5	2	0.2	0.4	0.2	0.1	0.05
	15	6	Mean	0.26	144	4.7	106	9.9	8.2	6.1	2.8	0.86
		2	S.D.	0.03	2	0.2	2	0.3	0.6	0.2	0.1	0.05
	60	6	Mean	0.25	144	4.7	108	9.8	7.7	6.0	2.7	0.82
		1	S.D.	0.02	2	0.1	2	0.2	0.2	0.2	0.1	0.04
250	6	Mean	0.23	143	4.8	106	10.3**	7.7	6.4**	2.9	0.81	
	1	S.D.	0.03	1	0.3	1	0.2D	0.5	0.2D	0.1	0.03	
Female	0	6	Mean	0.32	142	4.4	110	10.0	7.6	6.1	2.9	0.89
		2	S.D.	0.02	1	0.4	1	0.2	0.4	0.1	0.1	0.06
	15	6	Mean	0.29	142	4.5	110	9.8	7.6	6.1	2.8	0.88
		2	S.D.	0.03	1	0.3	1	0.3	0.6	0.2	0.2	0.06
	60	6	Mean	0.30	143	4.4	109	10.0	7.5	6.2	2.9	0.90
		3	S.D.	0.05	2	0.5	2	0.2	0.8	0.1	0.1	0.04
250	6	Mean	0.27	143	4.4	107**	10.3	7.7	6.6**	3.0	0.86	
	1	S.D.	0.02	1	0.2	2D	0.2	0.3	0.2D	0.1	0.07	

** : p<0.01 (Significant difference from control group)
D : Dunnett's test

Table 7-3 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Blood chemistry (Week 2 of recovery)

Sex	Dose mg/kg	No.	AST (GOT) IU/L	ALT (GPT) IU/L	LDH IU/L	γ -GTP IU/L	ALP IU/L	T.cho mg/dL	TC mg/dL	PL mg/dL	T.bili- rubin mg/dL	Glucose mg/dL
Male	0	Mean	64	28	51	1	585	57	54	105	0.1	150
		S.D.	7	4	10	0	107	9	20	11	0.0	18
Male	250	Mean	67	29	47	1	499	58	40	108	0.1	140
		S.D.	4	3	5	0	52	10	19	15	0.0	17
Female	0	Mean	59	23	41	2	283	62	15	118	0.1	118
		S.D.	6	4	10	1	101	4	3	8	0.0	22
Female	250	Mean	63	23	39	2	280	71*	13	124	0.1	116
		S.D.	6	6	5	1	52	9T	5	12	0.0	16

* : p<0.05 (Significant difference from control group)
T : Student's t-test

Table 7-4 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Blood chemistry (Week 2 of recovery)

Sex	Dose mg/kg	No.	BUN mg/dL	Crea- tinine mg/dL	Na mmol/L	K mmol/L	Cl mmol/L	Ca mg/dL	P mg/dL	TP g/dL	Albumin g/dL	A/G
Male	0	Mean	12	0.28	142	4.6	106	9.9	6.8	6.3	2.9	0.83
		S.D.	1	0.04	1	0.4	1	0.2	0.5	0.2	0.1	0.05
	250	Mean	13	0.29	144	4.4	108	9.7	6.6	6.0*	2.7*	0.85
		S.D.	2	0.03	2	0.2	2	0.3	0.6	0.2†	0.1†	0.03
Female	0	Mean	16	0.33	142	4.2	110	10.0	6.7	6.2	3.0	0.91
		S.D.	2	0.03	1	0.4	2	0.3	0.8	0.2	0.1	0.07
	250	Mean	14	0.32	142	4.3	109	10.0	6.9	6.3	2.9	0.87
		S.D.	2	0.03	2	0.3	2	0.2	0.6	0.2	0.1	0.04

* : p<0.05 (Significant difference from control group)
† : Student's t-test

Table 8-1 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Absolute and relative organ weight (Day 28)

Male

Dose mg/kg	Body weight		Brain g	Thymus mg(100g BW)	Heart g(100g BW)	Liver g(100g BW)	Spleen g(100g BW)	Kidney (R+L) g(100g BW)	Adrenal (R+L) mg(100g BW)
	No.	Mean S.D.							
0	No.	6		6	6	6	6	6	6
	Mean	354	1.97	499	1.27	10.12	0.87	2.72	66
	S.D.	25	0.05	94	0.21	0.90	0.13	0.32	4
Absolute 15	No.	6		6	6	6	6	6	6
	Mean	371	1.98	565	1.21	11.23	0.64	2.77	60
	S.D.	25	0.07	122	0.09	0.75	0.08	0.15	6
60	No.	6		6	6	6	6	6	6
	Mean	363	1.99	500	1.23	11.63	0.62	2.78	57
	S.D.	46	0.11	105	0.21	2.08	0.10	0.42	15
250	No.	6		6	6	6	6	6	6
	Mean	366	2.05	439	1.12	14.27**	0.65	2.95	64
	S.D.	24	0.07	97	0.09	1.68D	0.09	0.25	8
0	No.	6		6	6	6	6	6	6
	Mean		0.56	141	0.36	2.86	0.19	0.77	18
	S.D.		0.04	26	0.03	0.14	0.03	0.08	1
Relative 15	No.	6		6	6	6	6	6	6
	Mean		0.54	152	0.33	3.03	0.17	0.75	16
	S.D.		0.03	28	0.02	0.10	0.01	0.04	2
60	No.	6		6	6	6	6	6	6
	Mean		0.56	137	0.34	3.19*	0.17	0.76	16
	S.D.		0.05	21	0.04	0.21D	0.01	0.03	4
250	No.	6		6	6	6	6	6	6
	Mean		0.56	119	0.31*	3.88**	0.18	0.81	18
	S.D.		0.05	22	0.02D	0.23D	0.02	0.04	2

* : p<0.05 ; ** : p<0.01 (Significant difference from control group)
D : Dunnett's test

Table 8-2 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Absolute and relative organ weight (Day 28)

Male

Dose mg/kg	g(g/100g BW)		Testis (R+L)		Epididymis (R+L)	
	No.	Mean S.D.	No.	Mean S.D.	No.	Mean S.D.
0	No.	6	No.	2.79	6	761
	Mean	0.50	Mean	0.50	Mean	118
	S.D.		S.D.		S.D.	
Absolute 15	No.	6	No.	3.00	6	763
	Mean	0.22	Mean	0.22	Mean	104
	S.D.		S.D.		S.D.	
60	No.	6	No.	3.08	6	805
	Mean	0.21	Mean	0.21	Mean	66
	S.D.		S.D.		S.D.	
250	No.	6	No.	2.96	6	791
	Mean	0.33	Mean	0.33	Mean	95
	S.D.		S.D.		S.D.	
0	No.	6	No.	0.79	6	216
	Mean	0.14	Mean	0.14	Mean	37
	S.D.		S.D.		S.D.	
Relative 15	No.	6	No.	0.81	6	207
	Mean	0.10	Mean	0.10	Mean	35
	S.D.		S.D.		S.D.	
60	No.	6	No.	0.86	6	224
	Mean	0.07	Mean	0.07	Mean	24
	S.D.		S.D.		S.D.	
250	No.	6	No.	0.81	6	218
	Mean	0.10	Mean	0.10	Mean	33
	S.D.		S.D.		S.D.	

No significant difference in any treated groups from control group.

Table 8-3 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
 Absolute and relative organ weight (Day 28)
 Female

Dose mg/kg	Body weight		Brain g (g/100g BW)	Thymus mg (mg/100g BW)	Heart g (g/100g BW)	Liver g (g/100g BW)	Spleen g (g/100g BW)	Kidney (R+L) g (g/100g BW)	Adrenal (R+L) mg (mg/100g BW)
	No.	Mean S.D.							
0	No.	6	6	6	6	6	6	6	6
	Mean S.D.	215 12	1.83 0.06	408 84	0.75 0.06	5.86 0.46	0.42 0.06	1.62 0.07	61 8
15	No.	6	6	6	6	6	6	6	6
	Mean S.D.	210 13	1.85 0.10	443 54	0.76 0.04	6.16 0.50	0.46 0.09	1.74 0.12	65 9
60	No.	6	6	6	6	6	6	6	6
	Mean S.D.	213 14	1.86 0.05	417 108	0.77 0.06	6.91* 0.61D	0.46 0.05	1.76 0.09	68 6
250	No.	6	6	6	6	6	6	6	6
	Mean S.D.	215 16	1.83 0.05	444 65	0.77 0.05	9.61** 1.00D	0.47 0.05	1.75 0.11	70 10
0	No.	6	6	6	6	6	6	6	6
	Mean S.D.	215 12	1.83 0.05	444 65	0.77 0.05	9.61** 1.00D	0.47 0.05	1.75 0.11	70 10
15	No.	6	6	6	6	6	6	6	6
	Mean S.D.	212 13	1.88 0.03	212 26	0.36 0.01	2.94 0.25	0.22 0.03	0.83 0.07	31 3
60	No.	6	6	6	6	6	6	6	6
	Mean S.D.	216 14	1.88 0.05	196 48	0.36 0.02	3.25** 0.19D	0.22 0.01	0.83 0.06	32 4
250	No.	6	6	6	6	6	6	6	6
	Mean S.D.	217 15	1.85 0.08	207 31	0.36 0.03	4.47** 0.32D	0.22 0.02	0.81 0.03	33 4

* : p<0.05; ** : p<0.01 (Significant difference from control group)
 D : Dunnett's test

Table 8-4 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
 Absolute and relative organ weight (Day 28)

Female

Dose mg/kg	Ovary (K+L) mg/(mg/100g BW)		Uterus mg/(mg/100g BW)	
	No.	Mean S.D.	No.	Mean S.D.
0	6	78.9 6.5	6	422 85
	6	77.8 12.7	6	439 134
15	6	78.1 10.5	6	463 87
	6	83.2 6.6	6	439 92
60	6	36.8 2.5	6	196 32
	6	37.0 4.5	6	209 62
15	6	36.8 4.8	6	219 48
	6	38.7 2.2	6	207 57
250	6		6	
	6		6	

No significant difference in any treated groups from control group.

Table 8-5 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
 Absolute and relative organ weight (Week 2 of recovery)

Male

Dose mg/kg	Body weight		Brain mg(μg/100g BW)	Thymus mg(μg/100g BW)	Heart g(μ/100g BW)	Liver g(μ/100g BW)	Spleen g(μ/100g BW)	Kidney (R+L) mg(μg/100g BW)	Adrenal (R+L) mg(μg/100g BW)
	g	%							
Absolute	No.	6	6	6	6	6	6	6	6
	Mean	430	2.07	499	1.40	12.15	0.69	3.05	64
	S.D.	10	0.08	102	0.12	0.97	0.11	0.20	7
250	No.	6	6	6	6	6	6	6	6
	Mean	400	2.02	453	1.84	11.77	0.73	2.91	62
	S.D.	37	0.04	141	0.12	1.23	0.11	0.37	7
Relative	No.	6	6	6	6	6	6	6	6
	Mean	0.48	0.48	102	0.33	2.83	0.16	0.71	15
	S.D.	0.02	0.02	22	0.03	0.21	0.02	0.04	2
250	No.	6	6	6	6	6	6	6	6
	Mean	0.51	0.51	114	0.33	2.95	0.19	0.72	16
	S.D.	0.04	0.04	39	0.02	0.20	0.02	0.04	2

No significant difference between treated group and control group.

Table 8-6 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
 Absolute and relative organ weight (Week 2 of recovery)

Male

Dose mg/kg	Testis (R+L) g(g/100g BW)		Epididymis (R+L) mg(mg/100g BW)		
	No.	Mean S.D.	No.	Mean S.D.	
Absolute	0	6	3.27	6	1142
			0.16		66
250	0	6	3.23	6	1130
			0.16		58
Relative	0	6	0.76	6	268
			0.03		20
250	0	6	0.82	6	284
			0.10		19

No significant difference between treated group and control group.

Table 8-7 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
 Absolute and relative organ weight (Week 2 of recovery)
 Female

Dose mg/kg	Body weight		Brain mg(100g BW)	Thymus mg(100g BW)	Heart g(100g BW)	Liver g(100g BW)	Spleen g(100g BW)	Kidney (R+L) mg(100g BW)	Adrenal (R+L) mg(100g BW)
	g	g(g/100g BW)							
Absolute	No.	6	6	6	6	6	6	6	6
	Mean	234	1.83	427	0.84	6.37	0.51	1.71	76
	S.D.	28	0.05	85	0.08	0.94	0.14	0.19	15
250	No.	6	6	6	6	6	6	6	6
	Mean	227	1.88	315*	0.82	6.62	0.47	1.74	75
	S.D.	9	0.10	77T	0.05	0.54	0.05	0.06	7
Relative	No.	6	6	6	6	6	6	6	6
	Mean	0.79	0.79	182	0.36	2.73	0.22	0.73	32
	S.D.	0.09	0.09	30	0.02	0.13	0.04	0.05	5
250	No.	6	6	6	6	6	6	6	6
	Mean	0.83	0.83	139*	0.36	2.92	0.21	0.77	33
	S.D.	0.07	0.07	35T	0.02	0.23	0.03	0.04	3

* : p<0.05 (Significant difference from control group)

T : Student's t-test

Table 8-8 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
 Absolute and relative organ weight (Week 2 of recovery)

Female

Dose mg/kg	Ovary (R+L) mg/(mg/100g BW)		Uterus mg/(mg/100g BW)	
	No.	Mean S.D.	No.	Mean S.D.
Absolute	0	6 85.8 13.1	6 501 78	6 501 78
	250	6 88.0 13.4	6 478 56	6 478 56
Relative	0	6 37.0 6.1	6 215 22	6 215 22
	250	6 39.0 6.6	6 211 28	6 211 28

No significant difference between treated group and control group.

Table 9-1 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Gross pathological findings (Main group)

Organs	Sex:		M		M		F		F	
Findings	M	F	0	15	60	250	0	15	60	250
	6	6	6	6	6	6	6	6	6	6
Testis	1	1	1	0	1	-	-	-	-	-
Small										

Table 9-2 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
Gross pathological findings (Recovery group)

Organs	Sex:	M	M	F	F
Findings	Dose(mg/kg):	0	250	0	250
	Number:	6	6	6	6
Kidney					
Dilatation, pelvic		1	0	0	0

Table 10-3 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
 Histopathological findings (Main group)

Organs	Findings	Sex:		Dose (mg/kg):		M		F		F		F	
		M	F	0	15	60	250	0	15	60	250	0	60
Spinal cord, thoracic	Number examined	6	6	0	0	0	6	0	0	0	0	0	6
	Not remarkable												6
Spleen	Number examined	6	6	0	0	0	6	0	0	0	0	0	6
	Not remarkable												6
Stomach	Number examined	6	6	0	0	0	6	0	0	0	0	0	6
	Not remarkable												6
Testis	Number examined	6	6	1	0	0	6	1	0	0	0	0	6
	Not remarkable												6
	Atrophy, seminiferous tubular	1	1	0	0	0	1	0	0	0	0	0	1
	minimal	1	0	0	0	0	0	0	0	0	0	0	1
	moderate	0	1	0	0	0	0	0	0	0	0	0	1
	severe	0	0	0	0	0	1	0	0	0	0	0	1
Thymus	Number examined	6	6	0	0	0	6	0	0	0	0	0	6
	Not remarkable												6
Thyroid	Number examined	6	6	2	6	5	6	2	6	4	6	3	6
	Not remarkable												4
	Ectopic thymus	1	1	1	1	0	0	1	1	1	2	1	1
	minimal	4	4	4	4	0	0	4	4	1	1	1	1
	minimal	4	4	4	4	0	0	4	4	1	1	1	1
	minimal	0	0	0	0	1	3	0	0	0	0	0	3
Trachea	Number examined	6	6	0	0	0	6	0	0	0	0	0	6
	Not remarkable												6
Urinary bladder	Number examined	6	6	0	0	0	6	0	0	0	0	0	6
	Not remarkable												6
Uterus	Number examined	6	6	0	0	0	6	0	0	0	0	0	6
	Not remarkable												6

--: Not applicable

Table 10-4 A 28-day oral toxicity study of 2,6-di-tert-butyl-4-ethylphenol in rats with a recovery period of 2 weeks
 Histopathological findings (Recovery group)

Organs	Dose (mg/kg):	Sex:	M	M	F	F
Findings	Number:	Number:	6	250	6	250
Kidney						
Number examined			1	0	0	0
Dilatation, pelvic			1	0	0	0
mild			1	0	0	0
Regeneration, tubular			1	0	0	0
minimal			1	0	0	0
Mineralization, medullary			1	0	0	0
minimal			1	0	0	0
Liver						
Number examined			6	6	6	6
Not remarkable			1	1	0	0
Necrosis, focal			0	1	0	0
mild			0	1	0	0
Microgranuloma			5	5	6	6
minimal			5	5	6	6
Thyroid						
Number examined			6	6	6	6
Not remarkable			4	3	3	4
Cyst, ultimobranchial			2	3	3	2
minimal			2	3	3	2