1,3,5,7-テトラアザトリシクロ〔3.3.1.1 ^{3,7}〕デカンの
ラット及びマウスを用いた経口投与による
がん原性予備試験（混水試験）報告書

APPENDIX

(A1-1～A8-3-2)
2 週間試験：ラット/0187；マウス/0188

APPENDIXES

APPENDIXES (CONTINUED)

APPENDIXES (CONTINUED)

APPENDIX A 1-1

CLINICAL OBSERVATION (TWO-WEEK STUDY: SUMMARY)

RAT : MALE

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1 2

CLINICAL OBSERVATION (SUMMARY)
ALL ANIMALS

SEX : MALE

Clinical sign	Group Name	Administration Week-day 1-1	1-2	1-3	1-4	1-5	1-6	1-7	2-1	2-2	2-3	2-4	2-5	2-6	2-7
		1	1	1	1	1	1	1	1	1	1	1	1	1	1
DEATH	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	5	8	10	-	-	-	-	-
LOCOMOTOR MOVEMENT DECR	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	1	0	2	0	-	-	-	-	-
HUNCHBACK POSITION	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	7	7	5	2	0	-	-	-	-	-
WASTING	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	1	3	2	0	-	-	-	-	-
SOILED	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	1	1	4	5	2	0	-	-	-	-	-

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1 2

CLINICAL OBSERVATION (SUMMARY)
ALL ANIMALS

SEX : MALE

Clinical sign	Group Name	Administration Week-day 1-1	1-2	1-3	1-4	1-5	1-6	1-7	2-1	2-2	2-3	2-4	2-5	2-6	2-7
		1	1	1	1	1	1	1	1	1	1	1	1	1	1
PILOERECTION	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	1	7	8	5	2	0	-	-	-	-	-
EXOPHTHALMOS	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	1	1	1	1	1	1	0	0	0	-	-	-	-	-
EYE OPACITY	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	1	1	1	0	0	0	-	-	-	-	-
ANTERIOS CHAMBER OPACITY	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	1	1	1	0	0	0	-	-	-	-	-
NOSE HEMORRHAGIC DISCHA	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	5	2	0	-	-	-	-	-

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1 2

CLINICAL OBSERVATION (SUMMARY)
ALL ANIMALS

SEX : MALE

Clinical sign	Group Name	Administration Week-day 1-1 1	1-2 1	1-3 1	1-4 1	1-5 1	1-6 1	1-7 1	2-1 1	2-2 1	2-3 1	2-4 1	2-5 1	2-6 1	2-7 1
IRREGULAR BREATHING	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	2	0	-	-	-	-	-
ABNORMAL RESPIRATION	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	2	0	-	-	-	-	-
BRADYPNEA	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	1	0	-	-	-	-	-
SMALL STOOL	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	8	9	9	5	2	0	-	-	-	-	-
OLIGO-STOOL	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	8	9	9	4	2	0	-	-	-	-	-

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1 2

CLINICAL OBSERVATION (SUMMARY)
ALL ANIMALS

SEX : MALE

Clinical sign	Group Name	Administration Week-day 1-1 1	1-2 1	1-3 1	1-4 1	1-5 1	1-6 1	1-7 1	2-1 1	2-2 1	2-3 1	2-4 1	2-5 1	2-6 1	2-7 1
SUBNORMAL TEMP	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	1	0	0	0	-	-	-	-	-

APPENDIX A 1-2

CLINICAL OBSERVATION (TWO-WEEK STUDY: SUMMARY)

RAT : FEMALE

Clinical sign	Group Name	Administration Week-day 1-1 1	1-2 1	1-3 1	1-4 1	1-5 1	1-6 1	1-7 1	2-1 1	2-2 1	2-3 1	2-4 1	2-5 1	2-6 1	2-7 1
DEATH	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	1	1	4	5	9	9	10	-	-
LOCOMOTOR MOVEMENT DECR	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	4	3	1	1	0	-	-
HUNCHBACK POSITION	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	1	4	4	4	2	5	1	1	0	-	-
WASTING	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	1	1	2	3	1	1	0	-	-
SOILED	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	3	3	3	7	4	5	1	1	0	-	-

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1 2

CLINICAL OBSERVATION (SUMMARY)
ALL ANIMALS

SEX : FEMALE

Clinical sign	Group Name	Administration Week-day 1-1 1	1-2 1	1-3 1	1-4 1	1-5 1	1-6 1	1-7 1	2-1 1	2-2 1	2-3 1	2-4 1	2-5 1	2-6 1	2-7 1
PILOERECTION	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	4	5	4	8	6	5	1	1	0	-	-
SOILED PERI GENITALIA	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	1	2	2	2	1	1	0	0	0	-	-
NOSE HEMORRHAGIC DISCHA	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	7	4	5	1	1	0	-	-
IRREGULAR BREATHING	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	2	2	0	0	0	-	-
ABNORMAL RESPIRATION	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	2	2	0	0	0	-	-

Clinical sign	Group Name	Administration Week-day 1-1	1-2	1-3	1-4	1-5	1-6	1-7	2-1	2-2	2-3	2-4	2-5	2-6	2-7
		1	1	1	1	1	1	1	1	1	1	1	1	1	1
BRADYPNEA	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	0	2	0	0	0	-	-
SMALL STOOL	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	9	9	9	9	6	5	1	1	0	-	-
OLIGO-STOOL	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	10	10	9	9	6	5	1	1	0	-	-
SUBNORMAL TEMP	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	0	0	0	1	0	-	-

APPENDIX A 1-3

CLINICAL OBSERVATION (TWO-WEEK STUDY: SUMMARY)

MOSUE : MALE

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1 2

CLINICAL OBSERVATION (SUMMARY)
ALL ANIMALS

SEX : MALE

Clinical sign	Group Name	Administration Week-day 1-1	1-2	1-3	1-4	1-5	1-6	1-7	2-1	2-2	2-3	2-4	2-5	2-6	2-7
		1	1	1	1	1	1	1	1	1	1	1	1	1	1
PILOERECTION	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	0	0	2	2	3	3	3
OLIGO-STOOL	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	8	8	8	7	7	7	7

APPENDIX A 1-4

CLINICAL OBSERVATION (TWO-WEEK STUDY: SUMMARY)

MOSUE: FEMALE

Clinical sign	Group Name	Administration Week-day 1-1 1	1-2 1	1-3 1	1-4 1	1-5 1	1-6 1	1-7 1	2-1 1	2-2 1	2-3 1	2-4 1	2-5 1	2-6 1	2-7 1
DEATH	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	0	1	1	1	1	1	1
LATERAL	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	1
HUNCHBACK POSITION	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	1	1	0	0	0	1	1	0
WASTING	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	0	0	0	0	1	1	1
PILOERECTION	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	1	1	1	2	2	2	2	1

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1 2

CLINICAL OBSERVATION (SUMMARY)
ALL ANIMALS

SEX : FEMALE

Clinical sign	Group Name	Administration Week-day													
		1-1	1-2	1-3	1-4	1-5	1-6	1-7	2-1	2-2	2-3	2-4	2-5	2-6	2-7
		1	1	1	1	1	1	1	1	1	1	1	1	1	1
SMALL STOOL	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	0	0	0	0	2	2	1
OLIGO-STOOL	Control	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	6250 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	12500 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	25000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	50000 ppm	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	100000 ppm	0	0	0	0	0	0	0	9	9	5	5	5	5	5

APPENDIX A 2-1

BODY WEIGHT CHANGES (TWO-WEEK STUDY:SUMMARY)

RAT : MALE

STUDY NO. : 0187
ANIMAL : RAT F344
UNIT : g
REPORT TYPE : A1 2
SEX : MALE

BODY WEIGHT CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day 0-0	1-1	1-2	1-4	1-7	2-3	2-7
Control	123± 4	126± 4	128± 5	136± 5	147± 7	159± 8	176± 10
6250 ppm	123± 4	127± 4	128± 5	134± 8	144± 12	158± 8	176± 9
12500 ppm	123± 4	126± 4	128± 4	136± 4	147± 5	158± 6	174± 8
25000 ppm	123± 4	125± 5	127± 5	134± 6	144± 8	156± 7	170± 7
50000 ppm	123± 4	121± 4*	122± 4**	129± 4*	139± 4	148± 6**	155± 14**
100000 ppm	123± 4	114± 3**	105± 4**	95± 5**	77± 4**	-	-

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

APPENDIX A 2-2

BODY WEIGHT CHANGES (TWO-WEEK STUDY: SUMMARY)

RAT : FEMALE

STUDY NO. : 0187
ANIMAL : RAT F344
UNIT : g
REPORT TYPE : A1 2
SEX : FEMALE

BODY WEIGHT CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day 0-0	1-1	1-2	1-4	1-7	2-3	2-7
Control	101± 3	103± 4	103± 3	108± 3	115± 3	121± 4	130± 5
6250 ppm	101± 3	102± 5	102± 3	106± 4	114± 3	120± 4	131± 5
12500 ppm	101± 3	102± 3	102± 3	105± 5	113± 4	119± 4	128± 4
25000 ppm	101± 3	100± 4	102± 3	106± 2	113± 2	119± 2	128± 2
50000 ppm	101± 3	98± 3*	99± 3**	101± 3**	109± 2**	115± 2**	122± 2**
100000 ppm	101± 3	91± 2**	85± 3**	78± 4**	68± 5**	63± 0 ?	-

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

? : Significant test is not applied,because No. of data in this group is less than 3.

APPENDIX A 2-3

BODY WEIGHT CHANGES (TWO-WEEK STUDY:SUMMARY)

MOSUE : MALE

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
UNIT : g
REPORT TYPE : A1 2
SEX : MALE

BODY WEIGHT CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day 0-0	1-1	1-2	1-4	1-7	2-3	2-7
Control	24.2± 0.8	23.8± 0.8	24.0± 0.7	24.5± 0.7	25.0± 0.9	25.6± 0.8	26.2± 0.5
6250 ppm	24.2± 0.8	23.7± 1.0	24.2± 0.8	24.8± 1.0	25.2± 0.8	25.7± 1.0	26.6± 1.1
12500 ppm	24.2± 0.7	23.6± 0.7	24.0± 0.5	24.2± 0.7	24.7± 0.6	25.5± 0.7	26.2± 0.6
25000 ppm	24.2± 0.8	23.6± 0.8	23.9± 0.9	24.4± 0.9	24.8± 0.8	25.4± 1.0	26.3± 1.1
50000 ppm	24.2± 0.7	22.9± 0.9	22.1± 1.3**	24.2± 0.6	24.6± 0.7	25.3± 0.6	26.2± 0.7
100000 ppm	24.2± 0.7	21.4± 0.7**	20.6± 0.6**	20.0± 0.8**	19.5± 1.3**	19.9± 2.5**	18.8± 2.8**

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

APPENDIX A 2-4

BODY WEIGHT CHANGES (TWO-WEEK STUDY: SUMMARY)

MOSUE: FEMALE

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
UNIT : g
REPORT TYPE : A1 2
SEX : FEMALE

BODY WEIGHT CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day 0-0	1-1	1-2	1-4	1-7	2-3	2-7
Control	19.3± 0.6	18.8± 0.6	19.1± 0.7	19.3± 0.8	19.6± 0.7	20.2± 0.7	20.7± 0.6
6250 ppm	19.3± 0.7	17.9± 1.2	19.0± 0.6	19.7± 0.9	19.6± 0.8	20.4± 0.7	21.0± 0.6
12500 ppm	19.3± 0.6	17.2± 0.7**	18.7± 1.1	19.2± 0.8	19.5± 1.0	20.0± 0.9	20.7± 1.0
25000 ppm	19.3± 0.7	17.2± 0.9**	18.1± 1.3	19.1± 0.8	19.1± 0.5	19.9± 1.1	20.7± 0.9
50000 ppm	19.3± 0.6	17.6± 0.9**	18.6± 0.5	19.1± 0.7	19.4± 0.7	20.2± 0.7	20.6± 1.0
100000 ppm	19.3± 0.7	16.8± 0.7**	16.0± 0.6**	15.8± 0.8**	15.6± 1.8**	16.5± 2.0**	14.9± 2.3**

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

APPENDIX A 3-1

WATER CONSUMPTION CHANGES (TWO-WEEK STUDY: SUMMARY)

RAT: MALE

STUDY NO. : 0187
ANIMAL : RAT F344
UNIT : g
REPORT TYPE : A1 2
SEX : MALE

WATER CONSUMPTION CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day(effective) 1-3(3)	1-7(4)	2-3(3)	2-7(4)
Control	18.4± 1.2	18.7± 1.3	19.2± 2.2	19.6± 2.5
6250 ppm	19.1± 1.1	17.8± 5.6	20.3± 3.1	20.3± 1.4
12500 ppm	20.5± 0.9	21.0± 2.3	20.5± 1.4	20.5± 1.4
25000 ppm	21.6± 2.1**	21.4± 2.6	21.2± 1.9	21.0± 1.9
50000 ppm	20.5± 2.6	20.6± 1.5	22.6± 4.9	24.1± 5.9
100000 ppm	14.2± 2.4	8.0± 4.6	-	-

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

APPENDIX A 3-2

WATER CONSUMPTION CHANGES (TWO-WEEK STUDY: SUMMARY)

RAT: FEMALE

STUDY NO. : 0187
ANIMAL : RAT F344
UNIT : g
REPORT TYPE : A1 2
SEX : FEMALE

WATER CONSUMPTION CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day(effective) 1-3(3)	1-7(4)	2-3(3)	2-7(4)
Control	15.6± 1.0	16.3± 0.7	16.3± 1.3	16.4± 2.2
6250 ppm	16.6± 1.8	17.7± 2.3	18.1± 2.2	18.3± 2.8
12500 ppm	18.0± 1.5	17.2± 2.9	18.2± 1.8	18.4± 1.4*
25000 ppm	17.9± 2.1	18.8± 1.6*	17.7± 1.6	18.0± 1.7
50000 ppm	17.9± 7.1	19.9± 6.0	18.5± 3.3	19.7± 4.3*
100000 ppm	8.6± 2.0*	10.5± 2.8	13.5± 3.1	11.3± 0.0 ?

Significant difference : * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

? : Significant test is not applied,because No. of data in this group is less than 3.

APPENDIX A 3-3

WATER CONSUMPTION CHANGES (TWO-WEEK STUDY: SUMMARY)

MOUSE: MALE

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
UNIT : g
REPORT TYPE : A1 2
SEX : MALE

WATER CONSUMPTION CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day(effective) 1-3(3)	1-7(4)	2-3(3)	2-7(4)
Control	4.5± 0.3	4.6± 0.4	4.7± 0.4	4.2± 0.5
6250 ppm	4.9± 1.0	4.8± 1.0	4.8± 0.9	4.5± 1.1
12500 ppm	5.1± 0.7	5.1± 0.9	5.2± 0.7	4.7± 0.8
25000 ppm	5.8± 1.5*	5.7± 1.1	5.4± 1.0	4.8± 0.9
50000 ppm	5.0± 0.7	5.6± 0.6	5.2± 0.3	4.8± 0.5
100000 ppm	4.0± 1.3	7.9± 1.8**	8.6± 2.8**	6.3± 2.5

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

APPENDIX 3-4

WATER CONSUMPTION CHANGES(TWO-WEEK STUDY: SUMMARY)

MOUSE: FEMALE

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
UNIT : g
REPORT TYPE : A1 2
SEX : FEMALE

WATER CONSUMPTION CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day(effective) 1-3(3)	1-7(4)	2-3(3)	2-7(4)
Control	4.2± 0.4	4.8± 0.7	4.9± 0.7	5.1± 1.1
6250 ppm	4.5± 0.6	5.0± 0.4	5.0± 0.9	4.7± 0.4
12500 ppm	4.4± 0.4	4.9± 0.5	5.2± 0.7	4.9± 0.4
25000 ppm	4.6± 0.7	5.5± 0.7	5.6± 0.4	5.1± 0.9
50000 ppm	5.8± 0.6**	6.0± 0.7**	6.2± 0.6**	5.8± 0.8
100000 ppm	4.5± 0.9	7.9± 1.1**	9.9± 2.8**	5.2± 3.2

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

APPENDIX A 4-1

FOOD CONSUMPTION CHANGES (TWO-WEEK STUDY: SUMMARY)

RAT : MALE

STUDY NO. : 0187
ANIMAL : RAT F344
UNIT : g
REPORT TYPE : A1 2
SEX : MALE

FOOD CONSUMPTION CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day(effective) 1-7(7)	2-7(7)
Control	14.3± 0.5	14.9± 1.1
6250 ppm	13.8± 1.4	15.3± 0.9
12500 ppm	14.3± 0.5	15.0± 0.7
25000 ppm	13.7± 1.2	14.5± 0.9
50000 ppm	12.1± 0.5**	12.4± 1.5**
100000 ppm	3.8± 0.7**	-

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

APPENDIX A 4-2

FOOD CONSUMPTION CHANGES (TWO-WEEK STUDY: SUMMARY)

RAT : FEMALE

STUDY NO. : 0187
ANIMAL : RAT F344
UNIT : g
REPORT TYPE : A1 2
SEX : FEMALE

FOOD CONSUMPTION CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration 1-7(7)	week-day(effective) 2-7(7)
Control	11.6± 0.4	12.0± 0.6
6250 ppm	11.4± 0.7	11.9± 0.8
12500 ppm	11.1± 1.1	11.9± 0.4
25000 ppm	11.2± 0.4	11.6± 0.6
50000 ppm	10.2± 0.4**	10.7± 0.3**
100000 ppm	3.8± 0.4**	3.0± 0.0 ?

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

? : Significant test is not applied,because No. of data in this group is less than 3.

APPENDIX A 4-3

FOOD CONSUMPTION CHANGES (TWO-WEEK STUDY: SUMMARY)

MOSUE : MALE

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
UNIT : g
REPORT TYPE : A1 2
SEX : MALE

FOOD CONSUMPTION CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day(effective) 1-7(7)	2-7(7)
Control	4.1± 0.3	4.1± 0.1
6250 ppm	4.1± 0.3	4.0± 0.3
12500 ppm	3.9± 0.2	4.1± 0.2
25000 ppm	3.9± 0.2	4.1± 0.3
50000 ppm	3.8± 0.2**	4.1± 0.3
100000 ppm	2.4± 0.2**	3.2± 0.7*

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

APPENDIX A 4-4

FOOD CONSUMPTION CHANGES (TWO-WEEK STUDY: SUMMARY)

MOSUE : FEMALE

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
UNIT : g
REPORT TYPE : A1 2
SEX : FEMALE

FOOD CONSUMPTION CHANGES (SUMMARY)
ALL ANIMALS

Group Name	Administration week-day(effective) 1-7(7)	2-7(7)
Control	3.3± 0.3	3.6± 0.2
6250 ppm	3.3± 0.2	3.6± 0.2
12500 ppm	3.3± 0.2	3.7± 0.2
25000 ppm	3.1± 0.2	3.6± 0.2
50000 ppm	3.2± 0.2	3.6± 0.3
100000 ppm	2.2± 0.3**	2.7± 0.6**

Significant difference ; * : P ≦ 0.05 ** : P ≦ 0.01 Test of Dunnett

APPENDIX A 5-1

CHEMICAL INTAKE CHANGES (TWO-WEEK STUDY: SUMMARY)

RAT : MALE

STUDY NO. : 0187
ANIMAL : RAT F344
UNIT : g／kg／d a y
REPORT TYPE : A1 2
SEX : MALE

CHEMICAL INTAKE CHENGES (SUMMARY)
ALL ANIMALS

Group Name	Administration (weeks) 1	2
Control	0.000± 0.000	0.000± 0.000
6250 ppm	0.759± 0.221	0.718± 0.046
12500 ppm	1.785± 0.170	1.476± 0.059
25000 ppm	3.702± 0.299	3.089± 0.206
50000 ppm	7.398± 0.395	7.935± 2.777
100000 ppm	13.489± 7.411	-

APPENDIX A 5-2

CHEMICAL INTAKE CHANGES (TWO-WEEK STUDY: SUMMARY)

RAT : FEMALE

STUDY NO. : 0187
ANIMAL : RAT F344
UNIT : g／kg／d a y
REPORT TYPE : A1 2
SEX : FEMALE

CHEMICAL INTAKE CHENGES (SUMMARY)
ALL ANIMALS

Group Name	Administration (weeks) 1	2
Control	0.000± 0.000	0.000± 0.000
6250 ppm	0.972± 0.118	0.878± 0.129
12500 ppm	1.900± 0.278	1.798± 0.145
25000 ppm	4.180± 0.407	3.505± 0.360
50000 ppm	9.092± 2.615	8.126± 1.720
100000 ppm	15.524± 3.987	-

APPENDIX A 5-3

CHEMICAL INTAKE CHANGES (TWO-WEEK STUDY: SUMMARY)

MOUSE: MALE

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
UNIT : g／kg／d a y
REPORT TYPE : A1 2
SEX : MALE

CHEMICAL INTAKE CHENGES (SUMMARY)
ALL ANIMALS

Group Name	Administration (weeks) 1	2
Control	0.000± 0.000	0.000± 0.000
6250 ppm	1.199± 0.234	1.065± 0.245
12500 ppm	2.565± 0.421	2.214± 0.388
25000 ppm	5.794± 1.023	4.548± 0.785
50000 ppm	11.337± 1.173	9.063± 0.856
100000 ppm	40.802± 10.672	34.813± 16.210

APPENDIX A 5-4

CHEMICAL INTAKE CHANGES (TWO-WEEK STUDY: SUMMARY)

MOUSE: FEMALE

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
UNIT : g／kg／d a y
REPORT TYPE : A1 2
SEX : FEMALE

CHEMICAL INTAKE CHENGES (SUMMARY)
ALL ANIMALS

Group Name	Administration (weeks) 1	2
Control	0.000± 0.000	0.000± 0.000
6250 ppm	1.582± 0.111	1.399± 0.112
12500 ppm	3.133± 0.293	2.961± 0.267
25000 ppm	7.240± 0.970	6.187± 1.210
50000 ppm	15.543± 1.581	14.128± 1.719
100000 ppm	52.131± 11.500	35.906± 23.680

APPENDIX A 6-1

GROSS FINDINGS (TWO-WEEK STUDY : SUMMARY)

RAT : MALE: DEAD AND MORIBUND ANIMALS

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1
SEX : MALE

GROSS FINDINGS (SUMMARY)
DEAD AND MORIBUND ANIMALS (0- 2W)

Organ	Findings	Group Name NO. of Animals	Control 0 (%)	6250 ppm 0 (%)	12500 ppm 0 (%)	25000 ppm 0 (%)
subcutis	dry		- (-)	- (-)	- (-)	- (-)
thymus	atrophic		- (-)	- (-)	- (-)	- (-)
	red		- (-)	- (-)	- (-)	- (-)
	red zone		- (-)	- (-)	- (-)	- (-)

Organ	Findings	Group Name NO. of Animals	50000 ppm 0 (%)	100000 ppm 10 (%)
subcutis	dry		- (-)	10 (100)
thymus	atrophic		- (-)	10 (100)
	red		- (-)	4 (40)
	red zone		- (-)	4 (40)

APPENDIX A 6-2

GROSS FINDINGS (TWO-WEEK STUDY : SUMMARY)

RAT : FEMALE: DEAD AND MORIBUND ANIMALS

Organ	Findings	Group Name NO. of Animals	Control 0 (%)	6250 ppm 0 (%)	12500 ppm 0 (%)	25000 ppm 0 (%)
subcutis	dry		- (-)	- (-)	- (-)	- (-)
thymus	atrophic		- (-)	- (-)	- (-)	- (-)
	red		- (-)	- (-)	- (-)	- (-)
gl stomach	ulcer		- (-)	- (-)	- (-)	- (-)
adrenal	red		- (-)	- (-)	- (-)	- (-)

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1
SEX : FEMALE

GROSS FINDINGS (SUMMARY)
DEAD AND MORIBUND ANIMALS (0- 2W)

Organ	Findings	Group Name NO. of Animals	50000 ppm 0 (%)	100000 ppm 10 (%)
subcutis	dry		- (-)	10 (100)
thymus	atrophic		- (-)	9 (90)
	red		- (-)	4 (40)
gl stomach	ulcer		- (-)	1 (10)
adrenal	red		- (-)	1 (10)

APPENDIX A 6-3

GROSS FINDINGS (TWO-WEEK STUDY : SUMMARY)

RAT : FEMALE: SACRIFICED ANIMALS

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1
SEX : FEMALE

GROSS FINDINGS (SUMMARY)
SACRIFICED ANIMALS (2W)

Organ	Findings	Group Name / NO. of Animals	Control 10 (%)	6250 ppm 10 (%)	12500 ppm 10 (%)	25000 ppm 10 (%)
liver	herniation		1 (10)	0 (0)	0 (0)	0 (0)

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1
SEX : FEMALE

GROSS FINDINGS (SUMMARY)
SACRIFICED ANIMALS (2W)

Organ	Findings	Group Name	50000 ppm	100000 ppm
		NO. of Animals	10 (%)	0 (%)
liver	herniation		0 (0)	- (-)

APPENDIX A 6-4

GROSS FINDINGS (TWO-WEEK STUDY : SUMMARY)

MOUSE: FEMALE: DEAD AND MORIBUND ANIMALS

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1
SEX : FEMALE

GROSS FINDINGS (SUMMARY)
DEAD AND MORIBUND ANIMALS (0- 2W)

Organ	Findings	Group Name NO. of Animals	Control 0 (%)	6250 ppm 0 (%)	12500 ppm 0 (%)	25000 ppm 0 (%)
subcutis	dry		- (-)	- (-)	- (-)	- (-)

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1
SEX : FEMALE

GROSS FINDINGS (SUMMARY)
DEAD AND MORIBUND ANIMALS (0- 2W)

Organ	Findings	Group Name NO. of Animals	50000 ppm 0 (%)	100000 ppm 1 (%)
subcutis	dry		- (-)	1 (100)

APPENDIX A 6-5

GROSS FINDINGS (TWO-WEEK STUDY : SUMMARY)

MOUSE: MALE: SACRIFCED ANIMALS

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1
SEX : MALE

GROSS FINDINGS (SUMMARY)
SACRIFICED ANIMALS (2W)

Organ	Findings	Group Name / NO. of Animals	Control 10 (%)	6250 ppm 10 (%)	12500 ppm 10 (%)	25000 ppm 10 (%)
spleen	black zone		1 (10)	3 (30)	1 (10)	1 (10)
kidney	hydronephrosis		0 (0)	0 (0)	0 (0)	1 (10)

Organ	Findings	Group Name	50000 ppm	100000 ppm
		NO. of Animals	10 (%)	10 (%)
spleen	black zone		2 (20)	0 (0)
kidney	hydronephrosis		0 (0)	1 (10)

APPENDIX A 6-6

GROSS FINDINGS (TWO-WEEK STUDY : SUMMARY)

MOUSE: FEMALE: SACRIFCED ANIMALS

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1
SEX : FEMALE

GROSS FINDINGS (SUMMARY)
SACRIFICED ANIMALS (2W)

Organ	Findings	Group Name / NO. of Animals	Control 10 (%)	6250 ppm 10 (%)	12500 ppm 10 (%)	25000 ppm 10 (%)
subcutis	dry		0 (0)	0 (0)	0 (0)	0 (0)
thymus	atrophic		0 (0)	0 (0)	0 (0)	0 (0)
spleen	black zone		1 (10)	0 (0)	0 (0)	0 (0)

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1
SEX : FEMALE

GROSS FINDINGS (SUMMARY)
SACRIFICED ANIMALS (2W)

Organ	Findings	Group Name	50000 ppm	100000 ppm
		NO. of Animals	10 (%)	9 (%)
subcutis	dry		0 (0)	1 (11)
thymus	atrophic		0 (0)	1 (11)
spleen	black zone		2 (20)	1 (11)

APPENDIX A 7-1

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS

(TWO-WEEK STUDY: SUMMARY)

RAT : MALE : DEAD AND MORIBUND ANIMALS

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1
SEX : MALE

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS (SUMMARY)
DEAD AND MORIBUND ANIMALS (0- 2W)

Organ	Findings	Group Name	Control				6250 ppm				12500 ppm				25000 ppm			
		No. of Animals	0				0				0				0			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]																		
bone marrow	congestion		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
thymus	atrophy		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
	hemorrhage		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
spleen	atrophy		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
[Digestive system]																		
tongue	inflammation		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
stomach	vacuolic change:parietal cell		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
[Urinary system]																		
kidney	mineralization:cortico-medullary junction		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
[Endocrine system]																		
adrenal	hemorrhage		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

Organ	Findings	Group Name	50000 ppm				100000 ppm			
		No. of Animals	0				3			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]										
bone marrow	congestion		- (-)	- (-)	- (-)	- (-)	0 (0)	3 (100)	0 (0)	0 (0)
thymus	atrophy		- (-)	- (-)	- (-)	- (-)	1 (33)	2 (67)	0 (0)	0 (0)
	hemorrhage		- (-)	- (-)	- (-)	- (-)	0 (0)	0 (0)	3 (100)	0 (0)
spleen	atrophy		- (-)	- (-)	- (-)	- (-)	2 (67)	0 (0)	0 (0)	0 (0)
[Digestive system]										
tongue	inflammation		- (-)	- (-)	- (-)	- (-)	1 (33)	0 (0)	0 (0)	0 (0)
stomach	vacuolic change:parietal cell		- (-)	- (-)	- (-)	- (-)	2 (67)	0 (0)	0 (0)	0 (0)
[Urinary system]										
kidney	mineralization:cortico-medullary junction		- (-)	- (-)	- (-)	- (-)	1 (33)	0 (0)	0 (0)	0 (0)
[Endocrine system]										
adrenal	hemorrhage		- (-)	- (-)	- (-)	- (-)	0 (0)	2 (67)	1 (33)	0 (0)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

APPENDIX A 7-2

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS

(TWO-WEEK STUDY: SUMMARY)

RAT : FEMALE : DEAD AND MORIBUND ANIMALS

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS (SUMMARY)
DEAD AND MORIBUND ANIMALS (0- 2W)

Organ	Findings	Group Name	Control				6250 ppm				12500 ppm				25000 ppm			
		No. of Animals	0				0				0				0			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]																		
bone marrow	congestion		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
thymus	atrophy		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
	hemorrhage		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
spleen	atrophy		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
[Digestive system]																		
stomach	vacuolic change:parietal cell		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
[Urinary system]																		
kidney	mineralization:cortico-medullary junction		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
[Endocrine system]																		
adrenal	hemorrhage		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

Organ	Findings	Group Name	50000 ppm				100000 ppm			
		No. of Animals	0				4			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]										
bone marrow	congestion		- (-)	- (-)	- (-)	- (-)	0 (0)	4 (100)	0 (0)	0 (0)
thymus	atrophy		- (-)	- (-)	- (-)	- (-)	0 (0)	4 (100)	0 (0)	0 (0)
	hemorrhage		- (-)	- (-)	- (-)	- (-)	0 (0)	0 (0)	2 (50)	0 (0)
spleen	atrophy		- (-)	- (-)	- (-)	- (-)	4 (100)	0 (0)	0 (0)	0 (0)
[Digestive system]										
stomach	vacuolic change:parietal cell		- (-)	- (-)	- (-)	- (-)	0 (0)	1 (25)	0 (0)	0 (0)
[Urinary system]										
kidney	mineralization:cortico-medullary junction		- (-)	- (-)	- (-)	- (-)	4 (100)	0 (0)	0 (0)	0 (0)
[Endocrine system]										
adrenal	hemorrhage		- (-)	- (-)	- (-)	- (-)	1 (25)	2 (50)	1 (25)	0 (0)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

APPENDIX A 7-3

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS

(TWO-WEEK STUDY: SUMMARY)

RAT : MALE : SACRIFICED ANIMALS

STUDY NO. : 0187
ANIMAL : RAT F344
REPORT TYPE : A1
SEX : MALE

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS (SUMMARY)
SACRIFICED ANIMALS (2W)

Organ	Findings	Group Name	Control				6250 ppm				12500 ppm				25000 ppm			
		No. of Animals	2				2				2				2			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]																		
thymus	hemorrhage		1 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
[Digestive system]																		
stomach	vacuolic change:parietal cell		0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

Organ	Findings	Group Name	50000 ppm				100000 ppm			
		No. of Animals	2				0			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]										
thymus	hemorrhage		0 (0)	0 (0)	0 (0)	0 (0)	- (-)	- (-)	- (-)	- (-)
[Digestive system]										
stomach	vacuolic change:parietal cell		1 (50)	0 (0)	0 (0)	0 (0)	- (-)	- (-)	- (-)	- (-)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

APPENDIX A 7-4

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS

(TWO-WEEK STUDY: SUMMARY)

RAT : FEMALE : SACRIFICED ANIMALS

Organ	Findings	Group Name	Control				6250 ppm				12500 ppm				25000 ppm			
		No. of Animals	2				2				2				2			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]																		
thymus	congestion		0 (0)	0 (0)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
[Digestive system]																		
stomach	vacuolic change:parietal cell		0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
liver	herniation		1 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
[Urinary system]																		
kidney	mineralization:cortico-medullary junction		2 (100)	0 (0)	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

Organ	Findings	Group Name	50000 ppm				100000 ppm			
		No. of Animals	2				0			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]										
thymus	congestion		0 (0)	0 (0)	0 (0)	0 (0)	- (-)	- (-)	- (-)	- (-)
[Digestive system]										
stomach	vacuolic change:parietal cell		1 (50)	0 (0)	0 (0)	0 (0)	- (-)	- (-)	- (-)	- (-)
liver	herniation		0 (0)	0 (0)	0 (0)	0 (0)	- (-)	- (-)	- (-)	- (-)
[Urinary system]										
kidney	mineralization:cortico-medullary junction		2 (100)	0 (0)	0 (0)	0 (0)	- (-)	- (-)	- (-)	- (-)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

APPENDIX A 7-5

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS

(TWO-WEEK STUDY: SUMMARY)

MOUSE: FEMALE : DEAD AND MORIBUNDANIMALS

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1
SEX : FEMALE

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS (SUMMARY)
DEAD AND MORIBUND ANIMALS (0- 2W)

Organ	Findings	Group Name	Control				6250 ppm				12500 ppm				25000 ppm			
		No. of Animals	0				0				0				0			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]																		
thymus	atrophy		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
spleen	atrophy		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)
[Digestive system]																		
stomach	vacuolic change:parietal cell		- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)	- (-)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

Organ	Findings	Group Name	50000 ppm				100000 ppm			
		No. of Animals	0				1			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]										
thymus	atrophy		- (-)	- (-)	- (-)	- (-)	0 (0)	0 (0)	1 (100)	0 (0)
spleen	atrophy		- (-)	- (-)	- (-)	- (-)	1 (100)	0 (0)	0 (0)	0 (0)
[Digestive system]										
stomach	vacuolic change:parietal cell		- (-)	- (-)	- (-)	- (-)	0 (0)	1 (100)	0 (0)	0 (0)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

APPENDIX A 7-6

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS

(TWO-WEEK STUDY: SUMMARY)

MOUSE: MALE : SACRIFICED ANIMALS

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1
SEX : MALE

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS (SUMMARY)
SACRIFICED ANIMALS (2W)

Organ	Findings	Group Name	Control				6250 ppm				12500 ppm				25000 ppm			
		No. of Animals	2				2				2				2			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]																		
spleen	deposit of melanin		0 (0)	0 (0)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
[Digestive system]																		
stomach	vacuolic change:parietal cell		0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
liver	granulation		1 (50)	0 (0)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

Organ	Findings	Group Name	50000 ppm				100000 ppm			
		No. of Animals	2				2			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Hematopoietic system]										
spleen	deposit of melanin		0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
[Digestive system]										
stomach	vacuolic change:parietal cell		0 (0)	0 (0)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)
liver	granulation		1 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

APPENDIX A 7-7

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS

(TWO-WEEK STUDY: SUMMARY)

MOUSE: FEMALE : SACRIFICED ANIMALS

STUDY NO. : 0188
ANIMAL : MOUSE BDF1
REPORT TYPE : A1
SEX : FEMALE

HISTOLOGICAL FINDINGS : NON-NEOPLASTIC LESIONS (SUMMARY)
SACRIFICED ANIMALS (2W)

Organ	Findings	Group Name	Control				6250 ppm				12500 ppm				25000 ppm			
		No. of Animals	2				2				2				2			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Digestive system]																		
stomach	ulcer:forestomach		1 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
liver	granulation		1 (50)	0 (0)	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	2 (100)	0 (0)	0 (0)	0 (0)	1 (50)	0 (0)	0 (0)	0 (0)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

Organ	Findings	Group Name	50000 ppm				100000 ppm			
		No. of Animals	2				2			
			<1> (%)	<2> (%)	<3> (%)	<4> (%)	<1> (%)	<2> (%)	<3> (%)	<4> (%)
[Digestive system]										
stomach	ulcer:forestomach		0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
liver	granulation		2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)

<1>:Slight <2>:Moderate <3>:Marked <4>:Severe

APPENDIX A 8-1

IDENTITY AND PURITY OF TATCD PERFORMED

AT THE JAPAN BIOASSAY LABORATORY

(TWO-WEEK STUDIES)

IDENTITY OF 1,3,5,7-TETRAAZATRICYCLO[3.3.1.1^{3,7}]DECANE PERFORMED AT THE JAPAN BIOASSAY LABORATORY (TWO-WEEK STUDIES)

Lot no. DSJ7468

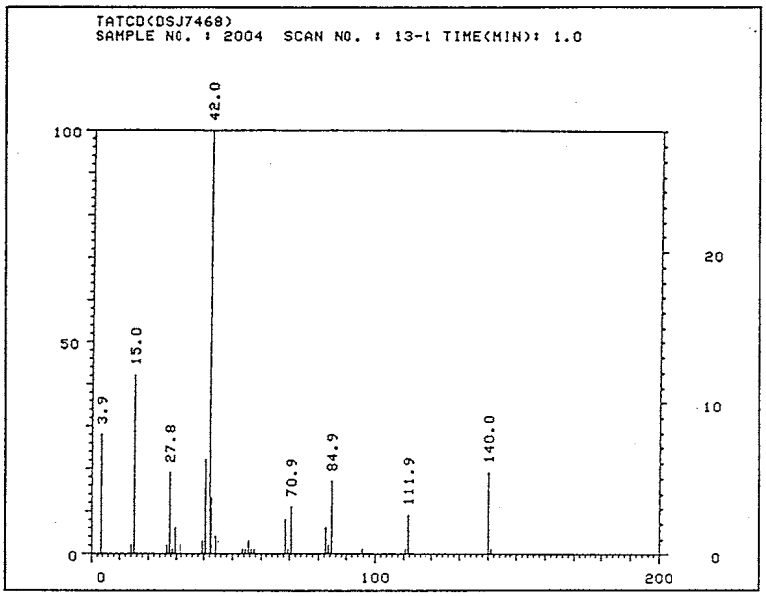
1. Spectral data

Mass Spectrometry

Instrument : Hitachi M-80B

Ionization : EI(Electron Ionization)

Ionization Voltage : 70eV



Mass Spectrum of 1,3,5,7-Tetraazatricyclo[3.3.1.1^{3,7}]decane

Result:

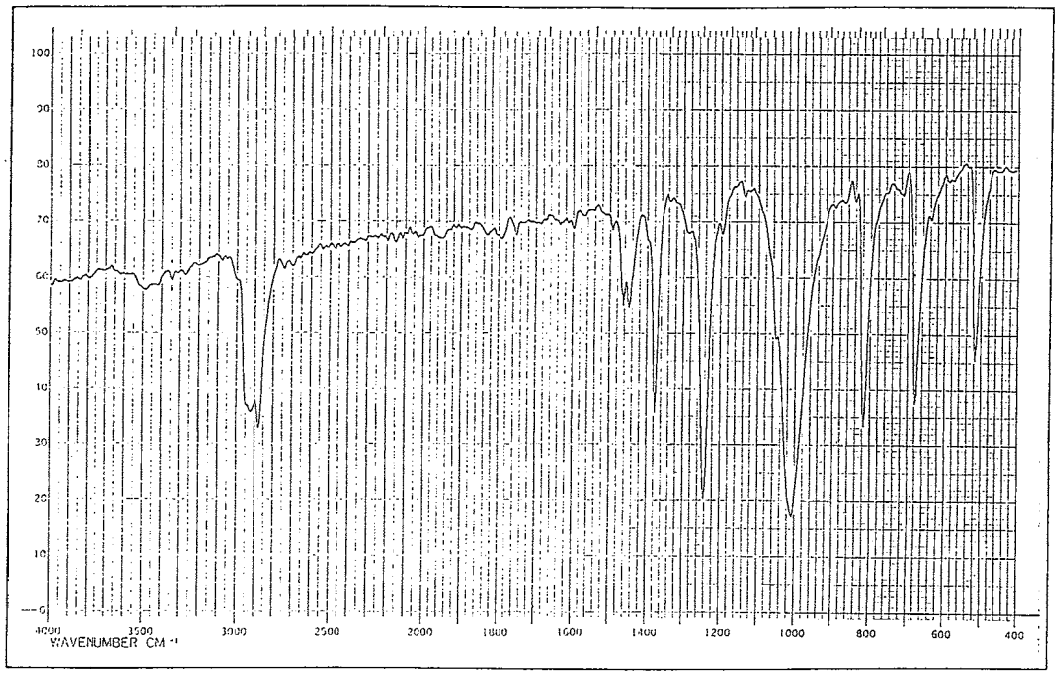
	Molecular Weight
Theoretical Value	140.1(Calculated)
Determined	140.0

Infrared Spectrum

Instrument : Hitachi 270-30

Cell : KBr

Slit : Medium



Infrared Spectrum of 1,3,5,7-Tetraazatricyclo[3.3.1.1^{3,7}]decane

Results:

Wave Number(CM^{-1})

Determined	Literature Value
480～ 530	480～ 530
640～ 700	640～ 700
780～ 830	780～ 830
910～1100	910～1100
1200～1270	1200～1270
1350～1420	1350～1420
1420～1490	1420～1490
2800～3000	2800～3000

(Performed by the WAKO PURE CHEMICAL INDUSTRIES, LTD.)

2. Conclusions: The result of the mass spectrum agreed with the theoretical value and the infrared spectrum agreed with the literature value.

APPENDIX A 8-2

STABILITY OF TATCD AT THE JAPAN BIOASSAY LABORATORY

(TWO-WEEK STUDIES)

STABILITY OF 1,3,5,7-TETRAAZATRICYCLO[3.3.1.1^{3,7}]DECANE AT THE JAPAN BIOASSAY LABORATORY (TWO-WEEK STUDIES)

Lot no. DSJ7468

1.Sample storage: 1,3,5,7-Tetraazatricyclo[3.3.1.1^{3,7}]decane was stored for about 6 weeks at 5°C.

2.Infrared Spectrum

Instrument : Hitachi 270-30

Cell : KBr

Slit : Medium

Results:

Wave Number (CM^{-1})

11/08/91	12/17/91
480～ 530	480～ 530
640～ 700	640～ 700
780～ 830	780～ 830
910～1100	910～1100
1200～1270	1200～1270
1350～1420	1350～1420
1420～1490	1420～1490
2800～3000	2800～3000

3. Conclusions: No notable differrence was observed between infrared spectrums of pre- and post-examination of the study.
Consequently, 1,3,5,7-tetraazatricyclo[3.3.1.1^{3,7}]decane was stable as the chemical when stored for about 6 weeks at 5°C.

APPENDIX A 8-3-1

ANANLYSIS OF TATCD CONCENTRATION IN DRINKING WATER

OF THE TOW-WEEK STUDIES

ANALYSIS OF 1,3,5,7-TETRAAZATRICYCLO[3.3.1.1^{3,7}]DECANE CONCENTRATION IN DRINKING WATER OF THE TWO-WEEK STUDIES

(Rat)

Concentration of 1,3,5,7-Tetraazatricyclo[3.3.1.1^{3,7}]decane in Drinking Water for Target Concentration(ppm)				
6250 (a)	12500 (a)	25000 (a)	50000 (a)	100000 (a)
6403.6(102.5)	12880.1(103.0)	25561.8(102.2)	51397.3(102.8)	107539.8(107.5)

(Mouse)

Concentration of 1,3,5,7-Tetraazatricyclo[3.3.1.1^{3,7}]decane in Drinking Water for Target Concentration(ppm)				
6250 (a)	12500 (a)	25000 (a)	50000 (a)	100000 (a)
6131.4(98.1)	12499.2(100.0)	25693.3(102.8)	51292.0(102.6)	98991.2(99.0)

(a) Percent of target concentration

Analytical method: The sample were analyzed by the Ultra Violet Spectrophotometry.

Instrument	: SHIMADZU UV-240	Slit	: 2 nm
Cell	: 10 mm Cell	Range	: 0 - 2
Solvent	: Distilled Water	Wave Length	: 200 nm

APPENDIX A 8-3-2

STABILITY OF TATCD CONCENTRATION IN DRINKING WATER OF THE TWO-WEEK STUDIES

STABILITY OF 1,3,5,7-TETRAAZATRICYCLO[3.3.1.1^{3,7}]DECANE IN DRINKING WATER OF THE TWO-WEEK STUDIES

(Rat)

	Concentration of 1,3,5,7-Tetraazatricyclo[3.3.1.1^{3,7}]decane in Drinking Water for Target Concentration(ppm)	
Date	6250 (b)	100000 (b)
11/08/91(a)	6022.7(100)	102759.8(100)
11/12/91	6112.9(101.5)	97507.7(94.9)

(Mouse)

	Concentration of 1,3,5,7-Tetraazatricyclo[3.3.1.1^{3,7}]decane in Drinking Water for Target Concentration(ppm)	
Date	6250 (b)	100000 (b)
11/08/91(a)	6022.7(100)	102759.8(100)
11/12/91	5983.5(99.3)	96453.2(93.9)

(a) Date of preparation
(b) Percent of concentration on preparation day

Analytical method: The sample were analyzed by the Ultra Violet Spectrophotometry.

Instrument	: SHIMADZU UV-240	Slit	: 2 nm
Cell	: 10 mm Cell	Range	: 0 - 2
Solvent	: Distilled Water	Wave Length	: 200 nm