

Experiment Number: 60311 - 05
Test Type: CHRONIC
Route: RESPIRATORY EXPOSURE WHOLE BODY
Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
Cobalt
CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
Time Report Requested: 14:48:12
First Dose M/F: 05/08/06 / 05/08/06
Lab: BNW

F2_RD

NTP Study Number: C60311
Lock Date: 12/03/2008
Cage Range: ALL
Date Range: ALL
Reasons For Removal: ALL
Removal Date Range: ALL
Treatment Groups: Include ALL
Study Gender: Both
TDMSE Version: 2.6.0.0_007
PWG Approval Date: NONE

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		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
DAY ON TEST		3	6	6	6	7	6	6	7	6	7	6	5	7	7	5	7	6	7	7	6	5	7	7	6	6	
FISCHER 344-TACONIC RATS MALE		8	1	2	9	2	8	1	3	7	2	6	4	3	2	6	2	8	0	3	8	8	0	1	6	8	
Control		3	1	6	7	9	2	6	0	6	9	3	2	0	9	2	9	8	5	0	3	3	3	2	9	8	
		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	
ANIMAL ID		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	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	0	0	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	
		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	males (cont...)

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Inflammation, Suppurative											4														
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+	+
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+	+
Liver	+	+		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Atrophy			2																						
Basophilic Focus					X								X		X	X									
Clear Cell Focus					X		X						X		X				X						
Eosinophilic Focus																									
Fatty Change												3						1							
Hepatodiaphragmatic Nodule			X																X						
Inflammation, Chronic Active													2												
Necrosis																									
Thrombosis																							1		
Bile Duct, Hyperplasia																								3	
Mesentery	+		+							+	+	+								+					+
Artery, Thrombosis																									3

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

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FISCHER 344-TACONIC RATS MALE Control	DAY ON TEST																				ANIMAL ID	males (cont...)				
	0 3 8 3	0 6 1 1	0 6 2 6	0 6 9 7	0 7 2 9	0 6 8 2	0 6 1 6	0 7 3 0	0 6 7 6	0 7 2 9	0 6 6 3	0 7 4 2	0 5 3 0	0 7 7 9	0 6 2 2	0 7 8 9	0 6 0 5	0 7 3 0	0 6 8 3	0 5 8 3			0 7 0 2	0 7 1 9	0 6 6 8	0 6 8 8
	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	
Fat, Necrosis	1				1			1	1	1		1	1				1			1						
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Acinus, Atrophy	1	1	1	1				1	1					1			1	1		1						
Acinus, Hyperplasia										2																
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Edema																			3			2				
Hyperplasia, Squamous										2	3									3	2	1				
Inflammation, Chronic Active																					1					
Mineralization																										
Ulcer										1	4						2			3						
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Edema																							2			
Mineralization																										
Ulcer																										
CARDIOVASCULAR SYSTEM																										
Blood Vessel																										
Aorta, Mineralization																										
Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+			
Cardiomyopathy	1	1	2	2	1		2	1		1	3	2	1	1	2	1	1	3	2		3	1	2			
Thrombosis																							1			
ENDOCRINE SYSTEM																										

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 + .. Tissue examined microscopically
 X .. Lesion present
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M .. Missing tissue
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DAY ON TEST	FISCHER 344-TACONIC RATS MALE																									males (cont...)
	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	
Control	3	6	6	6	7	6	6	7	6	7	6	5	7	7	5	7	6	7	7	6	5	7	7	6	6	
ANIMAL ID	8	1	2	9	2	8	1	3	7	2	6	4	3	2	6	2	8	0	3	8	8	0	1	6	8	
	3	1	6	7	9	2	6	0	6	9	3	2	0	9	2	9	8	5	0	3	3	3	2	9	8	
	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	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	0	0	0	0	0	0	0	0	0	0	0	
	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	

Adrenal Cortex	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Accessory Adrenal Cortical Nodule																							1			
Degeneration																										
Hyperplasia		1	1	1	2	1			1	3		1	3	1		1		2	1			1	2		2	
Adrenal Medulla	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Hyperplasia		1		2					3	4		3		1	3				1	4				2		
Islets, Pancreatic	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Parathyroid Gland	+	+	+	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Pituitary Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Angiectasis			1																							
Cyst																										
Pars Distalis, Hyperplasia				1	2		1					1										1				
Thyroid Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Hemorrhage																										
C-cell, Hyperplasia									1					1	2					3			1			

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

Epididymis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Cyst																									
Preputial Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	

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FISCHER 344-TACONIC RATS MALE	DAY ON TEST																									males (cont...)	
	0383	0681	0662	0669	0722	0681	0663	0737	0672	0664	0743	0677	0572	0762	0688	0703	0677	0668	0573	0788	0700	0683	0770	0665	0776		0666
Control	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
ANIMAL ID	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000	0000
	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	8

Ectasia Inflammation, Chronic Active 2 1 1 2 2

Prostate Hyperplasia Inflammation, Chronic Active + 2 2 1 1 1 3 1 2 2 4 1 2 1 1 2 3 3 1 1

Seminal Vesicle Inflammation, Chronic Active +

Testes Atrophy Infarct Arteriole, Inflammation, Chronic Active Interstitial Cell, Hyperplasia + 1 1 4 4 4 4 4 3 3 2 4 2 4 2 4 4 4 4 1 3 3 2 3

HEMATOPOIETIC SYSTEM

Bone Marrow +

Lymph Node Iliac, Ectasia Pancreatic, Ectasia Renal, Ectasia + 3

Lymph Node, Bronchial M M M + + + M + M + M M + M M + + M + M + M + + M

Lymph Node, Mandibular Atrophy Ectasia Hyperplasia + + + + + + + + + + M + + + + + + + + + + + + + + + + + 4 2

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically M .. Missing tissue 1-4 .. Lesion qualified as:
 X .. Lesion present A .. Autolysis precludes evaluation 1) Minimal 3) Moderate
 I .. Insufficient tissue BLANK .. Not examined microscopically 2) Mild 4) Marked

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DAY ON TEST		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
FISCHER 344-TACONIC RATS MALE		3	6	6	6	7	6	6	7	6	7	6	5	7	7	5	7	6	7	6	5	7	7	6	6	6
Control		8	1	2	9	2	8	1	3	7	2	6	4	3	2	6	2	8	0	3	8	8	0	1	6	8
ANIMAL ID		3	1	6	7	9	2	6	0	6	9	3	2	0	9	2	9	8	5	0	3	3	2	9	8	8
		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	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	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2
		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5

males (cont...)

Necrosis

Lymph Node, Mediastinal	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
-------------------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Lymph Node, Mesenteric Hemorrhage	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
-----------------------------------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Spleen	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Fibrosis		1							2		1									1					
Hematopoietic Cell Proliferation Hemorrhage																									
Necrosis											3														
Capsule, Angiectasis			1																						

Thymus	M	+	+	+	M	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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INTEGUMENTARY SYSTEM

Mammary Gland	+	M	+	+	+	+	+	+	M	+	+	M	+	M	+	M	+	+	+	+	M	M	+	M	M
Galactocele											3														
Hyperplasia									3																
Inflammation, Chronic Active																						1			

Skin	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cyst Epithelial Inclusion																						2			
Hyperplasia, Squamous												3													
Inflammation				3								3	1												

MUSCULOSKELETAL SYSTEM

Bone	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
------	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

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FISCHER 344-TACONIC RATS MALE Control	ANIMAL ID	3	6	6	6	7	6	6	7	6	7	6	5	7	7	5	7	6	7	6	5	7	7	6	6	5	7	6		6	
		8	1	2	9	2	8	1	3	7	2	6	4	3	2	6	2	8	0	3	8	8	0	1	6	8	0	1		6	8
		3	1	6	7	9	2	6	0	6	9	3	2	0	9	2	9	8	5	0	3	3	3	2	9	8	8	8		8	8

Skeletal Muscle

NERVOUS SYSTEM

Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Compression		2							2					2		2	1		2			3			2		3		3	
Edema																														
Hemorrhage				2																										
Infiltration Cellular, Mononuclear Cell												1																		
Metaplasia, Osseous																														
Meninges, Inflammation, Suppurative								3																						
Spinal Cord																														
Infiltration Cellular																														

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Foreign Body																														
Inflammation	1				1	1	1	1	1		1	1			1	1	1	1	1	1							1	1	2	
Metaplasia, Squamous																														
Ulcer																														
Lung	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Inflammation, Chronic Active																														
Metaplasia, Osseous																														
Mineralization																														
Thrombosis																														
Alveolar Epithelium, Hyperplasia																														

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	0 3 8 3	0 6 1 1	0 6 2 6	0 6 9 7	0 7 2 9	0 6 8 2	0 6 1 6	0 7 3 0	0 6 7 6	0 7 2 9	0 6 6 3	0 5 4 2	0 7 3 0	0 7 2 9	0 5 6 2	0 7 8 9	0 6 0 5	0 7 3 0	0 6 8 3	0 5 8 3	0 7 0 2	0 7 1 9	0 6 6 8	0 6 8 8			
Control	0 0 0 0 1	0 0 0 0 2	0 0 0 0 3	0 0 0 0 4	0 0 0 0 5	0 0 0 0 6	0 0 0 0 7	0 0 0 0 8	0 0 0 0 9	0 0 0 0 0	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 1	0 0 0 0 2	0 0 0 0 2	0 0 0 0 2	0 0 0 0 2	0 0 0 0 3	0 0 0 0 4	0 0 0 0 5

Nose	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	I	+	+	+	+	+
Foreign Body			X																						X
Inflammation, Suppurative			1							1															1
Inflammation, Chronic Active	1		1		1		1			1	2		1		1	1		1	1		1		1	1	1
Thrombosis																				4		2			
Olfactory Epithelium, Accumulation, Hyaline Droplet															2										
Olfactory Epithelium, Atrophy		1																1							
Olfactory Epithelium, Metaplasia, Respiratory		1						1					1										1	1	
Respiratory Epithelium, Hyperplasia			2					1	1		1				1	2		1	1		1	1			
Respiratory Epithelium, Necrosis																									
Turbinate, Atrophy			1																						
Turbinate, Hyperostosis							1																		

Trachea	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
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SPECIAL SENSES SYSTEM

Ear																									
Inflammation, Chronic Active																									+
																									3
Eye	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Cataract																									
Inflammation, Suppurative																									1
Metaplasia, Osseous																									1
																									1
																									1
Harderian Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Zymbal's Gland	+							+				+													

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

	DAY ON TEST	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	
FISCHER 344-TACONIC RATS MALE		3	6	6	6	7	6	6	7	6	7	6	5	7	7	5	7	6	7	7	6	5	7	7	6	6	6	
		8	1	2	9	2	8	1	3	7	2	6	4	3	2	6	2	8	0	3	8	8	0	1	6	8	8	
		3	1	6	7	9	2	6	0	6	9	3	2	0	9	2	9	8	5	0	3	3	2	9	8	8	8	
Control	ANIMAL ID	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	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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
		0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	males
		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	(cont...)	

URINARY SYSTEM

Kidney	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Infarct																										
Nephropathy	1	3	2	2	3	4	3	3	3	3	2	3	3	1	4	3	4	3	3	2	4	3	3	3	3	
Urinary Bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Hemorrhage																										
Inflammation, Granulomatous																									1	
Transitional Epithelium, Hyperplasia									4																	

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 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
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1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

DAY ON TEST																					* TOTALS										
	0730	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772	0772		0772	0772								
FISCHER 344-TACONIC RATS MALE	3	2	2	2	2	1	8	6	2	9	1	2	2	1	4	2	9	7	3	2	7	2	9	7	5	6	3	7	6		
Control	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	
ANIMAL ID	0026	0027	0028	0029	0030	0031	0032	0033	0034	0035	0036	0037	0038	0039	0040	0041	0042	0043	0044	0045	0046	0047	0048	0049	0050	0051	0052	0053	0054	0055	

ALIMENTARY SYSTEM

Esophagus Inflammation, Suppurative	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	1 4.0
Intestine Large, Cecum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+	+	+	+	+	49		
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50		
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+	+	+	+	+	48		
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+	+	+	+	+	48		
Liver Atrophy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	1 2.0	
Basophilic Focus					X																								5		
Clear Cell Focus			X	X								X				X													9		
Eosinophilic Focus									X									X	X										3		
Fatty Change																													2 2.0		
Hepatodiaphragmatic Nodule								X															X						4		
Inflammation, Chronic Active																													1 2.0		
Necrosis										1			3		2		1											5 1.6			
Thrombosis																													1 1.0		
Bile Duct, Hyperplasia																													1 3.0		
Mesentery Artery, Thrombosis	+	+							+	+					+		+	+			+								18	1 3.0	

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

FISCHER 344-TACONIC RATS MALE	DAY ON TEST																				* TOTALS		
	0730	0732	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739		0739	0739
Control	00026	00007	00008	00009	00010	00011	00012	00013	00014	00015	00016	00017	00018	00019	00020	00021	00022	00023	00024	00025	00026	00027	
Fat, Necrosis	2	1							1									1	1				14 1.1
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Acinus, Atrophy			1	1	1			1	1					1				1	3		1	1	23 1.1
Acinus, Hyperplasia																							1 2.0
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Stomach, Forestomach	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Edema																							2 2.5
Hyperplasia, Squamous			2						2												2	2	10 2.2
Inflammation, Chronic Active									2														2 1.5
Mineralization																			1	3			2 2.0
Ulcer																							4 2.5
Stomach, Glandular	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Edema																							1 2.0
Mineralization																					2		1 2.0
Ulcer													3										1 3.0
CARDIOVASCULAR SYSTEM																							
Blood Vessel																						+	1
Aorta, Mineralization																						3	1 3.0
Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Cardiomyopathy	1	2	1	2	2	2	1	3	2	1		2		2	1	2	1	1	1	3	2	3	45 1.7
Thrombosis									3			2		3							4		4 3.0
ENDOCRINE SYSTEM																							

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

DAY ON TEST		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	* TOTALS
FISCHER 344-TACONIC RATS MALE		7	7	7	7	7	6	6	6	7	6	5	7	7	5	4	7	6	6	7	7	6	7	5	6	3	6	3	
Control	ANIMAL ID	3	2	2	2	2	1	8	6	2	9	1	2	2	1	4	2	9	7	3	2	7	2	9	7	7	6		
		0	9	9	9	9	3	2	3	9	1	9	9	7	4	1	9	6	5	0	9	0	0	0	0	0	0	0	0
Adrenal Cortex		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Accessory Adrenal Cortical Nodule Degeneration								1					1															3 1.0	
Hyperplasia		1	3	1		1		2	1	1	1	1	1			2	1	2	2	1		1	2	1				1 3.0	
																												35 1.4	
Adrenal Medulla		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Hyperplasia			1			1		3	2	1				4					1	4	3							19 2.3	
Islets, Pancreatic		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Parathyroid Gland		+	+	+	+	+	M	+	+	+	+	+	M	M	+	+	+	+	+	+	+	+	+	M	+	+	+	45	
Pituitary Gland		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Angiectasis																												1 1.0	
Cyst																												1	
Pars Distalis, Hyperplasia			4	3	1					1	1	2		4			4	1			4	2	4			1		18 2.1	
Thyroid Gland		+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+		49	
Hemorrhage																			1									1 1.0	
C-cell, Hyperplasia											1											1						7 1.4	

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

Epididymis	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Cyst																							X						1
Preputial Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	

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+ .. Tissue examined microscopically

M .. Missing tissue

1-4 .. Lesion qualified as:

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X .. Lesion present

BLANK .. Not examined microscopically

2) Mild 4) Marked

I .. Insufficient tissue

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

FISCHER 344-TACONIC RATS MALE Control	DAY ON TEST																								* TOTALS				
	07030	0729	0779	0779	0779	0779	0663	0662	0663	0729	0769	0759	0779	0779	0574	0574	0779	0666	0666	0773	0772	0677	0672	0579		0578	0663	0667	
ANIMAL ID	00026	00027	00028	00029	00030	00031	00032	00033	00034	00035	00036	00037	00038	00039	00040	00041	00042	00043	00044	00045	00046	00047	00048	00049	00050	00051	00052	00053	
Ectasia Inflammation, Chronic Active						1												3										3 2.3	
Prostate Hyperplasia Inflammation, Chronic Active	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Seminal Vesicle Inflammation, Chronic Active	1		1		1	1	2			1	1		2	2	2			4	1	1	1	3		1	1		36 1.7		
Testes Atrophy Infarct Arteriole, Inflammation, Chronic Active Interstitial Cell, Hyperplasia	4	4	1	4	4		2	4		1		4	4		4	4			3			4	4	4	2		50		
																												35 3.3	
																												1 3.0	
																												2 2.5	
													2			1												7 2.1	
HEMATOPOIETIC SYSTEM																													
Bone Marrow	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50	
Lymph Node Iliac, Ectasia			+						+											+						+	+	+	12
Pancreatic, Ectasia																											2		1 2.0
Renal, Ectasia																										2	2		2 2.0
Lymph Node, Bronchial	M	+	M	M	+	+	+	+	M	M	+	+	+	+	+	+	+	+	+	M	M	+	M	+	M	M		27	
Lymph Node, Mandibular Atrophy Ectasia Hyperplasia	M	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	48	
																													1 2.0
																													1 4.0
																													1 2.0

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

FISCHER 344-TACONIC RATS MALE Control	DAY ON TEST																				* TOTALS							
	0730	0732	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739	0739		0739	0739					
ANIMAL ID	00026	00007	00008	00009	00010	00011	00012	00013	00014	00015	00016	00017	00018	00019	00020	00021	00022	00023	00024	00025	00026	00027	00028	00029	00030			
Necrosis																										2	1 2.0	
Lymph Node, Mediastinal	+	+	+	+	M	+	+	+	+	+	+	+	+	+	M	+	+	+	+	M	+	+	+	+	+		46	
Lymph Node, Mesenteric Hemorrhage	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+		49	1 2.0
Spleen	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		50	
Fibrosis		2													1					2	3						8 1.6	
Hematopoietic Cell Proliferation															2	2						2					3 2.0	
Hemorrhage												2															1 2.0	
Necrosis											3											3					3 3.0	
Capsule, Angiectasis																											1 1.0	
Thymus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+		46	
INTEGUMENTARY SYSTEM																												
Mammary Gland	+	M	M	+	+	M	M	M	M	+	M	+	M	+	+	+	M	+	+	+	+	+	+	+	M		31	
Galactocele																											1	2 2.0
Hyperplasia																											4	2 3.5
Inflammation, Chronic Active																												1 1.0
Skin	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		50
Cyst Epithelial Inclusion																												1 2.0
Hyperplasia, Squamous																											4	2 3.5
Inflammation																											3	7 2.4
MUSCULOSKELETAL SYSTEM																												
Bone	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		50

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Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

FISCHER 344-TACONIC RATS MALE	DAY ON TEST																								* TOTALS
	07 30	07 29	07 22	07 22	07 22	07 21	07 18	07 16	07 16	07 16	07 12	07 11	07 11	07 11	07 10	07 10	07 10	07 10	07 10	07 10	07 10	07 10	07 10		
Control	00 00 02 06	00 00 02 07	00 00 02 08	00 00 02 09	00 00 03 00	00 00 03 01	00 00 03 02	00 00 03 03	00 00 03 04	00 00 03 05	00 00 03 06	00 00 03 07	00 00 03 08	00 00 03 09	00 00 04 00	00 00 04 01	00 00 04 02	00 00 04 03	00 00 04 04	00 00 04 05	00 00 04 06	00 00 04 07	00 00 04 08	00 00 04 09	50

Skeletal Muscle

+

1

NERVOUS SYSTEM

Brain	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Compression				3		1							1		2					2		2			15
Edema								3												3					2
Hemorrhage									2																2
Infiltration Cellular, Mononuclear Cell																									1
Metaplasia, Osseous																				4					1
Meninges, Inflammation, Suppurative																									1
Spinal Cord																									1
Infiltration Cellular																									1

RESPIRATORY SYSTEM

Larynx	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Foreign Body								X																	3
Inflammation	1	1			1		2	2		2		2		1			1		1					2	28
Metaplasia, Squamous																							1		3
Ulcer												1													1
Lung	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Inflammation, Chronic Active	1		1	1	1		1				1	1		1	1			1	1		1	2			22
Metaplasia, Osseous											1										1				3
Mineralization																						2			1
Thrombosis																						2			2
Alveolar Epithelium, Hyperplasia							1																		3

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 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

FISCHER 344-TACONIC RATS MALE	DAY ON TEST																				* TOTALS					
	0730	0772	0779	0779	0779	0779	0779	0783	0783	0783	0783	0783	0783	0783	0783	0783	0783	0783	0783	0783		0783	0783	0783	0783	
Control	ANIMAL ID																									
	00026	00007	00008	00009	00010	00011	00012	00013	00014	00015	00016	00017	00018	00019	00020	00021	00022	00023	00024	00025	00026	00027	00028	00029	00030	

Nose	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+	48
Foreign Body					X			X												X					5
Inflammation, Suppurative								1	1		1		1							1			1		9 1.0
Inflammation, Chronic Active				1	1		2	1	1	2		2		1	1			1		3	1		1		28 1.2
Thrombosis						2					3					4				2	3				7 2.9
Olfactory Epithelium, Accumulation, Hyaline Droplet					1																				2 1.5
Olfactory Epithelium, Atrophy																									2 1.0
Olfactory Epithelium, Metaplasia, Respiratory	1												1	1			1		1	1	2				12 1.1
Respiratory Epithelium, Hyperplasia		1					2		1	1	1		3					1		1		1	1		20 1.3
Respiratory Epithelium, Necrosis																				1					1 1.0
Turbinate, Atrophy																									1 1.0
Turbinate, Hyperostosis		1																							2 1.0

Trachea + 50

SPECIAL SENSES SYSTEM

Ear																									1
Inflammation, Chronic Active																									1 3.0

Eye	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50
Cataract																						3			3 1.7
Inflammation, Suppurative																					2				1 2.0
Metaplasia, Osseous		2	2		1	1	1	1	1	1	1		2		1		1		1	2		1	1		31 1.2

Harderian Gland + 50

Zymbal's Gland + 4

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 BLANK .. Not examined microscopically
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 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

FISCHER 344-TACONIC RATS MALE	DAY ON TEST	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	* TOTALS		
	ANIMAL ID	7	7	7	7	6	6	6	7	6	5	7	7	5	4	7	6	6	7	7	6	7	5	6		3	
Control		3	2	2	2	1	8	6	2	9	1	2	2	1	4	2	9	7	3	2	7	2	9	7	7		
		0	9	9	9	3	2	3	9	1	9	9	7	4	1	9	6	5	0	9	0	4	8	8	6		
		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	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
		2	2	2	2	3	3	3	3	3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	5		
		6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	

URINARY SYSTEM

Kidney	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50			
Infarct										2											2						2	2.0
Nephropathy	2	3	3	3	3	3	2	3	3	1	4	3	2		3	3	3	4	3	2	4	4	3	2			49	2.9
Urinary Bladder	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	50			
Hemorrhage																											1	1.0
Inflammation, Granulomatous															1												2	1.0
Transitional Epithelium, Hyperplasia																											1	4.0

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 Test Type: CHRONIC
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 Cobalt
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 Lab: BNW

FISCHER 344-TACONIC RATS MALE		DAY ON TEST																				males (cont...)
1.25 mg/m3		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
ANIMAL ID		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		5	7	7	6	7	6	7	6	7	7	6	7	7	6	6	5	7	6	6	6	6
		4	3	2	2	0	8	2	7	2	2	8	3	2	9	3	8	3	7	6	6	6
		0	0	0	9	4	8	3	9	5	9	9	4	0	9	9	4	3	0	4	7	7
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
		0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	2	2	2
		1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	

ALIMENTARY SYSTEM

Esophagus	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Cecum Inflammation, Granulomatous	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Colon	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Large, Rectum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Duodenum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Ileum	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Intestine Small, Jejunum	+	+	+	+	+	+	+	+	+	+	A	+	+	+	+	+	+	+	+	+	+	+
Liver	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
Basophilic Focus			X	X				X	X						X	X	X					X
Clear Cell Focus			X	X				X	X						X	X						
Degeneration, Cystic							2	1				1										
Eosinophilic Focus																						
Fatty Change					1						1											
Hepatodiaphragmatic Nodule																			X			X
Mixed Cell Focus																						
Necrosis	2														3	1						
Mesentery		+																+				+
Fat, Necrosis		1																1				1
Pancreas	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

FISCHER 344-TACONIC RATS MALE 1.25 mg/m3	DAY ON TEST																								ANIMAL ID	males (cont...)
	0 5 4 0	0 7 3 0	0 7 2 0	0 6 2 4	0 7 0 8	0 6 8 3	0 7 2 9	0 6 7 5	0 7 2 9	0 7 2 9	0 6 8 4	0 7 3 0	0 7 2 9	0 6 9 4	0 6 3 8	0 5 8 3	0 7 6 4	0 6 6 7	0 6 6 3	0 6 6 7	0 5 7 4	0 6 8 2	0 7 8 9			
Acinus, Atrophy	1	2	1	1		2	1		1	1	2	3		2		1	1	1	1	2	1		1	2		
Salivary Glands	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Stomach, Forestomach Hyperplasia, Squamous Inflammation, Chronic Active Ulcer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Stomach, Glandular Erosion Inflammation, Chronic Active Ulcer	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Tooth Inflammation, Chronic Active																										

CARDIOVASCULAR SYSTEM

Blood Vessel																										
Heart	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+		
Cardiomyopathy	1	2	3	2	1		2	1	1	2	2	1	1	2	1	1		1	1		1	1	2	2	1	
Inflammation, Suppurative Thrombosis																										
Artery, Inflammation, Chronic Active																										
Atrium, Congestion Epicardium, Hyperplasia																										

ENDOCRINE SYSTEM

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FISCHER 344-TACONIC RATS MALE 1.25 mg/m3	DAY ON TEST																									ANIMAL ID	males (cont...)	
	0 5 4 0	0 7 3 0	0 7 2 0	0 6 2 4	0 7 0 8	0 6 8 3	0 7 2 5	0 6 7 9	0 7 2 9	0 7 2 9	0 6 8 4	0 7 3 0	0 7 2 9	0 6 9 4	0 6 3 3	0 5 8 0	0 7 3 4	0 6 6 7	0 6 6 7	0 6 6 3	0 5 7 4	0 6 8 2	0 6 7 9					
Adrenal Cortex Atrophy	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0 0 2 0 1	+		
Adrenal Cortex Hyperplasia		2	1							3	1		2	1		2	3			2			1		3	1	0 0 2 0 1	
Adrenal Cortex Necrosis																											0 0 2 0 1	
Adrenal Medulla Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0 0 2 0 1	+	
Adrenal Medulla Necrosis	2		3		1					4										1	2	2	4	1	1	3	0 0 2 0 1	
Islets, Pancreatic Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0 0 2 0 1	+	
Parathyroid Gland	+	+	+	+	+	+	+	+	+	+	+	+	+	+	M	+	+	+	+	+	+	+	+	+	M	0 0 2 0 1		
Pituitary Gland Hemorrhage	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0 0 2 0 1	+	
Pituitary Gland Pars Distalis, Hyperplasia	2	2			1							1	1							1	1				1	0 0 2 0 1		
Thyroid Gland C-cell, Hyperplasia	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0 0 2 0 1	+	
Thyroid Gland C-cell, Hyperplasia					1								1			1						1				0 0 2 0 1		

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

Epididymis

+ + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

Penis

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

FISCHER 344-TACONIC RATS MALE 1.25 mg/m3	DAY ON TEST																				ANIMAL ID	males (cont...)		
	0 5 4 0	0 7 3 0	0 7 2 0	0 6 2 4	0 7 0 8	0 6 8 3	0 7 2 9	0 6 7 5	0 7 2 9	0 7 2 9	0 6 8 4	0 7 3 0	0 7 2 9	0 6 9 4	0 6 3 8	0 5 8 3	0 7 6 4	0 6 6 7	0 6 6 3	0 5 7 4			0 6 8 2	0 7 9 5
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0 0 2 0 1	

Concretion

Preputial Gland
 Ectasia
 Inflammation, Chronic Active

+
 1 2 1

Prostate
 Hyperplasia
 Inflammation, Chronic Active

+
 2 4 2 1 2 2 1 1 1 2 1 1 1 1 1 1 1 2 3 1

Seminal Vesicle
 Inflammation, Chronic Active

+ +

Testes
 Atrophy
 Interstitial Cell, Hyperplasia

+
 2 2 2 2 1 4 4 4 4 3 4 4 4 3 3 2 3 2
 4 2 3

HEMATOPOIETIC SYSTEM

Bone Marrow

+ +

Lymph Node
 Iliac, Lumbar, Ectasia
 Iliac, Renal, Ectasia
 Lumbar, Hyperplasia
 Pancreatic, Necrosis
 Renal, Ectasia

+ +
 + +
 1
 4
 2

Lymph Node, Bronchial

+ + + + M M + M + M M + M M M M + M + M M + + M M

Lymph Node, Mandibular

+ M + +

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 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|--------------------|------------------|------------------|---|
| | 0
5
4
0 | 0
7
3
0 | 0
7
2
0 | 0
6
2
4 | 0
7
0
8 | 0
6
8
3 | 0
7
2
9 | 0
6
7
5 | 0
7
2
9 | 0
7
2
9 | 0
6
8
4 | 0
7
3
0 | 0
7
2
9 | 0
6
9
4 | 0
6
3
8 | 0
5
8
3 | 0
7
6
4 | 0
6
6
7 | 0
6
6
3 | 0
5
7
4 | | | 0
6
8
2 | 0
7
9
5 | |
| Inflammation, Chronic Active | | 1 | | 1 | 2 | | 1 | | 2 | 1 | 1 | | 1 | 1 | | 2 | 1 | 1 | 2 | | 2 | 1 | 1 | 2 | 2 |
| Thrombosis | 2 | | | | | | | | | | | | | | | | | | 3 | | | | | | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Olfactory Epithelium, Atrophy | | 1 | | 1 | | 1 | | 1 | | 1 | | | | | | 1 | 1 | 1 | | | | | | | 1 |
| Olfactory Epithelium, Hyperplasia | | | | | | | | | | | | | | | | 1 | | | | | | | | | |
| Olfactory Epithelium, Hyperplasia, Basal Cell | | | | | | | | | | | | | | | | | | | | | | | | | |
| Olfactory Epithelium, Metaplasia, Respiratory | | 1 | | | | 1 | 2 | | 2 | | 2 | | 2 | 1 | | 1 | 1 | | 1 | 3 | 1 | | 3 | 4 | |
| Olfactory Epithelium, Necrosis | | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| Respiratory Epithelium, Hyperplasia | 1 | 2 | | 1 | 1 | | 1 | | 1 | 1 | 1 | | 1 | | 1 | | | 1 | 1 | | | | 1 | 3 | |
| Respiratory Epithelium, Metaplasia, Squamous | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| Respiratory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | |
| Turbinate, Atrophy | 1 | 1 | 1 | 1 | | 1 | 1 | | 1 | 1 | 1 | | 1 | | | | 1 | | 1 | 1 | | 1 | 1 | 1 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Ear | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Cataract | | 1 | | | | 2 | | | | | | 2 | | | | | | | | | | | | 1 | |
| Metaplasia, Osseous | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | | | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | | | | 1 | 1 | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Zymbal's Gland | | | | | + | | | | | | | | | | + | | | | | | | | | | |

URINARY SYSTEM

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 + .. Tissue examined microscopically
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 I .. Insufficient tissue
 M .. Missing tissue
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 Species/Strain: RATS/F344/N Tac

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 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|
| | 0540 | 0730 | 0774 | 0624 | 0708 | 0673 | 0765 | 0779 | 0675 | 0779 | 0779 | 0664 | 0770 | 0779 | 0664 | 0665 | 0774 | 0667 | 0667 | 0666 | 0666 | 0577 | 0668 | 0674 | 0709 | |
| ANIMAL ID | 0020 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Accumulation, Hyaline Droplet | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cyst | | | | | | | | X | | | | | | | | | | | | | | | | | | |
| Nephropathy | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 4 | 3 | 3 | 4 | 2 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Transitional Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | |

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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|
| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 5 | 6 | 5 | 7 | 7 | 7 | 6 | 6 | 5 | 6 | 4 | 7 | 4 | 7 | 7 | 6 | 5 | | |
| | | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 8 | 0 | 9 | 2 | 2 | 0 | 1 | 7 | 6 | 4 | 1 | 3 | 3 | 2 | 1 | 6 | 9 | |
| | ANIMAL ID | 9 | 9 | 9 | 0 | 0 | 5 | 0 | 9 | 0 | 3 | 6 | 9 | 9 | 5 | 8 | 5 | 2 | 1 | 3 | 0 | 9 | 9 | 9 | 3 | 3 | |
| | | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | |
| | | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | * TOTALS |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------|--------------|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Intestine Large, Cecum
Inflammation, Granulomatous | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 4.0 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Intestine Large, Rectum | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Basophilic Focus | X | | | | | | | | | | | X | X | | X | X | | X | X | | | X | | X | 17 | | |
| Clear Cell Focus | X | | | | | | | X | | | | X | | | X | | X | | | | | | | | 11 | | |
| Degeneration, Cystic | | | | | | | | | | | | | 1 | | 1 | | | | | | | | | | | 5 1.2 | |
| Eosinophilic Focus | | | | | | | | | | | | X | | | | | | | | X | | | | | | 2 | |
| Fatty Change | | | 1 | | | | | | | | | | | | | | | | | | 2 | | | | | 4 1.3 | |
| Hepatodiaphragmatic Nodule | X | | | | | | | | | X | X | X | | | X | X | | | | | | | X | | | 9 | |
| Mixed Cell Focus | | | | | | | | | | | | | X | | | | | | | | | | | | | 1 | |
| Necrosis | | | 1 | | | | | | | 3 | | | | | | | | | | | | 2 | | | | 6 2.0 | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | | | 4 | |
| Fat, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | 4 1.0 | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|---------------|
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| ANIMAL ID | 00
22
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66 | 00
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77 | 00
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88 | 00
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33
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55 | 00
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66 | 00
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33
77 | 00
22
33
88 | 00
22
33
99 | |
| Acinus, Atrophy | | 2 | 1 | 1 | 4 | 1 | 1 | 1 | | 1 | 1 | 2 | | 1 | 2 | 1 | | | | 1 | 1 | 1 | | | | 35 1.4 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hyperplasia, Squamous | | 1 | | | | 2 | 2 | | | | | | | 3 | 3 | 3 | 3 | 1 | | 1 | 3 | | 3 | 2 | | 14 2.2 |
| Inflammation, Chronic Active | | | | | | | | | | | | 3 | | | 3 | 3 | | | | | | | | | | 4 2.8 |
| Ulcer | | | | | | | 1 | | | | | | | | | | | | | | | | 2 | | | 4 2.0 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Erosion | | | | | | | | | | | | | | 1 | | | | | | | | | | | | 1 1.0 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | 3 | | | | | | | | | | 1 3.0 |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | 2 | | | 2 1.5 |
| Tooth | | | | | | | | | | | | | | + | | | | | | | | | | | | 2 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 2.5 |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------------|
| Blood Vessel | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Cardiomyopathy | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 4 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | | | 44 1.5 |
| Inflammation, Suppurative | | | | | | | | | | 2 | | | | | | | | | | | | | | | | 1 2.0 |
| Thrombosis | | | 2 | | | | | | | | | | | | | | | | | | | | | | | 2 2.0 |
| Artery, Inflammation, Chronic Active | | | | | | | | | | | | | 3 | | | | | | | | | | | | | 1 3.0 |
| Atrium, Congestion | | | | | | | | | 2 | | | | | | | | | | | | | | | | | 1 2.0 |
| Epicardium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | 2 | | | 1 2.0 |

ENDOCRINE SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

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1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
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| ANIMAL ID | 00
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86 | 00
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87 | 00
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88 | 00
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89 | 00
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90 |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Atrophy | 1 | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Hyperplasia | 2 | | | 1 | | | 1 | 1 | | 1 | | 1 | 1 | 2 | 1 | | | | | | 1 | 3 | | 1 | 24 1.6 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hyperplasia | | 1 | 3 | | | | 1 | 3 | | | | 3 | 4 | 4 | | 4 | 4 | | | + | + | + | + | + | 21 2.5 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | 2 | | 1 2.0 |
| Parathyroid Gland | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + | + | + | 45 |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | 3 | | | | | 1 3.0 |
| Pars Distalis, Hyperplasia | 3 | 2 | | | 4 | | | | | | | | 3 | | | | | | | | | | | | 12 1.8 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| C-cell, Hyperplasia | | | 3 | | 4 | | | | | | | | | 1 | | | | | | | | | 1 | | 8 1.6 |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Penis | | | | | | | | | | | | | + | | | | | | | | | | | | 1 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
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|--|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
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| ANIMAL ID | 00
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44 |
| Concretion | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 2.0 |
| Preputial Gland
Ectasia
Inflammation, Chronic Active | + | | | | | | | | | | | | | | | | | | | | | | | 50 | 1 3.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 3 | 4 1.3 |
| Prostate
Hyperplasia
Inflammation, Chronic Active | + | | | | | | | | | | | | | | | | | | | | | | | 50 | 6 2.0 |
| | 1 | | | | | | | | | | | | | | | | | | | | | | | 2 | 39 1.5 |
| Seminal Vesicle
Inflammation, Chronic Active | + | | | | | | | | | | | | | | | | | | | | | | | 50 | 1 2.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| Testes
Atrophy
Interstitial Cell, Hyperplasia | + | | | | | | | | | | | | | | | | | | | | | | | 50 | 34 3.0 |
| | 4 3 2 3 | | | | | | | | | | | | | | | | | | | | | | | 4 | 10 2.1 |
| | 2 | | | | | | | | | | | | | | | | | | | | | | | | |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----|-------|
| Bone Marrow | + | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Lymph Node
Iliac, Lumbar, Ectasia
Iliac, Renal, Ectasia
Lumbar, Hyperplasia
Pancreatic, Necrosis
Renal, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | 9 | 1 1.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 3.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 1.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 4.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 3 | 3 2.7 |
| Lymph Node, Bronchial | + | | | | | | | | | | | | | | | | | | | | | | | 25 | |
| Lymph Node, Mandibular | + | | | | | | | | | | | | | | | | | | | | | | | 49 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
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 M .. Missing tissue
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|---|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|---|-----|-----|-----|-----|
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| ANIMAL ID | 00226 | 00002 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | 00000 | | | | | | |
| Congestion | | | | | | | | | | | | | | | | | | | | | | 3 | 1 | 3.0 | | | |
| Ectasia | | | | | | | | | | | | | | | | | | | | | | | 2 | 2 | 3.0 | | |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 1.5 | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 | | |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | 48 | | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Congestion | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 | | |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 | 8 | 1.6 |
| Hematopoietic Cell Proliferation | | | | | | | | | | | | | | | | | | | | | | | | 2 | 2.0 | | |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 | 2 | 2.0 |
| Thymus | + | + | + | + | M | + | + | M | + | + | M | + | + | + | + | + | + | + | M | + | + | + | + | 44 | | | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | + | M | M | + | M | + | + | + | M | + | + | + | + | M | + | M | M | M | M | + | + | M | + | 32 | | | |
| Galactocele | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 | 2.0 | |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 | 3.0 | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 | 2.0 | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | 2 | 2 | 2.5 | |
| Inflammation | | | | | | | | | | | | | | | | | | | | | | | | 3 | 3 | 5 | 2.2 |
| Inflammation, Granulomatous | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 | 4.0 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|---|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|--------|---|
| | 07
29 | 07
29 | 07
29 | 07
23 | 07
33 | 07
11 | 07
11 | 07
29 | 07
00 | 07
00 | 07
00 | 07
00 | 07
00 | 07
00 | 07
00 | 07
00 | 07
00 | 07
00 | 07
00 | 07
00 | | 07
00 | | | |
| ANIMAL ID | 00
22
22
66 | 00
22
22
77 | 00
22
22
88 | 00
22
22
99 | 00
22
22
00 | 00
22
22
11 | 00
22
22
33 | 00
22
22
33 | 00
22
22
33 | 00
22
22
33 | 00
22
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33 | 00
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33 | 00
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33 | 00
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22
33 | 00
22
22
33 | 00
22
22
33 | 00
22
22
33 | 00
22
22
33 | 00
22
22
33 | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Cranium, Fibrosis | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | | |
| Cranium, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | | |
| Vertebra, Degeneration | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Compression | | | 2 | | | | | | | | | | | | 1 | 2 | 2 | 2 | | 2 | | 2 | 14 1.9 | | |
| Hemorrhage | | | | | | | | | | | | | | | | 2 | 2 | | | | | | 3 2.0 | | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Inflammation | | 1 | | 1 | 1 | 1 | | 1 | 1 | | | | | 1 | | | | | 2 | | 1 | 1 | 1 | | |
| Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | 18 1.1 | | |
| Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Inflammation, Suppurative | | | | | | | | | | | | | | 4 | | | | | | | | | 1 4.0 | | |
| Inflammation, Chronic Active | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 50 3.0 | | |
| Metaplasia, Osseous | | | | | | | | 1 | | | | | | | | | | | | | | | 3 2.0 | | |
| Alveolar Epithelium, Hyperplasia | 4 | 3 | 3 | 4 | 2 | 2 | 2 | 2 | 4 | 3 | 3 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 3 | 4 | 2 | 2 |
| Alveolus, Proteinosis | 3 | 1 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 47 2.8 | |
| Artery, Mediastinum, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | 2 | | | | 1 2.0 | |
| Bronchiole, Epithelium, Hyperplasia | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 4 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 3 | 3 | 1 | 1 |
| Mediastinum, Metaplasia, Osseous | | | | | | | | | | | | | | | | | | | | | | | | 44 1.5 | |
| Mediastinum, Metaplasia, Osseous | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 | | |
| Foreign Body | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| Inflammation, Suppurative | | | | | | | | | | 1 | | 1 | 2 | | | | | | | 1 | 1 | 3 | | 12 1.7 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

1) Minimal 3) Moderate

2) Mild 4) Marked

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|
| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * TOTALS | |
| | | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 5 | 6 | 5 | 7 | 7 | 7 | 6 | 6 | 5 | 6 | 4 | 7 | 4 | 7 | 7 | | 6 |
| | | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 8 | 0 | 9 | 2 | 2 | 0 | 1 | 7 | 6 | 4 | 1 | 3 | 3 | 2 | | 1 |
| | | 9 | 9 | 9 | 0 | 0 | 5 | 0 | 9 | 0 | 3 | 6 | 9 | 9 | 5 | 8 | 5 | 2 | 1 | 3 | 0 | 9 | 9 | | 6 |
| | | 9 | 9 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 |
| 1.25 mg/m3 | ANIMAL ID | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | |
| | | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | |
| | | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | | |

| | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|--|---|---|---|---|---|---|--|---|---|---|---|---|---|---|-----------|------------|
| Inflammation, Chronic Active | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 2 | 1 | | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 35 | 1.3 |
| Thrombosis | | | | | | | | | | | | | | | | | | | | 2 | 2.5 |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | | | | | | 1 | 1 | | | | | | | | | 1 | | | | 4 | 1.0 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|--|---|---|---|---|--|--|--|---|---|--|--|--|---|--|---|---|---|--|--|---|-----------|------------|
| Olfactory Epithelium, Atrophy | 1 | | 1 | 1 | 1 | 1 | | | | 1 | 1 | | | | 1 | | 1 | 1 | 1 | | | 1 | 21 | 1.0 |
| Olfactory Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 |
| Olfactory Epithelium, Hyperplasia, Basal Cell | | | | | | | | | | | | | | | | | | 1 | | | | | 1 | 1.0 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|--|---|---|---|--|---|--|---|---|---|--|--|--|--|---|---|--|---|--|---|-----------|------------|
| Olfactory Epithelium, Metaplasia, Respiratory | 1 | 2 | | 1 | 1 | 1 | | 1 | | 1 | 3 | 2 | | | | | 2 | 1 | | 2 | | 1 | 26 | 1.7 |
| Olfactory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|--|---|---|--|---|---|---|---|---|-----------|------------|
| Respiratory Epithelium, Hyperplasia | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | | 1 | 1 | | 1 | 2 | 1 | 3 | 1 | 35 | 1.2 |
| Respiratory Epithelium, Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------------|---|---|---|---|---|---|---|---|---|---|--|---|---|---|---|---|---|---|---|---|---|---|-----------|------------|
| Respiratory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | 1 | | | 4 | 1.8 |
| Turbinate, Atrophy | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 35 | 1.0 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--|
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--|

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|------------|
| Ear | | | | | | + | | | | | | | | | | | | | | | | | 5 | |
| Inflammation, Chronic Active | | | | | | 1 | | | | | | | | | | | | 2 | | | 3 | | 5 | 1.8 |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Cataract | 1 | | 3 | 1 | | | | | | | | | 2 | | | | | | | 3 | | | 9 | 1.8 |
| Metaplasia, Osseous | 1 | 2 | 1 | 1 | 1 | | 1 | | 1 | | | 1 | 2 | 1 | 2 | | 1 | | 2 | 1 | 1 | | 36 | 1.3 |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--|
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--|

| | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|----------|--|
| Zymbal's Gland | | | | | | | | | | | + | | | | | | | | | | | | 3 | |
|----------------|--|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|--|--|----------|--|

URINARY SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
+ .. Tissue examined microscopically M .. Missing tissue
X .. Lesion present A .. Autolysis precludes evaluation
I .. Insufficient tissue BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
1) Minimal 3) Moderate
2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|------------|------------|
| FISCHER 344-TACONIC RATS MALE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 5 | 6 | 5 | 7 | 7 | 7 | 6 | 6 | 5 | 6 | 4 | 7 | 4 | 7 | 7 | | 6 | 5 | |
| | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 2 | 8 | 0 | 9 | 2 | 2 | 0 | 1 | 7 | 6 | 4 | 1 | 3 | 3 | 2 | 1 | | 6 | 9 | |
| 1.25 mg/m3 | 9 | 9 | 9 | 0 | 0 | 5 | 0 | 9 | 0 | 3 | 6 | 9 | 9 | 5 | 8 | 5 | 2 | 1 | 3 | 0 | 9 | 9 | 9 | 3 | 3 | | |
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | |
| | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | | | |
| | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | | |
| | * TOTALS | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Accumulation, Hyaline Droplet | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 | |
| Cyst | | | | | | | | | | X | | | | | | X | | | | | | | | | 3 | | |
| Nephropathy | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 4 | 4 | 4 | 3 | 3 | 2 | 1 | 3 | 3 | 4 | 4 | 3 | 49 | 3.0 |
| Thrombosis | | | | | | | | | | 1 | | | | | | | | | | | | | | | 1 | 1.0 | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Transitional Epithelium, Hyperplasia | | | | | | | | | | | | 4 | | | | | | | | | | | | | 1 | 4.0 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
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P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | males
(cont...) |
|-------------------------------|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|
| | 0719 | 0705 | 0667 | 0679 | 0677 | 0666 | 0677 | 0666 | 0677 | 0666 | 0677 | 0666 | 0677 | 0666 | 0677 | 0666 | 0677 | 0666 | 0677 | 0666 | 0677 | 0666 | 0677 | 0666 | 0677 | |
| 2.5 mg/m3 | 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 | |
| ANIMAL ID | 0040 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum
Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Colon
Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum
Inflammation, Chronic Active
Necrosis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Ileum
Inflammation, Suppurative
Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Jejunum
Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Basophilic Focus | | | | X | X | | | | | X | X | X | X | X | X | | | X | | | | | | X | |
| Clear Cell Focus | | | | X | | | | | | X | X | | | X | | X | | | | | | | | | |
| Fatty Change | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatodiaphragmatic Nodule | | | | | X | | | | | | | | X | | X | X | | X | | X | X | X | X | | |
| Mixed Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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 CAS Number: 7440-48-4

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 Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males (cont...) |
|-------------|-------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|-----------------|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| 7 | 7 | 6 | 7 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 5 | 5 | 6 | |
| 1 | 0 | 6 | 2 | 2 | 8 | 2 | 5 | 2 | 8 | 3 | 0 | 0 | 2 | 4 | 2 | 3 | 8 | 3 | 5 | 8 | 5 | 2 | 8 | 4 | 5 | |
| 9 | 5 | 7 | 9 | 9 | 3 | 9 | 2 | 1 | 8 | 0 | 9 | 3 | 8 | 6 | 9 | 0 | 8 | 0 | 5 | 8 | 5 | 2 | 8 | 4 | 4 | |
| 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | |

| | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Regeneration | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | |
| Infiltration Cellular | + | | | | | | | | | | | | | | | | | | | | | | | |
| Fat, Necrosis | 2
1 1 1 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Pancreas | + | | | | | | | | | | | | | | | | | | | | | | | |
| Acinus, Atrophy | 1 1 2 1 2 1 1 1 2 2 1 1 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Salivary Glands | + | | | | | | | | | | | | | | | | | | | | | | | |
| Stomach, Forestomach | + | | | | | | | | | | | | | | | | | | | | | | | |
| Hyperplasia, Squamous | 2 2 1 1 2 2 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | |
| Ulcer | 3 2 1 2 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Stomach, Glandular | + | | | | | | | | | | | | | | | | | | | | | | | |
| Erosion | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | |
| Ulcer | 2 | | | | | | | | | | | | | | | | | | | | | | | |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Heart | + | | | | | | | | | | | | | | | | | | | | | | | |
| Cardiomyopathy | 2 2 1 2 2 1 2 2 1 1 3 1 1 2 2 1 3 2 2 2 1 1 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Suppurative | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Thrombosis | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Atrium, Congestion | 2 | | | | | | | | | | | | | | | | | | | | | | | |

ENDOCRINE SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | males
(cont...) | | | | | |
|-----------------------------------|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|--------------------|----------|----------|----------|----------|----------|
| | 07
19 | 07
05 | 06
07 | 07
09 | 07
09 | 06
03 | 07
02 | 06
09 | 07
01 | 06
08 | 07
00 | 06
03 | 07
08 | 06
06 | 07
02 | 06
03 | 07
08 | 06
00 | 07
05 | 06
08 | | 05
02 | 05
08 | 06
04 | 05
05 | 06
06 |
| 2.5 mg/m3 | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0040 | 0004 | 0000 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 | 0004 |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Accessory Adrenal Cortical Nodule | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hyperplasia | 3 | 2 | | 1 | 2 | 1 | 1 | | | | | 1 | 2 | | | | 2 | | | 2 | | 1 | 1 | | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Hyperplasia | | 4 | | | | | 4 | | | | | 1 | | | | 4 | | | 2 | | | | | | 3 | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | |
| Hyperplasia | | | | | | | | | | | 4 | | | | | | | | | | | | | | | |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | M | + | + | + | + | + | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pars Distalis, Hyperplasia | | | | 4 | 4 | | | | | 3 | | | | 2 | | | | | 2 | 1 | | | 1 | | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| C-cell, Hyperplasia | | | | | | | | | | | | | | 2 | 2 | | | | 1 | | | 1 | | | | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

Epididymis

+ + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

Preputial Gland
Ectasia

+ + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
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 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | males
(cont...) | | | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--------------------|------|---|---|---|
| | 0719 | 0705 | 0667 | 0779 | 0779 | 0663 | 0779 | 0662 | 0779 | 0661 | 0779 | 0663 | 0779 | 0662 | 0779 | 0661 | 0779 | 0663 | 0779 | 0662 | | 0779 | | | |
| ANIMAL ID | 0040 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | 0044 | | | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | 1 | 1 | | | | |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | 2 | | | | |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | 1 | | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 2 | 1 | | 1 | 1 | | 2 | 2 | 1 | 1 | 3 | 1 | 2 | 1 | 2 | 1 |
| Seminal Vesicle | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Testes | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Atrophy | 4 | 2 | 4 | | 4 | 1 | 4 | | 4 | 1 | 4 | | 4 | 2 | 1 | 4 | 4 | 4 | 1 | 1 | | | | | 4 |
| Infarct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arteriole, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | |
| Interstitial Cell, Hyperplasia | | | | | | 1 | | | | 2 | | 1 | 1 | | | 1 | | | 1 | | | | 2 | 1 | |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 2 |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pancreatic, Infiltration Cellular, Histiocyte | | | | | | | | | | | | | | | | | | | | | | | | | + |
| Renal, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial | M | M | M | + | M | M | M | M | + | M | + | M | + | + | M | M | M | M | + | M | + | M | M | + | M |
| Lymph Node, Mandibular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Lymph Node, Mediastinal | + | M | M | + | + | + | + | + | + | + | + | + | M | + | + | + | + | M | + | + | + | + | + | + | + |

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 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) |
|-------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------------|
| | 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 | | |
| 2.5 mg/m3 | 7 | 7 | 6 | 7 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 6 | 7 | 7 | 6 | 7 | 7 | 6 | 6 | 5 | 5 | 6 | 0 | |
| | 1 | 0 | 6 | 2 | 2 | 8 | 2 | 5 | 2 | 8 | 3 | 0 | 0 | 2 | 4 | 2 | 3 | 8 | 3 | 8 | 3 | 2 | 8 | 4 | 5 | 0 | |
| | 9 | 5 | 7 | 9 | 9 | 3 | 9 | 2 | 1 | 8 | 0 | 9 | 3 | 8 | 6 | 9 | 0 | 8 | 0 | 5 | 8 | 5 | 2 | 8 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 0 | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 0 | | |

Hyperplasia, Lymphoid

2

Lymph Node, Mesenteric

+ + + + + + + + + + + + + + + + + M + + + + +

Spleen

+ +

Fibrosis

2

Necrosis

1

Stromal Hyperplasia

4

Thymus

+ + + + + + + + + + + + + + + M + + M + + + + +

INTEGUMENTARY SYSTEM

Mammary Gland

+ M + M M + M + M + + M M M M + + + + M + + M + +

Galactoceles

4

Hyperplasia

Skin

+ +

Hyperplasia, Squamous

4

Inflammation

3

2

3

3

3

2

MUSCULOSKELETAL SYSTEM

Bone

+ +

Cranium, Fracture

X

NERVOUS SYSTEM

Brain

+ +

Compression

2

2

2

2

2

1

2

1

2

2

Hemorrhage

2

3

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

M .. Missing tissue

1-4 .. Lesion qualified as:

X .. Lesion present

A .. Autolysis precludes evaluation

1) Minimal 3) Moderate

I .. Insufficient tissue

BLANK .. Not examined microscopically

2) Mild 4) Marked

Table with 22 columns for DAY ON TEST (0-9) and 22 columns for ANIMAL ID (0-21). Includes 'FISCHER 344-TACONIC RATS MALE' and '2.5 mg/m3' exposure levels. Right side label: 'males (cont...)'.

RESPIRATORY SYSTEM

Table with 22 columns for respiratory system findings. Rows include: Larynx (Autolysis, Foreign Body, Inflammation, Metaplasia, Squamous), Lung (Inflammation, Suppurative, Inflammation, Chronic Active, Alveolar Epithelium, Hyperplasia, Alveolus, Proteinosis, Bronchiole, Epithelium, Hyperplasia, Mediastinum, Inflammation, Suppurative), and Nose (Foreign Body, Hemorrhage, Inflammation, Suppurative, Inflammation, Chronic Active, Thrombosis, Olfactory Epithelium, Accumulation, Hyaline Droplet, Olfactory Epithelium, Atrophy, Olfactory Epithelium, Hyperplasia, Olfactory Epithelium, Metaplasia, Respiratory, Olfactory Epithelium, Necrosis, Respiratory Epithelium, Hyperplasia, Respiratory Epithelium, Metaplasia, Squamous).

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue
M .. Missing tissue
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Experiment Number: 60311 - 05
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Route: RESPIRATORY EXPOSURE WHOLE BODY
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P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
Cobalt
CAS Number: 7440-48-4

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Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS MALE | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | | |
|---|-------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|--|
| | 07
19 | 07
05 | 06
06
07 | 07
02
09 | 07
02
09 | 06
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03 | 07
02
09 | 06
05
02 | 07
02
01 | 06
08
08 | 07
03
00 | 06
07
03 | 06
02
08 | 07
04
06 | 06
02
09 | 07
03
00 | 06
08
08 | 07
03
00 | 06
02
05 | 06
06
08 | | | 05
05
02 | 05
04
08 | 06
05
04 | |
| 2.5 mg/m3 | 00
44
00
11 | 00
44
00
12 | 00
44
00
13 | 00
44
00
14 | 00
44
00
15 | 00
44
00
16 | 00
44
00
17 | 00
44
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18 | 00
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00
19 | 00
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00
20 | 00
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21 | 00
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22 | 00
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23 | 00
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26 | 00
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27 | 00
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00
28 | 00
44
00
29 | 00
44
00
30 | 00
44
00
31 | 00
44
00
32 | 00
44
00
33 | 00
44
00
34 | 00
44
00
35 | |
| Respiratory Epithelium, Necrosis Turbinate, Atrophy | 1 | 1 | 1 | 1 | 1 | 1 | | | 2 | 1 | 1 | | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Cataract | | | | | | | | | 1 | | | | | | | 3 | | | 2 | | | | | | | |
| Metaplasia, Osseous | | | 1 | | 1 | 1 | | 1 | 1 | 1 | | 1 | | 1 | | 2 | 1 | 1 | 1 | 2 | 2 | 1 | | 1 | 1 | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Accumulation, Hyaline Droplet | | | | | 2 | | | | | | | | | | | | | | 2 | | | | | | | |
| Congestion | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nephropathy | 3 | 3 | 3 | 4 | 3 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 4 | |
| Pelvis, Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Inflammation | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Transitional Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------------|
| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | 0698 | 0583 | 0729 | 0689 | 0729 | 0578 | 0776 | 0777 | 0777 | 0666 | 0666 | 0444 | 0555 | 0777 | 0666 | 0777 | 0666 | 0666 | 0777 | 0777 | 0777 | 0777 | * TOTALS |
| | 2.5 mg/m3 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | 0042 | |
| | ANIMAL ID | 6426 | 7427 | 8428 | 9429 | 0430 | 1431 | 2432 | 3433 | 4434 | 5435 | 6436 | 7437 | 8438 | 9439 | 0440 | 1441 | 2442 | 3443 | 4444 | 5445 | 6446 | 7447 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|-----------|------------|------------|
| Esophagus | + | + | + | + | + | + | + | + | M | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | 48 | | |
| Intestine Large, Cecum
Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | 1 | 1.0 |
| Intestine Large, Colon
Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | 1 | 1.0 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |
| Intestine Small, Duodenum
Inflammation, Chronic Active
Necrosis | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | 5 | 1.8 |
| | | | | | | | 2 | | | | 2 | | | | | | | | | 1 | | | | | | 1 | 2.0 |
| Intestine Small, Ileum
Inflammation, Suppurative
Epithelium, Hyperplasia | + | + | + | A | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | A | + | + | + | + | 47 | 1 | 1.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 |
| Intestine Small, Jejunum
Epithelium, Hyperplasia | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | A | + | + | + | + | 48 | 1 | 1.0 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Basophilic Focus | | | X | | | | | | X | X | | X | | | | | | | | | | X | X | 17 | | | |
| Clear Cell Focus | | | | X | | | X | | | | | | | | | | | | | | | | | | 7 | | |
| Fatty Change | | 3 | | | | | | | | | 1 | | | | | | | | | | | | | | 3 | 1.7 | |
| Hepatodiaphragmatic Nodule | | | | | | | | | | | | | | | | X | | | | | | X | | | 11 | | |
| Mixed Cell Focus | | | | | | | | | | | | | | | X | | | | | | | | | | 1 | | |
| Necrosis | | | | | | 2 | | | | | 1 | | | | | | | | 2 | | | | | | 4 | 1.5 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|-------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------|--------|
| | 06 | 05 | 07 | 06 | 07 | 05 | 07 | 07 | 07 | 07 | 06 | 06 | 06 | 04 | 05 | 07 | 06 | 07 | 07 | 06 | 06 | 07 | 07 | 07 | | 07 |
| 2.5 mg/m3 | 09 | 08 | 02 | 08 | 02 | 09 | 01 | 02 | 03 | 03 | 01 | 08 | 05 | 07 | 03 | 02 | 05 | 03 | 01 | 07 | 01 | 00 | 02 | 00 | 03 | |
| ANIMAL ID | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | |
| | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | |
| | 02 | 02 | 02 | 02 | 03 | 03 | 03 | 03 | 03 | 03 | 03 | 03 | 03 | 03 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 04 | 05 | |
| | 06 | 07 | 08 | 09 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 00 | |
| Regeneration | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Mesentery | + | | | | | | | | | + | | | | | + | + | | | | | | | | | | 9 |
| Infiltration Cellular | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Fat, Necrosis | 2 | | | | | | | | | 1 | | | | | 1 | 1 | | | | | | | | | | 8 1.1 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Acinus, Atrophy | | | 2 | 1 | 4 | 1 | | 2 | 2 | | 1 | | | | | 1 | 1 | | | 1 | | 1 | 2 | 1 | 1 | 28 1.4 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hyperplasia, Squamous | | 3 | | | | | 2 | | | | | | 2 | | | 3 | | | | | 1 | | | | 13 1.9 | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | 3 | | 2 2.5 | |
| Ulcer | | 4 | | | | | 4 | | | | 4 | | | | | 3 | | | | | | 3 | | | 10 2.8 | |
| Stomach, Glandular | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Erosion | | | | | | | | | | | | | 2 | | | | | | | | | | | | 2 2.0 | |
| Inflammation, Chronic Active | | 2 | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Ulcer | | | | | | 3 | | | | | 3 | | | | | | | | | | | | | | 2 3.0 | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Cardiomyopathy | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | | 3 | 3 | 1 | | 2 | 2 | 2 | 1 | 46 1.6 |
| Inflammation, Suppurative | | | | | | 2 | | | | | | | | | | | | | | | | | | | | 2 2.0 |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | 2 | | | | | 2 1.5 |
| Atrium, Congestion | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | |
|-------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------|----|----|----|----|----|
| | 06 | 05 | 07 | 06 | 07 | 05 | 07 | 07 | 07 | 07 | 06 | 06 | 06 | 04 | 05 | 07 | 06 | 07 | 06 | 06 | | 07 | 07 | 07 | 07 | |
| 2.5 mg/m3 | 08 | 08 | 02 | 08 | 02 | 09 | 01 | 02 | 03 | 03 | 01 | 08 | 05 | 07 | 03 | 02 | 05 | 03 | 01 | 07 | 06 | 01 | 00 | 02 | 00 | 03 |
| ANIMAL ID | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| | 22 | 22 | 22 | 22 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| | 67 | 78 | 89 | 90 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 00 | 00 | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Accessory Adrenal Cortical Nodule | | 1 | | | | | | | | | | | | | | | | | | | | | | | | 2 1.0 |
| Hyperplasia | | | | | 1 | | 1 | | 1 | 1 | | | | 1 | 2 | | 2 | 1 | | | 2 | 2 | | 1 | | 23 1.5 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Hyperplasia | | | | | | | | | | | | | | 3 | | 4 | | | | | | | 2 | | | 9 3.0 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Pituitary Gland | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | 3 | | | 1 3.0 |
| Pars Distalis, Hyperplasia | | | | 1 | | 3 | | 1 | 2 | 4 | | | | | | | 4 | 1 | | | | | | | | 14 2.4 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| C-cell, Hyperplasia | | 3 | | | | | | | | | | | | | | | | | | | | | | | | 5 1.8 |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Preputial Gland | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Ectasia | | | | | | | | | | | | | | | | | | | | | | | 3 | | | 1 3.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

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 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|---|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------|----|----|----|--------|
| | 06 | 05 | 07 | 06 | 07 | 05 | 07 | 07 | 07 | 07 | 06 | 06 | 06 | 04 | 05 | 07 | 06 | 07 | 06 | 06 | | 07 | 07 | 07 | 07 |
| 2.5 mg/m3 | 09 | 08 | 02 | 08 | 02 | 09 | 01 | 02 | 03 | 03 | 01 | 08 | 05 | 07 | 03 | 02 | 05 | 03 | 01 | 07 | 01 | 00 | 02 | 00 | 03 |
| ANIMAL ID | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 |
| | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| | 22 | 22 | 22 | 22 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 |
| | 66 | 77 | 88 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 00 | 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 00 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | 4 | 3 2.0 |
| Prostate | + | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 1.0 |
| Inflammation, Chronic Active | 1 | 2 | | 1 | 3 | 1 | 2 | 1 | | 2 | 3 | 2 | 2 | 1 | 2 | 4 | | | 1 | 3 | | 1 | 2 | 2 | 2 |
| | | | | | | | | | | | | | | | | | | | | | | | | 42 | 1.6 |
| Seminal Vesicle | + | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Testes | + | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Atrophy | 3 | 1 | 4 | | 4 | | 4 | 3 | 2 | 4 | 3 | 2 | | | | 3 | | 4 | 4 | 2 | | 4 | 3 | 3 | 2 |
| Infarct | | | | | | | | | | | | | | | | | | | | | | | | | 36 3.0 |
| Arteriole, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | 2 3.5 |
| Interstitial Cell, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 2.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | 2 | 12 1.3 |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| Pancreatic, Infiltration Cellular, Histiocyte | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Renal, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Lymph Node, Bronchial | + | M | M | + | M | M | + | + | M | M | + | + | + | M | + | + | M | M | M | + | + | + | M | + | M |
| | | | | | | | | | | | | | | | | | | | | | | | | 21 | |
| Lymph Node, Mandibular | + | | | | | | | | | | | | | | | | | | | | | | | 50 | |
| Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Lymph Node, Mediastinal | + | | | | | | | | | | | | | | | | | | | | | | | 46 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
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1-4 .. Lesion qualified as:
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| FISCHER 344-TACONIC RATS MALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|----------|
| | 0698 | 0583 | 0729 | 0689 | 0729 | 0598 | 0776 | 0777 | 0777 | 0777 | 0666 | 0666 | 0444 | 0555 | 0777 | 0666 | 0777 | 0666 | 0666 | 0777 | 0777 | 0777 | 0777 | | |
| ANIMAL ID | 00426 | 00447 | 00448 | 00449 | 00450 | 00451 | 00452 | 00453 | 00454 | 00455 | 00456 | 00457 | 00458 | 00459 | 00460 | 00461 | 00462 | 00463 | 00464 | 00465 | 00466 | 00467 | 00468 | | |
| Hyperplasia, Lymphoid | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Fibrosis | 3 | | | | 3 | | 1 | | | | | | | | | | 2 | | | 1 | | 3 | | 7 2.1 | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| Stromal Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | 47 | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | M | + | M | + | M | + | + | + | M | + | + | + | M | + | + | + | + | M | + | + | M | + | M | 30 | |
| Galactocoele | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 | |
| Hyperplasia | | | | | | | | | | | | 3 | | | | | | | | | | | | 1 3.0 | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | 5 3.0 | |
| Inflammation | 3 | | | | | 2 | | | | | | | | | | | | 3 | 3 | | | | 3 | 9 2.7 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Cranium, Fracture | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Compression | | 2 | | | 1 | | | | | | | | 1 | | 2 | | | 1 | | | 2 | 3 | 2 | 18 1.8 | |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | | 1 | 2 | | 4 2.0 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
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| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|-------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 6 | 5 | 7 | 6 | 7 | 5 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 4 | 5 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | 7 | | 7 |
| 2.5 mg/m3 | 9 | 8 | 2 | 8 | 2 | 9 | 1 | 2 | 3 | 3 | 1 | 8 | 5 | 7 | 3 | 2 | 5 | 3 | 1 | 7 | 1 | 0 | 2 | 0 | 3 |
| ANIMAL ID | 8 | 3 | 9 | 9 | 9 | 8 | 6 | 9 | 0 | 0 | 8 | 0 | 2 | 2 | 5 | 9 | 4 | 0 | 6 | 8 | 1 | 4 | 9 | 5 | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 0 |
| | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|--------|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Autolysis | | | | | | | | | | | | | X | | | | | | | | | | | | 1 | |
| Foreign Body | | | | | | | | | | | | | | | | | | | | | | | | | 2 | |
| Inflammation | | | | 1 | | 1 | | 1 | | | | | 1 | | | | | | 1 | | 2 | | | 1 | 18 1.1 | |
| Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | 1 | | | | | | 1 1.0 | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Inflammation, Chronic Active | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 50 2.9 | |
| Alveolar Epithelium, Hyperplasia | 4 | 2 | 4 | 3 | 4 | 1 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 2 | 3 | 3 | 2 | 4 | 4 | | 3 | 4 | 3 | 3 | 49 3.3 | |
| Alveolus, Proteinosis | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 49 2.9 | |
| Bronchiole, Epithelium, Hyperplasia | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 4 | 3 | 3 | | 3 | 1 | 3 | 3 | 2 | 3 | 3 | | 3 | 2 | 3 | 3 | 47 2.7 | |
| Mediastinum, Inflammation, Suppurative | | | | | | 2 | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Nose | + | + | + | I | + | + | + | + | + | + | + | A | + | A | + | + | + | + | + | + | I | + | + | + | 45 | |
| Foreign Body | | | | | | | | X | | | | | | | | | | | | | | X | | | 4 | |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Inflammation, Suppurative | | | | 3 | | 3 | | 4 | 2 | 2 | 1 | 2 | | | | 3 | 1 | 1 | 3 | | 3 | | 2 | 1 | 24 2.2 | |
| Inflammation, Chronic Active | 2 | 1 | 2 | | 3 | 1 | 3 | 1 | 2 | 1 | 2 | | | 1 | | 1 | 3 | 2 | 2 | 3 | | 3 | | 2 | 2 | 40 1.7 |
| Thrombosis | | | | | | | 4 | | | | | | | | | | | | 2 | | | | | | 4 2.8 | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Olfactory Epithelium, Atrophy | | | 1 | 1 | | 1 | 1 | | 2 | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | | | 1 | 1 | 34 1.0 |
| Olfactory Epithelium, Hyperplasia | | | | | | | | | | | | | | | | 2 | | 1 | | | | | | | 2 1.5 | |
| Olfactory Epithelium, Metaplasia, Respiratory | 1 | 1 | 1 | | 2 | | 3 | 3 | | 1 | | | 1 | | | 2 | | 1 | 1 | | 2 | | 1 | 1 | 37 1.5 | |
| Olfactory Epithelium, Necrosis | | | | | | | 2 | | | | | | | | | | | | | | | | | | 5 1.6 | |
| Respiratory Epithelium, Hyperplasia | 2 | 1 | 2 | | 3 | 1 | 4 | 2 | 3 | 1 | 1 | | 1 | | 1 | 3 | 1 | 2 | 4 | | 4 | 1 | 2 | 1 | 45 1.7 | |
| Respiratory Epithelium, Metaplasia, Squamous | 2 | | 1 | | | | 2 | 1 | | | 1 | | | | | | | | | | 1 | | | 1 | 11 1.2 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | |
|---|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------------|
| | 06
98 | 05
83 | 07
29 | 06
89 | 07
29 | 05
98 | 07
16 | 07
72 | 07
73 | 07
30 | 07
33 | 06
18 | 06
62 | 06
65 | 04
72 | 05
35 | 07
29 | 06
54 | 07
31 | 06
78 | | 06
61 | 07
04 | 07
29 | 07
05 | 07
30 | |
| ANIMAL ID | 00426 | 00442 | 00442 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | 00444 | |
| Respiratory Epithelium, Necrosis
Turbinates, Atrophy | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 5 1.4
35 1.0 |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Cataract | | | | 1 | | | 2 | | 1 | | | | | | | | | | 4 | 4 | 2 | | | | | | 9 2.2 |
| Metaplasia, Osseous | | | 2 | 1 | 2 | 1 | 1 | 2 | | | 1 | 1 | | | 1 | 1 | 2 | 1 | 1 | | 1 | 2 | 1 | | | | 33 1.2 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Accumulation, Hyaline Droplet | 4 | | | | | | | | | | | | | | | | | | 3 | | | | | | | | 4 2.8 |
| Congestion | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 1.0 |
| Nephropathy | 4 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | | 50 2.9 |
| Pelvis, Inflammation, Suppurative | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | 1 2.0 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Inflammation | | | | | | | | | | | | | | | | 3 | | | 3 | | | | | | | | 2 3.0 |
| Transitional Epithelium, Hyperplasia | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | 1 3.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | |
|-------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------|--------------------|----|----|----|
| | 07 | 06 | 06 | 05 | 05 | 06 | 07 | 07 | 06 | 06 | 07 | 07 | 07 | 07 | 07 | 07 | 05 | 06 | 07 | 06 | | | 06 | 07 | 07 |
| 5.0 mg/m3 | 3 | 9 | 2 | 1 | 5 | 4 | 3 | 1 | 7 | 9 | 8 | 3 | 3 | 2 | 2 | 2 | 2 | 7 | 8 | 1 | 9 | 1 | 2 | 7 | 2 |
| | 0 | 1 | 8 | 6 | 2 | 6 | 0 | 7 | 9 | 8 | 3 | 3 | 2 | 9 | 9 | 9 | 2 | 9 | 7 | 1 | 9 | 1 | 9 | 9 | 2 |
| | 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 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum
Necrosis | + | + | + | + | + | + | + | + | + | + | + | + | 3 | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Atrophy | | | | | | | | | | | | | | | | 1 | 2 | | | | | | | |
| Basophilic Focus | X | | | X | | | X | | X | X | X | X | | | | X | X | X | X | | | | X | X |
| Clear Cell Focus | | | | | | | | | | | | | | | X | X | X | X | X | | X | | | |
| Degeneration, Cystic | | | | | 1 | | | | | | | | | | | | | | | | | | | |
| Eosinophilic Focus | | | | X | | | | | | | | | | | | | | | | | | | | |
| Fatty Change | | | | | | | 1 | | | | | | | | | | | | | | | | | |
| Hepatodiaphragmatic Nodule | X | | | | | X | | | X | | | | | | | | | | | | X | | | X |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Mixed Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | | | | | | | | | | | | | 2 | | | | | | | | | | | |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | |
| Artery, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| DAY ON TEST | | 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 |
|--------------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FISCHER 344-TACONIC RATS MALE | | 7 | 6 | 6 | 5 | 5 | 6 | 7 | 7 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 6 | 7 | 6 | 6 | 7 | 7 | 4 | 7 | 7 | 7 | 7 |
| | | 3 | 9 | 2 | 1 | 5 | 4 | 3 | 1 | 7 | 9 | 2 | 1 | 2 | 2 | 2 | 2 | 7 | 8 | 1 | 9 | 1 | 2 | 2 | 7 | 2 | 9 | 9 | 9 |
| | | 0 | 1 | 8 | 6 | 2 | 6 | 0 | 7 | 9 | 8 | 3 | 3 | 2 | 9 | 9 | 9 | 2 | 9 | 7 | 1 | 9 | 1 | 9 | 2 | 9 | 2 | 9 | 9 |
| 5.0 mg/m3 | | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | | | |

males (cont...)

Fat, Necrosis

1

Pancreas

+ +

Acinus, Atrophy

1 1 1 1 2 2 2 1 1 2 2 2 1 2 2 1 2 2 1 2 1 2 1 2 2 2 2 2 2

Artery, Mineralization

2 2

Salivary Glands

+ +

Degeneration

Stomach, Forestomach

+ +

Hyperplasia, Squamous

2 1 2 2

Inflammation, Chronic Active

2 1 2 2

Ulcer

Stomach, Glandular

+ +

Inflammation, Chronic Active

1 3

Ulcer

CARDIOVASCULAR SYSTEM

Heart

+ +

Cardiomyopathy

1 2 1 2 1 2 1 1 2 1 2 2 1 2 1 2 2 2 2 2

Artery, Inflammation, Chronic Active

2

ENDOCRINE SYSTEM

Adrenal Cortex

+ +

Accessory Adrenal Cortical Nodule

1 1

Hyperplasia

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Adrenal Medulla

+ +

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

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Experiment Number: 60311 - 05
 Test Type: CHRONIC
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| FISCHER 344-TACONIC RATS MALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|--------------------|------|------|------|
| | 0730 | 0691 | 0628 | 0516 | 0554 | 0663 | 0777 | 0777 | 0666 | 0666 | 0777 | 0777 | 0777 | 0777 | 0777 | 0777 | 0555 | 0666 | 0777 | 0666 | | | 0666 | 0777 | 0777 |
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 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 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |
| Hyperplasia | | | 1 | 1 | 1 | | | | | | | | | | | | | | | | | | | | |
| Islets, Pancreatic Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | M | + | + | M | + | M | + | + | + | + | + | + | + | + | + | + |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Angiectasis Pars Distalis, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | 2 | 3 | 2 | 2 | | | | 4 | | 4 | | 1 | | | 1 | | | 2 | 3 | | | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| C-cell, Hyperplasia | | | | | | | 1 | | | | | 3 | | | | | 2 | | 2 | | | 4 | | | |
| Follicle, Cyst | | | | | | | | | | | | | | | | | | | | | | | | | |

GENERAL BODY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Peritoneum | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | |

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Epididymis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Preputial Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Inflammation, Chronic Active | | | 3 | | | | | | | 2 | | | | | | | | | | | | | | | |
| Prostate | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | 2 | 1 | 1 | | 1 | 1 | | | 1 | | 3 | 2 | | | 1 | | | 3 | 2 | 1 | 1 | 1 | | 2 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
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 M .. Missing tissue
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 Cobalt
 CAS Number: 7440-48-4

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 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|--------------------|------|------|------|------|------|
| | 0730 | 0691 | 0628 | 0516 | 0554 | 0662 | 0770 | 0777 | 0666 | 0676 | 0699 | 0722 | 0772 | 0777 | 0777 | 0777 | 0522 | 0678 | 0719 | 0669 | | | 0671 | 0772 | 0779 | 0472 | 0729 |
| Seminal Vesicle
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Testes
Atrophy | 4 | 2 | 1 | 1 | | | 4 | 4 | 1 | 1 | 4 | | 4 | 1 | 2 | 4 | 2 | 1 | 3 | 1 | 2 | 3 | 1 | | 4 | | |
| Infarct | | | | | | 4 | 2 | | | | | 2 | 3 | | | | | | | 2 | | 2 | | | 4 | | |
| Interstitial Cell, Hyperplasia | | 2 | | 1 | | | | | | 1 | | | | 1 | | | | | 1 | | 3 | | | | | | |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lymph Node
Pancreatic, Ectasia | | | + | | + | | | | | | | + | | | | | | + | | | | | + | | | | |
| Renal, Ectasia | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | |
| Renal, Hemorrhage | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Lymph Node, Bronchial | + | M | + | M | M | M | M | M | + | + | M | M | M | M | M | + | + | + | M | + | + | M | M | M | | | |
| Lymph Node, Mandibular
Ectasia | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Hyperplasia | | | | | | | | 2 | | | | | | | | | | | | | | | | | 2 | | |
| Lymph Node, Mediastinal | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Lymph Node, Mesenteric
Infiltration Cellular, Histiocyte | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Spleen
Fibrosis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Hematopoietic Cell Proliferation | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | |

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 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------------|----------------|----------------|----------------|
| | 07
30 | 06
91 | 06
28 | 05
16 | 05
54 | 06
62 | 07
70 | 07
77 | 06
66 | 06
63 | 07
71 | 07
72 | 07
72 | 07
72 | 07
72 | 07
72 | 05
52 | 06
68 | 07
71 | 06
69 | | | 07
72 | 07
72 | 04
40 |
| | 00
60
01 | 00
66
00 | 00
66
00 | 00
66
00 | 00
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00 | 00
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00 | 00
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00 | 00
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00 | 00
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00 | 00
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01 | 00
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11 | 00
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11 | 00
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11 | 00
66
11 | 00
66
11 | 00
66
11 | 00
66
22 | 00
66
22 | 00
66
22 | 00
66
22 | 00
66
22 | 00
66
22 | 00
66
22 |

Necrosis

2

Thymus

+ + + + + M + + + M + + + + + M + + + + + + + +

INTEGUMENTARY SYSTEM

Mammary Gland

+ + + + M + + + + M + + M + M M + M M + + + + +

Skin
 Cyst Epithelial Inclusion
 Hyperplasia, Squamous
 Inflammation

+
 3
 3

MUSCULOSKELETAL SYSTEM

Bone
 Maxilla, Inflammation, Chronic Active

+ +

Skeletal Muscle

+ +

NERVOUS SYSTEM

Brain
 Compression
 Edema
 Hemorrhage
 Infiltration Cellular, Mononuclear Cell

+
 3
 2 2
 3
 2
 1

RESPIRATORY SYSTEM

Larynx

+ +

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS MALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | | | |
|---|-------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|--------------------|----------|----------|----------|----------|----------|
| | 07
30 | 06
91 | 06
28 | 05
16 | 05
52 | 06
46 | 07
30 | 07
17 | 06
79 | 06
68 | 07
33 | 07
12 | 07
22 | 07
22 | 07
22 | 07
22 | 07
22 | 05
72 | 06
81 | 06
71 | | | 06
91 | 06
12 | 07
22 | 07
27 | 04
72 |
| Hyperkeratosis | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | |
| Inflammation | 1 | 1 | | | 1 | | | | | | 1 | | 1 | 1 | | | | | 2 | 1 | 1 | | | 1 | | | |
| Metaplasia, Squamous | | | | | | | | | | | 2 | | | | | | | | | 2 | | | | | | | |
| Respiratory Epithelium, Hyperplasia | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| Squamous Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Chronic Active | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Alveolar Epithelium, Hyperplasia | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 2 | 4 | |
| Alveolus, Proteinosis | 3 | 3 | 3 | 3 | 2 | 3 | 3 | | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 3 | 3 | 4 | 3 | 4 | 3 | 4 | 3 | |
| Bronchiole, Epithelium, Hyperplasia | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Foreign Body | | | | | | | | | | X | | | X | | | | | | X | | | | | | | | |
| Inflammation, Suppurative | 3 | 3 | 2 | 3 | 1 | 2 | 3 | 2 | 3 | 4 | 3 | | 4 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | |
| Inflammation, Chronic Active | 3 | 3 | 1 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 4 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 2 | |
| Thrombosis | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Olfactory Epithelium, Atrophy | 1 | 1 | | 1 | 1 | 1 | 2 | 1 | 1 | | | | 1 | 1 | 1 | | | 1 | | 1 | | | | | | 1 | |
| Olfactory Epithelium, Hyperplasia | 2 | | | | | | | | | | | | | | | | | | | | 1 | | | | | 1 | |
| Olfactory Epithelium, Hyperplasia, Basal Cell | 1 | | 1 | | | | | | | | | 1 | | | | | | 1 | | | 1 | | | 1 | | | |
| Olfactory Epithelium, Metaplasia, Respiratory | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | |
| Olfactory Epithelium, Necrosis | | | | | | | | 1 | | 2 | | | 3 | | | | | | | | | | | | | | |
| Respiratory Epithelium, Hyperplasia | 2 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 3 | 2 | 2 | 1 | 1 | |
| Respiratory Epithelium, Metaplasia, Squamous | 1 | 1 | | | 1 | 2 | 1 | | 1 | 2 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | |
| Respiratory Epithelium, Necrosis | | | | | | | 1 | 2 | | 2 | | | 1 | | | | | | | 1 | | | | | | | |
| Turbinate, Atrophy | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | 1 | 1 | 1 | 1 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

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 Cobalt
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 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | males
(cont...) | | | | |
|-------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|--------------------|---|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | | | |
| 5.0 mg/m3 | 7 | 6 | 6 | 5 | 5 | 6 | 7 | 7 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 5 | 6 | 7 | 6 | 6 | 7 | 7 | 4 | 7 |
| | 3 | 9 | 2 | 1 | 5 | 4 | 3 | 1 | 7 | 9 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 7 | 8 | 1 | 9 | 1 | 2 | 2 | 7 | 2 |
| | 0 | 1 | 8 | 6 | 2 | 6 | 0 | 7 | 9 | 8 | 3 | 3 | 2 | 9 | 9 | 9 | 2 | 9 | 7 | 1 | 9 | 1 | 9 | 9 | 0 | 9 |
| | 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 |
| | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| | 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 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |

Metaplasia, Squamous

1

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cataract | | | | | 3 | | | | | | 2 | | 1 | | | 2 | | 1 | | | | | | | |
| Metaplasia, Osseous | | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Accumulation, Hyaline Droplet | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cyst | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | | |
| Infarct | | | | | | | | | | | | | | | | | | | | | | | | | |
| Metaplasia, Osseous | | | | 2 | | | | | | | | | | | | | | | | | | | | | |
| Nephropathy | 3 | 3 | 2 | 2 | 1 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | 3 | 3 | 2 |
| Artery, Inflammation, Chronic Active | | | | | | | | | | | | | | | 3 | | | | | | | | | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
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 Species/Strain: RATS/F344/N Tac

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 Cobalt
 CAS Number: 7440-48-4

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 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | |
|-------------------------------|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|
| | 0689 | 0729 | 0779 | 0775 | 0648 | 0662 | 0772 | 0772 | 0772 | 0773 | 0566 | 0666 | 0641 | 0770 | 0668 | 0772 | 0772 | 0669 | 0661 | 0770 | | 0566 | 0667 | 0565 | 0666 | 0567 |
| 5.0 mg/m3 | 00626 | 00626 | 00626 | 00626 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 |
| | 678 | 729 | 779 | 775 | 648 | 662 | 772 | 772 | 772 | 773 | 566 | 666 | 641 | 770 | 668 | 772 | 772 | 669 | 661 | 770 | 566 | 667 | 565 | 666 | 567 | 667 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|
| Esophagus | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Duodenum Necrosis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 1.5 |
| Basophilic Focus | | X | | X | | | X | | | | X | | | X | | | | X | | X | | | | | | | 19 |
| Clear Cell Focus | | | | | | | | X | | | | | | | | | X | X | | | | | | | | | 9 |
| Degeneration, Cystic | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Eosinophilic Focus | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Fatty Change | | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 4 1.0 |
| Hepatodiaphragmatic Nodule | | | | | | | | | | | | | | | | | | X | X | X | | | | | | | 9 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Mixed Cell Focus | | | X | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 2.0 |
| Mesentery | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Artery, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |

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5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|--------|
| | 0689 | 0729 | 0779 | 0775 | 0648 | 0672 | 0677 | 0677 | 0677 | 0677 | 0566 | 0666 | 0644 | 0677 | 0666 | 0677 | 0677 | 0666 | 0666 | 0677 | | 0566 | 0666 | 0677 | 0666 | 0677 |
| ANIMAL ID | 00626 | 00667 | 00668 | 00669 | 00660 | 00661 | 00662 | 00663 | 00664 | 00665 | 00666 | 00667 | 00668 | 00669 | 00660 | 00661 | 00662 | 00663 | 00664 | 00665 | 00666 | 00667 | 00668 | 00669 | 00660 | |
| Fat, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Acinus, Atrophy | 1 | 1 | 1 | | | | | | 1 | 1 | | | | | 1 | | | | 1 | 1 | 2 | 1 | | 2 | 1 | 30 1.4 |
| Artery, Mineralization | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Degeneration | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 2.0 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hyperplasia, Squamous | | | | | 1 | 2 | 2 | | | | | | | 2 | | | | | | | | 1 | | | 1 | 11 1.5 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Ulcer | | | | | | 3 | 3 | | | | | | | | | | | | | | | | | | | 2 3.0 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Cardiomyopathy | 1 | 2 | 2 | 2 | 1 | 1 | | | 1 | 2 | 1 | 2 | | | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | | | 2 2 2 | 39 1.5 |
| Artery, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Accessory Adrenal Cortical Nodule | 1 | | | | | | | | | | | | | | | | | | | | | | | | | 3 1.0 |
| Hyperplasia | | | | 1 | 1 | | | 1 | 1 | | 2 | 1 | 1 | 1 | | | | | | | 1 | | | | 1 1 1 | 29 1.0 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
|--------------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------------|--------------|-----------------|--|
| DAY ON TEST | | 6 | 7 | 7 | 7 | 6 | 4 | 6 | 7 | 7 | 7 | 7 | 5 | 6 | 6 | 4 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | 5 | 6 | 5 | | |
| FISCHER 344-TACONIC RATS MALE | | 8 | 2 | 2 | 1 | 6 | 7 | 5 | 2 | 2 | 3 | 3 | 6 | 4 | 1 | 9 | 0 | 8 | 2 | 2 | 9 | 9 | 1 | 0 | 9 | 6 | 7 | |
| 5.0 mg/m3 | | 9 | 9 | 9 | 5 | 0 | 8 | 2 | 9 | 0 | 0 | 0 | 1 | 6 | 1 | 2 | 8 | 9 | 9 | 9 | 6 | 8 | 2 | 0 | 0 | 7 | | |
| ANIMAL ID | | 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 | | |
| | | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | | |
| | | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | | |
| | | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | * TOTALS | |
| Hyperplasia | | | | | | 4 | 4 | | | | | | | | | | | | | | | 3 | 3 | 4 | 9 2.4 | | | |
| Islets, Pancreatic
Hyperplasia | | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |
| | | | | | | | | | 3 | 2 | | | | | | | | 2 | | | | | | | 3 2.3 | | | |
| Parathyroid Gland | | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | 46 | | |
| Pituitary Gland
Angiectasis | | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |
| Pars Distalis, Hyperplasia | | 2 | 3 | | | | | | | | 1 | 4 | | 3 | | 1 | 3 | 4 | 3 | 2 | | 1 | | 1 | 22 3.0 | | | |
| Thyroid Gland
C-cell, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | 49 | | |
| Follicle, Cyst | | 1 | | 1 | | | | | | | | | | | | | | 3 | | | | 1 | | | | 9 2.0 | | |
| | | | | | | | X | | | | | | | | | | | | | | | | | | | 1 | | |

GENERAL BODY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------|--------------|
| Peritoneum
Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 2.0 |
|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|----------|--------------|

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---------------|--------------|--------------|
| Epididymis | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Preputial Gland
Atrophy | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | 48 | 1 3.0 |
| Inflammation, Chronic Active | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 3 2.0 | |
| Prostate
Hyperplasia | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | 1 1.0 |
| Inflammation, Chronic Active | | | | 2 | 2 | 2 | 2 | | | | 1 | | 3 | 2 | | | | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 28 1.6 | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|-------|--------|
| | 0689 | 0729 | 0779 | 0779 | 0668 | 0478 | 0662 | 0772 | 0772 | 0772 | 0772 | 0566 | 0666 | 0666 | 0441 | 0772 | 0668 | 0772 | 0772 | 0666 | | 0666 | 0775 | 0666 | 0566 | 0667 | 0565 | 0666 |
| 5.0 mg/m3 | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 00626 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 | 00662 |
| Seminal Vesicle Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Testes Atrophy | + | 4 | 2 | 2 | 4 | | | 4 | 3 | 2 | 4 | | 1 | 2 | | 4 | 4 | 2 | 4 | 4 | | + | 3 | | 2 | 1 | 50 | |
| Testes Infarct | | 3 | | | | | | | 4 | | | | 2 | | | | | | | 2 | | | | | | | | 39 2.6 |
| Testes Interstitial Cell, Hyperplasia | 2 | | | | | | | | 4 | | | | 3 | | 1 | 2 | | | | | | | | | | 2 | | 12 2.7 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 12 1.9 |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Lymph Node Pancreatic, Ectasia | | 3 | | | + | | | | | | | | + | + | | | | | | | | | | | | | | 9 |
| Lymph Node Pancreatic, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Lymph Node Pancreatic, Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Lymph Node, Bronchial | M | + | + | M | + | M | M | + | + | + | + | + | M | M | M | + | + | M | + | M | M | M | M | M | M | M | 20 | |
| Lymph Node, Mandibular Ectasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Lymph Node, Mandibular Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | 2 2.5 |
| Lymph Node, Mediastinal | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Lymph Node, Mesenteric Infiltration Cellular, Histiocyte | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Spleen Fibrosis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Spleen Hematopoietic Cell Proliferation | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 1.5 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 1.7 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

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 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|----|-------|----|
| | 0689 | 0729 | 0779 | 0775 | 0648 | 0667 | 0772 | 0772 | 0773 | 0773 | 0566 | 0666 | 0661 | 0479 | 0678 | 0729 | 0729 | 0669 | 0668 | 0750 | | 0665 | 0657 | | | |
| ANIMAL ID | 00626 | 00626 | 00626 | 00626 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | 00633 | | | | |
| Necrosis | | | 2 | | 2 | | | | | | 2 | | | 2 | | | | | | | 2 | | 6 2.0 | | | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | 46 | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | + | + | M | M | + | + | M | + | + | + | M | + | M | + | M | + | M | + | + | M | M | + | M | + | M | 31 |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Cyst Epithelial Inclusion | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Inflammation | | | | | 3 | 3 | | | | | | | | | | | | | | | | | | | 4 3.0 | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Maxilla, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | 4 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Compression | | | | | | | 2 | 2 | | | | | | | | | | | | | | | | | 7 2.3 | |
| Edema | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Hemorrhage | | | | | | | | | 1 | | | | | | 3 | | | | | | | | | | 3 2.0 | |
| Infiltration Cellular, Mononuclear Cell | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
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 BLANK .. Not examined microscopically

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 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|--------|
| | 0689 | 0729 | 0779 | 0775 | 0647 | 0662 | 0772 | 0772 | 0772 | 0772 | 0566 | 0666 | 0641 | 0770 | 0668 | 0772 | 0772 | 0666 | 0666 | 0756 | | 0665 |
| 5.0 mg/m3 | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | |
| | 00626 | 00662 | 00668 | 00669 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | 00660 | |
| Hyperkeratosis | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Inflammation | | | | | | | 1 | | | | | | 1 | | | | | | | 1 | 1 | 16 1.1 |
| Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | 2 2.0 |
| Respiratory Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Squamous Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Lung | | | | | | | | | | | | | | | | | | | | | | 50 |
| Inflammation, Chronic Active | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 50 2.9 |
| Alveolar Epithelium, Hyperplasia | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 1 | 3 | 4 | 4 | 4 | 3 | 4 | 49 3.6 |
| Alveolus, Proteinosis | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 49 3.1 |
| Bronchiole, Epithelium, Hyperplasia | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 50 3.7 |
| Nose | | | | | | | | | | | | | | | | | | | | | | 50 |
| Foreign Body | | | | | | X | | | | | | | | | | | X | | | | | 5 |
| Inflammation, Suppurative | 3 | | 2 | 3 | 3 | 3 | 1 | 1 | 2 | 1 | 3 | | 3 | 2 | 3 | 4 | 3 | 3 | 2 | 3 | 3 | 46 2.6 |
| Inflammation, Chronic Active | 3 | 1 | 3 | 3 | 3 | 3 | 1 | 2 | 2 | 2 | 3 | 1 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 49 2.6 |
| Thrombosis | 1 | | | | | | | | | | | | | | | | | | | | | 2 1.5 |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 1 | | | | | | | | | 1 | | | | | | | | | | | | 2 1.0 |
| Olfactory Epithelium, Atrophy | | | | | | | | | | | | | | | | | | | | | | 29 1.2 |
| Olfactory Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | 7 1.1 |
| Olfactory Epithelium, Hyperplasia, Basal Cell | | | | | | | | | | | | | | | | | | | | | | 13 1.0 |
| Olfactory Epithelium, Metaplasia, Respiratory | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 50 2.2 |
| Olfactory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | 5 1.8 |
| Respiratory Epithelium, Hyperplasia | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 4 | 2 | 2 | 1 | 2 | 50 2.2 |
| Respiratory Epithelium, Metaplasia, Squamous | 1 | | | | 1 | 1 | 1 | | 2 | 1 | 2 | | 1 | 1 | | 2 | 3 | 2 | 2 | 1 | 1 | 35 1.3 |
| Respiratory Epithelium, Necrosis | 1 | | 2 | 2 | | 2 | | | | | 1 | | | | | 2 | | 2 | 2 | | | 13 1.6 |
| Turbinate, Atrophy | | | | | | | | | | | | | | | | | | | | | | 41 1.0 |
| Trachea | | | | | | | | | | | | | | | | | | | | | | 50 |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

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Experiment Number: 60311 - 05
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 Cobalt
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------|-------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----------|
| FISCHER 344-TACONIC RATS MALE | DAY ON TEST | 06 | 07 | 07 | 07 | 06 | 04 | 06 | 07 | 07 | 07 | 07 | 05 | 06 | 06 | 04 | 07 | 06 | 07 | 07 | 06 | 06 | 07 | 05 | 06 | 05 | * TOTALS |
| | ANIMAL ID | 89 | 99 | 29 | 15 | 60 | 78 | 22 | 99 | 90 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | |
| 5.0 mg/m3 | | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | |

Metaplasia, Squamous

1 1.0

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Cataract | | | | | | | | | | | | | | | | | | 3 | 2 | | | | | | | 7 2.0 |
| Metaplasia, Osseous | 1 | 1 | 2 | 1 | | | | | 1 | | 1 | 1 | 1 | | 1 | 2 | 1 | 1 | | | | 1 | 1 | | | 31 1.1 |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Accumulation, Hyaline Droplet | | | | | | | | | | | | 3 | | | | | | | | | | | | | | 1 3.0 |
| Cyst | | | X | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Infarct | | | | | | | | | | | | | | | | | | | | | | | 2 | | | 1 2.0 |
| Metaplasia, Osseous | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Nephropathy | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 3 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 50 2.5 |
| Artery, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Inflammation | | | | 3 | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |

*** END OF MALE DATA ***

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
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Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| DAY ON TEST | FISCHER 344-TACONIC RATS FEMALE | | | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females (cont...) |
|-------------|---------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|-------------------|
| | 0732 | 0731 | 0730 | 0731 | 0674 | 0772 | 0773 | 0773 | 0531 | 0751 | 0773 | 0676 | 0773 | 0773 | 0233 | 0733 | 0535 | 0773 | 0678 | 0773 | 0677 | 0676 | 0676 | 0677 | 0673 | 0676 | 0677 | | |
| Control | 0010 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | M | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Angiectasis | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| Basophilic Focus | | X | | X | | X | | X | | | | | | | | | | | X | | X | | | | X | X | |
| Clear Cell Focus | | X | X | | | | | | | | | | X | | X | | | | | | | X | | | | | |
| Fatty Change | | | | | | | | | 1 | | 1 | | | | | | | | | | | 1 | 1 | 2 | | | |
| Hepatodiaphragmatic Nodule | | | | X | | X | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | |
| Mixed Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Regeneration | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | 1 |
| Serosa, Thrombosis | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | |
| Mesentery | + | | | | | | | + | | | | | | | + | + | | | | | | + | | | | | + |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
+ .. Tissue examined microscopically
X .. Lesion present
I .. Insufficient tissue
M .. Missing tissue
A .. Autolysis precludes evaluation
BLANK .. Not examined microscopically
1-4 .. Lesion qualified as:
1) Minimal 3) Moderate
2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|--|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|
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1 | 0
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1 | 0
6
3
1 | 0
7
3
4 | 0
6
7
6 | 0
6
4
3 | 0
7
3
0 | | |
| Fat, Necrosis | 1 | | | | | | | 1 | | | | | | | | | | 1 | | | | | | | | 1 | |
| Pancreas
Acinus, Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Salivary Glands
Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 2 |
| Stomach, Forestomach
Hyperplasia, Squamous
Ulcer | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 2
2 |
| Stomach, Glandular
Edema
Erosion | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 2
3 |
| Tongue | | | | | | | | | | | | | | | | | | | | | | | | | | | + |
| Tooth
Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | | |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Heart
Cardiomyopathy
Thrombosis
Artery, Inflammation, Chronic Active
Atrium, Congestion | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 2
2
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | 3
2 |

ENDOCRINE SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|---|-----------|----------------------|--|--|
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1 | 0
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2 | 0
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4 | 0
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0 | 0
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7
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1 | 0
6
8
3 | 0
7
3
1 | 0
6
7
4 | 0
6
4
6 | 0
7
3
0 | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | | |
| Accessory Adrenal Cortical Nodule | | | | | | | | | | | | | | | | | 1 | | | | | | | | 1 | | | |
| Atrophy | | | | | 3 | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Degeneration | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | |
| Hemorrhage | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | |
| Hyperplasia | 2 | | 2 | 2 | | 1 | | | | | | 2 | | 1 | | 1 | | 2 | 2 | 2 | | | 1 | 1 | 1 | | | |
| Necrosis | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| Degeneration, Cystic | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | |
| Hyperplasia | 3 | | | | | | | | | | 3 | | | | | 1 | | | | | 1 | | | | | | | |
| Infiltration Cellular, Mononuclear Cell | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| Hyperplasia | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| Parathyroid Gland | + | + | + | + | + | + | + | + | M | M | M | + | + | + | + | + | + | + | + | + | + | + | M | + | + | M | | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Pars Distalis, Hyperplasia | | 2 | | 3 | | | 2 | 4 | | 1 | | | | 3 | | | | | | | 4 | | 1 | | 3 | | | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | | |
| C-cell, Hyperplasia | | | | | | | | | 1 | | | | | | | | 3 | | 1 | | | | 1 | | | | | |
| Follicular Cell, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

GENERAL BODY SYSTEM

Peritoneum +

GENITAL SYSTEM

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 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
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 BLANK .. Not examined microscopically

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| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | females
(cont...) | | | |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
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| ANIMAL ID | 0
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1
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4 | 0
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1
0
5 |
| Clitoral Gland
Hyperplasia
Inflammation, Suppurative | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | 3 | + | + | + | + | + | + | + | + | + |
| Ovary
Cyst
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | + | + | + |
| Uterus
Angiectasis
Cyst
Inflammation, Suppurative
Inflammation, Chronic Active
Necrosis
Endometrium, Hyperplasia, Cystic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Lymph Node
Renal, Ectasia | | | | | | | | | | | | | | | | | + | | | + | | | | + | | |
| Lymph Node, Bronchial | M | M | + | + | M | + | + | + | M | M | + | M | + | + | M | M | M | M | + | + | + | + | M | M | + | |
| Lymph Node, Mandibular
Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + |
| Lymph Node, Mediastinal
Atrophy | + | M | M | + | + | + | + | + | + | + | M | + | + | + | + | + | + | M | + | + | + | + | + | + | + | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

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 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------------|-----------|----------------------|
| | 0
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| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0
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| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Mesenteric
Infiltration Cellular, Histiocyte | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Spleen
Hematopoietic Cell Proliferation
Infiltration Cellular, Histiocyte | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + |

INTEGUMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mammary Gland
Galactocoele
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skin
Cyst Epithelial Inclusion
Hyperkeratosis
Hyperplasia, Squamous | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

MUSCULOSKELETAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone
Fracture
Femur, Hyperostosis
Maxilla, Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | |

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| FISCHER 344-TACONIC RATS
FEMALE
Control | | DAY ON TEST | | | | | | | | | | | | | | | | | | | | females
(cont...) | | | | | | | | |
|---|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
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NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Compression | 1 | | | | | 2 | | | | | | | | 2 | | | 2 | 3 | 2 | | | 2 | | |
| Infiltration Cellular, Mononuclear Cell | | | | | | | | | | | | | | | | | | | | | | | | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Foreign Body | | | | | X | | | | | | | | | | | | | | | | | | | |
| Inflammation | | | 1 | 2 | 1 | 1 | | | | | 1 | 1 | 1 | 2 | | | 1 | | 1 | | | 1 | 1 | |
| Metaplasia, Squamous | | | | | 1 | 1 | | | | | | | | | | | | | | | | | | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Inflammation, Chronic Active | | 1 | 1 | | | | 1 | | | | | 1 | 1 | | | | 1 | | 1 | | | | | |
| Alveolar Epithelium, Hyperplasia | | | | | | | | 1 | | | | | | | | | | | | | | | | |
| Interstitial, Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | |
| Mediastinum, Inflammation | | | | | | | | | | | | | | | | | | | | | | | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Foreign Body | | | | | | | | | | | | | | X | | X | | | | | | | | |
| Inflammation, Suppurative | | | | | | | | | | | | | | 1 | | 1 | | | | | | | | |
| Inflammation, Chronic Active | 1 | | | 1 | 1 | | | | | | 1 | | 3 | | 1 | | 1 | | 1 | | | 1 | 1 | |
| Thrombosis | | | | | | | | | | | | | | | | | | 2 | | | | | | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | | | | | | | | | | 3 | | | 1 | | | 1 | | 1 | | | | | 1 | |
| Olfactory Epithelium, Metaplasia, Respiratory | | | | | | | | | | | | | | 1 | | | | | | 1 | | | | |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | | | | | | | | | | | 2 | | | | | | | | | | | | | |
| Respiratory Epithelium, Hyperplasia | | | | 1 | | 1 | | | | | | | | 2 | | 1 | 1 | 1 | | | | 1 | 1 | 2 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|--|----------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| FISCHER 344-TACONIC RATS
FEMALE | | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 5 | 7 | 7 | 6 | 7 | 7 | 7 | 2 | 7 | 5 | 7 | 6 | 7 | 7 | 6 | 6 | 7 |
| | Control | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 1 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 8 | 3 | 3 | 7 | 4 | 3 |
| | | 2 | 1 | 0 | 1 | 4 | 2 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 2 | 2 | 4 | 0 | 0 | 1 | 3 | 1 | 1 | 4 | 6 | 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 |
| | ANIMAL ID | 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 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | 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 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |

Respiratory Epithelium, Metaplasia, Squamous
 Respiratory Epithelium, Necrosis
 Turbinate, Atrophy
 Turbinate, Hyperostosis

2

1

Trachea +

SPECIAL SENSES SYSTEM

Ear
 Inflammation, Chronic Active

Eye +
 Cataract 2 2
 Metaplasia, Osseous 1

Harderian Gland
 Inflammation, Chronic Active

+
 4 4

URINARY SYSTEM

Kidney +
 Necrosis, Focal
 Nephropathy 3 3 3 3 1 2 2 2 3 3 3 2 3 3 3 2 3 3 2 3 3 2 1 3

Urinary Bladder +

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|------|
| | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | | 0731 |
| ANIMAL ID | 00126 | 00127 | 00128 | 00129 | 00130 | 00131 | 00132 | 00133 | 00134 | 00135 | 00136 | 00137 | 00138 | 00139 | 00140 | 00141 | 00142 | 00143 | 00144 | 00145 | 00146 | 00147 | 00148 | 00149 | 00150 | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Basophilic Focus | X | X | | X | X | | | | | | | X | | X | | | X | | X | | | | | | | 16 |
| Clear Cell Focus | | X | | | | | | | X | | | X | X | X | X | | | | | | | | | | | 12 |
| Fatty Change | | | | | 2 | | | | 2 | 2 | 1 | | | | | | | 3 | | 1 | | | 2 | 2 | | 13 1.6 |
| Hepatodiaphragmatic Nodule | | X | | | | | | | | | | | X | | | | | X | | X | | | | | | 6 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Mixed Cell Focus | | | | X | | | | | | | | | | | | | | | | | | | | | | 1 |
| Necrosis | | 1 | | | | | | | | 1 | 1 | | | | | | | | | | | | 3 | | | 6 1.3 |
| Regeneration | | | | | | | | | | | | | | | | | | | | | | | | | | 2 1.5 |
| Serosa, Thrombosis | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Mesentery | + | | + | | | | | | | | | + | | | | | + | + | | + | + | | | | | 13 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
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 Cobalt
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 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|--|
| | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | | |
| ANIMAL ID | 0016 | 0007 | 0008 | 0009 | 0010 | 0011 | 0012 | 0013 | 0014 | 0015 | 0016 | 0017 | 0018 | 0019 | 0020 | 0021 | 0022 | 0023 | 0024 | 0025 | 0026 | 0027 | 0028 | 0029 | |
| Fat, Necrosis | 1 | | | 1 | | | | | | | | 1 | | | | | | 1 | 1 | | 1 | 1 | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Acinus, Atrophy | | 1 | | | | 1 | | 1 | | 1 | | 1 | 1 | | | | | 1 | 1 | 2 | | | 1 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ulcer | | | | | | | | | | 1 | | | | | | | | | 2 | | 1 | | | 2 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Edema | | | | | | | | | | | | | | | | | | | | | | | | | |
| Erosion | | | | | | | | | | 3 | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tongue | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Cardiomyopathy | 1 | 2 | | 1 | 2 | | 1 | 1 | 1 | | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | | 2 | 2 | 1 | 2 | |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | | | | | |
| Artery, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | |
| Atrium, Congestion | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | |

ENDOCRINE SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

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FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|--------|
| | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | | 0731 |
| ANIMAL ID | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | 0011 | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Accessory Adrenal Cortical Nodule | | | | | | 1 | | | | | | | | | | 1 | | | | | | | | | 5 1.0 | |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Degeneration | | | | | | | | | | | | | | | | | | 2 | | | | | 2 | | 3 2.3 | |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | |
| Hyperplasia | | | 2 | | | 1 | | 2 | | 2 | | 1 | 1 | 1 | | 2 | | | | 1 | | 2 | 3 | | 3 | 25 1.6 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Degeneration, Cystic | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Hyperplasia | | | | | | 4 | | 1 | | | | | 1 | 2 | | | 2 | | 1 | | | 1 | | 1 | | 12 1.8 |
| Infiltration Cellular, Mononuclear Cell | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Parathyroid Gland | + | + | + | + | M | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | + | + | 42 | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Pars Distalis, Hyperplasia | 2 | 3 | | 2 | | | | | 3 | 2 | | 4 | | | | 4 | | 2 | | | | 1 | 3 | | 19 2.6 | |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| C-cell, Hyperplasia | 1 | | | | | | | | | 1 | | | | | | 2 | 1 | | | | | | 1 | | 9 1.3 | |
| Follicular Cell, Hyperplasia | | | | 1 | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |

GENERAL BODY SYSTEM

Peritoneum

1

GENITAL SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

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FEMALE
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|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | |
| ANIMAL ID | 0016 | 0017 | 0018 | 0019 | 0020 | 0021 | 0022 | 0023 | 0024 | 0025 | 0026 | 0027 | 0028 | 0029 | 0030 | 0031 | 0032 | 0033 | 0034 | 0035 | 0036 | 0037 | 0038 | 0039 | 0040 |
| Clitoral Gland
Hyperplasia
Inflammation, Suppurative | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 2 2.5 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 2 1.5 |
| Ovary
Cyst
Inflammation, Chronic Active | + | + | X | + | + | X | + | + | + | + | + | + | + | + | + | + | X | + | + | + | + | + | + | 50 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | 5 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Uterus
Angiectasis
Cyst
Inflammation, Suppurative
Inflammation, Chronic Active
Necrosis
Endometrium, Hyperplasia, Cystic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 2 2.5 |
| | | | | | | | | | | | | | | | | | | | | | | | | | 4 2.0 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|-------|-------|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Lymph Node
Renal, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | 4 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Lymph Node, Bronchial | + | + | M | + | + | M | M | M | + | + | + | M | M | M | + | + | + | M | + | + | M | M | M | + | M | 26 |
| Lymph Node, Mandibular
Atrophy | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Lymph Node, Mediastinal
Atrophy | + | + | M | M | + | M | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | 42 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
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FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | |
|--|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------------|
| | 0
7
3
1 | 0
7
3
1 | 0
6
9
1 | 0
7
3
2 | 0
7
3
2 | 0
7
3
1 | 0
7
2
2 | 0
7
3
2 | 0
7
3
2 | 0
7
3
2 | 0
3
1
6 | 0
5
3
0 | 0
7
3
1 | 0
7
3
2 | 0
7
3
3 | 0
7
3
3 | 0
7
3
3 | 0
7
3
3 | 0
6
7
4 | 0
7
3
0 | 0
7
3
1 | 0
6
3
3 | 0
6
6
8 | 0
7
9
3 | | 0
7
3
1 |
| ANIMAL ID | 0
0
1
2
6 | 0
0
1
2
7 | 0
0
1
2
8 | 0
0
1
3
9 | 0
0
1
3
0 | 0
0
1
3
1 | 0
0
1
3
2 | 0
0
1
3
3 | 0
0
1
3
3 | 0
0
1
3
4 | 0
0
1
3
5 | 0
0
1
3
6 | 0
0
1
3
7 | 0
0
1
3
8 | 0
0
1
4
9 | 0
0
1
4
0 | 0
0
1
4
1 | 0
0
1
4
2 | 0
0
1
4
3 | 0
0
1
4
4 | 0
0
1
4
5 | 0
0
1
4
6 | 0
0
1
4
7 | 0
0
1
4
8 | 0
0
1
4
9 | 0
0
1
5
0 |
| Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 3.0 |
| Lymph Node, Mesenteric
Infiltration Cellular, Histiocyte | + | | | | | | | | | | | | | | | | | | | | | | | | 50 | 1 2.0 |
| Spleen
Hematopoietic Cell Proliferation
Infiltration Cellular, Histiocyte | + | | | | | | | | | | | | | | | | | | | | | | | | 50 | 2 1.5
1 2.0 |
| Thymus | + M + + + M + | | | | | | | | | | | | | | | | | | | | | | | | 47 | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland
Galactocoele
Hyperplasia | + | | | | | | | | | | | | | | | | | | | | | | | | 50 | 1 3.0
3 2.3 |
| Skin
Cyst Epithelial Inclusion
Hyperkeratosis
Hyperplasia, Squamous | + | | | | | | | | | | | | | | | | | | | | | | | | 50 | 1 1.0
1 4.0
1 3.0 |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone
Fracture
Femur, Hyperostosis
Maxilla, Inflammation, Chronic Active | + | | | | | | | | | | | | | | | | | | | | | | | | 50 | 1 2.0
4 2.0
2 2.5 |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
| | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | | 0731 | 0731 | | |
| ANIMAL ID | 00126 | 00127 | 00128 | 00129 | 00130 | 00131 | 00132 | 00133 | 00134 | 00135 | 00136 | 00137 | 00138 | 00139 | 00140 | 00141 | 00142 | 00143 | 00144 | 00145 | 00146 | 00147 | 00148 | 00149 | 00150 |
| | 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 |

NERVOUS SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Compression | | | 1 | | | | 2 | 2 | | | 2 | 1 | 1 | | | | | | 3 | 2 | | 1 | | | 16 1.8 |
| Infiltration Cellular, Mononuclear Cell | | | | | | | | | 2 | | | | | | | | | | | | | | | | 1 2.0 |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|--------|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Foreign Body | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Inflammation | | 1 | 1 | 1 | 2 | 1 | | | 1 | | | | | 2 | | | 1 | | | | | 2 | 1 | | 22 1.2 |
| Metaplasia, Squamous | | 1 | | | 1 | | | | | | | | | | | | | | | | | | | | 4 1.0 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Inflammation, Chronic Active | 1 | 1 | | 1 | 1 | | 1 | 1 | | | 1 | 1 | | 1 | | | | | 1 | 1 | | | 1 | | 20 1.0 |
| Alveolar Epithelium, Hyperplasia | 1 | 1 | | | 1 | | 2 | | | | | | | 1 | | 1 | | | | | | | 1 | | 9 1.1 |
| Interstitial, Fibrosis | | | | | | | 2 | | | | | | | | | | | | | | | | | | 1 2.0 |
| Mediastinum, Inflammation | | | | | | | | | | | | | | | | | | | | | | 2 | | | 1 2.0 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Foreign Body | | | | X | | | X | | | | X | | | | | | | | | | | | | | 5 |
| Inflammation, Suppurative | | | | 1 | | | 1 | | | | 1 | | | | | | | | | | | | | 2 | 6 1.2 |
| Inflammation, Chronic Active | | 1 | 2 | 2 | 1 | | 2 | | | | 1 | 1 | | 1 | | 1 | | | 1 | 1 | 1 | | 2 | 22 1.3 | |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | 3 | | | | 1 | | | | | | | 1 | | | | | | | | | | | | 8 1.5 | |
| Olfactory Epithelium, Metaplasia, Respiratory | | | | | 1 | 1 | | | | | | 1 | | | | | | | | | | | | 1 | 6 1.0 |
| Respiratory Epithelium, Accumulation, Hyaline Droplet | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Respiratory Epithelium, Hyperplasia | | | | 1 | | | 1 | | | | 1 | 1 | | | | | | | 1 | | | | 2 | | 15 1.2 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
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 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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| FISCHER 344-TACONIC RATS
FEMALE
Control | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | |
|---|-------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|---|---|-----------|---------------|--|---------------|
| | ANIMAL ID | | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | |
| | | | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 3 | 5 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 6 | 6 | 7 | | | | |
| | | | 3 | 3 | 9 | 3 | 3 | 3 | 2 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 3 | 3 | 3 | 6 | 9 | 3 | | | | |
| | | | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 6 | 0 | 1 | 2 | 0 | 2 | 1 | 1 | 4 | 0 | 1 | 1 | 3 | 1 | | | | |
| | | | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | |
| | | | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | | | | |
| | | | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | 50 | | | |
| Respiratory Epithelium, Metaplasia, Squamous | | | | | | 1 | | | | | | | | | | | | | | | | | | | | 1 | 2 1.0 | | |
| Respiratory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 3.0 | | |
| Turbinate, Atrophy | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | | |
| Turbinate, Hyperostosis | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | 3 2.0 | | |
| Trachea | | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ear | | | | | | + | | | | + | | | | | | | | + | | | + | | | | | 4 | | | |
| Inflammation, Chronic Active | | | | | | 3 | | | | 2 | | | | | | | | 1 | | | 2 | | | | | | 4 2.0 | | |
| Eye | | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Cataract | | | | | 4 | | | | | 2 | | | | | | 3 | | | | | | 4 | | 2 | 1 | | 8 2.5 | | |
| Metaplasia, Osseous | | | 1 | 1 | 1 | | 1 | | 1 | 1 | | | | 2 | 1 | | 2 | 1 | | | | 1 | | 1 | 1 | | 24 1.1 | | |
| Harderian Gland | | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | 3 3.3 | | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Necrosis, Focal | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | 1 1.0 | | |
| Nephropathy | | | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 4 | | 3 | 3 | 3 | 4 | 3 | 2 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 3 | 3 | | 48 2.6 |
| Urinary Bladder | | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |

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 + .. Tissue examined microscopically
 X .. Lesion present
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 Cobalt
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 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------|
| | 0691 | 0692 | 0693 | 0694 | 0695 | 0696 | 0697 | 0698 | 0699 | 0690 | 0691 | 0692 | 0693 | 0694 | 0695 | 0696 | 0697 | 0698 | 0699 | 0690 | 0691 | 0692 | 0693 | 0694 | |
| ANIMAL ID | 0030 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon
Mucosa, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum
Infiltration Cellular, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | | |
| Basophilic Focus | | | X | X | | X | | | X | X | X | X | | | | X | | | | X | | | X | | |
| Clear Cell Focus | | X | | | | | | | | X | | X | | | | | | | | | | | | | |
| Eosinophilic Focus | | | | | | | | | | | | | | | | | | | | X | | | | | |
| Fatty Change | | | | | | | | | | | 1 | | | | | | | | | | | | | 1 | |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatodiaphragmatic Nodule | | X | X | | X | | | X | | | | X | | | X | | | | | | X | | | | |
| Mixed Cell Focus | | | | | X | | | | | | | X | | | | | | | | X | | | | | |
| Necrosis | | | 1 | | | | | 2 | 1 | | | | | | | | | | | | | | | | |
| Regeneration | | | | | | | | | | | | | | | | | | | | | | | | | 4 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
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Cobalt
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Lab: BNW

| DAY ON TEST | | 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 |
|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | | 6 | 6 | 7 | 5 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 7 | 6 |
| | | 9 | 2 | 1 | 9 | 3 | 3 | 4 | 4 | 8 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 8 | 3 | 7 | 3 | 1 | 3 | 3 | 4 |
| | | 1 | 4 | 6 | 0 | 1 | 0 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 6 | 2 | 6 | 0 | 0 | 2 | 1 | 1 | 1 | 6 |
| ANIMAL ID | | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |

females
(cont...)

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mesentery | + | + | + | | | | | | + | + | + | | | | | | | + | + | | + | | | | | | |
| Fibrosis | | | | 1 | | | | | | | | | | | | | | | | | | | | | | | |
| Fat, Necrosis | 2 | 1 | | | | | | 1 | 1 | 1 | | | | | | | | 1 | 1 | | 1 | | | | | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Basophilic Focus | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acinus, Atrophy | | | | | | | | 1 | 1 | | 1 | 1 | 2 | 1 | | 1 | | | | 1 | 1 | | 2 | | 1 | | |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Duct, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hyperplasia, Squamous | | | 4 | | | | | | | | | | | | | | | | | | | | | | 2 | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ulcer | | | 4 | | | | | | | 4 | | | | | | | | | | | | | | | | | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Ulcer | | | | | | | | | | | | | | | | | | | | | 2 | | + | + | + | + | + |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Blood Vessel | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cardiomyopathy | 2 | 1 | 1 | | 2 | 1 | | | | | 1 | 2 | 1 | 2 | | 1 | | 1 | 1 | 1 | 2 | | 1 | | 2 | 3 | |
| Thrombosis | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | 2 |

ENDOCRINE SYSTEM

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
+ .. Tissue examined microscopically
X .. Lesion present
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FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------------------|
| | 0691 | 0692 | 0693 | 0694 | 0695 | 0696 | 0697 | 0698 | 0699 | 0690 | 0691 | 0692 | 0693 | 0694 | 0695 | 0696 | 0697 | 0698 | 0699 | 0690 | 0691 | 0692 | 0693 | |
| ANIMAL ID | 00301 | 00302 | 00303 | 00304 | 00305 | 00306 | 00307 | 00308 | 00309 | 00310 | 00311 | 00312 | 00313 | 00314 | 00315 | 00316 | 00317 | 00318 | 00319 | 00320 | 00321 | 00322 | 00323 | |
| Adrenal Cortex Degeneration Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | | 2 | | | 2 | | | 2 | | | 2 | | | 2 | | | 2 | 2 | 4 | | 1 | 2 | | 1 |
| Adrenal Medulla Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | 1 | 1 | 3 | | 2 | | | 3 | | | | | 1 | 2 | | | 2 | 2 | 3 | | 2 | 1 | | 1 |
| Islets, Pancreatic Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | 4 | | | | | | | | | | | | | | | | | | | | | | | |
| Parathyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | |
| Pituitary Gland Pars Distalis, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | 1 | | 3 | 1 | 3 | 4 | | | | | 4 | 1 | | 4 | | | | 2 | | 1 | 4 | | 4 | |
| Thyroid Gland C-cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | | | | | 1 | | | | | | | | | 2 | | | | | | | | | | |

GENERAL BODY SYSTEM

Peritoneum

+

GENITAL SYSTEM

Clitoral Gland
Hyperplasia
Inflammation, Chronic Active

+ + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

Ovary
Cyst

+ + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

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 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | 0691 | 0624 | 0716 | 0590 | 0731 | 0770 | 0666 | 0666 | 0777 | 0777 | 0777 | 0777 | 0777 | 0593 | 0551 | 0733 | 0688 | 0733 | 0670 | 0767 | 0666 | 0731 | 0777 | 0777 | 0666 | 0666 | |
| | ANIMAL ID | 0030 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 | 0033 |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

females
(cont...)

Necrosis

Uterus

Inflammation, Suppurative
 Inflammation, Chronic Active
 Endometrium, Hyperplasia, Cystic

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

HEMATOPOIETIC SYSTEM

Bone Marrow

Lymph Node

Deep Cervical, Infiltration Cellular
 Iliac, Ectasia

Lymph Node, Bronchial

Lymph Node, Mandibular

Fibrosis
 Necrosis

Lymph Node, Mediastinal

Ectasia

Lymph Node, Mesenteric

Ectasia

Spleen

Fibrosis
 Hematopoietic Cell Proliferation

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| + | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | + | + | + | M | + | + | M | M | M | M | M | M | M | + | + | + | M | M | + | M | + | M | M | + | | | |
| + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
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 Cobalt
 CAS Number: 7440-48-4

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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------------------|---|---|---|---|
| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | 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 |
| | ANIMAL ID | 6 | 6 | 7 | 5 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 7 | 6 | 7 | 7 | 6 | 6 |
| | | 9 | 2 | 1 | 9 | 3 | 3 | 4 | 4 | 8 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 8 | 3 | 7 | 3 | 1 | 3 | 3 | 3 | 4 | 6 | 6 | 6 | 6 | |
| | | 1 | 4 | 6 | 0 | 1 | 0 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 6 | 2 | 6 | 0 | 0 | 2 | 1 | 1 | 1 | 1 | 6 | 6 | 6 | 6 | 6 | |
| | | 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 | 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 | |
| | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 2 | 3 | 4 | 5 | 6 | 6 | 6 | 6 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) | | | | |

Necrosis

1

Thymus

+ + + + + M + + + M + + + + + + + + + + + + + + + + +

Thrombosis

2

INTEGUMENTARY SYSTEM

Mammary Gland

+ +

Galactocele

1

Hyperplasia

2

Inflammation, Chronic Active

Skin

+ +

Cyst Epithelial Inclusion

Hyperplasia, Squamous

Inflammation

2

Subcutaneous Tissue, Inflammation

MUSCULOSKELETAL SYSTEM

Bone

+ +

Femur, Hyperostosis

3

Skeletal Muscle

+

NERVOUS SYSTEM

Brain

+ +

Compression

1

1

2

1

2

2

Hemorrhage

2

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

M .. Missing tissue

A .. Autolysis precludes evaluation

BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:

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| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------------------|
| | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FISCHER 344-TACONIC RATS FEMALE
1.25 mg/m3 | 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 | | |
| | 6 | 6 | 7 | 5 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 7 | 6 | 6 | |
| | 9 | 2 | 1 | 9 | 3 | 3 | 4 | 4 | 8 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 8 | 3 | 7 | 3 | 1 | 3 | 3 | 4 | 4 | |
| | 1 | 4 | 6 | 0 | 1 | 0 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 6 | 2 | 6 | 0 | 0 | 2 | 1 | 1 | 1 | 6 | | |
| | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 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 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 2 | 2 | 5 | | females (cont...) |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Foreign Body | | | | | | | | | | | | | | | | | X | | | | | | | | | | |
| Inflammation | | 2 | 2 | | 1 | 1 | | | 1 | | | | | | | | 1 | 2 | | | 2 | | | 2 | | | |
| Metaplasia, Squamous | | | 1 | | | | | 1 | | | | | | | | 1 | | | | | | | | | | | |
| Respiratory Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Inflammation, Chronic Active | 2 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| Alveolar Epithelium, Hyperplasia | 2 | 4 | 4 | 4 | 3 | 4 | 1 | 2 | 1 | 1 | 3 | 2 | 1 | 3 | 3 | 1 | 4 | 1 | 3 | 2 | 1 | | 1 | 4 | 4 | | |
| Alveolar Epithelium, Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolus, Proteinosis | 2 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | | |
| Bronchiole, Epithelium, Hyperplasia | 1 | 1 | 1 | 3 | 2 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Foreign Body | | | | | | | | | | | | | | | | | X | | | | | | | X | | | |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | 1 | | | | | | 1 | | | | |
| Inflammation, Chronic Active | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Thrombosis | 2 | | | | | | | 3 | | | | | | | | | | | 3 | | | | | | | | |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| Olfactory Epithelium, Atrophy | | 1 | | | 1 | | | 1 | 2 | 1 | | | | | | 1 | 1 | 1 | 1 | | | 1 | 1 | 2 | 1 | | |
| Olfactory Epithelium, Metaplasia, Respiratory | | | | | 1 | 1 | 1 | | | | | | | 1 | | 2 | 2 | | 1 | | 1 | | | 1 | | | |
| Olfactory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| Respiratory Epithelium, Hyperplasia | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | | 1 | | |
| Respiratory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Turbinate, Atrophy | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | 1 | | 1 | | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Turbinate, Hyperostosis | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------------------------------|--|
| | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | | |
| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | 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 | | |
| | 6 | 6 | 7 | 5 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 5 | 5 | 7 | 6 | 7 | 6 | 7 | 6 | 7 | 7 | 6 | 6 | |
| | 9 | 2 | 1 | 9 | 3 | 3 | 4 | 4 | 8 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 8 | 3 | 7 | 3 | 1 | 3 | 3 | 4 | | |
| | 1 | 4 | 6 | 0 | 1 | 0 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 6 | 2 | 6 | 0 | 0 | 2 | 1 | 1 | 1 | 6 | | |
| | ANIMAL ID | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | females
(cont...) | |

Trachea +

SPECIAL SENSES SYSTEM

Ear +
 Inflammation, Chronic Active 3

Eye +
 Cataract 2 1 4 3 1
 Hemorrhage 2
 Metaplasia, Osseous 1 1 1 1 1 1
 Cornea, Inflammation, Chronic Active 2

Harderian Gland +
 Atrophy

Zymbal's Gland +

URINARY SYSTEM

Kidney +
 Cyst
 Infarct 3
 Nephropathy 1 3 1 3 3 2 1 3 3 2 3 3 3 1 2 2 3 1 3 1 3 3 1
 Renal Tubule, Hyperplasia 4

Urinary Bladder +

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
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| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
| | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | | 0708 | 0708 | | |
| ANIMAL ID | 00326 | 00327 | 00328 | 00329 | 00330 | 00331 | 00332 | 00333 | 00334 | 00335 | 00336 | 00337 | 00338 | 00339 | 00340 | 00341 | 00342 | 00343 | 00344 | 00345 | 00346 | 00347 | 00348 | 00349 | 00350 |
| | 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 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------------|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Cecum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Colon
Mucosa, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
2 2.0 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Duodenum
Infiltration Cellular, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 1.0 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Basophilic Focus | | | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | 20 |
| Clear Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | | 6 |
| Eosinophilic Focus | | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Fatty Change | 3 | | | | | | 1 | | | | | 1 | | | 2 | | | | | | | 2 | 2 | 3 | 9 1.8 |
| Fibrosis | 1 | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Hepatodiaphragmatic Nodule | | | | X | | | | X | | | | | | X | | | | | | X | | | | | 11 |
| Mixed Cell Focus | | | | | | | | | | | X | | | | | | | | | | | | | | 4 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 3 1.3 |
| Regeneration | | | | | | | | | | | 4 | | | | | | | | | | | 1 | | | 3 3.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
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FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|---|
| | 0708 | 0598 | 0697 | 0732 | 0624 | 0772 | 0772 | 0772 | 0772 | 0772 | 0573 | 0773 | 0773 | 0773 | 0473 | 0773 | 0673 | 0773 | 0577 | 0770 | | 0773 | 0683 | 0773 |
| ANIMAL ID | 00326 | 00337 | 00338 | 00339 | 00333 | 00334 | 00335 | 00336 | 00337 | 00338 | 00339 | 00340 | 00341 | 00342 | 00343 | 00344 | 00345 | 00346 | 00347 | 00348 | 00349 | 00350 | 00351 | |
| Mesentery
Fibrosis
Fat, Necrosis | + | | | | | | | + | + | | | | | | | + | | + | + | | | | | 15
1 1.0
14 1.1 |
| Pancreas
Basophilic Focus
Acinus, Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1
23 1.2 |
| Salivary Glands
Duct, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 2.0 |
| Stomach, Forestomach
Fibrosis
Hyperplasia, Squamous
Inflammation, Chronic Active
Ulcer | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 1.0
10 2.4
1 4.0
5 2.6 |
| Stomach, Glandular
Ulcer | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
3 1.7 |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Blood Vessel | | | | | | | | | | | | | | | | | | | | | | | | 1 |
| Heart
Cardiomyopathy
Thrombosis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
34 1.5
4 2.5 |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-----------------------|--|
| | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | | 0708 | | | | |
| ANIMAL ID | 00326 | 00327 | 00328 | 00329 | 00330 | 00331 | 00332 | 00333 | 00334 | 00335 | 00336 | 00337 | 00338 | 00339 | 00340 | 00341 | 00342 | 00343 | 00344 | 00345 | 00346 | 00347 | 00348 | 00349 | 00350 | |
| Adrenal Cortex Degeneration Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 3.0
27 1.7 | |
| Adrenal Medulla Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
27 2.0 | |
| Islets, Pancreatic Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 4.0 | |
| Parathyroid Gland | M | + | + | + | + | + | M | + | + | + | + | M | + | + | M | + | + | + | + | + | + | + | + | 45 | | |
| Pituitary Gland Pars Distalis, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
20 2.5 | |
| Thyroid Gland C-cell, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49
9 1.9 | |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Peritoneum | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| GENITAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Clitoral Gland Hyperplasia Inflammation, Chronic Active | + | + | + | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47
1 4.0
4 2.3 | |
| Ovary Cyst | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
6 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|
| | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | | 0708 | |
| ANIMAL ID | 00326 | 00327 | 00328 | 00329 | 00330 | 00331 | 00332 | 00333 | 00334 | 00335 | 00336 | 00337 | 00338 | 00339 | 00340 | 00341 | 00342 | 00343 | 00344 | 00345 | 00346 | 00347 | 00348 | 00349 | 00350 | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 2.0 |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 1.0 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2 1.5 |
| Endometrium, Hyperplasia, Cystic | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 2.0 |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Lymph Node | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | |
| Deep Cervical, Infiltration Cellular | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Iliac, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Lymph Node, Bronchial | + | + | + | M | M | M | M | M | + | M | + | M | + | M | M | M | M | + | M | M | M | M | M | M | 18 | | |
| Lymph Node, Mandibular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + | 48 | |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | 43 | | |
| Ectasia | | | | | | | | | | | | | | | | | | | | | | | | M | | 1 2.0 | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Ectasia | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| Hematopoietic Cell Proliferation | | | | | | | | | | | | | | | | | | | | | | | | | | 5 1.4 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

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 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | 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 | * TOTALS |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| | ANIMAL ID | 00078 | 00088 | 00097 | 00132 | 00164 | 00202 | 00232 | 00262 | 00292 | 00322 | 00352 | 00382 | 00412 | 00442 | 00472 | 00502 | 00532 | 00562 | 00592 | 00622 | 00652 | 00682 | 00712 | 00742 | 00772 | 00802 | 00832 | 00862 | 00892 | 00922 | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 |
| Thymus | | + | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | + | + | + | 46 | | |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Galactocele | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 |
| Hyperplasia | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | 2 | 2.0 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | 1 | 3.0 |
| Skin | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Cyst Epithelial Inclusion | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3.0 |
| Inflammation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 |
| Subcutaneous Tissue, Inflammation | | | | | | | | | | | | | | | | 4 | | | | | | | | | | | | | | | 1 | 4.0 |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Femur, Hyperostosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | |
| Skeletal Muscle | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Compression | | 2 | | 2 | | | | 3 | | | | | | 2 | | | 2 | | | | | | | | | | | | | 14 | 1.8 | |
| Hemorrhage | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 2.0 | |
| * .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| + .. Tissue examined microscopically | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| X .. Lesion present | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| I .. Insufficient tissue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M .. Missing tissue | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| A .. Autolysis precludes evaluation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BLANK .. Not examined microscopically | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1-4 .. Lesion qualified as: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1) Minimal 3) Moderate | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2) Mild 4) Marked | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

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 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|-------|-------|
| | 0708 | 0598 | 0697 | 0732 | 0674 | 0772 | 0772 | 0772 | 0772 | 0772 | 0578 | 0771 | 0770 | 0772 | 0472 | 0770 | 0678 | 0771 | 0771 | 0578 | | 0770 | 0773 | 0678 | 0773 | 0670 | 0773 | 0674 |
| ANIMAL ID | 00326 | 00337 | 00338 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 | 00333 |
| | 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 |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Foreign Body | | | X | | | | | | | X | | | | | | | | | | | | | | | | | | 3 |
| Inflammation | 1 | | 2 | | 2 | 1 | | 1 | | 1 | 2 | | 1 | 2 | | | 1 | | 2 | 1 | 2 | | | | 1 | | | 23 1.5 |
| Metaplasia, Squamous | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | 4 1.0 |
| Respiratory Epithelium, Hyperplasia | | | 2 | | 1 | | | | | | | | 1 | | | | | | | | | | | | | | | 4 1.3 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Inflammation, Chronic Active | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 50 3.0 |
| Alveolar Epithelium, Hyperplasia | 4 | 3 | 3 | 4 | 3 | 3 | 1 | 4 | 4 | 1 | 4 | 4 | 4 | 4 | 3 | 2 | 3 | 2 | 4 | 4 | 4 | 1 | 4 | 3 | 2 | | | 49 2.8 |
| Alveolar Epithelium, Metaplasia, Squamous | | | | | 4 | | | | | | 3 | | | | | | | | | | | | | | | | | 2 3.5 |
| Alveolus, Proteinosis | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 3 | 3 | 1 | | | 50 2.7 |
| Bronchiole, Epithelium, Hyperplasia | 1 | 1 | 2 | 2 | 1 | 3 | 1 | 1 | 2 | 1 | 2 | 3 | 1 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | | | | 47 1.5 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Foreign Body | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 1.3 |
| Inflammation, Chronic Active | 1 | 1 | | 1 | | 1 | 1 | 1 | 1 | | | 1 | 1 | 1 | 1 | | 1 | | 1 | 3 | 1 | 1 | 1 | 1 | 1 | | | 42 1.1 |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 2.8 |
| Olfactory Epithelium, Accumulation, Hyaline Droplet | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | | 2 1.0 |
| Olfactory Epithelium, Atrophy | | | | | | | | | | | 1 | | 1 | 1 | | 1 | 1 | 1 | | 1 | | | 1 | 1 | | | | 22 1.1 |
| Olfactory Epithelium, Metaplasia, Respiratory | | | | | 1 | 2 | | | 1 | | | 1 | | 2 | | | | 1 | 2 | 1 | | | | 1 | | | | 18 1.3 |
| Olfactory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 1.5 |
| Respiratory Epithelium, Hyperplasia | | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 43 1.0 |
| Respiratory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Turbinate, Atrophy | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | 38 1.0 |
| Turbinate, Hyperostosis | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | 2 2.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
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FEMALE
1.25 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|--|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
| | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | 0708 | | 0708 | | | |
| ANIMAL ID | 00326 | 00327 | 00328 | 00329 | 00330 | 00331 | 00332 | 00333 | 00334 | 00335 | 00336 | 00337 | 00338 | 00339 | 00340 | 00341 | 00342 | 00343 | 00344 | 00345 | 00346 | 00347 | 00348 | 00349 | 00350 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
|---------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|

SPECIAL SENSES SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------------|
| Ear
Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 4
4 2.0 |
| Eye
Cataract | + | + | | 1 | 4 | | | | | | 2 | | | | | | | | | | | | | | | 50
10 2.1 |
| Eye
Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | | | | 2
1 2.0 |
| Eye
Metaplasia, Osseous | | | | 1 | 1 | | | | | 1 | 1 | 1 | | | | | | | 1 | | | | | | | 19 1.1 |
| Eye
Cornea, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 1
1 2.0 |
| Harderian Gland
Atrophy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 2.0 |
| Zymbal's Gland | | | | | | | | | | | | | | | | | | | | | | | | | | 1 |

URINARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------------|------------|
| Kidney
Cyst | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1 | |
| Kidney
Infarct | | | | | | | | | | | | | | | | | | | | | | | | | | | 1
1 3.0 |
| Kidney
Nephropathy | 3 | 1 | 2 | 4 | 2 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 4 | 2 | 1 | 3 | 1 | 3 | 2 | 2 | 3 | 3 | 4 | 2 | 48 2.4 | |
| Kidney
Renal Tubule, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | 4
2 4.0 | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |

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 + .. Tissue examined microscopically
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 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|------|------|
| | 0730 | 0732 | 0737 | 0739 | 0768 | 0767 | 0773 | 0776 | 0766 | 0766 | 0722 | 0755 | 0777 | 0777 | 0777 | 0777 | 0766 | 0755 | 0777 | 0777 | | | 0777 | 0766 |
| | 0050 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 | 0055 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Esophagus | + | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Cecum Hemorrhage | + + + + + + + + + A + + + + + + + + + + + + + + + + | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Colon | + + + + + + + + + A + + + + + + + + + + + + + + + + | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Large, Rectum | + | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Duodenum | + | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Ileum | + + + + A + + + + A + + + + + + + + + + + + + + + + | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Jejunum Congestion | + + + + A + + A + A + + + + + + + + + + + + + + + + | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Jejunum Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Jejunum Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | | | |
| Intestine Small, Jejunum Necrosis | 3 | | | | | | | | | | | | | | | | | | | | | | | |
| Liver | + | | | | | | | | | | | | | | | | | | | | | | | |
| Basophilic Focus | X | | | | | | | | | | | | | | | | | | | | | | | |
| Clear Cell Focus | X | | | | | | | | | | | | | | | | | | | | | | | |
| Eosinophilic Focus | | | | | | | | | | | | | | | | | | | | | | | | |
| Fatty Change | 2 3 3 | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatodiaphragmatic Nodule | X | | | | | | | | | | | | | | | | | | | | | | | |
| Mixed Cell Focus | X | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | 2 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Regeneration | 3 | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
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| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|------|
| | 0730 | 0732 | 0737 | 0739 | 0768 | 0767 | 0766 | 0772 | 0771 | 0766 | 0762 | 0757 | 0777 | 0777 | 0777 | 0777 | 0766 | 0755 | 0777 | 0777 | 0777 | 0777 | 0766 | 0766 | | | 0777 |
| Bile Duct, Cyst | 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 | 00501 | |
| Mesentery
Fat, Necrosis | | | | | + | | | | | | | | | | | | | | | | | | | | | 00502 | |
| Pancreas
Acinus, Atrophy
Acinus, Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 00503 | |
| Salivary Glands
Atrophy
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 00504 | |
| Stomach, Forestomach
Edema
Erosion
Hyperplasia, Squamous
Inflammation, Chronic Active
Ulcer | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 00505 | |
| Stomach, Glandular
Erosion
Thrombosis
Ulcer | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 00506 | |
| Tongue | | | | | + | | | | | | | | | | | | | | | | | | | | | 00507 | |
| Tooth
Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | 00508 | |

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 + .. Tissue examined microscopically
 X .. Lesion present
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| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|
| | 0730 | 0732 | 0737 | 0739 | 0768 | 0768 | 0772 | 0773 | 0766 | 0766 | 0725 | 0758 | 0773 | 0773 | 0773 | 0773 | 0766 | 0758 | 0773 | 0773 | 0773 | 0766 | 0766 | 0773 | | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00501 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00502 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00503 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00504 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00505 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00506 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00507 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00508 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00509 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00510 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00511 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00512 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00513 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00514 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00515 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00516 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00517 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00518 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00519 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00520 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00521 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00522 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00523 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00524 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00525 | |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Cardiomyopathy | 2 | 2 | 1 | 2 | | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | | 1 | 2 | 1 | 1 | 2 |
| Thrombosis | | | | | | | | 2 | | | | | | | | | | | | | | | 3 | | |
| Artery, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Accessory Adrenal Cortical Nodule | | | | | | | | | | | | | | | | | | | | | | 1 | | 1 |
| Atrophy | | | | | | | | | | | | | | | 4 | | | | | | | | | |
| Degeneration | | | | | | | | 2 | | | | | | | | | | | | | | | | |
| Hyperplasia | 2 | 2 | | 1 | | 1 | 2 | 1 | | | | | 1 | 2 | 1 | | 2 | 1 | | 1 | | | | 3 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | 3 | | |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hyperplasia | | | 3 | 2 | | | | | 1 | | 1 | 2 | | 4 | | | 4 | | | 1 | | 4 | 3 | |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Parathyroid Gland | + | + | + | M | M | + | + | M | + | M | + | + | + | M | + | + | + | + | + | M | + | M | + | + |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | |
| Pars Distalis, Hyperplasia | 2 | | 2 | | | | | 4 | | | | | | 2 | 2 | | | 1 | | | | | 1 | 1 |
| Thyroid Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| C-cell, Hyperplasia | | | | | | | 1 | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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|--|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------------|-----------------------|
| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | 0
7
3
0 | 0
7
3
2 | 0
6
7
7 | 0
7
3
1 | 0
6
8
0 | 0
6
3
7 | 0
7
1
2 | 0
7
3
5 | 0
6
3
8 | 0
6
1
1 | 0
2
6
7 | 0
5
8
3 | 0
7
3
0 | 0
7
3
0 | 0
6
3
0 | 0
5
2
3 | 0
7
3
0 | 0
7
3
2 | 0
7
3
0 | 0
6
3
1 | 0
6
6
1 | 0
7
1
8 | 0
6
3
0 | females
(cont...) | |
| | ANIMAL ID | 0
0
5
0
1 | 0
0
5
0
2 | 0
0
5
0
3 | 0
0
5
0
4 | 0
0
5
0
5 | 0
0
5
0
6 | 0
0
5
0
7 | 0
0
5
0
8 | 0
0
5
0
9 | 0
0
5
0
0 | 0
0
5
0
1 | 0
0
5
0
2 | 0
0
5
0
3 | 0
0
5
0
4 | 0
0
5
0
5 | 0
0
5
0
6 | 0
0
5
0
7 | 0
0
5
0
8 | 0
0
5
0
9 | 0
0
5
0
0 | 0
0
5
0
1 | 0
0
5
0
2 | 0
0
5
0
3 | | 0
0
5
0
4 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clitoral Gland
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Ovary
Cyst | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Suppurative | X | | | X | | | | | | X | | | | | | | | | | | X | | | |
| Uterus
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Thrombosis
Endometrium, Hyperplasia, Cystic | | | | | | | | | | | | | | | | | | | | | | | | |
| | 2 | | | | | | | | | | | | | | | | | | | | | | | |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Lymph Node
Renal, Ectasia | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial | M | + | + | + | M | + | M | M | + | M | + | M | + | + | + | + | + | + | + | + | + | M | M | M |
| Lymph Node, Mandibular
Ectasia | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | 2 | | | | | | | | | | | | | | | | | | | | | |

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(cont...) | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|------|------|
| | 0730 | 0732 | 0737 | 0731 | 0739 | 0738 | 0733 | 0735 | 0736 | 0731 | 0733 | 0738 | 0739 | 0738 | 0733 | 0730 | 0736 | 0735 | 0737 | 0737 | | | 0737 | 0736 |
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Fibrosis | | | | 1 | | | | | | | | | | | | 2 | | 2 | | | | 1 | | |
| Hematopoietic Cell Proliferation | | | | 1 | | | | | | | | | | | | | | | | | | | 2 | |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | | | 2 | | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Galactocele | | | | | | | | | 1 | | | | | | 2 | | | | | | | | | |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Inflammation | | | | | | | | | | | | | | | | | | | | | | | | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Femur, Hyperostosis | | | | | | | | | | | | | | | | 3 | | | | | 3 | | | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Compression | | | | 2 | 2 | 1 | | 2 | | 3 | 2 | 2 | | | | 4 | | | | | | | | |
| Necrosis | | | | | | | | | | 3 | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
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 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|------------------|------------------|
| | 0
7
3
0 | 0
7
3
2 | 0
6
7
7 | 0
7
3
1 | 0
6
8
0 | 0
6
3
7 | 0
7
1
2 | 0
7
3
5 | 0
6
1
3 | 0
6
3
8 | 0
2
9
1 | 0
5
8
7 | 0
7
3
0 | 0
7
3
0 | 0
7
3
0 | 0
6
3
2 | 0
5
2
3 | 0
7
3
0 | 0
7
3
0 | 0
6
3
1 | | | 0
6
1
1 | 0
6
1
8 | 0
7
3
0 |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00501 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00502 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00503 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00504 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00505 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00506 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00507 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00508 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00509 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00510 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00511 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00512 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00513 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00514 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00515 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00516 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00517 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00518 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00519 | |
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 00520 | |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Foreign Body | | X | X | | | | | | | | | | | | | | | | | | | X | |
| Inflammation | | 2 | 2 | 2 | | 1 | | | | 1 | | | | | | | | | 1 | 2 | 2 | | |
| Metaplasia, Squamous | | | | 1 | | | | | | | | | | | | | | | | | | | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Chronic Active | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Alveolar Epithelium, Hyperplasia | 3 | 4 | 1 | 2 | 2 | 4 | 4 | 2 | 1 | 1 | 1 | 4 | 3 | 4 | 4 | 1 | 3 | 4 | 3 | 4 | 4 | 3 | 2 |
| Alveolar Epithelium, Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | 3 |
| Alveolus, Proteinosis | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 1 |
| Bronchiole, Epithelium, Hyperplasia | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 1 | | 1 | 2 | 3 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 1 |
| Nose | + | + | + | + | I | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Suppurative | 1 | | | 1 | | | | | | | | | | | | | | | | | | 1 | |
| Inflammation, Chronic Active | 1 | 1 | 1 | 1 | | | 1 | 4 | 1 | | | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 2 | |
| Thrombosis | | | | | | | | | 2 | | | | | | | | 1 | | | | | 1 | |
| Olfactory Epithelium, Atrophy | 1 | 1 | | 1 | | 1 | 1 | 1 | | | | 1 | 1 | | 1 | | 1 | | 1 | | 1 | 1 | |
| Olfactory Epithelium, Hyperplasia | | | | | | | | | | | | | 1 | | | | 1 | | | | | 1 | |
| Olfactory Epithelium, Hyperplasia, Basal Cell | | | | | | | | | | | | | | | | | | | | | | | |
| Olfactory Epithelium, Metaplasia, Respiratory | | | | 1 | | | 2 | | | 2 | | 1 | 1 | | | | 1 | | 1 | | | 2 | |
| Respiratory Epithelium, Hyperplasia | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| Respiratory Epithelium, Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | |
| Respiratory Epithelium, Necrosis | | | | | | | | | 1 | | | | | | | | | | | | | | |
| Turbinate, Atrophy | | | | 1 | | 1 | 1 | | 1 | | | 1 | | | | | | 1 | | 1 | | 1 | |
| Turbinate, Hyperostosis | | | | | | | | | | | | | | | | | 2 | | | 1 | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
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 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|------|------|------|------|------|
| | 0730 | 0733 | 0737 | 0739 | 0768 | 0767 | 0766 | 0772 | 0771 | 0766 | 0766 | 0722 | 0755 | 0777 | 0777 | 0777 | 0777 | 0766 | 0755 | 0777 | | | 0777 | 0777 | 0766 | 0766 | 0777 |
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | |
| | 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 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 2 | 2 | 2 | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | A | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Cataract | | | | 4 | | | | | | | | 2 | 1 | | | | | | | | | | 1 | | 1 | | |
| Metaplasia, Osseous | 1 | 1 | | 1 | 1 | | | 1 | 1 | | | | 1 | | 1 | | | | | | | 1 | 1 | | 1 | | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Hyperplasia | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |
| Mineralization | | | | | | | | | | | | | | | | | | | | | | | 1 | | | | |
| Nephropathy | 3 | 3 | 1 | 3 | 2 | 4 | 2 | 2 | 1 | 1 | 2 | 3 | 1 | 3 | 3 | 3 | 2 | 1 | 2 | | | 3 | 3 | 1 | 3 | | |
| Renal Tubule, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | | |

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| | | 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 | | | | | |
|---------------------------------|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------------|---|--|
| FISCHER 344-TACONIC RATS FEMALE | DAY ON TEST | 5 | 5 | 7 | 5 | 5 | 6 | 1 | 7 | 7 | 5 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 5 | 6 | 7 | 7 | 6 | 7 | 5 | 5 | | | | 5 | |
| 2.5 mg/m3 | ANIMAL ID | 9 | 9 | 3 | 4 | 8 | 5 | 1 | 3 | 3 | 9 | 0 | 3 | 3 | 3 | 2 | 3 | 3 | 9 | 1 | 3 | 3 | 9 | 1 | 3 | 9 | 3 | 2 | | | | |
| | | 1 | 0 | 1 | 1 | 9 | 4 | 7 | 1 | 1 | 3 | 5 | 2 | 1 | 2 | 2 | 8 | 2 | 1 | 0 | 8 | 1 | 1 | 5 | 2 | 0 | 5 | 2 | | | | |
| | | 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 | | | |
| | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | | | |
| | | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | | | |
| | | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|---|-----|-------|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | 49 | | | |
| Intestine Large, Cecum Hemorrhage | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 1 | 49 | 1 | 1.0 | |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | | |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 48 | | | |
| Intestine Small, Jejunum Congestion | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 1 | 47 | 1 | 1.0 | |
| Intestine Small, Jejunum Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Intestine Small, Jejunum Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Intestine Small, Jejunum Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Liver Basophilic Focus | | | X | | | X | | | X | | | | X | X | | X | X | X | X | | | X | X | | | | | 22 | | | |
| Liver Clear Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | |
| Liver Eosinophilic Focus | | | | | | | | | | | | | | | | | | | | X | | | X | | | | | 2 | | | |
| Liver Fatty Change | | | | | | | | | | | | | 2 | | 1 | | | | | | 1 | | | | | | | 6 2.0 | | | |
| Liver Hepatodiaphragmatic Nodule | | | X | | X | X | | | | | X | X | | | | | | X | | | | | | | | | | 12 | | | |
| Liver Mixed Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | |
| Liver Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 2.0 | | | |
| Liver Regeneration | | 2 | | | | | | | | | | 2 | 3 | | | 2 | | | | | | | | | | | | 5 2.4 | | | |

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FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|------|---|---|----|-----|
| | 0591 | 0590 | 0573 | 0554 | 0558 | 0561 | 0571 | 0577 | 0555 | 0566 | 0575 | 0577 | 0577 | 0577 | 0566 | 0577 | 0577 | 0555 | 0566 | 0577 | | 0567 | 0576 | 0577 | | | | |
| ANIMAL ID | 00526 | 00557 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | | | | | |
| Bile Duct, Cyst | | | | | | | | | | | | | | | | | | | | | | | | X | 1 | | | |
| Mesentery | + | + | | | | | | | | | | | | | | | | | | | | | | + | + | + | 8 | |
| Fat, Necrosis | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 8 | 1.0 |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | | |
| Acinus, Atrophy | 1 | | | | 1 | 1 | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 27 | 1.2 |
| Acinus, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | 1.0 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | | |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | 1.0 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 | 1 | 1 | 3.0 |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | | |
| Edema | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 | 1 | 1 | 3.0 |
| Erosion | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 | 1 | 1 | 2.0 |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | 2 | 2 | 2 | 2 | 3.0 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | 3.0 |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | | 1 | 4 | 2 | 2 | 2.5 |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | | |
| Erosion | | | | | | | | | | | | | | | | | | | | | | | | 2 | 1 | 1 | 1 | 2.0 |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | 1.0 |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | | 3 | 1 | 1 | 1 | 3.0 |
| Tongue | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 | 1 | 1 | 1.0 |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | + | + | 2 | 2 | 2.5 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | 3 | 2 | 2 | 2 | 2.5 |

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FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|
| | 0591 | 0590 | 0731 | 0549 | 0558 | 0614 | 0717 | 0771 | 0563 | 0675 | 0772 | 0773 | 0773 | 0773 | 0672 | 0733 | 0773 | 0590 | 0668 | 0771 | | 0771 | 0665 |
| ANIMAL ID | 00526 | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 |
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 |
| | 1 | 0 | 1 | 1 | 9 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|--|----|-----|
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Cardiomyopathy | 1 | 1 | 1 | | | 2 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | | 2 | 3 | 2 | 1 | 1 | | 2 | 1 | | 42 | 1.4 |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | 2.5 |
| Artery, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | 3 | | | | | | | 1 | 3.0 |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|-----|
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Accessory Adrenal Cortical Nodule | | | | | | | | | | | | | | 1 | | | | | | | | | | | 3 | 1.0 |
| Atrophy | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 4.0 |
| Degeneration | | | | | | | | | | | | 2 | | | | | | | | | | | 3 | | 3 | 2.3 |
| Hyperplasia | | | 1 | 3 | | | | | 1 | 1 | 2 | 1 | 1 | | 2 | 2 | 2 | 1 | | 1 | | 1 | 1 | | 28 | 1.5 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3.0 |
| Adrenal Medulla | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Hyperplasia | | 2 | | 1 | 2 | 4 | | 1 | 1 | 1 | 1 | | | | 4 | 4 | 3 | 4 | 2 | | 1 | 4 | 2 | | 27 | 2.3 |
| Islets, Pancreatic | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Parathyroid Gland | + | + | + | + | M | M | + | + | + | + | M | + | + | + | + | + | + | M | + | + | M | + | + | 38 | | |
| Pituitary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | 2 | | | 1 | 2.0 |
| Pars Distalis, Hyperplasia | | | 1 | | 1 | 2 | | | | | | 1 | 3 | 4 | | | | 3 | | 1 | | | 1 | | 18 | 1.9 |
| Thyroid Gland | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |
| C-cell, Hyperplasia | | | | | | | | | | | 1 | | 1 | | 1 | | | | 2 | | 1 | | 4 | | 8 | 1.6 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
|------------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------|
| DAY ON TEST | | 5 | 5 | 7 | 5 | 5 | 6 | 1 | 7 | 7 | 5 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 5 | 6 | 7 | 7 | 6 | 7 | |
| | | 9 | 9 | 3 | 4 | 8 | 5 | 1 | 3 | 3 | 9 | 0 | 3 | 3 | 3 | 2 | 3 | 3 | 9 | 1 | 3 | 3 | 9 | 3 | | |
| FISCHER 344-TACONIC RATS
FEMALE | | 1 | 0 | 1 | 1 | 9 | 4 | 7 | 1 | 1 | 3 | 5 | 2 | 1 | 2 | 8 | 2 | 1 | 2 | 0 | 8 | 1 | 1 | 5 | 2 | |
| 2.5 mg/m3 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| ANIMAL ID | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | |
| | | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | |
| | | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | * TOTALS |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------|------------|
| Clitoral Gland
Hyperplasia | + | + | + | + | + | + | + | + | M | + | + | + | + | + | M | + | + | + | + | + | + | + | + | M | + | 47 | | |
| | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | 1 | 2.0 |
| Ovary
Cyst | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Inflammation, Suppurative | | X | | | | | | | | | | | | | X | | | | | | X | | | | | | 7 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3.0 |
| Uterus
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Thrombosis | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 |
| Endometrium, Hyperplasia, Cystic | | | | | | | | | | | | | | | 4 | | | | | | | | | | | | 1 | 4.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 |

HEMATOPOIETIC SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------|------------|
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Lymph Node
Renal, Ectasia | | | | | + | + | | + | | | | | | | | | | | | | | | | | | | 7 | |
| | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | 1 | 1.0 |
| Lymph Node, Bronchial | + | M | M | + | + | M | M | M | M | M | + | M | + | + | M | M | M | M | M | M | M | M | M | M | M | 22 | | |
| Lymph Node, Mandibular
Ectasia | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | 47 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 2.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
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 Cobalt
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| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|-------|--------|
| | 0591 | 0590 | 0731 | 0734 | 0589 | 0654 | 0177 | 0773 | 0771 | 0593 | 0665 | 0772 | 0773 | 0773 | 0773 | 0672 | 0773 | 0773 | 0590 | 0668 | | 0771 | 0771 | 0675 | 0767 | 0771 | 0675 | 0732 |
| ANIMAL ID | 00526 | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 | 00549 | 00550 | 00551 | 00552 | |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | 48 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 5 1.4 |
| Hematopoietic Cell Proliferation | | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | 3 1.7 |
| Hemorrhage | | | | 2 | | | | | | | | | | 3 | | | | | | | | | | | | | | 3 2.3 |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | M | M | + | M | 46 |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Galactocele | 3 | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | 4 2.3 |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Inflammation | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Femur, Hyperostosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | 5 3.0 |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Compression | 2 | | | | | | | | | | | | | 2 | 2 | | | | | | | | | | | | | 14 2.2 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
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Experiment Number: 60311 - 05

Test Type: CHRONIC

Route: RESPIRATORY EXPOSURE WHOLE BODY

Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Cobalt

CAS Number: 7440-48-4

Date Report Requested: 01/18/2012

Time Report Requested: 14:48:12

First Dose M/F: 05/08/06 / 05/08/06

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
2.5 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|
| | 0591 | 0590 | 0731 | 0734 | 0558 | 0554 | 0617 | 0611 | 0773 | 0773 | 0556 | 0675 | 0773 | 0773 | 0773 | 0557 | 0661 | 0773 | 0773 | 0665 | | 0773 | | | |
| ANIMAL ID | 00526 | 00527 | 00528 | 00529 | 00530 | 00531 | 00532 | 00533 | 00534 | 00535 | 00536 | 00537 | 00538 | 00539 | 00540 | 00541 | 00542 | 00543 | 00544 | 00545 | 00546 | 00547 | 00548 | 00549 | 00550 |
| | 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 |
| | 5 | 5 | 7 | 5 | 5 | 6 | 1 | 7 | 7 | 5 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 5 | 6 | 7 | 7 | 6 | 7 |
| | 9 | 9 | 3 | 4 | 8 | 5 | 1 | 3 | 3 | 9 | 0 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 9 | 1 | 3 | 3 | 9 | 3 | 2 |
| | 1 | 0 | 1 | 1 | 9 | 4 | 7 | 1 | 1 | 3 | 5 | 2 | 1 | 2 | 2 | 8 | 2 | 1 | 2 | 0 | 8 | 1 | 1 | 5 | 2 |

RESPIRATORY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Foreign Body | | | | | X | | | | X | | X | | | | | | | | | | | | | | 6 |
| Inflammation | | | | | 2 | | | | 1 | | 2 | 1 | 2 | | | | | | | | | | | 1 | 14 1.6 |
| Metaplasia, Squamous | | | | | 1 | | | | | | 1 | | | | | | | | | | | | | | 3 1.0 |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Inflammation, Chronic Active | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 50 2.9 |
| Alveolar Epithelium, Hyperplasia | 2 | 1 | 4 | 2 | 2 | 3 | 1 | 4 | 4 | 1 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 4 | 4 | 3 | 4 | 3 | 3 | 2 | 50 2.7 |
| Alveolar Epithelium, Metaplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Alveolus, Proteinosis | 1 | 2 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 50 2.7 |
| Bronchiole, Epithelium, Hyperplasia | | | 1 | 3 | 1 | | 3 | | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 3 | 3 | 3 | 2 | 3 | 1 | 2 | 46 2.1 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Inflammation | | | | | | | | | | | 1 | | | | | | | | | | | | | | 1 1.0 |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | 1 | | | | | 4 1.0 |
| Inflammation, Chronic Active | 1 | | 1 | | 1 | | | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 39 1.1 |
| Thrombosis | | 1 | | | 4 | | | | | | | | | | | 1 | | | | | | | | 1 | 6 1.7 |
| Olfactory Epithelium, Atrophy | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | | 1 | 1 | | 1 | 1 | | | 1 | | 1 | 1 | 34 1.0 |
| Olfactory Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | 1 | | 3 1.0 |
| Olfactory Epithelium, Hyperplasia, Basal Cell | | | | | 1 | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Olfactory Epithelium, Metaplasia, Respiratory | | 1 | 1 | | | 1 | 1 | 1 | | | 1 | | | 1 | | 1 | 1 | 1 | 1 | | 2 | | 1 | 1 | 24 1.2 |
| Respiratory Epithelium, Hyperplasia | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 48 1.0 |
| Respiratory Epithelium, Metaplasia, Squamous | | | | | | | | | | | | 1 | | | | | | | | | 1 | | | 1 | 3 1.0 |
| Respiratory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Turbinate, Atrophy | 1 | | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | | 1 | | | 1 | 1 | 1 | | 1 | 1 | | 1 | 1 | 27 1.0 |
| Turbinate, Hyperostosis | | | | | | | | | | | | 1 | | | | 4 | | | | | | | 1 | | 5 1.8 |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade

+ .. Tissue examined microscopically

X .. Lesion present

I .. Insufficient tissue

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|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|--------|--------|--|
| | 0591 | 0590 | 0731 | 0734 | 0589 | 0654 | 0177 | 0773 | 0771 | 0563 | 0675 | 0772 | 0773 | 0773 | 0773 | 0672 | 0773 | 0773 | 0590 | 0678 | | 0771 | 0771 | 0665 | 0773 | |
| ANIMAL ID | 00526 | 00557 | 00558 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | 00555 | | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eye | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 | | |
| Cataract | 3 | | | | 3 | | | | | | | 1 | 2 | | | | 2 | | | | | | 4 | 11 2.2 | | |
| Metaplasia, Osseous | | 1 | 1 | | | | | 1 | 1 | | 1 | 1 | 1 | 1 | | 1 | | 1 | 1 | | | | 1 | 26 1.0 | | |
| Harderian Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | | |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Mineralization | | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 | | |
| Nephropathy | 1 | 1 | 3 | 2 | 1 | 3 | | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 47 2.0 | |
| Renal Tubule, Necrosis | | | | 3 | | | | | | | | | | | | | | | | | | | | 1 3.0 | | |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |

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 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------------------|------|
| FISCHER 344-TACONIC RATS FEMALE
5.0 mg/m3 | DAY ON TEST | 0731 | 0730 | 0731 | 0748 | 0773 | 0774 | 0760 | 0772 | 0777 | 0777 | 0777 | 0777 | 0777 | 0766 | 0779 | 0751 | 0755 | 0777 | 0766 | 0777 | 0744 | 0777 | 0777 | 0777 | 0777 | 0777 | females
(cont...) | |
| | ANIMAL ID | 0070 | 0072 | 0073 | 0074 | 0075 | 0076 | 0077 | 0078 | 0079 | 0080 | 0081 | 0082 | 0083 | 0084 | 0085 | 0086 | 0087 | 0088 | 0089 | 0090 | 0091 | 0092 | 0093 | 0094 | 0095 | 0096 | | 0097 |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | | 7 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Cecum
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Large, Rectum | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Angiectasis | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Basophilic Focus | X | X | X | X | X | | X | | X | X | X | X | | | X | X | X | X | X | | | | | X | X | | |
| Clear Cell Focus | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eosinophilic Focus | | | | | | | X | | | | | | | | | | | | | | | | | | | | |
| Fatty Change | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hepatodiaphragmatic Nodule | X | | | X | X | | | X | | | | | | | | | | | X | X | X | | | | X | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Regeneration | | | | 2 | | 1 | | | | | | | | | | | | | | | | 2 | | | | | |
| Mesentery | | | | | | | | | | | | + | + | | | | | | | | + | + | | | | | |
| Fat, Necrosis | | | | | | | | | | | | 1 | 1 | | | | | | | | 1 | 1 | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL

Date Report Requested: 01/18/2012

Test Type: CHRONIC

Cobalt

Time Report Requested: 14:48:12

Route: RESPIRATORY EXPOSURE WHOLE BODY

CAS Number: 7440-48-4

First Dose M/F: 05/08/06 / 05/08/06

Species/Strain: RATS/F344/N Tac

Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | females
(cont...) | | | | | | | | | | |
|---|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|---|---|---|---|---|---|---|---|---|---|
| ANIMAL ID | | 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 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | |
| | | 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 | 0 | 0 | |
| | | 7 | 7 | 7 | 4 | 7 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 5 | 5 | 7 | 6 | 7 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | | 3 | 3 | 3 | 7 | 3 | 7 | 0 | 2 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 0 | 3 | 4 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | 1 | 0 | 0 | 1 | 8 | 0 | 3 | 0 | 5 | 2 | 1 | 1 | 1 | 1 | 2 | 0 | 6 | 2 | 6 | 2 | 9 | 2 | 1 | 1 | 2 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | |
| | | 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 | 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 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | | 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 | 0 | 0 | 0 |
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|--|--|---|---|---|--|--|--|--|--|---|---|---|---|--|---|---|--|---|---|--|---|---|--|---|---|--|---|---|--|---|---|--|--|
| Pancreas | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Acinus, Atrophy | 1 | 1 | 1 | | | 1 | 1 | 1 | | | | | | 1 | 2 | 1 | 1 | | 1 | 2 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | | |
| Salivary Glands | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stomach, Forestomach | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Edema | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | |
| Stomach, Glandular | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Suppurative | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | | | |
| Tooth | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

CARDIOVASCULAR SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------|---|--|---|--|---|--|--|--|--|---|--|---|---|---|---|--|--|--|--|--|--|--|--|--|---|---|---|--|---|---|---|---|---|---|---|--|--|
| Heart | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cardiomyopathy | 2 | | 1 | | 2 | | | | | 1 | | 1 | 1 | 2 | 1 | | | | | | | | | | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | |
| Pericardium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | | 3 | | | | | | | | | | | | |

ENDOCRINE SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------------------|---|--|---|--|--|--|--|--|--|--|---|---|---|---|---|---|--|---|---|--|--|---|---|--|--|--|---|---|--|--|---|---|---|---|---|--|--|
| Adrenal Cortex | + | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Accessory Adrenal Cortical Nodule | | | | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | |
| Degeneration | | | | | | | | | | | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | |
| Hyperplasia | 3 | | 1 | | | | | | | | 1 | 1 | 1 | 1 | 2 | 1 | | 1 | | | | 1 | 2 | | | | 1 | 2 | | | 1 | 2 | 2 | 2 | 2 | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
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 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----------|----------------------|------|------|
| | 0731 | 0730 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | 0731 | | | 0731 | 0731 |
| | 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 |
| | 7 | 7 | 7 | 4 | 7 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 5 | 5 | 7 | 6 | 7 | 4 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 3 | 3 | 3 | 7 | 3 | 7 | 0 | 2 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 0 | 3 | 4 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | 1 | 0 | 1 | 8 | 0 | 3 | 0 | 5 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 6 | 2 | 6 | 2 | 9 | 2 | 1 | 1 | 1 | 1 | 1 | 2 |
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 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 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 2 | 2 | 3 | 4 | 5 | 5 |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | |
| Adrenal Medulla Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | | | | | | | 1 | 3 | | | | | | | 4 | | | | | | | 2 | | | | | | | |
| Islets, Pancreatic Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| | | | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | |
| Parathyroid Gland | + | M | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Pituitary Gland Angiectasis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Pars Distalis, Hyperplasia | | | | 4 | 3 | 1 | 1 | | | | | | | 1 | | | | | 1 | 2 | | | | 2 | 3 | 1 | | | |
| Thyroid Gland Hemorrhage | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| C-cell, Hyperplasia | | | | | | | 1 | | | | | | | 1 | | | | | | | 1 | | | | | | | | |

GENERAL BODY SYSTEM

NONE

GENITAL SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clitoral Gland Cyst | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | | | | | | X | | | |
| Inflammation, Chronic Active | | | | | | | | | | | 3 | | | | | | | | | | | | | | | 2 | | |
| Ovary | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue

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 Lab: BNW

| | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | females
(cont...) | | |
|---|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----------------------|---|---|
| DAY ON TEST | | 7 | 7 | 7 | 4 | 7 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 5 | 5 | 7 | 6 | 7 | 4 | 7 | 7 | | 7 | 7 |
| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | | 3 | 3 | 3 | 7 | 3 | 7 | 0 | 2 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 0 | 3 | 4 | 3 | 8 | 3 | 3 | | 3 | 3 |
| ANIMAL ID | | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Cyst | | | | | | | | | | | | | | | X | | | | | | X | | | | | | |
| Uterus | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Inflammation, Chronic Active | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | |
| Endometrium, Hyperplasia, Cystic | | | | | | | | | 3 | | | | | | | | | | | | | | | | | | |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Fibrosis | | | | | 1 | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node | | | | | | + | | + | | | | | | | | | | | | | | | + | | | | |
| Iliac, Ectasia | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | |
| Inguinal, Fibrosis | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Bronchial | | + | M | + | M | M | M | + | M | M | + | + | M | M | M | + | + | M | + | + | M | + | + | + | + | M | |
| Lymph Node, Mandibular | | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | M | + | + | + | + | + | + | + | + | + | |
| Lymph Node, Mediastinal | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Hyperplasia | | | | | | | | | 1 | | | | | | | | | | | | | | | | | | |
| Infiltration Cellular, Histiocyte | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Lymph Node, Mesenteric | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Fibrosis | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | |
| Spleen | | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | |
| Fibrosis | | | | | | | | | 2 | | | | | | | | | | | | | | | | | | |
| Hematopoietic Cell Proliferation | | | 1 | | 2 | | | | | | | | | | | | | | | | | | | | | | |
| Necrosis | | | | | | | | | | | | | | | | 1 | | | | | | | | | | | |

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 + .. Tissue examined microscopically M .. Missing tissue
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| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) |
|---|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|----------------------|
| | 0
7
3
1 | 0
7
3
0 | 0
7
3
1 | 0
4
7
8 | 0
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0 | 0
4
7
3 | 0
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2 | 0
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7 | 0
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7
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9 | 0
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0 | 0
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7
2
1 | 0
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0
7
2
3 | 0
0
7
2
4 | 0
0
7
2
5 | | |

Thymus + + + + + M + + + M + + + + + + + + + + + + + + + + + +

INTEGUMENTARY SYSTEM

Mammary Gland +
 Galactoceles 3
 Hyperplasia 2 3 1
 Skin +
 Hyperplasia, Squamous
 Ulcer 3

MUSCULOSKELETAL SYSTEM

Bone +
 Femur, Hyperostosis 1
 Maxilla, Inflammation, Chronic Active 2
 Skeletal Muscle

NERVOUS SYSTEM

Brain +
 Compression 2 2 2 2 2 3 2
 Hemorrhage 1 2 2 2

RESPIRATORY SYSTEM

Larynx +
 Foreign Body X

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically M .. Missing tissue
 X .. Lesion present A .. Autolysis precludes evaluation
 I .. Insufficient tissue BLANK .. Not examined microscopically
 1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------|----------------------|------------------|
| | 0
7
3
1 | 0
7
3
0 | 0
7
3
1 | 0
4
7
8 | 0
7
3
0 | 0
4
7
3 | 0
6
7
0 | 0
7
2
5 | 0
7
3
2 | 0
7
3
1 | 0
7
3
1 | 0
7
3
1 | 0
6
9
1 | 0
7
5
2 | 0
5
3
0 | 0
7
3
6 | 0
6
4
2 | 0
7
3
2 | 0
4
8
9 | 0
7
3
2 | | | 0
7
3
1 |
| Inflammation | | | | 2 | | 2 | | 1 | | | | | | 2 | 2 | | | | 1 | | 1 | | |
| Metaplasia, Squamous | | 1 | | | | | | 1 | | | | | | | 1 | | | | 1 | | | | |
| Respiratory Epithelium, Hyperplasia | | 1 | | | | | | | | | | | | | | | | | | | | | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Hemorrhage | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Suppurative | | | | | | | | 3 | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| Necrosis | | | | | | | | | | | | | | | | | | | | | | | |
| Pigmentation | | | | | | | | | | | | | | | | | | | | | | | |
| Alveolar Epithelium, Hyperplasia | 4 | 4 | 4 | 4 | | 1 | 3 | 3 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 2 | 1 | 4 | 2 | 4 | 3 | 4 | 4 |
| Alveolus, Proteinosis | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 |
| Bronchiole, Epithelium, Hyperplasia | 3 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Suppurative | 2 | 2 | 3 | | 3 | | 1 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | | | 2 | 2 | 2 | 1 | 2 | 2 |
| Inflammation, Chronic Active | 2 | 2 | 2 | 1 | 3 | 1 | 1 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 2 | 2 | 2 | 3 | 2 | 3 |
| Thrombosis | | | | | | | 1 | | | | | | | | | | | | | | | | |
| Olfactory Epithelium, Atrophy | | 2 | | 1 | | 1 | | | | 1 | 2 | 2 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Olfactory Epithelium, Hyperplasia | | | | | | | | | | | 1 | 1 | | | | | 1 | | | | 1 | | |
| Olfactory Epithelium, Hyperplasia, Basal Cell | | | 1 | | 1 | | 1 | 1 | | | | 1 | | | | | 1 | | 1 | | | | |
| Olfactory Epithelium, Metaplasia, Respiratory | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 2 | 3 | 2 | | | 2 | 3 | 2 | 3 | 2 | | 1 | 2 |
| Olfactory Epithelium, Necrosis | | | | | | | | 3 | | | | | | | | | | | | | | | |
| Respiratory Epithelium, Hyperplasia | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Respiratory Epithelium, Metaplasia, Squamous | 3 | 2 | 3 | 1 | | 2 | 1 | 2 | 1 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| Respiratory Epithelium, Necrosis | 1 | | 3 | | 1 | | | 3 | | | 1 | 1 | | 1 | | | | | 2 | | 1 | 1 | |
| Turbinate, Atrophy | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 |
| Turbinate, Hyperostosis | | | | | | | | | | | | | | | | | | | | | | | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
 + .. Tissue examined microscopically
 X .. Lesion present
 I .. Insufficient tissue
 M .. Missing tissue
 A .. Autolysis precludes evaluation
 BLANK .. Not examined microscopically

1-4 .. Lesion qualified as:
 1) Minimal 3) Moderate
 2) Mild 4) Marked

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 Route: RESPIRATORY EXPOSURE WHOLE BODY
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| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | ANIMAL ID | females
(cont...) | | | |
|---|-------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----------|----------------------|---|---|---|
| | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 |
| | 7 | 7 | 7 | 4 | 7 | 4 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 5 | 5 | 7 | 6 | 7 | 4 | 7 | 7 | 7 | 7 |
| | 3 | 3 | 3 | 7 | 3 | 7 | 0 | 2 | 3 | 3 | 3 | 3 | 3 | 9 | 1 | 3 | 0 | 3 | 4 | 3 | 8 | 3 | 3 | 3 | 3 |
| | 1 | 0 | 1 | 8 | 0 | 3 | 0 | 5 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 6 | 2 | 6 | 2 | 9 | 2 | 1 | 1 | 2 |
| | 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| | 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 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 0 | 1 | 2 | 3 | 4 | 5 |

Trachea +

SPECIAL SENSES SYSTEM

Ear
 Inflammation, Chronic Active

Eye
 Cataract +
 Metaplasia, Osseous 1 2 1 1 1

Harderian Gland
 Inflammation, Chronic Active + 2 2

URINARY SYSTEM

Kidney
 Cyst +
 Infarct 2
 Nephropathy 3 3 1 1 3 1 1 2 3 3 2 2 2 3 2 1 1 3 3 2 2 2 2 3

Urinary Bladder +

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 + .. Tissue examined microscopically M .. Missing tissue 1-4 .. Lesion qualified as:
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| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|-------|-------|-------|-------|------|
| | 0674 | 0673 | 0471 | 0772 | 0771 | 0570 | 0770 | 0664 | 0668 | 0661 | 0774 | 0579 | 0773 | 0667 | 0771 | 0772 | 0579 | 0777 | 0660 | 0773 | | 0777 | 0771 | 0667 | 0772 | 0667 | 0771 | 0667 |
| ANIMAL ID | 00726 | 00772 | 00778 | 00779 | 00770 | 00773 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | |
| | 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 |

ALIMENTARY SYSTEM

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-------|
| Esophagus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | M | + | + | + | + | + | + | + | + | + | + | 48 |
| Intestine Large, Cecum
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 4.0 |
| Intestine Large, Colon | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Large, Rectum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 49 |
| Intestine Small, Duodenum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Ileum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Intestine Small, Jejunum | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Liver | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Angiectasis | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Basophilic Focus | X | | X | X | X | | X | X | | X | X | | X | X | X | | X | X | X | | X | X | | | | | | 33 |
| Clear Cell Focus | | | | | | | X | | | X | X | | X | | | | | | | | | | | | | | | 6 |
| Eosinophilic Focus | | | | | | | | | | X | | | | | | | | | | | | | | | | | | 2 |
| Fatty Change | | | | | | | | | | | 2 | | | | | | | | 1 | | | | | | | | | 3 1.7 |
| Hepatodiaphragmatic Nodule
Inflammation, Chronic Active | | | X | X | | | | | | | | X | | | X | | | X | | | | X | X | | | | | 15 |
| Necrosis | | | | | 3 | | | | | | | | | | | | | | | 2 | | | | | | | | 2 2.5 |
| Regeneration | | | | | 1 | 1 | | | | | 2 | | | | | | | | | | | | | | | | | 2 1.0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | 4 1.8 |
| Mesentery | | + | | | | | | | + | | | | | | | + | | | | | + | + | | | | | | 9 |
| Fat, Necrosis | | 2 | | | | | | | 1 | | | | | | | 1 | | | | | 1 | 1 | | | | | | 9 1.1 |

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FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | |
|---|-------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|----------|------|--------|--------|
| | 0674 | 0673 | 0641 | 0673 | 0673 | 0659 | 0673 | 0663 | 0666 | 0666 | 0677 | 0657 | 0677 | 0666 | 0677 | 0677 | 0657 | 0677 | 0666 | 0677 | | 0666 | 0677 | |
| ANIMAL ID | 0076 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | 0077 | | |
| Pancreas | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Acinus, Atrophy | | 2 | | 1 | | 1 | 2 | | 1 | | 1 | | | 2 | 1 | 1 | 2 | 1 | | 1 | 2 | 1 | 1 | 32 1.2 |
| Salivary Glands | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Stomach, Forestomach | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Edema | | | | | | | | | | | 2 | | | | | | | | | | | | 1 2.0 | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | 2 | | | | | | | | | 3 2.7 | |
| Ulcer | | | | | | | | | | | | | | | | 4 | | | | | | | 2 3.5 | |
| Stomach, Glandular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Inflammation, Suppurative | | | | | | | | | | | | | | | | | | | | 1 | | | 1 1.0 | |
| Necrosis | | 1 | | | | | | | | | | | | | | | | | | | | | 1 1.0 | |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | |
| Tooth | | | | | | | | | + | | | | | | | | | | | | + | | 2 | |
| Inflammation, Chronic Active | | | | | | | | | 2 | | | | | | | | | | | | | 3 | 2 2.5 | |
| CARDIOVASCULAR SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Heart | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Cardiomyopathy | | | 1 | 2 | 1 | | 1 | 2 | 1 | 1 | 2 | | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 1 | 1 | 1 | 35 1.3 |
| Pericardium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | 1 | 1 3.0 |
| ENDOCRINE SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Adrenal Cortex | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | |
| Accessory Adrenal Cortical Nodule | | | | | | | | | | | | | 1 | | | | | | | | | | 4 1.0 | |
| Degeneration | | | | | | | | | | | | | | | | | | | 3 | 3 | | | 3 2.7 | |
| Hyperplasia | 4 | | 1 | 3 | 3 | | 1 | 2 | | | | | 3 | 4 | 2 | 1 | 3 | | | 1 | 3 | 1 | 28 1.9 | |

* .. Total animals with tissue examined microscopically; Total animals with lesion and mean severity grade
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FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | * TOTALS |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| | 0674 | 0673 | 0641 | 0673 | 0673 | 0659 | 0673 | 0663 | 0666 | 0666 | 0675 | 0673 | 0667 | 0673 | 0666 | 0677 | 0677 | 0657 | 0676 | 0677 | 0677 | 0677 | 0667 | |
| ANIMAL ID | 00726 | 00772 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 |
| Necrosis | 2 | | | | | | | | | | | | | | | | | | | | | | | 2 2.0 |
| Adrenal Medulla
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | 4 | 3 | | | | | 4 | | | | | | | | 1 | | | 4 | | | 2 |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Islets, Pancreatic
Hyperplasia | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| | | | | | | | | | | | | | | | | | | | | | | | | |
| Parathyroid Gland | M | + | + | + | + | + | + | + | M | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + |
| Pituitary Gland
Angiectasis | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Cyst
Pars Distalis, Hyperplasia | 3 | | 2 | | | 2 | 1 | | | | | | 1 | | 3 | 1 | 1 | | | | | | 4 | |
| Thyroid Gland
Hemorrhage | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| C-cell, Hyperplasia | | | | | | | | 1 | 2 | | | | | | | 1 | | | | | | | 4 | |
| GENERAL BODY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| NONE | | | | | | | | | | | | | | | | | | | | | | | | |
| GENITAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Clitoral Gland
Cyst | + | + | + | + | + | M | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |
| Inflammation, Suppurative | 2 | | | | | | | | | | | | | | | | | | | | | | | |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | |
| Ovary | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + |

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FEMALE
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|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|
| | 0674 | 0673 | 0471 | 0773 | 0773 | 0579 | 0773 | 0663 | 0663 | 0663 | 0773 | 0573 | 0773 | 0663 | 0773 | 0773 | 0573 | 0773 | 0663 | 0773 | | 0663 | 0773 |
| ANIMAL ID | 00726 | 00772 | 00778 | 00779 | 00777 | 00773 | 00773 | 00773 | 00773 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | |
| Cyst | | | | | | | X | | | | X | | | | | | | | | | X | | 5 |
| Uterus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Endometrium, Hyperplasia, Cystic | | | | | | | | 1 | | | 1 | | | | | | | | | | 1 | | 4 1.5 |
| HEMATOPOIETIC SYSTEM | | | | | | | | | | | | | | | | | | | | | | | |
| Bone Marrow | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Lymph Node | | | | | | | | | | | + | | | | + | | | | | | | | 5 |
| Iliac, Ectasia | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 |
| Inguinal, Fibrosis | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Lymph Node, Bronchial | M | + | + | + | + | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | M | 17 |
| Lymph Node, Mandibular | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 47 |
| Lymph Node, Mediastinal | + | + | + | + | + | + | + | + | + | M | + | + | + | M | + | + | + | + | + | + | + | + | 48 |
| Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | 1 1.0 |
| Infiltration Cellular, Histiocyte | | | | | | | | | | | | | | 2 | | | | | | | | | 1 2.0 |
| Lymph Node, Mesenteric | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Fibrosis | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 |
| Spleen | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| Fibrosis | | | | | | | | 2 | | | | | | | | | | | | | 3 | | 3 2.3 |
| Hematopoietic Cell Proliferation | | | | | | | | | | | | | | | | | | | | | | | 2 1.5 |
| Necrosis | | 1 | | | | | | | | | | | | | | | | | | | | | 2 1.0 |

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1-4 .. Lesion qualified as:
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Experiment Number: 60311 - 05
 Test Type: CHRONIC
 Route: RESPIRATORY EXPOSURE WHOLE BODY
 Species/Strain: RATS/F344/N Tac

P09: NON-NEOPLASTIC LESIONS BY INDIVIDUAL ANIMAL
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:12
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

| FISCHER 344-TACONIC RATS
FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | | | | | * TOTALS | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|--|--|
| | 0674 | 0673 | 0641 | 0672 | 0673 | 0659 | 0673 | 0663 | 0666 | 0666 | 0674 | 0657 | 0673 | 0667 | 0667 | 0652 | 0676 | 0667 | 0673 | 0673 | 0673 | 0667 | 0666 | 0677 | | | |
| ANIMAL ID | 00726 | 00772 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | | | |
| Thymus | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | M | + | + | + | + | + | + | + | + | 47 | | |
| INTEGUMENTARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mammary Gland | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Galactocoele | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | | |
| Hyperplasia | | | | | | | | | | 2 | | | | | | | | | | | | | | | 5 1.8 | | |
| Skin | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Hyperplasia, Squamous | | | | | | | | | | | | | | | | | | | | | | | | | 2 2.5 | | |
| Ulcer | | | | | | | | | | | | | | | | | | | | | | | | | 1 3.0 | | |
| MUSCULOSKELETAL SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bone | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Femur, Hyperostosis | | | | | | | | | | 2 | | | | | | | | | | | | | | | 2 1.5 | | |
| Maxilla, Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | | 1 2.0 | | |
| Skeletal Muscle | + | | | | | | | | | | | | | | | | | | | | | | | | 1 | | |
| NERVOUS SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Brain | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Compression | | | 1 | | | | | | | 2 | | | 2 | 1 | | | 2 | | | | 3 | 2 | | | 17 2.0 | | |
| Hemorrhage | | | | | | | | | | | 2 | | | | | | | | | | | | | | 3 1.7 | | |
| RESPIRATORY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Larynx | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | |
| Foreign Body | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | |

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FEMALE
5.0 mg/m3 | DAY ON TEST | | | | | | | | | | | | | | | | | | | | * TOTALS | | | | | | |
|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|------|-----|-----|-----|
| | 0674 | 0673 | 0641 | 0673 | 0673 | 0659 | 0673 | 0663 | 0666 | 0671 | 0675 | 0677 | 0666 | 0673 | 0677 | 0657 | 0676 | 0677 | 0677 | 0677 | | 0667 | 0676 | 0677 | | | |
| ANIMAL ID | 00726 | 00772 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | | | | |
| Inflammation | | | | | | | | | | | | | | | | | | | | | | | | 13 | 1.5 | | |
| Metaplasia, Squamous
Respiratory Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | | | | | | | 5 | 1.0 | | |
| Lung | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Hemorrhage | | | | | | 2 | | | | | | | | | | | | | | | | | | 1 | 2.0 | | |
| Inflammation, Suppurative
Inflammation, Chronic Active | | | | | | | | | | | | | | | | | | | | | | | | 50 | 2.9 | | |
| Necrosis | | | | | 2 | | | | | | | | | | | | | | | | | | | 1 | 2.0 | | |
| Pigmentation | | | | | 2 | | | | | | | | | | | | | | | | | | | 1 | 2.0 | | |
| Alveolar Epithelium, Hyperplasia | 4 | 3 | 2 | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 4 | 2 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 49 | 3.4 | |
| Alveolus, Proteinosis | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 50 | 2.9 | |
| Bronchiole, Epithelium, Hyperplasia | 4 | 3 | 4 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 4 | | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 1 | 48 | 3.8 | |
| Nose | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 | | | |
| Inflammation, Suppurative | 1 | | 1 | 2 | 2 | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 42 | 2.2 | |
| Inflammation, Chronic Active | 3 | 1 | 2 | 2 | 2 | 1 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 4 | 2 | 2 | 50 | 2.4 | |
| Thrombosis | | 3 | | | | | | | | | | | | | | | | | | | | | 2 | | 3 | 2.0 | |
| Olfactory Epithelium, Atrophy | 2 | 1 | 2 | 1 | | 1 | | 1 | 1 | 1 | 1 | | | 1 | 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | 1 | 35 | 1.2 | |
| Olfactory Epithelium, Hyperplasia | | | | | | | | | | | | | | | | | | 1 | | | | | | | 5 | 1.0 | |
| Olfactory Epithelium, Hyperplasia, Basal Cell | 1 | | 1 | | 1 | 1 | | | | | | 1 | | | | | | 1 | 1 | | 1 | | 1 | 1 | 19 | 1.0 | |
| Olfactory Epithelium, Metaplasia, Respiratory | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 3 | 2 | 1 | 3 | 2 | 4 | 2 | 2 | 2 | 1 | 3 | 3 | 3 | 2 | 1 | 2 | 47 | 2.1 |
| Olfactory Epithelium, Necrosis | | | | | | | | | | | | | | | | | | | | | | | | | 1 | 3.0 | |
| Respiratory Epithelium, Hyperplasia | 2 | 2 | 2 | 2 | | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 49 | 2.1 |
| Respiratory Epithelium, Metaplasia, Squamous | 2 | | | 3 | 3 | | 3 | 2 | 2 | 1 | | 2 | 2 | 1 | 3 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 45 | 2.0 |
| Respiratory Epithelium, Necrosis | | | | 1 | | | | | | | | 2 | | | 3 | | | | | 2 | 1 | | | | 15 | 1.6 | |
| Turbinate, Atrophy | | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 45 | 1.0 |
| Turbinate, Hyperostosis | | | | | | 1 | | 2 | | | | | | | | | | | | | | | | | 2 | 1.5 | |

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|---|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-------|-------|----------------------------|
| | 0674 | 0673 | 0641 | 0673 | 0673 | 0659 | 0673 | 0663 | 0666 | 0666 | 0675 | 0673 | 0673 | 0667 | 0673 | 0673 | 0657 | 0676 | 0677 | 0677 | | 0677 | 0666 | 0677 |
| ANIMAL ID | 00726 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | 00777 | |
| Trachea | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |
| SPECIAL SENSES SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Ear
Inflammation, Chronic Active | | | | | + | + | | | | | | | | | | | | | | | | | | 3
3 2.3 |
| Eye
Cataract
Metaplasia, Osseous | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
3 1.3
13 1.1 |
| Harderian Gland
Inflammation, Chronic Active | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
2 2.0 |
| URINARY SYSTEM | | | | | | | | | | | | | | | | | | | | | | | | |
| Kidney
Cyst
Infarct
Nephropathy | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50
1
2 1.5
48 2.1 |
| Urinary Bladder | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | + | 50 |

*** END OF REPORT ***

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