

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
Cobalt
CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
Time Report Requested: 14:48:11
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

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS MALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
-------------------------------	---------	------------	-----------	-----------

Disposition Summary

Animals Initially In Study	50	50	50	50
Early Deaths				
Accidentally Killed			1	
Moribund Sacrifice	28	28	27	32
Natural Death	5	2	6	2
Survivors				
Terminal Sacrifice	17	20	16	16
Animals Examined Microscopically	50	50	50	50

ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(48)	(48)
Inflammation, Suppurative	1 (2%)			
Intestine Large, Cecum	(49)	(50)	(49)	(50)
Inflammation, Granulomatous		1 (2%)		
Epithelium, Hyperplasia			1 (2%)	
Intestine Large, Colon	(50)	(50)	(49)	(50)
Epithelium, Hyperplasia			1 (2%)	
Intestine Large, Rectum	(50)	(49)	(49)	(49)
Intestine Small, Duodenum	(50)	(50)	(49)	(50)
Inflammation, Chronic Active			5 (10%)	
Necrosis			1 (2%)	1 (2%)
Intestine Small, Ileum	(48)	(50)	(47)	(50)
Inflammation, Suppurative			1 (2%)	
Epithelium, Hyperplasia			1 (2%)	
Intestine Small, Jejunum	(48)	(49)	(48)	(49)
Epithelium, Hyperplasia			1 (2%)	
Liver	(50)	(50)	(50)	(50)
Atrophy	1 (2%)			2 (4%)
Basophilic Focus	5 (10%)	17 (34%)	17 (34%)	19 (38%)
Clear Cell Focus	9 (18%)	11 (22%)	7 (14%)	9 (18%)
Degeneration, Cystic		5 (10%)		1 (2%)
Eosinophilic Focus	3 (6%)	2 (4%)		1 (2%)
Fatty Change	2 (4%)	4 (8%)	3 (6%)	4 (8%)

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS MALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Hepatodiaphragmatic Nodule	4 (8%)	9 (18%)	11 (22%)	9 (18%)
Inflammation, Chronic Active	1 (2%)			1 (2%)
Mixed Cell Focus		1 (2%)	1 (2%)	1 (2%)
Necrosis	5 (10%)	6 (12%)	4 (8%)	2 (4%)
Regeneration			1 (2%)	
Thrombosis	1 (2%)			
Bile Duct, Hyperplasia	1 (2%)			
Mesentery	(18)	(4)	(9)	(3)
Infiltration Cellular			1 (11%)	
Artery, Inflammation, Chronic Active				1 (33%)
Artery, Thrombosis	1 (6%)			
Fat, Necrosis	14 (78%)	4 (100%)	8 (89%)	1 (33%)
Pancreas	(50)	(50)	(49)	(50)
Acinus, Atrophy	23 (46%)	35 (70%)	28 (57%)	30 (60%)
Acinus, Hyperplasia	1 (2%)			
Artery, Mineralization				1 (2%)
Salivary Glands	(50)	(50)	(50)	(50)
Degeneration				1 (2%)
Stomach, Forestomach	(50)	(50)	(50)	(50)
Edema	2 (4%)			
Hyperplasia, Squamous	10 (20%)	14 (28%)	13 (26%)	11 (22%)
Inflammation, Chronic Active	2 (4%)	4 (8%)	2 (4%)	1 (2%)
Mineralization	2 (4%)			
Ulcer	4 (8%)	4 (8%)	10 (20%)	2 (4%)
Stomach, Glandular	(50)	(50)	(49)	(50)
Edema	1 (2%)			
Erosion		1 (2%)	2 (4%)	
Inflammation, Chronic Active		1 (2%)	1 (2%)	1 (2%)
Mineralization	1 (2%)			
Ulcer	1 (2%)	2 (4%)	2 (4%)	1 (2%)
Tooth	(0)	(2)	(0)	(0)
Inflammation, Chronic Active		2 (100%)		

CARDIOVASCULAR SYSTEM

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS MALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Blood Vessel	(1)	(1)	(0)	(0)
Aorta, Mineralization	1 (100%)			
Heart	(50)	(50)	(50)	(50)
Cardiomyopathy	45 (90%)	44 (88%)	46 (92%)	39 (78%)
Inflammation, Suppurative		1 (2%)	2 (4%)	
Thrombosis	4 (8%)	2 (4%)	2 (4%)	
Artery, Inflammation, Chronic Active		1 (2%)		1 (2%)
Atrium, Congestion		1 (2%)	1 (2%)	
Epicardium, Hyperplasia		1 (2%)		
ENDOCRINE SYSTEM				
Adrenal Cortex	(50)	(50)	(50)	(50)
Accessory Adrenal Cortical Nodule	3 (6%)		2 (4%)	3 (6%)
Atrophy		1 (2%)		
Degeneration	1 (2%)			
Hyperplasia	35 (70%)	24 (48%)	23 (46%)	29 (58%)
Necrosis		1 (2%)	1 (2%)	
Adrenal Medulla	(50)	(50)	(50)	(50)
Hyperplasia	19 (38%)	21 (42%)	9 (18%)	9 (18%)
Necrosis		1 (2%)		
Islets, Pancreatic	(50)	(50)	(48)	(49)
Hyperplasia		1 (2%)	1 (2%)	3 (6%)
Parathyroid Gland	(45)	(45)	(47)	(46)
Pituitary Gland	(50)	(50)	(49)	(49)
Angiectasis	1 (2%)			1 (2%)
Cyst	1 (2%)			
Hemorrhage		1 (2%)	1 (2%)	
Pars Distalis, Hyperplasia	18 (36%)	12 (24%)	14 (29%)	22 (45%)
Thyroid Gland	(49)	(50)	(50)	(49)
Hemorrhage	1 (2%)			
C-cell, Hyperplasia	7 (14%)	8 (16%)	5 (10%)	9 (18%)
Follicle, Cyst				1 (2%)

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS MALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
GENERAL BODY SYSTEM				
Peritoneum Inflammation, Chronic Active	(0)	(0)	(0)	(1) 1 (100%)
GENITAL SYSTEM				
Epididymis Cyst	(50) 1 (2%)	(50)	(50)	(50)
Penis Concretion	(0)	(1) 1 (100%)	(0)	(0)
Preputial Gland Atrophy	(50)	(50)	(49)	(48) 1 (2%)
Ectasia	3 (6%)	1 (2%)	1 (2%)	
Inflammation, Chronic Active	5 (10%)	4 (8%)	3 (6%)	3 (6%)
Prostate Fibrosis	(50)	(50)	(50)	(50)
Hyperplasia	1 (2%)	6 (12%)	1 (2%)	1 (2%)
Inflammation, Chronic Active	36 (72%)	39 (78%)	42 (84%)	28 (56%)
Seminal Vesicle Inflammation, Chronic Active	(50) 1 (2%)	(50) 1 (2%)	(50)	(50) 1 (2%)
Testes Atrophy	(50) 35 (70%)	(50) 34 (68%)	(50) 36 (72%)	(50) 39 (78%)
Infarct	1 (2%)		2 (4%)	12 (24%)
Arteriole, Inflammation, Chronic Active	2 (4%)		1 (2%)	
Interstitial Cell, Hyperplasia	7 (14%)	10 (20%)	12 (24%)	12 (24%)
HEMATOPOIETIC SYSTEM				
Bone Marrow Necrosis	(50)	(50)	(50) 1 (2%)	(50)
Lymph Node Iliac, Ectasia	(12) 1 (8%)	(9)	(5)	(9)
Iliac, Lumbar, Ectasia		1 (11%)		

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS MALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Iliac, Renal, Ectasia		1 (11%)		
Lumbar, Hyperplasia		1 (11%)		
Pancreatic, Ectasia	1 (8%)			1 (11%)
Pancreatic, Infiltration Cellular, Histiocyte			1 (20%)	
Pancreatic, Necrosis		1 (11%)		
Renal, Ectasia	2 (17%)	3 (33%)	1 (20%)	1 (11%)
Renal, Hemorrhage				1 (11%)
Lymph Node, Bronchial	(27)	(25)	(21)	(20)
Lymph Node, Mandibular	(48)	(49)	(50)	(48)
Atrophy	1 (2%)			
Congestion		1 (2%)		
Ectasia	1 (2%)	2 (4%)	1 (2%)	2 (4%)
Hyperplasia	1 (2%)	2 (4%)	1 (2%)	1 (2%)
Necrosis	1 (2%)	1 (2%)		
Lymph Node, Mediastinal	(46)	(48)	(46)	(48)
Hyperplasia, Lymphoid			1 (2%)	
Lymph Node, Mesenteric	(49)	(50)	(49)	(49)
Hemorrhage	1 (2%)			
Infiltration Cellular, Histiocyte				1 (2%)
Spleen	(50)	(50)	(50)	(50)
Congestion		1 (2%)		
Fibrosis	8 (16%)	8 (16%)	7 (14%)	4 (8%)
Hematopoietic Cell Proliferation	3 (6%)	2 (4%)		3 (6%)
Hemorrhage	1 (2%)	1 (2%)		
Necrosis	3 (6%)	2 (4%)	1 (2%)	6 (12%)
Stromal Hyperplasia			1 (2%)	
Capsule, Angiectasis	1 (2%)			
Thymus	(46)	(44)	(47)	(46)

INTEGUMENTARY SYSTEM

Mammary Gland	(31)	(32)	(30)	(31)
Galactocele	2 (6%)	1 (3%)	1 (3%)	
Hyperplasia	2 (6%)	1 (3%)	1 (3%)	
Inflammation, Chronic Active	1 (3%)			

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS MALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Skin	(50)	(50)	(50)	(50)
Cyst Epithelial Inclusion	1 (2%)			1 (2%)
Hemorrhage		1 (2%)		
Hyperplasia, Squamous	2 (4%)	2 (4%)	5 (10%)	1 (2%)
Inflammation	7 (14%)	5 (10%)	9 (18%)	4 (8%)
Inflammation, Granulomatous		1 (2%)		

MUSCULOSKELETAL SYSTEM

Bone	(50)	(50)	(50)	(50)
Cranium, Fibrosis		1 (2%)		
Cranium, Fracture			1 (2%)	
Cranium, Inflammation, Chronic Active		1 (2%)		
Maxilla, Inflammation, Chronic Active				1 (2%)
Vertebra, Degeneration		1 (2%)		
Skeletal Muscle	(1)	(0)	(0)	(4)

NERVOUS SYSTEM

Brain	(50)	(50)	(50)	(50)
Compression	15 (30%)	14 (28%)	18 (36%)	7 (14%)
Edema	2 (4%)			1 (2%)
Hemorrhage	2 (4%)	3 (6%)	4 (8%)	3 (6%)
Infiltration Cellular, Mononuclear Cell	1 (2%)			1 (2%)
Metaplasia, Osseous	1 (2%)			
Meninges, Inflammation, Suppurative	1 (2%)			
Spinal Cord	(1)	(0)	(0)	(0)
Infiltration Cellular	1 (100%)			

RESPIRATORY SYSTEM

Larynx	(50)	(50)	(50)	(50)
Autolysis			1 (2%)	
Foreign Body	3 (6%)		2 (4%)	

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS MALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Hyperkeratosis				1 (2%)
Inflammation	28 (56%)	18 (36%)	18 (36%)	16 (32%)
Metaplasia, Squamous	3 (6%)	1 (2%)	1 (2%)	2 (4%)
Ulcer	1 (2%)			
Respiratory Epithelium, Hyperplasia				1 (2%)
Squamous Epithelium, Hyperplasia				1 (2%)
Lung	(50)	(50)	(50)	(50)
Inflammation, Suppurative		1 (2%)	1 (2%)	
Inflammation, Chronic Active	22 (44%)	50 (100%)	50 (100%)	50 (100%)
Metaplasia, Osseous	3 (6%)	3 (6%)		
Mineralization	1 (2%)			
Thrombosis	2 (4%)			
Alveolar Epithelium, Hyperplasia	3 (6%)	47 (94%)	49 (98%)	49 (98%)
Alveolus, Proteinosis		48 (96%)	49 (98%)	49 (98%)
Artery, Mediastinum, Inflammation, Chronic Active		1 (2%)		
Bronchiole, Epithelium, Hyperplasia		44 (88%)	47 (94%)	50 (100%)
Mediastinum, Inflammation, Suppurative			1 (2%)	
Mediastinum, Metaplasia, Osseous		1 (2%)		
Nose	(48)	(47)	(45)	(50)
Foreign Body	5 (10%)	2 (4%)	4 (9%)	5 (10%)
Hemorrhage			1 (2%)	
Inflammation, Suppurative	9 (19%)	12 (26%)	24 (53%)	46 (92%)
Inflammation, Chronic Active	28 (58%)	35 (74%)	40 (89%)	49 (98%)
Thrombosis	7 (15%)	2 (4%)	4 (9%)	2 (4%)
Olfactory Epithelium, Accumulation, Hyaline Droplet	2 (4%)	4 (9%)	1 (2%)	2 (4%)
Olfactory Epithelium, Atrophy	2 (4%)	21 (45%)	34 (76%)	29 (58%)
Olfactory Epithelium, Hyperplasia		1 (2%)	2 (4%)	7 (14%)
Olfactory Epithelium, Hyperplasia, Basal Cell		1 (2%)		13 (26%)
Olfactory Epithelium, Metaplasia, Respiratory	12 (25%)	26 (55%)	37 (82%)	50 (100%)
Olfactory Epithelium, Necrosis		1 (2%)	5 (11%)	5 (10%)
Respiratory Epithelium, Hyperplasia	20 (42%)	35 (74%)	45 (100%)	50 (100%)
Respiratory Epithelium, Metaplasia, Squamous		1 (2%)	11 (24%)	35 (70%)
Respiratory Epithelium, Necrosis	1 (2%)	4 (9%)	5 (11%)	13 (26%)
Turbinate, Atrophy	1 (2%)	35 (74%)	35 (78%)	41 (82%)

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS MALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Turbinate, Hyperostosis	2 (4%)			
Trachea	(50)	(50)	(50)	(50)
Inflammation, Suppurative				1 (2%)
Metaplasia, Squamous				1 (2%)
SPECIAL SENSES SYSTEM				
Ear	(1)	(5)	(0)	(0)
Inflammation, Chronic Active	1 (100%)	5 (100%)		
Eye	(50)	(50)	(50)	(50)
Cataract	3 (6%)	9 (18%)	9 (18%)	7 (14%)
Inflammation, Suppurative	1 (2%)			
Metaplasia, Osseous	31 (62%)	36 (72%)	33 (66%)	31 (62%)
Harderian Gland	(50)	(50)	(50)	(50)
Zymbal's Gland	(4)	(3)	(0)	(1)
URINARY SYSTEM				
Kidney	(50)	(50)	(50)	(50)
Accumulation, Hyaline Droplet		1 (2%)	4 (8%)	1 (2%)
Congestion			1 (2%)	
Cyst		3 (6%)		1 (2%)
Fibrosis				1 (2%)
Infarct	2 (4%)			1 (2%)
Metaplasia, Osseous				1 (2%)
Nephropathy	49 (98%)	49 (98%)	50 (100%)	50 (100%)
Thrombosis		1 (2%)		
Artery, Inflammation, Chronic Active				1 (2%)
Pelvis, Inflammation, Suppurative			1 (2%)	
Urinary Bladder	(50)	(50)	(50)	(50)
Hemorrhage	1 (2%)			
Inflammation			2 (4%)	1 (2%)
Inflammation, Granulomatous	2 (4%)			
Transitional Epithelium, Hyperplasia	1 (2%)	1 (2%)	1 (2%)	

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
Cobalt
CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
Time Report Requested: 14:48:11
First Dose M/F: 05/08/06 / 05/08/06
Lab: BNW

Fischer 344-Taconic RATS MALE

Control

1.25 mg/m3

2.5 mg/m3

5.0 mg/m3

*** END OF MALE ***

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS FEMALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
---------------------------------	---------	------------	-----------	-----------

Disposition Summary

Animals Initially In Study	50	50	50	50
Early Deaths				
Moribund Sacrifice	11	20	19	24
Natural Death	4	4	7	1
Survivors				
Moribund Sacrifice				1
Terminal Sacrifice	35	26	24	24
Animals Examined Microscopically	50	50	50	50

ALIMENTARY SYSTEM

Esophagus	(50)	(50)	(49)	(48)
Intestine Large, Cecum	(50)	(50)	(49)	(50)
Hemorrhage			1 (2%)	
Inflammation, Chronic Active				1 (2%)
Intestine Large, Colon	(50)	(50)	(49)	(50)
Mucosa, Hyperplasia		2 (4%)		
Intestine Large, Rectum	(50)	(50)	(50)	(49)
Intestine Small, Duodenum	(48)	(50)	(50)	(50)
Infiltration Cellular, Chronic Active		1 (2%)		
Intestine Small, Ileum	(49)	(50)	(48)	(50)
Intestine Small, Jejunum	(50)	(50)	(47)	(50)
Congestion			1 (2%)	
Hemorrhage			1 (2%)	
Inflammation, Suppurative			1 (2%)	
Necrosis			1 (2%)	
Liver	(50)	(50)	(50)	(50)
Angiectasis	1 (2%)	1 (2%)		1 (2%)
Atrophy	1 (2%)			
Basophilic Focus	16 (32%)	20 (40%)	22 (44%)	33 (66%)
Clear Cell Focus	12 (24%)	6 (12%)	3 (6%)	6 (12%)
Eosinophilic Focus		1 (2%)	2 (4%)	2 (4%)
Fatty Change	13 (26%)	9 (18%)	6 (12%)	3 (6%)
Fibrosis		1 (2%)		

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS FEMALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Hepatodiaphragmatic Nodule	6 (12%)	11 (22%)	12 (24%)	15 (30%)
Inflammation, Chronic Active	1 (2%)			2 (4%)
Mixed Cell Focus	1 (2%)	4 (8%)	2 (4%)	
Necrosis	6 (12%)	3 (6%)	2 (4%)	2 (4%)
Regeneration	2 (4%)	3 (6%)	5 (10%)	4 (8%)
Bile Duct, Cyst			1 (2%)	
Serosa, Thrombosis	1 (2%)			
Mesentery	(13)	(15)	(8)	(9)
Fibrosis		1 (7%)		
Fat, Necrosis	12 (92%)	14 (93%)	8 (100%)	9 (100%)
Pancreas	(50)	(50)	(50)	(50)
Basophilic Focus		1 (2%)		
Acinus, Atrophy	18 (36%)	23 (46%)	27 (54%)	32 (64%)
Acinus, Hyperplasia			1 (2%)	
Salivary Glands	(50)	(50)	(50)	(50)
Atrophy	1 (2%)		1 (2%)	
Inflammation, Chronic Active			1 (2%)	
Duct, Hyperplasia		1 (2%)		
Stomach, Forestomach	(50)	(50)	(50)	(50)
Edema			1 (2%)	1 (2%)
Erosion			1 (2%)	
Fibrosis		1 (2%)		
Hyperplasia, Squamous	5 (10%)	10 (20%)	2 (4%)	3 (6%)
Inflammation, Chronic Active		1 (2%)	1 (2%)	
Ulcer	1 (2%)	5 (10%)	2 (4%)	2 (4%)
Stomach, Glandular	(50)	(50)	(50)	(50)
Edema	2 (4%)			
Erosion	1 (2%)		1 (2%)	
Inflammation, Suppurative				1 (2%)
Necrosis				1 (2%)
Thrombosis			1 (2%)	
Ulcer		3 (6%)	1 (2%)	1 (2%)
Tongue	(1)	(0)	(1)	(0)
Tooth	(1)	(0)	(2)	(2)
Inflammation, Chronic Active	1 (100%)		2 (100%)	2 (100%)

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS FEMALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
---------------------------------	---------	------------	-----------	-----------

CARDIOVASCULAR SYSTEM

Blood Vessel	(0)	(1)	(0)	(0)
Heart	(50)	(50)	(50)	(50)
Cardiomyopathy	41 (82%)	34 (68%)	42 (84%)	35 (70%)
Thrombosis	2 (4%)	4 (8%)	2 (4%)	
Artery, Inflammation, Chronic Active	1 (2%)		1 (2%)	
Atrium, Congestion	1 (2%)			
Pericardium, Hyperplasia				1 (2%)

ENDOCRINE SYSTEM

Adrenal Cortex	(50)	(50)	(50)	(50)
Accessory Adrenal Cortical Nodule	5 (10%)		3 (6%)	4 (8%)
Atrophy	1 (2%)		1 (2%)	
Degeneration	3 (6%)	1 (2%)	3 (6%)	3 (6%)
Hemorrhage	1 (2%)			
Hyperplasia	25 (50%)	27 (54%)	28 (56%)	28 (56%)
Necrosis	1 (2%)		1 (2%)	2 (4%)
Adrenal Medulla	(50)	(50)	(50)	(50)
Degeneration, Cystic	1 (2%)			
Hyperplasia	12 (24%)	27 (54%)	27 (54%)	10 (20%)
Infiltration Cellular, Mononuclear Cell	1 (2%)			
Islets, Pancreatic	(50)	(50)	(50)	(50)
Hyperplasia	1 (2%)	1 (2%)		1 (2%)
Parathyroid Gland	(42)	(45)	(38)	(45)
Pituitary Gland	(50)	(50)	(49)	(50)
Angiectasis			1 (2%)	2 (4%)
Cyst				1 (2%)
Pars Distalis, Hyperplasia	19 (38%)	20 (40%)	18 (37%)	19 (38%)
Thyroid Gland	(50)	(49)	(49)	(50)
Hemorrhage				1 (2%)
C-cell, Hyperplasia	9 (18%)	9 (18%)	8 (16%)	6 (12%)
Follicular Cell, Hyperplasia	1 (2%)			

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS FEMALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
GENERAL BODY SYSTEM				
Peritoneum	(1)	(1)	(0)	(0)
GENITAL SYSTEM				
Clitoral Gland	(49)	(47)	(47)	(46)
Cyst				1 (2%)
Hyperplasia	2 (4%)	1 (2%)	1 (2%)	
Inflammation, Suppurative	2 (4%)			1 (2%)
Inflammation, Chronic Active		4 (9%)		2 (4%)
Ovary	(50)	(50)	(50)	(50)
Cyst	5 (10%)	6 (12%)	7 (14%)	5 (10%)
Inflammation, Suppurative			1 (2%)	
Inflammation, Chronic Active	1 (2%)			
Necrosis		1 (2%)		
Uterus	(50)	(50)	(50)	(50)
Angiectasis	1 (2%)			
Cyst	1 (2%)			
Inflammation, Suppurative	1 (2%)	1 (2%)		
Inflammation, Chronic Active	1 (2%)	2 (4%)	1 (2%)	1 (2%)
Necrosis	2 (4%)			
Thrombosis			1 (2%)	
Endometrium, Hyperplasia, Cystic	4 (8%)	2 (4%)	1 (2%)	4 (8%)
HEMATOPOIETIC SYSTEM				
Bone Marrow	(50)	(50)	(50)	(50)
Fibrosis				1 (2%)
Lymph Node	(4)	(3)	(7)	(5)
Deep Cervical, Infiltration Cellular		1 (33%)		
Iliac, Ectasia		1 (33%)		1 (20%)
Inguinal, Fibrosis				1 (20%)

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS FEMALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Renal, Ectasia	1 (25%)		1 (14%)	
Lymph Node, Bronchial	(26)	(18)	(22)	(17)
Lymph Node, Mandibular	(48)	(48)	(47)	(47)
Atrophy	1 (2%)			
Ectasia			1 (2%)	
Fibrosis		1 (2%)		
Necrosis		1 (2%)		
Lymph Node, Mediastinal	(42)	(43)	(48)	(48)
Atrophy	1 (2%)			
Ectasia	1 (2%)	1 (2%)		
Hyperplasia				1 (2%)
Infiltration Cellular, Histiocyte				1 (2%)
Lymph Node, Mesenteric	(50)	(50)	(50)	(50)
Ectasia		1 (2%)		
Fibrosis				1 (2%)
Infiltration Cellular, Histiocyte	1 (2%)			
Spleen	(50)	(50)	(50)	(50)
Fibrosis		1 (2%)	5 (10%)	3 (6%)
Hematopoietic Cell Proliferation	2 (4%)	5 (10%)	3 (6%)	2 (4%)
Hemorrhage			3 (6%)	
Infiltration Cellular, Histiocyte	1 (2%)			
Necrosis		1 (2%)		2 (4%)
Thymus	(47)	(46)	(46)	(47)
Thrombosis		1 (2%)		

INTEGUMENTARY SYSTEM

Mammary Gland	(50)	(50)	(50)	(50)
Galactocele	1 (2%)	1 (2%)	4 (8%)	1 (2%)
Hyperplasia	3 (6%)	2 (4%)	1 (2%)	5 (10%)
Inflammation, Chronic Active		1 (2%)		
Skin	(50)	(50)	(50)	(50)
Cyst Epithelial Inclusion	1 (2%)	1 (2%)		
Hyperkeratosis	1 (2%)			
Hyperplasia, Squamous	1 (2%)	1 (2%)		2 (4%)

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS FEMALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Inflammation		1 (2%)	1 (2%)	
Ulcer				1 (2%)
Subcutaneous Tissue, Inflammation		1 (2%)		

MUSCULOSKELETAL SYSTEM

Bone	(50)	(50)	(50)	(50)
Fracture	1 (2%)			
Femur, Hyperostosis	4 (8%)	2 (4%)	5 (10%)	2 (4%)
Maxilla, Inflammation, Chronic Active	2 (4%)			1 (2%)
Skeletal Muscle	(1)	(1)	(0)	(1)

NERVOUS SYSTEM

Brain	(50)	(50)	(50)	(50)
Compression	16 (32%)	14 (28%)	14 (28%)	17 (34%)
Hemorrhage		2 (4%)		3 (6%)
Infiltration Cellular, Mononuclear Cell	1 (2%)			
Necrosis			1 (2%)	

RESPIRATORY SYSTEM

Larynx	(50)	(50)	(50)	(50)
Foreign Body	1 (2%)	3 (6%)	6 (12%)	2 (4%)
Inflammation	22 (44%)	23 (46%)	14 (28%)	13 (26%)
Metaplasia, Squamous	4 (8%)	4 (8%)	3 (6%)	5 (10%)
Respiratory Epithelium, Hyperplasia		4 (8%)		1 (2%)
Lung	(50)	(50)	(50)	(50)
Hemorrhage				1 (2%)
Inflammation, Suppurative				1 (2%)
Inflammation, Chronic Active	20 (40%)	50 (100%)	50 (100%)	50 (100%)
Necrosis				1 (2%)
Pigmentation				1 (2%)
Alveolar Epithelium, Hyperplasia	9 (18%)	49 (98%)	50 (100%)	49 (98%)

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
 CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
 Time Report Requested: 14:48:11
 First Dose M/F: 05/08/06 / 05/08/06
 Lab: BNW

Fischer 344-Taconic RATS FEMALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Alveolar Epithelium, Metaplasia, Squamous Alveolus, Proteinosis		2 (4%)	1 (2%)	
Bronchiole, Epithelium, Hyperplasia		50 (100%)	50 (100%)	50 (100%)
Interstitial, Fibrosis	47 (94%)	46 (92%)	48 (96%)	
Mediastinum, Inflammation	1 (2%)			
Nose	1 (2%)			
Foreign Body	(50)	(50)	(49)	(50)
Inflammation	5 (10%)	3 (6%)	1 (2%)	
Inflammation, Suppurative	6 (12%)	4 (8%)	4 (8%)	42 (84%)
Inflammation, Chronic Active	22 (44%)	42 (84%)	39 (80%)	50 (100%)
Thrombosis	1 (2%)	4 (8%)	6 (12%)	3 (6%)
Olfactory Epithelium, Accumulation, Hyaline Droplet	8 (16%)	2 (4%)		
Olfactory Epithelium, Atrophy		22 (44%)	35 (71%)	35 (70%)
Olfactory Epithelium, Hyperplasia			3 (6%)	5 (10%)
Olfactory Epithelium, Hyperplasia, Basal Cell			1 (2%)	19 (38%)
Olfactory Epithelium, Metaplasia, Respiratory	6 (12%)	18 (36%)	24 (49%)	47 (94%)
Olfactory Epithelium, Necrosis		2 (4%)		1 (2%)
Respiratory Epithelium, Accumulation, Hyaline Droplet	1 (2%)			
Respiratory Epithelium, Hyperplasia	15 (30%)	43 (86%)	48 (98%)	49 (98%)
Respiratory Epithelium, Metaplasia, Squamous	2 (4%)		3 (6%)	45 (90%)
Respiratory Epithelium, Necrosis	1 (2%)	1 (2%)	1 (2%)	15 (30%)
Turbinate, Atrophy	1 (2%)	38 (76%)	27 (55%)	45 (90%)
Turbinate, Hyperostosis	3 (6%)	2 (4%)	5 (10%)	2 (4%)
Trachea	(50)	(50)	(50)	(50)

SPECIAL SENSES SYSTEM

Ear	(4)	(4)	(0)	(3)
Inflammation, Chronic Active	4 (100%)	4 (100%)		3 (100%)
Eye	(50)	(50)	(49)	(50)
Cataract	8 (16%)	10 (20%)	11 (22%)	3 (6%)
Hemorrhage		1 (2%)		
Metaplasia, Osseous	24 (48%)	19 (38%)	26 (53%)	13 (26%)
Cornea, Inflammation, Chronic Active		1 (2%)		

a - Number of animals examined microscopically at site and number of animals with lesion

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

P03: INCIDENCE RATES OF NON-NEOPLASTIC LESIONS BY ANATOMIC SITE(a)
 Cobalt
CAS Number: 7440-48-4

Date Report Requested: 01/18/2012
Time Report Requested: 14:48:11
First Dose M/F: 05/08/06 / 05/08/06
Lab: BNW

Fischer 344-Taconic RATS FEMALE	Control	1.25 mg/m3	2.5 mg/m3	5.0 mg/m3
Harderian Gland	(50)	(50)	(50)	(50)
Atrophy		1 (2%)		
Hyperplasia			1 (2%)	
Inflammation, Chronic Active	3 (6%)			2 (4%)
Zymbal's Gland	(0)	(1)	(0)	(0)
<hr/>				
URINARY SYSTEM				
Kidney	(50)	(50)	(50)	(50)
Cyst		1 (2%)		1 (2%)
Infarct		1 (2%)		2 (4%)
Mineralization			1 (2%)	
Necrosis, Focal	1 (2%)			
Nephropathy	48 (96%)	48 (96%)	47 (94%)	48 (96%)
Renal Tubule, Hyperplasia		2 (4%)		
Renal Tubule, Necrosis			1 (2%)	
Urinary Bladder	(50)	(50)	(50)	(50)

*** END OF REPORT ***

a - Number of animals examined microscopically at site and number of animals with lesion