

Data Requirement

EPA OPPTS 870.3650
OECD 422

STUDY NO. 03-4242

BUTANE: COMBINED REPEATED-EXPOSURE TOXICITY WITH
REPRODUCTION/DEVELOPMENTAL TOXICITY AND
NEUROTOXICITY SCREENING IN RATS VIA
WHOLE-BODY INHALATION EXPOSURES

Amended Final Report

VOLUME II of III

[REDACTED]

Performed by: Huntingdon Life Sciences (HLS)
100 Mettlers Road
East Millstone, New Jersey 08875-2360

Submitted to: American Petroleum Institute (API)
1220 L Street, Northwest
Washington, D.C. 20005-4070

[REDACTED] [REDACTED]

Date: 15 August 2008
Amended Date: 14 May 2010

TABLE OF CONTENTS**VOLUME II**

COVER PAGE.....	290
TABLE OF CONTENTS.....	291
L. Individual Animal Gross and Microscopic Observations	292

	Individual Animal Gross and Microscopic Observations Main Study Preface	Appendix L
--	--	------------

Key to Abbreviations

LN	=	Lymph Node
Oviducts/Fallop	=	Oviducts/Fallopian Tubes
SC	=	Spinal Cord

Corresponding exposure levels for each group were as follows:

Group 1	-	0 ppm
Group 2	-	900 ppm
Group 3	-	3000 ppm
Group 4	-	9000 ppm

Notes

1. Unless otherwise specified in a histopathology note, the organ/tissue examined was the required (routine) section. (This note is always presented)
2. The dimensions of gross lesions are presented as a general range based on the actual dimensions noted during macroscopic examinations. The actual dimensions of gross lesions can be found in the raw data.

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1030
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Tibia	No gross observations on tissue.	SUBCHONDRAL/SUBFIBROUS BONE: FIBROUS CYST, Focal, Moderate.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal.	
		PERIportal MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight.	
		PARACORTICAL LYMPHOID ACTIVITY, Slight.	
		SINUS HISTIOCYTES, Moderate.	
		RETICULOendothelial CELL: GOLDEN-BROWN PIGMENT, Slight.	
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Focal, Moderate.	
		FOLLICULAR LYMPHOID ACTIVITY, Minimal.	
		PARACORTICAL LYMPHOID ACTIVITY, Moderate.	
		SINUS HISTIOCYTES, Moderate.	
Lungs	No gross observations on tissue.	ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal.	
		PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal.	

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1030
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Slight.	

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Cecum	Colon	Duodenum
Epididymides	Heart	Ileum	Jejunum	Kidneys
Mammary-protocol	Tibial Nerve	Prostate	Parathyroid	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Spleen
Stomach	Seminal vesicles	Testes	Thyroid	Urinary bladder

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1031
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Adrenal Glands	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Focal, Minimal.	
Brain	No gross observations on tissue.	HEMORRHAGE, Focal, Minimal.	
Tibia	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY FRAGMENT OF TIBIA PRESENT.	
Ileum	No gross observations on tissue.	Tissue is missing. - Tissue was trimmed in histology, but was not found on microscopic slide. Recut: no improvement.	
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	PERIportal MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. - SINGLE MODERATE FOCUS OF SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Moderate.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 296

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1031
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mesenteric LN		RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Focal, Moderate. FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Slight. SINUS HISTIOCYTES, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. SINUS EDEMA, Minimal.
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Slight. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. VASCULAR MINERALIZATION, Multifocal, Minimal.

Page 297

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1031
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissues without comment under Gross Observations were within normal limits at necropsy. The following tissues were unremarkable microscopically:

Sternal Marrow	Femoral Marrow	Tibial Marrow	Sternum	Femur
----------------	----------------	---------------	---------	-------

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 298

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice
PHASE DAY OF DEATH: 30

SEX: Male
PHASE: Dosing phase

ANIMAL: 1031
GROUP: 1

Tissue	Gross Observations/Comments			Microscopic Observations/Comments	
Cecum	Colon	Duodenum	Epididymides	Heart	
Jejunum	Mammary-protocol	Tibial Nerve	Prostate	Rectum/Low Colon	
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Spleen	
Seminal vesicles	Urinary bladder				

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice PHASE DAY OF DEATH: 30 SEX: Male PHASE: Dosing phase ANIMAL: 1032 GROUP: 1		
Tibia	No gross observations on tissue.	SUBCHONDRAL/SUBFIBROUS BONE: FIBROUS CYST, Focal, Moderate.
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOLOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Focal, Minimal. MEDULLARY PLASMACYTOSIS, Slight.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 300

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. SINUS EDEMA, Multifocal, Minimal. MEDULLARY PLASMACYTOSIS, Slight.
Lungs	Discolored, All lobes, Red, Foci, $\leq$ 0.1 cm	Examined; 3 correlations found: HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Slight. SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight. PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1032
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs		VASCULAR MINERALIZATION, Multifocal, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Slight.	
		SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Urinary bladder	No gross observations on tissue.	Tissue is unremarkable (with comment).	
		- SEMINAL FLUID MATERIAL PRESENT.	

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Cecum	Colon	Duodenum
Epididymides	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Prostate	Rectum/Low Colon	Cervical SC	Thoracic SC

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 302

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1032
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments		Microscopic Observations/Comments
Lumbar SC	Skin-protocol	Stomach	Seminal vesicles Testes
Thyroid	Thymus		

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1033
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Marked. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Moderate. MEDULLARY PLASMACYTOSIS, Minimal.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Slight. SINUS HISTIOCYTES, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Slight.

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 304

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1033
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Moderate. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.
Mammary-protocol . . .	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present. ACINAR EPITHELIAL VACUOLAR CHANGE, Moderate.
Pancreas	No gross observations on tissue.	ISLETS: MONONUCLEAR CELL INFLAMMATORY INFILTRATE, Focal, Slight.
Prostate	No gross observations on tissue.	LUMINAL CELLULAR DEBRIS, Multifocal, Minimal. INTERSTITIAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1033
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissues without comment under Gross Observations were within normal limits at necropsy. The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Ileum	Jejunum
Kidneys	Tibial Nerve	Rectum/Low Colon	Cervical SC	Thoracic SC

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1033
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments		Microscopic Observations/Comments
Lumbar SC	Skin-protocol	Seminal vesicles Testes	Thymus
Urinary bladder			

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice PHASE DAY OF DEATH: 30 SEX: Male PHASE: Dosing phase ANIMAL: 1034 GROUP: 1		
Tibia	No gross observations on tissue.	SUBCHONDRAL/SUBFIBROUS BONE: FIBROUS CYST, Multifocal, Moderate. - ONLY FRAGMENT OF TIBIA PRESENT.
Liver	No gross observations on tissue.	HEPATOCELLULAR NECROSIS/HEMORRHAGE, Multifocal, Slight. SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Slight. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. SUBCAPSULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Slight.
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Moderate. FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Slight.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 308

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1034
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Moderate. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Slight.	
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Moderate	Examined; 2 correlations found: HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Moderate. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Slight. SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Moderate. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1034
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mammary-protocol . . .	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Multifocal, Present.	
Prostate	No gross observations on tissue.	INTERSTITIAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Slight.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Slight. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:
 Adrenal Glands Sternal Marrow Femoral Marrow Tibial Marrow Brain

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 310

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice
PHASE DAY OF DEATH: 30
SEX: Male
PHASE: Dosing phase
ANIMAL: 1034
GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Sternum	Femur	Cecum
Epididymides	Heart	Ileum
Tibial Nerve	Rectum/Low Colon	Cervical SC
Skin-protocol	Stomach	Seminal vesicles
Urinary bladder		Testes
		Duodenum
		Kidneys
		Lumbar SC
		Thyroid

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 311

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1035
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Tibia	No gross observations on tissue.	PROMINENT LARGE SUBCHONDRAL ARTERIES, Multifocal, Marked.
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Focal, Slight.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Minimal. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Minimal.
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Slight. FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 312

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1035
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		SINUS HISTIOCYTES, Minimal. SINUS EDEMA, Multifocal, Minimal. MEDULLARY PLASMACYTOSIS, Moderate.	
Lungs	Discolored, All lobes, Red, Foci, <= 0.1 cm, Moderate	Examined; 2 correlations found: HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Slight. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal. INTERSTITIAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.	
Prostate	No gross observations on tissue.		

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 313

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice SEX: Male ANIMAL: 1035
PHASE DAY OF DEATH: 30 PHASE: Dosing phase GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.
Testes	No gross observations on tissue.	Tissue is unremarkable (with comment). - BILATERAL ARTIFACTUAL RUPTURE OF TUNICA.
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Slight. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Cecum	Colon	Duodenum
Epididymides	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Seminal vesicles	Thyroid
Thymus	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1036
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIportal MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. PERIportal MICROGRANULOMA, Focal, Moderate.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Slight. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Slight.	
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Slight. FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 315

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1036
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Minimal.
Lungs	No gross observations on tissue.	SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Slight. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present.
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 316

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1036
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Thyroid	No gross observations on tissue.	HEMORRHAGE/CONGESTION, Multifocal, Minimal.
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Moderate. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Ileum	Jejunum
Tibial Nerve	Prostate	Parathyroid	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Seminal vesicles
Testes	Thymus	Urinary bladder		

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 317

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1037
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Cecum	No gross observations on tissue.	CONGESTION/HEMORRHAGE, Minimal.	
Colon	No gross observations on tissue.	CONGESTION/HEMORRHAGE, Minimal.	
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. PERIPORTAL MICROGRANULOMA, Focal, Slight.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Minimal.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 318

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1037
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. SINUS EDEMA, Focal, Slight. MEDULLARY PLASMACYTOSIS, Slight.
Lungs	Discolored, All lobes, Red, Foci, <= 0.1 cm, Slight	Examined; 2 correlations found: HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Slight. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal. VASCULAR MINERALIZATION, Multifocal, Minimal. - EXTRA-PLEURAL TISSUE: HEMORRHAGE WITH DEGENERATION/NECROSIS.

25-Apr-06; 14:06
 Huntington Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present.
Prostate	No gross observations on tissue.	INTERSTITIAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.
Rectum/Low Colon	No gross observations on tissue.	CONGESTION/HEMORRHAGE, Minimal.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal.
		EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.
Testes	No gross observations on tissue.	TUBULAR CELLULAR DEGENERATION/NECROSIS, UNILATERAL, Focal, Slight.
Trachea	No gross observations on tissue.	SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands Sternal Marrow Femoral Marrow Tibial Marrow Brain

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1037
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments			Microscopic Observations/Comments	
Sternum	Femur	Tibia	Duodenum	Epididymides	
Extremity	Heart	Ileum	Jejunum	Tibial Nerve	
Parathyroid	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	
Stomach	Seminal vesicles	Thyroid	Thymus	Urinary bladder	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 321

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1038
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1
Liver	No gross observations on tissue.	CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. FIBROUS TAGS, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Minimal.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Slight. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Focal, Slight. MEDULLARY PLASMACYTOSIS, Multifocal, Slight.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 322

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1038
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	No gross observations on tissue.	SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal.
Mammary-protocol . . .	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Multifocal, Present.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.
Testes	No gross observations on tissue.	Tissue is unremarkable (with comment). - SEVERAL TUBULES ARE SLIGHTLY AUTOLYTIC/AGONAL CHANGE.
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1038
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Ileum	Jejunum
Kidneys	Tibial Nerve	Prostate	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Seminal vesicles
Thyroid	Thymus	Urinary bladder		

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Multifocal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Moderate.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 325

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1039
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. SINUS EDEMA, Multifocal, Minimal. MEDULLARY PLASMACYTOSIS, Slight.
Lungs	No gross observations on tissue.	SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Moderate. VASCULAR MINERALIZATION, Multifocal, Minimal.
Mammary-protocol . . .	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRECTIONS, Present.

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1039
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Moderate.

Tissues without comment under Gross Observations were within normal limits at necropsy. The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Ileum	Jejunum
Tibial Nerve	Prostate	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Seminal vesicles	Testes
Thyroid	Thymus	Urinary bladder		

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 327

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1040
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Ileum	No gross observations on tissue.	Tissue is unremarkable (with comment). - ILEUM IS VOID OF PEYER'S PATCHES.	
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Minimal. - CORTICAL TUBULAR NECROSIS/AUTOLYSIS/AGONAL CHANGE	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOLOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. SUBCAPSULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Marked. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Moderate.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 328

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1040
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1
Mesenteric LN		SINUS EDEMA, Focal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Minimal. MEDULLARY PLASMACYTOSIS, Minimal.
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Focal, Moderate. FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Slight.
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal. SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1040
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.	
Mammary-protocol . . .	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present.	
Prostate	No gross observations on tissue.	INTERSTITIAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Minimal. CAPSULE FIBROSIS, Focal, Slight.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Slight.	
Urinary bladder	No gross observations on tissue.	MINERAL DEPOSIT, Focal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 330

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1040
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
--------	-----------------------------	-----------------------------------

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Jejunum	Tibial Nerve
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Stomach	Seminal vesicles	Testes	Thyroid	Thymus

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 331

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1041
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Ileum	Abnormal Contents, Red, Thin fluid, Moderate	Tissue is unremarkable. Examined; no correlation found	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. MEDULLARY PLASMACYTOSIS, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 332

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1041
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		MEDULLARY PLASMACYTOSIS, Multifocal, Slight.	
Lungs	No gross observations on tissue.	SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Slight. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal. VASCULAR MINERALIZATION, Multifocal, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Skin-protocol	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Focal, Minimal.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 1041
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Testes	No gross observations on tissue.	Tissue is unremarkable (with comment). - SEVERAL TUBULES ARE SLIGHTLY AUTOLYTIC/AGONAL CHANGE.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Focal, Minimal.	
Trachea	No gross observations on tissue.	SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Urinary bladder	No gross observations on tissue.	LUMENAL DISTENSION, Marked. - MUCOSAL EPITHELIUM IS PARTIALLY MARKEDLY ATTENUATED FROM LUMENAL DISTENSION.	

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Jejunum	Kidneys
Mammary-protocol	Tibial Nerve	Prostate	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Stomach	Seminal vesicles	Thyroid

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2031
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 2032
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Moderate	No micropathology observations on tissue.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 2033
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Foci, </= 0.1 cm, Moderate	No micropathology observations on tissue.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2034
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 2035
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Foci, $\leq$ 0.1 cm, Moderate	No micropathology observations on tissue.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2036
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Slight	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 340

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2037
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2038
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2039
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Slight	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2040
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 2041
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Femur	Fracture, Shaft, Severe	No micropathology observations on tissue.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 3030
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Moderate	No micropathology observations on tissue.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 346

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3031
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	Discolored, All lobes, Red, Foci, $\leq$ 0.1 cm, Moderate	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3032
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 348

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3033
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 349

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3034
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	Discolored, All lobes, Red, Foci, $\leq$ 0.1 cm, Moderate	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3035
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3036
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3037
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 3038
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Slight	No micropathology observations on tissue.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 354

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3039
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 355

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 3040
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 356

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 3041
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Foci, </= 0.1 cm, Slight	No micropathology observations on tissue.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 357

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4030
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Femur	No gross observations on tissue.	EPIPHYSEAL CARTILAGINOUS ISLAND(S), Focal, Slight.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOLOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue..	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. MEDULLARY PLASMACYTOSIS, Moderate.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Moderate.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 358

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4030
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. SINUS EDEMA, Multifocal, Slight.
Lungs	No gross observations on tissue.	ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal. VASCULAR MINERALIZATION, Multifocal, Minimal.
Mammary-protocol . . .	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present.
Prostate	No gross observations on tissue.	INTERSTITIAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Moderate.
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 359

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4030
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
--------	-----------------------------	-----------------------------------

Trachea No gross observations on tissue.

GLANDULAR DILATATION, Multifocal, Moderate.

- TRACHEAL EPITHELIUM: LARGE PALE
EOSINOPHILIC INCLUSION BODIES.

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Tibia	Cecum	Colon	Duodenum
Epididymides	Heart	Ileum	Jejunum	Kidneys
Tibial Nerve	Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Seminal vesicles	Testes
Thyroid	Thymus	Urinary bladder		

25-Apr-06, 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4031
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Femoral Marrow	No gross observations on tissue.	Tissue is missing.	
Tibial Marrow	No gross observations on tissue.	Tissue is missing.	
Femur	No gross observations on tissue.	Tissue is missing.	
Tibia	No gross observations on tissue.	Tissue is missing.	
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, BILATERAL, Focal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	FIBROUS TAGS, Multifocal, Minimal. FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Slight.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.		

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 361

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4031
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.	
Lungs	Discolored, All lobes, Red, Foci, <= 0.1 cm, Moderate	Examined; 2 correlations found: PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Thyroid	No gross observations on tissue.	LYMPHOID NODULE, UNILATERAL, Focal, Slight.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Focal, Slight.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4031
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Brain	Sternum	Cecum
Colon	Duodenum	Epididymides	Heart	Ileum
Jejunum	Mammary-protocol	Tibial Nerve	Prostate	Parathyroid
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Stomach	Seminal vesicles	Testes	Thymus	Urinary bladder

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 363

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4032
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. PERIportal MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Marked. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Minimal. SINUS EDEMA, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. MEDULLARY PLASMACYTOSIS, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Moderate. FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Moderate. MEDULLARY PLASMACYTOSIS, Multifocal, Slight.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 364

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4032
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight. PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal. - OCCASSIONAL ARTERIES WITH MEDIAL HYPERTROPHY/HYPERPLASIA
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Tibial Marrow Brain

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4032
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Ileum	Jejunum
Kidneys	Mammary-protocol	Tibial Nerve	Prostate	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Spleen
Stomach	Seminal vesicles	Testes	Thyroid	Trachea
Urinary bladder				

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 366

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4033
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Epididymides	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal.	
Heart	No gross observations on tissue.	INFLAMMATORY CELL FOCI, Multifocal, Minimal.	
Liver	No gross observations on tissue.	CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Moderate. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Minimal. MEDULLARY PLASMACYTOSIS, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Minimal.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4033
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Moderate.
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal. SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Focal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Thyroid	No gross observations on tissue.	MONONUCLEAR CELL AGGREGATES, Focal, Minimal.
Trachea	No gross observations on tissue.	SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Ileum	Jejunum	Kidneys	Mammary-protocol
Tibial Nerve	Prostate	Parathyroid	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Seminal vesicles
Testes	Thymus	Urinary bladder		

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 369

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4034
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Tibia	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY PROXIMAL TIBIAL FRAGMENT PRESENT.	
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Minimal. SINUS EDEMA, Multifocal, Slight. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Minimal. MEDULLARY PLASMACYTOSIS, Multifocal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 370

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4034
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Multifocal, Minimal.	
Lungs	Discolored, All lobes, Red, Foci, <= 0.1 cm, Moderate	Examined; 3 correlations found: SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Focal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Moderate. VASCULAR MINERALIZATION, Multifocal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 371

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4034
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mammary-protocol . . .	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal.	
		EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Stomach	No gross observations on tissue.	DILATED GLANDS, Multifocal, Minimal.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Focal, Minimal.	

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Cecum	Colon	Duodenum
Epididymides	Heart	Ileum	Jejunum	Tibial Nerve
Prostate	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Skin-protocol	Seminal vesicles	Testes	Thyroid	Trachea

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 372

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4034
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 373

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4035
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, BILATERAL, Multifocal, Minimal. EOSINOPHILIC TUBULAR CASTS, UNILATERAL, Focal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Moderate. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. - NO DEFINITIVE GERMINAL CENTER	
Mediastinal LN	No gross observations on tissue.	Tissue is missing.	
Lungs	No gross observations on tissue.	ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 374

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4035
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal. VASCULAR MINERALIZATION, Multifocal, Minimal.
Prostate	No gross observations on tissue.	LUMINAL CELLULAR DEBRIS, Multifocal, Slight. INTERSTITIAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Minimal.
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Slight. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 375

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4035
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
--------	-----------------------------	-----------------------------------

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Ileum	Jejunum
Mammary-protocol	Tibial Nerve	Parathyroid	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Seminal vesicles
Testes	Thyroid	Urinary bladder		

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 376

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4036
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal. EOSINOPHILIC TUBULAR CASTS, UNILATERAL, Focal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. SUBCAPSULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Focal, Minimal. FIBROUS TAGS, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Moderate. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 377

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4036
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mesenteric LN		MEDULLARY PLASMACYTOSIS, Minimal.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Moderate.
Lungs	No gross observations on tissue.	ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 378

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4036
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mammary-protocol	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Moderate. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Moderate.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Ileum	Jejunum
Tibial Nerve	Prostate	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Seminal vesicles	Testes

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 379

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4036
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Thyroid	Thymus	Urinary bladder	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 380

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4037
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Adrenal Glands	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Slight. EOSINOPHILIC TUBULAR CASTS, UNILATERAL, Focal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. PERIPORTAL MICROGRANULOMA, Focal, Slight. FIBROUS TAGS, Focal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Minimal. SINUS EDEMA, Multifocal, Slight.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 381

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4037
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. MEDULLARY PLASMACYTOSIS, Multifocal, Slight.	
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Slight	Examined; 1 correlation found: SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal.	
Mammary-protocol . . .	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present. ACINAR EPITHELIAL VACUOLAR CHANGE, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 382

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4037
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Prostate	No gross observations on tissue.	INTERSTITIAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Thyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Slight.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Moderate.	

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain	Sternum
Femur	Tibia	Cecum	Colon	Duodenum

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 383

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4037	
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4	
Tissue	Gross Observations/Comments		Microscopic Observations/Comments	
Epididymides	Heart	Ileum	Jejunum	Tibial Nerve
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Stomach	Seminal vesicles	Testes	Urinary bladder	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 384

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4038
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Sternum	No gross observations on tissue.	PROMINENT CORTICAL HAVERSIAN SYSTEMS, Present.	
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOLOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. PERIPORTAL MICROGRANULOMA, Focal, Moderate.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Minimal. SINUS EDEMA, Multifocal, Slight. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 385

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4038
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Focal, Slight.
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Moderate	Examined; 2 correlations found: HEMORRHAGE/CONGESTION/EDEMA, Focal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Moderate. VASCULAR MINERALIZATION, Multifocal, Minimal.
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 386

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4038
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Stomach	No gross observations on tissue.	DILATED GLANDS, Multifocal, Minimal.	
Thyroid	No gross observations on tissue.	HEMORRHAGE/CONGESTION, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Slight.	
		SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Femur	Tibia	Cecum	Colon	Duodenum
Epididymides	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Prostate	Parathyroid	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Seminal vesicles	Testes
Thymus	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 387

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4039
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.	PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. SINUS EDEMA, Multifocal, Minimal. LYMPHOID DEPLETION, Multifocal, Moderate.	

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 388

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4039
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Foci, </= 0.1 cm, Slight	Examined; 1 correlation found: PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.	
Mammary-protocol . . .	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present. ACINAR EPITHELIAL VACUOLAR CHANGE, Multifocal, Slight. MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.
Trachea	No gross observations on tissue.	MUCOSAL EPITHELIAL EOSINOPHILIC DROPLETS/INCLUSION BODIES, Minimal. GLANDULAR DILATATION, Moderate. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Epididymides	Heart	Ileum	Jejunum
Tibial Nerve	Prostate	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Seminal vesicles	Testes
Thyroid	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 390

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4040
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4

Tibia	No gross observations on tissue.	SUBCHONDRAL/SUBFIBROUS BONE: FIBROUS CYST, Focal, Minimal.
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4040
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. SINUS EDEMA, Minimal. MEDULLARY PLASMACYTOSIS, Moderate.
Lungs	No gross observations on tissue.	PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	PROMINENT LUMINAL EOSINOPHILIC/BASOPHILIC SECRETIONS, Present.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 392

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4040
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Testes	No gross observations on tissue.	Tissue is unremarkable (with comment). - SEVERAL TUBULES ARE SLIGHTLY AUTOLYTIC/AGONAL CHANGE.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Minimal.	
Trachea	No gross observations on tissue.	MUCOSAL EPITHELIAL EOSINOPHILIC DROPLETS/INCLUSION BODIES, Multifocal, Minimal. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Cecum	Colon	Duodenum
Epididymides	Heart	Ileum	Jejunum	Tibial Nerve
Prostate	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 393

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4040
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Skin-protocol	Stomach	Seminal vesicles	Thyroid
			Urinary bladder

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 394

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

-----		-----
STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4041
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4
-----		-----
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
-----		-----
Femur	No gross observations on tissue.	METAPHYSEAL CARTILAGINOUS ISLAND(S), Multifocal, Slight.
Tibia	No gross observations on tissue.	SUBCHONDRAL/SUBFIBROUS BONE: FIBROUS CYST, Multifocal, Marked.
Ileum	No gross observations on tissue.	Tissue is unremarkable (with comment). - INTESTINAL TISSUE LACKS PEYER'S PATCHES.
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, BILATERAL, Focal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Moderate.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 395

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4041
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Foci, $\leq$ 0.1 cm, Slight	Examined; 2 correlations found: HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.	
Prostate	No gross observations on tissue.	LUMINAL CELLULAR DEBRIS, Minimal. INTERSTITIAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Moderate.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Stomach	No gross observations on tissue.	DILATED GLANDS, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 396

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Male	ANIMAL: 4041
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Thymus	No gross observations on tissue.	HEMORRHAGE, Focal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Slight.	

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Cecum	Colon	Duodenum	Epididymides
Heart	Jejunum	Mammary-protocol	Tibial Nerve	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Seminal vesicles
Testes	Thyroid	Urinary bladder		

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 397

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1530
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Duodenum	No gross observations on tissue.	Tissue is unremarkable (with comment). - PANCREATIC TISSUE INCLUDED; SLIGHT, FOCAL PERIVASCULAR MONONUCLEAR CELL AGGREGATES.
Heart	No gross observations on tissue.	INFLAMMATORY CELL FOCI, Focal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Minimal.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Moderate.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 398

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1530
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		SINUS HISTIOCYTES, Minimal. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Slight.
Lungs	No gross observations on tissue.	SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 399

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1530
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Ileum	Jejunum	Kidneys	Mammary-protocol	Tibial Nerve
Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Thyroid	Thymus
Trachea	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 400

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1531
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Duodenum	No gross observations on tissue.	Tissue is unremarkable (with comment). - PANCREATIC TISSUE INCLUDED: FOCAL, MINIMAL MONONUCLEAR CELL AGGREGATES.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOLOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Minimal. SINUS EDEMA, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.	

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 401

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1531
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	No gross observations on tissue.	SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal. VASCULAR MINERALIZATION, Multifocal, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is missing.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Slight. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 402

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1531
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Heart	Ileum	Jejunum	Kidneys	Mammary-protocol
Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Thyroid
Thymus	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 403

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1532
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Adrenal Glands	No gross observations on tissue.	Tissue is unremarkable (with comment). - Recut: no improvement	
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Minimal.	
Liver	No gross observations on tissue.	CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Slight. SINUS EDEMA, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 404

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

-----		-----
STATUS: Final phase sacrifice		SEX: Female
PHASE DAY OF DEATH: 30		ANIMAL: 1532
		PHASE: Dosing phase
		GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Mediastinal LN		SINUS EDEMA, Focal, Slight.
Lungs	No gross observations on tissue.	ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight.
		PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
		PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal.
		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Moderate.
		VASCULAR MINERALIZATION, Multifocal, Slight.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal.
		EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1532
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Trachea	No gross observations on tissue.	MUCOSAL EPITHELIAL EOSINOPHILIC DROPLETS/INCLUSION BODIES, Focal, Minimal. GLANDULAR DILATATION, Multifocal, Slight. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Uterus	No gross observations on tissue.	LUMENAL DISTENSION, BILATERAL, Marked. - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain	Sternum
Femur	Tibia	Cecum	Colon	Duodenum
Heart	Ileum	Jejunum	Mammary-protocol	Tibial Nerve
Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC	Thoracic SC

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1532
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments		Microscopic Observations/Comments
Lumbar SC	Skin-protocol	Stomach	Thyroid
			Urinary bladder

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 407

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1533
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Minimal.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 408

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1533
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	No gross observations on tissue.	ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.	
Ovaries	No gross observations on tissue.	CONGESTION, UNILATERAL, Slight.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Slight.	
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment).	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1533
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1
Vagina		- NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Oviducts/Fallop	Parathyroid	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Thyroid
Thymus	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 410

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1534
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Adrenal Glands	No gross observations on tissue.	Tissue is unremarkable (with comment). - Recut: no improvement	
Brain	No gross observations on tissue.	HEMORRHAGE/HEMATOCYST WITH FIBROUS ORGANIZATION, Focal, Moderate.	
Kidneys	No gross observations on tissue.	MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Multifocal, Minimal. CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal.	

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 411

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1534
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Slight.
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Focal, Moderate. PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal. VASCULAR MINERALIZATION, Multifocal, Minimal.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 412

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1534
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Trachea	No gross observations on tissue.	MUCOSAL EPITHELIAL EOSINOPHILIC DROPLETS/INCLUSION BODIES, Minimal. GLANDULAR DILATATION, Multifocal, Slight.
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Sternal Marrow	Femoral Marrow	Tibial Marrow	Sternum	Femur
Tibia	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Mammary-protocol	Tibial Nerve	Oviducts/Fallop
Ovaries	Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Thyroid	Thymus
Urinary bladder				

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 413

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1535
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), UNILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Moderate. FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Moderate. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 414

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1535
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Multifocal, Minimal.	
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Slight	Examined; 1 correlation found: PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 415

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1535
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Moderate. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Uterus	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Slight. - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Thyroid
Urinary bladder				

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 416

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

STATUS: Final phase sacrifice		SEX: Female
PHASE DAY OF DEATH: 31		PHASE: Dosing phase
		ANIMAL: 1536
		GROUP: 1

Femoral Marrow	No gross observations on tissue.	Tissue is missing.
Tibial Marrow	No gross observations on tissue.	Tissue is missing.
Femur	No gross observations on tissue.	Tissue is missing.
Tibia	No gross observations on tissue.	Tissue is missing.
Extremity	hair thin/absent, Both forepaws, Moderate	Examined; 1 correlation found: FOLLICULAR HYPERKERATOSIS/HAIR SHAFT ABSENT/DECREASED IN SIZE, Multifocal, Slight.
Ileum	Abnormal Contents, Red, Thin fluid, Moderate	Tissue is unremarkable. Examined; no correlation found
Kidneys	Dilated Pelvis, Right, Slight	Examined; 1 correlation found: DILATED PELVIS, UNILATERAL, Present. MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Focal, Minimal. - OCCASIONAL TUBULES APPEAR AUTOLYTIC/NECROTIC/AGONAL CHANGE.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 417

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1536
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Liver		PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
		SUBCAPSULAR HEMORRHAGE, Multifocal, Slight.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate.	
		PARACORTICAL LYMPHOID ACTIVITY, Moderate.	
		SINUS HISTIOCYTES, Multifocal, Moderate.	
		SINUS EDEMA, Minimal.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate.	
		PARACORTICAL LYMPHOID ACTIVITY, Marked.	
		SINUS HISTIOCYTES, Minimal.	
		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.	
		MEDULLARY PLASMACYTOSIS, Moderate.	
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Slight.	
		SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal.	
		ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Moderate.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 418

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1536
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs		PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.	
		PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal.	
		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.	
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment).	
		- PROMINENT PERIVASCULAR MONONUCLEAR CELL AGGREGATES.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Minimal.	
		EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Slight.	
		SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Brain	Sternum	Cecum
Colon	Duodenum	Heart	Jejunum	Mammary-protocol
Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Thyroid	Urinary bladder

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 420

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1537
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Slight. CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, BILATERAL, Multifocal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Moderate. MEDULLARY PLASMACYTOSIS, Moderate.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1537
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		PARACORTICAL LYMPHOID ACTIVITY, Moderate.	
		SINUS HISTIOCYTES, Multifocal, Minimal.	
		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.	
		MEDULLARY PLASMACYTOSIS, Slight.	
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Focal, Moderate.	
		ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal.	
		PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.	
		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal.	
		VASCULAR MINERALIZATION, Multifocal, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is missing.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal.	
		EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 422

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1537
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Thyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Moderate. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.	
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1537	
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1	
Tissue	Gross Observations/Comments		Microscopic Observations/Comments	
Duodenum	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Urinary bladder

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 424

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1538
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Femur	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY ONE MENISCUS PRESENT.	
Tibia	No gross observations on tissue.	SUBCHONDRAL/SUBFIBROUS BONE: FIBROUS CYST, Focal, Moderate.	
Extremity	hair thin/absent, Both forepaws, Moderate	Examined; 1 correlation found: EMPTY HAIR FOLLICLES/HAIR SHAFT ABSENT, Focal, Slight.	
Kidneys	No gross observations on tissue.	MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Focal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	CENTRIOLOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Moderate.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 425

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1538
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		SINUS HISTIOCYTES, Minimal.	
		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.	
		RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight.	
		SINUS EDEMA, Focal, Slight.	
Lungs	No gross observations on tissue.	ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal.	
		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.	
Ovaries	No gross observations on tissue.	CONGESTION, UNILATERAL, Slight.	
Skin-protocol	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Minimal.	
Skin (other)	Hair Thin/Absent, Cervical, Moderate	Examined; 1 correlation found: EMPTY HAIR FOLLICLE, Focal, Slight.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Slight.
Urinary bladder	No gross observations on tissue.	Tissue is missing.
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Mammary-protocol	Tibial Nerve	Oviducts/Fallop
Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Stomach	Thyroid	Thymus		

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 427

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

STATUS: Final phase sacrifice SEX: Female ANIMAL: 1539		
PHASE DAY OF DEATH: 31 PHASE: Dosing phase GROUP: 1		

Adrenal Glands	No gross observations on tissue.	Tissue is unremarkable (with comment). - Recut: no improvement
Brain	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.
Ileum	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS VOID OF PEYER'S PATCHES.
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Minimal.
Liver	No gross observations on tissue.	CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Slight. SINUS EDEMA, Moderate.
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Minimal. FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Moderate.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 428

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1539
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		SINUS HISTIOCYTES, Multifocal, Minimal.	
		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.	
		SINUS EDEMA, Slight.	
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal.	
		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.	
Ovaries	No gross observations on tissue.	CONGESTION, Slight.	
Parathyroid	No gross observations on tissue.	Tissue is missing.	
Thoracic SC	No gross observations on tissue.	HEMORRHAGE, Focal, Minimal.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Moderate.	
		SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 429

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1539
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment).
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Sternal Marrow	Femoral Marrow	Tibial Marrow	Sternum	Femur
Tibia	Cecum	Colon	Duodenum	Heart
Jejunum	Mammary-protocol	Tibial Nerve	Oviducts/Fallop	Rectum/Low Colon
Cervical SC	Lumbar SC	Skin-protocol	Stomach	Thyroid
Thymus	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 430

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1540
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Ileum	No gross observations on tissue.	Tissue is unremarkable (with comment). - ILEUM IS VOID OF PEYER'S PATCHES.	
Kidneys	No gross observations on tissue.	MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Slight. SINUS EDEMA, Focal, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Minimal.	
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 431

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1540
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Minimal.	
Thyroid	No gross observations on tissue.	MONONUCLEAR CELL AGGREGATES, UNILATERAL, Focal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Slight.	
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Tibial Marrow Brain

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 432

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1540
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Heart	Jejunum	Mammary-protocol	Tibial Nerve
Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Thymus	Urinary bladder

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 433

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1541
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Tibia	No gross observations on tissue.	SUBCHONDRAL/SUBFIBROUS BONE: FIBROUS CYST, Multifocal, Moderate.	
Cecum	No gross observations on tissue.	DILATED GLAND WITH CELLULAR DEBRIS, Focal, Minimal.	
Ileum	No gross observations on tissue.	Tissue is unremarkable (with comment). - ILEUM IS VOID OF PEYER'S PATCHES.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Marked. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Moderate. SINUS EDEMA, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Focal, Minimal. MEDULLARY PLASMACYTOSIS, Minimal.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1541
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN	No gross observations on tissue.	Tissue is missing.	
Lungs	No gross observations on tissue.	ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal. VASCULAR MINERALIZATION, Multifocal, Minimal.	
Ovaries	No gross observations on tissue.	CONGESTION, BILATERAL, Slight.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 435

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1541
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Colon	Duodenum	Heart
Jejunum	Kidneys	Mammary-protocol	Tibial Nerve	Oviducts/Fallop
Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Skin-protocol	Stomach	Thyroid	Thymus	Trachea
Urinary bladder				

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 2530
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 2531
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2532
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2533
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 440

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 2534
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Slight	No micropathology observations on tissue.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 441

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 2535
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 442

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2536
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2537
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2538
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2539
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2540
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2541
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 2
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 448

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3530
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	Discolored, All lobes, Red, Slight	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3531
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 450

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 3532
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3533
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm, Moderate	No micro pathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 3534
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	Discolored, All lobes, Red, Slight	No micropathology observations on tissue.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3535
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Extremity	hair thin/absent, Both forepaws, Moderate	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3536
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3537
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 456

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS:	SEX: Female	ANIMAL: 3538
PHASE DAY OF DEATH:	PHASE:	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3539
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 3
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3540
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Extremity	hair thin/absent, Both forepaws, Slight	No micropathology observations on tissue.
	hair thin/absent, Both forelegs, Moderate	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3541
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 460

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4530
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Moderate. MEDULLARY PLASMACYTOSIS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 461

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4530
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal.	
		SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal.	
		ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal.	
		PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.	
		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.	
		VASCULAR MINERALIZATION, Multifocal, Minimal.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal.	
		EXTRAMEDULLARY HEMATOPOIESIS, Minimal.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Slight.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Focal, Moderate.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 462

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4530
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Oviducts/Fallop	Ovaries	Parathyroid	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Stomach
Thyroid	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 463

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4531
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Kidneys	No gross observations on tissue.	MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Focal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOLOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Moderate. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Multifocal, Minimal.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 464

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4531
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		MEDULLARY PLASMACYTOSIS, Multifocal, Slight.
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Slight. SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Moderate. VASCULAR MINERALIZATION, Multifocal, Minimal.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice PHASE DAY OF DEATH: 30 SEX: Female PHASE: Dosing phase ANIMAL: 4531 GROUP: 4		
Trachea	No gross observations on tissue.	SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Thyroid
Thymus	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 466

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4532
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Tibia	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY TIBIAL EPIPHYSIS PRESENT.	
Duodenum	No gross observations on tissue.	Tissue is unremarkable (with comment). - SLIGHTLY AUTOLYTIC, BUT READABLE.	
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.	
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Slight. CONGESTION, Slight.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 467

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4532
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. SINUS EDEMA, Multifocal, Minimal.
Lungs	No gross observations on tissue.	SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal. VASCULAR MINERALIZATION, Multifocal, Minimal.
Ovaries	No gross observations on tissue.	CONGESTION, BILATERAL, Moderate.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 468

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4532
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal.	
		EXTRAMEDULLARY HEMATOPOIESIS, Minimal.	
Thyroid	No gross observations on tissue.	HEMORRHAGE/CONGESTION, BILATERAL, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Slight.	
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment).	
		- NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment).	
		- NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Cecum	Colon	Heart
Ileum	Jejunum	Mammary-protocol	Tibial Nerve	Oviducts/Fallop

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 469

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4532
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments		Microscopic Observations/Comments
Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC
Skin-protocol	Stomach	Thymus	Urinary bladder
			Lumbar SC

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4533
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Tibia	No gross observations on tissue.	SUBCHONDRAL/SUBFIBROUS BONE: FIBROUS CYST, Focal, Marked.
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. FIBROUS TAGS, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 471

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4533
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Mediastinal LN	No gross observations on tissue.	FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. MEDULLARY PLASMACYTOSIS, Slight.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.
Trachea	No gross observations on tissue.	MUCOSAL EPITHELIAL EOSINOPHILIC DROPLETS/INCLUSION BODIES, Multifocal, Minimal. GLANDULAR DILATATION, Multifocal, Slight. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 472

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4533
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
		ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Cecum	Colon	Duodenum
Heart	Ileum	Jejunum	Mammary-protocol	Tibial Nerve
Oviducts/Fallop	Ovaries	Parathyroid	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Thyroid
Urinary bladder				

25-Apr-06, 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Minimal.
Mesenteric LN	No gross observations on tissue.	CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Moderate. SINUS EDEMA, Multifocal, Slight.
Lungs	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. SINUS EDEMA, Focal, Slight.
		SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 474

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4534
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs		PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.	
		PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal.	
		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.	
		VASCULAR MINERALIZATION, Multifocal, Minimal.	
Ovaries	No gross observations on tissue.	CONGESTION, BILATERAL, Moderate.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Minimal.	
		EXTRAMEDULLARY HEMATOPOIESIS, Minimal.	
		CAPSULE FIBROSIS, Multifocal, Slight.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Slight.	
		SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Slight.	
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment).	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 475

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4534
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Vagina No gross observations on tissue.

- NO ENDOMETRIUM PRESENT.

Tissue is unremarkable (with comment).

- NORMAL PHYSIOLOGIC MORPHOLOGY OF THE
ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Extremity	Heart	Ileum	Jejunum
Kidneys	Mammary-protocol	Tibial Nerve	Oviducts/Fallop	Parathyroid
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Stomach	Thyroid	Thymus	Urinary bladder	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4535
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal. EOSINOPHILIC TUBULAR CASTS, UNILATERAL, Focal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Slight.
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Severe. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 477

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4535
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		SINUS EDEMA, Multifocal, Slight.	
		MEDULLARY PLASMACYTOSIS, Multifocal, Minimal.	
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal.	
		ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal.	
		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.	
		VASCULAR MINERALIZATION, Multifocal, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Spleen	No gross observations on tissue.	EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	MUCOSAL EPITHELIAL EOSINOPHILIC DROPLETS/INCLUSION BODIES, Multifocal, Minimal.	
		GLANDULAR DILATATION, Slight.	

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Stomach	Thyroid
Thymus	Urinary bladder			

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 479

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4536
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	MEDULLA: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal. CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal. CORTICAL TUBULAR MINERALIZATION, UNILATERAL, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Slight.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Minimal. CENTRILOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. FIBROUS TAGS, Multifocal, Slight.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Minimal. SINUS EDEMA, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	Tissue is inadequate and unreadable.

25-Apr-06, 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 480

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4536
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4
Lungs	Discolored, All lobes/ (post-fixation observation)	Examined; 2 correlations found: HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Slight. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Slight. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.
Ovaries	No gross observations on tissue.	CONGESTION, BILATERAL, Slight.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.
Thyroid	No gross observations on tissue.	HEMORRHAGE/CONGESTION, UNILATERAL, Minimal.

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Trachea	No gross observations on tissue.	MUCOSAL EPITHELIAL EOSINOPHILIC DROPLETS/INCLUSION BODIES, Slight. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight.
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Oviducts/Fallop	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Thymus	Urinary bladder

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 482

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4537
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Multifocal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal. CENTRILOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate. PARACORTICAL LYMPHOID ACTIVITY, Minimal. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	HEMORRHAGE, Multifocal, Slight. FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Minimal.

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Moderate.
Lungs	No gross observations on tissue.	SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal. ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. PERIVASCULAR/SUBPLEURAL MICROGRANULOMA, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 484

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4537
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Trachea	No gross observations on tissue.	MUCOSAL EPITHELIAL EOSINOPHILIC DROPLETS/INCLUSION BODIES, Multifocal, Slight.	
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Heart	Ileum	Jejunum	Mammary-protocol
Tibial Nerve	Oviducts/Fallop	Ovaries	Parathyroid	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Stomach
Thyroid	Thymus	Urinary bladder		

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4538
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Adrenal Glands	No gross observations on tissue.	CORTICAL VACUOLATION, Focal, Slight.	
Ileum	No gross observations on tissue.	Tissue is unremarkable (with comment).	
		- ILEUM IS VOID OF PEYER'S PATCHES.	
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Minimal.	
		CENTRILOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal.	
		PARACORTICAL LYMPHOID ACTIVITY, Minimal.	
		SINUS HISTIOCYTES, Multifocal, Moderate.	
		SINUS EDEMA, Multifocal, Moderate.	
		RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Moderate.	
		PARACORTICAL LYMPHOID ACTIVITY, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 486

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4538
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		SINUS HISTIOCYTES, Multifocal, Slight.	
		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.	
		SINUS EDEMA, Multifocal, Slight.	
Lungs	Discolored, All lobes, Red, Foci, <= 0.1 cm, Slight	Examined; 2 correlations found: HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.	
		ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal.	
		ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal.	
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight.	
		VASCULAR MINERALIZATION, Multifocal, Minimal.	
Ovaries	No gross observations on tissue.	CONGESTION, UNILATERAL, Slight.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal.	
		EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 487

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4538
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.
Uterus	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.

The following tissues were unremarkable microscopically:

Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain	Sternum
Femur	Tibia	Cecum	Colon	Duodenum
Heart	Jejunum	Mammary-protocol	Tibial Nerve	Oviducts/Fallop
Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Skin-protocol	Stomach	Thyroid	Trachea	Urinary bladder

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4539
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Multifocal, Minimal.	
		CENTRIOBULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal.	
		PARACORTICAL LYMPHOID ACTIVITY, Marked.	
		SINUS HISTIOCYTES, Multifocal, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal.	
		PARACORTICAL LYMPHOID ACTIVITY, Moderate.	
		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.	
		SINUS EDEMA, Focal, Minimal.	
		MEDULLARY PLASMACYTOSIS, Slight.	
Lungs	No gross observations on tissue.	HEMORRHAGE/CONGESTION/EDEMA, Multifocal, Slight.	
		SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal.	
		ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Moderate.	

25-Apr-06, 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES/GOLDEN BROWN PIGMENT-LADEN MACROPHAGES, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.
Thymus	No gross observations on tissue.	HEMORRHAGE, Focal, Minimal.
Trachea	No gross observations on tissue.	MUCOSAL EPITHELIAL EOSINOPHILIC DROPLETS/INCLUSION BODIES, Multifocal, Minimal. GLANDULAR DILATATION, Multifocal, Slight. SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Uterus	No gross observations on tissue.	GLANDULAR DILATATION, BILATERAL, Multifocal, Slight. - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
STATUS: Final phase sacrifice		SEX: Female
PHASE DAY OF DEATH: 31		PHASE: Dosing phase
		ANIMAL: 4539
		GROUP: 4
ESTRUS CYCLE.		
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment).
		- NORMAL PHYSIOLOGIC MORPHOLOGY OF THE
		ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Tibia	Cecum	Colon
Duodenum	Heart	Ileum	Jejunum	Kidneys
Mammary-protocol	Tibial Nerve	Oviducts/Fallop	Ovaries	Parathyroid
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Stomach	Thyroid	Urinary bladder		

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4540
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Multifocal, Minimal. - ARTIFACTUAL TISSUE ARCHITECTURE CHANGE OF MEDULLARY REGION OF ONE KIDNEY.	
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCUS/FOCI, Minimal. CENTRIOBLULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. PERIPORTAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Slight. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Slight.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 492

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4540
PHASE DAY OF DEATH: 31	PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		PARACORTICAL LYMPHOID ACTIVITY, Moderate. SINUS HISTIOCYTES, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Minimal. RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Minimal.
Lungs	No gross observations on tissue.	ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal. PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Slight. VASCULAR MINERALIZATION, Multifocal, Minimal.
Parathyroid	No gross observations on tissue.	Tissue is missing.
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Minimal. EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4540
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Thyroid	No gross observations on tissue.	HEMORRHAGE/CONGESTION, UNILATERAL, Focal, Slight. - ONLY SMALL FRAGMENT OF TISSUE ON ONE SIDE.	
Thymus	No gross observations on tissue.	HEMORRHAGE, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Moderate.	
Urinary bladder	No gross observations on tissue.	Tissue is unremarkable (with comment). - FOCAL MUCOSAL ARTIFACTUAL CHANGE.	
Uterus	No gross observations on tissue.	LUMENAL DISTENSION, BILATERAL, Moderate.	
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.	

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:
 Adrenal Glands Sternal Marrow Femoral Marrow Tibial Marrow Brain

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Page 494

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4540
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments		Microscopic Observations/Comments
Sternum	Femur	Tibia	Cecum
Duodenum	Heart	Ileum	Jejunum
Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon
Thoracic SC	Lumbar SC	Skin-protocol	Stomach
			Colon
			Mammary-protocol
			Cervical SC

25-Apr-06; 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4541
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Tibia	No gross observations on tissue.	SUBCHONDRAL/SUBFIBROUS BONE: FIBROUS CYST, Focal, Moderate.	
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Slight. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, BILATERAL, Focal, Minimal. EOSINOPHILIC TUBULAR CASTS, UNILATERAL, Focal, Minimal.	
Liver	No gross observations on tissue.	Tissue is unremarkable (with comment). - EXTRAMEDULLARY HEMATOPOIESIS/SINGLE MEGAKERYOCYTE.	
Mesenteric LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Slight. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Moderate. SINUS EDEMA, Multifocal, Slight. MEDULLARY PLASMACYTOSIS, Minimal.	
Mediastinal LN	No gross observations on tissue.	FOLLICULAR LYMPHOID ACTIVITY, Minimal. PARACORTICAL LYMPHOID ACTIVITY, Marked. SINUS HISTIOCYTES, Multifocal, Moderate.	

25-Apr-06; 14:06
Huntingdon Life Sciences, Inc. 034242
Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4541
PHASE DAY OF DEATH: 31		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.	
		RETICULOENDOTHELIAL CELL: GOLDEN-BROWN PIGMENT, Multifocal, Slight.	
		SINUS EDEMA, Multifocal, Minimal.	
Lungs	No gross observations on tissue.	SUBPLEURAL HEMORRHAGE/SUBACUTE INFLAMMATION/FIBROSIS, Multifocal, Minimal.	
		ARTERIAL MEDIAL HYPERTROPHY, Multifocal, Minimal.	
		PERIVASCULAR/PERIALVEOLAR SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Slight.	
		PERIBRONCHIAL/PERIVASCULAR LYMPHOID AGGREGATES, Multifocal, Minimal.	
Ovaries	No gross observations on tissue.	CONGESTION, UNILATERAL, Moderate.	
Spleen	No gross observations on tissue.	GOLDEN-BROWN PIGMENT, Multifocal, Minimal.	
		EXTRAMEDULLARY HEMATOPOIESIS, Multifocal, Minimal.	
Trachea	No gross observations on tissue.	GLANDULAR DILATATION, Multifocal, Slight.	
		SUBMUCOSAL SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Moderate.	

25-Apr-06, 14:06
 Huntingdon Life Sciences, Inc. 034242
 Main Study Animals

Butane: Combined Repeated-Exposure Toxicity, Reproduction and
 Neurotoxicity Screening in Rats
 via Whole-Body Inhalation Exposures
 Individual Animal Gross and Microscopic Observations

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Uterus	No gross observations on tissue.	LUMENAL DISTENSION, BILATERAL, Moderate. GLANDULAR DILATATION, BILATERAL, Slight.
Vagina	No gross observations on tissue.	Tissue is unremarkable (with comment). - NORMAL PHYSIOLOGIC MORPHOLOGY OF THE ESTRUS CYCLE.

Tissues without comment under Gross Observations were within normal limits at necropsy.
 The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Tibial Marrow	Brain
Sternum	Femur	Cecum	Colon	Duodenum
Heart	Ileum	Jejunum	Mammary-protocol	Tibial Nerve
Oviducts/Fallop	Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Skin-protocol	Stomach	Thyroid	Thymus
Urinary bladder				