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October 17, 2008

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U.S. Environmental Protection Agency
ATTN: TSCA Section 8(e) Coordinator
Office of Pollution Prevention and Toxics
1200 Pennsylvania Avenue, NW
Washington DC 20460

Attention: TSCA 8(e) Coordinator

RE: 8EHQ Number: 8EHQ-08-17177
Final Report: Allyl Alcohol – Acute Inhalation Toxicity Study in Male and Female Rats (WIL-14068)

Dear Sir or Madam:

In June 2008, Lyondell Chemical Company (Lyondell), a subsidiary of LyondellBasell Industries, submitted information to EPA in accordance with Section 8(e) of the Toxic Substances Control Act (TSCA) and EPA's 1991 Section 8(e) Reporting Guide. In that correspondence, Lyondell reported preliminary information from an acute inhalation toxicity study of allyl alcohol (CASRN: 107-18-6) in male and female rats. That submission was assigned 8EHQ Number 8EHQ-08-17177. At that time, the final report for this study was not available. Lyondell has now received the final report and is hereby providing a copy to EPA.

This study was conducted by WIL Research Laboratories, LLC for Lyondell.

Should you have any questions or require additional details, please do not hesitate to call me at 713-309-7791, FAX at 713-951-1574 or by e-mail at betsy.duncan@lyondellbasell.com.

Sincerely,

Betsy Duncan

Betsy Duncan
Business Consultant – Global Chemical Control
Regulatory Corporate TSCA Coordinator
Lyondell Chemical Company

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Enclosure

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Final Report
Allyl Alcohol – Acute Inhalation Toxicity Study in Male and Female Rats
(WIL-14068)

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FINAL REPORT

Volume 1 of 3
(Text, Figures 1-6, Tables 1-53 and Appendix A - Tables A1-A13)

STUDY TITLE

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS (WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

STUDY NUMBER

WIL-14068

DATA REQUIREMENT

OPPTS Guideline 870.1300
OPPTS Guideline 870.1350
OECD Guideline 403

STUDY DIRECTOR

Daniel T. Kirkpatrick, PhD, DABT

STUDY INITIATION DATE

30 November 2007

STUDY COMPLETION DATE

24 September 2008

PERFORMING LABORATORY

WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-8946

SPONSOR

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Houston, TX 77010

314884

COMPLIANCE STATEMENT

This study, designated WIL-14068, was conducted in compliance with the United States Environmental Protection Agency (EPA) Good Laboratory Practice Standards (40 CFR Part 792), 18 September 1989; the Organisation for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practice [C (97) 186/Final], 26 November 1997; the standard operating procedures of WIL Research Laboratories, LLC, and the protocol as approved by the sponsor with the following exception. The preliminary study was conducted prior to the protocol being signed by the study director. A Certificate of Analysis was provided by the supplier (presented in Appendix C); the characterization analyses were conducted according to unknown standards.

The protocol was designed to be in general accordance with the United States EPA, Office of Prevention, Pesticides and Toxic Substances (OPPTS) Guideline 870.1300, Acute Inhalation Toxicity, August, 1998 and Guideline 870.1350, Acute Inhalation Toxicity with Histopathology, June, 1996 and the Organisation for Economic Cooperation and Development (OECD) Guidelines for Testing Chemicals, Section 403.

Daniel T. Kirkpatrick, PhD, DABT
Director, Inhalation Toxicology
Study Director

24 Sept 2008
Date

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1. SUMMARY

1.1. OBJECTIVE

The objectives of the study were to determine the acute inhalation no-observed-adverse-effect level (NOAEL) for lethality and irreversible effects of allyl alcohol when administered once via whole-body inhalation to rats for 1, 4 or 8 hours and to determine the acute inhalation NOAEL for effects that were considered reversible. This study was conducted to provide additional data to support the derivation of Acute Exposure Guideline Level (AEGL) 1, 2 and 3 values for different exposure durations. These objectives were achieved using a modified acute study design with multiple exposure durations, selected clinical observations, novel stimulus/arousal response, clinical pathology and histopathology of the respiratory tract and other selected tissues and organs. A preliminary study was performed after exposure concentrations were targeted to assure that the high treatment level for each test duration did not cause excessive mortality or moribundity.

1.2. STUDY DESIGN

1.2.1. 1-HOUR EXPOSURE

Allyl alcohol was administered as a vapor via whole-body inhalation exposure for 1 hour to 3 groups (Groups 2-4) of Crl:CD(SD) rats. Target exposure levels were 50, 200 and 400 ppm. A concurrent control group (Group 1) received filtered air on a comparable regimen. Overall mean analyzed exposure concentrations were 0, 51, 220 and 403 ppm for Groups 1, 2, 3 and 4, respectively. Each group consisted of 5 males and 5 females. Following a 14-day non-exposure (recovery) period, all surviving rats were euthanized and subjected to necropsy.

1.2.2. 4-HOUR EXPOSURE

Allyl alcohol was administered as a vapor via whole-body inhalation exposure for 4 hours to 3 groups (Groups 6-8) of Crl:CD(SD) rats. Target exposure levels were 20, 50 and 100 ppm. A concurrent control group (Group 5) received filtered air on a comparable regimen. Overall mean analyzed exposure concentrations were 0, 22, 52 and

102 ppm for Groups 5, 6, 7 and 8, respectively. Each group consisted of 5 males and 5 females. Following a 14-day non-exposure (recovery) period, all surviving rats were euthanized and subjected to necropsy.

1.2.3. 8-HOUR EXPOSURE

Allyl alcohol was administered as a vapor via whole-body inhalation exposure for 8 hours to 3 groups (Groups 10-12) of Crl:CD(SD) rats. Target exposure levels were 10, 20 and 50 ppm. A concurrent control group (Group 9) received filtered air on a comparable regimen. Overall mean analyzed exposure concentrations were 0, 10, 21 and 52 ppm. Each group consisted of 5 males and 5 females. Following a 14-day non-exposure (recovery) period, all surviving rats were euthanized and subjected to necropsy.

1.2.4. PARAMETERS EVALUATED

All animals were observed twice daily for mortality and moribundity (except on the day of the scheduled necropsy). On the day of exposure, clinical examinations were performed 30 minutes into exposure (all exposure durations), 1 hour into exposure (4- and 8-hour exposures), 4 hours into exposure (8-hour exposure), at the end of each exposure duration and within 1 hour post-exposure (all exposure durations). Near the end of the exposure, the response to a loud-noise stimulus was evaluated. Assessment of gait was also performed within 1 hour post-exposure. During the post-exposure (recovery) period, clinical examinations were performed twice on study day 1, once in the morning and once in the afternoon, and once daily at approximately the same time each day on remaining post-exposure days (study days 2-14). Individual body weights were recorded immediately prior to exposure (study day 0) and on study days 1, 6 and 13. Clinical pathology evaluations (hematology, coagulation and serum chemistry) were performed for all rats at the scheduled necropsy (study day 14). Complete necropsies were conducted on all animals, and selected organs were weighed at the scheduled necropsy. Selected tissues were examined microscopically from all animals.

1.3. RESULTS

Following 1-, 4- or 8-hour exposures to allyl alcohol, there were no test substance-related effects on clinical pathology parameters (hematology, coagulation and serum chemistry) and organ weights or macroscopic findings. There were no test substance-related microscopic findings in the liver and kidneys, or for surviving animals, in the lungs.

Following 8 hours of exposure at 50 ppm, the death of 1 male on study day 1 was considered to be test substance-related. The cause of death was ulceration of the respiratory and olfactory epithelium in the nasal passages. With the exception of effects on the response to a novel stimulus during allyl alcohol exposures and a slight effect on gait for 1 female exposed to 50 ppm for 8 hours (1-hour post-exposure), no test substance-related effects on behavior were observed. The toxicological significance of impaired gait was considered questionable since this finding was not observed in any other study animal and was not accompanied by other behavior findings in the affected animal. During or following the 1, 4 and 8 hour exposures to allyl alcohol, other test substance-related clinical findings included gasping, flushing of the ears, forelimbs and/or hindlimbs, red or clear material around the mouth and/or nose and yellow material on the abdominal or urogenital surfaces. Flushing of extremities was consistent with the presence of aldehyde following metabolism of the alcohol. In addition, an increased respiration rate for one 50 ppm group male at the midpoint of the 8-hour exposure and rales for one 20 ppm group male and 1 male and 1 female in the 50 ppm group at 1 hour post-exposure were noted. These clinical findings were not observed during the 14-day non-exposure (recovery) period; therefore, test substance-related clinical findings were considered to be reversible in surviving animals.

Based on combined incidences for males and females, test substance-related effects on novel stimulus/arousal responses (i.e., no response to stimulus) were noted near the end of the allyl alcohol exposure at 200 ppm for 1 hour, 50 and 100 ppm for 4 hours and 20 and 50 ppm for 8 hours. Although 3 of 5 females in the 400 ppm (1-hour exposure) group failed to respond to the stimulus, all 5 males responded.

Test substance-related body weight losses noted in the 50 ppm group males exposed for 8 hours were transient. Body weight losses from study day 0 to 1 were noted in the 50 ppm group males which resulted in slightly lower (-5.6%) mean body weight in the 50 ppm group males on study day 1 compared to the control group. Mean body weight in the 50 ppm group males was similar to the control group on study day 13. Therefore, the body weight effects were reversible.

Exposure to allyl alcohol by inhalation to male and female Crl:CD (SD) albino rats for 1, 4 and 8 hours followed by a 14-day non-exposure (recovery) period was associated with test substance-related changes in the nasal cavity. Lesions in the olfactory epithelium were considered the most prominent and toxicologically significant nasal lesions. The most severe lesions were present in the high exposure (50 ppm) group males following an 8-hour exposure, where 1 early death and irreversible nasal mucosal lesions were present. Although the 14-day recovery period was not long enough to allow complete resolution of the nasal lesions, the nasal changes in all but 2 animals (from 50 ppm x 8 hour group) were considered reversible. Exposure to the test substance for 1 hour at 50, 200 and 400 ppm caused degeneration of olfactory epithelium, mild metaplasia of olfactory epithelium, chronic inflammation and hemorrhage; these findings were considered reversible. Exposure to the test substance for 4 hours at 20, 50 and 100 ppm caused degeneration of olfactory epithelium, degeneration of respiratory epithelium, chronic inflammation and goblet cell hyperplasia; these changes were also considered reversible. Exposure to the test substance for 8 hours at 10, 20 and 50 ppm caused degeneration, erosion, ulceration and metaplasia of olfactory epithelium, degeneration and erosion of respiratory epithelium, chronic inflammation, hemorrhage and hyperplasia of goblet cells. Ulceration, metaplasia of epithelium and severe degeneration of olfactory epithelium were irreversible and were limited to one 50 ppm group male that survived until terminal euthanasia and/or the one 50 ppm group male that died. Other changes, such as inflammation, goblet cell hyperplasia and lesser grades of degeneration of olfactory epithelium were considered reversible.

1.4. CONCLUSIONS

In this acute inhalation study, subgroups of animals received single exposures with durations of 1 hour (0, 50, 200 and 400 ppm), 4 hours (0, 20, 50 and 100 ppm) and 8 hours (0, 10, 20 and 50 ppm). Mortality was limited to 1 male exposed for 8 hours to 50 ppm. Test substance-related clinical findings of gasping, rales, increased respiration, flushing of the ears, forelimbs and/or hindlimbs, red or clear material around the mouth and/or nose and yellow material on the abdominal or urogenital surfaces noted during exposure or at 1 hour post-exposure were not observed during the recovery period and were therefore reversible in surviving animals. Complete recovery of all exposure-related clinical findings occurred by study day 14. A test substance-related body weight loss in the 50 ppm group males after 8 hours of exposure was transient. There were no test substance-related microscopic findings in the liver and kidneys, or for surviving animals, in the lungs. Reversible test substance-related changes in the nasal cavity included degeneration of olfactory epithelium, respiratory metaplasia of olfactory epithelium, chronic inflammation and hemorrhage at 50, 200 and 400 ppm for a 1-hour exposure. Exposure to the test substance for 4 hours at 20, 50 and 100 ppm caused degeneration of olfactory epithelium, degeneration of respiratory epithelium, chronic inflammation and goblet cell hyperplasia which were also considered reversible changes. Thus, no nasal effects in any 1-hour or 4-hour exposure group were considered irreversible. Exposure to the test substance for 8 hours at 10, 20 and 50 ppm produced degeneration, erosion, ulceration and respiratory metaplasia of olfactory epithelium, degeneration and erosion of respiratory epithelium, chronic inflammation, hemorrhage and hyperplasia of goblet cells. The most severe lesions were present in the high exposure (50 ppm) group males following an 8-hour exposure. Microscopic findings that were considered irreversible included ulceration, respiratory metaplasia and severe degeneration of olfactory epithelium were limited to 2 males in this group. Ulceration included both full thickness loss of the olfactory mucosa and breaching of the basal lamina leaving denuded submucosa. This change was considered irreversible from a histopathologic standpoint, since with a breach of the basal lamina, fibroplasia would

necessarily result in some degree of scar tissue during repair. With the exception of these 2 animals, the nasal lesions in the 8-hour exposure groups were considered reversible.

Based on the results of this study, the no-observed-adverse-effect level (NOAEL) for lethality and irreversible effects of allyl alcohol administered once via whole-body inhalation exposure to Crl:CD(SD) rats for 1 hour was 400 ppm for both sexes, for 4 hours was 100 ppm for both sexes and for 8 hours was 20 ppm for males and 50 ppm for females. In this study, the primary findings used to define the NOEL were adverse microscopic changes in the nasal cavity. Therefore, the NOEL and the NOAEL for all findings were equal. The NOAEL for all effects (reversible or irreversible) was less than the lowest concentration tested for females exposed for 1 hour (50 ppm) and males and females exposed for 4 hours (20 ppm) and 8 hours (10 ppm), and was 50 ppm for males exposed for 1 hour. The NOAEL for all effects was based primarily on the presence of degeneration of olfactory epithelium for the animals exposed for 1 hour or 8 hours and on the presence of inflammation for the animals exposed for 4 hours.

2. INTRODUCTION

2.1. GENERAL STUDY INFORMATION

This report presents the data from "Acute Inhalation Toxicity Study of Allyl Alcohol in Albino Rats (with 1-, 4- And 8-Hour Exposure Durations)". Due to software spacing constraints, the study title appears as "Acute Inh. Tox. Study of Allyl Alcohol in Rats" on the report tables.

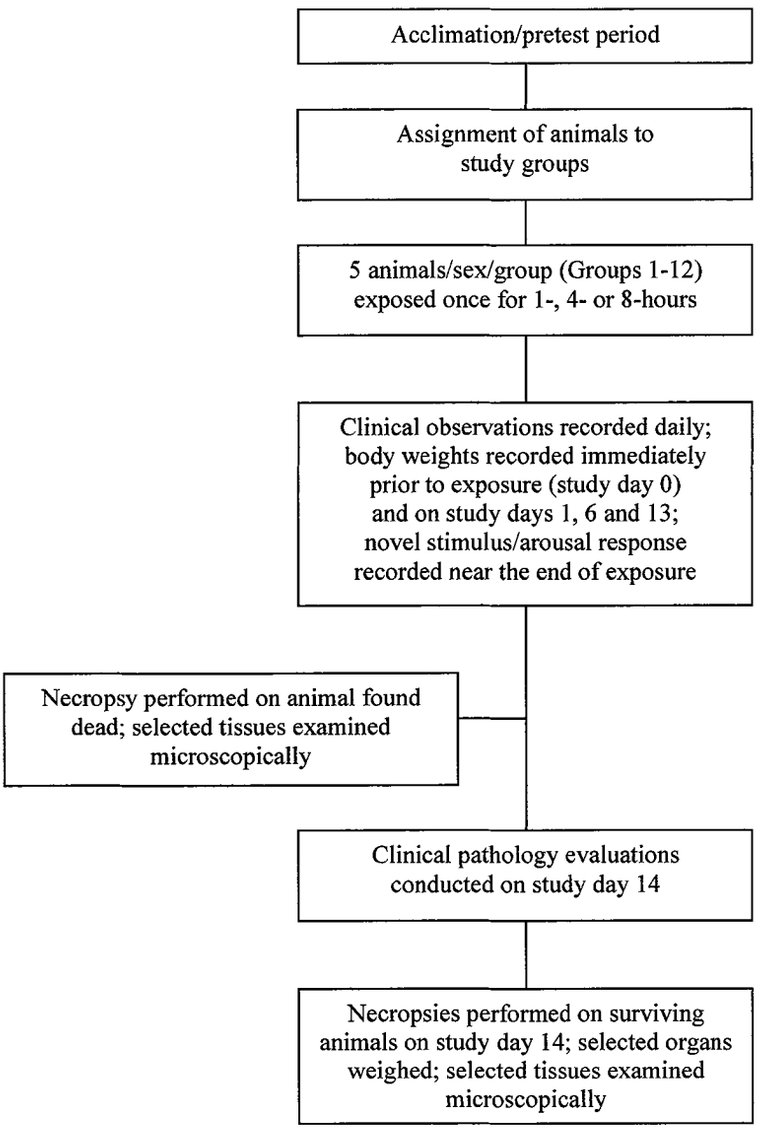
The following computer protocols were used for data collection during the study:

Computer Protocol	Type of Data Collected
WIL-14068R	Preliminary study data (Appendix B)
WIL-14068F	Main study data (1-hour exposure)
WIL-14068D	Main study data (4-hour exposure)
WIL-14068E	Main study data (8-hour exposure)
WIL-14068P	Pretest data for main study (Appendix E)

2.2. KEY STUDY DATES

Date(s)	Event(s)
20 November 2007	Experimental starting date (animal receipt)
27 and 28 November 2007	Assignment to preliminary study groups
28 November 2007	Experimental start date (initiation of exposure for preliminary study; study day 0)
3 December 2007	Assignment to main study groups
3 December 2007	Initiation of exposures for main study (4-hour exposure; study day 0)
4 December 2007	8-hour exposure for main study (study day 0)
7 December 2007	1-hour exposure for main study (study day 0)
17 December 2007	Scheduled necropsy (4-hour exposure; study day 14)
18 December 2007	Scheduled necropsy (8-hour exposure; study day 14)
21 December 2007	Scheduled necropsy (1-hour exposure; study day 14)
28 February 2008	Experimental termination (completion) date (last histopathological examination)

3. STUDY DESIGN



4. EXPERIMENTAL PROCEDURES - MATERIALS AND METHODS

4.1. TEST SUBSTANCE IDENTIFICATION

The test substance, allyl alcohol, was received on behalf of the sponsor from Aldrich Chemical Company, Inc., Sheboygan Falls, Wisconsin, on 2 October 2007, as follows:

Identification	Quantity Received	Physical Description
Allyl Alcohol Lot no. 02109PE CAS no. 107-18-6 [WIL log no. 7676A]	2 bottles Total gross weight: 4430.7 g	Clear, colorless liquid

Documentation regarding the purity and stability of the test substance is on file with the sponsor and WIL Research Laboratories LLC. A Certificate of Analysis for the test substance was provided by the supplier and is presented in Appendix C. The purity of the test substance was 99.4%. The test substance was stored at room temperature and was considered stable under this condition. Although the supplier did not provide an expiration date, purity stability analysis was performed following actual exposures. Because the purity of the test substance (99.1%) after use in and storage during the study was 99.7% of the purity value provided in the Certificate of Analysis, the test substance was considered to be stable during use on the study. A reserve sample of the test substance (approximately 4.6 g) was collected on 13 November 2007, and stored in the Archives of WIL Research Laboratories, LLC.

4.2. TEST SYSTEM

Crl:CD(SD) rats from Charles River Laboratories, Inc., Raleigh, North Carolina were used as the test system on this study. This species and strain of animal is recognized as appropriate for acute inhalation studies. The Sprague Dawley rat was used because it is a widely used strain for which significant historical control data are available. The animals were approximately 11 to 12 weeks old at the initiation of exposure.

4.3. ORGANIZATION OF TEST GROUPS, EXPOSURE LEVELS AND EXPOSURE REGIMEN

The test substance or filtered air (control group) was administered as a whole-body inhalation exposure for 1-, 4- and 8-hour exposure durations. The main study was conducted using 1-, 4- and 8-hour exposure durations with 4 exposure levels per exposure duration (3 test substance and 1 control). Exposures for the main study were conducted on 3 separate days (1 day per exposure duration); the day of exposure was considered to be study day 0 for each exposure duration.

The following tables present the study group assignment:

Main Study - 1-Hour Exposure Duration (WIL-14068F)

Group Number	Test Substance	Target Exposure Level (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
1	Filtered Air	0	1	5	5
2	Allyl Alcohol	50	1	5	5
3	Allyl Alcohol	200	1	5	5
4	Allyl Alcohol	400	1	5	5

Main Study - 4-Hour Exposure Duration (WIL-14068D)

Group Number	Test Substance	Target Exposure Level (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
5	Filtered Air	0	4	5	5
6	Allyl Alcohol	20	4	5	5
7	Allyl Alcohol	50	4	5	5
8	Allyl Alcohol	100	4	5	5

Main Study - 8-Hour Exposure Duration (WIL-14068E)

Group Number	Test Substance	Target Exposure Level (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
9	Filtered Air	0	8	5	5
10	Allyl Alcohol	10	8	5	5
11	Allyl Alcohol	20	8	5	5
12	Allyl Alcohol	50	8	5	5

Exposure levels were selected by the sponsor based on results from previous toxicity studies with the test substance.

The selected route of administration for this study was whole-body inhalation exposure because this is a reliable and accurate method of evaluating toxicity and is a possible route of human exposure. The number of animals selected for this study was the minimum required to meet the objectives of the study, yield statistically and scientifically meaningful data and to comply with testing guidelines for acute inhalation studies.

4.4. EXPOSURE METHODS

Animal exposures were conducted for 1, 4 and 8 hours as whole-body exposures in four 500-L stainless steel and glass whole-body inhalation exposure chambers. One chamber was dedicated for 1 group for each day's exposure. Exposure methods, durations and conditions are presented in detail in Appendix D.

Temperature, relative humidity, ventilation rate and negative pressure within each chamber were continually monitored and recorded approximately every 30 minutes. The daily mean chamber temperature ranged from 21°C to 24°C. The daily mean chamber relative humidity ranged from 13% to 57%. All chambers were operated under dynamic conditions, at least 12 air changes per hour, at a slight negative pressure. Oxygen content for the test substance chambers was measured on 21 November 2007 during the method development phase of the study and was at least 19% for all test substance chambers. Chamber environmental conditions are summarized in Appendix D.

Animals were housed in a normal animal colony room during non-exposure hours. Animals were individually housed in stainless steel wire-mesh caging during the exposures. For each exposure, the animals were transferred to exposure caging, transported to the exposure chamber room, exposed for the requisite duration and returned to their home cages. Food and water were withheld during the exposure periods.

4.5. EXPOSURE ATMOSPHERE GENERATION METHODS

Allyl alcohol was generated for exposure as a vapor using a bubbler-type vaporization system located within a containment cart that was exhausted through the facility exhaust system. Nitrogen was metered into the inlet stem of the gas washing bottle containing an appropriate quantity of test substance. Using a rotameter-type flowmeter, nitrogen was metered to the gas washing bottle. Nitrogen bubbled through a fritted disc and the liquid test substance to produce vapors of the test substance. The test substance vapors were piped to the chamber inlet and diluted to the desired concentration by mixing with chamber supply air. The control groups were exposed to clean, filtered air. A detailed description of the generation methods is presented Appendix D.

4.6. METHODS FOR CHARACTERIZATION OF EXPOSURE ATMOSPHERES

4.6.1. NOMINAL EXPOSURE CONCENTRATIONS

A nominal exposure concentration was calculated for each test substance group from the total amount of test substance used during the exposure and the total volume of air passed through the chamber during that day's exposure. The amount of test substance used was obtained by weighing the gas washing bottle prior to and after each day's exposure. The total volume of air passed through each chamber was calculated from the daily average chamber ventilation flow rate in liters per minute (LPM) and the exposure duration. The nominal concentration was calculated as follows.

$$\text{Concentration (ppm)} = \frac{WT \times MV \times 10^6}{GMW \times CF \times DUR}$$

Where:

WT = Weight of test substance used, grams
MV = Molar volume at 730 mmHg and 21°C, 25.11 L/mole
10^6 = ppm conversion factor
GMW = Test substance gram molecular weight, 58.08 g/mole
CF = Daily average chamber flow rate for a given day, LPM
DUR = Duration of the daily exposure, minutes

4.6.2. ANALYZED EXPOSURE CONCENTRATIONS

Analyzed exposure concentrations of the test substance atmospheres were determined at approximately 30-minute intervals for the 1-hour exposures and at approximately 60-minute intervals for the 4- and 8-hour exposures by standard gas chromatographic (GC) methods. Samples were collected manually from the approximate animal-breathing zone of the inhalation exposure chambers. A natural log quadratic equation based on the GC calibration curve was used to calculate the measured concentrations in parts per million (ppm). Details of these concentration analyses and results are presented in Appendix D and the results are summarized in Section 6.1.

4.7. ANIMAL RECEIPT AND ACCLIMATION/PRETEST PERIOD

Seventy male and 70 female Crl:CD(SD) rats were received in good health on 20 November 2007, from Charles River Laboratories, Inc., Raleigh, North Carolina. The animals were approximately 64 (males) or 56 days (females) old at receipt. Each animal was examined by a qualified technician on the day of receipt and weighed 6 days later. Additionally for the preliminary study, 3 Crl:CD(SD) rats/sex were transferred from the WIL stock colony. Each animal was uniquely identified by a Monel® metal ear tag displaying the permanent identification number. All animals were housed for a minimum 8- or 13-day acclimation/pretest period for the preliminary and main study, respectively.

During this period, each animal was observed twice daily for mortality and changes in general appearance or behavior.

Pretest data collection began on 26 November 2007. Individual body weights were recorded and detailed physical examinations were performed periodically during the pretest period. Pretest data are presented in Appendix E.

4.8. ANIMAL HOUSING

Upon arrival, all animals were housed individually in clean, stainless steel, wire-mesh cages suspended above cage-board. Animals were maintained in accordance with the *Guide for the Care and Use of Laboratory Animals* (National Research Council, 1996). The animal facilities at WIL Research Laboratories, LLC are accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC International).

4.9. DIET, DRINKING WATER AND MAINTENANCE

The basal diet used in this study, PMI Nutrition International, LLC, Certified Rodent LabDiet® 5002, is a certified feed with appropriate analyses performed by the manufacturer and provided to WIL Research Laboratories, LLC. Reverse osmosis-treated (on-site) drinking water, delivered by an automatic watering system, and the basal diet were provided ad libitum throughout the study with the following exception. Food and water were withheld during exposure and food, but not water, was withheld during the period of fasting prior to blood collection. Municipal water supplying the facility was analyzed for contaminants according to the standard operating procedures. The results of the diet and water analyses are maintained at WIL Research Laboratories, LLC. No contaminants were present in animal feed or water at concentrations sufficient to interfere with the objectives of this study.

4.10. ENVIRONMENTAL CONDITIONS

All animals were housed throughout the acclimation period and during the study in an environmentally controlled room. The room temperature and humidity controls were set

to maintain daily averages of 71 ± 5°F (22 ± 3°C) and 50 ± 20% relative humidity. Room temperature and relative humidity were controlled and monitored using the Metasys® DDC Electronic Environmental control system. These data were recorded approximately hourly and are summarized in Appendix F. Actual mean daily temperature ranged from 70.2°F to 70.6°F (21.2°C to 21.4°C) and mean daily relative humidity ranged from 34.5% to 48.0% during the study. Fluorescent lighting provided illumination for a 12-hour light (0600 hours to 1800 hours)/12-hour dark photoperiod. Air handling units were set to provide a minimum of 10 fresh air changes per hour.

4.11. ASSIGNMENT OF ANIMALS TO TREATMENT GROUPS

On 28 November 2007 and 3 December 2007 (prior to exposure) for the preliminary and main studies, respectively, all available rats were weighed and examined in detail for physical abnormalities. These data were collected using the WIL Toxicology Data Management System (WTDMS™) and reviewed by the study director. The animals judged suitable for assignment to the study were selected for use in a computerized randomization procedure. A printout containing the animal numbers, corresponding body weights and individual group assignments was generated using simple randomization. The animals were then arranged into groups according to the printout. Individual body weights at randomization were within ± 20% of the mean for each sex. For the preliminary study, each group (Groups 4A, 4B, 8A and 12A) consisted of 3 males and 3 females. For the main study, each group (Groups 1-12) consisted of 5 males and 5 females. Individual body weights ranged from 337 g to 392 g for males and from 230 g to 275 g for females in the preliminary study groups, and from 336 g to 443 g for males and from 207 g to 253 g for females in the main study groups at the initiation of test substance exposure.

5. PARAMETERS EVALUATED

5.1. CLINICAL OBSERVATIONS AND SURVIVAL

All animals were observed twice daily, once in the morning and once in the afternoon (except on the day of the scheduled necropsy), for mortality and moribundity.

On the day of exposures, clinical examinations were performed 30 minutes into exposure (all exposure durations), 1 hour into exposure (4- and 8-hour exposures), 4 hours into exposure (8-hour exposure), at the end of each exposure duration and within 1 hour post-exposure designated as 1-hour post-dosing for report presentation purposes (all exposure durations). All significant findings were recorded on exposure days. During the post-exposure (recovery) period, the animals were observed twice on study day 1, once in the morning and once in the afternoon, and once daily at approximately the same time each day on remaining post-exposure days (study days 2-13).

5.1.1. EXAMINATIONS DURING EXPOSURE

Clinical examinations were performed by technicians trained and qualified for Functional Observational Battery assessments; one technician performed all clinical examinations for all times during all exposures. The following parameters represent findings that could be reliably observed for all animals in each exposure chamber.

Posture (sitting or standing normally; asleep, lying on side or curled up; **lying on side with limbs in air**; **prostration**; or **other unusual posture**)
Convulsions (**present** or absent)
Tremors (**present** or absent)
Respiratory Character (normal, **increased rate, decreased rate**)
Hyperactivity (**present** or absent)
Bizarre/Stereotypic Behavior (**present [with description]** or absent)

These parameters were recorded only if they were considered to be abnormal findings (listed above in **bold**).

5.1.2. NOVEL STIMULUS/AROUSAL RESPONSE

Special attention was given to the state of arousal and response to novel stimuli during exposure. Towards the end of each exposure, the animal's response to a noise stimulus was measured. The same 3 technicians trained and qualified for Functional Observational Battery assessments made all of the observations for this study. For each exposure chamber, the technicians were each assigned to simultaneously observe the reaction of 3 or 4 of the 10 animals. These observations were difficult to conduct because the animals react within a second of the noise.

The noise was produced by allowing an item of appropriate mass (approximately 50 grams) to strike the steel side of the exposure chamber at the approximate level of the cage rack. The stimulus item was attached to a length of cotton rope that was held against the steel side of the chamber approximately 45 cm from the item. The stimulus item was raised until the rope was approximately perpendicular to the side of the chamber, and the item was released. The response to the stimulus was recorded for each animal visible in the chamber as: (1) no reaction; (2) slight reaction (ear flick, flinch or some evidence that the stimulus was heard); or (3) more energetic response (jump and/or vocalization). For 1-hour exposures, the response to a loud-noise stimulus was evaluated after the 30 minutes into exposure clinical examinations were performed.

5.1.3. EXAMINATIONS IMMEDIATELY AFTER EXPOSURE

Immediately after exposure, findings noted at the clinical examination or no significant clinical observations were recorded for individual animals during handling and while on a flat plastic surface (e.g., open field arena). An assessment of gait was also determined while briefly placed in the open field arena. If the animal did not move, the animal was prodded in order to assess gait. This first post-exposure observation was performed as soon as possible after animals were unloaded from the inhalation chamber. Observations were made for all animals within approximately 22 to 71 minutes after exposure to allyl alcohol was terminated. The animals from all exposure levels for each exposure duration were examined in random order with respect to exposure level. These observations were

conducted by the same technician who made all the observations during exposure. The observer was aware of exposure level.

5.1.4. EXAMINATIONS DURING THE RECOVERY PERIOD

Observations described in Section 5.1.3. were made in the morning and evening on the day after exposure and then once a day for 12 additional days. The morning observations the day after exposure were conducted at approximately 18 to 19 hours after exposures were terminated. The evening observations made the day after exposure were performed approximately 24 to 25 hours after exposure to allyl alcohol was terminated. The same technician who made observations during and immediately after exposure continued to make all observations during the first 5-7 days after exposure. Two different technicians conducted clinical observations from study day 6 (1-Hour Exposure) or 8 (4- and 8-Hour Exposures) to study day 14.

5.2. BODY WEIGHTS

Individual body weights were recorded prior to exposures on 26 November 2007 and on the days of randomization for the main study groups. Individual body weights were also recorded immediately prior to each exposure and on study days 1, 6 and 13 for each exposure duration of the main study. Mean body weights and mean body weight changes (main study only) were calculated for the corresponding intervals.

5.3. CLINICAL PATHOLOGY (MAIN STUDY)

Blood samples for clinical pathology evaluations (hematology, coagulation and serum chemistry) were collected from all animals on the day of the scheduled necropsy (study day 14). The animals were fasted overnight prior to blood collection. Blood was collected for hematology and serum chemistry evaluation via the retro-orbital sinus of animals anesthetized by isoflurane inhalation. Blood was collected for coagulation parameters at the time of euthanasia via the vena cava of animals anesthetized by isoflurane inhalation. Blood was collected into tubes containing EDTA (hematology), sodium citrate (coagulation) or no anticoagulant (serum chemistry). Clinical pathology

methods, procedures and references are presented in Appendix G. Interpretation of the clinical pathology data was performed by Ellen L. Ziemer, DVM, MS, PhD, DACVIM, DACVP (Appendix I). The following parameters were evaluated:

5.3.1. HEMATOLOGY AND COAGULATION

Total leukocyte count (White Cells)
Erythrocyte count (Red Cells)
Hemoglobin
Hematocrit
Mean corpuscular volume (MCV)
Mean corpuscular hemoglobin (MCH)
Mean corpuscular hemoglobin concentration (MCHC)
Platelet count (Platelet)
Prothrombin time (ProTime)
Activated partial thromboplastin time (APTT)
Reticulocyte count
  Percent (Reticulocyte)
  Absolute (Retic Absolute)
Differential leukocyte count -
  Percent and absolute
    -Neutrophil
    -Lymphocyte
    -Monocyte
    -Eosinophil
    -Basophil
    -Large unstained cell
Platelet estimate[a]
Red cell morphology (RBC Morphology)[a]

( ) - Designates tabular abbreviation
[a] - Presented on individual tables if a manual differential was performed, and the manual data were accepted and reported instead of the automated differential data

5.3.2. SERUM CHEMISTRY

Albumin
Total protein
Globulin [by calculation]
Albumin/globulin ratio (A/G Ratio) [by calculation]
Total bilirubin (Total Bili)
Urea nitrogen
Creatinine
Alkaline phosphatase (AlkalinePhos'tse)
Alanine aminotransferase (Alanine Transfer)
Aspartate aminotransferase (AspartatTransfer)
Gamma glutamyltransferase (GlutamylTransfer)
Glucose
Total cholesterol (Cholesterol)
Calcium
Chloride
Phosphorus
Potassium
Sodium
Triglycerides (Triglyceride)

( ) - Designates tabular abbreviation

5.4. ANATOMIC PATHOLOGY

5.4.1. MACROSCOPIC EXAMINATION

Main study animals were euthanized by isoflurane anesthesia and exsanguinated; a complete necropsy was conducted on all main study animals at the scheduled necropsy (study day 14) and on animals that were found dead. The necropsies included, but were not limited to, examination of the external surface, all orifices, and the cranial, thoracic, abdominal and pelvic cavities, including viscera. The following tissues and organs were collected and placed in 10% neutral-buffered formalin:

Kidneys (2)
Larynx
Liver (sections of 2 lobes)
Lungs (including bronchi, fixed by inflation with fixative)
Nasal Tissues[a]
Trachea
Gross lesions (when possible)

[a] - Following fixation in formalin, nasal tissues were decalcified and sections of 6 nasal levels were prepared for microscopic examination (Appendix H).

5.4.2. ORGAN WEIGHTS (MAIN STUDY)

The following organs were weighed from all animals at the scheduled necropsy:

Kidneys Lungs
Liver

Paired organs were weighed together. Organ-to-final-body-weight ratios were calculated.

5.4.3. SLIDE PREPARATION AND MICROSCOPIC EXAMINATION (MAIN STUDY)

After fixation, protocol-specified tissues were shipped to Biotechnics, Inc. (a division of WIL Research Laboratories, LLC), Hillsborough, North Carolina, for processing. The tissues were trimmed according to Biotechnics' standard operating procedures and the protocol. Trimmed tissues were processed into paraffin blocks, sectioned at 4 to 6 microns, mounted on glass microscope slides and stained with hematoxylin and eosin.

Microscopic examination was performed on all tissues listed in Section 5.4.1. collected from the animal that was found dead and from all animals at the scheduled necropsy. All 6 nasal levels taken at defined landmarks as described in Mery, et al. (1994) were examined microscopically. For nasal cavity lesions, descriptive diagnoses and severity grades were used to form an opinion regarding the reversibility of epithelial changes. One of 5 severity grades was used: minimal, mild, moderate, severe, and severe irreversible. These 5 grades were used to convey the extent, severity, and/or depth of the changes. Severe-irreversible was used when, in the opinion of the study pathologist, the changes would not likely completely recover to the original normal mucosa/submucosa at the microscopic level. Often, damaged epithelium may regenerate, but does so in a disorganized or undifferentiated fashion (Gaskell, 1990, page 277). Without complete recovery, the lesion would be considered irreversible (also see discussion in Sections 6.4.5.3. and 7.). Missing tissues were identified as not found at necropsy, lost at necropsy, lost during processing or other designations as appropriate. Tissues may appear on the report tables as not examined due to the tissue not being in the plane of

section, not present at trimming, etc. Microscopic examination was performed by Catherine Picut, Senior Pathologist, VMD, DACVP, DABT, WIL Research Laboratories, LLC (Appendix I).

5.5. STATISTICAL METHODS

All statistical tests were performed using appropriate computing devices or programs. Analyses were conducted using two-tailed tests (except as noted otherwise) for minimum significance levels of 1% and 5%, comparing each test substance-exposed group to the control group by sex. Each mean was presented with the standard deviation (S.D.), standard error (S.E.) and the number of animals (N) used to calculate the mean. In addition, percent difference from the control group is presented for body weights, clinical pathology parameters and organ weights. Due to the different rounding conventions inherent in the types of software used, the means, standard deviations and standard errors on the summary and individual tables may differ by ±1 in the last significant figure.

Body weight, body weight change, clinical pathology (except gamma glutamyltransferase) and organ weight data were subjected to a parametric one-way analysis of variance (ANOVA) (Snedecor and Cochran, 1980) to determine intergroup differences. If the ANOVA revealed statistically significant ($p<0.05$) intergroup variance, Dunnett's test (Dunnett, 1964) was used to compare the test substance-exposed groups to the control group.

5.6. DATA RETENTION

The sponsor has title to all documentation records, raw data, specimens, slides or other work product generated during the performance of the study. All work product generated by WIL Research Laboratories, LLC, including raw paper data and specimens, are retained in the Archives at WIL Research Laboratories, LLC as specified in the study protocol. A reserve sample of the test substance is retained in the Archives at WIL Research Laboratories, LLC in compliance with regulatory requirements.

Following issuance of the final report, all work product including raw paper data, the retention sample and pertinent electronic storage media will be shipped to the Archives of Experimental Pathology Laboratories Inc., (EPL Archives, Inc., 45610 Terminal Drive, Sterling, Virginia 20166). EPL Archives, Inc. will be responsible for assurance that all work product is stored in compliance with regulatory requirements and for a period of 10 years following issuance of the final report.

6. RESULTS AND DISCUSSION

6.1. EXPOSURE ATMOSPHERE RESULTS

Inhalation Report: Appendix D

Homogeneity of exposure concentrations was evaluated during the method development phase of the study. The results of the homogeneity analyses indicated that the homogeneity of each exposure chamber was adequate for the purpose of this study.

The daily nominal concentrations for the test substance groups are summarized in the following table:

Group Number	Nominal Concentration (ppm)
2	60.0
3	219.6
4	463.2
6	17.9
7	41.9
8	96.1
10	10.8
11	18.7
12	56.3

The daily mean analyzed concentrations for all groups during the main study are summarized in the following table:

Group Number	Target Allyl Alcohol Exposure Level (ppm)	Exposure Duration (hours)	Concentration (ppm)	Standard Deviation	Number of Samples
1	0	1	0.0	NA	1
2	50	1	50.9	1.8	2
3	200	1	220.3	8.8	2
4	400	1	402.9	18.1	2
5	0	4	0.0	0.0	4
6	20	4	21.9	1.6	5
7	50	4	52.2	4.8	6
8	100	4	102.4	3.5	4
9	0	8	0.0	0.0	8
10	10	8	10.2	0.8	9
11	20	8	21.1	0.9	8
12	50	8	51.7	3.2	9

6.2. 1-HOUR EXPOSURE (MAIN STUDY)

6.2.1. CLINICAL OBSERVATIONS AND SURVIVAL

Summary Data: Tables 1, 2, 3, 5, 6, 7, 8

Individual Data: Tables A1, A2, A3, A5, A6, A7, A8

All animals survived to the scheduled necropsy. For standard clinical observations, there were no test substance-related effects on behavior during exposure, at the end of exposure, 1-hour post exposure or during the recovery period. Test substance-related clinical findings included gasping, reddened ears, forelimbs and/or hindlimbs and red or clear material around the mouth and on ventral abdominal or urogenital surfaces. Reddened ears, forelimbs and/or hindlimbs are suggestive of an alcohol flush reaction caused by the presence of the aldehyde metabolite (acrolein). Therefore, this response will be referred to as flushing. The only clinical finding during exposure was gasping, noted for 1 female at 400 ppm. Gasping did not persist to 1 hour post-exposure and was not noted during the recovery period for this animal. Flushing of the ears, forelimbs and/or hindlimbs and red or clear material around the mouth and on ventral abdominal or urogenital surfaces was noted within 1 hour post-exposure in the 50, 200 and/or 400 ppm groups. Although all males in the 200 and 400 ppm groups had flushing of the forelimbs

and hindlimbs, the incidences of the findings at 1-hour post-exposure were generally concentration-dependent. None of these findings were present during the 14-day recovery period. A summary of selected clinical observations during exposure and post-exposure is presented in Text Table 1.

Text Table 1. Selected Clinical Observations - Main Study (1-Hour Exposure)

	Allyl Alcohol							
Sex	**Males**				**Females**			
Exposure Duration (hours)	1	1	1	1	1	1	1	1
Exposure Level (ppm)	0	50	200	400	0	50	200	400
Observation[a]								
Gasping								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/1
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Reddened forelimb(s)								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	1/1	5/5	5/5	0/0	0/0	3/3	4/4
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Reddened hindlimb(s)								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	1/1	5/5	5/5	0/0	0/0	2/2	4/4
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Reddened ear(s)								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	0/0	4/4	0/0	0/0	0/0	0/0
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Red/clear material around the mouth								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	1/1	2/2	0/0	0/0	2/2	3/3
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Clear material ventral abdominal/ urogenital area								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	0/0	0/0	0/0	0/0	1/1	4/2
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

a = Observations reported as total occurrence/number of animals

All other clinical findings in the test substance-exposed groups were observed with similar incidence in the control group, were limited to single animals, were not noted in an exposure-related manner and/or were common findings for laboratory rats of this age and strain.

6.2.2. NOVEL STIMULUS/AROUSAL RESPONSE

Summary Data: Table 4

Individual Data: Table A4

Novel stimulus/arousal response findings (response to a loud noise) for the 1-hour exposure duration are summarized in Text Table 2.

Text Table 2. Summary of Novel Stimulus/Arousal Response Findings During Exposure – 1-Hour Exposure

Sex	Males				Females			
Exposure Level (ppm)	**0**	**50**	**200**	**400**	**0**	**50**	**200**	**400**
Number of Animals Observed	5	5	5	5	5	5	5	5
No Reaction to Stimulus	1	0	3	0	1	0	3	3
Slight Reaction to Stimulus[a]	4	5	2	5	4	5	2	2
Energetic Response to Stimulus[b]	-	-	-	-	-	-	-	-

[a] = Ear flick, flinch or some evidence that the stimulus was heard
[b] = Jump and/or vocalization

For males and females combined, the incidence of "no reaction to stimulus" was 2 of 10, 0 of 10, 6 of 10 and 3 of 10 for the 0, 50, 200 and 400 ppm groups, respectively. The results for the 200 ppm group suggest a sedating effect of allyl alcohol vapor. Although 3 of 5 females in the 400 ppm group failed to respond to the stimulus, all 5 males responded. Although there appeared to be test substance-related effects, there was no clear dose response.

6.2.3. BODY WEIGHTS

Summary Data: Tables 9, 10, 11; Figures 1, 2

Individual Data: Tables A9, A10, A11

There were no test substance-related effects on body weights. There were no statistically significant differences when the control and test substance-exposed groups were compared.

6.2.4. CLINICAL PATHOLOGY

6.2.4.1. HEMATOLOGY AND COAGULATION

Summary Data: Table 12

Individual Data: Table A12

Pathology Report: Appendix I

Historical Control Data: Appendix J

There were no test substance-related alterations in hematology and coagulation parameters. In the 1-hour exposure-duration groups, the mean absolute eosinophil count was statistically significantly lower in the 200 ppm group females when compared to the control group. However, this difference from the control group value was small in magnitude and not dose-related. Furthermore, the mean absolute eosinophil count value in the 200 ppm group females was within the WIL historical control data ranges (version 2.5). There were no other statistically significant differences when the control and test substance-exposed groups were compared.

6.2.4.2. SERUM CHEMISTRY

Summary Data: Table 13

Individual Data: Table A13

Pathology Report: Appendix I

There were no test substance-related alterations in serum chemistry parameters. There were no statistically significant differences when the control and test substance-exposed groups were compared.

6.2.5. ANATOMIC PATHOLOGY

6.2.5.1. MACROSCOPIC EXAMINATION

Summary Data: Table 14

Individual Data: Table A14

Pathology Report: Appendix I

Review of the gross necropsy observations revealed no findings that were considered to be associated with exposure to the test substance.

6.2.5.2. ORGAN WEIGHTS

Summary Data: Table 15

Individual Data: Tables A15, A16

Pathology Report: Appendix I

There were no test substance-related alterations in final body weight or organ weights. There were no statistically significant differences when the control and test substance-exposed groups were compared.

6.2.5.3. MICROSCOPIC EXAMINATION

Summary Data: Table 16

Individual Data: Table A14

Pathology Report: Appendix I

Microscopic examinations were performed on tissues collected at necropsy following the 14-day observation period (study day 14). There were no test substance-related effects on the liver, kidneys, lungs or trachea.

Text Table 3 presents the summary incidence of selected histopathological findings for selected representative nasal levels and a combined summary of selected findings at all nasal levels. (See Summary Data Table 16 for the incidence of all histopathological findings for each of the 6 nasal levels.) The combined summary presents the number of animals with the selected findings taking into account all 6 nasal levels. The severity grade for each finding is presented as the highest grade for any of the 6 nasal levels.

Exposure to test substance for 1 hour caused degeneration of olfactory epithelium, metaplasia of olfactory epithelium, chronic inflammation and hemorrhage. Degeneration of olfactory epithelium (described below) and chronic inflammation (described below) were present in males and females, while metaplasia of olfactory epithelium (described below) was present in one 50 ppm group female. The severity of the changes suggested that these changes were of no clinical significance to the rats, and that the findings were considered to be reversible.

Degeneration of olfactory epithelium (noted in animals in all 3 test substance groups) was typically seen in the dorsal meatus of nasal level II and in the dorsal meatus and on the medial aspects of ethmoturbinates in nasal levels III, IV, V and VI. Degeneration was minimal to moderate and characterized by disruption of the architecture of the epithelial cells with cell loss, occasional nuclear debris and in moderate cases, flattening of epithelium. Flattening of the epithelium reflects a reduced number of cellular layers as a result of loss of sensory cells (Boorman et al., 1990). Although a clear exposure

concentration relationship was not apparent for degeneration of the olfactory epithelium, this finding was absent for all 10 control males and females exposed for 1 hour (or for any of the 30 control animals on study). Therefore, the change was considered test substance-related for all 3 exposure concentrations.

Chronic inflammation was present with increased severity and/or incidence in the 200 and 400 ppm group males and females. For males and females combined, the incidence of inflammation was 3/10, 2/10, 4/10 and 9/10 for the 0, 50, 200 and 400 ppm groups, respectively (derived from Text Table 3). Severity was greater (to moderate) in the 200 and 400 ppm group males. This change consisted of an accumulation of lymphocytes within the nasoturbinates, maxilloturbinates, lateral walls, and occasionally the septum and was most commonly seen at nasal levels I and II. There was commonly acanthosis of overlying stratified epithelium with leukocyte transmigration within the epithelium. Bowman's glands were prominent in areas of chronic inflammation.

One female in the 50 ppm group had mild metaplasia of olfactory epithelium, where normal olfactory epithelium had become columnar, ciliated and eosinophilic, similar to respiratory epithelium. This change was seen on the lateral aspect of the dorsal meatus in nasal level IV, which is a typical area for this change to occur (Gaskell, 1990; Dorman, et al., 2008). There was accompanying degeneration of olfactory epithelium in the adjacent tissue. The basement membrane remained intact. The change was limited to the epithelium, was localized and of clinically insignificant severity, and was considered reversible. Metaplasia was not seen in the higher exposure groups or in the control group.

Hemorrhage was present in one 200 ppm group male and one 400 ppm group male. It was minimal to mild and present within the submucosa of the ethmoturbinates. Hemorrhage was considered a test substance-related effect and was not present in the control group animals in this portion of the study.

All findings noted in the nasal cavity 14 days following a 1-hour exposure to concentrations of 50, 200 and 400 ppm were minimal to moderate in severity and were considered reversible based on the extent, severity, and/or depth of the changes. Based on the 1 female with metaplasia and 2 females with degeneration of olfactory epithelium in the 50 ppm group females, the no-observed-effect level (NOEL) for females exposed for 1 hour was less than 50 ppm, the lowest concentration tested. Based on the olfactory epithelial degeneration, hemorrhage and chronic inflammation in the 200 ppm group males, the NOEL in males was 50 ppm 14 days following the 1-hour exposure.

Text Table 3. Incidence Of Selected Histopathologic Findings For Selected Nasal Levels And A Summary Of Selected Findings At All Nasal Levels[a]
Study Day 14
1-Hour Exposure

Sex	Males				Females			
Exposure Level (ppm)	**0**	**50**	**200**	**400**	**0**	**50**	**200**	**400**
Nasal Level I [b]	5	5	5	5	5	5	5	5
Inflammation, Chronic	1	1	1	2	1	1	2	5
Minimal	1	1	0	1	0	1	1	1
Mild	0	0	1	1	1	0	1	4
Nasal Level II [b]	5	5	5	5	5	5	5	5
Inflammation, Chronic	0	0	1	3	0	0	1	0
Minimal	-	-	0	1	-	-	0	-
Mild	-	-	0	1	-	-	1	-
Moderate	-	-	1	1	-	-	0	-
Degeneration, Olfactory Epithelium	0	0	0	1	0	0	0	0
Minimal	-	-	-	1	-	-	-	-
Mild	-	-	-	0	-	-	-	-
Moderate	-	-	-	0	-	-	-	-
Nasal Level III [b]	5	5	5	5	5	5	5	5
Degeneration, Olfactory Epithelium	0	0	0	0	0	0	0	1
Minimal	-	-	-	-	-	-	-	0
Mild	-	-	-	-	-	-	-	0
Moderate	-	-	-	-	-	-	-	1
Nasal Level IV [b]	5	5	5	5	5	5	5	5
Degeneration, Olfactory Epithelium	0	0	1	0	0	2	0	1
Mild	-	-	1	-	-	2	-	0
Moderate	-	-	0	-	-	0	-	1
Metaplasia, Olfactory to Respiratory Epithelium	0	0	0	0	0	1	0	0
Mild	-	-	-	-	-	1	-	-

[a] = Summary Data Table 16 presents the incidence of all histopathological findings for each of the 6 nasal levels.
[b] = Number of tissues examined from each group

Text Table 3. Incidence Of Selected Histopathologic Findings For Selected Nasal Levels And A Summary Of Selected Findings At All Nasal Levels (continued)
Study Day 14
1-Hour Exposure

Sex	Males				Females			
Exposure Level (ppm)	**0**	**50**	**200**	**400**	**0**	**50**	**200**	**400**
Summary[c]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	1	2	0	2	0	1
Minimal	-	-	0	2	-	0	-	0
Mild	-	-	1	0	-	2	-	0
Moderate	-	-	0	0	-	0	-	1
Inflammation, Chronic	1	1	1	4	2	1	3	5
Minimal	1	1	0	2	0	1	1	0
Mild	0	0	0	1	2	0	2	5
Moderate	0	0	1	1	0	0	0	0
Hyperplasia, Goblet Cell	1	2	2	1	0	0	0	0
Minimal	0	1	0	0	-	-	-	-
Mild	1	1	2	1	-	-	-	-
Metaplasia, Olfactory to Respiratory Epithelium	0	0	0	0	0	1	0	0
Minimal	-	-	-	-	-	0	-	-
Mild						1		
Hemorrhage	0	0	1	1	0	0	0	0
Minimal	-	-	0	1	-	-	-	-
Mild	-	-	1	0	-	-	-	-

[c] = Summary of number of animals with lesion taking into account all 6 nasal levels; grade for each lesion is the highest grade for any of the 6 nasal levels.

6.3. 4-HOUR EXPOSURE (MAIN STUDY)

6.3.1. CLINICAL OBSERVATIONS AND SURVIVAL

Summary Data: Tables 17, 18, 19, 20, 22, 23, 24, 25

Individual Data: Tables A17, A18, A19, A20, A22, A23, A24, A25

All animals survived to the scheduled necropsy. For standard clinical observations, there were no test substance-related effects on behavior during exposure, at the end of exposure, 1 hour post-exposure or during the recovery period. Test substance-related clinical findings included gasping, flushing of the forelimbs and/or hindlimbs and red or clear material around the mouth or nose observed primarily at the 1 hour post-exposure

observation in the 100 ppm group females or in the 50 and 100 ppm group males. When these findings were observed in both the 50 and 100 ppm groups, the incidences were exposure concentration-dependent. For females exposed at 100 ppm for 4 hours, yellow material around the urogenital area was observed at 1 hour post-exposure. Complete recovery of all exposure-related clinical findings occurred by study day 2. A summary of selected clinical observations during exposure and post-exposure is presented in Text Table 4.

Text Table 4. Selected Clinical Observations - Main Study (4-Hour Exposure)

	Allyl Alcohol							
Sex	**Males**				**Females**			
Exposure Duration (hours)	4	4	4	4	4	4	4	4
Exposure Level (ppm)	0	20	50	100	0	20	50	100
Observation[a]								
Gasping								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	1/1
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	1/1	5/5	0/0	0/0	0/0	0/0
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Reddened forelimb(s)								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	2/2	4/4	0/0	0/0	0/0	3/3
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Reddened hindlimb(s)								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	2/2	4/4	0/0	0/0	0/0	2/2
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

a = Observations reported as total occurrence/number of animals

Text Table 4. Selected Clinical Observations - Main Study (4-Hour Exposure) (continued)								
	Allyl Alcohol							
Sex	**Males**				**Females**			
Exposure Duration (hours)	4	4	4	4	4	4	4	4
Exposure Level (ppm)	0	20	50	100	0	20	50	100
Observation[a]								
Red/clear material around the mouth or nose								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	2/2	5/4	0/0	1/1	1/1	4/4
Recovery Period	0/0	0/0	1/1	0/0	0/0	0/0	0/0	0/0

a = Observations reported as total occurrence/number of animals

All other clinical findings in the test substance-exposed groups were observed with similar incidence in the control group, were limited to single animals, were not observed in an exposure-related manner and/or were common findings for laboratory rats of this age and strain.

6.3.2. NOVEL STIMULUS/AROUSAL RESPONSE

Summary Data: Table 21

Individual Data: Table A21

Novel stimulus/arousal response findings (response to a loud noise) for the 4-hour exposure duration are summarized in Text Table 5.

Text Table 5. Summary of Novel Stimulus/Arousal Response Findings During Exposure - 4-Hour Exposure

Sex	**Males**				**Females**			
Exposure Level (ppm)	**0**	**20**	**50**	**100**	**0**	**20**	**50**	**100**
Number of Animals Observed	5	5	5	5	5	5	5	5
No Reaction to Stimulus	0	0	2	1	0	0	0	3
Slight Reaction to Stimulus[a]	5	5	3	3	5	5	5	1
Energetic Response to Stimulus[b]	-	-	-	1	-	-	-	1

[a] = Ear flick, flinch or some evidence that the stimulus was heard
[b] = Jump and/or vocalization

During exposure, findings for novel stimulus/arousal response were affected by exposure to the test substance. For males and females combined, the incidence of "no reaction to stimulus" was 0 of 10, 0 of 10, 2 of 10 and 4 of 10 for the 0, 20, 50 and 100 ppm groups, respectively. The results suggest a test substance-related weak sedating effect of allyl alcohol vapor at the two highest exposure concentrations used for the 4-hour exposure duration.

6.3.3. BODY WEIGHTS

Summary Data: Tables 26, 27, 28; Figures 3, 4

Individual Data: Tables A26, A27, A28

There were no test substance-related effects on body weights. Body weight losses were noted in all groups (including the control group) from study day 0 to 1. There were no statistically significant differences when the control and test substance-exposed groups were compared.

6.3.4. CLINICAL PATHOLOGY

6.3.4.1. HEMATOLOGY AND COAGULATION

Summary Data: Table 29

Individual Data: Table A29

Pathology Report: Appendix I

Historical Control Data: Appendix J

There were no test substance-related alterations in hematology and coagulation parameters. Statistically significantly higher percentage neutrophil and lower percentage lymphocyte counts in the 20 and 100 ppm group males were not toxicologically important because changes involved percentage differential cell counts, and no significant differences were noted in absolute differential cell counts. Furthermore, values were within the WIL historical control data ranges (version 2.5). Statistically significantly lower percentage and absolute reticulocyte counts in the 50 ppm group females did not occur in a dose-dependent manner, were within the WIL historical

control data range (version 2.5) and were not clearly test substance-related. There were no other statistically significant differences when the control and test substance-exposed groups were compared.

6.3.4.2. SERUM CHEMISTRY

Summary Data: Table 30

Individual Data: Table A30

Pathology Report: Appendix I

There were no test substance-related alterations in serum chemistry parameters. There were no statistically significant differences when the control and test substance-exposed groups were compared.

6.3.5. ANATOMIC PATHOLOGY

6.3.5.1. MACROSCOPIC EXAMINATION

Summary Data: Table 31

Individual Data: Table A31

Pathology Report: Appendix I

Review of the gross necropsy observations revealed no findings that were considered to be associated with exposure to the test substance.

6.3.5.2. ORGAN WEIGHTS

Summary Data: Table 32

Individual Data: Tables A32, A33

Pathology Report: Appendix I

Historical Control Data: Appendix J

There were no test substance-related alterations in final body weight or organ weights. Following the 4-hour exposure, lung weight (absolute) was statistically significantly higher in the 20 ppm (7.5%) and 100 ppm (13.2%) group females compared to the control group. Mean lung weight relative to final body weight was 10.7% higher than the

control group (statistically significant) in the 100 ppm group females. Given the absence of a dose response, the absence of histologic findings, and that the lung weights fell within the WIL historical control data range (version 2.4), the higher lung weights have no toxicologic relevance. There were no other statistically significant differences when the control and test substance-exposed groups were compared.

6.3.5.3. MICROSCOPIC EXAMINATION

Summary Data: Table 33

Individual Data: Table A31

Pathology Report: Appendix I

Microscopic examinations were performed on tissues collected at necropsy following the 14-day observation period (study day 14). There were no test substance-related effects on the liver, kidneys, lungs or trachea.

Text Table 6 presents the summary incidence of selected histopathological findings for selected representative nasal levels and a combined summary of selected findings at all nasal levels. (See Summary Data Table 33 for the incidence of all histopathological findings for each of the 6 nasal levels.) The combined summary presents the number of animals with the selected findings taking into account all 6 nasal levels. The severity grade for each finding is presented as the highest grade for any of the 6 nasal levels.

Test substance-related findings were limited to the respiratory tract and included degeneration of olfactory epithelium, degeneration of respiratory epithelium, chronic inflammation and goblet cell hyperplasia. All changes were of no clinical significance to the rats and were considered reversible.

Minimal to moderate degeneration of olfactory epithelium was observed in 50 and 100 ppm group males and females and was present most commonly in the dorsal meatus of nasal level II. Summary incidence (0/5, 1/5 and 5/5 for both males and females in the 20, 50 and 100 ppm groups, respectively) and severity were exposure concentration-related. When present, degeneration of the olfactory epithelium was

considered test substance-related since this finding was absent from all 30 control animals on study. Affected areas had loss of cellular orientation, occasional pyknotic nuclei and thinning of the epithelium. When summarized for all nasal levels combined, the incidence of olfactory epithelial degeneration appeared to be exposure concentration-related.

Minimal to mild degeneration of respiratory epithelium was present in 50 and 100 ppm group animals and noted in the nasopharyngeal meatus in nasal levels III and VI. The respiratory epithelium was vacuolated, with disruption of cell architecture and loss of contact with adjacent cells.

Inflammation was subacute to chronic, minimal to moderate, and consisted of an infiltration of lymphocytes within the naso- and maxillary turbinates, the lateral walls and the septum. There was occasional edema, hyperplasia of the transitional or squamous epithelium lining the surface and leukocyte transmigration within the epithelium. Bowman's glands were prominent in areas of inflammation. For males and females combined, the incidence of inflammation was 0/10, 7/10, 7/10 and 8/10 for the 0, 20, 50 and 100 ppm groups, respectively (derived from Text Table 6). The severity, but not the incidence of this finding appeared to be exposure concentration-related.

Goblet cell hyperplasia was minimal to moderate and characterized by expansion of the respiratory epithelial goblet cells lining the medial septum. Basophilic foamy mucus expanded individual cells, resulting in a crowding of the epithelium. This change had little correlation to the inflammation on an animal by animal basis, and was considered to be a primary test substance-related effect. This finding was noted for 50 and 100 ppm group males and 20 and 100 ppm group females without a clear exposure concentration dependence.

Hemorrhage within the ethmoturbinates was present to a moderate degree in 1 control group female and to a mild degree in one 20 ppm group female. Therefore, hemorrhage

was not considered a test substance-related change for the 4-hour exposure, unlike the 1-hour exposure.

All findings noted in the nasal cavity 14 days following a 4-hour exposure to concentrations of 20, 50 and 100 ppm were minimal to moderate in severity and were considered reversible based on the extent, severity, and/or depth of the changes. Since inflammation was present in the 20 ppm group males and females and goblet cell hyperplasia was present in one 20 ppm group female, the NOEL was less than 20 ppm, the lowest concentration tested, for males and females 14 days following the 4-hour exposure. However, the prominent finding of degeneration of the olfactory epithelium was not observed in the 20 ppm group animals.

Text Table 6. Incidence Of Selected Histopathologic Findings At Selected Nasal Levels And A Summary Of Selected Findings For All Nasal Levels[a]
Study Day 14
4-Hour Exposure

Sex	Males				Females			
Exposure Level (ppm)	**0**	**20**	**50**	**100**	**0**	**20**	**50**	**100**
Nasal Level II [b]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Inflammation, Chronic and Subacute	0	3	3	2	0	0	0	1
Minimal	-	0	1	0	-	-	-	0
Mild	-	3	0	2	-	-	-	1
Moderate	-	0	2	0	-	-	-	0
Degeneration, Olfactory Epithelium	0	0	0	4	0	0	1	4
Minimal	-	-	-	3	-	-	1	2
Mild	-	-	-	1	-	-	0	2
Hyperplasia, Goblet Cells	0	0	5	2	0	1	0	1
Minimal	-	-	2	0	-	0	-	0
Mild	-	-	3	0	-	1	-	1
Moderate	-	-	0	2	-	0	-	0

[a] = Summary Data Table 33 presents the incidence of all histopathological findings for each of the 6 nasal levels.
[b] = Number of tissues examined from each group

Text Table 6. Incidence Of Selected Histopathologic Findings At Selected Nasal Levels And A Summary Of Selected Findings For All Nasal Levels (continued)
Study Day 14
4-Hour Exposure

Sex	Males				Females			
Exposure Level (ppm)	**0**	**20**	**50**	**100**	**0**	**20**	**50**	**100**
Nasal Level III[b]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	1	4	0	0	1	1
Minimal	-	-	1	1	-	-	1	1
Mild	-	-	0	1	-	-	0	0
Moderate	-	-	0	2	-	-	0	0
Degeneration Respiratory Epithelium	0	0	1	0	0	0	0	1
Minimal	-	-	1	-	-	-	-	0
Mild	-	-	0	-	-	-	-	1
Summary[c]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	1	5	0	0	1	5
Minimal	-	-	1	1	-	-	1	2
Mild	-	-	0	2	-	-	0	3
Moderate	-	-	0	2	-	-	0	0
Inflammation[d]	0	3	4	5	0	4	3	3
Minimal	-	0	1	0	-	2	0	0
Mild	-	2	0	4	-	2	3	2
Moderate	-	1	3	1	-	0	0	1
Hyperplasia, Goblet Cell	0	0	5	2	0	1	0	2
Minimal	-	-	2	0	-	0	-	1
Mild	-	-	3	0	-	1	-	1
Moderate	-	-	0	2	-	0	-	0
Degeneration, Respiratory Epithelium	0	0	1	1	0	0	0	1
Minimal	-	-	1	0	-	-	-	0
Mild	-	-	0	1	-	-	-	1
Hemorrhage	0	0	0	0	1	1	0	0
Minimal	-	-	-	-	0	0	-	-
Mild	-	-	-	-	0	1	-	-
Moderate	-	-	-	-	1	0	-	-

[b] = Number of tissues examined from each group
[c] = Summary of number of animals with lesion taking into account all 6 nasal levels; grade for each lesion is the highest grade for any of the 6 nasal levels.
[d] = Inflammation, Chronic and Subacute

6.4. 8-HOUR EXPOSURE (MAIN STUDY)

6.4.1. CLINICAL OBSERVATIONS AND SURVIVAL

Summary Data: Tables 34, 35, 36, 37, 38, 40, 41, 42, 43

Individual Data: Tables A34, A35, A36, A37, A38, A40, A41, A42, A43

Following 8 hours of exposure at 50 ppm, there was a test substance-related effect on survival. Male no. 89993 in the 50 ppm group was found dead on study day 1 with red discoloration of the lungs. The cause of death was ulceration of the respiratory and olfactory epithelium in the nasal passages. There were severe lesions in the nasal passages, consisting of ulceration of respiratory epithelium at nasal level I and severe ulceration and degeneration of olfactory epithelium at nasal levels IV, V and VI. There was mild hemorrhage and edema in the lungs, as well as moderate to severe erosion of epithelium in the larynx and trachea, respectively, and severe ulceration of the epithelium in the larynx. The changes in the respiratory tract were considered to be test substance-related and could have rendered the animal markedly moribund leading to diminished breathing capabilities, hypoxia and death. The ulceration and degeneration of olfactory epithelium and the ulceration of respiratory epithelium in the nasal passages, as well as the ulceration in the epithelium of the larynx, were considered irreversible. Clinical findings for this male prior to death included gasping at the end of the 8-hour exposure, gasping, rales and red material around nose at 1 hour post-exposure, and rales and red material around the mouth and nose on study day 1, approximately 7 hours prior to death.

For standard clinical observations, the only test substance-related effects on behavior observed during exposure, at the end of exposure, 1 hour-post exposure or during the recovery period was a slight impairment in gait at 1 hour post-exposure for female no. 90076 exposed at 50 ppm for 8 hours. Other test substance-related clinical findings for surviving animals included gasping, increased respiration, rales, flushing of the forelimbs and/or hindlimbs and red or clear material around the mouth or nose primarily during exposure and/or at 1 hour post-exposure. With the exception of rales observed at

1-hour post-exposure for 1 male in the 20 ppm group, gasping, increased respiration and rales were limited to animals exposed to 50 ppm. For 1/5 females exposed at 10 ppm, 1/5 males exposed at 20 ppm and 3/5 females exposed at 50 ppm for 8 hours, yellow material around the urogenital area was also observed at 1 hour post-exposure. Complete recovery of all exposure-related clinical findings occurred by study day 14.

A summary of selected clinical observations during and post-exposure is presented in Text Table 7.

Text Table 7. Selected Clinical Observations - Main Study (8-Hour Exposure)								
	Allyl Alcohol							
Sex	**Males**				**Females**			
Exposure Duration (hours)	8	8	8	8	8	8	8	8
Exposure Level (ppm)	0	10	20	50	0	10	20	50
Observation[a]								
Gasping								
30 Minutes into Exposure	0/0	0/0	0/0	1/1	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
4 Hours into Exposure	0/0	0/0	0/0	1/1	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	1/1	0/0	0/0	0/0	1/1
1 Hour Post-Exposure	0/0	0/0	0/0	5/5	0/0	0/0	0/0	1/1
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Rales or increased respiration[b]								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
4 Hours into Exposure	0/0	0/0	0/0	1/1	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	1/1	1/1	0/0	0/0	0/0	1/1
Recovery Period	0/0	0/0	0/0	1/1	0/0	0/0	0/0	0/0
Reddened forelimb(s)								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
4 Hours into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	1/1	2/2	0/0	0/0	0/0	0/0	3/3
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Reddened hindlimb(s)								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
4 Hours into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	1/1	0/0	0/0	0/0	0/0	0/0
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0

a = Observations reported as total occurrence/number of animals
b = Increased respiration was noted once at 4 hours into exposure for male no. 89986 at 50 ppm.

Text Table 7. Selected Clinical Observations - Main Study (8-Hour Exposure) (continued)								
	Allyl Alcohol							
Sex	**Males**				**Females**			
Exposure Duration (hours)	8	8	8	8	8	8	8	8
Exposure Level (ppm)	0	10	20	50	0	10	20	50
Observation[a]								
Red/clear material around the mouth or nose								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
4 Hours into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
End of Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour Post-Exposure	0/0	0/0	2/1	7/4	0/0	2/1	4/2	5/4
Recovery Period	4/1	2/2	0/0	2/1	1/1	0/0	2/2	1/1

a = Observations reported as total occurrence/number of animals
b = Increased respiration was noted once at 4 hours into exposure for male no. 89986 at 50 ppm.

All other clinical findings in the test substance-exposed groups were observed with similar incidence in the control group, were limited to single animals, were not observed in an exposure-related manner and/or were common findings for laboratory rats of this age and strain.

6.4.2. NOVEL STIMULUS/AROUSAL RESPONSE

Summary Data: Table 39

Individual Data: Tables A39

Novel stimulus/arousal response findings (response to a loud noise) for the 8-hour exposure duration are summarized in Text Table 8.

Text Table 8. Summary of Novel Stimulus/Arousal Response Findings During Exposure - 8-Hour Exposure

Sex	**Males**				**Females**			
Exposure Level (ppm)	**0**	**10**	**20**	**50**	**0**	**10**	**20**	**50**
Number of Animals Observed	5	5	5	5	5	5	5	5
No Reaction to Stimulus	0	0	0	3	0	0	3	1
Slight Reaction to Stimulus[a]	5	5	5	2	5	5	2	4
Energetic Response to Stimulus[b]	-	-	-	-	-	-	-	-

[a] = Ear flick, flinch or some evidence that the stimulus was heard
[b] = Jump and/or vocalization

During exposure, findings for novel stimulus/arousal response were affected by exposure to the test substance. For males and females combined, the incidence of "no reaction to stimulus" was 0 of 10, 0 of 10, 3 of 10 and 4 of 10 for the 0, 10, 20 and 50 ppm groups, respectively. The results suggest a weak sedating effect of allyl alcohol vapor at the two highest exposure concentrations used for the 8-hour exposure duration. Female no. 90076, the animal noted with a slightly impaired gait at 1 hour post-exposure, had a typical slight reaction to the stimulus.

6.4.3. BODY WEIGHTS

Summary Data: Tables 44, 45, 46; Figures 5, 6

Individual Data: Tables A44, A45, A46

A transient test substance-related effect on body weights was noted in the 50 ppm group males. A higher mean body weight loss, statistically significant, from study day 0 to 1 was noted in the 50 ppm group males compared to the control group; body weight losses were noted for all male rats from study day 0 to 1. These body weight losses resulted in a slightly lower (-5.6%) mean body weight in the 50 ppm group males on study day 1 compared to the control group and a statistically significantly mean cumulative body weight loss from study day 0 to 6. Mean body weight in the 50 ppm group males was similar to the control group on study day 13. There were no other statistically significant differences when the control and test substance-exposed groups were compared.

6.4.4. CLINICAL PATHOLOGY

6.4.4.1. HEMATOLOGY AND COAGULATION

Summary Data: Table 47

Individual Data: Table A47

Pathology Report: Appendix I

Historical Control Data: Appendix J

There were no test substance-related alterations in hematology and coagulation parameters. Higher percentage and absolute large unstained cell (LUC) counts in the

50 ppm group males were statistically significant but not considered toxicologically important and were within the WIL historical control data ranges (version 2.5). Large unstained cells are large myeloperoxidase negative cells detected when automated cell counts are done. When microscopic correlations are done, the vast majority of LUC are lymphoid cells, so higher LUC counts are most likely a result of higher lymphocyte counts which were also present in the 50 ppm group males, but not statistically significant. There were no other statistically significant differences when the control and test substance-exposed groups were compared.

6.4.4.2. SERUM CHEMISTRY

Summary Data: Table 48

Individual Data: Table A48

Pathology Report: Appendix I

Historical Control Data: Appendix J

There were no test substance-related alterations in serum chemistry parameters. The statistically significantly lower globulin value and higher albumin/globulin ratio in the 10 ppm group females were due to an outlier (female no. 90037) and did not occur in a dose-dependent manner. A slightly lower glucose level in the 10 ppm group males was not considered test substance-related because the decrease did not occur in an exposure-related fashion, was within the WIL historical control data range (version 2.5) and was not toxicologically relevant because of the small magnitude of change. There were no other statistically significant differences when the control and test substance-exposed groups were compared.

6.4.5. ANATOMIC PATHOLOGY

6.4.5.1. MACROSCOPIC EXAMINATION

Summary Data: Tables 49, 50

Individual Data: Tables A49, A50

Pathology Report: Appendix I

Review of the gross necropsy observations for surviving animals revealed no findings that were considered to be associated with exposure to the test substance.

Test substance-related red discoloration of the lungs was noted for a single 50 ppm group male found dead on study day 1.

6.4.5.2. ORGAN WEIGHTS

Summary Data: Table 51

Individual Data: Tables A51, A52

Pathology Report: Appendix I

There were no test substance-related alterations in final body weight or organ weights. There were no statistically significant differences when the control and test substance-exposed groups were compared.

6.4.5.3. MICROSCOPIC EXAMINATION

Summary Data: Tables 52, 53

Individual Data: Tables A49, A50

Pathology Report: Appendix I

With the exception of one 50 ppm group male that was found dead on study day 1, microscopic examinations were performed on tissues collected at necropsy following the 14-day observation period (study day 14). There were no test substance-related effects on the liver, kidneys or trachea. With the exception of the animal that died on study day 1, there were no test substance-related effects on the lungs.

Text Table 9 presents the summary incidence of selected histopathological findings for selected representative nasal levels and a combined summary of selected findings at all nasal levels. (See Summary Data Tables 52 and 53 for the incidence of all histopathological findings for each of the 6 nasal levels.) The combined summary presents the number of animals with the selected findings taking into account all 6 nasal levels. The severity grade for each finding is presented as the highest grade for any of the 6 nasal levels.

Exposure to test substance for 8 hours caused degeneration, erosion, ulceration and metaplasia of olfactory epithelium; degeneration and erosion of respiratory epithelium; and chronic inflammation, hemorrhage and hyperplasia of goblet cells. Some changes in the olfactory epithelium of two 50 ppm group males were considered severe and irreversible. All changes in the nasal cavity of all 10 and 20 ppm group animals, all 50 ppm group females and the 3 remaining 50 ppm group males were considered reversible.

Degeneration of olfactory epithelium was minimal to severe-irreversible and present in the 10, 20 and 50 ppm group males and females. When summarized for all nasal levels combined, the severity (males) or the incidence and severity (females) of olfactory epithelial degeneration appeared to be exposure concentration-related. When present, degeneration of the olfactory epithelium was considered test substance-related since this finding was absent from all 30 control animals on study. Degeneration of olfactory epithelium was typically seen in the dorsal meatus, at which location the degeneration was similar to that described for the 1- and 4-hour exposures. In addition, there was moderate to severe degeneration of the olfactory epithelium lining multiple ethmoturbinates in nasal levels III through VI. This degeneration was disruption of the architecture of the epithelial cells with cell loss, pyknosis of individual cells, separation of cells from each other and from the basal lamina. There was vacuolation and streaming of the apical portions of the olfactory epithelium. This degeneration was considered irreversible in 2 animals, because it would be unlikely for the olfactory epithelium to

return to normal histologically. (Gaskell, 1990, at page 277). The degenerated olfactory epithelium would be expected to re-epithelialize with some type of epithelium, and most likely squamous or respiratory epithelium.

Ulceration of the olfactory epithelium was present in one 50 ppm group male that survived until terminal euthanasia. Ulceration and erosion were seen in, and contributed to the death of, one 50 ppm group male that died on study day 1. The ulcers breached the basal lamina leaving denuded submucosa, and this change was considered irreversible from a histopathologic standpoint, since with a breach of the basal lamina, fibroplasia would necessarily result in some degree of scar tissue during repair. However, grossly, the epithelium would appear to heal completely.

Metaplasia of olfactory epithelium was seen in one 50 ppm group male. This change was seen along broad expanses of the lateral aspect of the dorsal meatus with replacement of olfactory epithelium with eosinophilic transitional epithelium. There was no breach of the basal lamina or changes in the lamina propria. The metaplasia was of a degree that it was considered irreversible, since it would be unlikely to expect well-differentiated olfactory epithelium to re-epithelialize completely. Frequently, damaged olfactory epithelium regenerates, but there is incomplete resolution, as it does so in a disorganized fashion with atypical arrangements of the neural elements (Gaskell, 1990, at page 277).

Degeneration and erosion of respiratory epithelium of the nasopharynx was present in one 50 ppm group male. Erosion involves some degree of loss of the epithelium with retention of the basal lamina.

Hemorrhage within the ethmoturbinates and septum was present in one 50 ppm group male and was not present in females. Hemorrhage was present in the 50 ppm group male that had the erosion, ulceration and severe olfactory epithelial degeneration. Hemorrhage was considered a consequence of the tissue injury and inflammation and was not considered be a direct test substance-related effect.

Goblet cell hyperplasia was minimal to moderate and present in the 10, 20 and 50 ppm group males and females, and was most commonly seen at nasal levels I and II. The incidence and severity of goblet cell hyperplasia appeared to be exposure concentration-related for males, but not females. Goblet cell hyperplasia was similar to that described in the 4-hour exposure animals. This change did not correlate to the degree of inflammation, and was considered a test substance related effect, rather than a consequence of inflammation.

Goblet cell hyperplasia was minimal to moderate and present in the 10, 20 and 50 ppm group males and females, and was most commonly seen at nasal levels I and II. The incidence and severity of goblet cell hyperplasia appeared to be exposure concentration-related for males, but not females. Goblet cell hyperplasia was similar to that described in the 4-hour exposure animals. This change did not correlate to the degree of inflammation, and was considered a test substance related effect, rather than a consequence of inflammation.

Chronic inflammation of the nasal passages was minimal to moderate and present with increased incidence and severity in all exposure groups of males and females. For males and females combined, the incidence of inflammation was 3/10, 7/10, 9/10 and 10/10 for the 0, 10, 20 and 50 ppm groups, respectively (derived from Text Table 9). The severity of this finding appeared to be exposure concentration-related. Chronic inflammation was similar to that described in the 4-hour exposure study, and was primarily seen in nasal levels I and II.

Severe degeneration and ulceration of the olfactory epithelium (in 2 males) and metaplasia of olfactory epithelium (in 1 male) were limited to the 50 ppm group males and were considered irreversible. Other changes, such as inflammation, goblet cell hyperplasia and lesser grades of degeneration of olfactory epithelium, were present in males and females and were considered reversible (including all changes in the nasal cavity of animals exposed at 10 and 20 ppm and all females and the remaining 3 males

exposed at 50 ppm). Based on the degeneration of olfactory epithelium, inflammation and goblet cell hyperplasia in the 10 ppm group males and females, the no-observed-effect level (NOEL) was less than 10 ppm, the lowest concentration tested, for males or females following an 8-hour exposure.

Text Table 9. Incidence Of Selected Histopathologic Findings In Selected Nasal Levels And A Summary Of Selected Findings From All Nasal Levels
Study Day 14[a,b]
8-Hour Exposure

Sex	Males				Females			
Exposure Level (ppm)	**0**	**10**	**20**	**50**	**0**	**10**	**20**	**50**
Nasal Level II [c]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	3	0	2	0	1	2	3
Minimal	-	2	-	0	-	0	0	1
Mild	-	1	-	2	-	1	2	2
Goblet Cell Hyperplasia	0	2	2	4	0	0	1	1
Minimal	-	1	1	0	-	-	1	0
Mild	-	1	1	3	-	-	0	1
Moderate	-	0	0	1	-	-	0	0
Nasal Level IV [c]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	2	2	0	0	2	3
Minimal	-	-	1	0	-	-	1	0
Mild	-	-	1	0	-	-	1	1
Moderate	-	-	0	0	-	-	0	2
Severe-irreversible	-	-	0	2	-	-	0	0
Ulceration	0	0	0	2	0	0	0	0
Severe-irreversible	-	-	-	2	-	-	-	-
Erosion (in Olfactory Epithelium)	0	0	0	1	0	0	0	0
Moderate	-	-	-	1	-	-	-	-
Metaplasia, Olfactory to Respiratory Epithelium	0	0	0	1	0	0	0	0
Severe-irreversible	-	-	-	1	-	-	-	-
Hemorrhage	0	0	0	1	0	0	0	0
Moderate	-	-	-	1	-	-	-	-
Nasal Level V [c]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	0	3	0	0	3	0
Mild	-	-	-	0	-	-	2	-
Moderate	-	-	-	1	-	-	1	-
Severe	-	-	-	1	-	-	0	-
Severe-irreversible	-	-	-	1	-	-	0	-
Ulceration	0	0	0	1	0	0	0	0
Severe-irreversible	-	-	-	1	-	-	-	-
Erosion (in Olfactory Epithelium)	0	0	0	1	0	0	0	0
Severe	-	-	-	1	-	-	-	-

[a] = Summary Data Tables 52 and 53 present the incidence of all histopathological findings for each of the 6 nasal levels
[b] = Results for male no. 89993 found dead on study day 1 are included. Irreversible findings were limited to two 50 ppm group males (male nos. 89966 and 89993)
[c] = Number of tissues examined from each group

Text Table 9. Incidence Of Selected Histopathologic Findings In Selected Nasal Levels And A Summary Of Selected Findings From All Nasal Levels (continued)
Study Day 14[b]
8-Hour Exposure

Sex	Males				Females			
Exposure Level (ppm)	**0**	**10**	**20**	**50**	**0**	**10**	**20**	**50**
Summary[d]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	3	2	4	0	1	4	5
Minimal	-	1	1	0	-	0	0	1
Mild	-	2	1	0	-	1	3	1
Moderate	-	0	0	1	-	0	1	3
Severe	-	0	0	1	-	0	0	0
Severe, irreversible	-	0	0	2	-	0	0	0
Inflammation[e]	3	4	5	5	0	3	4	5
Minimal	2	1	0	1	-	0	0	0
Mild	1	3	4	2	-	3	4	4
Moderate	0	0	1	2	-	0	0	1
Hyperplasia, Goblet Cell	0	2	3	4	0	2	1	1
Minimal	-	1	2	0	-	0	1	0
Mild	-	1	1	3	-	2	0	0
Moderate	-	0	0	1	-	0	0	1
Degeneration, Respiratory Epithelium	0	0	0	2	0	0	0	0
Minimal	-	-	-	0	-	-	-	-
Mild	-	-	-	0	-	-	-	-
Moderate	-	-	-	2	-	-	-	-
Hemorrhage	0	0	0	1	0	0	0	0
Moderate	-	-	-	1	-	-	-	-
Metaplasia, Olfactory to Respiratory Epithelium	0	0	0	1	0	0	0	0
Severe-irreversible	-	-	-	1	-	-	-	-
Ulceration	-	-	-	2				
Severe, irreversible	-	-	-	2	-	-	-	-
Erosion (in Olfactory Epithelium)	0	0	0	1	0	0	0	0
Severe	-	-	-	1	-	-	-	-

[b] = Results for male no. 89993 found dead on study day 1 are included. Irreversible findings were limited to two 50 ppm group males (male nos. 89966 and 89993).
[d] = Summary of number of animals with lesion taking into account all 6 nasal levels; grade for each lesion is the highest grade for any of the 6 nasal levels.
[e] = Inflammation, Chronic and Subacute

There were no other test substance-related histologic changes. Remaining histologic changes were considered to be incidental findings or related to some aspect of experimental manipulation other than exposure to the test substance. There was no test substance-related alteration in the prevalence, severity or histologic character of those incidental tissue alterations.

6.4.6. DISCUSSION OF ANATOMIC PATHOLOGY FINDINGS

The distribution and nature of the changes in the upper respiratory tract, including degeneration of olfactory and respiratory epithelium and goblet cell hyperplasia are similar to those described by Hardisty, et al. (1999) and Renne, et al. (2007) as common tissue reactions to inhaled toxicants. Degeneration of olfactory epithelium is commonly seen in the anterior aspect of the dorsal meatus, as was seen in this study, since this anterior aspect of olfactory epithelium is most susceptible to injury from many inhaled toxicants (Hardisty, 1999; Renne, 2007). Degeneration of olfactory epithelium is commonly associated with thinning or attenuation of the olfactory epithelium (Hardisty, 1999), and this attenuation was commonly seen and recorded as moderate degeneration of olfactory epithelium in this study. It results in replacement of olfactory epithelium by respiratory-like cells, often with cilia (Hardisty, 1999; Renne, 2007).

Several common sequele of olfactory epithelial degeneration described by Hardisty (1999) and Renne (2007) were not present in this study. These include basal cell hyperplasia, regeneration of olfactory epithelium and eosinophilic globules within Bowman's glands. The nature of the repair process of olfactory epithelium is affected by the dose, duration of exposure, and extent of initial damage.

Goblet cell hyperplasia of respiratory epithelium of the median septum is a recognized common tissue reaction to inhaled toxicants, as is cytoplasmic vacuolation of respiratory or transitional epithelium along the lateral walls (Renne, 2007). Goblet cell hyperplasia of the median septum and vacuolar degeneration of the respiratory/transitional epithelium lining lateral walls were common findings in this series of studies. The incidence of

goblet cell hyperplasia was generally not exposure concentration-related. However, this finding was only present in 1 of 30 control animals on study and the lack of concentration dependence does not suggest a spontaneous finding in some animals.

7. DISCUSSION

The objectives of the study were to determine the acute inhalation no-observed-adverse-effect level (NOAEL) for lethality and irreversible effects of allyl alcohol when administered once via whole-body inhalation to rats for 1, 4 or 8 hours and to determine the acute inhalation NOAEL for effects that were likely reversible. This study was conducted to provide additional data to support the derivation of Acute Exposure Guideline Level (AEGL) 1, 2 and 3 values for different exposure durations. These objectives were achieved using a modified acute study design with multiple exposure durations, selected clinical observations, novel stimulus/arousal response, clinical pathology and histopathology of the respiratory tract and other selected tissues and organs. A preliminary study (Appendix B) was performed after exposure concentrations were targeted to assure that the high treatment level for each test duration did not cause excessive mortality or moribundity.

In the main study, mortality was limited to 1 male that was found dead on the day following exposure to 50 ppm for 8 hours. With the exception of effects on the response to a novel stimulus during allyl alcohol exposures and a slight effect on gait for 1 female exposed to 50 ppm for 8 hours (1-hour post-exposure), no test substance-related effects on behavior were observed during exposure, at the end of exposure, 1-hour post exposure or during the recovery period. The toxicological significance of impaired gait was considered questionable since this finding was not observed in any other study animal and was not accompanied by other behavior findings in the affected animal. This animal had a typical response to a novel stimulus presented near the end of the exposure period. During or following the 1, 4 and 8 hour exposures to allyl alcohol, other test substance-related clinical findings included gasping, flushing of the ears, forelimbs and/or hindlimbs, red or clear material around the mouth and/or nose and yellow material on the abdominal or urogenital surfaces. In addition, an increased respiration rate for 1 male at the midpoint of exposure at 50 ppm and rales for 1 male at 20 ppm and 1 male and 1 female at 50 ppm at 1 hour post-exposure were noted following the 8 hour

exposure. These clinical findings were not observed during the 14-day non-exposure (recovery) period or were observed at a similar incidence in the control group. Therefore, in animals that survived, all of the test substance-related clinical findings observed in this study were considered to be reversible.

A study design using 3 exposure durations with exposure concentrations decreasing with increasing exposure duration, permits evaluation of possible concentration times time (C x T) relationships. In the following discussion, the objective is to compare the test substance-related effects at equivalent or similar C x T values. Only the pure Haber's law equation (C x T = k) is considered and no attempt is made to fit the study results to a modified C x T equation.

Comparison of clinical findings at the highest exposure levels across exposure durations (High C x T =400 ppm-hours) (Text Table 10) demonstrated that exposure to a lower concentration of allyl alcohol for a longer duration resulted in higher incidences of gasping and red or clear material around the mouth and/or nose. Based on clinical effects on respiration and the death of 1 male (50 ppm x 8 hours) as a result of injury to the respiratory tract, it appears that for groups with equivalent high C x T, toxicity was positively dependent on exposure duration. However, the incidence of flushed ears, forelimbs and/or hindlimbs appeared to be positively-related to exposure concentration in these groups with equivalent high C x T. For example for males and females combined, the incidence of reddened forelimb(s) was 3/10, 7/10 and 9/10 for groups exposed to 50, 100 and 400 ppm allyl alcohol, respectively. A similar relationship to exposure concentration was observed for the groups with a mid-level C x T (160 - 200 ppm-hours). Compared to groups exposed to 20 ppm for 8 hours or 50 ppm for 4 hours, only the group exposed to 200 ppm for 1 hour had a high incidence of reddened forelimb(s) (8/10 for males and females combined). Flushing of extremities was consistent with the presence of aldehyde following metabolism of the alcohol (i.e., with a higher rate of metabolism to the aldehyde than the rate of metabolism of the aldehyde to a less toxic acid).

Text Table 10. Selected Clinical Observations						
	Allyl Alcohol					
Sex	**Males**			**Females**		
Exposure Duration (hours)	1	4	8	1	4	8
Exposure Level (ppm)	400	100	50	400	100	50
Observation[a]						
Gasping						
30 Minutes into Exposure	0/0	0/0	1/1	1/1	0/0	0/0
1 Hour into Exposure	NA	0/0	0/0	NA	1/1	0/0
4 Hours into Exposure	NA	NA	1/1	NA	NA	0/0
End of Exposure	0/0	0/0	1/1	0/0	0/0	1/1
1 Hour Post-Exposure	0/0	5/5	5/5	0/0	0/0	1/1
Reddened forelimb(s)						
1 Hour Post-Exposure	5/5	4/4	0/0	4/4	3/3	3/3
Reddened hindlimb(s)						
1 Hour Post-Exposure	5/5	4/4	0/0	4/4	2/2	0/0
Reddened ear(s)						
1 Hour Post-Exposure	4/4	0/0	0/0	0/0	0/0	0/0
Red/clear material around the mouth or nose						
1 Hour Post-Exposure	2/2	5/4	7/4	3/3	4/4	5/4

a = Observations reported as number of occurrences/number of animals
NA = Not applicable

Based on combined incidences for males and females, test substance-related effects on novel stimulus/arousal responses (i.e., no response to stimulus) were noted near the end of the allyl alcohol exposure at 200 ppm for 1 hour, 50 and 100 ppm for 4 hours and 20 and 50 ppm for 8 hours. Although 3 of 5 females in the 400 ppm (1-hour exposure) group failed to respond to the stimulus, all 5 males responded. Typically, the sedating effect of an alcohol is expected to be positively-dependent on vapor concentration. It is possible that the response to the noise stimulus is dependent on both a sedating effect of the alcohol vapor and a state of arousal related to the degree of respiratory irritation. It is also possible that individual animal variability of the response may be too high to provide clear results with the group size of 5 per sex.

Novel stimulus/arousal responses at the high exposure levels and the intermediate exposure levels across exposure durations (high C x T and mid C x T, respectively) are summarized (combined male and female incidences) in Text Tables 11 and 12.

Text Table 11. Summary of Novel Stimulus/Arousal Response Findings During Exposure High Exposure Levels for 1-, 4- and 8-Hour Exposures

	Combined Males and Females			
Exposure Level (ppm)	**0**	**50**	**100**	**400**
Exposure Duration (hours)	**All**	**8**	**4**	**1**
Number of Animals Observed	30	10	10	10
No Reaction to Stimulus	2	4	4	3
Slight Reaction to Stimulus[a]	28	6	4	7
Energetic Response to Stimulus[b]	-	-	2	-

[a] = Ear flick, flinch or some evidence that the stimulus was heard
[b] = Jump and/or vocalization

Text Table 12. Summary of Novel Stimulus/Arousal Response Findings During Exposure Mid Exposure Levels for 1-, 4- and 8-Hour Exposures

	Combined Males and Females			
Exposure Level (ppm)	**0**	**20**	**50**	**200**
Exposure Duration (hours)	**All**	**8**	**4**	**1**
Number of Animals Observed	30	10	10	10
No Reaction to Stimulus	2	3	2	6
Slight Reaction to Stimulus[a]	28	7	8	4
Energetic Response to Stimulus[b]	-	-	-	-

[a] = Ear flick, flinch or some evidence that the stimulus was heard
[b] = Jump and/or vocalization

The 3 groups with a high C x T of 400 ppm-hours, had similar incidences of no reaction to stimulus. When the 3 groups with an intermediate C x T of 200 ppm-hours were compared, the highest incidence of no reaction to stimulus was observed at the highest exposure concentration (200 ppm).

Test substance-related effects on body weights were noted only following longer exposure duration to the test substance in the 50 ppm group males exposed to allyl alcohol for 8 hours. Body weight effects in these males were reversible by study day 13.

There were no test substance-related effects on the liver, kidneys or trachea. With the exception of the animal that died on study day 1, there were no test substance-related effects on the lungs.

Exposure to allyl alcohol by inhalation for 1, 4 and 8 hours followed by a 14-day recovery period was associated with test substance-related changes in the nasal cavity. Lesions in the olfactory epithelium were considered the most prominent and toxicologically significant nasal lesions. The most severe lesions were present in the high exposure (50 ppm) group males following an 8-hour exposure, where 1 early death and irreversible nasal mucosal lesions were present. Although the 14-day recovery period was not long enough to allow complete resolution of the nasal lesions (Gaskell, 1990), the nasal changes in all but 2 animals (from 50 ppm x 8 hour group) were considered reversible.

Exposure to the test substance for 1 hour at 0, 50, 200 and 400 ppm caused degeneration of olfactory epithelium, respiratory metaplasia of olfactory epithelium, chronic inflammation and hemorrhage. Although a clear exposure concentration relationship was not apparent for degeneration of the olfactory epithelium, this finding was noted for all exposure concentrations (females only at 50 ppm) and was clearly test substance exposure-related (since not observed for any of 30 control animals on study). All findings noted in the nasal cavity 14 days following a 1-hour exposure to concentrations of 50, 200 and 400 ppm were minimal to moderate in severity and were considered reversible. A no-observed-effect level (NOEL) could not be established for females (i.e., NOEL less than 50 ppm, the lowest concentration tested); however the NOEL for males was 50 ppm.

Exposure to the test substance for 4 hours at 0, 20, 50 and 100 ppm caused degeneration of olfactory epithelium, degeneration of respiratory epithelium, chronic inflammation and goblet cell hyperplasia. Degeneration of olfactory epithelium and respiratory epithelium were limited to the 2 highest exposure concentrations, while inflammation and goblet cell

hyperplasia were observed in animals from all 3 exposure concentrations. The incidence and severity of degeneration of the olfactory epithelium and the severity of inflammation (males and females combined) appeared to be exposure concentration-related. All findings noted in the nasal cavity 14 days following a 4-hour exposure at any concentration were minimal to moderate in severity and were considered reversible. For males and females in the 4-hour exposure groups, the NOEL was less than 20 ppm, the lowest concentration tested.

Exposure to the test substance for 8 hours at 0, 10, 20 and 50 ppm caused an early death in one 50 ppm group male. The test substance exposure produced degeneration, erosion, ulceration, and respiratory metaplasia of olfactory epithelium, degeneration and erosion of respiratory epithelium, chronic inflammation, hemorrhage and hyperplasia of goblet cells. The severity of degeneration of olfactory epithelium and chronic inflammation was exposure concentration-related. Severe degeneration and ulceration of the olfactory epithelium (in 2 males) and respiratory metaplasia of olfactory epithelium (in 1 male) were limited to the 50 ppm group males (including the animal that died on study day 1) and were considered irreversible. Other changes, such as inflammation, goblet cell hyperplasia and lesser grades of degeneration of olfactory epithelium, were considered reversible (including all changes in the nasal cavity of animals exposed at 10 and 20 ppm and all females and the remaining 3 males exposed at 50 ppm). For males or females in the 8-hour exposure groups, the NOEL was less than 10 ppm, the lowest concentration tested.

With basal cells from the margins of an area of injury acting as progenitor cells for sensory cells and supporting cells, the rat olfactory epithelium can regenerate following complete desquamation of the mucosa (i.e., erosion or full-thickness injury without loss of the basal lamina) within 4-5 weeks after toxicant exposure (Boorman et al, 1990). Ulceration with breaching of the basal lamina producing an exposed submucosa typically induces fibroplasia, which would result in some degree of scar tissue during repair. Dorman et al (2008) described regions of the dorsal meatus that developed fibrovascular

stromal proliferation and appeared unlikely to fully recover since replacement of olfactory sensory cells is dependent upon a functional basal cell layer in the olfactory epithelium. Reestablishment of a complete basal cell layer is considered dependent on the condition of the basal lamina and the presence of residual fibroblast-derived stromal tissue (i.e., scarring). However, even in the case where ulceration is present, the diagnosis of severe, irreversible is made when, in the opinion of the study pathologist, the extent (amount of visible epithelium involved), severity, and/or depth of the lesion is so pronounced that it appears unlikely that the epithelium would completely recover to the original normal mucosa/submucosa at the microscopic level.

In this study, all nasal changes in males and females exposed for 1 hour or 4 hours at any allyl alcohol exposure concentration, in males and females exposed for 8 hours at 10 or 20 ppm or in all females and 2 males exposed for 8 hours at 50 ppm were minimal to moderate in severity and would be expected to fully resolve given sufficient recovery time. Using the prominent finding of degeneration of olfactory epithelium as an example, moderate severity was characterized by flattening or thinning of the mucosa caused by loss of sensory cells, but with an intact basal cell layer remaining. Although degeneration of olfactory epithelium was graded as severe for one of the remaining three 8-hour, 50 ppm group males, this and all other nasal findings for this animal were considered reversible. For two 8-hour, 50 ppm group males (one of which died after respiratory distress was observed clinically), severe and irreversible lesions consisted of degeneration and ulceration of olfactory epithelium in both animals and respiratory metaplasia of olfactory epithelium in 1 animal. The extent and/or depth of each of these lesions were so great that complete recovery was considered unlikely. In the case of irreversible ulceration, this means that extensive breaching of the basal lamina was found and would likely result in significant fibroplasia and scar formation rather than complete recovery to a functional epithelium.

A summary of selected microscopic findings for control groups (combined) and at the highest exposure level for each exposure duration (high C x T) are presented in Text Table 13.

Text Table 13. A Summary Of Selected Findings From All Nasal Levels (Study Day 14)[a] For The Highest Exposure Level of the 1-, 4-, and 8-Hour Exposures

Sex	Males				Females			
Exposure Duration (hour)	**All**	**1**	**4**	**8**	**All**	**1**	**4**	**8**
Exposure Level (ppm)	**0**	**400**	**100**	**50**	**0**	**400**	**100**	**50**
Summary[b]	**15**	**5**	**5**	**5**	**15**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	2	5	4	0	1	5	5
Minimal	-	2	1	0	-	0	2	1
Mild	-	0	2	0	-	0	3	1
Moderate	-	0	2	1	-	1	0	3
Severe	-	0	0	1	-	0	0	0
Severe, irreversible	-	0	0	2	-	0	0	0
Inflammation[c]	4	4	5	5	2	5	3	5
Minimal	3	2	0	1	0	0	0	0
Mild	1	1	4	2	2	5	2	4
Moderate	0	1	1	2	0	0	1	1
Hyperplasia, Goblet Cell	1	1	2	4	0	0	2	1
Minimal	0	0	0	0	-	-	1	0
Mild	1	1	0	3	-	-	1	0
Moderate	0	0	2	1	-	-	0	1
Degeneration, Respiratory Epithelium	0	0	1	2	0	0	1	0
Minimal	-	-	0	0	-	-	0	-
Mild	-	-	1	0	-	-	1	-
Moderate	-	-	0	2	-	-	0	-

[a] = Results for male no. 89993 found dead on study day 1 are included. Irreversible findings were limited to two 50 ppm group males (male nos. 89966 and 89993).
[b] = Summary of number of animals with lesion taking into account all 6 nasal levels; grade for each lesion is the highest grade for any of the 6 nasal levels.
[c] = Inflammation, Chronic and Subacute

Text Table 13. A Summary Of Selected Findings From All Nasal Levels (Study Day 14)[a] For The Highest Exposure Level of the 1-, 4-, and 8-Hour Exposures (continued)

Sex	Males				Females			
Exposure Duration (hour)	**All**	**1**	**4**	**8**	**All**	**1**	**4**	**8**
Exposure Level (ppm)	**0**	**400**	**100**	**50**	**0**	**400**	**100**	**50**
Summary[b]	**15**	**5**	**5**	**5**	**15**	**5**	**5**	**5**
Hemorrhage	0	1	0	1	1	0	0	0
Minimal	-	1	-	0	0	-	-	-
Mild	-	0	-	0	0	-	-	-
Moderate	-	0	-	1	1	-	-	-
Metaplasia, Respiratory Epithelium	0	0	0	1	0	0	0	0
Minimal	-	-	-	0	-	-	-	-
Mild	-	-	-	0	-	-	-	-
Severe, irreversible	-	-	-	1	-	-	-	-
Ulceration	0	0	0	2	0	0	0	0
Severe, irreversible	-	-	-	2	-	-	-	-

[a] = Results for male no. 89993 found dead on study day 1 are included. Irreversible findings were limited to two 50 ppm group males (male nos. 89966 and 89993).
[b] = Summary of number of animals with lesion taking into account all 6 nasal levels; grade for each lesion is the highest grade for any of the 6 nasal levels.
[c] = Inflammation, Chronic and Subacute

Although C x T was equivalent for these 3 groups, the incidence and/or the severity of olfactory epithelial degeneration appeared to be positively-dependent on the exposure duration. The incidence of this finding was highest in the 4-hour and 8-hour exposure groups (100 and 50 ppm, respectively), and the severity was greater in the 8-hour exposure group. Ulceration and respiratory epithelial metaplasia of the olfactory epithelium were only observed in the 8-hour exposure group males (50 ppm). In males, goblet cell hyperplasia and respiratory epithelial degeneration also had the highest incidences in this group. A relationship to exposure duration was also observed for the groups with a mid-level C x T (160 - 200 ppm-hours). Compared to groups exposed to 200 ppm for 1 hour or 50 ppm for 4 hours, the group exposed to 20 ppm for 8 hours had a higher incidence and severity of olfactory epithelial degeneration.

8. CONCLUSIONS

In this acute inhalation study, subgroups of animals received single exposures with durations of 1 hour (0, 50, 200 and 400 ppm), 4 hours (0, 20, 50 and 100 ppm) and 8 hours (0, 10, 20 and 50 ppm). Mortality was limited to 1 male exposed for 8 hours to 50 ppm. Test substance-related clinical findings of gasping, rales, increased respiration, flushing of the ears, forelimbs and/or hindlimbs, red or clear material around the mouth and/or nose and yellow material on the abdominal or urogenital surfaces noted during exposure or at 1 hour post-exposure were not observed during the recovery period and were therefore reversible in surviving animals. Complete recovery of all exposure-related clinical findings occurred by study day 14. A test substance-related body weight loss in the 50 ppm group males after 8 hours of exposure was transient. There were no test substance-related microscopic findings in the liver and kidneys, or for surviving animals, in the lungs. Reversible test substance-related changes in the nasal cavity included degeneration of olfactory epithelium, respiratory metaplasia of olfactory epithelium, chronic inflammation and hemorrhage at 50, 200 and 400 ppm for a 1-hour exposure. Exposure to the test substance for 4 hours at 20, 50 and 100 ppm caused degeneration of olfactory epithelium, degeneration of respiratory epithelium, chronic inflammation and goblet cell hyperplasia which were also considered reversible changes. Thus, no nasal effects in any 1-hour or 4-hour exposure group were considered irreversible. Exposure to the test substance for 8 hours at 10, 20 and 50 ppm produced degeneration, erosion, ulceration and respiratory metaplasia of olfactory epithelium, degeneration and erosion of respiratory epithelium, chronic inflammation, hemorrhage and hyperplasia of goblet cells. The most severe lesions were present in the high exposure (50 ppm) group males following an 8-hour exposure. Microscopic findings that were considered irreversible included ulceration, respiratory metaplasia and severe degeneration of olfactory epithelium were limited to 2 males in this group. Ulceration included both full thickness loss of the olfactory mucosa and breaching of the basal lamina leaving denuded submucosa. This change was considered irreversible from a histopathologic standpoint, since with a breach of the basal lamina, fibroplasia would

necessarily result in some degree of scar tissue during repair. With the exception of these 2 animals, the nasal lesions in the 8-hour exposure groups were considered reversible.

Based on the results of this study, the no-observed-adverse-effect level (NOAEL) for lethality and irreversible effects of allyl alcohol administered once via whole-body inhalation exposure to Crl:CD(SD) rats for 1 hour was 400 ppm for both sexes, for 4 hours was 100 ppm for both sexes and for 8 hours was 20 ppm for males and 50 ppm for females. In this study, the primary findings used to define the NOEL were adverse microscopic changes in the nasal cavity. Therefore, the NOEL and the NOAEL for all findings were equal. The NOAEL for all effects (reversible or irreversible) was less than the lowest concentration tested for females exposed for 1 hour (50 ppm) and males and females exposed for 4 hours (20 ppm) and 8 hours (10 ppm), and was 50 ppm for males exposed for 1 hour. The NOAEL for all effects was based primarily on the presence of degeneration of olfactory epithelium for the animals exposed for 1 hour or 8 hours and on the presence of inflammation for the animals exposed for 4 hours.

9. KEY STUDY PERSONNEL AND REPORT SUBMISSION

Report Submitted By:

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24 Sept 2008
Date

Report Prepared By:

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24 September 2008
Date

Report Reviewed By:

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24 Sept 2008
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24 Sept 2008
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Mark D. Nemec, BS, DABT
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24 Sept 2008
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24 Sep 2008
Date

Jeffrey T. Weinberg, BS
Project Specialist, Inhalation Toxicology

23-Sept-2008
Date

KEY STUDY PERSONNEL AND REPORT SUBMISSION (CONTINUED)

Study Personnel:

Susan C. Haley, BS	Manager, Clinical Pathology
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Michael A. Safron, AS, HT (ASCP), CM	Manager, Histology
Bennett J. Varsho, MPH, DABT	Operations Manager, Developmental and Reproductive Toxicology and the Formulations Laboratory
Robert A. Wally, BS, RAC	Manager, Reporting and Regulatory Technical Services

10. QUALITY ASSURANCE UNIT STATEMENT

10.1. PHASES INSPECTED

Date(s) of Inspection(s)	Phase Inspected	Date(s) Findings Reported to Study Director	Date(s) Findings Reported to Management	Auditor(s)
17-Dec-2007	Necropsy	17-Dec-2007	17-Jan-2008	C.Heifner
21-Jan-2008 07-Mar-2008	Study Records (I-1)	07-Mar-2008	24-April-2008	S.Power
21-Jan-2008 07-Mar-2008	Study Records (I-2)	07-Mar-2008	24-April-2008	S.Power
18-Jan-2008 07-Mar-2008	Study Records (N-1)	07-Mar-2008	24-April-2008	S.Power
07-Mar-2008	Study Records (P-1)	07-Mar-2008	24-April-2008	S.Power
07-Mar-2008 10-Mar-2008	Study Records (C-1)	10-Mar-2008	24-April-2008	S.Power
10-Mar-2008	Study Records (C-2)	10-Mar-2008	24-April-2008	S.Power
10-Mar-2008	Study Records (C-3)	10-Mar-2008	24-April-2008	S.Power
11-Mar-2008	Study Records (Ex-2)	13-Mar-2008	24-April-2008	S.Power
13-Mar-2008	Draft Report (Inhalation Appendix)	13-Mar-2008	24-April-2008	S.Power
11-Mar-2008 12-Mar-2008 13-Mar-2008	Study Records (Ex-1)	13-Mar-2008	24-April-2008	S.Power
20-Mar-2008	Study Records (N-1, Supplemental)	20-Mar-2008	24-April-2008	S.Power L.Goodrich
17-Mar-2008 24-Mar-2008	Draft Report (Pathology Appendix)	24-Mar-2008	24-April-2008	S.Power L.Goodrich
27-Mar-2008	Study Records (Ex-1, Supplemental)	28-Mar-2008	24-April-2008	S.Power

Date(s) of Inspection(s)	Phase Inspected	Date(s) Findings Reported to Study Director	Date(s) Findings Reported to Management	Auditor(s)
26-Mar-2008 27-Mar-2008 28-Mar-2008 31-Mar-2008 01-Apr-2008	Draft Report (without Inhalation and Pathology Appendices)	02-Apr-2008	20-May-2008	S.Power L.Goodrich
27-May-2008	Study Records (A-1, A-2)	27-May-2008	23-Jun-2008	N.Daniels
27-May-2008	Revised Draft Report (Analytical Appendix)	27-May-2008	23-Jun-2008	N.Daniels

This study was inspected in accordance with the U.S. EPA Good Laboratory Practice Standards (40 CFR Part 792), the OECD Principles of Good Laboratory Practice, the standard operating procedures of WIL Research Laboratories, LLC and the sponsor's protocol and protocol amendments, with the following exceptions. The data located in Appendix C (Certificate of Analysis) were the responsibility of the sponsor. Quality Assurance findings, derived from the inspections during the conduct of the study and from the inspections of the raw data and draft report, are documented and have been reported to the study director. A status report is submitted to management monthly.

This report accurately reflects the data generated during the study. The methods and procedures used in the study were those specified in the protocol, its amendments and the standard operating procedures of WIL Research Laboratories, LLC.

The raw data, the retention sample and the final report will be stored in the Archives at Experimental Pathology Laboratories Inc., (EPL Archives, Inc., 45610 Terminal Drive, Sterling, Virginia 20166) for a period of 10 years following finalization of the report.

10.2. APPROVAL

This study was inspected according to the criteria discussed in Section 10.1.

Report Audited By:

Nancy J. Daniels — 24 Sept 2008
Compliance Specialist — Date

Lori J. Goodrich, RQAP-GLP — 24 Sep 2008
Group Supervisor, Quality Assurance — Date

Steven P. Power — 24 September 2008
Associate Compliance Specialist — Date

Report Released By:

Heather L. Johnson, BS, RQAP-GLP — 24 Sep 2008
Manager, Quality Assurance — Date

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS (WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

Study Number: WIL-14068

QUALITY ASSURANCE STATEMENT

Phase Audited	Date of Audit	Date Reported To Principal Investigator	Date Reported To Management	Date Reported To Study Director
Documentation	15Jan08	15Jan08	15Jan08	12Sep08
Microtomy	15Feb08	15Feb08	19Feb08	12Sep08

Jaimie West
Quality Assurance Unit

12Sep08
Date

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11. REFERENCES

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12. DEVIATIONS FROM THE PROTOCOL

This study was conducted in accordance with the protocol and protocol amendments, except for the following.

- **Protocol Section 5.5** states that the approximate body weight for males and females at the initiation of exposure (study day 0) will be 250 to 350 grams. At the initiation of exposure (study day 0), body weights ranged from 336 to 443 grams for males and 207 to 275 grams for females.

- **Protocol Section 5.7** states that individual cage cards will be affixed to each cage and will display the study number, animal number and group (exposure level). Following animal exposure, animals were taken to the animal room and placed in random order in the cage rack according to Protocol Section 8.4. Due to performance of functional observational battery assessments in random order, the cage cards did not display the group or exposure level.

- **Protocol Section 7.7** states that the oxygen content of the exposure atmospheres for each system will be determined during pre-study method development and will be at least 19% in each chamber. Oxygen content for Chamber 1 was inadvertently not performed.

- **Protocol Section 7.7** states that the average relative humidity of the exposure atmosphere will be 30-70%. On 28 November 2007 (study day 0 for the preliminary study), the average relative humidity for Chambers 3 and 4 were 13 and 20%, respectively. Following animal exposure on this day, it was noted that the air humidifier was not functioning properly. Because Chamber 2 was documented at the normal humidity level while the humidifier was not functioning, new temperature and humidity probes for all chambers were calibrated and used for the duration of the study.

- **Protocol Section 7.9.2** states that using an appropriate gas chromatographic method, actual test substance vapor concentrations in each exposure chamber will be determined at least 2 times (approximately 30 minutes apart) for the 1-hour exposure duration. On 7 December 2007 (1-hour exposure study day 0) during the second round of sampling for the 1-hour exposure, a peak with the same retention time as the test substance peak appeared for the room air and Chamber 1 gas chromatographic results. This carry-over peak also occurred during method development generations on 6 and 10 December 2007. Due to the corrosive nature of the test substance, it was determined that the column was failing and causing a carry-over peak following the analysis of samples from the test substance chambers. Therefore, only the sample collected 20 minutes into exposure was reported for Chamber 1.

- **Protocol Section 7.9.2** states that the average daily concentration in each chamber will be considered acceptable if they are within 10% of the target concentrations. On 28 November 2007 (preliminary study day 0) and 7 December 2007 (1-hour exposure study day 0), the average daily concentrations for Chamber 3 were 14.5% and 10.2% greater than the target concentrations, respectively, outside the 10% protocol-specified range.

- **Protocol Section 7.9.3** states that during pre-study method development trials, the stability of the test substance gas concentrations over time would be evaluated. The concentration stability over time assessment for the test substance was inadvertently not performed. Adequate stability concentration was observed during the animal exposure.

- **Protocol Section 8.2** states that body weight of each animal will be determined during the post-exposure observation period on study day 4 (termination) of the preliminary study. Body weights for the preliminary study animals were performed on study day 5 prior to euthanizing the animals.

- **Protocol Section 8.5** states that the response to the stimulus will be recorded for animals visible in the chamber as: (1) no reaction; (2) slight reaction (ear flick or some evidence that the stimulus was heard); or (3) more energetic response (jump, flinch and/or vocalization). On 3 December 2007 (study day 0 for 4-hour exposure), the response to stimulus was recorded for animals visible in the chamber as: (1) no reaction; (2) slight reaction (ear flick, flinch or some evidence that the stimulus was heard); or (3) more energetic response (jump and/or vocalization).

- **Protocol Section 8.6** states that all animals surviving to preliminary study termination will be euthanized by carbon dioxide inhalation and discarded after the 4-day post-exposure observation period. Animals in the preliminary study were euthanized on study day 6.

These deviations did not negatively impact the quality or integrity of the data nor the outcome of the study.

FIGURES 1 - 6

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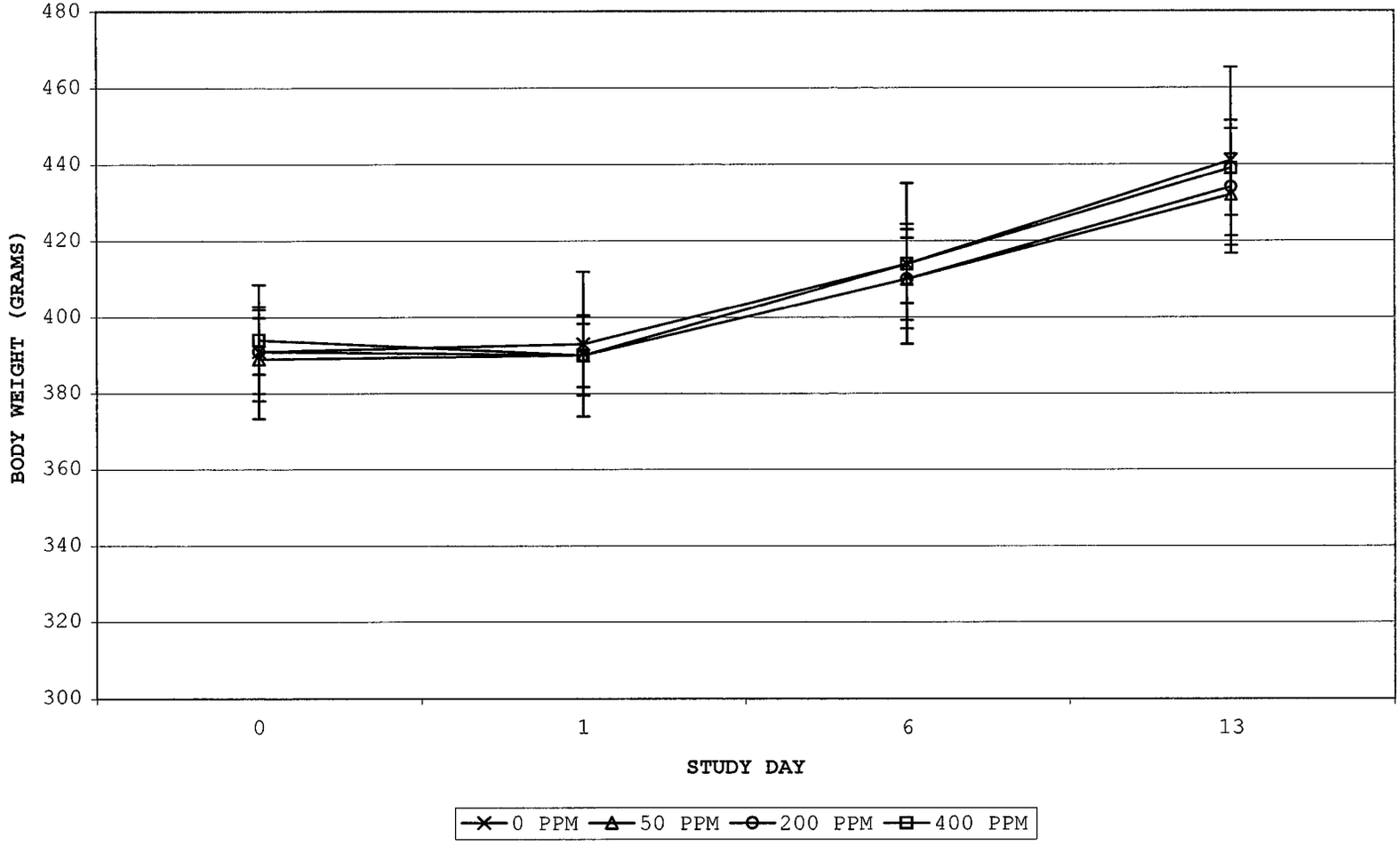
FIGURE 1
SUMMARY OF BODY WEIGHTS [G] (1-HOUR EXPOSURE - MALES)



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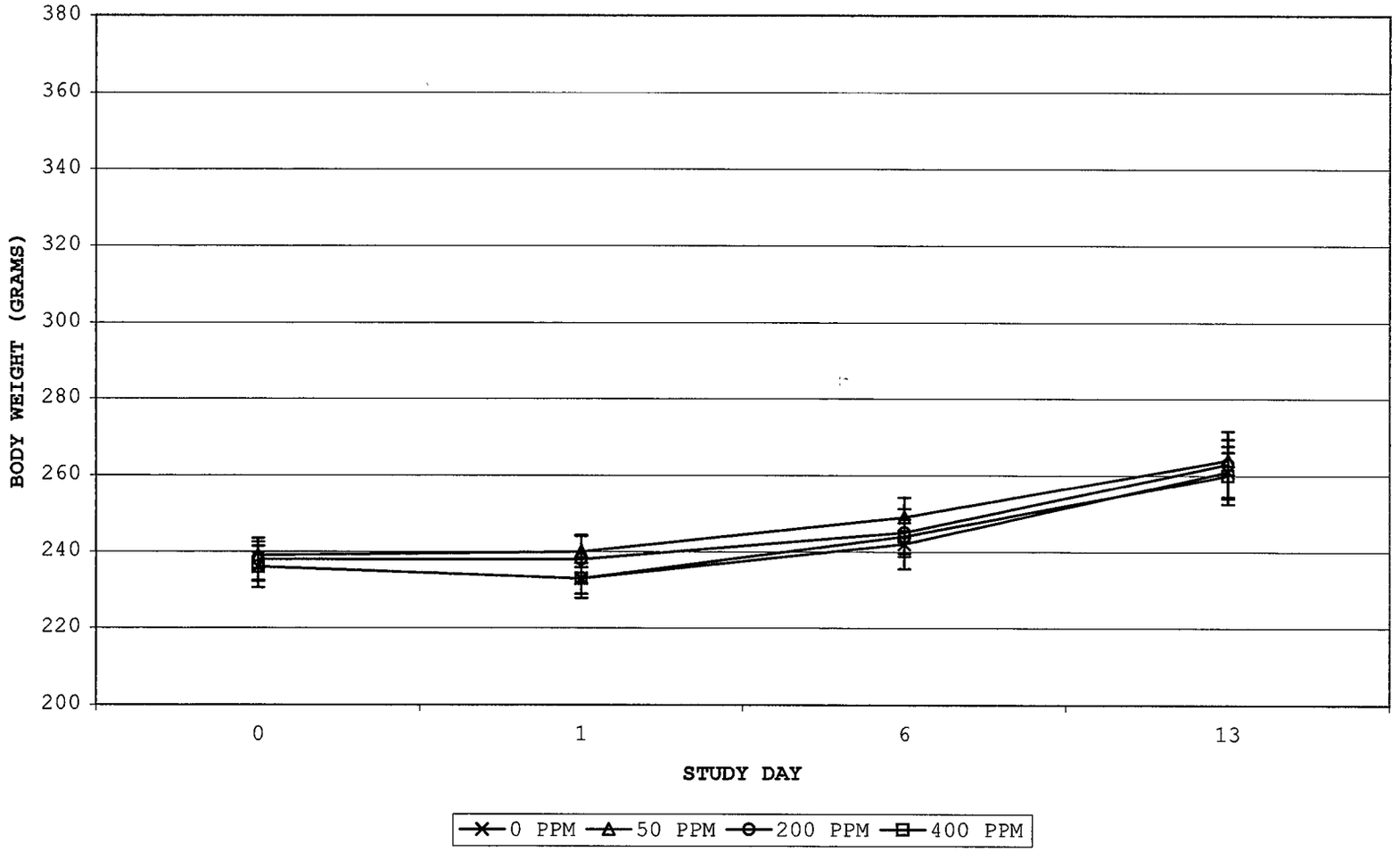
SPONSOR:LYONDELL CHEMICAL

FIGURE 2
SUMMARY OF BODY WEIGHTS [G] (1-HOUR EXPOSURE - FEMALES)



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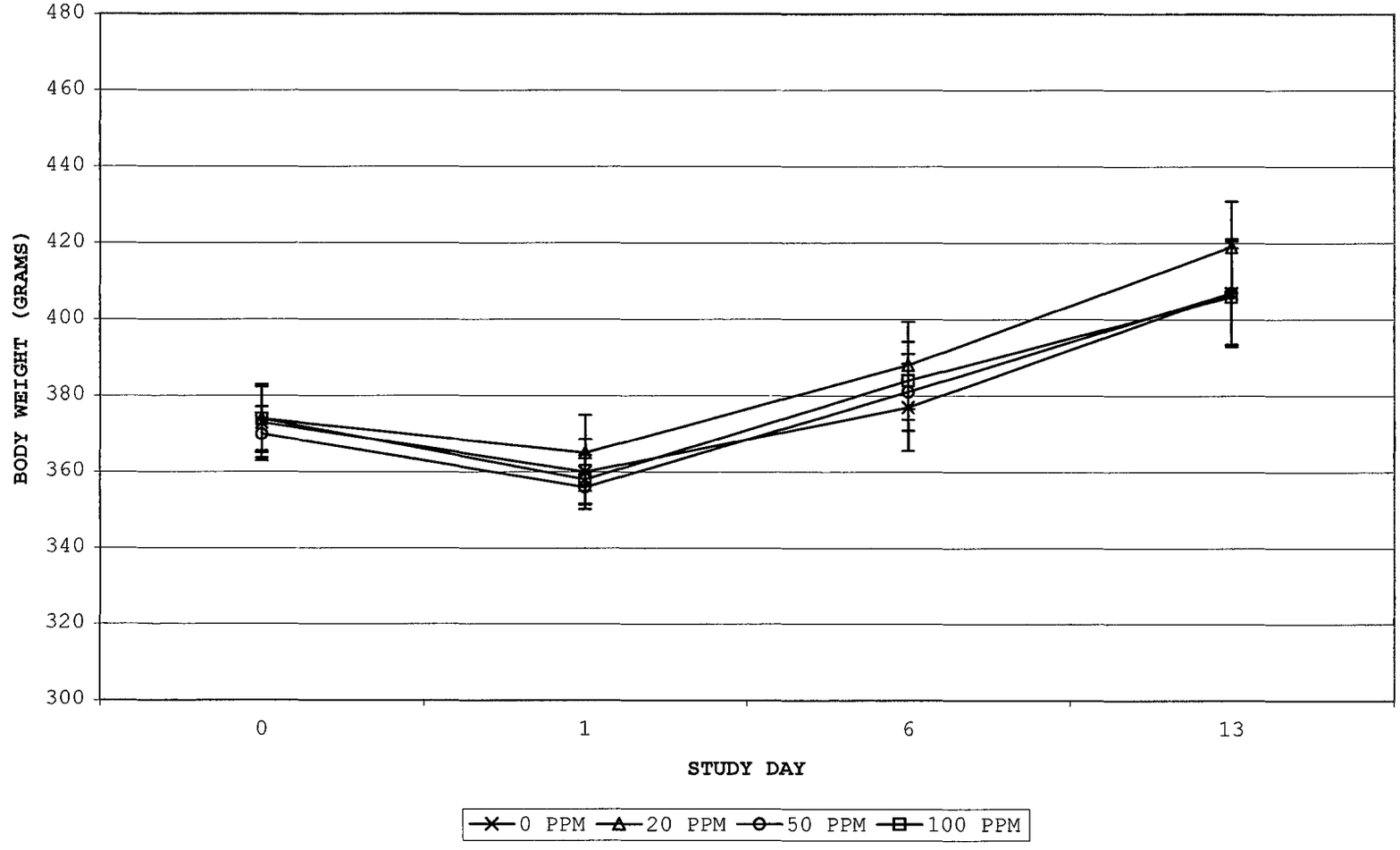
PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

FIGURE 3
SUMMARY OF BODY WEIGHTS [G] (4-HOUR EXPOSURE - MALES)



PROJECT NO.:WIL-14068D
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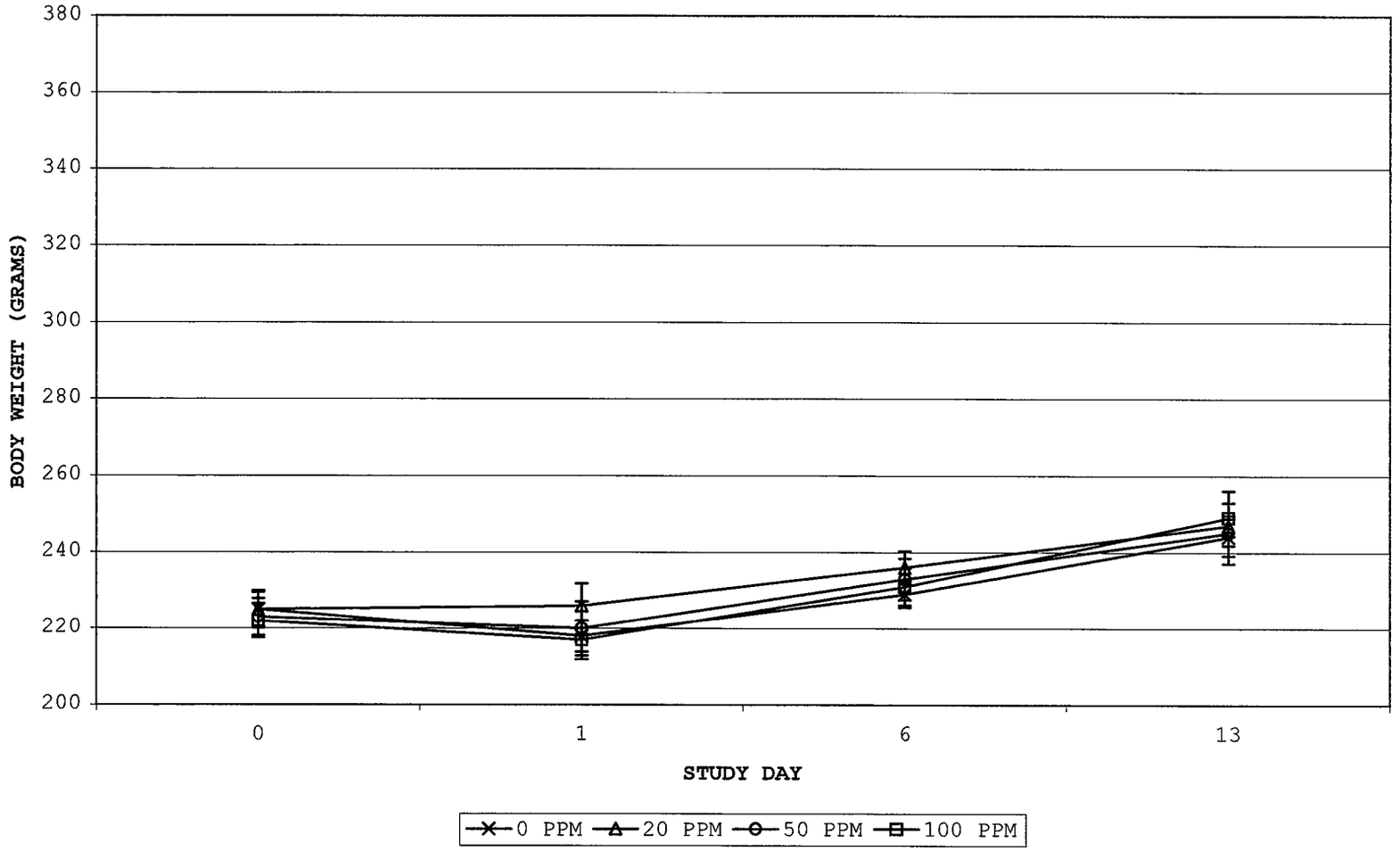
FIGURE 4
SUMMARY OF BODY WEIGHTS [G] (4-HOUR EXPOSURE - FEMALES)



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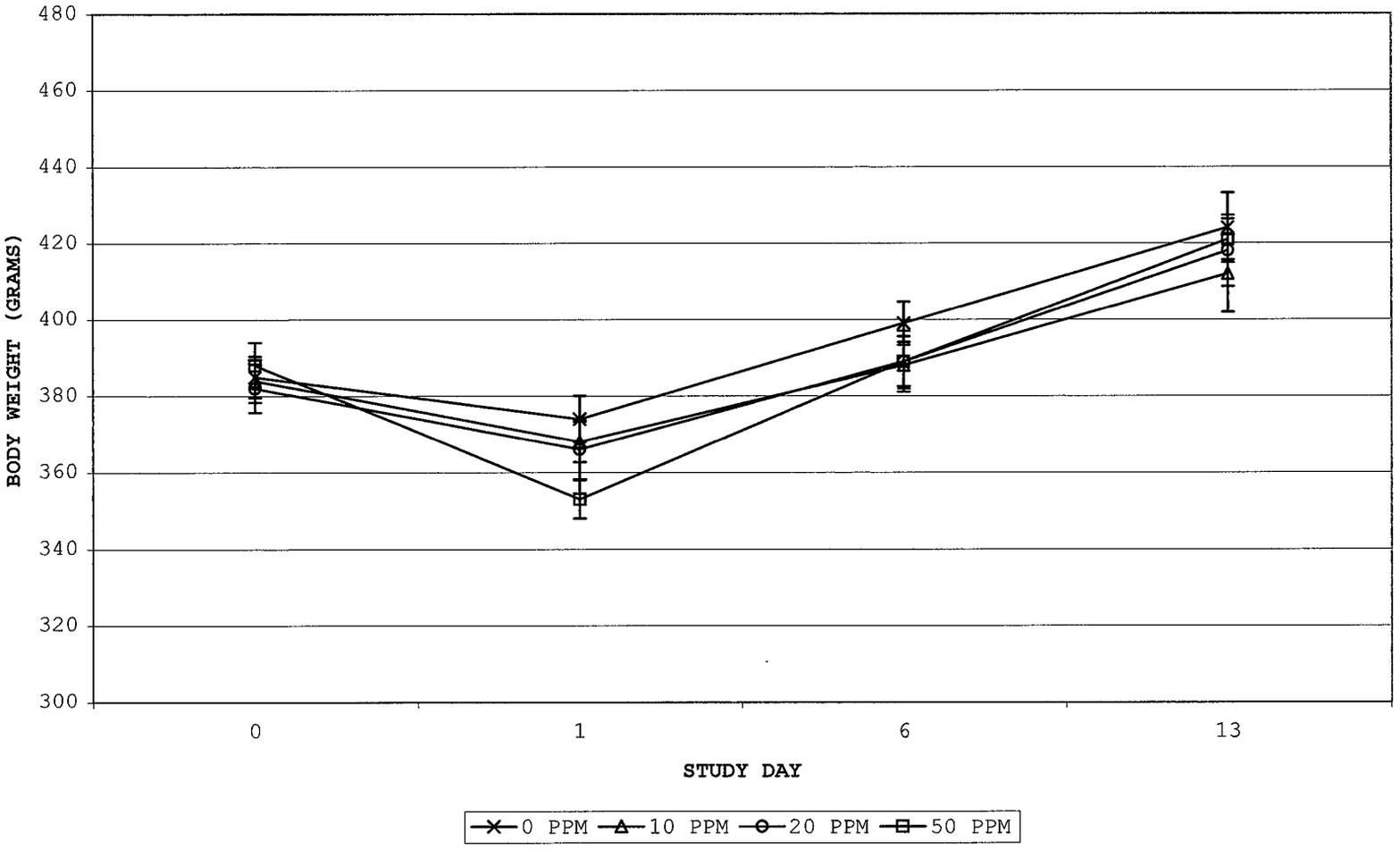
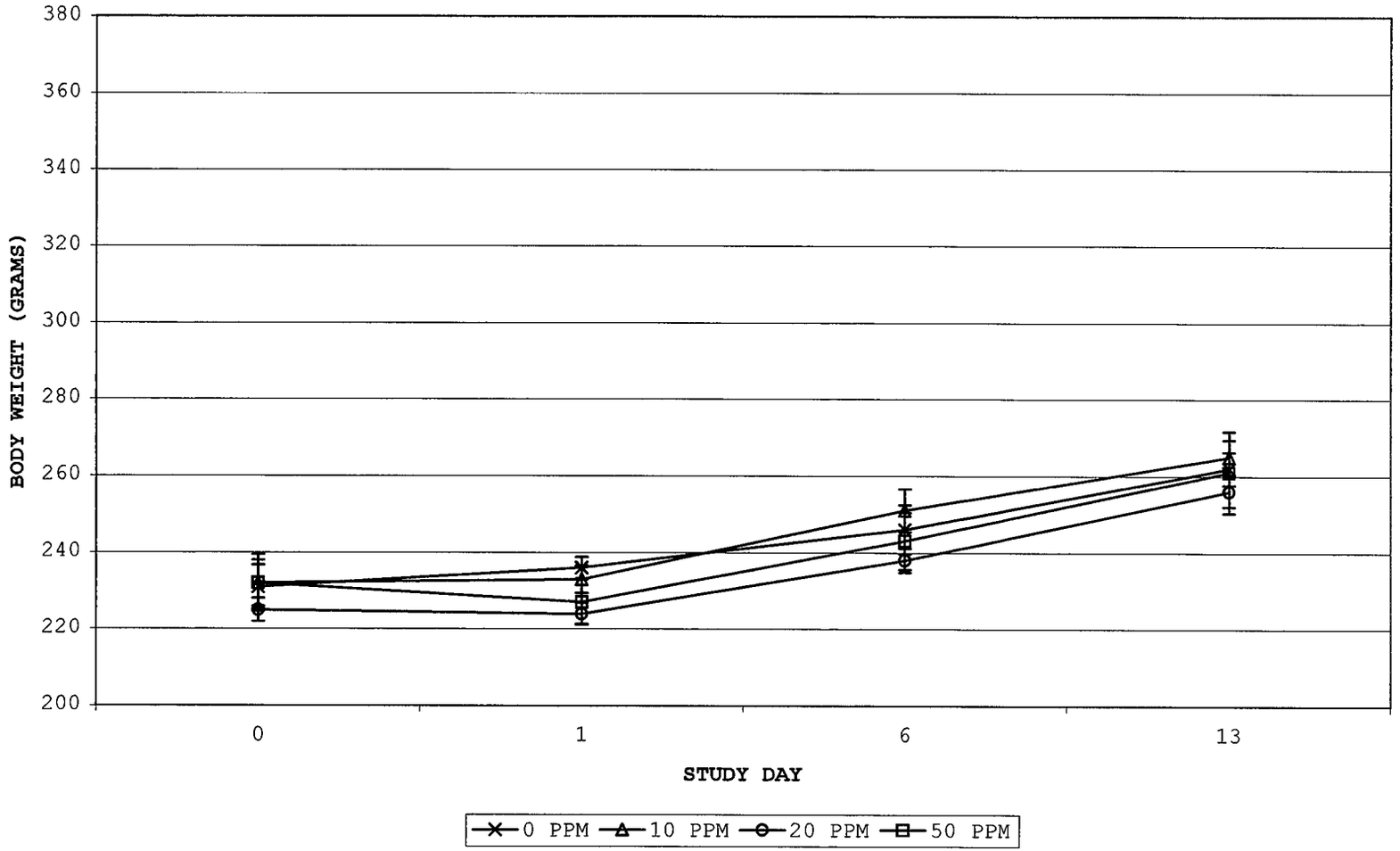
PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

FIGURE 5
SUMMARY OF BODY WEIGHTS [G] (8-HOUR EXPOSURE - MALES)



PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

FIGURE 6
SUMMARY OF BODY WEIGHTS [G] (8-HOUR EXPOSURE - FEMALES)



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TABLES 1 - 53

TABLE 1 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SURVIVAL AND DISPOSITION

MALES

GROUP :	1				2				3				4			
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE
0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
1	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
2	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
3	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
4	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
5	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
6	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
7	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
8	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
9	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
10	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
11	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
12	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
13	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5

DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

FEMALES

GROUP :	1				2				3				4			
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE
0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
1	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
2	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
3	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
4	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
5	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
6	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
7	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
8	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
9	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
10	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
11	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
12	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
13	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5

DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 2 (DISPOSITIONS - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 014			
GROUP:	1	2	3	4
DISPOSITION				
-SCHEDULED EUTHANASIA	5/ 5	5/ 5	5/ 5	5/ 5

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 2 (DISPOSITIONS - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 014			
GROUP:	1	2	3	4
DISPOSITION				
-SCHEDULED EUTHANASIA	5/ 5	5/ 5	5/ 5	5/ 5

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 3 (30 MINUTES INTO EXPOSURE - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS 30 MINUTES INTO EXPOSURE				

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 3 (30 MINUTES INTO EXPOSURE - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
CARDIO-PULMONARY -GASPING	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

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TABLE 4 (DURING EXPOSURE - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF NOVEL STIMULUS/AROUSAL RESPONSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
BEHAVIOR/CNS				
-NO REACTION TO STIMULUS	1/ 1	0/ 0	3/ 3	0/ 0
-SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH	4/ 4	5/ 5	2/ 2	5/ 5

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
BEHAVIOR/CNS				
-NO REACTION TO STIMULUS	1/ 1	0/ 0	3/ 3	3/ 3
-SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH	4/ 4	5/ 5	2/ 2	2/ 2

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 5 (END OF EXPOSURE - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS AT THE END OF EXPOSURE				

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS AT THE END OF EXPOSURE				

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 6 (1 HOUR POST-EXPOSURE - 1-HOUR EXPOSURE)
PROJECT NO.:WIL-14068F ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SPONSOR:LYONDELL CHEMICAL SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	4/ 4	0/ 0	0/ 0
BODY/INTEGUMENT				
-REDDENED FORELIMBS	0/ 0	1/ 1	5/ 5	5/ 5
-REDDENED HINDLIMBS	0/ 0	1/ 1	5/ 5	5/ 5
EYES/EARS/NOSE				
-REDDENED EARS	0/ 0	0/ 0	0/ 0	4/ 4
ORAL/DENTAL				
-WET RED MATERIAL AROUND MOUTH	0/ 0	0/ 0	1/ 1	1/ 1
-DRIED RED MATERIAL AROUND MOUTH	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 6 (1 HOUR POST-EXPOSURE - 1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: DAY 000				
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	5/ 5	1/ 1	1/ 1
BODY/INTEGUMENT				
-REDDENED FORELIMBS	0/ 0	0/ 0	3/ 3	4/ 4
-REDDENED HINDLIMBS	0/ 0	0/ 0	2/ 2	4/ 4
-WET CLEAR MATERIAL UROGENITAL AREA	0/ 0	0/ 0	1/ 1	2/ 2
-WET CLEAR MATERIAL VENTRAL ABDOMINAL AREA	0/ 0	0/ 0	0/ 0	2/ 2
EYES/EARS/NOSE				
-WET CLEAR MATERIAL AROUND MOUTH	0/ 0	0/ 0	1/ 1	1/ 1
ORAL/DENTAL				
-WET RED MATERIAL AROUND MOUTH	0/ 0	0/ 0	1/ 1	2/ 2

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 001 TO DAY 013			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	65/ 5	57/ 5	51/ 5	65/ 5
BODY/INTEGUMENT				
-HAIR LOSS LEFT FORELIMB	0/ 0	7/ 1	12/ 1	0/ 0
-HAIR LOSS RIGHT FORELIMB	0/ 0	8/ 1	12/ 1	0/ 0
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	0/ 0	0/ 0	2/ 2	0/ 0

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 001 TO DAY 013			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	64/ 5	52/ 5	52/ 5	63/ 5
BODY/INTEGUMENT				
-HAIR LOSS LEFT FORELIMB	0/ 0	12/ 2	12/ 1	2/ 1
-HAIR LOSS RIGHT FORELIMB	0/ 0	9/ 1	12/ 1	2/ 1
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	1/ 1	1/ 1	1/ 1	0/ 0

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

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TABLE 8 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 001			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	5/ 5	5/ 5	5/ 5

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 8 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: DAY 001				
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	5/ 5	5/ 5	5/ 5

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

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PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE 9 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHTS [G]

MALES

GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
DAY 0				
MEAN	391.	389.	391.	394.
% DIFFERENCE		-0.5	0.0	0.8
S.D.	39.3	24.4	24.6	19.9
S.E.	17.6	10.9	11.0	8.9
N	5	5	5	5
DAY 1				
MEAN	393.	390.	390.	390.
% DIFFERENCE		-0.8	-0.8	-0.8
S.D.	42.5	22.9	23.4	18.5
S.E.	19.0	10.2	10.5	8.3
N	5	5	5	5
DAY 6				
MEAN	414.	410.	410.	414.
% DIFFERENCE		-1.0	-1.0	0.0
S.D.	46.9	24.0	29.1	22.9
S.E.	21.0	10.7	13.0	10.3
N	5	5	5	5
DAY 13				
MEAN	441.	432.	434.	439.
% DIFFERENCE		-2.0	-1.6	-0.5
S.D.	54.4	23.9	34.3	27.7
S.E.	24.3	10.7	15.3	12.4
N	5	5	5	5

None significantly different from control group

TABLE 9 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHTS [G]

FEMALES

GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
DAY 0				
MEAN	236.	239.	238.	236.
% DIFFERENCE		1.3	0.8	0.0
S.D.	12.0	7.8	12.3	8.4
S.E.	5.4	3.5	5.5	3.8
N	5	5	5	5
DAY 1				
MEAN	233.	240.	238.	233.
% DIFFERENCE		3.0	2.1	0.0
S.D.	11.5	9.1	14.0	8.9
S.E.	5.1	4.1	6.3	4.0
N	5	5	5	5
DAY 6				
MEAN	242.	249.	245.	244.
% DIFFERENCE		2.9	1.2	0.8
S.D.	14.6	11.6	13.9	10.1
S.E.	6.5	5.2	6.2	4.5
N	5	5	5	5
DAY 13				
MEAN	261.	264.	263.	260.
% DIFFERENCE		1.1	0.8	-0.4
S.D.	19.0	8.2	19.2	13.7
S.E.	8.5	3.7	8.6	6.1
N	5	5	5	5

None significantly different from control group

TABLE 10 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF BODY WEIGHT CHANGES [G]

MALES

GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
DAY 0- 1				
MEAN	3.	1.	-1.	-4.
S.D.	3.9	3.0	2.9	3.7
S.E.	1.7	1.3	1.3	1.7
N	5	5	5	5
DAY 1- 6				
MEAN	20.	20.	20.	24.
S.D.	5.1	5.8	5.8	4.8
S.E.	2.3	2.6	2.6	2.1
N	5	5	5	5
DAY 6- 13				
MEAN	27.	22.	24.	25.
S.D.	9.1	3.7	6.8	7.0
S.E.	4.0	1.7	3.0	3.1
N	5	5	5	5

None significantly different from control group

MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

TABLE 10 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHT CHANGES [G]

FEMALES

GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
DAY 0- 1				
MEAN	-2.	1.	1.	-3.
S.D.	3.6	4.2	3.1	3.1
S.E.	1.6	1.9	1.4	1.4
N	5	5	5	5
DAY 1- 6				
MEAN	8.	9.	7.	10.
S.D.	5.8	7.9	5.8	1.8
S.E.	2.6	3.5	2.6	0.8
N	5	5	5	5
DAY 6- 13				
MEAN	19.	15.	18.	16.
S.D.	7.2	6.0	7.2	5.2
S.E.	3.2	2.7	3.2	2.3
N	5	5	5	5

None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE 11 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
DAY 0- 1				
MEAN	3.	1.	-1.	-4.
S.D.	3.9	3.0	2.9	3.7
S.E.	1.7	1.3	1.3	1.7
N	5	5	5	5
DAY 0- 6				
MEAN	23.	21.	19.	20.
S.D.	7.7	5.4	5.9	3.6
S.E.	3.5	2.4	2.6	1.6
N	5	5	5	5
DAY 0- 13				
MEAN	50.	43.	43.	46.
S.D.	15.4	6.3	11.9	10.3
S.E.	6.9	2.8	5.3	4.6
N	5	5	5	5

None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

TABLE 11 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
DAY 0- 1				
MEAN	-2.	1.	1.	-3.
S.D.	3.6	4.2	3.1	3.1
S.E.	1.6	1.9	1.4	1.4
N	5	5	5	5
DAY 0- 6				
MEAN	6.	10.	7.	8.
S.D.	4.2	5.0	4.4	4.5
S.E.	1.9	2.3	2.0	2.0
N	5	5	5	5
DAY 0- 13				
MEAN	25.	25.	25.	24.
S.D.	9.7	4.7	9.1	6.2
S.E.	4.4	2.1	4.1	2.8
N	5	5	5	5

None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

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TABLE 12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF HEMATOLOGY VALUES

MALES

ANALYSIS GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
WHITE CELLS (thous/uL)				
DAY 14 MEAN	9.99	10.21	11.40	13.36
% DIFFERENCE		2.2	14.1	33.7
S.D.	1.480	4.385	0.921	3.477
S.E.	0.662	1.961	0.412	1.555
N	5	5	5	5
RED CELLS (mil/uL)				
DAY 14 MEAN	8.55	8.20	8.45	8.67
% DIFFERENCE		-4.1	-1.2	1.4
S.D.	0.532	0.760	0.412	0.240
S.E.	0.238	0.340	0.184	0.107
N	5	5	5	5
HEMOGLOBIN (g/dL)				
DAY 14 MEAN	16.3	15.8	16.3	16.9
% DIFFERENCE		-3.1	0.0	3.7
S.D.	0.76	0.96	0.73	0.26
S.E.	0.34	0.43	0.33	0.12
N	5	5	5	5
HEMATOCRIT (%)				
DAY 14 MEAN	44.6	43.0	44.0	46.1
% DIFFERENCE		-3.6	-1.3	3.4
S.D.	2.12	3.59	2.05	1.18
S.E.	0.95	1.61	0.92	0.53
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	MALES 0 PPM	50 PPM	200 PPM	400 PPM
MCV (fL)				
DAY 14 MEAN	52.2	52.5	52.1	53.1
% DIFFERENCE		0.6	-0.2	1.7
S.D.	1.66	1.37	1.14	0.63
S.E.	0.74	0.61	0.51	0.28
N	5	5	5	5
MCH (pg)				
DAY 14 MEAN	19.1	19.3	19.3	19.5
% DIFFERENCE		1.0	1.0	2.1
S.D.	0.63	0.80	0.54	0.34
S.E.	0.28	0.36	0.24	0.15
N	5	5	5	5
MCHC (g/dL)				
DAY 14 MEAN	36.6	36.8	37.1	36.7
% DIFFERENCE		0.5	1.4	0.3
S.D.	0.49	1.08	0.55	0.50
S.E.	0.22	0.48	0.25	0.22
N	5	5	5	5
PLATELET (thous/uL)				
DAY 14 MEAN	1137.	1097.	1182.	1144.
% DIFFERENCE		-3.5	4.0	0.6
S.D.	103.3	92.7	84.5	226.2
S.E.	46.2	41.4	37.8	101.2
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:		MALES 0 PPM	50 PPM	200 PPM	400 PPM
PROTIME (seconds)					
DAY 14	MEAN	13.5	13.8	13.8	14.2
	% DIFFERENCE		2.2	2.2	5.2
	S.D.	1.01	1.80	0.83	1.45
	S.E.	0.51	0.81	0.37	0.65
	N	4	5	5	5
APTT (seconds)					
DAY 14	MEAN	17.3	18.0	19.6	18.8
	% DIFFERENCE		4.0	13.3	8.7
	S.D.	1.92	3.54	1.31	3.65
	S.E.	0.96	1.58	0.59	1.63
	N	4	5	5	5
RETICULOCYTE (%)					
DAY 14	MEAN	2.0	2.3	2.0	2.0
	% DIFFERENCE		15.0	0.0	0.0
	S.D.	0.17	0.21	0.13	0.32
	S.E.	0.08	0.09	0.06	0.14
	N	5	5	5	5
RETIC ABSOLUTE (thous/uL)					
DAY 14	MEAN	172.6	193.0	170.3	177.2
	% DIFFERENCE		11.8	-1.3	2.7
	S.D.	14.28	28.71	10.57	29.81
	S.E.	6.39	12.84	4.72	13.33
	N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

ANALYSIS GROUP:		MALES 0 PPM	50 PPM	200 PPM	400 PPM
NEUTROPHIL (%)					
DAY 14	MEAN	16.2	19.9	17.8	12.5
	% DIFFERENCE		22.8	9.9	-22.8
	S.D.	4.57	7.80	8.13	8.92
	S.E.	2.04	3.49	3.64	3.99
	N	5	5	5	5
LYMPHOCYTE (%)					
DAY 14	MEAN	80.0	76.2	78.3	84.3
	% DIFFERENCE		-4.8	-2.1	5.4
	S.D.	5.65	8.81	8.59	8.75
	S.E.	2.53	3.94	3.84	3.91
	N	5	5	5	5
MONOCYTE (%)					
DAY 14	MEAN	1.9	1.8	1.6	1.4
	% DIFFERENCE		-5.3	-15.8	-26.3
	S.D.	0.76	0.97	0.58	0.32
	S.E.	0.34	0.44	0.26	0.14
	N	5	5	5	5
EOSINOPHIL (%)					
DAY 14	MEAN	1.0	1.1	1.3	0.6
	% DIFFERENCE		10.0	30.0	-40.0
	S.D.	0.33	0.36	0.58	0.13
	S.E.	0.15	0.16	0.26	0.06
	N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

MALES

ANALYSIS GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
BASOPHIL (%)				
DAY 14 MEAN	0.4	0.3	0.4	0.4
% DIFFERENCE		-25.0	0.0	0.0
S.D.	0.14	0.11	0.16	0.18
S.E.	0.06	0.05	0.07	0.08
N	5	5	5	5
LG UNSTAIN CELL (%)				
DAY 14 MEAN	0.6	0.7	0.5	0.6
% DIFFERENCE		16.7	-16.7	0.0
S.D.	0.30	0.29	0.16	0.08
S.E.	0.14	0.13	0.07	0.04
N	5	5	5	5
NEU ABSOLUTE (thous/uL)				
DAY 14 MEAN	1.61	1.92	2.02	1.50
% DIFFERENCE		19.3	25.5	-6.8
S.D.	0.489	0.968	0.852	0.683
S.E.	0.219	0.433	0.381	0.305
N	5	5	5	5
LYMPH ABSOLUTE (thous/uL)				
DAY 14 MEAN	7.99	7.90	8.94	11.44
% DIFFERENCE		-1.1	11.9	43.2
S.D.	1.298	3.885	1.340	3.714
S.E.	0.581	1.737	0.599	1.661
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

ANALYSIS GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
		MALES		
MONO ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.19	0.17	0.19	0.19
% DIFFERENCE		-10.5	0.0	0.0
S.D.	0.068	0.098	0.073	0.045
S.E.	0.030	0.044	0.033	0.020
N	5	5	5	5
EOS ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.10	0.11	0.15	0.08
% DIFFERENCE		10.0	50.0	-20.0
S.D.	0.034	0.062	0.058	0.013
S.E.	0.015	0.028	0.026	0.006
N	5	5	5	5
BASO ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.04	0.04	0.05	0.06
% DIFFERENCE		0.0	25.0	50.0
S.D.	0.020	0.027	0.017	0.035
S.E.	0.009	0.012	0.007	0.016
N	5	5	5	5
LUC ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.06	0.07	0.06	0.09
% DIFFERENCE		16.7	0.0	50.0
S.D.	0.045	0.032	0.015	0.030
S.E.	0.020	0.014	0.007	0.014
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	FEMALES 0 PPM	50 PPM	200 PPM	400 PPM
WHITE CELLS (thous/uL)				
DAY 14 MEAN	7.92	5.86	5.94	6.93
% DIFFERENCE		-26.0	-25.0	-12.5
S.D.	3.053	1.091	2.249	1.755
S.E.	1.365	0.488	1.006	0.785
N	5	5	5	5
RED CELLS (mil/uL)				
DAY 14 MEAN	7.94	7.93	8.18	8.15
% DIFFERENCE		-0.1	3.0	2.6
S.D.	0.227	0.483	0.379	0.292
S.E.	0.102	0.216	0.169	0.131
N	5	5	5	5
HEMOGLOBIN (g/dL)				
DAY 14 MEAN	15.7	15.7	16.1	16.1
% DIFFERENCE		0.0	2.5	2.5
S.D.	0.63	0.88	0.96	0.41
S.E.	0.28	0.40	0.43	0.19
N	5	5	5	5
HEMATOCRIT (%)				
DAY 14 MEAN	41.6	41.5	43.3	43.5
% DIFFERENCE		-0.2	4.1	4.6
S.D.	1.53	2.58	1.95	1.16
S.E.	0.69	1.15	0.87	0.52
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

ANALYSIS GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
	FEMALES			
MCV (fL)				
DAY 14 MEAN	52.4	52.4	53.0	53.4
% DIFFERENCE		0.0	1.1	1.9
S.D.	0.97	0.79	2.31	0.81
S.E.	0.43	0.36	1.03	0.36
N	5	5	5	5
MCH (pg)				
DAY 14 MEAN	19.7	19.7	19.7	19.7
% DIFFERENCE		0.0	0.0	0.0
S.D.	0.44	0.44	0.94	0.34
S.E.	0.20	0.20	0.42	0.15
N	5	5	5	5
MCHC (g/dL)				
DAY 14 MEAN	37.7	37.6	37.2	37.0
% DIFFERENCE		-0.3	-1.3	-1.9
S.D.	0.83	0.63	0.74	0.36
S.E.	0.37	0.28	0.33	0.16
N	5	5	5	5
PLATELET (thous/uL)				
DAY 14 MEAN	1249.	1341.	1503.	1421.
% DIFFERENCE		7.4	20.3	13.8
S.D.	111.4	114.0	554.1	103.7
S.E.	49.8	51.0	247.8	46.4
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	FEMALES 0 PPM	50 PPM	200 PPM	400 PPM
PROTIME (seconds)				
DAY 14 MEAN	12.7	13.4	12.9	12.8
% DIFFERENCE		5.5	1.6	0.8
S.D.	0.54	1.23	1.20	0.78
S.E.	0.24	0.55	0.60	0.35
N	5	5	4	5
APTT (seconds)				
DAY 14 MEAN	18.2	18.2	17.2	17.8
% DIFFERENCE		0.0	-5.5	-2.2
S.D.	1.83	2.18	2.15	1.40
S.E.	0.82	0.97	1.07	0.63
N	5	5	4	5
RETICULOCYTE (%)				
DAY 14 MEAN	2.3	2.1	2.0	1.9
% DIFFERENCE		-8.7	-13.0	-17.4
S.D.	0.42	0.37	0.13	0.41
S.E.	0.19	0.17	0.06	0.19
N	5	5	5	5
RETIC ABSOLUTE (thous/uL)				
DAY 14 MEAN	186.5	165.6	165.7	157.2
% DIFFERENCE		-11.2	-11.2	-15.7
S.D.	37.80	36.38	8.96	31.52
S.E.	16.90	16.27	4.01	14.10
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

ANALYSIS GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
	FEMALES			
NEUTROPHIL (%)				
DAY 14 MEAN	11.8	14.2	14.3	9.1
% DIFFERENCE		20.3	21.2	-22.9
S.D.	3.26	6.16	6.89	3.43
S.E.	1.46	2.76	3.08	1.53
N	5	5	5	5
LYMPHOCYTE (%)				
DAY 14 MEAN	84.6	82.1	82.7	87.6
% DIFFERENCE		-3.0	-2.2	3.5
S.D.	2.83	6.57	7.07	3.30
S.E.	1.26	2.94	3.16	1.48
N	5	5	5	5
MONOCYTE (%)				
DAY 14 MEAN	1.5	1.6	1.4	1.5
% DIFFERENCE		6.7	-6.7	0.0
S.D.	0.43	0.79	0.43	0.48
S.E.	0.19	0.35	0.19	0.22
N	5	5	5	5
EOSINOPHIL (%)				
DAY 14 MEAN	1.2	1.2	0.8	0.9
% DIFFERENCE		0.0	-33.3	-25.0
S.D.	0.59	0.22	0.33	0.25
S.E.	0.26	0.10	0.15	0.11
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	FEMALES 0 PPM	50 PPM	200 PPM	400 PPM
BASOPHIL (%)				
DAY 14 MEAN	0.3	0.3	0.3	0.3
% DIFFERENCE		0.0	0.0	0.0
S.D.	0.08	0.11	0.09	0.04
S.E.	0.04	0.05	0.04	0.02
N	5	5	5	5
LG UNSTAIN CELL (%)				
DAY 14 MEAN	0.7	0.6	0.5	0.6
% DIFFERENCE		-14.3	-28.6	-14.3
S.D.	0.36	0.23	0.13	0.08
S.E.	0.16	0.10	0.06	0.04
N	5	5	5	5
NEU ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.91	0.79	0.75	0.65
% DIFFERENCE		-13.2	-17.6	-28.6
S.D.	0.386	0.187	0.236	0.371
S.E.	0.173	0.083	0.106	0.166
N	5	5	5	5
LYMPH ABSOLUTE (thous/uL)				
DAY 14 MEAN	6.73	4.86	5.01	6.05
% DIFFERENCE		-27.8	-25.6	-10.1
S.D.	2.701	1.161	2.242	1.443
S.E.	1.208	0.519	1.002	0.645
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

		FEMALES			
ANALYSIS	GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
MONO ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.12	0.09	0.09	0.11
	% DIFFERENCE		-25.0	-25.0	-8.3
	S.D.	0.034	0.050	0.050	0.052
	S.E.	0.015	0.022	0.022	0.023
	N	5	5	5	5
EOS ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.08	0.07	0.04**	0.06
	% DIFFERENCE		-12.5	-50.0	-25.0
	S.D.	0.022	0.011	0.011	0.014
	S.E.	0.010	0.005	0.005	0.006
	N	5	5	5	5
BASO ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.02	0.02	0.02	0.02
	% DIFFERENCE		0.0	0.0	0.0
	S.D.	0.017	0.008	0.009	0.004
	S.E.	0.007	0.004	0.004	0.002
	N	5	5	5	5
LUC ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.06	0.04	0.03	0.04
	% DIFFERENCE		-33.3	-50.0	-33.3
	S.D.	0.033	0.015	0.015	0.014
	S.E.	0.015	0.007	0.007	0.006
	N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

** = Significantly different from the control group at 0.01 using Dunnett's test

TABLE 13 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

		MALES			
ANALYSIS	GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
ALBUMIN (g/dL)					
DAY 14	MEAN	4.3	4.2	4.3	4.3
	% DIFFERENCE		-2.3	0.0	0.0
	S.D.	0.09	0.18	0.17	0.13
	S.E.	0.04	0.08	0.07	0.06
	N	5	5	5	5
TOTAL PROTEIN (g/dL)					
DAY 14	MEAN	6.6	6.7	6.8	6.6
	% DIFFERENCE		1.5	3.0	0.0
	S.D.	0.16	0.34	0.29	0.43
	S.E.	0.07	0.15	0.13	0.19
	N	5	5	5	5
GLOBULIN (g/dL)					
DAY 14	MEAN	2.4	2.4	2.5	2.3
	% DIFFERENCE		0.0	4.2	-4.2
	S.D.	0.15	0.21	0.15	0.33
	S.E.	0.07	0.09	0.07	0.15
	N	5	5	5	5
A/G RATIO					
DAY 14	MEAN	1.81	1.74	1.75	1.92
	% DIFFERENCE		-3.9	-3.3	6.1
	S.D.	0.098	0.135	0.070	0.297
	S.E.	0.044	0.060	0.031	0.133
	N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF SERUM CHEMISTRY VALUES

ANALYSIS GROUP:	MALES 0 PPM	50 PPM	200 PPM	400 PPM
TOTAL BILI (mg/dL)				
DAY 14 MEAN	0.1	0.1	0.1	0.1
% DIFFERENCE		0.0	0.0	0.0
S.D.	0.00	0.00	0.00	0.00
S.E.	0.00	0.00	0.00	0.00
N	5	5	5	5
UREA NITROGEN (mg/dL)				
DAY 14 MEAN	15.4	14.0	16.1	15.8
% DIFFERENCE		-9.1	4.5	2.6
S.D.	2.01	1.65	2.21	2.78
S.E.	0.90	0.74	0.99	1.24
N	5	5	5	5
CREATININE (mg/dL)				
DAY 14 MEAN	0.2	0.2	0.3	0.3
% DIFFERENCE		0.0	50.0	50.0
S.D.	0.00	0.05	0.08	0.10
S.E.	0.00	0.02	0.04	0.04
N	5	5	5	5
ALKALINEPHOS'TSE (U/L)				
DAY 14 MEAN	128.	140.	140.	145.
% DIFFERENCE		9.4	9.4	13.3
S.D.	5.0	26.8	48.5	28.8
S.E.	2.2	12.0	21.7	12.9
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 13 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 3

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

		MALES			
ANALYSIS	GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
ALANINE TRANSFER (U/L)					
DAY 14	MEAN	34.	34.	32.	35.
	% DIFFERENCE		0.0	-5.9	2.9
	S.D.	6.1	3.5	4.4	6.1
	S.E.	2.7	1.6	2.0	2.7
	N	5	5	5	5
ASPARTATTRANSFER (U/L)					
DAY 14	MEAN	122.	114.	118.	119.
	% DIFFERENCE		-6.6	-3.3	-2.5
	S.D.	25.2	31.7	30.4	15.9
	S.E.	11.3	14.2	13.6	7.1
	N	5	5	5	5
GLUTAMYLTRANSFER (U/L)					
DAY 14	MEAN	0.5	0.2	0.5	0.4
	% DIFFERENCE		-60.0	0.0	-20.0
	S.D.	0.50	0.13	0.49	0.46
	S.E.	0.22	0.06	0.22	0.21
	N	5	5	5	5
GLUCOSE (mg/dL)					
DAY 14	MEAN	113.	127.	113.	118.
	% DIFFERENCE		12.4	0.0	4.4
	S.D.	16.0	16.7	19.7	14.7
	S.E.	7.2	7.4	8.8	6.6
	N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 13 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 4

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

		MALES			
ANALYSIS	GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
CHOLESTEROL (mg/dL)					
DAY 14	MEAN	55.	62.	64.	63.
	% DIFFERENCE		12.7	16.4	14.5
	S.D.	3.9	9.6	16.2	12.8
	S.E.	1.7	4.3	7.2	5.7
	N	5	5	5	5
CALCIUM (mg/dL)					
DAY 14	MEAN	10.6	10.6	10.8	10.7
	% DIFFERENCE		0.0	1.9	0.9
	S.D.	0.24	0.21	0.19	0.35
	S.E.	0.11	0.09	0.09	0.16
	N	5	5	5	5
CHLORIDE (mEq/L)					
DAY 14	MEAN	103.	104.	102.	103.
	% DIFFERENCE		1.0	-1.0	0.0
	S.D.	1.5	1.9	0.5	1.5
	S.E.	0.7	0.9	0.2	0.7
	N	5	5	5	5
PHOSPHORUS (mg/dL)					
DAY 14	MEAN	8.2	7.4	7.7	7.7
	% DIFFERENCE		-9.8	-6.1	-6.1
	S.D.	0.30	0.40	0.52	1.02
	S.E.	0.14	0.18	0.23	0.46
	N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 13 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 5

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

	MALES			
ANALYSIS GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
POTASSIUM (mEq/L)				
DAY 14 MEAN	4.97	4.82	4.58	4.91
% DIFFERENCE		-3.0	-7.8	-1.2
S.D.	0.428	0.537	0.383	0.567
S.E.	0.192	0.240	0.171	0.253
N	5	5	5	5
SODIUM (mEq/L)				
DAY 14 MEAN	145.	145.	145.	145.
% DIFFERENCE		0.0	0.0	0.0
S.D.	1.3	1.8	0.5	0.9
S.E.	0.6	0.8	0.2	0.4
N	5	5	5	5
TRIGLYCERIDE (mg/dL)				
DAY 14 MEAN	54.	67.	69.	53.
% DIFFERENCE		24.1	27.8	-1.9
S.D.	13.9	26.0	44.7	12.8
S.E.	6.2	11.6	20.0	5.7
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 13 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 6

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

ANALYSIS GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
	FEMALES			
ALBUMIN (g/dL)				
DAY 14 MEAN	4.8	4.9	4.8	4.9
% DIFFERENCE		2.1	0.0	2.1
S.D.	0.39	0.40	0.34	0.16
S.E.	0.17	0.18	0.15	0.07
N	5	5	5	5
TOTAL PROTEIN (g/dL)				
DAY 14 MEAN	7.0	7.2	7.1	7.0
% DIFFERENCE		2.9	1.4	0.0
S.D.	0.42	0.33	0.29	0.16
S.E.	0.19	0.15	0.13	0.07
N	5	5	5	5
GLOBULIN (g/dL)				
DAY 14 MEAN	2.2	2.3	2.3	2.2
% DIFFERENCE		4.5	4.5	0.0
S.D.	0.15	0.13	0.21	0.27
S.E.	0.07	0.06	0.09	0.12
N	5	5	5	5
A/G RATIO				
DAY 14 MEAN	2.15	2.12	2.05	2.29
% DIFFERENCE		-1.4	-4.7	6.5
S.D.	0.280	0.314	0.278	0.299
S.E.	0.125	0.140	0.124	0.134
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 13 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

	FEMALES			
ANALYSIS GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
TOTAL BILI (mg/dL)				
DAY 14 MEAN	0.1	0.1	0.1	0.1
% DIFFERENCE		0.0	0.0	0.0
S.D.	0.04	0.00	0.00	0.00
S.E.	0.02	0.00	0.00	0.00
N	5	5	5	5
UREA NITROGEN (mg/dL)				
DAY 14 MEAN	15.2	14.2	13.2	13.4
% DIFFERENCE		-6.6	-13.2	-11.8
S.D.	1.48	2.90	0.71	0.63
S.E.	0.66	1.30	0.32	0.28
N	5	5	5	5
CREATININE (mg/dL)				
DAY 14 MEAN	0.3	0.2	0.3	0.3
% DIFFERENCE		-33.3	0.0	0.0
S.D.	0.04	0.05	0.04	0.10
S.E.	0.02	0.02	0.02	0.04
N	5	5	5	5
ALKALINEPHOS'TSE (U/L)				
DAY 14 MEAN	97.	87.	107.	84.
% DIFFERENCE		-10.3	10.3	-13.4
S.D.	19.3	21.3	20.8	15.1
S.E.	8.6	9.5	9.3	6.7
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 13 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

		FEMALES			
ANALYSIS	GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
ALANINE TRANSFER (U/L)					
DAY 14	MEAN	27.	30.	29.	28.
	% DIFFERENCE		11.1	7.4	3.7
	S.D.	4.2	2.5	4.5	5.2
	S.E.	1.9	1.1	2.0	2.3
	N	5	5	5	5
ASPARTATTRANSFER (U/L)					
DAY 14	MEAN	89.	87.	91.	83.
	% DIFFERENCE		-2.2	2.2	-6.7
	S.D.	15.1	18.7	9.8	15.6
	S.E.	6.8	8.4	4.4	7.0
	N	5	5	5	5
GLUTAMYLTRANSFER (U/L)					
DAY 14	MEAN	0.7	0.9	1.2	1.3
	% DIFFERENCE		28.6	71.4	85.7
	S.D.	0.38	0.67	0.90	0.43
	S.E.	0.17	0.30	0.40	0.19
	N	5	5	5	5
GLUCOSE (mg/dL)					
DAY 14	MEAN	109.	112.	117.	113.
	% DIFFERENCE		2.8	7.3	3.7
	S.D.	8.3	5.4	10.6	15.9
	S.E.	3.7	2.4	4.7	7.1
	N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

ANALYSIS GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
	FEMALES			
CHOLESTEROL (mg/dL)				
DAY 14 MEAN	75.	76.	79.	70.
% DIFFERENCE		1.3	5.3	-6.7
S.D.	12.3	11.4	20.0	23.5
S.E.	5.5	5.1	8.9	10.5
N	5	5	5	5
CALCIUM (mg/dL)				
DAY 14 MEAN	11.0	11.0	10.8	11.0
% DIFFERENCE		0.0	-1.8	0.0
S.D.	0.38	0.27	0.25	0.13
S.E.	0.17	0.12	0.11	0.06
N	5	5	5	5
CHLORIDE (mEq/L)				
DAY 14 MEAN	102.	103.	103.	103.
% DIFFERENCE		1.0	1.0	1.0
S.D.	1.1	1.6	1.5	2.3
S.E.	0.5	0.7	0.7	1.0
N	5	5	5	5
PHOSPHORUS (mg/dL)				
DAY 14 MEAN	7.0	6.6	7.3	7.2
% DIFFERENCE		-5.7	4.3	2.9
S.D.	0.81	0.50	0.77	0.40
S.E.	0.36	0.22	0.34	0.18
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

		FEMALES			
ANALYSIS	GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
POTASSIUM (mEq/L)					
DAY 14	MEAN	4.47	4.56	4.66	4.58
	% DIFFERENCE		2.0	4.3	2.5
	S.D.	0.147	0.517	0.634	0.154
	S.E.	0.066	0.231	0.284	0.069
	N	5	5	5	5
SODIUM (mEq/L)					
DAY 14	MEAN	144.	144.	144.	144.
	% DIFFERENCE		0.0	0.0	0.0
	S.D.	1.6	1.2	0.7	1.9
	S.E.	0.7	0.5	0.3	0.9
	N	5	5	5	5
TRIGLYCERIDE (mg/dL)					
DAY 14	MEAN	38.	43.	46.	35.
	% DIFFERENCE		13.2	21.1	-7.9
	S.D.	3.2	4.7	18.6	9.8
	S.E.	1.4	2.1	8.3	4.4
	N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 14 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	MALE			
GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS TERMINALLY EUTHANIZED	5	5	5	5
LYMPH NODE, MAND				
-DISCOLORATION, DARK RED	0	0	0	2
-ENLARGED	0	1	0	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	5	4	5	3

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	----- F E M A L E -----			
GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS TERMINALLY EUTHANIZED	5	5	5	5
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	5	5	5	5

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 15 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

	MALES			
GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
FINAL BODY WT (G)				
MEAN	411.	404.	403.	406.
% DIFFERENCE		-1.7	-1.9	-1.2
S.D.	50.3	25.2	28.9	26.6
S.E.	22.5	11.3	12.9	11.9
N	5	5	5	5
KIDNEYS (G)				
MEAN	2.89	2.92	2.73	2.70
% DIFFERENCE		1.0	-5.5	-6.6
S.D.	0.619	0.272	0.208	0.308
S.E.	0.277	0.122	0.093	0.138
N	5	5	5	5
KIDNEYS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.700	0.725	0.679	0.664
% DIFFERENCE		3.6	-3.0	-5.1
S.D.	0.0909	0.0647	0.0650	0.0389
S.E.	0.0407	0.0289	0.0291	0.0174
N	5	5	5	5
LIVER (G)				
MEAN	11.17	11.65	11.12	10.80
% DIFFERENCE		4.3	-0.4	-3.3
S.D.	2.217	1.291	1.296	1.834
S.E.	0.991	0.577	0.580	0.820
N	5	5	5	5

None significantly different from control group

GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
		MALES		
LIVER (G/100 G FINAL BODY WEIGHT)				
MEAN	2.702	2.878	2.756	2.649
% DIFFERENCE		6.5	2.0	-2.0
S.D.	0.2341	0.1525	0.1354	0.2957
S.E.	0.1047	0.0682	0.0606	0.1323
N	5	5	5	5
LUNGS (G)				
MEAN	1.46	1.49	1.46	1.38
% DIFFERENCE		2.1	0.0	-5.5
S.D.	0.228	0.105	0.080	0.119
S.E.	0.102	0.047	0.036	0.053
N	5	5	5	5
LUNGS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.355	0.369	0.364	0.340
% DIFFERENCE		3.9	2.5	-4.2
S.D.	0.0228	0.0300	0.0162	0.0134
S.E.	0.0102	0.0134	0.0072	0.0060
N	5	5	5	5

None significantly different from control group

TABLE 15 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

	FEMALES			
GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
FINAL BODY WT (G)				
MEAN	242.	244.	242.	239.
% DIFFERENCE		0.8	0.0	-1.2
S.D.	16.9	7.0	15.6	12.9
S.E.	7.5	3.1	7.0	5.8
N	5	5	5	5
KIDNEYS (G)				
MEAN	1.66	1.74	1.62	1.67
% DIFFERENCE		4.8	-2.4	0.6
S.D.	0.084	0.108	0.128	0.139
S.E.	0.037	0.048	0.057	0.062
N	5	5	5	5
KIDNEYS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.690	0.713	0.669	0.697
% DIFFERENCE		3.3	-3.0	1.0
S.D.	0.0657	0.0439	0.0351	0.0286
S.E.	0.0294	0.0196	0.0157	0.0128
N	5	5	5	5
LIVER (G)				
MEAN	7.14	6.87	6.55	6.88
% DIFFERENCE		-3.8	-8.3	-3.6
S.D.	0.319	0.316	0.485	0.926
S.E.	0.143	0.141	0.217	0.414
N	5	5	5	5

None significantly different from control group

	FEMALES			
GROUP:	0 PPM	50 PPM	200 PPM	400 PPM
LIVER (G/100 G FINAL BODY WEIGHT)				
MEAN	2.962	2.822	2.709	2.870
% DIFFERENCE		-4.7	-8.5	-3.1
S.D.	0.2628	0.1784	0.1196	0.2552
S.E.	0.1175	0.0798	0.0535	0.1141
N	5	5	5	5
LUNGS (G)				
MEAN	1.18	1.09	1.10	1.17
% DIFFERENCE		-7.6	-6.8	-0.8
S.D.	0.085	0.105	0.028	0.101
S.E.	0.038	0.047	0.012	0.045
N	5	5	5	5
LUNGS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.490	0.446	0.456	0.490
% DIFFERENCE		-9.0	-6.9	0.0
S.D.	0.0656	0.0398	0.0351	0.0457
S.E.	0.0294	0.0178	0.0157	0.0204
N	5	5	5	5

None significantly different from control group

TABLE 16 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
KIDNEYS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	4
-INFLAMMATION, CHRONIC, INTERSTITIAL	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
LARYNX				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LIVER				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LUNGS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LYMPH NODE, MAND				
TOTAL NUMBER EXAMINED	NA	1	NA	2
EXAMINED, UNREMARKABLE	NA	0	NA	0
-HEMORRHAGE	NA	1	NA	2
MODERATE	NA	1	NA	2

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

NA = NOT APPLICABLE

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
NASAL LEVEL I				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	3	3	4	3
-HYPERKERATOSIS	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
-HYPERPLASIA, EPITHELIAL, RESPIRATORY	0	1	0	0
MILD	NONE	1	NONE	NONE
-HYPERPLASIA, GOBLET CELL	1	1	0	0
MINIMAL	NONE	1	NONE	NONE
MILD	1	NONE	NONE	NONE
-INFLAMMATION, CHRONIC	1	1	1	2
MINIMAL	1	1	NONE	1
MILD	NONE	NONE	1	1
NASAL LEVEL II				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	4	3	1
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	1
MINIMAL	NONE	NONE	NONE	1
-HYPERPLASIA, GOBLET CELL	0	1	2	1
MILD	NONE	1	2	1
-INFLAMMATION, CHRONIC	0	0	1	3
MINIMAL	NONE	NONE	NONE	1
MILD	NONE	NONE	NONE	1
MODERATE	NONE	NONE	1	1

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
NASAL LEVEL II - CONTINUED				
NASAL LEVEL III				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
NASAL LEVEL IV				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	4	5
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	1	0
MILD	NONE	NONE	1	NONE
NASAL LEVEL V				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	4	4
-HEMORRHAGE	0	0	1	1
MINIMAL	NONE	NONE	NONE	1
MILD	NONE	NONE	1	NONE
NASAL LEVEL VI				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	4
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	1
MINIMAL	NONE	NONE	NONE	1

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
NASAL LEVEL VI - CONTINUED				
TRACHEA				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
KIDNEYS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	3	3	4	4
-INFLAMMATION, CHRONIC, INTERSTITIAL	0	0	0	1
MILD	NONE	NONE	NONE	1
-MINERALIZATION	2	2	1	0
MINIMAL	1	NONE	NONE	NONE
MILD	1	2	1	NONE
LARYNX				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LIVER				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LUNGS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	4	5	5
-ATELECTASIS	0	1	0	0
MILD	NONE	1	NONE	NONE

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
NASAL LEVEL I				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	4	4	3	0
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	0	1
MILD	NONE	NONE	NONE	1
-INFLAMMATION, CHRONIC	1	1	2	5
MINIMAL	NONE	1	1	1
MILD	1	NONE	1	4
NASAL LEVEL II				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	4	5
-INFLAMMATION, CHRONIC	0	0	1	0
MILD	NONE	NONE	1	NONE
NASAL LEVEL III				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	4
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	1
MODERATE	NONE	NONE	NONE	1
NASAL LEVEL IV				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	3	5	4
-DEGENERATION, OLFACTORY EPITHELIUM	0	2	0	1
MILD	NONE	2	NONE	NONE
MODERATE	NONE	NONE	NONE	1

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
NASAL LEVEL IV - CONTINUED				
-INFLAMMATION, CHRONIC	0	0	0	1
MILD	NONE	NONE	NONE	1
-METAPLASIA, OLFACTORY TO RESPIRATORY EPITHELIUM	0	1	0	0
MILD	NONE	1	NONE	NONE
NASAL LEVEL V				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	4
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	1
MODERATE	NONE	NONE	NONE	1
NASAL LEVEL VI				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	4	5	5	5
-INFLAMMATION, CHRONIC	1	0	0	0
MILD	1	NONE	NONE	NONE
TRACHEA				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5

1- 0 PPM 2- 50 PPM 3- 200 PPM 4- 400 PPM

TABLE 17 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SURVIVAL AND DISPOSITION

MALES

GROUP :	1				2				3				4			
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE
0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
1	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
2	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
3	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
4	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
5	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
6	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
7	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
8	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
9	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
10	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
11	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
12	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
13	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5

DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 17 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SURVIVAL AND DISPOSITION

FEMALES

GROUP :	1				2				3				4			
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE
0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
1	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
2	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
3	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
4	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
5	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
6	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
7	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
8	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
9	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
10	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
11	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
12	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
13	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5

DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

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TABLE 18 (DISPOSITIONS - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 014			
GROUP:	1	2	3	4
DISPOSITION				
-SCHEDULED EUTHANASIA	5/ 5	5/ 5	5/ 5	5/ 5

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE 18 (DISPOSITIONS - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: DAY 014				
GROUP:	1	2	3	4
DISPOSITION				
-SCHEDULED EUTHANASIA	5/ 5	5/ 5	5/ 5	5/ 5

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

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PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE 19 (30 MINUTES INTO EXPOSURE - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: DAY 000				
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS 30 MINUTES INTO EXPOSURE				

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 19 (30 MINUTES INTO EXPOSURE - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS 30 MINUTES INTO EXPOSURE				

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

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TABLE 20 (1 HOUR INTO EXPOSURE - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS 1 HOUR INTO EXPOSURE				

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
CARDIO-PULMONARY -GASPING	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

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TABLE 21 (DURING EXPOSURE - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF NOVEL STIMULUS/AROUSAL RESPONSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
BEHAVIOR/CNS				
-NO REACTION TO STIMULUS	0/ 0	0/ 0	2/ 2	1/ 1
-SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH	5/ 5	5/ 5	3/ 3	3/ 3
-ENERGETIC RESPONSE TO STIMULUS - JUMPING	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
BEHAVIOR/CNS				
-NO REACTION TO STIMULUS	0/ 0	0/ 0	0/ 0	3/ 3
-SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH	5/ 5	5/ 5	5/ 5	1/ 1
-ENERGETIC RESPONSE TO STIMULUS - JUMPING	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

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TABLE 22 (END OF EXPOSURE - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS AT END OF EXPOSURE				

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS AT END OF EXPOSURE				

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 23 (1 HOUR POST-EXPOSURE - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	5/ 5	1/ 1	0/ 0
BODY/INTEGUMENT				
-REDDENED HINDLIMBS	0/ 0	0/ 0	2/ 2	4/ 4
-REDDENED FORELIMBS	0/ 0	0/ 0	2/ 2	4/ 4
CARDIO-PULMONARY				
-GASPING	0/ 0	0/ 0	1/ 1	5/ 5
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	0/ 0	0/ 0	1/ 1	3/ 3
ORAL/DENTAL				
-DRIED RED MATERIAL AROUND MOUTH	0/ 0	0/ 0	1/ 1	2/ 2

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 23 (1 HOUR POST-EXPOSURE - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	3/ 3	4/ 4	1/ 1
BODY/INTEGUMENT				
-WET YELLOW MATERIAL UROGENITAL AREA	0/ 0	1/ 1	0/ 0	3/ 3
-REDDENED HINDLIMBS	0/ 0	0/ 0	0/ 0	2/ 2
-REDDENED FORELIMBS	0/ 0	0/ 0	0/ 0	3/ 3
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	0/ 0	0/ 0	0/ 0	1/ 1
ORAL/DENTAL				
-DRIED RED MATERIAL AROUND MOUTH	0/ 0	0/ 0	1/ 1	2/ 2
-DRIED CLEAR MATERIAL AROUND MOUTH	0/ 0	0/ 0	0/ 0	1/ 1
-WET CLEAR MATERIAL AROUND MOUTH	0/ 0	1/ 1	0/ 0	0/ 0

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

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TABLE 24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 001 TO DAY 013			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	65/ 5	65/ 5	64/ 5	65/ 5
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	0/ 0	0/ 0	1/ 1	0/ 0

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 001 TO DAY 013			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	65/ 5	58/ 5	59/ 5	65/ 5
BODY/INTEGUMENT				
-SCABBING DORSAL HEAD	0/ 0	0/ 0	4/ 1	0/ 0
-HAIR LOSS RIGHT FORELIMB	0/ 0	4/ 1	0/ 0	0/ 0
-HAIR LOSS LEFT FORELIMB	0/ 0	7/ 1	0/ 0	0/ 0
ORAL/DENTAL				
-SCABBING AROUND MOUTH	0/ 0	0/ 0	2/ 1	0/ 0

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

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TABLE 25 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: DAY 001				
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	5/ 5	4/ 4	5/ 5
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	0/ 0	0/ 0	1/ 1	0/ 0

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE 25 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: DAY 001				
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	5/ 5	4/ 4	5/ 5
ORAL/DENTAL				
-SCABBING AROUND MOUTH	0/ 0	0/ 0	1/ 1	0/ 0

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

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PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE 26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHTS [G]

MALES

GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
DAY 0				
MEAN	373.	374.	370.	374.
% DIFFERENCE		0.3	-0.8	0.3
S.D.	20.8	18.9	16.0	19.9
S.E.	9.3	8.5	7.1	8.9
N	5	5	5	5
DAY 1				
MEAN	360.	365.	356.	358.
% DIFFERENCE		1.4	-1.1	-0.6
S.D.	19.3	22.3	13.0	14.3
S.E.	8.6	10.0	5.8	6.4
N	5	5	5	5
DAY 6				
MEAN	377.	388.	381.	384.
% DIFFERENCE		2.9	1.1	1.9
S.D.	25.6	25.4	22.3	22.9
S.E.	11.4	11.4	10.0	10.2
N	5	5	5	5
DAY 13				
MEAN	407.	419.	407.	406.
% DIFFERENCE		2.9	0.0	-0.2
S.D.	30.1	26.5	31.6	28.3
S.E.	13.5	11.9	14.1	12.7
N	5	5	5	5

None significantly different from control group

TABLE 26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHTS [G]

GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
		FEMALES		
DAY 0				
MEAN	225.	225.	223.	222.
% DIFFERENCE		0.0	-0.9	-1.3
S.D.	10.0	11.0	10.9	10.2
S.E.	4.5	4.9	4.9	4.5
N	5	5	5	5
DAY 1				
MEAN	218.	226.	220.	217.
% DIFFERENCE		3.7	0.9	-0.5
S.D.	9.1	12.9	15.9	11.4
S.E.	4.1	5.8	7.1	5.1
N	5	5	5	5
DAY 6				
MEAN	229.	236.	233.	231.
% DIFFERENCE		3.1	1.7	0.9
S.D.	7.5	9.7	12.1	10.8
S.E.	3.4	4.3	5.4	4.8
N	5	5	5	5
DAY 13				
MEAN	244.	247.	245.	249.
% DIFFERENCE		1.2	0.4	2.0
S.D.	11.0	5.9	17.6	16.0
S.E.	4.9	2.7	7.9	7.1
N	5	5	5	5

None significantly different from control group

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE 27 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHT CHANGES [G]

MALES

GROUP:		0 PPM	20 PPM	50 PPM	100 PPM
DAY 0- 1					
	MEAN	-13.	-10.	-14.	-16.
	S.D.	4.7	3.9	5.5	7.1
	S.E.	2.1	1.7	2.5	3.2
	N	5	5	5	5
DAY 1- 6					
	MEAN	17.	24.	25.	26.
	S.D.	8.2	4.6	9.5	9.5
	S.E.	3.7	2.0	4.2	4.3
	N	5	5	5	5
DAY 6- 13					
	MEAN	30.	30.	26.	22.
	S.D.	11.4	5.1	11.8	6.4
	S.E.	5.1	2.3	5.3	2.9
	N	5	5	5	5

None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

TABLE 27 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHT CHANGES [G]

FEMALES

GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
DAY 0- 1				
MEAN	-6.	1.	-3.	-5.
S.D.	1.5	3.9	6.7	5.8
S.E.	0.7	1.7	3.0	2.6
N	5	5	5	5
DAY 1- 6				
MEAN	11.	10.	13.	14.
S.D.	4.2	4.6	6.4	2.3
S.E.	1.9	2.0	2.8	1.0
N	5	5	5	5
DAY 6- 13				
MEAN	15.	11.	12.	18.
S.D.	6.0	4.5	7.9	9.9
S.E.	2.7	2.0	3.5	4.4
N	5	5	5	5

None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

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PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE 28 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

		MALES			
	GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
DAY 0- 1					
	MEAN	-13.	-10.	-14.	-16.
	S.D.	4.7	3.9	5.5	7.1
	S.E.	2.1	1.7	2.5	3.2
	N	5	5	5	5
DAY 0- 6					
	MEAN	4.	14.	11.	10.
	S.D.	9.2	6.8	9.7	7.6
	S.E.	4.1	3.1	4.3	3.4
	N	5	5	5	5
DAY 0- 13					
	MEAN	34.	45.	37.	32.
	S.D.	15.3	9.1	17.5	13.2
	S.E.	6.8	4.1	7.8	5.9
	N	5	5	5	5

None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

TABLE 28 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
DAY 0- 1				
MEAN	-6.	1.	-3.	-5.
S.D.	1.5	3.9	6.7	5.8
S.E.	0.7	1.7	3.0	2.6
N	5	5	5	5
DAY 0- 6				
MEAN	4.	12.	10.	9.
S.D.	5.0	5.2	4.0	6.4
S.E.	2.2	2.3	1.8	2.9
N	5	5	5	5
DAY 0- 13				
MEAN	20.	22.	22.	27.
S.D.	10.0	7.4	8.7	6.4
S.E.	4.5	3.3	3.9	2.9
N	5	5	5	5

None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

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TABLE 29 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	MALES 0 PPM	20 PPM	50 PPM	100 PPM
WHITE CELLS (thous/uL)				
DAY 14 MEAN	9.03	7.97	9.10	8.58
% DIFFERENCE		-11.7	0.8	-5.0
S.D.	4.444	1.915	2.553	2.755
S.E.	1.987	0.856	1.142	1.232
N	5	5	5	5
RED CELLS (mil/uL)				
DAY 14 MEAN	8.52	8.43	8.48	8.64
% DIFFERENCE		-1.1	-0.5	1.4
S.D.	0.486	0.430	0.268	0.293
S.E.	0.217	0.192	0.120	0.131
N	5	5	5	5
HEMOGLOBIN (g/dL)				
DAY 14 MEAN	16.5	16.7	16.5	16.6
% DIFFERENCE		1.2	0.0	0.6
S.D.	0.41	0.66	0.53	0.53
S.E.	0.18	0.29	0.24	0.24
N	5	5	5	5
HEMATOCRIT (%)				
DAY 14 MEAN	45.2	45.0	44.4	45.3
% DIFFERENCE		-0.4	-1.8	0.2
S.D.	0.72	2.23	1.70	1.13
S.E.	0.32	1.00	0.76	0.50
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:		MALES 0 PPM	20 PPM	50 PPM	100 PPM
MCV (fL)					
DAY 14	MEAN	53.2	53.4	52.3	52.4
	% DIFFERENCE		0.4	-1.7	-1.5
	S.D.	2.75	2.09	1.65	0.87
	S.E.	1.23	0.94	0.74	0.39
	N	5	5	5	5
MCH (pg)					
DAY 14	MEAN	19.4	19.8	19.4	19.2
	% DIFFERENCE		2.1	0.0	-1.0
	S.D.	1.00	0.73	0.54	0.42
	S.E.	0.45	0.33	0.24	0.19
	N	5	5	5	5
MCHC (g/dL)					
DAY 14	MEAN	36.6	37.1	37.0	36.6
	% DIFFERENCE		1.4	1.1	0.0
	S.D.	0.42	0.45	0.36	0.36
	S.E.	0.19	0.20	0.16	0.16
	N	5	5	5	5
PLATELET (thous/uL)					
DAY 14	MEAN	1245.	950.	1127.	998.
	% DIFFERENCE		-23.7	-9.5	-19.8
	S.D.	134.5	174.8	225.6	185.8
	S.E.	60.2	78.2	100.9	83.1
	N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	MALES 0 PPM	20 PPM	50 PPM	100 PPM
PROTIME (seconds)				
DAY 14 MEAN	14.0	13.0	13.4	12.9
% DIFFERENCE		-7.1	-4.3	-7.9
S.D.	1.46	0.67	1.38	0.82
S.E.	0.65	0.30	0.69	0.37
N	5	5	4	5
APTT (seconds)				
DAY 14 MEAN	19.7	19.3	17.2	18.0
% DIFFERENCE		-2.0	-12.7	-8.6
S.D.	1.67	1.21	2.17	2.58
S.E.	0.74	0.54	1.08	1.15
N	5	5	4	5
RETICULOCYTE (%)				
DAY 14 MEAN	2.3	2.4	2.2	2.1
% DIFFERENCE		4.3	-4.3	-8.7
S.D.	0.53	0.32	0.49	0.29
S.E.	0.24	0.14	0.22	0.13
N	5	5	5	5
RETIC ABSOLUTE (thous/uL)				
DAY 14 MEAN	190.5	201.5	186.0	182.9
% DIFFERENCE		5.8	-2.4	-4.0
S.D.	37.29	32.55	39.90	26.50
S.E.	16.68	14.56	17.84	11.85
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 29 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 4

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF HEMATOLOGY VALUES

		MALES			
ANALYSIS	GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
NEUTROPHIL (%)					
DAY 14	MEAN	11.3	18.6*	14.1	18.8*
	% DIFFERENCE		64.6	24.8	66.4
	S.D.	2.73	5.62	1.67	5.72
	S.E.	1.22	2.51	0.75	2.56
	N	5	5	5	5
LYMPHOCYTE (%)					
DAY 14	MEAN	85.3	77.4*	81.8	76.7*
	% DIFFERENCE		-9.3	-4.1	-10.1
	S.D.	2.94	6.13	1.66	5.58
	S.E.	1.31	2.74	0.74	2.50
	N	5	5	5	5
MONOCYTE (%)					
DAY 14	MEAN	1.2	1.6	2.0	1.7
	% DIFFERENCE		33.3	66.7	41.7
	S.D.	0.37	0.60	0.91	0.38
	S.E.	0.17	0.27	0.41	0.17
	N	5	5	5	5
EOSINOPHIL (%)					
DAY 14	MEAN	1.2	1.2	0.9	1.7
	% DIFFERENCE		0.0	-25.0	41.7
	S.D.	0.84	0.51	0.29	0.62
	S.E.	0.38	0.23	0.13	0.28
	N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

* = Significantly different from the control group at 0.05 using Dunnett's test

TABLE 29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	MALES 0 PPM	20 PPM	50 PPM	100 PPM
BASOPHIL (%)				
DAY 14 MEAN	0.4	0.5	0.4	0.5
% DIFFERENCE		25.0	0.0	25.0
S.D.	0.11	0.15	0.08	0.07
S.E.	0.05	0.07	0.04	0.03
N	5	5	5	5
LG UNSTAIN CELL (%)				
DAY 14 MEAN	0.6	0.7	0.8	0.6
% DIFFERENCE		16.7	33.3	0.0
S.D.	0.18	0.11	0.19	0.13
S.E.	0.08	0.05	0.08	0.06
N	5	5	5	5
NEU ABSOLUTE (thous/uL)				
DAY 14 MEAN	1.08	1.41	1.30	1.54
% DIFFERENCE		30.6	20.4	42.6
S.D.	0.771	0.203	0.472	0.340
S.E.	0.345	0.091	0.211	0.152
N	5	5	5	5
LYMPH ABSOLUTE (thous/uL)				
DAY 14 MEAN	7.65	6.26	7.43	6.67
% DIFFERENCE		-18.2	-2.9	-12.8
S.D.	3.608	1.935	2.030	2.591
S.E.	1.614	0.866	0.908	1.159
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 29 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 6

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF HEMATOLOGY VALUES

		MALES			
ANALYSIS	GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
MONO ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.11	0.13	0.17	0.14
	% DIFFERENCE		18.2	54.5	27.3
	S.D.	0.055	0.060	0.077	0.045
	S.E.	0.024	0.027	0.034	0.020
	N	5	5	5	5
EOS ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.10	0.09	0.09	0.14
	% DIFFERENCE		-10.0	-10.0	40.0
	S.D.	0.064	0.029	0.041	0.057
	S.E.	0.029	0.013	0.018	0.025
	N	5	5	5	5
BASO ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.03	0.03	0.03	0.04
	% DIFFERENCE		0.0	0.0	33.3
	S.D.	0.016	0.005	0.013	0.013
	S.E.	0.007	0.002	0.006	0.006
	N	5	5	5	5
LUC ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.06	0.05	0.07	0.05
	% DIFFERENCE		-16.7	16.7	-16.7
	S.D.	0.042	0.013	0.029	0.024
	S.E.	0.019	0.006	0.013	0.011
	N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
		FEMALES		
WHITE CELLS (thous/uL)				
DAY 14 MEAN	6.26	6.46	5.97	6.82
% DIFFERENCE		3.2	-4.6	8.9
S.D.	1.851	1.778	0.971	1.786
S.E.	0.828	0.795	0.434	0.799
N	5	5	5	5
RED CELLS (mil/uL)				
DAY 14 MEAN	7.92	7.76	8.27	7.96
% DIFFERENCE		-2.0	4.4	0.5
S.D.	0.422	0.501	0.193	0.435
S.E.	0.189	0.224	0.086	0.195
N	5	5	5	5
HEMOGLOBIN (g/dL)				
DAY 14 MEAN	15.6	15.2	16.0	15.9
% DIFFERENCE		-2.6	2.6	1.9
S.D.	0.91	1.17	0.41	0.66
S.E.	0.41	0.52	0.18	0.29
N	5	5	5	5
HEMATOCRIT (%)				
DAY 14 MEAN	41.7	40.8	42.4	42.3
% DIFFERENCE		-2.2	1.7	1.4
S.D.	3.22	3.99	1.26	2.86
S.E.	1.44	1.78	0.56	1.28
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

		FEMALES			
ANALYSIS	GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
MCV (fL)					
DAY 14	MEAN	52.6	52.5	51.3	53.1
	% DIFFERENCE		-0.2	-2.5	1.0
	S.D.	1.91	2.20	1.11	1.86
	S.E.	0.85	0.98	0.50	0.83
	N	5	5	5	5
MCH (pg)					
DAY 14	MEAN	19.7	19.6	19.3	19.9
	% DIFFERENCE		-0.5	-2.0	1.0
	S.D.	0.42	0.44	0.39	0.39
	S.E.	0.19	0.20	0.18	0.18
	N	5	5	5	5
MCHC (g/dL)					
DAY 14	MEAN	37.5	37.4	37.7	37.5
	% DIFFERENCE		-0.3	0.5	0.0
	S.D.	1.03	1.14	0.54	1.12
	S.E.	0.46	0.51	0.24	0.50
	N	5	5	5	5
PLATELET (thous/uL)					
DAY 14	MEAN	1177.	1261.	1329.	1166.
	% DIFFERENCE		7.1	12.9	-0.9
	S.D.	173.9	120.8	147.1	205.4
	S.E.	77.8	54.0	65.8	91.9
	N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

ANALYSIS GROUP:	FEMALES 0 PPM	20 PPM	50 PPM	100 PPM
PROTIME (seconds)				
DAY 14 MEAN	12.0	12.0	12.2	12.3
% DIFFERENCE		0.0	1.7	2.5
S.D.	0.21	0.42	0.35	0.50
S.E.	0.09	0.19	0.16	0.22
N	5	5	5	5
APTT (seconds)				
DAY 14 MEAN	17.1	16.2	16.4	16.6
% DIFFERENCE		-5.3	-4.1	-2.9
S.D.	1.90	2.34	2.21	1.59
S.E.	0.85	1.05	0.99	0.71
N	5	5	5	5
RETICULOCYTE (%)				
DAY 14 MEAN	2.4	2.1	1.7*	1.9
% DIFFERENCE		-12.5	-29.2	-20.8
S.D.	0.30	0.38	0.19	0.38
S.E.	0.14	0.17	0.09	0.17
N	5	5	5	5
RETIC ABSOLUTE (thous/uL)				
DAY 14 MEAN	185.1	163.3	139.3*	154.4
% DIFFERENCE		-11.8	-24.7	-16.6
S.D.	21.98	19.86	16.73	27.69
S.E.	9.83	8.88	7.48	12.38
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

* = Significantly different from the control group at 0.05 using Dunnett's test

ANALYSIS GROUP:	FEMALES 0 PPM	20 PPM	50 PPM	100 PPM
NEUTROPHIL (%)				
DAY 14 MEAN	13.1	13.8	14.5	13.3
% DIFFERENCE		5.3	10.7	1.5
S.D.	3.46	2.76	4.72	4.31
S.E.	1.55	1.24	2.11	1.93
N	5	5	5	5
LYMPHOCYTE (%)				
DAY 14 MEAN	83.3	82.6	81.9	83.7
% DIFFERENCE		-0.8	-1.7	0.5
S.D.	3.39	2.92	4.61	4.27
S.E.	1.51	1.30	2.06	1.91
N	5	5	5	5
MONOCYTE (%)				
DAY 14 MEAN	1.4	1.5	1.6	1.1
% DIFFERENCE		7.1	14.3	-21.4
S.D.	0.61	0.30	0.58	0.18
S.E.	0.27	0.13	0.26	0.08
N	5	5	5	5
EOSINOPHIL (%)				
DAY 14 MEAN	1.2	1.1	1.2	0.9
% DIFFERENCE		-8.3	0.0	-25.0
S.D.	0.36	0.47	0.24	0.35
S.E.	0.16	0.21	0.11	0.16
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

ANALYSIS GROUP:	FEMALES 0 PPM	20 PPM	50 PPM	100 PPM
BASOPHIL (%)				
DAY 14 MEAN	0.3	0.3	0.3	0.4
% DIFFERENCE		0.0	0.0	33.3
S.D.	0.08	0.11	0.05	0.08
S.E.	0.04	0.05	0.02	0.04
N	5	5	5	5
LG UNSTAIN CELL (%)				
DAY 14 MEAN	0.7	0.6	0.4	0.6
% DIFFERENCE		-14.3	-42.9	-14.3
S.D.	0.41	0.23	0.16	0.15
S.E.	0.19	0.10	0.07	0.07
N	5	5	5	5
NEU ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.79	0.90	0.85	0.94
% DIFFERENCE		13.9	7.6	19.0
S.D.	0.169	0.351	0.272	0.508
S.E.	0.075	0.157	0.122	0.227
N	5	5	5	5
LYMPH ABSOLUTE (thous/uL)				
DAY 14 MEAN	5.24	5.32	4.90	5.68
% DIFFERENCE		1.5	-6.5	8.4
S.D.	1.666	1.412	0.885	1.348
S.E.	0.745	0.632	0.396	0.603
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

FEMALES

ANALYSIS GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
MONO ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.10	0.10	0.10	0.07
% DIFFERENCE		0.0	0.0	-30.0
S.D.	0.063	0.046	0.048	0.017
S.E.	0.028	0.020	0.021	0.007
N	5	5	5	5
EOS ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.07	0.07	0.07	0.06
% DIFFERENCE		0.0	0.0	-14.3
S.D.	0.019	0.036	0.022	0.019
S.E.	0.008	0.016	0.010	0.008
N	5	5	5	5
BASO ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.02	0.02	0.02	0.03
% DIFFERENCE		0.0	0.0	50.0
S.D.	0.007	0.013	0.005	0.011
S.E.	0.003	0.006	0.002	0.005
N	5	5	5	5
LUC ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.05	0.04	0.03	0.04
% DIFFERENCE		-20.0	-40.0	-20.0
S.D.	0.035	0.019	0.011	0.015
S.E.	0.016	0.009	0.005	0.007
N	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

ANALYSIS GROUP:		MALES 0 PPM	20 PPM	50 PPM	100 PPM
ALBUMIN (g/dL)					
DAY 14	MEAN	4.3	4.4	4.3	4.4
	% DIFFERENCE		2.3	0.0	2.3
	S.D.	0.21	0.16	0.08	0.11
	S.E.	0.09	0.07	0.04	0.05
	N	5	5	5	5
TOTAL PROTEIN (g/dL)					
DAY 14	MEAN	6.3	6.6	6.4	6.5
	% DIFFERENCE		4.8	1.6	3.2
	S.D.	0.21	0.27	0.14	0.33
	S.E.	0.09	0.12	0.06	0.15
	N	5	5	5	5
GLOBULIN (g/dL)					
DAY 14	MEAN	2.0	2.2	2.1	2.1
	% DIFFERENCE		10.0	5.0	5.0
	S.D.	0.05	0.18	0.10	0.22
	S.E.	0.02	0.08	0.04	0.10
	N	5	5	5	5
A/G RATIO					
DAY 14	MEAN	2.10	1.98	2.05	2.03
	% DIFFERENCE		-5.7	-2.4	-3.3
	S.D.	0.087	0.144	0.102	0.169
	S.E.	0.039	0.064	0.046	0.076
	N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

ANALYSIS GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
		MALES		
TOTAL BILI (mg/dL)				
DAY 14 MEAN	0.1	0.1	0.1	0.1
% DIFFERENCE		0.0	0.0	0.0
S.D.	0.00	0.00	0.00	0.00
S.E.	0.00	0.00	0.00	0.00
N	5	5	5	5
UREA NITROGEN (mg/dL)				
DAY 14 MEAN	14.6	13.5	12.9	14.3
% DIFFERENCE		-7.5	-11.6	-2.1
S.D.	3.79	1.67	1.43	1.50
S.E.	1.70	0.75	0.64	0.67
N	5	5	5	5
CREATININE (mg/dL)				
DAY 14 MEAN	0.3	0.2	0.2	0.3
% DIFFERENCE		-33.3	-33.3	0.0
S.D.	0.04	0.05	0.07	0.04
S.E.	0.02	0.02	0.03	0.02
N	5	5	5	5
ALKALINEPHOS'TSE (U/L)				
DAY 14 MEAN	168.	145.	137.	130.
% DIFFERENCE		-13.7	-18.5	-22.6
S.D.	33.6	32.2	29.0	15.6
S.E.	15.0	14.4	13.0	7.0
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

		MALES			
ANALYSIS	GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
ALANINE TRANSFER (U/L)					
DAY 14	MEAN	32.	34.	32.	34.
	% DIFFERENCE		6.3	0.0	6.3
	S.D.	4.4	4.6	2.6	6.4
	S.E.	2.0	2.1	1.2	2.9
	N	5	5	5	5
ASPARTATTRANSFER (U/L)					
DAY 14	MEAN	104.	103.	89.	102.
	% DIFFERENCE		-1.0	-14.4	-1.9
	S.D.	27.0	21.0	17.6	25.4
	S.E.	12.1	9.4	7.9	11.3
	N	5	5	5	5
GLUTAMYLTRANSFER (U/L)					
DAY 14	MEAN	0.7	0.6	1.0	0.8
	% DIFFERENCE		-14.3	42.9	14.3
	S.D.	0.29	0.51	0.79	0.51
	S.E.	0.13	0.23	0.35	0.23
	N	5	5	5	5
GLUCOSE (mg/dL)					
DAY 14	MEAN	110.	101.	115.	109.
	% DIFFERENCE		-8.2	4.5	-0.9
	S.D.	13.5	9.3	8.9	10.9
	S.E.	6.0	4.1	4.0	4.9
	N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 4

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

		MALES			
ANALYSIS	GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
CHOLESTEROL (mg/dL)					
DAY 14	MEAN	57.	62.	56.	65.
	% DIFFERENCE		8.8	-1.8	14.0
	S.D.	6.8	12.7	7.2	11.7
	S.E.	3.1	5.7	3.2	5.2
	N	5	5	5	5
CALCIUM (mg/dL)					
DAY 14	MEAN	10.7	10.5	10.5	10.6
	% DIFFERENCE		-1.9	-1.9	-0.9
	S.D.	0.33	0.32	0.21	0.35
	S.E.	0.15	0.14	0.09	0.16
	N	5	5	5	5
CHLORIDE (mEq/L)					
DAY 14	MEAN	104.	103.	103.	104.
	% DIFFERENCE		-1.0	-1.0	0.0
	S.D.	0.5	1.5	1.5	0.8
	S.E.	0.2	0.7	0.7	0.4
	N	5	5	5	5
PHOSPHORUS (mg/dL)					
DAY 14	MEAN	7.9	7.5	6.8	7.6
	% DIFFERENCE		-5.1	-13.9	-3.8
	S.D.	0.69	0.44	0.61	0.56
	S.E.	0.31	0.20	0.27	0.25
	N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE 30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF SERUM CHEMISTRY VALUES

ANALYSIS GROUP:	MALES 0 PPM	20 PPM	50 PPM	100 PPM
POTASSIUM (mEq/L)				
DAY 14 MEAN	4.84	4.89	4.60	4.92
% DIFFERENCE		1.0	-5.0	1.7
S.D.	0.371	0.468	0.373	0.413
S.E.	0.166	0.209	0.167	0.185
N	5	5	5	5
SODIUM (mEq/L)				
DAY 14 MEAN	145.	145.	144.	146.
% DIFFERENCE		0.0	-0.7	0.7
S.D.	1.8	2.2	0.8	0.4
S.E.	0.8	1.0	0.4	0.2
N	5	5	5	5
TRIGLYCERIDE (mg/dL)				
DAY 14 MEAN	45.	57.	56.	49.
% DIFFERENCE		26.7	24.4	8.9
S.D.	11.4	20.7	25.5	14.0
S.E.	5.1	9.3	11.4	6.2
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 6

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

	FEMALES			
ANALYSIS GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
ALBUMIN (g/dL)				
DAY 14 MEAN	4.7	4.9	4.8	4.8
% DIFFERENCE		4.3	2.1	2.1
S.D.	0.13	0.24	0.28	0.28
S.E.	0.06	0.11	0.12	0.12
N	5	5	5	5
TOTAL PROTEIN (g/dL)				
DAY 14 MEAN	6.7	6.9	6.7	6.8
% DIFFERENCE		3.0	0.0	1.5
S.D.	0.35	0.46	0.34	0.38
S.E.	0.16	0.20	0.15	0.17
N	5	5	5	5
GLOBULIN (g/dL)				
DAY 14 MEAN	2.0	2.0	1.9	2.0
% DIFFERENCE		0.0	-5.0	0.0
S.D.	0.23	0.25	0.15	0.22
S.E.	0.10	0.11	0.07	0.10
N	5	5	5	5
A/G RATIO				
DAY 14 MEAN	2.39	2.43	2.58	2.42
% DIFFERENCE		1.7	7.9	1.3
S.D.	0.238	0.212	0.231	0.339
S.E.	0.107	0.095	0.103	0.152
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

	FEMALES			
ANALYSIS GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
TOTAL BILI (mg/dL)				
DAY 14 MEAN	0.1	0.1	0.1	0.1
% DIFFERENCE		0.0	0.0	0.0
S.D.	0.00	0.00	0.05	0.04
S.E.	0.00	0.00	0.02	0.02
N	5	5	5	5
UREA NITROGEN (mg/dL)				
DAY 14 MEAN	16.4	15.5	15.3	13.5
% DIFFERENCE		-5.5	-6.7	-17.7
S.D.	1.88	1.48	2.27	1.40
S.E.	0.84	0.66	1.01	0.62
N	5	5	5	5
CREATININE (mg/dL)				
DAY 14 MEAN	0.3	0.3	0.2	0.3
% DIFFERENCE		0.0	-33.3	0.0
S.D.	0.10	0.05	0.05	0.05
S.E.	0.04	0.02	0.02	0.02
N	5	5	5	5
ALKALINEPHOS'TSE (U/L)				
DAY 14 MEAN	117.	101.	110.	127.
% DIFFERENCE		-13.7	-6.0	8.5
S.D.	13.6	28.7	25.4	25.9
S.E.	6.1	12.8	11.4	11.6
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

		FEMALES			
ANALYSIS	GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
ALANINE TRANSFER (U/L)					
DAY 14	MEAN	29.	37.	30.	34.
	% DIFFERENCE		27.6	3.4	17.2
	S.D.	2.0	10.8	3.4	5.1
	S.E.	0.9	4.8	1.5	2.3
	N	5	5	5	5
ASPARTATTRANSFER (U/L)					
DAY 14	MEAN	94.	93.	83.	97.
	% DIFFERENCE		-1.1	-11.7	3.2
	S.D.	18.4	18.7	20.8	15.9
	S.E.	8.2	8.4	9.3	7.1
	N	5	5	5	5
GLUTAMYLTRANSFER (U/L)					
DAY 14	MEAN	0.5	0.8	0.7	1.2
	% DIFFERENCE		60.0	40.0	140.0
	S.D.	0.32	0.60	0.35	0.54
	S.E.	0.14	0.27	0.16	0.24
	N	5	5	5	5
GLUCOSE (mg/dL)					
DAY 14	MEAN	108.	104.	119.	100.
	% DIFFERENCE		-3.7	10.2	-7.4
	S.D.	7.8	5.7	14.1	10.9
	S.E.	3.5	2.5	6.3	4.9
	N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 9

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

ANALYSIS GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
	FEMALES			
CHOLESTEROL (mg/dL)				
DAY 14 MEAN	74.	69.	69.	63.
% DIFFERENCE		-6.8	-6.8	-14.9
S.D.	7.0	19.4	18.8	16.1
S.E.	3.1	8.7	8.4	7.2
N	5	5	5	5
CALCIUM (mg/dL)				
DAY 14 MEAN	10.6	10.8	10.7	10.8
% DIFFERENCE		1.9	0.9	1.9
S.D.	0.46	0.43	0.18	0.43
S.E.	0.21	0.19	0.08	0.19
N	5	5	5	5
CHLORIDE (mEq/L)				
DAY 14 MEAN	104.	104.	104.	104.
% DIFFERENCE		0.0	0.0	0.0
S.D.	1.8	1.6	0.8	0.8
S.E.	0.8	0.7	0.4	0.4
N	5	5	5	5
PHOSPHORUS (mg/dL)				
DAY 14 MEAN	6.8	7.5	6.8	7.5
% DIFFERENCE		10.3	0.0	10.3
S.D.	0.78	0.65	0.87	1.29
S.E.	0.35	0.29	0.39	0.58
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE 30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF SERUM CHEMISTRY VALUES

ANALYSIS GROUP:	FEMALES 0 PPM	20 PPM	50 PPM	100 PPM
POTASSIUM (mEq/L)				
DAY 14 MEAN	4.70	4.66	4.30	4.56
% DIFFERENCE		-0.9	-8.5	-3.0
S.D.	0.167	0.226	0.414	0.551
S.E.	0.075	0.101	0.185	0.246
N	5	5	5	5
SODIUM (mEq/L)				
DAY 14 MEAN	144.	144.	144.	145.
% DIFFERENCE		0.0	0.0	0.7
S.D.	1.1	1.7	0.5	2.6
S.E.	0.5	0.7	0.2	1.2
N	5	5	5	5
TRIGLYCERIDE (mg/dL)				
DAY 14 MEAN	33.	32.	34.	36.
% DIFFERENCE		-3.0	3.0	9.1
S.D.	4.8	9.9	6.9	9.0
S.E.	2.2	4.4	3.1	4.0
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

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03/03/2008

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE 31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	MALE			
GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS TERMINALLY EUTHANIZED	5	5	5	5
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	5	5	5	5

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	----- F E M A L E -----			
GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS TERMINALLY EUTHANIZED	5	5	5	5
KIDNEYS				
-AREA(S), DEPRESSED	0	1	0	0
UTERUS				
-CONTENTS, CLEAR FLUID	1	0	0	0
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	4	4	5	5

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 32 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

	MALES			
GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
FINAL BODY WT (G)				
MEAN	375.	392.	379.	379.
% DIFFERENCE		4.5	1.1	1.1
S.D.	26.9	24.0	26.1	26.0
S.E.	12.0	10.7	11.7	11.6
N	5	5	5	5
KIDNEYS (G)				
MEAN	2.46	2.72	2.74	2.59
% DIFFERENCE		10.6	11.4	5.3
S.D.	0.301	0.227	0.172	0.268
S.E.	0.134	0.102	0.077	0.120
N	5	5	5	5
KIDNEYS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.654	0.696	0.725	0.681
% DIFFERENCE		6.4	10.9	4.1
S.D.	0.0445	0.0471	0.0586	0.0368
S.E.	0.0199	0.0211	0.0262	0.0165
N	5	5	5	5
LIVER (G)				
MEAN	9.71	10.77	10.57	10.19
% DIFFERENCE		10.9	8.9	4.9
S.D.	1.360	1.370	0.951	1.000
S.E.	0.608	0.612	0.425	0.447
N	5	5	5	5

None significantly different from control group

TABLE 32 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

	MALES			
GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
LIVER (G/100 G FINAL BODY WEIGHT)				
MEAN	2.580	2.744	2.785	2.681
% DIFFERENCE		6.4	7.9	3.9
S.D.	0.2271	0.2167	0.0702	0.1061
S.E.	0.1016	0.0969	0.0314	0.0475
N	5	5	5	5
LUNGS (G)				
MEAN	1.45	1.53	1.48	1.44
% DIFFERENCE		5.5	2.1	-0.7
S.D.	0.131	0.100	0.041	0.076
S.E.	0.059	0.045	0.018	0.034
N	5	5	5	5
LUNGS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.386	0.392	0.393	0.380
% DIFFERENCE		1.6	1.8	-1.6
S.D.	0.0142	0.0265	0.0226	0.0221
S.E.	0.0063	0.0118	0.0101	0.0099
N	5	5	5	5

None significantly different from control group

TABLE 32 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 3

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

FEMALES

GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
FINAL BODY WT (G)				
MEAN	223.	228.	224.	228.
% DIFFERENCE		2.2	0.4	2.2
S.D.	8.0	8.7	14.6	14.8
S.E.	3.6	3.9	6.5	6.6
N	5	5	5	5
KIDNEYS (G)				
MEAN	1.61	1.69	1.61	1.72
% DIFFERENCE		5.0	0.0	6.8
S.D.	0.091	0.099	0.073	0.079
S.E.	0.041	0.044	0.033	0.035
N	5	5	5	5
KIDNEYS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.722	0.740	0.722	0.760
% DIFFERENCE		2.5	0.0	5.3
S.D.	0.0287	0.0458	0.0363	0.0754
S.E.	0.0128	0.0205	0.0162	0.0337
N	5	5	5	5
LIVER (G)				
MEAN	6.38	6.53	6.13	6.37
% DIFFERENCE		2.4	-3.9	-0.2
S.D.	0.256	0.695	0.357	0.455
S.E.	0.115	0.311	0.159	0.204
N	5	5	5	5

None significantly different from control group

FEMALES

GROUP:	0 PPM	20 PPM	50 PPM	100 PPM
LIVER (G/100 G FINAL BODY WEIGHT)				
MEAN	2.866	2.853	2.740	2.801
% DIFFERENCE		-0.5	-4.4	-2.3
S.D.	0.1253	0.2009	0.0481	0.1651
S.E.	0.0560	0.0899	0.0215	0.0738
N	5	5	5	5
LUNGS (G)				
MEAN	1.06	1.14*	1.08	1.20**
% DIFFERENCE		7.5	1.9	13.2
S.D.	0.038	0.033	0.021	0.087
S.E.	0.017	0.015	0.009	0.039
N	5	5	5	5
LUNGS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.475	0.501	0.486	0.526*
% DIFFERENCE		5.5	2.3	10.7
S.D.	0.0269	0.0244	0.0307	0.0237
S.E.	0.0121	0.0109	0.0137	0.0106
N	5	5	5	5

* = Significantly different from the control group at 0.05 using Dunnett's test
** = Significantly different from the control group at 0.01 using Dunnett's test

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03/03/2008

TABLE 33 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	5	5	5	5
KIDNEYS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	3	4	5	5
-REGENERATION, RENAL TUBULAR	2	1	0	0
MINIMAL	2	1	NONE	NONE
LARYNX				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LIVER				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LUNGS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	4
-ATELECTASIS	0	0	0	1
MODERATE	NONE	NONE	NONE	1
NASAL LEVEL I				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	4	1	1
-HYPERKERATOSIS	0	0	0	1
MINIMAL	NONE	NONE	NONE	1

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 33 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	5	5	5	5
NASAL LEVEL I - CONTINUED				
-INFLAMMATION, CHRONIC	0	0	2	2
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	NONE	NONE	2
MODERATE	NONE	NONE	1	NONE
-INFLAMMATION, SUBACUTE	0	1	2	2
MILD	NONE	1	2	2
NASAL LEVEL II				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	2	0	0
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	4
MINIMAL	NONE	NONE	NONE	3
MILD	NONE	NONE	NONE	1
-HYPERPLASIA, GOBLET CELL	0	0	5	2
MINIMAL	NONE	NONE	2	NONE
MILD	NONE	NONE	3	NONE
MODERATE	NONE	NONE	NONE	2
-INFLAMMATION, CHRONIC	0	1	1	0
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	1	NONE	NONE
-INFLAMMATION, SUBACUTE	0	2	2	2
MILD	NONE	2	NONE	2
MODERATE	NONE	NONE	2	NONE

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	5	5	5	5
NASAL LEVEL II - CONTINUED				
NASAL LEVEL III				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	4	2	1
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	1	4
MINIMAL	NONE	NONE	1	1
MILD	NONE	NONE	NONE	1
MODERATE	NONE	NONE	NONE	2
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-INFLAMMATION, SUBACUTE	0	1	1	1
MILD	NONE	NONE	1	NONE
MODERATE	NONE	1	NONE	1
NASAL LEVEL IV				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	2
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	3
MILD	NONE	NONE	NONE	3
NASAL LEVEL V				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 33 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS PAGE 4

SPONSOR:LYONDELL CHEMICAL SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	5	5	5	5
NASAL LEVEL V - CONTINUED				
NASAL LEVEL VI				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	4
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	0	1
MILD	NONE	NONE	NONE	1
TRACHEA				
TOTAL NUMBER EXAMINED	4	5	5	5
EXAMINED, UNREMARKABLE	4	5	5	5
NOT PRESENT FOR EXAMINATION	1	0	0	0

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	5	5	5	5
KIDNEYS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	4	3	5
-INFLAMMATION, CHRONIC, INTERSTITIAL	0	1	0	0
MILD	NONE	1	NONE	NONE
-MINERALIZATION	0	1	2	0
MILD	NONE	1	2	NONE
LARYNX				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LIVER				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	4	5	5	4
-INFILTRATE, LYMPHOCYTE	1	0	0	1
MINIMAL	1	NONE	NONE	1
LUNGS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	4	5	4	5
-ATELECTASIS	1	0	1	0
MILD	1	NONE	1	NONE

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	5	5	5	5
NASAL LEVEL I				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	1	2	1
-HYPERPLASIA, GOBLET CELL	0	1	0	1
MINIMAL	NONE	NONE	NONE	1
MILD	NONE	1	NONE	NONE
-INFLAMMATION, CHRONIC	0	4	3	3
MINIMAL	NONE	2	NONE	NONE
MILD	NONE	2	3	2
MODERATE	NONE	NONE	NONE	1
NASAL LEVEL II				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	4	4	4	1
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	1	4
MINIMAL	NONE	NONE	1	2
MILD	NONE	NONE	NONE	2
-HEMORRHAGE	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
-HYPERPLASIA, GOBLET CELL	0	1	0	1
MILD	NONE	1	NONE	1
-INFLAMMATION, CHRONIC	0	0	0	1
MILD	NONE	NONE	NONE	1

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 33 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF MICROSCOPIC FINDINGS

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	5	5	5	5
NASAL LEVEL III				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	4	3
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	1	1
MINIMAL	NONE	NONE	1	1
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	0	1
MILD	NONE	NONE	NONE	1
NASAL LEVEL IV				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	4	4	5	4
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	1
MILD	NONE	NONE	NONE	1
-HEMORRHAGE	1	1	0	0
MILD	NONE	1	NONE	NONE
MODERATE	1	NONE	NONE	NONE
NASAL LEVEL V				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	4	5	5	5
-HEMORRHAGE	1	0	0	0
MILD	1	NONE	NONE	NONE

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM

TABLE 33 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	5	5	5	5
NASAL LEVEL VI				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	4	5	5	5
-HEMORRHAGE	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
TRACHEA				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
UTERUS				
TOTAL NUMBER EXAMINED	1	NA	NA	NA
EXAMINED, UNREMARKABLE	0	NA	NA	NA
-DILATATION, LUMEN	1	NA	NA	NA
MODERATE	1	NA	NA	NA

1- 0 PPM 2- 20 PPM 3- 50 PPM 4- 100 PPM
NA = NOT APPLICABLE

TABLE 34 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SURVIVAL AND DISPOSITION

MALES

GROUP :	1				2				3				4			
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE
0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
1	5	0	0	0	5	0	0	0	5	0	0	0	4	1	0	0
2	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
3	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
4	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
5	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
6	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
7	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
8	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
9	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
10	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
11	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
12	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
13	5	0	0	0	5	0	0	0	5	0	0	0	4	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	4

DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 34 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SURVIVAL AND DISPOSITION

FEMALES

GROUP :	1				2				3				4			
DAY	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE	LIVE	FD	EE	SE
0	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
1	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
2	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
3	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
4	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
5	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
6	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
7	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
8	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
9	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
10	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
11	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
12	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
13	5	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0
14	0	0	0	5	0	0	0	5	0	0	0	5	0	0	0	5

DAY = DAY OF STUDY FD = FOUND DEAD EE = EUTHANIZED IN EXTREMIS SE = SCHEDULED EUTHANASIA

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PSURVv4.09
03/03/2008

TABLE 35 (DISPOSITIONS - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 001 TO DAY 014			
GROUP:	1	2	3	4
DISPOSITION				
-FOUND DEAD	0/ 0	0/ 0	0/ 0	1/ 1
-SCHEDULED EUTHANASIA	5/ 5	5/ 5	5/ 5	4/ 4

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 35 (DISPOSITIONS - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 001 TO DAY 014			
GROUP:	1	2	3	4
DISPOSITION				
-SCHEDULED EUTHANASIA	5/ 5	5/ 5	5/ 5	5/ 5

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PCSUv4.07
03/18/2008

TABLE 36 (30 MINUTES INTO EXPOSURE - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: DAY 000				
GROUP:	1	2	3	4
CARDIO-PULMONARY -GASPING	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 36 (30 MINUTES INTO EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: DAY 000			
GROUP: 1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS 30 MINUTES INTO EXPOSURE			

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PCSUv4.07
02/27/2008
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TABLE 37 (1 HOUR INTO EXPOSURE - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS 1 HOUR INTO EXPOSURE				

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 37 (1 HOUR INTO EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS 1 HOUR INTO EXPOSURE				

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

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02/27/2008
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PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 38 (4 HOURS INTO EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: DAY 000				
GROUP:	1	2	3	4
CARDIO-PULMONARY				
-GASPING	0/ 0	0/ 0	0/ 0	1/ 1
-INCREASED RESPIRATION	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 38 (4 HOURS INTO EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: DAY 000			
GROUP: 1	2	3	4
NO SIGNIFICANT CLINICAL OBSERVATIONS 4 HOURS INTO EXPOSURE			

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

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TABLE 39 (DURING EXPOSURE - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF NOVEL STIMULUS/AROUSAL RESPONSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
BEHAVIOR/CNS				
-NO REACTION TO STIMULUS	0/ 0	0/ 0	0/ 0	3/ 3
-SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH	5/ 5	5/ 5	5/ 5	2/ 2

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 39 (DURING EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF NOVEL STIMULUS/AROUSAL RESPONSE FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: DAY 000				
GROUP:	1	2	3	4
BEHAVIOR/CNS				
-NO REACTION TO STIMULUS	0/ 0	0/ 0	3/ 3	1/ 1
-SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH	5/ 5	5/ 5	2/ 2	4/ 4

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

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PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 40 (END OF EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
CARDIO-PULMONARY -GASPING	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 40 (END OF EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE: DAY 000				
GROUP:	1	2	3	4
CARDIO-PULMONARY				
-GASPING	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

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PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 41 (1 HOUR POST-EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: DAY 000				
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	4/ 4	3/ 3	0/ 0
BODY/INTEGUMENT				
-REDDENED HINDLIMBS	0/ 0	0/ 0	1/ 1	0/ 0
-REDDENED FORELIMBS	0/ 0	1/ 1	2/ 2	0/ 0
-WET YELLOW MATERIAL UROGENITAL AREA	0/ 0	0/ 0	1/ 1	0/ 0
CARDIO-PULMONARY				
-GASPING	0/ 0	0/ 0	0/ 0	5/ 5
-RALES	0/ 0	0/ 0	1/ 1	1/ 1
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	0/ 0	0/ 0	1/ 1	4/ 4
ORAL/DENTAL				
-DRIED RED MATERIAL AROUND MOUTH	0/ 0	0/ 0	1/ 1	3/ 3

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 41 (1 HOUR POST-EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 000			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	5/ 5	4/ 4	3/ 3	0/ 0
BEHAVIOR/CNS				
-GAIT SCORE - SLIGHT IMPAIRMENT	0/ 0	0/ 0	0/ 0	1/ 1
BODY/INTEGUMENT				
-REDDENED FORELIMBS	0/ 0	0/ 0	0/ 0	3/ 3
-WET YELLOW MATERIAL UROGENITAL AREA	0/ 0	1/ 1	0/ 0	3/ 3
CARDIO-PULMONARY				
-GASPING	0/ 0	0/ 0	0/ 0	1/ 1
-RALES	0/ 0	0/ 0	0/ 0	1/ 1
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	0/ 0	1/ 1	2/ 2	2/ 2
ORAL/DENTAL				
-DRIED RED MATERIAL AROUND MOUTH	0/ 0	1/ 1	1/ 1	1/ 1
-WET CLEAR MATERIAL AROUND MOUTH	0/ 0	0/ 0	1/ 1	1/ 1
-DRIED CLEAR MATERIAL AROUND MOUTH	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

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TABLE 42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	DAY 001 TO DAY 013			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	61/ 5	62/ 5	53/ 5	52/ 4
BODY/INTEGUMENT				
-HAIR LOSS RIGHT FORELIMB	0/ 0	1/ 1	12/ 1	0/ 0
-HAIR LOSS LEFT FORELIMB	0/ 0	1/ 1	12/ 1	0/ 0
CARDIO-PULMONARY				
-RALES	0/ 0	0/ 0	0/ 0	1/ 1
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	4/ 1	2/ 2	0/ 0	1/ 1
ORAL/DENTAL				
-DRIED RED MATERIAL AROUND MOUTH	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 001 TO DAY 013			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	42/ 5	55/ 5	55/ 5	63/ 5
BODY/INTEGUMENT				
-HAIR LOSS RIGHT FORELIMB	22/ 2	3/ 1	7/ 1	0/ 0
-HAIR LOSS LEFT FORELIMB	22/ 2	8/ 1	5/ 1	0/ 0
-HAIR LOSS VENTRAL ABDOMINAL AREA	0/ 0	9/ 1	0/ 0	0/ 0
-SCABBING LEFT FORELIMB	4/ 1	0/ 0	0/ 0	0/ 0
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	1/ 1	0/ 0	2/ 2	1/ 1
-DRIED RED MATERIAL AROUND LEFT EYE	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

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TABLE 43 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE: DAY 001				
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	4/ 4	5/ 5	5/ 5	4/ 4
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	1/ 1	0/ 0	0/ 0	0/ 0

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 43 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- F E M A L E -----

TABLE RANGE:	DAY 001			
GROUP:	1	2	3	4
NORMAL				
-NO SIGNIFICANT CLINICAL OBSERVATIONS	4/ 4	5/ 5	5/ 5	4/ 4
EYES/EARS/NOSE				
-DRIED RED MATERIAL AROUND NOSE	1/ 1	0/ 0	0/ 0	0/ 0
-DRIED RED MATERIAL AROUND LEFT EYE	0/ 0	0/ 0	0/ 0	1/ 1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

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TABLE 44 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF BODY WEIGHTS [G]

MALES

GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
DAY 0				
MEAN	385.	384.	382.	388.
% DIFFERENCE		-0.3	-0.8	0.8
S.D.	12.1	12.5	14.0	13.4
S.E.	5.4	5.6	6.3	6.0
N	5	5	5	5
DAY 1				
MEAN	374.	368.	366.	353.
% DIFFERENCE		-1.6	-2.1	-5.6
S.D.	13.6	11.9	17.5	11.3
S.E.	6.1	5.3	7.8	5.0
N	5	5	5	5
DAY 6				
MEAN	399.	388.	389.	389.
% DIFFERENCE		-2.8	-2.5	-2.5
S.D.	12.7	13.6	17.6	12.9
S.E.	5.7	6.1	7.9	6.5
N	5	5	5	4
DAY 13				
MEAN	424.	412.	418.	421.
% DIFFERENCE		-2.8	-1.4	-0.7
S.D.	20.3	22.5	20.8	10.8
S.E.	9.1	10.1	9.3	5.4
N	5	5	5	4

None significantly different from control group

TABLE 44 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHTS [G]

FEMALES

GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
DAY 0				
MEAN	231.	232.	225.	232.
% DIFFERENCE		0.4	-2.6	0.4
S.D.	12.9	16.5	6.7	13.5
S.E.	5.7	7.4	3.0	6.0
N	5	5	5	5
DAY 1				
MEAN	236.	233.	224.	227.
% DIFFERENCE		-1.3	-5.1	-3.8
S.D.	6.2	8.0	6.2	13.2
S.E.	2.8	3.6	2.8	5.9
N	5	5	5	5
DAY 6				
MEAN	246.	251.	238.	243.
% DIFFERENCE		2.0	-3.3	-1.2
S.D.	14.2	12.5	6.8	16.7
S.E.	6.4	5.6	3.1	7.4
N	5	5	5	5
DAY 13				
MEAN	262.	265.	256.	261.
% DIFFERENCE		1.1	-2.3	-0.4
S.D.	9.7	10.1	9.0	24.0
S.E.	4.3	4.5	4.0	10.7
N	5	5	5	5

None significantly different from control group

PJTBWSUv5.14
03/18/2008

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 45 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHT CHANGES [G]

MALES

GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
DAY 0- 1				
MEAN	-11.	-16.	-16.	-35.**
S.D.	3.8	4.7	6.1	8.2
S.E.	1.7	2.1	2.7	3.7
N	5	5	5	5
DAY 1- 6				
MEAN	26.	20.	23.	33.
S.D.	3.6	3.7	7.2	7.0
S.E.	1.6	1.7	3.2	3.5
N	5	5	5	4
DAY 6- 13				
MEAN	25.	24.	29.	32.
S.D.	10.3	9.4	6.9	6.6
S.E.	4.6	4.2	3.1	3.3
N	5	5	5	4

** = Significantly different from the control group at 0.01 using Dunnett's test
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

TABLE 45 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHT CHANGES [G]

FEMALES

GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
DAY 0- 1				
MEAN	5.	2.	-1.	-5.
S.D.	8.6	10.4	6.4	4.3
S.E.	3.9	4.6	2.9	1.9
N	5	5	5	5
DAY 1- 6				
MEAN	10.	18.	14.	16.
S.D.	8.7	7.4	6.4	6.4
S.E.	3.9	3.3	2.8	2.9
N	5	5	5	5
DAY 6- 13				
MEAN	17.	14.	19.	18.
S.D.	5.6	5.3	7.7	7.8
S.E.	2.5	2.4	3.4	3.5
N	5	5	5	5

None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

TABLE 46 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
DAY 0- 1				
MEAN	-11.	-16.	-16.	-35.**
S.D.	3.8	4.7	6.1	8.2
S.E.	1.7	2.1	2.7	3.7
N	5	5	5	5
DAY 0- 6				
MEAN	14.	4.	7.	-2.**
S.D.	1.2	4.6	10.6	2.1
S.E.	0.5	2.0	4.7	1.1
N	5	5	5	4
DAY 0- 13				
MEAN	39.	28.	36.	31.
S.D.	11.3	10.8	10.7	7.0
S.E.	5.1	4.8	4.8	3.5
N	5	5	5	4

** = Significantly different from the control group at 0.01 using Dunnett's test
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 46 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
DAY 0- 1				
MEAN	5.	2.	-1.	-5.
S.D.	8.6	10.4	6.4	4.3
S.E.	3.9	4.6	2.9	1.9
N	5	5	5	5
DAY 0- 6				
MEAN	14.	19.	13.	11.
S.D.	9.5	7.9	11.3	4.3
S.E.	4.3	3.5	5.0	1.9
N	5	5	5	5
DAY 0- 13				
MEAN	31.	34.	32.	29.
S.D.	7.8	11.1	8.8	11.7
S.E.	3.5	5.0	4.0	5.2
N	5	5	5	5

None significantly different from control group
MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

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TABLE 47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
		MALES		
WHITE CELLS (thous/uL)				
DAY 14 MEAN	8.27	8.98	8.36	8.66
% DIFFERENCE		8.6	1.1	4.7
S.D.	1.690	2.281	1.753	1.736
S.E.	0.756	1.020	0.784	0.868
N	5	5	5	4
RED CELLS (mil/uL)				
DAY 14 MEAN	8.32	8.13	7.83	8.13
% DIFFERENCE		-2.3	-5.9	-2.3
S.D.	0.306	0.351	0.228	0.206
S.E.	0.137	0.157	0.102	0.103
N	5	5	5	4
HEMOGLOBIN (g/dL)				
DAY 14 MEAN	16.0	16.0	15.5	16.2
% DIFFERENCE		0.0	-3.1	1.3
S.D.	0.39	0.42	0.58	0.30
S.E.	0.18	0.19	0.26	0.15
N	5	5	5	4
HEMATOCRIT (%)				
DAY 14 MEAN	43.1	42.3	42.1	43.5
% DIFFERENCE		-1.9	-2.3	0.9
S.D.	1.52	1.54	1.68	0.75
S.E.	0.68	0.69	0.75	0.37
N	5	5	5	4

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
		MALES		
MCV (fL)				
DAY 14 MEAN	51.9	52.1	53.7	53.6
% DIFFERENCE		0.4	3.5	3.3
S.D.	2.34	1.23	1.79	0.89
S.E.	1.05	0.55	0.80	0.44
N	5	5	5	4
MCH (pg)				
DAY 14 MEAN	19.2	19.7	19.8	19.9
% DIFFERENCE		2.6	3.1	3.6
S.D.	0.53	0.48	0.69	0.24
S.E.	0.24	0.21	0.31	0.12
N	5	5	5	4
MCHC (g/dL)				
DAY 14 MEAN	37.1	37.8	37.0	37.1
% DIFFERENCE		1.9	-0.3	0.0
S.D.	0.77	0.58	0.38	0.75
S.E.	0.34	0.26	0.17	0.38
N	5	5	5	4
PLATELET (thous/uL)				
DAY 14 MEAN	1111.	1095.	1218.	1263.
% DIFFERENCE		-1.4	9.6	13.7
S.D.	199.3	141.8	160.6	101.6
S.E.	89.1	63.4	71.8	50.8
N	5	5	5	4

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

ANALYSIS GROUP:	MALES 0 PPM	10 PPM	20 PPM	50 PPM
PROTIME (seconds)				
DAY 14 MEAN	13.3	13.1	12.9	13.4
% DIFFERENCE		-1.5	-3.0	0.8
S.D.	0.92	0.58	0.68	0.67
S.E.	0.41	0.26	0.30	0.33
N	5	5	5	4
APTT (seconds)				
DAY 14 MEAN	18.9	19.5	18.7	19.7
% DIFFERENCE		3.2	-1.1	4.2
S.D.	3.32	0.96	2.52	0.58
S.E.	1.48	0.43	1.12	0.29
N	5	5	5	4
RETICULOCYTE (%)				
DAY 14 MEAN	2.2	2.1	2.4	2.2
% DIFFERENCE		-4.5	9.1	0.0
S.D.	0.30	0.34	0.36	0.57
S.E.	0.14	0.15	0.16	0.29
N	5	5	5	4
RETIC ABSOLUTE (thous/uL)				
DAY 14 MEAN	180.3	172.7	191.7	176.5
% DIFFERENCE		-4.2	6.3	-2.1
S.D.	24.25	31.61	29.43	44.56
S.E.	10.84	14.14	13.16	22.28
N	5	5	5	4

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	MALES 0 PPM	10 PPM	20 PPM	50 PPM
NEUTROPHIL (%)				
DAY 14 MEAN	19.0	16.3	21.0	13.7
% DIFFERENCE		-14.2	10.5	-27.9
S.D.	4.19	6.29	5.78	2.67
S.E.	1.87	2.81	2.59	1.34
N	5	5	5	4
LYMPHOCYTE (%)				
DAY 14 MEAN	76.2	79.4	74.5	81.6
% DIFFERENCE		4.2	-2.2	7.1
S.D.	4.55	6.38	6.41	3.85
S.E.	2.04	2.85	2.87	1.93
N	5	5	5	4
MONOCYTE (%)				
DAY 14 MEAN	2.4	1.7	2.1	2.2
% DIFFERENCE		-29.2	-12.5	-8.3
S.D.	1.00	0.47	0.95	0.66
S.E.	0.45	0.21	0.42	0.33
N	5	5	5	4
EOSINOPHIL (%)				
DAY 14 MEAN	1.6	1.7	1.6	1.3
% DIFFERENCE		6.3	0.0	-18.8
S.D.	0.70	0.38	1.03	0.62
S.E.	0.32	0.17	0.46	0.31
N	5	5	5	4

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

MALES

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
BASOPHIL (%)				
DAY 14 MEAN	0.4	0.4	0.3	0.4
% DIFFERENCE		0.0	-25.0	0.0
S.D.	0.11	0.15	0.13	0.05
S.E.	0.05	0.07	0.06	0.03
N	5	5	5	4
LG UNSTAIN CELL (%)				
DAY 14 MEAN	0.4	0.6	0.5	0.9**
% DIFFERENCE		50.0	25.0	125.0
S.D.	0.11	0.18	0.11	0.19
S.E.	0.05	0.08	0.05	0.10
N	5	5	5	4
NEU ABSOLUTE (thous/uL)				
DAY 14 MEAN	1.58	1.41	1.75	1.16
% DIFFERENCE		-10.8	10.8	-26.6
S.D.	0.552	0.560	0.620	0.182
S.E.	0.247	0.250	0.277	0.091
N	5	5	5	4
LYMPH ABSOLUTE (thous/uL)				
DAY 14 MEAN	6.29	7.19	6.25	7.11
% DIFFERENCE		14.3	-0.6	13.0
S.D.	1.189	2.125	1.475	1.631
S.E.	0.532	0.950	0.660	0.816
N	5	5	5	4

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

** = Significantly different from the control group at 0.01 using Dunnett's test

TABLE 47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:		MALES 0 PPM	10 PPM	20 PPM	50 PPM
MONO ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.20	0.15	0.17	0.20
	% DIFFERENCE		-25.0	-15.0	0.0
	S.D.	0.124	0.046	0.060	0.081
	S.E.	0.055	0.021	0.027	0.040
	N	5	5	5	4
EOS ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.13	0.15	0.13	0.10
	% DIFFERENCE		15.4	0.0	-23.1
	S.D.	0.044	0.039	0.074	0.039
	S.E.	0.020	0.017	0.033	0.019
	N	5	5	5	4
BASO ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.03	0.03	0.02	0.03
	% DIFFERENCE		0.0	-33.3	0.0
	S.D.	0.013	0.015	0.009	0.005
	S.E.	0.006	0.007	0.004	0.003
	N	5	5	5	4
LUC ABSOLUTE (thous/uL)					
DAY 14	MEAN	0.04	0.06	0.04	0.08*
	% DIFFERENCE		50.0	0.0	100.0
	S.D.	0.014	0.023	0.013	0.019
	S.E.	0.006	0.010	0.006	0.010
	N	5	5	5	4

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

* = Significantly different from the control group at 0.05 using Dunnett's test

TABLE 47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	FEMALES 0 PPM	10 PPM	20 PPM	50 PPM
WHITE CELLS (thous/uL)				
DAY 14 MEAN	7.77	6.25	6.27	6.86
% DIFFERENCE		-19.6	-19.3	-11.7
S.D.	2.359	0.661	1.636	3.484
S.E.	1.055	0.331	0.732	1.558
N	5	4	5	5
RED CELLS (mil/uL)				
DAY 14 MEAN	7.39	7.38	7.44	7.72
% DIFFERENCE		-0.1	0.7	4.5
S.D.	0.188	0.125	0.839	0.231
S.E.	0.084	0.062	0.375	0.104
N	5	4	5	5
HEMOGLOBIN (g/dL)				
DAY 14 MEAN	15.2	15.1	14.9	15.4
% DIFFERENCE		-0.7	-2.0	1.3
S.D.	0.33	0.42	1.47	0.38
S.E.	0.15	0.21	0.66	0.17
N	5	4	5	5
HEMATOCRIT (%)				
DAY 14 MEAN	40.0	39.0	38.7	40.3
% DIFFERENCE		-2.5	-3.3	0.8
S.D.	0.67	1.04	4.20	1.26
S.E.	0.30	0.52	1.88	0.57
N	5	4	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
	FEMALES			
MCV (fL)				
DAY 14 MEAN	54.2	52.9	52.1	52.2
% DIFFERENCE		-2.4	-3.9	-3.7
S.D.	1.94	1.60	1.85	1.08
S.E.	0.87	0.80	0.83	0.48
N	5	4	5	5
MCH (pg)				
DAY 14 MEAN	20.6	20.5	20.1	19.9
% DIFFERENCE		-0.5	-2.4	-3.4
S.D.	0.56	0.53	0.81	0.51
S.E.	0.25	0.27	0.36	0.23
N	5	4	5	5
MCHC (g/dL)				
DAY 14 MEAN	38.0	38.9	38.6	38.2
% DIFFERENCE		2.4	1.6	0.5
S.D.	0.84	0.60	0.55	0.79
S.E.	0.37	0.30	0.25	0.35
N	5	4	5	5
PLATELET (thous/uL)				
DAY 14 MEAN	1257.	1237.	1211.	1246.
% DIFFERENCE		-1.6	-3.7	-0.9
S.D.	124.7	100.0	209.3	216.4
S.E.	55.8	50.0	93.6	96.8
N	5	4	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

FEMALES

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
PROTIME (seconds)				
DAY 14 MEAN	11.5	11.7	12.0	11.7
% DIFFERENCE		1.7	4.3	1.7
S.D.	0.72	0.51	0.51	0.52
S.E.	0.32	0.23	0.25	0.26
N	5	5	4	4
APTT (seconds)				
DAY 14 MEAN	14.6	16.4	17.0	15.4
% DIFFERENCE		12.3	16.4	5.5
S.D.	2.09	2.56	0.59	0.95
S.E.	0.94	1.15	0.29	0.47
N	5	5	4	4
RETICULOCYTE (%)				
DAY 14 MEAN	2.0	1.7	2.2	1.9
% DIFFERENCE		-15.0	10.0	-5.0
S.D.	0.31	0.41	0.36	0.30
S.E.	0.14	0.21	0.16	0.13
N	5	4	5	5
RETIC ABSOLUTE (thous/uL)				
DAY 14 MEAN	147.1	122.5	164.8	151.1
% DIFFERENCE		-16.7	12.0	2.7
S.D.	25.93	27.58	20.56	26.56
S.E.	11.60	13.79	9.20	11.88
N	5	4	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

	FEMALES			
ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
NEUTROPHIL (%)				
DAY 14 MEAN	12.9	11.1	10.0	11.9
% DIFFERENCE		-14.0	-22.5	-7.8
S.D.	6.45	2.12	2.21	3.60
S.E.	2.88	1.06	0.99	1.61
N	5	4	5	5
LYMPHOCYTE (%)				
DAY 14 MEAN	83.5	84.2	86.3	83.3
% DIFFERENCE		0.8	3.4	-0.2
S.D.	6.83	3.64	2.02	4.10
S.E.	3.05	1.82	0.90	1.84
N	5	4	5	5
MONOCYTE (%)				
DAY 14 MEAN	1.2	2.0	1.5	2.1
% DIFFERENCE		66.7	25.0	75.0
S.D.	0.32	0.71	0.23	0.64
S.E.	0.14	0.36	0.10	0.28
N	5	4	5	5
EOSINOPHIL (%)				
DAY 14 MEAN	1.3	1.8	1.3	1.8
% DIFFERENCE		38.5	0.0	38.5
S.D.	0.76	0.94	0.46	0.71
S.E.	0.34	0.47	0.21	0.32
N	5	4	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	FEMALES 0 PPM	10 PPM	20 PPM	50 PPM
BASOPHIL (%)				
DAY 14 MEAN	0.3	0.2	0.3	0.3
% DIFFERENCE		-33.3	0.0	0.0
S.D.	0.19	0.10	0.12	0.07
S.E.	0.08	0.05	0.05	0.03
N	5	4	5	5
LG UNSTAIN CELL (%)				
DAY 14 MEAN	0.7	0.8	0.5	0.6
% DIFFERENCE		14.3	-28.6	-14.3
S.D.	0.28	0.24	0.16	0.18
S.E.	0.12	0.12	0.07	0.08
N	5	4	5	5
NEU ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.93	0.70	0.62	0.77
% DIFFERENCE		-24.7	-33.3	-17.2
S.D.	0.404	0.179	0.196	0.288
S.E.	0.180	0.090	0.088	0.129
N	5	4	5	5
LYMPH ABSOLUTE (thous/uL)				
DAY 14 MEAN	6.57	5.26	5.41	5.77
% DIFFERENCE		-19.9	-17.7	-12.2
S.D.	2.332	0.549	1.417	3.112
S.E.	1.043	0.275	0.634	1.392
N	5	4	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF HEMATOLOGY VALUES

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
	FEMALES			
MONO ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.09	0.13	0.10	0.15
% DIFFERENCE		44.4	11.1	66.7
S.D.	0.024	0.053	0.028	0.093
S.E.	0.011	0.026	0.012	0.042
N	5	4	5	5
EOS ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.10	0.11	0.08	0.11
% DIFFERENCE		10.0	-20.0	10.0
S.D.	0.058	0.057	0.034	0.036
S.E.	0.026	0.029	0.015	0.016
N	5	4	5	5
BASO ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.02	0.01	0.02	0.02
% DIFFERENCE		-50.0	0.0	0.0
S.D.	0.017	0.005	0.008	0.011
S.E.	0.007	0.003	0.004	0.005
N	5	4	5	5
LUC ABSOLUTE (thous/uL)				
DAY 14 MEAN	0.06	0.05	0.03	0.05
% DIFFERENCE		-16.7	-50.0	-16.7
S.D.	0.032	0.017	0.022	0.030
S.E.	0.014	0.009	0.010	0.013
N	5	4	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

None significantly different from control group

TABLE 48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

		MALES			
ANALYSIS	GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
ALBUMIN (g/dL)					
DAY 14	MEAN	4.2	4.2	4.2	4.2
	% DIFFERENCE		0.0	0.0	0.0
	S.D.	0.11	0.11	0.13	0.10
	S.E.	0.05	0.05	0.06	0.05
	N	5	5	5	4
TOTAL PROTEIN (g/dL)					
DAY 14	MEAN	6.5	6.5	6.4	6.5
	% DIFFERENCE		0.0	-1.5	0.0
	S.D.	0.39	0.23	0.19	0.27
	S.E.	0.17	0.10	0.09	0.14
	N	5	5	5	4
GLOBULIN (g/dL)					
DAY 14	MEAN	2.4	2.3	2.2	2.4
	% DIFFERENCE		-4.2	-8.3	0.0
	S.D.	0.24	0.16	0.19	0.14
	S.E.	0.11	0.07	0.09	0.07
	N	5	5	5	4
A/G RATIO					
DAY 14	MEAN	1.75	1.81	1.94	1.74
	% DIFFERENCE		3.4	10.9	-0.6
	S.D.	0.141	0.133	0.178	0.054
	S.E.	0.063	0.059	0.080	0.027
	N	5	5	5	4

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 48 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF SERUM CHEMISTRY VALUES

MALES

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
TOTAL BILI (mg/dL)				
DAY 14 MEAN	0.1	0.1	0.1	0.1
% DIFFERENCE		0.0	0.0	0.0
S.D.	0.04	0.00	0.00	0.00
S.E.	0.02	0.00	0.00	0.00
N	5	5	5	4
UREA NITROGEN (mg/dL)				
DAY 14 MEAN	14.0	14.6	13.6	14.5
% DIFFERENCE		4.3	-2.9	3.6
S.D.	1.18	1.72	1.40	0.45
S.E.	0.53	0.77	0.63	0.23
N	5	5	5	4
CREATININE (mg/dL)				
DAY 14 MEAN	0.2	0.2	0.3	0.2
% DIFFERENCE		0.0	50.0	0.0
S.D.	0.05	0.00	0.09	0.05
S.E.	0.02	0.00	0.04	0.03
N	5	5	5	4
ALKALINEPHOS'TSE (U/L)				
DAY 14 MEAN	133.	125.	105.	144.
% DIFFERENCE		-6.0	-21.1	8.3
S.D.	17.1	24.9	15.5	27.9
S.E.	7.6	11.1	6.9	13.9
N	5	5	5	4

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
		MALES		
ALANINE TRANSFER (U/L)				
DAY 14 MEAN	33.	36.	28.	28.
% DIFFERENCE		9.1	-15.2	-15.2
S.D.	7.0	1.9	2.8	3.7
S.E.	3.1	0.9	1.2	1.8
N	5	5	5	4
ASPARTATTRANSFER (U/L)				
DAY 14 MEAN	90.	123.	101.	96.
% DIFFERENCE		36.7	12.2	6.7
S.D.	13.0	30.3	18.3	18.2
S.E.	5.8	13.5	8.2	9.1
N	5	5	5	4
GLUTAMYLTRANSFER (U/L)				
DAY 14 MEAN	0.6	0.7	0.5	0.5
% DIFFERENCE		16.7	-16.7	-16.7
S.D.	0.24	0.55	0.55	0.73
S.E.	0.11	0.25	0.25	0.37
N	5	5	5	4
GLUCOSE (mg/dL)				
DAY 14 MEAN	116.	104.*	106.	112.
% DIFFERENCE		-10.3	-8.6	-3.4
S.D.	3.7	9.5	3.5	2.6
S.E.	1.7	4.3	1.6	1.3
N	5	5	5	4

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

* = Significantly different from the control group at 0.05 using Dunnett's test

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 48 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF SERUM CHEMISTRY VALUES

ANALYSIS GROUP:	MALES 0 PPM	10 PPM	20 PPM	50 PPM
CHOLESTEROL (mg/dL)				
DAY 14 MEAN	52.	54.	70.	63.
% DIFFERENCE		3.8	34.6	21.2
S.D.	10.8	5.7	19.4	11.1
S.E.	4.9	2.5	8.7	5.6
N	5	5	5	4
CALCIUM (mg/dL)				
DAY 14 MEAN	10.8	10.2	10.5	10.6
% DIFFERENCE		-5.6	-2.8	-1.9
S.D.	0.44	0.15	0.49	0.41
S.E.	0.20	0.07	0.22	0.20
N	5	5	5	4
CHLORIDE (mEq/L)				
DAY 14 MEAN	101.	102.	102.	102.
% DIFFERENCE		1.0	1.0	1.0
S.D.	0.9	1.4	0.9	1.6
S.E.	0.4	0.6	0.4	0.8
N	5	5	5	4
PHOSPHORUS (mg/dL)				
DAY 14 MEAN	7.1	7.1	7.6	8.2
% DIFFERENCE		0.0	7.0	15.5
S.D.	0.44	0.50	0.84	1.05
S.E.	0.20	0.22	0.37	0.52
N	5	5	5	4

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 5

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF SERUM CHEMISTRY VALUES

		MALES			
ANALYSIS	GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
POTASSIUM (mEq/L)					
DAY 14	MEAN	4.51	4.65	4.84	5.01
	% DIFFERENCE		3.1	7.3	11.1
	S.D.	0.284	0.242	0.355	0.802
	S.E.	0.127	0.108	0.159	0.401
	N	5	5	5	4
SODIUM (mEq/L)					
DAY 14	MEAN	145.	144.	146.	146.
	% DIFFERENCE		-0.7	0.7	0.7
	S.D.	0.8	1.5	0.8	0.6
	S.E.	0.4	0.7	0.4	0.3
	N	5	5	5	4
TRIGLYCERIDE (mg/dL)					
DAY 14	MEAN	64.	39.	42.	50.
	% DIFFERENCE		-39.1	-34.4	-21.9
	S.D.	24.4	14.6	6.6	7.5
	S.E.	10.9	6.5	3.0	3.8
	N	5	5	5	4

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 48 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF SERUM CHEMISTRY VALUES

ANALYSIS GROUP:	FEMALES 0 PPM	10 PPM	20 PPM	50 PPM
ALBUMIN (g/dL)				
DAY 14 MEAN	4.7	4.9	4.8	4.9
% DIFFERENCE		4.3	2.1	4.3
S.D.	0.35	0.26	0.13	0.37
S.E.	0.15	0.12	0.06	0.17
N	5	5	5	5
TOTAL PROTEIN (g/dL)				
DAY 14 MEAN	7.0	6.8	6.9	7.0
% DIFFERENCE		-2.9	-1.4	0.0
S.D.	0.41	0.29	0.16	0.44
S.E.	0.18	0.13	0.07	0.20
N	5	5	5	5
GLOBULIN (g/dL)				
DAY 14 MEAN	2.3	1.9**	2.1	2.1
% DIFFERENCE		-17.4	-8.7	-8.7
S.D.	0.11	0.19	0.12	0.18
S.E.	0.05	0.09	0.05	0.08
N	5	5	5	5
A/G RATIO				
DAY 14 MEAN	2.04	2.60**	2.30	2.29
% DIFFERENCE		27.5	12.7	12.3
S.D.	0.115	0.304	0.165	0.251
S.E.	0.051	0.136	0.074	0.112
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

** = Significantly different from the control group at 0.01 using Dunnett's test

ANALYSIS GROUP:	FEMALES 0 PPM	10 PPM	20 PPM	50 PPM
TOTAL BILI (mg/dL)				
DAY 14 MEAN	0.1	0.1	0.1	0.1
% DIFFERENCE		0.0	0.0	0.0
S.D.	0.04	0.00	0.00	0.00
S.E.	0.02	0.00	0.00	0.00
N	5	5	5	5
UREA NITROGEN (mg/dL)				
DAY 14 MEAN	16.1	14.1	15.4	15.1
% DIFFERENCE		-12.4	-4.3	-6.2
S.D.	1.24	1.81	2.48	1.82
S.E.	0.55	0.81	1.11	0.82
N	5	5	5	5
CREATININE (mg/dL)				
DAY 14 MEAN	0.3	0.2	0.3	0.3
% DIFFERENCE		-33.3	0.0	0.0
S.D.	0.00	0.05	0.05	0.05
S.E.	0.00	0.02	0.02	0.02
N	5	5	5	5
ALKALINEPHOS'TSE (U/L)				
DAY 14 MEAN	97.	104.	110.	96.
% DIFFERENCE		7.2	13.4	-1.0
S.D.	19.6	26.3	32.9	42.1
S.E.	8.8	11.8	14.7	18.8
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

TABLE 48 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF SERUM CHEMISTRY VALUES

FEMALES

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
ALANINE TRANSFER (U/L)				
DAY 14 MEAN	32.	29.	26.	29.
% DIFFERENCE		-9.4	-18.8	-9.4
S.D.	6.1	7.4	1.6	7.8
S.E.	2.7	3.3	0.7	3.5
N	5	5	5	5
ASPARTATTRANSFER (U/L)				
DAY 14 MEAN	89.	85.	83.	85.
% DIFFERENCE		-4.5	-6.7	-4.5
S.D.	3.9	5.4	15.7	16.2
S.E.	1.7	2.4	7.0	7.3
N	5	5	5	5
GLUTAMYLTRANSFER (U/L)				
DAY 14 MEAN	1.5	1.2	0.9	1.2
% DIFFERENCE		-20.0	-40.0	-20.0
S.D.	0.57	0.46	0.80	0.58
S.E.	0.25	0.20	0.36	0.26
N	5	5	5	5
GLUCOSE (mg/dL)				
DAY 14 MEAN	112.	107.	116.	114.
% DIFFERENCE		-4.5	3.6	1.8
S.D.	20.0	7.2	9.0	12.0
S.E.	9.0	3.2	4.0	5.4
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
	FEMALES			
CHOLESTEROL (mg/dL)				
DAY 14 MEAN	78.	67.	71.	70.
% DIFFERENCE		-14.1	-9.0	-10.3
S.D.	15.6	7.3	8.2	17.3
S.E.	7.0	3.3	3.7	7.7
N	5	5	5	5
CALCIUM (mg/dL)				
DAY 14 MEAN	10.6	10.9	10.6	10.8
% DIFFERENCE		2.8	0.0	1.9
S.D.	0.43	0.28	0.36	0.32
S.E.	0.19	0.12	0.16	0.14
N	5	5	5	5
CHLORIDE (mEq/L)				
DAY 14 MEAN	102.	102.	103.	103.
% DIFFERENCE		0.0	1.0	1.0
S.D.	1.0	0.7	1.9	1.5
S.E.	0.4	0.3	0.8	0.7
N	5	5	5	5
PHOSPHORUS (mg/dL)				
DAY 14 MEAN	6.3	6.6	6.0	7.1
% DIFFERENCE		4.8	-4.8	12.7
S.D.	0.89	0.46	0.80	0.37
S.E.	0.40	0.21	0.36	0.17
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

ANALYSIS GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
	FEMALES			
POTASSIUM (mEq/L)				
DAY 14 MEAN	4.63	4.50	4.57	4.61
% DIFFERENCE		-2.8	-1.3	-0.4
S.D.	0.054	0.238	0.384	0.291
S.E.	0.024	0.106	0.172	0.130
N	5	5	5	5
SODIUM (mEq/L)				
DAY 14 MEAN	143.	143.	144.	144.
% DIFFERENCE		0.0	0.7	0.7
S.D.	0.0	0.8	2.1	1.6
S.E.	0.0	0.4	0.9	0.7
N	5	5	5	5
TRIGLYCERIDE (mg/dL)				
DAY 14 MEAN	88.	36.	35.	37.
% DIFFERENCE		-59.1	-60.2	-58.0
S.D.	122.8	4.8	4.9	10.8
S.E.	54.9	2.2	2.2	4.8
N	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

None significantly different from control group

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 49 (UNSCHEDULED DEATH - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MACROSCOPIC FINDINGS

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

	MALE			
GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	0	0	0	1
LUNGS				
-DISCOLORATION, DARK RED	0	0	0	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 49 (UNSCHEDULED DEATH - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MACROSCOPIC FINDINGS

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

	----- F E M A L E -----			
GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	0	0	0	0

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	M A L E			
GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS TERMINALLY EUTHANIZED	5	5	5	4
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	5	5	5	4

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MACROSCOPIC FINDINGS

SCHEDULED NECROPSY

	----- F E M A L E -----			
GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS TERMINALLY EUTHANIZED	5	5	5	5
LIVER				
-PALE	0	0	1	0
UTERUS				
-CONTENTS, CLEAR FLUID	1	0	0	1
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	4	5	4	4

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 51 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

	MALES			
GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
FINAL BODY WT (G)				
MEAN	394.	381.	387.	392.
% DIFFERENCE		-3.3	-1.8	-0.5
S.D.	20.8	16.5	18.2	11.0
S.E.	9.3	7.4	8.1	5.5
N	5	5	5	4
KIDNEYS (G)				
MEAN	2.77	2.81	2.72	2.90
% DIFFERENCE		1.4	-1.8	4.7
S.D.	0.310	0.187	0.390	0.243
S.E.	0.139	0.083	0.175	0.122
N	5	5	5	4
KIDNEYS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.702	0.740	0.703	0.741
% DIFFERENCE		5.4	0.1	5.6
S.D.	0.0687	0.0600	0.1067	0.0613
S.E.	0.0307	0.0268	0.0477	0.0307
N	5	5	5	4
LIVER (G)				
MEAN	11.33	10.26	11.00	10.94
% DIFFERENCE		-9.4	-2.9	-3.4
S.D.	0.995	0.755	0.590	0.270
S.E.	0.445	0.338	0.264	0.135
N	5	5	5	4

None significantly different from control group

TABLE 51 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

	MALES			
GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
LIVER (G/100 G FINAL BODY WEIGHT)				
MEAN	2.872	2.694	2.843	2.794
% DIFFERENCE		-6.2	-1.0	-2.7
S.D.	0.1573	0.1497	0.0962	0.0756
S.E.	0.0704	0.0669	0.0430	0.0378
N	5	5	5	4
LUNGS (G)				
MEAN	1.48	1.48	1.51	1.50
% DIFFERENCE		0.0	2.0	1.4
S.D.	0.088	0.138	0.081	0.087
S.E.	0.039	0.062	0.036	0.044
N	5	5	5	4
LUNGS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.376	0.388	0.391	0.383
% DIFFERENCE		3.2	4.0	1.9
S.D.	0.0208	0.0256	0.0272	0.0278
S.E.	0.0093	0.0114	0.0122	0.0139
N	5	5	5	4

None significantly different from control group

TABLE 51 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL SUMMARY OF ORGAN WEIGHTS AND ORGAN WTS. RELATIVE TO BODY WTS.

FEMALES

GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
FINAL BODY WT (G)				
MEAN	240.	243.	235.	240.
% DIFFERENCE		1.3	-2.1	0.0
S.D.	10.9	10.4	9.0	19.2
S.E.	4.9	4.6	4.0	8.6
N	5	5	5	5
KIDNEYS (G)				
MEAN	1.71	1.74	1.68	1.75
% DIFFERENCE		1.8	-1.8	2.3
S.D.	0.095	0.128	0.098	0.163
S.E.	0.042	0.057	0.049	0.073
N	5	5	4	5
KIDNEYS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.714	0.716	0.722	0.733
% DIFFERENCE		0.3	1.1	2.7
S.D.	0.0255	0.0290	0.0460	0.0471
S.E.	0.0114	0.0130	0.0230	0.0211
N	5	5	4	5
LIVER (G)				
MEAN	7.01	7.09	6.71	6.80
% DIFFERENCE		1.1	-4.3	-3.0
S.D.	0.590	0.622	0.457	0.512
S.E.	0.264	0.278	0.204	0.229
N	5	5	5	5

None significantly different from control group

FEMALES

GROUP:	0 PPM	10 PPM	20 PPM	50 PPM
LIVER (G/100 G FINAL BODY WEIGHT)				
MEAN	2.919	2.916	2.854	2.843
% DIFFERENCE		-0.1	-2.2	-2.6
S.D.	0.1360	0.1453	0.1212	0.1669
S.E.	0.0608	0.0650	0.0542	0.0746
N	5	5	5	5
LUNGS (G)				
MEAN	1.23	1.19	1.23	1.26
% DIFFERENCE		-3.3	0.0	2.4
S.D.	0.185	0.063	0.077	0.044
S.E.	0.083	0.028	0.034	0.020
N	5	5	5	5
LUNGS (G/100 G FINAL BODY WEIGHT)				
MEAN	0.512	0.489	0.524	0.529
% DIFFERENCE		-4.5	2.3	3.3
S.D.	0.0566	0.0338	0.0289	0.0244
S.E.	0.0253	0.0151	0.0129	0.0109
N	5	5	5	5

None significantly different from control group

TABLE 52 (UNSCHEDULED DEATH - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	0	0	0	1
KIDNEYS				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-HYDRONEPHROSIS	0	0	0	1
MILD	NONE	NONE	NONE	1
LARYNX				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-EROSION, EPITHELIAL	0	0	0	1
MODERATE	NONE	NONE	NONE	1
-HYPERPLASIA, EPITHELIAL	0	0	0	1
MODERATE	NONE	NONE	NONE	1
-INFLAMMATION, SUBACUTE	0	0	0	1
MILD	NONE	NONE	NONE	1
-ULCERATION	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
LIVER				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 52 (UNSCHEDULED DEATH - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	0	0	0	1
LUNGS				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-CONGESTION	0	0	0	1
MODERATE	NONE	NONE	NONE	1
-EDEMA	0	0	0	1
MILD	NONE	NONE	NONE	1
-HEMORRHAGE	0	0	0	1
MILD	NONE	NONE	NONE	1
NASAL LEVEL I				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	0	1
MILD	NONE	NONE	NONE	1
-ULCERATION	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
NASAL LEVEL II				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	1
MILD	NONE	NONE	NONE	1
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	0	1
MILD	NONE	NONE	NONE	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 52 (UNSCHEDULED DEATH - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	0	0	0	1
NASAL LEVEL II - CONTINUED				
-HYPERPLASIA, GOBLET CELL	0	0	0	1
MILD	NONE	NONE	NONE	1
NASAL LEVEL III				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	1
NASAL LEVEL IV				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
-EROSION	0	0	0	1
MODERATE	NONE	NONE	NONE	1
-ULCERATION	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
NASAL LEVEL V				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
-EROSION	0	0	0	1
SEVERE	NONE	NONE	NONE	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	0	0	0	1
NASAL LEVEL V - CONTINUED				
-INFLAMMATION, SUBACUTE	0	0	0	1
MODERATE	NONE	NONE	NONE	1
-ULCERATION	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
NASAL LEVEL VI				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	0	1
MODERATE	NONE	NONE	NONE	1
-EROSION	0	0	0	1
SEVERE	NONE	NONE	NONE	1
-ULCERATION	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
TRACHEA				
TOTAL NUMBER EXAMINED	0	0	0	1
EXAMINED, UNREMARKABLE	0	0	0	0
-EROSION, EPITHELIAL	0	0	0	1
SEVERE	NONE	NONE	NONE	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 52 (UNSCHEDULED DEATH - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED	0	0	0	0

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE 53 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	4
KIDNEYS				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	4	5	5	4
-REGENERATION, RENAL TUBULAR	1	0	0	0
MINIMAL	1	NONE	NONE	NONE
LARYNX				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	5	5	5	3
-HYPERPLASIA, EPITHELIAL	0	0	0	1
MILD	NONE	NONE	NONE	1
LIVER				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	5	5	5	4
LUNGS				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	5	5	5	4
NASAL LEVEL I				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	3	1	1	1
-HYPERKERATOSIS	0	1	1	1
MINIMAL	NONE	1	1	NONE
MILD	NONE	NONE	NONE	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 53 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	4
NASAL LEVEL I - CONTINUED				
-HYPERPLASIA, EPITHELIAL	1	0	0	0
MILD	1	NONE	NONE	NONE
-INFLAMMATION, CHRONIC	2	4	4	3
MINIMAL	1	1	1	NONE
MILD	1	3	2	3
MODERATE	NONE	NONE	1	NONE
NASAL LEVEL II				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	3	0	3	0
-DEGENERATION, OLFACTORY EPITHELIUM	0	3	0	1
MINIMAL	NONE	2	NONE	NONE
MILD	NONE	1	NONE	1
-HEMORRHAGE	0	0	0	1
MILD	NONE	NONE	NONE	1
-HYPERPLASIA, GOBLET CELL	0	2	2	3
MINIMAL	NONE	1	1	NONE
MILD	NONE	1	1	2
MODERATE	NONE	NONE	NONE	1
-INFLAMMATION, CHRONIC	2	2	2	2
MINIMAL	1	1	NONE	1
MILD	1	1	2	NONE
MODERATE	NONE	NONE	NONE	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 53 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	4
NASAL LEVEL II - CONTINUED				
NASAL LEVEL III				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	5	4	4	2
-DEGENERATION, OLFACTORY EPITHELIUM	0	1	0	2
MILD	NONE	1	NONE	NONE
MODERATE	NONE	NONE	NONE	2
-HEMORRHAGE	0	0	0	1
MILD	NONE	NONE	NONE	1
-HYPERPLASIA, GOBLET CELL	0	0	1	0
MINIMAL	NONE	NONE	1	NONE
-INFLAMMATION, CHRONIC	0	0	1	0
MILD	NONE	NONE	1	NONE
NASAL LEVEL IV				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	5	5	3	2
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	2	1
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	NONE	1	NONE
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	0	1
MILD	NONE	NONE	NONE	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 53 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	4
NASAL LEVEL IV - CONTINUED				
-HEMORRHAGE	0	0	0	1
MODERATE	NONE	NONE	NONE	1
-INFLAMMATION, SUBACUTE	0	0	0	1
MILD	NONE	NONE	NONE	1
-METAPLASIA, OLFACTORY TO RESPIRATORY EPITHELIUM	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
-ULCERATION	0	0	0	1
SEVERE, IRREVERSIBLE	NONE	NONE	NONE	1
NASAL LEVEL V				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	5	5	5	2
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	2
MODERATE	NONE	NONE	NONE	1
SEVERE	NONE	NONE	NONE	1
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	0	1
MODERATE	NONE	NONE	NONE	1
-EROSION	0	0	0	1
MODERATE	NONE	NONE	NONE	1
NASAL LEVEL VI				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	5	5	5	2
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	0	2
MILD	NONE	NONE	NONE	1
MODERATE	NONE	NONE	NONE	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 53 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- MALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	4
NASAL LEVEL VI - CONTINUED				
-DEGENERATION, RESPIRATORY EPITHELIUM	0	0	0	1
MILD	NONE	NONE	NONE	1
-HEMORRHAGE	0	0	0	1
MILD	NONE	NONE	NONE	1
TRACHEA				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	5	5	5	4

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 53 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
KIDNEYS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	4	5	3	4
-INFLAMMATION, CHRONIC, INTERSTITIAL	1	0	0	0
MILD	1	NONE	NONE	NONE
-MINERALIZATION	0	0	2	1
MILD	NONE	NONE	2	1
LARYNX				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LIVER				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
LUNGS				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
NASAL LEVEL I				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	3	1	0
-HYPERPLASIA, GOBLET CELL	0	2	0	1
MILD	NONE	2	NONE	NONE
MODERATE	NONE	NONE	NONE	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 53 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
NASAL LEVEL I - CONTINUED				
-INFLAMMATION, CHRONIC	0	2	4	5
MILD	NONE	2	4	4
MODERATE	NONE	NONE	NONE	1
NASAL LEVEL II				
TOTAL NUMBER EXAMINED	5	5	5	4
EXAMINED, UNREMARKABLE	5	3	3	1
NOT PRESENT FOR EXAMINATION	0	0	0	1
-DEGENERATION, OLFACTORY EPITHELIUM	0	1	2	3
MINIMAL	NONE	NONE	NONE	1
MILD	NONE	1	2	2
-HYPERPLASIA, GOBLET CELL	0	0	1	1
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	NONE	NONE	1
-INFLAMMATION, CHRONIC	0	1	0	0
MILD	NONE	1	NONE	NONE
NASAL LEVEL III				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	1	2
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	4	3
MINIMAL	NONE	NONE	2	1
MILD	NONE	NONE	1	NONE
MODERATE	NONE	NONE	1	2

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 53 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
NASAL LEVEL III - CONTINUED				
NASAL LEVEL IV				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	3	2
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	2	3
MINIMAL	NONE	NONE	1	NONE
MILD	NONE	NONE	1	1
MODERATE	NONE	NONE	NONE	2
NASAL LEVEL V				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	2	5
-DEGENERATION, OLFACTORY EPITHELIUM	0	0	3	0
MILD	NONE	NONE	2	NONE
MODERATE	NONE	NONE	1	NONE
NASAL LEVEL VI				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5
TRACHEA				
TOTAL NUMBER EXAMINED	5	5	5	5
EXAMINED, UNREMARKABLE	5	5	5	5

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM

TABLE 53 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF MICROSCOPIC FINDINGS

----- FEMALE -----

GROUP:	1	2	3	4
NUMBER OF ANIMALS IN DOSE GROUP	5	5	5	5
NUMBER OF ANIMALS EXAMINED DAY 13	5	5	5	5
UTERUS				
TOTAL NUMBER EXAMINED	NA	NA	NA	NA
EXAMINED, UNREMARKABLE	NA	NA	NA	NA
NOT PRESENT FOR EXAMINATION	1	NA	NA	1

1- 0 PPM 2- 10 PPM 3- 20 PPM 4- 50 PPM
NA = NOT APPLICABLE

APPENDIX A

Individual Animal Data

TABLE A1 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
89968	M	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89976	M	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90002	M	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90008	M	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90024	M	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89969	M	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89983	M	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89985	M	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89989	M	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90034	M	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89977	M	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89980	M	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89984	M	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90017	M	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90018	M	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89965	M	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89971	M	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
89979	M	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90005	M	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90013	M	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (12)

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
90052	F	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90058	F	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90061	F	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90093	F	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90098	F	0 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90046	F	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90056	F	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90062	F	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90073	F	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90100	F	50 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90067	F	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90071	F	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90089	F	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90097	F	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90095	F	200 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90047	F	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90072	F	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90079	F	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90084	F	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14
90087	F	400 PPM	SCHEDULED EUTHANASIA	14	21-DEC-07	14

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (12)

TABLE A2 (DISPOSITIONS - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 14 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89968	M	0 PPM	DISPOSITION	14	7:31	P	SCHEDULED EUTHANASIA
89976	M	0 PPM	DISPOSITION	14	7:30	P	SCHEDULED EUTHANASIA
90002	M	0 PPM	DISPOSITION	14	7:31	P	SCHEDULED EUTHANASIA
90008	M	0 PPM	DISPOSITION	14	7:31	P	SCHEDULED EUTHANASIA
90024	M	0 PPM	DISPOSITION	14	7:29	P	SCHEDULED EUTHANASIA
89969	M	50 PPM	DISPOSITION	14	7:31	P	SCHEDULED EUTHANASIA
89983	M	50 PPM	DISPOSITION	14	7:26	P	SCHEDULED EUTHANASIA
89985	M	50 PPM	DISPOSITION	14	7:31	P	SCHEDULED EUTHANASIA
89989	M	50 PPM	DISPOSITION	14	7:27	P	SCHEDULED EUTHANASIA
90034	M	50 PPM	DISPOSITION	14	7:30	P	SCHEDULED EUTHANASIA
89977	M	200 PPM	DISPOSITION	14	7:30	P	SCHEDULED EUTHANASIA
89980	M	200 PPM	DISPOSITION	14	7:31	P	SCHEDULED EUTHANASIA
89984	M	200 PPM	DISPOSITION	14	7:26	P	SCHEDULED EUTHANASIA
90017	M	200 PPM	DISPOSITION	14	7:29	P	SCHEDULED EUTHANASIA
90018	M	200 PPM	DISPOSITION	14	7:28	P	SCHEDULED EUTHANASIA
89965	M	400 PPM	DISPOSITION	14	7:30	P	SCHEDULED EUTHANASIA
89971	M	400 PPM	DISPOSITION	14	7:28	P	SCHEDULED EUTHANASIA
89979	M	400 PPM	DISPOSITION	14	7:30	P	SCHEDULED EUTHANASIA
90005	M	400 PPM	DISPOSITION	14	7:27	P	SCHEDULED EUTHANASIA
90013	M	400 PPM	DISPOSITION	14	7:29	P	SCHEDULED EUTHANASIA
90052	F	0 PPM	DISPOSITION	14	7:27	P	SCHEDULED EUTHANASIA
90058	F	0 PPM	DISPOSITION	14	7:26	P	SCHEDULED EUTHANASIA
90061	F	0 PPM	DISPOSITION	14	7:28	P	SCHEDULED EUTHANASIA
90093	F	0 PPM	DISPOSITION	14	7:31	P	SCHEDULED EUTHANASIA
90098	F	0 PPM	DISPOSITION	14	7:27	P	SCHEDULED EUTHANASIA
90046	F	50 PPM	DISPOSITION	14	7:27	P	SCHEDULED EUTHANASIA
90056	F	50 PPM	DISPOSITION	14	7:27	P	SCHEDULED EUTHANASIA
90062	F	50 PPM	DISPOSITION	14	7:27	P	SCHEDULED EUTHANASIA
90073	F	50 PPM	DISPOSITION	14	7:32	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

STUDY DAYS: 14 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90100	F	50 PPM	DISPOSITION	14	7:31	P	SCHEDULED EUTHANASIA
90067	F	200 PPM	DISPOSITION	14	7:29	P	SCHEDULED EUTHANASIA
90071	F	200 PPM	DISPOSITION	14	7:29	P	SCHEDULED EUTHANASIA
90089	F	200 PPM	DISPOSITION	14	7:28	P	SCHEDULED EUTHANASIA
90097	F	200 PPM	DISPOSITION	14	7:29	P	SCHEDULED EUTHANASIA
90095	F	200 PPM	DISPOSITION	14	7:30	P	SCHEDULED EUTHANASIA
90047	F	400 PPM	DISPOSITION	14	7:30	P	SCHEDULED EUTHANASIA
90072	F	400 PPM	DISPOSITION	14	7:26	P	SCHEDULED EUTHANASIA
90079	F	400 PPM	DISPOSITION	14	7:27	P	SCHEDULED EUTHANASIA
90084	F	400 PPM	DISPOSITION	14	7:28	P	SCHEDULED EUTHANASIA
90087	F	400 PPM	DISPOSITION	14	7:28	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A3 (30 MINUTES INTO EXPOSURE - 1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90047	F	400 PPM	CARDIO-PULMONARY	0	14:16	P	GASPING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.11
02/27/2008
R:03/03/2008

TABLE A4 (DURING EXPOSURE - 1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL NOVEL STIMULUS/AROUSAL RESPONSE OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89968	M	0 PPM	BEHAVIOR/CNS	0	14:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89976	M	0 PPM	BEHAVIOR/CNS	0	14:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90002	M	0 PPM	BEHAVIOR/CNS	0	14:39	P	NO REACTION TO STIMULUS
90008	M	0 PPM	BEHAVIOR/CNS	0	14:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90024	M	0 PPM	BEHAVIOR/CNS	0	14:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89969	M	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89983	M	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89985	M	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89989	M	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90034	M	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89977	M	200 PPM	BEHAVIOR/CNS	0	14:41	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89980	M	200 PPM	BEHAVIOR/CNS	0	14:41	P	NO REACTION TO STIMULUS
89984	M	200 PPM	BEHAVIOR/CNS	0	14:41	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90017	M	200 PPM	BEHAVIOR/CNS	0	14:41	P	NO REACTION TO STIMULUS
90018	M	200 PPM	BEHAVIOR/CNS	0	14:41	P	NO REACTION TO STIMULUS
89965	M	400 PPM	BEHAVIOR/CNS	0	14:43	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89971	M	400 PPM	BEHAVIOR/CNS	0	14:43	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89979	M	400 PPM	BEHAVIOR/CNS	0	14:43	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90005	M	400 PPM	BEHAVIOR/CNS	0	14:43	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90013	M	400 PPM	BEHAVIOR/CNS	0	14:43	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90052	F	0 PPM	BEHAVIOR/CNS	0	14:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90058	F	0 PPM	BEHAVIOR/CNS	0	14:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90061	F	0 PPM	BEHAVIOR/CNS	0	14:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90093	F	0 PPM	BEHAVIOR/CNS	0	14:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90098	F	0 PPM	BEHAVIOR/CNS	0	14:39	P	NO REACTION TO STIMULUS
90046	F	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90056	F	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90062	F	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90073	F	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A4 (DURING EXPOSURE - 1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL NOVEL STIMULUS/AROUSAL RESPONSE OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90100	F	50 PPM	BEHAVIOR/CNS	0	14:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90067	F	200 PPM	BEHAVIOR/CNS	0	14:41	P	NO REACTION TO STIMULUS
90071	F	200 PPM	BEHAVIOR/CNS	0	14:41	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90089	F	200 PPM	BEHAVIOR/CNS	0	14:41	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90097	F	200 PPM	BEHAVIOR/CNS	0	14:41	P	NO REACTION TO STIMULUS
90095	F	200 PPM	BEHAVIOR/CNS	0	14:41	P	NO REACTION TO STIMULUS
90047	F	400 PPM	BEHAVIOR/CNS	0	14:43	P	NO REACTION TO STIMULUS
90072	F	400 PPM	BEHAVIOR/CNS	0	14:43	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90079	F	400 PPM	BEHAVIOR/CNS	0	14:43	P	NO REACTION TO STIMULUS
90084	F	400 PPM	BEHAVIOR/CNS	0	14:43	P	NO REACTION TO STIMULUS
90087	F	400 PPM	BEHAVIOR/CNS	0	14:43	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A5 (END OF EXPOSURE - 1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
NO SIGNIFICANT CLINICAL OBSERVATIONS AT END OF EXPOSURE							

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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02/27/2008
R:03/25/2008

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A6 (1 HOUR POST-EXPOSURE - 1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89968	M	0 PPM	NORMAL	0	15:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89976	M	0 PPM	NORMAL	0	15:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90002	M	0 PPM	NORMAL	0	15:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90008	M	0 PPM	NORMAL	0	15:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90024	M	0 PPM	NORMAL	0	15:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89969	M	50 PPM	NORMAL	0	15:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89983	M	50 PPM	NORMAL	0	15:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89985	M	50 PPM	BODY/INTEGUMENT	0	15:36	P	REDDENED FORELIMBS
				0	15:36	P	REDDENED HINDLIMBS
89989	M	50 PPM	NORMAL	0	15:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90034	M	50 PPM	NORMAL	0	15:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89977	M	200 PPM	BODY/INTEGUMENT	0	15:32	P	REDDENED FORELIMBS
				0	15:32	P	REDDENED HINDLIMBS
89977	M	200 PPM	ORAL/DENTAL	0	15:32	1	WET RED MATERIAL AROUND MOUTH
89980	M	200 PPM	BODY/INTEGUMENT	0	15:39	P	REDDENED FORELIMBS
				0	15:39	P	REDDENED HINDLIMBS
89984	M	200 PPM	BODY/INTEGUMENT	0	15:11	P	REDDENED FORELIMBS
				0	15:11	P	REDDENED HINDLIMBS
90017	M	200 PPM	BODY/INTEGUMENT	0	15:25	P	REDDENED FORELIMBS
				0	15:25	P	REDDENED HINDLIMBS
90018	M	200 PPM	BODY/INTEGUMENT	0	15:18	P	REDDENED FORELIMBS
				0	15:18	P	REDDENED HINDLIMBS
89965	M	400 PPM	BODY/INTEGUMENT	0	15:34	P	REDDENED FORELIMBS
				0	15:34	P	REDDENED HINDLIMBS
89965	M	400 PPM	EYES/EARS/NOSE	0	15:34	P	REDDENED EARS
89971	M	400 PPM	BODY/INTEGUMENT	0	15:19	P	REDDENED FORELIMBS
				0	15:19	P	REDDENED HINDLIMBS
89971	M	400 PPM	EYES/EARS/NOSE	0	15:19	P	REDDENED EARS
89979	M	400 PPM	BODY/INTEGUMENT	0	15:35	P	REDDENED FORELIMBS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89979	M	400 PPM	BODY/INTEGUMENT	0	15:35	P	REDDENED HINDLIMBS
89979	M	400 PPM	ORAL/DENTAL	0	15:35	1	DRIED RED MATERIAL AROUND MOUTH
90005	M	400 PPM	BODY/INTEGUMENT	0	15:13	P	REDDENED FORELIMBS
				0	15:13	P	REDDENED HINDLIMBS
90005	M	400 PPM	EYES/EARS/NOSE	0	15:14	P	REDDENED EARS
90005	M	400 PPM	ORAL/DENTAL	0	15:13	1	WET RED MATERIAL AROUND MOUTH
90013	M	400 PPM	BODY/INTEGUMENT	0	15:27	P	REDDENED FORELIMBS
				0	15:27	P	REDDENED HINDLIMBS
90013	M	400 PPM	EYES/EARS/NOSE	0	15:27	P	REDDENED EARS
90052	F	0 PPM	NORMAL	0	15:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90058	F	0 PPM	NORMAL	0	15:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90061	F	0 PPM	NORMAL	0	15:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90093	F	0 PPM	NORMAL	0	15:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90098	F	0 PPM	NORMAL	0	15:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90046	F	50 PPM	NORMAL	0	15:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90056	F	50 PPM	NORMAL	0	15:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90062	F	50 PPM	NORMAL	0	15:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90073	F	50 PPM	NORMAL	0	15:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90100	F	50 PPM	NORMAL	0	15:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90067	F	200 PPM	BODY/INTEGUMENT	0	15:28	1	WET CLEAR MATERIAL UROGENITAL AREA
90071	F	200 PPM	BODY/INTEGUMENT	0	15:29	P	REDDENED FORELIMBS
				0	15:29	P	REDDENED HINDLIMBS
90071	F	200 PPM	EYES/EARS/NOSE	0	15:29	1	WET CLEAR MATERIAL AROUND MOUTH
90089	F	200 PPM	NORMAL	0	15:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90097	F	200 PPM	BODY/INTEGUMENT	0	15:26	P	REDDENED FORELIMBS
				0	15:26	P	REDDENED HINDLIMBS
90097	F	200 PPM	ORAL/DENTAL	0	15:26	2	WET RED MATERIAL AROUND MOUTH
90095	F	200 PPM	BODY/INTEGUMENT	0	15:31	P	REDDENED FORELIMBS
90047	F	400 PPM	NORMAL	0	15:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90072	F	400 PPM	BODY/INTEGUMENT	0	15:08	P	REDDENED FORELIMBS
				0	15:08	P	REDDENED HINDLIMBS
				0	15:10	2	WET CLEAR MATERIAL UROGENITAL AREA
				0	15:10	2	WET CLEAR MATERIAL VENTRAL ABDOMINAL AREA
90072	F	400 PPM	EYES/EARS/NOSE	0	15:10	2	WET CLEAR MATERIAL AROUND MOUTH
90079	F	400 PPM	BODY/INTEGUMENT	0	15:16	P	REDDENED FORELIMBS
				0	15:16	P	REDDENED HINDLIMBS
90079	F	400 PPM	ORAL/DENTAL	0	15:16	1	WET RED MATERIAL AROUND MOUTH
90084	F	400 PPM	BODY/INTEGUMENT	0	15:22	P	REDDENED FORELIMBS
				0	15:22	P	REDDENED HINDLIMBS
				0	15:23	2	WET CLEAR MATERIAL UROGENITAL AREA
				0	15:23	2	WET CLEAR MATERIAL VENTRAL ABDOMINAL AREA
90084	F	400 PPM	ORAL/DENTAL	0	15:23	2	WET RED MATERIAL AROUND MOUTH
90087	F	400 PPM	BODY/INTEGUMENT	0	15:22	P	REDDENED FORELIMBS
				0	15:22	P	REDDENED HINDLIMBS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89968	M	0 PPM	NORMAL	1	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89976	M	0 PPM	NORMAL	1	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90002	M	0 PPM	NORMAL	1	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90002	M	0 PPM	NORMAL	4	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90008	M	0 PPM	NORMAL	1	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90024	M	0 PPM	NORMAL	1	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90024	M	0 PPM	NORMAL	7	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89969	M	50 PPM	NORMAL	1	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89983	M	50 PPM	NORMAL	1	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89983	M	50 PPM	NORMAL	10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89985	M	50 PPM	NORMAL	9	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89985	M	50 PPM	BODY/INTEGUMENT	1	9:23	1	HAIR LOSS LEFT FORELIMB
				1	9:23	1	HAIR LOSS RIGHT FORELIMB
				2	9:06	1	HAIR LOSS LEFT FORELIMB
				2	9:06	1	HAIR LOSS RIGHT FORELIMB
				3	9:09	1	HAIR LOSS LEFT FORELIMB
				3	9:09	1	HAIR LOSS RIGHT FORELIMB
				4	9:50	1	HAIR LOSS LEFT FORELIMB
				4	9:50	1	HAIR LOSS RIGHT FORELIMB
				5	9:48	1	HAIR LOSS LEFT FORELIMB
				5	9:48	1	HAIR LOSS RIGHT FORELIMB
				6	10:06	1	HAIR LOSS LEFT FORELIMB
				6	10:06	1	HAIR LOSS RIGHT FORELIMB
				7	9:57	1	HAIR LOSS LEFT FORELIMB
				7	9:57	1	HAIR LOSS RIGHT FORELIMB
				8	9:53	1	HAIR LOSS RIGHT FORELIMB
89989	M	50 PPM	NORMAL	1	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89989	M	50 PPM	NORMAL	6	9:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90034	M	50 PPM	NORMAL	1	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89977	M	200 PPM	NORMAL	1	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89977	M	200 PPM	NORMAL	10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89977	M	200 PPM	EYES/EARS/NOSE	8	9:51	1	DRIED RED MATERIAL AROUND NOSE
89980	M	200 PPM	NORMAL	1	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89984	M	200 PPM	NORMAL	1	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89984	M	200 PPM	NORMAL	12	10:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90017	M	200 PPM	NORMAL	1	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90017	M	200 PPM	EYES/EARS/NOSE	8	9:48	1	DRIED RED MATERIAL AROUND NOSE
90018	M	200 PPM	NORMAL	10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90018	M	200 PPM	BODY/INTEGUMENT	1	9:13	1	HAIR LOSS LEFT FORELIMB
				1	9:14	1	HAIR LOSS RIGHT FORELIMB
				2	8:58	2	HAIR LOSS RIGHT FORELIMB
				2	8:58	1	HAIR LOSS LEFT FORELIMB
				3	9:02	2	HAIR LOSS LEFT FORELIMB
				3	9:02	2	HAIR LOSS RIGHT FORELIMB
				4	9:42	3	HAIR LOSS LEFT FORELIMB
				4	9:42	3	HAIR LOSS RIGHT FORELIMB
				5	9:42	3	HAIR LOSS RIGHT FORELIMB
				5	9:42	2	HAIR LOSS LEFT FORELIMB
				6	9:58	2	HAIR LOSS RIGHT FORELIMB
				6	9:58	1	HAIR LOSS LEFT FORELIMB
				7	9:49	1	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90018	M	200 PPM	BODY/INTEGUMENT	7	9:49	2	HAIR LOSS RIGHT FORELIMB
				8	9:46	2	HAIR LOSS LEFT FORELIMB
				8	9:46	2	HAIR LOSS RIGHT FORELIMB
				9	9:36	1	HAIR LOSS RIGHT FORELIMB
				9	9:36	1	HAIR LOSS LEFT FORELIMB
				11	11:00	2	HAIR LOSS LEFT FORELIMB
				11	11:00	2	HAIR LOSS RIGHT FORELIMB
				12	10:03	2	HAIR LOSS LEFT FORELIMB
				12	10:03	2	HAIR LOSS RIGHT FORELIMB
				13	9:21	2	HAIR LOSS LEFT FORELIMB
				13	9:21	2	HAIR LOSS RIGHT FORELIMB
89965	M	400 PPM	NORMAL	1	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89971	M	400 PPM	NORMAL	1	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89971	M	400 PPM	NORMAL	6	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89979	M	400 PPM	NORMAL	1	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90005	M	400 PPM	NORMAL	1	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90005	M	400 PPM	NORMAL	9	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90013	M	400 PPM	NORMAL	1	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90052	F	0 PPM	NORMAL	1	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90052	F	0 PPM	NORMAL	12	10:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90058	F	0 PPM	NORMAL	1	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90061	F	0 PPM	NORMAL	1	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90061	F	0 PPM	EYES/EARS/NOSE	12	10:03	1	DRIED RED MATERIAL AROUND NOSE
90093	F	0 PPM	NORMAL	1	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 12

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90093	F	0 PPM	NORMAL	2	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90098	F	0 PPM	NORMAL	1	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90046	F	50 PPM	NORMAL	1	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 13

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90046	F	50 PPM	NORMAL	5	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90056	F	50 PPM	NORMAL	1	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90056	F	50 PPM	BODY/INTEGUMENT	7	9:46	1	HAIR LOSS LEFT FORELIMB
				8	9:44	1	HAIR LOSS LEFT FORELIMB
				11	10:58	1	HAIR LOSS LEFT FORELIMB
				12	10:01	1	HAIR LOSS LEFT FORELIMB
90062	F	50 PPM	NORMAL	1	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90062	F	50 PPM	BODY/INTEGUMENT	5	9:41	1	HAIR LOSS LEFT FORELIMB
				5	9:41	1	HAIR LOSS RIGHT FORELIMB
				6	9:56	1	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90062	F	50 PPM	BODY/INTEGUMENT	6	9:56	1	HAIR LOSS RIGHT FORELIMB
				7	9:48	1	HAIR LOSS RIGHT FORELIMB
				8	9:45	1	HAIR LOSS LEFT FORELIMB
				8	9:45	1	HAIR LOSS RIGHT FORELIMB
				9	9:35	1	HAIR LOSS LEFT FORELIMB
				9	9:35	1	HAIR LOSS RIGHT FORELIMB
				10	11:25	1	HAIR LOSS LEFT FORELIMB
				10	11:25	1	HAIR LOSS RIGHT FORELIMB
				11	10:58	1	HAIR LOSS LEFT FORELIMB
				11	10:58	1	HAIR LOSS RIGHT FORELIMB
				12	10:02	2	HAIR LOSS LEFT FORELIMB
				12	10:02	2	HAIR LOSS RIGHT FORELIMB
				13	9:20	1	HAIR LOSS LEFT FORELIMB
				13	9:20	1	HAIR LOSS RIGHT FORELIMB
90062	F	50 PPM	EYES/EARS/NOSE	8	9:45	1	DRIED RED MATERIAL AROUND NOSE
90073	F	50 PPM	NORMAL	1	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90100	F	50 PPM	NORMAL	1	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90100	F	50 PPM	NORMAL	2	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90067	F	200 PPM	NORMAL	4	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90067	F	200 PPM	BODY/INTEGUMENT	1	9:18	1	HAIR LOSS LEFT FORELIMB
				1	9:18	1	HAIR LOSS RIGHT FORELIMB
				2	9:01	2	HAIR LOSS LEFT FORELIMB
				2	9:01	2	HAIR LOSS RIGHT FORELIMB
				3	9:05	2	HAIR LOSS LEFT FORELIMB
				3	9:05	2	HAIR LOSS RIGHT FORELIMB
				5	9:44	2	HAIR LOSS LEFT FORELIMB
				5	9:44	2	HAIR LOSS RIGHT FORELIMB
				6	10:02	2	HAIR LOSS LEFT FORELIMB
				6	10:02	2	HAIR LOSS RIGHT FORELIMB
				7	9:53	2	HAIR LOSS LEFT FORELIMB
				7	9:53	2	HAIR LOSS RIGHT FORELIMB
				8	9:49	2	HAIR LOSS LEFT FORELIMB
				8	9:49	2	HAIR LOSS RIGHT FORELIMB
				9	9:39	2	HAIR LOSS LEFT FORELIMB
				9	9:39	2	HAIR LOSS RIGHT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 16

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90067	F	200 PPM	BODY/INTEGUMENT	10	11:27	2	HAIR LOSS LEFT FORELIMB
				10	11:27	2	HAIR LOSS RIGHT FORELIMB
				11	11:02	1	HAIR LOSS LEFT FORELIMB
				11	11:02	1	HAIR LOSS RIGHT FORELIMB
				12	10:05	1	HAIR LOSS LEFT FORELIMB
				12	10:05	1	HAIR LOSS RIGHT FORELIMB
				13	9:26	1	HAIR LOSS LEFT FORELIMB
				13	9:26	1	HAIR LOSS RIGHT FORELIMB
90071	F	200 PPM	NORMAL	1	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90089	F	200 PPM	NORMAL	1	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90089	F	200 PPM	NORMAL	10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90089	F	200 PPM	EYES/EARS/NOSE	9	9:37	1	DRIED RED MATERIAL AROUND NOSE
90097	F	200 PPM	NORMAL	1	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90095	F	200 PPM	NORMAL	1	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90095	F	200 PPM	NORMAL	12	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90047	F	400 PPM	NORMAL	1	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90047	F	400 PPM	BODY/INTEGUMENT	7	9:54	1	HAIR LOSS LEFT FORELIMB
				7	9:54	1	HAIR LOSS RIGHT FORELIMB
				12	10:07	1	HAIR LOSS LEFT FORELIMB
				12	10:07	1	HAIR LOSS RIGHT FORELIMB
90072	F	400 PPM	NORMAL	1	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	8:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90072	F	400 PPM	NORMAL	13	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90079	F	400 PPM	NORMAL	1	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	8:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90084	F	400 PPM	NORMAL	1	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	10:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90087	F	400 PPM	NORMAL	1	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A7 (DAILY OBSERVATIONS - RECOVERY PERIOD - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 20

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90087	F	400 PPM	NORMAL	3	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	11:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	11:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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TABLE A8 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 1

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89968	M	0 PPM	NORMAL	1	14:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89976	M	0 PPM	NORMAL	1	14:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90002	M	0 PPM	NORMAL	1	15:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90008	M	0 PPM	NORMAL	1	14:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90024	M	0 PPM	NORMAL	1	14:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89969	M	50 PPM	NORMAL	1	14:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89983	M	50 PPM	NORMAL	1	14:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89985	M	50 PPM	NORMAL	1	14:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89989	M	50 PPM	NORMAL	1	14:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90034	M	50 PPM	NORMAL	1	14:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89977	M	200 PPM	NORMAL	1	14:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89980	M	200 PPM	NORMAL	1	15:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89984	M	200 PPM	NORMAL	1	14:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90017	M	200 PPM	NORMAL	1	14:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90018	M	200 PPM	NORMAL	1	14:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89965	M	400 PPM	NORMAL	1	14:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89971	M	400 PPM	NORMAL	1	14:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89979	M	400 PPM	NORMAL	1	14:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90005	M	400 PPM	NORMAL	1	14:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90013	M	400 PPM	NORMAL	1	14:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90052	F	0 PPM	NORMAL	1	14:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90058	F	0 PPM	NORMAL	1	14:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90061	F	0 PPM	NORMAL	1	14:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90093	F	0 PPM	NORMAL	1	15:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90098	F	0 PPM	NORMAL	1	14:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90046	F	50 PPM	NORMAL	1	14:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90056	F	50 PPM	NORMAL	1	14:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90062	F	50 PPM	NORMAL	1	14:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90073	F	50 PPM	NORMAL	1	15:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A8 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 1

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90100	F	50 PPM	NORMAL	1	14:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90067	F	200 PPM	NORMAL	1	14:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90071	F	200 PPM	NORMAL	1	14:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90089	F	200 PPM	NORMAL	1	14:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90097	F	200 PPM	NORMAL	1	14:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90095	F	200 PPM	NORMAL	1	14:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90047	F	400 PPM	NORMAL	1	14:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90072	F	400 PPM	NORMAL	1	14:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90079	F	400 PPM	NORMAL	1	14:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90084	F	400 PPM	NORMAL	1	14:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90087	F	400 PPM	NORMAL	1	14:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.11
02/27/2008
R:03/03/2008

TABLE A9 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 1: 0 PPM				
89968	377.	380.	400.	419.
89976	443.	450.	474.	514.
90002	389.	387.	411.	444.
90008	409.	414.	436.	461.
90024	336.	335.	347.	366.
MEAN	391.	393.	414.	441.
S.D.	39.3	42.5	46.9	54.4
S.E.	17.6	19.0	21.0	24.3
N	5	5	5	5

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A9 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 2: 50 PPM				
89969	357.	358.	374.	395.
89983	416.	411.	437.	454.
89985	375.	377.	400.	426.
89989	410.	412.	424.	450.
90034	387.	390.	414.	436.
MEAN	389.	390.	410.	432.
S.D.	24.4	22.9	24.0	23.9
S.E.	10.9	10.2	10.7	10.7
N	5	5	5	5

TABLE A9 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 3:	200 PPM			
89977	412.	406.	429.	453.
89980	415.	416.	443.	477.
89984	398.	398.	418.	439.
90017	363.	364.	377.	401.
90018	367.	367.	382.	397.
MEAN	391.	390.	410.	434.
S.D.	24.6	23.4	29.1	34.3
S.E.	11.0	10.5	13.0	15.3
N	5	5	5	5

TABLE A9 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 4:	400 PPM			
89965	375.	376.	395.	422.
89971	421.	417.	446.	478.
89979	375.	369.	390.	405.
90005	394.	392.	415.	446.
90013	405.	396.	424.	447.
MEAN	394.	390.	414.	439.
S.D.	19.9	18.5	22.9	27.7
S.E.	8.9	8.3	10.3	12.4
N	5	5	5	5

TABLE A9 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 1: 0 PPM				
90052	251.	250.	258.	282.
90058	235.	231.	247.	275.
90061	244.	239.	251.	265.
90093	224.	220.	223.	242.
90098	224.	227.	230.	241.
MEAN	236.	233.	242.	261.
S.D.	12.0	11.5	14.6	19.0
S.E.	5.4	5.1	6.5	8.5
N	5	5	5	5

TABLE A9 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 2: 50 PPM				
90046	227.	231.	230.	255.
90056	248.	252.	262.	277.
90062	237.	236.	252.	265.
90073	239.	233.	250.	261.
90100	243.	247.	250.	260.
MEAN	239.	240.	249.	264.
S.D.	7.8	9.1	11.6	8.2
S.E.	3.5	4.1	5.2	3.7
N	5	5	5	5

TABLE A9 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 3:	200 PPM			
90067	221.	221.	224.	238.
90071	229.	228.	238.	252.
90089	251.	256.	254.	280.
90097	245.	247.	259.	284.
90095	243.	240.	251.	261.
MEAN	238.	238.	245.	263.
S.D.	12.3	14.0	13.9	19.2
S.E.	5.5	6.3	6.2	8.6
N	5	5	5	5

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 4:	400 PPM			
90047	249.	247.	258.	280.
90072	229.	224.	232.	248.
90079	234.	236.	247.	263.
90084	239.	234.	242.	262.
90087	229.	227.	238.	246.
MEAN	236.	233.	244.	260.
S.D.	8.4	8.9	10.1	13.7
S.E.	3.8	4.0	4.5	6.1
N	5	5	5	5

PJTBWv4.22
03/18/2008

TABLE A10 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 1:	0 PPM		
89968	3.	20.	19.
89976	7.	24.	40.
90002	-2.	24.	33.
90008	6.	22.	25.
90024	-1.	12.	19.
MEAN	3.	20.	27.
S.D.	3.9	5.1	9.1
S.E.	1.7	2.3	4.0
N	5	5	5

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A10 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 2:		50 PPM	
89969	1.	16.	20.
89983	-5.	26.	18.
89985	2.	23.	26.
89989	2.	12.	26.
90034	3.	25.	22.
MEAN	1.	20.	22.
S.D.	3.0	5.8	3.7
S.E.	1.3	2.6	1.7
N	5	5	5

TABLE A10 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 3:	200 PPM		
89977	-6.	23.	25.
89980	1.	28.	34.
89984	0.	20.	21.
90017	1.	13.	24.
90018	0.	15.	15.
MEAN	-1.	20.	24.
S.D.	2.9	5.8	6.8
S.E.	1.3	2.6	3.0
N	5	5	5

TABLE A10 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 4:	400 PPM		
89965	2.	18.	27.
89971	-4.	30.	31.
89979	-5.	21.	15.
90005	-2.	24.	31.
90013	-8.	28.	22.
MEAN	-4.	24.	25.
S.D.	3.7	4.8	7.0
S.E.	1.7	2.1	3.1
N	5	5	5

TABLE A10 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 1:	0 PPM		
90052	-1.	8.	24.
90058	-5.	16.	28.
90061	-5.	13.	14.
90093	-4.	3.	18.
90098	4.	3.	11.
MEAN	-2.	8.	19.
S.D.	3.6	5.8	7.2
S.E.	1.6	2.6	3.2
N	5	5	5

TABLE A10 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 2:	50 PPM		
90046	4.	-1.	25.
90056	4.	10.	15.
90062	-1.	16.	13.
90073	-5.	17.	11.
90100	4.	3.	11.
MEAN	1.	9.	15.
S.D.	4.2	7.9	6.0
S.E.	1.9	3.5	2.7
N	5	5	5

TABLE A10 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 3:	200 PPM		
90067	0.	4.	13.
90071	-1.	10.	14.
90089	5.	-2.	26.
90097	2.	12.	25.
90095	-3.	11.	10.
MEAN	1.	7.	18.
S.D.	3.1	5.8	7.2
S.E.	1.4	2.6	3.2
N	5	5	5

TABLE A10 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 4:	400 PPM		
90047	-3.	12.	21.
90072	-5.	8.	17.
90079	3.	11.	15.
90084	-5.	9.	20.
90087	-3.	11.	8.
MEAN	-3.	10.	16.
S.D.	3.1	1.8	5.2
S.E.	1.4	0.8	2.3
N	5	5	5

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A11 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 1: 0 PPM			
89968	3.	22.	42.
89976	7.	31.	71.
90002	-2.	22.	55.
90008	6.	28.	53.
90024	-1.	11.	30.
MEAN	3.	23.	50.
S.D.	3.9	7.7	15.4
S.E.	1.7	3.5	6.9
N	5	5	5

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A11 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 2:	50 PPM		
89969	1.	18.	38.
89983	-5.	21.	39.
89985	2.	25.	51.
89989	2.	14.	40.
90034	3.	28.	49.
MEAN	1.	21.	43.
S.D.	3.0	5.4	6.3
S.E.	1.3	2.4	2.8
N	5	5	5

TABLE A11 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 3:	200 PPM		
89977	-6.	17.	41.
89980	1.	29.	63.
89984	0.	20.	41.
90017	1.	14.	38.
90018	0.	15.	31.
MEAN	-1.	19.	43.
S.D.	2.9	5.9	11.9
S.E.	1.3	2.6	5.3
N	5	5	5

TABLE A11 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 4: 400 PPM			
89965	2.	20.	47.
89971	-4.	25.	57.
89979	-5.	16.	30.
90005	-2.	22.	52.
90013	-8.	20.	42.
MEAN	-4.	20.	46.
S.D.	3.7	3.6	10.3
S.E.	1.7	1.6	4.6
N	5	5	5

TABLE A11 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 1:	0 PPM		
90052	-1.	7.	32.
90058	-5.	11.	39.
90061	-5.	7.	21.
90093	-4.	0.	18.
90098	4.	6.	17.
MEAN	-2.	6.	25.
S.D.	3.6	4.2	9.7
S.E.	1.6	1.9	4.4
N	5	5	5

TABLE A11 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 2:	50 PPM		
90046	4.	3.	28.
90056	4.	14.	29.
90062	-1.	15.	28.
90073	-5.	12.	23.
90100	4.	7.	18.
MEAN	1.	10.	25.
S.D.	4.2	5.0	4.7
S.E.	1.9	2.3	2.1
N	5	5	5

TABLE A11 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 3:	200 PPM		
90067	0.	3.	16.
90071	-1.	9.	23.
90089	5.	3.	29.
90097	2.	14.	39.
90095	-3.	8.	18.
MEAN	1.	7.	25.
S.D.	3.1	4.4	9.1
S.E.	1.4	2.0	4.1
N	5	5	5

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 4:	400 PPM		
90047	-3.	9.	30.
90072	-5.	3.	19.
90079	3.	14.	29.
90084	-5.	4.	23.
90087	-3.	8.	16.
MEAN	-3.	8.	24.
S.D.	3.1	4.5	6.2
S.E.	1.4	2.0	2.8
N	5	5	5

PJTBWv4.22
03/18/2008
R:03/18/2008

TABLE A12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 0 PPM		MALES								
89968	8.74	8.72	15.9	43.9	50.4	18.2	36.2	1226.	14.5	19.4
89976	10.52	8.50	16.5	45.6	53.7	19.4	36.1	1036.	14.0	18.4
90002	8.96	7.66	15.2	41.3	54.0	19.9	36.8	1050.	12.2	15.8
90008	12.34	8.98	17.1	46.9	52.2	19.0	36.4	1107.	13.1	15.5
90024	9.41	8.90	16.8	45.2	50.7	18.9	37.3	1264.	QNS	QNS
MEAN	9.99	8.55	16.3	44.6	52.2	19.1	36.6	1137.	13.5	17.3
S.D.	1.480	0.532	0.76	2.12	1.66	0.63	0.49	103.3	1.01	1.92
S.E.	0.662	0.238	0.34	0.95	0.74	0.28	0.22	46.2	0.51	0.96
N	5	5	5	5	5	5	5	5	4	4

QNS = QUANTITY NOT SUFFICIENT

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 0 PPM MALES								
89968	2.1	184.4	15.2	81.1	1.9	1.1	0.3	0.4
89976	2.1	181.0	11.4	85.1	1.7	1.1	0.3	0.4
90002	2.1	159.6	23.1	71.5	3.1	1.4	0.5	0.5
90008	2.0	183.4	17.9	77.5	2.0	0.9	0.6	1.1
90024	1.7	154.7	13.2	84.7	1.0	0.5	0.3	0.4
MEAN	2.0	172.6	16.2	80.0	1.9	1.0	0.4	0.6
S.D.	0.17	14.28	4.57	5.65	0.76	0.33	0.14	0.30
S.E.	0.08	6.39	2.04	2.53	0.34	0.15	0.06	0.14
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 3

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 0 PPM	MALES							
89968	1.33	7.08	0.17	0.10	0.02	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89976	1.20	8.95	0.18	0.11	0.03	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90002	2.07	6.40	0.27	0.13	0.05	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90008	2.21	9.56	0.25	0.11	0.07	0.14	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90024	1.24	7.97	0.10	0.04	0.03	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.61	7.99	0.19	0.10	0.04	0.06		
S.D.	0.489	1.298	0.068	0.034	0.020	0.045		
S.E.	0.219	0.581	0.030	0.015	0.009	0.020		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 50 PPM MALES										
89969	5.83	7.84	14.9	39.8	50.8	19.1	37.5	1086.	13.6	14.4
89983	11.11	7.64	15.6	40.8	53.4	20.4	38.3	1139.	12.0	16.0
89985	5.93	7.48	14.9	40.7	54.3	19.9	36.7	940.	12.7	16.3
89989	16.16	9.07	16.7	47.0	51.8	18.4	35.6	1162.	16.7	23.0
90034	12.00	8.97	16.9	46.9	52.3	18.9	36.1	1157.	14.1	20.3
MEAN	10.21	8.20	15.8	43.0	52.5	19.3	36.8	1097.	13.8	18.0
S.D.	4.385	0.760	0.96	3.59	1.37	0.80	1.08	92.7	1.80	3.54
S.E.	1.961	0.340	0.43	1.61	0.61	0.36	0.48	41.4	0.81	1.58
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 5

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 50 PPM MALES								
89969	2.5	193.7	22.9	73.3	2.0	1.2	0.2	0.4
89983	2.0	156.5	30.5	63.9	3.1	1.5	0.4	0.6
89985	2.3	173.3	20.8	74.9	2.3	0.5	0.3	1.2
89989	2.5	225.3	15.1	81.7	0.9	1.1	0.5	0.7
90034	2.4	216.1	10.0	87.1	0.8	1.1	0.3	0.7
MEAN	2.3	193.0	19.9	76.2	1.8	1.1	0.3	0.7
S.D.	0.21	28.71	7.80	8.81	0.97	0.36	0.11	0.29
S.E.	0.09	12.84	3.49	3.94	0.44	0.16	0.05	0.13
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 50 PPM MALES								
89969	1.34	4.28	0.11	0.07	0.01	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89983	3.39	7.10	0.34	0.17	0.04	0.07	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89985	1.24	4.44	0.14	0.03	0.02	0.07	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89989	2.44	13.20	0.15	0.17	0.08	0.11	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90034	1.20	10.46	0.10	0.13	0.04	0.08	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.92	7.90	0.17	0.11	0.04	0.07		
S.D.	0.968	3.885	0.098	0.062	0.027	0.032		
S.E.	0.433	1.737	0.044	0.028	0.012	0.014		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 200 PPM MALES										
89977	10.50	8.18	16.1	43.5	53.1	19.7	37.0	1297.	13.8	18.7
89980	11.14	7.91	15.6	41.7	52.7	19.7	37.3	1199.	12.4	18.2
89984	12.68	8.48	15.8	42.6	50.2	18.7	37.2	1062.	14.6	21.6
90017	12.00	8.77	17.4	46.1	52.5	19.8	37.7	1158.	14.2	19.9
90018	10.68	8.91	16.7	46.2	51.9	18.8	36.2	1192.	13.8	19.8
MEAN	11.40	8.45	16.3	44.0	52.1	19.3	37.1	1182.	13.8	19.6
S.D.	0.921	0.412	0.73	2.05	1.14	0.54	0.55	84.5	0.83	1.31
S.E.	0.412	0.184	0.33	0.92	0.51	0.24	0.25	37.8	0.37	0.59
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 200 PPM MALES								
89977	2.2	179.6	11.0	86.2	1.3	0.8	0.2	0.5
89980	2.1	164.0	19.7	74.9	2.2	2.0	0.5	0.8
89984	1.9	158.7	17.2	78.9	2.3	0.7	0.4	0.4
90017	1.9	165.9	10.7	86.0	1.2	1.2	0.3	0.5
90018	2.1	183.2	30.6	65.6	1.1	1.8	0.6	0.4
MEAN	2.0	170.3	17.8	78.3	1.6	1.3	0.4	0.5
S.D.	0.13	10.57	8.13	8.59	0.58	0.58	0.16	0.16
S.E.	0.06	4.72	3.64	3.84	0.26	0.26	0.07	0.07
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 9

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 200 PPM MALES								
89977	1.15	9.05	0.14	0.09	0.02	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89980	2.19	8.34	0.24	0.22	0.05	0.08	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89984	2.18	10.01	0.29	0.09	0.06	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90017	1.29	10.32	0.15	0.15	0.04	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90018	3.27	7.00	0.12	0.19	0.06	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	2.02	8.94	0.19	0.15	0.05	0.06		
S.D.	0.852	1.340	0.073	0.058	0.017	0.015		
S.E.	0.381	0.599	0.033	0.026	0.007	0.007		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 400 PPM MALES										
89965	14.20	8.97	17.2	48.0	53.5	19.1	35.8	1292.	13.2	13.9
89971	16.02	8.47	16.6	45.1	53.2	19.5	36.7	1063.	12.9	18.0
89979	10.17	8.63	16.7	45.5	52.7	19.4	36.8	953.	15.1	19.5
90005	9.31	8.86	17.1	46.4	52.3	19.3	36.9	949.	16.3	24.1
90013	17.10	8.42	16.8	45.4	53.9	20.0	37.1	1463.	13.5	18.4
MEAN	13.36	8.67	16.9	46.1	53.1	19.5	36.7	1144.	14.2	18.8
S.D.	3.477	0.240	0.26	1.18	0.63	0.34	0.50	226.2	1.45	3.65
S.E.	1.555	0.107	0.12	0.53	0.28	0.15	0.22	101.2	0.65	1.63
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 400 PPM		MALES						
89965	1.9	167.7	5.8	90.9	1.4	0.5	0.6	0.7
89971	1.9	160.1	8.2	88.8	1.3	0.7	0.5	0.5
89979	1.8	158.3	11.1	85.3	2.0	0.7	0.2	0.6
90005	2.6	229.8	28.1	69.1	1.2	0.8	0.3	0.6
90013	2.0	170.3	9.4	87.5	1.3	0.5	0.6	0.7
MEAN	2.0	177.2	12.5	84.3	1.4	0.6	0.4	0.6
S.D.	0.32	29.81	8.92	8.75	0.32	0.13	0.18	0.08
S.E.	0.14	13.33	3.99	3.91	0.14	0.06	0.08	0.04
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 12

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 400 PPM MALES								
89965	0.83	12.91	0.20	0.07	0.08	0.10	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89971	1.31	14.23	0.21	0.10	0.08	0.09	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89979	1.13	8.67	0.21	0.07	0.02	0.07	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90005	2.61	6.43	0.11	0.07	0.03	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90013	1.60	14.97	0.22	0.08	0.10	0.13	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.50	11.44	0.19	0.08	0.06	0.09		
S.D.	0.683	3.714	0.045	0.013	0.035	0.030		
S.E.	0.305	1.661	0.020	0.006	0.016	0.014		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 13

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 0 PPM	FEMALES									
90052	8.87	7.70	15.4	39.8	51.7	20.0	38.8	1244.	12.3	17.0
90058	6.65	7.74	15.3	41.2	53.3	19.8	37.1	1284.	12.3	16.4
90061	12.83	7.99	15.4	41.9	52.4	19.3	36.7	1391.	13.6	20.9
90093	5.96	8.25	16.8	44.0	53.4	20.3	38.1	1081.	12.7	17.6
90098	5.31	8.04	15.5	41.2	51.2	19.3	37.6	1244.	12.5	19.2
MEAN	7.92	7.94	15.7	41.6	52.4	19.7	37.7	1249.	12.7	18.2
S.D.	3.053	0.227	0.63	1.53	0.97	0.44	0.83	111.4	0.54	1.83
S.E.	1.365	0.102	0.28	0.69	0.43	0.20	0.37	49.8	0.24	0.82
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 14

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 0 PPM		FEMALES						
90052	1.9	145.9	8.5	87.5	1.6	0.8	0.3	1.3
90058	2.4	187.2	9.0	86.2	2.2	1.5	0.3	0.8
90061	2.3	185.7	12.1	85.5	1.0	0.5	0.4	0.6
90093	3.0	247.1	16.6	80.3	1.5	1.1	0.2	0.4
90098	2.1	166.7	12.6	83.3	1.4	2.0	0.2	0.5
MEAN	2.3	186.5	11.8	84.6	1.5	1.2	0.3	0.7
S.D.	0.42	37.80	3.26	2.83	0.43	0.59	0.08	0.36
S.E.	0.19	16.90	1.46	1.26	0.19	0.26	0.04	0.16
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A12 (1-HOUR EXPOSURE)

PROJECT NO.:WIL-14068F — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 15

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 0 PPM	FEMALES							
90052	0.75	7.76	0.14	0.07	0.03	0.11	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90058	0.60	5.73	0.15	0.10	0.02	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90061	1.55	10.97	0.13	0.07	0.05	0.07	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90093	0.99	4.78	0.09	0.06	0.01	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90098	0.67	4.42	0.07	0.11	0.01	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.91	6.73	0.12	0.08	0.02	0.06		
S.D.	0.386	2.701	0.034	0.022	0.017	0.033		
S.E.	0.173	1.208	0.015	0.010	0.007	0.015		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 50 PPM FEMALES										
90046	6.40	8.29	16.3	43.4	52.4	19.6	37.4	1210.	12.2	14.7
90056	6.19	7.97	15.9	41.4	52.0	19.9	38.4	1453.	14.9	19.5
90062	5.66	7.85	16.0	42.2	53.8	20.3	37.8	1366.	14.5	20.2
90073	4.09	7.16	14.1	37.2	51.9	19.7	37.9	1441.	12.6	19.0
90100	6.95	8.38	16.0	43.5	52.0	19.1	36.7	1233.	12.7	17.6
MEAN	5.86	7.93	15.7	41.5	52.4	19.7	37.6	1341.	13.4	18.2
S.D.	1.091	0.483	0.88	2.58	0.79	0.44	0.63	114.0	1.23	2.18
S.E.	0.488	0.216	0.40	1.15	0.36	0.20	0.28	51.0	0.55	0.97
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 50 PPM	FEMALES							
90046	1.9	156.7	8.5	88.7	0.9	1.2	0.3	0.5
90056	2.0	160.4	13.5	81.2	2.8	1.2	0.2	1.0
90062	2.4	187.0	11.6	85.4	1.1	0.9	0.3	0.6
90073	1.6	113.5	24.7	71.4	2.0	1.5	0.1	0.4
90100	2.5	210.5	12.8	83.8	1.2	1.1	0.4	0.6
MEAN	2.1	165.6	14.2	82.1	1.6	1.2	0.3	0.6
S.D.	0.37	36.38	6.16	6.57	0.79	0.22	0.11	0.23
S.E.	0.17	16.27	2.76	2.94	0.35	0.10	0.05	0.10
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 50 PPM FEMALES								
90046	0.54	5.67	0.06	0.08	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90056	0.83	5.03	0.18	0.07	0.01	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90062	0.66	4.84	0.06	0.05	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90073	1.01	2.92	0.08	0.06	0.01	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90100	0.89	5.83	0.09	0.07	0.03	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.79	4.86	0.09	0.07	0.02	0.04		
S.D.	0.187	1.161	0.050	0.011	0.008	0.015		
S.E.	0.083	0.519	0.022	0.005	0.004	0.007		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 200 PPM		FEMALES								
90067	3.84	7.79	14.7	40.7	52.2	18.8	36.0	1178.	CLT	CLT
90071	7.37	8.64	16.9	44.5	51.4	19.5	38.0	1174.	14.7	20.4
90089	3.95	8.49	16.1	43.2	50.8	19.0	37.3	1405.	12.1	15.7
90097	9.04	8.11	17.1	45.8	56.5	21.1	37.4	2480.	12.6	16.2
90095	5.48	7.85	15.8	42.4	54.0	20.2	37.4	1279.	12.3	16.6
MEAN	5.94	8.18	16.1	43.3	53.0	19.7	37.2	1503.	12.9	17.2
S.D.	2.249	0.379	0.96	1.95	2.31	0.94	0.74	554.1	1.20	2.15
S.E.	1.006	0.169	0.43	0.87	1.03	0.42	0.33	247.8	0.60	1.07
N	5	5	5	5	5	5	5	5	4	4

CLT = CLOTTED

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 200 PPM		FEMALES						
90067	1.9	151.0	22.6	74.3	1.9	0.7	0.2	0.3
90071	1.9	164.0	14.5	82.6	1.2	0.9	0.2	0.6
90089	2.0	168.5	19.2	77.4	1.2	1.3	0.3	0.6
90097	2.1	173.7	5.7	91.2	1.8	0.4	0.4	0.5
90095	2.2	171.2	9.5	88.1	0.9	0.8	0.2	0.6
MEAN	2.0	165.7	14.3	82.7	1.4	0.8	0.3	0.5
S.D.	0.13	8.96	6.89	7.07	0.43	0.33	0.09	0.13
S.E.	0.06	4.01	3.08	3.16	0.19	0.15	0.04	0.06
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 200 PPM		FEMALES						
90067	0.87	2.85	0.07	0.03	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90071	1.07	6.09	0.09	0.06	0.02	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90089	0.76	3.06	0.05	0.05	0.01	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90097	0.52	8.24	0.17	0.04	0.03	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90095	0.52	4.83	0.05	0.04	0.01	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.75	5.01	0.09	0.04	0.02	0.03		
S.D.	0.236	2.242	0.050	0.011	0.009	0.015		
S.E.	0.106	1.002	0.022	0.005	0.004	0.007		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 400 PPM		FEMALES								
90047	7.46	7.63	15.4	41.6	54.5	20.2	37.0	1386.	11.8	16.7
90072	6.36	8.22	16.1	43.7	53.1	19.6	36.9	1497.	12.7	20.0
90079	8.10	8.27	16.5	44.0	53.2	19.9	37.5	1406.	12.8	17.7
90084	8.58	8.30	16.1	43.4	52.3	19.3	37.0	1540.	12.8	16.5
90087	4.17	8.32	16.3	44.7	53.7	19.6	36.5	1274.	14.0	18.1
MEAN	6.93	8.15	16.1	43.5	53.4	19.7	37.0	1421.	12.8	17.8
S.D.	1.755	0.292	0.41	1.16	0.81	0.34	0.36	103.7	0.78	1.40
S.E.	0.785	0.131	0.19	0.52	0.36	0.15	0.16	46.4	0.35	0.63
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 400 PPM		FEMALES						
90047	2.3	178.1	5.7	90.7	2.0	0.9	0.3	0.5
90072	2.2	181.8	8.8	88.5	1.1	0.7	0.3	0.7
90079	1.7	140.4	8.2	88.0	1.9	1.0	0.3	0.6
90084	2.1	176.3	14.9	82.0	1.5	0.7	0.3	0.6
90087	1.3	109.4	8.1	88.9	0.9	1.3	0.2	0.5
MEAN	1.9	157.2	9.1	87.6	1.5	0.9	0.3	0.6
S.D.	0.41	31.52	3.43	3.30	0.48	0.25	0.04	0.08
S.E.	0.19	14.10	1.53	1.48	0.22	0.11	0.02	0.04
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

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TABLE A12 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 400 PPM	FEMALES							
90047	0.43	6.77	0.15	0.06	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90072	0.56	5.62	0.07	0.04	0.02	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90079	0.66	7.13	0.16	0.08	0.02	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90084	1.28	7.04	0.13	0.06	0.02	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90087	0.34	3.71	0.04	0.06	0.01	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.65	6.05	0.11	0.06	0.02	0.04		
S.D.	0.371	1.443	0.052	0.014	0.004	0.014		
S.E.	0.166	0.645	0.023	0.006	0.002	0.006		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

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SPONSOR:LYONDELL CHEMICAL

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0 PPM		MALES									
89968	4.2	6.7	2.5	1.71	0.1	18.6	0.2	128.	36.	138.	0.2
89976	4.4	6.8	2.4	1.81	0.1	13.8	0.2	135.	26.	118.	1.2
90002	4.2	6.4	2.2	1.90	0.1	16.2	0.2	130.	43.	156.	0.1
90008	4.2	6.7	2.5	1.71	0.1	14.0	0.2	121.	34.	94.	0.1
90024	4.3	6.5	2.2	1.91	0.1	14.5	0.2	128.	33.	104.	0.8
MEAN	4.3	6.6	2.4	1.81	0.1	15.4	0.2	128.	34.	122.	0.5
S.D.	0.09	0.16	0.15	0.098	0.00	2.01	0.00	5.0	6.1	25.2	0.50
S.E.	0.04	0.07	0.07	0.044	0.00	0.90	0.00	2.2	2.7	11.3	0.22
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068F
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TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 0 PPM		MALES						
89968	129.	56.	10.5	102.	8.0	5.46	143.	39.
89976	127.	61.	10.9	101.	7.8	4.59	144.	69.
90002	117.	53.	10.6	105.	8.3	5.39	146.	51.
90008	99.	53.	10.8	102.	8.2	4.80	145.	67.
90024	94.	51.	10.3	103.	8.6	4.59	146.	42.
MEAN	113.	55.	10.6	103.	8.2	4.97	145.	54.
S.D.	16.0	3.9	0.24	1.5	0.30	0.428	1.3	13.9
S.E.	7.2	1.7	0.11	0.7	0.14	0.192	0.6	6.2
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	50 PPM	MALES									
89969	4.2	6.5	2.3	1.83	0.1	15.5	0.2	134.	33.	110.	0.4
89983	4.1	6.7	2.6	1.56	0.1	13.8	0.2	102.	39.	169.	0.3
89985	4.0	6.2	2.2	1.80	0.1	14.2	0.2	144.	30.	107.	0.3
89989	4.4	7.1	2.7	1.63	0.1	11.3	0.3	177.	32.	98.	0.1
90034	4.4	6.8	2.4	1.87	0.1	15.1	0.3	144.	36.	88.	0.1
MEAN	4.2	6.7	2.4	1.74	0.1	14.0	0.2	140.	34.	114.	0.2
S.D.	0.18	0.34	0.21	0.135	0.00	1.65	0.05	26.8	3.5	31.7	0.13
S.E.	0.08	0.15	0.09	0.060	0.00	0.74	0.02	12.0	1.6	14.2	0.06
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068F
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TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 50 PPM		MALES						
89969	138.	51.	10.4	103.	7.3	4.64	145.	61.
89983	127.	74.	10.4	102.	7.6	5.63	143.	111.
89985	99.	61.	10.6	107.	6.9	4.31	148.	57.
89989	140.	54.	10.9	103.	7.4	4.45	145.	42.
90034	133.	68.	10.7	103.	8.0	5.08	146.	64.
MEAN	127.	62.	10.6	104.	7.4	4.82	145.	67.
S.D.	16.7	9.6	0.21	1.9	0.40	0.537	1.8	26.0
S.E.	7.4	4.3	0.09	0.9	0.18	0.240	0.8	11.6
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 200 PPM		MALES									
89977	4.3	6.6	2.3	1.85	0.1	15.0	0.2	124.	30.	97.	1.3
89980	4.1	6.5	2.4	1.72	0.1	17.2	0.3	98.	30.	147.	0.1
89984	4.5	7.2	2.7	1.69	0.1	17.3	0.3	162.	31.	153.	0.3
90017	4.5	7.0	2.5	1.79	0.1	12.8	0.2	102.	30.	85.	0.7
90018	4.3	6.8	2.5	1.69	0.1	18.3	0.4	214.	40.	108.	0.2
MEAN	4.3	6.8	2.5	1.75	0.1	16.1	0.3	140.	32.	118.	0.5
S.D.	0.17	0.29	0.15	0.070	0.00	2.21	0.08	48.5	4.4	30.4	0.49
S.E.	0.07	0.13	0.07	0.031	0.00	0.99	0.04	21.7	2.0	13.6	0.22
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068F
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TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 200 PPM		MALES						
89977	119.	68.	10.7	101.	7.7	4.53	145.	73.
89980	94.	88.	11.1	102.	8.1	4.90	145.	144.
89984	137.	50.	11.0	102.	8.0	5.01	145.	57.
90017	123.	66.	10.7	101.	7.8	4.39	146.	44.
90018	91.	48.	10.7	102.	6.8	4.07	146.	29.
MEAN	113.	64.	10.8	102.	7.7	4.58	145.	69.
S.D.	19.7	16.2	0.19	0.5	0.52	0.383	0.5	44.7
S.E.	8.8	7.2	0.09	0.2	0.23	0.171	0.2	20.0
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	400 PPM	MALES									
89965	4.2	6.4	2.2	1.87	0.1	15.0	0.3	162.	36.	142.	0.1
89971	4.5	6.8	2.4	1.89	0.1	20.2	0.4	110.	33.	104.	0.4
89979	4.2	6.0	1.8	2.42	0.1	12.5	0.2	177.	43.	109.	1.2
90005	4.4	7.0	2.6	1.73	0.1	15.9	0.4	155.	35.	128.	0.2
90013	4.4	7.0	2.6	1.67	0.1	15.6	0.2	119.	26.	110.	0.1
MEAN	4.3	6.6	2.3	1.92	0.1	15.8	0.3	145.	35.	119.	0.4
S.D.	0.13	0.43	0.33	0.297	0.00	2.78	0.10	28.8	6.1	15.9	0.46
S.E.	0.06	0.19	0.15	0.133	0.00	1.24	0.04	12.9	2.7	7.1	0.21
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

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TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 400 PPM		MALES						
89965	115.	80.	11.0	102.	9.0	5.71	145.	65.
89971	113.	55.	10.7	103.	6.7	4.93	144.	37.
89979	144.	48.	10.7	106.	8.6	4.94	146.	56.
90005	107.	60.	10.2	103.	7.0	4.11	146.	43.
90013	112.	71.	11.1	103.	7.3	4.86	146.	65.
MEAN	118.	63.	10.7	103.	7.7	4.91	145.	53.
S.D.	14.7	12.8	0.35	1.5	1.02	0.567	0.9	12.8
S.E.	6.6	5.7	0.16	0.7	0.46	0.253	0.4	5.7
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

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TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0 PPM		FEMALES									
90052	4.7	7.0	2.3	2.03	0.1	14.6	0.3	85.	30.	85.	0.7
90058	4.4	6.6	2.2	1.97	0.1	16.6	0.3	113.	31.	114.	0.1
90061	4.5	6.8	2.3	1.94	0.1	14.8	0.3	74.	21.	74.	0.6
90093	5.1	7.1	2.0	2.62	0.1	13.2	0.2	92.	28.	89.	0.9
90098	5.3	7.7	2.4	2.20	0.0	16.7	0.3	120.	24.	82.	1.1
MEAN	4.8	7.0	2.2	2.15	0.1	15.2	0.3	97.	27.	89.	0.7
S.D.	0.39	0.42	0.15	0.280	0.04	1.48	0.04	19.3	4.2	15.1	0.38
S.E.	0.17	0.19	0.07	0.125	0.02	0.66	0.02	8.6	1.9	6.8	0.17
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 0 PPM		FEMALES						
90052	107.	78.	11.0	101.	7.9	4.47	144.	42.
90058	97.	72.	10.6	102.	6.8	4.52	143.	34.
90061	109.	73.	10.8	103.	7.9	4.41	146.	40.
90093	120.	59.	10.9	102.	6.3	4.28	142.	36.
90098	111.	93.	11.6	104.	6.3	4.68	145.	39.
MEAN	109.	75.	11.0	102.	7.0	4.47	144.	38.
S.D.	8.3	12.3	0.38	1.1	0.81	0.147	1.6	3.2
S.E.	3.7	5.5	0.17	0.5	0.36	0.066	0.7	1.4
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	50 PPM	FEMALES									
90046	5.0	7.5	2.4	2.06	0.1	15.2	0.2	72.	31.	72.	0.3
90056	4.5	6.8	2.3	1.93	0.1	14.8	0.3	108.	33.	105.	0.8
90062	4.6	6.9	2.4	1.94	0.1	10.6	0.2	81.	30.	65.	0.4
90073	5.5	7.5	2.1	2.67	0.1	18.2	0.3	111.	26.	106.	1.9
90100	4.8	7.2	2.4	1.98	0.1	12.4	0.2	64.	30.	86.	1.3
MEAN	4.9	7.2	2.3	2.12	0.1	14.2	0.2	87.	30.	87.	0.9
S.D.	0.40	0.33	0.13	0.314	0.00	2.90	0.05	21.3	2.5	18.7	0.67
S.E.	0.18	0.15	0.06	0.140	0.00	1.30	0.02	9.5	1.1	8.4	0.30
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP:	50 PPM	FEMALES						
90046	112.	69.	11.1	101.	6.7	4.19	143.	42.
90056	104.	87.	10.6	103.	6.6	5.16	143.	51.
90062	116.	87.	11.0	105.	6.0	4.10	146.	41.
90073	112.	74.	11.3	102.	7.3	5.09	144.	39.
90100	118.	61.	10.8	104.	6.2	4.28	144.	41.
MEAN	112.	76.	11.0	103.	6.6	4.56	144.	43.
S.D.	5.4	11.4	0.27	1.6	0.50	0.517	1.2	4.7
S.E.	2.4	5.1	0.12	0.7	0.22	0.231	0.5	2.1
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 200 PPM		FEMALES									
90067	4.9	7.3	2.5	1.98	0.1	12.5	0.3	88.	21.	91.	0.1
90071	4.2	6.7	2.5	1.67	0.1	13.9	0.2	136.	32.	92.	1.1
90089	4.8	6.8	2.0	2.40	0.1	12.4	0.3	103.	29.	94.	2.0
90097	5.1	7.3	2.3	2.23	0.1	13.8	0.3	121.	29.	102.	2.2
90095	4.8	7.2	2.4	1.98	0.1	13.4	0.3	89.	32.	75.	0.6
MEAN	4.8	7.1	2.3	2.05	0.1	13.2	0.3	107.	29.	91.	1.2
S.D.	0.34	0.29	0.21	0.278	0.00	0.71	0.04	20.8	4.5	9.8	0.90
S.E.	0.15	0.13	0.09	0.124	0.00	0.32	0.02	9.3	2.0	4.4	0.40
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 200 PPM	FEMALES							
90067	104.	49.	10.7	102.	7.1	4.39	143.	29.
90071	119.	102.	10.8	102.	7.6	4.79	144.	74.
90089	114.	76.	10.5	103.	6.3	4.07	144.	38.
90097	114.	75.	11.2	101.	8.4	5.70	144.	55.
90095	133.	91.	10.8	105.	7.2	4.36	145.	33.
MEAN	117.	79.	10.8	103.	7.3	4.66	144.	46.
S.D.	10.6	20.0	0.25	1.5	0.77	0.634	0.7	18.6
S.E.	4.7	8.9	0.11	0.7	0.34	0.284	0.3	8.3
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	400 PPM	FEMALES									
90047	5.0	7.2	2.3	2.22	0.1	12.9	0.2	94.	28.	68.	0.5
90072	5.0	7.1	2.2	2.28	0.1	14.5	0.4	95.	21.	97.	1.5
90079	4.9	6.9	2.0	2.44	0.1	13.1	0.2	71.	24.	65.	1.5
90084	4.6	7.1	2.5	1.86	0.1	13.5	0.3	64.	31.	86.	1.5
90087	4.9	6.8	1.8	2.67	0.1	13.2	0.4	95.	34.	98.	1.3
MEAN	4.9	7.0	2.2	2.29	0.1	13.4	0.3	84.	28.	83.	1.3
S.D.	0.16	0.16	0.27	0.299	0.00	0.63	0.10	15.1	5.2	15.6	0.43
S.E.	0.07	0.07	0.12	0.134	0.00	0.28	0.04	6.7	2.3	7.0	0.19
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A13 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 400 PPM		FEMALES						
90047	131.	60.	11.1	102.	6.8	4.54	143.	51.
90072	102.	91.	11.1	104.	7.4	4.73	146.	33.
90079	115.	80.	11.0	102.	7.2	4.75	143.	33.
90084	126.	84.	10.9	100.	6.9	4.42	143.	34.
90087	93.	33.	10.8	106.	7.8	4.45	147.	24.
MEAN	113.	70.	11.0	103.	7.2	4.58	144.	35.
S.D.	15.9	23.5	0.13	2.3	0.40	0.154	1.9	9.8
S.E.	7.1	10.5	0.06	1.0	0.18	0.069	0.9	4.4
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

PCHEv4.03
03/03/2008

FINAL REPORT

Volume 2 of 3
(Appendices A [Tables A14-A52] - B)

STUDY TITLE

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS (WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

STUDY NUMBER

WIL-14068

DATA REQUIREMENT

OPPTS Guideline 870.1300
OPPTS Guideline 870.1350
OECD Guideline 403

STUDY DIRECTOR

Daniel T. Kirkpatrick, PhD, DABT

STUDY INITIATION DATE

30 November 2007

STUDY COMPLETION DATE

24 September 2008

PERFORMING LABORATORY

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1407 George Road
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SPONSOR

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APPENDIX A

Individual Animal Data (continued)

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89968 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.42	2.625
LUNGS	1.25	0.315
KIDNEYS	2.29	0.577
FINAL BODY WT(G)	397.	

	GRADE
NASAL LEVEL I	1
MICRO: HYPERKERATOSIS SEPTUM	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89976 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.54	3.068
LUNGS	1.75	0.369
KIDNEYS	3.42	0.722
FINAL BODY WT(G)	474.	

NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALLS	1
	HYPERPLASIA, GOBLET CELL SEPTUM	2

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90002 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	11.52	2.789	
LUNGS	1.52	0.368	
KIDNEYS	3.28	0.794	
FINAL BODY WT(G)	413.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90008 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.94	2.527
LUNGS	1.58	0.365
KIDNEYS	3.33	0.769
FINAL BODY WT(G)	433.	

NO SIGNIFICANT CHANGES OBSERVED

	GRADE			
GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90024 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	8.42	2.499
LUNGS	1.21	0.359
KIDNEYS	2.15	0.638
FINAL BODY WT(G)	337.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89969 GROUP 2: 50 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.95	2.719
LUNGS	1.43	0.391
KIDNEYS	2.73	0.746
FINAL BODY WT(G)	366.	

NO SIGNIFICANT CHANGES OBSERVED

	GRADE			
GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89983 GROUP 2: 50 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	13.17	3.049
LUNGS	1.38	0.319
KIDNEYS	2.70	0.625
FINAL BODY WT(G)	432.	

NASAL LEVEL I
NO SIGNIFICANT CHANGES OBSERVED

GRADE 1

MICRO: HYPERPLASIA, GOBLET CELL
VENTRAL MEATUS

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89985 GROUP 2: 50 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.73	2.716
LUNGS	1.44	0.365
KIDNEYS	2.76	0.699
FINAL BODY WT(G)	395.	

		GRADE
LYMPH NODE, MAND	GROSS: ENLARGED BILATERAL	P
LYMPH NODE, MAND	MICRO: HEMORRHAGE	3
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, TESTES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, DIAPHRAGM, LARYNX, NASAL TISSUES

MICRO: KIDNEYS, LIVER, LUNGS, TRACHEA, LARYNX, NASAL LEVEL I, NASAL LEVEL II, NASAL LEVEL III, NASAL LEVEL IV, NASAL LEVEL V, NASAL LEVEL VI

GROSS/MICRO CORRELATIONS

GROSS FINDING	
LYMPH NODE, MAND: ENLARGED	<===> CONFIRMING MICROSCOPIC FINDING
	<===>LYMPH NODE, MAND: HEMORRHAGE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 89989 GROUP 2: 50 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.26	2.926
LUNGS	1.64	0.391
KIDNEYS	3.29	0.785
FINAL BODY WT(G)	419.	

		GRADE
NASAL LEVEL I	MICRO: HYPERPLASIA, EPITHELIAL, RESPIRATORY SEPTUM	2
	INFLAMMATION, CHRONIC SEPTUM	1
NASAL LEVEL II	MICRO: HYPERPLASIA, GOBLET CELL SEPTUM	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, TESTES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, DIAPHRAGM, LARYNX, NASAL TISSUES

MICRO: KIDNEYS, LIVER, LUNGS, TRACHEA, LARYNX, NASAL LEVEL III, NASAL LEVEL IV, NASAL LEVEL V, NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90034 GROUP 2: 50 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.15	2.978
LUNGS	1.55	0.380
KIDNEYS	3.14	0.770
FINAL BODY WT(G)	408.	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89977 GROUP 3: 200 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.04	2.846
LUNGS	1.49	0.352
KIDNEYS	2.60	0.615
FINAL BODY WT(G)	423.	

NASAL LEVEL II
NO SIGNIFICANT
CHANGES OBSERVED

GRADE
2

MICRO: HYPERPLASIA, GOBLET CELL
SEPTUM

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 89980 GROUP 3: 200 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.34	2.837
LUNGS	1.57	0.361
KIDNEYS	2.69	0.618
FINAL BODY WT(G)	435.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALLS	2
NASAL LEVEL II	MICRO: HYPERPLASIA, GOBLET CELL SEPTUM	2
	INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALLS	3
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM ETHMOTURBINATES	2
NASAL LEVEL V	MICRO: HEMORRHAGE ETHMOTURBINATES	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL III	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89984 GROUP 3: 200 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.80	2.878
LUNGS	1.44	0.351
KIDNEYS	3.04	0.741
FINAL BODY WT(G)	410.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90017 GROUP 3: 200 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.67	2.592
LUNGS	1.46	0.391
KIDNEYS	2.80	0.751
FINAL BODY WT(G)	373.	

NO SIGNIFICANT CHANGES OBSERVED

	GRADE			
GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90018 GROUP 3: 200 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.77	2.626
LUNGS	1.35	0.363
KIDNEYS	2.50	0.672
FINAL BODY WT(G)	372.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89965 GROUP 4: 400 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.38	2.641
LUNGS	1.36	0.346
KIDNEYS	2.68	0.682
FINAL BODY WT(G)	393.	

		GRADE
NASAL LEVEL III	MICRO: NO SIGNIFICANT CHANGES OBSERVED TISSUE DISTORTED. NO DORSAL MEATUS	
NASAL LEVEL V	MICRO: HEMORRHAGE NASOPHARYNGEAL REGION	1
LYMPH NODE, MAND	GROSS: DISCOLORATION, DARK RED RIGHT	P
LYMPH NODE, MAND	MICRO: HEMORRHAGE	3
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
NASAL LEVEL IV	NASAL LEVEL VI		

GROSS/MICRO CORRELATIONS

GROSS FINDING	
	<===> CONFIRMING MICROSCOPIC FINDING
LYMPH NODE, MAND: DISCOLORATION, DARK RED	<===>LYMPH NODE, MAND: HEMORRHAGE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 89971 GROUP 4: 400 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	13.45	3.043
LUNGS	1.51	0.342
KIDNEYS	3.15	0.713
FINAL BODY WT(G)	442.	

NASAL LEVEL II
NO SIGNIFICANT
CHANGES OBSERVED

GRADE

MICRO: INFLAMMATION, CHRONIC 2
NASO-MAXILLO-TURBINATES, LATERAL WALLS

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89979 GROUP 4: 400 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	8.63	2.332
LUNGS	1.21	0.327
KIDNEYS	2.31	0.624
FINAL BODY WT(G)	370.	

		GRADE
NASAL LEVEL II	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALLS	1
NASAL LEVEL VI	MICRO: DEGENERATION, OLFACTORY EPITHELIUM ETHMOTURBINATES	1
LYMPH NODE, MAND	GROSS: DISCOLORATION, DARK RED BILATERAL	P
LYMPH NODE, MAND	MICRO: HEMORRHAGE	3
NO SIGNIFICANT CHANGES OBSERVED		

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, TESTES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, DIAPHRAGM, LARYNX, NASAL TISSUES

MICRO: KIDNEYS, LIVER, LUNGS, TRACHEA, LARYNX, NASAL LEVEL I, NASAL LEVEL III, NASAL LEVEL IV, NASAL LEVEL V

GROSS/MICRO CORRELATIONS

GROSS FINDING	<===> CONFIRMING MICROSCOPIC FINDING
LYMPH NODE, MAND: DISCOLORATION, DARK RED	<===>LYMPH NODE, MAND: HEMORRHAGE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 90005 GROUP 4: 400 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.89	2.400
LUNGS	1.35	0.328
KIDNEYS	2.78	0.675
FINAL BODY WT(G)	412.	

NASAL LEVEL I
NO SIGNIFICANT
CHANGES OBSERVED

NASAL LEVEL II

		GRADE
MICRO:	INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALLS	1
MICRO:	HYPERPLASIA, GOBLET CELL	2

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90013 GROUP 4: 400 PPM MALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.65	2.828
LUNGS	1.48	0.359
KIDNEYS	2.57	0.624
FINAL BODY WT(G)	412.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
KIDNEYS	MICRO: INFLAMMATION, CHRONIC, INTERSTITIAL	1
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALLS	2
NASAL LEVEL II	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALLS	3
	DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	1

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90052 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.45	2.833
LUNGS	1.12	0.426
KIDNEYS	1.74	0.662
FINAL BODY WT(G)	263.	

KIDNEYS
NASAL LEVEL I

NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO: MINERALIZATION		2
MICRO: INFLAMMATION, CHRONIC		2
NASO-MAXILLO-TURBINATES, LATERAL WALLS		

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90058 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.79	2.694
LUNGS	1.07	0.425
KIDNEYS	1.58	0.627
FINAL BODY WT(G)	252.	

KIDNEYS
NO SIGNIFICANT
CHANGES OBSERVED

MICRO: MINERALIZATION GRADE 1

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90061 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.86	2.800
LUNGS	1.19	0.486
KIDNEYS	1.59	0.649
FINAL BODY WT(G)	245.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90093 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.12	3.193
LUNGS	1.21	0.543
KIDNEYS	1.76	0.789
FINAL BODY WT(G)	223.	

NASAL LEVEL VI

NO SIGNIFICANT CHANGES OBSERVED

MICRO: INFLAMMATION, CHRONIC — GRADE
ETHMOTURBINATES — 2

GROSS:

ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
HEART	INTESTINE	KIDNEYS	LIVER
LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
OVARIES	PANCREAS	PITUITARY	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
UTERUS	CERVIX	VAGINA	DIAPHRAGM
LARYNX	NASAL TISSUES		

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
NASAL LEVEL IV	NASAL LEVEL V		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90098 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	7.47	3.291	
LUNGS	1.29	0.568	
KIDNEYS	1.64	0.722	
FINAL BODY WT(G)	227.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90046 GROUP 2: 50 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.68	2.843
LUNGS	0.98	0.417
KIDNEYS	1.64	0.698
FINAL BODY WT(G)	235.	

NASAL LEVEL IV

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2
	METAPLASIA, OLFACTORY TO RESPIRATORY EPITHELIUM DORSAL MEATUS	2

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 90056 GROUP 2: 50 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.50	2.569
LUNGS	1.04	0.411
KIDNEYS	1.81	0.715
FINAL BODY WT(G)	253.	

KIDNEYS
LUNGS

NASAL LEVEL IV

NASAL LEVEL V

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	MINERALIZATION	2
MICRO:	ATELECTASIS TERMINAL CHANGE	2
MICRO:	DEGENERATION, OLFACTORY EPITHELIUM ETHMOTURBINATES	2
MICRO:	NO SIGNIFICANT CHANGES OBSERVED HEMORRHAGE AND EDEMA WITHIN NASAL CAVITY	

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	TRACHEA	LARYNX	NASAL LEVEL I
	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90062 GROUP 2: 50 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.90	2.794
LUNGS	1.26	0.510
KIDNEYS	1.75	0.709
FINAL BODY WT(G)	247.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 90073 GROUP 2: 50 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.94	2.833
LUNGS	1.07	0.437
KIDNEYS	1.62	0.661
FINAL BODY WT(G)	245.	

KIDNEYS: NO SIGNIFICANT CHANGES OBSERVED

GRADE: 2

MICRO: MINERALIZATION

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90100 GROUP 2: 50 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.34	3.071
LUNGS	1.09	0.456
KIDNEYS	1.87	0.782
FINAL BODY WT(G)	239.	

NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO: INFLAMMATION, CHRONIC		
NASO-MAXILLO-TURBINATES, LATERAL WALLS		1

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90067 GROUP 3: 200 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	5.78	2.604
LUNGS	1.11	0.500
KIDNEYS	1.55	0.698
FINAL BODY WT(G)	222.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE				
GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90071 GROUP 3: 200 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.45	2.792
LUNGS	1.08	0.468
KIDNEYS	1.45	0.628
FINAL BODY WT(G)	231.	

NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

GRADE

MICRO: INFLAMMATION, CHRONIC 2
NASO-MAXILLO-TURBINATES, LATERAL WALLS

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90089 GROUP 3: 200 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.01	2.728
LUNGS	1.09	0.424
KIDNEYS	1.79	0.696
FINAL BODY WT(G)	257.	

NASAL LEVEL II
NO SIGNIFICANT
CHANGES OBSERVED

GRADE 2

MICRO: INFLAMMATION, CHRONIC
NASO-MAXILLO-TURBINATES, LATERAL WALLS

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90097 GROUP 3: 200 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.61	2.572
LUNGS	1.07	0.416
KIDNEYS	1.63	0.634
FINAL BODY WT(G)	257.	

KIDNEYS
NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO: MINERALIZATION		2
MICRO: INFLAMMATION, CHRONIC		1
	NASO-MAXILLO-TURBINATES, LATERAL WALLS	

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 90095 GROUP 3: 200 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	6.90	2.851	
LUNGS	1.14	0.471	
KIDNEYS	1.67	0.690	
FINAL BODY WT(G)	242.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90047 GROUP 4: 400 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	8.26	3.214
LUNGS	1.19	0.463
KIDNEYS	1.87	0.728
FINAL BODY WT(G)	257.	

NASAL LEVEL I
NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO: INFLAMMATION, CHRONIC		
NASO-MAXILLO-TURBINATES, LATERAL WALLS		2

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 90072 GROUP 4: 400 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.35	2.848
LUNGS	1.11	0.498
KIDNEYS	1.57	0.704
FINAL BODY WT(G)	223.	

NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	DEGENERATION, RESPIRATORY EPITHELIUM VENTRAL MEATUS	2
	INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALLS	2

GROSS:

ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
HEART	INTESTINE	KIDNEYS	LIVER
LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
OVARIES	PANCREAS	PITUITARY	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
UTERUS	CERVIX	VAGINA	DIAPHRAGM
LARYNX	NASAL TISSUES		

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90079 GROUP 4: 400 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.83	2.811
LUNGS	1.28	0.527
KIDNEYS	1.75	0.720
FINAL BODY WT(G)	243.	

NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO: INFLAMMATION, CHRONIC		
NASO-MAXILLO-TURBINATES, LATERAL WALLS		2

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

ANIMAL NO. 90084 GROUP 4: 400 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.15	2.967
LUNGS	1.03	0.427
KIDNEYS	1.61	0.668
FINAL BODY WT(G)	241.	

		GRADE
KIDNEYS	MICRO: INFLAMMATION, CHRONIC, INTERSTITIAL	2
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALLS	1
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	3
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	3
	INFLAMMATION, CHRONIC ETHMOTURBINATES	2
NASAL LEVEL V	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS AND ETHMOTURBINATES	3

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL II	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

TABLE A14 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90087 GROUP 4: 400 PPM FEMALE SCHEDULED EUTH 12/21/07 DATE OF DEATH: 12/21/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	5.80	2.511
LUNGS	1.24	0.537
KIDNEYS	1.54	0.667
FINAL BODY WT(G)	231.	

NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

GRADE

MICRO: INFLAMMATION, CHRONIC 2
NASO-MAXILLO-TURBINATES, LATERAL WALLS

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE; P-PRESENT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A15 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89968	397.	10.42	1.25	2.29
89976	474.	14.54	1.75	3.42
90002	413.	11.52	1.52	3.28
90008	433.	10.94	1.58	3.33
90024	337.	8.42	1.21	2.15
MEAN	411.	11.17	1.46	2.89
S.D.	50.3	2.217	0.228	0.619
S.E.	22.5	0.991	0.102	0.277
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A15 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89969	366.	9.95	1.43	2.73
89983	432.	13.17	1.38	2.70
89985	395.	10.73	1.44	2.76
89989	419.	12.26	1.64	3.29
90034	408.	12.15	1.55	3.14
MEAN	404.	11.65	1.49	2.92
S.D.	25.2	1.291	0.105	0.272
S.E.	11.3	0.577	0.047	0.122
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A15 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 200 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89977	423.	12.04	1.49	2.60
89980	435.	12.34	1.57	2.69
89984	410.	11.80	1.44	3.04
90017	373.	9.67	1.46	2.80
90018	372.	9.77	1.35	2.50
MEAN	403.	11.12	1.46	2.73
S.D.	28.9	1.296	0.080	0.208
S.E.	12.9	0.580	0.036	0.093
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A15 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 400 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89965	393.	10.38	1.36	2.68
89971	442.	13.45	1.51	3.15
89979	370.	8.63	1.21	2.31
90005	412.	9.89	1.35	2.78
90013	412.	11.65	1.48	2.57
MEAN	406.	10.80	1.38	2.70
S.D.	26.6	1.834	0.119	0.308
S.E.	11.9	0.820	0.053	0.138
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A15 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90052	263.	7.45	1.12	1.74
90058	252.	6.79	1.07	1.58
90061	245.	6.86	1.19	1.59
90093	223.	7.12	1.21	1.76
90098	227.	7.47	1.29	1.64
MEAN	242.	7.14	1.18	1.66
S.D.	16.9	0.319	0.085	0.084
S.E.	7.5	0.143	0.038	0.037
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A15 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90046	235.	6.68	0.98	1.64
90056	253.	6.50	1.04	1.81
90062	247.	6.90	1.26	1.75
90073	245.	6.94	1.07	1.62
90100	239.	7.34	1.09	1.87
MEAN	244.	6.87	1.09	1.74
S.D.	7.0	0.316	0.105	0.108
S.E.	3.1	0.141	0.047	0.048
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A15 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 200 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90067	222.	5.78	1.11	1.55
90071	231.	6.45	1.08	1.45
90089	257.	7.01	1.09	1.79
90097	257.	6.61	1.07	1.63
90095	242.	6.90	1.14	1.67
MEAN	242.	6.55	1.10	1.62
S.D.	15.6	0.485	0.028	0.128
S.E.	7.0	0.217	0.012	0.057
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A15 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 400 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90047	257.	8.26	1.19	1.87
90072	223.	6.35	1.11	1.57
90079	243.	6.83	1.28	1.75
90084	241.	7.15	1.03	1.61
90087	231.	5.80	1.24	1.54
MEAN	239.	6.88	1.17	1.67
S.D.	12.9	0.926	0.101	0.139
S.E.	5.8	0.414	0.045	0.062
N	5	5	5	5

FBW = FINAL BODY WEIGHT

POFBWv4.14
03/03/2008
R:03/25/2008

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89968	397.	2.625	0.315	0.577
89976	474.	3.068	0.369	0.722
90002	413.	2.789	0.368	0.794
90008	433.	2.527	0.365	0.769
90024	337.	2.499	0.359	0.638
MEAN	411.	2.702	0.355	0.700
S.D.	50.3	0.2341	0.0228	0.0909
S.E.	22.5	0.1047	0.0102	0.0407
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89969	366.	2.719	0.391	0.746
89983	432.	3.049	0.319	0.625
89985	395.	2.716	0.365	0.699
89989	419.	2.926	0.391	0.785
90034	408.	2.978	0.380	0.770
MEAN	404.	2.878	0.369	0.725
S.D.	25.2	0.1525	0.0300	0.0647
S.E.	11.3	0.0682	0.0134	0.0289
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 200 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89977	423.	2.846	0.352	0.615
89980	435.	2.837	0.361	0.618
89984	410.	2.878	0.351	0.741
90017	373.	2.592	0.391	0.751
90018	372.	2.626	0.363	0.672
MEAN	403.	2.756	0.364	0.679
S.D.	28.9	0.1354	0.0162	0.0650
S.E.	12.9	0.0606	0.0072	0.0291
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 400 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89965	393.	2.641	0.346	0.682
89971	442.	3.043	0.342	0.713
89979	370.	2.332	0.327	0.624
90005	412.	2.400	0.328	0.675
90013	412.	2.828	0.359	0.624
MEAN	406.	2.649	0.340	0.664
S.D.	26.6	0.2957	0.0134	0.0389
S.E.	11.9	0.1323	0.0060	0.0174
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90052	263.	2.833	0.426	0.662
90058	252.	2.694	0.425	0.627
90061	245.	2.800	0.486	0.649
90093	223.	3.193	0.543	0.789
90098	227.	3.291	0.568	0.722
MEAN	242.	2.962	0.490	0.690
S.D.	16.9	0.2628	0.0656	0.0657
S.E.	7.5	0.1175	0.0294	0.0294
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068F
SPONSOR:LYONDELL CHEMICAL

TABLE A16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90046	235.	2.843	0.417	0.698
90056	253.	2.569	0.411	0.715
90062	247.	2.794	0.510	0.709
90073	245.	2.833	0.437	0.661
90100	239.	3.071	0.456	0.782
MEAN	244.	2.822	0.446	0.713
S.D.	7.0	0.1784	0.0398	0.0439
S.E.	3.1	0.0798	0.0178	0.0196
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A16 (1-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 200 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90067	222.	2.604	0.500	0.698
90071	231.	2.792	0.468	0.628
90089	257.	2.728	0.424	0.696
90097	257.	2.572	0.416	0.634
90095	242.	2.851	0.471	0.690
MEAN	242.	2.709	0.456	0.669
S.D.	15.6	0.1196	0.0351	0.0351
S.E.	7.0	0.0535	0.0157	0.0157
N	5	5	5	5

FBW = FINAL BODY WEIGHT

FEMALE GROUP: 400 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90047	257.	3.214	0.463	0.728
90072	223.	2.848	0.498	0.704
90079	243.	2.811	0.527	0.720
90084	241.	2.967	0.427	0.668
90087	231.	2.511	0.537	0.667
MEAN	239.	2.870	0.490	0.697
S.D.	12.9	0.2552	0.0457	0.0286
S.E.	5.8	0.1141	0.0204	0.0128
N	5	5	5	5

FBW = FINAL BODY WEIGHT

POFBWv4.14
03/03/2008

TABLE A17 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
89975	M	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
89982	M	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
89991	M	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90009	M	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90030	M	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
89988	M	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90000	M	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90003	M	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90012	M	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90028	M	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
89972	M	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
89973	M	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
89990	M	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
89995	M	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90023	M	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
89981	M	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
89998	M	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90010	M	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90027	M	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90032	M	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (12)

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
90039	F	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90059	F	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90075	F	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90082	F	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90085	F	0 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90045	F	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90048	F	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90060	F	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90068	F	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90083	F	20 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90051	F	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90070	F	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90077	F	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90090	F	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90104	F	50 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90035	F	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90036	F	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90044	F	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90057	F	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14
90088	F	100 PPM	SCHEDULED EUTHANASIA	14	17-DEC-07	14

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (12)

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A18 (DISPOSITIONS - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 14 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89975	M	0 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
89982	M	0 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
89991	M	0 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90009	M	0 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90030	M	0 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
89988	M	20 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90000	M	20 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90003	M	20 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90012	M	20 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90028	M	20 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
89972	M	50 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
89973	M	50 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
89990	M	50 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
89995	M	50 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90023	M	50 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
89981	M	100 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
89998	M	100 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90010	M	100 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90027	M	100 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90032	M	100 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90039	F	0 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90059	F	0 PPM	DISPOSITION	14	8:14	P	SCHEDULED EUTHANASIA
90075	F	0 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90082	F	0 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90085	F	0 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90045	F	20 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90048	F	20 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90060	F	20 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90068	F	20 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

STUDY DAYS: 14 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90083	F	20 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90051	F	50 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90070	F	50 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90077	F	50 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90090	F	50 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90104	F	50 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90035	F	100 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90036	F	100 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90044	F	100 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90057	F	100 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA
90088	F	100 PPM	DISPOSITION	14	8:15	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A19 (30 MINUTES INTO EXPOSURE - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
NO SIGNIFICANT CLINICAL OBSERVATIONS AT 30 MINUTES INTO EXPOSURE							

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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02/27/2008
R:03/03/2008

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A20 (1 HOUR INTO EXPOSURE - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90044	F	100 PPM	CARDIO-PULMONARY	0	12:40	P	GASPING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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02/27/2008
R:03/03/2008

TABLE A21 (DURING EXPOSURE - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL NOVEL STIMULUS/AROUSAL RESPONSE OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89975	M	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89982	M	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89991	M	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90009	M	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90030	M	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89988	M	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90000	M	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90003	M	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90012	M	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90028	M	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89972	M	50 PPM	BEHAVIOR/CNS	0	15:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89973	M	50 PPM	BEHAVIOR/CNS	0	15:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89990	M	50 PPM	BEHAVIOR/CNS	0	15:39	P	NO REACTION TO STIMULUS
89995	M	50 PPM	BEHAVIOR/CNS	0	15:39	P	NO REACTION TO STIMULUS
90023	M	50 PPM	BEHAVIOR/CNS	0	15:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89981	M	100 PPM	BEHAVIOR/CNS	0	15:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89998	M	100 PPM	BEHAVIOR/CNS	0	15:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90010	M	100 PPM	BEHAVIOR/CNS	0	15:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90027	M	100 PPM	BEHAVIOR/CNS	0	15:40	P	NO REACTION TO STIMULUS
90032	M	100 PPM	BEHAVIOR/CNS	0	15:40	P	ENERGETIC RESPONSE TO STIMULUS - JUMPING
90039	F	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90059	F	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90075	F	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90082	F	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90085	F	0 PPM	BEHAVIOR/CNS	0	15:33	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90045	F	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90048	F	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90060	F	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90068	F	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A21 (DURING EXPOSURE - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL NOVEL STIMULUS/AROUSAL RESPONSE OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90083	F	20 PPM	BEHAVIOR/CNS	0	15:36	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90051	F	50 PPM	BEHAVIOR/CNS	0	15:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90070	F	50 PPM	BEHAVIOR/CNS	0	15:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90077	F	50 PPM	BEHAVIOR/CNS	0	15:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90090	F	50 PPM	BEHAVIOR/CNS	0	15:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90104	F	50 PPM	BEHAVIOR/CNS	0	15:39	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90035	F	100 PPM	BEHAVIOR/CNS	0	15:40	P	NO REACTION TO STIMULUS
90036	F	100 PPM	BEHAVIOR/CNS	0	15:40	P	NO REACTION TO STIMULUS
90044	F	100 PPM	BEHAVIOR/CNS	0	15:40	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90057	F	100 PPM	BEHAVIOR/CNS	0	15:40	P	NO REACTION TO STIMULUS
90088	F	100 PPM	BEHAVIOR/CNS	0	15:40	P	ENERGETIC RESPONSE TO STIMULUS - JUMPING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A22 (END OF EXPOSURE - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
NO SIGNIFICANT CLINICAL OBSERVATIONS AT END OF EXPOSURE							

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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02/27/2008
R:03/03/2008

TABLE A23 (1 HOUR POST-EXPOSURE - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89975	M	0 PPM	NORMAL	0	16:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89982	M	0 PPM	NORMAL	0	16:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89991	M	0 PPM	NORMAL	0	16:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90009	M	0 PPM	NORMAL	0	16:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90030	M	0 PPM	NORMAL	0	16:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89988	M	20 PPM	NORMAL	0	16:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90000	M	20 PPM	NORMAL	0	16:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90003	M	20 PPM	NORMAL	0	16:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90012	M	20 PPM	NORMAL	0	16:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90028	M	20 PPM	NORMAL	0	16:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89972	M	50 PPM	BODY/INTEGUMENT	0	16:19	P	REDDENED HINDLIMBS
				0	16:19	P	REDDENED FORELIMBS
89973	M	50 PPM	NORMAL	0	16:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89990	M	50 PPM	EYES/EARS/NOSE	0	16:34	1	DRIED RED MATERIAL AROUND NOSE
89995	M	50 PPM	BODY/INTEGUMENT	0	16:32	P	REDDENED HINDLIMBS
				0	16:32	P	REDDENED FORELIMBS
90023	M	50 PPM	CARDIO-PULMONARY	0	16:34	P	GASPING
90023	M	50 PPM	ORAL/DENTAL	0	16:35	2	DRIED RED MATERIAL AROUND MOUTH
89981	M	100 PPM	CARDIO-PULMONARY	0	16:23	P	GASPING
89981	M	100 PPM	EYES/EARS/NOSE	0	16:23	1	DRIED RED MATERIAL AROUND NOSE
89998	M	100 PPM	BODY/INTEGUMENT	0	16:13	P	REDDENED HINDLIMBS
				0	16:14	P	REDDENED FORELIMBS
89998	M	100 PPM	CARDIO-PULMONARY	0	16:09	P	GASPING
89998	M	100 PPM	EYES/EARS/NOSE	0	16:10	1	DRIED RED MATERIAL AROUND NOSE
89998	M	100 PPM	ORAL/DENTAL	0	16:11	1	DRIED RED MATERIAL AROUND MOUTH
90010	M	100 PPM	BODY/INTEGUMENT	0	16:16	P	REDDENED HINDLIMBS
				0	16:17	P	REDDENED FORELIMBS
90010	M	100 PPM	CARDIO-PULMONARY	0	16:17	P	GASPING
90027	M	100 PPM	BODY/INTEGUMENT	0	16:15	P	REDDENED HINDLIMBS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A23 (1 HOUR POST-EXPOSURE - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90027	M	100 PPM	BODY/INTEGUMENT	0	16:16	P	REDDENED FORELIMBS
90027	M	100 PPM	CARDIO-PULMONARY	0	16:15	P	GASPING
90027	M	100 PPM	EYES/EARS/NOSE	0	16:15	1	DRIED RED MATERIAL AROUND NOSE
90032	M	100 PPM	BODY/INTEGUMENT	0	16:41	P	REDDENED HINDLIMBS
				0	16:41	P	REDDENED FORELIMBS
90032	M	100 PPM	CARDIO-PULMONARY	0	16:40	P	GASPING
90032	M	100 PPM	ORAL/DENTAL	0	16:41	1	DRIED RED MATERIAL AROUND MOUTH
90039	F	0 PPM	NORMAL	0	16:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90059	F	0 PPM	NORMAL	0	16:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90075	F	0 PPM	NORMAL	0	16:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90082	F	0 PPM	NORMAL	0	16:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90085	F	0 PPM	NORMAL	0	16:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90045	F	20 PPM	ORAL/DENTAL	0	16:27	1	WET CLEAR MATERIAL AROUND MOUTH
90048	F	20 PPM	NORMAL	0	16:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90060	F	20 PPM	NORMAL	0	16:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90068	F	20 PPM	NORMAL	0	16:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90083	F	20 PPM	BODY/INTEGUMENT	0	16:07	1	WET YELLOW MATERIAL UROGENITAL AREA
90051	F	50 PPM	NORMAL	0	16:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90070	F	50 PPM	NORMAL	0	16:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90077	F	50 PPM	NORMAL	0	16:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90090	F	50 PPM	ORAL/DENTAL	0	16:37	1	DRIED RED MATERIAL AROUND MOUTH
90104	F	50 PPM	NORMAL	0	16:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90035	F	100 PPM	NORMAL	0	16:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90036	F	100 PPM	BODY/INTEGUMENT	0	16:33	1	WET YELLOW MATERIAL UROGENITAL AREA
				0	16:33	P	REDDENED HINDLIMBS
				0	16:33	P	REDDENED FORELIMBS
90036	F	100 PPM	EYES/EARS/NOSE	0	16:33	1	DRIED RED MATERIAL AROUND NOSE
90044	F	100 PPM	BODY/INTEGUMENT	0	16:36	1	WET YELLOW MATERIAL UROGENITAL AREA
				0	16:36	P	REDDENED FORELIMBS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A23 (1 HOUR POST-EXPOSURE - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90044	F	100 PPM	ORAL/DENTAL	0	16:36	1	DRIED RED MATERIAL AROUND MOUTH
90057	F	100 PPM	ORAL/DENTAL	0	16:25	1	DRIED CLEAR MATERIAL AROUND MOUTH
90088	F	100 PPM	BODY/INTEGUMENT	0	16:42	P	REDDENED HINDLIMBS
				0	16:42	P	REDDENED FORELIMBS
				0	16:42	2	WET YELLOW MATERIAL UROGENITAL AREA
90088	F	100 PPM	ORAL/DENTAL	0	16:42	2	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89975	M	0 PPM	NORMAL	1	10:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:57	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89982	M	0 PPM	NORMAL	1	10:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89991	M	0 PPM	NORMAL	1	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89991	M	0 PPM	NORMAL	4	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90009	M	0 PPM	NORMAL	1	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90030	M	0 PPM	NORMAL	1	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 3

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90030	M	0 PPM	NORMAL	7	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89988	M	20 PPM	NORMAL	1	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90000	M	20 PPM	NORMAL	1	10:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90000	M	20 PPM	NORMAL	10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90003	M	20 PPM	NORMAL	1	10:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90012	M	20 PPM	NORMAL	1	10:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 5

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90012	M	20 PPM	NORMAL	13	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90028	M	20 PPM	NORMAL	1	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89972	M	50 PPM	NORMAL	1	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89973	M	50 PPM	NORMAL	1	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 6

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89973	M	50 PPM	NORMAL	3	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89990	M	50 PPM	NORMAL	2	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89990	M	50 PPM	EYES/EARS/NOSE	1	10:19	1	DRIED RED MATERIAL AROUND NOSE
89995	M	50 PPM	NORMAL	1	10:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89995	M	50 PPM	NORMAL	6	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90023	M	50 PPM	NORMAL	1	10:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89981	M	100 PPM	NORMAL	1	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89981	M	100 PPM	NORMAL	9	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89998	M	100 PPM	NORMAL	1	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90010	M	100 PPM	NORMAL	1	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 9

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90010	M	100 PPM	NORMAL	12	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90027	M	100 PPM	NORMAL	1	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90032	M	100 PPM	NORMAL	1	10:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90039	F	0 PPM	NORMAL	1	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 10

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90039	F	0 PPM	NORMAL	2	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90059	F	0 PPM	NORMAL	1	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90075	F	0 PPM	NORMAL	1	10:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 11

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90075	F	0 PPM	NORMAL	5	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90082	F	0 PPM	NORMAL	1	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	8:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90085	F	0 PPM	NORMAL	1	10:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90085	F	0 PPM	NORMAL	8	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90045	F	20 PPM	NORMAL	1	10:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90048	F	20 PPM	NORMAL	1	10:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 13

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90048	F	20 PPM	NORMAL	11	10:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90060	F	20 PPM	NORMAL	1	10:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90068	F	20 PPM	NORMAL	1	10:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90068	F	20 PPM	BODY/INTEGUMENT	5	9:55	1	HAIR LOSS RIGHT FORELIMB
				5	9:55	1	HAIR LOSS LEFT FORELIMB
				6	9:45	1	HAIR LOSS RIGHT FORELIMB
				6	9:45	1	HAIR LOSS LEFT FORELIMB
				7	9:45	1	HAIR LOSS RIGHT FORELIMB
				7	9:45	1	HAIR LOSS LEFT FORELIMB
				9	9:14	1	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90068	F	20 PPM	BODY/INTEGUMENT	10	9:20	1	HAIR LOSS RIGHT FORELIMB
				10	9:21	1	HAIR LOSS LEFT FORELIMB
				11	10:35	1	HAIR LOSS LEFT FORELIMB
				12	9:25	1	HAIR LOSS LEFT FORELIMB
90083	F	20 PPM	NORMAL	1	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90051	F	50 PPM	NORMAL	1	10:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90051	F	50 PPM	BODY/INTEGUMENT	4	9:52	P	SCABBING DORSAL HEAD
				5	9:53	P	SCABBING DORSAL HEAD
				6	9:42	P	SCABBING DORSAL HEAD

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 15

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90051	F	50 PPM	BODY/INTEGUMENT	7	9:43	P	SCABBING DORSAL HEAD
90070	F	50 PPM	NORMAL	1	10:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90077	F	50 PPM	NORMAL	1	10:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90090	F	50 PPM	NORMAL	1	10:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90090	F	50 PPM	NORMAL	5	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90090	F	50 PPM	ORAL/DENTAL	2	9:22	P	SCABBING AROUND MOUTH
				3	9:32	P	SCABBING AROUND MOUTH
90104	F	50 PPM	NORMAL	1	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90035	F	100 PPM	NORMAL	1	10:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:54	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 17

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90035	F	100 PPM	NORMAL	6	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90036	F	100 PPM	NORMAL	1	10:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90044	F	100 PPM	NORMAL	1	10:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90044	F	100 PPM	NORMAL	9	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90057	F	100 PPM	NORMAL	1	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90088	F	100 PPM	NORMAL	1	10:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:55	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:56	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	10:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A24 (DAILY OBSERVATIONS - RECOVERY PERIOD - 4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90088	F	100 PPM	NORMAL	12	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A25 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 1

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89975	M	0 PPM	NORMAL	1	16:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89982	M	0 PPM	NORMAL	1	16:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89991	M	0 PPM	NORMAL	1	16:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90009	M	0 PPM	NORMAL	1	16:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90030	M	0 PPM	NORMAL	1	16:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89988	M	20 PPM	NORMAL	1	16:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90000	M	20 PPM	NORMAL	1	16:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90003	M	20 PPM	NORMAL	1	16:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90012	M	20 PPM	NORMAL	1	16:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90028	M	20 PPM	NORMAL	1	16:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89972	M	50 PPM	NORMAL	1	16:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89973	M	50 PPM	NORMAL	1	16:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89990	M	50 PPM	EYES/EARS/NOSE	1	16:13	1	DRIED RED MATERIAL AROUND NOSE
89995	M	50 PPM	NORMAL	1	16:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90023	M	50 PPM	NORMAL	1	16:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89981	M	100 PPM	NORMAL	1	16:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89998	M	100 PPM	NORMAL	1	16:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90010	M	100 PPM	NORMAL	1	16:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90027	M	100 PPM	NORMAL	1	16:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90032	M	100 PPM	NORMAL	1	16:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90039	F	0 PPM	NORMAL	1	16:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90059	F	0 PPM	NORMAL	1	16:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90075	F	0 PPM	NORMAL	1	16:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90082	F	0 PPM	NORMAL	1	15:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90085	F	0 PPM	NORMAL	1	16:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90045	F	20 PPM	NORMAL	1	16:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90048	F	20 PPM	NORMAL	1	16:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90060	F	20 PPM	NORMAL	1	16:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90068	F	20 PPM	NORMAL	1	16:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A25 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 1

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90083	F	20 PPM	NORMAL	1	16:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90051	F	50 PPM	NORMAL	1	16:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90070	F	50 PPM	NORMAL	1	16:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90077	F	50 PPM	NORMAL	1	16:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90090	F	50 PPM	ORAL/DENTAL	1	16:16	P	SCABBING AROUND MOUTH
90104	F	50 PPM	NORMAL	1	16:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90035	F	100 PPM	NORMAL	1	16:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90036	F	100 PPM	NORMAL	1	16:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90044	F	100 PPM	NORMAL	1	16:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90057	F	100 PPM	NORMAL	1	16:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90088	F	100 PPM	NORMAL	1	16:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 1:	0 PPM			
89975	376.	362.	389.	412.
89982	398.	384.	410.	440.
89991	383.	371.	384.	432.
90009	342.	335.	346.	377.
90030	367.	347.	357.	376.
MEAN	373.	360.	377.	407.
S.D.	20.8	19.3	25.6	30.1
S.E.	9.3	8.6	11.4	13.5
N	5	5	5	5

TABLE A26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 2:	20 PPM			
89988	376.	368.	390.	424.
90000	398.	390.	420.	456.
90003	352.	337.	362.	394.
90012	359.	347.	364.	392.
90028	386.	381.	405.	428.
MEAN	374.	365.	388.	419.
S.D.	18.9	22.3	25.4	26.5
S.E.	8.5	10.0	11.4	11.9
N	5	5	5	5

TABLE A26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 3: 50 PPM				
89972	388.	371.	405.	451.
89973	360.	352.	374.	389.
89990	350.	341.	357.	378.
89995	384.	368.	404.	431.
90023	369.	348.	365.	388.
MEAN	370.	356.	381.	407.
S.D.	16.0	13.0	22.3	31.6
S.E.	7.1	5.8	10.0	14.1
N	5	5	5	5

TABLE A26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 4:	100 PPM			
89981	381.	364.	399.	428.
89998	361.	354.	371.	387.
90010	399.	377.	414.	443.
90027	382.	359.	380.	398.
90032	348.	338.	356.	376.
MEAN	374.	358.	384.	406.
S.D.	19.9	14.3	22.9	28.3
S.E.	8.9	6.4	10.2	12.7
N	5	5	5	5

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 1:	0 PPM			
90039	236.	229.	241.	263.
90059	218.	212.	223.	239.
90075	222.	214.	226.	244.
90082	234.	227.	231.	236.
90085	213.	209.	223.	239.
MEAN	225.	218.	229.	244.
S.D.	10.0	9.1	7.5	11.0
S.E.	4.5	4.1	3.4	4.9
N	5	5	5	5

TABLE A26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 2: 20 PPM				
90045	218.	215.	228.	245.
90048	233.	238.	249.	256.
90060	239.	242.	245.	251.
90068	222.	219.	231.	242.
90083	212.	216.	230.	243.
MEAN	225.	226.	236.	247.
S.D.	11.0	12.9	9.7	5.9
S.E.	4.9	5.8	4.3	2.7
N	5	5	5	5

TABLE A26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 3: 50 PPM				
90051	221.	223.	237.	244.
90070	220.	211.	227.	242.
90077	208.	199.	215.	220.
90090	234.	240.	241.	250.
90104	234.	229.	245.	269.
MEAN	223.	220.	233.	245.
S.D.	10.9	15.9	12.1	17.6
S.E.	4.9	7.1	5.4	7.9
N	5	5	5	5

TABLE A26 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 4:	100 PPM			
90035	207.	201.	215.	226.
90036	219.	210.	227.	242.
90044	223.	228.	243.	251.
90057	225.	220.	231.	260.
90088	235.	226.	239.	267.
MEAN	222.	217.	231.	249.
S.D.	10.2	11.4	10.8	16.0
S.E.	4.5	5.1	4.8	7.1
N	5	5	5	5

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A27 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 1:	0 PPM		
89975	-14.	27.	23.
89982	-14.	26.	30.
89991	-12.	13.	48.
90009	-7.	11.	31.
90030	-20.	10.	19.
MEAN	-13.	17.	30.
S.D.	4.7	8.2	11.4
S.E.	2.1	3.7	5.1
N	5	5	5

TABLE A27 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 2:	20 PPM		
89988	-8.	22.	33.
90000	-8.	30.	36.
90003	-15.	25.	32.
90012	-12.	17.	28.
90028	-5.	24.	23.
MEAN	-10.	24.	30.
S.D.	3.9	4.6	5.1
S.E.	1.7	2.0	2.3
N	5	5	5

TABLE A27 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 3:	50 PPM		
89972	-17.	34.	46.
89973	-8.	22.	15.
89990	-9.	16.	21.
89995	-16.	36.	27.
90023	-21.	17.	24.
MEAN	-14.	25.	26.
S.D.	5.5	9.5	11.8
S.E.	2.5	4.2	5.3
N	5	5	5

TABLE A27 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 4:	100 PPM		
89981	-17.	35.	29.
89998	-7.	17.	16.
90010	-22.	37.	29.
90027	-23.	21.	17.
90032	-10.	18.	20.
MEAN	-16.	26.	22.
S.D.	7.1	9.5	6.4
S.E.	3.2	4.3	2.9
N	5	5	5

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 1: 0 PPM			
90039	-7.	12.	22.
90059	-6.	11.	15.
90075	-8.	12.	18.
90082	-7.	4.	6.
90085	-4.	14.	15.
MEAN	-6.	11.	15.
S.D.	1.5	4.2	6.0
S.E.	0.7	1.9	2.7
N	5	5	5

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 2:		20 PPM	
90045	-3.	13.	17.
90048	5.	11.	7.
90060	3.	3.	6.
90068	-3.	12.	11.
90083	4.	14.	13.
MEAN	1.	10.	11.
S.D.	3.9	4.6	4.5
S.E.	1.7	2.0	2.0
N	5	5	5

TABLE A27 (4-HOUR EXPOSURE)

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SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 3:		50 PPM	
90051	2.	14.	7.
90070	-9.	16.	16.
90077	-9.	16.	5.
90090	6.	1.	9.
90104	-5.	16.	24.
MEAN	-3.	13.	12.
S.D.	6.7	6.4	7.9
S.E.	3.0	2.8	3.5
N	5	5	5

TABLE A27 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 4:	100 PPM		
90035	-6.	14.	11.
90036	-9.	17.	15.
90044	5.	15.	8.
90057	-5.	11.	29.
90088	-9.	13.	29.
MEAN	-5.	14.	18.
S.D.	5.8	2.3	9.9
S.E.	2.6	1.0	4.4
N	5	5	5

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A28 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 1: 0 PPM			
89975	-14.	13.	36.
89982	-14.	12.	42.
89991	-12.	1.	49.
90009	-7.	4.	35.
90030	-20.	-10.	9.
MEAN	-13.	4.	34.
S.D.	4.7	9.2	15.3
S.E.	2.1	4.1	6.8
N	5	5	5

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 2:	20 PPM		
89988	-8.	14.	48.
90000	-8.	22.	58.
90003	-15.	10.	42.
90012	-12.	5.	33.
90028	-5.	19.	42.
MEAN	-10.	14.	45.
S.D.	3.9	6.8	9.1
S.E.	1.7	3.1	4.1
N	5	5	5

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A28 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 3:	50 PPM		
89972	-17.	17.	63.
89973	-8.	14.	29.
89990	-9.	7.	28.
89995	-16.	20.	47.
90023	-21.	-4.	19.
MEAN	-14.	11.	37.
S.D.	5.5	9.7	17.5
S.E.	2.5	4.3	7.8
N	5	5	5

TABLE A28 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 4:	100 PPM		
89981	-17.	18.	47.
89998	-7.	10.	26.
90010	-22.	15.	44.
90027	-23.	-2.	16.
90032	-10.	8.	28.
MEAN	-16.	10.	32.
S.D.	7.1	7.6	13.2
S.E.	3.2	3.4	5.9
N	5	5	5

TABLE A28 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 1:	0 PPM		
90039	-7.	5.	27.
90059	-6.	5.	21.
90075	-8.	4.	22.
90082	-7.	-4.	2.
90085	-4.	10.	26.
MEAN	-6.	4.	20.
S.D.	1.5	5.0	10.0
S.E.	0.7	2.2	4.5
N	5	5	5

TABLE A28 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 2:	20 PPM		
90045	-3.	10.	27.
90048	5.	16.	23.
90060	3.	6.	12.
90068	-3.	9.	20.
90083	4.	18.	31.
MEAN	1.	12.	22.
S.D.	3.9	5.2	7.4
S.E.	1.7	2.3	3.3
N	5	5	5

TABLE A28 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 3:	50 PPM		
90051	2.	16.	23.
90070	-9.	7.	22.
90077	-9.	7.	12.
90090	6.	7.	16.
90104	-5.	11.	35.
MEAN	-3.	10.	22.
S.D.	6.7	4.0	8.7
S.E.	3.0	1.8	3.9
N	5	5	5

TABLE A28 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 4:	100 PPM		
90035	-6.	8.	19.
90036	-9.	8.	23.
90044	5.	20.	28.
90057	-5.	6.	35.
90088	-9.	4.	32.
MEAN	-5.	9.	27.
S.D.	5.8	6.4	6.4
S.E.	2.6	2.9	2.9
N	5	5	5

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 0 PPM		MALES								
89975	16.39	8.32	17.1	46.2	55.6	20.6	37.0	1155.	13.9	21.0
89982	5.53	8.21	16.3	44.5	54.2	19.8	36.6	1399.	14.1	20.9
89991	9.30	8.01	16.0	44.5	55.6	20.0	35.9	1369.	12.1	17.3
90009	8.36	9.13	16.6	45.5	49.9	18.2	36.5	1211.	13.7	18.7
90030	5.56	8.94	16.6	45.2	50.6	18.6	36.8	1090.	16.2	20.8
MEAN	9.03	8.52	16.5	45.2	53.2	19.4	36.6	1245.	14.0	19.7
S.D.	4.444	0.486	0.41	0.72	2.75	1.00	0.42	134.5	1.46	1.67
S.E.	1.987	0.217	0.18	0.32	1.23	0.45	0.19	60.2	0.65	0.74
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 0 PPM		MALES						
89975	2.6	214.0	14.7	82.6	1.2	0.5	0.3	0.7
89982	2.6	213.8	11.0	85.9	1.1	1.1	0.4	0.6
89991	2.6	207.2	8.0	89.1	0.9	0.6	0.4	0.9
90009	2.1	191.9	13.3	82.1	0.9	2.6	0.5	0.6
90030	1.4	125.8	9.5	86.8	1.8	1.3	0.2	0.4
MEAN	2.3	190.5	11.3	85.3	1.2	1.2	0.4	0.6
S.D.	0.53	37.29	2.73	2.94	0.37	0.84	0.11	0.18
S.E.	0.24	16.68	1.22	1.31	0.17	0.38	0.05	0.08
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 0 PPM MALES								
89975	2.40	13.54	0.20	0.09	0.05	0.12	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89982	0.61	4.75	0.06	0.06	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89991	0.75	8.28	0.09	0.06	0.04	0.09	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90009	1.11	6.86	0.08	0.21	0.04	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90030	0.53	4.83	0.10	0.07	0.01	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.08	7.65	0.11	0.10	0.03	0.06		
S.D.	0.771	3.608	0.055	0.064	0.016	0.042		
S.E.	0.345	1.614	0.024	0.029	0.007	0.019		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 20 PPM		MALES								
89988	9.44	8.14	16.1	42.8	52.6	19.7	37.5	1095.	12.5	20.1
90000	10.01	7.96	16.8	45.4	57.0	21.1	37.0	660.	13.7	19.4
90003	5.52	9.05	17.7	48.5	53.6	19.5	36.4	1053.	13.7	20.4
90012	8.39	8.64	16.8	44.9	52.0	19.5	37.5	919.	12.7	17.3
90028	6.50	8.35	16.1	43.4	52.0	19.3	37.1	1024.	12.3	19.4
MEAN	7.97	8.43	16.7	45.0	53.4	19.8	37.1	950.	13.0	19.3
S.D.	1.915	0.430	0.66	2.23	2.09	0.73	0.45	174.8	0.67	1.21
S.E.	0.856	0.192	0.29	1.00	0.94	0.33	0.20	78.2	0.30	0.54
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 20 PPM MALES								
89988	1.9	157.5	15.5	80.1	2.4	0.9	0.3	0.8
90000	2.6	203.8	12.0	85.0	1.1	1.0	0.4	0.5
90003	2.7	248.8	22.4	72.8	2.0	1.3	0.7	0.7
90012	2.2	194.0	17.0	79.6	1.4	0.9	0.4	0.7
90028	2.4	203.3	26.1	69.7	1.0	2.1	0.5	0.6
MEAN	2.4	201.5	18.6	77.4	1.6	1.2	0.5	0.7
S.D.	0.32	32.55	5.62	6.13	0.60	0.51	0.15	0.11
S.E.	0.14	14.56	2.51	2.74	0.27	0.23	0.07	0.05
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 20 PPM MALES								
89988	1.47	7.56	0.23	0.08	0.03	0.07	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90000	1.20	8.51	0.11	0.10	0.04	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90003	1.23	4.01	0.11	0.07	0.04	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90012	1.43	6.68	0.12	0.07	0.03	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90028	1.70	4.53	0.07	0.14	0.03	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.41	6.26	0.13	0.09	0.03	0.05		
S.D.	0.203	1.935	0.060	0.029	0.005	0.013		
S.E.	0.091	0.866	0.027	0.013	0.002	0.006		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 50 PPM		MALES								
89972	8.67	8.43	16.9	46.0	54.6	20.1	36.7	1176.	13.7	17.8
89973	9.72	8.26	16.4	44.0	53.3	19.8	37.2	1272.	CLT	CLT
89990	5.70	8.23	15.6	41.6	50.6	18.9	37.4	1142.	12.3	17.0
89995	12.80	8.63	16.5	45.0	52.2	19.1	36.6	741.	15.2	19.5
90023	8.60	8.87	16.9	45.2	51.0	19.0	37.3	1303.	12.3	14.3
MEAN	9.10	8.48	16.5	44.4	52.3	19.4	37.0	1127.	13.4	17.2
S.D.	2.553	0.268	0.53	1.70	1.65	0.54	0.36	225.6	1.38	2.17
S.E.	1.142	0.120	0.24	0.76	0.74	0.24	0.16	100.9	0.69	1.08
N	5	5	5	5	5	5	5	5	4	4

CLT = CLOTTED

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 50 PPM		MALES						
89972	2.7	227.6	13.5	80.9	3.5	0.6	0.4	1.0
89973	2.4	198.1	11.8	84.4	1.2	1.3	0.5	0.8
89990	2.1	170.7	13.8	82.3	2.0	0.7	0.3	0.8
89995	2.4	208.6	16.2	80.1	1.4	1.0	0.4	0.9
90023	1.4	124.8	15.1	81.3	1.7	1.1	0.3	0.5
MEAN	2.2	186.0	14.1	81.8	2.0	0.9	0.4	0.8
S.D.	0.49	39.90	1.67	1.66	0.91	0.29	0.08	0.19
S.E.	0.22	17.84	0.75	0.74	0.41	0.13	0.04	0.08
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP:	50 PPM	MALES						
89972	1.17	7.01	0.30	0.05	0.04	0.09	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89973	1.15	8.20	0.12	0.12	0.04	0.08	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89990	0.79	4.69	0.11	0.04	0.02	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89995	2.07	10.26	0.18	0.13	0.05	0.11	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90023	1.30	6.99	0.15	0.10	0.02	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.30	7.43	0.17	0.09	0.03	0.07		
S.D.	0.472	2.030	0.077	0.041	0.013	0.029		
S.E.	0.211	0.908	0.034	0.018	0.006	0.013		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A29 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 10

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 100 PPM MALES										
89981	7.15	8.50	16.5	45.2	53.2	19.4	36.4	1212.	13.5	19.0
89998	8.33	9.04	16.9	46.3	51.3	18.7	36.5	1091.	12.7	20.8
90010	13.38	8.82	16.8	45.9	52.0	19.1	36.7	709.	13.6	18.3
90027	7.48	8.55	17.0	45.6	53.4	19.8	37.2	985.	13.2	18.3
90032	6.58	8.29	15.7	43.4	52.3	19.0	36.3	995.	11.6	13.8
MEAN	8.58	8.64	16.6	45.3	52.4	19.2	36.6	998.	12.9	18.0
S.D.	2.755	0.293	0.53	1.13	0.87	0.42	0.36	185.8	0.82	2.58
S.E.	1.232	0.131	0.24	0.50	0.39	0.19	0.16	83.1	0.37	1.15
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 100 PPM		MALES						
89981	2.5	212.7	15.3	79.4	2.0	2.2	0.4	0.7
89998	2.2	199.9	23.8	72.4	1.5	1.3	0.5	0.6
90010	2.0	172.6	11.9	83.8	1.5	1.7	0.5	0.7
90027	1.7	143.9	17.7	78.2	2.1	0.9	0.6	0.4
90032	2.2	185.3	25.5	69.9	1.2	2.4	0.5	0.5
MEAN	2.1	182.9	18.8	76.7	1.7	1.7	0.5	0.6
S.D.	0.29	26.50	5.72	5.58	0.38	0.62	0.07	0.13
S.E.	0.13	11.85	2.56	2.50	0.17	0.28	0.03	0.06
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 100 PPM MALES								
89981	1.10	5.68	0.14	0.16	0.03	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89998	1.99	6.04	0.12	0.11	0.04	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90010	1.59	11.20	0.20	0.22	0.06	0.09	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90027	1.33	5.85	0.16	0.07	0.05	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90032	1.68	4.60	0.08	0.16	0.03	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.54	6.67	0.14	0.14	0.04	0.05		
S.D.	0.340	2.591	0.045	0.057	0.013	0.024		
S.E.	0.152	1.159	0.020	0.025	0.006	0.011		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 0 PPM		FEMALES								
90039	9.03	8.16	15.5	41.8	51.2	19.0	37.0	1359.	12.0	16.6
90059	4.75	7.83	15.5	42.0	53.6	19.8	36.8	1363.	11.8	16.9
90075	7.21	8.14	16.2	42.3	51.9	19.9	38.3	1008.	11.8	14.2
90082	5.61	8.25	16.6	45.7	55.4	20.1	36.4	1029.	11.9	18.7
90085	4.70	7.22	14.2	36.7	50.8	19.7	38.8	1124.	12.3	18.9
MEAN	6.26	7.92	15.6	41.7	52.6	19.7	37.5	1177.	12.0	17.1
S.D.	1.851	0.422	0.91	3.22	1.91	0.42	1.03	173.9	0.21	1.90
S.E.	0.828	0.189	0.41	1.44	0.85	0.19	0.46	77.8	0.09	0.85
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068D
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TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 0 PPM		FEMALES						
90039	2.6	209.3	10.9	85.4	1.8	0.8	0.4	0.7
90059	2.7	207.9	18.6	77.7	1.1	1.5	0.4	0.7
90075	2.0	161.7	9.9	84.9	2.3	1.1	0.3	1.4
90082	2.1	173.6	14.1	82.4	1.0	1.6	0.3	0.5
90085	2.4	173.0	11.8	85.9	0.9	0.9	0.2	0.3
MEAN	2.4	185.1	13.1	83.3	1.4	1.2	0.3	0.7
S.D.	0.30	21.98	3.46	3.39	0.61	0.36	0.08	0.41
S.E.	0.14	9.83	1.55	1.51	0.27	0.16	0.04	0.19
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 0 PPM FEMALES								
90039	0.99	7.71	0.16	0.07	0.03	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90059	0.89	3.69	0.05	0.07	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90075	0.71	6.12	0.17	0.08	0.02	0.10	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90082	0.79	4.62	0.06	0.09	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90085	0.55	4.04	0.04	0.04	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.79	5.24	0.10	0.07	0.02	0.05		
S.D.	0.169	1.666	0.063	0.019	0.007	0.035		
S.E.	0.075	0.745	0.028	0.008	0.003	0.016		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP:	20 PPM	FEMALES								
90045	6.63	7.63	15.0	41.0	53.7	19.7	36.7	1303.	12.1	17.2
90048	8.93	8.21	16.2	43.0	52.4	19.7	37.5	1047.	11.5	15.1
90060	7.09	8.18	15.9	44.2	54.0	19.4	36.0	1298.	12.5	18.9
90068	5.41	6.98	13.3	34.0	48.7	19.0	39.0	1342.	12.2	17.1
90083	4.22	7.80	15.8	41.8	53.6	20.2	37.8	1315.	11.6	12.8
MEAN	6.46	7.76	15.2	40.8	52.5	19.6	37.4	1261.	12.0	16.2
S.D.	1.778	0.501	1.17	3.99	2.20	0.44	1.14	120.8	0.42	2.34
S.E.	0.795	0.224	0.52	1.78	0.98	0.20	0.51	54.0	0.19	1.05
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP:	20 PPM	FEMALES						
90045	2.3	173.9	9.1	87.2	1.5	0.8	0.4	0.9
90048	1.9	156.0	15.8	80.6	1.9	0.9	0.3	0.5
90060	1.9	157.7	15.6	79.8	1.5	1.8	0.5	0.7
90068	2.7	190.7	13.7	83.5	1.3	0.7	0.3	0.5
90083	1.8	138.2	14.9	82.1	1.1	1.4	0.2	0.3
MEAN	2.1	163.3	13.8	82.6	1.5	1.1	0.3	0.6
S.D.	0.38	19.86	2.76	2.92	0.30	0.47	0.11	0.23
S.E.	0.17	8.88	1.24	1.30	0.13	0.21	0.05	0.10
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP:	20 PPM	FEMALES						
90045	0.60	5.78	0.10	0.05	0.03	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90048	1.41	7.20	0.17	0.08	0.02	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90060	1.11	5.66	0.11	0.13	0.04	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90068	0.74	4.51	0.07	0.04	0.01	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90083	0.63	3.46	0.05	0.06	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.90	5.32	0.10	0.07	0.02	0.04		
S.D.	0.351	1.412	0.046	0.036	0.013	0.019		
S.E.	0.157	0.632	0.020	0.016	0.006	0.009		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

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TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 50 PPM		FEMALES								
90051	7.06	8.25	16.3	43.8	53.1	19.7	37.2	1283.	12.4	15.7
90070	5.30	8.34	15.6	41.8	50.1	18.7	37.4	1570.	12.4	15.3
90077	5.81	8.54	16.4	43.7	51.1	19.2	37.5	1203.	12.6	16.1
90090	6.87	8.02	15.5	41.1	51.2	19.3	37.7	1231.	11.8	20.2
90104	4.83	8.18	16.1	41.6	50.8	19.6	38.6	1358.	11.9	14.6
MEAN	5.97	8.27	16.0	42.4	51.3	19.3	37.7	1329.	12.2	16.4
S.D.	0.971	0.193	0.41	1.26	1.11	0.39	0.54	147.1	0.35	2.21
S.E.	0.434	0.086	0.18	0.56	0.50	0.18	0.24	65.8	0.16	0.99
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 50 PPM		FEMALES						
90051	1.8	150.7	17.5	78.3	1.9	1.5	0.3	0.6
90070	1.7	143.2	17.5	79.2	1.2	1.3	0.3	0.5
90077	1.4	116.3	8.8	88.0	1.1	1.4	0.2	0.5
90090	1.6	128.6	10.0	85.8	2.5	1.1	0.3	0.3
90104	1.9	157.5	18.8	78.4	1.4	0.9	0.2	0.2
MEAN	1.7	139.3	14.5	81.9	1.6	1.2	0.3	0.4
S.D.	0.19	16.73	4.72	4.61	0.58	0.24	0.05	0.16
S.E.	0.09	7.48	2.11	2.06	0.26	0.11	0.02	0.07
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 50 PPM FEMALES								
90051	1.23	5.52	0.13	0.10	0.02	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90070	0.93	4.20	0.06	0.07	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90077	0.51	5.11	0.07	0.08	0.01	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90090	0.69	5.89	0.17	0.07	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90104	0.91	3.79	0.07	0.04	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.85	4.90	0.10	0.07	0.02	0.03		
S.D.	0.272	0.885	0.048	0.022	0.005	0.011		
S.E.	0.122	0.396	0.021	0.010	0.002	0.005		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 100 PPM		FEMALES								
90035	8.89	8.64	16.9	47.2	54.6	19.5	35.8	1117.	12.6	16.7
90036	6.52	7.78	15.9	42.6	54.7	20.4	37.3	1405.	11.9	15.5
90044	5.44	8.14	15.9	40.8	50.1	19.5	38.9	1286.	12.0	14.6
90057	4.84	7.71	15.4	40.9	53.1	20.0	37.8	858.	11.9	18.3
90088	8.42	7.55	15.2	40.2	53.2	20.1	37.7	1164.	13.0	18.0
MEAN	6.82	7.96	15.9	42.3	53.1	19.9	37.5	1166.	12.3	16.6
S.D.	1.786	0.435	0.66	2.86	1.86	0.39	1.12	205.4	0.50	1.59
S.E.	0.799	0.195	0.29	1.28	0.83	0.18	0.50	91.9	0.22	0.71
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 100 PPM		FEMALES						
90035	1.9	163.3	13.1	84.2	0.8	0.9	0.4	0.6
90036	2.2	174.3	9.8	87.3	1.2	0.7	0.4	0.6
90044	1.3	105.6	11.4	84.8	1.2	1.5	0.5	0.7
90057	2.1	162.5	11.4	86.0	1.2	0.8	0.3	0.4
90088	2.2	166.4	20.7	76.4	1.2	0.6	0.3	0.8
MEAN	1.9	154.4	13.3	83.7	1.1	0.9	0.4	0.6
S.D.	0.38	27.69	4.31	4.27	0.18	0.35	0.08	0.15
S.E.	0.17	12.38	1.93	1.91	0.08	0.16	0.04	0.07
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A29 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 100 PPM		FEMALES						
90035	1.16	7.49	0.07	0.08	0.04	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90036	0.64	5.69	0.08	0.05	0.03	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90044	0.62	4.62	0.06	0.08	0.03	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90057	0.55	4.16	0.06	0.04	0.01	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90088	1.74	6.43	0.10	0.05	0.03	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.94	5.68	0.07	0.06	0.03	0.04		
S.D.	0.508	1.348	0.017	0.019	0.011	0.015		
S.E.	0.227	0.603	0.007	0.008	0.005	0.007		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0 PPM MALES											
89975	4.4	6.5	2.1	2.14	0.1	14.1	0.3	195.	26.	84.	0.6
89982	4.0	6.0	2.0	2.07	0.1	15.0	0.3	161.	32.	125.	0.5
89991	4.3	6.3	2.0	2.12	0.1	11.7	0.3	154.	30.	82.	1.2
90009	4.1	6.2	2.1	1.96	0.1	20.8	0.3	124.	38.	141.	0.6
90030	4.5	6.5	2.0	2.19	0.1	11.4	0.2	208.	33.	89.	0.5
MEAN	4.3	6.3	2.0	2.10	0.1	14.6	0.3	168.	32.	104.	0.7
S.D.	0.21	0.21	0.05	0.087	0.00	3.79	0.04	33.6	4.4	27.0	0.29
S.E.	0.09	0.09	0.02	0.039	0.00	1.70	0.02	15.0	2.0	12.1	0.13
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 0 PPM		MALES						
89975	130.	65.	10.9	104.	6.9	4.28	143.	51.
89982	95.	48.	10.3	104.	8.7	5.01	147.	27.
89991	115.	61.	11.1	103.	8.4	4.96	147.	49.
90009	101.	52.	10.5	103.	7.9	5.25	144.	40.
90030	111.	58.	10.9	104.	7.8	4.68	146.	56.
MEAN	110.	57.	10.7	104.	7.9	4.84	145.	45.
S.D.	13.5	6.8	0.33	0.5	0.69	0.371	1.8	11.4
S.E.	6.0	3.1	0.15	0.2	0.31	0.166	0.8	5.1
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 3

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 20 PPM		MALES									
89988	4.4	6.8	2.5	1.76	0.1	12.1	0.2	124.	30.	86.	0.8
90000	4.3	6.2	2.0	2.14	0.1	13.6	0.2	135.	39.	138.	1.0
90003	4.6	6.8	2.3	2.04	0.1	12.9	0.3	200.	39.	92.	0.1
90012	4.2	6.4	2.2	1.92	0.1	16.3	0.3	143.	30.	107.	1.2
90028	4.5	6.7	2.2	2.02	0.1	12.5	0.2	121.	32.	92.	0.1
MEAN	4.4	6.6	2.2	1.98	0.1	13.5	0.2	145.	34.	103.	0.6
S.D.	0.16	0.27	0.18	0.144	0.00	1.67	0.05	32.2	4.6	21.0	0.51
S.E.	0.07	0.12	0.08	0.064	0.00	0.75	0.02	14.4	2.1	9.4	0.23
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 4

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 20 PPM		MALES						
89988	97.	64.	11.0	101.	7.2	4.59	143.	82.
90000	110.	62.	10.2	101.	7.3	4.92	142.	75.
90003	108.	57.	10.4	104.	8.2	5.69	147.	53.
90012	87.	46.	10.3	104.	7.6	4.64	146.	34.
90028	102.	81.	10.6	103.	7.1	4.60	146.	42.
MEAN	101.	62.	10.5	103.	7.5	4.89	145.	57.
S.D.	9.3	12.7	0.32	1.5	0.44	0.468	2.2	20.7
S.E.	4.1	5.7	0.14	0.7	0.20	0.209	1.0	9.3
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	50 PPM	MALES									
89972	4.3	6.3	2.1	2.08	0.1	11.1	0.2	126.	34.	73.	2.4
89973	4.3	6.3	2.0	2.16	0.1	15.0	0.3	187.	32.	110.	0.4
89990	4.4	6.6	2.2	2.00	0.1	12.5	0.1	134.	30.	70.	0.9
89995	4.2	6.5	2.2	1.90	0.1	13.3	0.2	111.	30.	102.	0.7
90023	4.2	6.3	2.0	2.11	0.1	12.4	0.2	129.	36.	92.	0.7
MEAN	4.3	6.4	2.1	2.05	0.1	12.9	0.2	137.	32.	89.	1.0
S.D.	0.08	0.14	0.10	0.102	0.00	1.43	0.07	29.0	2.6	17.6	0.79
S.E.	0.04	0.06	0.04	0.046	0.00	0.64	0.03	13.0	1.2	7.9	0.35
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 50 PPM		MALES						
89972	125.	68.	10.9	104.	6.9	4.52	144.	99.
89973	112.	55.	10.4	100.	6.7	4.40	143.	53.
89990	106.	52.	10.5	103.	6.2	4.36	143.	33.
89995	123.	53.	10.4	103.	6.5	5.26	144.	56.
90023	107.	50.	10.5	103.	7.8	4.47	145.	41.
MEAN	115.	56.	10.5	103.	6.8	4.60	144.	56.
S.D.	8.9	7.2	0.21	1.5	0.61	0.373	0.8	25.5
S.E.	4.0	3.2	0.09	0.7	0.27	0.167	0.4	11.4
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 100 PPM MALES											
89981	4.3	6.4	2.2	1.98	0.1	15.8	0.3	120.	39.	95.	1.1
89998	4.4	6.5	2.1	2.11	0.1	14.9	0.3	151.	34.	130.	0.1
90010	4.2	6.0	1.8	2.28	0.1	15.4	0.2	128.	32.	91.	1.4
90027	4.4	6.6	2.2	1.97	0.1	13.4	0.3	138.	40.	125.	0.8
90032	4.5	6.9	2.4	1.83	0.1	12.2	0.3	111.	24.	69.	0.5
MEAN	4.4	6.5	2.1	2.03	0.1	14.3	0.3	130.	34.	102.	0.8
S.D.	0.11	0.33	0.22	0.169	0.00	1.50	0.04	15.6	6.4	25.4	0.51
S.E.	0.05	0.15	0.10	0.076	0.00	0.67	0.02	7.0	2.9	11.3	0.23
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 100 PPM		MALES						
89981	128.	73.	10.9	104.	7.7	4.48	146.	64.
89998	104.	59.	10.6	103.	8.0	5.34	146.	40.
90010	105.	81.	10.3	104.	8.1	5.29	145.	65.
90027	106.	58.	10.2	105.	6.7	5.00	146.	42.
90032	101.	53.	11.0	105.	7.4	4.51	146.	36.
MEAN	109.	65.	10.6	104.	7.6	4.92	146.	49.
S.D.	10.9	11.7	0.35	0.8	0.56	0.413	0.4	14.0
S.E.	4.9	5.2	0.16	0.4	0.25	0.185	0.2	6.2
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 9

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0 PPM FEMALES											
90039	4.6	6.5	2.0	2.35	0.1	16.4	0.2	111.	29.	92.	1.1
90059	4.9	7.3	2.4	2.03	0.1	17.5	0.4	115.	29.	88.	0.4
90075	4.8	6.5	1.8	2.69	0.1	14.6	0.2	105.	27.	71.	0.5
90082	4.7	6.6	1.9	2.44	0.1	19.0	0.4	112.	32.	122.	0.3
90085	4.6	6.5	1.9	2.45	0.1	14.7	0.3	140.	27.	95.	0.4
MEAN	4.7	6.7	2.0	2.39	0.1	16.4	0.3	117.	29.	94.	0.5
S.D.	0.13	0.35	0.23	0.238	0.00	1.88	0.10	13.6	2.0	18.4	0.32
S.E.	0.06	0.16	0.10	0.107	0.00	0.84	0.04	6.1	0.9	8.2	0.14
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 0 PPM		FEMALES						
90039	114.	72.	10.9	103.	6.8	4.74	142.	29.
90059	108.	80.	10.5	103.	6.2	4.47	144.	31.
90075	100.	71.	11.1	105.	6.8	4.88	145.	40.
90082	117.	64.	10.7	103.	8.1	4.81	144.	37.
90085	100.	81.	9.9	107.	6.2	4.59	144.	30.
MEAN	108.	74.	10.6	104.	6.8	4.70	144.	33.
S.D.	7.8	7.0	0.46	1.8	0.78	0.167	1.1	4.8
S.E.	3.5	3.1	0.21	0.8	0.35	0.075	0.5	2.2
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	20 PPM	FEMALES									
90045	4.8	6.8	2.0	2.36	0.1	14.5	0.3	90.	34.	80.	0.4
90048	5.1	7.2	2.0	2.50	0.1	17.8	0.4	115.	52.	123.	1.7
90060	5.2	7.6	2.4	2.15	0.1	15.0	0.4	62.	32.	76.	0.2
90068	4.6	6.6	1.9	2.40	0.1	14.2	0.3	139.	43.	97.	1.1
90083	4.8	6.5	1.7	2.73	0.1	16.2	0.3	98.	24.	88.	0.7
MEAN	4.9	6.9	2.0	2.43	0.1	15.5	0.3	101.	37.	93.	0.8
S.D.	0.24	0.46	0.25	0.212	0.00	1.48	0.05	28.7	10.8	18.7	0.60
S.E.	0.11	0.20	0.11	0.095	0.00	0.66	0.02	12.8	4.8	8.4	0.27
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP:	20 PPM	FEMALES						
90045	108.	65.	10.8	104.	7.2	4.54	144.	31.
90048	111.	80.	11.0	101.	7.4	4.46	142.	48.
90060	103.	92.	11.3	104.	8.2	5.03	146.	32.
90068	104.	68.	10.2	105.	6.7	4.72	144.	26.
90083	96.	40.	10.5	105.	8.2	4.56	146.	22.
MEAN	104.	69.	10.8	104.	7.5	4.66	144.	32.
S.D.	5.7	19.4	0.43	1.6	0.65	0.226	1.7	9.9
S.E.	2.5	8.7	0.19	0.7	0.29	0.101	0.7	4.4
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 50 PPM	FEMALES										
90051	4.6	6.5	1.9	2.45	0.1	15.3	0.2	126.	34.	109.	0.9
90070	4.7	6.6	1.9	2.52	0.1	12.6	0.3	127.	28.	93.	0.1
90077	4.5	6.2	1.7	2.73	0.1	14.8	0.2	95.	30.	91.	0.7
90090	5.2	7.0	1.8	2.90	0.2	18.9	0.3	73.	31.	60.	1.0
90104	4.9	7.0	2.1	2.32	0.2	15.1	0.2	131.	25.	64.	0.8
MEAN	4.8	6.7	1.9	2.58	0.1	15.3	0.2	110.	30.	83.	0.7
S.D.	0.28	0.34	0.15	0.231	0.05	2.27	0.05	25.4	3.4	20.8	0.35
S.E.	0.12	0.15	0.07	0.103	0.02	1.01	0.02	11.4	1.5	9.3	0.16
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A30 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL SERUM CHEMISTRY VALUES

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP:	50 PPM	FEMALES						
90051	95.	43.	10.6	103.	6.9	4.70	144.	26.
90070	126.	76.	10.6	104.	7.1	4.52	144.	32.
90077	117.	85.	10.6	103.	8.0	4.54	144.	29.
90090	126.	57.	11.0	105.	5.8	4.03	145.	38.
90104	130.	86.	10.8	104.	6.1	3.71	145.	43.
MEAN	119.	69.	10.7	104.	6.8	4.30	144.	34.
S.D.	14.1	18.8	0.18	0.8	0.87	0.414	0.5	6.9
S.E.	6.3	8.4	0.08	0.4	0.39	0.185	0.2	3.1
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A30 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 15

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 100 PPM FEMALES											
90035	5.0	7.3	2.2	2.27	0.2	13.4	0.3	156.	39.	99.	2.0
90036	5.2	7.0	1.8	2.94	0.1	12.2	0.2	119.	33.	77.	1.3
90044	4.7	7.0	2.3	2.04	0.1	13.0	0.2	88.	39.	121.	1.0
90057	4.5	6.4	1.9	2.33	0.1	15.9	0.3	129.	27.	92.	0.5
90088	4.7	6.5	1.9	2.54	0.1	13.2	0.3	143.	32.	95.	1.3
MEAN	4.8	6.8	2.0	2.42	0.1	13.5	0.3	127.	34.	97.	1.2
S.D.	0.28	0.38	0.22	0.339	0.04	1.40	0.05	25.9	5.1	15.9	0.54
S.E.	0.12	0.17	0.10	0.152	0.02	0.62	0.02	11.6	2.3	7.1	0.24
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 100 PPM	FEMALES							
90035	90.	56.	11.2	105.	9.6	5.37	149.	45.
90036	97.	88.	10.9	105.	7.3	4.49	145.	43.
90044	107.	68.	10.6	103.	6.3	4.78	142.	29.
90057	92.	45.	10.2	104.	7.6	4.18	144.	24.
90088	116.	60.	11.2	104.	6.6	3.96	144.	37.
MEAN	100.	63.	10.8	104.	7.5	4.56	145.	36.
S.D.	10.9	16.1	0.43	0.8	1.29	0.551	2.6	9.0
S.E.	4.9	7.2	0.19	0.4	0.58	0.246	1.2	4.0
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A31 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89975 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.90	2.861
LUNGS	1.51	0.396
KIDNEYS	2.49	0.654
FINAL BODY WT(G)	381.	

NO SIGNIFICANT CHANGES OBSERVED

	GRADE			
GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 89982 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.26	2.780
LUNGS	1.52	0.375
KIDNEYS	2.92	0.721
FINAL BODY WT(G)	405.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89991 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.62	2.429
LUNGS	1.60	0.404
KIDNEYS	2.46	0.621
FINAL BODY WT(G)	396.	

KIDNEYS — NO SIGNIFICANT CHANGES OBSERVED

TRACHEA — NOT PRESENT FOR EXAMINATION

GRADE

MICRO: REGENERATION, RENAL TUBULAR 1

MICRO: NOT PRESENT FOR EXAMINATION
NOT IN PLANE OF SECTION

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	LIVER	LUNGS	LARYNX	NASAL LEVEL I
	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

MICRO:TRACHEA

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90009 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	8.60	2.486
LUNGS	1.34	0.387
KIDNEYS	2.10	0.607
FINAL BODY WT(G)	346.	

KIDNEYS
NO SIGNIFICANT
CHANGES OBSERVED

GRADE

MICRO: REGENERATION, RENAL TUBULAR 1

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 5

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90030 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	8.18	2.344
LUNGS	1.29	0.370
KIDNEYS	2.32	0.665
FINAL BODY WT(G)	349.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE				
GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 89988 GROUP 2: 20 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.55	2.946
LUNGS	1.60	0.408
KIDNEYS	2.65	0.676
FINAL BODY WT(G)	392.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90000 GROUP 2: 20 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.63	2.993
LUNGS	1.53	0.363
KIDNEYS	3.06	0.725
FINAL BODY WT(G)	422.	

KIDNEYS — NASAL LEVEL II — NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	REGENERATION, RENAL TUBULAR	1
MICRO:	INFLAMMATION, CHRONIC	2
	NASO-MAXILLO-TURBINATES. ARTIFACTUAL LOSS OF EPITHELIUM	

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90003 GROUP 2: 20 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.84	2.674
LUNGS	1.57	0.427
KIDNEYS	2.81	0.764
FINAL BODY WT(G)	368.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90012 GROUP 2: 20 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.	
LIVER	9.17	2.492	NASAL LEVEL II
LUNGS	1.36	0.370	NO SIGNIFICANT
KIDNEYS	2.45	0.666	CHANGES OBSERVED
FINAL BODY WT(G)	368.		

					GRADE
MICRO:	INFLAMMATION, SUBACUTE				2
	NASOTURBINATE, MAXILLOTURBINATE, SEPTUM, LAT WALL				
GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
	EYES	HEART	INTESTINE	KIDNEYS	
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD	
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH	
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS	
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX	
	NASAL TISSUES				
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA	
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV	
	NASAL LEVEL V	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90028 GROUP 2: 20 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.67	2.615
LUNGS	1.60	0.392
KIDNEYS	2.65	0.650
FINAL BODY WT(G)	408.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, SUBACUTE NASOTURBINATE, MAXILLOTURBINATE	2
NASAL LEVEL II	MICRO: INFLAMMATION, SUBACUTE NASOTURBINATE, MAXILLOTURBINATE, SEPTUM, LAT WALL	2
NASAL LEVEL III	MICRO: INFLAMMATION, SUBACUTE NASOTURBINATE, MAXILLOTURBINATE, LATERAL WALLS, SEPTUM	3

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89972 GROUP 3: 50 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.78	2.832
LUNGS	1.53	0.368
KIDNEYS	2.94	0.707
FINAL BODY WT(G)	416.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC MAXILLOTURBINATE	1
NASAL LEVEL II	MICRO: HYPERPLASIA, GOBLET CELL SEPTUM	2
	INFLAMMATION, CHRONIC NASOTURBINATE, MAXILLOTURBINATE, SEPTUM, LAT WALL	1
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 89973 GROUP 3: 50 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.97	2.709
LUNGS	1.47	0.399
KIDNEYS	2.85	0.774
FINAL BODY WT(G)	368.	

NASAL LEVEL II
NO SIGNIFICANT
CHANGES OBSERVED

GRADE 1

MICRO: HYPERPLASIA, GOBLET CELL
SEPTUM

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 89990 GROUP 3: 50 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.78	2.763
LUNGS	1.43	0.404
KIDNEYS	2.65	0.749
FINAL BODY WT(G)	354.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, SUBACUTE	
	MAXILLOTURBINATE	2
NASAL LEVEL II	MICRO: INFLAMMATION, SUBACUTE	
	NASOTURBINATE, MAXILLOTURBINATE, SEPTUM, LAT WALL	3
	HYPERPLASIA, GOBLET CELL	
	SEPTUM	2
NASAL LEVEL III	MICRO: INFLAMMATION, SUBACUTE	
	NASOTURBINATE, MAXILLOTURBINATE, LATERAL WALLS, SEPTUM	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 89995 GROUP 3: 50 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.41	2.881
LUNGS	1.47	0.371
KIDNEYS	2.50	0.631
FINAL BODY WT(G)	396.	

NASAL LEVEL I — MICRO: INFLAMMATION, CHRONIC — GRADE 3
NASOTURBINATE, MAXILLOTURBINATE

NASAL LEVEL II — MICRO: HYPERPLASIA, GOBLET CELL — GRADE 1
SEPTUM

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90023 GROUP 3: 50 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.89	2.740
LUNGS	1.52	0.421
KIDNEYS	2.76	0.765
FINAL BODY WT(G)	361.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, SUBACUTE	2
	TURBINATES, SEPTUM, LATERAL WALL	
NASAL LEVEL II	MICRO: INFLAMMATION, SUBACUTE	3
	NASOTURBINATE, MAXILLOTURBINATE, SEPTUM, LAT WALL	
	HYPERPLASIA, GOBLET CELL	2
	SEPTUM	
NASAL LEVEL III	MICRO: DEGENERATION, RESPIRATORY EPITHELIUM	1
	SEPTUM AND LATERAL WALL, VENTRAL ASPECT	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 89981 GROUP 4: 100 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.76	2.710
LUNGS	1.49	0.375
KIDNEYS	2.58	0.650
FINAL BODY WT(G)	397.	

		GRADE
LUNGS	MICRO: ATELECTASIS	3
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC	2
	NASOTURBINATE, LATERAL WALLS, MULTIFOCAL	
NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	2
	DORSAL MEATUS	
	INFLAMMATION, SUBACUTE	2
	NASOTURBINATE, MAXILLOTURBINATE, SEPTUM, LAT WALL	
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	3
	DORSAL MEATUS	
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	2
	DORSAL MEATUS	
NASAL LEVEL VI	MICRO: DEGENERATION, RESPIRATORY EPITHELIUM	2
	NASOPHARYNGEAL MEATUS	
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	TRACHEA	LARYNX
	NASAL LEVEL V			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 89998 GROUP 4: 100 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.69	2.619
LUNGS	1.47	0.397
KIDNEYS	2.66	0.719
FINAL BODY WT(G)	370.	

		GRADE
NASAL LEVEL I	MICRO: HYPERKERATOSIS	1
	MEDIAN SEPTUM, UNILATERAL	
	INFLAMMATION, CHRONIC	2
	NASOTURBINATE, LATERAL WALLS, MULTIFOCAL	
NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	1
	DORSAL MEATUS	
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	1
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	2
	DORSAL MEATUS	

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90010 GROUP 4: 100 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.35	2.748
LUNGS	1.43	0.346
KIDNEYS	2.99	0.724
FINAL BODY WT(G)	413.	

		GRADE
NASAL LEVEL II	MICRO: INFLAMMATION, SUBACUTE NASOTURBINATE AND MAXILLOTURBINATE, MULTIFOCAL	2
	DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	1
	HYPERPLASIA, GOBLET CELL SEPTUM	3
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90027 GROUP 4: 100 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.38	2.798
LUNGS	1.49	0.402
KIDNEYS	2.43	0.655
FINAL BODY WT(G)	371.	

NASAL LEVEL I — MICRO: INFLAMMATION, SUBACUTE — GRADE 2
NASOTURBINATE, LATERAL WALLS, MULTIFOCAL

NASAL LEVEL II — MICRO: DEGENERATION, OLFACTORY EPITHELIUM — GRADE 1
DORSAL MEATUS

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90032 GROUP 4: 100 PPM MALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	8.76	2.532
LUNGS	1.31	0.379
KIDNEYS	2.28	0.659
FINAL BODY WT(G)	346.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, SUBACUTE NASOTURBINATE, LATERAL WALLS, MULTIFOCAL	2
NASAL LEVEL II	MICRO: HYPERPLASIA, GOBLET CELL SEPTUM	3
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	3
	INFLAMMATION, SUBACUTE NASOLACRIMAL DUCT	3
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90039 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.53	2.767
LUNGS	1.04	0.441
KIDNEYS	1.68	0.712
FINAL BODY WT(G)	236.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE				
GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90059 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.63	3.055
LUNGS	1.12	0.516
KIDNEYS	1.51	0.696
FINAL BODY WT(G)	217.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE				
GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90075 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	5.97	2.739
LUNGS	1.04	0.477
KIDNEYS	1.52	0.697
FINAL BODY WT(G)	218.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90082 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.32	2.899
LUNGS	1.02	0.468
KIDNEYS	1.62	0.743
FINAL BODY WT(G)	218.	

		GRADE
NASAL LEVEL II	MICRO: HEMORRHAGE LATERAL WALL	1
NASAL LEVEL IV	MICRO: HEMORRHAGE ETHMOTURBINATES	3
NASAL LEVEL V	MICRO: HEMORRHAGE ETHMOTURBINATES	2
NASAL LEVEL VI	MICRO: HEMORRHAGE	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90085 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.46	2.871
LUNGS	1.06	0.471
KIDNEYS	1.71	0.760
FINAL BODY WT(G)	225.	

LIVER
LUNGS
UTERUS

UTERUS
NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO:	INFILTRATE, LYMPHOCYTE	1
MICRO:	ATELECTASIS	2
GROSS:	CONTENTS, CLEAR FLUID BOTH HORNS	P
MICRO:	DILATATION, LUMEN	3

GROSS:

ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
HEART	INTESTINE	KIDNEYS	LIVER
LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
OVARIES	PANCREAS	PITUITARY	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
CERVIX	VAGINA	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	TRACHEA	LARYNX	NASAL LEVEL I
NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
NASAL LEVEL VI			

GROSS/MICRO CORRELATIONS

GROSS FINDING	<===> CONFIRMING MICROSCOPIC FINDING
UTERUS: CONTENTS, CLEAR FLUID	<===>UTERUS: DILATATION, LUMEN

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90045 GROUP 2: 20 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.09	2.707
LUNGS	1.09	0.484
KIDNEYS	1.61	0.716
FINAL BODY WT(G)	225.	

KIDNEYS

NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	MINERALIZATION	2
	INFLAMMATION, CHRONIC, INTERSTITIAL	2
MICRO:	INFLAMMATION, CHRONIC	1
	NASOTURBINATE, MAXILLOTURBINATE	

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 27

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90048 GROUP 2: 20 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.41	3.075
LUNGS	1.14	0.473
KIDNEYS	1.68	0.697
FINAL BODY WT(G)	241.	

NO SIGNIFICANT CHANGES OBSERVED

	GRADE			
GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90060 GROUP 2: 20 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.81	2.961
LUNGS	1.18	0.513
KIDNEYS	1.65	0.717
FINAL BODY WT(G)	230.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
KIDNEYS	GROSS: AREA(S), DEPRESSED	P
	FEW, PINPOINT TO 1 MM IN DIAMETER, IN CORTEX, RIGHT	
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC	2
	NASOTURBINATE, MAXILLOTURBINATE	

GROSS:

ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
HEART	INTESTINE	LIVER	LYMPH NODE, MES
LUNGS	MAMMARY GLAND	OVIDUCTS	OVARIES
PANCREAS	PITUITARY	SPINAL CORD	SAL. GLAND MAND
SKIN	SPLEEN	STOMACH	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
CERVIX	VAGINA	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
NASAL LEVEL V	NASAL LEVEL VI		

GROSS/MICRO CORRELATIONS

GROSS FINDING	
KIDNEYS: AREA(S), DEPRESSED	<===>GROSS UNCONFIRMED

<===> CONFIRMING MICROSCOPIC FINDING

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90068 GROUP 2: 20 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.73	2.939
LUNGS	1.14	0.498
KIDNEYS	1.86	0.812
FINAL BODY WT(G)	229.	

		GRADE
NASAL LEVEL I	MICRO: HYPERPLASIA, GOBLET CELL SEPTUM	2
	INFLAMMATION, CHRONIC NASOTURBINATE, LATERAL WALLS, MULTIFOCAL	2
NASAL LEVEL II	MICRO: HYPERPLASIA, GOBLET CELL SEPTUM	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90083 GROUP 2: 20 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	5.61	2.585
LUNGS	1.16	0.535
KIDNEYS	1.64	0.756
FINAL BODY WT(G)	217.	

NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

NASAL LEVEL IV

		GRADE
MICRO:	INFLAMMATION, CHRONIC NASOTURBINATE, LATERAL WALLS, MULTIFOCAL	1
MICRO:	HEMORRHAGE ETHMOTURBINATES	2

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90051 GROUP 3: 50 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.19	2.776
LUNGS	1.09	0.489
KIDNEYS	1.68	0.753
FINAL BODY WT(G)	223.	

		GRADE
LUNGS	MICRO: ATELECTASIS	2
NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	1
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	TRACHEA	LARYNX
	NASAL LEVEL I	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 32

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90070 GROUP 3: 50 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	5.97	2.677
LUNGS	1.05	0.471
KIDNEYS	1.56	0.700
FINAL BODY WT(G)	223.	

KIDNEYS — NASAL LEVEL I — NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	MINERALIZATION	2
MICRO:	INFLAMMATION, CHRONIC	2
	NASOTURBINATE, LATERAL WALLS, MULTIFOCAL	

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90077 GROUP 3: 50 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	5.62	2.796
LUNGS	1.08	0.537
KIDNEYS	1.54	0.766
FINAL BODY WT(G)	201.	

NASAL LEVEL I
NO SIGNIFICANT
CHANGES OBSERVED

				GRADE
MICRO: INFLAMMATION, CHRONIC				2
NASOTURBINATE, MAXILLOTURBINATE				
GROSS: ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES	
HEART	INTESTINE	KIDNEYS	LIVER	
LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS	
OVARIES	PANCREAS	PITUITARY	SPINAL CORD	
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH	
THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER	
UTERUS	CERVIX	VAGINA	DIAPHRAGM	
LARYNX	NASAL TISSUES			
MICRO: KIDNEYS	LIVER	LUNGS	TRACHEA	
LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV	
NASAL LEVEL V	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90090 GROUP 3: 50 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.29	2.711
LUNGS	1.10	0.474
KIDNEYS	1.58	0.681
FINAL BODY WT(G)	232.	

KIDNEYS
NASAL LEVEL I

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	MINERALIZATION	2
MICRO:	INFLAMMATION, CHRONIC	2
	NASOTURBINATE, LATERAL WALLS, MULTIFOCAL	

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90104 GROUP 3: 50 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.57	2.738
LUNGS	1.10	0.458
KIDNEYS	1.70	0.708
FINAL BODY WT(G)	240.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE				
GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90035 GROUP 4: 100 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.18	2.986
LUNGS	1.13	0.546
KIDNEYS	1.82	0.879
FINAL BODY WT(G)	207.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC TURBINATES, SEPTUM, LATERAL WALL	2
NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	1
	HYPERPLASIA, GOBLET CELL SEPTUM	2
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL III	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90036 GROUP 4: 100 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.12	2.795
LUNGS	1.15	0.525
KIDNEYS	1.73	0.790
FINAL BODY WT(G)	219.	

NASAL LEVEL I

NASAL LEVEL II

NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO: INFLAMMATION, CHRONIC				2
NASOTURBINATE, LATERAL WALLS, MULTIFOCAL				
MICRO: DEGENERATION, OLFACTORY EPITHELIUM				1
DORSAL MEATUS				

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90044 GROUP 4: 100 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	5.85	2.543
LUNGS	1.12	0.487
KIDNEYS	1.61	0.700
FINAL BODY WT(G)	230.	

LIVER
NASAL LEVEL I
NASAL LEVEL III
NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFILTRATE, LYMPHOCYTE	1
MICRO:	HYPERPLASIA, GOBLET CELL	1
	SEPTUM	
MICRO:	DEGENERATION, OLFACTORY EPITHELIUM	1
	DORSAL MEATUS	

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL II	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A31 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90057 GROUP 4: 100 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.91	2.891
LUNGS	1.30	0.544
KIDNEYS	1.69	0.707
FINAL BODY WT(G)	239.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC TURBINATES, SEPTUM, LATERAL WALL	3
NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2
	INFLAMMATION, CHRONIC NASOTURBINATE, MAXILLOTURBINATE, SEPTUM, LAT WALL	2
NASAL LEVEL III	MICRO: DEGENERATION, RESPIRATORY EPITHELIUM VENTRAL MEATUS	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 90088 GROUP 4: 100 PPM FEMALE SCHEDULED EUTH 12/17/07 DATE OF DEATH: 12/17/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.78	2.790
LUNGS	1.28	0.527
KIDNEYS	1.76	0.724
FINAL BODY WT(G)	243.	

NASAL LEVEL II NO SIGNIFICANT CHANGES OBSERVED

GRADE

MICRO: DEGENERATION, OLFACTORY EPITHELIUM 2
DORSAL MEATUS

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

TABLE A32 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89975	381.	10.90	1.51	2.49
89982	405.	11.26	1.52	2.92
89991	396.	9.62	1.60	2.46
90009	346.	8.60	1.34	2.10
90030	349.	8.18	1.29	2.32
MEAN	375.	9.71	1.45	2.46
S.D.	26.9	1.360	0.131	0.301
S.E.	12.0	0.608	0.059	0.134
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A32 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G] — DAY 14

MALE GROUP: 20 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89988	392.	11.55	1.60	2.65
90000	422.	12.63	1.53	3.06
90003	368.	9.84	1.57	2.81
90012	368.	9.17	1.36	2.45
90028	408.	10.67	1.60	2.65
MEAN	392.	10.77	1.53	2.72
S.D.	24.0	1.370	0.100	0.227
S.E.	10.7	0.612	0.045	0.102
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A32 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89972	416.	11.78	1.53	2.94
89973	368.	9.97	1.47	2.85
89990	354.	9.78	1.43	2.65
89995	396.	11.41	1.47	2.50
90023	361.	9.89	1.52	2.76
MEAN	379.	10.57	1.48	2.74
S.D.	26.1	0.951	0.041	0.172
S.E.	11.7	0.425	0.018	0.077
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A32 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 100 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89981	397.	10.76	1.49	2.58
89998	370.	9.69	1.47	2.66
90010	413.	11.35	1.43	2.99
90027	371.	10.38	1.49	2.43
90032	346.	8.76	1.31	2.28
MEAN	379.	10.19	1.44	2.59
S.D.	26.0	1.000	0.076	0.268
S.E.	11.6	0.447	0.034	0.120
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A32 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90039	236.	6.53	1.04	1.68
90059	217.	6.63	1.12	1.51
90075	218.	5.97	1.04	1.52
90082	218.	6.32	1.02	1.62
90085	225.	6.46	1.06	1.71
MEAN	223.	6.38	1.06	1.61
S.D.	8.0	0.256	0.038	0.091
S.E.	3.6	0.115	0.017	0.041
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A32 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 20 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90045	225.	6.09	1.09	1.61
90048	241.	7.41	1.14	1.68
90060	230.	6.81	1.18	1.65
90068	229.	6.73	1.14	1.86
90083	217.	5.61	1.16	1.64
MEAN	228.	6.53	1.14	1.69
S.D.	8.7	0.695	0.033	0.099
S.E.	3.9	0.311	0.015	0.044
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A32 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90051	223.	6.19	1.09	1.68
90070	223.	5.97	1.05	1.56
90077	201.	5.62	1.08	1.54
90090	232.	6.29	1.10	1.58
90104	240.	6.57	1.10	1.70
MEAN	224.	6.13	1.08	1.61
S.D.	14.6	0.357	0.021	0.073
S.E.	6.5	0.159	0.009	0.033
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A32 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 100 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90035	207.	6.18	1.13	1.82
90036	219.	6.12	1.15	1.73
90044	230.	5.85	1.12	1.61
90057	239.	6.91	1.30	1.69
90088	243.	6.78	1.28	1.76
MEAN	228.	6.37	1.20	1.72
S.D.	14.8	0.455	0.087	0.079
S.E.	6.6	0.204	0.039	0.035
N	5	5	5	5

FBW = FINAL BODY WEIGHT

POFBWv4.14
03/03/2008
R:03/25/2008

TABLE A33 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G] — DAY 13

MALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89975	381.	2.861	0.396	0.654
89982	405.	2.780	0.375	0.721
89991	396.	2.429	0.404	0.621
90009	346.	2.486	0.387	0.607
90030	349.	2.344	0.370	0.665
MEAN	375.	2.580	0.386	0.654
S.D.	26.9	0.2271	0.0142	0.0445
S.E.	12.0	0.1016	0.0063	0.0199
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A33 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G] — DAY 13

MALE GROUP: 20 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89988	392.	2.946	0.408	0.676
90000	422.	2.993	0.363	0.725
90003	368.	2.674	0.427	0.764
90012	368.	2.492	0.370	0.666
90028	408.	2.615	0.392	0.650
MEAN	392.	2.744	0.392	0.696
S.D.	24.0	0.2167	0.0265	0.0471
S.E.	10.7	0.0969	0.0118	0.0211
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068D
SPONSOR:LYONDELL CHEMICAL

TABLE A33 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89972	416.	2.832	0.368	0.707
89973	368.	2.709	0.399	0.774
89990	354.	2.763	0.404	0.749
89995	396.	2.881	0.371	0.631
90023	361.	2.740	0.421	0.765
MEAN	379.	2.785	0.393	0.725
S.D.	26.1	0.0702	0.0226	0.0586
S.E.	11.7	0.0314	0.0101	0.0262
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A33 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 100 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89981	397.	2.710	0.375	0.650
89998	370.	2.619	0.397	0.719
90010	413.	2.748	0.346	0.724
90027	371.	2.798	0.402	0.655
90032	346.	2.532	0.379	0.659
MEAN	379.	2.681	0.380	0.681
S.D.	26.0	0.1061	0.0221	0.0368
S.E.	11.6	0.0475	0.0099	0.0165
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A33 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 5

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G] — DAY 13

FEMALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90039	236.	2.767	0.441	0.712
90059	217.	3.055	0.516	0.696
90075	218.	2.739	0.477	0.697
90082	218.	2.899	0.468	0.743
90085	225.	2.871	0.471	0.760
MEAN	223.	2.866	0.475	0.722
S.D.	8.0	0.1253	0.0269	0.0287
S.E.	3.6	0.0560	0.0121	0.0128
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A33 (4-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 20 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90045	225.	2.707	0.484	0.716
90048	241.	3.075	0.473	0.697
90060	230.	2.961	0.513	0.717
90068	229.	2.939	0.498	0.812
90083	217.	2.585	0.535	0.756
MEAN	228.	2.853	0.501	0.740
S.D.	8.7	0.2009	0.0244	0.0458
S.E.	3.9	0.0899	0.0109	0.0205
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A33 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G] — DAY 13

FEMALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90051	223.	2.776	0.489	0.753
90070	223.	2.677	0.471	0.700
90077	201.	2.796	0.537	0.766
90090	232.	2.711	0.474	0.681
90104	240.	2.738	0.458	0.708
MEAN	224.	2.740	0.486	0.722
S.D.	14.6	0.0481	0.0307	0.0363
S.E.	6.5	0.0215	0.0137	0.0162
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A33 (4-HOUR EXPOSURE)

PROJECT NO.:WIL-14068D — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G] — DAY 13

FEMALE GROUP: 100 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90035	207.	2.986	0.546	0.879
90036	219.	2.795	0.525	0.790
90044	230.	2.543	0.487	0.700
90057	239.	2.891	0.544	0.707
90088	243.	2.790	0.527	0.724
MEAN	228.	2.801	0.526	0.760
S.D.	14.8	0.1651	0.0237	0.0754
S.E.	6.6	0.0738	0.0106	0.0337
N	5	5	5	5

FBW = FINAL BODY WEIGHT

POFBWv4.14
03/03/2008

TABLE A34 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SURVIVAL AND DISPOSITION

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
89996	M	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90001	M	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90007	M	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90016	M	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90029	M	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
89997	M	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
89999	M	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90019	M	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90026	M	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90031	M	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
89992	M	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90004	M	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90020	M	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90021	M	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90025	M	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
89966	M	50 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
89967	M	50 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
89986	M	50 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
89993	M	50 PPM	FOUND DEAD	12	05-DEC-07	1
90014	M	50 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (12)

ANIMAL	SEX	GROUP	TYPE OF DEATH	AGE IN WEEKS A	DATE OF DEATH	DAYS ON STUDY
90049	F	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90055	F	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90096	F	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90101	F	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90102	F	0 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90037	F	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90040	F	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90043	F	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90065	F	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90086	F	10 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90038	F	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90042	F	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90063	F	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90074	F	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90081	F	20 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90050	F	50 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90053	F	50 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90064	F	50 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90076	F	50 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14
90094	F	50 PPM	SCHEDULED EUTHANASIA	14	18-DEC-07	14

A = CALCULATED TO THE NEAREST WHOLE WEEK USING THE MEAN AGE IN WEEKS AT INITIATION OF DOSING (12)

TABLE A35 (DISPOSITIONS - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89996	M	0 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90001	M	0 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90007	M	0 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90016	M	0 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90029	M	0 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
89997	M	10 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
89999	M	10 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90019	M	10 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90026	M	10 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90031	M	10 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
89992	M	20 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90004	M	20 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90020	M	20 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90021	M	20 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90025	M	20 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
89966	M	50 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
89967	M	50 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
89986	M	50 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
89993	M	50 PPM	DISPOSITION	1	17:55	P	FOUND DEAD
90014	M	50 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90049	F	0 PPM	DISPOSITION	14	8:04	P	SCHEDULED EUTHANASIA
90055	F	0 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90096	F	0 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90101	F	0 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90102	F	0 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90037	F	10 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90040	F	10 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90043	F	10 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90065	F	10 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A35 (DISPOSITIONS - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 14

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90086	F	10 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90038	F	20 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90042	F	20 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90063	F	20 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90074	F	20 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90081	F	20 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90050	F	50 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90053	F	50 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90064	F	50 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90076	F	50 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA
90094	F	50 PPM	DISPOSITION	14	8:05	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A36 (30 MINUTES INTO EXPOSURE - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89967	M	50 PPM	CARDIO-PULMONARY	0	9:22	P	GASPING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.11
02/27/2008
R:03/03/2008

TABLE A37 (1 HOUR INTO EXPOSURE - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
NO SIGNIFICANT CLINICAL OBSERVATIONS AT 1 HOUR INTO EXPOSURE							

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.11
02/27/2008
R:03/03/2008

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A38 (4 HOURS INTO EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89967	M	50 PPM	CARDIO-PULMONARY	0	12:51	P	GASPING
89986	M	50 PPM	CARDIO-PULMONARY	0	12:52	P	INCREASED RESPIRATION

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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R:03/03/2008

TABLE A39 (DURING EXPOSURE - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL NOVEL STIMULUS/AROUSAL RESPONSE OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89996	M	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90001	M	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90007	M	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90016	M	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90029	M	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89997	M	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89999	M	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90019	M	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90026	M	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90031	M	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89992	M	20 PPM	BEHAVIOR/CNS	0	16:47	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90004	M	20 PPM	BEHAVIOR/CNS	0	16:47	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90020	M	20 PPM	BEHAVIOR/CNS	0	16:47	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90021	M	20 PPM	BEHAVIOR/CNS	0	16:47	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90025	M	20 PPM	BEHAVIOR/CNS	0	16:47	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89966	M	50 PPM	BEHAVIOR/CNS	0	16:49	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89967	M	50 PPM	BEHAVIOR/CNS	0	16:49	P	NO REACTION TO STIMULUS
89986	M	50 PPM	BEHAVIOR/CNS	0	16:49	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
89993	M	50 PPM	BEHAVIOR/CNS	0	16:49	P	NO REACTION TO STIMULUS
90014	M	50 PPM	BEHAVIOR/CNS	0	16:49	P	NO REACTION TO STIMULUS
90049	F	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90055	F	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90096	F	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90101	F	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90102	F	0 PPM	BEHAVIOR/CNS	0	16:44	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90037	F	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90040	F	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90043	F	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90065	F	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90086	F	10 PPM	BEHAVIOR/CNS	0	16:46	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90038	F	20 PPM	BEHAVIOR/CNS	0	16:47	P	NO REACTION TO STIMULUS
90042	F	20 PPM	BEHAVIOR/CNS	0	16:47	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90063	F	20 PPM	BEHAVIOR/CNS	0	16:47	P	NO REACTION TO STIMULUS
90074	F	20 PPM	BEHAVIOR/CNS	0	16:47	P	NO REACTION TO STIMULUS
90081	F	20 PPM	BEHAVIOR/CNS	0	16:47	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90050	F	50 PPM	BEHAVIOR/CNS	0	16:49	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90053	F	50 PPM	BEHAVIOR/CNS	0	16:49	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90064	F	50 PPM	BEHAVIOR/CNS	0	16:49	P	NO REACTION TO STIMULUS
90076	F	50 PPM	BEHAVIOR/CNS	0	16:49	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH
90094	F	50 PPM	BEHAVIOR/CNS	0	16:49	P	SLIGHT REACTION TO STIMULUS - EAR FLICK, FLINCH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A40 (END OF EXPOSURE - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89993	M	50 PPM	CARDIO-PULMONARY	0	16:44	P	GASPING
90053	F	50 PPM	CARDIO-PULMONARY	0	16:43	P	GASPING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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TABLE A41 (1 HOUR POST-EXPOSURE - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89996	M	0 PPM	NORMAL	0	17:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90001	M	0 PPM	NORMAL	0	17:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90007	M	0 PPM	NORMAL	0	17:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90016	M	0 PPM	NORMAL	0	17:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90029	M	0 PPM	NORMAL	0	17:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89997	M	10 PPM	NORMAL	0	17:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89999	M	10 PPM	NORMAL	0	17:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90019	M	10 PPM	BODY/INTEGUMENT	0	17:42	P	REDDENED FORELIMBS
90026	M	10 PPM	NORMAL	0	17:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90031	M	10 PPM	NORMAL	0	17:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89992	M	20 PPM	BODY/INTEGUMENT	0	17:32	P	REDDENED FORELIMBS
				0	17:32	P	REDDENED HINDLIMBS
89992	M	20 PPM	CARDIO-PULMONARY	0	17:31	1	RALES
89992	M	20 PPM	EYES/EARS/NOSE	0	17:31	1	DRIED RED MATERIAL AROUND NOSE
89992	M	20 PPM	ORAL/DENTAL	0	17:31	1	DRIED RED MATERIAL AROUND MOUTH
90004	M	20 PPM	BODY/INTEGUMENT	0	17:40	1	WET YELLOW MATERIAL UROGENITAL AREA
				0	17:40	1	REDDENED FORELIMBS
90020	M	20 PPM	NORMAL	0	17:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90021	M	20 PPM	NORMAL	0	17:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90025	M	20 PPM	NORMAL	0	17:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89966	M	50 PPM	CARDIO-PULMONARY	0	17:53	P	GASPING
89966	M	50 PPM	EYES/EARS/NOSE	0	17:53	1	DRIED RED MATERIAL AROUND NOSE
89966	M	50 PPM	ORAL/DENTAL	0	17:53	1	DRIED RED MATERIAL AROUND MOUTH
89967	M	50 PPM	CARDIO-PULMONARY	0	17:27	P	GASPING
89967	M	50 PPM	EYES/EARS/NOSE	0	17:27	1	DRIED RED MATERIAL AROUND NOSE
89967	M	50 PPM	ORAL/DENTAL	0	17:27	1	DRIED RED MATERIAL AROUND MOUTH
89986	M	50 PPM	CARDIO-PULMONARY	0	17:49	P	GASPING
89986	M	50 PPM	EYES/EARS/NOSE	0	17:49	1	DRIED RED MATERIAL AROUND NOSE
89986	M	50 PPM	ORAL/DENTAL	0	17:49	1	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A41 (1 HOUR POST-EXPOSURE - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89993	M	50 PPM	CARDIO-PULMONARY	0	17:33	P	GASPING
				0	17:33	P	RALES
89993	M	50 PPM	EYES/EARS/NOSE	0	17:33	1	DRIED RED MATERIAL AROUND NOSE
90014	M	50 PPM	CARDIO-PULMONARY	0	17:25	P	GASPING
90049	F	0 PPM	NORMAL	0	17:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90055	F	0 PPM	NORMAL	0	17:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90096	F	0 PPM	NORMAL	0	17:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90101	F	0 PPM	NORMAL	0	17:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90102	F	0 PPM	NORMAL	0	17:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90037	F	10 PPM	NORMAL	0	17:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90040	F	10 PPM	NORMAL	0	17:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90043	F	10 PPM	NORMAL	0	17:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90065	F	10 PPM	BODY/INTEGUMENT	0	17:37	1	WET YELLOW MATERIAL UROGENITAL AREA
90065	F	10 PPM	EYES/EARS/NOSE	0	17:37	1	DRIED RED MATERIAL AROUND NOSE
90065	F	10 PPM	ORAL/DENTAL	0	17:37	1	DRIED RED MATERIAL AROUND MOUTH
90086	F	10 PPM	NORMAL	0	17:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90038	F	20 PPM	EYES/EARS/NOSE	0	17:37	1	DRIED RED MATERIAL AROUND NOSE
90038	F	20 PPM	ORAL/DENTAL	0	17:36	1	DRIED RED MATERIAL AROUND MOUTH
90042	F	20 PPM	NORMAL	0	17:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90063	F	20 PPM	EYES/EARS/NOSE	0	17:45	1	DRIED RED MATERIAL AROUND NOSE
90063	F	20 PPM	ORAL/DENTAL	0	17:45	1	WET CLEAR MATERIAL AROUND MOUTH
90074	F	20 PPM	NORMAL	0	17:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90081	F	20 PPM	NORMAL	0	17:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90050	F	50 PPM	BODY/INTEGUMENT	0	17:28	P	REDDENED FORELIMBS
90050	F	50 PPM	EYES/EARS/NOSE	0	17:28	1	DRIED RED MATERIAL AROUND NOSE
90050	F	50 PPM	ORAL/DENTAL	0	17:29	1	DRIED RED MATERIAL AROUND MOUTH
90053	F	50 PPM	BODY/INTEGUMENT	0	17:50	2	WET YELLOW MATERIAL UROGENITAL AREA
				0	17:50	1	REDDENED FORELIMBS
90053	F	50 PPM	EYES/EARS/NOSE	0	17:50	1	DRIED RED MATERIAL AROUND NOSE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A41 (1 HOUR POST-EXPOSURE - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 0 THROUGH 0

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90064	F	50 PPM	BODY/INTEGUMENT	0	17:29	P	REDDENED FORELIMBS
				0	17:30	1	WET YELLOW MATERIAL UROGENITAL AREA
90064	F	50 PPM	CARDIO-PULMONARY	0	17:30	P	RALES
90064	F	50 PPM	ORAL/DENTAL	0	17:30	1	DRIED CLEAR MATERIAL AROUND MOUTH
90076	F	50 PPM	BEHAVIOR/CNS	0	17:39	P	GAIT SCORE - SLIGHT IMPAIRMENT
90094	F	50 PPM	BODY/INTEGUMENT	0	17:23	1	WET YELLOW MATERIAL UROGENITAL AREA
90094	F	50 PPM	CARDIO-PULMONARY	0	17:23	P	GASPING
90094	F	50 PPM	ORAL/DENTAL	0	17:22	1	WET CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89996	M	0 PPM	NORMAL	1	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90001	M	0 PPM	NORMAL	5	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90001	M	0 PPM	EYES/EARS/NOSE	1	11:21	1	DRIED RED MATERIAL AROUND NOSE
				2	9:49	1	DRIED RED MATERIAL AROUND NOSE
				3	10:12	1	DRIED RED MATERIAL AROUND NOSE
				4	9:36	1	DRIED RED MATERIAL AROUND NOSE
90007	M	0 PPM	NORMAL	1	11:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:52	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90007	M	0 PPM	NORMAL	4	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90016	M	0 PPM	NORMAL	1	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90029	M	0 PPM	NORMAL	1	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90029	M	0 PPM	NORMAL	7	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89997	M	10 PPM	NORMAL	1	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89999	M	10 PPM	NORMAL	1	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:49	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89999	M	10 PPM	NORMAL	11	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89999	M	10 PPM	BODY/INTEGUMENT	7	9:33	1	HAIR LOSS RIGHT FORELIMB
				7	9:33	1	HAIR LOSS LEFT FORELIMB
90019	M	10 PPM	NORMAL	1	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90026	M	10 PPM	NORMAL	1	11:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90026	M	10 PPM	NORMAL	13	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90026	M	10 PPM	EYES/EARS/NOSE	12	9:29	1	DRIED RED MATERIAL AROUND NOSE
90031	M	10 PPM	NORMAL	1	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:00	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90031	M	10 PPM	EYES/EARS/NOSE	9	9:29	1	DRIED RED MATERIAL AROUND NOSE
89992	M	20 PPM	NORMAL	2	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89992	M	20 PPM	BODY/INTEGUMENT	1	11:09	2	HAIR LOSS RIGHT FORELIMB
				1	11:09	2	HAIR LOSS LEFT FORELIMB
				3	10:03	2	HAIR LOSS RIGHT FORELIMB
				3	10:03	2	HAIR LOSS LEFT FORELIMB
				4	9:33	2	HAIR LOSS RIGHT FORELIMB
				4	9:33	2	HAIR LOSS LEFT FORELIMB
				5	9:13	2	HAIR LOSS LEFT FORELIMB
				5	9:13	2	HAIR LOSS RIGHT FORELIMB
				6	9:20	2	HAIR LOSS RIGHT FORELIMB
				6	9:20	2	HAIR LOSS LEFT FORELIMB
				7	9:26	2	HAIR LOSS RIGHT FORELIMB
				7	9:26	2	HAIR LOSS LEFT FORELIMB
				8	9:21	2	HAIR LOSS RIGHT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 6

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89992	M	20 PPM	BODY/INTEGUMENT	8	9:22	2	HAIR LOSS LEFT FORELIMB
				9	9:31	1	HAIR LOSS RIGHT FORELIMB
				9	9:31	1	HAIR LOSS LEFT FORELIMB
				10	10:05	1	HAIR LOSS RIGHT FORELIMB
				10	10:05	1	HAIR LOSS LEFT FORELIMB
				11	9:31	2	HAIR LOSS RIGHT FORELIMB
				11	9:31	2	HAIR LOSS LEFT FORELIMB
				12	9:21	1	HAIR LOSS RIGHT FORELIMB
				12	9:21	2	HAIR LOSS LEFT FORELIMB
				13	11:11	1	HAIR LOSS RIGHT FORELIMB
				13	11:11	1	HAIR LOSS LEFT FORELIMB
90004	M	20 PPM	NORMAL	1	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:44	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90020	M	20 PPM	NORMAL	1	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90020	M	20 PPM	NORMAL	6	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90021	M	20 PPM	NORMAL	1	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90025	M	20 PPM	NORMAL	1	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90025	M	20 PPM	NORMAL	9	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89966	M	50 PPM	NORMAL	1	11:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:53	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89967	M	50 PPM	NORMAL	1	11:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:01	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 9

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89967	M	50 PPM	NORMAL	12	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89986	M	50 PPM	NORMAL	1	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:50	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89993	M	50 PPM	CARDIO-PULMONARY	1	11:10	P	RALES
89993	M	50 PPM	EYES/EARS/NOSE	1	11:10	1	DRIED RED MATERIAL AROUND NOSE
89993	M	50 PPM	ORAL/DENTAL	1	11:10	1	DRIED RED MATERIAL AROUND MOUTH
90014	M	50 PPM	NORMAL	1	11:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90014	M	50 PPM	NORMAL	12	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90049	F	0 PPM	NORMAL	1	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90049	F	0 PPM	BODY/INTEGUMENT	2	9:51	1	HAIR LOSS RIGHT FORELIMB
				2	9:51	1	HAIR LOSS LEFT FORELIMB
				3	10:14	1	HAIR LOSS RIGHT FORELIMB
				3	10:14	1	HAIR LOSS LEFT FORELIMB
				4	9:42	1	HAIR LOSS LEFT FORELIMB
				4	9:42	1	HAIR LOSS RIGHT FORELIMB
				5	9:22	2	HAIR LOSS RIGHT FORELIMB
				5	9:22	2	HAIR LOSS LEFT FORELIMB
				6	9:30	2	HAIR LOSS RIGHT FORELIMB
				6	9:30	2	HAIR LOSS LEFT FORELIMB
				7	9:35	2	HAIR LOSS RIGHT FORELIMB
				7	9:35	2	HAIR LOSS LEFT FORELIMB
				8	9:30	1	HAIR LOSS RIGHT FORELIMB
				8	9:30	1	HAIR LOSS LEFT FORELIMB
				9	9:39	1	HAIR LOSS RIGHT FORELIMB
				9	9:39	1	HAIR LOSS LEFT FORELIMB
				10	10:15	1	HAIR LOSS RIGHT FORELIMB
				10	10:15	1	HAIR LOSS LEFT FORELIMB
				11	9:39	1	HAIR LOSS RIGHT FORELIMB
				11	9:39	1	HAIR LOSS LEFT FORELIMB
				12	9:30	2	HAIR LOSS RIGHT FORELIMB
				12	9:30	2	HAIR LOSS LEFT FORELIMB
				13	11:20	2	HAIR LOSS RIGHT FORELIMB
				13	11:20	2	HAIR LOSS LEFT FORELIMB
90055	F	0 PPM	NORMAL	1	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:45	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90055	F	0 PPM	NORMAL	3	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90096	F	0 PPM	NORMAL	2	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:42	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90096	F	0 PPM	EYES/EARS/NOSE	1	11:23	1	DRIED RED MATERIAL AROUND NOSE
90101	F	0 PPM	NORMAL	2	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90101	F	0 PPM	BODY/INTEGUMENT	1	11:06	2	HAIR LOSS RIGHT FORELIMB
				1	11:06	2	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 12

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90101	F	0 PPM	BODY/INTEGUMENT	3	10:00	2	HAIR LOSS RIGHT FORELIMB
				3	10:01	2	HAIR LOSS LEFT FORELIMB
				3	10:01	P	SCABBING LEFT FORELIMB
				4	9:31	2	HAIR LOSS RIGHT FORELIMB
				4	9:32	2	HAIR LOSS LEFT FORELIMB
				4	9:32	P	SCABBING LEFT FORELIMB
				5	9:12	P	SCABBING LEFT FORELIMB
				5	9:12	2	HAIR LOSS RIGHT FORELIMB
				5	9:12	2	HAIR LOSS LEFT FORELIMB
				6	9:18	3	HAIR LOSS RIGHT FORELIMB
				6	9:19	3	HAIR LOSS LEFT FORELIMB
				7	9:24	3	HAIR LOSS RIGHT FORELIMB
				7	9:24	3	HAIR LOSS LEFT FORELIMB
				7	9:24	P	SCABBING LEFT FORELIMB
				8	9:20	1	HAIR LOSS RIGHT FORELIMB
				8	9:20	1	HAIR LOSS LEFT FORELIMB
				10	10:04	2	HAIR LOSS RIGHT FORELIMB
				10	10:04	2	HAIR LOSS LEFT FORELIMB
				11	9:30	2	HAIR LOSS RIGHT FORELIMB
				11	9:30	2	HAIR LOSS LEFT FORELIMB
				13	11:10	1	HAIR LOSS RIGHT FORELIMB
				13	11:10	1	HAIR LOSS LEFT FORELIMB
90102	F	0 PPM	NORMAL	1	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 13

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90102	F	0 PPM	NORMAL	8	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90037	F	10 PPM	NORMAL	1	11:03	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:59	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90040	F	10 PPM	NORMAL	1	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90040	F	10 PPM	NORMAL	11	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90043	F	10 PPM	NORMAL	1	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:46	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90065	F	10 PPM	NORMAL	1	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90086	F	10 PPM	NORMAL	1	11:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:06	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90086	F	10 PPM	BODY/INTEGUMENT	2	9:45	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				5	9:16	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				5	9:16	1	HAIR LOSS RIGHT FORELIMB
				5	9:16	1	HAIR LOSS LEFT FORELIMB
				6	9:23	1	HAIR LOSS RIGHT FORELIMB
				6	9:23	1	HAIR LOSS LEFT FORELIMB
				6	9:23	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				7	9:29	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				8	9:24	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				8	9:24	1	HAIR LOSS LEFT FORELIMB
				9	9:34	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				9	9:34	1	HAIR LOSS LEFT FORELIMB
				10	10:09	1	HAIR LOSS LEFT FORELIMB
				11	9:34	1	HAIR LOSS LEFT FORELIMB
				11	9:34	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				12	9:25	1	HAIR LOSS RIGHT FORELIMB
				12	9:25	1	HAIR LOSS LEFT FORELIMB
				12	9:25	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				13	11:14	1	HAIR LOSS LEFT FORELIMB
				13	11:14	1	HAIR LOSS VENTRAL ABDOMINAL AREA
90038	F	20 PPM	NORMAL	2	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90038	F	20 PPM	BODY/INTEGUMENT	6	9:22	1	HAIR LOSS RIGHT FORELIMB
				6	9:22	1	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 16

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90038	F	20 PPM	BODY/INTEGUMENT	7	9:27	1	HAIR LOSS RIGHT FORELIMB
				7	9:27	1	HAIR LOSS LEFT FORELIMB
				8	9:23	1	HAIR LOSS RIGHT FORELIMB
				8	9:23	1	HAIR LOSS LEFT FORELIMB
				9	9:32	1	HAIR LOSS RIGHT FORELIMB
				10	10:07	1	HAIR LOSS RIGHT FORELIMB
				10	10:07	1	HAIR LOSS LEFT FORELIMB
				11	9:33	2	HAIR LOSS LEFT FORELIMB
				12	9:23	1	HAIR LOSS RIGHT FORELIMB
				13	11:13	1	HAIR LOSS RIGHT FORELIMB
90038	F	20 PPM	EYES/EARS/NOSE	1	11:13	1	DRIED RED MATERIAL AROUND NOSE
90042	F	20 PPM	NORMAL	1	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90063	F	20 PPM	NORMAL	1	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:09	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90063	F	20 PPM	NORMAL	6	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90063	F	20 PPM	EYES/EARS/NOSE	8	9:27	1	DRIED RED MATERIAL AROUND NOSE
90074	F	20 PPM	NORMAL	1	11:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:48	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90081	F	20 PPM	NORMAL	1	11:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:47	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 18

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90081	F	20 PPM	NORMAL	9	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:26	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90050	F	50 PPM	NORMAL	2	9:40	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:12	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:04	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90050	F	50 PPM	EYES/EARS/NOSE	1	11:08	1	DRIED RED MATERIAL AROUND LEFT EYE
90053	F	50 PPM	NORMAL	1	11:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:51	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90053	F	50 PPM	NORMAL	13	11:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90053	F	50 PPM	EYES/EARS/NOSE	3	10:14	1	DRIED RED MATERIAL AROUND NOSE
90064	F	50 PPM	NORMAL	1	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:41	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:25	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:11	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90076	F	50 PPM	NORMAL	1	11:14	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				2	9:43	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	10:05	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:23	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:07	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:24	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:13	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90094	F	50 PPM	NORMAL	1	11:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A42 (DAILY OBSERVATIONS - RECOVERY PERIOD - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 20

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 13

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90094	F	50 PPM	NORMAL	2	9:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				3	9:58	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				4	9:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				5	9:10	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				6	9:15	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				7	9:22	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				8	9:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				9	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				10	10:02	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				11	9:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				12	9:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
				13	11:08	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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R:03/03/2008

TABLE A43 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 1

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
89996	M	0 PPM	NORMAL	1	17:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90001	M	0 PPM	EYES/EARS/NOSE	1	17:35	1	DRIED RED MATERIAL AROUND NOSE
90007	M	0 PPM	NORMAL	1	17:38	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90016	M	0 PPM	NORMAL	1	17:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90029	M	0 PPM	NORMAL	1	17:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89997	M	10 PPM	NORMAL	1	17:27	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89999	M	10 PPM	NORMAL	1	17:35	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90019	M	10 PPM	NORMAL	1	17:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90026	M	10 PPM	NORMAL	1	17:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90031	M	10 PPM	NORMAL	1	17:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89992	M	20 PPM	NORMAL	1	17:21	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90004	M	20 PPM	NORMAL	1	17:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90020	M	20 PPM	NORMAL	1	17:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90021	M	20 PPM	NORMAL	1	17:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90025	M	20 PPM	NORMAL	1	17:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89966	M	50 PPM	NORMAL	1	17:39	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89967	M	50 PPM	NORMAL	1	17:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
89986	M	50 PPM	NORMAL	1	17:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90014	M	50 PPM	NORMAL	1	17:18	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90049	F	0 PPM	NORMAL	1	17:37	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90055	F	0 PPM	NORMAL	1	17:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90096	F	0 PPM	EYES/EARS/NOSE	1	17:37	1	DRIED RED MATERIAL AROUND NOSE
90101	F	0 PPM	NORMAL	1	17:19	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90102	F	0 PPM	NORMAL	1	17:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90037	F	10 PPM	NORMAL	1	17:17	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90040	F	10 PPM	NORMAL	1	17:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90043	F	10 PPM	NORMAL	1	17:31	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90065	F	10 PPM	NORMAL	1	17:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90086	F	10 PPM	NORMAL	1	17:30	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE A43 (SECOND DAILY OBSERVATIONS - FIRST DAY OF RECOVERY - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS

SPONSOR:LYONDELL CHEMICAL INDIVIDUAL CLINICAL OBSERVATIONS

STUDY DAYS: 1 THROUGH 1

ANIMAL	SEX	GROUP	CATEGORY	STUDY DAY	TIME	GRADE	OBSERVATIONS
90038	F	20 PPM	NORMAL	1	17:28	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90042	F	20 PPM	NORMAL	1	17:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90063	F	20 PPM	NORMAL	1	17:33	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90074	F	20 PPM	NORMAL	1	17:34	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90081	F	20 PPM	NORMAL	1	17:32	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90050	F	50 PPM	EYES/EARS/NOSE	1	17:20	1	DRIED RED MATERIAL AROUND LEFT EYE
90053	F	50 PPM	NORMAL	1	17:36	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90064	F	50 PPM	NORMAL	1	17:20	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90076	F	50 PPM	NORMAL	1	17:29	P	NO SIGNIFICANT CLINICAL OBSERVATIONS
90094	F	50 PPM	NORMAL	1	17:16	P	NO SIGNIFICANT CLINICAL OBSERVATIONS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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02/27/2008
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TABLE A44 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 1:	0 PPM			
89996	368.	355.	382.	407.
90001	377.	368.	391.	404.
90007	395.	383.	411.	453.
90016	396.	390.	411.	435.
90029	388.	372.	401.	423.
MEAN	385.	374.	399.	424.
S.D.	12.1	13.6	12.7	20.3
S.E.	5.4	6.1	5.7	9.1
N	5	5	5	5

TABLE A44 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 2: 10 PPM				
89997	382.	359.	379.	400.
89999	374.	360.	381.	398.
90019	389.	377.	393.	424.
90026	402.	384.	410.	446.
90031	371.	359.	378.	392.
MEAN	384.	368.	388.	412.
S.D.	12.5	11.9	13.6	22.5
S.E.	5.6	5.3	6.1	10.1
N	5	5	5	5

TABLE A44 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 3

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 3: 20 PPM				
89992	359.	339.	367.	392.
90004	390.	369.	380.	415.
90020	386.	379.	401.	424.
90021	379.	360.	387.	411.
90025	395.	383.	411.	449.
MEAN	382.	366.	389.	418.
S.D.	14.0	17.5	17.6	20.8
S.E.	6.3	7.8	7.9	9.3
N	5	5	5	5

TABLE A44 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 4

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHTS [G]

MALES

DAY	0	1	6	13
ANIMALS FROM GROUP 4:	50 PPM			
89966	373.	341.	372.	411.
89967	408.	360.	403.	436.
89986	389.	361.	389.	423.
89993	379.	340.		
90014	392.	362.	391.	415.
MEAN	388.	353.	389.	421.
S.D.	13.4	11.3	12.9	10.8
S.E.	6.0	5.0	6.5	5.4
N	5	5	4	4

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 1:	0 PPM			
90049	237.	235.	236.	258.
90055	229.	237.	250.	268.
90096	249.	242.	264.	273.
90101	214.	226.	227.	248.
90102	228.	240.	251.	263.
MEAN	231.	236.	246.	262.
S.D.	12.9	6.2	14.2	9.7
S.E.	5.7	2.8	6.4	4.3
N	5	5	5	5

TABLE A44 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 6

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 2: 10 PPM				
90037	216.	224.	240.	252.
90040	245.	243.	256.	268.
90043	225.	235.	255.	274.
90065	219.	226.	236.	258.
90086	253.	238.	267.	276.
MEAN	232.	233.	251.	265.
S.D.	16.5	8.0	12.5	10.1
S.E.	7.4	3.6	5.6	4.5
N	5	5	5	5

TABLE A44 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 3: 20 PPM				
90038	216.	221.	246.	259.
90042	222.	215.	228.	241.
90063	231.	225.	235.	266.
90074	232.	229.	238.	259.
90081	223.	230.	243.	258.
MEAN	225.	224.	238.	256.
S.D.	6.7	6.2	6.8	9.0
S.E.	3.0	2.8	3.1	4.0
N	5	5	5	5

TABLE A44 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALES

DAY	0	1	6	13
ANIMALS FROM GROUP 4:	50 PPM			
90050	228.	229.	240.	253.
90053	231.	221.	240.	257.
90064	245.	237.	263.	293.
90076	244.	241.	254.	272.
90094	212.	208.	219.	228.
MEAN	232.	227.	243.	261.
S.D.	13.5	13.2	16.7	24.0
S.E.	6.0	5.9	7.4	10.7
N	5	5	5	5

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A45 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 1:	0 PPM		
89996	-13.	27.	25.
90001	-9.	23.	13.
90007	-12.	28.	41.
90016	-6.	21.	24.
90029	-16.	29.	22.
MEAN	-11.	26.	25.
S.D.	3.8	3.6	10.3
S.E.	1.7	1.6	4.6
N	5	5	5

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 2:	10 PPM		
89997	-23.	20.	21.
89999	-14.	21.	17.
90019	-12.	16.	31.
90026	-18.	26.	36.
90031	-12.	19.	14.
MEAN	-16.	20.	24.
S.D.	4.7	3.7	9.4
S.E.	2.1	1.7	4.2
N	5	5	5

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 3:	20 PPM		
89992	-20.	28.	25.
90004	-21.	11.	35.
90020	-7.	22.	22.
90021	-19.	27.	24.
90025	-12.	28.	37.
MEAN	-16.	23.	29.
S.D.	6.1	7.2	6.9
S.E.	2.7	3.2	3.1
N	5	5	5

TABLE A45 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 4

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 4:	50 PPM		
89966	-32.	31.	40.
89967	-48.	43.	32.
89986	-28.	28.	34.
89993	-39.		
90014	-30.	29.	24.
MEAN	-35.	33.	32.
S.D.	8.2	7.0	6.6
S.E.	3.7	3.5	3.3
N	5	4	4

TABLE A45 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 5

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 1:	0 PPM		
90049	-2.	1.	22.
90055	8.	13.	18.
90096	-7.	22.	9.
90101	12.	1.	21.
90102	12.	11.	12.
MEAN	5.	10.	17.
S.D.	8.6	8.7	5.6
S.E.	3.9	3.9	2.5
N	5	5	5

TABLE A45 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 6

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 2:	10 PPM		
90037	8.	16.	12.
90040	-2.	13.	12.
90043	10.	20.	18.
90065	7.	10.	22.
90086	-15.	29.	8.
MEAN	2.	18.	14.
S.D.	10.4	7.4	5.3
S.E.	4.6	3.3	2.4
N	5	5	5

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 3:	20 PPM		
90038	5.	25.	13.
90042	-7.	13.	13.
90063	-6.	10.	31.
90074	-3.	9.	21.
90081	7.	13.	15.
MEAN	-1.	14.	19.
S.D.	6.4	6.4	7.7
S.E.	2.9	2.8	3.4
N	5	5	5

TABLE A45 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	1- 6	6- 13
ANIMALS FROM GROUP 4:	50 PPM		
90050	1.	11.	13.
90053	-10.	19.	17.
90064	-8.	26.	30.
90076	-3.	13.	19.
90094	-4.	11.	9.
MEAN	-5.	16.	18.
S.D.	4.3	6.4	7.8
S.E.	1.9	2.9	3.5
N	5	5	5

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TABLE A46 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 1:	0 PPM		
89996	-13.	14.	39.
90001	-9.	14.	27.
90007	-12.	16.	58.
90016	-6.	15.	39.
90029	-16.	13.	35.
MEAN	-11.	14.	39.
S.D.	3.8	1.2	11.3
S.E.	1.7	0.5	5.1
N	5	5	5

TABLE A46 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 2:	10 PPM		
89997	-23.	-3.	18.
89999	-14.	7.	24.
90019	-12.	4.	35.
90026	-18.	8.	44.
90031	-12.	7.	21.
MEAN	-16.	4.	28.
S.D.	4.7	4.6	10.8
S.E.	2.1	2.0	4.8
N	5	5	5

TABLE A46 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 3:	20 PPM		
89992	-20.	8.	33.
90004	-21.	-10.	25.
90020	-7.	15.	38.
90021	-19.	8.	32.
90025	-12.	16.	54.
MEAN	-16.	7.	36.
S.D.	6.1	10.6	10.7
S.E.	2.7	4.7	4.8
N	5	5	5

TABLE A46 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 4

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

MALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 4:	50 PPM		
89966	-32.	-1.	38.
89967	-48.	-5.	28.
89986	-28.	0.	34.
89993	-39.		
90014	-30.	-1.	23.
MEAN	-35.	-2.	31.
S.D.	8.2	2.1	7.0
S.E.	3.7	1.1	3.5
N	5	4	4

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 1:	0 PPM		
90049	-2.	-1.	21.
90055	8.	21.	39.
90096	-7.	15.	24.
90101	12.	13.	34.
90102	12.	23.	35.
MEAN	5.	14.	31.
S.D.	8.6	9.5	7.8
S.E.	3.9	4.3	3.5
N	5	5	5

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 2:	10 PPM		
90037	8.	24.	36.
90040	-2.	11.	23.
90043	10.	30.	49.
90065	7.	17.	39.
90086	-15.	14.	23.
MEAN	2.	19.	34.
S.D.	10.4	7.9	11.1
S.E.	4.6	3.5	5.0
N	5	5	5

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 3:	20 PPM		
90038	5.	30.	43.
90042	-7.	6.	19.
90063	-6.	4.	35.
90074	-3.	6.	27.
90081	7.	20.	35.
MEAN	-1.	13.	32.
S.D.	6.4	11.3	8.8
S.E.	2.9	5.0	4.0
N	5	5	5

TABLE A46 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CUMULATIVE BODY WEIGHT CHANGES [G]

FEMALES

DAY	0- 1	0- 6	0- 13
ANIMALS FROM GROUP 4:	50 PPM		
90050	1.	12.	25.
90053	-10.	9.	26.
90064	-8.	18.	48.
90076	-3.	10.	28.
90094	-4.	7.	16.
MEAN	-5.	11.	29.
S.D.	4.3	4.3	11.7
S.E.	1.9	1.9	5.2
N	5	5	5

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TABLE A47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 0 PPM MALES										
89996	7.53	8.01	15.9	42.6	53.1	19.8	37.2	922.	13.1	18.6
90001	7.24	8.21	15.4	41.1	50.1	18.8	37.6	938.	11.9	13.3
90007	11.22	8.26	16.0	43.4	52.5	19.3	36.8	1161.	14.3	19.9
90016	8.14	8.27	16.3	45.3	54.8	19.7	36.0	1122.	13.9	21.4
90029	7.22	8.83	16.4	43.2	49.0	18.6	38.0	1412.	13.1	21.2
MEAN	8.27	8.32	16.0	43.1	51.9	19.2	37.1	1111.	13.3	18.9
S.D.	1.690	0.306	0.39	1.52	2.34	0.53	0.77	199.3	0.92	3.32
S.E.	0.756	0.137	0.18	0.68	1.05	0.24	0.34	89.1	0.41	1.48
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 0 PPM MALES								
89996	2.5	203.6	15.0	81.0	1.0	2.4	0.2	0.4
90001	1.8	150.6	22.5	71.8	3.0	1.9	0.3	0.4
90007	2.4	194.7	22.1	72.7	3.6	0.7	0.4	0.5
90016	1.9	157.8	13.9	81.2	1.9	1.9	0.5	0.6
90029	2.2	194.9	21.5	74.4	2.3	1.0	0.4	0.3
MEAN	2.2	180.3	19.0	76.2	2.4	1.6	0.4	0.4
S.D.	0.30	24.25	4.19	4.55	1.00	0.70	0.11	0.11
S.E.	0.14	10.84	1.87	2.04	0.45	0.32	0.05	0.05
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 3

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 0 PPM MALES								
89996	1.13	6.10	0.07	0.18	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90001	1.63	5.20	0.22	0.14	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90007	2.48	8.16	0.40	0.08	0.05	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90016	1.13	6.61	0.15	0.15	0.04	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90029	1.55	5.38	0.16	0.08	0.03	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.58	6.29	0.20	0.13	0.03	0.04		
S.D.	0.552	1.189	0.124	0.044	0.013	0.014		
S.E.	0.247	0.532	0.055	0.020	0.006	0.006		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 10 PPM MALES										
89997	10.13	8.52	16.6	44.8	52.6	19.4	37.0	1065.	13.2	20.0
89999	8.76	8.23	16.2	42.4	51.5	19.7	38.2	873.	12.3	18.5
90019	11.15	8.11	15.8	42.1	51.9	19.4	37.4	1162.	13.8	19.4
90026	9.64	8.21	15.9	41.5	50.5	19.4	38.3	1124.	12.7	18.8
90031	5.20	7.56	15.5	40.7	53.8	20.5	38.2	1253.	13.3	20.9
MEAN	8.98	8.13	16.0	42.3	52.1	19.7	37.8	1095.	13.1	19.5
S.D.	2.281	0.351	0.42	1.54	1.23	0.48	0.58	141.8	0.58	0.96
S.E.	1.020	0.157	0.19	0.69	0.55	0.21	0.26	63.4	0.26	0.43
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 5

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 10 PPM MALES								
89997	1.9	160.8	7.3	88.0	1.7	1.9	0.4	0.8
89999	2.5	209.1	24.1	71.2	2.0	1.5	0.6	0.6
90019	2.0	165.0	16.2	80.0	1.8	1.1	0.4	0.6
90026	2.4	198.5	14.1	82.0	0.9	1.9	0.3	0.6
90031	1.7	130.2	19.7	75.6	2.1	2.0	0.2	0.3
MEAN	2.1	172.7	16.3	79.4	1.7	1.7	0.4	0.6
S.D.	0.34	31.61	6.29	6.38	0.47	0.38	0.15	0.18
S.E.	0.15	14.14	2.81	2.85	0.21	0.17	0.07	0.08
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 10 PPM MALES								
89997	0.74	8.92	0.17	0.19	0.04	0.08	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89999	2.11	6.24	0.17	0.13	0.05	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90019	1.81	8.93	0.20	0.12	0.04	0.07	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90026	1.36	7.91	0.09	0.19	0.03	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90031	1.02	3.93	0.11	0.11	0.01	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.41	7.19	0.15	0.15	0.03	0.06		
S.D.	0.560	2.125	0.046	0.039	0.015	0.023		
S.E.	0.250	0.950	0.021	0.017	0.007	0.010		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 20 PPM		MALES								
89992	8.54	8.21	15.6	42.8	52.1	19.0	36.4	1136.	12.5	18.0
90004	7.36	7.86	16.2	44.1	56.1	20.6	36.8	1003.	13.6	20.0
90020	7.63	7.75	15.3	41.0	52.8	19.7	37.3	1293.	12.0	14.8
90021	6.96	7.61	14.7	39.8	52.3	19.4	37.1	1227.	13.5	21.4
90025	11.32	7.74	15.9	42.6	55.0	20.5	37.3	1429.	12.7	19.5
MEAN	8.36	7.83	15.5	42.1	53.7	19.8	37.0	1218.	12.9	18.7
S.D.	1.753	0.228	0.58	1.68	1.79	0.69	0.38	160.6	0.68	2.52
S.E.	0.784	0.102	0.26	0.75	0.80	0.31	0.17	71.8	0.30	1.12
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 20 PPM		MALES						
89992	2.3	190.1	11.6	84.9	1.9	0.7	0.2	0.7
90004	2.7	212.5	22.1	73.2	1.9	2.2	0.2	0.4
90020	2.3	176.2	27.3	67.2	1.4	3.1	0.5	0.5
90021	2.0	152.6	20.8	73.6	3.8	1.2	0.3	0.5
90025	2.9	227.2	23.1	73.8	1.7	0.8	0.2	0.5
MEAN	2.4	191.7	21.0	74.5	2.1	1.6	0.3	0.5
S.D.	0.36	29.43	5.78	6.41	0.95	1.03	0.13	0.11
S.E.	0.16	13.16	2.59	2.87	0.42	0.46	0.06	0.05
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 20 PPM MALES								
89992	0.99	7.25	0.17	0.06	0.02	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90004	1.63	5.39	0.14	0.16	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90020	2.08	5.12	0.10	0.24	0.04	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90021	1.44	5.12	0.26	0.08	0.02	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90025	2.61	8.35	0.19	0.09	0.02	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.75	6.25	0.17	0.13	0.02	0.04		
S.D.	0.620	1.475	0.060	0.074	0.009	0.013		
S.E.	0.277	0.660	0.027	0.033	0.004	0.006		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 10

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 50 PPM MALES										
89966	9.73	8.01	15.8	43.6	54.5	19.7	36.2	1295.	14.1	19.7
89967	8.97	8.33	16.4	44.4	53.4	19.7	36.8	1143.	12.5	19.5
89986	9.82	7.90	16.0	42.6	53.9	20.2	37.5	1229.	13.6	19.0
90014	6.12	8.27	16.4	43.3	52.4	19.9	37.9	1383.	13.4	20.4
MEAN	8.66	8.13	16.2	43.5	53.6	19.9	37.1	1263.	13.4	19.7
S.D.	1.736	0.206	0.30	0.75	0.89	0.24	0.75	101.6	0.67	0.58
S.E.	0.868	0.103	0.15	0.37	0.44	0.12	0.38	50.8	0.33	0.29
N	4	4	4	4	4	4	4	4	4	4

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 11

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 50 PPM MALES								
89966	3.0	240.1	10.2	86.9	1.5	0.5	0.3	0.6
89967	2.1	172.7	14.1	81.5	2.1	1.1	0.4	0.8
89986	1.9	153.7	13.9	80.2	3.1	1.4	0.4	1.0
90014	1.7	139.4	16.7	77.8	2.2	2.0	0.4	1.0
MEAN	2.2	176.5	13.7	81.6	2.2	1.3	0.4	0.9
S.D.	0.57	44.56	2.67	3.85	0.66	0.62	0.05	0.19
S.E.	0.29	22.28	1.34	1.93	0.33	0.31	0.03	0.10
N	4	4	4	4	4	4	4	4

thous/uL = THOUSANDS/MICROLITER

TABLE A47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 12

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 50 PPM MALES								
89966	1.00	8.46	0.15	0.05	0.03	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89967	1.26	7.32	0.19	0.10	0.03	0.08	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
89986	1.37	7.88	0.31	0.14	0.03	0.10	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90014	1.02	4.76	0.13	0.12	0.02	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	1.16	7.11	0.20	0.10	0.03	0.08		
S.D.	0.182	1.631	0.081	0.039	0.005	0.019		
S.E.	0.091	0.816	0.040	0.019	0.003	0.010		
N	4	4	4	4	4	4		

thous/uL = THOUSANDS/MICROLITER

TABLE A47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 0 PPM		FEMALES								
90049	4.76	7.60	15.3	40.4	53.1	20.2	37.9	1283.	10.6	11.6
90055	10.99	7.25	14.7	39.6	54.6	20.3	37.1	1175.	11.1	14.7
90096	6.52	7.19	15.3	40.9	56.9	21.3	37.4	1328.	11.2	16.2
90101	8.89	7.58	15.3	39.2	51.7	20.2	39.0	1092.	12.1	13.8
90102	7.68	7.35	15.6	40.1	54.6	21.2	38.8	1407.	12.3	16.9
MEAN	7.77	7.39	15.2	40.0	54.2	20.6	38.0	1257.	11.5	14.6
S.D.	2.359	0.188	0.33	0.67	1.94	0.56	0.84	124.7	0.72	2.09
S.E.	1.055	0.084	0.15	0.30	0.87	0.25	0.37	55.8	0.32	0.94
N	5	5	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 0 PPM		FEMALES						
90049	2.5	190.5	20.6	75.4	1.7	2.0	0.2	0.2
90055	1.8	134.0	5.7	91.4	1.2	0.5	0.3	0.9
90096	1.9	135.1	6.7	89.7	1.3	1.3	0.1	0.8
90101	1.7	125.2	16.4	79.3	0.8	2.2	0.6	0.7
90102	2.0	150.5	15.0	81.9	1.2	0.7	0.3	0.8
MEAN	2.0	147.1	12.9	83.5	1.2	1.3	0.3	0.7
S.D.	0.31	25.93	6.45	6.83	0.32	0.76	0.19	0.28
S.E.	0.14	11.60	2.88	3.05	0.14	0.34	0.08	0.12
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 15

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 0 PPM	FEMALES							
90049	0.98	3.59	0.08	0.09	0.01	0.01	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90055	0.63	10.04	0.13	0.06	0.03	0.10	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90096	0.44	5.85	0.08	0.09	0.01	0.05	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90101	1.45	7.06	0.07	0.20	0.05	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90102	1.15	6.29	0.10	0.06	0.02	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.93	6.57	0.09	0.10	0.02	0.06		
S.D.	0.404	2.332	0.024	0.058	0.017	0.032		
S.E.	0.180	1.043	0.011	0.026	0.007	0.014		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

TABLE A47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP:	10 PPM	FEMALES								
90037	6.46	7.51	15.1	38.2	50.8	20.1	39.6	1233.	11.2	14.5
90040	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT	12.5	20.0
90043	6.76	7.41	15.0	39.3	53.0	20.3	38.2	1145.	11.5	16.0
90065	5.28	7.21	14.7	38.1	52.9	20.4	38.6	1193.	11.9	17.9
90086	6.51	7.37	15.7	40.3	54.7	21.3	39.0	1377.	11.4	13.7
MEAN	6.25	7.38	15.1	39.0	52.9	20.5	38.9	1237.	11.7	16.4
S.D.	0.661	0.125	0.42	1.04	1.60	0.53	0.60	100.0	0.51	2.56
S.E.	0.331	0.062	0.21	0.52	0.80	0.27	0.30	50.0	0.23	1.15
N	4	4	4	4	4	4	4	4	5	5

CLT = CLOTTED

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 10 PPM FEMALES								
90037	1.2	92.6	8.9	86.8	1.9	1.2	0.1	1.0
90040	CLT	CLT	CLT	CLT	CLT	CLT	CLT	CLT
90043	1.6	121.3	14.0	78.9	3.0	2.9	0.3	0.9
90065	1.6	116.8	10.9	84.6	1.4	2.3	0.2	0.6
90086	2.2	159.3	10.6	86.4	1.6	0.9	0.1	0.5
MEAN	1.7	122.5	11.1	84.2	2.0	1.8	0.2	0.8
S.D.	0.41	27.58	2.12	3.64	0.71	0.94	0.10	0.24
S.E.	0.21	13.79	1.06	1.82	0.36	0.47	0.05	0.12
N	4	4	4	4	4	4	4	4

CLT = CLOTTED

thous/uL = THOUSANDS/MICROLITER

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 10 PPM FEMALES								
90037	0.57	5.61	0.12	0.08	0.01	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90040	CLT	CLT	CLT	CLT	CLT	CLT	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90043	0.95	5.33	0.20	0.19	0.02	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90065	0.57	4.46	0.08	0.12	0.01	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90086	0.69	5.63	0.10	0.06	0.01	0.03	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.70	5.26	0.13	0.11	0.01	0.05		
S.D.	0.179	0.549	0.053	0.057	0.005	0.017		
S.E.	0.090	0.275	0.026	0.029	0.003	0.009		
N	4	4	4	4	4	4		

CLT = CLOTTED

thous/uL = THOUSANDS/MICROLITER

TABLE A47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 20 PPM		FEMALES								
90038	6.45	7.30	14.9	38.3	52.4	20.4	39.0	1457.	11.4	16.3
90042	4.81	8.40	15.7	41.5	49.4	18.7	38.0	1336.	CLT	CLT
90063	8.97	7.58	15.8	41.4	54.5	20.8	38.1	976.	12.6	17.2
90074	5.91	7.78	15.9	40.9	52.5	20.4	38.9	1273.	12.1	16.9
90081	5.21	6.12	12.4	31.6	51.5	20.2	39.2	1011.	11.8	17.7
MEAN	6.27	7.44	14.9	38.7	52.1	20.1	38.6	1211.	12.0	17.0
S.D.	1.636	0.839	1.47	4.20	1.85	0.81	0.55	209.3	0.51	0.59
S.E.	0.732	0.375	0.66	1.88	0.83	0.36	0.25	93.6	0.25	0.29
N	5	5	5	5	5	5	5	5	4	4

CLT = CLOTTED

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

TABLE A47 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL HEMATOLOGY VALUES

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 20 PPM		FEMALES						
90038	2.2	163.0	8.3	87.0	1.8	2.0	0.3	0.5
90042	2.2	188.4	13.4	83.5	1.2	1.2	0.3	0.5
90063	2.3	175.7	10.4	86.0	1.5	1.0	0.2	0.8
90074	1.7	133.0	10.2	86.1	1.5	1.4	0.5	0.4
90081	2.7	163.8	7.8	89.1	1.7	0.8	0.2	0.4
MEAN	2.2	164.8	10.0	86.3	1.5	1.3	0.3	0.5
S.D.	0.36	20.56	2.21	2.02	0.23	0.46	0.12	0.16
S.E.	0.16	9.20	0.99	0.90	0.10	0.21	0.05	0.07
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 20 PPM FEMALES								
90038	0.53	5.61	0.12	0.13	0.02	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90042	0.64	4.01	0.06	0.06	0.01	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90063	0.93	7.72	0.13	0.09	0.02	0.07	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90074	0.60	5.09	0.09	0.08	0.03	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90081	0.40	4.64	0.09	0.04	0.01	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.62	5.41	0.10	0.08	0.02	0.03		
S.D.	0.196	1.417	0.028	0.034	0.008	0.022		
S.E.	0.088	0.634	0.012	0.015	0.004	0.010		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

ANIMAL	WHITE CELLS	RED CELLS	HEMO-GLOBIN	HEMATO-CRIT	MCV	MCH	MCHC	PLATELET	PROTIME	APTT
	thous/uL	mil/uL	g/dL	%	fL	pg	g/dL	thous/uL	seconds	seconds
GROUP: 50 PPM		FEMALES								
90050	12.76	8.05	15.4	41.3	51.3	19.1	37.3	1144.	11.3	14.2
90053	5.24	7.74	15.5	41.2	53.3	20.0	37.6	1180.	QNS	QNS
90064	7.23	7.67	15.8	41.0	53.5	20.5	38.4	1480.	12.1	15.2
90076	4.32	7.73	15.6	39.6	51.3	20.1	39.3	1454.	12.2	16.5
90094	4.73	7.40	14.8	38.4	51.8	19.9	38.5	973.	11.2	15.5
MEAN	6.86	7.72	15.4	40.3	52.2	19.9	38.2	1246.	11.7	15.4
S.D.	3.484	0.231	0.38	1.26	1.08	0.51	0.79	216.4	0.52	0.95
S.E.	1.558	0.104	0.17	0.57	0.48	0.23	0.35	96.8	0.26	0.47
N	5	5	5	5	5	5	5	5	4	4

QNS = QUANTITY NOT SUFFICIENT

thous/uL = THOUSANDS/MICROLITER, mil/uL = MILLIONS/MICROLITER, fL = FEMTOLITERS, pg = PICOGRAMS, g/dL = GRAMS/DECILITER

ANIMAL	RETIC-ULOCYTE	RETIC ABSOLUTE	NEUTRO-PHIL	LYMPH-OCYTE	MONOCYTE	EOSIN-OPHIL	BASOPHIL	LG UNST-AIN CELL
	%	thous/uL	%	%	%	%	%	%
GROUP: 50 PPM	FEMALES							
90050	2.0	164.6	9.1	86.5	2.1	1.3	0.3	0.7
90053	1.9	145.4	7.8	88.1	1.5	1.8	0.3	0.4
90064	1.8	140.8	12.1	82.8	3.1	0.9	0.3	0.8
90076	2.4	187.6	13.4	81.4	1.6	2.7	0.4	0.5
90094	1.6	116.9	16.9	77.8	2.2	2.2	0.2	0.8
MEAN	1.9	151.1	11.9	83.3	2.1	1.8	0.3	0.6
S.D.	0.30	26.56	3.60	4.10	0.64	0.71	0.07	0.18
S.E.	0.13	11.88	1.61	1.84	0.28	0.32	0.03	0.08
N	5	5	5	5	5	5	5	5

thous/uL = THOUSANDS/MICROLITER

TABLE A47 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 24

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL HEMATOLOGY VALUES — DAY 14

ANIMAL	NEU ABSOLUTE	LYMPH ABSOLUTE	MONO ABSOLUTE	EOS ABSOLUTE	BASO ABSOLUTE	LUC ABSOLUTE	PLATELET ESTIMATE	RBC MORPHOLOGY
	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL	thous/uL		
GROUP: 50 PPM FEMALES								
90050	1.16	11.05	0.27	0.16	0.04	0.09	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90053	0.41	4.61	0.08	0.10	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90064	0.88	5.98	0.23	0.06	0.02	0.06	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90076	0.58	3.51	0.07	0.12	0.02	0.02	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
90094	0.80	3.68	0.10	0.11	0.01	0.04	PLATELET ESTIMATE AND MORPHOLOGY NOT REVIEWED	
MEAN	0.77	5.77	0.15	0.11	0.02	0.05		
S.D.	0.288	3.112	0.093	0.036	0.011	0.030		
S.E.	0.129	1.392	0.042	0.016	0.005	0.013		
N	5	5	5	5	5	5		

thous/uL = THOUSANDS/MICROLITER

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TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0 PPM		MALES									
89996	4.0	6.0	2.1	1.94	0.0	15.7	0.3	103.	29.	74.	0.5
90001	4.1	6.3	2.2	1.84	0.1	13.9	0.3	137.	40.	107.	0.5
90007	4.2	6.7	2.4	1.73	0.1	12.4	0.2	138.	29.	97.	0.5
90016	4.3	7.0	2.7	1.60	0.1	13.7	0.2	142.	26.	81.	0.4
90029	4.2	6.7	2.5	1.64	0.1	14.1	0.2	145.	41.	91.	1.0
MEAN	4.2	6.5	2.4	1.75	0.1	14.0	0.2	133.	33.	90.	0.6
S.D.	0.11	0.39	0.24	0.141	0.04	1.18	0.05	17.1	7.0	13.0	0.24
S.E.	0.05	0.17	0.11	0.063	0.02	0.53	0.02	7.6	3.1	5.8	0.11
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 0 PPM MALES								
89996	113.	56.	10.5	100.	7.4	4.25	144.	49.
90001	115.	55.	10.3	102.	6.6	4.77	144.	52.
90007	116.	54.	11.3	101.	7.2	4.38	145.	103.
90016	113.	61.	11.2	102.	7.7	4.86	146.	74.
90029	122.	33.	10.6	102.	6.8	4.29	145.	44.
MEAN	116.	52.	10.8	101.	7.1	4.51	145.	64.
S.D.	3.7	10.8	0.44	0.9	0.44	0.284	0.8	24.4
S.E.	1.7	4.9	0.20	0.4	0.20	0.127	0.4	10.9
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 3

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	10 PPM	MALES									
89997	4.2	6.7	2.5	1.71	0.1	14.7	0.2	130.	38.	100.	1.1
89999	4.0	6.1	2.1	1.90	0.1	12.4	0.2	81.	35.	144.	0.1
90019	4.1	6.5	2.4	1.73	0.1	17.2	0.2	133.	35.	112.	0.7
90026	4.3	6.4	2.2	2.00	0.1	14.3	0.2	138.	37.	164.	1.3
90031	4.2	6.6	2.4	1.71	0.1	14.2	0.2	142.	33.	93.	0.1
MEAN	4.2	6.5	2.3	1.81	0.1	14.6	0.2	125.	36.	123.	0.7
S.D.	0.11	0.23	0.16	0.133	0.00	1.72	0.00	24.9	1.9	30.3	0.55
S.E.	0.05	0.10	0.07	0.059	0.00	0.77	0.00	11.1	0.9	13.5	0.25
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 4

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 10 PPM MALES								
89997	118.	54.	10.4	102.	7.7	4.45	145.	61.
89999	100.	62.	10.2	100.	7.3	4.84	142.	32.
90019	106.	54.	10.1	102.	6.6	4.74	144.	22.
90026	92.	53.	10.4	102.	7.4	4.87	145.	38.
90031	102.	46.	10.1	104.	6.6	4.33	146.	44.
MEAN	104.	54.	10.2	102.	7.1	4.65	144.	39.
S.D.	9.5	5.7	0.15	1.4	0.50	0.242	1.5	14.6
S.E.	4.3	2.5	0.07	0.6	0.22	0.108	0.7	6.5
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 5

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	20 PPM	MALES									
89992	4.1	6.5	2.5	1.65	0.1	15.0	0.2	101.	27.	89.	0.1
90004	4.1	6.2	2.1	1.99	0.1	15.0	0.2	86.	30.	131.	0.1
90020	4.4	6.7	2.3	1.96	0.1	12.2	0.4	99.	29.	85.	1.0
90021	4.3	6.5	2.2	1.96	0.1	13.4	0.3	127.	31.	104.	1.2
90025	4.3	6.3	2.0	2.14	0.1	12.2	0.2	113.	24.	96.	0.1
MEAN	4.2	6.4	2.2	1.94	0.1	13.6	0.3	105.	28.	101.	0.5
S.D.	0.13	0.19	0.19	0.178	0.00	1.40	0.09	15.5	2.8	18.3	0.55
S.E.	0.06	0.09	0.09	0.080	0.00	0.63	0.04	6.9	1.2	8.2	0.25
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 6

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 20 PPM MALES								
89992	107.	65.	10.3	101.	7.0	4.84	145.	50.
90004	104.	64.	9.8	103.	7.5	4.75	146.	36.
90020	102.	104.	11.1	103.	6.7	4.46	146.	48.
90021	108.	64.	10.5	103.	8.5	5.42	147.	38.
90025	111.	54.	10.8	102.	8.5	4.72	145.	37.
MEAN	106.	70.	10.5	102.	7.6	4.84	146.	42.
S.D.	3.5	19.4	0.49	0.9	0.84	0.355	0.8	6.6
S.E.	1.6	8.7	0.22	0.4	0.37	0.159	0.4	3.0
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	50 PPM	MALES									
89966	4.3	6.9	2.6	1.67	0.1	13.9	0.3	128.	28.	82.	0.1
89967	4.1	6.4	2.3	1.77	0.1	14.9	0.2	182.	32.	123.	0.2
89986	4.1	6.4	2.4	1.72	0.1	14.4	0.2	119.	23.	90.	0.1
90014	4.1	6.3	2.3	1.79	0.1	14.8	0.2	146.	27.	90.	1.6
MEAN	4.2	6.5	2.4	1.74	0.1	14.5	0.2	144.	28.	96.	0.5
S.D.	0.10	0.27	0.14	0.054	0.00	0.45	0.05	27.9	3.7	18.2	0.73
S.E.	0.05	0.14	0.07	0.027	0.00	0.23	0.03	13.9	1.8	9.1	0.37
N	4	4	4	4	4	4	4	4	4	4	4

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 8

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 50 PPM MALES								
89966	113.	75.	11.2	100.	9.4	6.18	145.	61.
89967	109.	57.	10.5	102.	8.6	4.69	146.	47.
89986	115.	51.	10.4	102.	7.0	4.37	145.	48.
90014	111.	70.	10.3	104.	7.7	4.79	146.	44.
MEAN	112.	63.	10.6	102.	8.2	5.01	146.	50.
S.D.	2.6	11.1	0.41	1.6	1.05	0.802	0.6	7.5
S.E.	1.3	5.6	0.20	0.8	0.52	0.401	0.3	3.8
N	4	4	4	4	4	4	4	4

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 0 PPM FEMALES											
90049	4.4	6.7	2.2	1.98	0.1	16.6	0.3	127.	40.	87.	1.7
90055	4.6	6.8	2.2	2.04	0.1	15.6	0.3	72.	36.	91.	2.1
90096	5.3	7.7	2.4	2.21	0.2	15.0	0.3	98.	28.	95.	0.7
90101	4.6	7.0	2.4	1.90	0.1	15.2	0.3	93.	25.	85.	1.8
90102	4.6	6.8	2.2	2.07	0.1	18.0	0.3	97.	30.	88.	1.1
MEAN	4.7	7.0	2.3	2.04	0.1	16.1	0.3	97.	32.	89.	1.5
S.D.	0.35	0.41	0.11	0.115	0.04	1.24	0.00	19.6	6.1	3.9	0.57
S.E.	0.15	0.18	0.05	0.051	0.02	0.55	0.00	8.8	2.7	1.7	0.25
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 10

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 0 PPM FEMALES								
90049	142.	78.	10.2	103.	4.8	4.69	143.	31.
90055	114.	73.	10.3	101.	6.2	4.66	143.	37.
90096	86.	100.	11.3	102.	6.9	4.63	143.	30.
90101	108.	57.	10.7	103.	7.0	4.60	143.	308.
90102	109.	83.	10.7	101.	6.5	4.55	143.	36.
MEAN	112.	78.	10.6	102.	6.3	4.63	143.	88.
S.D.	20.0	15.6	0.43	1.0	0.89	0.054	0.0	122.8
S.E.	9.0	7.0	0.19	0.4	0.40	0.024	0.0	54.9
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 11

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 10 PPM FEMALES											
90037	4.8	6.4	1.6	2.95	0.1	11.7	0.2	116.	20.	89.	0.8
90040	4.9	6.9	2.0	2.39	0.1	15.4	0.3	66.	25.	83.	1.2
90043	5.0	6.8	1.8	2.71	0.1	12.6	0.2	100.	26.	77.	1.6
90065	5.3	7.2	1.9	2.75	0.1	15.3	0.2	100.	36.	88.	1.8
90086	4.6	6.8	2.1	2.19	0.1	15.5	0.3	138.	37.	90.	0.8
MEAN	4.9	6.8	1.9	2.60	0.1	14.1	0.2	104.	29.	85.	1.2
S.D.	0.26	0.29	0.19	0.304	0.00	1.81	0.05	26.3	7.4	5.4	0.46
S.E.	0.12	0.13	0.09	0.136	0.00	0.81	0.02	11.8	3.3	2.4	0.20
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 12

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 10 PPM FEMALES								
90037	107.	60.	10.7	101.	6.0	4.89	142.	40.
90040	105.	71.	11.0	102.	6.8	4.32	144.	42.
90043	116.	69.	11.2	102.	6.8	4.35	144.	37.
90065	112.	58.	11.0	103.	6.2	4.57	143.	32.
90086	97.	75.	10.5	102.	7.1	4.38	143.	31.
MEAN	107.	67.	10.9	102.	6.6	4.50	143.	36.
S.D.	7.2	7.3	0.28	0.7	0.46	0.238	0.8	4.8
S.E.	3.2	3.3	0.12	0.3	0.21	0.106	0.4	2.2
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 13

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP:	20 PPM	FEMALES									
90038	4.9	7.0	2.1	2.39	0.1	18.3	0.2	68.	28.	78.	1.1
90042	4.6	6.6	2.0	2.26	0.1	13.8	0.3	134.	27.	111.	0.6
90063	4.7	6.9	2.1	2.22	0.1	12.8	0.3	123.	24.	76.	0.6
90074	4.7	7.0	2.3	2.09	0.1	17.8	0.2	143.	25.	80.	0.1
90081	4.9	6.9	2.0	2.52	0.1	14.3	0.3	83.	27.	72.	2.2
MEAN	4.8	6.9	2.1	2.30	0.1	15.4	0.3	110.	26.	83.	0.9
S.D.	0.13	0.16	0.12	0.165	0.00	2.48	0.05	32.9	1.6	15.7	0.80
S.E.	0.06	0.07	0.05	0.074	0.00	1.11	0.02	14.7	0.7	7.0	0.36
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 14

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 20 PPM FEMALES								
90038	115.	73.	11.1	103.	5.0	4.51	144.	43.
90042	109.	79.	10.2	102.	6.5	4.26	145.	33.
90063	113.	58.	10.9	101.	6.9	4.93	142.	37.
90074	113.	76.	10.4	103.	6.1	5.00	142.	34.
90081	132.	68.	10.6	106.	5.3	4.15	147.	30.
MEAN	116.	71.	10.6	103.	6.0	4.57	144.	35.
S.D.	9.0	8.2	0.36	1.9	0.80	0.384	2.1	4.9
S.E.	4.0	3.7	0.16	0.8	0.36	0.172	0.9	2.2
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 15

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	ALBUMIN	TOTAL PROTEIN	GLOBULIN	A/G RATIO	TOTAL BILI	UREA NITROGEN	CREAT-ININE	ALKALINE PHOS'TSE	ALANINE TRANSFER	ASPARTAT TRANSFER	GLUTAMYL TRANSFER
	g/dL	g/dL	g/dL		mg/dL	mg/dL	mg/dL	U/L	U/L	U/L	U/L
GROUP: 50 PPM FEMALES											
90050	5.2	7.3	2.1	2.53	0.1	13.2	0.3	68.	34.	79.	1.4
90053	4.4	6.3	1.9	2.36	0.1	14.9	0.3	91.	27.	102.	1.9
90064	4.7	7.2	2.4	1.94	0.1	15.2	0.2	165.	39.	102.	0.3
90076	4.8	7.0	2.2	2.14	0.1	14.3	0.3	97.	20.	76.	1.3
90094	5.3	7.4	2.1	2.50	0.1	18.1	0.2	57.	23.	66.	1.2
MEAN	4.9	7.0	2.1	2.29	0.1	15.1	0.3	96.	29.	85.	1.2
S.D.	0.37	0.44	0.18	0.251	0.00	1.82	0.05	42.1	7.8	16.2	0.58
S.E.	0.17	0.20	0.08	0.112	0.00	0.82	0.02	18.8	3.5	7.3	0.26
N	5	5	5	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, U/L = INTERNATIONAL UNIT/LITER, g/dL = GRAMS/DECILITER

TABLE A48 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 16

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL SERUM CHEMISTRY VALUES — DAY 14

ANIMAL	GLUCOSE	CHOL-ESTEROL	CALCIUM	CHLORIDE	PHOS-PHORUS	POTAS-SIUM	SODIUM	TRIGLY-CERIDE
	mg/dL	mg/dL	mg/dL	mEq/L	mg/dL	mEq/L	mEq/L	mg/dL
GROUP: 50 PPM FEMALES								
90050	131.	97.	11.0	101.	7.3	4.89	142.	53.
90053	105.	54.	10.5	104.	7.1	4.91	144.	34.
90064	101.	63.	10.6	103.	7.5	4.58	143.	38.
90076	120.	59.	10.8	105.	6.5	4.41	145.	23.
90094	113.	76.	11.3	103.	7.1	4.25	146.	39.
MEAN	114.	70.	10.8	103.	7.1	4.61	144.	37.
S.D.	12.0	17.3	0.32	1.5	0.37	0.291	1.6	10.8
S.E.	5.4	7.7	0.14	0.7	0.17	0.130	0.7	4.8
N	5	5	5	5	5	5	5	5

mg/dL = MILLIGRAMS/DECILITER, mEq/L = MILLIEQUIVALENTS/LITER

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TABLE A49 (UNSCHEDULED DEATH - 8-HOUR EXPOSURE)
PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SPONSOR:LYONDELL CHEMICAL INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89993 GROUP 4: 50 PPM MALE FOUND DEAD 12/06/07 DATE OF DEATH: 12/05/07 STUDY DAY: 1

			GRADE
	KIDNEYS	MICRO: HYDRONEPHROSIS	2
		UNILATERAL	
	LUNGS	GROSS: DISCOLORATION, DARK RED	P
		ALL LOBES	
	LUNGS	MICRO: CONGESTION	3
		HEMORRHAGE	2
		FOCAL	
		EDEMA	2
		ALVEOLAR	
	TRACHEA	MICRO: EROSION, EPITHELIAL	4
		DIFFUSE	
	LARYNX	MICRO: EROSION, EPITHELIAL	3
		INFLAMMATION, SUBACUTE	2
		HYPERPLASIA, EPITHELIAL	3
		ULCERATION	5
	NASAL LEVEL I	MICRO: ULCERATION	5
		SEPTUM	
		DEGENERATION, RESPIRATORY EPITHELIUM	2
		DORSAL MEATUS	
	NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	2
		DORSAL MEATUS	
		HYPERPLASIA, GOBLET CELL	2
		SEPTUM	
		DEGENERATION, RESPIRATORY EPITHELIUM	2

ANIMAL NO. 89993 GROUP 4: 50 PPM MALE FOUND DEAD 12/06/07 DATE OF DEATH: 12/05/07 STUDY DAY: 1

			GRADE
		VENTRAL MEATUS	
NASAL LEVEL IV	MICRO:	DEGENERATION, OLFACTORY EPITHELIUM	5
		SEPTUM, ETHMOTURBINATE 3	
		EROSION	3
		OLFACTORY EPITHELIUM, ETHMOTURBINATES	
		ULCERATION	5
		ETHMOTURBINATES	
NASAL LEVEL V	MICRO:	DEGENERATION, OLFACTORY EPITHELIUM	5
		ETHMOTURBINATES	
		EROSION	4
		OLFACTORY EPITHELIUM, ETHMOTURBINATES	
		INFLAMMATION, SUBACUTE	3
		NASOLACRIMAL DUCT	
		ULCERATION	5
		NASOLACRIMAL DUCT	
NASAL LEVEL VI	MICRO:	DEGENERATION, OLFACTORY EPITHELIUM	5
		ETHMOTURBINATES, NASOPHARYNGEAL MEATUS	
		EROSION	4
		ETHMOTURBINATES	
		ULCERATION	5
		ETHMOTURBINATES	

TABLE A49 (UNSCHEDULED DEATH - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89993 GROUP 4: 50 PPM MALE FOUND DEAD 12/06/07 DATE OF DEATH: 12/05/07 STUDY DAY: 1

				GRADE
			DEGENERATION, RESPIRATORY EPITHELIUM RESPIRATORY EPITHELIUM, NASOPHARYNGEAL MEATUS	3
CAUSE OF DEATH:	NASAL LEVEL I	MICRO:	ULCERATION	5
	NASAL LEVEL VI	MICRO:	ULCERATION	5
	NASAL LEVEL IV	MICRO:	ULCERATION	5
	NO SIGNIFICANT CHANGES OBSERVED			

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	MAMMARY GLAND	PANCREAS
	PITUITARY	PROSTATE	SPINAL CORD	SAL. GLAND MAND
	SKIN	SPLEEN	STOMACH	SEMINAL VESICLES
	TESTES	THYMUS	THYROID GLANDS	TRACHEA
	URINARY BLADDER	DIAPHRAGM	LARYNX	NASAL TISSUES
MICRO:	LIVER	NASAL LEVEL III		

GROSS/MICRO CORRELATIONS

GROSS FINDING	<===> CONFIRMING MICROSCOPIC FINDING
LUNGS: DISCOLORATION, DARK RED	<===>LUNGS: CONGESTION

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89996 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.99	2.923
LUNGS	1.48	0.394
KIDNEYS	2.54	0.676
FINAL BODY WT(G)	376.	

KIDNEYS NASAL LEVEL I NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	REGENERATION, RENAL TUBULAR	1
MICRO:	INFLAMMATION, CHRONIC	1
	NASO-MAXILLO-TURBINATES, LATERAL WALL	

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SPONSOR:LYONDELL CHEMICAL INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90001 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.76	2.603
LUNGS	1.34	0.357
KIDNEYS	2.40	0.640
FINAL BODY WT(G)	375.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90007 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.30	2.915
LUNGS	1.55	0.367
KIDNEYS	2.74	0.649
FINAL BODY WT(G)	422.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC	2
	NASO-MAXILLO-TURBINATES, LATERAL WALL	
	HYPERPLASIA, EPITHELIAL	2
	NASO-MAXILLO-TURBINATES, LATERAL WALL	
NASAL LEVEL II	MICRO: INFLAMMATION, CHRONIC	2
	LATERAL WALL	

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, TESTES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, DIAPHRAGM, LARYNX, NASAL TISSUES

MICRO: KIDNEYS, LIVER, LUNGS, TRACHEA, LARYNX, NASAL LEVEL III, NASAL LEVEL IV, NASAL LEVEL V, NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
PROJECT NO.:WIL-14068E ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SPONSOR:LYONDELL CHEMICAL INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90016 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.	NASAL LEVEL II					GRADE
LIVER	11.87	2.902		MICRO: INFLAMMATION, CHRONIC LATERAL WALL				1
LUNGS	1.47	0.359	NO SIGNIFICANT					
KIDNEYS	3.06	0.748	CHANGES OBSERVED	GROSS: ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
FINAL BODY WT(G)	409.			EYES	HEART	INTESTINE	KIDNEYS	
				LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
				PANCREAS	PITUITARY	PROSTATE	SPINAL CORD	
				SAL. GLAND MAND	SKIN	SPLEEN	STOMACH	
				SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS	
				TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX	
				NASAL TISSUES				
				MICRO: KIDNEYS	LIVER	LUNGS	TRACHEA	
				LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV	
				NASAL LEVEL V	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90029 GROUP 1: 0 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.71	3.018
LUNGS	1.56	0.402
KIDNEYS	3.10	0.799
FINAL BODY WT(G)	388.	

NO SIGNIFICANT CHANGES OBSERVED

	GRADE			
GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 89997 GROUP 2: 10 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.75	2.898
LUNGS	1.39	0.375
KIDNEYS	2.96	0.798
FINAL BODY WT(G)	371.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	2
	HYPERKERATOSIS SEPTUM	1
NASAL LEVEL II	MICRO: INFLAMMATION, CHRONIC SEPTUM	1
	HYPERPLASIA, GOBLET CELL SEPTUM	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 89999 GROUP 2: 10 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.32	2.505
LUNGS	1.43	0.384
KIDNEYS	2.51	0.675
FINAL BODY WT(G)	372.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC	
	NASO-MAXILLO-TURBINATES, LATERAL WALL	2
NASAL LEVEL II	MICRO: INFLAMMATION, CHRONIC	
	NASO-MAXILLO-TURBINATES	2
	HYPERPLASIA, GOBLET CELL	
	SEPTUM	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, TESTES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, DIAPHRAGM, LARYNX, NASAL TISSUES

MICRO: KIDNEYS, LIVER, LUNGS, TRACHEA, LARYNX, NASAL LEVEL III, NASAL LEVEL IV, NASAL LEVEL V, NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90019 GROUP 2: 10 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.16	2.612
LUNGS	1.68	0.432
KIDNEYS	2.93	0.753
FINAL BODY WT(G)	389.	

NASAL LEVEL I — MICRO: INFLAMMATION, CHRONIC — GRADE 1
NASO-MAXILLO-TURBINATES, LATERAL WALL

NASAL LEVEL II — MICRO: DEGENERATION, OLFACTORY EPITHELIUM — GRADE 1
DORSAL MEATUS

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90026 GROUP 2: 10 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.24	2.768
LUNGS	1.56	0.384
KIDNEYS	2.76	0.680
FINAL BODY WT(G)	406.	

NASAL LEVEL I
NASAL LEVEL II
NASAL LEVEL III

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	2
MICRO:	DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	1
MICRO:	DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90031 GROUP 2: 10 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	9.83	2.686
LUNGS	1.34	0.366
KIDNEYS	2.91	0.795
FINAL BODY WT(G)	366.	

NASAL LEVEL II
NO SIGNIFICANT
CHANGES OBSERVED

MICRO: DEGENERATION, OLFACTORY EPITHELIUM GRADE 2
DORSAL MEATUS

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 89992 GROUP 3: 20 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.49	2.890
LUNGS	1.50	0.413
KIDNEYS	2.55	0.702
FINAL BODY WT(G)	363.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC	
	NASO-MAXILLO-TURBINATES, LATERAL WALL	1
	HYPERKERATOSIS	
	SEPTUM	1
NASAL LEVEL II	MICRO: INFLAMMATION, CHRONIC	
	NASO-MAXILLO-TURBINATES	2
	HYPERPLASIA, GOBLET CELL	
	SEPTUM	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90004 GROUP 3: 20 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.03	2.887
LUNGS	1.45	0.380
KIDNEYS	3.23	0.846
FINAL BODY WT(G)	382.	

		GRADE
NASAL LEVEL II	MICRO: INFLAMMATION, CHRONIC	2
	NASO-MAXILLO-TURBINATES	
	HYPERPLASIA, GOBLET CELL	1
	SEPTUM	
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	2
	DORSAL MEATUS	
NASAL LEVEL VI	MICRO: NO SIGNIFICANT CHANGES OBSERVED	
	RECUT EXAMINED. TRAUMA TO NASOPHARYNGEAL MEATUS	
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90020 GROUP 3: 20 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.59	2.674
LUNGS	1.43	0.361
KIDNEYS	2.17	0.548
FINAL BODY WT(G)	396.	

NASAL LEVEL I

NASAL LEVEL IV

NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO: INFLAMMATION, CHRONIC				2
NASO-MAXILLO-TURBINATES, LATERAL WALL				
MICRO: DEGENERATION, OLFACTORY EPITHELIUM				1
ETHMOTURBINATES				

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90021 GROUP 3: 20 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.93	2.854
LUNGS	1.63	0.426
KIDNEYS	2.80	0.731
FINAL BODY WT(G)	383.	

NASAL LEVEL I
NO SIGNIFICANT
CHANGES OBSERVED

GRADE

MICRO: INFLAMMATION, CHRONIC 3
NASO-MAXILLO-TURBINATES, LATERAL WALL

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
NASAL TISSUES			

MICRO:

KIDNEYS	LIVER	LUNGS	TRACHEA
LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90025 GROUP 3: 20 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.98	2.908
LUNGS	1.55	0.376
KIDNEYS	2.83	0.687
FINAL BODY WT(G)	412.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC	
	NASO-MAXILLO-TURBINATES, LATERAL WALL	2
NASAL LEVEL III	MICRO: INFLAMMATION, CHRONIC	
	NASO-MAXILLO-TURBINATES, LATERAL WALL	2
	HYPERPLASIA, GOBLET CELL	
	SEPTUM	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 89966 GROUP 4: 50 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.			GRADE
LIVER	11.06	2.903	NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	2
LUNGS	1.57	0.412		HYPERKERATOSIS DORSAL MEATUS	2
KIDNEYS	3.00	0.787			
FINAL BODY WT(G)	381.		NASAL LEVEL II	MICRO: HEMORRHAGE NASO-MAXILLO-TURBINATES	2
			NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	3
				HEMORRHAGE NASO-MAXILLO-TURBINATES, LATERAL WALL	2
			NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM ETHMOTURBINATES	5
				INFLAMMATION, SUBACUTE ETHMOTURBINATES	2
				HEMORRHAGE ETHMOTURBINATES	3
				METAPLASIA, OLFACTORY TO RESPIRATORY EPITHELIUM DORSAL MEATUS, SEPTUM	5
				ULCERATION OLFACTORY EPITHELIUM, LATERAL MEATUS	5
			NASAL LEVEL V	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS, ETHMOTURBINATE 3	3

ANIMAL NO. 89966 GROUP 4: 50 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

			GRADE
NASAL LEVEL VI	MICRO:	DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS/ETHMOTURBINATE 1	3
		HEMORRHAGE ETHMOTURBINATES	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89967 GROUP 4: 50 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.23	2.759
LUNGS	1.47	0.361
KIDNEYS	3.01	0.740
FINAL BODY WT(G)	407.	

NASAL LEVEL II
NO SIGNIFICANT CHANGES OBSERVED

NASAL LEVEL III
NO SIGNIFICANT CHANGES OBSERVED

			GRADE
MICRO:	HYPERPLASIA, GOBLET CELL	SEPTUM	2
	INFLAMMATION, CHRONIC	NASO-MAXILLO-TURBINATES	1
MICRO:	NO SIGNIFICANT CHANGES OBSERVED	MISSING DORSAL MEATUS. RECUT EXAMINED.	

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 89986 GROUP 4: 50 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.	LARYNX	MICRO: HYPERPLASIA, EPITHELIAL	GRADE
LIVER	10.87	2.780	NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC	2
LUNGS	1.57	0.402		NASO-MAXILLO-TURBINATES, LATERAL WALL	
KIDNEYS	3.06	0.783	NASAL LEVEL II	MICRO: HYPERPLASIA, GOBLET CELL	3
FINAL BODY WT(G)	391.			SEPTUM	
				INFLAMMATION, CHRONIC	3
				NASO-MAXILLO-TURBINATES	
			NASAL LEVEL IV	MICRO: DEGENERATION, RESPIRATORY EPITHELIUM	2
			NASAL LEVEL V	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	4
				ETHMOTURBINATES	
				DEGENERATION, RESPIRATORY EPITHELIUM	3
				NASOPHARYNGEAL MEATUS	
				EROSION	3
				RESPIRATORY EPITHELIUM, NASOPHARYNGEAL MEATUS	
			NASAL LEVEL VI	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	2
				ETHMOTURBINATES	
				DEGENERATION, RESPIRATORY EPITHELIUM	2
				RESPIRATORY EPITHELIUM, NASOPHARYNGEAL MEATUS	
			NO SIGNIFICANT CHANGES OBSERVED	GROSS:	

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH

ANIMAL NO. 89986 GROUP 4: 50 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

				GRADE
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	NASAL LEVEL III			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90014 GROUP 4: 50 PPM MALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	10.60	2.732
LUNGS	1.39	0.358
KIDNEYS	2.54	0.655
FINAL BODY WT(G)	388.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC	2
	NASO-MAXILLO-TURBINATES, LATERAL WALL	
NASAL LEVEL II	MICRO: HYPERPLASIA, GOBLET CELL	2
	DEGENERATION, OLFACTORY EPITHELIUM	2
	DORSAL MEATUS	
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	3

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	SEMINAL VESICLES	TESTES	THYMUS	THYROID GLANDS
	TRACHEA	URINARY BLADDER	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90049 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.20	3.025
LUNGS	1.21	0.508
KIDNEYS	1.80	0.756
FINAL BODY WT(G)	238.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90055 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.32	2.976
LUNGS	1.34	0.545
KIDNEYS	1.69	0.687
FINAL BODY WT(G)	246.	

KIDNEYS
UTERUS

UTERUS

NO SIGNIFICANT
CHANGES OBSERVED

		GRADE
MICRO:	INFLAMMATION, CHRONIC, INTERSTITIAL	2
GROSS:	CONTENTS, CLEAR FLUID BOTH HORNS	P
MICRO:	NOT PRESENT FOR EXAMINATION NOT PRESENT AT WET TRIMMING	

GROSS: ADRENAL GLANDS, BRAIN, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, OVIDUCTS, OVARIES, PANCREAS, PITUITARY, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, CERVIX, VAGINA, DIAPHRAGM, LARYNX, NASAL TISSUES

MICRO: LIVER, LUNGS, TRACHEA, LARYNX, NASAL LEVEL I, NASAL LEVEL II, NASAL LEVEL III, NASAL LEVEL IV, NASAL LEVEL V, NASAL LEVEL VI

NOT PRESENT FOR EXAMINATION

MICRO: UTERUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90096 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	7.68	3.048	
LUNGS	1.41	0.560	
KIDNEYS	1.80	0.714	
FINAL BODY WT(G)	252.		

NASAL LEVEL II
NO SIGNIFICANT
CHANGES OBSERVED

MICRO: NO SIGNIFICANT CHANGES OBSERVED
DORSAL MEATUS MISSING. RECUT EXAMINED.

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90101 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.16	2.762
LUNGS	0.93	0.417
KIDNEYS	1.57	0.704
FINAL BODY WT(G)	223.	

NO SIGNIFICANT CHANGES OBSERVED

					GRADE
GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES	
	HEART	INTESTINE	KIDNEYS	LIVER	
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS	
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD	
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH	
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER	
	UTERUS	CERVIX	VAGINA	DIAPHRAGM	
	LARYNX	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA	
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III	
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90102 GROUP 1: 0 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.71	2.784
LUNGS	1.28	0.531
KIDNEYS	1.71	0.710
FINAL BODY WT(G)	241.	

NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90037 GROUP 2: 10 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.64	2.874
LUNGS	1.25	0.541
KIDNEYS	1.54	0.667
FINAL BODY WT(G)	231.	

NO SIGNIFICANT CHANGES OBSERVED

	GRADE			
GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL II	NASAL LEVEL III
	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90040 GROUP 2: 10 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.	NASAL LEVEL II
LIVER	6.94	2.833	
LUNGS	1.11	0.453	NO SIGNIFICANT
KIDNEYS	1.75	0.714	CHANGES OBSERVED
FINAL BODY WT(G)	245.		

GRADE

2

MICRO: INFLAMMATION, CHRONIC
NASO-MAXILLO-TURBINATES

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90043 GROUP 2: 10 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.91	3.126
LUNGS	1.18	0.466
KIDNEYS	1.87	0.739
FINAL BODY WT(G)	253.	

NO SIGNIFICANT CHANGES OBSERVED

NASAL LEVEL I

		GRADE
MICRO:	HYPERPLASIA, GOBLET CELL SEPTUM	2
	INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	2

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90065 GROUP 2: 10 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.42	2.755
LUNGS	1.14	0.489
KIDNEYS	1.71	0.734
FINAL BODY WT(G)	233.	

NASAL LEVEL I — NO SIGNIFICANT CHANGES OBSERVED

			GRADE
MICRO:	HYPERPLASIA, GOBLET CELL	SEPTUM	2
	INFLAMMATION, CHRONIC	NASO-MAXILLO-TURBINATES, LATERAL WALL	2

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90086 GROUP 2: 10 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.54	2.992
LUNGS	1.25	0.496
KIDNEYS	1.83	0.726
FINAL BODY WT(G)	252.	

NASAL LEVEL II
NO SIGNIFICANT
CHANGES OBSERVED

					GRADE
MICRO: DEGENERATION, OLFACTORY EPITHELIUM					2
GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES	
	HEART	INTESTINE	KIDNEYS	LIVER	
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS	
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD	
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH	
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER	
	UTERUS	CERVIX	VAGINA	DIAPHRAGM	
	LARYNX	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA	
	LARYNX	NASAL LEVEL I	NASAL LEVEL III	NASAL LEVEL IV	
	NASAL LEVEL V	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90038 GROUP 3: 20 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.10	3.008
LUNGS	1.22	0.517
KIDNEYS	1.79	0.758
FINAL BODY WT(G)	236.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC	2
	NASO-MAXILLO-TURBINATES, LATERAL WALL	
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	2
	DORSAL MEATUS	

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90042 GROUP 3: 20 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.20	2.793
LUNGS	1.24	0.559
KIDNEYS	1.69	0.761
FINAL BODY WT(G)	222.	

NASAL LEVEL I
NO SIGNIFICANT
CHANGES OBSERVED

GRADE

MICRO: INFLAMMATION, CHRONIC 2
NASO-MAXILLO-TURBINATES, LATERAL WALL

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL IV
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90063 GROUP 3: 20 PPM FEMALE SCHEDULED EUTH 12/18/07

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	7.27	2.943	2
LUNGS	1.35	0.547	1
FINAL BODY WT(G)	247.		2

NASAL LEVEL I MICRO: INFLAMMATION, CHRONIC 2
NASO-MAXILLO-TURBINATES, LATERAL WALL
NASAL LEVEL III MICRO: DEGENERATION, OLFACTORY EPITHELIUM 2
DORSAL MEATUS
NASAL LEVEL IV MICRO: DEGENERATION, OLFACTORY EPITHELIUM
ETHMOTURBINATES
NASAL LEVEL V MICRO: DEGENERATION, OLFACTORY EPITHELIUM
ETHMOTURBINATES
NO SIGNIFICANT CHANGES OBSERVED

GROSS:ADRENAL GLANDS
HEART
LYMPH NODE, MES
OVARIES
SAL. GLAND MAND
THYMUS
UTERUS
MICRO:KIDNEYS
LARYNX
GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

BRAIN
INTESTINE
LUNGS
PANCREAS
SKIN
THYROID GLANDS
CERVIX
NASAL TISSUES
LIVER
NASAL LEVEL II

ESOPHAGUS
KIDNEYS
MAMMARY GLAND
PITUITARY
SPLEEN
TRACHEA
VAGINA

LUNGS
NASAL LEVEL VI

EYES
LIVER
OVIDUCTS
SPINAL CORD
STOMACH
URINARY BLADDER
DIAPHRAGM

TRACHEA

ANIMAL NO. 90074 GROUP 3: 20 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.41	2.705
LUNGS	1.20	0.506
KIDNEYS	1.67	0.705
FINAL BODY WT(G)	237.	

		GRADE
KIDNEYS	MICRO: MINERALIZATION	2
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	2
NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM	1
NASAL LEVEL V	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL IV	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90081 GROUP 3: 20 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.57	2.820
LUNGS	1.14	0.489
KIDNEYS	1.55	0.665
FINAL BODY WT(G)	233.	

		GRADE
KIDNEYS	MICRO: MINERALIZATION	2
LIVER	GROSS: PALE ALL LOBES	P
NASAL LEVEL II	MICRO: HYPERPLASIA, GOBLET CELL	1
	DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	3
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM ETHMOTURBINATES	1
NASAL LEVEL V	MICRO: DEGENERATION, OLFACTORY EPITHELIUM ETHMOTURBINATES	3

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LYMPH NODE, MES
	LUNGS	MAMMARY GLAND	OVIDUCTS	OVARIES
	PANCREAS	PITUITARY	SPINAL CORD	SAL. GLAND MAND
	SKIN	SPLEEN	STOMACH	THYMUS
	THYROID GLANDS	TRACHEA	URINARY BLADDER	UTERUS
	CERVIX	VAGINA	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL I	NASAL LEVEL VI		

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90081 GROUP 3: 20 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

GROSS/MICRO CORRELATIONS GROSS FINDING		GRADE
LIVER: PALE	<===> CONFIRMING MICROSCOPIC FINDING <===>GROSS UNCONFIRMED	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90050 GROUP 4: 50 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.30	3.120
LUNGS	1.25	0.534
KIDNEYS	1.87	0.799
FINAL BODY WT(G)	234.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	2
NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	1

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL III	NASAL LEVEL IV	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90053 GROUP 4: 50 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.37	2.746
LUNGS	1.26	0.543
KIDNEYS	1.60	0.690
FINAL BODY WT(G)	232.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	2
NASAL LEVEL III	MICRO: NO SIGNIFICANT CHANGES OBSERVED MISSING DORSAL MEATUS. RECUT EXAMINED.	
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	3
NO SIGNIFICANT CHANGES OBSERVED		

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL II	NASAL LEVEL III	NASAL LEVEL V
	NASAL LEVEL VI			

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90064 GROUP 4: 50 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.10	2.689
LUNGS	1.31	0.496
KIDNEYS	1.82	0.689
FINAL BODY WT(G)	264.	

		GRADE
NASAL LEVEL I	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	3
NASAL LEVEL II	MICRO: NOT PRESENT FOR EXAMINATION N2 LOST AT MICROTOMY	
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	3
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	3

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL V	NASAL LEVEL VI	

NOT PRESENT FOR EXAMINATION

MICRO:NASAL LEVEL II

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

ANIMAL NO. 90076 GROUP 4: 50 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	7.10	2.806
LUNGS	1.30	0.514
KIDNEYS	1.92	0.759
FINAL BODY WT(G)	253.	

		GRADE
UTERUS	GROSS: CONTENTS, CLEAR FLUID BOTH HORNS	P
UTERUS	MICRO: NOT PRESENT FOR EXAMINATION NOT SUBMITTED	
NASAL LEVEL I	MICRO: HYPERPLASIA, GOBLET CELL SEPTUM	3
	INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	2
NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2
	HYPERPLASIA, GOBLET CELL SEPTUM	2
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	CERVIX	VAGINA	DIAPHRAGM	LARYNX
	NASAL TISSUES			
MICRO:	KIDNEYS	LIVER	LUNGS	TRACHEA
	LARYNX	NASAL LEVEL IV	NASAL LEVEL V	NASAL LEVEL VI

ANIMAL NO. 90076 GROUP 4: 50 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

GRADE

NOT PRESENT FOR EXAMINATION

MICRO:UTERUS

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A50 (SCHEDULED NECROPSY - 8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

ANIMAL NO. 90094 GROUP 4: 50 PPM FEMALE SCHEDULED EUTH 12/18/07 DATE OF DEATH: 12/18/07 STUDY DAY: 14

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	6.14	2.856
LUNGS	1.20	0.558
KIDNEYS	1.56	0.726
FINAL BODY WT(G)	215.	

KIDNEYS

		GRADE
NASAL LEVEL I	MICRO: MINERALIZATION	2
	MICRO: INFLAMMATION, CHRONIC NASO-MAXILLO-TURBINATES, LATERAL WALL	2
NASAL LEVEL II	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2
NASAL LEVEL III	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS AND TURBINATES	3
NASAL LEVEL IV	MICRO: DEGENERATION, OLFACTORY EPITHELIUM DORSAL MEATUS	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS:	ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
	HEART	INTESTINE	KIDNEYS	LIVER
	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	OVIDUCTS
	OVARIES	PANCREAS	PITUITARY	SPINAL CORD
	SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
	THYMUS	THYROID GLANDS	TRACHEA	URINARY BLADDER
	UTERUS	CERVIX	VAGINA	DIAPHRAGM
	LARYNX	NASAL TISSUES		
MICRO:	LIVER	LUNGS	TRACHEA	LARYNX
	NASAL LEVEL V	NASAL LEVEL VI		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL; 2-MILD; 3-MODERATE; 4-SEVERE;
5-SEVERE, IRREVERSIBLE; P-PRESENT

PGRHv4.61
09/15/2008

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A51 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89996	376.	10.99	1.48	2.54
90001	375.	9.76	1.34	2.40
90007	422.	12.30	1.55	2.74
90016	409.	11.87	1.47	3.06
90029	388.	11.71	1.56	3.10
MEAN	394.	11.33	1.48	2.77
S.D.	20.8	0.995	0.088	0.310
S.E.	9.3	0.445	0.039	0.139
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A51 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 10 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89997	371.	10.75	1.39	2.96
89999	372.	9.32	1.43	2.51
90019	389.	10.16	1.68	2.93
90026	406.	11.24	1.56	2.76
90031	366.	9.83	1.34	2.91
MEAN	381.	10.26	1.48	2.81
S.D.	16.5	0.755	0.138	0.187
S.E.	7.4	0.338	0.062	0.083
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A51 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 20 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89992	363.	10.49	1.50	2.55
90004	382.	11.03	1.45	3.23
90020	396.	10.59	1.43	2.17
90021	383.	10.93	1.63	2.80
90025	412.	11.98	1.55	2.83
MEAN	387.	11.00	1.51	2.72
S.D.	18.2	0.590	0.081	0.390
S.E.	8.1	0.264	0.036	0.175
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A51 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

MALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89966	381.	11.06	1.57	3.00
89967	407.	11.23	1.47	3.01
89986	391.	10.87	1.57	3.06
90014	388.	10.60	1.39	2.54
MEAN	392.	10.94	1.50	2.90
S.D.	11.0	0.270	0.087	0.243
S.E.	5.5	0.135	0.044	0.122
N	4	4	4	4

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A51 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90049	238.	7.20	1.21	1.80
90055	246.	7.32	1.34	1.69
90096	252.	7.68	1.41	1.80
90101	223.	6.16	0.93	1.57
90102	241.	6.71	1.28	1.71
MEAN	240.	7.01	1.23	1.71
S.D.	10.9	0.590	0.185	0.095
S.E.	4.9	0.264	0.083	0.042
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A51 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 10 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90037	231.	6.64	1.25	1.54
90040	245.	6.94	1.11	1.75
90043	253.	7.91	1.18	1.87
90065	233.	6.42	1.14	1.71
90086	252.	7.54	1.25	1.83
MEAN	243.	7.09	1.19	1.74
S.D.	10.4	0.622	0.063	0.128
S.E.	4.6	0.278	0.028	0.057
N	5	5	5	5

FBW = FINAL BODY WEIGHT

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A51 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 20 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90038	236.	7.10	1.22	1.79
90042	222.	6.20	1.24	1.69
90063	247.	7.27	1.35	NA
90074	237.	6.41	1.20	1.67
90081	233.	6.57	1.14	1.55
MEAN	235.	6.71	1.23	1.68
S.D.	9.0	0.457	0.077	0.098
S.E.	4.0	0.204	0.034	0.049
N	5	5	5	4

FBW = FINAL BODY WEIGHT

NA = NOT APPLICABLE

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A51 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]

FEMALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90050	234.	7.30	1.25	1.87
90053	232.	6.37	1.26	1.60
90064	264.	7.10	1.31	1.82
90076	253.	7.10	1.30	1.92
90094	215.	6.14	1.20	1.56
MEAN	240.	6.80	1.26	1.75
S.D.	19.2	0.512	0.044	0.163
S.E.	8.6	0.229	0.020	0.073
N	5	5	5	5

FBW = FINAL BODY WEIGHT

POFBWv4.14
03/27/2008
R:03/27/2008

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A52 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89996	376.	2.923	0.394	0.676
90001	375.	2.603	0.357	0.640
90007	422.	2.915	0.367	0.649
90016	409.	2.902	0.359	0.748
90029	388.	3.018	0.402	0.799
MEAN	394.	2.872	0.376	0.702
S.D.	20.8	0.1573	0.0208	0.0687
S.E.	9.3	0.0704	0.0093	0.0307
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A52 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 2

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G] — DAY 14

MALE GROUP: 10 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89997	371.	2.898	0.375	0.798
89999	372.	2.505	0.384	0.675
90019	389.	2.612	0.432	0.753
90026	406.	2.768	0.384	0.680
90031	366.	2.686	0.366	0.795
MEAN	381.	2.694	0.388	0.740
S.D.	16.5	0.1497	0.0256	0.0600
S.E.	7.4	0.0669	0.0114	0.0268
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A52 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

MALE GROUP: 20 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89992	363.	2.890	0.413	0.702
90004	382.	2.887	0.380	0.846
90020	396.	2.674	0.361	0.548
90021	383.	2.854	0.426	0.731
90025	412.	2.908	0.376	0.687
MEAN	387.	2.843	0.391	0.703
S.D.	18.2	0.0962	0.0272	0.1067
S.E.	8.1	0.0430	0.0122	0.0477
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A52 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 4

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G] — DAY 14

MALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
89966	381.	2.903	0.412	0.787
89967	407.	2.759	0.361	0.740
89986	391.	2.780	0.402	0.783
90014	388.	2.732	0.358	0.655
MEAN	392.	2.794	0.383	0.741
S.D.	11.0	0.0756	0.0278	0.0613
S.E.	5.5	0.0378	0.0139	0.0307
N	4	4	4	4

FBW = FINAL BODY WEIGHT

TABLE A52 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 0 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90049	238.	3.025	0.508	0.756
90055	246.	2.976	0.545	0.687
90096	252.	3.048	0.560	0.714
90101	223.	2.762	0.417	0.704
90102	241.	2.784	0.531	0.710
MEAN	240.	2.919	0.512	0.714
S.D.	10.9	0.1360	0.0566	0.0255
S.E.	4.9	0.0608	0.0253	0.0114
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A52 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 10 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90037	231.	2.874	0.541	0.667
90040	245.	2.833	0.453	0.714
90043	253.	3.126	0.466	0.739
90065	233.	2.755	0.489	0.734
90086	252.	2.992	0.496	0.726
MEAN	243.	2.916	0.489	0.716
S.D.	10.4	0.1453	0.0338	0.0290
S.E.	4.6	0.0650	0.0151	0.0130
N	5	5	5	5

FBW = FINAL BODY WEIGHT

TABLE A52 (8-HOUR EXPOSURE)

PROJECT NO.:WIL-14068E — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 7

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G] — DAY 14

FEMALE GROUP: 20 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90038	236.	3.008	0.517	0.758
90042	222.	2.793	0.559	0.761
90063	247.	2.943	0.547	NA
90074	237.	2.705	0.506	0.705
90081	233.	2.820	0.489	0.665
MEAN	235.	2.854	0.524	0.722
S.D.	9.0	0.1212	0.0289	0.0460
S.E.	4.0	0.0542	0.0129	0.0230
N	5	5	5	4

FBW = FINAL BODY WEIGHT

NA = NOT APPLICABLE

PROJECT NO.:WIL-14068E
SPONSOR:LYONDELL CHEMICAL

TABLE A52 (8-HOUR EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]

FEMALE GROUP: 50 PPM

ANIMAL	FBW(G)	LIVER	LUNGS	KIDNEYS
90050	234.	3.120	0.534	0.799
90053	232.	2.746	0.543	0.690
90064	264.	2.689	0.496	0.689
90076	253.	2.806	0.514	0.759
90094	215.	2.856	0.558	0.726
MEAN	240.	2.843	0.529	0.733
S.D.	19.2	0.1669	0.0244	0.0471
S.E.	8.6	0.0746	0.0109	0.0211
N	5	5	5	5

FBW = FINAL BODY WEIGHT

POFBWv4.14
03/27/2008
R:03/27/2008

APPENDIX B

Preliminary Study General Procedures, Results and Individual Animal Data

1. GENERAL PROCEDURES

A preliminary study was performed after exposure concentrations were targeted to assure that the high treatment level for each test duration did not cause excessive mortality or moribundity.

Allyl alcohol was administered as a vapor via whole-body inhalation exposure to 4 groups (Groups 4A and 4B, 8A and 12A) of Crl:CD(SD) rats for 1, 4 or 8 hours. Target exposure levels were 400 and 600 ppm for 1 hour (Groups 4A and 4B), 100 ppm for 4 hours (Group 8A) and 50 ppm for 8 hours (Group 12A). Overall mean analyzed exposure concentrations were 423, 638, 115 and 52 ppm for Groups 4A, 4B, 8A and 12A, respectively. Each group consisted of 3 males and 3 females. The animals were approximately 11 weeks old at the initiation of exposure. Following exposure and a 6-day non-exposure (recovery) period (study day 6), all rats were euthanized by carbon dioxide inhalation and discarded without examination.

A preliminary study was conducted using 1-, 4- and 8-hour exposure durations with 1 or 2 exposure levels per exposure duration. For the 1-hour preliminary study, 2 groups were exposed separately in Chamber 4.

The following table presents the study group assignment:

Preliminary Study (WIL-14068R)

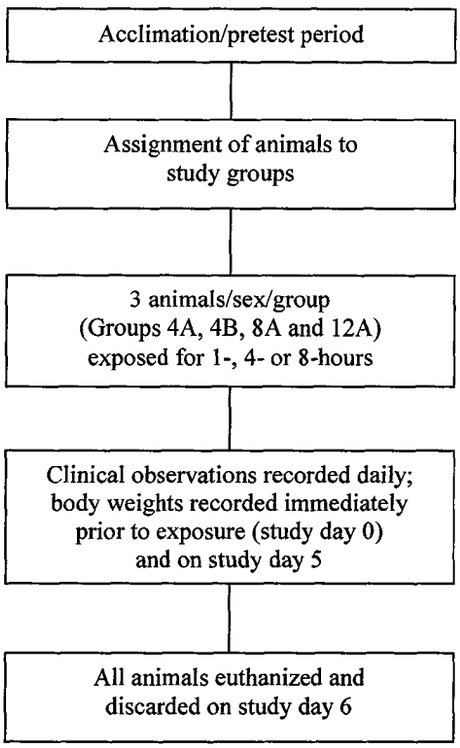
Group Number	Test Substance	Target Exposure Level (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
4A	Allyl Alcohol	400	1	3	3
4B	Allyl Alcohol	600	1	3	3
8A	Allyl Alcohol	100	4	3	3
12A	Allyl Alcohol	50	8	3	3

All animals were observed twice daily for mortality and moribundity. Individual body weights were recorded prior to exposures on 26 November 2007, immediately prior to exposure and during the post-exposure observation period on study day 5. On the day of

exposure, clinical examinations were performed 30 minutes into exposure (all exposure durations), 1 hour into exposure (4 and 8 hours of exposure), 4 hours into exposure (8 hours of exposure) and within 1 hour post-exposure (all exposure durations). During the post-exposure (recovery) period, clinical examinations were performed daily.

After a 6-day post-exposure observation period (study day 6), all surviving preliminary study animals were euthanized by carbon dioxide inhalation and discarded without examination.

2. STUDY DESIGN



3. RESULTS

The daily nominal concentrations for the test substance groups are summarized in the following table:

Group Number	Nominal Concentration (ppm)
4A	452.7
4B	692.6
8A	93.5
12A	51.2

The daily mean analyzed concentrations for all groups during the preliminary study are summarized in the following table:

Group Number	Target Allyl Alcohol Exposure Level (ppm)	Exposure Duration (hours)	Concentration (ppm)	Standard Deviation	Number of Samples
4A	400	1	423.4	29.9	2
4B	600	1	638.1	48.8	3
8A	100	4	114.5	4.1	4
12A	50	8	52.0	7.5	8

All animals survived to the scheduled euthanasia. Test substance-related clinical findings noted during exposure included gasping or labored respiration in the 50, 100, 400 and 600 ppm group males and females exposed for 8 hours, 4 hours, 1 hour and 1 hour, respectively. Gasping was also observed at the 1-hour post-exposure observation, but only in the 100 ppm (4-hour exposure) and 600 ppm (1-hour exposure) group males. Post-exposure findings of flushing and red and/or clear material around the mouth were noted in the 50, 100, 400 and/or 600 ppm groups within 1 hour post-exposure. In addition, male no. 87330 exposed for 1 hour at 400 ppm was noted as having a slight impairment in gait at 1 hour post-exposure while the gait of all other animals was normal. While some of these findings persisted to the 1-hour post-exposure observation, only red material around the mouth or nose was present on the first non-exposure day during the 6-day recovery period. A summary of selected clinical observations during exposure and post-exposure is presented in the following text table.

Selected Clinical Observations - Preliminary Study								
	Allyl Alcohol							
Sex	**Males**				**Females**			
Exposure Duration (hours)	8	4	1	1	8	4	1	1
Exposure Level (ppm)	50	100	400	600	50	100	400	600
Observation[a]								
Gasping								
30 Minutes into Exposure	2/2	0/0	0/0	1/1	1/1	1/1	0/0	0/0
1 Hour into Exposure	0/0	0/0	1/1	0/0	0/0	1/1	1/1	0/0
4 Hours into Exposure	1/1	0/0	NA	NA	0/0	0/0	NA	NA
8 Hours into Exposure	0/0	NA	NA	NA	0/0	NA	NA	NA
1 Hour Post-Exposure	0/0	3/3	0/0	1/1	0/0	0/0	0/0	0/0
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Labored respiration								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
4 Hours into Exposure	0/0	0/0	NA	NA	0/0	0/0	NA	NA
8 Hours into Exposure	2/2	NA	NA	NA	0/0	NA	NA	NA
1 Hour Post-Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Reddened forelimb(s)								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
4 Hours into Exposure	0/0	0/0	NA	NA	0/0	0/0	NA	NA
8 Hours into Exposure	0/0	NA	NA	NA	0/0	NA	NA	NA
1 Hour Post-Exposure	3/3	3/3	0/0	3/3	0/0	3/3	0/0	1/1
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Reddened hindlimb(s)								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
4 Hours into Exposure	0/0	0/0	NA	NA	0/0	0/0	NA	NA
8 Hours into Exposure	0/0	NA	NA	NA	0/0	NA	NA	NA
1 Hour Post-Exposure	3/3	3/3	0/0	3/3	1/1	3/3	0/0	0/0
Recovery Period	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Red/clear material around the mouth or nose								
30 Minutes into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
1 Hour into Exposure	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
4 Hours into Exposure	0/0	0/0	NA	NA	0/0	0/0	NA	NA
8 Hours into Exposure	0/0	NA	NA	NA	0/0	NA	NA	NA
1 Hour Post-Exposure	1/1	2/2	2/2	3/3	0/0	2/2	1/1	2/2
Recovery Period	3/2	0/0	0/0	0/0	0/0	0/0	0/0	0/0

a = Observations reported as total occurrence/number of animals
NA = Not applicable

All other clinical findings in the test substance-exposed groups were limited to single animals, were not observed in an exposure-related manner and/or were common findings for laboratory rats of this age and strain.

There were no test substance-related effects on body weights. There were no remarkable differences when the body weights on study day 5 in test substance-exposed groups were compared to the study day 0 body weights.

During the preliminary study, the targeted high-exposure level for each test duration did not cause mortality or moribundity. Therefore, the high-exposure levels of allyl alcohol used for the main study were 400, 100 and 50 ppm for 1, 4 and 8 hours of exposure, respectively.

TABLE B1 (DISPOSITIONS)

PROJECT NO.:WIL-14068R — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-28-07 TO 12-04-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87314	M	50 PPM	DISPOSITION	12-04-07	13:30	P	EUTHANIZED AND DISCARDED
87316	M	50 PPM	DISPOSITION	12-04-07	13:30	P	EUTHANIZED AND DISCARDED
87317	M	50 PPM	DISPOSITION	12-04-07	13:30	P	EUTHANIZED AND DISCARDED
87319	M	100 PPM	DISPOSITION	12-04-07	13:35	P	EUTHANIZED AND DISCARDED
87320	M	100 PPM	DISPOSITION	12-04-07	13:35	P	EUTHANIZED AND DISCARDED
87322	M	100 PPM	DISPOSITION	12-04-07	13:35	P	EUTHANIZED AND DISCARDED
87323	M	400 PPM	DISPOSITION	12-04-07	13:39	P	EUTHANIZED AND DISCARDED
87325	M	400 PPM	DISPOSITION	12-04-07	13:39	P	EUTHANIZED AND DISCARDED
87330	M	400 PPM	DISPOSITION	12-04-07	13:39	P	EUTHANIZED AND DISCARDED
87321	M	600 PPM	DISPOSITION	12-04-07	13:47	P	EUTHANIZED AND DISCARDED
87326	M	600 PPM	DISPOSITION	12-04-07	13:47	P	EUTHANIZED AND DISCARDED
87328	M	600 PPM	DISPOSITION	12-04-07	13:47	P	EUTHANIZED AND DISCARDED
87292	F	50 PPM	DISPOSITION	12-04-07	13:43	P	EUTHANIZED AND DISCARDED
87296	F	50 PPM	DISPOSITION	12-04-07	13:43	P	EUTHANIZED AND DISCARDED
87299	F	50 PPM	DISPOSITION	12-04-07	13:43	P	EUTHANIZED AND DISCARDED
87302	F	100 PPM	DISPOSITION	12-04-07	13:43	P	EUTHANIZED AND DISCARDED
87303	F	100 PPM	DISPOSITION	12-04-07	13:44	P	EUTHANIZED AND DISCARDED
87304	F	100 PPM	DISPOSITION	12-04-07	13:44	P	EUTHANIZED AND DISCARDED
87305	F	400 PPM	DISPOSITION	12-04-07	13:44	P	EUTHANIZED AND DISCARDED
87306	F	400 PPM	DISPOSITION	12-04-07	13:44	P	EUTHANIZED AND DISCARDED
87307	F	400 PPM	DISPOSITION	12-04-07	13:44	P	EUTHANIZED AND DISCARDED
87294	F	600 PPM	DISPOSITION	12-04-07	13:47	P	EUTHANIZED AND DISCARDED
87295	F	600 PPM	DISPOSITION	12-04-07	13:48	P	EUTHANIZED AND DISCARDED
87301	F	600 PPM	DISPOSITION	12-04-07	13:48	P	EUTHANIZED AND DISCARDED

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

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03/13/2008

PROJECT NO.:WIL-14068R
SPONSOR:LYONDELL CHEMICAL

TABLE B2 (30 MINUTES INTO EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-28-07 TO 11-28-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87316	M	50 PPM	CARDIO-PULMONARY	11-28-07	8:27	P	GASPING
87317	M	50 PPM	CARDIO-PULMONARY	11-28-07	8:27	P	GASPING
87321	M	600 PPM	CARDIO-PULMONARY	11-28-07	13:10	P	GASPING
87296	F	50 PPM	CARDIO-PULMONARY	11-28-07	8:27	P	GASPING
87302	F	100 PPM	CARDIO-PULMONARY	11-28-07	8:24	P	GASPING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-14068R
SPONSOR:LYONDELL CHEMICAL

TABLE B3 (1 HOUR INTO EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-28-07 TO 11-28-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87330	M	400 PPM	CARDIO-PULMONARY	11-28-07	8:58	P	GASPING
87302	F	100 PPM	CARDIO-PULMONARY	11-28-07	8:53	P	GASPING
87306	F	400 PPM	CARDIO-PULMONARY	11-28-07	8:59	P	GASPING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.11
03/13/2008

TABLE B4 (4 HOURS INTO EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-28-07 TO 11-28-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87316	M	50 PPM	CARDIO-PULMONARY	11-28-07	11:49	P	GASPING

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-14068R
SPONSOR:LYONDELL CHEMICAL

TABLE B5 (8 HOURS INTO EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-28-07 TO 11-28-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87314	M	50 PPM	CARDIO-PULMONARY	11-28-07	15:45	P	LABORED RESPIRATION
87316	M	50 PPM	CARDIO-PULMONARY	11-28-07	15:45	P	LABORED RESPIRATION

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PCRDv4.11
03/13/2008

TABLE B6 (1 HOUR POST-EXPOSURE)

PROJECT NO.:WIL-14068R — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS —

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-28-07 TO 11-28-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87314	M	50 PPM	BEHAVIOR/CNS	11-28-07	16:18	P	GAIT SCORE - NORMAL
87314	M	50 PPM	BODY/INTEGUMENT	11-28-07	16:19	P	FORELIMBS REDDENED
				11-28-07	16:19	P	HINDLIMBS REDDENED
87316	M	50 PPM	BEHAVIOR/CNS	11-28-07	16:19	P	GAIT SCORE - NORMAL
87316	M	50 PPM	BODY/INTEGUMENT	11-28-07	16:20	P	FORELIMBS REDDENED
				11-28-07	16:20	P	HINDLIMBS REDDENED
87317	M	50 PPM	BEHAVIOR/CNS	11-28-07	16:20	P	GAIT SCORE - NORMAL
87317	M	50 PPM	BODY/INTEGUMENT	11-28-07	16:20	P	FORELIMBS REDDENED
				11-28-07	16:20	P	HINDLIMBS REDDENED
87317	M	50 PPM	EYES/EARS/NOSE	11-28-07	16:21	P	DRIED RED MATERIAL AROUND NOSE
87319	M	100 PPM	BEHAVIOR/CNS	11-28-07	12:41	P	GAIT SCORE - NORMAL
87319	M	100 PPM	BODY/INTEGUMENT	11-28-07	0:00	P	FORELIMBS REDDENED
				11-28-07	0:00	P	HINDLIMBS REDDENED
87319	M	100 PPM	CARDIO-PULMONARY	11-28-07	12:41	P	GASPING
87319	M	100 PPM	ORAL/DENTAL	11-28-07	12:41	1	DRIED CLEAR MATERIAL AROUND MOUTH
87320	M	100 PPM	BEHAVIOR/CNS	11-28-07	12:38	P	GAIT SCORE - NORMAL
87320	M	100 PPM	BODY/INTEGUMENT	11-28-07	0:00	P	FORELIMBS REDDENED
				11-28-07	0:00	P	HINDLIMBS REDDENED
87320	M	100 PPM	CARDIO-PULMONARY	11-28-07	12:38	P	GASPING
87320	M	100 PPM	ORAL/DENTAL	11-28-07	12:39	1	DRIED RED MATERIAL AROUND MOUTH
87322	M	100 PPM	BEHAVIOR/CNS	11-28-07	12:36	P	GAIT SCORE - NORMAL
87322	M	100 PPM	BODY/INTEGUMENT	11-28-07	0:00	P	FORELIMBS REDDENED
				11-28-07	0:00	P	HINDLIMBS REDDENED
87322	M	100 PPM	CARDIO-PULMONARY	11-28-07	12:36	P	GASPING
87323	M	400 PPM	BEHAVIOR/CNS	11-28-07	9:49	P	GAIT SCORE - NORMAL
87325	M	400 PPM	BEHAVIOR/CNS	11-28-07	9:49	P	GAIT SCORE - NORMAL
87325	M	400 PPM	ORAL/DENTAL	11-28-07	9:49	1	DRIED CLEAR MATERIAL AROUND MOUTH
87330	M	400 PPM	BEHAVIOR/CNS	11-28-07	9:47	P	GAIT SCORE - SLIGHT IMPAIRMENT
87330	M	400 PPM	ORAL/DENTAL	11-28-07	9:48	2	WET CLEAR MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE B6 (1 HOUR POST-EXPOSURE)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-28-07 TO 11-28-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87321	M	600 PPM	BEHAVIOR/CNS	11-28-07	14:32	P	GAIT SCORE - NORMAL
87321	M	600 PPM	BODY/INTEGUMENT	11-28-07	0:00	P	FORELIMBS REDDENED
				11-28-07	0:00	P	HINDLIMBS REDDENED
87321	M	600 PPM	ORAL/DENTAL	11-28-07	14:32	3	WET CLEAR MATERIAL AROUND MOUTH
87326	M	600 PPM	BEHAVIOR/CNS	11-28-07	14:29	P	GAIT SCORE - NORMAL
87326	M	600 PPM	BODY/INTEGUMENT	11-28-07	0:00	P	FORELIMBS REDDENED
				11-28-07	0:00	P	HINDLIMBS REDDENED
87326	M	600 PPM	ORAL/DENTAL	11-28-07	14:30	1	WET CLEAR MATERIAL AROUND MOUTH
87328	M	600 PPM	BEHAVIOR/CNS	11-28-07	14:27	P	GAIT SCORE - NORMAL
87328	M	600 PPM	BODY/INTEGUMENT	11-28-07	0:00	P	FORELIMBS REDDENED
				11-28-07	0:00	P	HINDLIMBS REDDENED
87328	M	600 PPM	CARDIO-PULMONARY	11-28-07	14:28	P	GASPING
87328	M	600 PPM	ORAL/DENTAL	11-28-07	14:27	1	DRIED RED MATERIAL AROUND MOUTH
87292	F	50 PPM	BEHAVIOR/CNS	11-28-07	16:21	P	GAIT SCORE - NORMAL
87296	F	50 PPM	BEHAVIOR/CNS	11-28-07	16:22	P	GAIT SCORE - NORMAL
87296	F	50 PPM	BODY/INTEGUMENT	11-28-07	16:22	P	HINDLIMBS REDDENED
87299	F	50 PPM	BEHAVIOR/CNS	11-28-07	16:23	P	GAIT SCORE - NORMAL
87302	F	100 PPM	BEHAVIOR/CNS	11-28-07	12:47	P	GAIT SCORE - NORMAL
87302	F	100 PPM	BODY/INTEGUMENT	11-28-07	0:00	P	FORELIMBS REDDENED
				11-28-07	0:00	P	HINDLIMBS REDDENED
87303	F	100 PPM	BEHAVIOR/CNS	11-28-07	12:44	P	GAIT SCORE - NORMAL
87303	F	100 PPM	BODY/INTEGUMENT	11-28-07	12:45	1	WET CLEAR MATERIAL ABDOMINAL AREA
				11-28-07	12:45	1	WET CLEAR MATERIAL UROGENITAL AREA
				11-28-07	0:00	P	FORELIMBS REDDENED
				11-28-07	0:00	P	HINDLIMBS REDDENED
87303	F	100 PPM	ORAL/DENTAL	11-28-07	12:45	1	DRIED RED MATERIAL AROUND MOUTH
87304	F	100 PPM	BEHAVIOR/CNS	11-28-07	12:42	P	GAIT SCORE - NORMAL
87304	F	100 PPM	BODY/INTEGUMENT	11-28-07	0:00	P	FORELIMBS REDDENED
				11-28-07	0:00	P	HINDLIMBS REDDENED

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 11-28-07 TO 11-28-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87304	F	100 PPM	ORAL/DENTAL	11-28-07	12:43	1	DRIED CLEAR MATERIAL AROUND MOUTH
87305	F	400 PPM	BEHAVIOR/CNS	11-28-07	9:47	P	GAIT SCORE - NORMAL
87306	F	400 PPM	BEHAVIOR/CNS	11-28-07	9:45	P	GAIT SCORE - NORMAL
87307	F	400 PPM	BEHAVIOR/CNS	11-28-07	9:41	P	GAIT SCORE - NORMAL
87307	F	400 PPM	BODY/INTEGUMENT	11-28-07	9:43	2	WET CLEAR MATERIAL ABDOMINAL AREA
				11-28-07	9:44	1	WET CLEAR MATERIAL UROGENITAL AREA
87307	F	400 PPM	ORAL/DENTAL	11-28-07	9:42	1	DRIED CLEAR MATERIAL AROUND MOUTH
87294	F	600 PPM	BEHAVIOR/CNS	11-28-07	14:25	P	GAIT SCORE - NORMAL
87294	F	600 PPM	BODY/INTEGUMENT	11-28-07	0:00	P	FORELIMBS REDDENED
87294	F	600 PPM	ORAL/DENTAL	11-28-07	14:25	1	WET RED MATERIAL AROUND MOUTH
87295	F	600 PPM	BEHAVIOR/CNS	11-28-07	14:23	P	GAIT SCORE - NORMAL
87295	F	600 PPM	BODY/INTEGUMENT	11-28-07	14:24	1	WET YELLOW MATERIAL UROGENITAL AREA
87301	F	600 PPM	BEHAVIOR/CNS	11-28-07	14:21	P	GAIT SCORE - NORMAL
87301	F	600 PPM	ORAL/DENTAL	11-28-07	14:22	1	DRIED RED MATERIAL AROUND MOUTH

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE B7 (DAILY OBSERVATIONS - RECOVERY PERIOD)

PROJECT NO.:WIL-14068R — ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS — PAGE 1

SPONSOR:LYONDELL CHEMICAL — INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-29-07 TO 12-02-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87314	M	50 PPM	BEHAVIOR/CNS	11-29-07	8:58	P	GAIT SCORE - NORMAL
				11-29-07	15:03	P	GAIT SCORE - NORMAL
				11-30-07	9:13	P	GAIT SCORE - NORMAL
				12-01-07	12:51	P	GAIT SCORE - NORMAL
				12-02-07	12:51	P	GAIT SCORE - NORMAL
87314	M	50 PPM	BODY/INTEGUMENT	12-01-07	12:50	1	HAIR LOSS RIGHT FORELIMB
				12-01-07	12:50	1	HAIR LOSS LEFT FORELIMB
				12-02-07	12:51	1	HAIR LOSS RIGHT FORELIMB
				12-02-07	12:51	1	HAIR LOSS LEFT FORELIMB
87314	M	50 PPM	EYES/EARS/NOSE	11-29-07	8:59	1	DRIED RED MATERIAL AROUND NOSE
				11-29-07	15:03	1	DRIED RED MATERIAL AROUND NOSE
87316	M	50 PPM	BEHAVIOR/CNS	11-29-07	9:00	P	GAIT SCORE - NORMAL
				11-29-07	15:04	P	GAIT SCORE - NORMAL
				11-30-07	9:14	P	GAIT SCORE - NORMAL
				12-01-07	12:52	P	GAIT SCORE - NORMAL
				12-02-07	12:52	P	GAIT SCORE - NORMAL
87316	M	50 PPM	BODY/INTEGUMENT	12-01-07	12:51	1	HAIR LOSS RIGHT FORELIMB
				12-01-07	12:51	1	HAIR LOSS LEFT FORELIMB
				12-02-07	12:52	1	HAIR LOSS RIGHT FORELIMB
				12-02-07	12:52	1	HAIR LOSS LEFT FORELIMB
87317	M	50 PPM	BEHAVIOR/CNS	11-29-07	9:01	P	GAIT SCORE - NORMAL
				11-29-07	15:06	P	GAIT SCORE - NORMAL
				11-30-07	9:15	P	GAIT SCORE - NORMAL
				12-01-07	13:03	P	GAIT SCORE - NORMAL
				12-02-07	12:53	P	GAIT SCORE - NORMAL
87317	M	50 PPM	BODY/INTEGUMENT	12-01-07	12:52	1	HAIR LOSS RIGHT FORELIMB
				12-01-07	12:52	1	HAIR LOSS LEFT FORELIMB
				12-02-07	12:52	1	HAIR LOSS RIGHT FORELIMB
				12-02-07	12:52	1	HAIR LOSS LEFT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE B7 (DAILY OBSERVATIONS - RECOVERY PERIOD)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-29-07 TO 12-02-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87317	M	50 PPM	ORAL/DENTAL	11-29-07	9:01	1	DRIED RED MATERIAL AROUND MOUTH
87319	M	100 PPM	BEHAVIOR/CNS	11-29-07	9:02	P	GAIT SCORE - NORMAL
				11-29-07	15:07	P	GAIT SCORE - NORMAL
				11-30-07	9:16	P	GAIT SCORE - NORMAL
				12-01-07	12:53	P	GAIT SCORE - NORMAL
				12-02-07	12:53	P	GAIT SCORE - NORMAL
87320	M	100 PPM	BEHAVIOR/CNS	11-29-07	9:04	P	GAIT SCORE - NORMAL
				11-29-07	15:08	P	GAIT SCORE - NORMAL
				11-30-07	9:17	P	GAIT SCORE - NORMAL
				12-01-07	12:54	P	GAIT SCORE - NORMAL
				12-02-07	12:54	P	GAIT SCORE - NORMAL
87322	M	100 PPM	BEHAVIOR/CNS	11-29-07	9:05	P	GAIT SCORE - NORMAL
				11-29-07	15:08	P	GAIT SCORE - NORMAL
				11-30-07	9:18	P	GAIT SCORE - NORMAL
				12-01-07	12:54	P	GAIT SCORE - NORMAL
				12-02-07	12:54	P	GAIT SCORE - NORMAL
87323	M	400 PPM	BEHAVIOR/CNS	11-29-07	9:06	P	GAIT SCORE - NORMAL
				11-29-07	15:09	P	GAIT SCORE - NORMAL
				11-30-07	9:19	P	GAIT SCORE - NORMAL
				12-01-07	12:55	P	GAIT SCORE - NORMAL
				12-02-07	12:55	P	GAIT SCORE - NORMAL
87325	M	400 PPM	BEHAVIOR/CNS	11-29-07	9:07	P	GAIT SCORE - NORMAL
				11-29-07	15:10	P	GAIT SCORE - NORMAL
				11-30-07	9:19	P	GAIT SCORE - NORMAL
				12-01-07	12:55	P	GAIT SCORE - NORMAL
				12-02-07	12:56	P	GAIT SCORE - NORMAL
87325	M	400 PPM	BODY/INTEGUMENT	12-01-07	12:55	1	HAIR LOSS RIGHT FORELIMB
				12-01-07	12:55	1	HAIR LOSS LEFT FORELIMB
				12-02-07	12:56	1	HAIR LOSS RIGHT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-14068R
SPONSOR:LYONDELL CHEMICAL

TABLE B7 (DAILY OBSERVATIONS - RECOVERY PERIOD)
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL CLINICAL OBSERVATIONS

TABLE RANGE: 11-29-07 TO 12-02-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87325	M	400 PPM	BODY/INTEGUMENT	12-02-07	12:56	1	HAIR LOSS LEFT FORELIMB
87330	M	400 PPM	BEHAVIOR/CNS	11-29-07	9:08	P	GAIT SCORE - NORMAL
				11-29-07	15:11	P	GAIT SCORE - NORMAL
				11-30-07	9:20	P	GAIT SCORE - NORMAL
				12-01-07	12:56	P	GAIT SCORE - NORMAL
				12-02-07	12:56	P	GAIT SCORE - NORMAL
87321	M	600 PPM	BEHAVIOR/CNS	11-29-07	9:17	P	GAIT SCORE - NORMAL
				11-29-07	15:19	P	GAIT SCORE - NORMAL
				11-30-07	9:29	P	GAIT SCORE - NORMAL
				12-01-07	13:06	P	GAIT SCORE - NORMAL
				12-02-07	13:03	P	GAIT SCORE - NORMAL
87326	M	600 PPM	BEHAVIOR/CNS	11-29-07	9:18	P	GAIT SCORE - NORMAL
				11-29-07	15:19	P	GAIT SCORE - NORMAL
				11-30-07	9:30	P	GAIT SCORE - NORMAL
				12-01-07	13:06	P	GAIT SCORE - NORMAL
				12-02-07	13:03	P	GAIT SCORE - NORMAL
87328	M	600 PPM	BEHAVIOR/CNS	11-29-07	9:19	P	GAIT SCORE - NORMAL
				11-29-07	15:20	P	GAIT SCORE - NORMAL
				11-30-07	9:31	P	GAIT SCORE - NORMAL
				12-01-07	13:07	P	GAIT SCORE - NORMAL
				12-02-07	13:04	P	GAIT SCORE - NORMAL
87292	F	50 PPM	BEHAVIOR/CNS	11-29-07	9:09	P	GAIT SCORE - NORMAL
				11-29-07	15:11	P	GAIT SCORE - NORMAL
				11-30-07	9:21	P	GAIT SCORE - NORMAL
				12-01-07	12:57	P	GAIT SCORE - NORMAL
				12-02-07	12:57	P	GAIT SCORE - NORMAL
87296	F	50 PPM	BEHAVIOR/CNS	11-29-07	9:10	P	GAIT SCORE - NORMAL
				11-29-07	15:12	P	GAIT SCORE - NORMAL
				11-30-07	9:22	P	GAIT SCORE - NORMAL

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 11-29-07 TO 12-02-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87296	F	50 PPM	BEHAVIOR/CNS	12-01-07	12:57	P	GAIT SCORE - NORMAL
				12-02-07	12:57	P	GAIT SCORE - NORMAL
87299	F	50 PPM	BEHAVIOR/CNS	11-29-07	9:10	P	GAIT SCORE - NORMAL
				11-29-07	15:13	P	GAIT SCORE - NORMAL
				11-30-07	9:23	P	GAIT SCORE - NORMAL
				12-01-07	12:58	P	GAIT SCORE - NORMAL
				12-02-07	12:58	P	GAIT SCORE - NORMAL
87302	F	100 PPM	BEHAVIOR/CNS	11-29-07	9:11	P	GAIT SCORE - NORMAL
				11-29-07	15:13	P	GAIT SCORE - NORMAL
				11-30-07	9:23	P	GAIT SCORE - NORMAL
				12-01-07	12:59	P	GAIT SCORE - NORMAL
				12-02-07	12:59	P	GAIT SCORE - NORMAL
87303	F	100 PPM	BEHAVIOR/CNS	11-29-07	9:12	P	GAIT SCORE - NORMAL
				11-29-07	15:14	P	GAIT SCORE - NORMAL
				11-30-07	9:24	P	GAIT SCORE - NORMAL
				12-01-07	12:59	P	GAIT SCORE - NORMAL
				12-02-07	12:59	P	GAIT SCORE - NORMAL
87304	F	100 PPM	BEHAVIOR/CNS	11-29-07	9:13	P	GAIT SCORE - NORMAL
				11-29-07	15:15	P	GAIT SCORE - NORMAL
				11-30-07	9:25	P	GAIT SCORE - NORMAL
				12-01-07	13:00	P	GAIT SCORE - NORMAL
				12-02-07	13:00	P	GAIT SCORE - NORMAL
87305	F	400 PPM	BEHAVIOR/CNS	11-29-07	9:14	P	GAIT SCORE - NORMAL
				11-29-07	15:16	P	GAIT SCORE - NORMAL
				11-30-07	9:26	P	GAIT SCORE - NORMAL
				12-01-07	13:01	P	GAIT SCORE - NORMAL
				12-02-07	13:00	P	GAIT SCORE - NORMAL
87306	F	400 PPM	BEHAVIOR/CNS	11-29-07	9:15	P	GAIT SCORE - NORMAL
				11-29-07	15:16	P	GAIT SCORE - NORMAL

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 11-29-07 TO 12-02-07

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
87306	F	400 PPM	BEHAVIOR/CNS	11-30-07	9:26	P	GAIT SCORE - NORMAL
				12-01-07	13:01	P	GAIT SCORE - NORMAL
				12-02-07	13:01	P	GAIT SCORE - NORMAL
87307	F	400 PPM	BEHAVIOR/CNS	11-29-07	9:16	P	GAIT SCORE - NORMAL
				11-29-07	15:17	P	GAIT SCORE - NORMAL
				11-30-07	9:27	P	GAIT SCORE - NORMAL
				12-01-07	13:02	P	GAIT SCORE - NORMAL
				12-02-07	13:02	P	GAIT SCORE - NORMAL
87294	F	600 PPM	BEHAVIOR/CNS	11-29-07	9:20	P	GAIT SCORE - NORMAL
				11-29-07	15:21	P	GAIT SCORE - NORMAL
				11-30-07	9:32	P	GAIT SCORE - NORMAL
				12-01-07	13:08	P	GAIT SCORE - NORMAL
				12-02-07	13:04	P	GAIT SCORE - NORMAL
87295	F	600 PPM	BEHAVIOR/CNS	11-29-07	9:21	P	GAIT SCORE - NORMAL
				11-29-07	15:21	P	GAIT SCORE - NORMAL
				11-30-07	9:33	P	GAIT SCORE - NORMAL
				12-01-07	13:08	P	GAIT SCORE - NORMAL
				12-02-07	13:05	P	GAIT SCORE - NORMAL
87301	F	600 PPM	BEHAVIOR/CNS	11-29-07	9:22	P	GAIT SCORE - NORMAL
				11-29-07	15:22	P	GAIT SCORE - NORMAL
				11-30-07	9:34	P	GAIT SCORE - NORMAL
				12-01-07	13:08	P	GAIT SCORE - NORMAL
				12-02-07	13:06	P	GAIT SCORE - NORMAL

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

PROJECT NO.:WIL-14068R
SPONSOR:LYONDELL CHEMICAL

TABLE B8
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALE GROUP: 50 PPM

DAY	0	5
ANIMAL		
87314	379.	373.
87316	387.	372.
87317	351.	328.
MEAN	372.	358.
S.D.	18.9	25.7
S.E.	10.9	14.8
N	3	3

PROJECT NO.:WIL-14068R
SPONSOR:LYONDELL CHEMICAL

TABLE B8
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALE GROUP: 100 PPM

DAY	0	5
ANIMAL		
87319	337.	336.
87320	376.	364.
87322	354.	351.
MEAN	356.	350.
S.D.	19.6	14.0
S.E.	11.3	8.1
N	3	3

TABLE B8

PROJECT NO.:WIL-14068R
SPONSOR:LYONDELL CHEMICAL

ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALE GROUP: 400 PPM

DAY	0	5
ANIMAL		
87323	369.	376.
87325	368.	387.
87330	370.	371.
MEAN	369.	378.
S.D.	1.0	8.2
S.E.	0.6	4.7
N	3	3

TABLE B8
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

MALE GROUP: 600 PPM

DAY	0	5
ANIMAL		
87321	392.	399.
87326	387.	394.
87328	387.	393.
MEAN	389.	395.
S.D.	2.9	3.2
S.E.	1.7	1.9
N	3	3

FEMALE GROUP: 50 PPM

DAY	0	5
ANIMAL		
87292	257.	249.
87296	239.	234.
87299	260.	251.
MEAN	252.	245.
S.D.	11.4	9.3
S.E.	6.6	5.4
N	3	3

PROJECT NO.:WIL-14068R
SPONSOR:LYONDELL CHEMICAL

TABLE B8
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALE GROUP: 100 PPM

DAY	0	5
ANIMAL		
87302	245.	239.
87303	263.	264.
87304	275.	272.
MEAN	261.	258.
S.D.	15.1	17.2
S.E.	8.7	9.9
N	3	3

TABLE B8
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALE GROUP: 400 PPM

DAY	0	5
ANIMAL		
87305	245.	243.
87306	256.	258.
87307	258.	250.
MEAN	253.	250.
S.D.	7.0	7.5
S.E.	4.0	4.3
N	3	3

TABLE B8
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
INDIVIDUAL BODY WEIGHTS [G]

FEMALE GROUP: 600 PPM

DAY	0	5
ANIMAL		
87294	235.	237.
87295	230.	235.
87301	232.	230.
MEAN	232.	234.
S.D.	2.5	3.6
S.E.	1.5	2.1
N	3	3

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03/13/2008
R:03/18/2008

FINAL REPORT

Volume 3 of 3
(Appendices C - K)

STUDY TITLE

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS (WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

STUDY NUMBER

WIL-14068

DATA REQUIREMENT

OPPTS Guideline 870.1300
OPPTS Guideline 870.1350
OECD Guideline 403

STUDY DIRECTOR

Daniel T. Kirkpatrick, PhD, DABT

STUDY INITIATION DATE

30 November 2007

STUDY COMPLETION DATE

24 September 2008

PERFORMING LABORATORY

WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-8946

SPONSOR

Lyondell Chemical Company
One Houston Center, Suite 1600
1221 McKinney Street
Houston, TX 77010

APPENDIX C

Certificate Of Analysis (Supplier-Provided Data) And
Purity Stability Assessment (WIL Research Laboratories, LLC)

SIGMA-ALDRICH

3050 Spruce Street
Saint Louis, Missouri 63103 USA
Telephone (800)-521-8956 • (314) 771-5765
Fax (800)-325-5052 • (314) 771-5757
sigma-aldrich.com

Certificate of Analysis

WIL RESEARCH LABATORIES INC
ATTN: DAN KIRKPATRICK
1407 GEORGE RD
ASHLAND OH 44805

PO NBR: CC/GIBSON

PRODUCT NUMBER: 240532-SPEC

LOT NUMBER: 02109PE

PRODUCT NAME: ALLYL ALCOHOL, 99+%

FORMULA: C3H6O

FORMULA WEIGHT: 58.08

APPEARANCE	COLORLESS LIQUID
REFRACTIVE INDEX AT 20 DEG C	1.4125
INFRARED SPECTRUM	CONFORMS TO STRUCTURE.
GAS LIQUID CHROMATOGRAPHY	99.4%
QUALITY CONTROL ACCEPTANCE DATE	NOVEMBER 2006

ALDRICH CHEMICAL COMPANY
RONNIE MARTIN
SEPTEMBER 24, 2007

Accelerating Customers' Success through Leadership in Life Science, High Technology and Service

SIGMA-ALDRICH

Certificate of Analysis

Product Name	Allyl alcohol, ≥99%
Product Number	240532
Product Brand	Sigma-Aldrich
CAS Number	107-18-6
Molecular Formula	$CH_2=CHCH_2OH$
Molecular Weight	58.08

TEST	SPECIFICATION	LOT 02109PE RESULTS
APPEARANCE	COLORLESS LIQUID	COLORLESS LIQUID
REFRACTIVE INDEX AT 20 DEG C	1.412 +/- 0.002	1.4125
INFRARED SPECTRUM		CONFORMS TO STRUCTURE.
GAS LIQUID CHROMATOGRAPHY	99.0% (MINIMUM)	99.4%
QUALITY CONTROL ACCEPTANCE DATE		NOVEMBER 2006

Barbara Rajzer, Supervisor
Quality Control
Milwaukee, Wisconsin USA

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS (WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

Test Substance

Analytical Chemistry Department

WIL Research Laboratories, LLC

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1. SUMMARY

This report provides a detailed description of a method using gas chromatography with flame ionization detection for the determination of test substance (allyl alcohol) purity. Test substance purity was assessed using gas chromatography with flame ionization detection and was expressed as the area percent of the allyl alcohol chromatographic peak. A single sample of the test substance used during this study was collected and analyzed. The mean area percent (purity) of the test substance collected after use for inhalation exposures was 99.1%. This value is 99.7% of the purity value provided on the Certificate of Analysis.

2. INTRODUCTION

This report provides a detailed description of a method using gas chromatography (GC) with flame ionization detection (FID) for the determination of test substance (allyl alcohol) purity. Test substance purity was assessed using GC/FID and expressed as the area percent of the allyl alcohol chromatographic peak. A single sample of the test substance used during this study was collected after use for the inhalation exposures and analyzed to assess test substance purity and stability.

2.1. REFERENCE STANDARD IDENTIFICATION

The reference standard was received from Aldrich Chemical Co, St. Louis, Missouri, on 5 May 2004 as follows:

Identification	Quantity Received	Physical Description
Allyl Alcohol Batch No. 08903MB Expiration Date: May 2009 [WIL log no. ARS-0324A]	1 Bottle Total net weight: 100 mL	Clear liquid

A Certificate of Analysis for the reference standard was provided by the supplier and is presented in Appendix B. The reference standard was stored at room temperature.

2.2. EXPERIMENTAL

2.3. GAS CHROMATOGRAPHY

Instrument:	Varian CP-3800 gas chromatograph equipped with a flame ionization detector (FID), autosampler and a Varian MS Workstation data management system or equivalent system
Column:	J & W Scientific DB-wax column, 30 × 0.25 mm ID, 0.25-µm film thickness
Temperature Program:	50°C for 0 minute, ramp at 5°C/minute to 110°C, hold 0.0 minute, ramp at 50°C/minute to 235°C, hold 0.0 minute
Carrier Gas:	Helium at 1.0 mL/minute
Injector Temperature:	250°C
Injection Volume:	0.2 µL split (70:1)
Detector:	FID at 250°C
Retention Time:	Approximately 3.8 minutes
Total Run Time:	14.5 minutes

2.4. PREPARATION OF TEST SUBSTANCE SAMPLE

A test substance sample (allyl alcohol, WIL log no. 7676A) was received from the WIL Inhalation Department and analyzed for test substance purity. The test substance was transferred to an amber autosampler vial for GC/FID analysis.

2.5. PREPARATION OF REFERENCE STANDARD SAMPLE

The reference standard (allyl alcohol, WIL log no. ARS-0324A) was purchased from Aldrich Chemical Co., St. Louis, Missouri. A sample was transferred to an amber autosampler vial for analysis.

2.6. CALIBRATION AND QUANTITATION

Typically, triplicate injections were made each of reference standard and test substance sample. The peak area data from the last 2 injections of each reference standard or test

substance sample were transferred to a Microsoft Excel® spreadsheet where the purity was calculated based on the area percent of the peaks present in the chromatograms.

3. RESULTS AND DISCUSSION

A test substance sample was collected after use in the study and was prepared for assessment of purity as previously described. Under the described chromatographic conditions, the retention time for allyl alcohol was approximately 3.8 minutes. Figures 1 and 2 are typical chromatograms of the test substance sample and the reference standard, respectively. Figure 3 is the chromatogram of a blank air injection. The total analysis time required for each run was approximately 14.5 minutes.

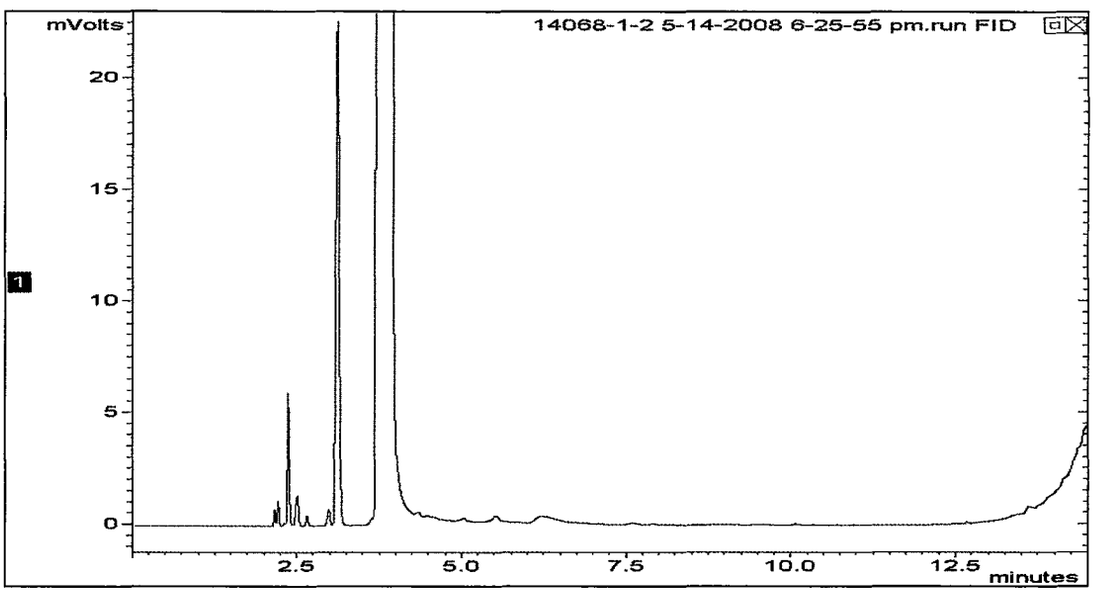

Figure 1: Representative Chromatogram Of A Bulk Allyl Alcohol Sample

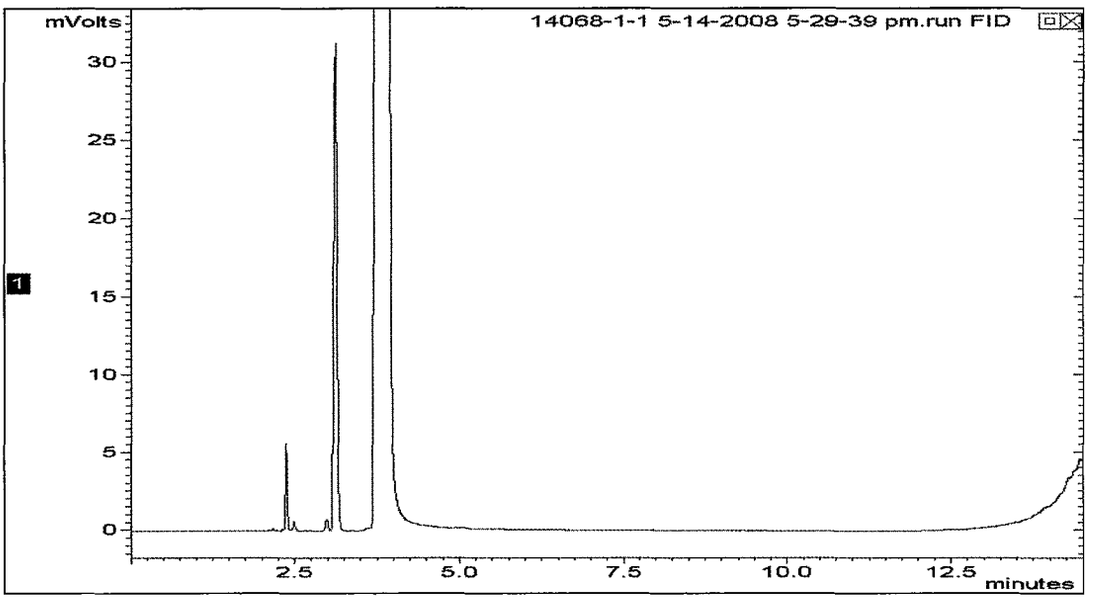

Figure 2: Representative Chromatogram Of The Reference Standard

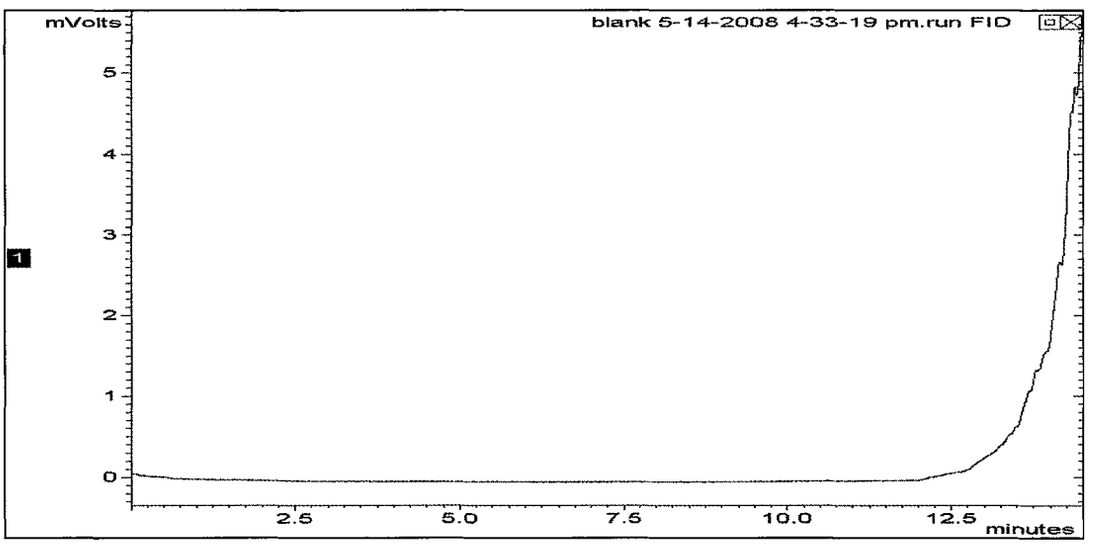

Figure 3: Representative Chromatogram Of A Blank Air Sample

3.1. TEST SUBSTANCE PURITY AND STABILITY ASSESSMENTS

As shown in Figures 1 and 2, one major peak (retention time at approximately 3.8 minutes) was present in the GC/FID chromatograms used to assess allyl alcohol purity. The peak area percent data from the analysis of the test substance sample are summarized in Table 1. Also, 4 to 9 very minor peaks were present in these purity assessments. The mean area percent (purity) of the test substance sample collected after use in the study was 99.1%. To assess stability of the test substance, the purity assessment result was compared to the purity value (99.4%) listed on the Certificate of Analysis. The test substance purity after use and storage of the test substance during the study was 99.7% of the original value provided on the Certificate of Analysis.

4. CONCLUSION

Test substance purity was assessed using GC/FID and expressed as the area percent of the allyl alcohol chromatographic peak. A test substance sample was collected after use on the study and analyzed for purity. Because the purity of the test substance (99.1%) after use in and storage during the study was 99.7% of the purity value provided in the Certificate of Analysis, the test substance was considered to be stable during use on the study.

5. KEY STUDY PERSONNEL AND REPORT SUBMISSION

Report Submitted By:

Daniel T. Kirkpatrick, PhD, DABT
Director, Inhalation Toxicology
Study Director

24 Sept 2008
Date

Report Prepared By:

Eric S. Bodle, PhD
Research Chemist, Analytical Chemistry

23 September 2008
Date

Report Reviewed By:

Philip L. Stetson, MD, PhD
Associate Director, Analytical Chemistry

23 Sept 2008
Date

Daniel W. Sved, PhD
Director, Metabolism and Analytical Chemistry

23 September 2008
Date

Study Personnel:

Stephen F. Farris, BS	Chemist I
Michelle M. Flora, BA	Publishing Specialist, Study Analysis and Reports
Melissa A. Hull, BS	Group Supervisor, Regulatory Technical Services

TABLE 1

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS
(WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

Table 1: Purity Stability Assessment Of Test Substance (WIL Log No. 7676A)
(Analyzed 14 May 2008)

Test Substance (WIL log no.)	Analyzed Date	Ref # (14068 -)	Run #	Ret Time	Area	Percent Area	Mean Relative Area (%)	Percent Of Initial Value (%)
7676A-1	14-May-08	1 - 2	7	2.17	1162	0.0102	**99.1**	**99.7**
				2.22	1887	0.0166		
				2.37	10436	0.0917		
				2.51	4501	0.0395		
				2.66	1010	0.00887		
				2.99	2136	0.0188		
				3.12	77542	0.681		
				3.85	11274497	99.1		
				5.52	2191	0.0193		
				6.24	5980	0.0525		
7676A-1	14-May-08	1 - 2	8	2.17	1113	0.00997		
				2.22	1807	0.0162		
				2.37	10761	0.0963		
				2.51	4347	0.0389		
				2.66	1033	0.00925		
				2.99	2153	0.0193		
				3.11	75189	0.673		
				3.85	11063642	99.1		
				5.52	2165	0.0194		
				6.24	6684	0.0598		

Initial Purity Value

Test Material	Purity (%)
WIL log no. 7676A-1	99.4

ATTACHMENT I

Supporting Data

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS
(WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

Table 1a : Purity Assessment of Test Substance (WIL Log No. 7676A)
(Analyzed 14 May 2008)

Run#	Ref # (WIL Log No.)	Ret Time	Area	Percent Area	Mean Relative Area (%)
4	14068-1-1	2.37	10258	0.0902	**98.9**
	ARS-0324A	2.49	1838	0.0162	
		2.99	2142	0.0188	
		3.12	107596	0.946	
		3.85	11248344	98.9	
5	14068-1-1	2.37	10175	0.0910	
	ARS-0324A	2.49	1601	0.0143	
		2.99	2063	0.0184	
		3.11	104709	0.936	
		3.85	11064415	98.9	
7	14068-1-2	2.17	1162	0.0102	**99.1**
	7676A-1	2.22	1887	0.0166	
		2.37	10436	0.0917	
		2.51	4501	0.0395	
		2.66	1010	0.00887	
		2.99	2136	0.0188	
		3.12	77542	0.681	
		3.85	11274497	99.1	
		5.52	2191	0.0193	
		6.24	5980	0.0525	
8	14068-1-2	2.17	1113	0.0100	
	7676A-1	2.22	1807	0.0162	
		2.37	10761	0.0963	
		2.51	4347	0.0389	
		2.66	1033	0.00925	
		2.99	2153	0.0193	
		3.11	75189	0.673	
		3.85	11063642	99.1	
		5.52	2165	0.0194	
		6.24	6684	0.0598	

14068results.xls 1a
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ATTACHMENT II

Certificate Of Analysis

SIGMA-ALDRICH

Certificate of Analysis

Product Name	Allyl alcohol, ≥99%
Product Number	240532
Product Brand	Sigma-Aldrich
CAS Number	107-18-6
Molecular Formula	$CH_2=CHCH_2OH$
Molecular Weight	58.08

TEST	SPECIFICATION	LOT 08903MB RESULTS
APPEARANCE	COLORLESS LIQUID	COLORLESS LIQUID
REFRACTIVE INDEX AT 20 DEG C	1.412 +/- 0.002	1.4130
INFRARED SPECTRUM	CONFORMS TO STRUCTURE.	CONFORMS TO STRUCTURE.
GAS LIQUID CHROMATOGRAPHY	99.0% (MINIMUM)	99.38 %
COLOR TEST		<10 APHA
QUALITY CONTROL ACCEPTANCE DATE		OCTOBER 2003

Barbara Rejzer, Supervisor
Quality Control
Milwaukee, Wisconsin USA

APPENDIX D

Exposure Atmosphere Generation Report (WIL Research Laboratories, LLC)

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS (WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

Exposure Atmosphere Generation Report

Inhalation Department

WIL Research Laboratories, LLC

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1. EXPOSURE METHODS

1.1. EXPOSURE REGIMEN

The test substance or filtered air (control group) was administered as a whole-body inhalation exposure for 1-, 4- and 8-hour exposure durations. A preliminary study was conducted using 1-, 4- and 8-hour exposure durations with 1 or 2 exposure levels per exposure duration. The main study was conducted using the same exposure durations as the preliminary study with 4 exposure levels per exposure duration (3 test substance and 1 control). Exposures for the main study were conducted on 3 separate days (1 day per exposure duration) where each day was study day 0 for the groups exposed. A detailed description of the study design and exposure schedule is presented in the main report. The following table presents the overall schedule for inhalation exposures:

	Study Day	Date
Preliminary Study	0	28 November 2007
4-Hour Exposure	0	3 December 2007
8-Hour Exposure	0	4 December 2007
1-Hour Exposure	0	7 December 2007

1.2. INHALATION EXPOSURE SYSTEM DESCRIPTION

Exposures were conducted in four 500-L stainless steel and glass whole-body inhalation exposure chambers. One chamber was dedicated for 1 group for each day's exposure. For the 1-hour preliminary study, 2 groups were exposed separately in Chamber 4. The following table presents the chambers and exposure durations for each group:

Group Number	Chamber Number	Target Exposure Concentration (ppm)	Exposure Duration (hours)
4A	4	400	1
4B	4	600	1
8A	3	100	4
12A	2	50	8
1	1	0	1
2	2	50	1
3	3	200	1
4	4	400	1
5	1	0	4
6	2	20	4
7	3	50	4
8	4	100	4
9	1	0	8
10	2	10	8
11	3	20	8
12	4	50	8

Chamber supply air was provided from a HEPA- and charcoal-filtered, temperature- and humidity-controlled source. Treatment of exhaust air consisted of charcoal and HEPA filtration.

1.3. ANIMAL TRANSPORT AND PLACEMENT

Animals were individually housed in stainless steel wire-mesh caging during the exposures. Food and water were withheld during the exposure periods.

Animals were housed in a normal animal colony room during non-exposure hours. For the exposure each day, the animals were transferred to exposure caging, transported to the exposure chamber room, exposed for the requisite duration and returned to their home cages in the animal colony room.

1.4. EXPOSURE ENVIRONMENTAL CONDITIONS

Chamber temperature, relative humidity, ventilation rate and negative pressure within each chamber were continually monitored and recorded at approximately 30-minute intervals through the use of LabVIEW® for Windows Data Acquisition Software (National Instruments Corporation, Austin, TX) and a personal computer with appropriate hardware. Chamber temperature and relative humidity were monitored with an Omega Model No. HX94C Humidity and Temperature transmitter probe (Omega Engineering, Inc., Stamford, CT). The daily average temperature and relative humidity of the exposure atmosphere were to be 20°C to 24°C and 30% to 70%, respectively.

All chambers were operated under dynamic conditions, at least 12 air changes per hour (100 LPM), at a slight negative pressure. Chamber airflow was monitored by a sharp edge orifice plate and Dwyer Magnehelic® Indicating Transmitter pressure gauge (Michigan City, IN). Each gauge was calibrated under the conditions of exposure for conversion from pressure to airflow in standard liters per minute (SLPM) through the use of a Fox Gas Mass Flowmeter Transmitter (Model FT2, Fox Thermal Instruments, Marina, CA). Daily means for chamber temperature, relative humidity and ventilation rate over the study period are presented in Tables 1 through 3 of this appendix. The following table summarizes the grand mean environmental conditions for the main study for all chambers:

	Chamber 1	Chamber 2	Chamber 3	Chamber 4
Temperature (°C):	23	23	23	24
Standard Deviation:	0.0	0.0	0.0	0.0
Relative Humidity (%):	57	55	36	55
Standard Deviation:	5.7	5.0	3.6	6.0
Chamber Ventilation Rate (SLPM):	112	108	106	112
Standard Deviation:	0.0	0.0	1.0	0.0
No. of Exposure Days:	3	3	3	3

Oxygen content for the test substance chambers was measured on 21 November 2007 during the method development phase of the study using a Drager Pac III equipped with a calibrated oxygen sensor (Draeger Safety, Pittsburgh, PA). Oxygen content was at least 19% for all test substance chambers.

2. TEST ATMOSPHERE GENERATION METHODS

A vapor atmosphere of the test substance was generated using a system similar to that shown in Figure 1. The system operated as follows. Vapors of the test substance were generated using a 125-mL stem frit, 250-mL bottom frit and/or 500-mL bottom frit bubbler-type vaporization system (gas washing bottle, Ace Glass, Inc., Vineland, NJ) located within a containment cart that was exhausted through the facility exhaust system. Nitrogen was metered into the inlet stem of the gas washing bottle (GWB) containing an appropriate quantity of test substance. Nitrogen bubbled through a fritted disc and the liquid test substance to produce vapors of the test substance. Using a Cole Parmer (Vernon Hills, IL) or Key Instruments (Trevose, PA) rotameter-type flowmeter, nitrogen was metered to the gas washing bottle. The test substance vapors were piped to the chamber inlet and diluted to the desired concentration by mixing with chamber supply air. The GWB, flowmeter and nitrogen flow rate used for each group are summarized in the following table:

Group (number)	GWB size (mL)	Flowmeter Manufacturer	Flowmeter Model Number	Nitrogen Flow Rate (L/minute)
4A	500	Cole Parmer	PMR1-010360	2017
4B	500	Cole Parmer	PMR1-010360	3354-3651
8A	250	Cole Parmer	PMR1-010336	398
12A	250	Cole Parmer	PMR1-010359	270-303
1	NA	Key Instruments	None listed	412
2	250	Cole Parmer	PMR1-010359	287
3	250	Cole Parmer	PMR1-010336	882-898
4	500	Cole Parmer	PMR1-010360	2017
5	NA	Cole Parmer	PMR1-010359	383-431
6	125	Key Instruments	None listed	94-109
7	250	Cole Parmer	PMR1-010336	205-237
8	250	Cole Parmer	PMR1-010360	443
9	NA	Cole Parmer	PMR1-010359	415
10	125	Key Instruments	02086	53-57
11	125	Key Instruments	None listed	82-103
12	250	Cole Parmer	PMR1-010336	286-333

NA = Not applicable

3. METHODS OF CHARACTERIZATION OF EXPOSURE ATMOSPHERES

3.1. NOMINAL EXPOSURE CONCENTRATIONS

A nominal exposure concentration was calculated for each test substance group from the total amount of test substance used during the exposure and the total volume of air passed through the chamber during that day's exposure. The amount of test substance used was obtained by weighing the gas washing bottle prior to and after each day's exposure. The total volume of air passed through each chamber was calculated from the daily average chamber ventilation flowrate in liters per minute (LPM) and the exposure duration. The nominal concentration was calculated as follows.

$$\text{Concentration (ppm)} = \frac{WT \times MV \times 10^6}{GMW \times CF \times DUR}$$

Where:

WT	=	Weight of test substance used, grams
MV	=	Molar volume at 730 mmHg and 21°C, 25.11 L/mole
10^6	=	ppm conversion factor
GMW	=	Test substance gram molecular weight, 58.08 g/mole
CF	=	Daily average chamber flowrate for a given day, LPM
DUR	=	Duration of the daily exposure, minutes

3.2. ANALYZED EXPOSURE CONCENTRATIONS

3.2.1. ANALYTICAL METHODS

Analyzed exposure concentrations were determined at approximately 30-minute intervals for the 1-hour exposures and at approximately 60-minute intervals for the 4- and 8-hour exposures using a gas chromatograph (GC). Samples were collected from the approximate animal-breathing zone of the inhalation exposure chambers via 1/8-inch Teflon sample lines. Samples were collected manually using an external multi-position valve (Model E16, Valco Instruments Co., Inc., Houston, TX) and a Hewlett Packard Model 3396 Series II integrator (with BASIC program). Gas-sample injection onto the chromatography column occurred via an internal gas-sampling valve with a sample loop. The chromatograph was displayed and the area under the sample peak was calculated and stored. The concentration in parts per million (ppm) was calculated using an ln-quadratic equation based on the GC calibration curve. The following table summarizes the operational parameters for the gas chromatography methods:

Instrument:	Hewlett Packard 5890 Series II
Detector:	Flame Ionization (FID)
Column:	J&W Scientific, DB-5 30 m × 0.53 mm ID, 0.5-micron film thickness
Integrator:	Hewlett Packard Model 3396 Series II

Exposure Dates:	11/28-12/3/07	12/4-12/7/07
Gases (mL/minute)		
Carrier – Helium:	16	12
Fuel – Hydrogen:	35	42
Air:	304	399
Temperatures (°C)		
Column (Oven):	150	100
Detector:	275	200
Injector	NA	200
Auxiliary:	98	100
Integrator Run Parameters		
Chart Zero Offset:	0	0
Chart Attenuation:	5	0/5*
Chart Speed (cm/minute):	1.0	1.0
Peak Area Rejection Value:	0	0
Peak Threshold:	4	0/2*
Peak Width:	0.04	0.04
Retention Time (minutes):	0.64	0.93

* = Parameters used for the 7 December 2007 exposure
NA = Not applicable

3.2.2. GAS CHROMATOGRAPH CALIBRATION

The GC was calibrated using gas-phase standards prepared to contain a known vapor concentrations of the test substance in 40-L Tedlar® gas bags (SKC, Eighty Four, PA). Standard bags were prepared by metering 30 L of air into the bag using a dry test meter (Model DTM-200A, Elster American Meter Co., Nebraska City, NE) and then injecting a known volume of test substance into the bag. Using a hand-held heated blower, the bag was warmed until total volatilization of the test substance was visually observed. Concentrations of the gas-phase standards are calculated as follows:

$$\text{Concentration (ppm)} = \frac{VOL \times R \times T \times D \times 10^{-3} \times 10^{6}}{L \times GMW \times P}$$

Where:

VOL = Volume of test substance vaporized into bag, µL
R = Universal constant, 62.36 L mmHg/mole K
T = Nominal laboratory temperature in K (273 + 21°C = 294 K)
D = Density of the test substance, 0.8520 g/mL
L = Volume of air used to prepare bag, 30 L
GMW = Gram molecular weight, 58.08 g/mole
P = Nominal laboratory barometric pressure, 730 mmHg
10^{-3} = µL to mL conversion factor
10^{6} = Conversion factor to ppm

Prior to initiation of animal exposures, the GC was calibrated with standards prepared and analyzed in triplicate. A separate calibration curve was used for each exposure day. Each curve was defined using standards prepared at 5 vapor concentrations spanning an appropriate range relative to the target exposure concentrations for the study. The prime calibration curve was prepared using the quadratic formula and used to calculate exposure concentrations for all chambers. The peak area (y) and the theoretical concentrations of the calibration standards (x) were fit with least-squares regression analysis to the ln-quadratic function:

$$\ln (y) = a \times [\ln (x)]^2 + b \times \ln (x) + c$$

Prior to the initiation of each day's exposure, 1 of the 5 standards was prepared and analyzed, and the prime calibration curve was used to perform a calibration check of the GC. The GC was considered to be within normal calibration limits if the analyzed concentration of the prepared standard was within ±10% of the known concentration. The following table summarizes the standard parameters for the preliminary (A), 1-hour (B), 4-hour (C) and 8-hour (D) exposures:

Standard (ppm)	Volume of Test Substance (µL)	Exposure
4	0.3	D
12	1.0	CD
25	2.0	ABCD
49	4.0	D
98	8.0	ABCD
246	20	ABC
491	40	ABC
700	57	AB

3.3. DETERMINATION OF HOMOGENEITY OF EXPOSURE ATMOSPHERES

Homogeneity of exposure concentrations was evaluated during the method development phase of the study. Four test locations and a reference location were used for these determinations. The test locations were Right Front, Left Front, Right Rear and Left Rear. Samples were collected and analyzed on the GC as rapidly as possible by alternating from the reference location and then to a test location. The measured concentration was calculated as a percent difference for each position from the reference location. Homogeneity was performed in triplicate at target concentrations of 20, 100 and 400 ppm for Chambers 2, 3 and 4, respectively. The results are presented in Table 4 of this appendix. The following table summarizes the mean data of the replicates for each test substance chamber:

Chamber Number	Test Location	Mean % From Reference
2	Right Front	-0.7
	Left Front	-3.4
	Right Rear	-1.7
	Left Rear	-4.1
3	Right Front	-4.3
	Left Front	4.5
	Right Rear	2.1
	Left Rear	2.2
4	Right Front	0.9
	Left Front	-1.6
	Right Rear	-0.1
	Left Rear	-0.4

These data indicate that the homogeneity of each exposure chamber atmosphere was adequate for the purpose of this study.

4. RESULTS OF CHARACTERIZATION OF ACTUAL EXPOSURE CONCENTRATIONS

4.1. NOMINAL EXPOSURE CONCENTRATIONS

The daily nominal concentrations for the test substance groups are summarized in the following table:

Group Number	Nominal Concentration (ppm)
4A	452.7
4B	692.6
8A	93.5
12A	51.2
2	60.0
3	219.6
4	463.2
6	17.9
7	41.9
8	96.1
10	10.8
11	18.7
12	56.3

4.2. ANALYZED EXPOSURE CONCENTRATIONS

Individual test atmosphere concentrations for each group are presented in Table 5 of this appendix. The daily mean analyzed concentrations for all groups are summarized in the following table:

Group Number	Exposure Duration (hours)	Concentration (ppm)	Standard Deviation	Number of Samples
4A	1	423.4	29.9	2
4B	1	638.1	48.8	3
8A	4	114.5	4.1	4
12A	8	52.0	7.5	8
1	1	0.0	NA	1
2	1	50.9	1.8	2
3	1	220.3	8.8	2
4	1	402.9	18.1	2
5	4	0.0	0.0	4
6	4	21.9	1.6	5
7	4	52.2	4.8	6
8	4	102.4	3.5	4
9	8	0.0	0.0	8
10	8	10.2	0.8	9
11	8	21.1	0.9	8
12	8	51.7	3.2	9

5. KEY STUDY PERSONNEL AND REPORT SUBMISSION

Report Submitted By:

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Study Director

24 Sept 2008
Date

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23 Sep 2008
Date

Report Reviewed By:

Andrew J. Smith, BS
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23 Sep 2008
Date

Robert A. Wally, BS, RAC
Manager, Reporting and Regulatory Technical Services

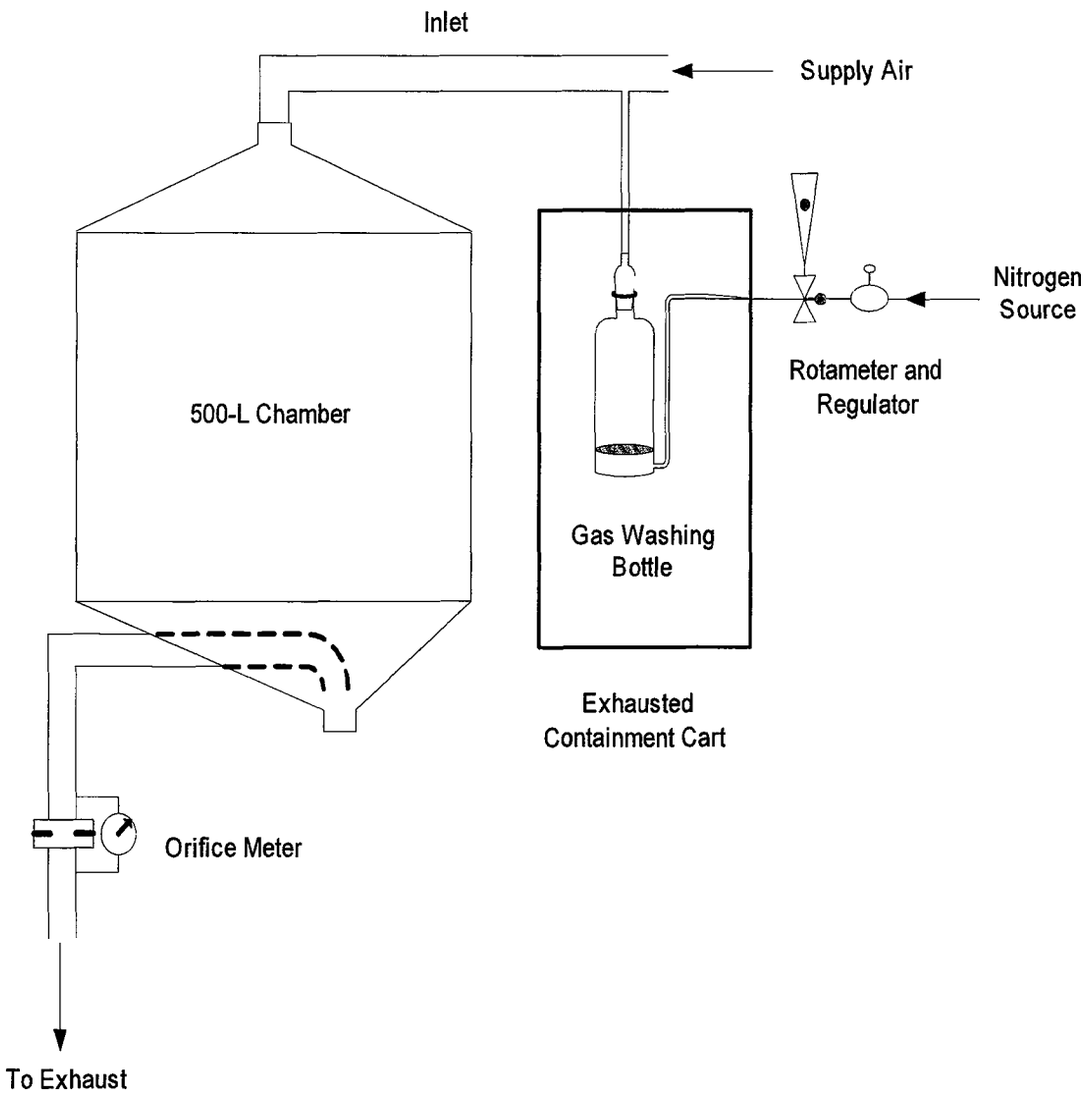
23 Sept 2008
Date

Study Personnel:

Randy M. Barrett, BS	Data Coordinator, Study Analysis and Reports

FIGURE 1

FIGURE 1: ATMOSPHERE GENERATION AND EXPOSURE SYSTEM



TABLES 1-5

PAGE 1

INHALATION TABLE 1
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
DAILY MEAN CHAMBER TEMPERATURE [DEGREES CELSIUS]

PROJECT NO.:WIL-14068
SPONSOR:LYONDELL CHEMICAL

PRELIMINARY STUDY

DATE	CHAMBER 2	CHAMBER 3	CHAMBER 4
11/28/07	21.	22.	22.
11/28/07	NA	NA	23.
GRAND MEAN	21.	22.	23.
S.D.	NA	NA	0.7
C.V.(%)	NA	NA	3.04
N	1	1	2

NA = NOT APPLICABLE

INHALATION TABLE 1
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
DAILY MEAN CHAMBER TEMPERATURE [DEGREES CELSIUS]

PROJECT NO.:WIL-14068
SPONSOR:LYONDELL CHEMICAL

MAIN STUDY

DATE	CHAMBER 1	CHAMBER 2	CHAMBER 3	CHAMBER 4
12/03/07	23.	23.	23.	24.
12/04/07	23.	23.	23.	24.
12/07/07	23.	23.	23.	24.
GRAND MEAN	23.	23.	23.	24.
S.D.	0.0	0.0	0.0	0.0
C.V.(%)	0.00	0.00	0.00	0.00
N	3	3	3	3

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INHALATION TABLE 2
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
DAILY MEAN CHAMBER RELATIVE HUMIDITY [%]

PROJECT NO.:WIL-14068
SPONSOR:LYONDELL CHEMICAL

PRELIMINARY STUDY

DATE	CHAMBER 2	CHAMBER 3	CHAMBER 4
11/28/07	47.	13.	20.
11/28/07	NA	NA	20.
GRAND MEAN	47.	13.	20.
S.D.	NA	NA	0.0
C.V.(%)	NA	NA	0.0
N	1	1	2

NA = NOT APPLICABLE

PROJECT NO.:WIL-14068
SPONSOR:LYONDELL CHEMICAL

INHALATION TABLE 2
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
DAILY MEAN CHAMBER RELATIVE HUMIDITY [%]

MAIN STUDY

DATE	CHAMBER 1	CHAMBER 2	CHAMBER 3	CHAMBER 4
12/03/07	55.	54.	35.	55.
12/04/07	52.	50.	33.	49.
12/07/07	63.	60.	40.	61.
GRAND MEAN	57.	55.	36.	55.
S.D.	5.7	5.0	3.6	6.0
C.V.(%)	10.00	9.09	10.00	10.91
N	3	3	3	3

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INHALATION TABLE 3
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
DAILY MEAN CHAMBER VENTILATION RATE [SLPM]

PROJECT NO.:WIL-14068
SPONSOR:LYONDELL CHEMICAL

PRELIMINARY STUDY

DATE	CHAMBER 2	CHAMBER 3	CHAMBER 4
11/28/07	109.	104.	113.
11/28/07	NA	NA	103.
GRAND MEAN	109.	104.	108.
S.D.	NA	NA	7.1
C.V.(%)	NA	NA	6.57
N	1	1	2

NA = NOT APPLICABLE

INHALATION TABLE 3
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
DAILY MEAN CHAMBER VENTILATION RATE [SLPM]

PROJECT NO.:WIL-14068
SPONSOR:LYONDELL CHEMICAL

MAIN STUDY

DATE	CHAMBER 1	CHAMBER 2	CHAMBER 3	CHAMBER 4
12/03/07	112.	108.	107.	112.
12/04/07	112.	108.	106.	112.
12/07/07	112.	108.	105.	112.
GRAND MEAN	112.	108.	106.	112.
S.D.	0.0	0.0	1.0	0.0
C.V.(%)	0.00	0.00	0.94	0.00
N	3	3	3	3

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INHALATION TABLE 4

PROJECT NO.:WIL-14068 ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS PAGE 1
SPONSOR:LYONDELL CHEMICAL TEST ATMOSPHERE HOMOGENEITY DETERMINATION

TARGET: 50 PPM CHAMBER 2

DATE	SAMPLING LOCATION	CONCENTRATION (PPM)	% FROM REFERENCE	MEAN %
11/27/07	REFERENCE PORT	50.4		
	RIGHT FRONT	51.2	1.6	
	REFERENCE PORT	50.9		
	RIGHT FRONT	49.8	-2.2	
	REFERENCE PORT	50.3		
	RIGHT FRONT	49.6	-1.4	-0.7
	REFERENCE PORT	50.4		
	LEFT FRONT	48.4	-4.0	
	REFERENCE PORT	48.8		
	LEFT FRONT	49.2	0.8	
	REFERENCE PORT	51.9		
	LEFT FRONT	48.2	-7.1	-3.4
	REFERENCE PORT	51.1		
	RIGHT REAR	49.6	-2.9	
	REFERENCE PORT	47.6		
	RIGHT REAR	48.8	2.5	
	REFERENCE PORT	53.9		
	RIGHT REAR	51.3	-4.8	-1.7
	REFERENCE PORT	50.3		
	LEFT REAR	47.1	-6.4	
	REFERENCE PORT	45.9		
	LEFT REAR	47.0	2.4	
	REFERENCE PORT	54.8		
	LEFT REAR	50.2	-8.4	-4.1

PPM = PARTS PER MILLION

PAGE 2

INHALATION TABLE 4
ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
TEST ATMOSPHERE HOMOGENEITY DETERMINATION

PROJECT NO.:WIL-14068
SPONSOR:LYONDELL CHEMICAL

TARGET: 100 PPM

CHAMBER 3

DATE	SAMPLING LOCATION	CONCENTRATION (PPM)	% FROM REFERENCE	MEAN %
11/27/07	REFERENCE PORT	116.0		
	RIGHT FRONT	112.3	-3.2	
	REFERENCE PORT	115.6		
	RIGHT FRONT	105.8	-8.5	
	REFERENCE PORT	106.1		
	RIGHT FRONT	104.7	-1.3	-4.3
	REFERENCE PORT	119.6		
	LEFT FRONT	122.0	2.0	
	REFERENCE PORT	108.2		
	LEFT FRONT	115.1	6.4	
	REFERENCE PORT	106.3		
	LEFT FRONT	111.8	5.2	4.5
	REFERENCE PORT	116.9		
	RIGHT REAR	119.7	2.4	
	REFERENCE PORT	109.9		
	RIGHT REAR	112.4	2.3	
	REFERENCE PORT	107.7		
	RIGHT REAR	109.4	1.6	2.1
	REFERENCE PORT	115.6		
	LEFT REAR	115.8	0.2	
	REFERENCE PORT	109.3		
	LEFT REAR	113.3	3.7	
	REFERENCE PORT	105.3		
	LEFT REAR	108.2	2.8	2.2

PPM = PARTS PER MILLION

INHALATION TABLE 4

PROJECT NO.:WIL-14068 ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS PAGE 3
SPONSOR:LYONDELL CHEMICAL TEST ATMOSPHERE HOMOGENEITY DETERMINATION

TARGET: 400 PPM CHAMBER 4

DATE	SAMPLING LOCATION	CONCENTRATION (PPM)	% FROM REFERENCE	MEAN %
11/27/07	REFERENCE PORT	423.6		
	RIGHT FRONT	431.4	1.8	
	REFERENCE PORT	410.2		
	RIGHT FRONT	413.8	0.9	
	REFERENCE PORT	401.3		
	RIGHT FRONT	400.9	-0.1	0.9
	REFERENCE PORT	423.4		
	LEFT FRONT	420.5	-0.7	
	REFERENCE PORT	420.3		
	LEFT FRONT	409.6	-2.5	
	REFERENCE PORT	405.8		
	LEFT FRONT	399.4	-1.6	-1.6
	REFERENCE PORT	413.0		
	RIGHT REAR	405.3	-1.9	
	REFERENCE PORT	411.5		
	RIGHT REAR	411.8	0.1	
	REFERENCE PORT	411.1		
	RIGHT REAR	417.7	1.6	-0.1
	REFERENCE PORT	417.1		
	LEFT REAR	407.2	-2.4	
	REFERENCE PORT	411.1		
	LEFT REAR	410.9	0.0	
	REFERENCE PORT	415.0		
	LEFT REAR	419.6	1.1	-0.4

PPM = PARTS PER MILLION

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INHALATION TABLE 5

PROJECT NO.:WIL-14068 ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS PAGE 1
SPONSOR:LYONDELL CHEMICAL INDIVIDUAL TEST ATMOSPHERE CONCENTRATIONS

EXPOSURE DATE:28-NOV-07

GROUP 12A		GROUP 8A		GROUP 4A		GROUP 4B	
TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)
0:19	43.9	0:34	116.5	0:38	444.5	5:09	687.7
1:20	44.8	1:25	108.3	0:53	402.2	5:23	636.5
2:19	62.6	2:24	115.9			5:40	590.1
3:19	63.7	3:22	117.1				
4:19	50.9						
5:20	46.6						
6:20	51.3						
7:20	51.8						
MEAN	52.0		114.5		423.4		638.1
SD	7.5		4.1		29.9		48.8
CV(%)	14.42		3.58		7.06		7.65
N	8		4		2		3

INHALATION TABLE 5

PROJECT NO.:WIL-14068 ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS PAGE 2
SPONSOR:LYONDELL CHEMICAL INDIVIDUAL TEST ATMOSPHERE CONCENTRATIONS

EXPOSURE DATE:07-DEC-07

GROUP 1		GROUP 2		GROUP 3		GROUP 4	
TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)
0:20	0.0	0:22	49.6	0:25	226.5	0:27	415.7
		0:50	52.1	0:52	214.1	0:54	390.1
MEAN	0.0		50.9		220.3		402.9
SD	NA		1.8		8.8		18.1
CV(%)	NA		3.54		3.99		4.49
N	1		2		2		2

NA = NOT APPLICABLE

INHALATION TABLE 5

PROJECT NO.:WIL-14068 ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS PAGE 3
SPONSOR:LYONDELL CHEMICAL INDIVIDUAL TEST ATMOSPHERE CONCENTRATIONS

EXPOSURE DATE:03-DEC-07

GROUP 5		GROUP 6		GROUP 7		GROUP 8	
TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)
0:30	0.0	0:32	19.2	0:35	56.5	0:37	97.7
1:34	0.0	1:37	22.8	1:39	56.7	1:42	103.3
2:31	0.0	2:34	22.3	2:08	46.1	2:43	102.3
3:21	0.0	3:25	23.3	2:39	56.1	3:31	106.1
		3:47	21.8	3:06	49.4		
				3:28	48.3		
MEAN	0.0		21.9		52.2		102.4
SD	0.0		1.6		4.8		3.5
CV(%)	NA		7.31		9.20		3.42
N	4		5		6		4

NA = NOT APPLICABLE

INHALATION TABLE 5

PROJECT NO.:WIL-14068 ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS PAGE 4
SPONSOR:LYONDELL CHEMICAL INDIVIDUAL TEST ATMOSPHERE CONCENTRATIONS

EXPOSURE DATE:04-DEC-07

GROUP 9		GROUP 10		GROUP 11		GROUP 12	
TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)	TIME INTO GENERATION (H:MM)	CONCENTRATION (PPM)
0:21	0.0	0:26	8.7	0:28	22.1	0:30	56.6
1:05	0.0	0:49	11.6	1:10	22.7	0:52	51.4
2:05	0.0	1:08	10.6	2:11	20.3	1:12	52.2
3:05	0.0	2:08	10.2	3:11	20.6	2:14	49.6
4:23	0.0	3:08	10.5	4:29	20.5	3:13	49.4
5:22	0.0	4:26	10.1	5:26	20.9	4:31	53.7
6:26	0.0	5:24	10.0	6:30	20.7	5:29	54.2
7:23	0.0	6:28	9.8	7:28	20.6	6:32	45.7
		7:25	9.9			7:31	52.6
MEAN	0.0		10.2		21.1		51.7
SD	0.0		0.8		0.9		3.2
CV(%)	NA		7.84		4.27		6.19
N	8		9		8		9

NA = NOT APPLICABLE

MANUALv1.0
01/15/2008
R:03/19/2008

APPENDIX E

Pretest Data For Main Study Animals

PRETEST DATA

PROJECT NO.:WIL-14068P ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SPONSOR:LYONDELL CHEMICAL SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

----- M A L E -----

TABLE RANGE:	11-26-07 TO 12-06-07
GROUP:	1
NORMAL	
-NO SIGNIFICANT CLINICAL OBSERVATIONS	209/70
EYES/EARS/NOSE	
-DRIED RED MATERIAL AROUND RIGHT EYE	1/ 1
-DRIED RED MATERIAL AROUND LEFT EYE	1/ 1
ORAL/DENTAL	
-UPPER INCISORS BROKEN	1/ 1

1- PRETEST

----- F E M A L E -----

TABLE RANGE: 11-26-07 TO 12-06-07
GROUP: 1

NORMAL
-NO SIGNIFICANT CLINICAL OBSERVATIONS 209/70

BODY/INTEGUMENT
-SCABBING DORSAL HEAD 1/ 1

1- PRETEST

PRETEST DATA

PROJECT NO.:WIL-14068P
SPONSOR:LYONDELL CHEMICAL

ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
SUMMARY OF BODY WEIGHTS [G]

	MALES
GROUP:	PRETEST
26-NOV-07	
MEAN	327.
% DIFFERENCE	
S.D.	11.6
S.E.	1.4
N	70
30-NOV-07	
MEAN	350.
% DIFFERENCE	
S.D.	16.2
S.E.	1.9
N	70
03-DEC-07	
MEAN	374.
% DIFFERENCE	
S.D.	21.4
S.E.	2.6
N	70

	FEMALES
GROUP:	PRETEST
26-NOV-07	
MEAN	203.
% DIFFERENCE	
S.D.	8.9
S.E.	1.1
N	70
30-NOV-07	
MEAN	213.
% DIFFERENCE	
S.D.	11.1
S.E.	1.3
N	70
03-DEC-07	
MEAN	226.
% DIFFERENCE	
S.D.	11.1
S.E.	1.3
N	70

APPENDIX F

Animal Room Environmental Conditions

PROJECT NO.:WIL- 14068
SPONSOR: LYONDELL CHEMICAL

ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
TEMPERATURE/HUMIDITY - DAILY SUMMARY REPORT BY STUDY

STUDY SPECIFICATIONS: 14068

DATE IN: 11/21/07 TIME IN: 12:00
DATE OUT: 11/28/07 TIME OUT: 8:00

ROOM SPECIFICATIONS: B ROOM 53 SENSOR 2
SPECIES: RAT

LOW TEMPERATURE °F: 66.0 HIGH TEMPERATURE °F: 76.0 LOW HUMIDITY: 30.0
LOW TEMPERATURE °C: 18.9 HIGH TEMPERATURE °C: 24.4 HIGH HUMIDITY: 70.0

	TEMPERATURE		HUMIDITY
DATE	MEAN (°F)	MEAN (°C)	MEAN (%RH)
21-Nov-07	70.3	21.3	48.0
22-Nov-07	70.4	21.3	43.0
23-Nov-07	70.4	21.4	40.6
24-Nov-07	70.5	21.4	40.5
25-Nov-07	70.4	21.3	40.6
26-Nov-07	70.4	21.4	43.1
27-Nov-07	70.4	21.3	39.9
28-Nov-07	70.3	21.3	39.9

GRAND STATS	MEAN	MIN	MAX
TEMPERATURE °F	70.4	70.3	70.5
TEMPERATURE °C	21.3	21.3	21.4
HUMIDITY (%RH)	41.9	39.9	48.0
N DAYS	8		

NOTE: + = VALUE WAS GREATER THAN HIGH RANGE
\- = VALUE WAS LESS THAN LOW RANGE
NOTE: MEANS REPRESENT THE MEAN OF THE DAILY VALUES

ACUTE INH. TOX. STUDY OF ALLYL ALCOHOL IN RATS
TEMPERATURE/HUMIDITY - DAILY SUMMARY REPORT BY STUDY

PROJECT NO.:WIL- 14068
SPONSOR: LYONDELL CHEMICAL

STUDY SPECIFICATIONS: 14068

DATE IN: 11/20/07 TIME IN: 12:00
DATE OUT: 12/21/07 TIME OUT: 8:00

ROOM SPECIFICATIONS: B ROOM 55
SPECIES: RAT

LOW TEMPERATURE °F: 66.0 HIGH TEMPERATURE °F: 76.0 LOW HUMIDITY: 30.0
LOW TEMPERATURE °C: 18.9 HIGH TEMPERATURE °C: 24.4 HIGH HUMIDITY: 70.0

	TEMPERATURE		HUMIDITY
DATE	MEAN (°F)	MEAN (°C)	MEAN (%RH)
20-Nov-07	70.5	21.4	40.5
21-Nov-07	70.3	21.3	42.1
22-Nov-07	70.2	21.2	39.6
23-Nov-07	70.6	21.4	37.8
24-Nov-07	70.4	21.3	37.7
25-Nov-07	70.4	21.3	37.9
26-Nov-07	70.4	21.4	40.3
27-Nov-07	70.4	21.3	36.8
28-Nov-07	70.5	21.4	37.4
29-Nov-07	70.4	21.3	37.3
30-Nov-07	70.4	21.3	36.7
01-Dec-07	70.5	21.4	36.0
02-Dec-07	70.5	21.4	40.1
03-Dec-07	70.6	21.4	37.4
04-Dec-07	70.5	21.4	36.5
05-Dec-07	70.5	21.4	36.2
06-Dec-07	70.5	21.4	34.5
07-Dec-07	70.5	21.4	37.1
08-Dec-07	70.4	21.3	36.9
09-Dec-07	70.4	21.3	37.8
10-Dec-07	70.5	21.4	37.9
11-Dec-07	70.5	21.4	40.8
12-Dec-07	70.5	21.4	36.9

NOTE: + = VALUE WAS GREATER THAN HIGH RANGE
- = VALUE WAS LESS THAN LOW RANGE
NOTE: MEANS REPRESENT THE MEAN OF THE DAILY VALUES

REPORT 4
VERSION 1.09
3/17/2008 17:15

STUDY SPECIFICATIONS: 14068
DATE IN: 11/20/07 TIME IN: 12:00
DATE OUT: 12/21/07 TIME OUT: 8:00

ROOM SPECIFICATIONS: B ROOM 55
SPECIES: RAT
LOW TEMPERATURE °F: 66.0 HIGH TEMPERATURE °F: 76.0 LOW HUMIDITY: 30.0
LOW TEMPERATURE °C: 18.9 HIGH TEMPERATURE °C: 24.4 HIGH HUMIDITY: 70.0

	TEMPERATURE		HUMIDITY
DATE	MEAN (°F)	MEAN (°C)	MEAN (%RH)
13-Dec-07	70.5	21.4	37.7
14-Dec-07	70.5	21.4	37.2
15-Dec-07	70.4	21.3	37.1
16-Dec-07	70.5	21.4	37.1
17-Dec-07	70.5	21.4	36.2
18-Dec-07	70.4	21.3	35.2
19-Dec-07	70.5	21.4	36.2
20-Dec-07	70.5	21.4	35.3
21-Dec-07	70.5	21.4	35.1

GRAND STATS	MEAN	MIN	MAX
TEMPERATURE °F	70.5	70.2	70.6
TEMPERATURE °C	21.4	21.2	21.4
HUMIDITY (%RH)	37.5	34.5	42.1
N DAYS	32		

NOTE: + = VALUE WAS GREATER THAN HIGH RANGE
\- = VALUE WAS LESS THAN LOW RANGE
NOTE: MEANS REPRESENT THE MEAN OF THE DAILY VALUES

ROOM SPECIFICATIONS:	B ROOM 53 SENSOR 2		
SPECIES:	RAT		
LOW TEMPERATURE:	66.0	DATE IN:	11/21/07
HIGH TEMPERATURE:	76.0	TIME IN:	12:00
LOW HUMIDITY:	30.0	DATE OUT:	11/28/07
HIGH HUMIDITY:	70.0	TIME OUT:	8:00

ROOM B ROOM 53 SENSOR 2 SUMMARY

	TEMPERATURE	HUMIDITY
MEAN	70.4	41.7
MIN	70.1	37.0
MAX	71.0	54.9
SD	0.16	2.75
N SAMPLES	165	165
FIRST DAY	11/21/07	
LAST DAY	11/28/07	
N DAYS	8	

NOTE: TEMPERATURE UNITS = DEGREES FAHRENHEIT
HUMIDITY UNITS = % RELATIVE HUMIDITY
NOTE: MEANS REPRESENT THE MEAN OF ALL VALUES

ROOM SPECIFICATIONS:	B ROOM 55		
SPECIES:	RAT		
LOW TEMPERATURE:	66.0	DATE IN:	11/20/07
HIGH TEMPERATURE:	76.0	TIME IN:	12:00
LOW HUMIDITY:	30.0	DATE OUT:	12/21/07
HIGH HUMIDITY:	70.0	TIME OUT:	8:00

ROOM B ROOM 55 SUMMARY

	TEMPERATURE	HUMIDITY
MEAN	70.5	37.5
MIN	69.3	31.8
MAX	71.5	57.0
SD	0.28	2.51
N SAMPLES	738	738
FIRST DAY	11/20/07	
LAST DAY	12/21/07	
N DAYS	32	

NOTE: TEMPERATURE UNITS = DEGREES FAHRENHEIT
HUMIDITY UNITS = % RELATIVE HUMIDITY
NOTE: MEANS REPRESENT THE MEAN OF ALL VALUES

STUDY 14068 SUMMARY

MEAN	70.4	38.2
MIN	69.3	31.8
MAX	71.5	57.0
SD	0.26	3.03
N SAMPLES	903	903
FIRST DAY	11/20/07	
LAST DAY	12/21/07	
N DAYS	32	

NOTE: TEMPERATURE UNITS = DEGREES FAHRENHEIT
HUMIDITY UNITS = % RELATIVE HUMIDITY
NOTE: MEANS REPRESENT THE MEAN OF ALL VALUES

APPENDIX G

Clinical Pathology Methods, Procedures And References

CLINICAL PATHOLOGY METHODS, PROCEDURES AND REFERENCES

Serum Chemistry - Hitachi 912

Albumin - Bromcresol Green (BCG) Method, Modification of the Doumas reaction. Default unit: g/dL. Hitachi 912 Application Code 413. Roche Reagent, catalog number 11970569.

A/G Ratio - Calculated from Albumin and Globulin Results. Default unit: %.

Alkaline Phosphatase - based on the International Federation of Clinical Chemistry (IFCC) Method (Tietz *et al.* J Clin Chem Clin Biochem 1983; 21:731-748). Default unit: U/L. Hitachi 912 Application Code 158. Roche Reagent, catalog number 2172933.

Alanine Aminotransferase - Modification of the International Federation of Clinical Chemistry (IFCC) recommended method. Default unit: U/L. Hitachi 912 Application Code 706. Roche Reagent, catalog number 450065.

Aspartate Aminotransferase - Kinetic method based on the International Federation of Clinical Chemistry (IFCC) recommendations. Default unit: U/L. Hitachi 912 Application Code 713. Roche Reagent, catalog number 450064.

Bilirubin (Total) - Diazo method developed by Wahlefeld *et al.* Scand J Clin Lab Invest 1972; 29: Supplement 126. Default unit: mg/dL. Hitachi 912 Application Code 018. Roche Reagent, catalog number 1822730.

Blood Urea Nitrogen (BUN) - A urease-triggered methodology based upon the method of Talke and Schubert Klin Wschr, 1965; 43:174. Default unit: mg/dL. Hitachi 912 Application Code 427. Roche Reagent, catalog number 1489321.

Calcium - Modified method using a gamma-amino-butyric acid (GABA) buffer. Default unit: mg/dL. Hitachi 912 Application Code 180. Roche Reagent, catalog number 1125621.

Chloride - An ion-selective electrode that measures the electrical potential of the ions present in solution. Default unit: mEq/L. Hitachi 912 Application. Roche Reagent, catalog numbers 450043,450042, and 450041.

Cholesterol - Enzymatic reaction as described by Trinder. Ann Clin Biochem 1974; 12:266. Default unit: mg/dL. Hitachi 912 Application Code 722. Roche Reagent, catalog number 450061.

Creatinine - Modified Jaffe reaction based on the work of Poper *et al.* Biochem Z 1937; 291:354, and Seelig and Wuest. Aerztl Labor 1969; 15:34. Default unit: mg/dL. Hitachi 912 Application Code 727. Roche Reagent, catalog number 450019.

Gamma-Glutamyltransferase (GGT) - Method based on the studies of Persijn and Van der Slik, J Clin Chem Clin Biochem, 1976; 14:421-427. Default unit: U/L. Hitachi 912 Application Code 479. Roche Reagent, catalog number 2016885.

Globulin - Calculation obtained by subtracting Albumin from Total Protein. Default unit: g/dL.

Glucose - Glucose hexokinase method based on the work of Schmidt, Peterson and Young. Klin Wschr 1961; 39:1244. Methods of Enzymatic Analysis, 2nd Eng ed. New York, Academic Press, 1974; 1196. Anal Biochemistry 1958; 23:301. Default unit: mg/dL. Hitachi 912 Application Code 767. Roche Reagent, catalog number 450058.

Phosphorus - Method involves the formation of ammonium phosphomolybdate. Default unit: mg/dL. Hitachi 912 Application Code 714. Roche Reagent, catalog number 1040898.

Potassium - An ion-selective electrode that measures the electrical potential of the ions present in solution. Default unit: mEq/L. Hitachi 912 Application. Roche Reagent, catalog numbers 450043,450042, and 450041.

Sodium - An ion-selective electrode that measures the electrical potential of the ions present in solution. Default unit: mEq/L. Hitachi 912 Application. Roche Reagent, catalog number 450043,450042, and 450041.

Total Protein - Endpoint biuret method that utilizes a sample blank. Default unit: g/dL. Hitachi 912 Application Code 756. Roche Reagent, catalog number 1040901.

Triglycerides - Method that utilizes lipase from a microorganism to promote rapid and complete hydrolysis of triglycerides to glycerol. Default unit: mg/dL. Hitachi 912 Application Code 781. Roche Reagent, catalog number 1488899.

Hematology - Manual Methods

White Cell Differential - Manual method of counting 100 white cells stained with Wright Giemsa and entered on-line into the data files.

Reticulocyte Count - Manual method of counting the reticulocytes present in 1000 red blood cells stained with New Methylene Blue and entered on-line into the data files.

Red Blood Cell Morphology - Manual method of evaluating red blood cells on a Wright Giemsa-stained slide and entered on-line into the data files.

Platelet Estimate- Manual method of evaluating platelets on a Wright Giemsa-stained slide. Platelet estimation is evaluated and entered on-line into the data files as decreased, adequate or increased. Platelet clumps present on the slide will be reported as part of the RBC morphology.

AMAX Destiny Amelung Coagulation

Mechanical (Ball Method) Measurement – Mechanical measurement methods depend on the physical formation of fibrin strands that attach to a moving mechanical device that either completes or opens an electrical circuit. The elapsed time from the addition of the starting reagent, up to the beginning of fibrin formation is measured.

Prothrombin Time (Protime-PT)/(PTM)- mechanical clot detection is used to measure and record the time required for plasma specimens to clot by adding an excess of thromboplastin reagent and an optional amount of calcium to citrated plasma. The PT measures from factor VII through fibrin formation (extrinsic and common pathways of coagulation). Default unit: sec.

Activated Partial Thromboplastin Time (APTT)/(PTTM)- mechanical clot detection is used to measure and record clotting time in a one-stage procedure which consists of recalcifying plasma in the presence of an excess of platelet-like reagent (cephalin) containing a plasma activator. The APTT measures the clotting time from factor XII through fibrin formation (intrinsic and common pathways of coagulation) Default unit: sec.

Hematology-Bayer Advia® 120-Siemens Healthcare Diagnostics/(Formerly: Bayer Advia®120)

WBC Count - The whole blood sample is mixed with ADVIA® 120 BASO reagent that contains acid and surfactant. The red cells are hemolyzed, and the white blood cells are then analyzed using two angle laser light scatter signals. Default unit: x 10^3 cells/μL

RBC / Platelet Count - Both red blood cells and platelets are analyzed by a single optical cytometer after appropriate dilution of the blood sample with ADVIA® 120 RBC/PLT reagent. The red blood cells are isovolumetrically sphered and lightly fixed with glutaraldehyde to preserve the spherical shape. Red cells and platelets are counted from the signals from a common detector with 2 different gain settings. Default unit RBC: x 10^6cells/µL. Default unit PLT: x 10^3 cells/µL

Hgb - Hemoglobin: The hemoglobin method is a modification of the manual cyanmethemoglobin method developed by the International Committee for standardization in Hematology (ICSH). Default unit: g/dL.

Hematocrit - The percentage of blood volume that is occupied by red blood cells. Also referred to as the packed red cell volume. On the ADVIA® 120 Hematology System this parameter is derived from the measured red cell volume (MCV) and the red cell count (RBC). Default unit: %.

MCH - Mean Corpuscular Hemoglobin: the average weight of hemoglobin in the red blood cells, calculated from the RBC and Hgb measurements. Default unit: pg.

MCHC - Mean Corpuscular Hemoglobin Concentration: the average concentration of hemoglobin in the red blood cells. This parameter is computed from the measured hemoglobin and the computed hematocrit. Default unit: g/dL.

MCV - Mean Corpuscular Volume: the average volume of the red blood cells. Default unit: fL

White blood cell differential - The ADVIA® 120 Hematology System White Blood Cell Differential (WBC DIFF) methods, consists of both the Peroxidase method and the Basophil/Lobularity method. The ADVIA® 120 Hematology System performs a six-part differential that consists of basophils, eosinophils, large unstained cells, lymphocytes, monocytes, and neutrophils. The white blood cell differential count is reported in percent and the actual number of each type of cell per microliter of blood.

Reticulocyte - This method uses a nucleic acid dye (oxazine 750) to stain cellular RNA. The ADVIA® 120 autoRETIC reagent isovolumetrically spheres the erythroid cells and stains cellular RNA. Low-angle laser light scatter, high-angle laser light scatter, and absorption characteristics of all cells are counted and measured. The absorption data are used to classify each cell as a reticulocyte or mature red blood cell based on its RNA content. The reticulocyte is reported in percent and actual number x 10^9cells/Liter = thous/µl.

References:

ADVIA® 120 Hematology System Operator's Guide: Copyright© 1997, 1998. Siemens Healthcare Diagnostics/ (Formerly: Bayer Corporation Diagnostics Division).

AMAX Destiny Operation Manual SW V 1.1.4, 31/08/05. Trinity Biotech Plc.

APPENDIX H

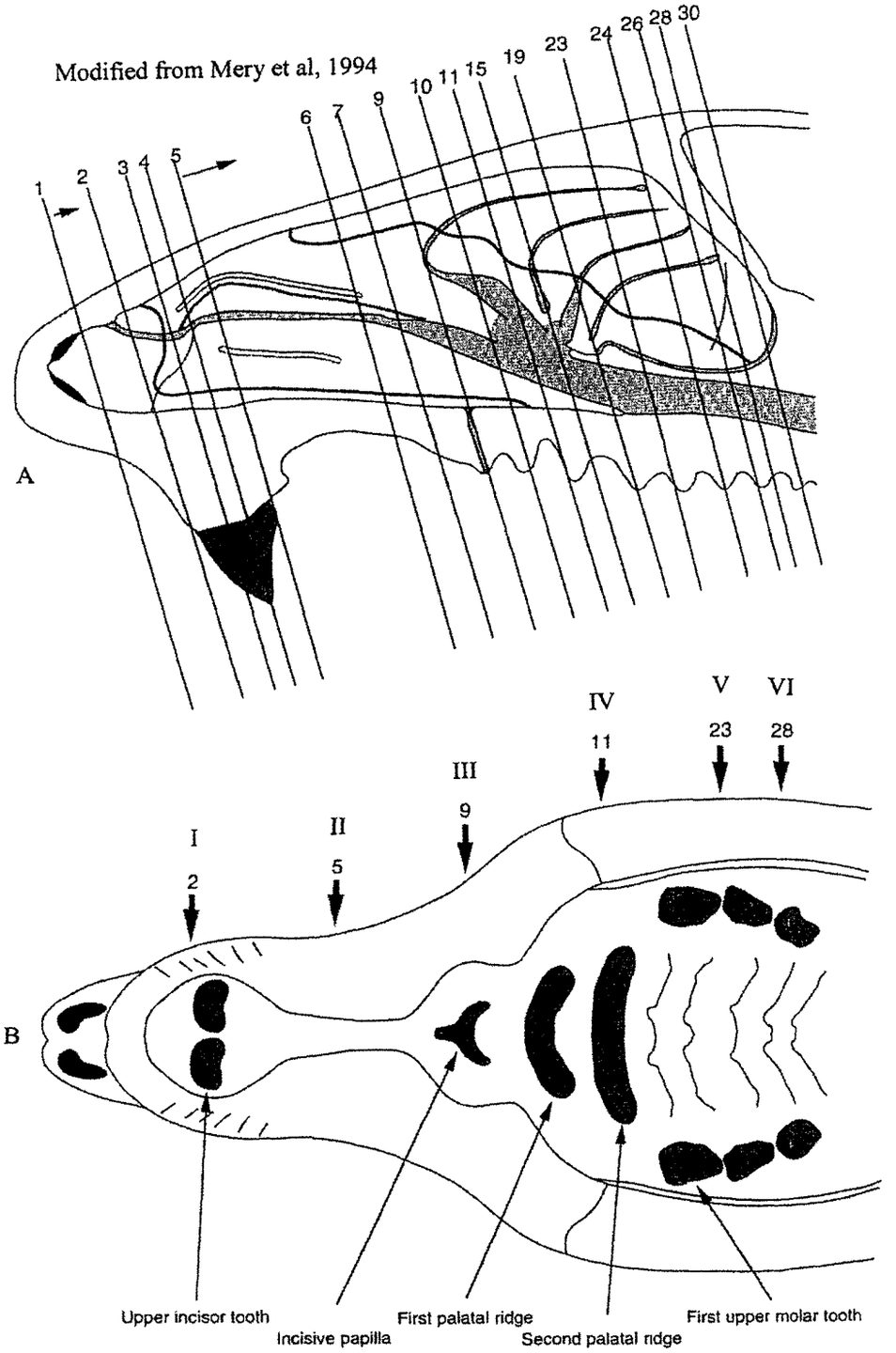
Nasal Levels Description, Figure Legend and Figure (modified from Mery et al., 1994)

Text Table H-1 Description of Nasal Levels[a]

Nasal Level (for report)	Cross-Sectional Levels	Primary Epithelia Present
I	1-3	Squamous, +/- Transitional, +/- Respiratory
II	4-8	Squamous, Transitional, Respiratory, +/- Olfactory
III	9-10	+/- Squamous, Respiratory, Olfactory
VI	11-19	Respiratory, Olfactory
V	20-23	Respiratory, Olfactory
VI	24-30	Respiratory, Olfactory

[a] - Based on Mery et al, 1994

Figure Legend: Modified from Mery et al, 1994. A) Midsaggital section of the nasal passages of a F-344 rat with the septum removed to reveal the turbinates. Major landmarks on dorsal buccal cavity used for section level identification are shown for comparison with Figure B. Straight lines indicate the cross-sectional levels selected for transverse diagrams. Curving solid lines indicate the junction of the squamous-transitional/respiratory epithelia (anterior line) and respiratory/olfactory epithelia (posterior line). All cross-sections are numbered in sequence, and missing numbers reflect the lack of landmarks for their identification in this figure. B) Dorsal buccal cavity to show major landmarks used for section level identification. The short arrows indicate section levels recommended by Morgan, 1991.


Modified from Mery et al, 1994
1
2
3
4
5
6
7
9
10
11
15
19
23
24
26
28
30
A
I
II
III
IV
V
VI
2
5
9
11
23
28
B
Upper incisor tooth
Incisive papilla
First palatal ridge
Second palatal ridge
First upper molar tooth

APPENDIX I

Pathology Report (WIL Research Laboratories, LLC)

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS (WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

PATHOLOGY REPORT

Pathology Department

WIL Research Laboratories, LLC

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1. INTRODUCTION

The objectives of this study were to: 1) determine the acute inhalation no-observed-adverse-effect level (NOAEL) for lethality and irreversible effects; and 2) determine the acute inhalation NOAEL for effects that are likely to be reversible. This study was conducted to provide additional data to support the derivation of AEGL 1, 2 and 3 values for different durations of time. These objectives were achieved using a modified acute study design with multiple exposure durations, selected clinical observations, novel stimulus/arousal response, clinical pathology and histopathology of the respiratory tract and other selected tissues and organs. A preliminary study was performed after exposure concentrations had been targeted to assure that the high treatment level for each test duration did not cause excessive mortality or moribundity.

2. STUDY DESIGN

Male and female Crl:CD (SD) rats were administered Allyl Alcohol via whole-body inhalation exposure, as indicated in the following tables. The preliminary study was conducted using 1-hour, 4-hour and 8-hour exposure durations with 1 or 2 exposure levels per exposure duration. The main study was conducted using the same exposure durations as the preliminary study, but with 4 exposure levels per exposure duration (3 test substance and 1 control).

For the preliminary study, animals euthanized in extremis or that survived to the preliminary necropsy were euthanized by carbon dioxide inhalation and discarded after the 4-day post-exposure observation period.

For the main study, animals that survived to the scheduled necropsy (study day 14) were euthanized with isoflurane and exsanguinated. These animals were necropsied and examined as described in Section 3.2. (Anatomic Pathology).

ORGANIZATION OF TEST GROUPS (PRELIMINARY STUDY)

1-Hour Exposure Duration

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
4A	Allyl Alcohol	400	1	3	3
4B	Allyl Alcohol	600	1	3	3

4-Hour Exposure Duration

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
8A	Allyl Alcohol	100	4	3	3

8-Hour Exposure Duration

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
12A	Allyl Alcohol	50	8	3	3

ORGANIZATION OF TEST GROUPS (MAIN STUDY)

1-Hour Exposure Duration (WIL-14068F)

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
1	Filtered Air	0	1	5	5
2	Allyl Alcohol	50	1	5	5
3	Allyl Alcohol	200	1	5	5
4	Allyl Alcohol	400	1	5	5

4-Hour Exposure Duration (WIL-14068D)

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
5	Filtered Air	0	4	5	5
6	Allyl Alcohol	20	4	5	5
7	Allyl Alcohol	50	4	5	5
8	Allyl Alcohol	100	4	5	5

8-Hour Exposure Duration (WIL-14068E)

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
9	Filtered Air	0	8	5	5
10	Allyl Alcohol	10	8	5	5
11	Allyl Alcohol	20	8	5	5
12	Allyl Alcohol	50	8	5	5

3. METHODS

3.1. CLINICAL PATHOLOGY (MAIN STUDY)

Hematology and serum chemistry parameters were evaluated from all main study animals on the day of the scheduled necropsy (post-exposure day 14). The animals were fasted overnight before blood collection and necropsy. For hematology (except clotting parameters) and standard serum chemistry evaluations, blood samples were collected from the retro-orbital sinus from animals anesthetized using isoflurane. Blood samples for clotting evaluations were collected via the vena cava at necropsy (animals anesthetized using isoflurane). Anticoagulants were potassium EDTA for the hematology parameters and sodium citrate for the coagulation parameters. Anticoagulants were not used for serum chemistry samples.

The following parameters were evaluated.

3.1.1. HEMATOLOGY AND COAGULATION

Total leukocyte count (White Cells)
Erythrocyte count (Red Cells)
Hemoglobin
Hematocrit
Mean corpuscular volume (MCV)
Mean corpuscular hemoglobin (MCH)
Mean corpuscular hemoglobin concentration (MCHC)
Platelet count (Platelet)
Prothrombin time (ProTime)
Activated partial thromboplastin time (APTT)
Reticulocyte count
  Percent (Reticulocyte)
  Absolute (Retic Absolute)

Differential leukocyte count -
  Percent and absolute
  -Neutrophil
  -Lymphocyte
  -Monocyte
  -Eosinophil
  -Basophil
  -Large unstained cell
Platelet estimate [a]
Red cell morphology (RBC Morphology) [a]

( ) - Designates tabular abbreviation
[a] - Presented on individual tables if a manual differential was performed, and the manual data were accepted and reported instead of the automated differential data

3.1.2. SERUM CHEMISTRY

Albumin
Total protein
Globulin [by calculation]
Albumin/globulin ratio (A/G Ratio) [by calculation]
Total bilirubin (Total Bili)
Urea nitrogen
Creatinine
Alkaline phosphatase (AlkalinePhos'tse)
Alanine aminotransferase (Alanine Transfer)

Aspartate aminotransferase (AspartatTransfer)
Gamma glutamyltransferase (GlutamylTransfer)
Glucose
Total cholesterol (Cholesterol)
Calcium
Chloride
Phosphorus
Potassium
Sodium
Triglycerides (Triglyceride)

( ) - Designates tabular abbreviation

3.2. ANATOMIC PATHOLOGY (MAIN STUDY)

3.2.1. MACROSCOPIC EXAMINATION

Complete postmortem examinations were performed on all main study animals at the scheduled necropsy (post-exposure day 14). At the scheduled necropsy, animals were euthanized with isoflurane and exsanguinated. At the time of necropsy, the following tissues and organs were collected and placed in 10% neutral-buffered formalin fixative unless otherwise noted:

Kidneys (2)
Larynx
Liver (sections of 2 lobes)
Lungs (including bronchi, fixed by inflation with fixative)
Nasal Tissue [a]
Trachea
Gross lesions (when possible)

[a] - Following fixation in formalin, nasal tissues were decalcified and sections of 6 nasal levels were prepared for microscopic examination.

3.2.2. ORGAN WEIGHTS

The following organs were weighed from all animals at the scheduled necropsy:

Kidneys
Liver
Lungs

Paired organs were weighed together. Organ-to-body weight ratios were calculated.

3.2.3. MICROSCOPIC EXAMINATION

Microscopic examination of routinely prepared hematoxylin-eosin stained paraffin sections was performed on all tissues collected at necropsy from all animals in all exposure groups, and in any animals that died or were euthanized prior to the scheduled sacrifice. All 6 nasal levels were taken at defined landmarks as described in Mery, et al. 1994 and were examined microscopically. Stained histologic sections were examined by light microscopy and observations were entered in the WIL Toxicology Data Management System (WTDMS™) by the pathologist. For nasal cavity lesions, descriptive diagnoses and severity grades were used to form an opinion regarding the

reversibility of epithelial changes. One of 5 severity grades were used; namely, minimal, mild, moderate, severe, and severe-irreversible. These five grades were used to convey the extent, severity, and/or depth of the changes. Severe-irreversible was used when, in the opinion of the study pathologist, the changes would not likely completely recover to the original normal mucosa/submucosa at the microscopic level. Often, damaged epithelium may regenerate, but does so in a disorganized or undifferentiated fashion (Gaskell, 1990, page 277). Without complete recovery, the lesion would be considered irreversible. All gross necropsy observations were addressed. Histologic sections were of adequate size and quality for detailed evaluation. The number of tissues examined from each dosage group may not necessarily equal the number of animals included in the group due to sectioning difficulties. The number of missing tissues was negligible and did not interfere with detection of test substance-related histologic alterations in the study. Histopathologic lesions were classified using standard published terminology to the extent possible. The WTDMS™ histopathology tables contain all of the recorded data and serve as the basis for this narrative report.

3.3. ABBREVIATIONS

The following abbreviations may apply to this report:

Interval - point in the study at which event occurred (specimen collection, necropsy, etc.)
SN - scheduled necropsy

3.4. DATA INTERPRETATION

In the discussion of clinical pathology parameters, values derived from the control group animals at all time points evaluated were considered as concurrent control values for purposes of constructing a 'normal' range for the present study. In addition, historical control values for this laboratory were consulted to refine data interpretation. Unless otherwise stated in this report, the 'normal' historical control range was represented by

values within the WIL Historical control reference range (essentially a 95% confidence interval).

In the discussion of organ weight changes, the indication of higher or lower mean organ weights refers to a statistically significant ($p<0.05$ or $p<0.01$ using Dunnett's test) difference between test substance-treated versus control group animals in the present study. In addition, historical control values for this laboratory were consulted to refine data interpretation.

4. RESULTS

4.1. SURVIVAL

There was 1 early death. Animal no. 89993 in Group 12 (14068E, 8-hour exposure, 50 ppm) was found dead on study day 1 with red discoloration of the lungs. The cause of death was the ulceration of the respiratory and olfactory epithelium in the nasal passages. There were severe lesions in the nasal passages, consisting of ulceration of respiratory epithelium at nasal level I and severe ulceration and degeneration of olfactory epithelium at nasal levels IV, V and VI. There was mild hemorrhage and edema in the lungs, as well as moderate to severe erosion of epithelium in the larynx and trachea, respectively, and severe ulceration of the epithelium in the larynx. The changes in the respiratory tract were considered to be test substance-related and could have rendered the animal markedly moribund leading to diminished breathing capabilities, hypoxia and death. The ulceration and degeneration of olfactory epithelium and the ulceration of respiratory epithelium in the nasal passages, as well as the ulceration in the epithelium of the larynx, were considered irreversible.

4.2. CLINICAL PATHOLOGY

4.2.1. HEMATOLOGY AND COAGULATION

There were no test substance-related alterations in hematology and coagulation parameters. Some statistically significant ($p<0.05$ or $p<0.01$ using Dunnett's test) differences were observed when the control and test substance-treated groups were compared. In the 1-hour exposure duration groups, lower absolute eosinophil counts in the 200 ppm group females were small in magnitude and not dose-related. In the 4-hour exposure duration groups, higher percentage neutrophil and lower percentage lymphocyte counts in the 20 and 100 ppm group males were not toxicologically important because changes involved percentage differential cell counts, and no significant differences were noted in absolute differential cell counts. Lower percentage and absolute reticulocyte counts in the 50 ppm group females did not occur in a dose-dependent manner and were not clearly test substance-related. In the 8-hour exposure duration groups, higher

percentage and absolute large unstained cell (LUC) counts in the 50 ppm group males were statistically significant but not considered toxicologically important. Large unstained cells are large myeloperoxidase negative cells detected by the Bayer Advia when automated cell counts are done. When microscopic correlations are done, the vast majority of LUC are lymphoid cells, so higher LUC counts are most likely a result of higher lymphocyte counts which were also present in the 50 ppm group males, but not statistically significant.

4.2.2. SERUM CHEMISTRY

There were no test substance-related alterations in serum chemistry parameters. Some statistically significant ($p<0.05$ or $p<0.01$ using Dunnett's test) differences were observed when the control and test substance-treated groups were compared in the 8-hour exposure duration groups, but not in the 1- or 4-hour exposure duration groups. Lower globulin values and higher albumin/globulin ratios in the 10 ppm group females were due to an outlier (animal no. 90037) and did not occur in a dose-dependent manner. A slightly lower glucose in the 10 ppm group males was not considered test substance-related because the decrease did not occur in a dose related fashion, and was not toxicologically relevant because of the small magnitude of change.

4.3. GROSS OBSERVATIONS

Review of the gross necropsy observations revealed no observations that were considered to be associated with administration of the test substance.

4.4. ORGAN WEIGHTS

There were no test substance-related alterations in final body weight or organ weights.

Several organ weight changes were statistically significant when compared to the control group, but were toxicologically irrelevant. At 4-hours exposure (14068D - females), lung weight (absolute) was higher in the 20 ppm (7.5%) and 100 ppm (13.2%) group compared to the control group. In this same 4-hour exposure group, the lung weight

relative to final body weight was 10.7% higher in the 100 ppm group. Given the absence of a dose response, the absence of histologic findings, and that the lung weights fell within historical control range (WIL historical control tables, version 2.4), the higher lung weights had no toxicologic relevance.

4.5. HISTOLOGIC CHANGES

4.5.1. CHANGES ASSOCIATED WITH TEST SUBSTANCE EXPOSURE

14068 F 1-Hour Exposure: Exposure to test substance for 1 hour caused degeneration of olfactory epithelium, metaplasia of olfactory epithelium, chronic inflammation and hemorrhage. Degeneration of olfactory epithelium (described below) and chronic inflammation (described below) were present in males and females, while metaplasia of olfactory epithelium (described below) was present in one 50 ppm group female. The severity of the changes suggested that these changes were of no clinical significance to the rats, and that the findings were considered to be reversible.

Degeneration of olfactory epithelium was typically seen in the dorsal meatus of nasal level II and in the dorsal meatus and on the medial aspects of ethmoturbinates in nasal levels III, IV, V and VI . Degeneration was minimal to moderate and characterized by disruption of the architecture of the epithelial cells with cell loss, occasional nuclear debris and in moderate cases, flattening of epithelium.

Chronic inflammation was present with increased severity and/or incidence in the 200 and 400 ppm group males and females. This change consisted of an accumulation of lymphocytes within the nasoturbinates, maxilloturbinates, lateral walls, and occasionally the septum and was most commonly seen at nasal levels I and II. There was commonly acanthosis of overlying stratified epithelium with leukocyte transmigration within the epithelium. Bowman's glands were prominent in areas of chronic inflammation.

One female in the 50 ppm group had mild metaplasia of olfactory epithelium, where normal olfactory epithelium had become columnar, ciliated and eosinophilic, similar to

respiratory epithelium. This change was seen on the lateral aspect of the dorsal meatus in nasal level IV, which is a typical area for this change to occur (Gaskell, 1990; Dorman, et al., 2008). There was accompanying degeneration of olfactory epithelium in the adjacent tissue. The basement membrane remained intact. The change was limited to the epithelium, was localized and of clinically insignificant severity, and was considered reversible. Metaplasia was not seen in the higher dose groups or in the control group.

Hemorrhage was present in one 200 ppm group male and one 400 ppm group male. It was minimal to mild and present within the submucosa of the ethmoturbinates. Hemorrhage was considered a test substance-related effect and was not present in the control group animals in this portion of the study.

Based on the 1 female with metaplasia of olfactory epithelium and 2 females with degeneration of olfactory epithelium in the 50 ppm group females, there was no NOEL (no-observed-effect level) for females in this 1-hour exposure study. Based on the olfactory epithelial degeneration, hemorrhage and chronic inflammation in the 200 ppm group males, the NOEL in males was 50 ppm in this 1-hour exposure study.

Text Table 1. Incidence Of Selected Histopathologic Findings For Selected Nasal Levels And A Summary Of Selected Findings At All Nasal Levels
Study Day 14

1-Hour Exposure (14068F)

Sex	Males				Females			
Exposure Level (ppm)	**0**	**50**	**200**	**400**	**0**	**50**	**200**	**400**
Nasal Level I [a]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Inflammation, Chronic	1	1	1	2	1	1	2	5
Minimal	1	1	0	1	0	1	1	1
Mild	0	0	1	1	1	0	1	4
Nasal Level II [a]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Inflammation, Chronic	0	0	1	3	0	0	1	0
Minimal	-	-	0	1	-	-	0	-
Mild	-	-	0	1	-	-	1	-
Moderate	-	-	1	1	-	-	0	-
Degeneration, Olfactory Epithelium	0	0	0	1	0	0	0	0
Minimal	-	-	-	1	-	-	-	-
Mild	-	-	-	0	-	-	-	-
Moderate	-	-	-	0	-	-	-	-
Nasal Level III [a]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	0	0	0	0	0	1
Minimal	-	-	-	-	-	-	-	0
Mild	-	-	-	-	-	-	-	0
Moderate	-	-	-	-	-	-	-	1
Nasal Level IV [a]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	1	0	0	2	0	1
Mild	-	-	1	-	-	2	-	0
Moderate	-	-	0	-	-	0	-	1
Metaplasia, Olfactory to Respiratory Epithelium	0	0	0	0	0	1	0	0
Mild	-	-	-	-	-	1	-	-

[a] = Number of tissues examined from each group.

Text Table 1. Incidence Of Selected Histopathologic Findings For Selected Nasal Levels And A Summary Of Selected Findings At All Nasal Levels Study Day 14 (continued)

1-Hour Exposure (14068F)

Sex	Males				Females			
Exposure Level (ppm)	**0**	**50**	**200**	**400**	**0**	**50**	**200**	**400**
Summary [b]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	1	2	0	2	0	1
Minimal	-	-	0	2	-	0	-	0
Mild	-	-	1	0	-	2	-	0
Moderate	-	-	0	0	-	0	-	1
Inflammation, Chronic	1	1	1	4	2	1	3	5
Minimal	1	1	0	2	0	1	1	0
Mild	0	0	0	1	2	0	2	5
Moderate	0	0	1	1	0	0	0	0
Hyperplasia, Goblet Cell	1	2	2	1	0	0	0	0
Minimal	0	1	0	0	-	-	-	-
Mild	1	1	2	1	-	-	-	-
Metaplasia, Olfactory to Respiratory Epithelium	0	0	0	0	0	1	0	0
Minimal	-	-	-	-	-	0	-	-
Mild	-	-	-	-	-	1	-	-
Hemorrhage	0	0	1	1	0	0	0	0
Minimal	-	-	0	1	-	-	-	-
Mild	-	-	1	0	-	-	-	-

[b] = Summary of number of animals with lesion taking into account all 6 nasal levels. Grade for each lesion is the highest grade for any of the 6 nasal levels.

14068D 4-Hour Exposure: Test substance-related findings were limited to the respiratory tract and included degeneration of olfactory epithelium, degeneration of respiratory epithelium, chronic inflammation and goblet cell hyperplasia. All changes were of no clinical significance to the rats and were considered reversible. Since inflammation was present in the 20 ppm group males and females and goblet cell hyperplasia was present in the 20 ppm group females, there was no NOEL for males or females in this 4-hour exposure study.

Degeneration of olfactory epithelium was minimal to moderate and present most commonly in the dorsal meatus of nasal level II. Affected areas had loss of cellular orientation, occasional pyknotic nuclei and thinning of the epithelium.

Degeneration of respiratory epithelium was minimal to mild and noted in the nasopharyngeal meatus in nasal levels III and VI. The respiratory epithelium was vacuolated, with disruption of cell architecture and loss of contact with adjacent cells.

Inflammation was subacute to chronic, minimal to moderate, and consisted of an infiltration of lymphocytes within the naso- and maxillary turbinates, the lateral walls and the septum. There was occasional edema, hyperplasia of the transitional or squamous epithelium lining the surface and leukocyte transmigration within the epithelium. Bowman's glands were prominent in areas of inflammation.

Goblet cell hyperplasia was minimal to moderate and characterized by expansion of the respiratory epithelial goblet cells lining the medial septum. Basophilic foamy mucus expanded individual cells, resulting in a crowding of the epithelium. This change had little correlation to the inflammation on an animal by animal basis, and was considered to be a primary test substance-related effect.

Hemorrhage within the ethmoturbinates was present to a moderate degree in 1 control female and to a mild degree in one 20 ppm group female. Therefore hemorrhage was not considered a test substance-related change in this 4-hour exposure study, unlike the 1-hour exposure study.

Text Table 2. Incidence Of Selected Histopathologic Findings At Selected Nasal Levels And A Summary Of Selected Findings For All Nasal Levels Study Day 14

4-Hour Exposure (14068D)

Sex	Males				Females			
Exposure Level (ppm)	**0**	**20**	**50**	**100**	**0**	**20**	**50**	**100**
Nasal Level II [a]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Inflammation, Chronic and Subacute	0	3	3	2	0	0	0	1
Minimal	-	0	1	0	-	-	-	0
Mild	-	3	0	2	-	-	-	1
Moderate	-	0	2	0	-	-	-	0
Degeneration, Olfactory Epithelium	0	0	0	4	0	0	1	4
Minimal	-	-	-	3	-	-	1	2
Mild	-	-	-	1	-	-	0	2
Hyperplasia, Goblet Cells	0	0	5	2	0	1	0	1
Minimal	-	-	2	0	-	0	-	0
Mild	-	-	3	0	-	1	-	1
Moderate	-	-	0	2	-	0	-	0
Nasal Level III [a]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	1	4	0	0	1	1
Minimal	-	-	1	1	-	-	1	1
Mild	-	-	0	1	-	-	0	0
Moderate	-	-	0	2	-	-	0	0
Degeneration Respiratory Epithelium	0	0	1	0	0	0	0	1
Minimal	-	-	1	-	-	-	-	0
Mild	-	-	0	-	-	-	-	1
Summary [b]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	1	5	0	0	1	5
Minimal	-	-	1	1	-	-	1	2
Mild	-	-	0	2	-	-	0	3
Moderate	-	-	0	2	-	-	0	0
Inflammation[c]	0	3	4	5	0	4	3	3
Minimal	-	0	1	0	-	2	0	0
Mild	-	2	0	4	-	2	3	2
Moderate	-	1	3	1	-	0	0	1

[a] = Number of tissues examined from each group.
[b] = Summary of number of animals with lesion taking into account all 6 nasal levels. Grade for each lesion is the highest grade for any of the 6 nasal levels.
[c] = Inflammation, Chronic and Subacute

Text Table 2. Incidence Of Selected Histopathologic Findings At Selected Nasal Levels And A Summary Of Selected Findings For All Nasal Levels Study Day 14 (continued)

4-Hour Exposure (14068D)

Sex	Males				Females			
Exposure Level (ppm)	**0**	**20**	**50**	**100**	**0**	**20**	**50**	**100**
Summary (continued) [b]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Hyperplasia, Goblet Cell	0	0	5	2	0	1	0	2
Minimal	-	-	2	0	-	0	-	1
Mild	-	-	3	0	-	1	-	1
Moderate	-	-	0	2	-	0	-	0
Degeneration, Respiratory Epithelium	0	0	1	1	0	0	0	1
Minimal	-	-	1	0	-	-	-	0
Mild	-	-	0	1	-	-	-	1
Hemorrhage	0	0	0	0	1	1	0	0
Minimal	-	-	-	-	0	0	-	-
Mild	-	-	-	-	0	1	-	-
Moderate	-	-	-	-	1	0	-	-

[b] = Summary of number of animals with lesion taking into account all 6 nasal levels. Grade for each lesion is the highest grade for any of the 6 nasal levels.
[c] = Inflammation, Chronic and Subacute

14068E 8-Hour Exposure: Exposure to test substance for 8 hours caused degeneration, erosion, ulceration and metaplasia of olfactory epithelium; degeneration and erosion of respiratory epithelium; and chronic inflammation, hemorrhage and hyperplasia of goblet cells. Ulceration, metaplasia of olfactory epithelium and severe degeneration of olfactory epithelium were limited to the 50 ppm group males and were considered irreversible. Other changes, such as inflammation, goblet cell hyperplasia and lesser grades of degeneration of olfactory epithelium, were present in males and females and were considered reversible. Based on the inflammation, degeneration of olfactory epithelium and goblet cell hyperplasia in the 10 ppm group males and females, there was no NOEL for males or females in this 8-hour exposure study.

Degeneration of olfactory epithelium was minimal to severe-irreversible and present in the 10, 20 and 50 ppm group males and females. Degeneration of olfactory epithelium was typically seen in the dorsal meatus, at which location the degeneration was similar to that described in studies 14068F and 14068D above. In addition, there was moderate to severe degeneration of the olfactory epithelium lining multiple ethmoturbinates in nasal levels III - VI. This degeneration was disruption of the architecture of the epithelial cells with cell loss, pyknosis of individual cells, separation of cells from each other and from the basal lamina. There was vacuolation and streaming of the apical portions of the olfactory epithelium. This degeneration was considered irreversible in two animals, because it would be unlikely for the olfactory epithelium to return to normal histologically. (Gaskell, 1990, at page 277). The degenerated olfactory epithelium would be expected to re-epithelialize with some type of epithelium, and most likely squamous or respiratory epithelium.

Ulceration of the olfactory epithelium was present in one 50 ppm group male that survived until terminal euthanasia. Ulceration and erosion were seen in, and contributed to the death of, one 50 ppm group male that died on study day 1. The ulcers breached the basal lamina leaving denuded submucosa. There was no exposed bone or damage to nerve bundles. This ulceration was considered irreversible from a histopathologic standpoint, since with a breach of the basal lamina, fibroplasia would necessarily result in some degree of scar tissue during repair. However, grossly, the epithelium would appear to heal completely.

Metaplasia of olfactory epithelium was seen in one 50 ppm group male. This change was seen along broad expanses of the lateral aspect of the dorsal meatus with replacement of olfactory epithelium with eosinophilic transitional epithelium. There was no breach of the basal lamina or changes in the lamina propria. The metaplasia was of a degree that it was considered irreversible, since it would be unlikely to expect well-differentiated olfactory epithelium to re-epithelialize completely. Frequently, damaged olfactory

epithelium regenerates, but there is incomplete resolution, as it does so in a disorganized fashion with atypical arrangements of the neural elements (Gaskell, 1990, at page 277).

Degeneration and erosion of respiratory epithelium of the nasopharynx was present in one 50 ppm group male. Erosion involves some degree of loss of the epithelium with retention of the basal lamina.

Hemorrhage within the ethmoturbinates and septum was present in one 50 ppm group male and was not present in females. Hemorrhage was present in the 50 ppm group male that had the erosion, ulceration and severe olfactory epithelial degeneration. Hemorrhage was considered a consequence of the tissue injury and inflammation and was not considered be a direct test substance-related effect.

Goblet cell hyperplasia was minimal to moderate and present in the 10, 20 and 50 ppm group males and females, and was most commonly seen at nasal levels I and II. Goblet cell hyperplasia was similar to that described in the 4-hour exposure animals. This change did not correlate to the degree of inflammation, and was considered a test substance-related effect, rather than a consequence of inflammation.

Chronic inflammation of the nasal passages was minimal to moderate and present with increased incidence and severity in all exposure groups of males and females. Chronic inflammation was similar to that described in the 4-hour exposure study, and was primarily seen in nasal levels I and II.

Text Table 3. Incidence Of Selected Histopathologic Findings In Selected Nasal Levels And A Summary Of Selected Findings From All Nasal Levels
Study Day 14[a]
8-Hour Exposure (14068E)

Sex	Males				Females			
Exposure Level (ppm)	**0**	**10**	**20**	**50**	**0**	**10**	**20**	**50**
Nasal Level II [b]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	3	0	2	0	1	2	3
Minimal	-	2	-	0	-	0	0	1
Mild	-	1	-	2	-	1	2	2
Goblet Cell Hyperplasia	0	2	2	4	0	0	1	1
Minimal	-	1	1	0	-	-	1	0
Mild	-	1	1	3	-	-	0	1
Moderate	-	0	0	1	-	-	0	0
Nasal Level IV [b]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	2	2	0	0	2	3
Minimal	-	-	1	0	-	-	1	0
Mild	-	-	1	0	-	-	1	1
Moderate	-	-	0	0	-	-	0	2
Severe-irreversible	-	-	0	2	-	-	0	0
Ulceration	0	0	0	2	0	0	0	0
Severe-irreversible	-	-	-	2	-	-	-	-
Erosion (in Olfactory Epithelium)	0	0	0	1	0	0	0	0
Moderate	-	-	-	1	-	-	-	-
Metaplasia, Olfactory to Respiratory Epithelium	0	0	0	1	0	0	0	0
Severe-irreversible	-	-	-	1	-	-	-	-
Hemorrhage	0	0	0	1	0	0	0	0
Moderate	-	-	-	1	-	-	-	-
Nasal Level V [b]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	0	0	3	0	0	3	0
Mild	-	-	-	0	-	-	2	-
Moderate	-	-	-	1	-	-	1	-
Severe	-	-	-	1	-	-	0	-
Severe-irreversible	-	-	-	1	-	-	0	-
Ulceration	0	0	0	1	0	0	0	0
Severe-irreversible	-	-	-	1	-	-	-	-
Erosion (in Olfactory Epithelium)	0	0	0	1	0	0	0	0
Severe	-	-	-	1	-	-	-	-

[a] = Results for male no. 89993 found dead on study day 1 are included. Irreversible findings were limited to two 50 ppm group males (male nos. 89966 and 89993).
[b] = Number of tissues examined from each group

Text Table 3. Incidence Of Selected Histopathologic Findings In Selected Nasal Levels And A Summary Of Selected Findings From All Nasal Levels (continued)
Study Day 14[a]
8-Hour Exposure (14068E)

Sex	Males				Females			
Exposure Level (ppm)	**0**	**10**	**20**	**50**	**0**	**10**	**20**	**50**
Summary[c]	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Degeneration, Olfactory Epithelium	0	3	2	4	0	1	4	5
Minimal	-	1	1	0	-	0	0	1
Mild	-	2	1	0	-	1	3	1
Moderate	-	0	0	1	-	0	1	3
Severe	-	0	0	1	-	0	0	0
Severe, irreversible	-	0	0	2	-	0	0	0
Inflammation[d]	3	4	5	5	0	3	4	5
Minimal	2	1	0	1	-	0	0	0
Mild	1	3	4	2	-	3	4	4
Moderate	0	0	1	2	-	0	0	1
Hyperplasia, Goblet Cell	0	2	3	4	0	2	1	1
Minimal	-	1	2	0	-	0	1	0
Mild	-	1	1	3	-	2	0	0
Moderate	-	0	0	1	-	0	0	1
Degeneration, Respiratory Epithelium	0	0	0	2	0	0	0	0
Minimal	-	-	-	0	-	-	-	-
Mild	-	-	-	0	-	-	-	-
Moderate	-	-	-	2	-	-	-	-
Hemorrhage	0	0	0	1	0	0	0	0
Moderate	-	-	-	1	-	-	-	-
Metaplasia, Olfactory to Respiratory Epithelium	0	0	0	1	0	0	0	0
Severe-irreversible	-	-	-	1	-	-	-	-
Ulceration	-	-	-	2				
Severe, irreversible	-	-	-	2	-	-	-	-
Erosion (in Olfactory Epithelium)	0	0	0	1	0	0	0	0
Severe	-	-	-	1	-	-	-	-

[a] = Results for male no. 89993 found dead on study day 1 are included. Irreversible findings were limited to two 50 ppm group males (male nos. 89966 and 89993).
[c] = Summary of number of animals with lesion taking into account all 6 nasal levels; grade for each lesion is the highest grade for any of the 6 nasal levels.
[d] = Inflammation, Chronic and Subacute

There were no other test substance-related histologic changes. Remaining histologic changes were considered to be incidental findings or related to some aspect of experimental manipulation other than administration of the test substance. There was no test substance-related alteration in the prevalence, severity or histologic character of those incidental tissue alterations.

5. DISCUSSION

The distribution and nature of the changes in the upper respiratory tract, including degeneration of olfactory and respiratory epithelium and goblet cell hyperplasia are similar to those described by Hardisty, et al. (1999) and Renne, et al. (2007) as common tissue reactions to inhaled toxicants. Degeneration of olfactory epithelium is commonly seen in the anterior aspect of the dorsal meatus, as was seen in this study, since this anterior aspect of olfactory epithelium is most susceptible to injury from many inhaled toxicants (Hardisty, 1999; Renne, 2007). Degeneration of olfactory epithelium is commonly associated with thinning or attenuation of the olfactory epithelium (Hardisty, 1999), and this attenuation was commonly seen and recorded as moderate degeneration of olfactory epithelium in this study. It results in replacement of olfactory epithelium by respiratory-like cells, often with cilia (Hardisty, 1999; Renne, 2007).

Several common sequele of olfactory epithelial degeneration described by Hardisty (1999) and Renne (2007) were not present in this study. These include basal cell hyperplasia, regeneration of olfactory epithelium and eosinophilic globules within Bowman's glands. The nature of the repair process of olfactory epithelium is affected by the dose, duration of exposure, and extent of initial damage.

Goblet cell hyperplasia of respiratory epithelium of the median septum is a recognized common tissue reaction to inhaled toxicants, as is cytoplasmic vacuolation of respiratory or transitional epithelium along the lateral walls (Renne, 2007). Goblet cell hyperplasia of the median septum and vacuolar degeneration of the respiratory/transitional epithelium lining lateral walls were common findings in this series of studies.

6. CONCLUSIONS

Exposure to allyl alcohol by inhalation to male and female Crl:CD (SD) albino rats for 1, 4 and 8 hours followed by a 14-day non-exposure (recovery) period was associated with test substance-related changes in the nasal cavity. The most severe lesions were present in the high dose (50 ppm) group males in the 8-hour exposure study, where 1 early death and irreversible nasal mucosal lesions were present.

Exposure of the test substance for 1 hour daily at 0, 50, 200 and 400 ppm caused degeneration of olfactory epithelium, mild metaplasia of olfactory epithelium to respiratory epithelium, chronic inflammation and hemorrhage. The findings were reversible. There was no NOEL for females, and the NOEL for males was 50 ppm.

Exposure to the test substance for 4 hours daily at 0, 20, 50 and 100 ppm caused degeneration of olfactory epithelium, degeneration of respiratory epithelium, chronic inflammation and goblet cell hyperplasia. All changes were considered reversible. There was no NOEL for males or females in this 4-hour exposure study.

Exposure to the test substance for 8 hours daily at 0, 10, 20 and 50 ppm caused an early death in one 50 ppm group male. The test substance caused degeneration, erosion, ulceration and metaplasia of olfactory epithelium to respiratory epithelium, degeneration and erosion of respiratory epithelium, chronic inflammation, hemorrhage and hyperplasia of goblet cells. Severe and irreversible ulceration, metaplasia of olfactory epithelium and degeneration of olfactory epithelium were limited to one 50 ppm group male that survived until terminal euthanasia and the one 50 ppm group male that died early (ulceration and severe degeneration only). Other changes, such as inflammation, goblet cell hyperplasia and lesser grades of degeneration of olfactory epithelium were considered reversible. There was no NOEL for males or females in this 8-hour exposure study.

7. REFERENCES

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8. REPORT SUBMISSION

Report Submitted By:

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23 Sept 2008
Date

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22 Sept 08
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23 Sep 2008
Date

APPENDIX J

WIL Historical Control Data [Crl:CD(SD) Rats]

Sex: M | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 108 / 117
Species: RAT | Age: 7 - 39 Weeks | Range of Study Dates: 01/03 - 03/07
Strain: Crl:CD(SD) | Report Type: **Excluding +/- 5 S.D.**

ADRENAL GLANDS

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.0620	0.01024	1373	0.0415 / 0.0825	0.0313 / 0.0927	0.03 / 0.10
OW relative to FBW:	0.015	0.0040	1373	0.007 / 0.023	0.003 / 0.027	0.01 / 0.03
OW relative to brain:	3.024	0.4853	1363	2.054 / 3.995	1.568 / 4.480	1.53 / 4.90

BRAIN

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	2.05	0.132	1411	1.79 / 2.31	1.66 / 2.45	1.51 / 2.60
OW relative to FBW:	0.489	0.1088	1411	0.272 / 0.707	0.163 / 0.816	0.24 / 1.02
OW relative to brain:	NA			0.00	0.00	

CAUDA EPID, LEFT

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.2661	0.03484	30	0.1964 / 0.3358	0.1616 / 0.3707	0.19 / 0.33
OW relative to FBW:	0.070	0.0097	30	0.050 / 0.089	0.040 / 0.099	0.05 / 0.09
OW relative to brain:	13.421	1.5877	30	10.246 / 16.597	8.658 / 18.185	10.15 / 16.29

Sex: M | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 108 / 117
Species: RAT | Age: 7 - 39 Weeks | Range of Study Dates: 01/03 - 03/07
Strain: Crl:CD(SD) | Report Type: **Excluding +/- 5 S.D.**

CAUDA EPID, RIGHT

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.2548	0.02781	30	0.1992 / 0.3104	0.1714 / 0.3383	0.19 / 0.30
OW relative to FBW:	0.067	0.0095	30	0.048 / 0.086	0.038 / 0.095	0.05 / 0.09
OW relative to brain:	12.869	1.3695	30	10.130 / 15.608	8.760 / 16.977	9.91 / 15.37

EPIDIDYMIDES

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	1.25	0.285	1159	0.68 / 1.82	0.40 / 2.11	0.38 / 2.13
OW relative to FBW:	0.277	0.0404	1159	0.196 / 0.358	0.156 / 0.398	0.14 / 0.41
OW relative to brain:	60.337	12.3521	1159	35.632 / 85.041	23.280 / 97.393	20.11 / 96.03

EPIDIDYMIS, LEFT

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.5421	0.16551	96	0.2111 / 0.8731	0.0456 / 1.0386	0.20 / 0.78
OW relative to FBW:	0.148	0.0367	96	0.074 / 0.221	0.038 / 0.258	0.07 / 0.23
OW relative to brain:	27.568	7.9731	96	11.622 / 43.515	3.649 / 51.488	11.11 / 38.42

Sex: M Study Type: SUBCHRONIC Number of Studies/Control Groups: 108 / 117
Species: RAT Age: 7 - 39 Weeks Range of Study Dates: 01/03 - 03/07
Strain: Crl:CD(SD) Report Type: **Excluding +/- 5 S.D.**

EPIDIDYMIS, RIGHT

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.54	0.158	48	0.22 / 0.85	0.06 / 1.01	0.21 / 0.73
OW relative to FBW:	0.147	0.0351	48	0.077 / 0.217	0.041 / 0.252	0.07 / 0.21
OW relative to brain:	27.317	7.5785	48	12.160 / 42.474	4.582 / 50.053	11.67 / 37.31

HEART

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	1.49	0.259	1346	0.98 / 2.01	0.72 / 2.27	0.75 / 2.60
OW relative to FBW:	0.348	0.0546	1346	0.239 / 0.457	0.184 / 0.512	0.22 / 0.59
OW relative to brain:	72.688	10.6928	1346	51.303 / 94.074	40.610 / 104.767	42.61 / 116.93

KIDNEYS

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	3.20	0.611	1392	1.98 / 4.42	1.37 / 5.03	1.76 / 5.32
OW relative to FBW:	0.749	0.1204	1392	0.508 / 0.989	0.388 / 1.110	0.40 / 1.17
OW relative to brain:	155.998	25.0308	1382	105.936 / 206.060	80.906 / 231.090	95.14 / 239.44

Sex: M | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 108 / 117
Species: RAT | Age: 7 - 39 Weeks | Range of Study Dates: 01/03 - 03/07
Strain: Crl:CD(SD) | Report Type: **Excluding +/- 5 S.D.**

LIVER

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	12.8	2.82	1390	7.1 / 18.4	4.3 / 21.3	6.57 / 23.15
OW relative to FBW:	2.964	0.4381	1390	2.088 / 3.840	1.650 / 4.278	2.16 / 5.17
OW relative to brain:	622.421	118.2003	1380	386.021 / 858.822	267.820 / 977.022	359.46 / 1024.34

LUNGS

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	1.62	0.295	140	1.03 / 2.21	0.73 / 2.50	1.01 / 2.31
OW relative to FBW:	0.399	0.0846	140	0.230 / 0.568	0.145 / 0.653	0.25 / 0.73
OW relative to brain:	80.191	10.9363	130	58.318 / 102.063	47.382 / 113.000	56 98 / 106.45

PITUITARY

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.0129	0.00252	423	0.0079 / 0.0180	0.0054 / 0.0205	0.01 / 0.02
OW relative to FBW:	0.003	0.0007	423	0.002 / 0.005	0.001 / 0.005	0.00 / 0.01
OW relative to brain:	0.632	0.1070	423	0.418 / 0.846	0.311 / 0.953	0.27 / 1.04

Sex: M | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 108 / 117
Species: RAT | Age: 7 - 39 Weeks | Range of Study Dates: 01/03 - 03/07
Strain: Crl:CD(SD) | Report Type: **Excluding +/- 5 S.D.**

PROSTATE

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.80	0.242	289	0.31 / 1.28	0.07 / 1.52	0.15 / 1.48
OW relative to FBW:	0.187	0.0494	289	0.088 / 0.286	0.039 / 0.335	0.07 / 0.43
OW relative to brain:	38.736	10.8562	289	17.024 / 60.449	6.168 / 71.305	8.57 / 75.29

SEM VES/COAG GL.

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	1.7412	0.45458	50	0.8320 / 2.6504	0.3775 / 3.1049	0.81 / 2.65
OW relative to FBW:	0.405	0.0765	50	0.252 / 0.558	0.175 / 0.634	0.27 / 0.60
OW relative to brain:	85.217	20.2815	50	44.654 / 125.780	24.372 / 146.061	42.86 / 127.27

SPLEEN

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.76	0.140	1326	0.48 / 1.04	0.34 / 1.18	0.35 / 1.34
OW relative to FBW:	0.176	0.0338	1326	0.108 / 0.243	0.074 / 0.277	0.10 / 0.34
OW relative to brain:	36.822	5.9975	1326	24.827 / 48.817	18.830 / 54.815	19.89 / 66.34

Sex: M
Species: RAT
Strain: Crl:CD(SD)

Study Type: SUBCHRONIC
Age: 7 - 39 Weeks

Number of Studies/Control Groups: 108 / 117
Range of Study Dates: 01/03 - 03/07
Report Type: **Excluding +/- 5 S.D.**

TESTES

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	3.39	0.367	1354	2.66 / 4.12	2.29 / 4.49	1.57 / 5.31
OW relative to FBW:	0.803	0.1664	1354	0.470 / 1.135	0.304 / 1.302	0.38 / 1.41
OW relative to brain:	165.305	15.7221	1344	133.861 / 196.749	118.139 / 212.471	76.96 / 261.58

TESTIS, LEFT

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	1.47	0.128	18	1.22 / 1.73	1.09 / 1.86	1.18 / 1.68
OW relative to FBW:	0.462	0.0528	18	0.356 / 0.567	0.303 / 0.620	0.39 / 0.55
OW relative to brain:	77.398	6.1620	18	65.074 / 89.722	58.912 / 95.884	65 56 / 88.42

TESTIS, RIGHT

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	1.48	0.124	18	1.24 / 1.73	1.11 / 1.86	1.23 / 1.68
OW relative to FBW:	0.465	0.0506	18	0.364 / 0.567	0.313 / 0.617	0.40 / 0 56
OW relative to brain:	78.071	6.3931	18	65.284 / 90.857	58.891 / 97.250	68.33 / 91.57

Sex: M
Species: RAT
Strain: Crl:CD(SD)

Study Type: SUBCHRONIC
Age: 7 - 39 Weeks

Number of Studies/Control Groups: 108 / 117
Range of Study Dates: 01/03 - 03/07
Report Type: **Excluding +/- 5 S.D.**

THYMUS GLAND

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.3828	0.15778	930	0.0673 / 0.6984	0.00 / 0.8562	0.08 / 1.03
OW relative to FBW:	0.099	0.0605	930	0.00 / 0.220	0.00 / 0.281	0.01 / 0.36
OW relative to brain:	19.014	8.4976	930	2.019 / 36.009	0.00 / 44.507	3.18 / 52.62

THYROID/PARATHYROID

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.0248	0.00603	1206	0.0127 / 0.0368	0.0067 / 0.0429	0.01 / 0.05
OW relative to FBW:	0.006	0.0015	1206	0.003 / 0.009	0.001 / 0.010	0.00 / 0.01
OW relative to brain:	1.204	0.2767	1206	0.650 / 1.757	0.374 / 2.034	0.50 / 2.48

Version 2.4
13-Aug-07

Sex: F
Species: RAT
Strain: Crl:CD(SD)

Study Type: SUBCHRONIC
Age: 7 - 39 Weeks

Number of Studies/Control Groups: 110 / 119
Range of Study Dates: 01/03 - 03/07
Report Type: **Excluding +/- 5 S.D.**

ADRENAL GLANDS

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.0710	0.01119	1393	0.0486 / 0.0934	0.0374 / 0.1046	0.03 / 0.12
OW relative to FBW:	0.029	0.0058	1393	0.018 / 0.041	0.012 / 0.046	0.01 / 0.06
OW relative to brain:	3.758	0.5703	1383	2.617 / 4.898	2.047 / 5.469	1.40 / 6.12

BRAIN

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	1.89	0.101	1428	1.69 / 2.09	1.59 / 2.19	1.54 / 2.18
OW relative to FBW:	0.778	0.1190	1428	0.540 / 1.016	0.421 / 1.135	0.46 / 1.34
OW relative to brain:	NA			0.00	0.00	

HEART

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.98	0.146	1364	0.69 / 1.27	0.54 / 1.42	0.57 / 1.67
OW relative to FBW:	0.398	0.0472	1364	0.304 / 0.493	0.257 / 0.540	0.26 / 0.60
OW relative to brain:	51.839	6.9863	1364	37.867 / 65.812	30.880 / 72.798	33.91 / 82.27

Sex: F Study Type: SUBCHRONIC Number of Studies/Control Groups: 110 / 119
Species: RAT Age: 7 - 39 Weeks Range of Study Dates: 01/03 - 03/07
Strain: Crl:CD(SD) Report Type: **Excluding +/- 5 S.D.**

KIDNEYS

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	1.92	0.276	1407	1.37 / 2.47	1.09 / 2.75	1.03 / 2.92
OW relative to FBW:	0.784	0.1081	1407	0.568 / 1.001	0.460 / 1.109	0.40 / 1.24
OW relative to brain:	101.689	13.1388	1397	75.411 / 127.966	62.272 / 141.105	54.79 / 150.00

LIVER

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	7.5	1.15	1408	5.2 / 9.8	4.0 / 10.9	4.04 / 12.02
OW relative to FBW:	3.058	0.4502	1408	2.158 / 3.959	1.708 / 4.409	2.16 / 5.20
OW relative to brain:	396.664	57.1578	1398	282.349 / 510.980	225.191 / 568.138	233.53 / 656.83

LUNGS

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	1.27	0.196	151	0.88 / 1.67	0.68 / 1.86	0.51 / 1.96
OW relative to FBW:	0.528	0.0899	151	0.348 / 0.707	0.258 / 0.797	0.31 / 0.96
OW relative to brain:	67.877	9.6371	141	48.603 / 87.151	38.965 / 96.788	28.81 / 100.00

Sex: F Study Type: SUBCHRONIC Number of Studies/Control Groups: 110 / 119
Species: RAT Age: 7 - 39 Weeks Range of Study Dates: 01/03 - 03/07
Strain: Crl:CD(SD) Report Type: **Excluding +/- 5 S.D.**

OVARIES

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.1266	0.02077	81	0.0851 / 0.1682	0.0643 / 0.1890	0.08 / 0.19
OW relative to FBW:	0.057	0.0089	81	0.039 / 0.075	0.031 / 0.084	0.04 / 0.08
OW relative to brain:	6.834	1.0811	81	4.671 / 8.996	3.590 / 10.077	4.54 / 9.72

OVARIES/OVIDUCTS

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.1316	0.02194	1265	0.0877 / 0.1755	0.0658 / 0.1974	0.06 / 0.21
OW relative to FBW:	0.053	0.0108	1265	0.032 / 0.075	0.021 / 0.086	0.02 / 0.09
OW relative to brain:	6.957	1.1197	1265	4.718 / 9.196	3.598 / 10.316	3.15 / 11.13

PITUITARY

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.0165	0.00401	434	0.0084 / 0.0245	0.0044 / 0.0285	0.01 / 0.03
OW relative to FBW:	0.007	0.0013	434	0.004 / 0.009	0.003 / 0.010	0.00 / 0.01
OW relative to brain:	0.874	0.1983	434	0.478 / 1.271	0.279 / 1.469	0.51 / 1.77

Sex: F Study Type: SUBCHRONIC Number of Studies/Control Groups: 110 / 119
Species: RAT Age: 7 - 39 Weeks Range of Study Dates: 01/03 - 03/07
Strain: Crl:CD(SD) Report Type: **Excluding +/- 5 S.D.**

SPLEEN

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.51	0.086	1345	0.34 / 0.68	0.26 / 0.77	0.29 / 0.88
OW relative to FBW:	0.208	0.0355	1345	0.137 / 0.279	0.102 / 0.315	0.11 / 0.36
OW relative to brain:	27.114	4.2996	1345	18.515 / 35.714	14.216 / 40.013	15.71 / 46.24

THYMUS GLAND

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.3363	0.12537	949	0.0856 / 0.5870	0.00 / 0.7124	0.09 / 0.75
OW relative to FBW:	0.145	0.0701	949	0.005 / 0.285	0.00 / 0.355	0.03 / 0.37
OW relative to brain:	18.020	7.0945	949	3.832 / 32.209	0.00 / 39.304	4.61 / 40.31

THYROID/PARATHYROID

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.0203	0.00533	1213	0.0096 / 0.0309	0.0043 / 0.0363	0.01 / 0.05
OW relative to FBW:	0.008	0.0023	1213	0.004 / 0.013	0.001 / 0.015	0.00 / 0.02
OW relative to brain:	1.073	0.2801	1213	0.513 / 1.633	0.233 / 1.913	0.40 / 2.60

Sex: F | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 110 / 119
Species: RAT | Age: 7 - 39 Weeks | Range of Study Dates: 01/03 - 03/07
Strain: Crl:CD(SD) | Report Type: **Excluding +/- 5 S.D.**

UTERUS

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.63	0.249	644	0.14 / 1.13	0.00 / 1.38	0.22 / 1.75
OW relative to FBW:	0.255	0.0895	644	0.076 / 0.434	0.00 / 0.523	0.11 / 0.68
OW relative to brain:	33.533	12.6906	644	8.151 / 58.914	0.00 / 71.604	11.96 / 86.74

UTERUS/CERVIX

	Mean	S.D.	N	Mean +/- 2 S.D.	Mean +/- 3 S.D.	Observed Low/High Value
Absolute OW:	0.75	0.277	40	0.19 / 1.30	0.00 / 1.58	0.43 / 1.53
OW relative to FBW:	0.306	0.1080	40	0.090 / 0.522	0.00 / 0.630	0.16 / 0.63
OW relative to brain:	39.943	14.5643	40	10.815 / 69.072	0.00 / 83.636	23.50 / 80.95

Sex: M | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 52 / 52

Species: RAT | Age: 9 - 12 Weeks | Range of Study Dates: 12/02 - 02/07

Strain: Crl:CD(SD) | Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

Serum Chemistry Values

A/G Ratio

Mean	S.D.	N	Reference Range
1.98	0.208	411	1.56 / 2.47

Alanine Aminotransferase (U/L)

Mean	S.D.	N	Reference Range
40	7.3	411	25 / 60

Albumin (g/dL)

Mean	S.D.	N	Reference Range
4.3	0.19	411	3.9 / 4.7

Alkaline Phosphatase (U/L)

Mean	S.D.	N	Reference Range
203	44.3	411	122 / 322

Aspartate Aminotransferase (UL)

Mean	S.D.	N	Reference Range
95	17.1	411	67 / 154

Calcium (mg/dL)

Mean	S.D.	N	Reference Range
11.1	0.50	411	10.3 / 12.7

Chloride (mEq/L)

Mean	S.D.	N	Reference Range
102	1.6	411	99 / 106

Cholesterol (mg/dL)

Mean	S.D.	N	Reference Range
50	9.8	393	30 / 74

Creatine Kinase (U/L)

Mean	S.D.	N	Reference Range
471	280.3	106	136 / 1562

Creatinine (mg/dL)

Mean	S.D.	N	Reference Range
0.2	0.06	412	0.1 / 0.3

Sex: M | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 52 / 52

Species: RAT | Age: 9 - 12 Weeks | Range of Study Dates: 12/02 - 02/07

Strain: Crl:CD(SD) | Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

GGT (U/L)

Mean	S.D.	N	Reference Range
0.5	0.36	60	0.1 / 1.4

Globulin (g/dL)

Mean	S.D.	N	Reference Range
2.2	0.21	411	1.7 / 2.6

Glucose (mg/dL)

Mean	S.D.	N	Reference Range
116	20.9	822	81 / 181

Phosphorus (mg/dL)

Mean	S.D.	N	Reference Range
9.8	1.30	411	7.8 / 13.7

Potassium (mEq/L)

Mean	S.D.	N	Reference Range
5.36	0.905	411	4.17 / 8.46

Sodium (mEq/L)

Mean	S.D.	N	Reference Range
145	1.8	411	142 / 151

Total Bilirubin (mg/dL)

Mean	S.D.	N	Reference Range
0.1	0.04	393	0.1 / 0.2

Total Protein (g/dL)

Mean	S.D.	N	Reference Range
6.4	0.29	411	5.8 / 7.1

Triglyceride (mg/dL)

Mean	S.D.	N	Reference Range
48	17.3	355	18 / 97

Urea Nitrogen (mg/dL)

Mean	S.D.	N	Reference Range
14.1	2.17	411	9.8 / 19.7

Sex:	M	Study Type: SUBCHRONIC		Number of Studies/Control Groups:	52 / 52
Species:	RAT	Age:	9 - 12 Weeks	Range of Study Dates:	12/02 - 02/07
Strain:	Crl:CD(SD)	Serum/Hematology/Coagulation Instrument:	912/ADVIA/AMAX		

Version 2.5
26-Sep-07

Sex: F | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 53 / 53

Species: RAT | Age: 9 - 12 Weeks | Range of Study Dates: 12/02 - 02/07

Strain: Crl:CD(SD) | Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

Serum Chemistry Values

A/G Ratio

Mean	S.D.	N	Reference Range
2.10	0.227	422	1.64 / 2.66

Alanine Aminotransferase (U/L)

Mean	S.D.	N	Reference Range
34	8.4	424	21 / 67

Albumin (g/dL)

Mean	S.D.	N	Reference Range
4.6	0.26	423	4.1 / 5.2

Alkaline Phosphatase (U/L)

Mean	S.D.	N	Reference Range
125	29.0	424	67 / 191

Aspartate Aminotransferase (UL)

Mean	S.D.	N	Reference Range
96	19.0	424	66 / 160

Calcium (mg/dL)

Mean	S.D.	N	Reference Range
11.1	0.60	423	10.0 / 12.8

Chloride (mEq/L)

Mean	S.D.	N	Reference Range
103	1.6	424	99 / 107

Cholesterol (mg/dL)

Mean	S.D.	N	Reference Range
64	12.5	403	39 / 97

Creatine Kinase (U/L)

Mean	S.D.	N	Reference Range
452	275.2	103	137 / 1441

Creatinine (mg/dL)

Mean	S.D.	N	Reference Range
0.3	0.07	423	0.2 / 0.4

Sex: F | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 53 / 53

Species: RAT | Age: 9 - 12 Weeks | Range of Study Dates: 12/02 - 02/07

Strain: Crl:CD(SD) | Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

GGT (U/L)

Mean	S.D.	N	Reference Range
0.7	0.45	90	0.2 / 2.3

Globulin (g/dL)

Mean	S.D.	N	Reference Range
2.2	0.22	422	1.7 / 2.7

Glucose (mg/dL)

Mean	S.D.	N	Reference Range
112	15.1	846	79 / 165

Phosphorus (mg/dL)

Mean	S.D.	N	Reference Range
9.2	1.76	424	6.2 / 14.8

Potassium (mEq/L)

Mean	S.D.	N	Reference Range
5.35	1.070	424	4.07 / 8.94

Sodium (mEq/L)

Mean	S.D.	N	Reference Range
144	1.9	424	140 / 150

Total Bilirubin (mg/dL)

Mean	S.D.	N	Reference Range
0.1	0.06	403	0.1 / 0.3

Total Protein (g/dL)

Mean	S.D.	N	Reference Range
6.8	0.37	423	6.0 / 7.7

Triglyceride (mg/dL)

Mean	S.D.	N	Reference Range
42	12.4	365	19 / 75

Urea Nitrogen (mg/dL)

Mean	S.D.	N	Reference Range
15.8	2.25	423	11.3 / 22.4

Sex: F	Study Type: SUBCHRONIC	Number of Studies/Control Groups: 53 / 53
Species: RAT	Age: 9 - 12 Weeks	Range of Study Dates: 12/02 - 02/07
Strain: Crl:CD(SD)	Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX	

Version 2.5
26-Sep-07

Sex: M Study Type: SUBCHRONIC Number of Studies/Control Groups: 35 / 35

Species: RAT Age: 9 - 12 Weeks Range of Study Dates: 06/04 - 02/07

Strain: Crl:CD(SD) Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

Hematology Values

Basophil - Abs (thous/uL)

Mean	S.D.	N	Reference Range
0.04	0.025	273	0.01 / 0.14

Basophil (%)

Mean	S.D.	N	Reference Range
0.4	0.18	273	0.1 / 1.1

Eosiniphil (%)

Mean	S.D.	N	Reference Range
1.1	0.69	273	0.3 / 3.7

Eosinophil - Abs (thous/uL)

Mean	S.D.	N	Reference Range
0.11	0.063	273	0.03 / 0.43

Hematocrit (%)

Mean	S.D.	N	Reference Range
46.6	2.88	273	39.8 / 53.4

Hemoglobin (g/dL)

Mean	S.D.	N	Reference Range
15.6	0.72	273	13.5 / 17.1

LG Unstain Cell

Mean	S.D.	N	Reference Range
0.8	0.28	273	0.2 / 1.5

Luc Absolute (thous/uL)

Mean	S.D.	N	Reference Range
0.08	0.041	273	0.02 / 0.22

Lymphocyte - Abs (thous/uL)

Mean	S.D.	N	Reference Range
8.07	2.233	273	4.19 / 14.33

Lymphocyte (%)

Mean	S.D.	N	Reference Range
82.8	4.19	273	69.9 / 89.8

Sex: M | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 35 / 35
Species: RAT | Age: 9 - 12 Weeks | Range of Study Dates: 06/04 - 02/07
Strain: Crl:CD(SD) | Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

MCH (pg)

Mean	S.D.	N	Reference Range
19.6	0.68	273	18.3 / 21.3

MCHC (g/dL)

Mean	S.D.	N	Reference Range
33.5	1.48	273	30.1 / 36.6

MCV (fL)

Mean	S.D.	N	Reference Range
58.7	3.13	273	52.5 / 66.2

Monocyte - Abs (thous/uL)

Mean	S.D.	N	Reference Range
0.18	0.074	273	0.07 / 0.42

Monocyte (%)

Mean	S.D.	N	Reference Range
1.8	0.59	273	0.8 / 3.4

Neutrophil - Abs (thous/uL)

Mean	S.D.	N	Reference Range
1.25	0.429	273	0.57 / 2.50

Neutrophil (%)

Mean	S.D.	N	Reference Range
12.9	3.68	273	6.8 / 26.0

Platelet (thous/uL)

Mean	S.D.	N	Reference Range
1102	174.8	273	653 / 1502

Red Cell Width (%)

Mean	S.D.	N	Reference Range
11.2	0.45	5	11.0 / 12.0

Sex: M | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 35 / 35

Species: RAT | Age: 9 - 12 Weeks | Range of Study Dates: 06/04 - 02/07

Strain: Crl:CD(SD) | Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

Red Cells (mil/uL)

Mean	S.D.	N	Reference Range
7.96	0.494	273	6.77 / 9.04

Reticulocyte - Abs (mil/uL)

Mean	S.D.	N	Reference Range
0.184	0.0423	179	0.106 / 0.283

Reticulocyte - Abs (thous/uL)

Mean	S.D.	N	Reference Range
69.5	101.78	273	0.1 / 312.7

Reticulocyte (%)

Mean	S.D.	N	Reference Range
2.5	0.66	273	1.3 / 4.5

White Cells (thous/uL)

Mean	S.D.	N	Reference Range
9.7	2.56	273	5.2 / 17.1

Version 2.5
25-Sep-07

Sex: M	Study Type: SUBCHRONIC	Number of Studies/Control Groups: 21 / 21
Species: RAT	Age: 9 - 12 Weeks	Range of Study Dates: 10/05 - 02/07
Strain: Crl:CD(SD)	Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX	

Hematology Values

APTT (seconds)

Mean	S.D.	N	Reference Range
20.3	2.16	151	16.4 / 26.6

Fibrinogen (mg/dL)

Mean	S.D.	N	Reference Range
246.40	20.178	10	211.00 / 287.00

Prothrombin Time (seconds)

Mean	S.D.	N	Reference Range
16.4	1.83	151	13.2 / 20.1

Version 2.5
24-Sep-07

Sex: F Study Type: SUBCHRONIC Number of Studies/Control Groups: 37 / 37

Species: RAT Age: 9 - 12 Weeks Range of Study Dates: 06/04 - 02/07

Strain: Crl:CD(SD) Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

Hematology Values

Basophil - Abs (thous/uL)

Mean	S.D.	N	Reference Range
0.03	0.020	282	0.00 / 0.14

Basophil (%)

Mean	S.D.	N	Reference Range
0.3	0.18	282	0.0 / 1.2

Eosiniphil (%)

Mean	S.D.	N	Reference Range
1.3	0.72	282	0.4 / 4.2

Eosinophil - Abs (thous/uL)

Mean	S.D.	N	Reference Range
0.10	0.055	282	0.03 / 0.34

Hematocrit (%)

Mean	S.D.	N	Reference Range
44.3	2.99	282	38.4 / 51.1

Hemoglobin (g/dL)

Mean	S.D.	N	Reference Range
15.1	0.77	282	13.1 / 16.7

LG Unstain Cell

Mean	S.D.	N	Reference Range
0.7	0.30	282	0.0 / 1.6

Luc Absolute (thous/uL)

Mean	S.D.	N	Reference Range
0.06	0.034	282	0.00 / 0.16

Lymphocyte - Abs (thous/uL)

Mean	S.D.	N	Reference Range
6.41	2.079	282	3.05 / 12.93

Lymphocyte (%)

Mean	S.D.	N	Reference Range
83.0	5.25	282	65.1 / 90.7

Sex: F | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 37 / 37
Species: RAT | Age: 9 - 12 Weeks | Range of Study Dates: 06/04 - 02/07
Strain: Crl:CD(SD) | Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

MCH (pg)

Mean	S.D.	N	Reference Range
19.6	0.67	282	18.3 / 21.2

MCHC (g/dL)

Mean	S.D.	N	Reference Range
34.2	1.70	282	30.4 / 37.6

MCV (fL)

Mean	S.D.	N	Reference Range
57.4	2.85	282	51.7 / 63.9

Monocyte - Abs (thous/uL)

Mean	S.D.	N	Reference Range
0.13	0.063	282	0.04 / 0.34

Monocyte (%)

Mean	S.D.	N	Reference Range
1.6	0.61	282	0.7 / 3.9

Neutrophil - Abs (thous/uL)

Mean	S.D.	N	Reference Range
0.95	0.373	282	0.38 / 2.30

Neutrophil (%)

Mean	S.D.	N	Reference Range
12.9	4.95	282	5.7 / 29.7

Platelet (thous/uL)

Mean	S.D.	N	Reference Range
1144	167.3	282	734 / 1531

Red Cell Width (%)

Mean	S.D.	N	Reference Range
10.4	0.55	5	10.0 / 11.0

Sex: F | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 37 / 37

Species: RAT | Age: 9 - 12 Weeks | Range of Study Dates: 06/04 - 02/07

Strain: Crl:CD(SD) | Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

Red Cells (mil/uL)

Mean	S.D.	N	Reference Range
7.72	0.461	282	6.61 / 8.55

Reticulocyte - Abs (mil/uL)

Mean	S.D.	N	Reference Range
0.144	0.0321	175	0.088 / 0.225

Reticulocyte - Abs (thous/uL)

Mean	S.D.	N	Reference Range
62.1	84.74	282	0.1 / 289.4

Reticulocyte (%)

Mean	S.D.	N	Reference Range
2.0	0.52	282	1.1 / 4.0

White Cells (thous/uL)

Mean	S.D.	N	Reference Range
7.7	2.33	282	3.8 / 15.1

Version 2.5
25-Sep-07

Sex: F | Study Type: SUBCHRONIC | Number of Studies/Control Groups: 24 / 24

Species: RAT | Age: 9 - 12 Weeks | Range of Study Dates: 10/05 - 02/07

Strain: Crl:CD(SD) | Serum/Hematology/Coagulation Instrument: 912/ADVIA/AMAX

Hematology Values

APTT (seconds)

Mean	S.D.	N	Reference Range
19.0	2.14	176	15.0 / 24.8

Fibrinogen (mg/dL)

Mean	S.D.	N	Reference Range
197.40	18.846	10	169.00 / 228.00

Prothrombin Time (seconds)

Mean	S.D.	N	Reference Range
14.3	1.62	176	11.9 / 17.1

Version 2.5
24-Sep-07

APPENDIX K

Study Protocol

Study Number: WIL-14068

PROTOCOL AMENDMENT III

Sponsor: Lyondell Chemical Company

A. Title of Study:

Acute Inhalation Toxicity Study of Allyl Alcohol in Albino Rats (With 1-, 4- And 8-Hour Exposure Durations)

B. Protocol Modification:

1) The following information add a new section to the protocol.

7.4.1 Test Article Characterization for Purity and Stability:

Upon signing of this protocol amendment by the study director, a sample (5-10 mL) of the test article will be collected from the primary test article container (container received from supplier) and transferred to the WIL Research Laboratories, LLC Analytical Chemistry Department. The percent concentration of allyl alcohol will be determined by the Analytical Chemistry Department using a gas chromatographic method with detection by flame ionization. This analysis will be performed as soon as possible (no later than May 23, 2008). Purity of allyl alcohol will be expressed as area percent. To assess the stability of the test article, the purity value will be compared to the purity of 99.4 % from the Aldrich Chemical Company certificate of analysis that was received with the test article.

C. Reason for Protocol Modification:

1) To add an analysis for purity/stability.

Approved By:
Lyondell Chemical Company

Abby A. Li, PhD
Sponsor Representative — 13 May 2008 Date

Prepared By:
WIL Research Laboratories, LLC

Daniel T. Kirkpatrick, PhD, DABT
Study Director — 12 May 2008 Date

Christopher P. Chengelis, PhD, DABT
Director, Toxicology — 12 May 2008 Date

Study Number: WIL-14068

PROTOCOL AMENDMENT II

Sponsor: Lyondell Chemical Company

A. Title of Study:

Acute Inhalation Toxicity Study of Allyl Alcohol in Albino Rats (with 1-, 4- and 8-Hour Exposure Durations)

B. Protocol Modification:

1) **3** **STUDY SCHEDULE:**

The following study-specific dates are added to the protocol:

Experimental Starting Date:	20 November 2007
Experimental Start Date	28 November 2007
Experimental Completion/Termination Date:	28 February 2008
Proposed Audited Draft Report Date	11 April 2008

2) **8.2** **Body Weights:**

In accordance with the study director notification dated December 4, 2007, all animals will receive an additional body weight determination on the day following exposure (study day 1).

3) **8.5** **Novel Stimulus/Arousal Response (Main Study Only):**

In accordance with the A-198 dated December 4, 2007, this section of the protocol is amended to the following:

During the main study exposures, special attention will be given to the state of arousal and response to novel stimuli during exposure (as close as possible to the end of the exposure period) by producing a loud-noise stimulus. The noise will be produced by allowing a 3/4-inch PVC pipe coupling, of approximately 50 grams in mass, to strike the side of the exposure chamber at the approximate level of the cage rack. The stimulus item will be attached to a length of cotton rope that will be held

against the side of the chamber approximately 40 cm from the item. The item will be raised until the rope is approximately perpendicular to the side of the chamber, and the coupling will be released. The response to the stimulus will be recorded for animals visible in the chamber as:

1) No reaction

2) Slight reaction (ear flick, flinch or some evidence that the stimulus was heard)

3) More energetic response (jump and/or vocalization)

Inhalation department personnel will be responsible for performing the actual stimulus and three DART personnel trained on Functional Observational Battery assessments will observe the animals in the chambers during each assessment according to the following plan:

One person standing in front of the chamber will be responsible for viewing and grading the first 4 animals on the left side of the exposure battery.

One person standing on the right side of the chamber will be responsible for viewing and grading the 5 animals on the right side of the exposure battery.

One additional person standing on the right side of the chamber will be responsible for viewing and grading the last animal on the left side of the exposure battery.

4) **8.8.2 Organ Weights:**

In accordance with the study director notification dated December 4, 2007, the following will be removed from the list of organs to be weighed at necropsy:

Larynx
Nasal Tissues
Trachea

C. Reason for Protocol Modification:

1) Addition of study-specific dates.

2) Addition of interval for body weight collection.

3) Change in grading criteria and clarification of method of assessment of novel stimulus/arousal response.

4) Removal of organs for which organ weights will be collected at necropsy.

Approved By:

Lyondell Chemical Company

Abby A. Li, PhD
Sponsor Representative

18 April 2008
Date

Prepared By:

WIL Research Laboratories, LLC

Daniel T. Kirkpatrick, PhD, DABT
Study Director

11 Apr 2008
Date

Christopher P. Chengelis, PhD, DABT
Director, Toxicology

11 Apr 08
Date

Study Number: WIL-14068

PROTOCOL AMENDMENT I

Sponsor: Lyondell Chemical Company

A. Title of Study:

Acute Inhalation Toxicity Study of Allyl Alcohol in Albino Rats (with 1-, 4- and 8-Hour Exposure Durations)

B. Protocol Modification:

1) **2.5** **Study Pathologist:**

The study pathologist will be:

Catherine A. Picut, VMD, DACVP, DABT
Senior Pathologist

2) **8.8.3** **Microscopic Examination:**

Tissues will be shipped to Biotechnics for slide preparation. The tissues will be shipped to the following address:

Biotechnics, Inc.
310 Millstone Dr.
Hillsborough, NC 27278

C. Reason for Protocol Modification:

1) Addition of study pathologist.

2) Clarification of location where histology slides will be prepared.

Approved By:

Inotek Pharmaceuticals Corporation

Abby A. Li, PhD
Sponsor Representative

7 Jan 2008
Date

Prepared By:

WIL Research Laboratories, LLC

Daniel T. Kirkpatrick, PhD, DABT
Study Director

4 Jan 2008
Date

Christopher P. Chengelis, PhD, DABT
Director, Toxicology
for:

4 Jan 2008
Date

PROTOCOL

ACUTE INHALATION TOXICITY STUDY OF ALLYL ALCOHOL IN ALBINO RATS (WITH 1-, 4- AND 8-HOUR EXPOSURE DURATIONS)

Submitted To:

Lyondell Chemical Company
One Houston Center, Suite 1600
1221 McKinney Street
Houston, TX 77010

Testing Facility:

WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-8946

1 OBJECTIVE:

The objectives of this study are to: 1) determine the acute inhalation NOAEL for lethality and irreversible effects; and 2) determine the acute inhalation NOAEL for effects that are likely to be reversible. This study is being conducted to provide additional data to support the derivation of AEGL 1, 2 and 3 values for different durations of time. These objectives will be achieved using a modified acute study design with multiple exposure durations, selected clinical observations, novel stimulus/arousal response, clinical pathology and histopathology of the respiratory tract and other selected tissues and organs. A preliminary study will be performed after exposure concentrations have been targeted to assure that the high treatment level for each test duration does not cause excessive mortality or moribundity.

The protocol and study have been designed based on the following guidelines:

Environmental Protection Agency (EPA), Office of Prevention, Pesticides and Toxic Substances (OPPTS) Guideline 870.1300, Acute Inhalation Toxicity, August, 1998.

Environmental Protection Agency (EPA), Office of Prevention, Pesticides and Toxic Substances (OPPTS) Guideline 870.1350, Acute Inhalation Toxicity with Histopathology, June, 1996.

Organisation for Economic Cooperation and Development (OECD): Guidelines for Testing Chemicals, Section 403.

This study will be conducted in compliance with the following Good Laboratory Practice Regulations:

U.S. Environmental Protection Agency - TSCA: 40 CFR Part 792

Organisation for Economic Cooperation and Development: C(97) 186/Final

2 PERSONNEL INVOLVED IN THE STUDY:

2.1 Sponsor Representative:

Abby A. Li, PhD
Exponent
1010 14th Street
San Francisco, CA 94114
Telephone: (415) 558-8802
Fax: (510) 558-8898
Email: abbyli@exponent.com

2.2 WIL Study Director:

Daniel T. Kirkpatrick, PhD, DABT
Director, Inhalation Toxicology
Tel: (419) 289-8700 x2072
Fax: (419) 289-3650
Email: dkirkpatrick@wilresearch.com

2.3 WIL Deputy Directors:

Melissa J. Beck, PhD
Assistant Director, Neurosciences

Jeffrey T. Weinberg, BS
Project Specialist, Inhalation Toxicology

2.4 WIL Departmental Responsibilities:

Christopher P. Chengelis, PhD, DABT
Director, Toxicology

Mark D. Nemec, BS, DABT
Director, Developmental
and Reproductive Toxicology

George A. Parker, DVM, PhD, DACVP, DABT
Director, Pathology

Andrew J. Smith, BS
Manager, Inhalation Toxicology

Ronald E. Wilson, BS
Director, Informational Systems

Carol A. Kopp, BS, LAT
Manager, Gross Pathology and
Developmental Toxicology Laboratory

Sally A. Keets, AS
Senior Operations Manager, Vivarium

Heather L. Johnson, BS, RQAP-GLP
Manager, Quality Assurance

Daniel W. Sved, PhD
Director, Metabolism and Analytical Chemistry

Robert A. Wally, BS, RAC
Manager, Reporting and
Regulatory Technical Services

Walter Miller, Jr., BS, DVM
Clinical Veterinarian, Head of Surgery
and Experimental Medicine

3 STUDY SCHEDULE:

Proposed Experimental Starting Date:	To be added by protocol amendment.
Proposed Experimental Start Date:	To be added by protocol amendment.
Proposed Experimental Completion/ Termination Date:	To be added by protocol amendment.
Proposed Audited Report Date:	To be added by protocol amendment.

4 TEST ARTICLE DATA:

4.1 Identification:

Allyl Alcohol

4.2 Lot Number:

02109PE

4.3 Purity:

99.4%

4.4 Stability:

Considered to be stable under conditions of storage and use.

4.5 Physical Description:

To be documented by WIL Research Laboratories, LLC.

4.6 Storage Conditions:

To be determined.

4.7 Personnel Safety Data:

Provided by the Sponsor in the form of a Material Safety Data Sheet.

At a minimum, technical staff will wear safety glasses, appropriate gloves and facility clothing when handling or working with the test article. Additional personal protective equipment, such as a respirator, protective coveralls or sleeve covers, may be required, i.e. during removal of animals from exposure chambers. Specific equipment and its use will be defined by study management and communicated to technical staff, as appropriate.

5 TEST SYSTEM:

5.1 Species:

Rat

5.2 Strain:

Crl:CD®(SD)

5.3 Source:

Charles River Laboratories, Inc.
The facility from which animals were received will be documented in the study records.

5.4 Number on Study:

Seventy male and 70 female rats will be ordered specifically for this study.

The number of animals used will be the minimum number needed to meet the objectives of the study. For each exposure duration, 5 males and 5 females will used for each of 3 treatment levels and a control group for a total of 60 male and 60 female rats (20 males and 20 females for each of the 3 exposure durations). Any animals not selected for use on this study will be transferred for use on other studies, returned to stock or euthanized by CO_2 inhalation.

Twelve male and 12 female rats may be ordered specifically for this study or may be transferred from a stock colony used for acute studies for use in the preliminary study.

5.5 Approximate Weight:

250 to 350 grams for males and females at initiation of exposure, ± 20% of the mean

5.6 Approximate Age:

Approximately 10-11 weeks of age at the time of exposure

5.7 Identification System:

Animals will be uniquely identified by a metal ear tag displaying the animal number. Individual cage cards will be affixed to each cage and will display the study number, animal number and group (exposure level).

5.8 Justification for Selection:

This species and strain is generally recognized to be appropriate for acute inhalation studies. The Crl:CD®(SD) rat will be utilized because it is a widely-used strain for which significant historical control data are available. The number of animals selected is the minimum needed to yield statistically and scientifically meaningful data and to comply with testing guidelines.

6 SPECIFIC (NON-EXPOSURE PERIOD) MAINTENANCE SCHEDULE:

6.1 Animal Housing:

The animals will be individually housed in suspended wire mesh cages in an environmentally controlled room. The cages will be elevated above cage-board or other suitable material. The cages will be subject to routine cleaning at a frequency consistent with maintaining good animal health.

6.2 Environmental Conditions:

Controls will be set to maintain an average daily temperature of 71 ± 5°F (22 ± 3°C) and an average daily relative humidity of 50 ± 20%. Temperature and relative humidity will be monitored continuously. Data for these two parameters will be scheduled for automatic collection on an hourly basis. Fluorescent lighting controlled by light timers will provide illumination for a 12 hour light/dark photoperiod. Temporary adjustments to the light/dark cycles may be made to accommodate protocol specified activities. The ventilation rate will be set at a minimum of 10 room air changes per hour, 100% fresh air.

6.3 Drinking Water:

Reverse osmosis treated tap water will be available *ad libitum* via an automatic watering system throughout the study, except during exposure periods. Filters servicing the automatic watering system are changed regularly according to WIL Standard Operating Procedures. Water supplying the laboratory is analyzed for contaminants according to WIL Standard Operating Procedures to ascertain that none are present at concentrations that would be expected to affect the outcome of the study.

6.4 Basal Diet:

PMI Nutrition International, LLC Certified Rodent LabDiet® 5002 will be offered *ad libitum* throughout the study, except during exposure periods. Periodic analysis of the certified feed for the presence of heavy metals and pesticides are performed and provided by the manufacturer to ensure that none are present at concentrations that would be expected to affect the outcome of the study.

7 EXPERIMENTAL DESIGN:

7.1 Organization of Test Groups (Preliminary Study):

1-Hour Exposure Duration

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
4A	Allyl Alcohol	400	1	3	3
4B	Allyl Alcohol	600	1	3	3

4-Hour Exposure Duration

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
8A	Allyl Alcohol	100	4	3	3

8-Hour Exposure Duration

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
12A	Allyl Alcohol	50	8	3	3

7.2 Organization of Test Groups (Main Study):

1-Hour Exposure Duration

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
1	Filtered Air	0	1	5	5
2	Allyl Alcohol	50	1	5	5
3	Allyl Alcohol	200	1	5	5
4	Allyl Alcohol	400	1	5	5

4-Hour Exposure Duration

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
5	Filtered Air	0	4	5	5
6	Allyl Alcohol	20	4	5	5
7	Allyl Alcohol	50	4	5	5
8	Allyl Alcohol	100	4	5	5

8-Hour Exposure Duration

Group Number	Treatment	Exposure Concentration (ppm)	Exposure Duration (hours)	Number of Animals	
				Males	Females
9	Filtered Air	0	8	5	5
10	Allyl Alcohol	10	8	5	5
11	Allyl Alcohol	20	8	5	5
12	Allyl Alcohol	50	8	5	5

7.3 Animal Receipt and Acclimation:

Each animal will be inspected by a qualified technician upon receipt. Animals judged to be in good health and suitable as test subjects will be acclimated for a minimum of 7 days. All animals will be weighed and permanently identified with an ear tag. During the acclimation period, each animal will be observed twice daily for changes in general appearance and behavior.

7.4 Randomization:

Animals will be ordered specifically for this study. The animals will be selected based on the body weight requirements, the appearance of general good health, and will be formally randomized, using simple randomization, into the requisite

groups. The weight variation will not exceed ± 20% of the mean weight for any animal selected.

7.5 Exposure Levels and Treatment Regimen:

The preliminary study will be conducted using 1-hour, 4-hour and 8-hour exposure durations with 1 or 2 exposure levels per exposure duration. The main study will be conducted using the same exposure durations as the preliminary study, but with 4 exposure levels per exposure duration (3 test article and 1 control). These levels were selected by the Sponsor based on previous toxicity studies with the test article.

7.6 Route and Rationale of Test Article Administration:

The route of administration will be whole-body inhalation exposure since this is a reliable and accurate method of evaluating toxicity and is a possible route of human exposure.

7.7 Exposure Methods:

Exposures will be conducted in stainless steel and glass whole-body exposure chambers. The exposure chambers will be operated under dynamic conditions from a HEPA- and charcoal-filtered air source. Airflow rate through the chambers will be such that there are at least 12 air changes per hour through the exposure system. Appropriate ranges for airflow rates will be determined during pre-study method development and included in a description of exposure, test atmosphere generation and monitoring methods, which will be approved by the study director. If modification of an airflow range is required during the study, study director approval is required (preferably before or at the time a change is implemented).

Daily average temperature and relative humidity of the exposure atmosphere will be 22 ± 2°C and 30-70%, respectively. Temperature and relative humidity will be monitored continuously and recorded at approximately 30-minute intervals during each exposure. Oxygen content of the exposure atmospheres for each system will be determined during pre-study method development and will be at least 19% in each chamber.

All animals will be housed in a normal animal colony room during non-exposure hours. For each exposure, the animals will be placed in exposure batteries, transported to the exposure room, exposed for the requisite duration, and returned to their home cages. Food and water will not be available during the exposures.

7.8 Test Material Generation Methods:

Test atmosphere concentrations will be generated using an appropriate device, such as a heated bead column or gas-washing bottle. Specific test atmosphere generation equipment and operating parameters will be selected to produce the required vapor exposure concentrations.

Further details of generation systems and methodologies, including specific types and/or models and operating conditions, will be defined during pre-study method development and included in a description of exposure, test atmosphere generation and monitoring methods, which will be approved by the study director. If modifications of methods or operating conditions are required during the study, study director approval is required (preferably before or at the time a change is implemented).

7.9 Methods of Characterization of Exposure Atmospheres:

7.9.1 Nominal Concentrations:

If possible, nominal exposure concentrations will be calculated for each exposure using the following formula:

$$\text{ppm Test Article (TA)} = \frac{\text{Wt. TA} \bullet \text{Mol. Vol.} \bullet 10^6}{\text{MW} \bullet \text{Ch. Flow} \bullet \text{Exp. Dur.}}$$

Where:

Wt. TA	=	Weight of test article used during an exposure, in grams
Mol. Vol.	=	Molar volume at 730 mmHg and 21°C, 25.11 L/mole
10^6	=	ppm conversion factor
MW	=	Test article molecular weight, in grams/mole
Ch. Flow	=	Average chamber flow rate, in liters per minute (LPM)
Exp. Dur.	=	Duration of exposure, in minutes

7.9.2 Analyzed Exposure Concentrations:

Using an appropriate gas chromatographic method, actual test article vapor concentrations in each exposure chamber will be determined at least at hourly intervals for the 4-hour and 8-hour exposure durations and at least at two times (approximately 30 minutes apart) for the 1-hour exposure duration.

Analytical methods will be defined during pre-study method development and included in a description of exposure, test atmosphere generation and monitoring methods, which will be approved by the study director. If modifications of methods or operating conditions are required during the study, study director approval is required (preferably before or at the time a change is implemented).

The average daily concentrations in each chamber will be considered acceptable if they are within 10% of their target concentrations.

7.9.3 Temporal Stability and Homogeneity of Vapor Test Atmospheres:

During pre-study method development trials, the stability of the test article gas concentrations over time and the spatial homogeneity of the test article gas concentrations within each test chamber will be evaluated. Methods and results of these evaluations will be documented in the study records and described in the study report.

8 EXPERIMENTAL OBSERVATIONS:

8.1 Viability Observations:

All animals will be observed for mortality/moribundity twice daily, once in the morning and once in the afternoon, except on the day of scheduled necropsy. Moribund animals will be euthanized to ensure that tissues will not be lost due to autolysis.

8.2 Body Weights:

The body weight of each animal will be determined immediately prior to all exposures and during the post-exposure observation period on study day 4 (termination) for the preliminary study and on study days 6 and 13 (termination) (for each exposure duration) for the main study. In addition, animals that die on study will be weighed as soon as possible after death; however these weights will not be included in any mean calculations.

8.3 Clinical Observations During Exposures:

Clinical observations will be performed by technicians who are trained and currently qualified for Functional Observational Battery assessments. The same technicians will perform the observations during exposures and the post-exposure observations. The objective of observations during exposures is to record findings that can be observed reliably for all animals in each exposure chamber. The following represents the standard list that will be used for this study. If other significant findings related to behavior or nervous system

function are observed, the Study Director will be notified for confirmation and possible addition to this standard observation list.

Posture (sitting or standing normally; asleep, lying on side or curled up, lying on side with limbs in air, prostration or other unusual posture
Convulsions (present or absent)
Tremors (present or absent)
Respiratory Character (normal, increased rate, decreased rate)
Hyperactivity (present or absent)
Bizarre/Stereotypic Behavior (present with description or absent)

Observations during exposures will be performed during the preliminary and main studies according to the following schedule (for each exposure duration, the last set of observations will be performed as close as possible to the end of the exposure period):

1-Hour Exposure: Lethality and obvious signs of toxicity after approximately 30 minutes and 1 hour of exposure.

4-Hour Exposure: Lethality and obvious signs of toxicity after 30 minutes, 1 hour and 4 hours of exposure.

8-Hour Exposure: Lethality and obvious signs of toxicity after 30 minutes, 1 hour, 4 hours and 8 hours of exposure.

8.4 Daily Clinical Observations:

Clinical observations will be performed by technicians who are trained and currently qualified for Functional Observational Battery assessments. Disciplined clinical observations will be conducted on all surviving preliminary and main study animals as soon as possible following exposure (beginning approximately 15 minutes after exposure; with completion within 1 hour). Inhalation Department personnel will remove the animals from the exposure chambers and will place the animals in a cage rack in a randomized order and then will move the cage rack to the room where detailed physical examinations will be performed. Disciplined clinical observations will be conducted according to SOP T1-281, as revised. In addition to the requirements of this SOP, gait score and tremors will be graded using standard FOB criteria (SOP T1-112, as revised). If 2 technicians perform these assessments, observations will be conducted in randomized order with respect to gender and dose level across technician. Only the presence of findings will be documented during the examinations. An assessment of gait will be determined by briefly placing animals on a flat plastic surface (e.g., cart top). If the animal does not move, the animal will be prodded in order to assess gait. The surface used for the

assessment will be wiped down between animals. Hyperactivity will not be assessed after animals are prodded.

On study days 1-4 following the day of preliminary study exposure and on study days 1-13 following the day of main study exposure (study day 0), disciplined clinical observations will be conducted according the procedure described above. The animals will be observed using the same random placement as used for the exposure day post-exposure observations. On the first post-exposure day for each group by exposure duration, observations will be conducted twice, once in the morning and once in the afternoon. On all remaining post-exposure days, observations will be conducted once daily at approximately the same time each day.

Observations will include, but are not limited to, changes in the skin, fur, eyes and mucous membranes, respiratory, circulatory, autonomic and central nervous system functions, somatomotor activity and behavior patterns, including tremors and convulsions, changes in the level of activity, gait and posture, reactivity to handling or sensory stimuli, altered strength and sterotypies or bizarre behavior. Findings noted at the clinical examination will be recorded for individual animals.

8.5 Novel Stimulus/Arousal Response (Main Study Only):

During the main study exposures, special attention will be given to the state of arousal and response to novel stimuli during exposure (as close as possible to the end of the exposure period) by producing a loud-noise stimulus. The noise will be produced by allowing a PVC or stainless steel pipe coupling, or other item of appropriate mass (approximately 50 grams) to strike the steel side of the exposure chamber at the approximate level of the cage rack. The stimulus item will be attached to a length of cotton rope that will be held against the steel side of the chamber approximately 45 cm from the item. The stimulus item will be raised until the rope is approximately perpendicular to the side of the chamber, and item will be released. The response to the stimulus will be recorded for animals visible in the chamber as: (1) no reaction; (2) slight reaction (ear flick or some evidence that the stimulus was heard); or (3) more energetic response (jump, flinch and/or vocalization).

8.6 Termination of Preliminary and Main Studies:

All animals *in extremis* or surviving to preliminary study termination will be euthanized by CO_2 inhalation and discarded after the 4-day post-exposure observation period.

All animals *in extremis* or surviving to main study termination will be euthanized with isoflurane and exsanguinated. A complete gross necropsy examination will be conducted.

8.7 Clinical Pathology (Main Study Animals Only):

Hematology and serum chemistry parameters will be evaluated from all main study animals on the day of the scheduled necropsy (post-exposure day 14). The animals will be fasted overnight before blood collection and necropsy. For hematology (except clotting parameters) and standard serum chemistry evaluations, blood samples will be collected from the retro-orbital sinus from animals anesthetized using isoflurane. Blood samples for clotting evaluations will be collected via the vena cava at necropsy (animals anesthetized using isoflurane). EDTA will be used for the anticoagulant on samples collected for hematology, and sodium citrate will be used for samples collected for clotting determinations. Serum collection tubes will be used for blood samples collected for serum chemistry.

8.7.1 Hematology:

Activated partial thromboplastin time	MCHC
Differential leukocyte count[a]	MCV
Erythrocyte count	Platelet count
Hematocrit	Prothrombin time
Hemoglobin	Reticulocyte count
MCH	Total leukocyte count

[a] = If performed manually, results will include platelet estimates and RBC morphology.

8.7.2 Serum Chemistry:

A/G ratio	Glucose
Alanine aminotransferase	Phosphorus
Albumin	Potassium
Alkaline phosphatase	Sodium
Aspartate aminotransferase	Total bilirubin
Calcium	Total cholesterol
Chloride	Total protein
Creatinine	Triglycerides
Gamma glutamyltransferase	Urea nitrogen
Globulin	

8.8 Anatomic Pathology (Main Study Animals Only):

8.8.1 Macroscopic Examination:

A complete necropsy will be conducted on all the animals at the scheduled necropsy or animals found dead or euthanized *in extremis*. A complete necropsy will be conducted on all animals at the scheduled necropsy after overnight fasting. Animals *in extremis* or at the scheduled necropsies will be euthanized with isoflurane and exsanguinated. Necropsy will include examination of the external surface; all orifices; and the cranial, thoracic, abdominal and pelvic cavities, including viscera. Tissues listed below will be collected and placed in 10% neutral-buffered formalin (except as noted):

Kidneys (2)	Nasal tissues[a]
Larynx	Liver (sections of two lobes)
Lungs (including bronchi, fixed by inflation with fixative)	Trachea
	Gross lesions (when possible)

a - Following fixation in formalin, nasal tissues will be decalcified and sections of 6 nasal levels will be prepared for microscopic examination as defined by SOP T4-016 (as revised).

8.8.2 Organ Weights:

The following organs from all animals at the scheduled necropsy will be weighed:

Kidneys	Nasal tissues
Larynx	Liver
Lungs	Trachea

Paired organs will be weighed together. Organ-to-body-weight ratios will be calculated from animals euthanized at the scheduled necropsy.

8.8.3 Microscopic Examination:

Microscopic examination of hematoxylin-eosin stained paraffin sections will be performed on the tissues/organs listed in Section 8.8.1 from all animals in all exposure groups, and in any animals that die or are euthanized prior to scheduled sacrifice. Nasal sectioning will be performed using the method of Morgan in which 6 nasal sections are produced using specifically defined landmarks for sectioning (Mery et al., 1994). All 6 nasal levels will be examined microscopically. The histology slides will be prepared at either the WIL Research Laboratories site in Ashland Ohio, or the WIL Research subsidiary

(Biotechnics) in Hillsborough, North Carolina. If the tissues are shipped to North Carolina, an appropriate protocol amendment will be issued.

Histopathologic findings will be described with sufficient detail to assess extent, severity and relevance of changes. If possible, the study pathologist will use the descriptive diagnoses and severity values to form an opinion regarding the reversibility of epithelial changes. Where possible, individual diagnoses will be detailed and include identification of subtopography of the tissue being examined. For example, for epithelial degradation in the nose, a diagnosis will include the specific type of nasal epithelium (squamous, transitional, respiratory or olfactory) in which the change is found. Based on use of an acute single exposure paradigm and the sensitivity of the rat nasal epithelial tissues to irritant injury, it is anticipated that microscopic examination of the nasal tissues will be particularly important to interpretation histopathological effects, including reversibility, in the current study.

Where appropriate, one of five severity grades, minimal, mild, moderate, severe and severe, irreversible will be used to convey the extent (e.g., portion of epithelial surface affected), severity and/or depth of a change. In this context, depth refers to the depth from the normal luminal surface of the epithelium. For example, depth of injury in the nasal respiratory epithelium could range from loss of cilia and goblet cell hyperplasia, to loss or degeneration of respiratory epithelial cells to complete denudation of the basement membrane to ulceration with perforation of the basement membrane. The depth of a microscopic lesion in an epithelium will be considered along with other lesion characteristics in the evaluation of reversibility. The severe, irreversible grade will be used when, in the opinion of the study pathologist, full resolution or recovery is unlikely.

Special stains may be used at the discretion of the pathologist to further characterize lesions and changes. Any special stains used will be documented in the individual animal data and interpretation of results will be included in the final report.

9 STATISTICAL METHODS:

All statistical tests for experimental data will be performed using appropriate computing devices or programs as referenced below. All analyses will be two-tailed for significance levels of 5% and 1%. Mean values will be presented with standard deviations. Body weights and body weight changes, as well as clinical pathology values and absolute and relative organ weights will be subjected to a one-way analysis of variance (Snedecor, 1980). If a statistically significant difference ($p<0.05$)

is present in this ANOVA, a comparison of the control group to each treated group by Dunnett's test (Dunnett, 1964) will be performed. Statistical analysis will not be performed on groups with an N of two (2) or less.

10 REPORT:

The final report will include the following: summary, objective, test material identification and receipt, method of test atmosphere generation and characterization, observations, mortality, body weights, clinical pathology results, organ weights, gross necropsy findings and histopathology findings.

WIL Research Laboratories will submit one copy of an audited draft report in a timely manner upon completion of data collection prior to issuance of the final report. One revision will be permitted as part of the cost of the study, from which the Sponsor's reasonable revisions and suggestions will be incorporated into the final report, as appropriate. Additional changes or revisions may be made, at extra cost. It is expected that the Sponsor will review the draft report and provide comments to WIL within a two-month time frame following submission. WIL will submit the final report within one month following receipt of comments. If the Sponsor's comments and/or authorization to finalize the report have not been received at WIL within one year following submission of the draft report, WIL may elect to finalize the report following appropriate written notification to the Sponsor. The original paper final report (containing original signatures) and two electronic copies (one in PDF and one in MS Word format) of the final report on CD-R will be provided. Requests for additional paper copies of the final report may result in additional charges.

11 QUALITY ASSURANCE:

The study will be audited by the WIL Quality Assurance Unit while in progress to assure compliance with Good Laboratory Practice Regulations, adherence to the protocol and to WIL Standard Operating Procedures. The raw data and draft report will be audited by the WIL Quality Assurance Unit prior to submission to the Sponsor to assure that the final report accurately describes the conduct and the findings of the study.

12 RECORDS TO BE MAINTAINED:

All original raw data, as defined by WIL SOPs and the applicable GLPs, will be maintained in permanently bound notebooks or in loose-leaf notebooks, and at study completion, will be returned to the Sponsor within 15 days of issuing the final report.

13 WORK PRODUCT:

Sponsor will have title to all documentation records, raw data, slides, specimens, or other work product generated during the performance of the study. Following

completion of the study and approval of the final report, all raw data, the protocol and all reports will be maintained at EPL Archives, Inc. at 45610 Terminal Drive, Sterling, VA 20166 following issuance of the final report.

14 ANIMAL WELFARE ACT COMPLIANCE:

This study will comply with all applicable sections of the Final Rules of the Animal Welfare Act regulations (9 CFR). The Sponsor should make particular note of the following:

- The Sponsor signature on this protocol documents for the Study Director the Sponsor's assurance that the study described in this protocol does not unnecessarily duplicate previous experiments.
- Whenever possible, procedures used in this study have been designed to avoid or minimize discomfort, distress or pain to animals. All methods are described in this study protocol or in written laboratory Standard Operating Procedures.
- Animals that experience severe or chronic pain or distress that cannot be relieved will be painlessly euthanized as deemed appropriate by the veterinary staff and Study Director. The Sponsor will be advised by the Study Director of all circumstances which could lead to this action in as timely a manner as possible.
- Methods of euthanasia used during this study are in conformance with the above referenced regulation.
- The Sponsor/Study Director has considered alternatives to procedures that may cause more than momentary or slight pain or distress to the animals and has provided a written narrative description (AWA covered species) of the methods and sources used to determine that alternatives are not available.

15 REFERENCES:

Mery, S., Gross, E.A., Joyner, D.R., Godo, M., and Morgan, K.T. Nasal Diagrams: A Tool for Recording the Distribution of Nasal Lesions in Rats and Mice. *Toxicologic Pathology* **1994**, 22, pp. 353-372.

Dunnett, C.W. New tables for multiple comparisons with a control. *Biometrics* **1964**, 20, pp. 482-491.

Snedecor, G.W.; Cochran, W.G. One Way Classifications; Analysis of Variance. In *Statistical Methods*, 7th ed.; The Iowa State University Press: Ames, IA, **1980**; pp. 215-237.

16 PROTOCOL APPROVAL:

Sponsor approval received via email on November 30, 2007.

Lyondell Chemical Company

Abby A. Li, PhD
Sponsor Representative

3-Dec-2007
Date

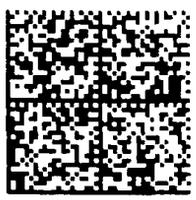
WIL Research Laboratories, LLC

Daniel T. Kirkpatrick, PhD, DABT
Study Director

30-Nov-2007
Date

Christopher P. Chengelis, PhD, DABT
Director, Toxicology

30 Nov 2007
Date



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