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EPA EAST - Room 6428: Attn Section 8(e)
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington DC 20460-0001

Attention: TSCA 8(e) Coordinator

RE: Glycol Ether PM-250
Acute Oral Toxicity Study in Rats
8eHQ-06-16523

Dear Sir or Madam:

On behalf of Lyondell Chemical Company (Lyondell), enclosed is the final report titled **Acute Oral Toxicity Study of Glycol Ether PM-250 in Albino Rats (Up and Down Procedure)**. Lyondell is submitting this report as follow-up to a TSCA Section 8(e) notification (8EHQ Number: 8eHQ-06-16523) which was submitted based on preliminary data from the study.

Should you have any questions or require additional details, please do not hesitate to call me at 713-309-7884. I may also be reached by e-mail at timothy.yagley@lyondell.com.

Sincerely,

Timothy J. Yagley
Business Consultant - Chemical Control
Corporate TSCA Coordinator
Lyondell Chemical Company



Enclosures

CONTAIN NO CBI



8EMQ-06-16523

FINAL REPORT

STUDY TITLE

ACUTE ORAL TOXICITY STUDY OF
GLYCOL ETHER PM-250 IN ALBINO RATS
(UP AND DOWN PROCEDURE)

STUDY NUMBER

WIL-14063

STUDY DIRECTOR

Jonathan M. Hurley, BS

STUDY INITIATION DATE

18 May 2006

STUDY COMPLETION DATE

20 September 2006

PERFORMING LABORATORY

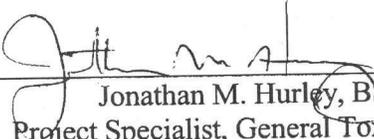
WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-9281

SPONSOR

Lyondell Chemical Company
One Houston Center, Suite 700
1221 McKinney Street
Houston, TX 77010

COMPLIANCE STATEMENT

This study, designated WIL-14063, was conducted in compliance with the United States Environmental Protection Agency (EPA) Good Laboratory Practice Standards (40 CFR Part 792), September 18, 1989; the standard operating procedures of WIL Research Laboratories, LLC, and the protocol as approved by the sponsor. Analytical confirmation of the concentration, purity, homogeneity and stability of the dosing mixture was not performed. A Certificate of Analysis was provided by the sponsor (presented in Appendix A). The characterization analyses were not conducted according to Good Laboratory Practice Standards.



Jonathan M. Hurley, BS
Project Specialist, General Toxicology
Study Director

20 Sep 06
Date

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1. SUMMARY

1.1. OBJECTIVE

The objectives of this study were to determine the acute oral median lethal dose and evaluate potential systemic toxicity of the test article when administered as a single dose to albino rats.

1.2. TEST GUIDELINES

The protocol was designed to be in general compliance with the Environmental Protection Agency (EPA) Office of Prevention, Pesticides and Toxic Substances (OPPTS) Guideline 870.1100 (2002) and the Organisation for Economic Cooperation and Development (OECD) Guidelines for Testing of Chemicals, Section 425 (2001).

1.3. STUDY DESIGN

The acute oral toxicity of Glycol Ether PM-250 was evaluated in this single-dose study in rats. Initially, the test article was administered once orally via gavage at the limit test level of 2000 mg/kg to a single fasted female albino rat. No mortality was observed and a final 4 female animals were dosed at 2000 mg/kg.

Mortality, clinical observations and body weight changes were evaluated over a 14-day observation period. All animals were subjected to a gross necropsy.

1.4. RESULTS

There were no deaths, remarkable body weight changes or gross necropsy findings. Clinical findings included hypoactivity, twitching, prostrate posture, tremors, intermittent convulsions, impaired equilibrium, abnormal respiration pattern, cool extremities, abnormal excretion, partial closure of the eyes, hair loss on the forelimbs and various discolored areas due to discharges/excretions.

1.5. CONCLUSIONS

Based on the results of this study, the LD₅₀ of Glycol Ether PM-250 was greater than 2000 mg/kg when administered once orally via gavage to fasted female albino rats.

2. INTRODUCTION

2.1. GENERAL STUDY INFORMATION

This study presents the data from “Acute Oral Toxicity Study Of Glycol Ether PM-250 In Albino Rats (Up And Down Procedure)”. Due to software spacing constraints, the study title is presented as “Acute Oral Toxicity Study Of Glycol Ether PM-250 In Albino Rats” on the report tables.

The following computer protocol was used for data collection during the study:

<u>Computer Protocol(s)</u>	<u>Type of Data Collected</u>
WIL-14063	Main study data

2.2. KEY STUDY DATES

<u>Date(s)</u>	<u>Event(s)</u>
22 May 2006	Experimental start date (first day of dosing)
7 June 2006	Experimental termination date (date of last necropsy)

3. EXPERIMENTAL PROCEDURES - MATERIALS AND METHODS

3.1. TEST ARTICLE IDENTIFICATION

The test article, Glycol Ether PM-250, was received from Lyondell Technical Center, Newtown Square, Pennsylvania, on 3 May 2006, as follows:

<u>Identification</u>	<u>Quantity Received</u>	<u>Physical Description</u>
Glycol Ether PM-250 Lot no. QST19705 [WIL log no. 6938A]	1 bottle Gross weight: 245.0 g	Clear, colorless liquid

Purity and stability data were the responsibility of the sponsor. A Certificate of Analysis for the test article was provided by the sponsor and is presented in Appendix A. The test article was stored at controlled room temperature and was considered stable under these conditions. A reserve sample of the test article (approximately 2.94 g) was collected on 10 May 2006, and stored in the Archives of WIL Research Laboratories, LLC.

3.2. PREPARATION

Prior to use, the original container of the test article was agitated to ensure a homogeneous mixture. A sufficient amount of test article was dispensed into a labeled storage vessel and stirred using a magnetic stirrer continuously throughout the dosing procedure.

3.3. METHOD OF TEST ARTICLE ADMINISTRATION/TREATMENT REGIMEN

The rats were fasted approximately 18-20 hours prior to dosing. Food was returned approximately 4 hours after dosing. Female albino rats were administered the test article once orally via gavage at a level of 2000 mg/kg. Initially, the test article was administered once orally via gavage at the limit test level of 2000 mg/kg to a single fasted female albino rat. No mortality was observed and a final 4 animals were dosed at 2000 mg/kg.

The test article was dosed undiluted based on its specific gravity. The dose volume was determined by dividing the dose level of 2000 mg/kg, expressed as g/kg, by the specific gravity 0.9810 g/mL, as determined by WIL Research Laboratories, LLC Formulations personnel. Individual doses were calculated based on fasted body weights taken just prior to dosing and the dose volume of 2.0 mL/kg.

3.4. ROUTE AND RATIONALE OF TEST ARTICLE ADMINISTRATION

The selected route of administration for this study was oral (by gavage) in order to evaluate the acute toxicity of the test article. The animal model, the albino rat, is generally recognized as appropriate for acute oral toxicity studies. The experimental design used the procedures and standards required by the current federal and international regulations.

3.5. ANIMAL RECEIPT AND ACCLIMATION

The albino rats utilized for this study were received in good health from Charles River Laboratories, Inc., Raleigh, North Carolina, on 16 May 2006. The rats were uniquely identified by a metal eartag displaying the animal number and were acclimated to the laboratory for a minimum of 7 days. During the acclimation period, the rats were observed twice daily for mortality and moribundity.

3.6. ANIMAL HOUSING

Upon arrival, all animals were housed individually in clean, stainless steel, wire-mesh cages suspended above cage-board. The animals were maintained by the animal husbandry staff of WIL Research Laboratories, LLC in accordance with standard operating procedures.

3.7. 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. Municipal water

supplying the facility is sampled 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. The basal diet and municipal water, delivered by an automatic watering system, were provided *ad libitum*, except during the 18- to 20-hour period immediately prior to dosing and the 4-hour period after dosing when food was withheld.

3.8. ENVIRONMENTAL CONDITIONS

The animal room was maintained with controlled temperature, humidity and light (0600 hours to 1800 hours). The room temperature and humidity controls were set to maintain daily averages of $71 \pm 5^{\circ}\text{F}$ ($22 \pm 3^{\circ}\text{C}$) and $50 \pm 20\%$ relative humidity. Room temperature and relative humidity were controlled and monitored using the Metasys DDC Electronic Environmental control system and were recorded approximately hourly. These data are summarized in Appendix C. Actual mean daily temperature ranged from 70.4°F to 71.0°F (21.3°C to 21.6°C) and mean daily relative humidity ranged from 41.3% to 52.9% during the study.

3.9. ASSIGNMENT OF ANIMALS TO TREATMENT GROUPS

Animals used in the study were randomly selected based on health and body weight from available stock and assigned to groups by use of the WIL Toxicology Data Management System (WTDMS™). The selected animals were approximately 9 weeks old at initiation of dosing; body weight values ranged from 200 g to 229 g.

3.10. DATA RETENTION

The sponsor has title to all documentation records, raw data, specimens or other work product generated during the performance of the study. Following issuance of the final report, all work product including raw paper data, pertinent electronic storage media, the protocol and all reports will be shipped to EPL Archives, Inc. at 45610 Terminal Drive, Sterling, Virginia 20166.

WIL-14063
Lyondell Chemical Company

Glycol Ether PM-250

A reserve sample of the test article is retained in the Archives at WIL Research Laboratories, LLC in compliance with regulatory requirements.

4. PARAMETERS EVALUATED

4.1. MORTALITY

The rats were observed at approximately 15 minutes and 1, 2 and 4 hours post-dosing on study day 0 and twice daily (morning and afternoon) thereafter for 14 days.

4.2. CLINICAL OBSERVATIONS

The rats were observed at approximately 15 minutes and 1, 2 and 4 hours post-dosing on study day 0 and once daily thereafter for 14 days.

Observations included, but were not limited to, evaluation for changes in appearance of skin and fur, eyes, mucous membranes, respiratory and circulatory systems, autonomic effects and central nervous system effects.

4.3. BODY WEIGHTS

Body weights were obtained and recorded on study days 0 (initiation), 7 and 14 (termination).

4.4. NECROPSY

Upon termination, all rats were euthanized by carbon dioxide inhalation. The major organ systems of the cranial, thoracic and abdominal cavities were examined for all animals.

5. RESULTS AND DISCUSSION

5.1. MORTALITY

All animals survived to the scheduled necropsy.

5.2. CLINICAL OBSERVATIONS

Summary Data: Table 1

Individual Data: Table 5

Clinical findings included hypoactivity, twitching, prostrate posture, tremors (intermittent or continuous), intermittent convulsions, impaired equilibrium, abnormal respiration pattern (labored or increased), cool extremities, abnormal excretion (decreased defecation and/or soft feces), partial closure of the eyes, hair loss on the forelimbs and various discolored areas due to discharges/excretions (described as clear, red and/or yellow material around the mouth, eyes, forelimb(s), urogenital area and/or nose).

5.3. BODY WEIGHTS

Summary Data: Tables 2, 3

Individual Data: Tables 6, 7

There were no remarkable body weight changes noted during the study.

5.4. NECROPSY

Summary Data: Table 4

Individual Data: Table 8

There were no macroscopic findings at the scheduled necropsy.

6. CONCLUSIONS

Based on the results of this study, the LD₅₀ of Glycol Ether PM-250 was greater than 2000 mg/kg when administered once orally via gavage to fasted female albino rats.

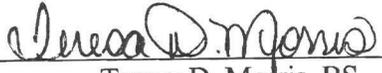
7. KEY STUDY PERSONNEL AND REPORT SUBMISSION

Reviewed By:



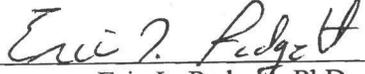
Jay G. Henson, BS
Group Supervisor, Study Analysis and Reports

20 Sep 06
Date



Teresa D. Morris, BS
Senior Operations Manager, Toxicology

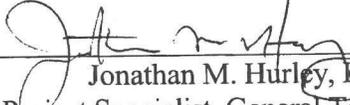
20 Sep 06
Date



Eric L. Padgett, PhD
Assistant Director, Toxicology and
Head of Juvenile Toxicology

20 Sep 06
Date

Prepared, Approved and Submitted By:



Jonathan M. Hurley, BS
Project Specialist, General Toxicology
Study Director

20 Sep 06
Date

Study Personnel:

Carol A. Kopp, BS, LAT	Manager, Gross Pathology and Developmental Toxicology Laboratory
Theresa M. Rafeld	Group Manager, Formulations Laboratory
John J. Setser, BS, RLATG	Group Manager, Toxicology

8. QUALITY ASSURANCE UNIT STATEMENT

8.1. PHASES INSPECTED

<u>Date(s) of Inspection(s)</u>	<u>Phase Inspected</u>	<u>Date(s) Findings Reported to Study Director</u>	<u>Date(s) Findings Reported to Management</u>	<u>Auditor(s)</u>
22-May-2006	Test Article Dispense	22-May-2006	26-Jun-2006	T.DeVan Booth / N.Daniels
22-May-2006	Post Dose Observations	22-May-2006	26-Jun-2006	N.Daniels
01-Jun-2006	Animal Care Equipment Room	02-Jun-2006	25-Jul-2006	A.Deppe
08-Aug-2006	Draft Report	08-Aug-2006	20-Sep-2006	N.Daniels
08-Aug-2006	Study Records (Rx-1)	08-Aug-2006	20-Sep-2006	N.Daniels
08-Aug-2006	Study Records (I-1)	08-Aug-2006	20-Sep-2006	N.Daniels

This study was inspected in accordance with the U.S. EPA Good Laboratory Practice Standards (40 CFR Part 792), the standard operating procedures of WIL Research Laboratories, LLC and the sponsor's protocol and protocol amendments, with the following exception. 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 WIL Research Laboratories, LLC or at the location specified by the sponsor.

WIL-14063
Lyondell Chemical Company

Glycol Ether PM-250

8.2. APPROVAL

This study was inspected according to the criteria discussed in Section 8.1.

Report Audited By:

Nancy J. Daniels
Nancy J. Daniels
Compliance Specialist

20 Sept 2006
Date

Report Released By:

Heather L. Osborn
Heather L. Osborn, BS, RQAP-GLP
Manager, Quality Assurance

20 Sept 2006
Date

TABLES 1 - 8

TABLE 1
 ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
 SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PROJECT NO.: WIL-14063
 SPONSOR: LYONDELL CHEMICAL

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

TABLE RANGE: 05-22-06 TO 06-07-06
 GROUP: 1

DISPOSITION	5/	5
-PRIMARY NECROPSY (DAY 14)		
ACUTES	57/	5
-APPEARED NORMAL	3/	3
-HYPOACTIVITY	15/	5
-TWITCHING	16/	5
-PROSTRATE	18/	5
-PARTIAL CLOSURE RIGHT EYE	18/	5
-PARTIAL CLOSURE LEFT EYE	5/	2
-RESPIRATION LABORED	4/	3
-TREMORS, INTERMITTENT	1/	1
-EXTREMITIES COOL TO TOUCH	2/	2
-DEFECATION DECREASED	3/	2
-IMPAIRED EQUILIBRIUM	2/	2
-RESPIRATION RATE INCREASED	2/	1
-WET CLEAR MATERIAL AROUND MOUTH	2/	2
-CONVULSIONS, INTERMITTENT	1/	1
-TREMORS, CONTINUOUS	5/	4
-CLEAR DISCHARGE LEFT EYE	4/	4
-CLEAR DISCHARGE RIGHT EYE	4/	4
-SOFT FECES		

1- 2000 MG/KG

TABLE 1
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

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

TABLE RANGE: 05-22-06 TO 06-07-06
GROUP: 1

ACUTES	1/	1
-DRIED RED MATERIAL FORELIMB (S)	2/	2
-WET YELLOW MATERIAL UROGENITAL AREA	2/	2
-DRIED YELLOW MATERIAL UROGENITAL AREA	1/	1
-DRIED RED MATERIAL AROUND LEFT EYE	7/	2
-HAIR LOSS FORELIMB (S)	1/	1
-DRIED RED MATERIAL AROUND NOSE		

1- 2000 MG/KG

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07/31/2006

TABLE 2
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
SUMMARY OF BODY WEIGHTS [G]

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

GROUP:		2000 MG/KG	
DAY		MEAN	S.D.
0		211.	11.0
			N 5
7		252.	9.4
			N 5
14		271.	11.5
			N 5

FEMALES

PBFSTV5.26
07/31/2006

TABLE 3
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
SUMMARY OF BODY WEIGHT CHANGES [G]

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

GROUP:		2000 MG/KG	
DAY	0 TO 7		
	MEAN	41.	
	S.D.	5.8	
	N	5	
	7 TO 14		
	MEAN	20.	
	S.D.	3.4	
	N	5	

BBFSTV5.26
07/31/2006
R:08/03/2006

TABLE 4
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
SUMMARY OF MACROSCOPIC FINDINGS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

SCHEDULED NECROPSY

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

1- 2000 MG/KG

PGRSI2V4.07
07/31/2006
R:08/16/2006

TABLE 5
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
INDIVIDUAL CLINICAL OBSERVATIONS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

OBSERVATION	NO.	SEX	GRP	HOUR POST-DOSE				DAY POST-DOSE										
				q	1	2	4	1	2	3	4							
APPEARED NORMAL	27905	F	1	-	-	-	-	-	P	P	P	P	P	P	P	P	P	P
	27892	F	1	-	-	-	-	-	-	P	P	P	P	P	P	P	P	P
	27894	F	1	-	-	-	-	-	-	P	P	P	P	P	P	P	P	P
	27896	F	1	-	-	-	-	-	-	P	P	P	P	P	P	P	P	P
HYPOACTIVITY	27897	F	1	-	-	-	-	-	-	P	P	P	P	P	P	P	P	P
	27905	F	1	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	27892	F	1	P	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	27896	F	1	-	P	-	-	-	-	-	-	-	-	-	-	-	-	-
Twitching	27905	F	1	-	P	P	P	-	-	-	-	-	-	-	-	-	-	-
	27892	F	1	P	-	P	P	-	-	-	-	-	-	-	-	-	-	-
	27894	F	1	P	-	P	P	-	-	-	-	-	-	-	-	-	-	-
	27896	F	1	-	P	P	P	-	-	-	-	-	-	-	-	-	-	-
Prostrate	27897	F	1	P	P	P	P	-	-	-	-	-	-	-	-	-	-	-
	27905	F	1	-	P	P	P	-	-	-	-	-	-	-	-	-	-	-
	27892	F	1	P	P	P	P	-	-	-	-	-	-	-	-	-	-	-
	27894	F	1	-	P	P	P	-	-	-	-	-	-	-	-	-	-	-
Partial Closure Right Eye	27896	F	1	-	P	P	P	-	-	-	-	-	-	-	-	-	-	-
	27897	F	1	P	P	P	P	-	-	-	-	-	-	-	-	-	-	-
	27905	F	1	-	P	P	P	-	-	-	-	-	-	-	-	-	-	-
	27892	F	1	P	P	P	P	-	-	-	-	-	-	-	-	-	-	-

1- 2000 MG/KG
GRP = GROUP
GRADE CODE: P = PRESENT S = SLIGHT M = MODERATE V = SEVERE - = NOT SEEN AT THAT INTERVAL
SEX CODE: M = MALE F = FEMALE
HOUR POST-DOSE CODE: p = prior to dosing q = 1/4 h = 1/2

TABLE 5
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
INDIVIDUAL CLINICAL OBSERVATIONS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

OBSERVATION	NO.	SEX	GRP	HOUR POST-DOSE				DAY POST-DOSE							
				q	1	2	4	1	2	3	4				
PARTIAL CLOSURE RIGHT EYE	27897	F	1	P	P	P	P	-	-	-	-	-	-	-	-
PARTIAL CLOSURE LEFT EYE	27905	F	1	-	P	P	P	-	-	-	-	-	-	-	-
	27892	F	1	P	P	P	P	-	-	-	-	-	-	-	-
	27894	F	1	P	P	P	P	-	-	-	-	-	-	-	-
	27896	F	1	-	P	P	P	-	-	-	-	-	-	-	-
	27897	F	1	P	P	P	P	-	-	-	-	-	-	-	-
RESPIRATION LABORED	27905	F	1	P	P	P	P	-	-	-	-	-	-	-	-
	27894	F	1	-	-	-	P	-	-	-	-	-	-	-	-
TREMORS, INTERMITTENT	27905	F	1	-	-	P	P	-	-	-	-	-	-	-	-
	27892	F	1	-	P	-	-	-	-	-	-	-	-	-	-
	27897	F	1	-	-	-	P	-	-	-	-	-	-	-	-
EXTREMITIES COOL TO TOUCH	27905	F	1	-	-	-	P	-	-	-	-	-	-	-	-
DEFECATION DECREASED	27905	F	1	-	-	-	-	P	-	-	-	-	-	-	-
	27896	F	1	-	-	-	-	P	-	-	-	-	-	-	-
IMPAIRED EQUILIBRIUM	27894	F	1	P	-	-	-	-	-	-	-	-	-	-	-
	27896	F	1	P	P	-	-	-	-	-	-	-	-	-	-
RESPIRATION RATE INCREASED	27896	F	1	P	-	-	-	-	-	-	-	-	-	-	-
	27897	F	1	-	P	-	-	-	-	-	-	-	-	-	-
WET CLEAR MATERIAL AROUND MOUTH	27894	F	1	-	P	-	P	-	-	-	-	-	-	-	-
CONVULSIONS, INTERMITTENT	27892	F	1	-	-	P	-	-	-	-	-	-	-	-	-
	27894	F	1	-	P	-	-	-	-	-	-	-	-	-	-
TREMORS, CONTINUOUS	27894	F	1	-	-	-	P	-	-	-	-	-	-	-	-

1- 2000 MG/KG
GRP = GROUP
GRADE CODE: P = PRESENT S = SLIGHT M = MODERATE V = SEVERE - = NOT SEEN AT THAT INTERVAL
SEX CODE: M = MALE F = FEMALE
HOUR POST-DOSE CODE: p = prior to dosing q = 1/4 h = 1/2

TABLE 5
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
INDIVIDUAL CLINICAL OBSERVATIONS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

OBSERVATION	NO.	SEX	GRP	HOUR POST-DOSE				DAY POST-DOSE					
				q	1	2	4	1	2	3	4		
CLEAR DISCHARGE LEFT EYE	27892	F	1	-	-	-	-	-	-	-	-	-	-
	27894	F	1	-	-	-	-	-	-	-	-	-	-
	27896	F	1	-	-	-	-	-	-	-	-	-	-
	27897	F	1	-	-	-	-	-	-	-	-	-	-
CLEAR DISCHARGE RIGHT EYE	27892	F	1	-	-	-	-	-	-	-	-	-	-
	27894	F	1	-	-	-	-	-	-	-	-	-	-
	27896	F	1	-	-	-	-	-	-	-	-	-	-
	27897	F	1	-	-	-	-	-	-	-	-	-	-
SOFT FECES	27892	F	1	-	-	-	-	-	-	-	-	-	-
	27894	F	1	-	-	-	-	-	-	-	-	-	-
	27896	F	1	-	-	-	-	-	-	-	-	-	-
	27897	F	1	-	-	-	-	-	-	-	-	-	-
DRIED RED MATERIAL FORELIMB(S)	27892	F	1	-	-	-	-	-	-	-	-	-	-
	27894	F	1	-	-	-	-	-	-	-	-	-	-
WET YELLOW MATERIAL UROGENITAL AREA	27894	F	1	-	-	-	-	-	-	-	-	-	-
	27896	F	1	-	-	-	-	-	-	-	-	-	-
DRIED YELLOW MATERIAL UROGENITAL AREA	27896	F	1	-	-	-	-	-	-	-	-	-	-
	27897	F	1	-	-	-	-	-	-	-	-	-	-
DRIED RED MATERIAL AROUND LEFT EYE	27897	F	1	-	-	-	-	-	-	-	-	-	-
	27892	F	1	-	-	-	-	-	-	-	-	-	-
HAIR LOSS FORELIMB(S)	27897	F	1	-	-	-	-	-	-	-	-	-	-
	27897	F	1	-	-	-	-	-	-	-	-	-	-
DRIED RED MATERIAL AROUND NOSE	27905	F	1	-	-	-	-	-	-	-	-	-	-
	27905	F	1	-	-	-	-	-	-	-	-	-	-

1- 2000 MG/KG

GRP = GROUP

GRADE CODE: P = PRESENT S = SLIGHT M = MODERATE V = SEVERE - = NOT SEEN AT THAT INTERVAL

SEX CODE: M = MALE F = FEMALE

HOUR POST-DOSE CODE: p = prior to dosing q = 1/4 h = 1/2

TABLE 6
 ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
 INDIVIDUAL BODY WEIGHTS [G]

PROJECT NO.: WIL-14063
 SPONSOR: LYONDELL CHEMICAL

FEMALE GROUP: 2000 MG/KG

DAY	0	7	14
ANIMAL			
27905	209.	255.	272.
27892	210.	257.	281.
27894	205.	247.	263.
27896	200.	238.	257.
27897	229.	262.	284.
MEAN	211.	252.	271.
S.D.	11.0	9.4	11.5
N	5	5	5

PBFTSV4.44
 07/31/2006

TABLE 7
 ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
 INDIVIDUAL BODY WEIGHT CHANGES [G]

PROJECT NO.: WIL-14063
 SPONSOR: LYONDELL CHEMICAL

FEMALE GROUP: 2000 MG/KG

ANIMAL	DAY 0 TO 7	DAY 7 TO 14
27905	46.	17.
27892	47.	24.
27894	42.	16.
27896	38.	19.
27897	33.	22.
MEAN	41.	20.
S.D.	5.8	3.4
N	5	5

PBFTSV4.44
 07/31/2006

TABLE 8
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
INDIVIDUAL MACROSCOPIC FINDINGS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

ANIMAL NO. 27905 GROUP 1: 2000 MG/KG FEMALE SCHEDULED EUTH 06/05/06 DATE OF DEATH: 06/05/06 STUDY DAY: 14
GRADE

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	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

TABLE 8
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
INDIVIDUAL MACROSCOPIC FINDINGS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

ANIMAL NO. 27892 GROUP 1: 2000 MG/KG FEMALE SCHEDULED EUTH 06/07/06 DATE OF DEATH: 06/07/06 STUDY DAY: 14
GRADE

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	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

TABLE 8
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
INDIVIDUAL MACROSCOPIC FINDINGS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

ANIMAL NO. 27894 GROUP 1: 2000 MG/KG FEMALE SCHEDULED EUTH 06/07/06 DATE OF DEATH: 06/07/06 STUDY DAY: 14 GRADE

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	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

TABLE 8
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
INDIVIDUAL MACROSCOPIC FINDINGS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

ANIMAL NO. 27896 GROUP 1: 2000 MG/KG FEMALE SCHEDULED EUTH 06/07/06 DATE OF DEATH: 06/07/06 STUDY DAY: 14
GRADE

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	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

TABLE 8
ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
INDIVIDUAL MACROSCOPIC FINDINGS

PROJECT NO.: WIL-14063
SPONSOR: LYONDELL CHEMICAL

ANIMAL NO. 27897 GROUP 1: 2000 MG/KG FEMALE SCHEDULED EUTH 06/07/06 DATE OF DEATH: 06/07/06 STUDY DAY: 14 GRADE

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	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT
PGRHV4.54
07/31/2006

WIL-14063
Lyondell Chemical Company

Glycol Ether PM-250

APPENDIX A

Certificate Of Analysis (Sponsor-Provided Data)

Lyondell Chemical Company
 1221 McKinney Street, Suite 1600
 P.O. Box 3646
 Houston, TX 77253-3646
 1-888-777-0232



Glycol Ether PM-250

Lot Number QST19705
 B/L Number _____

<u>Property</u>	<u>Specification</u>	<u>Analysis</u>
Appearance	Clear liquid	<u>Pass</u>
Color, APHA	250 max.	<u>95</u>
Apparent PH	6 - 7	<u>6.1</u>
DPM, wt%	10 - 12	<u>11.8</u>
TPM, wt%	Report	<u>44.5</u>
PM Heavies, wt%	Report	<u>43.7</u>
Hydroxyl Number, mg KOH/g	Report	<u>246</u>
Viscosity @ 25 C, cSt	Report	<u>7.4</u>
Water, wt%	Report	<u>0.0177</u>

Reported by: Farhad Fadakar

Date July 27, 2005

Lyondell Chemical Company disclaims any liability in connection with the use of this information and does not warrant against infringement by reason of the use of any of its products in combination with other materials and in any process. The applicable MSDS should be reviewed by the customer before handling.

WIL-14063
Lyondell Chemical Company

Glycol Ether PM-250

APPENDIX B

EPA-Provided Software Output AOT425StatPGM, Version 1.0 (Westat)

AOT425statpgm (Version: 1.0) Test Results and Recommendations
Acute Oral Toxicity (OECD Test Guideline 425) Statistical Program

Date/Time: Tuesday, August 01, 2006, 3:26:02 PM

Data file name: 14063.dat

Last modified: 8/1/2006 3:26:00 PM

Test/Substance: WIL-14063

Test type: Limit Test

Limit dose (mg/kg): 2000

Assumed LD50 (mg/kg): Default

Assumed sigma (mg/kg): 0.5

DATA:

Test Seq.	Animal ID	Dose (mg/kg)	Short-term Result	Long-term Result
-----------	-----------	--------------	-------------------	------------------

1	27905	2000	O	O
2	27892	2000	O	O
3	27894	2000	O	O
4	27896	2000	O	O
5	27897	2000	O	O

(X = Died, O = Survived)

Dose Recommendation: The limit test is complete.

SUMMARY OF LONG-TERM RESULTS:

Dose	O	X	Total
2000	5	0	5
All Doses	5	0	5

Statistical Estimates:

The LD50 is greater than 2000 mg/kg.

WIL-14063
Lyondell Chemical Company

Glycol Ether PM-250

APPENDIX C

Animal Room Environmental Conditions

ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
 TEMPERATURE/HUMIDITY - DAILY SUMMARY REPORT BY STUDY

PROJECT NO.: WIL- 14063
 SPONSOR: LYONDELL CHEMICAL

STUDY SPECIFICATIONS: 14063

ROOM SPECIFICATIONS: B ROOM 77
 SPECIES: RAT

DATE IN: 05/15/06
 DATE OUT: 06/07/06
 TIME IN: 7:00
 TIME OUT: 16:00
 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

DATE	TEMPERATURE		HUMIDITY	
	MEAN (°F)	MEAN (°C)	MEAN	(%RH)
15-May-06	70.6	21.4	48.4	
16-May-06	70.6	21.4	47.9	
17-May-06	70.6	21.5	47.7	
18-May-06	70.4	21.3	44.7	
19-May-06	70.6	21.5	44.7	
20-May-06	70.9	21.6	42.1	
21-May-06	70.8	21.5	41.8	
22-May-06	70.8	21.5	41.9	
23-May-06	70.8	21.5	41.3	
24-May-06	70.6	21.4	42.6	
25-May-06	70.5	21.4	46.9	
26-May-06	70.4	21.4	50.0	
27-May-06	70.5	21.4	47.6	
28-May-06	70.6	21.4	48.7	
29-May-06	70.9	21.6	49.6	
30-May-06	70.7	21.5	50.5	
31-May-06	71.0	21.6	52.9	
01-Jun-06	70.6	21.5	52.4	
02-Jun-06	70.4	21.4	47.5	
03-Jun-06	70.4	21.3	47.8	
04-Jun-06	70.5	21.4	44.5	
05-Jun-06	70.5	21.4	44.5	
06-Jun-06	70.5	21.4	44.8	

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
 7/31/2006 13:25

ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
TEMPERATURE/HUMIDITY - DAILY SUMMARY REPORT BY STUDY

PROJECT NO.: WIL- 14063
SPONSOR: LYONDELL CHEMICAL

STUDY SPECIFICATIONS: 14063 DATE IN: 05/15/06 TIME IN: 7:00
DATE OUT: 06/07/06 TIME OUT: 16:00

ROOM SPECIFICATIONS: B ROOM 77 LOW TEMPERATURE °F: 66.0 HIGH TEMPERATURE °F: 76.0 LOW HUMIDITY: 30.0
SPECIES: RAT LOW TEMPERATURE °C: 18.9 HIGH TEMPERATURE °C: 24.4 HIGH HUMIDITY: 70.0

DATE	TEMPERATURE		HUMIDITY	
	MEAN (°F)	MEAN (°C)	MEAN	(%RH)
07-Jun-06	70.5	21.4	46.7	

GRAND STATS

	MEAN	MIN	MAX
TEMPERATURE °F	70.6	70.4	71.0
TEMPERATURE °C	21.4	21.3	21.6
HUMIDITY (%RH)	46.6	41.3	52.9
N DAYS	24		

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
 7/31/2006 13:25

ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
TEMPERATURE/HUMIDITY - END OF STUDY SUMMARY REPORT

PROJECT NO.: WIL- 14063
SPONSOR: LYONDELL CHEMICAL

ROOM SPECIFICATIONS: B ROOM 77
SPECIES: RAT
LOW TEMPERATURE: 66.0 DATE IN: 05/15/06
HIGH TEMPERATURE: 76.0 TIME IN: 7:00
LOW HUMIDITY: 30.0 DATE OUT: 06/07/06
HIGH HUMIDITY: 70.0 TIME OUT: 16:00

TEMPERATURE HUMIDITY

ROOM B ROOM 77 SUMMARY

MEAN 70.6 46.5
MIN 69.2 37.7
MAX 73.3 70.1
SD 0.53 4.55
N SAMPLES 562 562
FIRST DAY 05/15/06
LAST DAY 06/07/06
N DAYS 24

REPORT 5
VERSION 1.10
7/31/2006 13:28

NOTE: TEMPERATURE UNITS = DEGREES FAHRENHEIT
HUMIDITY UNITS = % RELATIVE HUMIDITY
NOTE: MEANS REPRESENT THE MEAN OF ALL VALUES

ACUTE ORAL TOXICITY STUDY OF GLYCOL ETHER PM-250 IN ALBINO RATS
TEMPERATURE/HUMIDITY - END OF STUDY SUMMARY REPORT

13:28 31-Jul-06

PROJECT NO.: WIL- 14063
SPONSOR: LYONDELL CHEMICAL

STUDY 14063 SUMMARY

MEAN	70.6	46.5
MIN	69.2	37.7
MAX	73.3	70.1
SD	0.53	4.55
N SAMPLES	562	562
FIRST DAY	05/15/06	
LAST DAY	06/07/06	
N DAYS	24	

NOTE: TEMPERATURE UNITS = DEGREES FAHRENHEIT
HUMIDITY UNITS = % RELATIVE HUMIDITY
NOTE: MEANS REPRESENT THE MEAN OF ALL VALUES

REPORT 5
VERSION 1.10
7/31/2006 13:28

APPENDIX D

Study Protocol



Study Number: WIL-14063

PROTOCOL AMENDMENT I

Sponsor: Lyondell Chemical Company

A. Title of Study:

Acute Oral Toxicity Study of Glycol Ether PM-250 in Albino Rats
(Up-and-Down Procedure)

B. Protocol Modification:

1) 4.2 Lot Number:

QST19705

C. Reason for Protocol Modification:

1) Lot number was listed incorrectly in the protocol.

Approved By:

Lyondell Chemical Company

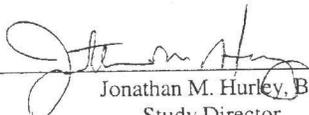


Willem D. Faber, PhD, DABT
Sponsor Representative

8/21/06
Date

Prepared By:

WIL Research Laboratories, LLC



Jonathan M. Hurley, BS
Study Director

8/18/06
Date

PROTOCOL

**ACUTE ORAL TOXICITY STUDY OF
GLYCOL ETHER PM-250 IN ALBINO RATS
(UP-AND-DOWN PROCEDURE)**

Submitted To:

Lyondell Chemical Company
One Houston Center, Suite 700
1221 McKinney Street
Houston, TX 77010

WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-9281

1 OBJECTIVE:

To determine the acute oral median lethal dose and evaluate potential systemic toxicity of the test article when administered as a single dose to albino rats.

This protocol has been designed and the study will be conducted in general compliance with the following guidelines:

Environmental Protection Agency (EPA) Office of Prevention, Pesticides and Toxic Substances (OPPTS) guideline 870.1100 (2002).

Organisation for Economic Cooperation and Development (OECD) Guidelines for Testing of Chemicals, Section 425 (2001).

The European Union (EU) Guideline in the Official Journal of the European Communities [92/69, Annex V, B1, as amended in Commission Directive 2004/73/EC (2004)].

The study will be conducted in compliance with the U.S. EPA Good Laboratory Practices (40 CFR Part 792); with the exception that analytical confirmation of the concentration, homogeneity and stability of the dosing mixture (if prepared) will not be performed.

2 PERSONNEL INVOLVED IN THE STUDY:

2.1 Sponsor Representative:

Willem D. Faber, PhD, DABT
Willem Faber Toxicology Consulting, LLC
Phone: (585) 742-1568
Fax: (585) 742-3215
Email: wfaber@msn.com

2.2 WIL Study Director:

Jonathan M. Hurley, BS
Project Specialist, Toxicology
Phone: (419) 289-8700
Fax: (419) 289-3650
E-mail: jhurley@wilresearch.com

2.3 WIL Deputy Director:

Teresa D. Morris BS
Operations Manager, Toxicology

2.4 WIL Departmental Responsibilities:

Christopher P. Chengelis, PhD, DABT
Director, Toxicology

Eric L. Padgett, PhD
Assistant Director, Toxicology
and Head of Juvenile Toxicology

Daniel W. Sved, PhD
Director, Metabolism and Analytical Chemistry

Theresa M. Rafeld
Group Manager, Formulations Laboratory

Ronald E. Wilson, BS
Director, Informational Systems

Sally A. Keets, AS
Senior Operations Manager, Vivarium

Carol A. Kopp, BS, LAT
Manager, Gross Pathology and Developmental
Toxicology Laboratory

Lisa T. Snyder, DVM
Clinical Veterinarian

Robert A. Wally, BS, RAC
Manager, Reporting and Regulatory Technical Services

Heather L. Osborn, BS, RQAP-GLP
Manager, Quality Assurance

3 STUDY SCHEDULE:

Proposed Experimental Start Date:	May 22, 2006
Proposed Experimental Termination Date:	June 7, 2006
Proposed Audited Draft Report Date:	July 19, 2006

4 TEST ARTICLE:

Unless otherwise noted, the identity, strength, purity, composition, stability and method of syntheses (fabrication and/or derivation) of the test article will be documented by the Sponsor. A Certificate of Analysis for the test article will be provided to WIL Research Laboratories for inclusion in the final report.

4.1 Identification:

Glycol Ether PM-250

4.2 Lot Number:

1130738

4.3 Purity:

Responsibility of the Sponsor

4.4 Stability:

Responsibility of the Sponsor

4.5 Physical Description:

Clear colorless liquid

4.6 Storage Conditions:

Room temperature

4.7 Personnel Safety:

At minimum, nitrile gloves, eye protection and long sleeves (lab coat) are to be worn during dose administration. Refer to Material Safety Data Sheet for complete available information.

4.8 Retention Samples:

A retention sample of the test article (as received) will be collected in accordance with WIL Research Laboratories, LLC SOP No. T2-001. Dosing preparation samples will not be collected.

4.9 Unused Test Article:

The unused portion of the test article will be discarded following the issuance of the final study report.

5 TEST SYSTEM:**5.1 Species:**

Albino rat

5.2 Strain:

CrI:CD(SD)

5.3 Source:

Charles River Laboratories, Inc.
(Documentation of the specific breeding facility will be maintained in the study records and included in the final report.)

5.4 Number on Study:

Minimum required to determine limit dose or median lethal dose; three to five animals for a limit test or one animal per dose administration for the main test. Three to fifteen animals obtained from the acute stock colony will be utilized.

5.5 Sex:

Female (nulliparous and nonpregnant)

5.6 Body Weight Range:

Approximately 170 to 300 grams at initiation of dosing, \pm 20% of the mean of previously tested animals.

5.7 Approximate Age:

Eight to 12 weeks old at initiation of dosing.

5.8 Identification System:

Each animal will be uniquely identified by a metal eartag displaying the animal number. Individual cage cards will be affixed to each cage and will display the animal number, group and study number.

5.9 Justification for Selection:

This species and strain is generally recognized as appropriate for acute oral toxicity studies. The number of animals selected is the minimum required to satisfy regulatory guidelines. No information exists to indicate a difference in sensitivity between the sexes. Therefore, only females will be used to reduce variability and as a means of minimizing the number of animals used. The experimental design uses the procedures and standards required by the current federal and international test guidelines.

6 SPECIFIC MAINTENANCE SCHEDULE:

6.1 Animal Housing:

The animals will be individually housed in suspended wire-mesh cages in an environmentally controlled room. Animals will be housed in clean cages elevated above cage-board or other suitable material that will be changed at least three times each week. Animals will be changed out into clean cages approximately every two weeks. The facilities at WIL Research Laboratories, LLC are fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC International).

6.2 Environmental Conditions:

Controls will be set to maintain an average daily temperature of $71 \pm 5^{\circ}\text{F}$ ($22 \pm 3^{\circ}\text{C}$) and an average daily relative humidity of $50\% \pm 20\%$. 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:

Municipal water will be available *ad libitum*. Filters servicing the automatic watering system will be changed regularly according to standard operating procedures (SOPs). Municipal water supplying the laboratory is analyzed for contaminants according to SOPs to ascertain that none are present at concentrations that would be expected to affect the outcome of the study and the results are maintained on file.

6.4 Basal Diet:

PMI Nutrition International, LLC Certified Rodent LabDiet® 5002 will be offered *ad libitum* during the study except during the 18- to 20-hour period immediately prior to dosing and four-hour period after dosing when food will be withheld. Standard Operating Procedures provide specifications for acceptable levels of heavy metals and pesticides that are reasonably expected to be present in the diet without interfering with the purpose or conduct of the study. Analyses are performed and provided by the manufacturer and the results are maintained on file.

7 EXPERIMENTAL DESIGN:

7.1 Animal Receipt and Acclimation:

Each animal will be inspected by a qualified technician upon receipt. Rats judged to be in good health and suitable as test animals will be acclimated to laboratory conditions for a minimum of seven days. All rats will be initially weighed and permanently identified with an eartag. During the acclimation period, each rat will be observed twice daily for changes in general appearance and behavior.

All relevant records and data collected during the acclimation period for animals used on this study will be maintained on file.

7.2 Veterinary Care:

Animals will be monitored by the technical staff for any condition requiring possible veterinary care. If any such condition is identified, a staff veterinarian will be notified for an examination and evaluation. Animals will be treated as outlined in the Animal Welfare Act Compliance section of the protocol.

7.3 Route and Rationale of Test Article Administration:

The route of administration will be oral (by gavage) in order to evaluate the acute toxicity of the test article. This study is intended to provide information on the health hazards likely to arise from a short-term exposure to the test article by the oral route.

7.4 Treatment Levels:

The LD₅₀ is expected to be greater than the selected limit test level (2.0 g/); therefore, a limit test with up to five females will be conducted.

The limit test will be initiated with a single animal. If compound-related mortality is observed within 48 hours, the main test will be conducted. If no mortality is observed within 48 hours, four additional animals will be dosed sequentially at 2.0 g/kg. If three or more animals survive, no further testing is required. If mortality is observed for three or more animals, the main test will be conducted. If three or more animals survive, no further testing is required.

For LD₅₀ determination where a limit test dose is not sufficient, a single animal will be dosed at a level below the expected LD₅₀ of the test article. This single animal will be observed for a minimum of 48 hours following dose administration. The next dose level will be increased if the animal survives and appears healthy subsequent to the dose administration. The dose level will be decreased if the animal dies or is moribund subsequent to dose administration and is not expected to recover within the 14-day observation period. Additional dosage levels will be incremented by a factor selected by the Study Director and/or Sponsor and will be increased or decreased until:

- a) 3 consecutive animals survive at the upper bound
- b) 5 reversals occur in any 6 animals tested
- c) At least 4 animals have followed the first reversal and the specified likelihood-ratios exceed the critical value.

7.5 Treatment Groups:

Following the acclimation period, animals will be randomly selected from available stock based upon health and fasted body weight. Test animals will be fasted approximately 18-20 hours prior to dosing.

7.6 Test Article Preparation:

The test article will be dosed undiluted based on density or may be diluted, if necessary, to administer dosages of 50 mg/kg or less. If diluted, an appropriate vehicle will be used, and will be documented in the study file. No vehicle will be used without the Sponsor's approval.

The dosing mixtures, if required, will be prepared using gravimetric or volumetric methods. The methods that will be used are expected to result in the intended test article concentration in the dosing mixtures. Dosing mixtures will be mixed during preparation and throughout dose administration to ensure homogeneity. Any visible evidence of instability (e.g., evolution of heat, formation of gas, color

change, etc.) will be noted in the study records. The dosing mixtures will be prepared on the day of dosing. Actual preparation procedures will be documented in the study records and presented in the final report. Analysis of dosing preparations will not be performed.

7.7 Method of Administration:

Individual dosages will be calculated based upon each animal's fasted body weight taken just before administration of the test article. Doses will be administered using a ball-tipped oral dosing needle affixed to an appropriate size syringe. Feed will be returned to the animals approximately four hours after dosing.

If it is necessary based on the physical/chemical properties of a test article to use a dose volume greater than 20 ml/kg with an aqueous vehicle or greater than 10 ml/kg with a non-aqueous vehicle, the dose will be split into two equal portions and given approximately four-hours apart. One additional viability and clinical observation (see below) will be conducted at one hour after the second dose. In addition, feed will be returned one hour after the second dose instead of at four hours after the initial dose.

8 OBSERVATIONS:

8.1 Viability and Clinical Observation:

Test animals will be observed for clinical signs of toxicity, mortality and moribundity at approximately 15 minutes and one, two and four hours after dose administration. Thereafter, the animals will be observed daily for clinical signs and twice daily (morning and afternoon) for mortality and moribundity for a period of 14 days. Moribund animals will be euthanized by carbon dioxide inhalation.

Observations will include, but are not limited to, evaluation for changes in appearance of skin and fur, eyes, mucous membranes, respiratory and circulatory system, autonomic effects and central nervous systems effects. The time of death for any animals that die on study will be noted as precisely as possible.

If signs of systemic toxicity are present at the end of 14 days, the observation period may be extended. The type of toxic signs, rate of onset and length of recovery will be considered when making this determination.

8.2 Body Weights:

The body weight of each animal will be determined on study days 0, 7, and 14 (termination). In addition, animals that die on study or need to be euthanized *in extremis* will be weighed as soon as they are found in that condition. If the study is extended, body weights will continue to be collected weekly.

8.3 Necropsy

Animals will be euthanized by carbon dioxide inhalation. A gross necropsy examination on major organ systems of the cranial, thoracic and abdominal cavities will be conducted on all animals found dead, euthanized *in extremis* or euthanized at termination.

Tissues will not normally be collected. If requested by the sponsor prior to initiation of the study, all gross lesions will be collected in 10% neutral buffered formalin for subsequent evaluation. A staff pathologist will review the tissue(s) collected and make recommendations for microscopic examination of any gross lesions which appear to be due to test material toxicity.

9 DETERMINATION OF LD50:

At the termination of the project, all data will be collected and the acute oral median lethal dose (LD₅₀) will be determined using the EPA-provided statistical program AOT425StatPGM (Westat).

10 REPORT:

The final report will include, but will not necessarily be limited to, the following: compliance statement, summary, objective, test article identification and receipt information, methods, individual and summary tables for clinical observations, mortality, body weights, body weight changes, gross necropsy findings, and microscopic pathology findings (if applicable), an estimated or calculated LD₅₀, results and discussion, key personnel, a signed QAU statement and protocol deviation(s), if any.

WIL Research Laboratories will provide one (1) copy of an Audited Draft Report, submitted approximately six weeks following completion of the experimental phase, 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. Four copies (the unbound original, two bound copies and one electronic copy) of the final report will be provided. Requests for additional paper copies of the final report may result in additional charges.

11 RECORDS TO BE MAINTAINED:

All original raw data records (as defined by the applicable GLPs and WIL SOPs) generated by WIL Research Laboratories, LLC will be collected and maintained by WIL Research Laboratories, LLC.

12 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.

Any work product, including documents, specimens, and samples, that are required by this protocol, its amendments, or other written instructions of the Sponsor, to be shipped by WIL Research Laboratories, LLC to another location will be appropriately packaged and labeled as defined by WIL's SOPs and delivered to a common carrier for shipment. WIL Research Laboratories, LLC will not be responsible for shipment following delivery to the common carrier.

13 QUALITY ASSURANCE:

The study will be audited by the WIL Quality Assurance Unit while in progress to assure compliance with EPA Good Laboratory Practices and adherence to the protocol and to WIL SOPs. The raw data and draft report will be audited by the WIL Quality Assurance Unit to assure that the final report accurately describes the conduct and the findings of the study.

14 PROTOCOL MODIFICATION:

Modification of the protocol may be accomplished during the course of this investigation. However, no changes will be made in the study design without the verbal or written permission of the Sponsor. In the event that the Sponsor verbally requests or approves a change in the protocol, such changes will be made by appropriate documentation in the form of a protocol amendment. All alterations of the protocol and reasons for the modification(s) will be signed and dated by the Study Director and the Sponsor Representative.

15 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, there are no generally accepted non-animal alternatives and 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.

16 PROTOCOL APPROVAL:

Sponsor approval received by the Study Director via email on May 17, 2006.

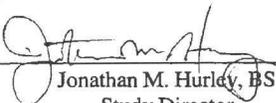
Lyondell Chemical Company



Willem D. Faber, Ph.D., DABT
Sponsor Representative

5/19/06
Date

WIL Research Laboratories, LLC



Jonathan M. Hurley, BS
Study Director

5/18/06
Date

