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Submitting Organization			
ARIZONA CHEMICAL CO			
Contractor			
Document Title			
INITIAL SUBMISSION: LETTER FROM ATTYS OF ARIZONA CHEM CO TO USEPA REGARDING 17 HEALTH AND ECOTOXICITY STUDIES OF VARIOUS CHEMICALS, WITH ATTACHMENTS AND DATED 110299 (SANITIZED)			
Chemical Category			
TALL OIL FATTY ACIDS, TALL-OIL PITCH, *, (CONFIDENTIAL)			

**INITIAL
SUB-
MISSION**

A 03

8EHQ-1199-14580S

ARNOLD & PORTER

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November 2, 1999

Hand Delivery

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Attention: TSCA Section 8(e) Coordinator
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

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Company Sanitized

Re: TSCA § 8(e) Submittal

Dear Sir/Madam:

Enclosed are 17 studies submitted pursuant to Section 8(e) of the Toxic Substances Control Act (TSCA). These studies are being submitted pursuant to the TSCA Compliance Audit Agreement between EPA and the Arizona Chemical Company (Arizona). Arizona Chemical Company has its headquarters at 5220 Belfort Road, Suite 200, Jacksonville, Florida 32256-6012.

Following is a summary of the relevant results of each study, including the chemical identity of the substance tested, the adverse effects being reported, and a discussion of exposure and other considerations.

1. Acute Oral Toxicity of Aqueous Rosin Ester Dispersion

An acute oral toxicity study in rats was conducted on a commercial Arizona product that can be described generically as an aqueous rosin ester dispersion.¹ The specific composition of this substance is

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¹ Because the trade name and specific identity of the test material are TSCA Confidential Business Information, both confidential and non-confidential versions of this letter and the study are being submitted.

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November 2, 1999

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The test was conducted by Pharmakon Laboratories (Study #PH402-AZ-003-89). One animal died in the study. The LD₅₀ was determined to be greater than 5,000 mg/kg body weight. However, the test laboratory reported observations of "abnormal gait, abnormal stance, piloerection and dyspnea" in some test animals. This study is being submitted pursuant to Section 8(e) based upon EPA guidance that an abnormal stance and abnormal gait observed in test animals potentially are behavioral effects that might be indicative of neurotoxicological effects of a test substance. Two LD₅₀ studies on the major component of this product also have been conducted. The results of these tests showed no animal deaths at the highest dose (5,000 mg/kg in one study and 2,000 mg/g in the other study). No neurobehavioral effects were noted in either study.

2. Sensitization Study of Tall-Oil Fatty Acids

A skin sensitization study in guinea pigs was conducted on a commercial Arizona product, tall oil fatty acids (CASRN 61790-12-3). The test was conducted by Huntingdon Laboratories (Study #HRC920168D/BGV 5/SS). Ten out of twenty animals in the study were reported to have shown signs of sensitization based upon erythema observed at the challenge site. No animal deaths occurred during the study. The test animals exhibited only moderate skin sensitization. However, the study is being submitted pursuant to Section 8(e) based upon EPA guidance that skin sensitization studies might be reportable if there is evidence of strong sensitization and there is either actual or significant potential for exposure to the test substance. Arizona has found no other studies indicating that tall oil fatty acid is a skin sensitizer, and Arizona is aware of two studies in which tall oil fatty acid was determined not to be a skin sensitizer in tests performed using human volunteers. In addition, Arizona has no record of indications of skin sensitization in workers who handle material at its facilities.

3. Fifteen Ecotoxicity Studies on Tall-Oil Fatty Acids, Tall Oil Pitch, Alpha Pinene, Delta-3-Carene, and Tall Oil

EPA has provided guidance to industry regarding the reportability of acute ecotoxicity studies under TSCA Section 8(e). Based upon this guidance, test materials with LC₅₀ or EC₅₀ values of less than 1 mg/L are considered by the Agency to be of "high" concern; test materials with LC₅₀ or EC₅₀ values between 1 and 100 mg/L are considered to be of "moderate" concern; and test materials with LC₅₀ or EC₅₀ values of greater than 100 mg/L are considered to be of "low" concern. EPA guidance further states that acute ecotoxicity studies indicating a high concern should be submitted under Section 8(e) if there also is evidence that the test material has bioaccumulated to a pronounced degree or that it is or could be (based on use patterns) widespread in

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environmental media. Agency guidance states that test results showing moderate concerns should be reported if usage patterns and/or monitoring data for the test material suggest that the material is present in environmental media at or near concentrations where the effects in question could reasonably be expected to be manifested. According to EPA, results of acute ecotoxicity studies indicating a low concern need not be submitted.

Arizona has in its possession ecotoxicity studies on tall oil fatty acids, tall oil pitch, alpha pinene, delta-3-carene, and tall oil. The results of the studies are summarized below. Arizona does not have any information to support a conclusion that these substances are widespread in environmental media or that they are present in environmental media at or near concentrations where the effects in question could reasonably be expected to be manifested. Further, Arizona has questions regarding the interpretation of these data because of the manner in which the test materials were introduced into the test medium. Nevertheless, Arizona is submitting these data pursuant to Section 8(e) out of an abundance of caution, because four of these substances are commercial products currently manufactured by Arizona and because one (delta-3-carene) is not manufactured by Arizona but is a terpene that is likely to be a component in turpentine-derived products that are manufactured by Arizona.

Of the five ecotoxicity studies that were conducted on the commercial Arizona product, tall oil fatty acids (CASRN 61790-12-3), only one study included results which EPA classifies within the range of high concerns, and the remainder indicated moderate concern. Three algal growth inhibition studies showed EC₅₀ values from 0.79 to 9 mg/L (test report #s STZ 12/5/98, 308061/472 and 308201/649). One immobilization test with *Daphnia Magna* showed a 48-hour EC₅₀ value of 55.7 mg/L (test report #308069/472). One acute toxicity test on zebrafish showed a 96-hour LC₅₀ value of 10-20 mg/L (test report #308065/472).

Two ecotoxicity studies that were conducted on the commercial Arizona product, tall oil pitch (CASRN 8016-81-7), indicated low concern. An algal growth inhibition study showed an EC₅₀ value of greater than 1000 mg/L (test report #308061/473). An immobilization test with *Daphnia Magna* showed a 48-hour EC₅₀ value of greater than 2000mg/L (test report #308069/473). Nominal concentrations of test substance were used to determine the EC₅₀ values in these studies. It is likely that the actual water solubility of the test substance is less than 10 mg/L; therefore, it also is likely that EC₅₀ values for the soluble portion of the test substance are less than 10 mg/L.

Three ecotoxicity studies were conducted on a commercial Arizona product, alpha pinene (CASRN 80-56-8; the substance also might be described by CASRN 68996-65-9

68956-56-9

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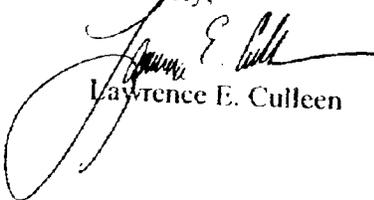
for "terpenes and terpenoids, turpentine oil, alpha pinene fraction"). These studies indicated moderate to low concern. An algal growth inhibition study showed an EC₅₀ value of 278 mg/L (test report #308061/487). An immobilization test with *Daphnia Magna* showed a 48-hour EC₅₀ value of 6.74 mg/L (test report #308069/487). An acute toxicity test on zebrafish showed a 96-hour LC₅₀ value of 10-20 mg/L (test report #308065/487). Nominal concentrations of the test substance were used to determine the EC₅₀ and LC₅₀ values in these studies. It is likely that the actual water solubility of the test substance is less than 10 mg/L; thus, it also is likely that EC₅₀ and LC₅₀ values for the soluble portion of the test substance are less than 10 mg/L.

Three ecotoxicity studies were conducted on delta-3-carene (CASRN 13466-78-9; the substance might also be described by CASRN 91770-80-8 for "terpenes and terpenoids, turpentine oil, 3-carene fraction"). These studies indicated moderate to low concern. This substance is not manufactured by Arizona in the U.S.; however, it is likely to be a naturally occurring component in turpentine-derived products that are manufactured by Arizona. An algal growth inhibition study showed an EC₅₀ value of 100-200 mg/L (test report #308061/488). An immobilization test with *Daphnia Magna* showed a 48-hour EC₅₀ value of 18.3 mg/L (test report #308069/488). A test on acute toxicity to zebrafish showed a 96-hour LC₅₀ value of 5-10 mg/L (test report #308065/488). Nominal concentrations of test substance were used to determine the EC₅₀ and LC₅₀ values in these studies. It is likely that the actual water solubility of the test substance is less than 10 mg/L; therefore, it also is likely that EC₅₀ and LC₅₀ values for the soluble portion of the test substance are less than 10 mg/L.

Two ecotoxicity studies that were conducted on the commercial Arizona product, tall oil (CASRN 8002-26-4), indicated moderate concern. An algal growth inhibition study showed an EC₅₀ value of 15 mg/L (test report #STZ 14/98). An immobilization test with *Daphnia Magna* showed a 48-hour EC₅₀ value of 30 mg/L (test report #STZ 14/98).

Please contact me (at 202/942-5477) with any comments or questions that you have concerning these matters. Thank you.

Sincerely,



Lawrence E. Cullen

Enclosures
cc: Tony Ellis, EPA
Diane Staab, Arizona

A 07

PHARMAKON RESEARCH INTERNATIONAL, INC.
WAVERLY, PENNSYLVANIA 18471

PHONE
(717) 586-2411

FAX
(717) 586-2450

Acute Exposure Oral Toxicity

PH 402-AZ-003-89

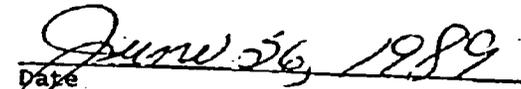
Lot #PC-8965

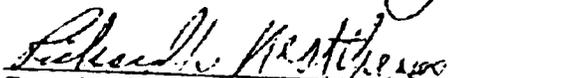
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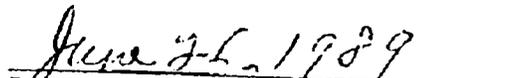
Submitted to

Arizona Chemical Company
Panama City, Florida


Victor T. Mallory, B.S., RLAT
Study Director


Date


Test Facility Management


Date

Acute Exposure Oral Toxicity

PH 402-AZ-003-89

To determine the single dose toxicity, Lot #PC-8965, was orally administered to a group of ten rats (five males and five females) in a Limit Test at a dose level of 5 g/kg. Signs observed during the study included decreased activity, diarrhea, abnormal stance, abnormal gait, poor grooming, piloerection and dyspnea. One of 10 animals died at the 5 g/kg dose level. Necropsy of this animal revealed reddish-brown oral discharge and bright orange intestines. Upon terminal necropsy, mottled lungs, mottled kidneys and/or soft, atrophied and discolored testes were observed in three males. No visible lesions were observed in the six animals.

Based upon the observations made in the Limit Test, the acute oral LD₅₀ for Lot #PC-8965, was determined to be greater than 5 g/kg.

Acute Exposure Oral Toxicity

PH 402-AZ-003-89

Sponsor:

Arizona Chemical Company
1001 East Business Highway 98
Panama City, Florida 32401

Testing Facility:

Pharmakon Research International, Inc.
Waverly, Pennsylvania 18471

Test Facility
S.O.P. No.:

PH-402

Study No.:

PH 402-AZ-003-89

Purpose of
the Study:

To determine the single-dose oral toxicity of a test
article administered to rats.

Ownership of
the Study:

The sponsor owns the study. All raw data, analysis,
and reports are the property of the sponsor.

Study Monitor:

R. B. Doughty, Ph.D.

Study Director:

Victor T. Mallory, B.S., RLAT, Pharmakon Research
International, Inc.

Technical
Performance:

Shirley Chappuis, A.S., LAT, Susan E. Armondi, LAT and
Thomas O'Neill, B.S.

Q.A.U.
Responsible
Personnel:

Douglas B. Hay, Ph.D.

Dates of
Performance:

May 24, 1989 through June 7, 1989

Good Laboratory
Practices
Statement:

This study was conducted in compliance with the Good
Laboratory Practice Regulations as stated in the
Federal Register, Vol. 48, No. 230, Tuesday, November
29, 1983. There were no significant deviations from

Acute Exposure Oral Toxicity
PH 402-AZ-003-89

the GLP Regulations which affected the quality or integrity of the study. Q.A.U. findings derived from the inspection(s) during the conduct of this study and from the audit of the final report are documented and have been provided to the study director and the test facility management.

Records Maintained:

All raw data, final reports, documentation and protocol will be maintained in the central files of Pharmakon Research International, Inc.

Recordings:

Standard Pharmakon Notebook

Notebook Reference:

Notebook #1280, pages 115-117

Raw Data:

Copies of notebook recordings attached.

Statistics:

Not applicable

TEST ARTICLE

Compound Description:

--- white viscous liquid

Lot No.:

PC-8965

Specific Gravity:

Not applicable

Amount Submitted:

234.10 grams (gross weight)

Date Submitted:

May 9, 1989

Special Handling Instructions:

Standard precautions

Analysis of Purity:

The purity, identity, strength and stability of the test article were the responsibility of the sponsor.

Stability:

There was no apparent change in the physical state of the test article during administration.

TEST SYSTEM

Species:

Rat

**Acute Exposure Oral Toxicity
PH 402-AZ-003-89**

Strain: Sprague Dawley

**Supplier
(Source):** Charles River Laboratories, Inc., Wilmington,
Massachusetts

Sex: Male and female

**Weight at
Initiation:** Young adult animals

No. on Study: Ten (10)

**Method and
Justification for
Randomization:** Selection based upon body weight

**Acclimation
Period:** Five (5) days

**System of
Identification:** Cages marked with an animal number and dose level.
Rats were identified by metal numbered ear tag.

HUSBANDRY

**Research Facility
Registration:** U.S.D.A. Registration No. 23-107 under the Animal
Welfare Act 74: SC 2131 et seq.

Animal Rooms: Separate isolation by test system.
Light cycle - 12 hours light, 12 hours dark.
Temperature/Humidity - Maintained at a temperature of
22°C ± 3°C and a humidity of 30 to 70%.

Housing: Rats housed individually in stainless steel 1/2" wire
mesh cages. Size in accordance with the "Guide for
the Care and Use of Laboratory Animals" of the
Institute of Laboratory Animal Resources, National
Research Council.

Sanitization: Waste material was removed twice weekly. Cages and
feeders were sanitized every two weeks.

Acute Exposure Oral Toxicity
PH 402-AZ-003-89

Food: Wayne Lab Blox^R, ad libitum, checked daily and added or replaced as needed. Feeders were designed to reduce soiling, bridging, and scattering.

Food Analysis: There were no contaminants that were reasonably expected to be present in the dietary material known to be capable of interfering with the purpose or conduct of the study.

Water: Availability - fresh tap water, ad libitum.

Water Analysis: Water is monitored for contaminants at periodic intervals according to Standard Operating Procedure PH-018.

METHODS

Rationale for Test System: According to the EPA Federal Register, Vol. 50, No. 188, Friday, September 27, 1985.

Compound Preparation: Test article was dosed as received

Dose Administration: 5 g/kg

Rationale for Dose Selection: At the sponsor's request

Volume Administration: 5 ml/kg

Vehicle: Not applicable

Route of Administration: Oral

Rationale for Route of Administration: Potential route of human exposure

Frequency and Duration of Administration: Once (1)

**Acute Exposure Oral Toxicity
PH 402-AZ-003-89****No. of Animals
Per Dose Group:**

Ten (10) (five males and five females)

**No. and Code of
Dose Group:**

<u>Rat No.</u>	<u>Dose Level</u>
6066-6075	5 g/kg

Length of Study:

Fourteen (14) days

**Method of Study
Performance:**

One group of ten rats (5 males and 5 females) was fasted for eighteen hours and orally administered the test article at 5 g/kg. The rats were observed at one, four and twenty-four hours and daily through Day 14 after dosing for pharmacotoxic signs, CNS effects and mortality. Body weights were recorded at study initiation, on Day 7, upon death and study termination (Table I).

Results:

Signs observed during the study included decreased activity, diarrhea, abnormal gait, abnormal stance, poor grooming, piloerection and dyspnea (Table II). One of ten rats died at the 5 g/kg dose level (Table III). Necropsy of this animal revealed reddish-brown oral discharge and bright orange intestines. Upon terminal necropsy, mottled lungs, mottled kidneys, and/or soft, atrophied and discolored testes were observed in three males. No visible lesions were observed in the six remaining animals (Table IV).

Conclusions:

Based upon the observations made in the Limit Test, the acute oral LD₅₀ for Lot #PC-8965 was estimated to be greater than 5 g/kg.

Table I
Summary of Body Weights (grams)

Acute Exposure Oral Toxicity

PH 402-AZ-003-89

Lot #PC-8965

Males @ 5.0 g/kg				Females @ 5.0 g/kg			
<u>Animal</u> <u>No.</u>	<u>Initial</u>	<u>Day 7</u>	<u>Final</u>	<u>Animal</u> <u>No.</u>	<u>Initial</u>	<u>Day 7</u>	<u>Final</u>
6066	223	292	321	6071	205	244	257
6067	221	282	313	6072	185	209	218
6068	232	300	339	6073	183	-	-
6069	210	260	255	6074	188	213	229
6070	230	295	326	6075	193	228	232
\bar{x}	223.2	285.8	310.8		190.8	223.5	234.0
S.D.	8.70	15.85	32.59		8.79	15.93	16.47

Table II
 Clinical Observations
 Acute Exposure Oral Toxicity
 PH 402-AZ-003-89
 Lot #PC-8965

Clinical Signs	Sex	Hours				Days													
		1	4	24		2	3	4	5	6	7	8	9	10	11	12	13	14	
No signs	M	5	3	5		5	5	5	5	5	5	5	5	5	5	5	5	4	4
	F	5	3	4		4	4	4	4	4	4	4	4	4	4	4	4	4	4
Decreased activity	M	0	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	F	0	2	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Abnormal gait	M	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	F	0	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Abnormal stance	M	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	F	0	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diarrhea	M	0	1	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	F	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
Poor grooming	M	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	F	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1	1
Piloerection	M	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	F	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	1	1
Dyspnea	M	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
	F	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	1

Table IV
Necropsy Observations
(Incidence Values)

PH 402-AZ-003-89

Lot #8958

(5.0 g/kg)

<u>Observation</u>	<u>Interim Deaths</u> <u>Incidence</u>		<u>Terminal Necropsy</u> <u>Incidence</u>	
	<u>M</u>	<u>F</u>	<u>M</u>	<u>F</u>
No visible lesions	-	-	2	4
Oral discharge: reddish-brown	0	1	0	0
Intestines: bright orange	0	1	0	0
Kidneys: mottled	0	0	3	0
Lungs: mottled	0	0	1	0
Testes: soft, atrophied; Left - mottled white Right - discolored white	0	0	1	0

B 04

PHARMAKON RESEARCH INTERNATIONAL, INC.
WAVERLY, PENNSYLVANIA 18471

QUALITY ASSURANCE UNIT STATEMENT

PHONE
(717) 586-2411
FAX
(717) 586-3450

Study No.: PH 402-AZ-003-89

Study Director: Victor T. Mallory

This study was conducted in compliance with the Good Laboratory Practice Regulations. The Quality Assurance Unit conducted the inspections listed below and reported the results to the study director and to management on the dates indicated.

The following inspections were performed:

<u>Interval</u>	<u>Date</u>
<u>In Life Phase</u>	<u>May 24, 1989</u>
<u>Reporting Phase</u>	<u>June 16, 1989</u>
<u>Date QAU Report Issued</u>	

To Study Director To Management

June 16, 1989

June 16, 1989

16 June 1989
Date

[Signature]
Quality Assurance

PHARMAKON RESEARCH INTERNATIONAL, INC.
WAVERLY, PENNSYLVANIA 18471

PHONE
(717) 586-2411
FAX
(717) 586-3450

COMPLIANCE STATEMENT

This study was conducted in compliance with the Principles of Good Laboratory Practices (GLP) as promulgated by the following regulatory agencies:

U.S. Food and Drug Administration, as stated in the Federal Register, Part II of December 22, 1978, Title 21, part 58 and all subsequent revisions.

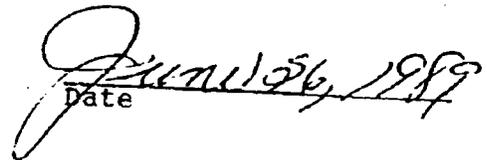
U.S. Environmental Protection Agency as stated in the Federal Register, Vol. 48, No. 230, Tuesday, November 29, 1983.

Organization for Economic Co-operation and Development Guidelines for Testing Chemicals (OECD), ISBN 92-64-12221-4, adopted by the council at its 535th meeting on 12th May, 1981.

Study No.: PH 402-AZ-003-89

"To the best of my knowledge, this study was conducted in accordance with applicable Good Laboratory Practice regulations; there were no deviations from these regulations that impacted on study conclusions."


Study Director


Date

B 06

RAW DATA
APPENDIX

ACUTE TOXICOLOGY STUDY ASSIGNMENT FORM

Title: Acute Exposure Oral Toxicity Study No.: P11402-A2-003-89

Sponsor: Arizona Chemical Company

Purpose: To determine the LD₅₀ using a single exposure and a 14-day post exposure observation period

Method: Refer to protocol 402

Date of Initiation: 5/24/89 Date of Termination: 6/7/89

Test Article and Description: Lot# PC-8965 white viscous

Liquid Deterred-5/9/89 Amt. - 234.10g (Gross Weight)

Vehicle: Not Applicable (N/A)

Dose Levels: 5000mg/kg

Route of Administration: oral, by gavage

Animal P.O. #: 051089STOX

Species: Rat

Weight Range: young adult animals

No. of Animals on Study: Ten (10)

Scale #: Animals # 21

Animals shave/fluorescein: N/A

Ph of Test Article: N/A

Compound Preparation: See below

Dose Level: 5000mg/kg Test Weight: N/A Final Volume: N/A

Dose Level	Test Weight	Final Volume
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/
/	/	/

Comments: Approximately 18ml removed from stock 5/24/89

Investigator: Shirley Chavira Date: 6/7/89

Study Director: Eric J. Miller Date: 6/7/89

Acute Toxicology

LD₅₀

Sponsor: Arizona Chemical Company

Species: Rat

Test Article:

Vehicle: N/A

Study No.: PH402-AZ-003-87

Room No.: Tox VII

Route: Oral IP IV SC

Time of Dose: 9:05am - 9:25am 5/24/89

Date: 5/24/89

Dose Level: 5000mg/kg

Dose Volume: 5 ml/kg

Animal No.	Sex	Ml. Given	Initial Weights (grams)			Final Day	Animal No.	Sex	Ml. Given	Initial Weights (grams)			Final Day
			Day	Day 7	Day					Day	Day 7	Day	
6066	♂	1.1	223	292	321	6071	♀	1.0	205	244	259		
6067	♀	1.1	221	282	313	6072	♀	0.9	185	209	218		
6068	♂	1.2	232	300	339	6073	♀	0.9	183	5/25/89	172		
6069	♂	1.1	210	260	255	6074	♀	0.9	186	213	229		
6070	♂	1.2	230	295	326	6075	♀	1.0	193	228	232		
Initials		5/24/89	5/24/89	5/24/89	6/7/89			5/24/89	6/7/89	5/24/89	6/7/89		

TOXIC SIGNS	HOURS					DAYS						
	0	1	2	4	24	2	3	4	5	6	7	
No Signs		5/5		3/3	5/4	5/4	5/4	5/4	5/4	5/4	5/4	
Activity: Inc. * Dec. *				1/2								
Convulsions												
Paralysis												
Diarrhea				1/0								
Salivation												
Lacrimation												
Ptosis												
Poor Grooming												
Chromodacryorrhea												
Pilo-erection												
Muscle Tone: Inc. * Dec. *												
Abnormal Gait				0/1								
Abnormal Stance				0/1								
Dyspnea												
Cyanosis												
Tremors												
Loss of Righting Reflex												
Prostration												
Mortality (AM)	0/0		-	0/1	0/0	0/0	0/0	0/0	0/0	0/0	0/0	
Mortality (PM)			0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	
Initials	5/24/89	5/24/89	5/24/89	5/24/89	5/24/89	5/24/89	5/24/89	5/24/89	5/24/89	5/24/89	5/24/89	

*Inc. = Increased *Dec. = Decreased

Study Director: John Miller 6/7/89

Acute Toxicology
Observations (continued)

Sponsor: Arizona Chemical Company

Study Number: PH 402-12-003-89

Test Article:

Lot Number: N/A

Toxic Signs (continued)	Days							
	8	9	10	11	12	13	14	
No signs	5/4	5/4	6/4	5/4	5/4	4/4	4/4	
Activity: Inc. Dec.						2/4	4/4	
Convulsions						2/4		
Paralysis								
Diarrhea								
Salivation								
Lacrimation								
Ptosis								
Poor Grooming								
Chromodacrorrhoea						1/0	1/0	
Piloerection								
Muscle Tone: Inc. Dec.						1/0	1/0	
Abnormal Gait								
Abnormal Stance								
Dyspnea								
Cyanosis							1/0	
Tremors								
Loss of Righting Reflex								
Prostration								
Mortality (AM)	0/0	0/0	0/0	0/0	0/0	0/0	0/0	
Mortality (PM)	0/0	0/0	0/0	0/0	0/0	0/0	-	
Initials	6/12/89 SC	6/12/89 SC	6/13/89 SC	6/14/89 SC	6/15/89 SC	6/16/89 SC	6/17/89 SC	

Observations and
Comments

No additional
observations and/or
comments 6/17/89

Necropsy Findings

(N=None)

#160739 - reddish brown oral discharge, intestines bright orange 5/25/89 SC 60660 - kidneys mottled 60670 - kidneys mottled
 60680 - N, 60690 - lungs mottled, kidneys mottled, testes soft, atrophied right testis discolored white left testis mottled white
 1.0700 - N, 60710 - N, 60712 - N, 60740 - N, 60750 - N, 60759 - N, 60759 - N

Inc. = Increased

Dec. = Decreased

ATA222

Study Director

[Signature] 6/17/89

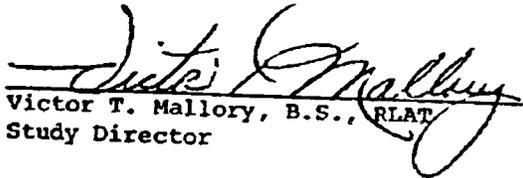
Final Report Amendment
Acute Exposure Oral Toxicity
PH 402-AZ-003-89

Test Article
Designation:

Original Designation

Corrected Designation

Reason For Amendment: Test article label of per sponsor. was in error, as


Victor T. Mallory, B.S., RLAT
Study Director


Date

CERTIFICATE OF AUTHENTICITY

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END