OFFICE OF TOXIC SUBSTANCES REV. 7/27/82

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INTER-OFFICE MEMO Olin

JAN 25 1974

TO J. Wedig AT New Haven DATE January 23, 1974

FROM S. J. Chiras AT Rochester COPY TO

SUBJECT Toxicity of Industrial Compounds

Enclosed please find subject reports from the University of Michigan.

S. J. Chiras

jc
Enc.

RECEIVED

000002

WHY FILE THIS COPY? IF YOU MUST RETAIN IT, SPECIFY A DEFINITE RETENTION PERIOD. ONE YEAR ... OTHER ...

THE UNIVERSITY OF MICHIGAN
SCHOOL OF PUBLIC HEALTH
Department of Environmental and Industrial Health
ANN ARBOR, MICHIGAN 48104

NOV 20 1974

NOV 20 1973

November 27, 1973

Dr. John Wedig
Olin Corporation
275 Winchester Ave.
New Haven, Connecticut 06504

Dear Dr. Wedig:

Enclosed is the report of our findings on the acute toxicity of certain industrial compounds following the criteria of the Federal Hazardous Substances Labeling Act. At the present time we are conducting some supplementary tests which will be reported to you in the very near future. The supplementary tests include inhalation studies at 20,000 ppm or saturated vapor levels for several compounds, inhalation studies below 200 ppm for CBr_4, dermal toxicity tests for those chemicals where total mortalities occurred at 2 gm/kg, and supplementary skin irritation tests where the outcome of the first test was equivocal according to the criteria of the Act.

Sincerely yours,

Rolf Hartung, Ph.D.
Professor of
Environmental Toxicology

GCA

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TOXICITY OF INDUSTRIAL COMPOUNDS

Submitted to:

Olin Corporation

New Haven, Connecticut

November 27, 1973

Prepared by:

Rolf Hartung, Ph.D.

Environmental & Industrial Health

School of Public Health

University of Michigan

Ann Arbor, Michigan

000064

ACUTE ORAL TOXICITY STUDIES

Methods

Acute oral toxicity studies were done in male and female Sprague-Dawley rats. The animals were starved for 24 hours prior to the initiation of the test. Water was available ad libitum during this time. Materials to be tested were either administered as supplied or diluted with corn oil. An initial series of range-finding tests was done to determine the approximate toxicity of each compound. The actual test was run in at least five different groups of rats of five individuals each consisting of 3 males and 2 females. The dose levels were chosen so that at least two groups of animals for each compound to be tested exhibited partial mortalities. When two consecutive dose levels showed a 100% response or a 0% response, only the more centrally located data point was utilized in the subsequent statistical evaluation. The statistical evaluation was done by logistic analysis according to Berkson (1944, 1949, 1950, 1955). Computer outputs from those analyses are included as part of this report.

Results

o-Fluoronitrobenzene (10% in corn oil)

LD_{50} 440 mg/kg (fiducial limits: 324-598 mg/kg)

Symptoms: lethargy, death 3 to 4 hours after exposure.

o-fluoroaniline (10% in corn oil)

LD_{50} 1,423 mg/kg (fiducial limits: 1,308-1,547 mg/kg)

Symptoms: tremors and convulsions, chromodacryorhea, death occurs 24 to 48 hours after exposure.

o-fluorophenol (10% in corn oil)

LD_{50} 1,326 mg/kg (fiducial limits: 1,186-1,483 mg/kg)

Symptoms: tremors, salivation, chromodacryorhea, death within 3 to 6 hours after exposure.

3-fluorosalicylaldehyde (25% suspension in corn oil)

LD_{50} 1,721 mg/kg (fiducial limits: 421-7,033 mg/kg)

Symptoms: lethargy, diarrhea, deaths occur within 24 to 48 hours.

o-fluorotoluene

LD_{50} 6,924 mg/kg (fiducial limits: 3,809-12,327 mg/kg)

Symptoms: very lethargic, chromodacryorhea, diarrhea, deaths occur within 18 to 72 hours.

m-bromobenzotrifluoride

LD_{50} 6,075 mg/kg (fiducial limits: 3,857-9,566 mg/kg)

Symptoms: lethargy, diarrhea, deaths occur within 48 to 96 hours after exposure.

m-hydroxybenzotrifluoride

LD_{50} 325 mg/kg (fiducial limits: 217-487 mg/kg)

Symptoms: lethargy, chromodacryorhea, at high dose levels deaths occur within 6 hours, at low dose levels deaths may be delayed as much as 10 to 11 days. The material is considerably less toxic when administered in a 20% concentration in corn oil. Under those conditions the LD_{50} appears to be in access of 3,000 mg/kg.

2-amino-5-chlorobenzotrifluoride

LD_{50} 2,669 mg/kg (fiducial limits: 1,360-5,238 mg/kg)

Symptoms: lethargy, deaths occur within 24 to 48 hours after dosing.

Surfactant 10G (50%)

LD_{50} 15.29 g/kg (fiducial limits: 8.20-28.51 g/kg)

Symptoms: diarrhea, lethargy, deaths occur within 24 to 72 hours after dosing.

Tolutriazole 40W

LD_{50} 3,403 mg/kg (fiducial limits: 0.028-421008640. mg/kg)

The dose response curve for this compound appears to have a very shallow slope.

Symptoms: lathargy, death occurs within 24 hours after exposure.

Carbontetrabromide 60TC (20% in corn oil)

LD_{50} 4,471 mg/kg (fiducial limits: 2,875-6,953 mg/kg)

Symptoms: diarrhea, chromodacryorhea, lethargy,
deaths occur 24 to 96 hours after exposure.

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Skin and Eye Irritation Studies

Methods: Skin and eye irritation were determined in white New Zealand rabbits according to the methodology published in 1500.41 and 1500.42 of Title 16, Chapt. II, Subchapter C - Federal Hazardous Substances Act Regulations, as published in the Federal Register 38 (187): 27012-27038 (Sept. 27, 1973). The grading of the eye irritation scores was done on hand of the Illustrated Guide for Irritation by Hazardous Substances using an opthalmoscope and fluorescein dye, as required.

PRIMARY SKIN IRRITATION IN RABBITS

Compound: o-fluoronitrobenzene

		Test Values					
	Rabbit No.	1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	1	1	1	1	2	1
" "	72	1	1	1	1	2	1
Abraded Skin	24	1	2	2	2	2	2
" "	72	1	2	2	2	2	2
Subtotal		4	6	6	6	8	6
Edema							
Intact Skin	24	0	0	0	0	0	0
" "	72	0	0	0	0	0	0
Abraded Skin	24	0	0	0	0	0	1
" "	72	0	0	0	0	0	1
Subtotal		0	0	0	0	0	2
Total		4	6	6	6	8	8
Primary Irritation Score		1.0	1.5	1.5	1.5	2.0	2.0

Average Score 1.58

PRIMARY SKIN IRRITATION IN RABBITS

Compound: o-fluoroaniline

		Test Values					
	Rabbit No.	1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	0	0	0	0	1	0
" "	72	0	0	0	0	0	0
Abraded Skin	24	2	2	3	3	2	2
" "	72	2	2	2	2	2	3
Subtotal		4	4	5	5	5	4
Edema							
Intact Skin	24	0	0	0	0	0	0
" "	72	0	0	0	0	0	0
Abraded Skin	24	0	1	1	1	0	0
" "	72	0	0	0	0	0	0
Subtotal		0	1	1	1	0	0
Total		4	5	6	6	5	4
Primary Irritation Score		1.0	1.25	1.5	1.5	1.25	1.0

Average Score 1.25

PRIMARY SKIN IRRITATION IN RABBITS

Compound: o-fluorophenol

		Test Values					
	Rabbit No.	1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	4	1	4	1	4	4
" "	72	4	4	4	4	4	4
Abraded Skin	24	4	4	4	4	4	4
" "	72	4	4	4	4	4	4
Subtotal		16	13	16	13	16	16
Edema							
Intact Skin	24	2	2	3	1	2	3
" "	72	2	1	1	1	1	1
Abraded Skin	24	2	2	3	3	3	2
" "	72	2	2	1	1	1	2
Subtotal		8	7	8	6	7	8
Total		24	20	24	19	23	24
Primary Irritation Score		6.0	5.0	6.0	4.75	5.75	6.0

Average Score 5.58

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PRIMARY SKIN IRRITATION IN RABBITS

Compound: 3-fluorosalicylaldehyde

		Test Values					
	Rabbit No.	1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	2	1	2	2	1	1
" "	72	1	1	0	0	0	0
Abraded Skin	24	2	2	2	3	2	2
" "	72	2	2	2	2	2	2
Subtotal		7	6	6	7	5	5
Edema							
Intact Skin	24	0	0	0	0	0	0
" "	72	0	0	0	0	0	0
Abraded Skin	24	3	2	2	2	3	3
" "	72	1	1	2	2	2	2
Subtotal		4	3	4	4	5	5
Total		11	9	10	11	10	10
Primary Irritation Score		2.75	1.75	2.0	2.75	2.5	2.5

Average Score 2.38

PRIMARY SKIN IRRITATION IN RABBITS

Compound: o-fluorotoluene

		Test Values					
Rabbit No.		1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	1	1	2	1	0	1
" "	72	1	1	2	1	0	1
Abraded Skin	24	2	2	2	1	1	2
" "	72	1	2	2	1	1	1
Subtotal		5	6	8	4	2	5
Edema							
Intact Skin	24	0	0	0	0	0	0
" "	72	0	0	0	0	0	0
Abraded Skin	24	0	0	0	1	0	0
" "	72	0	0	1	0	0	0
Subtotal		0	0	1	1	0	0
Total		5	6	9	5	2	5
Primary Irritation Score		1.25	1.5	2.25	1.25	0.5	1.25

Average Score 1.29

PRIMARY SKIN IRRITATION IN RABBITS

Compound: m-bromobenzotrifluoride

		Test Values					
Rabbit No.		1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	2	1	1	1	2	1
" "	72	1	1	1	1	2	1
Abraded Skin	24	2	2	2	2	2	2
" "	72	2	2	2	2	2	2
Subtotal		7	6	6	6	8	6
Edema							
Intact Skin	24	1	0	0	0	1	1
" "	72	0	0	0	0	0	0
Abraded Skin	24	1	1	0	0	1	1
" "	72	1	0	0	0	0	1
Subtotal		3	1	0	0	2	3
Total		10	7	6	6	10	9
Primary Irritation Score		2.5	1.75	1.5	1.5	2.5	2.25

Average Score 2.0

PRIMARY SKIN IRRITATION IN RABBITS

Compound: 2-amino-5-chlorobenzotrifluoride

		Test Values					
Rabbit No.		1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	2	2	1	1	2	2
" "	72	0	0	0	0	0	0
Abraded Skin	24	2	1	1	2	2	2
" "	72	1	0	1	1	1	1
Subtotal		5	3	3	4	5	5
Edema							
Intact Skin	24	1	1	0	0	1	1
" "	72	0	0	0	0	0	0
Abraded Skin	24	1	0	0	1	0	1
" "	72	0	0	0	0	0	0
Subtotal		2	1	0	1	1	2
Total		7	4	3	5	6	7
Primary Irritation Score		1.75	1.0	0.75	1.25	1.5	1.75

Average Score 1.33

PRIMARY SKIN IRRITATION IN RABBITS

Compound: 4-chloro-3-nitrobenzotrifluoride

		Test Values					
Rabbit No.		1	2	3	4	5	6
	Time (Hrs.)						
Erythema & Eschar							
Intact Skin	24	1	2	1	1	1	1
" "	72	1	1	0	1	0	0
Abraded Skin	24	3	3	2	2	3	2
" "	72	2	2	2	2	2	2
Subtotal		7	8	5	6	6	5
Edema							
Intact Skin	24	0	0	0	0	0	0
" "	72	0	0	0	0	0	0
Abraded Skin	24	1	1	2	1	2	1
" "	72	1	1	0	1	0	0
Subtotal		2	2	2	2	2	1
Total		9	10	7	8	8	6
Primary Irritation Score		2.25	2.5	1.75	2.0	2.0	1.5

Average Score 2.0

PRIMARY SKIN IRRITATION IN RABBITS

Compound: Surfactant 100 (50%)

		Test Values					
Rabbit No.		1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	0	0	0	0	1	0
" "	72	0	0	0	0	0	0
Abraded Skin	24	2	2	2	2	2	2
" "	72	2	1	1	1	1	1
Subtotal		4	3	3	3	4	3
Edema							
Intact Skin	24	0	0	0	0	0	0
" "	72	0	0	0	0	0	0
Abraded Skin	24	0	0	0	0	0	0
" "	72	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0
Total		4	3	3	3	4	3
Primary Irritation Score		1.0	0.75	0.75	0.75	1.0	0.75

Average Score 0.83

PRIMARY SKIN IRRITATION IN RABBITS

Compound: Tolutriazole 40W

		Test Values					
Rabbit No.		1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	4	4	4	4	4	2
" "	72	0	0	0	0	0	1
Abraded Skin	24	3	3	2	3	3	2
" "	72	2	2	2	3	3	2
Subtotal		5	5	4	6	6	8
Edema							
Intact Skin	24	0	0	0	0	0	0
" "	72	0	0	0	0	0	0
Abraded Skin	24	2	1	1	2	1	1
" "	72	2	1	1	2	1	1
Subtotal		4	2	2	4	2	2
Total		9	7	6	10	8	10
Primary Irritation Score		2.25	1.75	1.5	2.5	2.0	2.5

Average Score 2.08

PRIMARY SKIN IRRITATION IN RABBITS

Compound: Carbontetrabromide 60TC

		Test Values					
Rabbit No.		1	2	3	4	5	6
	Time (Hrs.)						
Erythema & eschar							
Intact Skin	24	2	2	2	2	2	2
" "	72	2	2	2	2	2	2
Abraded Skin	24	3	2	2	2	2	2
" "	72	2	2	2	2	2	2
Subtotal		9	8	8	8	8	8
Edema							
Intact Skin	24	4	2	4	2	2	3
" "	72	2	0	2	0	1	0
Abraded Skin	24	4	2	4	2	4	4
" "	72	2	2	2	2	2	2
Subtotal		12	6	12	6	9	9
Total		21	14	20	14	17	17
Primary Irritation Score		5.25	3.5	5.0	3.5	4.25	4.25

Average Score 4.22

EYE IRRITATION

Compound: o-fluoronitrobenzene

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	0	0	0	0	0	0
	48	0	0	0	0	0	0
	72	0	0	0	0	0	0
Iris	24	0	0	0	0	0	0
	48	0	0	0	0	0	0
	72	0	0	0	0	0	0
Conjunctivae; redness	24	< 1	< 1	1	< 1	< 1	< 1
	48	0	0	< 1	0	< 1	0
	72	0	0	0	0	0	< 1
Conjunctivae; chemosis	24	< 1	1	< 1	1	< 1	< 1
	48	0	0	< 1	1	< 1	0
	72	0	0	0	0	0	0

No rabbits show significant eye irritation.

EYE IRRITATION

Compound: o-fluoroaniline

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	0	1*	0	0	0	0
	48	0	0	0	0	0	0
	72	0	0	0	0	0	0
Iris	24	0	1*	0	1*	0	0
	48	0	1*	0	< 1	0	0
	72	0	0	0	0	0	0
Conjunctivae; redness	24	1	2*	1	2*	1	1
	48	< 1	1	< 1	2*	1	1
	72	< 1	1	< 1	2*	< 1	1
Conjunctivae; chemosis	24	1	2*	1	2*	1	2*
	48	< 1	2*	< 1	2*	1	1
	72	< 1	2*	< 1	2*	< 1	1

*positive reaction

3/6 rabbits show positive reactions for eye irritation in the first test.

EYE IRRITATION

Compound: o-fluorophenol

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	4*	3*	4*	3*	4*	4*
	48	4*	3*	4*	2*	3*	4*
	72	3*	< 2*	4*	2*	3*	3*
Iris	24	?	?	?	?	?	?
	48	?	?	?	> 1*	?	?
	72	?	?	?	> 1*	?	?
Conjunctivae; redness	24	3*	3*	3*	3*	3*	3*
	48	3*	3*	3*	3*	3*	3*
	72	3*	3*	3*	3*	3*	3*
Conjunctivae; chemosis	24	3*	4*	4*	4*	4*	3*
	48	4*	4*	4*	4*	4*	4*
	72	4*	4*	4*	4*	4*	4*

*positive reaction

All 6 rabbits display significant eye irritation.

EYE IRRITATION

Compound: 3-fluorosalycaldehyde

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	2*	1*	0	2*	1*	2*
	48	2*	1*	0	1*	1*	2*
	72	1*	0	0	1*	<1	2*
Iris	24	1(?)	1*	1*	1*	1*	1*
	48	1(?)	1*	0	1*	1*	1*
	72	1*	1*	0	1*	1*	1*
Conjunctivae; redness	24	2*	2*	3*	3*	3*	3*
	48	3*	3*	2*	3*	3*	3*
	72	2*	2*	1	3*	2*	2*
Conjunctivae; chemosis	24	3*	3*	3*	3*	2*	3*
	48	3*	3*	2*	3*	2*	2*
	72	2*	2*	1	2*	2*	2*

*positive reaction

All 6 rabbits display significant eye irritation.

EYE IRRITATION

Compound: o-fluorotoluene

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	0	0	0	0	0	0
	48	0	0	0	0	0	0
	72	0	0	0	0	0	0
Iris	24	0	1*	0	< 1	< 1	< 1
	48	0	0	0	0	< 1	< 1
	72	0	0	0	0	0	0
Conjunctivae; redness	24	1	1	< 1	1	1	1
	48	0	1	1	1	1	1
	72	0	1	1	1	0	0
Conjunctivae; chemosis	24	2*	2*	1	1	1	1
	48	0	1	0	1	1	1
	72	1	1	0	0	0	1

*positive reaction

2/6 rabbits show positive reactions for eye irritation in the first test.

EYE IRRITATION

Compound: M-bromobenzotrifluoride

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	0	0	0	0	0	0
	48	0	0	0	0	0	0
	72	0	0	0	0	0	0
Iris	24	< 1	1*	< 1	< 1	0	0
	48	0	0	0	0	0	0
	72	0	0	0	0	0	0
Conjunctivae; redness	24	2*	2*	< 2	2*	2*	2*
	48	1	1	1	< 1	< 1	1
	72	1	< 1	0	0	0	1
Conjunctivae; chemosis	24	2*	2*	2*	2*	2*	2*
	48	1	1	1	< 1	< 1	1
	72	< 1	< 1	0	0	0	1

*positive reaction

All 6 rabbits display significant eye irritation.

EYE IRRITATION

Compound: 2-amino-5-chlorobenzotrifluoride

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	0	0	1*	<1	1*	<1
	48	0	0	1*	0	1*	0
	72	0	0	1*	0	1*	0
Iris	24	<1	<1	1*	1*	1*	1*
	48	0	0	1*	1*	1*	<1
	72	0	0	1*	1*	1*	0
Conjunctivae; redness	24	2*	2*	2*	3*	3*	3*
	48	2*	2*	2*	3*	3*	2*
	72	1	1	2*	2*	2*	2*
Conjunctivae; chemosis	24	2*	2*	2*	3*	3*	3*
	48	2*	1	2*	2*	2*	2*
	72	1	1	2*	2*	2*	1

*positive reaction

All 6 rabbits display significant eye irritation.

EYE IRRITATION

Compound: Surfactant 10G

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	0	0	0	0	0	0
	48	0	0	0	0	0	0
	72	0	0	0	0	0	0
Iris	24	0	0	0	0	0	0
	48	0	0	0	0	0	0
	72	0	0	0	0	0	0
Conjunctivae; redness	24	1	1	1	1	1	1
	48	0	0	1	1	0	< 1
	72	0	0	0	0	0	0
Conjunctivae; chemosis	24	1	1	1	1	1	1
	48	0	0	1	1	< 1	< 1
	72	0	0	0	0	0	0

No rabbits display significant eye irritation.

EYE IRRITATION

Compound: tolutriazole 40W

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	1*	1*	0	1*	1*	0
	48	1*	1*	0	1*	1*	0
	72	1*	1*	0	1*	1*	0
Iris	24	1*	1*	< 1	1*	1*	< 1
	48	1*	1*	0	1*	1*	< 1
	72	< 1	1*	0	1*	1*	< 1
Conjunctivae; redness	24	2*	2*	2*	3*	3*	2*
	48	2*	3*	2*	3*	3*	2*
	72	2*	3*	1	3*	3*	2*
Conjunctivae; chemosis	24	2*	2*	2*	3*	3*	2*
	48	2*	3*	2*	2*	2*	2*
	72	2*	3*	1	2*	2*	2*

*positive reaction

All 6 rabbits display significant eye irritation.

EYE IRRITATION

Compound: Carbontetrabromide 60TC

		Grades for Ocular Lesions					
	Rabbit No.	1	2	3	4	5	6
	Hours						
Corneal opacity or ulceration	24	0	0	3*	1*	3*	1*
	48	0	0	3*	0	2*	1*
	72	0	0	4*	0	2*	0
Iris	24	< 1	0	?	1*	?	1*
	48	< 1	0	?	< 1	1*	1*
	72	0	0	?	0	1*	1*
Conjunctivae; redness	24	2*	2*	3*	3*	3*	3*
	48	2*	2*	3*	3*	3*	3*
	72	1	2*	3*	3*	3*	2*
Conjunctivae; chemosis	24	2*	2*	4*	4*	4*	3*
	48	2*	3*	4*	4*	3*	3*
	72	1	3*	4*	3*	3*	2*

*positive reaction

All 6 rabbits display significant eye irritation.

Acute Inhalation Studies

Methods: All compounds were administered at nominal concentrations of 200 ppm to 10 rats in a stainless steel inhalation chamber with a capacity of 160 liters. The air flow was monitored with a calibrated rotameter, and the toxicant was added onto a 50 cm evaporation column with an adjustable Mil-Royal instrument pump. The evaporation column could be heated to aid evaporation. The duration of exposure was one hour, followed by a one-hour period to clear the chamber of any residues prior to opening. All exposures were dynamic at the flow rates indicated in the data sheets.

Supplementary tests at 20,000 ppm or saturated vapor are in progress for o-fluoronitrobenzene, o-fluoroaniline, o-fluorophenol, and o-fluorotoluene.

Acute Inhalation Studies

Compound: o-fluoronitrobenzene

Nominal Concentration: 200 ppm

Chamber Size: 160 l **Flow Rate:** 120 lpm

Temperature: 28° C **Duration of Exposure:** 1 hr.

Number of animals exposed: 5 male and 5 female Sprague-Dawley rats

Survival after 14 days: All survived.

Symptoms: Some animals were prostrate towards the end of the exposure.

Acute Inhalation Studies

Compound: o-fluoroaniline

Nominal Concentration: 200 ppm

Chamber Size: 160 l Flow Rate: 120 lpm

Temperature: 28° C Duration of Exposure: 1 hr.

Number of animals exposed: 5 male and 5 female Sprague-Dawley rats

Survival after 14 days: All survived.

Symptoms: Some animals were prostrate towards the end of the exposure.

Acute Inhalation Studies

Compound: o-fluorophenol

Nominal Concentration: 200 ppm

Chamber Size: 160 l Flow Rate: 120 lpm

Temperature: 28° C Duration of Exposure: 1 hr.

Number of animals exposed: 5 male and 5 female Sprague-Dawley rats

Survival after 14 days: All survived.

Symptoms: None observed.

Acute Inhalation Studies

Compound: o-fluorotoluene

Nominal Concentration: 200 ppm

Chamber Size: 160 l

Flow Rate: 120 lpm

Temperature: 28° C

Duration of Exposure: 1 hr.

Number of animals exposed: 5 male and 5 female Sprague-Dawley rats

Survival after 14 days: All survived.

Symptoms: None observed.

Acute Inhalation Studies

Compound: 3-fluorosalicaldehyde (10% in ethanol)

Nominal Concentration: (200 ppm) saturated vapor concentration

Chamber Size: 160 l Flow Rate: 120 lpm

Temperature: 28° C Duration of Exposure: 1 hr.

Number of animals exposed: 5 male and 5 female Sprague-Dawley rats

Survival after 14 days: All survived.

Symptoms: All animals appeared sedated during the exposure. All rats were colored yellow.

Acute Inhalation Studies

Compound: Carbontetrabromide

Nominal Concentration: 200 ppm

Chamber Size: 160 l Flow Rate: 120 lpm

Temperature: 28° C Duration of Exposure: 1 hr.

Number of animals exposed: 5 male and 5 female Sprague-Dawley rats

Survival after 14 days: 5 out of 5 male rats died, and 2 out of 5 female rats died within 48 hours after cessation of the exposure.

Symptoms: All animals exhibited difficulties in breathing, coughing, and exitation. The eyes were watering.

ACUTE DERMAL TOXICITY STUDIES

Methods

An appropriate number of rabbits was prepared by clipping the hair from their trunks under sodium pentobarbital anesthesia. The toxicant was introduced at 2 g/kg of body weight into a sleeve of rubber or mylar that had been lined with aluminum foil, according to paragraph 1500.40 of Title 16 Chapter 2 Subchapter C -- Federal Hazardous Substances Act Regulations. Animals were placed in holders for the first 24 hours, then the sleeves were removed and the skin was cleaned as far as possible. Animals were returned to their regular cages and observed daily for the next two weeks.

Results

O-fluoronitrobenzene - At 2 g/kg all 6 rabbits died within the first 24 hours.

O-fluoroaniline - At 2 g/kg 5 out of 6 rabbits died within 24 to 72 hours.

Symptoms: Animals are unable to stand, have tremors, have bluish eyes (methemoglobinemia?), and appear to become hypothermic.

O-fluorophenol - At 2 g/kg 5 out of 6 rabbits died within 6 to 48 hours.

Symptoms: Salivation, difficulty in standing, convulsions.

3-fluorosalycaldehyde - At 2 g/kg 1 out of 6 rabbits died after 72 hours.

O-fluorotoluene - At a dose of 2 g/kg all animals survived for 2 weeks. All rabbits convulsed for a brief period of time shortly after administration of the chemical.

M-bromobenzotrifluoride - All 6 rabbits survived a dose of 2 g/kg. Some animals exhibited slight convulsions shortly after the administration of the chemical.

2-amino-5-chlorobenzotrifluoride - At a dose of 2 g/kg one out of 6 animals died within 24 hours. The rabbits experienced convulsions for a short period of time after the administration of the chemical. Other observed symptoms included difficulty in breathing, cyanosis, and salivation.

Surfactant 10G - All 6 rabbits survived a dose of 2 g/kg without noticeable symptoms.

4-chloro-3-nitrobenzotrifluoride - 4 out of 6 animals died within 30 hours at a dose level of 2 g/kg. Symptoms included lethargy and inability to stand.

Carbontetrabromide 60TC - 6 out of 6 rabbits died at the dose level of 2 g/kg within 2 to 48 hours. Symptoms included pain and inability to stand.