

Microfiche No. OTS0515587		
New Doc I.D. 86-870001425		
Old Doc I.D.		
Date Produced 12/16/58	Date Recieved 8/03/87	TSCA section 8D
Submitting Organization UNION CARBIDE CORP		
Contractor MELLON INST OF IND RESEARCH		
Document Title RANGE FINDING TESTS ON 2,3-DICHLORO-1-PROPENE		
Chemical Category 2,3-DICHLORO-1-PROPENE (78-88-6)		

Confidential

Report 21107



000048300F

86-870001425

R: 12-16-58

1/FS

1-5-59

MELLON INSTITUTE OF INDUSTRIAL RESEARCH

UNIVERSITY OF PITTSBURGH

SPECIAL REPORT

on

CONTAINS NO CBI

AKG 3 REC'D

Range Finding Tests on 2,3-Dichloro-1-Propene

Union Carbide Chemicals Co., U.C.C.

Industrial Fellowship No. 274-21

Summary

The above compound has an acute oral LD₅₀ for rats, by stomach intubation of 0.32 (0.26 to 0.40) gm./kg. as a 1% solution in corn oil. For comparison 1,4-dichlorobutene-2 has an LD₅₀ of 0.089 gm./kg., allyl chloride 0.7 and trichloroethane-1,1,2 1.1 ml./kg. and trichloroethylene 9.05 ml./kg. The compound in question is not an ICC Class B poison but nevertheless it is a highly toxic compound by the oral route.

Covered applications to the skin of rabbits for 24 hours resulted in an LD₅₀ of 1.6 (1.2 to 2.1) ml./kg. The LD₅₀ values for the comparative compounds mentioned above are in order: 0.62, 2.2, 3.7 and >20 ml./kg.

Inhalation of concentrated vapor by rats is lethal in 15 minutes. It is obvious that spilling this compound in a small room would result in immediate hazard to life.

A concentration of 1000 p.p.m. inhaled by rats for 4 hours killed 6 of 6, 500 p.p.m. killed 3 of 6 and 250 p.p.m. 0 of 6 demonstrating the definite toxicity of the vapor.

On rabbit skin applied uncovered it causes erythema in 24 hours. Grade 5. Similarly it falls in Grade 5 in the corneal necrosis test as 0.005 ml. amounts cause moderate damage.

Sample

On 10-13-58 we received 8 ounces of 2,3-dichloro-1-propene, identified by code DS 3-48-3, from South Charleston to confirm an opinion regarding ICC poison status.

Single Oral Dose

The LD₅₀ for rats fed a 1% solution in corn oil, by stomach intubation, is 0.32 (0.26 to 0.40) gm./kg.

Carworth Farms-Nelson, non-fasted rats, 5 to 6 weeks of age and 90-120 grams in weight were dosed at levels differing by a factor of 2.0 in a geometric series. The rats were reared in our own colony and maintained from time of weaning on Rockland rat diet (complete). The method of moving average for calculating the median-effective dose (LD₅₀) was applied to the 14-day mortality data.

Autopsy findings were not particularly instructive as to primary site of injury. Congestion was noted in lungs, liver and kidney. The gastrointestinal tract was slightly opaque and contained the compound. When given undiluted 0.25 ml./kg. was lethal to 5 rats. Lower doses of undiluted propene were not given because of the small volume to be measured.

Skin Penetration

By the percutaneous route the LD₅₀ for rabbits is 1.6 (1.2 to 2.1) ml./kg. of undiluted compound.

Male albino New Zealand strain rabbits, 3 to 5 months of age and averaging 2.5 kg. in weight were immobilized during the 24-hour skin contact period. Thereafter, the VINYLITE sheeting used to retain the dose in contact with the clipped skin of the trunk was removed and the animals were caged for the remainder of the 14-day observation period. The rabbits were procured locally and maintained on Rockland rabbit ration. The moving average method of calculating the LD₅₀ was used.

These covered applications caused marked skin erythema followed in a few instances by necrosis. Lungs had petechial hemorrhage in 3 deaths and frank hemorrhage in a 4th case. Livers were pale or mottled with increased prominence of acini. Kidneys were off-color or pale.

Inhalation

Concentrated vapor, generated at room temperature by passing air at 2.5 liters/minute through a fritted glass disc immersed in 50 ml. of 2,3-dichloro-1-propene caused 100% mortality among 6 female rats exposed 15 minutes. One survived the 15 minute inhalation period in an anaesthetized state and died within 4 hours. Grade 7.

A metered concentration of 1000 p.p.m. killed 6 female rats that inhaled this vapor-air mixture 4 hours. At 500 p.p.m. 3 of 6 died and a group of 6 survived 14 days after 4 hours in 250 p.p.m. Grade 10.

Irritation

Undiluted 2,3-dichloro-1-propene caused moderate or marked erythema upon application to the clipped skin of the rabbit belly in 0.01 ml. amounts. Grade 5.

Instillation in rabbit eyes of 0.02 ml. amounts undiluted caused severe corneal damage and 0.005 ml. amounts moderate injury. Grade 5.

Charles P. Carpenter

Typed: December 19, 1958 - ccf


ASSISTANT ADMINISTRATIVE FELLOW

Table 21-244

2,3-Dichloro-1-Propene

Single Doses to Male Albino Rats by Mouth

Fed by Stomach Tube as Solution in Corn Oil, 1 ml. = 0.01 gm.

Rat Number	1958 Date Dosed	Grams Wt.	Weight Change in 14 Days	Dosage; Grams per Kilo	Dose in Grams	Dose in ml. of Solution	Days to Death
67791	11-5	110	-	0.50	0.0550	5.5	1
67795	11-5	101	-	0.50	0.0505	5.0	1
67796	11-5	102	-	0.50	0.0510	5.1	1
67792	11-5	90	-	0.50	0.0450	4.5	1
67797	11-5	113	-	0.50	0.0565	5.6	1
66834	11-4	105	-	0.25	0.02625	2.6	2
66879	11-4	99	+ 57	0.25	0.02475	2.5	-
66872	11-4	95	+ 44	0.25	0.02375	2.4	-
66835	11-4	105	+ 57	0.25	0.02650	2.6	-
66856	11-4	101	+ 56	0.25	0.02525	2.5	-

LD50 = 0.38 (0.26 to 0.40) gm./kg.

Table 21-245

Single Doses to Male Albino Rabbits by Skin Penetration

Administered Undiluted under VINYLITE Dam for 24 Hours

Rabbit No.	1958 Date Clipped	1958 Date Applied	Gm. Wt.	Weight Change in 14 Days	Dosage; Ml. per Kilo	Dose in ml.	Days to Death
62246	10-14	10-16	2528	-	2.5	6.3	1
62243	10-14	10-16	2402	-	2.5	6.0	1
62275	10-27	10-28	2282	-	2.5	5.7	1
62276	10-27	10-28	2392	-	2.5	6.0	1
62256	10-22	10-23	2369	-	1.25	3.0	1
62267	10-22	10-23	2360	-	1.25	3.0	-
62272	10-22	10-23	2316	-	1.25	2.9	-
62269	10-22	10-23	2295	-	1.25	2.9	-

LD50 = 1.58 (1.16 to 2.13) ml./kg.

Table 21-246

2,3-Dichloro-1-Propene (21-220)

Single Inhalation of Dynamic Concentrated Vapors generated at 14.5°C., by
Female CFN Rats in 9-Liter Desicc. 1 p.p.m. = 0.0045 mg./l.

Rat Number	1958 Date Inhaled	Initial Wt., gms.	Weight Change in 14 Days	Calc. Conc., p.p.m.	Duration	Mins. to Death in Chamber	Days to Death
66163	10-21	92	-	40,480	15 min.	-	0
66164	10-21	92	-	40,480	15 min.	15 min.	0
66168	10-21	94	-	40,480	15 min.	15 min.	0
66180	10-21	90	-	40,480	15 min.	15 min.	0
66177	10-21	88	-	40,480	15 min.	15 min.	0
66174	10-21	90	-	40,480	15 min.	15 min.	0

Table 21-247

Single Inhalation of Metered p.p.m.

Rat Number	1958 Date Inhaled	Initial Wt., gms.	Weight Change in 14 Days	Conc., p.p.m.	Duration	Hours to Death in Chamber	Days to Death
66591	11-6	112	-	1000	4 hrs.	-	0
66592	11-6	120	-	1000	4 hrs.	4 hrs.	0
66695	11-6	114	-	1000	4 hrs.	-	0
66664	11-6	122	-	1000	4 hrs.	4 hrs.	0
66667	11-6	128	-	1000	4 hrs.	-	0
66665	11-6	108	-	1000	4 hrs.	-	0
66719	11-7	136	+ 26	500	4 hrs.	-	-
66720	11-7	136	+ 24	500	4 hrs.	-	-
66723	11-7	100	- 10	500	4 hrs.	-	-
66589	11-7	100	-	500	4 hrs.	-	1
67971	11-7	118	-	500	4 hrs.	-	0
67972	11-7	114	-	500	4 hrs.	-	0
67952	11-10	100	+ 29	250	4 hrs.	-	-
67953	11-10	110	+ 33	250	4 hrs.	-	-
67954	11-10	102	+ 15	250	4 hrs.	-	-
67957	11-10	105	+ 32	250	4 hrs.	-	-
67561	11-10	124	+ 28	250	4 hrs.	-	-
XXX53	11-10	126	+ 42	250	4 hrs.	-	-

CERTIFICATE OF AUTHENTICITY

THIS IS TO CERTIFY that the microimages appearing on this microfiche are accurate and complete reproductions of the records of U.S. Environmental Protection Agency documents as delivered in the regular course of business for microfilming.

Data produced 12 22 88 Barbara Smith
(Month) (Day) (Year) Camera Operator

Place Syracuse New York
(City) (State)

