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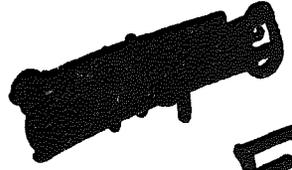
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887 KINDERKAMACK ROAD • RIVER EDGE, NEW JERSEY 07661

TELEPHONE: 201-262-8899 FAX: 201-262-0019

MAILING ADDRESS: P.O. BOX 6389 RIVER EDGE, NEW JERSEY 07661



FYI-0494-000960



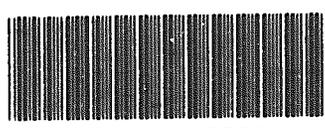
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CERTIFIED MAIL

REC'D
OFFICE OF POLLUTION
PREVENTION AND TOXICS
54 APR 12 AM 8:53

April 7, 1994

Document Processing Center (TS-790)
Attn: Section 8(e) Coordinator
Office of Toxic Substances
U.S. Environmental Protection Agency
401 "M" Street, S.W.
Washington, D.C. 20460



84940000060

ORIGINAL

SECTION 8(e) NOTICE

Re: 1,3,4,4-Tetrachloro-1,2,3,4-tetrafluoro-1-butene [Also called Compound 4 in the report]

Dear Sir/Madame:

The following notice is submitted to you in accordance with paragraph V, F in the Agreement between Halocarbon Products Corporation (the Company) and the EPA, "Consent Agreement re Docket No. TSCA-90-H-18", with respect to Section 8(e). Although the report indicates slight toxicity to animals, this notice is FOR YOUR INFORMATION ONLY because the information need not be reported under the provisions of Article V of EPA Statement of Interpretation and Enforcement Policy; Notification of Substantial Risk dated March 16, 1978.

I am the Vice President and Technical Director of the Company. My address is at Company headquarters:

Halocarbon Products Corporation
887 Kinderkamack Road
River Edge, New Jersey 07611
Phone: 201-262-8899

The address of the Company manufacturing site is:

Halocarbon Products Corporation
1100 Dittman Court
North Augusta, South Carolina 29841
Phone: 803-278-3500

The appended reports for the chemical substance 1,3,4,4-Tetrachloro-1,2,3,4-tetrafluoro-1-butene were prepared by:

Hazelton Laboratories America, Inc.
1330-B Piccard Drive
Rockville, Maryland 20850

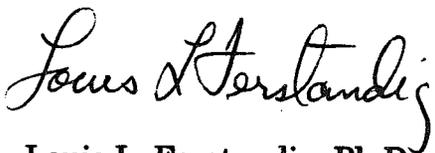
We are not aware of any additional information or supporting technical data.

(The appended reports covered more than one compound so, in connection with this submission, please refer to the data relating to the referenced compound only.)

In summary, the data show:

Rats exposed to 250 ppm showed very little effect. However, exposure to 2500 ppm for 15 minutes resulted in pulmonary hemorrhage and tracheal blockage.

Very truly yours,



Louis L. Ferstandig, Ph.D
Vice President & Technical Director

LLF:bc

ACUTE INHALATION EXPOSURE, 15 MINUTES - RATS

COMPOUNDS:

2-chloro-1,1,1,4,4,4-hexafluorobutene-2	10a	
asym dibromodifluoroethylene	10b	
asym tetrabromodifluoroethane	10c	
1,3,4,4-tetrachloro-1,2,3,4-tetrafluorobutene-1		10d
D-1	10e	

Submitted to

Halocarbon Products Corporation
Hackensack, New Jersey

February 7, 1966



HAZLETON LABORATORIES, INCORPORATED

Metropolitan Washington, D. C.

Area Code 703 • Jefferson 2-5800

P.O. BOX 30, FALLS CHURCH, VIRGINIA 22046



Sponsor: Halocarbon Products Corporation

Date: February 7, 1966

Materials: Compound 1: 2-chloro-1,1,1,4,4,4-hexafluorobutene-2
Compound 2: asym dibromodifluoroethylene
Compound 3: asym tetrabromodifluoroethane
Compound 4: 1,3,4,4-tetrachloro-1,2,3,4-tetrafluorobutene-1
Compound 5: D-1

Subject: Acute Inhalation Exposure, 15 Minutes - Rats

OBJECTIVE

The purpose of this study was to assess the acute inhalation toxicity of the above materials by exposing groups of four rats respectively to aerosols of Compounds 3 and 5 and vapors of Compounds 1, 2, and 4 for 15-minute periods.

MATERIALS

The materials were received from Halocarbon Products Corporation on January 14, 1966. Compounds 1 through 4 were clear, volatile liquids stored in metal cylinders. Compound 5 was a clear, viscous liquid contained in a glass container.

METHOD

Five groups of animals, each consisting of four male Charles River Caesarian-derived rats (210 to 230 grams), were exposed respectively



- 2 -

to an aerosol or a vapor atmosphere of Compounds 1 through 5. The exposures were conducted under dynamic conditions in a 100-liter exposure chamber.

The aerosols of Compounds 3 and 5 were generated by metering the liquids with a precision liquid metering pump into a positive pressure spray nozzle assembly. The saturated vapors were generated by bubbling a known flow of air through a fritted disk bubbler jar. The aerosols or vapors were introduced into the main chamber airflow which was maintained by a positive pressure rotary pump located at the exhaust side of the chamber. The total chamber flow was monitored by a rotameter.

Nominal chamber concentrations were calculated from the ratio of the rate of liquid feed to the total airflow in the case of the aerosols or the ratio of the flow rate of the saturated vapors to the total airflow in the case of the vapor atmospheres.

During exposure the animals were housed in compartmented stainless steel exposure baskets, centered in the chamber on bars. The animals were observed continuously for toxic signs and death. Following exposures the surviving animals were group housed and observed daily for latent toxic effects and death for 14 days.

Necropsies were performed on all animals which succumbed during the study. At the termination of the 14-day observation period, the survivors were sacrificed by carbon dioxide asphyxia. The lungs, liver, and kidneys were examined grossly for pathological signs and stored in 10% formalin solution for possible histological studies.



RESULTS

Compound 1 (2-chloro-1,1,1,4,4,4-hexafluorobutene-2)

Saturated vapor atmosphere of Compound 1 having an approximate concentration of 790,000 ppm at 25° C. was introduced at a rate of 158 milliliters per minute into the airstream of the chamber. The total chamber flow, vapor flow plus the make-up airflow, was 50 liters per minute. The nominal concentration of the agent was calculated to be 2500 ppm.

Hyperemia in the exposed body surfaces such as the ears and the paws was the only observable reaction during and after the 15-minute exposure. However, one rat died at Day 1 postexposure, two at Day 3, and the last one at Day 8. The mortality was 100%.

Gross necropsy of the animals which died at Day 1 revealed pulmonary hemorrhage and a frothy mucus-like substance blocking the lumen of the trachea. More severe pulmonary hemorrhage was noted in the other three animals.

Compound 2 (asym dibromodifluoroethylene)

At 25° C. a saturated vapor of Compound 2 has a concentration of 197,000 ppm. At a rate of 635 milliliters per minute, this saturated vapor was diluted with air to give a final rate of 50 liters per minute. The calculated nominal concentration of the compound was 2500 ppm.

During the 15-minute exposure gasping was the prominent sign. Following the exposure gasping, hypopnea, periods of apnea, and hyperemia



of the skin were noted. Within two hours postexposure two rats succumbed. The third rat died in the next half hour and the fourth within 24 hours.

Gross necropsy of all these animals revealed severe pulmonary hemorrhage and tracheal blockage by frothy mucus-like substance.

Compound 3 (asym tetrabromodifluoroethane)

A total of 282.75 milliliters of the solution of Compound 3 was aerosolized in the 15-minute exposure. The solution consisted of 10% of active ingredient. The total chamber flow was 100 liters per minute. The calculated nominal concentration of the compound was 1200 ppm.

Hyperemia, apnea, and muscular twitching were noted during and after the inhalation exposure. All four animals succumbed within one hour postexposure. Convulsions preceded death in two of the animals.

Necropsy findings were foamy nasal discharge, pulmonary hemorrhage, and exceptionally rapid blood coagulation. The liver of one of the rats was congested.

Compound 4 (1,3,4,4-tetrachloro-1,2,3,4-tetrafluorobutene-1)

Saturated vapor of Compound 4, having an approximate concentration of 10,500 ppm, was diluted with air to provide a nominal chamber concentration of 2500 ppm. The rate of vapor flow was 12 liters per minute, and the total flow rate was 50 liters per minute.

During exposure all animals exhibited hyperemia. Muscular spasms were also noted in two animals. Two rats died at Day 1 post-exposure and one at Day 11. No significant abnormality was detected in the single survivor during the 14-day observation period.



Gross necropsy on the animals which succumbed showed pulmonary hemorrhage and tracheal blockage. However, no pathologic tissue alteration was noted in the sacrificed animal.

Compound 5 (D-1)

A total of 16.3 milliliters of Compound 5 was aerosolized in the 15-minute exposure. The total chamber flow, i.e., air ejected through the spray nozzle plus the make-up air, was 50 liters per minute. The calculated chamber concentration was 2500 ppm.

Apnea was observed in all animals during exposure. In addition, foamy nasal discharge, hyperemia of the body surfaces, and ptosis were noted after the exposure. All four animals died within one hour, and death was preceded by convulsions.

The major findings at necropsy were profuse salivation, foamy nasal discharge, and pulmonary hemorrhage.

SUMMARY

The dose-mortality data for the five compounds are summarized below.

Compound	Nominal Conc. ppm	Mortality											Cumulative Mortality	
		15-Min. Exposure	Hours After Exposure				Days After Exposure							
			1	2	3	24	1	2	3	4	5	8		11
1	2500	0	-	-	-	-	1	-	2	-	-	1	-	4/4
2	2500	0	-	2	1	1	-	-	-	-	-	-	-	4/4
3	1200	0	4	-	-	-	-	-	-	-	-	-	-	4/4
4	2500	0	-	-	-	-	2	-	-	-	-	-	1	3/4
5	2500	0	4	-	-	-	-	-	-	-	-	-	-	4/4



- 6 -

The inhalation toxicities of five compounds have been investigated. Compounds 2, 3, and 5 caused the death of the animals within hours after a 15-minute exposure. Compounds 1 and 4 exhibited latent toxic effects and caused fatality within two weeks. Pulmonary damage was the prominent finding in necropsies.

Submitted by

H. N. MacFarland

H. N. MacFARLAND, Ph.D.

Director

Inhalation Division

Supervision: Leong
Experimental: Beasley, Martin

mjo

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ACUTE INHALATION EXPOSURES, 15 MINUTES - RATS

COMPOUND 4: 1,3,4,4-tetrachloro-1,2,3,4- *10a*
tetrafluorobutene-1

COMPOUND 5: D-2 *10e*

FINAL REPORT



HAZLETON LABORATORIES

INCORPORATED • FALLS CHURCH, VIRGINIA

ACUTE INHALATION EXPOSURES, 15 MINUTES - RATS

COMPOUND 4: 1,3,4,4-tetrachloro-1,2,3,4-¹⁰
tetrafluorobutene-1

COMPOUND 5: D-~~2~~¹ *ne*

FINAL REPORT

Submitted to
Halocarbon Products Corporation
Hackensack, New Jersey

April 29, 1966



HAZLETON LABORATORIES, INCORPORATED

FALLS CHURCH, VIRGINIA



Sponsor: Halocarbon Products Corporation

Date: April 29, 1966

Material: Compound 4: 1,3,4,4-tetrachloro-1,2,3,4-tetrafluorobutene-1
Compound 5: D-2

Subject: Acute Inhalation Exposures, 15 Minutes - Rats

OBJECTIVE

The purpose of this study was to assess the acute inhalation toxicities in rats undergoing exposure to 250 ppm of Compound 4 and a saturated vapor atmosphere of Compound 5 (D-2).

MATERIALS

The materials were received from Halocarbon Products Corporation on January 14, 1966. Compound 4 was a clear, volatile liquid stored in a metal cylinder. Compound 5 was a yellowish, viscous liquid stored in a glass container.

METHOD

Two groups of animals, each consisting of four male Charles River Caesarian-derived rats (210 to 230 grams), were employed. One group was exposed to 250 ppm of Compound 4; the other group was exposed to the saturated vapor of Compound 5 (D-2). The exposures were conducted under dynamic conditions in a 100-liter exposure chamber.

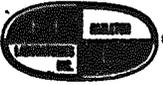


The saturated vapor of Compound 4, which has an approximate concentration of 10,500 ppm, was generated by bubbling a known flow of air through a fritted disk bubbler jar. The saturated vapor was introduced into the main chamber airflow, which was maintained by a positive pressure rotary pump located at the exhaust side of the chamber. The total chamber airflow rate was monitored by a rotameter. Nominal chamber concentration was calculated from the ratio of the flow rate of the saturated vapor of Compound 4 to the total flow rate through the chamber.

For the study of Compound 5 (D-2), a semi-closed system was used to provide saturated vapor chamber atmosphere. The system was arranged as such that the rate of saturated vapor entering the chamber was equal to that of the air being exhausted. In addition, a water manometer was used to indicate the chamber pressure equilibration.

During exposure, the animals were housed in compartmented exposure baskets, centered in the chamber on bars. The animals were observed continuously for toxic signs and death. Following exposures, the animals were group housed and observed daily for latent toxic effects and mortality for 14 days.

At the termination of the 14-day observation period, the animals were sacrificed by carbon dioxide asphyxia. The trachea, lungs, liver, and kidneys were examined grossly for pathological signs and stored in a 10% formalin solution for possible histological studies.



RESULTS

Compound 4 (1,3,4,4-tetrachloro-1,2,3,4-tetrafluorobutene-1)

At the rate of 1.19 liters per minute, saturated vapor of Compound 4 was introduced into the main chamber airflow. The total airflow rate was 50 liters per minute. The nominal concentration was calculated to be approximately 250 ppm.

During exposure, gasping and hypopnea were noted. Nasal discharge and slight dyspnea were observed for two days following exposure. From Day 3 through Day 14, the animals appeared normal. No deaths occurred during this study. At terminal gross necropsy, no significant tissue alterations were noted.

Compound 5 (D-2)

Saturated vapor atmosphere of Compound 5, having a nominal concentration of 66 ppm, was drawn through the chamber at 50 liters per minute.

No significant toxic signs were noted either during the exposure or during the 14-day observation period. No deaths occurred in this study. At terminal necropsy, hemorrhagic spots were noted on the lung surfaces of two of the animals, one of which also exhibited partial pulmonary consolidation. No gross tissue alterations were noted in the two remaining animals.



SUMMARY

The acute inhalation toxicities of Compounds 4 and 5 (D-2) have been investigated.

Animals exposed to 250 ppm of Compound 4 exhibited hypopnea for three days. Thereafter, they appeared essentially normal. On the other hand, animals exposed to the saturated vapor atmosphere of Compound 5 showed no significant toxic reactions. However, at necropsy, pulmonary hemorrhage and consolidation were noted in two of the animals.

Submitted by

B. J. Leong

K. J. LEONG, Ph.D.
Supervisor, Inhalation
Toxicology Section
Inhalation Division

Report

Preparation: Beasley, Leong
Supervision: Leong
Experimental: Beasley

mjo



Halocarbon

PRODUCTS CORPORATION

887 KINDERKAMACK ROAD • RIVER EDGE, NEW JERSEY 07661

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MAILING ADDRESS: P.O. BOX 661 • RIVER EDGE, NEW JERSEY 07661

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April 7, 1994

Document Processing Center (TS-790)
 Attn: Section 8(e) Coordinator
 Office of Toxic Substances
 U.S. Environmental Protection Agency
 401 M Street, S.W.
 Washington, DC 20460

REC'D
 OFFICE OF POLLUTION
 PREVENTION AND TOXICS
 04 APR 12 AM 8:52

Re: Consent Order regarding Halocarbon Products Corporation Docket No. TSCA 90-H-18

Dear Sir/Madame:

This submission is made pursuant to the Consent Order referenced above.

Transmitted herewith are reports on the chemicals listed below:

- * Trifluoroacetyl chloride (CAS 354-32-5)
- ** 2-Chloro-1,1,1,4,4,4-hexafluorobutene-2 (CAS 400-44-2)
- ** Asym dibromodifluoroethylene (CAS 430-85-3)
- ** 1,1,1,2-Tetrabromo-2,2,-difluoroethane (CAS 3470-67-5)
- ** 1,3,4,4-Tetrachloro-1,2,3,4-tetrafluoro-1-butene
- ** C₄F₆Br₄ (CAS 375-24-6)
- ** C₄F₄Br₄Cl₂
- ** CFCl₂(CF₂CFBr)_nCl where n is approximately 2 to 5
- ** CFCIBr(CF₂CFBr)_nBr where n is approximately 5 to 10
- ** CFCIBr(CF₂CFBr)_nBr where n is approximately 4 to 8
- ** CFCIBr(CF₂CFBr)_nBr where n is approximately 2 to 5
- ** CFCl₂(CF₂CFBr)_nCl where n is approximately 3 to 6
- ** CFCl₂(CF₂CFBr)_nCl where n is approximately 4 to 8
- ** 1,1,1,4,4,4-Hexafluoro-2-butanone
- ** 2-Hydroxy-1,1,1,4,4,4-hexafluorobutane
- * 1,1,3,3-Tetrabromo-1,2,2,3-tetrafluoropropane (99%) (CAS 36567-29-0)
- ** Mixture of 2,3-dichloro-1,1,1,4,4,4-hexafluoro-2-butene (99.94%) (CAS 374-07-2) & 2-chloro-1,1,1,4,4,4-hexafluoro-2-butene (0.06%) (CAS 400-44-2)
- ** 1,1-Dibromo-1-chloro-2,2,2-trifluoroethane (CAS 754-17-6)
- ** Cl(CF₂CFCl)₂Cl (CAS 423-38-1)

Reports on chemicals designated by a single asterisk (*) are submitted under paragraph V.F.b of said Consent Order.

Reports on chemicals designated by double asterisks (**) are submitted under paragraph V.F.c on a For Your Information Only basis.

I hereby certify on behalf of Halocarbon Products Corporation that the audit required by said Consent Order has been completed and that to the best of my information and belief the reports listed above are the only reports or studies required or questionably required to be submitted to EPA pursuant to said Consent Order.

Very truly yours,
Halocarbon Products Corporation

By Louis L. Ferstandig
Louis L. Ferstandig, Ph.D
Vice President & Technical Director

LLF:bc
Enclosures

Best Available Copy