



# Halocarbon

PRODUCTS CORPORATION

~~8548-0194 12987~~

887 KINDERKAMACK ROAD • RIVER EDGE, NEW JERSEY 07661

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

MAILING ADDRESS:

RIVER EDGE, NEW JERSEY 07661

**FYI-0494-000967**  
April 7, 1994



FYI-94-000967  
INIT 04/12/94

CERTIFIED MAIL

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

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



84948000067

## ORIGINAL

SECTION 8(e) NOTICE

Re: Asym dibromodifluoroethylene (CAS 430-85-3) [Also called Compound 2 in the reports]

Dear Sir/Madame:

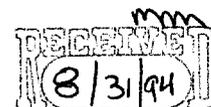
The following notice is submitted to you in accordance with paragraph V, F in the Agreement between Halocarbon Products Corporation (the Company) and the EPA, "Consent Agreement re Docket No. TSCA-90-H-18", with respect to Section 8(e). Although the report indicates slight toxicity to animals, this notice 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 Asym dibromodifluoroethylene (CAS 430-85-3) 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.

(These 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



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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



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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	15-Min. Exposure	Mortality											Cumulative Mortality
			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



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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

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ACUTE INHALATION EXPOSURE, 15 MINUTES - RATS

COMPOUND 2: asym dibromodifluoroethylene  
COMPOUND 5: D-1

10b  
10c

FINAL REPORT

Submitted to  
Halocarbon Products Corporation  
Hackensack, New Jersey

April 7, 1966



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HAZLETON LABORATORIES, INCORPORATED  
FALLS CHURCH, VIRGINIA



**Sponsor:** Halocarbon Products Corporation

**Date:** April 7, 1966

**Material:** Compound 2: asym dibromodifluoroethylene  
Compound 5: D-1

**Subject:** Acute Inhalation Exposure, 15 Minutes - Rats

#### OBJECTIVE

The purpose of this study was to assess the acute inhalation toxicity in rats undergoing exposure to 250 ppm of a vapor of Compound 2 or an aerosol of Compound 5.

#### MATERIAL

The materials were received from Halocarbon Products Corporation on January 14, 1966. Compound 2 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 a vapor of Compound 2; the other group was exposed to an aerosol of Compound 5. The exposures were conducted under dynamic conditions in a 100-liter exposure chamber.



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The saturated vapor of Compound 2, which has an approximate concentration of 197,000 ppm, was generated by bubbling a known flow of air through a fritted disk bubbler jar. The aerosol of Compound 5 was generated by metering the liquid with a precision liquid pump into a positive pressure spray nozzle assembly. The vapor or the aerosol 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 concentrations were calculated from the ratio of the flow rate of the saturated vapor of Compound 2 to the total airflow rate and from the ratio of the rate of liquid feed to the total airflow in the case of the aerosol of Compound 5.

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.

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## RESULTS

### Compound 2 (asym dibromodifluoroethylene)

A total of 63.5 milliliters per minute of a saturated vapor of Compound 2 was introduced into the exposure chamber at a chamber airflow rate of 50 liters per minute. The nominal concentration was calculated to be approximately 250 ppm.

No significant toxic signs were noted during the exposure period. A slight degree of dyspnea was noted during the observation period. No deaths occurred following exposure to this concentration of Compound 2.

No significant tissue alterations were noted at terminal gross necropsy.

### Compound 5 (D-1)

At the rate of 0.128 milliliters per minute, Compound 5 was aerosolized at a chamber airflow rate of 59 liters per minute. The nominal chamber concentration was calculated to be 250 ppm (the molecular weight of the compound was given to be approximately 500).

During exposure, hypopnea, periods of apnea, nasal discharge, and slight thoracic muscular spasms were noted. Following exposure, the animals exhibited hypopnea, bloody nasal discharge, asthenia, and anorexia for five to six days. One animal succumbed on Day 5. For the remaining eight days, the surviving animals appeared essentially normal.



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At gross necropsy, the lungs of the one animal which succumbed appeared mottled with hemorrhagic patches, and the surface of the kidneys also appeared mottled. Terminal gross necropsy of the remaining animals revealed a pale white appearance of the pulmonary tissue surface.

#### SUMMARY

The acute inhalation toxicity of Compounds 2 and 5 at a concentration of 250 ppm has been investigated.

No significant toxic reactions or gross necropsy findings were recorded following exposure to Compound 2.

Exposure to Compound 5 caused observable pulmonary functional changes. One animal succumbed. The prominent findings at necropsy were pulmonary tissue alterations.

Prepared by

*A. Gerald Beasley*  
A. GERALD BEASLEY, B.A.  
Inhalation Toxicology  
Section

Inhalation Division

Submitted by

*K. J. Leong*

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

Supervision: Leong  
Experimental: Beasley, Martin

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# Halocarbon

PRODUCTS CORPORATION

887 KINDERKAMACK ROAD • RIVER EDGE, NEW JERSEY 07661

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

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

April 7, 1994

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

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

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
- \*\* C<sub>4</sub>F<sub>6</sub>Br<sub>4</sub> (CAS 375-24-6)
- \*\* C<sub>4</sub>F<sub>4</sub>Br<sub>4</sub>Cl<sub>2</sub>
- \*\* CFCl<sub>2</sub>(CF<sub>2</sub>CFBr)<sub>n</sub>Cl where n is approximately 2 to 5
- \*\* CFC1Br(CF<sub>2</sub>CFBr)<sub>n</sub>Br where n is approximately 5 to 10
- \*\* CFC1Br(CF<sub>2</sub>CFBr)<sub>n</sub>Br where n is approximately 4 to 8
- \*\* CFC1Br(CF<sub>2</sub>CFBr)<sub>n</sub>Br where n is approximately 2 to 5
- \*\* CFCl<sub>2</sub>(CF<sub>2</sub>CFBr)<sub>n</sub>Cl where n is approximately 3 to 6
- \*\* CFCl<sub>2</sub>(CF<sub>2</sub>CFBr)<sub>n</sub>Cl 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(CF<sub>2</sub>CFCl)<sub>2</sub>Cl (CAS 423-38-1)

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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