

CONTAINS NO CBI

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Halocarbon

PRODUCTS CORPORATION

887 KINDERKAMACK ROAD • RIVER EDGE, NEW JERSEY 07661

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

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(A)

CERTIFIED MAIL

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

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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, D.C. 20460



88940000217

SECTION 8(e) NOTICE

Re: C₄F₆Br₄ (CAS 375-24-6) [Report Name: Halocarbon Oil 370]

Dear Sir/Madame:

ORIGINAL

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 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

RECEIVED
8/31/94

19 pgs.

The appended reports for the chemical substance $C_4F_6Br_4$ (CAS 375-24-6) 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 8.6 mg/L succumbed within 72 minutes. Necropsies revealed severe pulmonary hemorrhage and congested livers. The acute dermal LD50 for rabbits was between 100 and 500 microliters (240 and 1200 mg).

Very truly yours,



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

LLF:bc

ACUTE INHALATION EXPOSURE - RATS
HALOCARBON OILS 370 AND 375
FINAL REPORT

Submitted to
Halocarbon Products Corporation
Hackensack, New Jersey

November 22, 1967



HAZLETON LABORATORIES, INCORPORATED

FALLS CHURCH, VIRGINIA



Sponsor: Halocarbon Products Corporation

Date: November 22, 1967

Material: Halocarbon Oils 370 and 375

Subject: FINAL REPORT
Acute Inhalation Exposure - Rats

OBJECTIVE

The objective of this study was to evaluate the effects in rats of a six hour inhalation exposure to the saturated vapors of Halocarbon Oils 370 and 375.

MATERIALS

One bottle each of Halocarbon Oils 370 and 375 were received from Halocarbon on October 17, 1967. They were both clear oils with a characteristic odor. For the purpose of this study, they were considered to be free from impurities and used as received.

METHODS

Two groups of six male rats (300 to 381 grams) were exposed to the saturated vapors of Halocarbon Oils 370 and 375.

The Halocarbon Oil 370 was placed in a 100 milliliter round bottom boiling flask immersed in a 52° C. constant temperature water



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bath. Nitrogen was bubbled through the oil at a rate of 4 liters per minute, then combined with an oxygen flow of 1 liter per minute. This mixture of 80% nitrogen, 20% oxygen, and the compound vapor passed through a glass wool trap and a coarse fritted glass disk to remove all aerosol droplets. The saturated artificial air was then introduced into a 15.5-liter nylon and plexiglas chamber. A 500 ml. gas collecting bottle containing 300 ml. of cooled benzene was attached to the chamber exhaust to collect the Halocarbon oil vapors that passed through the chamber. The chamber atmosphere was drawn through this gas collecting bottle by a positive pressure rotary pump. A water manometer was attached to the chamber and the rotary pump was regulated to maintain the chamber at ambient pressure. An identical generating system was utilized with Halocarbon Oil 375.

The concentration of each Halocarbon oil was calculated from the ratio of net compound weight loss (the difference between the reservoir weight loss and the weight gain by the glass trap) to the total chamber airflow.

During exposure, the rats were individually housed in a compartmented wire mesh cage. The animals were observed for signs of irritation, toxicity, and time of death. The time of death was noted to the nearest minute.



At the termination of the exposure, the surviving animals were group housed and observed for 14 days for latent toxic effects or death. Gross necropsies were performed on all animals which succumbed during the exposure or observation period and on those sacrificed at the termination of the 14-day observation period. The lungs, trachea, kidneys, liver, and other organs showing gross abnormalities were removed and examined for gross pathological signs. These tissues were preserved in 10% formalin for possible future histopathological examination.

RESULTS

Halocarbon Oil 370

All six rats succumbed within 75 minutes of the six-hour exposure period. The chamber airflow was 5 liters/minute, and the net oil loss was 3.23 grams. Thus, the nominal concentration of oil in the experimental atmosphere was calculated to be 8.6 mg/liter of chamber air.

All rats showed restlessness, gasping, eye irritation, hyperemia of the ears, and moist and swollen nares within the first 15 minutes of exposure. These conditions persisted in all animals until death. All animals died during the exposure and the individual times of death are shown in Table No. 1. The Lt50 was found to be 62 minutes.



Table No. 1 - Time of death of animals exposed to
8.6 mg/l of Halocarbon Oil 370

<u>Rat No.</u>	<u>Minutes of Exposure Prior to Death</u>
1	49
2	52
3	62
4	64
5	68
6	72

Mean 61 ± 9.3

Lt50: 62 minutes

95% confidence limits (Litchfield & Wilcoxon)
53.5 minutes to 62.9 minutes

Necropsies performed on all animals immediately after termination of the exposure showed severe hemorrhaging in the lungs and congestion of the livers in each of the animals. Blood was found in the small intestine of five of the six rats. No compound related abnormalities were noted in the trachea and kidney.

Halocarbon Oil 375

The exposure duration was six hours. The chamber airflow was 5 liters per minute, and the net oil loss was 0.36 grams. Thus, the concentration of oil in the experimental atmosphere was calculated to be 0.2 mg/liter of chamber air.



All rats showed restlessness, eye irritation, puffy eyelids, and hyperemic ears within the first hour. These conditions persisted for the duration of the exposure. After 350 minutes of exposure, Animal No. 6 became pale and dyspneic.

On the first day of postexposure observation, most animals sneezed frequently, four had dried blood around the nares, and all exposed skin areas appeared moderately hyperemic. Eyelids appeared to remain irritated and eyes were glassy. The rats were not active.

One rat died on the second observation day. Necropsy showed that the lungs contained blood and the liver was congested. The other five rats appeared normal with the exception of hyperemia of the ears, which persisted on the third day of postexposure and to a lesser degree on the fourth day. From the fifth day until sacrifice all five animals appeared normal.

Gross necropsies performed at the termination of the 14-day observation period on the five remaining rats showed two cases of lung adhesions, three cases of pulmonary lobular consolidation, three cases of lungs with dark spots, and one case of a lung which appeared to contain many tumors. Three rats had greyish colored livers. One instance of slight kidney degeneration and another with poor kidney differentiation was noted. A black area on the spleen from one rat was also seen.



SUMMARY

Halocarbon Oil 370

Six male rats were exposed to the saturated vapors of Halocarbon Oil 370 at a nominal concentration of 8.6 mg/liter of chamber air. Signs of irritation noted throughout the exposure were restlessness, eye irritation, hyperemia of the ears, gasping, and moist, swollen nares.

All animals succumbed within the first 72 minutes of exposure, and the LT_{50} was 62 minutes. Gross necropsies of these animals revealed severe pulmonary hemorrhage and congestion of the livers.

Halocarbon Oil 375

Six male rats were exposed for six hours to the saturated vapors of Halocarbon Oil 375 at a nominal concentration of 0.2 mg/liter of chamber air. Signs of irritation seen during the exposure included puffy eyelids and hyperemic ears. One rat became pale and dyspneic after 350 minutes of exposure.

One rat died on the second observation day, and the remaining five rats showed hyperemic ears for the first four observation days. From the fifth day until the end of the 14-day observation period no abnormalities were noted.



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Gross necropsies of the remaining five rats showed lobular pulmonary consolidation, dark spots on the lung surfaces, and slightly discolored livers.

Submitted by:

Neil A. Littlefield
NEIL A. LITTLEFIELD, Ph.D.
Supervisor, Inhalation Toxicology
Section, Inhalation Division

ACUTE DERMAL TOXICITY - RABBITS

HALOCARBON OIL 370

HALOCARBON OIL 375

FINAL REPORT

Submitted to

Halocarbon Products Corporation
Hackensack, New Jersey

January 3, 1968



HAZLETON LABORATORIES, INCORPORATED

FALLS CHURCH, VIRGINIA



Sponsor: Halocarbon Products Corporation

Date: January 3, 1968

Material: Halocarbon Oil 370
Halocarbon Oil 375

Lot No:

Subject: FINAL REPORT
Acute Dermal Toxicity - Rabbits
Project No. 147-111

SUMMARY

Halocarbon Oil 370 and Halocarbon Oil 375 were each evaluated for dermal irritation and toxicity by a 24-hour application to intact and abraded abdominal skin of albino rabbits at dosage levels of 100 and 500 $\mu\text{l}/\text{animal}$.

Death occurred in one animal at the 100 $\mu\text{l}/\text{rabbit}$ level and in all animals at the 500 $\mu\text{l}/\text{rabbit}$ group exposed to Halocarbon Oil 370; therefore, its acute dermal LD_{50} is assumed to be greater than 100 $\mu\text{l}/\text{rabbit}$ but less than 500 $\mu\text{l}/\text{rabbit}$. Severe skin irritation was produced at the lower level, characterized by moderate or marked erythema and edema, blanching, fissuring, and necrosis of exposed areas, generally followed by desquamation and/or sloughing; death at the higher level precluded the evaluation for skin irritation.

No deaths nor signs of toxicity were noted in animals exposed to Halocarbon Oil 375; therefore, its dermal LD_{50} is assumed to be greater than 500 $\mu\text{l}/\text{animal}$. The compound also elicited moderate to severe skin



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irritation consisting of erythema, edema, blanching, coriaceous and necrotic areas, followed by desquamation and/or sloughing.

MATERIALS

Identification Halocarbon Oil 370; Halocarbon Oil 375.

Description Clear colorless liquids, no discernible odor.

Receipt Date October 17, 1967, from Halocarbon Products Corporation.

Purity Considered to be free of impurities and used as received.

METHODS

Animals Adult albino rabbits, either sex, of the New Zealand White variety.

Body Weight Range At initiation, 2.0 to 2.9 kg.

Administration A single application of Halocarbon Oil 370 and 375 each was made to two groups of four rabbits each at dosage levels of 100 and 500 μ l/animal. The test material was applied to the closely clipped intact (half the animals) and abraded (half the animals) abdominal skin of each rabbit beneath polyethylene "Saran" wrap binding. The trunk of each animal was then wrapped with gauze and adhesive tape. After an exposure period of 24 hours, the binders



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were removed, and the abdominal skin was cleansed with Fuller's earth to remove any compound residue.

Diet Purina Rabbit Chow and water available ad libitum.

Observations and Records

Mortality and Toxic Effects: Recorded immediately following application, at 24 hours, and once daily thereafter for a total of 14 days.

Dermal Effects: The amount of compound residue present at 24 hours was estimated. Dermal irritation recorded at 24 hours for both levels and once daily thereafter for a total of 14 days.

Body Weights: Recorded initially and terminally.

Terminal Studies

Sacrifice: Surviving animals sacrificed by intravenous air embolism after a 14-day observation period.

Gross Necropsy: Performed on all animals which died and on those sacrificed at termination.

RESULTS

Halocarbon Oil 370

Principal Toxic Effects: Death in one animal at the 100 μ l. level on Day 5, which was preceded by depression, labored respiration, apparent bloating, diarrhea, and terminal body weight loss;



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also, apparent enlargement and thickening of the scrotum (possibly edema resulting from local irritation) in two animals at the 100 μ l. level by Day 3; total mortality by 24 hours at the 500 μ l. level.

Compound Residue: No compound residue was evident on the binders and/or abdomen following removal of the binders at 24 hours.

Gross Signs of Dermal Irritation: Gross signs of dermal irritation were precluded by death in all animals at the 500 μ l. level. However, at the 100 μ l. level severe skin irritation was elicited, which, at 24 hours, consisted of moderate to marked erythema and edema, that gradually diminished or completely subsided by termination in the three surviving animals; blanching and a brown coloration of the exposed areas, which disappeared by Day 13; development of slight desquamation by Day 7 or Day 8, which subsided by Day 13; development of coriaceous and necrotic areas within Day 3 to Day 5, which (necrotic areas) later sloughed off, exposing raw areas in two animals and persisted in the third animal; and slight fissuring in two animals by Day 9 and Day 11.

Major Necropsy Findings: At death - dark red coloration of and firm appearance of the lung lobes, a pitted renal surface, and intestinal distension. At sacrifice - enlarged appearance of the kidneys with a dark red corticomedullary zone and a rough hepatic surface in two animals.



Halocarbon Oil 375

Principal Toxic Effects: An enlarged-appearing scrotal sac in one animal and nasal discharge in another animal at the 100 μ l. level; transient diarrhea and terminal body weight loss in one animal at the 500 μ l. level.

Compound Residue: Little or none of the compound residue was present on the binders or abdomen following removal of the binders at 24 hours.

Gross Signs of Dermal Irritation: Severe irritation was produced and, at 24 hours, consisted of moderate to marked erythema and edema at both levels, which gradually diminished and subsided by Day 13; blanching and a brown coloration of the exposure area in all animals; development of coriaceous areas in all animals during the second week, which either persisted to termination or sloughed off; slight transient desquamation in one or two animals at both levels; slight fissuring at the 500 μ l. level; and development of necrotic areas by Day 2 or Day 3 in two animals at the 100 μ l. level and between Day 2 and Day 10 in all animals at the 500 μ l. level, which began to slough off by Day 12 or Day 13, exposing new skin or raw areas which were still present at termination.



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Major Necropsy Findings: None except kidneys showing a pitted surface and poor differentiation between the cortex and medulla or a red coloration of the medulla.

Submitted by

Marcelina B Powers
MARCELINA B. POWERS, D.V.M.
Research Coordinator
Toxicology Division

Report Preparation: Clarke
Supervision: Mitterer, Broughton
Experimental: Nelson, Vincent

sfh

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CONTAINS NO CBI
Halocarbon

PRODUCTS CORPORATION

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Re

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
APR 12 11 05 AM '94

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)

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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