

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations Issue date: 2/8/2011 Revision date: 2/23/2023 Supersedes: 7/29/2020 Version: 3.1

## **SECTION 1: Identification**

#### 1.1. Identification

Product form : Substance

Substance name : BROMOETHANE (1,1-D2, 98%)

 CAS-No.
 : 74-96-4

 Product code
 : DLM-2604

 Formula
 : CH3CD2Br

 Synonyms
 : Ethyl bromide

#### 1.2. Recommended use and restrictions on use

No additional information available

#### 1.3. Supplier

Cambridge Isotope Laboratories, Inc.

50 Frontage Rd

01810

ANDOVER, MA, 01810

USA

T 1-800-322-1174

cilsales@isotope.com - www.isotope.com

#### 1.4. Emergency telephone number

Emergency number : 1-703-741-5970

Chemtrec 1-800-424-9300 24 hours

## **SECTION 2: Hazard(s) identification**

#### 2.1. Classification of the substance or mixture

#### **GHS US classification**

Flammable liquids Category 2 H225 Highly flammable liquid and vapor

Acute toxicity (oral) Category 4 H302 Harmful if swallowed Acute toxicity (inhalation) Category 4 H332 Harmful if inhaled

Carcinogenicity Category 2 H351 Suspected of causing cancer (Inhalation, oral)

Full text of H statements : see section 16

#### 2.2. GHS Label elements, including precautionary statements

## **GHS US labeling**

Hazard pictograms (GHS US) :







Signal word (GHS US) : Danger

Hazard statements (GHS US) : H225 - Highly flammable liquid and vapor

H302+H332 - Harmful if swallowed or if inhaled H351 - Suspected of causing cancer (Inhalation, oral)

Precautionary statements (GHS US) : P201 - Obtain special instructions before use.

P202 - Do not handle until all safety precautions have been read and understood.

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No

smoking. heat, hot surfaces, open flames, sparks

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P233 - Keep container tightly closed.

P240 - Ground/Bond container and receiving equipment.

P241 - Use explosion-proof electrical, lighting, ventilating equipment.

P242 - Use only non-sparking tools.

P243 - Take precautionary measures against static discharge.

P261 - Avoid breathing dust, fume, gas, mist, spray, vapors.

P264 - Wash hands, forearms and face thoroughly after handling.

P270 - Do not eat, drink or smoke when using this product.

P271 - Use only outdoors or in a well-ventilated area.

P280 - Wear eye protection, face protection, protective clothing, protective gloves.

P301+P312 - If swallowed: Call a doctor, a POISON CENTER if you feel unwell.

P303+P361+P353 - If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.

P308+P313 - If exposed or concerned: Get medical advice/attention.

P312 - Call a doctor, a POISON CENTER if you feel unwell.

P330 - Rinse mouth

P370+P378 - In case of fire: Use dry sand, alcohol resistant foam to extinguish.

P403+P235 - Store in a well-ventilated place. Keep cool.

P405 - Store locked up.

P501 - Dispose of contents/container to a licensed hazardous-waste disposal contractor or collection site except for empty clean containers which can be disposed of as non-hazardous waste.

#### 2.3. Other hazards which do not result in classification

No additional information available

#### 2.4. Unknown acute toxicity (GHS US)

Not applicable

#### **SECTION 3: Composition/Information on ingredients**

#### 3.1. Substances

Name	Product identifier	%	GHS US classification
BROMOETHANE (1,1-D2, 98%) (Main constituent)	CAS-No.: 74-96-4	100	Flam. Liq. 2, H225 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Carc. 2, H351

Full text of hazard classes and H-statements : see section 16

#### 3.2. Mixtures

Not applicable

## **SECTION 4: First-aid measures**

#### 4.1. Description of first aid measures

First-aid measures general

First-aid measures after inhalation

- : If you feel unwell, seek medical advice (show the label where possible). Evacuate danger area.
- When symptoms occur: go into open air and ventilate suspected area. If not breathing, give artificial respiration. Get medical advice/attention.

First-aid measures after skin contact

First-aid measures after eye contact

- Wash with plenty of soap and water. Get immediate medical advice/attention.
- Rinse cautiously with water for several minutes.

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First-aid measures after indestion

: Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get medical advice/attention.

## 4.2. Most important symptoms and effects (acute and delayed)

Potential Adverse human health effects and symptoms

: Narcosis. Dizziness. Ataxia. Weakness. Tremors. This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. Stomach - Irregularities - Based on Human Evidence.

Symptoms/effects
Symptoms/effects after inhalation
Symptoms/effects after skin contact

: Suspected of causing cancer (if inhaled, if swallowed).: Harmful if inhaled. May cause respiratory irritation.

Symptoms/effects after eye contact
Symptoms/effects after ingestion

May be harmful in contact with skin. May cause moderate irritation.

May cause eye irritation.

: May cause eye irritation.: Harmful if swallowed.: Suspected carcinogen.

## 4.3. Immediate medical attention and special treatment, if necessary

No additional information available

Chronic symptoms

## **SECTION 5: Fire-fighting measures**

#### 5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water spray. Dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2).

#### 5.2. Specific hazards arising from the chemical

Fire hazard : Highly flammable liquid and vapor.

Hazardous decomposition products in case of fire : Carbon oxides (CO, CO2).

#### 5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions : Fight fire with normal precautions from a reasonable distance. Wear a self contained breathing

apparatus. Do not enter fire area without proper protective equipment, including respiratory

protection.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Wear

recommended personal protective equipment.

## **SECTION 6: Accidental release measures**

#### 6.1. Personal precautions, protective equipment and emergency procedures

#### 6.1.1. For non-emergency personnel

Protective equipment : Wear recommended personal protective equipment. Ensure there is adequate ventilation.

Remove all sources of ignition. Evacuate the danger area. Special attention should be given to

low areas/pits where flammable vapors can accumulate.

Emergency procedures : Avoid breathing vapors, mist, gas. Avoid dust formation.

## 6.1.2. For emergency responders

Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer

to section 8: "Exposure controls/personal protection".

#### 6.2. Environmental precautions

Prevent entry to sewers and public waters. Do not allow to enter drains or water courses. Avoid release to the environment.

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#### 6.3. Methods and material for containment and cleaning up

For containment : Clean up any spills as soon as possible, using an absorbent material to collect it. Small

quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. For large spills, confine the spill in a dike and charge it with wet sand or earth for

subsequent safe disposal.

Methods for cleaning up : This material and its container must be disposed of in a safe way, and as per local legislation.

#### 6.4. Reference to other sections

For further information refer to section 13.

## **SECTION 7: Handling and storage**

#### 7.1. Precautions for safe handling

Precautions for safe handling : Avoid contact with skin and eyes. Avoid breathing dust, mist or spray. Use explosion-proof

equipment. Keep away from sources of ignition - No smoking. Take precautionary measures

against static discharge.

Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or

smoking and when leaving work. Handle in accordance with good industrial hygiene and safety

oractice.

#### 7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Store in a well-ventilated place. Keep container tightly closed.

Storage conditions : Store refrigerated (-5 °C to 5 °C). Protect from light.

## **SECTION 8: Exposure controls/personal protection**

#### 8.1. Control parameters

BROMOETHANE (1,1-D2, 98%) (74-96-4)	
USA - ACGIH - Occupational Exposure Limits	
ACGIH OEL TWA [ppm]	5 ppm CNS impairment. Liver damage. Confirmed animal carcinogen with unknown relevance to humans. Danger of cutaneous absorption.
Remark (ACGIH)	PEL 5 ppm; 22 mg/m3 California permissible exposure limits for chemical contaminates. (Title 8, Article 107) Skin.
USA - OSHA - Occupational Exposure Limits	
OSHA PEL TWA [1]	890 mg/m³ Occupational Exposure Limits (OSHA) - Table Z -1 Limits for Air Contaminants. See Appendix D - Substances with No Established RELs
OSHA PEL TWA [2]	200 ppm Occupational Exposure Limits (OSHA) - Table Z -1 Limits for Air Contaminants. See Appendix D - Substances with No Established RELs

#### 8.2. Appropriate engineering controls

Appropriate engineering controls : Wash hands and other exposed areas with mild soap and water before eating, drinking or

smoking and when leaving work.

Environmental exposure controls : Avoid release to the environment.

## 8.3. Individual protection measures/Personal protective equipment

#### Personal protective equipment:

Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.

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#### Materials for protective clothing:

Wear suitable protective clothing and gloves

#### Hand protection:

Wear suitable protective clothing and gloves

#### Eye protection:

Wear eye protection. Chemical goggles or face shield with safety glasses

#### Skin and body protection:

Wear suitable protective clothing, gloves and eye/face protection

#### Respiratory protection:

In case of inadequate ventilation wear respiratory protection. Approved supplied air respirator

#### Personal protective equipment symbol(s):









## **SECTION 9: Physical and chemical properties**

## 9.1. Information on basic physical and chemical properties

Physical state : Liquid Appearance : Clear.

Color
Color
Color
Color
Color
Color
Color
Colorless to light yellow
Color
Colo

Boiling point :  $37 - 40 \,^{\circ}\text{C}$  (99 -  $104 \,^{\circ}\text{F}$ ) - lit Flash point :  $-23 \,^{\circ}\text{C}$  (-9  $^{\circ}\text{F}$ ) - closed cup

Relative evaporation rate (butyl acetate=1) : No data available Flammability (solid, gas) : No data available

 Vapor pressure
 : 519.7 hPa (389.8 mmHg) at 20 °C (68 °F)

 Vapor pressure at 50°C
 : 1,745.2 hPa (1,309.0 mmHg) at 55 °C (131 °F)

Relative vapor density at 20°C : 3.76 - (Air = 1.0)

Relative density : 1.46 g/mL at 25 °C (77 °F)

Molecular mass : 110.98 g/mol (Labeled)

Solubility : No data available

Partition coefficient n-octanol/water (Log Pow) : No data available

Auto-ignition temperature : 511 °C (952 °F)

Decomposition temperature : No data available

Auto-ignition temperature : 511 °C (952 °F)

Decomposition temperature : No data available

Viscosity, kinematic : No data available

Viscosity, dynamic : No data available

Explosion limits : Lower explosion limit: 6.75 vol % (V)
Upper explosion limit: 11.25 vol % (V)

Explosive properties : No data available
Oxidizing properties : No data available

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## 9.2. Other information

No additional information available

## **SECTION 10: Stability and reactivity**

## 10.1. Reactivity

No additional information available

#### 10.2. Chemical stability

Stable if stored under recommended conditions.

#### 10.3. Possibility of hazardous reactions

Vapors may form explosive mixture with air.

## 10.4. Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Protect from sunlight.

## 10.5. Incompatible materials

Strong oxidizing agents. Strong bases. Magnesium. potassium. Sodium (Na). Salts. Aluminum. zinc. Alkali metals.

## 10.6. Hazardous decomposition products

Carbon oxides (CO, CO2). Hydrogen bromide.

## **SECTION 11: Toxicological information**

#### 11.1. Information on toxicological effects

Acute toxicity (oral) : Harmful if swallowed.
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Harmful if inhaled.

BROMOETHANE (1,1-D2, 98%) (74-96-4)	
LD50 oral rat	1350 mg/kg
LC50 Inhalation - Rat [ppm]	26980 ppm 1 h
ATE US (oral)	500 mg/kg body weight
ATE US (gases)	4500 ppmV/4h
ATE US (vapors)	11 mg/l/4h
ATE US (dust, mist)	1.5 mg/l/4h

Skin corrosion/irritation : Not classified
Serious eye damage/irritation : Not classified
Respiratory or skin sensitization : Not classified
Germ cell mutagenicity : Not classified

Carcinogenicity : Suspected of causing cancer (Inhalation, oral).

BROMOETHANE (1,1-D2, 98%) (74-96-4)	
IARC group	3 - Not classifiable
Reproductive toxicity :	Not classified
STOT-single exposure :	Not classified
STOT-repeated exposure :	Not classified

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Aspiration hazard : Not classified
Viscosity, kinematic : No data available

Potential Adverse human health effects and symptoms : Narcosis. Dizziness. Ataxia. Weakness. Tremors. This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and

knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any

specific property of the product. Stomach - Irregularities - Based on Human Evidence.

Symptoms/effects : Suspected of causing cancer (if inhaled, if swallowed).

Symptoms/effects after inhalation : Harmful if inhaled. May cause respiratory irritation.

Symptoms/effects after skin contact : May be harmful in contact with skin. May cause moderate irritation.

Symptoms/effects after eye contact : May cause eye irritation. Symptoms/effects after ingestion : Harmful if swallowed. Chronic symptoms : Suspected carcinogen.

## **SECTION 12: Ecological information**

## 12.1. Toxicity

Ecology - general : The product is not considered harmful to aquatic organisms or to cause long-term adverse

effects in the environment.

#### **BROMOETHANE (1,1-D2, 98%) (74-96-4)**

NOEC chronic algae 200 mg/l Growth inhibition NOEC - Pseudokirchneriella subcapitata - 72 h - OECD Test

Guideline 201

#### 12.2. Persistence and degradability

No additional information available

## 12.3. Bioaccumulative potential

No additional information available

## 12.4. Mobility in soil

No additional information available

#### 12.5. Other adverse effects

Other adverse effects : Avoid release to the environment. Disposal must be done according to official regulations.

## **SECTION 13: Disposal considerations**

#### 13.1. Disposal methods

Regional legislation (waste) : Waste materials should be disposed of under conditions which meet Federal, State, and local

environmental control regulations.

Product/Packaging disposal recommendations : Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed

professional waste disposal service to dispose of this material.

Ecology - waste materials : Dispose of as unused product.

## **SECTION 14: Transport information**

In accordance with DOT / TDG / IMDG / IATA

#### 14.1. UN number

DOT NA No : UN1891 UN-No. (TDG) : UN1891

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UN-No. (IMDG) : 1891 UN-No. (IATA) : 1891

## 14.2. UN proper shipping name

Proper Shipping Name (DOT) : Ethyl bromide
Proper Shipping Name (TDG) : ETHYL BROMIDE
Proper Shipping Name (IMDG) : ETHYL BROMIDE
Proper Shipping Name (IATA) : Ethyl bromide

## 14.3. Transport hazard class(es)

#### DOT

Transport hazard class(es) (DOT) : 6.1 Hazard labels (DOT) : 6.1



#### **TDG**

Transport hazard class(es) (TDG) : 6.1 Hazard labels (TDG) : 6.1



#### **IMDG**

Transport hazard class(es) (IMDG) : 6.1 Hazard labels (IMDG) : 6.1



#### IATA

Transport hazard class(es) (IATA) : 6.1 Hazard labels (IATA) : 6.1



## 14.4. Packing group

Packing group (DOT) : II
Packing group (TDG) : II
Packing group (IMDG) : II
Packing group (IATA) : II

## 14.5. Environmental hazards

Other information : No supplementary information available.

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#### 14.6. Special precautions for user

Special transport precautions : Not dangerous

**DOT** 

UN-No.(DOT) : UN1891

DOT Special Provisions (49 CFR 172.102) IB2 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite

(31HZ1). Additional Requirement: Only liquids with a vapor pressure less than or equal to 110

kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized.

IP8 - Ammonia solutions may be transported in rigid or composite plastic IBCs (31H1, 31H2 and 31HZ1) that have successfully passed, without leakage or permanent deformation, the

hydrostatic test specified in 178.814 of this subchapter at a test pressure that is not less than 1.5

times the vapor pressure of the contents at 55 C (131 F). T7 - 4 178.274(d)(2) Normal..... 178.275(d)(3)

TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.

TP13 - Self-contained breathing apparatus must be provided when this hazardous material is

transported by sea.

DOT Packaging Exceptions (49 CFR 173.xxx) 153 DOT Packaging Non Bulk (49 CFR 173.xxx) 202 DOT Packaging Bulk (49 CFR 173.xxx) 243 DOT Quantity Limitations Passenger aircraft/rail (49 : 5 L

CFR 173.27)

DOT Quantity Limitations Cargo aircraft only (49 : 60 L

CFR 175.75)

**DOT Vessel Stowage Location** : B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a

> passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this

section is exceeded.

**DOT Vessel Stowage Other** 40 - Stow "clear of living quarters",85 - Under deck stowage must be in mechanically ventilated

space

**TDG** 

UN-No. (TDG) : UN1891 **Explosive Limit and Limited Quantity Index** 0.1 L Excepted quantities (TDG) : E4 : 5 L

Passenger Carrying Road Vehicle or Passenger

Carrying Railway Vehicle Index

Emergency Response Guide (ERG) Number : 131

Limited quantities (IMDG) : 100 ml Excepted quantities (IMDG) : E4 Packing instructions (IMDG) : P001 IBC packing instructions (IMDG) IBC02 IBC special provisions (IMDG) B8 Tank instructions (IMDG) T7 Tank special provisions (IMDG) TP2, TP13

EmS-No. (Fire) : F-A - FIRE SCHEDULE Alfa - GENERAL FIRE SCHEDULE EmS-No. (Spillage) : S-A - SPILLAGE SCHEDULE Alfa - TOXIC SUBSTANCES

Stowage category (IMDG) : B

Stowage and handling (IMDG) : SW2, SW5

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Segregation (IMDG) : SGG10

Flash point (IMDG) :

Properties and observations (IMDG) : Colourless volatile liquid evolving irritating vapour with a narcotic effect. Boiling point: 38°C.

Vapour can be ignited by an electric spark or similar sources of ignition. Toxic if swallowed, by

skin contact or by inhalation.

MFAG-No : 131

IATA

PCA Excepted quantities (IATA) : E4 PCA Limited quantities (IATA) : Y641 PCA limited quantity max net quantity (IATA) : 1L PCA packing instructions (IATA) 654 PCA max net quantity (IATA) 5L CAO packing instructions (IATA) : 662 CAO max net quantity (IATA) : 60L : 6L ERG code (IATA)

## 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

## **SECTION 15: Regulatory information**

#### 15.1. US Federal regulations

BROMOETHANE (1,1-D2, 98%) (74-96-4)	
SARA Section 302 Threshold Planning Quantity (TPQ)	Not subject to reporting requirements of the United States SARA Section 302.
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Delayed (chronic) health hazard

Commercial status of components according to the United States Environmental Protection Agency's Toxic Substances Control Act (TSCA):

Name	CAS-No.	Listing	Commercial status	Flags
BROMOETHANE (1,1-D2, 98%)	74-96-4	Not present	-	

## 15.2. International regulations

#### **CANADA**

No additional information available

## **EU-Regulations**

No additional information available

## National regulations

#### **BROMOETHANE (1,1-D2, 98%) (74-96-4)**

CAUTION: This material is supplied for research and development purposes subject to the R&D exemption under TSCA, 40 CFR 720.36, and must meet the requirements of the exemption, including supervision by a "technically qualified individual" as defined by 40 CFR 720.3(ee). The use of this material for "commercial purposes" as defined by 40 CFR 720.3(r) is not permitted in the United States.

#### 15.3. US State regulations

BROMOETHANE (1,1-D2, 98%) (74-96-4)	
U.S California - Proposition 65 - Carcinogens List	Yes

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BROMOETHANE (1,1-D2, 98%) (74-96-4)	
U.S California - Proposition 65 - Developmental Toxicity	No
U.S California - Proposition 65 - Reproductive Toxicity - Female	No
U.S California - Proposition 65 - Reproductive Toxicity - Male	No

## **SECTION 16: Other information**

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Other information : This product is not radioactive. The data given for this product are those of the corresponding

unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the

corresponding unlabeled compound.

Full text of H-phrases	
H225	Highly flammable liquid and vapor
H302	Harmful if swallowed
H332	Harmful if inhaled
H351	Suspected of causing cancer

#### Hazard Rating

Health : \* - Chronic (long-term) health effects may result from repeated overexposure

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