

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 13/12/2010 Revision date: 24/03/2021 Supersedes: 15/06/2016 Version: 12.0

DLM-458

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Substance

Substance name : DEUTERIUM CHLORIDE (D, 99%)

EC Index-No. : 017-002-00-2 (Unlabeled) EC-No. : 231-595-7 (Unlabeled)

CAS-No. : 7698-05-7

REACH registration No : 01-2119484862-27

Product code : DLM-458
Formula : DCl
Synonyms : HCl

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category : Professional use

Industrial/Professional use spec : For professional use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.

50 Frontage Road Andover, MA 01810

USA

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours) International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

 Press. Gas (Comp.)
 H280

 Acute Tox. 3 (Inhalation:gas)
 H331

 Skin Corr. 1A
 H314

 Eye Dam. 1
 H318

 STOT SE 3
 H335

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

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

R5 C; R35 Xi; R41 T; R23 Xi; R37

Full text of R-phrases: see section 16

GHS-US classification

 Press. Gas (Comp.)
 H280

 Acute Tox. 3 (Inhalation)
 H331

 Skin Corr. 1A
 H314

 Eye Dam. 1
 H318

 STOT SE 3
 H335

Full text of H statements : see section 16

24/03/2021 EN (English US) 1/9

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Adverse physicochemical, human health and environmental effects

No additional information available

Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)







GHS06

GHS05

GHS04

Signal word (CLP) : Danger

Hazard statements (CLP) : H280 - Contains gas under pressure; may explode if heated

H314 - Causes severe skin burns and eye damage

H331 - Toxic if inhaled

H335 - May cause respiratory irritation H318 - Causes serious eye damage

Precautionary statements (CLP) P260 - Do not breathe dust, fume, mist, gas, spray, vapors.

P264 - Wash Both hands thoroughly after handling P271 - Use only outdoors or in a well-ventilated area. P280 - Wear protective clothing, protective gloves.

P301+P330+P331 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

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. P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses, if present and easy to do. Continue rinsing.

GHS-US labeling

Hazard pictograms (GHS-US)







Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H280 - Contains gas under pressure; may explode if heated

H314 - Causes severe skin burns and eye damage

H318 - Causes serious eye damage

H331 - Toxic if inhaled

H335 - May cause respiratory irritation

Precautionary statements (GHS-US) P260 - Do not breathe dust, fume, gas, mist, spray, vapors.

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

P264 - Wash Both hands thoroughly after handling.

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

P280 - Wear protective clothing, protective gloves.

P301+P330+P331 - If swallowed: rinse mouth. Do NOT induce vomiting

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

P305+P351+P338 - If in eyes: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing P310 - Immediately call a poison center or doctor

P311 - Call a poison center or doctor

P312 - Call a poison center or doctor if you feel unwell

P321 - Specific treatment (see Hazard pictograms (CLP) on this label)

P363 - Wash contaminated clothing before reuse.

P403+P233 - Store in a well-ventilated place. Keep container tightly closed.

P405 - Store locked up.

P410+P403 - Protect from sunlight. Store in a well-ventilated place.

P501 - Dispose of contents/container to Comply with applicable regulations

Other hazards

No additional information available

24/03/2021 EN (English US) 2/9

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
DEUTERIUM CHLORIDE (D, 99%)	(CAS-No.) 7698-05-7 (EC-No.) 231-595-7 (Unlabeled) (EC Index-No.) 017-002-00-2 (Unlabeled) (REACH-no) 01-2119484862-27	100	R5 C; R35 Xi; R41 T; R23 Xi; R37
Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
DEUTERIUM CHLORIDE (D, 99%)	(CAS-No.) 7698-05-7 (EC-No.) 231-595-7 (Unlabeled) (EC Index-No.) 017-002-00-2 (Unlabeled) (REACH-no) 01-2119484862-27	100	Press. Gas (Comp.), H280 Acute Tox. 3 (Inhalation:gas), H331 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT SE 3, H335

Full text of R- and H- phrases: see section 16

Name	Product identifier	%	GHS-US classification
DEUTERIUM CHLORIDE (D, 99%) (Main constituent)	(CAS-No.) 7698-05-7	100	Press. Gas (Comp.), H280 Acute Tox. 3 (Inhalation), H331 Skin Corr. 1A, H314 Eye Dam. 1, H318 STOT SE 3, H335

Full text of H-phrases: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general : Move out of dangerous area. Consult a physician and show this safety data sheet.

First-aid measures after inhalation : If breathed in, move person to fresh air. If not breathing, give artificial respiration. Consult a

physician.

First-aid measures after skin contact : Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water.

Take victim immediately to hospital. Consult a physician.

First-aid measures after eye contact : Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician. Continue

rinsing eyes during transport to hospital.

First-aid measures after ingestion : Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse

mouth with water. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation : Toxic if inhaled. May cause respiratory irritation. Symptoms/effects after skin contact : Causes severe skin burns and eye damage.

Symptoms/effects after eye contact : Causes serious eye damage. Symptoms/effects after ingestion : May be harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

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

5.2. Special hazards arising from the substance or mixture

Fire hazard : Contains gas under pressure; may explode if heated.

5.3. Advice for firefighters

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.

Other information : Use water spray to cool unopened containers

24/03/2021 EN (English US) 3/9

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures : Wear respiratory protection. Avoid breathing vapors, mist or gas. Ensure adequate ventilation.

Evacuate personnel to safe areas.

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.

6.3. Methods and material for containment and cleaning up

For containment : Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable,

closed containers for 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

No additional information available

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed : Avoid contact with skin and eyes. Avoid inhalation of vapor or mist.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Wash hands before

breaks and at the end of workday.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Keep container tightly closed in a cool, dry and well-ventilated place.

Storage conditions : Store at room temperature away from light and moisture.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

DEUTERIUM CHLORIDE (D,	99%) (7698-05-7)	
Italy - Portugal - USA ACGIH	ACGIH Ceiling (ppm)	2 ppm Upper Respiratory Tract Irritation. Not classifiable as a human carcinogen.
USA NIOSH	NIOSH REL (ceiling) (mg/m³)	7 mg/m³ Often used in aqueous solution.
USA NIOSH	NIOSH REL (ceiling) (ppm)	5 ppm Often used in aqueous solution.
USA NIOSH	Remark (NIOSH)	Often used in an aqueous solution.
USA OSHA	OSHA PEL (Ceiling) (mg/m³)	7 mg/m³ The value in mg/m³ is approximate. Ceiling limit is to be determined from breathing-zone air samples.
USA OSHA	OSHA PEL (Ceiling) (ppm)	5 ppm Ceiling limit is to be determined from breathing- zone air samples.
USA OSHA	Remark (OSHA)	PEL 0.3 ppm / 0.45 mg/m3 - California permissible exposure limits for chemical contaminants. C 2 ppm - California permissible exposure limits for chemical contaminants.

8.2. Exposure controls

Appropriate engineering controls : Handle in accordance with good industrial hygiene and safety practice. Wash hands before

breaks and at the end of workday.

Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.



Materials for protective clothing

: Wear suitable protective clothing and gloves.

Hand protection : Wear suitable protective clothing and gloves.

Eye protection : Wear safety glasses with side shields (or goggles) and a face shield.

Skin and body protection : Wear suitable protective clothing, gloves and eye/face protection.

24/03/2021 EN (English US) 4/9

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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

Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

: Gas Physical state

Appearance : Compressed Gas : 37.47 g/mol (Labeled) Molecular mass

Color Colorless

Odor No data available Odor threshold No data available pН : No data available Relative evaporation rate (butyl acetate=1) : No data available Melting point : -114 °C (-173 °F) - lit. Freezing point : No data available **Boiling** point : -85 °C (-121 °F) - lit. Flash point : No data available Auto-ignition temperature No data available Decomposition temperature No data available Flammability (solid, gas) : No data available

Vapor pressure 226.636 hPa at 21.1 °C (70.0 °F);

546.596 hPa at 37.7 °C (99.9 °F)

Relative vapor density at 20 °C : No data available Relative density No data available

Relative gas density 1.18 g/mL at 25 °C (77 °F)

Solubility Soluble in water. Log Pow : No data available Log Kow : No data available Viscosity, kinematic No data available : No data available Viscosity, dynamic Explosive properties : No data available : No data available Oxidizing properties **Explosion limits** : No data available

Other information

No additional information available

SECTION 10: Stability and reactivity

Reactivity

No additional information available

Chemical stability

Stable if stored under recommended conditions.

Possibility of hazardous reactions

No additional information available

Conditions to avoid 10.4.

No additional information available

Incompatible materials

Bases, Amines, Alkali metals, Metals, Permanganates, e.g. Potassium permanganate. Fluorine, Metal acetylides, Hexalithium disilicide.

Hazardous decomposition products

Hydrogen chloride gas.

SECTION 11: Toxicological information

Information on toxicological effects

: Inhalation:gas: Toxic if inhaled. Acute toxicity

DEUTERIUM CHLORIDE (D, 99%) (7698-05-7)	
LD50 oral	900 mg/kg Rabbit
LC50 inhalation rat (ppm)	1562 ppm/4h

24/03/2021 EN (English US) 5/9

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

DEUTERIUM CHLORIDE (D, 99%) (7698-05-7	
ATE CLP (gases)	1562.000 ppmV/4h
Skin corrosion/irritation	: Skin - Reconstructed humanepidermis (RhE) - Result: Corrosive - (OECD Test Guideline 431)
Serious eye damage/irritation	: Eyes - Bovine cornea - Result: Corrosive - (OECD Test Guideline 437)
Respiratory or skin sensitization	: Maximisation Test - Guinea pig. Result: negative - (OECD Test Guideline 406)
Germ cell mutagenicity	: Chromosome aberration test in vitro. Chinese hamster ovary cells. Result: Conflicting results have been seen in different studies.
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity – single exposure	: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation - Acute inhalation toxicity - mucosal irritations, Cough Shortness of breath, Inhalation may lead to the formation of oedemas in the respiratory tract, Possible damages:, damage of respiratory tract, tissue damage(Hydrochloric Acid)
Specific target organ toxicity – repeated exposure	: Not classified
Aspiration hazard	: Not classified
Potential Adverse human health effects and symptoms	: Burning sensation. Cough. Laryngitis. Shortness of breath. Spasm, inflammation and edema of the larynx. Spasm, inflammation, and edema of the bronchi. Pulmonary edema. Pneumonitis. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. 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.
Symptoms/effects after inhalation	: Toxic if inhaled. May cause respiratory irritation.
Symptoms/effects after skin contact	: Causes severe skin burns and eye damage.
Symptoms/effects after eye contact	: Causes serious eye damage.
Symptoms/effects after ingestion	: May be harmful if swallowed.

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.

DEUTERIUM CHLORIDE (D, 99%) (7698-05-7)	
LC50 fish 1	282 mg/l Gamubsia affinis (Mosquito fish) - 96 h

12.2. Persistence and degradability

No additional information available

Bioaccumulative potential

No additional information available

Mobility in soil

No additional information available

Results of PBT and vPvB assessment

No additional information available

Other adverse effects

Other adverse effects : May be harmful to aquatic organisms due to the shift of the pH.

SECTION 13: Disposal considerations

Waste treatment 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 ADR / RID / IMDG / IATA / ADN

UN number 14.1.

UN-No.(DOT) : 1050

24/03/2021 EN (English US) 6/9

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

UN1050 DOT NA no.

14.2. **UN proper shipping name**

Proper Shipping Name (DOT) : Hydrogen chloride, anhydrous

: 2.3 - Class 2.3 - Poisonous gas 49 CFR 173.115 Class (DOT)

: 2.3 - Poison gas Hazard labels (DOT)

8 - Corrosive





DOT Special Provisions (49 CFR 172.102)

: 3 - This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone C (see 173.116(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter.

N86 - UN pressure receptacles made of aluminum alloy are not authorized.

N89 - When steel UN pressure receptacles are used, only those bearing the "H" mark are

authorized.

DOT Packaging Exceptions (49 CFR 173.xxx) : None DOT Packaging Non Bulk (49 CFR 173.xxx) : 304 DOT Packaging Bulk (49 CFR 173.xxx) : None DOT RQ : 5000 lbs Marine pollutant : No

Additional information 14.3.

Other information : No supplementary information available.

Special transport precautions : IATA Passenger/Cargo: Not permitted for transport.

Overland transport

Class (ADR) : 2 - Gases Hazard identification number (Kemler No.) : 268 Classification code (ADR) : 2TC

: 2.3 - Toxic gases Hazard labels (ADR)

8 - Corrosive substances



Orange plates

1050

Tunnel restriction code (ADR) : C/D Limited quantities (ADR) 0 **EAC** : 2RE APP : A(c) Excepted quantities (ADR) : F0

Transport by sea

: D - The material must be stowed "on deck only" on a cargo vessel and on a passenger vessel **DOT Vessel Stowage Location**

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, but the material is prohibited on passenger

vessels in which the limiting number of passengers is exceeded.

DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

MFAG-No : 125

Air transport

DOT Quantity Limitations Passenger aircraft/rail : Forbidden

(49 CFR 173.27)

24/03/2021 EN (English US) 7/9

DEUTERIUM CHLORIDE (D, 99%) DLM-45.

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

DOT Quantity Limitations Cargo aircraft only (49 : Forbidden

CFR 175.75)

Civil Aeronautics Law : Gases under pressure/Gases toxic under pressure

14.4. Environmental hazards

Other information : No supplementary information available.

14.5. Special precautions for user

Special transport precautions : IATA Passenger/Cargo: Not permitted for transport.

14.6. 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

DEUTERIUM CHLORIDE (D, 99%) (7698-05-7)	
SARA Section 302 Threshold Planning Quantity (TPQ)	Subject to reporting requirements of United States SARA Section 302
SARA Section 311/312 Hazard Classes	Sudden release of pressure hazard
SARA Section 313 - Emission Reporting	Subject to reporting requirements of United States SARA Section 313

15.2. International regulations

CANADA

DEUTERIUM CHLORIDE (D, 99%) (7698-05-7)

Not listed on the Canadian DSL (Domestic Substances List)

15.2.1. National regulations

No additional information available

15.3. US State regulations

DEUTERIUM CHLORIDE (D, 99%)(7698-05-7)	
U.S California - Proposition 65 - Carcinogens List	No
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
State or local regulations	U.S Massachusetts - Right To Know List U.S Pennsylvania - RTK (Right to Know) List U.S New Jersey - Right to Know Hazardous Substance List

SECTION 16: Other information

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 R-, H- and EUH-phrases:

toxt of it; if and bott prinacoo.	
Acute Tox. 3 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 3
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Press. Gas (Comp.)	Gases under pressure Compressed gas
Skin Corr. 1A	Skin corrosion/irritation Category 1A
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H280	Contains gas under pressure; may explode if heated
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage

24/03/2021 EN (English US) 8/9

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

H331	Toxic if inhaled
H335	May cause respiratory irritation
R23	Toxic by inhalation
R35	Causes severe burns
R37	Irritating to respiratory system
R41	Risk of serious damage to eyes
R5	Heating may cause an explosion
С	Corrosive
Т	Toxic
Xi	Irritant

NFPA health hazard : 2 - Materials that, under emergency conditions, can cause

temporary incapacitation or residual injury.

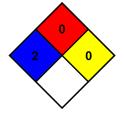
NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions,

including intrinsically noncombustible materials such as

concrete, stone, and sand.

NFPA reactivity : 0 - Material that in themselves are normally stable, even

under fire conditions.



Hazard Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is

given

Flammability : 1 Slight Hazard
Physical : 1 Slight Hazard

CIL Substance SDS

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

24/03/2021 EN (English US) 9/9