



1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%)

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

Date of issue: 05/01/2011

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Supersedes: 19/05/2017

Version: 2.1

DLM-181

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

1.1. Product identifier

Product form	: Substance
Substance name	: 1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%)
EC-No.	: 203-786-5 (Unlabeled)
CAS-No.	: 38274-25-8
REACH registration No	: 01-2119471849-20
Product code	: DLM-181
Formula	: HOCH2(CD2)2CH2OH
Synonyms	: 1,4-Butylene glycol / Tetramethylene glycol

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

USA: 1-800-322-1174 Int: 1-978-749-8000

cilsales@isotope.com www.isotope.com

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]

Acute Tox. 4 (Oral) H302

STOT SE 3 H336

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

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

Xn; R22

R67

Full text of R-phrases: see section 16

GHS-US classification

Acute Tox. 4 (Oral) H302

STOT SE 3 H336

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

Kidney, Central nervous system.

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2.2. Label elements

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

Hazard pictograms (CLP) :



GHS07

Signal word (CLP) :

Warning

Hazard statements (CLP) :

H302 - Harmful if swallowed
H336 - May cause drowsiness or dizziness

Precautionary statements (CLP) :

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.
P301+P312 - IF SWALLOWED: Call a doctor, a POISON CENTER if you feel unwell.
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 - Call a doctor, a POISON CENTER if you feel unwell.
P330 - Rinse mouth.

GHS-US labeling

Hazard pictograms (GHS-US) :



GHS07

Signal word (GHS-US) :

Warning

Hazard statements (GHS-US) :

H302 - Harmful if swallowed
H336 - May cause drowsiness or dizziness

Precautionary statements (GHS-US) :

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.
P301+P312 - If swallowed: Call a doctor, a POISON CENTER if you feel unwell
P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
P312 - Call a doctor, a POISON CENTER if you feel unwell
P330 - Rinse mouth.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
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

No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%)	(CAS-No.) 38274-25-8 (EC-No.) 203-786-5 (Unlabeled) (REACH-no) 01-2119471849-20	100	Xn; R22 R67
Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%)	(CAS-No.) 38274-25-8 (EC-No.) 203-786-5 (Unlabeled) (REACH-no) 01-2119471849-20	100	Acute Tox. 4 (Oral), H302 STOT SE 3, H336

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

Name	Product identifier	%	GHS-US classification
1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%) (Main constituent)	(CAS-No.) 38274-25-8	100	Acute Tox. 4 (Oral), H302 STOT SE 3, H336

1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%)

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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 : If you feel unwell, seek medical advice (show the label where possible). Evacuate danger area.
- First-aid measures after inhalation : 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 : Wash with plenty of soap and water. Get immediate medical advice/attention.
- First-aid measures after eye contact : Rinse cautiously with water for several minutes.
- First-aid measures after ingestion : 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, both acute and delayed

- Symptoms/effects : May cause drowsiness or dizziness.
- Symptoms/effects after inhalation : May be 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.

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

Treat symptomatically.

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

No additional information available

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.

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. Avoid breathing dust, mist or spray. Avoid dust formation. Ensure there is adequate ventilation. Evacuate the danger area.
- Emergency procedures : Ventilate spillage area. Avoid breathing vapors, mist, dust. Avoid contact with skin and eyes.

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 : Clean up any spills as soon as possible, using an absorbent material to collect it. Small Spill: Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor. 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.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Avoid contact with skin and eyes. Avoid dust formation. Provide good ventilation in process area to prevent formation of vapor. Use only outdoors or in a well-ventilated area. Avoid breathing dust, mist, vapors. Wear personal protective equipment.
- Hygiene measures : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

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

1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%) (38274-25-8)	
DNEL/DMEL (Workers)	
Long-term - systemic effects, dermal	19 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	136 mg/m ³
PNEC (Water)	
PNEC aqua (freshwater)	0.813 mg/l
PNEC aqua (marine water)	0.0813 mg/l
PNEC aqua (intermittent, marine water)	8.13 mg/l
PNEC (Sediment)	
PNEC sediment (freshwater)	3.61 mg/kg dwt
PNEC sediment (marine water)	0.361 mg/kg dwt
PNEC (Soil)	
PNEC soil	0.244 mg/kg dwt
PNEC (STP)	
PNEC sewage treatment plant	1554 mg/l

8.2. Exposure controls

- Appropriate engineering controls : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Ensure good ventilation of the work station.
- 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 eye protection. Chemical goggles or face shield with safety glasses. 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.
- Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- Physical state : Liquid
- Appearance : Viscous
- Molecular mass : 94.15 g/mol (Labeled)
- Color : Colorless
- Odor : No data available
- Odor threshold : No data available
- pH : No data available
- Relative evaporation rate (butyl acetate=1) : No data available
- Melting point : 16 °C (61 °F) - lit
- Freezing point : No data available

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Boiling point	: 230 °C (446 °F) - lit
Flash point	: 134 °C (273 °F) - closed cup
Auto-ignition temperature	: 385 °C (725 °F) at 1,013 hPa (760 mmHg)
Decomposition temperature	: No data available
Flammability (solid, gas)	: No data available
Vapor pressure	: 0.019 hPa (0.014 mmHg) at 25 °C (77 °F) – (OECD Test Guideline 104)
Relative vapor density at 20 °C	: 3.11 - (Air = 1.0)
Relative density	: No data available
Specific gravity / density	: 1.017 g/ml at 25 °C (77 °F) - lit.
Solubility	: Water: 100 g/l at 25 °C (77 °F) – (OECD Test Guideline 105) - completely miscible
Log Pow	: -0.88 at 25 °C (77 °F) – (OECD Test Guideline 107)
Log Kow	: No data available
Viscosity, kinematic	: 83.2 mm ² /s at 20 °C (68 °F)
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidizing properties	: No data available
Explosion limits	: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Five years after receipt if stored as stated in "Storage" section. Re-QC after 5 years.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

No additional information available

10.5. Incompatible materials

Strong oxidizing agents. Acid chlorides. Acid anhydrides. Reducing agents.

10.6. Hazardous decomposition products

Carbon oxides (CO, CO₂).

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Harmful if swallowed.

1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%) (38274-25-8)	
LD50 oral rat	1500 mg/kg male and female
LD50 dermal rat	> 5000 mg/kg male and female
LC50 inhalation rat (mg/l)	> 51.1 mg/l/4h male and female (OECD Test Guideline 403)
ATE CLP (oral)	500.000 mg/kg body weight

Skin corrosion/irritation	: Skin - Rabbit - Result: No skin irritation - 24 Hours
Serious eye damage/irritation	: Eyes - Rabbit - Result: No eye irritation
Respiratory or skin sensitization	: Not classified Maximisation Test (GPMT) Guinea pig Result: Did not cause sensitization
Germ cell mutagenicity	: In vitro mammalian cell gene mutation test - Chinese hamster ovary cells - Result: Negative
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity – single exposure	: May cause drowsiness or dizziness.
Specific target organ toxicity – repeated exposure	: Not classified

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1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%) (38274-25-8)

LOAEL (oral,rat,90 days)	500 mg/kg bodyweight/day male and female
NOAEL (oral,rat,90 days)	50 mg/kg bodyweight/day male and female

Aspiration hazard	: Not classified
Potential Adverse human health effects and symptoms	: 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. Effects on humans. Gastrointestinal complaints.
Symptoms/effects after inhalation	: May be 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.

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.
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1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%) (38274-25-8)

LC50 fish 1	> 30000 mg/l static test - Pimephales promelas (fathead minnow) (OECD Test Guideline 203) - 96 h
EC50 Daphnia 1	813 mg/l static test - Daphnia magna (Water flea) - 48 h (OECD Test Guideline 202)
EC50 other aquatic organisms 1	> 500 mg/l static test - Desmodesmus subspicatus (Scenedesmus subspicatus) - 72 h

12.2. Persistence and degradability

1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%) (38274-25-8)

Persistence and degradability	aerobic - Exposure time 10 d.
Biodegradation	90 - 100 % - Readily biodegradable (OECD Test Guideline 302B)

12.3. Bioaccumulative potential

1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%) (38274-25-8)

Log Pow	-0.88 at 25 °C (77 °F) - OECD Test Guideline 107
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12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects	: An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
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SECTION 13: Disposal considerations

13.1. 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

14.1. UN number

Not applicable

14.2. UN proper shipping name

Not applicable

14.3. Additional information

Other information	: No supplementary information available.
Special transport precautions	: Not classified as dangerous in the meaning of transport regulations.

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Overland transport

No additional information available

Transport by sea

No additional information available

Air transport

No additional information available

14.4. Environmental hazards

Other information : No supplementary information available.

14.5. Special precautions for user

Special transport precautions : Not classified as dangerous in the meaning of transport regulations.

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

1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%) (38274-25-8)	
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	Immediate (acute) health hazard Delayed (chronic) health hazard
SARA Section 313 - Emission Reporting	Not subject to reporting requirements of the United States SARA Section 313.

15.2. International regulations

CANADA

1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%) (38274-25-8)
Listed on the Canadian DSL (Domestic Substances List)

15.2.1. National regulations

No additional information available

15.3. US State regulations

1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%)(38274-25-8)	
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. - 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:

Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
STOT SE 3	Specific target organ toxicity (single exposure) Category 3

1,4-BUTANEDIOL-2,2,3,3-D4 (D, 98%)

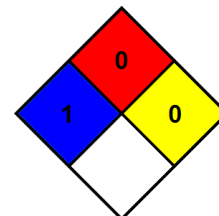
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H302	Harmful if swallowed
H336	May cause drowsiness or dizziness
R22	Harmful if swallowed
R67	Vapors may cause drowsiness and dizziness
Xn	Harmful

- NFPA health hazard : 1 - Materials that, under emergency conditions, can cause significant irritation.
- 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 : 1 Slight Hazard - Irritation or minor reversible injury possible
- Flammability : 0 Minimal Hazard
- Physical : 0 Minimal 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