



# DL-1,4-DITHIOTHREITOL(D10, 98%)

## Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations  
Issue date: 1/10/2011 Revision date: 9/27/2023 Supersedes: 5/15/2019 Version: 2.2

### SECTION 1: Identification

#### 1.1. Identification

Product form : Substance  
Substance name : DL-1,4-DITHIOTHREITOL(D10, 98%)  
CAS-No. : 3483-12-3  
Product code : DLM-2622  
Formula : DSCD2CD(OD)CD(OD)CD2SD  
Synonyms : (2S,3S)-1,4-Bis(sulfanyl)butane-2,3-diol; Cleland's Reagent; threo-1,4-Dimercapto-2,3-butanediol; DL-1,4-Dimercapto-2,3-dihydroxybutane; threo-2,3-Dihydroxy-1,4-dithiolbutane

#### 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](mailto:cilsales@isotope.com) - [www.isotope.com](http://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

|   |      |                                  |
|---|------|----------------------------------|
| Acute toxicity (oral) Category 3  | H301 | Toxic if swallowed               |
| Skin corrosion/irritation Category 2  | H315 | Causes skin irritation           |
| Serious eye damage/eye irritation Category 2A   | H319 | Causes serious eye irritation    |
| Specific target organ toxicity – Single exposure, Category 3,<br>Respiratory tract irritation | H335 | May cause respiratory irritation |

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) : H301 - Toxic if swallowed  
H315 - Causes skin irritation  
H319 - Causes serious eye irritation  
H335 - May cause respiratory irritation

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|                                   |   |
|-----------------------------------|---|
| Precautionary statements (GHS US) | : P261 - Avoid breathing dust, fume, gas, mist, spray, vapors.<br>P264 - Wash Both hands thoroughly after handling.<br>P270 - Do not eat, drink or smoke when using this product.<br>P271 - Use only outdoors or in a well-ventilated area.<br>P280 - Wear protective clothing, protective gloves.<br>P301+P310 - If swallowed: Immediately call a poison center or doctor.<br>P302+P352 - If on skin: Wash with plenty of water.<br>P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing.<br>P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.<br>P312 - Call a poison center or doctor if you feel unwell.<br>P321 - Specific treatment (see Hazard pictograms (CLP) on this label).<br>P330 - Rinse mouth.<br>P332+P313 - If skin irritation occurs: Get medical advice/attention.<br>P337+P313 - If eye irritation persists: Get medical advice/attention.<br>P362 - Take off contaminated clothing and wash before reuse.<br>P403+P233 - Store in a well-ventilated place. Keep container tightly closed.<br>P405 - Store locked up.<br>P501 - Dispose of contents/container to Comply with applicable regulations. |
|-----------------------------------|---|

### 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  |
|---|--------------------|-----|--|
| DL-1,4-DITHIOTHREITOL(D10, 98%)<br>(Main constituent) | CAS-No.: 3483-12-3 | 100 | Acute Tox. 3 (Oral), H301<br>Skin Irrit. 2, H315<br>Eye Irrit. 2A, H319<br>STOT SE 3, H335 |

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            | : Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.                   |
| 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 | : Wash off with soap and plenty of water. Consult a physician.  |
| First-aid measures after eye contact  | : Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.                                      |
| 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. |

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

|   |  |
|---|--|
| Potential Adverse human health effects and symptoms | : Nausea. Headache. Vomiting. Central nervous system depression. 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. Liver - Irregularities - Based on Human Evidence. |
| Symptoms/effects after inhalation                   | : May cause respiratory irritation.  |
| Symptoms/effects after skin contact                 | : Causes skin irritation.  |
| Symptoms/effects after eye contact                  | : Causes serious eye irritation.   |
| Symptoms/effects after ingestion                    | : Toxic if swallowed.  |

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

No additional information available

## SECTION 5: Fire-fighting measures

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

Suitable extinguishing media : Use water spray, alcohol-resistant foam, dry chemical, or carbon dioxide.

### 5.2. Specific hazards arising from the chemical

Hazardous decomposition products in case of fire : Carbon oxides (CO, CO<sub>2</sub>). Sulphur oxides.

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

Firefighting instructions : Wear self contained breathing apparatus for fire fighting if necessary.

## SECTION 6: Accidental release measures

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

#### 6.1.1. For non-emergency personnel

Emergency procedures : Use personal protective equipment. Avoid dust formation. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Avoid breathing dust.

#### 6.1.2. For emergency responders

No additional information available

### 6.2. Environmental precautions

Do not let product enter drains.

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

For containment : Take up mechanically (sweeping, shoveling) and collect in suitable container for disposal.

### 6.4. Reference to other sections

No additional information available

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### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

|                                   |  |
|-----------------------------------|--|
| Additional hazards when processed | : Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Provide appropriate exhaust ventilation at places where dust is formed. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. |
| 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 refrigerated (-5 °C to 5 °C). Protect from light.                 |

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

|  |  |
|--|--|
| <b>DL-1,4-DITHIOTHREITOL(D10, 98%) (3483-12-3)</b> |  |
| <b>USA - ACGIH - Occupational Exposure Limits</b>  |  |
| ACGIH chemical category                            | No component of this product present at levels greater than or equal to 0.1% is identifiable as a carcinogen or potential carcinogen by ACGIH. |

#### 8.2. Appropriate engineering controls

|                                  |  |
|----------------------------------|--|
| Appropriate engineering controls | : Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday. |
| Environmental exposure controls  | : Prevent further leakage or spillage if safe to do so. Do not let product enter drains.                                     |

#### 8.3. Individual protection measures/Personal protective equipment

##### Personal protective equipment:

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

|  |
|--|
| <b>Materials for protective clothing:</b>  |
| Wear suitable protective clothing and gloves   |
| <b>Hand protection:</b>  |
| Wear suitable protective clothing and gloves   |
| <b>Eye protection:</b>   |
| Wear safety glasses with side shields (or goggles) and a face shield.  |
| <b>Skin and body protection:</b>   |
| Choose body protection according to the amount and concentration of the dangerous substance at the work place. |
| <b>Respiratory protection:</b>   |
| When appropriate, use NIOSH/CEN approved respirator.   |

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### Personal protective equipment symbol(s):



## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

|   |                                    |
|---|------------------------------------|
| Physical state                                  | : Solid                            |
| Appearance                                      | : Powder.                          |
| Color   | : White                            |
| Odor  | : Unpleasant                       |
| Odor threshold                                  | : No data available                |
| pH  | : 4 – 6 at 15.4 g/l 25 °C (77 °F)  |
| Melting point                                   | : 41 – 44 °C (106 - 111 °F) - lit. |
| Freezing point                                  | : No data available                |
| Boiling point                                   | : No data available                |
| Flash point                                     | : 113 °C (235 °F) - closed cup     |
| Relative evaporation rate (butyl acetate=1)     | : No data available                |
| Flammability (solid, gas)                       | : No data available                |
| Vapor pressure                                  | : No data available                |
| Relative vapor density at 20°C                  | : No data available                |
| Relative density                                | : No data available                |
| Molecular mass                                  | : 164.31 g/mol (Labeled)           |
| Solubility                                      | : Water: 15.4 g/l                  |
| Partition coefficient n-octanol/water (Log Pow) | : 0.05                             |
| Auto-ignition temperature                       | : No data available                |
| Decomposition temperature                       | : No data available                |
| Viscosity, kinematic                            | : No data available                |
| Viscosity, dynamic                              | : No data available                |
| Explosion limits                                | : No data available                |
| Explosive properties                            | : No data available                |
| Oxidizing properties                            | : No data available                |

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

May decompose on exposure to moist air or water.

### 10.2. Chemical stability

Five years after receipt of order if stored as above. Re-QC after five years.

### 10.3. Possibility of hazardous reactions

No additional information available

### 10.4. Conditions to avoid

Air sensitive.

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### 10.5. Incompatible materials

Oxidizing agents. Bases. Reducing agents. Alkali metals.

### 10.6. Hazardous decomposition products

Carbon oxides. Sulphur oxides.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

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

#### DL-1,4-DITHIOTHREITOL(D10, 98%) (3483-12-3)

|               |                       |
|---------------|-----------------------|
| LD50 oral rat | 400 mg/kg             |
| ATE US (oral) | 100 mg/kg body weight |

Skin corrosion/irritation : Causes skin irritation.  
pH: 4 – 6 at 15.4 g/l 25 °C (77 °F)

Serious eye damage/irritation : Causes serious eye irritation.  
pH: 4 – 6 at 15.4 g/l 25 °C (77 °F)

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

STOT-single exposure : May cause respiratory irritation.

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

Viscosity, kinematic : No data available

Potential Adverse human health effects and symptoms : Nausea. Headache. Vomiting. Central nervous system depression. 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. Liver - Irregularities - Based on Human Evidence.

Symptoms/effects after inhalation : May cause respiratory irritation.

Symptoms/effects after skin contact : Causes skin irritation.

Symptoms/effects after eye contact : Causes serious eye irritation.

Symptoms/effects after ingestion : Toxic 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.

#### DL-1,4-DITHIOTHREITOL(D10, 98%) (3483-12-3)

|                      |   |
|----------------------|---|
| EC50 - Crustacea [1] | 27 mg/l Daphnia magna (Water flea) - 48 h |
|----------------------|---|

### 12.2. Persistence and degradability

No additional information available

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### 12.3. Bioaccumulative potential

#### DL-1,4-DITHIOTHREITOL(D10, 98%) (3483-12-3)

|   |      |
|---|------|
| Partition coefficient n-octanol/water (Log Pow) | 0.05 |
|---|------|

### 12.4. Mobility in soil

No additional information available

### 12.5. Other adverse effects

Other adverse effects : 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 : UN3335  
UN-No. (TDG) : UN3335  
UN-No. (IMDG) : Not applicable  
UN-No. (IATA) : 3335

### 14.2. UN proper shipping name

Proper Shipping Name (DOT) : Aviation regulated solid, n.o.s.  
Proper Shipping Name (TDG) : AVIATION REGULATED SOLID, N.O.S.  
Proper Shipping Name (IMDG) : Not applicable  
Proper Shipping Name (IATA) : Aviation regulated solid, n.o.s.

### 14.3. Transport hazard class(es)

#### DOT

Transport hazard class(es) (DOT) : 9  
Hazard labels (DOT) : 9



#### TDG

Transport hazard class(es) (TDG) : 9  
Hazard labels (TDG) : 9

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### IMDG

Transport hazard class(es) (IMDG) : Not applicable

### IATA

Transport hazard class(es) (IATA) : 9

Hazard labels (IATA) : 9



### 14.4. Packing group

Packing group (DOT) : Not applicable

Packing group (TDG) : Not applicable

Packing group (IMDG) : Not applicable

Packing group (IATA) : III

### 14.5. Environmental hazards

Other information : No supplementary information available.

### 14.6. Special precautions for user

Special transport precautions : Not dangerous goods.

### DOT

UN-No.(DOT) : UN3335

DOT Special Provisions (49 CFR 172.102) : A35 - This includes any material which is not covered by any of the other classes but which has an anesthetic, narcotic, noxious or other similar properties such that, in the event of spillage or leakage on an aircraft, extreme annoyance or discomfort could be caused to crew members so as to prevent the correct performance of assigned duties.

DOT Packaging Exceptions (49 CFR 173.xxx) : 155

DOT Packaging Non Bulk (49 CFR 173.xxx) : 204

DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 400 kg

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 400 kg

DOT Vessel Stowage Location : A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

### TDG

UN-No. (TDG) : UN3335



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|  |   |
|--|---|
| TDG Special Provisions                     | : 16 - (1) The technical name of at least one of the most dangerous substances that predominantly contributes to the hazard or hazards posed by the dangerous goods must be shown, in parentheses, on the shipping document following the shipping name in accordance with clause 3.5(1)(c)(ii)(A) of Part 3 (Documentation). The technical name must also be shown, in parentheses, on a small means of containment or on a tag following the shipping name in accordance with subsections 4.11(2) and (3) of Part 4 (Dangerous Goods Safety Marks).<br>(2) Despite subsection (1), the technical name for the following dangerous goods is not required to be shown on a shipping document or on a small means of containment when Canadian law for domestic transport or an international convention for international transport prohibits the disclosure of the technical name:<br>(a) UN1544, ALKALOID SALTS, SOLID, N.O.S. or ALKALOIDS, SOLID, N.O.S;<br>(b) UN1851, MEDICINE, LIQUID, TOXIC, N.O.S;<br>(c) UN3140, ALKALOID SALTS, LIQUID, N.O.S. or ALKALOIDS, LIQUID, N.O.S;<br>(d) UN3248, MEDICINE, LIQUID, FLAMMABLE, TOXIC, N.O.S; or<br>(e) UN3249, MEDICINE, SOLID, TOXIC, N.O.S.<br>(3) Despite subsection (1), the technical name for the following dangerous goods is not required to be shown on a small means of containment:<br>(a) UN2814, INFECTIOUS SUBSTANCE, AFFECTING HUMANS; or<br>(b) UN2900, INFECTIOUS SUBSTANCE, AFFECTING ANIMALS,63 - These Regulations do not apply to these dangerous goods unless they are to be transported by aircraft. |
| Explosive Limit and Limited Quantity Index | : 0   |
| Excepted quantities (TDG)                  | : E1  |
| Emergency Response Guide (ERG) Number      | : 171   |

### IMDG

No data available

### IATA

|  |         |
|--|---------|
| PCA Excepted quantities (IATA)               | : E1    |
| PCA Limited quantities (IATA)                | : Y956  |
| PCA limited quantity max net quantity (IATA) | : 30kgG |
| PCA packing instructions (IATA)              | : 956   |
| PCA max net quantity (IATA)                  | : 100kg |
| CAO packing instructions (IATA)              | : 956   |
| CAO max net quantity (IATA)                  | : 200kg |
| Special provision (IATA)                     | : A27   |
| ERG code (IATA)                              | : 9A    |

### 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

| DL-1,4-DITHIOTHREITOL(D10, 98%) (3483-12-3)        |   |
|--|---|
| 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<br>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 |
|---------------------------------|-----------|-------------|-------------------|-------|
| DL-1,4-DITHIOTHREITOL(D10, 98%) | 3483-12-3 | Not present | -                 |       |

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### 15.2. International regulations

#### CANADA

##### DL-1,4-DITHIOTHREITOL(D10, 98%) (3483-12-3)

Listed on the Canadian DSL (Domestic Substances List)

#### EU-Regulations

No additional information available

#### National regulations

No additional information available

### 15.3. US State regulations

No additional information available

## SECTION 16: Other information

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Revision date : 09/27/2023

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 |                                  |
|------------------------|----------------------------------|
| H301                   | Toxic if swallowed               |
| H315                   | Causes skin irritation           |
| H319                   | Causes serious eye irritation    |
| H335                   | May cause respiratory irritation |

Safety Data Sheet (SDS), USA

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.