



SIGMA-ALDRICH

## Material Safety Data Sheet

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Version 1,100

### Section 1 - Product and Company Information

**Product Name** 1,4-DITHIO-DL-THREITOL  
**Product Number** 43819  
**Brand** Fluka Chemical

**Company** Sigma-Aldrich  
**Street Address** 3050 Spruce Street  
**City, State, Zip, Country** SAINT LOUIS, MO 63103 US  
**Technical Phone:** 800-325-5832  
**Fax:** 800-325-5052  
**Emergency Phone:** 314-776-6555

### Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313	EC no	Annex I Index Number
DL-DITHIOTHREITOL	3483-12-3	No	222-468-7	

**Formula** C4H10O2S2  
**Synonyms** 2,3-Butanediol, 1,4-dimercapto-, (R\*,R\*)- (9CI), Cieland reagent, D-threo-1,4-Dimercapto-2,3-butanediol, (R\*,R\*)-1,4-Dimercapto-2,3-butanediol, 1,4-Dithiothreitol, D-1,4-Dithiothreitol, Sputolysin, Threitol, 1,4-dithio-, WR 34678

### Section 3 - Hazards Identification

**Emergency Overview**  
Toxic (USA) Harmful (EU).  
Harmful if swallowed. Irritating to eyes, respiratory system and skin.  
Unpleasant odor. Target organ(s): Central nervous system.

**HMIS Rating**  
Health: 2\* Flammability: 1 Reactivity: 1

**NFPA Rating**  
Health: 2 Flammability: 1 Reactivity: 1

\*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

### Section 4 - First Aid Measures

**Oral Exposure**  
If swallowed, wash out mouth with water provided person is conscious. Call a physician.

**Inhalation Exposure**  
If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

#### Dermal Exposure

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

#### Eye Exposure

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

### Section 5 - Fire Fighting Measures

**Flash Point:** 235 °F 113 °C

**Autoignition Temp:** N/A

#### Extinguishing Media

**Suitable**  
Water spray, Carbon dioxide, dry chemical powder, or appropriate foam.

#### Firefighting

##### Protective Equipment

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.

##### Specific Hazard(s)

Emits toxic fumes under fire conditions.

### Section 6 - Accidental Release Measures

#### Procedure to be Followed in Case of Leak or Spill

Evacuate area.

#### Procedure(s) of Personal Precaution(s)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

#### Methods for Cleaning Up

Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

### Section 7 - Handling and Storage

#### Handling

##### User Exposure

Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

#### Storage

##### Suitable

Keep tightly closed. Store at 2-8°C

#### Special Requirements

Store under inert gas. Moisture sensitive.

### Section 8 - Exposure Controls / PPE

#### Engineering Controls

Mechanical exhaust required. Safety shower and eye bath.

#### Personal Protective Equipment

##### Respiratory

Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N99 (US) or type P2 (EN 143) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.

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**Hand**  
Compatible chemical-resistant gloves.  
**Eye**  
Chemical safety goggles.

**General Hygiene Measures**  
Wash thoroughly after handling.

## Section 9 - Physical/Chemical Properties

Appearance Physical State Solid	Color White	Form Powder	Odor Unpleasant odor.
<b>Molecular Weight:</b> 154.25 AMU			
<b>pH</b>	4.0 - 6.0		
<b>BP/BP Range</b>	N/A		
<b>MP/MP Range</b>	40 - 44 °C		
<b>Freezing Point</b>	N/A		
<b>Vapor Pressure</b>	N/A		
<b>Vapor Density</b>	N/A		
<b>Saturated Vapor Conc.</b>	N/A		
<b>SG/Density</b>	N/A		
<b>Bulk Density</b>	N/A		
<b>Odor Threshold</b>	N/A		
<b>Volatile%</b>	N/A		
<b>VOC Content</b>	N/A		
<b>Water Content</b>	N/A		
<b>Solvent Content</b>	N/A		
<b>Evaporation Rate</b>	N/A		
<b>Viscosity</b>	N/A		
<b>Partition Coefficient</b>	N/A		
<b>Decomposition Temp.</b>	N/A		
<b>Flash Point °F</b>	235 °F		Method: closed cup
<b>Flash Point °C</b>	113 °C		Method: closed cup
<b>Explosion Limits</b>	N/A		
<b>Flammability</b>	N/A		
<b>Autoignition Temp</b>	N/A		
<b>Solubility</b>			
Solubility In Water: 0.1 M in H <sub>2</sub> O, 20°C			
Solvent: complete, colorless			

N/A = not available

## Section 10 - Stability and Reactivity

**Stability**  
**Stable**  
Stable.  
**Conditions of Instability**  
May decompose on exposure to moist air or water.  
**Materials to Avoid**  
Bases, Oxidizing agents, Reducing agents, Alkali metals.

**Hazardous Decomposition Products**  
**Hazardous Decomposition Products**  
Carbon monoxide, Carbon dioxide, Sulfur oxides, Hydrogen sulfide gas.

**Hazardous Polymerization**  
**Hazardous Polymerization**  
Will not occur.

## Section 11 - Toxicological Information

**Route of Exposure**  
**Skin Contact**  
Causes skin irritation.  
**Skin Absorption**  
May be harmful if absorbed through the skin.  
**Eye Contact**  
Causes eye irritation.  
**Inhalation**  
May be harmful if inhaled. Material is irritating to mucous membranes and upper respiratory tract.  
**Ingestion**  
Harmful if swallowed.

**Target Organ(s) or System(s)**  
Central nervous system.

**Signs and Symptoms of Exposure**  
Exposure can cause: Nausea, headache, and vomiting. CNS depression. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**RTECS Number:** EK1610000

### Toxicity Data

Oral - Rat: 400 mg/kg(LD50)  
Oral - Rat: 400 mg/kg(LD50)  
Intraperitoneal - Mouse: 154 MG/KG (LD50)  
Intramuscular - Mouse: 108 MG/KG (LD50)  
Remarks: Behavioral:Convulsions or effect on seizure threshold.

## Section 12 - Ecological Information

No data available.

## Section 13 - Disposal Considerations

**Appropriate Method of Disposal of Substance or Preparation**  
Contact a licensed professional waste disposal service to dispose of this material.  
Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.  
Observe all federal, state, and local environmental regulations.

## Section 14 - Transport Information

**DOT**  
**Proper Shipping Name:** None  
**Non-Hazardous for Transport:** This substance is considered to be non-hazardous for transport.

**IATA**  
**Non-Hazardous for Air Transport:** Non-hazardous for air transport.

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## Section 15 - Regulatory Information

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### EU Additional Classification

Symbol of Danger: Xn

Indication of Danger

Harmful.

Risk Statements R: 22 36/37/38

Harmful if swallowed. Irritating to eyes, respiratory system and skin.

Safety Statements S: 26 36

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.

### US Classification and Label Text

Indication of Danger

Toxic (USA) Harmful (EU).

Risk Statements

Harmful if swallowed. Irritating to eyes, respiratory system and skin.

Safety Statements

In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.

US Statements

Unpleasant odor. Target organ(s): Central nervous system.

### United States Regulatory Information

SARA Listed: No

TSCA Inventory Item: Yes

### Canada Regulatory Information

#### WHMIS Classification

This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

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## Section 16 - Other Information

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### Disclaimer

For R&D use only. Not for drug, household or other uses.

### Warranty

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2007 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.

