

**Order  
Number**
**Customer  
Number**
**1. Identification of the substance/preparation and of the company/undertaking**
**Product name** : Cleland's Reagent

**Catalog #** : 233155

**Chemical formula** : C<sub>4</sub>H<sub>10</sub>O<sub>2</sub>S<sub>2</sub>
**Supplier** : Manufactured by EMD Biosciences, Inc.  
10394 Pacific Center Court  
San Diego, CA 92121  
(858)450-5558/(800)854-3417  
FAX: (858)453-3552

**Synonym** : Dithiothreitol; DTT

**Emergency  
telephone number** : **Call Chemtrec®**  
**(800)424-9300 (within U.S.A.)**  
**(703)527-3887 (outside U.S.A.)**
**2. Composition / information on ingredients**
**Substance/Preparation** : Substance

Chemical name*	CAS No.	EC Number	Symbol	R-Phrases
1) Dithiothreitol; DTT	3483-12-3	248-531-9	Xn	R22, R36/38

**3. Hazards identification**
**Physical/chemical hazards** : Not applicable.

**Human health hazards** : CAUTION!  
MAY BE HARMFUL IF SWALLOWED.  
MAY CAUSE EYE AND SKIN IRRITATION.

**4. First-aid measures**
**First-Aid measures**

- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin Contact** : In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
- Eye Contact** : Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

**Effects and symptoms**

- Ingestion** : Hazardous in case of ingestion.
- Skin Contact** : Hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
- Eye Contact** : Hazardous in case of eye contact (irritant).

**Aggravating conditions** : Repeated or prolonged exposure is not known to aggravate medical condition.

## 5. Fire-fighting measures

- Flammability of the Product** : May be combustible at high temperature.
- Extinguishing Media**
- Suitable** : SMALL FIRE: Use DRY chemical powder.  
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.
- Hazardous thermal (de)composition products** : These products are carbon oxides (CO, CO<sub>2</sub>), sulfur oxides (SO<sub>2</sub>, SO<sub>3</sub>...).
- Special fire-fighting procedures** : Fire fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.
- Protection of fire-fighters** : Be sure to use an approved/certified respirator or equivalent.

## 6. Accidental release measures

- Personal precautions** : Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.
- Small Spill and Leak** : Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.
- Large Spill and Leak** : Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system

## 7. Handling and storage

- Handling** : Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. Do not ingest. Do not breathe dust. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents, alkalis.
- Storage** : Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 4°C (39.2°F).
- Packaging materials**
- Recommended use** : Use original container.

## 8. Exposure controls/personal protection

- Engineering measures** : Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
- Hygiene measures** : Wash hands, forearms, and face thoroughly after handling compounds and before eating, smoking, using lavatory, and at the end of day.

<u>Ingredient Name</u>	<u>Occupational Exposure Limits</u>
1) Cleland's Reagent	Not available.

### Personal protective equipment

- Respiratory system** : Dust respirator. Be sure to use an approved/certified respirator or equivalent.
- Skin and body** : Lab coat.
- Hands** : Gloves.
- Eyes** : Splash goggles.

### Protective Clothing (Pictograms)



## 9. Physical and chemical properties

- Physical state** : Solid. (Solid powder.)
- Color** : White.
- Molecular Weight** : 154.2 g/mole
- Melting Point** : 42 to 44°C (107.6 to 111.2°F)
- Solubility** : Easily soluble in cold water.
- Flash point** : OPEN CUP: >110°C (230°F).
- Explosive properties** : Risks of explosion of the product in presence of mechanical impact: Not available.  
Risks of explosion of the product in presence of static discharge: Not available.

## 10. Stability and reactivity

- Stability** : The product is stable.
- Conditions to avoid** : Incompatible with some alkalies.
- Materials to avoid** : Reactive with oxidizing agents, reducing agents, alkalis.
- Hazardous Decomposition Products** : These products are carbon oxides (CO, CO<sub>2</sub>), sulfur oxides (SO<sub>2</sub>, SO<sub>3</sub>...).

## 11. Toxicological information

- RTECS #** : **EK1610000**
- Local effects**
- Skin irritation** : Hazardous in case of skin contact (irritant).
- Acute toxicity** : LD50: Not available.  
LC50: Not available.
- Chronic toxicity** : Repeated or prolonged exposure is not known to aggravate medical condition.
- Other Toxic Effects on Humans** : Not available.  
Hazardous in case of skin contact (irritant), of ingestion.  
  
Not available.  
  
Not available.
- Carcinogenic effects** : Not available.
- Mutagenic effects** : Not available.
- Reproduction toxicity** : Not available.
- Teratogenic effects** : Not available.

## 12. Ecological information

- Ecotoxicity** : Not available.
- Toxicity of the Products of Biodegradation** : The products of degradation are less toxic than the product itself.


## 13. Disposal considerations

- Methods of disposal; Waste of residues; Contaminated packaging** : Waste must be disposed of in accordance with federal, state and local environmental control regulations.

## 14. Transport information

- International transport regulations**
- Land - Road/Railway**
- ADR/RID Class** : Not controlled under ADR (Europe).
- Sea**
- IMDG Class** : Not controlled under IMDG.
- Air**
- IATA-DGR Class** : Not controlled under IATA.
- Special Provisions for Transport** : Not applicable.

## 15. Regulatory information

- EU Regulations**
- Hazard symbol(s)** : 
- Classification** : Harmful
- Risk Phrases** : R22- Harmful if swallowed.  
R36/38- Irritating to eyes and skin.
- Safety Phrases** : S26- In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.  
S36- Wear suitable protective clothing.

**Contains**  
**U.S. Federal Regulations**

- : - Cleland's Reagent
- : TSCA: No products were found.
- SARA 302/304/311/312 extremely hazardous substances: No products were found.
- SARA 302/304 emergency planning and notification: No products were found.
- SARA 302/304/311/312 hazardous chemicals: No products were found.
- SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No products were found.
- SARA 313 toxic chemical notification and release reporting: No products were found.
- Clean Water Act (CWA) 307: No products were found.
- Clean Water Act (CWA) 311: No products were found.
- Clean air act (CAA) 112 accidental release prevention: No products were found.
- Clean air act (CAA) 112 regulated flammable substances: No products were found.
- Clean air act (CAA) 112 regulated toxic substances: No products were found.

**HCS Classification**

- : CLASS: Irritating substance.

**State Regulations**

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**WHMIS (Canada)**

- : Not controlled under WHMIS (Canada).
- CEPA DSL: Cleland's Reagent

**16. Other information**

**Hazardous Material  
Information System  
(U.S.A.)**

Health	2
Fire Hazard	1
Reactivity	0
Personal Protection	E

**National Fire  
Protection  
Association (U.S.A.)**



**Notice to Reader**

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