

**Safety Data Sheet**

according to UK REACH Regulation

**DTT (racemic)**

Revision date: 03.03.2020

Product code: RL-1020

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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier**

DTT (racemic)

**Further trade names**

Cleland's Reagent, DL-Dithiothreitol,  
(2S,3S;2R,3R)-threo-1,4-Dimercapto-2,3-butandiol  
1,4-bis(sulfanyl)butane-2,3-diol  
1,4-disulfanylbutane-2,3-diol  
1,4-Ditiotreita

Substance name: DL-Dithiothreitol  
CAS No: 3483-12-3  
EC No: 222-468-7

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

Use as laboratory reagent

**Uses advised against**

Do not use for private purposes (household).

**1.3. Details of the supplier of the safety data sheet**

Company name: Iris Biotech GmbH  
Street: Adalbert-Zoellner-Straße 1  
Place: D-95615 Marktredwitz, Germany  
Post-office box: 568  
D-95605 Marktredwitz, Germany  
Telephone: +49 9231 97121 0  
Telefax: +49 9231 97121 99  
e-mail: info@iris-biotech.de  
Contact person: Compliance Department  
Telephone: +49 9231 97121 0  
e-mail: sds@iris-biotech.de  
Internet: www.iris-biotech.de  
Responsible Department: Only available during office hours.

**1.4. Emergency telephone number:** +49 (0)89 19240 (POISON CENTER Munich: 24 h)**Further Information**

Emergency telephone: 24 h (POISON CENTER Munich)

**SECTION 2: Hazards identification****2.1. Classification of the substance or mixture****GB CLP Regulation**

Hazard categories:  
Acute toxicity: Acute Tox. 4  
Skin corrosion/irritation: Skin Irrit. 2  
Serious eye damage/eye irritation: Eye Irrit. 2  
Specific target organ toxicity - single exposure: STOT SE 3  
Hazardous to the aquatic environment: Aquatic Chronic 3  
Hazard Statements:  
Harmful if swallowed.  
Causes skin irritation.  
Causes serious eye irritation.  
May cause respiratory irritation.  
Harmful to aquatic life with long lasting effects.

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**2.2. Label elements**
**GB CLP Regulation**
**Signal word:** Warning

**Pictograms:**

**Hazard statements**

H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H412	Harmful to aquatic life with long lasting effects.

**Precautionary statements**

P264	Wash hands thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P302+P352	IF ON SKIN: Wash with plenty of water.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.

**Additional advice on labelling**

Warning - substance not yet tested completely.

**2.3. Other hazards**

No information available.

**SECTION 3: Composition/information on ingredients**
**3.1. Substances**
**Chemical characterization**

(2S,3S;2R,3R)-threo-1,4-Dimercapto-2,3-butandiol

 Sum formula: C<sub>4</sub>H<sub>10</sub>O<sub>2</sub>S<sub>2</sub>

Molecular weight: 154,25 g/mol

**Hazardous components**

CAS No	Chemical name	Quantity
	EC No	
	Index No	
	REACH No	
	GHS Classification	
3483-12-3	DL-DithiothreitolDL-Dithiothreitol	<= 100 %
	222-468-7	
	Acute Tox. 4, Skin Irrit. 2, Eye Irrit. 2, STOT SE 3, Aquatic Chronic 3; H302 H315 H319 H335 H412	

Full text of H and EUH statements: see section 16.

**Specific Conc. Limits, M-factors and ATE**

CAS No	EC No	Chemical name	Quantity
		Specific Conc. Limits, M-factors and ATE	
3483-12-3	222-468-7	DL-DithiothreitolDL-Dithiothreitol	<= 100 %
		inhalation: Data lacking (gases); dermal: Data lacking; oral: LD50 = 400 mg/kg	

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**SECTION 4: First aid measures****4.1. Description of first aid measures****General information**

In case of accident or unwellness, seek medical advice immediately (show directions for use or safety data sheet if possible).

**After inhalation**

Provide fresh air. Medical treatment necessary. Remove casualty to fresh air and keep warm and at rest. In case of irregular breathing or respiratory arrest provide artificial respiration.

In all cases of doubt, or when symptoms persist, seek medical advice.

**After contact with skin**

After contact with skin, wash immediately with plenty of water and soap. Take off immediately all contaminated clothing and wash it before reuse. If skin irritation occurs: Get medical advice/attention.

**After contact with eyes**

In case of contact with eyes, rinse immediately with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Subsequently consult an ophthalmologist.

**After ingestion**

Rinse mouth immediately and drink 1 glass of water. Medical treatment necessary. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person or a person with cramps.

In all cases of doubt, or when symptoms persist, seek medical advice.

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

No information available.

**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**

Co-ordinate fire-fighting measures to the fire surroundings. Water spray. alcohol resistant foam. Dry extinguishing powder. Carbon dioxide (CO<sub>2</sub>). Sand.

**Unsuitable extinguishing media**

High power water jet.

**5.2. Special hazards arising from the substance or mixture**

Non-flammable. Thermal decomposition can lead to the escape of irritating gases and vapours.

In case of fire may be liberated: Carbon dioxide (CO<sub>2</sub>). Carbon monoxide (CO). Sulfur oxides.

**5.3. Advice for firefighters**

Wear a self-contained breathing apparatus and chemical protective clothing. Full protection suit.

Co-ordinate fire-fighting measures to the fire surroundings.

**Additional information**

Suppress gases/vapours/mists with water spray jet. Collect contaminated fire extinguishing water separately.

Do not allow entering drains or surface water. Usual measures for fire prevention.

**SECTION 6: Accidental release measures****6.1. Personal precautions, protective equipment and emergency procedures****General measures**

Provide adequate ventilation. Avoid dust formation. Do not breathe dust. Avoid contact with skin, eyes and clothes. Use personal protection equipment. Provide adequate ventilation.

Wear personal protection equipment.

In case of fire: Evacuate area.

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**6.2. Environmental precautions**

Do not allow to enter into surface water or drains.  
Do not allow to enter into soil/subsoil.

**6.3. Methods and material for containment and cleaning up****Other information**

Take up mechanically. Treat the recovered material as prescribed in the section on waste disposal. Take up mechanically, placing in appropriate containers for disposal. Avoid dust formation.  
Clear contaminated areas thoroughly.

**6.4. Reference to other sections**

Safe handling: see section 7  
Personal protection equipment: see section 8  
Disposal: see section 13 Treat the recovered material as prescribed in the section on waste disposal.

**SECTION 7: Handling and storage****7.1. Precautions for safe handling****Advice on safe handling**

If handled uncovered, arrangements with local exhaust ventilation have to be used. Avoid dust formation. Do not breathe dust. Provide adequate ventilation.  
Avoid contact with skin, eyes and clothes.

**Advice on protection against fire and explosion**

Usual measures for fire prevention.

**Advice on general occupational hygiene**

Remove contaminated, saturated clothing immediately. Draw up and observe skin protection programme.  
Wash hands and face before breaks and after work and take a shower if necessary. When using do not eat, drink, smoke, sniff. Avoid contact with skin, eyes and clothes. Provide adequate ventilation.

**7.2. Conditions for safe storage, including any incompatibilities****Requirements for storage rooms and vessels**

Keep container tightly closed. Keep locked up. Store in a place accessible by authorized persons only.  
Provide adequate ventilation as well as local exhaustion at critical locations.  
Handle and store contents under inert gas. Protect from moisture.  
storage temperature: 2 °C - 8 °C

**Hints on joint storage**

No special measures are necessary.

**7.3. Specific end use(s)**

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated.

**SECTION 8: Exposure controls/personal protection****8.1. Control parameters****Additional advice on limit values**

To date, no national critical limit values exist.

**8.2. Exposure controls****Appropriate engineering controls**

If handled uncovered, arrangements with local exhaust ventilation have to be used. Do not breathe dust. The receiver of our product is singularly responsible for adhering to existing laws and regulations.

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**Individual protection measures, such as personal protective equipment****Eye/face protection**

Suitable eye protection: goggles. Wear safety goggles. Rules for the use of eye and face protection note (BGR 192).

**Hand protection**

When handling with chemical substances, protective gloves must be worn with the CE-label including the four control digits. The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves. Wear suitable gloves.

The quality of the protective gloves resistant to chemicals must be chosen as a function of the specific working place concentration and quantity of hazardous substances.

**Skin protection**

Use of protective clothing. Wear suitable protective clothing.

**Respiratory protection**

In case of inadequate ventilation wear respiratory protection. If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn.

**Environmental exposure controls**

Discharge into the environment must be avoided.

**SECTION 9: Physical and chemical properties****9.1. Information on basic physical and chemical properties**

Physical state:	solid
Colour:	white/ whitish
Odour:	characteristic/ rotten

**Changes in the physical state**

Melting point/freezing point:	40-43 °C
Boiling point or initial boiling point and boiling range:	125-130 °C
Sublimation point:	not determined
Softening point:	not determined
Flash point:	113 °C

**Flammability**

Solid/liquid:	No data available
Gas:	No data available

**Explosive properties**

The product is not: Explosive.

Lower explosion limits:	No data available
Upper explosion limits:	No data available
Auto-ignition temperature:	No data available

**Self-ignition temperature**

Solid:	not determined
Gas:	not applicable

Decomposition temperature:	not determined
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**Oxidizing properties**

Not oxidising.

pH-Value (at 25 °C):	4-6
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Viscosity / dynamic:	not determined
Viscosity / kinematic:	not determined
Water solubility: (at 20 °C)	1500 g/L
<b>Solubility in other solvents</b>	
No data available	
Partition coefficient n-octanol/water:	log Pow = 0,12 (25 °C)
Vapour pressure:	No data available
Density (at 20 °C):	1,0 g/cm <sup>3</sup>
Bulk density:	ca. 300 kg/m <sup>3</sup>
Relative vapour density:	not determined

**9.2. Other information****Information with regard to physical hazard classes**

Sustaining combustion: No data available

**Other safety characteristics**

Solid content: not determined

Evaporation rate: not determined

**Further Information****SECTION 10: Stability and reactivity****10.1. Reactivity**

No data available

**10.2. Chemical stability**Decomposes in contact with water.  
Stable under recommended storage conditions.**10.3. Possibility of hazardous reactions**

No data available

**10.4. Conditions to avoid**Protect from moisture.  
Keep away from heat.  
UV-radiation/sunlight**10.5. Incompatible materials**Oxidizing agents, strong.  
Strong acid  
Bases, strong.  
Alkali metals.**10.6. Hazardous decomposition products**Thermal decomposition can lead to the escape of irritating gases and vapours.  
In case of fire may be liberated: Carbon dioxide (CO<sub>2</sub>). Carbon monoxide (CO). Sulfur oxides.**Further information**

In case of fire: See chapter 5.

**SECTION 11: Toxicological information****11.1. Information on hazard classes as defined in GB CLP Regulation****Toxicokinetics, metabolism and distribution**

No data available

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**Acute toxicity**

Harmful if swallowed.

LD50, Mouse, subcutan (s.c.): 108 mg/kg

CAS No	Chemical name				
	Exposure route	Dose	Species	Source	Method
3483-12-3	DL-Dithiothreitol				
	oral	LD50 400 mg/kg	Rat		
	dermal	Data lacking			
	inhalation	Data lacking			

**Irritation and corrosivity**

Causes skin irritation.

Causes serious eye irritation.

**Sensitising effects**

Based on available data, the classification criteria are not met.

**Carcinogenic/mutagenic/toxic effects for reproduction**

Based on available data, the classification criteria are not met.

**STOT-single exposure**

May cause respiratory irritation. (DL-Dithiothreitol)

**STOT-repeated exposure**

Based on available data, the classification criteria are not met.

**Aspiration hazard**

Based on available data, the classification criteria are not met.

**Specific effects in experiment on an animal**

No data available

**Additional information on tests**

Classification according to Regulation (EC) No 1272/2008 [CLP]: health hazard properties

**Practical experience**

No data available

**11.2. Information on other hazards**
**Other information**

Nausea. Headache. vomiting. Depression of the central nervous system.

liver - Irregularities - Practical experience/human evidence

**Further information**

RTECS: EK1610000

Caution! To the best of our knowledge the toxicological properties of this material have not been thoroughly investigated.

Handle in accordance with good industrial hygiene and safety practice.

**SECTION 12: Ecological information**
**12.1. Toxicity**

Harmful to aquatic life with long lasting effects.

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CAS No	Chemical name					
	Aquatic toxicity	Dose	[h]   [d]	Species	Source	Method
3483-12-3	DL-DithiothreitolDL-Dithiothreitol					
	Acute crustacea toxicity	EC50	27 mg/l	48 h	Daphnia magna (Big water flea)	

**12.2. Persistence and degradability**

No data available

**12.3. Bioaccumulative potential**

The product has not been tested.

No indication of bioaccumulation potential.

**Partition coefficient n-octanol/water**

CAS No	Chemical name	Log Pow
3483-12-3	DL-DithiothreitolDL-Dithiothreitol	0,12

**12.4. Mobility in soil**

No data available

**12.5. Results of PBT and vPvB assessment**

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

**12.7. Other adverse effects**

Harmful to aquatic life with long lasting effects.

**Further information**

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

Avoid release to the environment.

**SECTION 13: Disposal considerations****13.1. Waste treatment methods****Disposal recommendations**

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil.

Dispose of waste according to applicable legislation.

Consult the appropriate local waste disposal expert about waste disposal.

Dispose of waste according to applicable legislation.

**List of Wastes Code - used product**

070108 WASTES FROM ORGANIC CHEMICAL PROCESSES; wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals; other still bottoms and reaction residues; hazardous waste

**List of Wastes Code - contaminated packaging**

150110 WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED; packaging (including separately collected municipal packaging waste); packaging containing residues of or contaminated by hazardous substances; hazardous waste

**Contaminated packaging**

Non-contaminated packages may be recycled.

Handle contaminated packages in the same way as the substance itself.

**SECTION 14: Transport information****Land transport (ADR/RID)****14.2. UN proper shipping name:**

No dangerous good in sense of these transport regulations.



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**Inland waterways transport (ADN)****14.2. UN proper shipping name:** No dangerous good in sense of these transport regulations.**Marine transport (IMDG)****14.2. UN proper shipping name:** No dangerous good in sense of these transport regulations.**Air transport (ICAO-TI/IATA-DGR)****14.2. UN proper shipping name:** No dangerous good in sense of these transport regulations.**14.5. Environmental hazards**

ENVIRONMENTALLY HAZARDOUS: No

**14.6. Special precautions for user**

No data available

**14.7. Maritime transport in bulk according to IMO instruments**

not applicable

**SECTION 15: Regulatory information****15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture****EU regulatory information**2004/42/EC (VOC): 100 % (1000 g/l)  
Information according to 2012/18/EU (SEVESO III): Not subject to 2012/18/EU (SEVESO III)**Additional information**

Safety Data Sheet according to Regulation (EC) No. 1907/2006 (REACH)

**National regulatory information**

Employment restrictions: Observe restrictions to employment for juveniles according to the 'juvenile work protection guideline' (94/33/EC). Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.

Water hazard class (D): 3 - highly hazardous to water

**15.2. Chemical safety assessment**

For this substance a chemical safety assessment has not been carried out.

**SECTION 16: Other information****Abbreviations and acronyms**ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)  
IMDG: International Maritime Code for Dangerous Goods  
IATA: International Air Transport Association  
GHS: Globally Harmonized System of Classification and Labelling of Chemicals  
EINECS: European Inventory of Existing Commercial Chemical Substances  
ELINCS: European List of Notified Chemical Substances  
CAS: Chemical Abstracts Service  
LC50: Lethal concentration, 50%  
LD50: Lethal dose, 50%  
CLP: Classification, labelling and Packaging  
REACH: Registration, Evaluation and Authorization of Chemicals  
GHS: Globally Harmonised System of Classification, Labelling and Packaging of Chemicals  
UN: United Nations  
DNEL: Derived No Effect Level  
DMEL: Derived Minimal Effect Level

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PNEC: Predicted No Effect Concentration  
ATE: Acute toxicity estimate  
LL50: Lethal loading, 50%  
EL50: Effect loading, 50%  
EC50: Effective Concentration 50%  
ErC50: Effective Concentration 50%, growth rate  
NOEC: No Observed Effect Concentration  
BCF: Bio-concentration factor  
PBT: persistent, bioaccumulative, toxic  
vPvB: very persistent, very bioaccumulative  
RID: Regulations concerning the international carriage of dangerous goods by rail  
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures)  
EmS: Emergency Schedules  
MFAG: Medical First Aid Guide  
ICAO: International Civil Aviation Organization  
MARPOL: International Convention for the Prevention of Marine Pollution from Ships  
IBC: Intermediate Bulk Container  
VOC: Volatile Organic Compounds  
SVHC: Substance of Very High Concern  
For abbreviations and acronyms, see table at <http://abbrev.esdscom.eu>

**Relevant H and EUH statements (number and full text)**

H302	Harmful if swallowed.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H412	Harmful to aquatic life with long lasting effects.

**Further Information**

The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights. The receiver of our product is singularly responsible for adhering to existing laws and regulations.