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Version number: 2

1 Identification

· **Product identifier**

· **Trade name: β-Mercaptoethanol Molecular biology grade**

· **Article number:** A1108
· **CAS Number:**
60-24-2
· **EC number:**
200-464-6
· **Application of the substance / the mixture**
Molecular biology
Laboratory chemical

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
AppliChem GmbH
Ottoweg 4
D-64291 Darmstadt
Tel.: +49 (0)6151 93570
Fax.: +49 (0)6151 935711
msds@applichem.com

· **Information department:** Dept. Compliance
· **Emergency telephone number:** +49(0)6151 93570 (Inside normal buisness hours)

2 Hazard(s) identification

· **Classification of the substance or mixture**

Flam. Liq. 4	H227	Combustible liquid.
Acute Tox. 3	H301	Toxic if swallowed.
Acute Tox. 2	H310	Fatal in contact with skin.
Acute Tox. 3	H331	Toxic if inhaled.
Skin Irrit. 2	H315	Causes skin irritation.
Eye Dam. 1	H318	Causes serious eye damage.
Skin Sens. 1	H317	May cause an allergic skin reaction.
STOT RE 2	H373	May cause damage to organs through prolonged or repeated exposure.

· **Label elements**
· **GHS label elements**
The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS05 GHS06 GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
2-mercaptoethanol
· **Hazard statements**

H227	Combustible liquid.
H301+H331	Toxic if swallowed or if inhaled.
H310	Fatal in contact with skin.
H315	Causes skin irritation.

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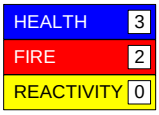
H318 Causes serious eye damage.
H317 May cause an allergic skin reaction.
H373 May cause damage to organs through prolonged or repeated exposure.

· **Precautionary statements**
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P273 Avoid release to the environment.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P341 If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing.
P302+P352 IF ON SKIN: Wash with plenty of water.

· **Classification system:**
· **NFPA ratings (scale 0 - 4)**

Health = 3
Fire = 2
Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 3
Fire = 2
Reactivity = 0

· **Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**
· **CAS No. Description**
60-24-2 2-mercaptoethanol
· **Identification number(s)**
· **EC number:** 200-464-6

4 First-aid measures

· **Description of first aid measures**
· **General information:** Personal protection for the First Aider.
· **After inhalation:**
Supply fresh air or oxygen; call for doctor.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:**
Wash off with plenty of water.
Call a doctor immediately.
Dab with polyethylene glycol 400.
Immediately remove any clothing soiled by the product.
· **After eye contact:** Rinse opened eye for several minutes under running water. Then consult a doctor.
· **After swallowing:**
Rinse out mouth.
Immediately call a doctor.
· **Information for doctor:**
· **Most important symptoms and effects, both acute and delayed** No further relevant information available.

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· **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:** Water, CO2, foam, powder.
· **Special hazards arising from the substance or mixture**
Combustible.
Vapours ara heavier than air and may spread along floors.
Can form explosive gas-air mixtures.
In case of fire, the following can be released:
(SO2, SO3)
(H2S)
· **Advice for firefighters**
· **Protective equipment:**
Wear self-contained respiratory protective device.
In order to avoid contact with skin, keep a safety distance and wear suitable protective clothing.
· **Additional information**
Contain escaping vapours with water.
Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Avoid substance contact.
Do not inhale steams/aerosols.
Ensure adequate ventilation
· **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (AppliSorb).
Dispose of the collected material according to regulations.
Ensure adequate ventilation.
Clean up affected area.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Do not inhale substance.
Work only in fume cabinet.
Prevent formation of aerosols.
· **Information about protection against explosions and fires:** No special measures required.

· **Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** No special requirements.
· **Information about storage in one common storage facility:** Not required.
· **Further information about storage conditions:**
Store in dry conditions.
Accesible for authorised persons only.
Store receptacle in a well ventilated area.
Keep receptacle tightly sealed.

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· **Recommended storage temperature:** 2-8 °C
· **Storage class:** 6.1 A
· **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

· **Control parameters**

· **Components with limit values that require monitoring at the workplace:**	
60-24-2 2-mercaptoethanol	
WEEL	Long-term value: 0.2 ppm Skin

· **Additional information:** The lists that were valid during the creation were used as basis.

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Store protective clothing separately.
Avoid contact with the eyes and skin.
· **Breathing equipment:**
Respiratory protection required when vapours/aerosols are generated.
Filter B
· **Protection of hands:**

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
· **For the permanent contact gloves made of the following materials are suitable:**
Recommended thickness of the material: ≥ 0.7 mm
Butyl rubber, BR
Value for the permeation: Level ≥ 480 min
· **As protection from splashes gloves made of the following materials are suitable:**
Nitrile rubber, NBR
Recommended thickness of the material: ≥ 0.40 mm
Value for the permeation: Level ≥ 120 min
· **Eye protection:**

Tightly sealed goggles

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9 Physical and chemical properties

· **Information on basic physical and chemical properties**
· **General Information**
· **Appearance:**

Form:	Fluid
Color:	Colorless
· **Odor:**	Characteristic
· **pH-value at 20 °C (68 °F):**	4.5 - 6
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	154 - 161 °C (309 - 322 °F)
· **Flash point:**	68 °C (154 °F)
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapor pressure at 20 °C (68 °F):**	3.6 hPa (3 mm Hg)
· **Density at 20 °C (68 °F):**	1.12 g/cm³ (9.346 lbs/gal)
· **Solubility in / Miscibility with**	
Water:	Soluble. Not miscible or difficult to mix.
· **Viscosity:**	
Dynamic:	Not determined.
Kinematic:	Not determined.
· **Solvent content:**	
Organic solvents:	0.0 %
VOC content:	0.0 g/l / 0.00 lb/gl
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity** No further relevant information available.
· **Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
Moisture
Heating
· **Possibility of hazardous reactions**
No dangerous reactions known.

Violent reactions possible with:
strong oxidants
Forms explosive gas mixture with air.
· **Conditions to avoid** No further relevant information available.
· **Incompatible materials:** strong oxidants
· **Hazardous decomposition products:**
Hydrogen sulfide
In the event of fire: See chapter 5

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11 Toxicological information

· **Information on toxicological effects**
· **Acute toxicity:**
· **LD/LC50 values that are relevant for classification:**

· Components	Type	Value	Species
60-24-2 2-mercaptoethanol			
Oral	LD50	244 mg/kg (rat)	
Dermal	LD50	150 mg/kg (rabbit)	

· **Primary irritant effect:**
· **on the skin:**
Irritant to skin and mucous membranes.
Danger of skin absorption.
· **on the eye:**
Strong irritant with the danger of severe eye injury.
Risk of corneal clouding.
· **Sensitization:** Sensitization possible through skin contact.
· **Other information (about experimental toxicology):** Further hazardous properties cannot be excluded.
· **Additional toxicological information:**
offensive odour
The product should be handled with the care usual when dealing with chemicals.

· **Carcinogenic categories**

· IARC (International Agency for Research on Cancer)
Substance is not listed.

· NTP (National Toxicology Program)
Substance is not listed.

· OSHA-Ca (Occupational Safety & Health Administration)
Substance is not listed.

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:**
Highly toxic for aquatic organisms.
May cause long-term adverse effects in the aquatic environment.
· **Persistence and degradability** The product is biodegradable.
· **Behavior in environmental systems:**
· **Bioaccumulative potential** No further relevant information available.
· **Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:**
Very toxic for aquatic organisms
Water hazard class 3 (Assessment by list): extremely hazardous for water
Danger to drinking water if even extremely small quantities leak into the ground.
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation:** Chemicals must be disposed of in compliance with the respective national regulations.

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· **Uncleaned packagings:**
· **Recommendation:**
Disposal must be made according to official regulations.
Packagings that cannot be cleansed are to be disposed of in the same manner as the product.

14 Transport information

· **UN-Number**
· **DOT, ADR, IMDG, IATA** UN2966

· **UN proper shipping name**
· **DOT** Thioglycol
· **ADR** Thioglycol, ENVIRONMENTALLY HAZARDOUS
· **IMDG** THIOGLYCOL, MARINE POLLUTANT
· **IATA** THIOGLYCOL

· **Transport hazard class(es)**

· **DOT**

· **Class** 6.1 Toxic substances
· **Label** 6.1

· **ADR**

· **Class** 6.1 (T1) Toxic substances
· **Label** 6.1

· **IMDG**

· **Class** 6.1 Toxic substances
· **Label** 6.1

· **IATA**

· **Class** 6.1 Toxic substances
· **Label** 6.1

· **Packing group**
· **DOT, ADR, IMDG, IATA** II

· **Environmental hazards:**
· **Marine pollutant:** No
Yes (DOT)
Symbol (fish and tree)
· **Special marking (ADR):** Symbol (fish and tree)

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· **Special precautions for user**	Warning: Toxic substances
· **Danger code (Kemler):**	60
· **EMS Number:**	F-A,S-A
· **Stowage Category**	A
· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	
· **DOT**	
· **Remarks:**	Special marking with the symbol (fish and tree).
· **ADR**	
· **Excepted quantities (EQ)**	Code: E4 Maximum net quantity per inner packaging: 1 ml Maximum net quantity per outer packaging: 500 ml
· **IMDG**	
· **Limited quantities (LQ)**	100 ml
· **Excepted quantities (EQ)**	Code: E4 Maximum net quantity per inner packaging: 1 ml Maximum net quantity per outer packaging: 500 ml
· **UN "Model Regulation":**	UN 2966 THIOGLYCOL, 6.1, II, ENVIRONMENTALLY HAZARDOUS

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **Sara**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

· **Section 313 (Specific toxic chemical listings):**
Substance is not listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65**

· **Chemicals known to cause cancer:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Cancerogenity categories**

· **EPA (Environmental Protection Agency)**
Substance is not listed.

· **TLV (Threshold Limit Value established by ACGIH)**
Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

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· **GHS label elements**
The substance is classified and labeled according to the Globally Harmonized System (GHS).
· **Hazard pictograms**

GHS05 GHS06 GHS07 GHS08

· **Signal word** Danger

· **Hazard-determining components of labeling:**
2-mercaptoethanol
· **Hazard statements**

H227	Combustible liquid.
H301+H331	Toxic if swallowed or if inhaled.
H310	Fatal in contact with skin.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H317	May cause an allergic skin reaction.
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· **Precautionary statements**

P280	Wear protective gloves/protective clothing/eye protection/face protection.
P273	Avoid release to the environment.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P341	If inhaled: If breathing is difficult, remove person to fresh air and keep comfortable for breathing.
P302+P352	IF ON SKIN: Wash with plenty of water.

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** Dept. Compliance
· **Contact:** Mr. Th. Stöckle
· **Date of preparation / last revision** 10/06/2016 / 1
· **Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organisation
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
DOT: US Department of Transportation
IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
VOC: Volatile Organic Compounds (USA, EU)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Liq. 4: Flammable liquids – Category 4
Acute Tox. 3: Acute toxicity – Category 3

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Acute Tox. 2: Acute toxicity – Category 2
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
Skin Sens. 1: Skin sensitisation – Category 1
STOT RE 2: Specific target organ toxicity (repeated exposure) – Category 2