SAFETY DATA SHEET

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name: 1-Methoxy-2-propanol EMPLURA®

Product Number: 1.16738
Catalogue No.: 116738
Brand: Millipore
CAS-No.: 107-98-2

1.2 Other means of identification

No data available

1.3 Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Chemical production, Solvent

1.4 Details of the supplier of the safety data sheet

Company: Sigma-Aldrich Pte Ltd
(Co. Registration No. 199403788W)
2 Science Park Drive
#05-01/12 Ascent Building
SINGAPORE 118222
SINGAPORE

Telephone: +65 6890 6633
Fax: +65 6890 6639
E-mail address: TechnicalService@merckgroup.com

1.5 Emergency telephone

Emergency Phone #: 1-800-262-8200

SECTION 2: Hazards identification

2.1 GHS Classification

Flammable liquids (Category 3), H226
Specific target organ toxicity - single exposure (Category 3), Central nervous system, H336

For the full text of the H-Statements mentioned in this Section, see Section 16.

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word: Warning

Hazard statement(s)
H226 Flammable liquid and vapor.
H336 May cause drowsiness or dizziness.
Precautionary statement(s)

Prevention

P210 Keep away from heat/ sparks/ open flames/ hot surfaces. No smoking.
P233 Keep container tightly closed.
P240 Ground/bond container and receiving equipment.
P261 Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.

Response

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/ doctor if you feel unwell.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.

Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.

Disposal

P501 Dispose of contents/ container to an approved waste disposal plant.

2.3 Other hazards - none

SECTION 3: Composition/information on ingredients

Substance / Mixture : Substance

3.1 Substances

<table>
<thead>
<tr>
<th>Formula</th>
<th>Molecular weight</th>
<th>CAS-No.</th>
<th>EC-No.</th>
<th>Index-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C4H10O2</td>
<td>90.12 g/mol</td>
<td>107-98-2</td>
<td>203-539-1</td>
<td>603-064-00-3</td>
</tr>
</tbody>
</table>

Hazardous ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-methoxy-2-propanol</td>
<td>Flam. Liq. 3; STOT SE 3; H226, H336</td>
<td>&lt;= 100 %</td>
</tr>
<tr>
<td>2-methoxy-1-propanol</td>
<td>Flam. Liq. 3; 2; 1; Repr. 1B; STOT SE 3; H226, H315, H318, H360, H335</td>
<td>&gt;= 0.1 - &lt; 0.3 %</td>
</tr>
</tbody>
</table>

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice

Show this material safety data sheet to the doctor in attendance.
If inhaled
After inhalation: fresh air. Call in physician.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/shower.

In case of eye contact
After eye contact: rinse out with plenty of water. Remove contact lenses.

If swallowed
After swallowing: immediately make victim drink water (two glasses at most). Consult a physician.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Water Foam Carbon dioxide (CO2) Dry powder

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air at elevated temperatures.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters
In the event of fire, wear self-contained breathing apparatus.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.
6.3 **Methods and materials for containment and cleaning up**
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up with liquid-absorbent material (e.g. Chemizorb® ). Dispose of properly. Clean up affected area.

6.4 **Reference to other sections**
For disposal see section 13.

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**SECTION 7: Handling and storage**

7.1 **Precautions for safe handling**

**Advice on safe handling**
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

**Advice on protection against fire and explosion**
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

**Hygiene measures**
Change contaminated clothing. Wash hands after working with substance. For precautions see section 2.2.

7.2 **Conditions for safe storage, including any incompatibilities**

**Storage conditions**
Protected from light. Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition.

Recommended storage temperature see product label.

**Storage class**
Storage class (TRGS 510): 3: Flammable liquids

7.3 **Specific end use(s)**
Apart from the uses mentioned in section 1.3 no other specific uses are stipulated.

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**SECTION 8: Exposure controls/personal protection**

8.1 **Control parameters**

**Ingredients with workplace control parameters**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-methoxy-2-propanol</td>
<td>107-98-2</td>
<td>PEL (long term)</td>
<td>100 ppm 369 mg/m3</td>
<td>Singapore. Workplace Safety and Health Act - First Schedule Permissible Exposure Limits of Toxic Substances</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PEL (short term)</td>
<td>150 ppm 553 mg/m3</td>
<td>Singapore. Workplace Safety and Health Act - First Schedule Permissible Exposure Limits of Toxic Substances</td>
</tr>
</tbody>
</table>

8.2 **Exposure controls**

**Appropriate engineering controls**
Change contaminated clothing. Wash hands after working with substance.
Personal protective equipment

Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Safety glasses

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: butyl-rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Butoject® (KCL 898)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.4 mm
Break through time: 120 min
Material tested:Camatril® (KCL 730 / Aldrich Z677442, Size M)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when vapours/aerosols are generated. Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Appearance</td>
<td>Form: liquid</td>
</tr>
<tr>
<td></td>
<td>Color: colorless</td>
</tr>
<tr>
<td>b) Odor</td>
<td>ethanolic</td>
</tr>
<tr>
<td>c) Odor Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>d) pH</td>
<td>No data available</td>
</tr>
<tr>
<td>e) Melting point/freezing point</td>
<td>Melting point: -96 °C at 1,013 hPa - (ECHA)</td>
</tr>
<tr>
<td>f) Initial boiling point and boiling range</td>
<td>118 - 119 °C at 1,013 hPa</td>
</tr>
</tbody>
</table>
g) Flash point 34 °C - closed cup
h) Evaporation rate No data available
i) Flammability (solid, gas) No data available
j) Upper/lower flammability or explosive limits
   Upper explosion limit: 16 % (V)
   Lower explosion limit: 1.8 % (V)
k) Vapor pressure 14.53 hPa at 25 °C
l) Vapor density 3.11 - (Air = 1.0)
m) Density 0.921 g/cm³ at 25 °C - DIN 51757
   Relative density No data available
n) Water solubility 1,000 g/l at 20 °C - Regulation (EC) No. 440/2008, Annex, A.6- completely miscible
o) Partition coefficient: n-octanol/water
   Pow: < 1 at 20 °C - Bioaccumulation is not expected.
p) Autoignition temperature No data available
q) Decomposition temperature No data available
r) Viscosity Viscosity, kinematic: No data available
   Viscosity, dynamic: 1.7 mPa.s at 25 °C
s) Explosive properties No data available
t) Oxidizing properties none

9.2 Other safety information

Surface tension 70.7 mN/m at 1g/l at 20 °C
   - OECD Test Guideline 115

Relative vapor density 3.11 - (Air = 1.0)

SECTION 10: Stability and reactivity

10.1 Reactivity
Can violently decompose at elevated temperatures Stable under recommended storage conditions.
Vapor/air-mixtures are explosive at intense warming.

10.2 Chemical stability
Sensitive to air.
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Violent reactions possible with:
   Strong oxidizing agents
   Acid halides
   Acid anhydrides
   Acid chlorides
Generates dangerous gases or fumes in contact with:
10.4 Conditions to avoid
May form explosive peroxides.
Heating.

10.5 Incompatible materials
Strong oxidizing agents

10.6 Hazardous decomposition products
Peroxides
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - male and female - 4,016 mg/kg
(EC Directive 92/69/EEC B.1 Acute Toxicity (Oral))
Symptoms: Nausea, Vomiting, Irritations of mucous membranes in the mouth, pharynx,
oesophagus and gastrointestinal tract.
LC50 Inhalation - Rat - 4 h - > 6 mg/l - aerosol
Remarks: (IUCLID)
Inhalation: Irritating to respiratory system.
LD50 Dermal - Rat - male and female - > 2,000 mg/kg

Skin corrosion/irritation
Skin - Rabbit
Result: No skin irritation - 4 h

Serious eye damage/eye irritation
Eyes - Rabbit
Result: No eye irritation
(Regulation (EC) No. 440/2008, Annex, B.5)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative

Germ cell mutagenicity
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Metabolic activation: without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Test Type: Micronucleus test
Species: Mouse
Cell type: Bone marrow
Application Route: Intraperitoneal
Method: OECD Test Guideline 474
Result: negative

**Carcinogenicity**
No data available

**Reproductive toxicity**
No data available

**Specific target organ toxicity - single exposure**
May cause drowsiness or dizziness. - Central nervous system
Remarks: Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)

**Specific target organ toxicity - repeated exposure**
No data available

**Aspiration hazard**
No data available

11.2 **Additional Information**
Repeated dose toxicity - Rabbit - male and female - Dermal - 21 Days - NOAEL (No observed adverse effect level) - > 1,000 mg/kg

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

After absorption of toxic quantities:

CNS disorders
narcosis

Toxic effect on:

Liver
Kidney

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

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**SECTION 12: Ecological information**

12.1 **Toxicity**

Toxicity to fish
static test LC50 - Leuciscus idus (Golden orfe) - 6,812 mg/l - 96 h (DIN 38412 part 15)

Toxicity to daphnia and other aquatic
static test LC50 - Daphnia magna (Water flea) - 23,300 mg/l - 48 h
Remarks: (ECHA)
invertebrates
Toxicity to algae static test ErC50 - Pseudokirchneriella subcapitata (green algae) - > 1,000 mg/l - 7 d
Remarks: (ECHA)

12.2 Persistence and degradability
Biodegradability aerobic Dissolved organic carbon (DOC) - Exposure time 28 d
Result: 96 % - Readily biodegradable.
(OECD Test Guideline 301E)

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Endocrine disrupting properties
No data available

12.7 Other adverse effects
No data available

SECTION 13: Disposal considerations
13.1 Waste treatment methods
Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. See www.retrologistik.com for processes regarding the return of chemicals and containers, or contact us there if you have further questions.

SECTION 14: Transport information
14.1 UN number
ADR/RID: 3092  IMGD: 3092  IATA-DGR: 3092

14.2 UN proper shipping name
ADR/RID: 1-METHOXY-2-PROPANOL
IMGD: 1-METHOXY-2-PROPANOL
IATA-DGR: 1-Methoxy-2-propanol

14.3 Transport hazard class(es)
ADR/RID: 3  IMGD: 3  IATA-DGR: 3

14.4 Packaging group
ADR/RID: III  IMGD: III  IATA-DGR: III

14.5 Environmental hazards
ADR/RID: no  IMDG Marine pollutant: no  IATA-DGR: no

14.6 Special precautions for user
None
14.7 Incompatible materials
Strong oxidizing agents

Other regulations
Hazchem Code : 2Y

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Notification status
DSL: All components of this product are on the Canadian DSL
ENCs: On the inventory, or in compliance with the inventory
ISHL: On the inventory, or in compliance with the inventory
KECI: On the inventory, or in compliance with the inventory
NZIoC: On the inventory, or in compliance with the inventory
PICCS: On the inventory, or in compliance with the inventory

SECTION 16: Other information

Full text of H-Statements referred to under sections 2 and 3.

H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.
H360 May damage fertility or the unborn child.

Further information
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 Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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