1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

<table>
<thead>
<tr>
<th><strong>Product name</strong></th>
<th>Ethylene glycol</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Number</strong></td>
<td>324558</td>
</tr>
<tr>
<td><strong>Brand</strong></td>
<td>Sigma-Aldrich</td>
</tr>
<tr>
<td><strong>Index-No.</strong></td>
<td>603-027-00-1</td>
</tr>
<tr>
<td><strong>CAS-No.</strong></td>
<td>107-21-1</td>
</tr>
</tbody>
</table>

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

- **Identified uses**: Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

- **Company**: Sigma-Aldrich
- **3050 Spruce Street**
- **SAINT LOUIS MO 63103 USA**
- **Telephone**: +1 800-325-5832
- **Fax**: +1 800-325-5052

1.4 Emergency telephone number

- **Emergency Phone #**: (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

**GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)**

- **Acute toxicity, Oral (Category 4)**, H302
- **Specific target organ toxicity - repeated exposure, Oral (Category 2)**, Kidney, H373

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

2.2 GHS Label elements, including precautionary statements

**Pictogram**

<table>
<thead>
<tr>
<th><strong>Signal word</strong></th>
<th>Warning</th>
</tr>
</thead>
</table>

**Hazard statement(s)**

- **H302**: Harmful if swallowed.
- **H373**: May cause damage to organs (Kidney) through prolonged or repeated exposure if swallowed.

**Precautionary statement(s)**

- **P260**: Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
- **P264**: Wash skin thoroughly after handling.
- **P270**: Do not eat, drink or smoke when using this product.
- **P301 + P312 + P330**: IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell. Rinse mouth.
- **P314**: Get medical advice/ attention if you feel unwell.
- **P501**: Dispose of contents/ container to an approved waste disposal plant.
2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>1,2-Ethanediol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Formula</td>
<td>C₂H₆O₂</td>
</tr>
<tr>
<td>Molecular weight</td>
<td>62.07 g/mol</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>107-21-1</td>
</tr>
<tr>
<td>EC-No.</td>
<td>203-473-3</td>
</tr>
<tr>
<td>Index-No.</td>
<td>603-027-00-1</td>
</tr>
<tr>
<td>Registration number</td>
<td>01-2119456816-28-XXXX</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hazardous components</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Acute Tox. 4; STOT RE 2; H302, H373</td>
<td>&lt;= 100 %</td>
</tr>
</tbody>
</table>

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

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. 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

5. FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture
Carbon oxides

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information
No data available

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.
For personal protection see section 8.

6.2 Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up
Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

6.4 Reference to other sections
For disposal see section 13.

7. HANDLING AND STORAGE

7.1 Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Hygroscopic.
Storage class (TRGS 510): Combustible liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. EXPOSURE CONTROLS/PERS...
### Predicted No Effect Concentration (PNEC)

<table>
<thead>
<tr>
<th>Compartment</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soil</td>
<td>1.53 mg/kg</td>
</tr>
<tr>
<td>Marine water</td>
<td>1 mg/l</td>
</tr>
<tr>
<td>Fresh water</td>
<td>10 mg/l</td>
</tr>
<tr>
<td>Marine sediment</td>
<td>3.7 mg/kg</td>
</tr>
<tr>
<td>Fresh water sediment</td>
<td>37 mg/kg</td>
</tr>
<tr>
<td>Sewage treatment plant</td>
<td>199.5 mg/l</td>
</tr>
<tr>
<td>Aquatic intermittent release</td>
<td>10 mg/l</td>
</tr>
</tbody>
</table>

### 8.2 Exposure controls

**Appropriate engineering controls**
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.

**Personal protective equipment**

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

**Skin protection**
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

- **Full contact**
  - Material: Nitrile rubber
  - Minimum layer thickness: 0.11 mm
  - Break through time: 480 min
  - Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

- **Splash contact**
  - Material: Nitrile rubber
  - Minimum layer thickness: 0.11 mm
  - Break through time: 480 min
  - Material tested: Dermatril® (KCL 740 / Aldrich Z677272, Size M)

Data source: KCL GmbH, D-36124 Eichenzell, phone +49 (0)6659 87300, e-mail sales@kcl.de, test method: EN374
If used in solution, or mixed with other substances, and under conditions which differ from EN 374, contact the supplier of the CE approved gloves. This recommendation is advisory only and must be evaluated by an industrial hygienist and safety officer familiar with the specific situation of anticipated use by our customers. It should not be construed as offering an approval for any specific use scenario.

**Body Protection**
Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

**Respiratory protection**
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multipurpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

**Control of environmental exposure**
Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

**9.1 Information on basic physical and chemical properties**

- **Appearance**
  - Form: liquid
  - Colour: colourless

- **Odour**
  - No data available
c) Odour Threshold  No data available
d) pH  No data available
e) Melting point/freezing point  Melting point/range: -13 °C (9 °F)
f) Initial boiling point and boiling range  196 - 198 °C (385 - 388 °F)
g) Flash point  111 °C (232 °F) - closed cup
h) Evaporation rate  1
i) Flammability (solid, gas)  No data available
j) Upper/lower flammability or explosive limits  Upper explosion limit: 15.3 %(V)
  Lower explosion limit: 3.2 %(V)
k) Vapour pressure  0.11 hPa (0.08 mmHg) at 20 °C (68 °F)
  0.13 hPa (0.10 mmHg) at 20 °C (68 °F)
l) Vapour density  2.14 - (Air = 1.0)
m) Relative density  1.113 g/mL at 25 °C (77 °F)
n) Water solubility  completely misciblesoluble
o) Partition coefficient: n-octanol/water  log Pow: -1.36
p) Auto-ignition temperature  400 °C (752 °F)Auto-flammability
q) Decomposition temperature  No data available
r) Viscosity  No data available
s) Explosive properties  No data available
t) Oxidizing properties  No data available

9.2 Other safety information
   Relative vapour density  2.14 - (Air = 1.0)

10. STABILITY AND REACTIVITY
10.1 Reactivity  No data available
10.2 Chemical stability  Stable under recommended storage conditions.
10.3 Possibility of hazardous reactions  No data available
10.4 Conditions to avoid  No data available
10.5 Incompatible materials  Strong acids, Strong oxidizing agents, Strong bases, Aldehydes, Aluminum
10.6 Hazardous decomposition products  In the event of fire: see section 5

11. TOXICOLOGICAL INFORMATION
11.1 Information on toxicological effects
   Acute toxicity
   LD50 Oral - Rat - 4,700 mg/kg
Inhalation: No data available
LD50 Dermal - Rabbit - 10,626 mg/kg
No data available

**Skin corrosion/irritation**
Skin - Rabbit
Result: No skin irritation

**Serious eye damage/eye irritation**
Eyes - Rabbit
Result: Mild eye irritation - 24 h

**Respiratory or skin sensitisation**
No data available

**Germ cell mutagenicity**
No data available

**Carcinogenicity**
This product is or contains a component that is probably not carcinogenic based on its IARC, ACGIH, NTP, or EPA classification.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

**Reproductive toxicity**
Laboratory experiments have shown teratogenic effects.

Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

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

**Specific target organ toxicity - repeated exposure**
Oral - May cause damage to organs through prolonged or repeated exposure. - Kidney

**Aspiration hazard**
No data available

**Additional Information**
RTECS: KW2975000

When ingested early symptoms mimic alcohol inebriation and are followed by nausea, vomiting, abdominal pain, weakness, muscle tenderness, respiratory failure, convulsions, cardiovascular collapse, pulmonary edema, hypocalcemic tetany, and severe metabolic acidosis. Without treatment, death may occur in 8 to 24 hours. Victims who survive the initial toxicity period usually develop renal failure along with brain and liver damage. Exposure to and/or consumption of alcohol may increase toxic effects.

Central nervous system - Irregularities - Based on Human Evidence
Central nervous system - Irregularities - Based on Human Evidence

12. **ECOLOGICAL INFORMATION**

12.1 **Toxicity**

Toxicity to fish

<table>
<thead>
<tr>
<th>LC50</th>
<th>Oncorhynchus mykiss (rainbow trout)</th>
<th>18,500 mg/l</th>
<th>96 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50</td>
<td>Leuciscus idus (Golden orfe)</td>
<td>&gt; 10,000 mg/l</td>
<td>48 h</td>
</tr>
<tr>
<td>NOEC</td>
<td>Pimephales promelas (fathead minnow)</td>
<td>32,000 mg/l</td>
<td>7 d</td>
</tr>
<tr>
<td>NOEC</td>
<td>Pimephales promelas (fathead minnow)</td>
<td>39,140 mg/l</td>
<td>96 h</td>
</tr>
</tbody>
</table>
Toxicity to daphnia and other aquatic invertebrates

- EC50 - Daphnia magna (Water flea) - 74,000 mg/l - 24 h
- NOEC - Daphnia (water flea) - 24,000 mg/l - 48 h
- LC50 - Daphnia magna (Water flea) - 41,000 mg/l - 48 h

12.2 Persistence and degradability
No data available
- Ratio BOD/ThBOD: 0.78%

12.3 Bioaccumulative potential
Does not bioaccumulate.
- Bioaccumulation: other fish - 61 d
  - 50 mg/l
- Bioconcentration factor (BCF): 0.60

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 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
Product
Offer surplus and non-recyclable solutions to a licensed disposal company. 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.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
- UN number: 3082
- Class: 9
- Packing group: III
- Proper shipping name: Environmentally hazardous substance, liquid, n.o.s. (Ethylene glycol)
- Reportable Quantity (RQ): 5000 lbs

- Poison Inhalation Hazard: No

IMDG
Not dangerous goods

IATA
Not dangerous goods

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

- Ethylene glycol
  - CAS-No.: 107-21-1
  - Revision Date: 2007-07-01

SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components
Ethylene glycol  
CAS-No. 107-21-1  
Revision Date 2007-07-01

Pennsylvania Right To Know Components
Ethylene glycol  
CAS-No. 107-21-1  
Revision Date 2007-07-01

New Jersey Right To Know Components
Ethylene glycol  
CAS-No. 107-21-1  
Revision Date 2007-07-01

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

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

Acute Tox.  Acute toxicity
H302  Harmful if swallowed.
H373  May cause damage to organs through prolonged or repeated exposure if swallowed.
STOT RE  Specific target organ toxicity - repeated exposure

HMIS Rating
Health hazard: 1  
Chronic Health Hazard: *  
Flammability: 1  
Physical Hazard 0

NFPA Rating
Health hazard: 1  
Fire Hazard: 1  
Reactivity Hazard: 0

Further information
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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.

Preparation Information
Sigma-Aldrich Corporation  
Product Safety – Americas Region  
1-800-521-8956

Version: 5.8  
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