SAFETY DATA SHEET

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

1.1 Product identifiers

Product name : Glycerol
Product Number : 49767
Brand : Sigma
CAS-No. : 56-81-5

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

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Inc.
3050 SPRUCE ST
ST. LOUIS MO  63103
UNITED STATES

Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone

Emergency Phone # : 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture.

2.2 GHS Label elements, including precautionary statements

No hazard pictogram, no signal word, no hazard statement(s), no precautionary statement(s) required

2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

SECTION 3: Composition/information on ingredients

3.1 Substances

Sigma - 49767
The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada.
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**
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. 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.

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 and neutralising material (e.g. Chemizorb® H⁺, Merck Art. No. 101595). Dispose of properly. Clean up affected area.

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

SECTION 7: Handling and storage

7.1 **Precautions for safe handling**
For precautions see section 2.2.

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

**Storage conditions**
Tightly closed.

hygroscopic

**Storage class**
Storage class (TRGS 510): 10: Combustible liquids

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**

**Ingredients with workplace control parameters**
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 EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Full contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 480 min
Material tested: KCL 741 Dermatril® L

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 EN 16523-1 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: 0.11 mm
Break through time: 480 min
Material tested: KCL 741 Dermatril® L

**Respiratory protection**
Recommended Filter type: Filter A-(P2)
The entrepreneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented. 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a) Appearance
   Form: viscous
   Color: clear

b) Odor
   odorless

c) Odor Threshold
   Not applicable

d) pH
   ca.5 at 100 g/l at 20 °C (68 °F) - (External MSDS)

e) Melting point/freezing point
   Melting point/range: 20 °C (68 °F)

f) Initial boiling point and boiling range
   182 °C 360 °F at 27 hPa

g) Flash point
   199 °C (390 °F) at ca.1,013 hPa - Pensky-Martens closed cup - ISO 2719

h) Evaporation rate
   No data available

i) Flammability (solid, gas)
   No data available

j) Upper/lower flammability or explosive limits
   Upper explosion limit: 19 %(V) at 1013 hPa
   Lower explosion limit: 2.7 %(V) at 1013 hPa

k) Vapor pressure
   < 0.001 hPa at 20 °C (68 °F)

l) Vapor density
   3.18 - (Air = 1.0)

m) Density
   1.25 g/mL
   Relative density
   No data available

n) Water solubility
   1,000 g/l at 25 °C (77 °F) - miscible

o) Partition coefficient: n-octanol/water
   log Pow: -1.75 at 25 °C (77 °F) - Bioaccumulation is not expected.

p) Autoignition temperature
   370 °C (698 °F)

q) Decomposition temperature
   > 290 °C (> 554 °F) -
9.2 Other safety information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface tension</td>
<td>ca.63.4 mN/m at 1,000g/l at 20 °C (68 °F)</td>
</tr>
<tr>
<td>Relative vapor density</td>
<td>3.18 - (Air = 1.0)</td>
</tr>
</tbody>
</table>

SECTION 10: Stability and reactivity

10.1 Reactivity
Forms explosive mixtures with air on intense heating.
A range from approx. 15 Kelvin below the flash point is to be rated as critical.

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

10.3 Possibility of hazardous reactions
Risk of explosion with:
- halogens
- Strong oxidizing agents
- peroxi compounds
- hydrogen peroxide
- Nitriles
- perchloric acid
- with
- Lead oxides
- Nitric acid
- with
- sulfuric acid
Risk of ignition or formation of inflammable gases or vapours with:
- potassium permanganate
- hydrides
- calcium hypochlorite
- Fluorine
- with
- Lead oxides
Exothermic reaction with:
- Oxides of phosphorus
- chromium(VI) oxide
- phosphorus halides
- Acetic anhydride
- with
- phosphorus oxichloride
- with
- Nitrobenzene
10.4 **Conditions to avoid**

Strong heating.

10.5 **Incompatible materials**

No data available

10.6 **Hazardous decomposition products**

In the event of fire: see section 5

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**SECTION 11: Toxicological information**

11.1 **Information on toxicological effects**

**Acute toxicity**

LD50 Oral - Rat - female - 27,200 mg/kg
Remarks: (ECHA)

LC50 Inhalation - Rat - male and female - 4 h - > 5,850 mg/l - aerosol
Remarks: (ECHA)

LD50 Dermal - Guinea pig - male and female - 56,750 mg/kg
Remarks: (ECHA)

**Skin corrosion/irritation**

Skin - Rabbit
Result: No skin irritation - 24 h
Remarks: (ECHA)

**Serious eye damage/eye irritation**

Eyes - Rabbit
Result: No eye irritation - 7 Days
Remarks: (ECHA)

**Respiratory or skin sensitization**

Local lymph node assay (LLNA) - Mouse
Result: negative
(OECD Test Guideline 429)

**Germ cell mutagenicity**

Test Type: Ames test
Test system: S. typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Remarks: (IUCLID)

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Test Type: sister chromatid exchange assay
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: unscheduled DNA synthesis assay  
Test system: rat hepatocytes  
Method: OECD Test Guideline 482  
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

**Carcinogenicity**

IARC: No ingredient 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 ingredient 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 on OSHA’s list of regulated carcinogens.

**Reproductive toxicity**

No data available

**Specific target organ toxicity - single exposure**

No data available

**Specific target organ toxicity - repeated exposure**

No data available

**Aspiration hazard**

No data available

**11.2 Additional Information**

Repeated dose toxicity - Rat - male - Oral - 28 Days - NOAEL (No observed adverse effect level) - > 1,600 mg/kg  
Remarks: (ECHA)

RTECS: MA8050000  
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.  
Kidney - Irregularities - Based on Human Evidence  
Stomach - Irregularities - Based on Human Evidence

**SECTION 12: Ecological information**

**12.1 Toxicity**

Toxicity to fish  
static test LC50 - Oncorhynchus mykiss (rainbow trout) - 54,000 mg/l - 96 h  
Remarks: (ECHA)
12.2 Persistence and degradability
Biodegradability  aerobic  - Exposure time 1 d
   Result: 94 % - Readily biodegradable.
   Remarks: (ECHA)

<table>
<thead>
<tr>
<th>Property</th>
<th>Result</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biochemical Oxygen Demand (BOD)</td>
<td>870 mg/g</td>
<td>(External MSDS)</td>
</tr>
<tr>
<td>Chemical Oxygen Demand (COD)</td>
<td>1,160 mg/g</td>
<td>(External MSDS)</td>
</tr>
<tr>
<td>Theoretical oxygen demand</td>
<td>1,217 mg/g</td>
<td>(Lit.)</td>
</tr>
<tr>
<td>Ratio BOD/ThBOD</td>
<td>71 %</td>
<td>(Lit.)</td>
</tr>
</tbody>
</table>

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

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.

SECTION 14: Transport information

DOT (US)
   Not dangerous goods

IMDG
   Not dangerous goods
**IATA**
Not dangerous goods

**Further information**
Not classified as dangerous in the meaning of transport regulations.

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**SECTION 15: Regulatory information**

**SARA 302 Components**
This material does not contain any components with a section 302 EHS TPQ.

**SARA 313 Components**
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 311/312 Hazards**
Chronic Health Hazard

**Massachusetts Right To Know Components**

<table>
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<td>2007-03-01</td>
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**Pennsylvania Right To Know Components**

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**SECTION 16: Other information**

**Further information**
The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. 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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