SAFETY DATA SHEET

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

1.1 Product identifiers

Product name : Glutaraldehyde solution
Product Number : G5882
Brand : Sigma-Aldrich

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 Street
ST. LOUIS MO  63103
UNITED STATES
Telephone : +1 314 771-5765
Fax : +1 800 325-5052

1.4 Emergency telephone number

Emergency Phone # : +1-703-527-3887

SECTION 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
Acute toxicity, Inhalation (Category 4), H332
Skin corrosion (Category 1B), H314
Serious eye damage (Category 1), H318
Respiratory sensitisation (Category 1), H334
Skin sensitisation (Category 1), H317
Specific target organ toxicity - single exposure (Category 3), Respiratory system, H335
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 2), H411

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 Danger
Hazard statement(s)
H302 + H332 Harmful if swallowed or if inhaled.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H335 May cause respiratory irritation.
H400 Very toxic to aquatic life.
H411 Toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P285 In case of inadequate ventilation wear respiratory protection.
P301 + P312 + P330 IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth.
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor.
P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
P342 + P311 If experiencing respiratory symptoms: Call a POISON CENTER/doctor.
P363 Wash contaminated clothing before reuse.
P391 Collect spillage.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

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

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Synonyms : Glutaric dialdehyde solution
            Gluteraldehyde
            Pentane-1,5-dial

Formula : C₅H₈O₂
Molecular weight : 100.12 g/mol
### SECTION 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**
Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. Consult a physician.

**In case of eye contact**
Continue rinsing eyes during transport to hospital. Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

**If swallowed**
Do NOT induce vomiting. 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

---

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

---

**Glutaral**

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS-No.</td>
<td>Flam. Liq. 4; Acute Tox. 3; Acute Tox. 1; Skin Corr. 1B; Eye Dam. 1; Resp. Sens. 1; Skin Sens. 1A; STOT SE 3; Aquatic Acute 1; Aquatic Chronic 1; H227, H301, H330, H314, H318, H334, H317, H335, H400, H410</td>
<td>&gt;= 20 - &lt; 30 %</td>
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<td>EC-No.</td>
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<tr>
<td>Index-No.</td>
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**Methanol**

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<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS-No.</td>
<td>Flam. Liq. 2; Acute Tox. 3; STOT SE 1; H225, H301, H331, H311, H370</td>
<td>&gt;= 0.1 - &lt; 1 %</td>
</tr>
<tr>
<td>EC-No.</td>
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<td></td>
</tr>
<tr>
<td>Index-No.</td>
<td></td>
<td></td>
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<tr>
<td>Registration number</td>
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<td></td>
</tr>
<tr>
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<td>200-659-6</td>
<td></td>
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<tr>
<td></td>
<td>603-001-00-X</td>
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</tr>
<tr>
<td></td>
<td>01-2119433307-44-XXX</td>
<td></td>
</tr>
</tbody>
</table>

---

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada.
SECTION 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
Carbon oxides

5.3 Advice for firefighters

Wear self-contained breathing apparatus for firefighting if necessary.

5.4 Further information

No data available

SECTION 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. Discharge into the environment must be avoided.

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.

SECTION 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.
Recommended storage temperature -20 °C
Store under inert gas. Air sensitive.
Storage class (TRGS 510): 8B: Non-combustible, corrosive hazardous materials

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated
### Components 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>Glutaral</td>
<td>111-30-8</td>
<td>C</td>
<td>0.2 ppm 0.8 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>0.05 ppm 0.2 mg/m³</td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
</tbody>
</table>

Glutaraldehyde can cause occupational asthma and skin sensitization responses such as contact dermatitis. Exposure related symptoms may include one or more of the following: shortness of breath, chest tightness, wheeze, cough, skin rash, hives, and irritation of the nose, throat, skin or eye. Hazard communication training required by sections 5191 or 5194 shall address these health hazards and symptoms along with the measures taken by the employer to evaluate and control exposures that can include medical evaluations, exposure monitoring, ventilation systems, work practices, and personal protective equipment. The communication system required by section 3203 shall inform employees where to report possible health symptoms and where to ask questions, report concerns, and receive information about the employer's evaluation and control measures.

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glutaral</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

Dermal Sensitization  
Respiratory sensitization  
Central Nervous System impairment  
Upper Respiratory Tract irritation  
Eye irritation  
Skin irritation  
Not classifiable as a human carcinogen

Methanol  | 67-56-1 | TWA 200 ppm | USA. ACGIH Threshold Limit Values (TLV)  

Headache  
Nausea  
Dizziness  
Eye damage  
Substances for which there is a Biological Exposure Index or Indices (see BEI® section)  
Danger of cutaneous absorption

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
</tbody>
</table>

Headache  
Nausea  
Dizziness  
Eye damage
<table>
<thead>
<tr>
<th>Parameters</th>
<th>Value</th>
<th>Biological specimen</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methanol</td>
<td>15 mg/l</td>
<td>Urine</td>
<td>ACGIH - Biological Exposure Indices (BEI)</td>
</tr>
</tbody>
</table>

**Biological occupational exposure limits**

### 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**
Tightly fitting safety goggles. Faceshield (8-inch minimum). 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 multi-purpose 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. Discharge into the environment must be avoided.

---

**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>Form</td>
<td>liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>No data available</td>
</tr>
<tr>
<td>Odour Threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>2.9</td>
</tr>
<tr>
<td>Melting/Freezing point</td>
<td>-10 °C (14 °F)</td>
</tr>
<tr>
<td>Initial boiling point</td>
<td>101 °C 214 °F at 1,013 hPa</td>
</tr>
<tr>
<td>Flash point</td>
<td>No data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid,</td>
<td>No data available</td>
</tr>
</tbody>
</table>
SECTION 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 bases, Strong oxidizing agents

10.6 Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides
Other decomposition products - No data available
Hazardous decomposition products formed under fire conditions. - Carbon oxides
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
No data available
LD50 Oral - Rat - male and female - 200 mg/kg (Glutaral)  
(US-EPA) 
Inhalation: No data available 

LC50 Inhalation - Rat - male and female - 4 h - 0.28 mg/l (Glutaral)  
(OECD Test Guideline 403) 
Inhalation: Corrosive to respiratory system. (Glutaral)  
Dermal: No data available 

LD50 Dermal - Rabbit - male and female - > 1,000 mg/kg (Glutaral)  
(US-EPA) 
No data available 

**Skin corrosion/irritation**  
Skin - Rabbit (Glutaral)  
Result: Corrosive - 4 h  
(OECD Test Guideline 404)  
Remarks: (50% solution)  
(Regulation (EC) No 1272/2008, Annex VI) (Glutaral) 

**Serious eye damage/eye irritation**  
Eyes - Rabbit (Glutaral)  
Result: Irreversible effects on the eye  
(Draize Test)  
Remarks: (50% solution)  
Causes serious eye damage. (Glutaral)  

**Respiratory or skin sensitisation**  
May cause allergic respiratory and skin reactions Chronic exposure may cause dermatitis.  
largely based on human evidence (Glutaral) 

**Germ cell mutagenicity**  
Mutagenicity (mammal cell test): chromosome aberration. (Glutaral)  
Chinese hamster lung cells  
Result: positive  
(50% solution)  
OECD Test Guideline 486 (Glutaral)  
Rat - male - Liver cells  
Result: negative  
(50% solution) 

**Carcinogenicity**  
This product is or contains a component that is not classifiable as to its carcinogenicity  
based on its IARC, ACGIH, NTP, or EPA classification. (Glutaral) 

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  
on OSHA’s list of regulated carcinogens. 

**Reproductive toxicity**  
No data available 

**Specific target organ toxicity - single exposure**  
May cause respiratory irritation. - Respiratory system (Glutaral)  
Classified according to Regulation (EU) 1272/2008, Annex VI (Table 3.1/3.2)
Acute oral toxicity - If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach. (Glutaral)
Acute inhalation toxicity - mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract (Glutaral)

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available (Glutaral)

Additional Information
Repeated dose toxicity - Rat - male and female - Oral - 52 Weeks - No observed adverse effect level - 30.5 mg/kg - Lowest observed adverse effect level - 116.6 mg/kg (Glutaral)
Repeated dose toxicity - Rat - male and female - Dermal - 13 Weeks - No observed adverse effect level - 150 mg/kg (Glutaral)
RTECS: Not available

burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea, Vomiting (Glutaral)
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. (Glutaral)
Liver - Irregularities - Based on Human Evidence
Liver - Irregularities - Based on Human Evidence (Glutaral)

SECTION 12: Ecological information

12.1 Toxicity
Toxicity to fish
static test LC50 - Oncorhynchus mykiss (rainbow trout) - 0.8 mg/l - 96 h (Glutaral)
(US-EPA)

Toxicity to algae
static test ErC50 - Desmodesmus subspicatus (green algae) - 0.6 mg/l - 72 h (Glutaral)
(OECD Test Guideline 201)

Toxicity to bacteria

12.2 Persistence and degradability
Biodegradability
aerobic - Exposure time 70 d (Glutaral)
Result: 90 - 100 % - Biodegradable in sea water
(OECD Test Guideline 306)

Biochemical Oxygen Demand (BOD) 235 mg/g (Glutaral)
Remarks: (IUCLID)

Chemical Oxygen Demand (COD) 1,385 mg/g (Glutaral)
Remarks: (IUCLID)

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available (Glutaral)
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**
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

Additional ecological information

**Biological effects:**
Bactericidal effect. Forms toxic mixtures in water, dilution measures notwithstanding. When discharged properly, no impairments in the function of adapted biological wastewater treatment plants are to be expected. Discharge into the environment must be avoided.

---

**SECTION 13: Disposal considerations**

13.1 **Waste treatment methods**

**Product**
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. Offer surplus and non-recyclable solutions to a licensed disposal company.

**Contaminated packaging**
Dispose of as unused product.

---

**SECTION 14: Transport information**

**DOT (US)**
UN number: 3265  Class: 8  Packing group: II
Proper shipping name: Corrosive liquid, acidic, organic, n.o.s. (Glutaral)
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

**IMDG**
UN number: 3265  Class: 8  Packing group: II  EMS-No: F-A, S-B
Proper shipping name: CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S. (Glutaral)
Marine pollutant: yes

**IATA**
UN number: 3265  Class: 8  Packing group: II
Proper shipping name: Corrosive liquid, acidic, organic, n.o.s. (Glutaral)

---

**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**
Acute Health Hazard, Chronic Health Hazard

**Massachusetts Right To Know Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glutaral</td>
<td>111-30-8</td>
<td>1993-02-16</td>
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</table>

**Pennsylvania Right To Know Components**

<table>
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<th>Revision Date</th>
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</thead>
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<td>1993-02-16</td>
</tr>
<tr>
<td>Glutaral</td>
<td>111-30-8</td>
<td>1993-02-16</td>
</tr>
<tr>
<td>Methanol</td>
<td>67-56-1</td>
<td>2007-07-01</td>
</tr>
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</table>

**California Prop. 65 Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>, which is/are known to the State of California to cause birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>.</td>
<td>67-56-1</td>
<td>2012-03-16</td>
</tr>
</tbody>
</table>

**SECTION 16: Other information**

**Further information**

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Version: 6.2 Revision Date: 04/02/2019 Print Date: 08/08/2019