SAFETY DATA SHEET

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

1.1 Product identifiers

Product name: Potassium permanganate
Product Number: 223468
Brand: SIGALD
Index-No.: 025-002-00-9
CAS-No.: 7722-64-7

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

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

Oxidizing solids (Category 2), H272
Acute toxicity, Oral (Category 4), H302
Skin corrosion (Category 1), H314
Serious eye damage (Category 1), H318
Reproductive toxicity (Category 2), H361
Specific target organ toxicity - repeated exposure, Inhalation (Category 2), Brain, H373
Short-term (acute) aquatic hazard (Category 1), H400
Long-term (chronic) aquatic hazard (Category 1), H410

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):
- H272: May intensify fire; oxidizer.
- H302: Harmful if swallowed.
- H314: Causes severe skin burns and eye damage.
- H361: Suspected of damaging fertility or the unborn child.
- H373: May cause damage to organs (Brain) through prolonged or repeated exposure if inhaled.
- H410: Very toxic to aquatic life with long lasting effects.

Precautionary statement(s):
- P201: Obtain special instructions before use.
- P202: Do not handle until all safety precautions have been read and understood.
- P210: Keep away from heat.
- P220: Keep/Store away from clothing/ combustible materials.
- P221: Take any precaution to avoid mixing with combustibles.
- P260: Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
- P264: Wash skin thoroughly after handling.
- P270: Do not eat, drink or smoke when using this product.
- P273: Avoid release to the environment.
- P280: Wear protective gloves/ protective clothing/ eye protection/ face 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.
- P308 + P313: IF exposed or concerned: Get medical advice/ attention.
- P363: Wash contaminated clothing before reuse.
- P370 + P378: In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
- P391: Collect spillage.
- 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

3.1 Substances

<table>
<thead>
<tr>
<th>Formula</th>
<th>Molecular weight</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KMnO₄</td>
<td>158.03 g/mol</td>
<td>7722-64-7</td>
</tr>
</tbody>
</table>

The life science business of Merck KGaA, Darmstadt, Germany operates as MilliporeSigma in the US and Canada
EC-No. : 231-760-3  
Index-No. : 025-002-00-9

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium permanganate</td>
<td>Ox. Sol. 2; Acute Tox. 4; Skin Corr. 1; Eye Dam. 1; Repr. 2; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H272, H302, H314, H318, H361, H373, H400, H410 M-Factor - Aquatic Acute: 10 M-Factor - Aquatic Chronic: 10</td>
<td>&lt;= 100 %</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  
First aider needs to protect himself. 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. Call a physician immediately.

In case of eye contact  
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed  
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

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
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

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

5.2 Special hazards arising from the substance or mixture

Potassium oxides
Manganese/manganese oxides
Not combustible.
Has a fire-promoting effect due to release of oxygen.
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

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: Avoid inhalation of dusts. Avoid substance contact. Ensure adequate ventilation. 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 dry. Dispose of properly. Clean up affected area. Avoid generation of dusts.

6.4 Reference to other sections
For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling
Work under hood. Do not inhale substance/mixture.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition.

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

**Storage conditions**
Tightly closed. Do not store near combustible materials.
Storage class (TRGS 510): 5.1B: Oxidizing hazardous materials

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**

<table>
<thead>
<tr>
<th>Ingredients with workplace control parameters</th>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Potassium permanganate</td>
<td>7722-64-7</td>
<td>C</td>
<td>5 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA</td>
<td>0.1 mg/m³</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Remarks</td>
<td>Not classifiable as a human carcinogen</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA</td>
<td>0.02 mg/m³</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Not classifiable as a human carcinogen</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TWA</td>
<td>1 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>ST</td>
<td>3 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>PEL</td>
<td>0.2 mg/m³</td>
<td>California permissible exposure limits for chemical contaminants (Title 8, Article 107)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>C</td>
<td>5 mg/m³</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
</tbody>
</table>

8.2 **Exposure controls**

**Appropriate engineering controls**
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face 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). Tightly fitting safety goggles

**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: 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 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: 0.11 mm
Break through time: 480 min
Material tested: KCL 741 Dermatril® L

**Body Protection**

protective clothing

**Respiratory protection**

required when dusts 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.

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**SECTION 9: Physical and chemical properties**

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

| a) Appearance | Form: solid |
| b) Odor | No data available |
| c) Odor Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | No data available |
| f) Initial boiling point and boiling range | No data available |
| g) Flash point | () Not applicable |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | The product is not flammable. |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapor pressure | No data available |
9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
No data available

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:
- powdered aluminium
- Ammonia
- ammonium compounds
- arsenic
- Dimethylformamide
- acetic acid
- Acetic anhydride
- formaldehyde
- oxidisable substances
- Nitro compounds
- phosphorus
- pyridine
- strong reducing agents
- hydrochloric acid
- sulfur
- Titanium
- sugars
- ammonium nitrate
- sulfuric acid
- Combustible Liquids
- Organic Substances
- mineral acids
- anhydrides
- mineral wool

The substance or mixture is classified as oxidizing with the category 2.
Alcohols with sulfuric acid alkali salts with sulfuric acid
Risk of ignition or formation of inflammable gases or vapours with:
Acetaldehyde Alcohol antimony Aldehydes silanes dimethyl sulfoxide
Ethylene glycol ethanol Hydrogen fluoride organic solvent glycerol hydroxylamine
Organic Substances oxalic acid sulfuric acid hydrogen sulphide hydrogen peroxide triethanolamine
Esters glycerol with sulfuric acid sulfuric acid with
Organic Substances Exothermic reaction with:
Reducing agents Nitric acid carbides
Generates dangerous gases or fumes in contact with:
Hydrogen chloride gas

10.4 Conditions to avoid
no information available

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5
SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity
LD50 Oral - Rat - 750 mg/kg
Remarks: (RTECS)
Inhalation: No data available
LD50 Dermal - Rat - male and female - > 2,000 mg/kg
(OECD Test Guideline 402)
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Corrosive after 4 hours or less of exposure
(OECD Test Guideline 404)

Serious eye damage/eye irritation
Causes serious eye damage.

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: negative
(OECD Test Guideline 406)

Germ cell mutagenicity
Ames test
Escherichia coli/Salmonella typhimurium
Result: negative
In vitro mammalian cell gene mutation test
Mouse lymphoma test
Result: negative
OECD Test Guideline 474
Rat - male and female - Bone marrow
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
Suspected of damaging the unborn child.

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Inhalation - May cause damage to organs through prolonged or repeated exposure. - Brain

Aspiration hazard
No data available

11.2 Additional Information
RTECS: SD6475000
Contact with skin can cause: Edema, Necrosis, Effects due to ingestion may include: methemoglobinema, psychological disturbances, Vomiting, Nausea, Diarrhea
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

**SECTION 12: Ecological information**

**12.1 Toxicity**

| Toxicity to fish | semi-static test LC50 - Poecilia reticulata (guppy) - 0.47 mg/l - 96 h (OECD Test Guideline 203) |
| Toxicity to daphnia and other aquatic invertebrates | semi-static test EC50 - Daphnia magna (Water flea) - 0.06 mg/l - 48 h (OECD Test Guideline 202) |
| Toxicity to algae | static test ErC50 - Desmodesmus subspicatus (green algae) - 0.8 mg/l - 72 h (OECD Test Guideline 201) |
| | static test NOEC - Desmodesmus subspicatus (green algae) - 0.32 mg/l - 72 h (OECD Test Guideline 201) |
| Toxicity to bacteria | static test EC50 - activated sludge - 164 mg/l - 180 min (OECD Test Guideline 209) |

**12.2 Persistence and degradability**

The methods for determining the biological degradability are not applicable to inorganic substances.

**12.3 Bioaccumulative potential**

**12.4 Mobility in soil**

**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

**SECTION 13: Disposal considerations**

**13.1 Waste treatment methods**

**Product**

Waste material must be disposed of in accordance with the national and local regulations. No mixing with other waste. Handle uncleaned containers like the product. 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

**DOT (US)**
UN number: 1490  Class: 5.1  Packing group: II
Proper shipping name: Potassium permanganate
Reportable Quantity (RQ): 100 lbs
Poison Inhalation Hazard: No

**IMDG**
UN number: 1490  Class: 5.1  Packing group: II
Proper shipping name: POTASSIUM PERMANGANATE
Marine pollutant: yes

**IATA**
UN number: 1490  Class: 5.1  Packing group: II
Proper shipping name: Potassium permanganate

SECTION 15: Regulatory information

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

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

<table>
<thead>
<tr>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potassium permanganate</td>
<td>7722-64-7</td>
</tr>
</tbody>
</table>

**SARA 311/312 Hazards**
Reactivity Hazard, Acute Health Hazard

**Massachusetts Right To Know Components**
No components are subject to the Massachusetts Right to Know Act.

SECTION 16: Other information

**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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