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

1.1 Product identifiers

- Product name: Hydrazine monohydrate
- Product Number: 207942
- Brand: Sigma-Aldrich
- Index-No. : 007-008-00-3
- CAS-No.: 7803-57-8

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)

- Flammable liquids (Category 3), H226
- Acute toxicity, Oral (Category 3), H301
- Acute toxicity, Inhalation (Category 2), H330
- Acute toxicity, Dermal (Category 3), H311
- Skin corrosion (Category 1B), H314
- Serious eye damage (Category 1), H318
- Skin sensitization (Category 1), H317
- Carcinogenicity (Category 1B), H350
- 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**

<table>
<thead>
<tr>
<th>Signal Word</th>
<th>Hazard statement(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Danger</td>
<td>Flammable liquid and vapor.</td>
</tr>
<tr>
<td></td>
<td>Toxic if swallowed or in contact with skin.</td>
</tr>
<tr>
<td></td>
<td>Causes severe skin burns and eye damage.</td>
</tr>
<tr>
<td></td>
<td>May cause an allergic skin reaction.</td>
</tr>
<tr>
<td></td>
<td>Fatal if inhaled.</td>
</tr>
<tr>
<td></td>
<td>May cause cancer.</td>
</tr>
<tr>
<td></td>
<td>Very toxic to aquatic life with long lasting effects.</td>
</tr>
</tbody>
</table>

**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/ sparks/ open flames/ hot surfaces. No smoking.
- **P233** Keep container tightly closed.
- **P240** Ground/bond container and receiving equipment.
- **P241** Use explosion-proof electrical/ ventilating/ lighting/ equipment.
- **P242** Use only non-sparking tools.
- **P243** Take precautionary measures against static discharge.
- **P260** Do not breathe mist or vapors.
- **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 must not be allowed out of the workplace.
- **P273** Avoid release to the environment.
- **P280** Wear protective gloves/ protective clothing/ eye protection/ face protection.
- **P284** Wear respiratory protection.
- **P301 + P310 + P330** IF SWALLOWED: Immediately call a POISON CENTER/ doctor. 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.
- **P333 + P313** If skin irritation or rash occurs: Get medical advice/ attention.
- **P362** Take off contaminated clothing and wash before reuse.
P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
P391 Collect spillage.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P403 + P235 Store in a well-ventilated place. Keep cool.
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
Synonyms: Hydrazinium hydroxide

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrazine monohydrate</td>
<td>Flam. Liq. 3; Acute Tox. 3; Acute Tox. 2; Acute Tox. 3; Skin Corr. 1B; Eye Dam. 1; Skin Sens. 1; Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H226, H301, H330, H311, H314, H318, H317, H350, H400, H410 Concentration limits: &gt;= 10 %: Skin Corr. 1B, H314; 3 - &lt; 10 %: Skin Irrit. 2, H315; 3 - &lt; 10 %: Eye Irrit. 2, H319; M-Factor - Aquatic Acute: 10 - 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 aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

**If inhaled**
After inhalation: fresh air. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

**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**
If swallowed: give water to drink (two glasses at most). Seek medical advice immediately. In exceptional cases only, if medical care is not available within one hour, induce vomiting (only in persons who are wide awake and fully conscious), administer activated charcoal (20 - 40 g in a 10% slurry) and consult a doctor as quickly as possible. 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**
Small (incipient) fires must be extinguished with alcohol resistant foam, dry chemical powder or carbon dioxide. Large amounts of water are ineffective. Cool containers with large amounts of water.

5.2 Special hazards arising from the substance or mixture
Nature of decomposition products not known.
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
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**
Remove container from danger zone and cool with water. Suppress (knock down) gases/vapors/mists with a water spray jet. 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 carefully 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.

### 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**
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.

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

**Storage conditions**
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons.

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

<table>
<thead>
<tr>
<th>Ingredients with workplace control parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>hydrazine monohydrate</td>
</tr>
<tr>
<td>Remarks</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Potential Occupational Carcinogen</td>
</tr>
<tr>
<td>TWA</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Skin designation</td>
</tr>
<tr>
<td>PEL</td>
</tr>
<tr>
<td></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 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: Latex gloves
Minimum layer thickness: 0.6 mm
Break through time: 480 min
Material tested: Lapren® (KCL 706 / Aldrich Z677558, Size M)

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: 30 min
Material tested: KCL 741 Dermatril® L

**Body Protection**
Flame retardant antistatic protective clothing.

**Respiratory protection**
Recommended Filter type: Filter type K
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. Risk of explosion.

---

**SECTION 9: Physical and chemical properties**

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

a) **Appearance**
   Form: liquid, clear
   Color: colorless

b) **Odor**
   No data available

c) **Odor Threshold**
   No data available

d) **pH**
   10.6 - 10.7 at 10 g/l

e) **Melting point/freezing point**
   Melting point/range: -51.7 °C (-61.1 °F) - lit.

f) **Initial boiling point and boiling range**
   120.1 °C 248.2 °F - lit.

g) **Flash point**
   38 °C (100 °F) - closed cup - (anhydrous substance)

h) **Evaporation rate**
   No data available

i) **Flammability (solid, gas)**
   No data available

j) **Upper/lower flammability or explosive limits**
   No data available

k) **Vapor pressure**
   7 hPa at 25 °C (77 °F)

l) **Vapor density**
   No data available

m) **Density**
   1.032 g/cm³ at 25 °C (77 °F) - lit.
Relative density  
No data available

n) Water solubility  
completely soluble

o) Partition coefficient: n-octanol/water  
No data available

p) Autoignition temperature  
No data available

q) Decomposition temperature  
> 250 °C (> 482 °F) -

r) Viscosity  
No data available

s) Explosive properties  
Not explosive

t) Oxidizing properties  
No data available

9.2 Other safety information

Solubility in other solvents  
Ethanol - soluble

SECTION 10: Stability and reactivity

10.1 Reactivity

Vapor/air-mixtures are explosive at intense warming.

10.2 Chemical stability

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

10.3 Possibility of hazardous reactions

Exothermic reaction with:

Oxidizing agents
Heavy metals
Light metals
metallic oxides
halogens
Metals
acids
Organic Substances
Nitro compounds
strong alkalis
Risk of explosion with:
Alkali metals
sodium
mercury compounds
tin (II) chloride
Violent reactions possible with:
Heavy metals
alkalines
Light metals
metallic chlorides
metallic oxides
halogens
Metals
Acids
Oxidizing agents
organic nitro compounds
Heavy metal salts

10.4 Conditions to avoid
Heat, flames and sparks.
Heating.

10.5 Incompatible materials
Oxidizing agents, Oxygen, Copper, Organic materials, Zinc

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 - male - 262 mg/kg
(OECD Test Guideline 401)
Remarks: anhydrous substance
LC50 Inhalation - Rat - male - 4 h - 0.76 mg/l - vapor
Remarks: (ECHA)
anhydrous substance
Dermal: No data available
No data available

Skin corrosion/irritation
Skin - Rabbit
Result: Corrosive - 4 h
Remarks: (55% solution)
anhydrous substance

Serious eye damage/eye irritation
Remarks: Causes serious eye damage.

Respiratory or skin sensitization
(Regulation (EC) No 1272/2008, Annex VI) (anhydrous substance)

Germ cell mutagenicity
No data available

Carcinogenicity
Presumed to have carcinogenic potential for humans

IARC: 2A - Group 2A: Probably carcinogenic to humans
The data in this record has been derived from the water-free form of this substance. (hydrazine monohydrate)

NTP: RAHC - Reasonably anticipated to be a human carcinogen
The data in this record has been derived from the water-free form of this substance. (hydrazine monohydrate)
monohydrate)

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

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

Liver - Irregularities - Based on Human Evidence

Liver - Irregularities - Based on Human Evidence

---

### SECTION 12: Ecological information

#### 12.1 Toxicity

**Toxicity to fish**

<table>
<thead>
<tr>
<th>Static test LC50</th>
<th>Poecilia reticulata (guppy)</th>
<th>0.61 mg/l</th>
<th>96 h</th>
</tr>
</thead>
</table>

Remarks: (ECHA)

**Toxicity to daphnia and other aquatic invertebrates**

<table>
<thead>
<tr>
<th>Semi-static test EC50</th>
<th>Daphnia pulex (Water flea)</th>
<th>0.16 mg/l</th>
<th>48 h</th>
</tr>
</thead>
</table>

Remarks: (US-EPA)

(in analogy to similar products)

**Toxicity to algae**

<table>
<thead>
<tr>
<th>Static test ErC50</th>
<th>Desmodesmus subspicatus (green algae)</th>
<th>0.017 mg/l</th>
<th>48 h</th>
</tr>
</thead>
</table>


**Toxicity to bacteria**

<table>
<thead>
<tr>
<th>Static test EC50</th>
<th>Activated sludge</th>
<th>5.5 mg/l</th>
<th>3 h</th>
</tr>
</thead>
</table>

(OECD Test Guideline 209)

**Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)**

<table>
<thead>
<tr>
<th>Semi-static test NOEC</th>
<th>Daphnia magna (Water flea)</th>
<th>0.123 mg/l</th>
<th>21 d</th>
</tr>
</thead>
</table>

(OECD Test Guideline 211)
12.2 Persistence and degradability
Biodegradability aerobically - Exposure time 24 h
Result: 99 % - Inherently biodegradable.
(OECD Test Guideline 302B)
Remarks: (anhydrous substance)

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.

SECTION 14: Transport information
DOT (US)
UN number: 2030  Class: 8 (6.1)  Packing group: II
Proper shipping name: Hydrazine aqueous solution
Reportable Quantity (RQ): 1 lbs
Poison Inhalation Hazard: No

IMDG
UN number: 2030  Class: 8 (6.1)  Packing group: II
Proper shipping name: HYDRAZINE, AQUEOUS SOLUTION
Marine pollutant: yes
EMS-No: F-A, S-B

IATA
UN number: 2030  Class: 8 (6.1)  Packing group: II
Proper shipping name: Hydrazine, aqueous solution

SECTION 15: Regulatory information

**SARA 302 Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrazine monohydrate</td>
<td>7803-57-8</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

**SARA 313 Components**

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

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrazine monohydrate</td>
<td>7803-57-8</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

**Massachusetts Right To Know Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrazine monohydrate</td>
<td>7803-57-8</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

**Pennsylvania Right To Know Components**

<table>
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<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
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<tbody>
<tr>
<td>hydrazine monohydrate</td>
<td>7803-57-8</td>
<td>2007-07-01</td>
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</tbody>
</table>

**California Prop. 65 Components**

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>hydrazine monohydrate</td>
<td>7803-57-8</td>
<td>2007-09-28</td>
</tr>
</tbody>
</table>

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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Version: 6.19 Revision Date: 10/27/2023 Print Date: 01/06/2024