1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Hydrazine hydrate

Product Number: 225819

Brand: Sigma-Aldrich

Supplier: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO  63103
USA

Telephone: +1 800-325-5832
Fax: +1 800-325-5052
Emergency Phone #: (314) 776-6555

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

2. HAZARDS IDENTIFICATION

Emergency Overview

OSHA Hazards
Carcinogen, Target Organ Effect, Highly toxic by inhalation, Toxic by ingestion, Toxic by skin absorption, Skin sensitiser, Irritant, Corrosive

Target Organs
Nerves., Blood, Liver, Kidney

GHS Classification
Acute toxicity, Oral (Category 3)
Acute toxicity, Inhalation (Category 1)
Acute toxicity, Dermal (Category 3)
Skin corrosion (Category 1B)
Serious eye damage (Category 1)
Skin sensitisation (Category 1)
Carcinogenicity (Category 1B)
Acute aquatic toxicity (Category 1)

GHS Label elements, including precautionary statements

Pictogram

Signal word: Danger

Hazard statement(s)
H301 + H311 Toxic if swallowed or in contact with skin
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H330 Fatal if inhaled.
H350 May cause cancer.
H400 Very toxic to aquatic life.

Precautionary statement(s)
P201 Obtain special instructions before use.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Avoid release to the environment.
Wear protective gloves/ protective clothing/ eye protection/ face protection.
Wear respiratory protection.
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 or doctor/ physician.

HMIS Classification

- Health hazard: 4
- Chronic Health Hazard: *
- Flammability: 1
- Physical hazards: 0

NFPA Rating

- Health hazard: 4
- Fire: 1
- Reactivity Hazard: 0

Potential Health Effects

- **Inhalation**: May be fatal if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Causes respiratory tract irritation.
- **Skin**: Toxic if absorbed through skin. Causes skin burns. Causes skin irritation.
- **Eyes**: Causes eye burns. Causes eye irritation.
- **Ingestion**: Toxic if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrazine hydrate</td>
<td>Flam. Liq. 3; Acute Tox. 3; Skin Corr. 1B; Skin Sens. 1; Carc. 1B; Aquatic Acute 1; Aquatic Chronic 1; H226, H301 + H311 + H331, H314, H317, H350, H410</td>
<td>50 - 70 %</td>
</tr>
<tr>
<td>CAS-No.</td>
<td>10217-52-4</td>
<td></td>
</tr>
<tr>
<td>EC-No.</td>
<td>206-114-9</td>
<td></td>
</tr>
<tr>
<td>Index-No.</td>
<td>007-008-00-3</td>
<td></td>
</tr>
</tbody>
</table>

For the full text of the H-Statements and R-Phrases mentioned in this Section, see Section 16

4. 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. Take victim immediately to hospital. Consult a physician.

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

**If swallowed**
Do NOT induce vomiting. Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.
5. FIREFIGHTING MEASURES

Conditions of flammability
Not flammable or combustible.

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

Special protective equipment for firefighters
Wear self contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Hazardous decomposition products formed under fire conditions. - nitrogen oxides (NOx)

6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Wear respiratory protection. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

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.

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.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Conditions for safe storage
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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Components</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrazine hydrate</td>
<td>10217-52-4</td>
<td>TWA</td>
<td>0.01 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>Remarks</td>
<td></td>
<td>TWA</td>
<td>0.1 ppm</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.1 mg/m3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>USA. NIOSH Recommended Exposure Limits</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Potential Occupational Carcinogen See Appendix A 2 hour ceiling value</td>
</tr>
</tbody>
</table>

Remarks Upper Respiratory Tract cancer Confirmed animal carcinogen with unknown relevance to humans Danger of cutaneous absorption

Skin notation

Skin designation The value in mg/m3 is approximate.
Personal protective equipment

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).

Hand 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: butyl-rubber
Minimum layer thickness: 0.3 mm
Break through time: 480 min
Material tested:Butoject® (KCL 897 / Aldrich Z677647, Size M)

Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0.11 mm
Break through time: 30 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.

Eye 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 and 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.

Hygiene measures
Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form clear, liquid
Colour colourless

Safety data
pH no data available
Melting point/freezing point no data available
Boiling point no data available
Flash point 96 °C (205 °F) - closed cup
Ignition temperature no data available
Auto-ignition temperature no data available
Lower explosion limit 3.5 %(V)
Upper explosion limit 99.99 %(V)
Vapour pressure 7 hPa (5 mmHg) at 25 °C (77 °F)
10. STABILITY AND REACTIVITY

Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
no data available

Conditions to avoid
no data available

Materials to avoid
Zinc, Oxidizing agents, Organic materials, Oxygen, Copper

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - nitrogen oxides (NOx)
Other decomposition products - no data available

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
no data available

Inhalation LC50
no data available

Dermal LD50
no data available

Other information on acute toxicity
no data available

Skin corrosion/irritation
no data available

Serious eye damage/eye irritation
Eyes: no data available

Respiratory or skin sensitisation
no data available

Germ cell mutagenicity

no data available

Carcinogenicity

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Hydrazine hydrate)

NTP: Reasonably anticipated to be a human carcinogenThe reference note has been added by TD based on the background information of the NTP. (Hydrazine hydrate)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a
Reproductive toxicity
no data available

Teratogenicity
no data available

Specific target organ toxicity - single exposure (Globally Harmonized System)
no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System)
no data available

Aspiration hazard
no data available

Potential health effects
- **Inhalation**: May be fatal if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. Causes respiratory tract irritation.
- **Ingestion**: Toxic if swallowed.
- **Skin**: Toxic if absorbed through skin. Causes skin burns. Causes skin irritation.
- **Eyes**: Causes eye burns. Causes eye irritation.

Signs and Symptoms of Exposure
Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, burning sensation, Cough, wheezing, laryngitis, Shortness of breath, Headache, Nausea

Synergistic effects
no data available

Additional Information
RTECS: Not available

12. ECOLOGICAL INFORMATION

Toxicity
no data available

Persistence and degradability
no data available

Bioaccumulative potential
no data available

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Very toxic to aquatic life.

13. DISPOSAL CONSIDERATIONS
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: 2030  Class: 8 (6.1)  Packing group: II
Proper shipping name: Hydrazine aqueous solution
Reportable Quantity (RQ): 2 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

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

IATA
UN number: 2030  Class: 8 (6.1)  Packing group: II
Proper shipping name: Hydrazine, aqueous solution
IATA Passenger: Not permitted for transport

15. REGULATORY INFORMATION

OSHA Hazards
Carcinogen, Target Organ Effect, Highly toxic by inhalation, Toxic by ingestion, Toxic by skin absorption, Skin sensitiser, Irritant, Corrosive

SARA 302 Components
The following components are subject to reporting levels established by SARA Title III, Section 302:

<table>
<thead>
<tr>
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<td>10217-52-4</td>
<td>2007-07-01</td>
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SARA 313 Components
The following components are subject to reporting levels established by SARA Title III, Section 313:

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</table>

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

Massachusetts Right To Know Components

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</tbody>
</table>

Pennsylvania Right To Know Components

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<td>10217-52-4</td>
<td>2007-07-01</td>
</tr>
</tbody>
</table>

New Jersey Right To Know Components

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California Prop. 65 Components

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<tbody>
<tr>
<td>Hydrazine hydrate</td>
<td>10217-52-4</td>
<td>2007-09-28</td>
</tr>
</tbody>
</table>

WARNING! This product contains a chemical known to the State of California to cause cancer.
16. OTHER INFORMATION

Text of H-code(s) and R-phrase(s) mentioned in Section 3

| Acute Tox. | Acute toxicity                        |
| Aquatic Acute | Acute aquatic toxicity                |
| Aquatic Chronic | Chronic aquatic toxicity              |
| Carc. | Carcinogenicity                        |
| Flam. Liq. | Flammable liquids                      |
| H226 | Flammable liquid and vapour.          |
| H301 + H311 + | Toxic if swallowed, in contact with skin or if inhaled |
| H331 |                                      |
| H314 | Causes severe skin burns and eye damage. |
| H317 | May cause an allergic skin reaction.  |
| H350 | May cause cancer.                      |
| H410 | Very toxic to aquatic life with long lasting effects. |
| Skin Corr. | Skin corrosion                        |
| Skin Sens. | Skin sensitisation                    |

Further information

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