1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name: Hexamethylenetetramine

Product Number: 398160
Brand: Sigma-Aldrich
Index-No.: 612-101-00-2

CAS-No.: 100-97-0

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

Identified uses: Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

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

Telephone: +1 800-325-5832
Fax: +1 800-325-5052

1.4 Emergency telephone number

Emergency Phone #: (314) 776-6555

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

GHS Classification in accordance with 29 CFR 1910 (OSHA HCS)
Flammable solids (Category 2), H228
Skin sensitisation (Category 1), H317

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: Warning

Hazard statement(s)
H228: Flammable solid.
H317: May cause an allergic skin reaction.

Precautionary statement(s)
P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P240: Ground/bond container and receiving equipment.
P241: Use explosion-proof electrical/ ventilating/ lighting/ equipment.
P261: Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P272: Contaminated work clothing should not be allowed out of the workplace.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.
P333 + P313: If skin irritation or rash occurs: Get medical advice/ attention.
2.3 Hazards not otherwise classified (HNOC) or not covered by GHS - none

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

<table>
<thead>
<tr>
<th>Synonyms</th>
<th>Classification</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urotropine</td>
<td>Flam. Sol. 2; Skin Sens. 1; H228, H317</td>
<td>&lt;= 100 %</td>
</tr>
<tr>
<td>1,3,5,7-Tetraazatricyclo[3.3.1.13,7]decane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hexamine</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methenamine</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Flush eyes with water as a precaution.

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

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, Nitrogen oxides (NOx), Hydrogen cyanide (hydrocyanic acid)

5.3 Advice for firefighters
Wear self-contained breathing apparatus for firefighting if necessary.
5.4 **Further information**
Use water spray to cool unopened containers.

6. **ACCIDENTAL RELEASE MEASURES**

6.1 **Personal precautions, protective equipment and emergency procedures**
Use personal protective equipment. Avoid dust formation. Avoid breathing vapours, mist or gas. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Avoid breathing dust. 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.

6.3 **Methods and materials for containment and cleaning up**
Sweep up and shovel. Contain spillage, and then collect with an electrically protected vacuum cleaner or by wet-brushing and place in container for disposal according to local regulations (see section 13). Keep in suitable, closed containers for disposal. Contain spillage, pick up with an electrically protected vacuum cleaner or by wet-brushing and transfer to a container for disposal according to local regulations (see section 13).

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

7. **HANDLING AND STORAGE**

7.1 **Precautions for safe handling**
Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Further processing of solid materials may result in the formation of combustible dusts. The potential for combustible dust formation should be taken into consideration before additional processing occurs. Provide appropriate exhaust ventilation at places where dust is formed. Keep away from sources of ignition - No smoking. Take measures to prevent the build up of electrostatic charge. 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.

- **hygroscopic**
- Storage class (TRGS 510): Flammable solid hazardous materials

7.3 **Specific end use(s)**
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

8. **EXPOSURE CONTROLS/PERSOAL PROTECTION**

8.1 **Control parameters**
Contains no substances with occupational exposure limit values.

8.2 **Exposure 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**
  Face shield and safety glasses 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, Flame retardant antistatic protective clothing., 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 particle respirator type N100 (US) or type P3 (EN 143) 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.

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9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

| a) Appearance | Form: crystalline | Colour: colourless |
| b) Odour | ammoniacal |
| c) Odour Threshold | No data available |
| d) pH | No data available |
| e) Melting point/freezing point | 280 °C (536 °F) |
| f) Initial boiling point and boiling range | No data available |
| g) Flash point | 250 °C (482 °F) - closed cup |
| h) Evaporation rate | No data available |
| i) Flammability (solid, gas) | The substance or mixture is a flammable solid with the category 2. |
| j) Upper/lower flammability or explosive limits | No data available |
| k) Vapour pressure | < 0.01 hPa (< 0.01 mmHg) at 20 °C (68 °F) |
| l) Vapour density | No data available |
| m) Relative density | 1.331 g/cm³ |
| n) Water solubility | soluble |
| o) Partition coefficient: n-octanol/water | log Pow: -2.179 at 20 °C (68 °F) |
| p) Auto-ignition temperature | No data available |
9.2 **Other safety information**

- **Decomposition temperature**: No data available
- **Viscosity**: No data available
- **Explosive properties**: No data available
- **Oxidizing properties**: No data available

- **Surface tension**: 70.4 mN/m at 20 °C (68 °F)

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**
- Exposure to moisture
- Heat, flames and sparks.

10.5 **Incompatible materials**
- Strong acids
- Acids
- Strong oxidizing agents

10.6 **Hazardous decomposition products**
- Other decomposition products - No data available
- In the event of fire: see section 5

11. **TOXICOLOGICAL INFORMATION**

11.1 **Information on toxicological effects**

- **Acute toxicity**
  - LD50 Oral - Rat - > 20,000 mg/kg
  - 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: No skin irritation - 4 h
  - (OECD Test Guideline 404)

- **Serious eye damage/eye irritation**
  - Eyes - Rabbit
  - Result: No eye irritation
  - (OECD Test Guideline 405)

- **Respiratory or skin sensitisation**
  - Maximisation Test (GPMT) - Guinea pig
  - Result: May cause sensitisation by skin contact.
  - (OECD Test Guideline 406)

- **Germ cell mutagenicity**
  - Salmonella typhimurium
  - Result: negative

  - Mouse - male
Result: negative

**Carcinogenicity**

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.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

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 identified as a carcinogen or potential carcinogen by OSHA.

**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

**Additional Information**

Repeated dose toxicity
Rat - male - Oral - NOAEL : >= 80 mg/kg

Rat - female - Oral - NOAEL : >= 100 mg/kg

RTECS: MN4725000

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

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12. ECOLOGICAL INFORMATION

12.1 **Toxicity**

Toxicity to fish static test LC50 - Cyprinodon variegatus (sheepshead minnow) - 49,000 mg/l - 96 h (OECD Test Guideline 203)

Toxicity to daphnia and other aquatic invertebrates static test EC50 - Daphnia magna (Water flea) - 36,000 mg/l - 48 h

12.2 **Persistence and degradability**

Biodegradability aerobic - Exposure time 28 d

Result: 35 % - According to the results of tests of biodegradability this product is not readily biodegradable. (OECD Test Guideline 301D)

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 Other adverse effects
No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product
Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1328  Class: 4.1  Packing group: III
Proper shipping name: Hexamethylenetetramine
Reportable Quantity (RQ):
Poison Inhalation Hazard: No

IMDG
UN number: 1328  Class: 4.1  Packing group: III  EMS-No: F-A, S-G
Proper shipping name: HEXAMETHYLENETETRAMINE

IATA
UN number: 1328  Class: 4.1  Packing group: III
Proper shipping name: Hexamethylenetetramine

15. REGULATORY INFORMATION

SARA 302 Components
No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

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
Fire Hazard, Chronic Health Hazard

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

Pennsylvania Right To Know Components

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CAS-No.</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexamethylenetetramine</td>
<td>100-97-0</td>
<td>2007-03-01</td>
</tr>
</tbody>
</table>

New Jersey Right To Know Components

<table>
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<tbody>
<tr>
<td>Hexamethylenetetramine</td>
<td>100-97-0</td>
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</tr>
</tbody>
</table>

California Prop. 65 Components
This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

16. OTHER INFORMATION

Full text of H-Statements referred to under sections 2 and 3.

Flam. Sol.  Flammable solids
H228 Flammable solid.
H317 May cause an allergic skin reaction.
Skin Sens. Skin sensitisation

**HMIS Rating**
- Health hazard: 0
- Chronic Health Hazard: *
- Flammability: 2
- Physical Hazard: 2

**NFPA Rating**
- Health hazard: 0
- Fire Hazard: 1
- Reactivity Hazard: 2

**Further information**
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Sigma-Aldrich Corporation
Product Safety – Americas Region
1-800-521-8956
Version: 4.8 Revision Date: 07/13/2015 Print Date: 07/27/2016