SAFETY DATA SHEET
Methoxylamine HCl

Section 1. Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product Code: 400036
Product Name: Methoxylamine HCl

1.2 Relevant identified uses of the substance or mixture and uses advised against:
Relevant identified uses: For research use only, not for human or veterinary use.

1.3 Details of the Supplier of the Safety Data Sheet:

| Company Name: Cayman Chemical Company |
| 1180 E. Ellsworth Rd.                  |
| Ann Arbor, MI 48108                   |
| Web site address: www.caymanchem.com  |
| Information: Cayman Chemical Company  |
| +1 (734)971-3335                      |

1.4 Emergency telephone number:

| Emergency Contact: CHEMTREC Within USA and Canada: +1 (800)424-9300 |
| CHEMTREC Outside USA and Canada: +1 (703)527-3887                  |

Section 2. Hazards Identification

2.1 Classification of the Substance or Mixture:
Acute Toxicity: Oral, Category 4
Acute Toxicity: Skin, Category 4
Skin Corrosion/Irritation, Category 2
Serious Eye Damage/Eye Irritation, Category 2
Skin Sensitization, Category 1
Specific Target Organ Toxicity (repeated exposure), Category 1
Aquatic Toxicity (Acute), Category 1
Aquatic Toxicity (Chronic), Category 3

2.2 Label Elements:

GHS Signal Word: Danger

GHS Hazard Phrases:
H302: Harmful if swallowed.
H312: Harmful in contact with skin.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H319: Causes serious eye irritation.
H372: Causes damage to organs (blood, spleen) through prolonged or repeated exposure.
H400: Very toxic to aquatic life.
H412: Harmful to aquatic life with long lasting effects.
GHS Precaution Phrases:
- P260: Do not breathe dust/fume/gas/mist/vapors/spray.
- P264: Wash hands thoroughly after handling.
- 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.

GHS Response Phrases:
- P301+312: IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.
- P302+352: IF ON SKIN: Wash with plenty of soap and water.
- P305+351+338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P312: Call a POISON CENTER or doctor/physician if you feel unwell.
- P314: Get medical attention/advice if you feel unwell.
- P321: Specific treatment (see ... on this label).
- P330: Rinse mouth.
- P332+313: If skin irritation occurs, get medical advice/attention.
- P333+313: If skin irritation or rash occurs, seek medical advice/attention.
- P337+313: If eye irritation persists, get medical advice/attention.
- P362+364: Take off contaminated clothing and wash it before reuse.
- P391: Collect spillage.

GHS Storage and Disposal Phrases:
Please refer to Section 7 for Storage and Section 13 for Disposal information.

2.3 Adverse Human Health Effects and Symptoms:
- Causes damage to organs (blood, spleen) through prolonged or repeated exposure.
- Causes severe skin burns and serious eye irritation.
- Harmful if swallowed or in contact with skin.
- Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract, eyes, and skin.
- May be harmful by inhalation.
- May cause an allergic skin reaction.
- Very toxic to aquatic life with long lasting effects.
- To the best of our knowledge, the toxicological properties have not been thoroughly investigated.

Section 3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>CAS # / RTECS #</th>
<th>Hazardous Components (Chemical Name)/ REACH Registration No.</th>
<th>Concentration</th>
<th>EC No./ EC Index No.</th>
<th>GHS Classification</th>
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<tbody>
<tr>
<td>593-56-6</td>
<td>Methoxylamine hydrochloride</td>
<td>100.0 %</td>
<td>209-798-7 NA</td>
<td>STOT (RE) 1: H372</td>
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<tr>
<td>NC3980000</td>
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<td></td>
<td></td>
<td>Aquatic (A) 1: H400</td>
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<td></td>
<td></td>
<td></td>
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<td>Acute Tox.(O) 4: H302</td>
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<td></td>
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<td>Acute Tox.(D) 4: H312</td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td>Skin Corr. 2: H315</td>
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<td></td>
<td></td>
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<td>Skin Sens. 1: H317</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Eye Damage 2: H319</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Aquatic (C) 3: H412</td>
</tr>
</tbody>
</table>
Section 4. First Aid Measures

4.1 Description of First Aid Measures:

In Case of Inhalation: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Get immediate medical attention.

In Case of Skin Contact: Immediately wash skin with soap and plenty of water for at least 20 minutes. Remove contaminated clothing. Get medical attention if symptoms occur. Wash clothing before reuse.

In Case of Eye Contact: Hold eyelids apart and flush eyes with plenty of water for at least 20 minutes. Have eyes examined and tested by medical personnel.

In Case of Ingestion: Wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Get medical attention. Do NOT induce vomiting unless directed to do so by medical personnel.

Section 5. Fire Fighting Measures

5.1 Suitable Extinguishing Media: Use alcohol-resistant foam, carbon dioxide, water, or dry chemical spray.

Unsuitable Extinguishing Media: A solid water stream may be inefficient.

5.2 Flammable Properties and Hazards:

Flash Pt: No data available.

Explosive Limits: LEL: No data. UEL: No data.

Autoignition Pt: No data.

5.3 Fire Fighting Instructions: As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent), and full protective gear to prevent contact with skin and eyes.

Section 6. Accidental Release Measures

6.1 Protective Precautions, Protective Equipment and Emergency Procedures: Avoid raising and breathing dust, and provide adequate ventilation. As conditions warrant, wear a NIOSH approved self-contained breathing apparatus, or respirator, and appropriate personal protection (rubber boots, safety goggles, and heavy rubber gloves).

6.2 Environmental Precautions: Take steps to avoid release into the environment, if safe to do so.

6.3 Methods and Material For Containment and Cleaning: Contain spill and collect, as appropriate. Transfer to a chemical waste container for disposal in accordance with local regulations.

Section 7. Handling and Storage

7.1 Precautions To Be Taken in Handling: Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid prolonged or repeated exposure.

7.2 Precautions To Be Taken in Storing: Keep container tightly closed. Store in accordance with information listed on the product insert.

Other Precautions: Hygroscopic.
Section 8. Exposure Controls/Personal Protection

8.1 Exposure Parameters:

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Partial Chemical Name</th>
<th>Britain EH40</th>
<th>France VL</th>
<th>Europe</th>
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<table>
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<th>Partial Chemical Name</th>
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<td>No data.</td>
<td>No data.</td>
<td>No data.</td>
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</tbody>
</table>

8.2 Exposure Controls:

8.2.1 Engineering Controls: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

8.2.2 Personal Protection Equipment:

- **Eye Protection:** Safety glasses
- **Protective Gloves:** Compatible chemical-resistant gloves
- **Other Protective Clothing:** Lab coat
- **Respiratory Equipment:** NIOSH approved respirator, as conditions warrant.
- **Work/Hygienic/Maintenance Practices:**
  - Do not take internally.
  - Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
  - Wash thoroughly after handling.
  - No data available.

Section 9. Physical and Chemical Properties

9.1 Information on Basic Physical and Chemical Properties

- **Physical States:** [ ] Gas [ ] Liquid [X] Solid
- **Appearance and Odor:** A crystalline solid
- **Melting Point:** No data.
- **Boiling Point:** No data.
- **Flash Pt:** No data.
- **Evaporation Rate:** No data.
- **Flammability (solid, gas):** No data available.
- **Explosive Limits:** LEL: No data. UEL: No data.
- **Vapor Pressure (vs. Air or mm Hg):** No data.
- **Vapor Density (vs. Air = 1):** No data.
- **Specific Gravity (Water = 1):** No data.
- **Solubility in Water:** No data.
- **Autoignition Pt:** No data.
SAFETY DATA SHEET
Methoxylamine HCl

9.2 Other Information
Percent Volatile: No data.
Molecular Formula & Weight: CH₅N₂O · HCl 83.5

Section 10. Stability and Reactivity
10.1 Reactivity: No data available.
10.2 Stability: Unstable [ ] Stable [X]
10.3 Stability Note(s): Stable if stored in accordance with information listed on the product insert.
10.4 Conditions To Avoid: No data available.
10.5 Incompatibility - Materials acid anhydrides
To Avoid: oxidizing agents
10.6 Hazardous carbon dioxide
Decomposition or carbon monoxide
Byproducts: hydrogen chloride gas
nitrogen oxides

Section 11. Toxicological Information
11.1 Information on The toxicological effects of this product have not been thoroughly studied.
Toxicological Effects: Methoxylamine HCl - Investigated as a mutagen.
Chronic Toxicological Effects: Only select Registry of Toxic Effects of Chemical Substances (RTECS) data is presented here. See actual entry in RTECS for complete information.
Methoxylamine HCl RTECS Number: NC3980000

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
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<th>IARC</th>
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<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
</tbody>
</table>

Section 12. Ecological Information
12.1 Toxicity: Very toxic to aquatic life.
Avoid release into the environment.
Runoff from fire control or dilution water may cause pollution.
12.2 Persistence and Degradability: No data available.
12.3 Bioaccumulative Potential: No data available.
12.4 Mobility in Soil: No data available.
12.5 Results of PBT and vPvB assessment: No data available.
12.6 Other adverse effects: No data available.
Section 13. Disposal Considerations

13.1 Waste Disposal Method: Dispose in accordance with local, state, and federal regulations.

Section 14. Transport Information

14.1 LAND TRANSPORT (US DOT):

DOT Proper Shipping Name: Corrosive solid, acidic, organic, n.o.s. (Methoxylamine HCl)
DOT Hazard Class: 8 CORROSIVE
UN/NA Number: UN3261 Packing Group: II

14.1 LAND TRANSPORT (European ADR/RID):

ADR/RID Shipping Name: Corrosive solid, acidic, organic, n.o.s. (Methoxylamine HCl)
UN Number: 3261 Packing Group: II
Hazard Class: 8 - CORROSIVE

14.3 AIR TRANSPORT (ICAO/IATA):

ICAO/IATA Shipping Name: Corrosive solid, acidic, organic, n.o.s. (Methoxylamine HCl)
UN Number: 3261 Packing Group: II
Hazard Class: 8 - CORROSIVE IATA Classification: 8

Additional Transport Information:

Transport in accordance with local, state, and federal regulations.

When sold in quantities of less than or equal to 1 mL, or 1 g, with an Excepted Quantity Code of E1, E2, E4, or E5, this item meets the De Minimis Quantities exemption, per IATA 2.6.10. Therefore packaging does not have to be labeled as Dangerous Goods/Excepted Quantity.

Section 15. Regulatory Information

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>S. 302 (EHS)</th>
<th>S. 304 RQ</th>
<th>S. 313 (TRI)</th>
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<tbody>
<tr>
<td>593-56-6</td>
<td>Methoxylamine hydrochloride</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

CAS # Hazardous Components (Chemical Name) Other US EPA or State Lists

<table>
<thead>
<tr>
<th>CAS #</th>
<th>Hazardous Components (Chemical Name)</th>
<th>CAA HAP,ODC: No; CWA NPDES: No; TSCA: Yes - Inventory; CA PROP.65: No</th>
</tr>
</thead>
<tbody>
<tr>
<td>593-56-6</td>
<td>Methoxylamine hydrochloride</td>
<td></td>
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</tbody>
</table>

Regulatory Information Statement:

This SDS was prepared in accordance with 29 CFR 1910.1200 and Regulation (EC) No.1272/2008.

Section 16. Other Information

Revision Date: 12/26/2015
Additional Information About This Product: No data available.
Company Policy or Disclaimer: DISCLAIMER: This information is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.