Section 1 - Product and Company Information

Product Name                GUANIDINE HYDROCHLORIDE, 99%
Product Number              177253
Brand                       ALDRICH
Company                     Sigma-Aldrich Canada, Ltd
Address                     2149 Winston Park Drive
                            Oakville ON L6H 6J8 CA
Technical Phone:            9058299500
Fax:                        9058299292
Emergency Phone:           800-424-9300

Section 2 - Composition/Information on Ingredient

Substance Name             GUANIDINE HYDROCHLORIDE
CAS #                      50-01-1
SARA 313                   No

Formula                    CH5N3.ClH
Synonyms                   Aminoformamidine hydrochloride *
                            Aminomethanamidine hydrochloride *
                            Carbamidine hydrochloride *
                            Guanidine chloride *
                            Guanidine hydrochloride *
                            Guanidinium chloride *
                            Guanidinium hydrochloride *
                            Iminourea hydrochloride *
                            USAF EK-749

RTECS Number:             MF4300000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW
Toxic (USA) Harmful (EU).
Toxic if swallowed. Irritating to eyes and skin.
Target organ(s): Bone marrow. Nerves.

HMIS RATING
HEALTH: 2*
FLAMMABILITY: 0
REACTIVITY: 1

NFPA RATING
HEALTH: 2
FLAMMABILITY: 0
REACTIVITY: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE
If swallowed, wash out mouth with water provided person is conscious. Call a physician.
INHALATION EXPOSURE
   If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE
   In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE
   In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

FLASH POINT
   N/A

AUTOIGNITION TEMP
   N/A

FLAMMABILITY
   N/A

EXTINGUISHING MEDIA
   Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING
   Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Emits toxic fumes under fire conditions.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL
   Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)
   Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP
   Sweep up, place in a bag and hold for waste disposal. Avoid raising dust. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING
   User Exposure: Do not breathe dust. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated exposure.

STORAGE
   Suitable: Keep tightly closed.

SPECIAL REQUIREMENTS
   Hygroscopic.

Section 8 - Exposure Controls / PPE
ENGINEERING CONTROLS
Mechanical exhaust required. Safety shower and eye bath.

PERSONAL PROTECTIVE EQUIPMENT
Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face particle respirator type N99 (US) or type P2 (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.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES
Wash thoroughly after handling.

Section 9 - Physical/Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>At Temperature or Pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Physical State: Solid</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Color: White</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Form: Fine crystals</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Odor: Odorless</td>
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</tr>
<tr>
<td>Molecular Weight</td>
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<tr>
<td>pH</td>
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<tr>
<td>MP/MP Range</td>
<td>185.0 - 189.0 °C</td>
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<td>Freezing Point</td>
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<td>Explosion Limits</td>
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<td>Miscellaneous Data</td>
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<td>Solubility</td>
<td>Solubility in Water:complete, colorless 6 M in H2O, 20°C</td>
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</table>

N/A = not available

Section 10 - Stability and Reactivity

STABILITY
Stable: Stable.
Conditions to Avoid: Moisture.
Materials to Avoid: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION
Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE
Skin Contact: Causes skin irritation.
Skin Absorption: May be harmful if absorbed through the skin.
Eye Contact: Causes eye irritation.
Inhalation: May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract.
Ingestion: Harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)
Nerves. Bone marrow.

SIGNS AND SYMPTOMS OF EXPOSURE
To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

CONDITIONS AGGRAVATED BY EXPOSURE
May cause nervous system disturbances.

TOXICITY DATA

Oral
Rat
475 mg/kg
LD50
Gastrointestinal: Hypermotility, diarrhea.

Oral
Mouse
571 mg/kg
LD50

Intraperitoneal
Mouse
500 MG/KG
LD50

IRRITATION DATA

Skin
Rabbit
500 mg
24H
Remarks: Severe irritation effect
Eyes
Rabbit
81.4 mg
Remarks: Moderate irritation effect

Section 12 - Ecological Information
No data available.

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION
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. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT
Proper Shipping Name: None
Non-Hazardous for Transport: This substance is considered to be non-hazardous for transport.

IATA
Non-Hazardous for Air Transport: Non-hazardous for air transport.

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION
Symbol of Danger: Xn
Indication of Danger: Harmful.
R: 22-36/38
Risk Statements: Harmful if swallowed. Irritating to eyes and skin.
S: 22
Safety Statements: Do not breathe dust.

US CLASSIFICATION AND LABEL TEXT
Indication of Danger: Toxic (USA) Harmful (EU).
Risk Statements: Irritating to eyes and skin. Toxic if swallowed.
Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Wear suitable protective clothing.

UNITED STATES REGULATORY INFORMATION
SARA LISTED: No
TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION
WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER
WARRANTY
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 Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale.
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