Material Safety Data Sheet
Hydrazine dihydrochloride

Section 1 - Chemical Product and Company Identification

MSDS Name: Hydrazine dihydrochloride
Synonyms: Diamine hydrochloride; Hydrazine dichloride, Hydrazinium chloride.

Section 2 - Composition, Information on Ingredients

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>Percent</th>
<th>EINECS/ELINCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5341-61-7</td>
<td>Hydrazine dihydrochloride</td>
<td>&gt;98</td>
<td>226-283-2</td>
</tr>
</tbody>
</table>

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: colorless to white solid.
Warning! Suspect cancer hazard. May cause cancer. Toxic if swallowed, inhaled or absorbed through the skin. May cause allergic skin reaction. May cause eye and skin irritation. May cause respiratory tract irritation. This substance may form hazardous decomposition products which may cause possible burns.
Target Organs: Blood, kidneys, central nervous system, liver, skin.

Potential Health Effects
Eye: May cause eye irritation.
Skin: May cause skin irritation. May be absorbed through the skin in harmful amounts. May cause skin sensitization, an allergic reaction, which becomes evident upon re-exposure to this material.
Ingestion: May cause gastrointestinal irritation with nausea, vomiting and diarrhea. Many hydrazines are moderate hemolytic agents. Damage to kidneys may be directly or indirectly linked to red blood cell hemolysis which is the destruction or dissolution of red blood cells, with subsequent release of hemoglobin.
Inhalation: May cause respiratory tract irritation. Hydrazines are central nervous system stimulants. Exposure to hydrazine hydrochloride may cause anxiety and spasms.
Chronic: May cause liver and kidney damage.

Section 4 - First Aid Measures

Eyes: Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical aid immediately.
Skin: Get medical aid. Flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse.
Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical aid immediately.
Inhalation: Remove from exposure and move to fresh air immediately. If breathing is difficult, give oxygen. Get medical aid. Do NOT use mouth-to-mouth resuscitation. If breathing has ceased apply...
artificial respiration using oxygen and a suitable mechanical device such as a bag and a mask. 
Notes to Physician: Treat symptomatically and supportively.

**Section 5 - Fire Fighting Measures**

**General Information:** As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Dusts at sufficient concentrations can form explosive mixtures with air. During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion. Risk of explosion in the event of decomposition. 
**Extinguishing Media:** Use water spray, dry chemical, carbon dioxide, or appropriate foam. 
**Flash Point:** Not applicable. 
**Autoignition Temperature:** Not applicable. 
**Explosion Limits, Lower:** Not available. 
**Upper:** Not available. 
**NFPA Rating:** (estimated) Health: 2; Flammability: 0; Instability: 0

**Section 6 - Accidental Release Measures**

**General Information:** Use proper personal protective equipment as indicated in Section 8. 
**Spills/Leaks:** Clean up spills immediately, observing precautions in the Protective Equipment section. Sweep up or absorb material, then place into a suitable clean, dry, closed container for disposal. Avoid generating dusty conditions. Provide ventilation. 

**Section 7 - Handling and Storage**

**Handling:** Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Use with adequate ventilation. Minimize dust generation and accumulation. May form flammable dust-air mixtures. Avoid contact with eyes, skin, and clothing. Keep container tightly closed. Avoid ingestion and inhalation. 
**Storage:** Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. 

**Section 8 - Exposure Controls, Personal Protection**

**Engineering Controls:** Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate ventilation to keep airborne concentrations low. 
**Exposure Limits**

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH</th>
<th>NIOSH</th>
<th>OSHA - Final PELs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrazine dihydrochloride</td>
<td>none listed</td>
<td>none listed</td>
<td>none listed</td>
</tr>
</tbody>
</table>

**Personal Protective Equipment**

**Eyes:** Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166. 
**Skin:** Wear appropriate protective gloves to prevent skin exposure. 
**Clothing:** Wear appropriate protective clothing to prevent skin exposure.
Section 9 - Physical and Chemical Properties

**Physical State:** Solid  
**Appearance:** colorless to white  
**Odor:** none reported  
**pH:** Not available.  
**Vapor Pressure:** Negligible.  
**Vapor Density:** Not available.  
**Evaporation Rate:** Negligible.  
**Viscosity:** Not available.  
**Boiling Point:** 392 deg F  
**Freezing/Melting Point:** 388 deg F  
**Decomposition Temperature:** 392 deg F  
**Solubility:** Moderately soluble in water.  
**Specific Gravity/Density:** 1.42 (water=1)  
**Molecular Formula:** Cl₂H₆N₂  
**Molecular Weight:** 104.9614

Section 10 - Stability and Reactivity

**Chemical Stability:** Stable. However, may decompose if heated.  
**Conditions to Avoid:** Incompatible materials, temperatures above 200°C.  
**Incompatibilities with Other Materials:** Oxidizing agents.  
**Hazardous Decomposition Products:** Hydrogen chloride, oxides of nitrogen.  
**Hazardous Polymerization:** Has not been reported.

Section 11 - Toxicological Information

**RTECS#:**  
**CAS#** 5341-61-7: MV2298000  
**LD50/LC50:** Not available.  
**Carcinogenicity:**  
CAS# 5341-61-7: Not listed by ACGIH, IARC, NTP, or CA Prop 65.  
**Epidemiology:** No information available.  
**Teratogenicity:** No information available.  
**Reproductive Effects:** No information available.  
**Mutagenicity:** No information available.  
**Neurotoxicity:** No information available.  
**Other Studies:**

Section 12 - Ecological Information

**Ecotoxicity:** No data available. No information available.  
**Environmental:** Hydrazine dihydrochloride is very toxic to aquatic organisms. It may cause long-term adverse effects in the aquatic environment.
Physical: No information available.
Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.
RCRA U-Series: None listed.

Section 14 - Transport Information

| IATA | 
|---|---|
| Shipping Name: | TOXIC SOLID, INORGANIC, N.O.S. |
| Hazard Class: | 6.1 |
| UN Number: | UN3288 |
| Packing Group: | III |

Section 15 - Regulatory Information

Hazard Symbols:
T N

Risk Phrases:
R 23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
R 43 May cause sensitization by skin contact.
R 45 May cause cancer.
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Safety Phrases:
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S 53 Avoid exposure - obtain special instructions before use.
S 60 This material and its container must be disposed of as hazardous waste.
S 61 Avoid release to the environment. Refer to special instructions/safety data sheets.

Section 16 - Additional Information

MSDS Creation Date: 12/12/1997
Revision #7 Date: 4/09/2003
The information above 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. In no event shall INDO GULF GROUP be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if INDO GULF GROUP has been advised of the possibility of such damages.