Material Safety Data Sheet

Section 1. Product and Company Identification

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Hydrochloric Acid 6N</th>
<th>Product Code</th>
<th>VW3204</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>EMD Chemicals Inc.</td>
<td>Effective Date</td>
<td>1/27/2004</td>
</tr>
<tr>
<td></td>
<td>P.O. Box 70</td>
<td>Print Date</td>
<td>5/3/2004</td>
</tr>
<tr>
<td></td>
<td>480 Democrat Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gibbstown, NJ 08027</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prior to January 1, 2003 EMD Chemicals Inc. was EM</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industries, Inc. or EM Science, Division of EM Industries,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Inc.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

For More Information Call
856-423-6300 Technical Service
Monday-Friday: 8:00 AM - 5:00 PM

In Case of Emergency Call
800-424-9300 CHEMTREC (USA)
613-996-6666 CANUTEC (Canada)
24 Hours/Day: 7 Days/Week

Synonym None.

Material Uses Laboratory Reagent

Chemical Family Inorganic acid.

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrochloric acid</td>
<td>7647-01-0</td>
<td>18.5</td>
</tr>
<tr>
<td>Water</td>
<td>7732-18-5</td>
<td>81.5</td>
</tr>
</tbody>
</table>

Section 3. Hazards Identification

Physical State and Appearance
Liquid. (Fuming liquid.)

Emergency Overview
DANGER POISON!
MAY BE FATAL IF SWALLOWED.
HARMFUL IF INHALED.
CAUSES SEVERE EYE AND SKIN BURNS.
MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
MAY CAUSE ALLERGIC SKIN REACTION.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
LUNGS, RESPIRATORY TRACT.
CONTAINS MATERIAL WHICH MAY CAUSE DAMAGE TO THE FOLLOWING ORGANS:
SKIN, EYE, LENS OR CORNEA.

Routes of Entry Absorbed through skin. Dermal contact. Inhalation. Ingestion.

Potential Acute Health Effects

<table>
<thead>
<tr>
<th>Eyes</th>
<th>Extremely hazardous in case of eye contact (corrosive). Causes severe eye burns. Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>Hazardous in case of skin contact (corrosive, irritant). Skin contact produces burns. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. May be hazardous in case of skin contact (sensitizer).</td>
</tr>
</tbody>
</table>

Continued on Next Page
Inhalation
Extremely hazardous in case of inhalation. May be fatal if inhaled. May be hazardous in case of inhalation (lung irritant).

Ingestion
Extremely hazardous in case of ingestion. May be fatal if swallowed.

Potential Chronic Health Effects
"Carcinogenic Effects"
This material is not known to cause cancer in animals or humans.

Additional information See Toxicological Information (section 11)

Medical Conditions Aggravated by Overexposure:
Repeated or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection. Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4. First Aid Measures

Eye Contact
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Inhalation
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion
If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Section 5. Fire Fighting Measures

Flammability of the Product
May be combustible at high temperature.

Auto-ignition Temperature
Not available.

Flash Points
Not available.

Flammable Limits
Not available.

Products of Combustion
These products are carbon oxides (CO, CO2), halogenated compounds, hydrogen chloride.

Fire Hazards in Presence of Various Substances
Not available.

Explosion Hazards in Presence of Various Substances
Risks of explosion of the product in presence of static discharge: No.
Risks of explosion of the product in presence of mechanical impact: No.

Fire Fighting Media and Instructions
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Protective Clothing (Fire)
Be sure to use an approved/certified respirator or equivalent.

Special Remarks on Fire Hazards
Flammable hydrogen gas may be produced on prolonged contact with metals such as aluminum, tin, lead and zinc. (Hydrochloric acid)

Special Remarks on Explosion Hazards
Not available.

Continued on Next Page
Section 6. Accidental Release Measures

Small Spill and Leak  Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill and Leak  Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Use water spray curtain to divert vapor drift. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Eliminate all ignition sources. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

Spill Kit Information  The following EMD Chemicals Inc. SpillSolv (TM) absorbent is recommended for this product: SX1310  Acid Treatment  Kit

Section 7. Handling and Storage

Handling  Do not ingest. Do not breathe vapor or mist. Avoid prolonged or repeated contact with skin. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.

Storage  Keep container tightly closed. Keep container in a cool, well-ventilated area.

Section 8. Exposure Controls/Personal Protection

Engineering Controls  Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection

<table>
<thead>
<tr>
<th>Eyes</th>
<th>Face shield.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body</td>
<td>Full suit.</td>
</tr>
<tr>
<td>Respiratory</td>
<td>Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.</td>
</tr>
<tr>
<td>Hands</td>
<td>Gloves.</td>
</tr>
<tr>
<td>Feet</td>
<td>Boots.</td>
</tr>
</tbody>
</table>

Protective Clothing (Pictograms)

Personal Protection in Case of a Large Spill  Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product Name  Exposure Limits

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Exposure Limits</th>
</tr>
</thead>
</table>
| Hydrochloric acid | BMWA_MAK (Austria, 2001).  
Spitzenbegrenzung: 16 mg/m³ 8 times per shift, 5 minute(s).  
Spitzenbegrenzung: 10 ppm 8 times per shift, 5 minute(s).  
TWA: 8 mg/m³ 8 hour(s).  
TWA: 5 ppm 8 hour(s).  
NOHSC (Australia, 2002). Notes: Documentation for the substances with this footnote can be found in the 5th Edition of the ACGIH documentation of the threshold limit values and biological exposure indices.1 For all other substances with 'H' in Column 7 the documentation can be found in the 6th Edition of the ACGIH documentation of the threshold limit values and biological exposure indices.2  
AMP: 7.5 mg/m³ 15 minute(s).  
AMP: 5 ppm 15 minute(s).  
Lijst Grenswaarden (Belgium, 2002).  
VCD: 15 mg/m³ 15 minute(s). |

Continued on Next Page
VCD: 10 ppm 15 minute(s).
VL: 8 mg/m³ 8 hour(s).
VL: 5 ppm 8 hour(s).

SUVA (Switzerland, 2001).
Kurzzeitsgrenzwerte: 7.5 mg/m³ 15 minute(s).
Kurzzeitsgrenzwerte: 5 ppm 15 minute(s).
MAK: 7.5 mg/m³ 8 hour(s).
MAK: 5 ppm 8 hour(s).

STEL: 15 mg/m³ 10 minute(s).
STEL: 10.185 ppm 10 minute(s).
TWA: 8 mg/m³ 8 hour(s).
TWA: 5.432 ppm 8 hour(s).

BAUA (Germany, 1997).
Spitzenbegrenzung: 8 mg/m³
TWA: 8 mg/m³ 8 hour(s).

MAK-Werte Liste (Germany, 2000).
Spitzenbegrenzung: 7.6 mg/m³ 15 minute(s).
Spitzenbegrenzung: 5 ML/M³ 15 minute(s).
TWA: 7.6 mg/m³ 8 hour(s).
TWA: 5 ML/M³ 8 hour(s).

TRGS900 MAK (Germany, 2002).
Spitzenbegrenzung: 8 mg/m³
TWA: 8 mg/m³ 8 hour(s).

Arbejdstilsynet (Denmark, 2000).
Loftværdi: 7 mg/m³
Loftværdi: 5 ppm
GV: 7 mg/m³ 8 hour(s).
GV: 5 ppm 8 hour(s).

DK-Arbejdstyrelsenet (Denmark, 1996).
Loftværdi: 7 mg/m³
Loftværdi: 5 ppm
GV: 7 mg/m³ 8 hour(s).
GV: 5 ppm 8 hour(s).

INSHT (Spain, 2002).
STEL: 15 mg/m³ 15 minute(s).
STEL: 10 ppm 15 minute(s).
TWA: 7.6 mg/m³ 8 hour(s).
TWA: 5 ppm 8 hour(s).

STEL: 10 mg/m³ 15 minute(s).
STEL: 15 ppm 15 minute(s).
TWA: 5 mg/m³ 8 hour(s).
TWA: 8 ppm 8 hour(s).

EU OEL (Europe, 2000). Notes: Indicative
STEL: 15 mg/m³ 15 minute(s).
STEL: 10 ppm 15 minute(s).
TWA: 8 mg/m³ 8 hour(s).
TWA: 5 ppm 8 hour(s).

Työterveyslaitos (Finland, 2002).
STEL: 7.6 mg/m³ 15 minute(s).
STEL: 5 ppm 15 minute(s).

INRS (France, 1999). Notes: Advisory
VLE: 7.5 mg/m³ 15 minute(s).
VLE: 5 ppm 15 minute(s).

NAOSH (Ireland, 2002).
STEL: 14 mg/m³ 15 minute(s).
STEL: 10 ppm 15 minute(s).
OEL: 7 mg/m³ 8 hour(s).
OEL: 5 ppm 8 hour(s).

JSOH (Japan, 1996).
CEIL: 7.5 mg/m³
CEIL: 5 ppm

Continued on Next Page
CEIL: 7 mg/m³
CEIL: 5 ppm

Nationale MAC-lijst (Netherlands, 2003). Notes: Administrative
TGG 15 min: 15 mg/m³ 15 minute(s).
TGG 15 min: 10 ppm 15 minute(s).
TGG 8 uur: 8 mg/m³ 8 hour(s).
TGG 8 uur: 5 ppm 8 hour(s).

Arbeidstilsynet (Norway, 2001).
Takverdi: 7 mg/m³
Takverdi: 5 ppm
AN: 7 mg/m³ 8 hour(s).
AN: 5 ppm 8 hour(s).

NZ OSH (NZ, 1994).
CEIL: 7.5 mg/m³
CEIL: 5 ppm

AFS (Sweden, 2000).
TGV: 8 mg/m³
TGV: 5 ppm
KTV: 8 mg/m³ 15 minute(s).
KTV: 5 ppm 15 minute(s).

EH40-OES (United Kingdom (UK), 2002).
STEL: 8 mg/m³ 15 minute(s).
STEL: 5 ppm 15 minute(s).
TWA: 2 mg/m³ 8 hour(s).
TWA: 1 ppm 8 hour(s).

ACGIH (United States, 2003).
CEIL: 2 ppm

NIOSH REL (United States, 2001).
CEIL: 7 mg/m³
CEIL: 5 ppm

OSHA Final Rule (United States, 1989).
CEIL: 7 mg/m³
CEIL: 5 ppm

OSHA PEL (United States, 1974).
CEIL: 7 mg/m³
CEIL: 5 ppm

CEIL: 7 mg/m³
CEIL: 5 ppm

Water

Section 9. Physical and Chemical Properties

Odor
Pungent.

Color
Clear. Colorless to slight yellow

Physical State and Appearance
Liquid. (Fuming liquid.)

Molecular Weight
Not applicable.

Molecular Formula
HCL in Aqueous solution

pH
Not available.

Boiling/Condensation Point
The lowest known value is 99.9°C (211.8°F) (Water). Weighted average: 101.77°C (215.2°F)

Melting/Freezing Point
May start to solidify at -0.1°C (31.8°F) based on data for: Water. Weighted average: -13.77°C (7.2°F)

Critical Temperature
The lowest known value is 51.5°C (124.7°F) (Hydrochloric acid).

Continued on Next Page
**Section 10. Stability and Reactivity**

The product is stable.

**Section 11. Toxicological Information**

**Toxicity**
- Acute oral toxicity (LD₅₀): 4865 mg/kg (Rabbit) (Calculated value for the mixture).
- Acute toxicity of the vapor (LC₅₀): 2995 ppm 4 hours (Mouse) (Calculated value for the mixture).

**Chronic Effects on Humans**
Contains material which may cause damage to the following organs: lungs, upper respiratory tract, skin, eye, lens or cornea.

**Acute Effects on Humans**
Extremely hazardous in case of eye contact (corrosive). Causes severe eye burns. Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching. Hazardous in case of skin contact (corrosive, irritant). Skin contact produces burns. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. May be hazardous in case of skin contact (sensitizer). Extremely hazardous in case of inhalation. May be fatal if inhaled. May be hazardous in case of inhalation (lung irritant). Extremely hazardous in case of ingestion. May be fatal if swallowed.

**Synergetic Products (Toxicologically)**
Not available.

**Irritancy**
Draize Test: Not available.

**Sensitization**
Hazardous in case of skin contact (sensitizer). Slightly hazardous in case of inhalation (lung sensitizer).

**Carcinogenic Effects**
This material is not known to cause cancer in animals or humans.

**Toxicity to Reproductive System**
Not available.

**Teratogenic Effects**
Not available.

**Mutagenic Effects**
Not available.
Section 12. Ecological Information

Ecotoxicity 
Not available.

BOD5 and COD 
Not available.

Toxicity of the Products of Biodegradation 
The products of degradation are as toxic as the product itself.

Section 13. Disposal Considerations

EPA Waste Number D002

Treatment Specified technology- Neutralize to pH 6-9. Contact your local permitted waste disposal site (TSD) for permissible treatments sites. ALWAYS CONTACT PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

Section 14. Transport Information

DOT Classification Proper Shipping Name: HYDROCHLORIC ACID SOLUTION
Hazard Class: 8
UN number: UN1789
Packing Group: II
RQ: 5000 lbs. (2268 kg)

TDG Classification Not available.

IMO/IMDG Classification Proper Shipping Name: HYDROCHLORIC ACID SOLUTION
Hazard Class: 8
UN number: UN1789
Packing Group: II
RQ: 5000

ICAO/IATA Classification Not available.

Section 15. Regulatory Information

U.S. Federal Regulations TSCA 8(b) inventory: Hydrochloric acid; Water
SARA 302/304/311/312 extremely hazardous substances: Hydrochloric acid
SARA 302/304 emergency planning and notification: Hydrochloric acid
SARA 302/304/311/312 hazardous chemicals: Hydrochloric acid
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Hydrochloric acid: Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
SARA 313 toxic chemical notification and release reporting: Hydrochloric acid 18.5%
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: Hydrochloric acid
Clean air act (CAA) 112 accidental release prevention: Hydrochloric acid
Clean air act (CAA) 112 regulated flammable substances: No products were found.
Clean air act (CAA) 112 regulated toxic substances: Hydrochloric acid

WHMIS (Canada) Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
Class D-2A: Material causing other toxic effects (VERY TOXIC).
CLASS E: Corrosive liquid.

CEPA DSL: Hydrochloric acid; Water
This product has been classified in accordance with the hazard criteria of the Controlled Product Regulations and the MSDS contains all required information.

International Regulations

Continued on Next Page
### Section 16. Other Information

#### National Fire Protection Association (U.S.A.)

<table>
<thead>
<tr>
<th>Health</th>
<th>Fire Hazard</th>
<th>Reactivity</th>
<th>Specific Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

**Changed Since Last Revision +**

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