Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

<table>
<thead>
<tr>
<th>Common Name/Trade Name</th>
<th>Hydrogen bromide, 33% Solution in Acetic Acid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturer</td>
<td>SPECTRUM CHEMICAL MFG. CORP. 14422 S. SAN PEDRO STREET GARDENA, CA 90248</td>
</tr>
<tr>
<td>Commercial Name(s)</td>
<td>Not available.</td>
</tr>
<tr>
<td>Synonym</td>
<td>Not available.</td>
</tr>
<tr>
<td>Chemical Name</td>
<td>Hydrogen bromide, 33% Solution in Acetic Acid</td>
</tr>
<tr>
<td>Chemical Family</td>
<td>(Acid,)</td>
</tr>
<tr>
<td>Chemical Formula</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>Supplier</td>
<td>SPECTRUM CHEMICAL MFG. CORP. 14422 S. SAN PEDRO STREET GARDENA, CA 90248</td>
</tr>
</tbody>
</table>

Section 2. Composition and Information on Ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS #</th>
<th>TWA (mg/m³)</th>
<th>STEL (mg/m³)</th>
<th>CEIL (mg/m³)</th>
<th>% by Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Hydrogen bromide</td>
<td>10035-10-6</td>
<td>10</td>
<td></td>
<td></td>
<td>33</td>
</tr>
<tr>
<td>2) Acetic acid</td>
<td>64-19-7</td>
<td>10</td>
<td></td>
<td></td>
<td>67</td>
</tr>
</tbody>
</table>

Toxicological Data on Ingredients

Hydrogen bromide:
- GAS (LC50): Acute: 142.5 ppm 4 hour(s) [Rat].

Acetic acid:
- ORAL (LD50): Acute: 3310 mg/kg [Rat]. 4960 mg/kg [Mouse]. 3530 mg/kg [Rat].
- DERMAL (LD50): Acute: 1060 mg/kg [Rat].

Section 3. Hazards Identification

Potential Acute Health Effects
- Extremely hazardous in case of skin contact (corrosive). Hazardous in case of eye contact (irritant), of ingestion, of inhalation (lung irritant). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Severe over-exposure can result in death.

Continued on Next Page
**Section 4. First Aid Measures**

### Eye Contact

Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Do not use an eye ointment. Seek medical attention.

### Skin Contact

If the chemical got onto the clothed portion of the body, remove the contaminated clothes as quickly as possible, protecting your own hands and body. Place the victim under a deluge shower. If the chemical got on the victim's exposed skin, such as the hands: Gently and thoroughly wash the contaminated skin with running water and non-abrasive soap. Be particularly careful to clean folds, crevices, creases and groin. Cold water may be used. If irritation persists, seek medical attention. Wash contaminated clothing before reusing.

### Serious Skin Contact

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

### Inhalation

Allow the victim to rest in a well ventilated area. Seek immediate medical attention.

### Serious Inhalation

Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek immediate medical attention.

### Ingestion

Do not induce vomiting. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek immediate medical attention.

### Serious Ingestion

Not available.

---

**Section 5. Fire and Explosion Data**

### Flammability of the Product

Non-flammable.

### Auto-Ignition Temperature

Not applicable.

### Flash Points

Not applicable.

### Flammable Limits

Not applicable.

### Products of Combustion

Not available.

### Fire Hazards in Presence of Various Substances

Not applicable.

### Explosion Hazards in Presence of Various Substances

Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.
Slightly explosive to explosive in presence of oxidizing materials.

### Fire Fighting Media and Instructions

Not applicable.

### Special Remarks on Fire Hazards

Not available.

---

*Continued on Next Page*
**Section 6. Accidental Release Measures**

**Small Spill**
Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container. If necessary: **Neutralize the residue with a dilute solution of sodium carbonate.**

**Large Spill**
Corrosive liquid. 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. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. **Neutralize the residue with a dilute solution of sodium carbonate.** Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

**Section 7. Handling and Storage**

**Precautions**
Keep locked up. Keep container dry. Do not ingest. Do not breathe gas/fumes/vapour/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as metals, acids, alkalis.

May corrode metallic surfaces and glass. Store in a polyethylene container.

**Storage**
May corrode metallic surfaces. Store in a metallic or coated fiberboard drum using a strong polyethylene inner package. May corrode glass. Store in an appropriate container. Corrosive materials should be stored in a separate safety storage cabinet or room.

**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 threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

**Personal Protection**

**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.

**Exposure Limits**

**Hydrogen bromide**
- TWA: 3 (ppm) from ACGIH (TLV)
- TWA: 10 (mg/m³) from ACGIH

**Acetic acid**
- TWA: 10 STEL: 15 (ppm) from ACGIH (TLV) [1998]
- TWA: 10 (ppm) from NIOSH
- Australia: TWA: 10 (ppm)

Consult local authorities for acceptable exposure limits.

**Section 9. Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state and appearance</td>
<td>Liquid.</td>
</tr>
<tr>
<td>Odor</td>
<td>Not available.</td>
</tr>
<tr>
<td>Taste</td>
<td>Not available.</td>
</tr>
<tr>
<td>Color</td>
<td>Not available.</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>Not applicable.</td>
</tr>
<tr>
<td>pH (1% soln/water)</td>
<td>Acidic.</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>The lowest known value is 118.1°C (244.6°F) (Acetic acid).</td>
</tr>
<tr>
<td>Melting Point</td>
<td>May start to solidify at 16.6°C (61.9°F) based on data for: Acetic acid.</td>
</tr>
<tr>
<td>Critical Temperature</td>
<td>Not available.</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>Weighted average: 1.37 (Water = 1)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>The highest known value is 11 mm of Hg (@ 20°C) (Acetic acid).</td>
</tr>
</tbody>
</table>

*Continued on Next Page*
Hydrogen bromide, 33% Solution in Acetic Acid

- **Vapor Density**: The highest known value is 2.07 (Air = 1) (Acetic acid).
- **Volutility**: Not available.
- **Odor Threshold**: The highest known value is 1.018 ppm (Acetic acid)
- **Water/Oil Dist. Coeff.**: The product is more soluble in water.
- **Ionicity (in Water)**: Not available.
- **Dispersion Properties**: Partially dispersed in methanol, diethyl ether, n-octanol. See solubility in water, methanol, diethyl ether, n-octanol, acetone.
- **Solubility**: Easily soluble in cold water, hot water. Partially soluble in methanol, diethyl ether, n-octanol, acetone.

### Section 10. Stability and Reactivity Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stability</strong></td>
<td>The product is stable.</td>
</tr>
<tr>
<td><strong>Instability Temperature</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Conditions of Instability</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Incompatibility with various substances</strong></td>
<td>Highly reactive with metals, alkalis. Reactive with acids.</td>
</tr>
<tr>
<td><strong>Corrosivity</strong></td>
<td>Extremely corrosive in presence of aluminum, of zinc. Highly corrosive in presence of copper. Corrosive in presence of glass, of steel, of stainless steel(304), of stainless steel(316).</td>
</tr>
<tr>
<td><strong>Special Remarks on Reactivity</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Special Remarks on Corrosivity</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Polymerization</strong></td>
<td>No.</td>
</tr>
</tbody>
</table>

### Section 11. Toxicological Information

<table>
<thead>
<tr>
<th>Property</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Routes of Entry</strong></td>
<td>Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.</td>
</tr>
<tr>
<td><strong>Toxicity to Animals</strong></td>
<td>WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 3310 mg/kg [Rat]. (Acetic acid). Acute dermal toxicity (LD50): 1060 mg/kg [Rat]. (Acetic acid). Acute toxicity of the gas (LC50): 142.5 ppm 4 hour(s) [Rat]. (Hydrogen bromide).</td>
</tr>
<tr>
<td><strong>Chronic Effects on Humans</strong></td>
<td>The substance is toxic to lungs, mucous membranes, blood, kidneys, bladder, gastrointestinal tract, upper respiratory tract.</td>
</tr>
<tr>
<td><strong>Other Toxic Effects on Humans</strong></td>
<td>Extremely hazardous in case of skin contact (corrosive). Hazardous in case of ingestion, of inhalation (lung irritant).</td>
</tr>
<tr>
<td><strong>Special Remarks on Toxicity to Animals</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Special Remarks on Chronic Effects on Humans</strong></td>
<td>Not available.</td>
</tr>
<tr>
<td><strong>Special Remarks on other Toxic Effects on Humans</strong></td>
<td>Not available.</td>
</tr>
</tbody>
</table>
Section 12. Ecological Information

Ecotoxicity
Not available.

BOD5 and COD
Not available.

Products of Biodegradation
Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

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

Special Remarks on the Products of Biodegradation
Not available.

Section 13. Disposal Considerations

Waste Disposal

Section 14. Transport Information

DOT Classification
CLASS 8: Corrosive liquid.

Identification
: Corrosive Liquid, Flammable, n.o.s (Acetic Acid, Hydrogen Bromide, Solution)  (Acetic acid) : UN2920  PG: II

Special Provisions for Transport
Not available.

DOT (Pictograms)

Section 15. Other Regulatory Information and Pictograms

Federal and State Regulations
Rhode Island RTK hazardous substances: Acetic acid
Pennsylvania RTK: Hydrogen bromide; Acetic acid
Florida: Acetic acid
Minnesota: Acetic acid
Massachusetts RTK: Hydrogen bromide; Acetic acid
New Jersey: Acetic acid
TSCA 8(b) inventory: Hydrogen bromide; Acetic acid
CERCLA: Hazardous substances.: Acetic acid: 5000 lbs. (2268 kg);

California Proposition 65

Warnings

Other Regulations

Other Classifications
WHMIS (Canada)  CLASS D-2A: Material causing other toxic effects (VERY TOXIC).
CLASS E: Corrosive liquid.

DSCL (EEC)  R26- Very toxic by inhalation.
R35- Causes severe burns.

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

Continued on Next Page
### Hydrogen bromide, 33% Solution in Acetic Acid

#### Personal Protection
- **WHMIS (Canada)** (Pictograms)
- **DSCL (Europe)** (Pictograms)
- **TDG (Canada)** (Pictograms)
- **ADR (Europe)** (Pictograms)

#### Protective Equipment
- Gloves.
- Full suit.
- Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
- Face shield.

#### Section 16. Other Information

<table>
<thead>
<tr>
<th>MSDS Code</th>
<th>H3281</th>
</tr>
</thead>
<tbody>
<tr>
<td>References</td>
<td>Not available.</td>
</tr>
<tr>
<td>Other Special Considerations</td>
<td>Not available.</td>
</tr>
</tbody>
</table>

Verified by Sonia Owen.  
Printed 9/12/2006.

CALL (310) 516-8000  

Continued on Next Page
Notice to Reader

All chemicals may pose unknown hazards and should be used with caution. This Material Safety Data Sheet (MSDS) applies only to the material as packaged. If this product is combined with other materials, deteriorates, or becomes contaminated, it may pose hazards not mentioned in this MSDS. It shall be the user's responsibility to develop proper methods of handling and personal protection based on the actual conditions of use. While this MSDS is based on technical data judged to be reliable, Spectrum Quality Products, Inc. assumes no responsibility for the completeness or accuracy of the information contained herein.