1. Product and Company Identification

Material name: HYDROBROMIC ACID
Version #: 02
Revision date: 08-29-2011
CAS #: Mixture
Product Codes: J.T.Baker: 0160, 4801
Synonym(s): Hydrogen Bromide Solution
Manufacturer: Avantor Performance Materials, Inc.
Address: 3477 Corporate Parkway Suite #200 Center Valley, PA 18034 US
Customer Service: 855-282-6867
24 Hour Emergency: 908-859-2151
Chemtrec: 800-424-9300

2. Hazards Identification

Emergency overview: DANGER
Corrosive. Harmful if inhaled. Causes severe skin and eye burns. Causes digestive tract burns. Mist or vapor extremely irritating to eyes and respiratory tract.
OSHA regulatory status: This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects:
- **Routes of exposure**: Ingestion. Inhalation. Skin contact. Eye contact.
- **Eyes**: Corrosive. Causes severe eye burns. Vapor or spray may cause eye damage, impaired sight or blindness.
- **Skin**: Corrosive. Causes severe skin burns.
- **Inhalation**: Corrosive. Harmful if inhaled. May cause damage to mucous membranes in nose, throat, lungs and bronchial system.
- **Ingestion**: Corrosive. Ingestion may produce burns to the lips, oral cavity, upper airway, esophagus and possibly the digestive tract.
- **Target organs**: Eyes. Skin. Lungs. Respiratory system.
- **Chronic effects**: Corrosive. Prolonged contact causes serious tissue damage.
- **Potential environmental effects**: The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.

3. Composition / Information on Ingredients

<table>
<thead>
<tr>
<th>Hazardous components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN BROMIDE</td>
<td>10035-10-6</td>
<td>40 - 60</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Non-hazardous components</th>
<th>CAS #</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>WATER</td>
<td>7732-18-5</td>
<td>40 - 60</td>
</tr>
</tbody>
</table>

4. First Aid Measures

**First aid procedures**
- **Eye contact**: Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately. In case of irritation from airborne exposure, move to fresh air. Get medical attention immediately.
Skin contact: Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash clothing separately before reuse. Destroy or thoroughly clean contaminated shoes.

Inhalation: Move to fresh air. If breathing stops, provide artificial respiration. If breathing is difficult, give oxygen. Call a physician or poison control center immediately.

Ingestion: Call a physician or poison control center immediately. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.

Notes to physician: Keep victim under observation. Treat symptomatically.

General advice: Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties: The product is not flammable. No unusual fire or explosion hazards noted.

Extinguishing media

- Suitable extinguishing media: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Unsuitable extinguishing media: None known.

Protection of firefighters

- Specific hazards arising from the chemical: Fire may produce irritating, corrosive and/or toxic gases.
- Protective equipment and precautions for firefighters: Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Wear self-contained breathing apparatus with a full facepiece operated in the positive pressure demand mode when fighting fires.

Specific methods: In the event of fire and/or explosion do not breathe fumes. Use water spray to cool unopened containers.

6. Accidental Release Measures

Personal precautions: Wear appropriate personal protective equipment. Do not breathe mist or vapor. Do not get in eyes, on skin, on clothing. Do not taste or swallow. Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Use caution when combining with water; DO NOT add water to acid, ALWAYS add acid to water while stirring to prevent release of heat, steam and fumes.

Environmental precautions: Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

Methods for containment: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Prevent entry into waterways, sewer, basements or confined areas.

Methods for cleaning up: Large Spills: Dike far ahead of spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills in original containers for re-use. Clean up in accordance with all applicable regulations. Neutralize spill area and washings with soda ash or lime. Collect in a non-combustible container for prompt disposal.

J. T. Baker NEUTRASORB® acid neutralizers are recommended for spills of this product.

7. Handling and Storage

Handling: Wear appropriate personal protective equipment. Do not breathe mist or vapor. Do not get in eyes, on skin, on clothing. Do not taste or swallow. Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Use only with adequate ventilation. Use caution when combining with water; DO NOT add water to acid, ALWAYS add acid to water while stirring to prevent release of heat, steam and fumes.

Storage: Do not store in metal containers. Keep tightly closed in a dry, cool and well-ventilated place.
8. Exposure Controls / Personal Protection

ACGIH

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN BROMIDE (10035-10-6)</td>
<td>Ceiling</td>
<td>2.0000 ppm</td>
</tr>
</tbody>
</table>

Occupational exposure limits

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN BROMIDE (10035-10-6)</td>
<td>PEL</td>
<td>3.0000 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10.0000 mg/m³</td>
</tr>
</tbody>
</table>

Engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal protective equipment

Eye / face protection
Wear chemical goggles and face shield.

Skin protection
Wear appropriate chemical resistant clothing. Wear appropriate chemical resistant gloves.

Respiratory protection
If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Respirator type: Chemical respirator with acid gas cartridge.

General hygiene considerations
Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

General
Wear chemical protective equipment that is specifically recommended by the manufacturer. Launder contaminated clothing before reuse.

9. Physical & Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless to yellowish</td>
</tr>
<tr>
<td>Odor</td>
<td>Pungent</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>Not available</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Form</td>
<td>Liquid</td>
</tr>
<tr>
<td>pH</td>
<td>Not available</td>
</tr>
<tr>
<td>Melting point</td>
<td>12.2 °F (-11 °C)</td>
</tr>
<tr>
<td>Freezing point</td>
<td>12.2 °F (-11 °C)</td>
</tr>
<tr>
<td>Boiling point</td>
<td>251.6 °F (122 °C)</td>
</tr>
<tr>
<td>Flash point</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>Not available</td>
</tr>
<tr>
<td>Flammability limits in air, upper, % by volume</td>
<td>Not available</td>
</tr>
<tr>
<td>Flammability limits in air, lower, % by volume</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor density</td>
<td>2.8</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>1.5</td>
</tr>
<tr>
<td>Relative density</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility (water)</td>
<td>Soluble</td>
</tr>
</tbody>
</table>
Partition coefficient (n-octanol/water) Not available
Auto-ignition temperature Not available.
Decomposition temperature Not available.

10. Chemical Stability & Reactivity Information
Chemical stability Material is stable under normal conditions.
Conditions to avoid Do not mix with other chemicals. Unsuitable containers: metals.
Hazardous decomposition products Hydrogen bromide. May decompose upon heating to produce corrosive and/or toxic fumes.
Possibility of hazardous reactions Hazardous polymerization does not occur.

11. Toxicological Information

<table>
<thead>
<tr>
<th>Toxicological data Components</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>HYDROGEN BROMIDE (10035-10-6)</td>
<td>Acute Inhalation LC50 Mouse: 814 mg/l 1.00 Hours</td>
</tr>
<tr>
<td></td>
<td>Acute Inhalation LC50 Rat: 2858 mg/l 1.00 Hours</td>
</tr>
</tbody>
</table>

Sensitization Not a skin sensitizer.
Acute effects Harmful if inhaled.
Local effects Causes severe burns. Mist or vapor extremely irritating to eyes and respiratory tract.
Chronic effects Corrosive. Prolonged contact causes serious tissue damage.
Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.
Skin corrosion/irritation Corrosive to skin and eyes.
Epidemiology No epidemiological data is available for this product.
Mutagenicity No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Neurological effects No data available for this product.
Reproductive effects Contains no ingredient listed as toxic to reproduction.
Teratogenicity No data available to indicate product or any components present at greater than 0.1% may cause birth defects.
Symptoms and target organs Corrosive effects.
Further information Danger of very serious irreversible effects. Symptoms may be delayed.

12. Ecological Information
Ecotoxicity The product may affect the acidity (pH-factor) in water with risk of harmful effects to aquatic organisms.
Environmental effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Persistence and degradability Expected to be readily biodegradable.
Partition coefficient (n-octanol/water) Not available

13. Disposal Considerations
Waste codes D002: Waste Corrosive material [pH <=2 or =>12.5, or corrosive to steel]
Disposal instructions Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. All wastes must be handled in accordance with local, state and federal regulations.
Contaminated packaging
Since emptied containers retain product residue, follow label warnings even after container is emptied. Offer rinsed packaging material to local recycling facilities.

14. Transport Information

DOT
Basic shipping requirements:
UN number UN1788
Proper shipping name Hydrobromic acid
Hazard class 8
Packing group II
Additional information:
Special provisions B2, B15, IB2, N41, T7, TP2

Basic shipping requirements:
Labels required 8

Additional information:
Packaging exceptions 154
Packaging non bulk 202
Packaging bulk 242
ERG number 154

IATA
Basic shipping requirements:
UN number 1788
Proper shipping name Hydrobromic acid
Hazard class 8
Packing group II
Additional information:

ERG code 8L

IMDG
Basic shipping requirements:
UN number 1788
Proper shipping name HYDROBROMIC ACID
Hazard class 8
Packing group II

15. Regulatory Information

US federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

CERCLA (Superfund) reportable quantity
None
Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
- Immediate Hazard - Yes
- Delayed Hazard - No
- Fire Hazard - No
- Pressure Hazard - No
- Reactivity Hazard - No

Section 311 hazardous chemical
Yes

Inventory status

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>No</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>No</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations
This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - Pennsylvania RTK - Hazardous Substances: Listed substance
HYDROGEN BROMIDE (CAS 10035-10-6) Listed.

Saf-T-Data
Health: 3 - Severe
Flammability: 0 - None
Reactivity: 1 - Slight
Contact: 4 - Extreme (Corrosive)
Lab Protective Equip: D - GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: W - White (Corrosive)

16. Labeling Info

Label Hazard Warning
DANGER
Corrosive. Harmful if inhaled. Causes severe skin and eye burns. Causes digestive tract burns. Mist or vapor extremely irritating to eyes and respiratory tract.

Label Precautions
Do not breathe mist or vapor. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. Keep container closed.

Label First Aid
Immediately flush eyes with plenty of water for at least 15 minutes. Immediately flush skin with plenty of water. If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Get medical attention immediately. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance.

17. Other Information

NFPA ratings
- Health: 3
- Flammability: 0
- Instability: 0

Material name: HYDROBROMIC ACID
MSDS US COV
MSDS ID: H3768 Version #: 02 Revision date: 08-29-2011

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Issue date

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