A. Product Identification

Synonyms: Sulfuretted Hydrogen; Hepatic Gas; Hydrosulfuric Acid
Chemical Name: Hydrogen Sulfide
Chemical Family: Inorganic Acid
Chemical Formula: H2S
CAS Reg. No.: 7783-06-4
Product No.: Not Established

Product and/or Components Entered on EPA's TSCA Inventory: YES

This product is in U.S. commerce, and is listed in the Toxic Substances Control Act (TSCA) Inventory of Chemicals; hence, it may be subject to applicable TSCA provisions and restrictions.

B. Hazardous Components

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>CAS Number</th>
<th>% By Wt.</th>
<th>OSHA PEL</th>
<th>ACGIH TLV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Sulfide</td>
<td>7783-06-4</td>
<td>100</td>
<td>10 ppm</td>
<td>10 ppm@</td>
</tr>
</tbody>
</table>

@ Short term exposure limit is 15 ppm.

C. Personal Protection Information

Ventilation: Use adequate ventilation to control exposure below recommended levels.

Respiratory Protection: For concentrations exceeding the recommended exposure level, use NIOSH/MSHA approved air purifying respirator. If conditions immediately dangerous to life or health (IDLH) exist, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA) equipment.

Eye Protection: For splash protection use chemical goggles and face shield.

Skin Protection: Gloves and coveralls of rubber or neoprene construction if liquid contact could occur. Avoid...
unnecessary skin contamination with material.

NOTE: Personal protection information shown in Section C is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

D. Handling and Storage Precautions

Proper personal protective equipment must be used when handling this chemical.

Do not get liquefied gas into eyes, on skin, or on clothing. May cause freeze burns upon direct contact. Do not breathe vapor, mist, fume or dust. May be harmful. Launder contaminated clothing before reuse. Use only with adequate ventilation. Wash thoroughly after handling.

Keep away from heat, sparks, and flames. Secure container to prevent damage. Store in a well-ventilated area. Store in tightly closed container. Bond and ground during transfer. Do not puncture or incinerate container.

Handle cylinders with care. Protect cylinders from physical damage. Containers should not be subjected to temperatures above 125°F. Do not heat cylinders by any means to increase the product discharge rate. Use a check valve or trap in the discharge line to prevent backflows into the cylinders. All electrical equipment should be non-sparking or explosion proof. Test atmosphere periodically for H2S. Do not rely on sense of smell for H2S release. Use product in a closed system.

E. Reactivity Data

Stability: Stable
Conditions to Avoid: Heat, flame, or other sources of ignition.
Incompatibility (Materials to Avoid): Concentrated nitric acid, sulfuric acid, and other strong oxidizers. Vapors will combust spontaneously when mixed with chlorine, nitrogen trifluoride, or oxygen trifluoride vapors. Distinct hydrogen sulfide odor can be masked by high concentrations of vapors or gas of other chemicals.

Hazardous Polymerization: Will Not Occur
Conditions to Avoid: Not Applicable
Hazardous Decomposition Products: Sulfur Oxides formed when burned.

F. Health Hazard Data

Recommended Exposure Limits:

See Section B.

Acute Effects of Overexposure:

Eye: May be irritating to eyes at levels near the permissible exposure limit. Liquid may cause freeze burns.
Skin: Gas not expected to be irritating to skin. Liquid may cause freeze burns, irritation, reddening or swelling.

Inhalation: Toxic by inhalation. Release of liquefied product may create atmospheres which can rapidly exceed lethal levels. Acute low level exposure that exceeds the permissible exposure limit will result in irritation of the nose and throat, headache, dizziness, nausea, and nervousness.

Ingestion: Liquid may cause freeze burns and death.

Subchronic and Chronic Effects of Overexposure:

Humans breathing up to 8 ppm of hydrogen sulfide over a two month period experienced nausea, headache, shortness of breath, sleep disturbance, eye and throat irritation.

Other Health Effects:

The odor of hydrogen sulfide may not be recognized after prolonged inhalation due to paralysis of the sense of smell. Effects from inhaling the fumes may lead to chronic bronchitis, respiratory irritation, increased loss of pulmonary function, and tearing of the eyes.

Health Hazard Categories:

<table>
<thead>
<tr>
<th>Animal</th>
<th>Human</th>
<th>Animal</th>
<th>Human</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known Carcinogen</td>
<td>___</td>
<td>___</td>
<td>Toxic</td>
</tr>
<tr>
<td>Suspect Carcinogen</td>
<td>___</td>
<td>___</td>
<td>Corrosive</td>
</tr>
<tr>
<td>Mutagen</td>
<td>___</td>
<td>___</td>
<td>Irritant</td>
</tr>
<tr>
<td>Teratogen</td>
<td>___</td>
<td>___</td>
<td>Target Organ Toxin</td>
</tr>
<tr>
<td>Allergic Sensitizer</td>
<td>___</td>
<td>___</td>
<td>Specify - Skin &amp; Eye Hazard - Freeze burns;</td>
</tr>
<tr>
<td>Highly Toxic</td>
<td>___</td>
<td>___</td>
<td></td>
</tr>
</tbody>
</table>

First Aid and Emergency Procedures:

NOTE: For freeze burns, immediately flush effected area with tap water for at least fifteen minutes, seek immediate medical attention.

Eye: Flush eyes with running water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Skin: Wash skin with soap and water for at least fifteen minutes. If irritation or adverse symptoms develop, seek medical attention.

Inhalation: Immediately remove from exposure. If breathing is difficult, give oxygen. If breathing ceases, administer artificial respiration followed by oxygen. Seek immediate medical attention.

Ingestion: If illness or adverse symptoms develop, seek medical attention.

Prompt medical attention is mandatory in all cases of overexposure to hydrogen sulfide. Rescue personnel should be equipped with NIOSH/MSHA approved self-contained breathing apparatus (SCBA). Rescue personnel should recognize the hazards of overexposure due to olfactory fatigue. The use of rescue equipment which might contain ignition sources or cause static discharges should be avoided.
Nitrite treatment as medical therapy has been used in persons overexposed to hydrogen sulfide, but the benefits of this treatment are still considered by some to be of questionable usefulness.

Therapy can only be undertaken by qualified emergency medical personnel.

Treatment should be initiated with inhalation of amyl nitrite for fifteen to thirty seconds of each minute until 10 ml of a 3% solution of sodium nitrite can be injected intravenously at a rate of 2.5 to 5 ml per minute. Sodium nitrite injections may be repeated if necessary.

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### G. Physical Data

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless Gas or Liquefied Gas</td>
</tr>
<tr>
<td>Odor</td>
<td>Repulsive (rotten egg) Odor</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>-75F (-60C)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>394.0 psia @ 100F (37.8C)</td>
</tr>
<tr>
<td>Vapor Density (Air = 1)</td>
<td>1.176 @ 60F (15.6C)</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Slight</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1)</td>
<td>0.79 @ 60F (15.6C)</td>
</tr>
<tr>
<td>Percent Volatile by Volume</td>
<td>100</td>
</tr>
<tr>
<td>Evaporation Rate (Ethyl Ether = 1)</td>
<td>&gt;1</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Not Applicable</td>
</tr>
</tbody>
</table>

### H. Fire and Explosion Data

- **Flash Point (Method Used):** Flammable Gas
- **Flammable Limits (% by Volume in Air):**
  - LEL - 4
  - UEL - 44
- **Fire Extinguishing Media:** Dry chemical, foam or carbon dioxide (CO2)

**Special Fire Fighting Procedures:** Shut off source, if possible. Water for or spray may be used to cool exposed containers and equipment. Use NIOSH/MSHA approved self-contained breathing apparatus. Wear protective equipment and/or garments described in Section C.

**Fire and Explosion Hazards:** Sulfur oxides formed when burned. Vapors are heavier than air and may travel to an ignition source and flashback. Autoignition temperature is 500F (260C).

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### I. Spill, Leak and Disposal Procedures

**Precautions Required if Material is Released or Spilled:**
- Evacuate area of all unnecessary personnel. Wear protective equipment and/or garments described in Section C if exposure conditions warrant.
- Shut off source. Ventilate confined area.

**Waste Disposal (Insure Conformity with all Applicable Disposal Regulations):**
- Incinerate or place in permitted waste management facility.

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### J. DOT Transportation

**Shipping Name:** Hydrogen sulfide, liquefied
**Hazard Class:** 2.3 (Poisonous gas)
**ID Number:** UN 1053
Packing Group: Not applicable
Marking: Hydrogen Sulfide, liquefied, UN1053, RQ* Inhalation hazard
Label: Poison gas and Flammable gas
Placard: Poisonous gas/1053
Hazardous Substance/RQ: Hydrogen sulfide/100#
Shipping Description: Hydrogen sulfide, liquefied, 2.3 (Poisonous gas), UN 1053, RQ*, Poison - Inhalation Hazard Zone B
Packaging References: 49 CFR 173.304, 173.314, 173.315

* Enter the letters "RQ" as shown only if the hazardous substance is present in a quantity, in one package, which equals or exceeds the reportable quantity (RQ) shown for the hazardous substance.

K. RCRA Classification - Unadulterated Product as a Waste

Ignitable (D001); Hydrogen Sulfide (U135)

Prior to disposal, consult your environmental contact to determine if the TCLP (Toxicity Characteristic Leaching Procedure, EPA Test Method 1311) is required. Reference 40 CFR Part 261.

L. Protection Required for Work on Contaminated Equipment

Contact immediate supervisor for specific instructions before work is initiated. Wear protective equipment and/or garments described in Section C if exposure conditions warrant. If repair of user's equipment is required, purge equipment with an inert gas prior to repairing.

M. Hazard Classification

_X_ This product meets the following hazard definition(s) as defined by the Occupational Safety and Health Hazard Communication Standard (29 CFR Section 1910.1200):

___ Combustible Liquid ___ Flammable Aerosol ___ Oxidizer
_X_ Compressed Gas ___ Explosive ___ Pyrophoric
_X_ Flammable Gas _X_ Health Hazard (Section F) ___ Unstable
___ Flammable Liquid ___ Organic Peroxide ___ Water Reactive
___ Flammable Solid

___ Based on information presently available, this product does not meet any of the hazard definitions of 29 CFR Section 1910.1200.

N. Additional Comments

As of the preparation date, this product did not contain a chemical or chemicals subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

NFPA 704 Hazard Codes - - - - - - - - Signals

Health : 3 Slight - 1
Flammability: 4 Moderate - 2
Reactivity : 0  
Special Haz.: -