Safety Data Sheet

Material Name: 1-8% Hydrogen Sulfide in Helium

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
1-8% Hydrogen Sulfide in Helium

Product Use
Industrial and Specialty Gas Applications

Restrictions on Use
None known.

Details of the supplier of the safety data sheet
MATHESON TRI-GAS, INC.
150 Allen Road, Suite 302
Basking Ridge, NJ 07920
General Information: 1-800-416-2505
Emergency #: 1-800-424-9300 (CHEMTREC)
Outside the US: 703-527-3887 (Call collect)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
Gases Under Pressure - Compressed gas
Acute Toxicity - Inhalation - Gas - Category 2
Specific Target Organ Toxicity - Single Exposure - Category 1 (cardiovascular system, central nervous system, respiratory system)
Specific Target Organ Toxicity - Repeated Exposure - Category 1 Inhalation (nervous system, respiratory system)
Hazardous to the Aquatic Environment - Acute - Category 1
Hazardous to the Aquatic Environment - Chronic - Category 2

GHS Label Elements

Signal Word
Danger

Hazard Statement(s)
Contains gas under pressure; may explode if heated.
Fatal if inhaled.
Causes damage to organs.
Causes damage to organs through prolonged or repeated exposure.
Very toxic to aquatic life.
Toxic to aquatic life with long lasting effects.

Precautionary Statement(s)

Prevention
Use only outdoors or in a well-ventilated area.
Do not breathe dust/fume/gas/mist/vapors/spray.
Wear respiratory protection.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Avoid release to the environment.

Response
Collect spillage.
If exposed: Call a POISON CENTER or doctor/physician.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Immediately call a POISON CENTER or doctor.
Specific treatment is urgent (see label).

Storage
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Statement(s) of Unknown Aquatic Toxicity
92% of the mixture consists of ingredient(s) of unknown acute aquatic toxicity.

Other Hazards
Rapid release of compressed gas may cause frostbite.

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### Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS</th>
<th>Component Name</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>7783-06-4</td>
<td>Hydrogen sulfide</td>
<td>1-8</td>
</tr>
<tr>
<td>7440-59-7</td>
<td>Helium</td>
<td>92-99</td>
</tr>
</tbody>
</table>

---

### Section 4 - FIRST AID MEASURES

**Inhalation**
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

**Skin**
If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115°F; 41-46°C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

**Eyes**
Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.

**Ingestion**
If swallowed, get medical attention.

**Most Important Symptoms/Effects**

**Acute**
potentially fatal if inhaled, frostbite, cardiovascular system damage, central nervous system damage, respiratory system damage

**Delayed**
nervous system damage, respiratory system damage

**Indication of any immediate medical attention and special treatment needed**
For inhalation, consider oxygen.

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### Section 5 - FIRE FIGHTING MEASURES

**Extinguishing Media**
Material Name: 1-8% Hydrogen Sulfide in Helium

Suitable Extinguishing Media
regular dry chemical, carbon dioxide. Large fires: water spray or fog, foam.

Unsuitable Extinguishing Media
Do not use high-pressure water streams.

Special Hazards Arising from the Chemical
Pressurized containers may rupture or explode if exposed to sufficient heat.

Hazardous Combustion Products
oxides of sulfur

Advice for firefighters
Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Fire Fighting Measures
Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Do not direct water at source of leak or safety devices; icing may occur. Stay upwind and keep out of low areas. Avoid inhalation of material or combustion by-products. Stay away from the ends of tanks. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile).

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up
Keep unnecessary people away, isolate hazard area and deny entry. Stop leak if possible without personal risk. Do not touch or walk through spilled material. Use water spray to reduce vapors or divert vapor cloud drift. Do not direct water at spill or source of leak. Ventilate closed spaces before entering.

Environmental Precautions
Avoid release to the environment. Collect spillage. Prevent entry into waterways, sewers, basements, or confined areas.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling
Use only outdoors or in a well-ventilated area. Do not breathe gas. Wear respiratory protection. Wash thoroughly after handling. Do not eat, drink or smoke when using this product.

Conditions for Safe Storage, Including any Incompatibilities
Store in a well-ventilated place. Keep container tightly closed. Store locked up.

Incompatible Materials
combustible materials, metals, oxidizing materials, halogens, metal oxides, metal salts, bases

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

<table>
<thead>
<tr>
<th>Component</th>
<th>Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen sulfide</td>
<td>7783-06-4</td>
</tr>
<tr>
<td>ACGIH:</td>
<td>1 ppm TWA</td>
</tr>
<tr>
<td></td>
<td>5 ppm STEL</td>
</tr>
</tbody>
</table>
Safety Data Sheet

Material Name: 1-8% Hydrogen Sulfide in Helium

<table>
<thead>
<tr>
<th>NIOSH:</th>
<th>10 ppm Ceiling 10 min ; 15 mg/m³ Ceiling 10 min</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 ppm IDLH</td>
<td></td>
</tr>
<tr>
<td>Europe:</td>
<td>5 ppm TWA ; 7 mg/m³ TWA</td>
</tr>
<tr>
<td>OSHA (US):</td>
<td>10 ppm STEL ; 14 mg/m³ STEL</td>
</tr>
<tr>
<td>Mexico:</td>
<td>20 ppm Ceiling</td>
</tr>
<tr>
<td>Helium:</td>
<td>7440-59-7</td>
</tr>
<tr>
<td>ACGIH:</td>
<td>(See Appendix F: Minimal Oxygen Content )</td>
</tr>
</tbody>
</table>

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)
There are no biological limit values for any of this product's components.

Engineering Controls
Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection
For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection
For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

Respiratory Protection
The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA. 100 ppm. Any powered, air-purifying respirator with cartridge(s) providing protection against this substance. Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern. Any supplied-air respirator. Any self-contained breathing apparatus with a full facepiece. Emergency or planned entry into unknown concentrations or IDLH conditions - Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Escape - Any air-purifying full-facepiece respirator (gas mask) with a chin-style, front-mounted or back-mounted canister providing protection against the compound of concern. Any appropriate escape-type, self-contained breathing apparatus.

Glove Recommendations
Wear insulated gloves.

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**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

<table>
<thead>
<tr>
<th>Appearance</th>
<th>colorless gas</th>
<th>Physical State</th>
<th>gas</th>
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</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Not available</td>
<td>Color</td>
<td>Not available</td>
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</table>
Safety Data Sheet

Material Name: 1-8% Hydrogen Sulfide in Helium

SDS ID: 00244662

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tr>
<td>Odor Threshold</td>
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<tr>
<td>pH</td>
<td>Not available</td>
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<tr>
<td>Melting Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Boiling Point</td>
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</tr>
<tr>
<td>Boiling Point Range</td>
<td>Not available</td>
</tr>
<tr>
<td>Freezing point</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
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<tr>
<td>Flammability (solid, gas)</td>
<td>Not available</td>
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<tr>
<td>Autoignition Temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>Not available</td>
</tr>
<tr>
<td>Lower Explosive Limit</td>
<td>Not available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not available</td>
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<tr>
<td>Upper Explosive Limit</td>
<td>Not available</td>
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<tr>
<td>Vapor Pressure</td>
<td>Not available</td>
</tr>
<tr>
<td>Vapor Density (air=1)</td>
<td>Not available</td>
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<tr>
<td>Specific Gravity (water=1)</td>
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<tr>
<td>Water Solubility</td>
<td>Not available</td>
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<tr>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available</td>
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<tr>
<td>Viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility (Other)</td>
<td>Not available</td>
</tr>
<tr>
<td>Density</td>
<td>Not available</td>
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<tr>
<td>Physical Form</td>
<td>compressed gas</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>Not available</td>
</tr>
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</table>

Other Information
No additional information available.

**Section 10 - STABILITY AND REACTIVITY**

Reactivity
No reactivity hazard is expected.

Chemical Stability
Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions
Will not polymerize.

Conditions to Avoid
Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Avoid contact with incompatible materials.

Incompatible Materials
combustible materials, metals, oxidizing materials, halogens, metal oxides, metal salts, bases

Hazardous decomposition products
oxides of sulfur

Thermal decomposition products
oxides of sulfur

**Section 11 - TOXICOLOGICAL INFORMATION**

Information on Likely Routes of Exposure

Inhalation
irritation, cough, lack of sense of smell, sensitivity to light, tingling sensation, changes in blood pressure, nausea, vomiting, difficulty breathing, headache, drowsiness, loss of coordination, dizziness, mood swings, disorientation, hallucinations, pain in extremities, tremors, visual disturbances, suffocation, lung congestion, internal bleeding,
irregular heartbeat, heart disorders, nerve damage, respiratory system damage, cardiovascular system damage, brain
damage, convulsions, coma, death

**Skin Contact**
- frostbite, irritation, skin disorders

**Eye Contact**
- irritation, sensitivity to light, tearing, frostbite, visual disturbances, eye damage

**Ingestion**
- Ingestion of gas is unlikely.

### Acute and Chronic Toxicity

**Component Analysis - LD50/LC50**
The components of this material have been reviewed in various sources and the following selected endpoints are
published:

**Hydrogen sulfide (7783-06-4)**
- Inhalation LC50 Rat 700 mg/m3 4 h

### Product Toxicity Data

**Acute Toxicity Estimate**
- No data available.

**Immediate Effects**
- potentially fatal if inhaled, frostbite, cardiovascular system damage, central nervous system damage, respiratory
system damage

**Delayed Effects**
- nervous system damage, respiratory system damage

**Irritation/Corrosivity Data**
- May cause irritation on contact.

**Respiratory Sensitization**
- No data available.

**Dermal Sensitization**
- No data available.

**Component Carcinogenicity**
- None of this product’s components are listed by ACGIH, IARC, NTP, DFG or OSHA.

**Germ Cell Mutagenicity**
- No data available.

**Tumorigenic Data**
- No data available

**Reproductive Toxicity**
- No data available.

**Specific Target Organ Toxicity - Single Exposure**
- Cardiovascular system, central nervous system, respiratory system

**Specific Target Organ Toxicity - Repeated Exposure**
- nervous system, respiratory system

**Aspiration hazard**
- Not applicable.

**Medical Conditions Aggravated by Exposure**
- respiratory disorders, nervous system disorders, eye disorders

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**Section 12 - ECOLOGICAL INFORMATION**

**Component Analysis - Aquatic Toxicity**

| Hydrogen | 7783-06-4 |
Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose in accordance with all applicable regulations. Subject to disposal regulations. U.S. EPA 40 CFR 262.
Component Waste Numbers
The U.S. EPA has not published waste numbers for this product's components.

Section 14 - TRANSPORT INFORMATION

US DOT Information:
Shipping Name: COMPRESSED GAS, TOXIC, N.O.S.
Hazard Class: 2.3
UN/NA #: UN1955
Required Label(s): 2.3
Marine pollutant
Further information: Inhalation Hazard Zone B

IMDG Information:
Hazard Class: 2.3
UN#: UN1995
Required Label(s): 2.3
Marine pollutant
International Bulk Chemical Code
This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations
This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>SARA 302</th>
<th>SARA 313</th>
<th>CERCLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen sulfide</td>
<td>7783-06-4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARA 302:</td>
<td>500 lb TPQ</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SARA 313:</td>
<td></td>
<td>1 % de minimis concentration</td>
<td></td>
</tr>
<tr>
<td>CERCLA:</td>
<td>100 lb final RQ ; 45.4 kg final RQ</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Material Name: 1-8% Hydrogen Sulfide in Helium

OSHA (safety): 1500 lb TQ
SARA 304: 100 lb EPCRA RQ

SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories
Gas Under Pressure; Acute toxicity; Specific Target Organ Toxicity

U.S. State Regulations
The following components appear on one or more of the following state hazardous substances lists:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen sulfide</td>
<td>7783-06-4</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Helium</td>
<td>7440-59-7</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Not listed under California Proposition 65

Canada Regulations
Canadian WHMIS Ingredient Disclosure List (IDL)
Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which meet WHMIS criteria specified in the Controlled Products Regulations and are present above the threshold limits listed on the IDL

<table>
<thead>
<tr>
<th>Hydrogen sulfide</th>
<th>7783-06-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 %</td>
<td></td>
</tr>
</tbody>
</table>

Component Analysis - Inventory
Hydrogen sulfide (7783-06-4)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>DSL</td>
<td>EIN</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Helium (7440-59-7)

<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>DSL</td>
<td>EIN</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Section 16 - OTHER INFORMATION

NFPA Ratings
Health: 4 Fire: 0 Reactivity: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes
New SDS: 08/14/2015
Safety Data Sheet

Material Name: 1-8% Hydrogen Sulfide in Helium

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania®; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC – European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR - Korea; LD50/LC50 - Lethal Dose/Lethal Concentration; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of Lists™ - ChemADVISOR’s Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX - Mexico; Ne- Non-specific; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; Nq - Non-quantitative; NSL – Non-Domestic Substance List (Canada); NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL - Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH - Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA - Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW - Taiwan; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UN/NA - United Nations /North American; US - United States; VLE - Exposure Limit Value (Mexico); VN (Draft) - Vietnam (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada).

Other Information

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