Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
Hydrogen Sulfide, Hydrosulfuric Acid

Synonyms
Hydrogen sulfide (H2S); Dihydrogen monosulfide; Dihydrogen sulfide; Sulfur dihydride; Sulfureted hydrogen; Sulfur hydride; Sewer gas

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.
Flammable Gases - Category 1
Gases Under Pressure - Liquefied gas
Acute Toxicity - Inhalation - Dust/Mist - Category 2
Acute Toxicity - Inhalation - Vapor - Category 2
Specific target organ toxicity - Single exposure - Category 1
Specific target organ toxicity - Repeated exposure - Category 1
Hazardous to the Aquatic Environment - Acute - Category 1
Hazardous to the Aquatic Environment - Chronic - Category 1

GHS Label Elements

Signal Word
Danger

Hazard Statement(s)
Extremely flammable gas.
Contains gas under pressure; may explode if heated.
Fatal if inhaled.
Causes serious eye irritation.
Causes damage to organs. (Cardiovascular system, central nervous system, respiratory system)
Causes damage to organs through prolonged or repeated exposure. (nervous system, respiratory system)
Very toxic to aquatic life with long lasting effects.
Safety Data Sheet

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Precautionary Statement(s)

Prevention
Keep away from heat, sparks, open flame, and hot surfaces - No smoking.
Do not breathe gas.
Use only outdoors or in a well-ventilated area.
Wear respiratory protection.
Do not eat, drink or smoke when using this product.
Wear eye protection/face protection.
Wash thoroughly after handling.
Avoid release to the environment.

Response
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources if safe to do so.
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/physician.
Specific treatment is urgent, see first aid section of Safety Data Sheet.
IF IN EYES.
Rinse cautiously with water for several minutes.
Remove contact lenses, if present and easy to do.
Continue rinsing.
If eye irritation persists.
Get medical advice/attention.
Collect spillage.

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

Disposal
Dispose in accordance with all applicable regulations.

Other Hazards
May cause frostbite upon sudden release of liquefied gas.

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>100</td>
</tr>
</tbody>
</table>

Section 4 - FIRST AID MEASURES

Inhalation
Do not attempt rescue in confined spaces without adequate protective gear and proper training. 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

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Issue date: 2019-04-19  Revision 4.0  Print date: 2019-04-19
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. Remove contact lenses, if present and easy to do. Continue rinsing. Then get immediate medical attention.

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

**Most Important Symptoms/Effects**

**Acute**
- frostbite, mild skin irritation, eye irritation, cardiovascular system damage, central nervous system damage,
- respiratory system damage

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

**Note to Physicians**
For inhalation, consider oxygen.

### Section 5 - FIRE FIGHTING MEASURES

**Extinguishing Media**

**Suitable Extinguishing Media**
- regular dry chemical, carbon dioxide, water spray, foam, Let burn unless leak can be stopped immediately. Large fires: Use water spray, fog or regular foam.

**Unsuitable Extinguishing Media**
- None known.

**Special Hazards Arising from the Chemical**
- Extremely flammable. Containers may rupture or explode if exposed to heat. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back.

**Hazardous Combustion Products**
- oxides of sulfur

**Fire Fighting Measures**
- Move container from fire area if it can be done without risk. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. 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. Keep unnecessary people away, isolate hazard area and deny entry. For tank, rail car or tank truck, evacuation radius: 800 meters (1/2 mile). Do not attempt to extinguish fire unless flow of material can be stopped first. Flood with fine water spray. Do not scatter spilled material with high-pressure water streams. Cool containers with water. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Stay upwind and keep out of low areas. Stop flow of gas.

**Special Protective Equipment and Precautions for Firefighters**
- Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

### 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. Do not touch or walk through spilled material. Eliminate all ignition sources if safe to do so. Fully encapsulating, vapor protective clothing should be worn for spills and leaks with no fire. All equipment used when handling the product must be grounded. Use only non-sparking tools. Stop leak if possible without personal risk. Use water spray to reduce vapors or divert vapor cloud
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SDS ID: 00244247

drift. If possible, turn leaking containers so that gas escapes rather than liquid. Ventilate closed spaces before entering. Isolate area until gas has dispersed. Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).

Environmental Precautions
Avoid release to the environment. Collect spillage.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling
Keep away from heat, sparks, open flame, and hot surfaces - No smoking. Do not breathe gas. Use only outdoors or in a well-ventilated area. Wear respiratory protection. Do not eat, drink or smoke when using this product. Wear eye/face protection. Wash hands thoroughly after handling. Avoid release to the environment.

Conditions for Safe Storage, Including any Incompatibilities
Store in a well-ventilated place.
Keep container tightly closed.
Protect from sunlight.
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>
<tr>
<td>NIOSH:</td>
<td>10 ppm Ceiling 10 min ; 15 mg/m3 Ceiling 10 min</td>
</tr>
<tr>
<td></td>
<td>100 ppm IDLH</td>
</tr>
<tr>
<td>Europe:</td>
<td>5 ppm TWA ; 7 mg/m3 TWA</td>
</tr>
<tr>
<td></td>
<td>10 ppm STEL ; 14 mg/m3 STEL</td>
</tr>
</tbody>
</table>
Material Name: Hydrogen Sulfide, Hydrosulfuric Acid

OSHA (US): 20 ppm Ceiling  
Mexico: 1 ppm TWA [VLE-PPT ]  
5 ppm STEL [PPT-CT ]  

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

Engineering Controls  
Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. All energized electrical equipment must be designed in accordance with the electrical classification of the area (e.g., Class I, Division 1). Ensure compliance with applicable exposure limits.

Individual Protection Measures, such as Personal Protective Equipment  
Eye/face protection  
Wear splash resistant safety goggles with a faceshield. 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: Wear appropriate chemical resistant clothing. 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 facemask. 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  
For the gas: Wear appropriate chemical resistant gloves. For the liquid: Wear insulated gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Appearance</th>
<th>colorless gas</th>
<th>Physical State</th>
<th>liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>rotten eggs, paralyzes sense of smell above 100ppm</td>
<td>Color</td>
<td>colorless</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>0.14 ppm (Recognition Arsine )</td>
<td>pH</td>
<td>4.1 at 0.1 N (Aqueous solution )</td>
</tr>
<tr>
<td>Melting Point</td>
<td>-85.6 °C (-122 °F )</td>
<td>Boiling Point</td>
<td>-60.2 °C (-76 °F )</td>
</tr>
<tr>
<td>Boiling Point Range</td>
<td>Not available</td>
<td>Freezing point</td>
<td>Not available</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not available</td>
<td>Flammability (solid, gas)</td>
<td>Flammable gas</td>
</tr>
</tbody>
</table>
Material Name: Hydrogen Sulfide, Hydrosulfuric Acid

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoignition Temperature</td>
<td>260 °C (500 °F )</td>
<td>Flash Point</td>
<td>(Flammable gas )</td>
</tr>
<tr>
<td>Lower Explosive Limit</td>
<td>4.0 to 4.3 % (by volume )</td>
<td>Decomposition temperature</td>
<td>Not available</td>
</tr>
<tr>
<td>Upper Explosive Limit</td>
<td>44 to 46 % (by volume )</td>
<td>Vapor Pressure</td>
<td>18100 hPa @ 20 °C</td>
</tr>
<tr>
<td>Vapor Density (air=1)</td>
<td>1.19</td>
<td>Specific Gravity (water=1)</td>
<td>Not available</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>4 g/L ( @ 20 °C )</td>
<td>Partition coefficient: n-octanol/water</td>
<td>Not available</td>
</tr>
<tr>
<td>Viscosity</td>
<td>0.0128 cp</td>
<td>Kinematic viscosity</td>
<td>Not available</td>
</tr>
<tr>
<td>Solubility (Other)</td>
<td>Not available</td>
<td>Density</td>
<td>1.5355 g/L at 0 °C</td>
</tr>
<tr>
<td>Log KOW</td>
<td>0.45 at 25 °C</td>
<td>Physical Form</td>
<td>compressed, liquefied gas</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>H2-S</td>
<td>Molecular Weight</td>
<td>34.08</td>
</tr>
</tbody>
</table>

**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 inhalation of material or combustion by-products.

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

**Hazardous 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, changes in blood pressure, nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, Disorientation, hallucinations, pain in extremities, tremors, visual disturbances, suffocation, lung congestion, internal bleeding, heart disorders, nerve damage, brain damage, convulsions, coma, death

**Skin Contact**
irritation, skin disorders
Safety Data Sheet

Material Name: Hydrogen Sulfide, Hydrosulfuric Acid

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

Ingestion
ingestion of a 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

| Inhalation - Vapor | 0.7 mg/L |

Immediate Effects
frostbite, mild skin irritation, eye irritation, cardiovascular system damage, central nervous system damage, respiratory system damage

Delayed Effects
nervous system damage, respiratory system damage

Irritation/Corrosivity Data
mild skin irritation, eye irritation

Respiratory Sensitization
No information available for the product.

Dermal Sensitization
No information available for the product.

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
No data available.

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

Section 12 - ECOLOGICAL INFORMATION

Ecotoxicity
Very toxic to aquatic life with long lasting effects.

Component Analysis - Aquatic Toxicity

| Hydrogen sulfide       | 7783-06-4 |

Fish:
LC50 96 h Lepomis macrochirus 0.0448 mg/L [flow-through ]; LC50 96 h Pimephales promelas 0.016 mg/L [flow-through ]

Persistence and Degradability
No information available for the product.

Bioaccumulative Potential
This material is believed not to bioaccumulate.

Mobility
No information available for the product.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. U.S. EPA 40 CFR 262.
Hazardous Waste Number(s): D001.

Component Waste Numbers

| Hydrogen sulfide | waste number U135 |

Section 14 - TRANSPORT INFORMATION

US DOT Information:
Shipping Name: HYDROGEN SULFIDE
Hazard Class: 2.3
UN/NA #: UN1053
Required Label(s): 2.3 2.1
Marine pollutant

IMDG Information:
Shipping Name: HYDROGEN SULPHIDE
Hazard Class: 2.3
UN#: UN1053
Required Label(s): 2.3 2.1
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>Hydrogen sulfide</th>
<th>7783-06-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARA 302:</td>
<td>500 lb TPQ</td>
</tr>
<tr>
<td>SARA 313:</td>
<td>1 % de minimis concentration</td>
</tr>
<tr>
<td>CERCLA:</td>
<td>100 lb final RQ ; 45.4 kg final RQ</td>
</tr>
</tbody>
</table>
Material Name: Hydrogen Sulfide, Hydrosulfuric Acid

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

SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories
Flammable; Gas Under Pressure; Acute toxicity; Serious Eye Damage/Eye Irritation; 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>
</tbody>
</table>

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)
Not listed under California Proposition 65.

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

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

<table>
<thead>
<tr>
<th>KR - REACH CCA</th>
<th>MX</th>
<th>NZ</th>
<th>PH</th>
<th>TH-TECI</th>
<th>TW</th>
<th>VN (Draft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Yes</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: 4 Instability: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Summary of Changes
Updated: 05/01/2015

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
Safety Data Sheet

Material Name: Hydrogen Sulfide, Hydrosulfuric Acid

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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