Hydrogen Sulfide (0.00001% - 0.9999%) in Ethylene
Safety Data Sheet
according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations
Date of issue: 08/13/2015 Version: 2.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier
Product form : Mixture
Product name : Hydrogen Sulfide (0.00001% - 0.9999%) in Ethylene
Product code : SG-2002-02859

1.2. Relevant identified uses of the substance or mixture and uses advised against
Use of the substance/mixture : Test gas/Calibration gas.

1.3. Details of the supplier of the safety data sheet
Air Liquide
2700 Post Oak Boulevard
Houston, TX 77056 - USA
T 1-800-819-1704
www.us.airliquide.com

1.4. Emergency telephone number
Emergency number : CHEMTREC: 1-800-424-9300

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture
GHS-US classification
Flam. Gas 1 H220
Compressed gas H280
STOT SE 3 H336
Full text of H-phrases: see section 16

2.2. Label elements
GHS-US labeling
Hazard pictograms (GHS-US) :

Signal word (GHS-US) : Danger
Hazard statements (GHS-US)
H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated
H336 - May cause drowsiness or dizziness
OSHA-H01 - May displace oxygen and cause rapid suffocation
CGA-HG04 - May form explosive mixtures with air
CGA-HG16 - Extended exposure to gas reduces the ability to smell sulfides.

Precautionary statements (GHS-US)
P202 - Do not handle until all safety precautions have been read and understood
P210 - Keep away from heat, hot surfaces, open flames, sparks. - No smoking
P261 - Avoid breathing gas
P271 - Use only outdoors or in a well-ventilated area
P280 - Wear eye protection, face protection, protective gloves, protective clothing
P304+P313 - If exposed or concerned: Get medical advice/attention
P331 - Avoid all contact with skin
P340 - Use only with equipment rated for cylinder pressure
P351 - Take precautions to prevent release to the environment
P361/373 - Mixtures with air may be explosive in the presence of ignition source
P381 - Eliminate all ignition sources if safe to do so
P403 - Store in a well-ventilated place
P405 - Store locked up
P501 - Dispose of contents/container in accordance with local/regional/national/international regulations
CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)
CGA-PG05 - Use a back flow preventive device in the piping
CGA-PG06 - Close valve after each use and when empty
CGA-PG10 - Use only with equipment rated for cylinder pressure
CGA-PG14 - Approach suspected leak area with caution
Hydrogen Sulfide (0.00001% - 0.9999%) in Ethylene

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

CGA-PG21 - Open valve slowly
CGA-PG29 - Do not depend on odor to detect presence of gas

2.3. Other hazards
No additional information available

2.4. Unknown acute toxicity (GHS US)
Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substance
Not applicable

3.2. Mixture

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene</td>
<td>(CAS No) 74-85-1</td>
<td>99.0001 -</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>99.99999</td>
<td>Flam. Gas 1, H220</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Liquefied gas, H280</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>STOT SE 3, H336</td>
</tr>
<tr>
<td>Hydrogen Sulfide</td>
<td>(CAS No) 7783-06-4</td>
<td>0.00001 -</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.9999</td>
<td>Flam. Gas 1, H220</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Liquefied gas, H280</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Acute Tox. 2 (Inhalation:gas), H330</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>STOT SE 3, H335</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aquatic Acute 1, H400</td>
</tr>
</tbody>
</table>

Full text of H-phrases: see section 16

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation: Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact: Adverse effects not expected from this product.

First-aid measures after eye contact: Adverse effects not expected from this product.

First-aid measures after ingestion: Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/injuries after inhalation: May displace oxygen and cause rapid suffocation. May cause drowsiness or dizziness.

Symptoms/injuries after skin contact: Adverse effects not expected from this product.

Symptoms/injuries after eye contact: Adverse effects not expected from this product.

Symptoms/injuries after ingestion: Ingestion is not considered a potential route of exposure.

Chronic symptoms: Adverse effects not expected from this product.

4.3. Indication of any immediate medical attention and special treatment needed

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media: Use extinguishing media appropriate for surrounding fire.

Unsuitable extinguishing media: Do not use water jet to extinguish.

5.2. Special hazards arising from the substance or mixture

Fire hazard: This product is flammable.

Explosion hazard: Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. May form flammable/explosive vapor-air mixture.

Reactivity: None known.

5.3. Advice for firefighters

Firefighting instructions: In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.

Protection during firefighting: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Do not enter fire area without proper protective equipment, including respiratory protection.
SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Ensure adequate ventilation.

6.1.1. For non-emergency personnel

Protective equipment: Wear protective equipment consistent with the site emergency plan.

6.1.2. For emergency responders

Protective equipment: Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection.
Emergency procedures: Evacuate and limit access. Ventilate area. Remove ignition sources. Monitor concentration of released product. Consider the risk of potentially explosive atmospheres. Wear self-contained breathing apparatus when entering atmospheres of unknown contaminant concentration until proven to be safe.

6.2. Environmental precautions

Try to stop release if safe to do so.

6.3. Methods and material for containment and cleaning up

For containment: Try to stop release if safe to do so.
Methods for cleaning up: Dispose of this material and its container in accordance with local regulations.

6.4. Reference to other sections

See also Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Additional hazards when processed: Pressurized container: Do not pierce or burn, even after use. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Handle empty containers with care because residual vapors are flammable. In use, may form flammable vapor-air mixture.

Precautions for safe handling: Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Use only non-sparking tools.

Hygiene measures: Do not eat, drink or smoke when using this product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Comply with applicable regulations. Proper grounding procedures to avoid static electricity should be followed.
Storage conditions: Do not expose to temperatures exceeding 52°C (125°F). Keep container closed when not in use. Protect cylinder from physical damage. Store in well ventilated area. Store locked up.

Incompatible products: None known.
Incompatible materials: Oxidizing materials. Air.

7.3. Specific end use(s)

See Section 1.2.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Substance</th>
<th>ACGIH</th>
<th>OSHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrogen Sulfide (0.00001% - 0.9999%) in Ethylene</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Hydrogen Sulfide (7783-06-4)</td>
<td>ACGIH TWA (ppm)</td>
<td>1 ppm</td>
</tr>
<tr>
<td>ACGIH</td>
<td>ACGIH STEL (ppm)</td>
<td>5 ppm</td>
</tr>
<tr>
<td>OSHA</td>
<td>OSHA PEL (Ceiling) (ppm)</td>
<td>20 ppm</td>
</tr>
<tr>
<td>Ethylene (74-85-1)</td>
<td>ACGIH TWA (ppm)</td>
<td>200 ppm</td>
</tr>
</tbody>
</table>
8.2. Exposure controls

Appropriate engineering controls: Ensure exposure is below occupational exposure limits. Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leakages. Oxygen detectors should be used when asphyxiating gases may be released. Consider work permit system e.g. for maintenance activities.


Skin and body protection: Wear suitable protective clothing, e.g. - lab coats, coveralls or flame resistant clothing.

Respiratory protection: None necessary during normal and routine operations. See Sections 5 & 6.

Thermal hazard protection: None necessary during normal and routine operations.

Environmental exposure controls: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.


SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state: Gas
Appearance: Clear, colorless gas.
Color: Colorless
Odor: Sulfide-like Rotten eggs.
Odor threshold: No data available
pH: No data available
Melting point: No data available
Freezing point: No data available
Boiling point: No data available
Flash point: No data available
Relative evaporation rate (butyl acetate=1): No data available
Flammability (solid, gas): See Section 2.1 and 2.2
Explosion limits: No data available
Explosive properties: Without adequate ventilation formation of explosive mixtures may be possible.
Oxidizing properties: None.
Vapor pressure: No data available
Relative density: No data available
Relative vapor density at 20 °C: No data available
Molecular mass: Not applicable for gas-mixtures.
Relative gas density: Similar to air
Solubility: No data available
Log Pow: No data available
Log Kow: No data available
Auto-ignition temperature: No data available
Decomposition temperature: No data available
Viscosity: No data available
Viscosity, kinematic: No data available
Viscosity, dynamic: No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

None known.
### 10.2. Chemical stability
Stable under normal conditions.

### 10.3. Possibility of hazardous reactions
Can form explosive mixture with air.

### 10.4. Conditions to avoid
None under recommended storage and handling conditions (see section 7).

### 10.5. Incompatible materials
Oxidizing materials. Air.

### 10.6. Hazardous decomposition products
Under normal conditions of storage and use hazardous decomposition products should not be produced.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

**Acute toxicity**: Not classified

<table>
<thead>
<tr>
<th><strong>Hydrogen Sulfide (7783-06-4)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 inhalation rat (mg/l)</td>
<td>0.99 mg/l (Exposure time: 1 h)</td>
</tr>
<tr>
<td>LC50 inhalation rat (ppm)</td>
<td>356 ppm/4h</td>
</tr>
<tr>
<td>ATE US (gases)</td>
<td>356.000 ppmV/4h</td>
</tr>
<tr>
<td>ATE US (vapors)</td>
<td>0.990 mg/l/4h</td>
</tr>
<tr>
<td>ATE US (dust, mist)</td>
<td>0.990 mg/l/4h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Ethylene (74-85-1)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 inhalation rat (ppm)</td>
<td>82000.0 ppmV/4h</td>
</tr>
<tr>
<td>ATE US (gases)</td>
<td>82000.000 ppmV/4h</td>
</tr>
</tbody>
</table>

**Skin corrosion/irritation**: Not classified

**Serious eye damage/irritation**: Not classified

**Respiratory or skin sensitization**: Not classified

**Germ cell mutagenicity**: Not classified

**Carcinogenicity**: Not classified

**Reproductive toxicity**: Not classified

**Specific target organ toxicity (single exposure)**: May cause drowsiness or dizziness.

**Specific target organ toxicity (repeated exposure)**: Not classified

**Aspiration hazard**: Not classified

**Symptoms/injuries after inhalation**: May displace oxygen and cause rapid suffocation. May cause drowsiness or dizziness.

**Symptoms/injuries after skin contact**: Adverse effects not expected from this product.

**Symptoms/injuries after eye contact**: Adverse effects not expected from this product.

**Symptoms/injuries after ingestion**: Ingestion is not considered a potential route of exposure.

**Symptoms/injuries upon intravenous administration**: Not known.

**Chronic symptoms**: Adverse effects not expected from this product.

## SECTION 12: Ecological information

### 12.1. Toxicity

<table>
<thead>
<tr>
<th><strong>Hydrogen Sulfide (7783-06-4)</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 fish 1</td>
<td>0.0448 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [flow-through])</td>
</tr>
<tr>
<td>EC50 Daphnia 1</td>
<td>0.022 mg/l (Exposure time: 96 h - Species: Gammarus pseudolimnaeus)</td>
</tr>
<tr>
<td>LC50 fish 2</td>
<td>0.016 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through])</td>
</tr>
</tbody>
</table>
12.2. Persistence and degradability

Hydrogen Sulfide (7783-06-4)
Persistence and degradability: Not applicable for inorganic gases.

Ethylene (74-85-1)
Persistence and degradability: The substance is biodegradable. Unlikely to persist.

12.3. Bioaccumulative potential

Hydrogen Sulfide (7783-06-4)
BCF fish 1: (no bioaccumulation expected)
Log Pow: Not applicable for inorganic gases.
Bioaccumulative potential: No data available.

Ethylene (74-85-1)
BCF fish 1: 4 - 4.6
Log Pow: 1.13
Bioaccumulative potential: Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 9.

12.4. Mobility in soil

Hydrogen Sulfide (7783-06-4)
Ecology - soil: Because of its high volatility, the product is unlikely to cause ground or water pollution.

Ethylene (74-85-1)
Ecology - soil: Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5. Other adverse effects

Effect on ozone layer: No known effects from this product.
Effect on the global warming: No known ecological damage caused by this product.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods: Contact supplier if guidance is required. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into areas where there is a risk of forming an explosive mixture with air.

Waste disposal recommendations: Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods.

SECTION 14: Transport information

Department of Transportation (DOT)
In accordance with DOT
Transport document description: UN1954 Compressed gas, flammable, n.o.s. (Hydrogen Sulfide, Ethylene)
UN-No.(DOT): UN1954
Proper Shipping Name (DOT): Compressed gas, flammable, n.o.s.
Hazard labels (DOT): 2.1 - Flammable gas

DOT Packaging Non Bulk (49 CFR 173.xxx): 302;305
DOT Packaging Bulk (49 CFR 173.xxx): 314;315
DOT Symbols: G - Identifies PSN requiring a technical name
DOT Packaging Exceptions (49 CFR 173.xxx): 306
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27): Forbidden
Hydrogen Sulfide (0.00001% - 0.9999%) in Ethylene
Safety Data Sheet

DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75):
150 kg

DOT Vessel Stowage Location:
D - The material must be stowed “on deck only” on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded.

DOT Vessel Stowage Other:
40 - Stow “clear of living quarters”

Additional information:
No supplementary information available.

ADR
Transport document description:
UN 1954 COMPRESSED GAS, FLAMMABLE, N.O.S., 2.1, (B/D)
Class (ADR):
2 - Gases
Hazard identification number (Kemler No.):
23
Classification code (ADR):
1F
Hazard labels (ADR):
2.1 - Flammable gases

Orange plates:
23
1954

Tunnel restriction code (ADR):
B/D
Limited quantities (ADR):
0
Excepted quantities (ADR):
E0

Transport by sea
UN-No. (IMDG):
1954
Proper Shipping Name (IMDG):
COMPRESSED GAS, FLAMMABLE, N.O.S.
Class (IMDG):
2 - Gases

Air transport
UN-No. (IATA):
1954
Proper Shipping Name (IATA):
COMPRESSED GAS, FLAMMABLE, N.O.S.
Class (IATA):
2

SECTION 15: Regulatory information

15.1. US Federal regulations

Hydrogen Sulfide (7783-06-4)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on the United States SARA Section 302
Subject to reporting requirements of United States SARA Section 313
SARA Section 302 Threshold Planning Quantity (TPQ):
500
SARA Section 313 - Emission Reporting:
1.0 %

Ethylene (74-85-1)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Subject to reporting requirements of United States SARA Section 313
SARA Section 313 - Emission Reporting:
1.0 %

15.2. International regulations

CANADA
## Hydrogen Sulfide (7783-06-4)

**Listed on the Canadian DSL (Domestic Substances List)**

<table>
<thead>
<tr>
<th>WHMIS Classification</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class A - Compressed Gas</td>
<td></td>
</tr>
<tr>
<td>Class B Division 1 - Flammable Gas</td>
<td></td>
</tr>
<tr>
<td>Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects</td>
<td></td>
</tr>
<tr>
<td>Class D Division 2 Subdivision B - Toxic material causing other toxic effects</td>
<td></td>
</tr>
</tbody>
</table>

### EU-Regulations

**Hydrogen Sulfide (7783-06-4)**

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

**Ethylene (74-85-1)**

Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

### Classification according to Regulation (EC) No. 1272/2008 [CLP]

Not classified

### Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

No additional information available

### National regulations

**Hydrogen Sulfide (7783-06-4)**

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

Listed on the Canadian IDL (Ingredient Disclosure List)

**Ethylene (74-85-1)**

Listed on the AICS (Australian Inventory of Chemical Substances)

Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)

Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory

Listed on the Korean ECL (Existing Chemicals List)

Listed on NZIoC (New Zealand Inventory of Chemicals)

Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)

### 15.3. US State regulations

**Hydrogen Sulfide (7783-06-4)**

U.S. - Massachusetts - Right To Know List

U.S. - New Jersey - Right to Know Hazardous Substance List

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

U.S. - Pennsylvania - RTK (Right to Know) List

**Ethylene (74-85-1)**

U.S. - Massachusetts - Right To Know List

U.S. - New Jersey - Right to Know Hazardous Substance List

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

U.S. - Pennsylvania - RTK (Right to Know) List

### SECTION 16: Other information

**Indication of changes**

Revised safety data sheet in accordance with OSHA final rule on GHS implementation promulgated March 26, 2012.
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Other information: This Safety Data Sheet is offered pursuant to OSHA’s Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product.

Full text of H-phrases:

<table>
<thead>
<tr>
<th>Acute Tox. 2 (Inhalation:gas)</th>
<th>Acute toxicity (inhalation:gas) Category 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aquatic Acute 1</td>
<td>Hazardous to the aquatic environment - Acute Hazard Category 1</td>
</tr>
<tr>
<td>Compressed gas</td>
<td>Gases under pressure Compressed gas</td>
</tr>
<tr>
<td>Flam. Gas 1</td>
<td>Flammable gases Category 1</td>
</tr>
<tr>
<td>Liquefied gas</td>
<td>Gases under pressure Liquefied gas</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity (single exposure) Category 3</td>
</tr>
<tr>
<td>STOT SE 3</td>
<td>Specific target organ toxicity (single exposure) Category 3</td>
</tr>
<tr>
<td>H220</td>
<td>Extremely flammable gas</td>
</tr>
<tr>
<td>H280</td>
<td>Contains gas under pressure; may explode if heated</td>
</tr>
<tr>
<td>H330</td>
<td>Fatal if inhaled</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation</td>
</tr>
<tr>
<td>H336</td>
<td>May cause drowsiness or dizziness</td>
</tr>
<tr>
<td>H400</td>
<td>Very toxic to aquatic life</td>
</tr>
</tbody>
</table>

SDS US (GHS HazCom 2012)

This Safety Data Sheet is offered pursuant to OSHA’s Hazard Communication Standard, 29 CFR, 1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of Air Liquide America Corporation’s knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either express or implied, are provided. The information contained herein relates only to this specific product. If this product is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.