

Material Safety Data Sheet



Hydrogen Sulfide

Section 1. Chemical product and company identification

Product Name : Hydrogen Sulfide
Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253
Product use : Synthetic/Analytical chemistry.
Synonym :
MSDS# : 001029
Date of Preparation/Revision : **2/12/2008.**
In case of emergency : 1-866-734-3438

Section 2. Hazards identification

Physical state : Gas. (COLORLESS LIQUEFIED COMPRESSED GAS WITH A ROTTEN EGG ODOR, BUT ODORLESS AT POISONOUS CONCENTRATIONS. [NOTE: SENSE OF SMELL BECOMES RAPIDLY FATIGUED AND CAN NOT BE RELIED UPON TO WARN OF THE CONTINUOUS PRESENCE OF H₂S.])

Emergency overview : Danger!
MAY BE FATAL IF INHALED.
FLAMMABLE GAS.
CONTENTS UNDER PRESSURE.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, RESPIRATORY TRACT, EYES, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
VAPOR MAY CAUSE FLASH FIRE.
MAY CAUSE EYE AND SKIN IRRITATION.
Avoid contact with skin and clothing. Do not breathe gas. Keep away from heat, sparks and flame. Do not puncture or incinerate container. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.
Contact with rapidly expanding gases can cause frostbite.

Routes of entry : Inhalation,Dermal,Eyes

Potential acute health effects

Eyes : Moderately irritating to the eyes.

Skin : Moderately irritating to the skin.

Inhalation : Very toxic by inhalation.

Ingestion : Ingestion is not a normal route of exposure for gases

Potential chronic health effects : **CARCINOGENIC EFFECTS** Not available.
MUTAGENIC EFFECTS Not available.
TERATOGENIC EFFECTS: Not available.

Medical conditions aggravated by overexposure : Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.
See toxicological Information (section 11)

Section 3. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% Volume</u>	<u>Exposure limits</u>
-------------	-------------------	-----------------	------------------------

Hydrogen Sulfide

Hydrogen Sulfide

7783-06-4

100

ACGIH TLV (United States, 9/2004). Notes: Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(124):36338-33351, June 30, 1993, for revised OSHA PEL.

STEL: 21 mg/m³ 15 minute(s). Form: All forms

STEL: 15 ppm 15 minute(s). Form: All forms

TWA: 14 mg/m³ 8 hour(s). Form: All forms

TWA: 10 ppm 8 hour(s). Form: All forms

NIOSH REL (United States, 6/2001).

CEIL: 15 mg/m³ 10 minute(s). Form: All forms

CEIL: 10 ppm 10 minute(s). Form: All forms

OSHA PEL Z2 (United States, 6/2002).

AMP: 50 ppm 10 minute(s). Form: All forms

CEIL: 20 ppm Form: All forms

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention if symptoms appear.

Section 5. Fire fighting measures

- Flammability of the product** : Flammable.
- Auto-ignition temperature** : 259.85°C (499.7°F)
- Flammable limits** : Lower: 4% Upper: 44%
- Products of combustion** : These products are sulfur oxides (SO₂, SO₃...).
- Fire fighting media and instructions** : In case of fire, use water spray (fog), foam, dry chemicals, or CO₂.

If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area.

Extremely flammable. Gas may accumulate in confined areas, travel considerable distance to source of ignition and flash back causing fire or explosion.

- Special protective equipment for fire-fighters** : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 7. Handling and storage

- Handling** : Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire, minimize ignition sources. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not puncture or incinerate container. Wash thoroughly after handling. High pressure gas. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Storage** : Keep container tightly closed. Keep container in a cool, well-ventilated area. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. The engineering controls also need to keep gas, vapor or dust concentrations below any explosive limits. Use explosion-proof ventilation equipment.

Personal protection

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
- Hands** : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Personal protection in case of a large spill** : Full chemical resistant suit and self-contained breathing apparatus only by trained and authorized persons.

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

- Molecular weight** : 34.08 g/mole
- Molecular formula** : H₂S
- Boiling/condensation point** : -59.99°C (-76°F)
- Melting/freezing point** : -82.77°C (-117°F)
- Critical temperature** : 100.5°C (212.9°F)
- Vapor pressure** : 252 psig
- Vapor density** : 1.19 (Air = 1)
- Specific Volume (ft³/lb)** : 11.236
- Gas Density (lb/ft³)** : 0.089

Section 10. Stability and reactivity

- Stability and reactivity** : The product is stable.
- Incompatibility with various substances** : Extremely reactive or incompatible with oxidizing agents.

Section 11. Toxicological information

Toxicity data

<u>Ingredient name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Hydrogen Sulfide	LC50	712 ppm (1 hour (s))	Inhalation	Rat
	LC50	634 ppm (1 hour (s))	Inhalation	Mouse

IDLH : 100 ppm

Chronic effects on humans : Causes damage to the following organs: lungs, upper respiratory tract, eyes, central nervous system (CNS), eye, lens or cornea.

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material for humans.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
Hydrogen Sulfide	Pimephales promelas (LC50)	96 hour(s)	0.007 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	0.007 mg/l
	Pimephales promelas (LC50)	96 hour(s)	0.0071 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	0.009 mg/l
	Pimephales promelas (LC50)	96 hour(s)	0.0107 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	0.012 mg/l

Products of degradation : These products are sulfur oxides (SO₂, SO₃...).

Toxicity of the products of biodegradation : The products of degradation are less toxic than the product itself.

Environmental fate : Not available.



Environmental hazards : Very toxic to aquatic organisms.

Toxicity to the environment : Not available.





Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

Section 14. Transport information

<u>Regulatory information</u>	<u>UN number</u>	<u>Proper shipping name</u>	<u>Class</u>	<u>Packing group</u>	<u>Label</u>	<u>Additional information</u>
DOT Classification	UN1053	HYDROGEN SULFIDE	2.3	Not applicable (gas).	 	<p>Reportable quantity 100 lbs. (45.36 kg)</p> <p>Limited quantity Yes.</p>

Hydrogen Sulfide

						<p>Packaging instruction Passenger Aircraft Quantity limitation: Forbidden.</p> <p>Cargo Aircraft Quantity limitation: Forbidden.</p> <p>Special provisions 2, B9, B14</p>
TDG Classification	UN1053	HYDROGEN SULFIDE; OR HYDROGEN SULPHIDE	2.3	Not applicable (gas).	 	<p>Explosive Limit and Limited Quantity Index 0</p> <p>ERAP Index 0</p> <p>Passenger Carrying Ship Index Forbidden</p> <p>Passenger Carrying Road or Rail Index Forbidden</p>
Mexico Classification	UN1053	HYDROGEN SULFIDE	2.3	Not applicable (gas).	 	-

Section 15. Regulatory information

United States

- U.S. Federal regulations** : TSCA 8(b) inventory: Hydrogen Sulfide
SARA 302/304/311/312 extremely hazardous substances: Hydrogen Sulfide
SARA 302/304 emergency planning and notification: Hydrogen Sulfide
SARA 302/304/311/312 hazardous chemicals: Hydrogen Sulfide
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Hydrogen Sulfide: Fire hazard, Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: Hydrogen Sulfide
Clean air act (CAA) 112 regulated flammable substances: No products were found.

Hydrogen Sulfide

Clean air act (CAA) 112 regulated toxic substances: Hydrogen Sulfide

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	: Hydrogen Sulfide	7783-06-4	100
Supplier notification	: Hydrogen Sulfide	7783-06-4	100

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations : Pennsylvania RTK: Hydrogen Sulfide: (environmental hazard, generic environmental hazard)
Massachusetts RTK: Hydrogen Sulfide
New Jersey: Hydrogen Sulfide

Canada

WHMIS (Canada) : Class A: Compressed gas.
Class B-1: Flammable gas.
Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
Class D-2B: Material causing other toxic effects (TOXIC).
CEPA DSL: Hydrogen Sulfide

Section 16. Other information

United States

Label Requirements : MAY BE FATAL IF INHALED.
FLAMMABLE GAS.
CONTENTS UNDER PRESSURE.
CAUSES DAMAGE TO THE FOLLOWING ORGANS: LUNGS, RESPIRATORY TRACT, EYES, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
VAPOR MAY CAUSE FLASH FIRE.
MAY CAUSE EYE AND SKIN IRRITATION.

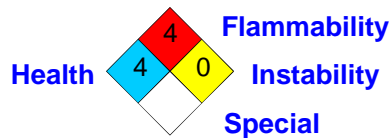
Canada

Label Requirements : Class A: Compressed gas.
Class B-1: Flammable gas.
Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).
Class D-2B: Material causing other toxic effects (TOXIC).

Hazardous Material Information System (U.S.A.)

Health	*	4
Fire hazard		4
Reactivity		0
Personal protection		C

National Fire Protection Association (U.S.A.)



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.