

## Praxair Material Safety Data Sheet

### 1. Chemical Product and Company Identification

<b>Product Name:</b> Hydrogen sulphide mixture, flammable	<b>Trade Name:</b> Hydrogen sulphide mixture, flammable
<b>Product Use:</b> Many.	
<b>Chemical Name:</b> Not applicable.	<b>Synonym:</b> Not available.
<b>Chemical Formula:</b> Not available.	<b>Chemical Family:</b> Not applicable.
<b>Telephone:</b> <b>Emergencies:</b> * 1-800-363-0042	<b>Supplier /Manufacture:</b> Praxair Canada Inc. 1 City Centre Drive Suite 1200 Mississauga, ON L5B 1M2  <b>Phone:</b> 905-803-1600 <b>Fax:</b> 905-803-1682

*\*Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier or Praxair sales representative.*

### 2. Composition and Information on Ingredients

INGREDIENTS	% (VOL)	CAS NUMBER	LD <sub>50</sub> (Species & Routes)	LC <sub>50</sub> (Rat, 4 hrs.)	TLV-TWA (ACGIH)
Hydrogen sulfide	0.0001-0.99	7783-06-4	Not available.	356 ppm	10 ppm
AND CONTAINS ONE OR MORE OF THE FOLLOWING GASES:					
Butane	99.1 - 99.999	106-97-8	Not available.	Not available.	800 ppm
1-Butene	99.1 - 99.999	106-98-9	Not available.	Not available.	Not available.
Deuterium	99.1 - 99.999	7782-39-0	Not available.	Not available.	Not available.
Ethane	99.1 - 99.999	74-84-0	Not available.	Not available.	Simple asphyxiant.
Ethylene	99.1 - 99.999	74-85-1	Not available.	Not available.	Simple asphyxiant.
Hydrogen	99.1 - 99.999	1333-74-0	Not available.	Not available.	Simple asphyxiant.
Isobutane	99.1 - 99.999	75-28-5	Not available.	Not available.	Not available.
Methane	99.1 - 99.999	74-82-8	Not available.	Not available.	Simple asphyxiant.
Propane	99.1 - 99.999	74-98-6	Not available.	Not available.	1000 ppm
Propylene	99.1 - 99.999	115-07-1	Not available.	Not available.	Simple asphyxiant.

### 3. Hazards Identification

#### Emergency Overview

**DANGER!** Flammable, high-pressure gas. May form explosive mixture with air. Can cause rapid suffocation. May cause dizziness and drowsiness. Self-contained breathing apparatus may be required by rescue workers.

**ROUTES OF EXPOSURE:** Inhalation.

**THRESHOLD LIMIT VALUE:** TLV-TWA Data from 2007 Guide to Occupational Exposure Values (ACGIH). TLV-TWAs should be used as a guide in the control of health hazards and not as fine lines between safe and dangerous concentrations.

#### EFFECTS OF A SINGLE (ACUTE) OVEREXPOSURE:

**INHALATION:** Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headaches, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

**SKIN CONTACT:** No evidence of adverse effects from available information.

**SKIN ABSORPTION:** No evidence of adverse effects from available information.

**SWALLOWING:** An unlikely route of exposure. This product is a gas at normal temperature and pressure.

**EYE CONTACT:** No evidence of adverse effects from available information.

#### EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE:

No evidence of adverse effects from available information.

#### OTHER EFFECTS OF OVEREXPOSURE:

Gas is an asphyxiant. Lack of oxygen can cause death.

#### MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

#### SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION:

None currently known.

#### CARCINOGENICITY:

Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.

### 4. First Aid Measures

#### INHALATION:

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

#### SKIN CONTACT:

Wash with soap and water.

#### SWALLOWING:

This product is a gas at normal temperature and pressure.

#### EYE CONTACT:

Flush with water.

#### NOTES TO PHYSICIAN:

There is no specific antidote. Treatment of over-exposure should be directed at the control of symptoms and the clinical condition.

### 5. Fire Fighting Measures

<b>FLAMMABLE :</b> Yes.	<b>IF YES, UNDER WHAT CONDITIONS?</b>	Forms explosive mixtures with air and oxidizing agents.
<b>FLASH POINT (test method)</b> Flammable Gas.	<b>AUTOIGNITION TEMPERATURE</b>	Not available.
<b>FLAMMABLE LIMITS IN AIR, % by volume:</b>	<b>LOWER:</b> Not available.	<b>UPPER:</b> Not available.

#### EXTINGUISHING MEDIA:

CO2, dry chemical, water spray or fog.

#### SPECIAL FIRE FIGHTING PROCEDURES:

**DANGER!** Evacuate all personnel from danger area. Immediately cool cylinders with water spray from maximum distance taking care not to extinguish flames. Remove ignition source if without risk. If flames are accidentally extinguished. Explosive re-ignition may occur; therefore, appropriate measures should be taken; e.g., total evacuation. Re-approach with extreme caution. Use self-contained breathing apparatus. Stop flow of gas if without risk while continuing cooling water spray. Remove all containers from area if without risk. Allow fire to burn out.

#### UNUSUAL FIRE AND EXPLOSION HAZARD:

Forms explosive mixture with air and oxidizing agents. Container may rupture due to heat of fire. Do not extinguish flames due to possibility of explosive re-ignition. Flammable vapours may spread from spill. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with appropriate device. No part of a container should be subjected to a temperature higher than 52 C. Vapours form from this product may travel or be moved by air currents an ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges, or other ignition sources at locations distant from product handling point. Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature.

#### HAZARDOUS COMBUSTION PRODUCTS:

Sulfur Dioxide/Sulfur/Hydrogen

#### SENSITIVITY TO IMPACT:

Avoid impact against container.

#### SENSITIVITY TO STATIC DISCHARGE:

Not available.

### 6. Accidental Release Measures

#### STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

**DANGER!** Forms explosive mixtures with air. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus operated in the pressure demand mode and appropriate protective clothing. Remove all sources of ignition if without risk. Reduce vapours with fog or fine water spray. Shut off leak if without risk. Ventilate area of leak or move leaking container to well ventilated area. Flammable vapours may spread from spill. Before entering area, especially confined areas, check atmosphere with appropriate device.

#### WASTE DISPOSAL METHOD:

Prevent waste from contaminating the surrounding environment. Keep personnel away. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, provincial, and local regulations.

## 7. Handling and Storage

### PRECAUTIONS TO BE TAKEN IN STORAGE:

Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 52 C. Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

### PRECAUTIONS TO BE TAKEN IN HANDLING:

Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. If valve is hard to open, discontinue use and contact your supplier.

For additional information on storage and handling, refer to Compressed Gas Association (CGA) pamphlet P-1, *Safe Handling of Compressed Gases in Containers*, available from the CGA. Refer to Section 16 for the address and phone number along with a list of other available publications.

### OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE:

**Flammable high-pressure gas.** Use only in a closed system. Use piping and equipment adequately designed to withstand pressures to be encountered. Use only spark-proof tools and explosion-proof equipment. Keep away from heat, sparks, and open flame. **May form explosive mixtures with air.** Ground all equipment. **Gas can cause rapid suffocation due to oxygen deficiency.** Store and use with adequate ventilation. Close valve after each use; keep closed even when empty. **Prevent reverse flow.** Reverse flow into cylinder may cause rupture. Use a check valve or other protective device in any line or piping from the cylinder. **When returning cylinder to supplier,** be sure valve is closed, then install valve outlet plug tightly. **Never work on a pressurized system.** If there is a leak, close the cylinder valve. Vent the system down in a safe and environmentally sound manner in compliance with all federal, provincial, and local laws; then repair the leak. **Never place a compressed gas cylinder where it may become part of an electrical circuit.**

## 8. Exposure Controls/Personal Protection

### VENTILATION/ENGINEERING CONTROLS:

**LOCAL EXHAUST:** Explosion-proof, corrosion-resistant system is acceptable.

**MECHANICAL (general):** Inadequate..

**SPECIAL:** Inadequate.

**OTHER:** Not applicable.

### PERSONAL PROTECTION:

**RESPIRATORY PROTECTION:** Select in accordance with provincial regulations, local bylaws or guidelines. Selection should also be based on the current CSA standard Z94.4, "Selection, Care and Use of Respirators". Respirators should also be approved by NIOSH and MSHA.

**SKIN PROTECTION:** Preferred for cylinder handling.

**EYE PROTECTION:** Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

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**OTHER PROTECTIVE EQUIPMENT:** Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines.

## 9. Physical and Chemical Properties

<b>PHYSICAL STATE:</b> Gas.	<b>FREEZING POINT:</b> Not available.	<b>pH:</b> Not available.
<b>BOILING POINT:</b> Not available.	<b>VAPOUR PRESSURE:</b> Not available.	<b>MOLECULAR WEIGHT:</b> Not available.
<b>SPECIFIC GRAVITY:</b> Not available. LIQUID ( Water = 1)	<b>SOLUBILITY IN WATER:</b> Not available.	
<b>SPECIFIC GRAVITY:</b> Not available. VAPOUR (air = 1)	<b>EVAPORATION RATE</b> (Butyl Acetate=1): Not available.	<b>COEFFICIENT OF WATER/OIL DISTRIBUTION:</b> Not available.
<b>VAPOUR DENSITY:</b> Not available.	<b>% VOLATILES BY VOLUME:</b> Not available.	<b>ODOUR THRESHOLD:</b> Not available.

**APPEARANCE & ODOUR:** Colourless gas at normal temperature and pressure. Odour of rotten eggs. Hydrogen Sulphide deadens the sense of smell.

## 10. Stability and Reactivity

<b>STABILITY:</b>	The product is stable.
<b>CONDITIONS OF CHEMICAL INSTABILITY:</b>	Not available - mixture not tested.
<b>INCOMPATIBILITY (materials to avoid):</b>	Avoid contact with ammonia, bases, bromine pentafluoride, chlorine trifluoride, chromium trioxide and heat, copper (powdered copper and air), fluorine, lead leadoxide. Mercury, nitric acid, nitrogen trifluoride, nitrogen sulfide, organic compounds, oxidizing agents, oxygen difluoride, rubber, sodium and moisture, and water
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	Thermal decomposition or burning may produce sulphur oxides, sulphur, hydrogen.
<b>HAZARDOUS POLYMERIZATION:</b>	Will not occur.
<b>CONDITIONS OF REACTIVITY:</b>	None currently known.

## 11. Toxicological Information

See section 3.

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## 12. Ecological Information

No adverse ecological effects expected. This product does not contain any Class I or Class II ozone-depleting chemicals. The components of this mixture are not listed as marine pollutants by TDG Regulations.

## 13. Disposal Considerations

**WASTE DISPOSAL METHOD:** Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

## 14. Transport Information

**TDG/IMO SHIPPING NAME:** Compressed gas, flammable, n.o.s.

HAZARD CLASS:	IDENTIFICATION #:	PRODUCT RQ:
TDG Class 2.1: Flammable gas.	UN 1954	Any accidental release in a quantity that could pose a danger to public safety or any sustained release of 10 minutes or more

**SHIPPING LABEL(s):** Flammable gas

**PLACARD (when required):** Flammable gas

### SPECIAL SHIPPING INFORMATION:

Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of vehicle can present serious safety hazards.

## 15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, provincial, and local regulations.

**DSL (Canada)** This product is on the DSL list

**WHMIS (Canada)** Class A: Compressed gas.  
Class B-1: Flammable gas.

### International Regulations

**EINECS** Not available.

**DSCL (EEC)** Not available - mixture not tested.

**International Lists** No products were found.

## 16. Other Information

### MIXTURES:

When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death.

### HAZARD RATING SYSTEM:

#### HMIS RATINGS:

HEALTH 2

FLAMMABILITY 4

PHYSICAL HAZARD 2

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#### STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

**THREADED:** CGA-330  
**PIN-INDEXED YOKE:** Not available.  
**ULTRA-HIGH-INTEGRITY CONNECTION:** Not available.

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlets V-1 and V-7 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information about this product can be found in the following pamphlets published by the Compressed Gas Association, Inc. (CGA), 4221 Walney Road, 5th Floor, Chantilly, VA 20151-2923, Telephone (703) 788-2700, Fax (703) 961-1831, website: www.cganet.com.

AV-1 Safe Handling and Storage of Compressed Gas  
P-1 Safe Handling of Compressed Gases in Containers  
P-14 Accident Prevention in Oxygen-Rich, Oxygen-Deficient Atmospheres  
SB-2 Oxygen-Deficient Atmospheres  
V-1 Compressed Gas Cylinder Valve Inlet and Outlet Connections  
V-7 Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures  
--- Handbook of Compressed Gases, Fourth Edition

**For more indepth information for each component, refer to the pure product MSDS.**

**The information contained in this MSDS is generated from technical sources using the Chemmate Mixture MSDS system and the pure-product MSDS for each component. These mixtures are not tested as a whole for chemical, physical, or health effects.**

#### PREPARATION INFORMATION:

**DATE:** 10/15/2007  
**DEPARTMENT:** Safety and Environmental Services  
**TELEPHONE:** 905-803-1600

The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair Canada Inc., it is the user's obligation to determine the conditions of safe use of the product.

Praxair Canada Inc. requests the users of this product to study this Material Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety nformation, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

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Praxair Canada Inc.  
1 City Centre Drive  
Suite 1200  
Mississauga, ON L5B 1M2