



Material Safety Data Sheet

Hydrogen Sulfide 25 ppm, Methane
2.5%, Carbon Monoxide 50 ppm,
Oxygen 19% in Nitrogen Cylinder
(REVISED 2/10/03)

EMERGENCY PHONE: (800) 424-9300

Section 1 - Identification

Product Code: 682-0001-58
Product Name: Cylinder, Hydrogen Sulfide 25 ppm, Methane 2.5%,
Carbon Monoxide 50 ppm, Oxygen 19%, Balance
Nitrogen
Synonyms: Four gas cylinder, calibration gas, four part mix
Chemical Family: Gas Mixtures
CAS #: N/A
Molecular Formula: H_2S, CH_4, CO, O_2, N_2

NFPA Rating

Health	4
Flammability	0
Reactivity	0
Special	None

Section 2 - Ingredients

Chemical	CAS #	%	OSHA/PEL	ACGIH TLV
Hydrogen Sulfide	7783-06-4	.0005 < x <.001	20 ppm TWA	10 ppm TWA
Methane	74-82-8	2.0 < x < 3.0	None	None
Carbon Monoxide	630-08-0	.0001 < x <.001	50 ppm TWA	25 ppm TWA
Oxygen	7782-44-7	17 < x < 21	None	None
Nitrogen	7727-37-9	68.0 < x < 89.0	None	None

Section 3 - Physical Data

Boiling Point: -194°C. (-317° F.)
% Volatiles: N/A
Solubility in Water: Slightly Soluble
Specific Gravity ($H_2O = 1$): N/A
Freezing/Melting Point: -210°C. (-346° F.)
Evaporation Rate
(butyl acetate = 1): N/A
Vapor Density (air = 1): N/A
Vapor Pressure: N/A
Appearance and Odor: Colorless gas with a "rotten-egg" odor due to the presence of hydrogen sulfide.
Other:



Section 4 - Fire and Explosion Hazard Data

Flash Point (°F):	N/A
Flammable Limits in Air, % by volume:	Lower: 4.0% H ₄ S Upper: 44.0% H ₄ S Lower: 5.0% CH ₄ Upper: 15.0% CH ₄ Lower: 12.5% CO Upper: 74.0% CO
Autoignition Temperature:	N/A
Extinguishing Media:	None required. Use any extinguishing media suitable for surrounding fire.
Special Fire Fighting Procedures:	Wear positive pressure SCBA's for all fire fighting involving hazardous materials. Stop flow of gas supply if possible. Use water spray to cool surrounding containers until well after flames are extinguished. Cylinders may rupture violently when involved in a fire situation.
NFPA Ratings (Scale 0-4):	Health = 4, Fire = 0, Reactivity = 0

Section 5 - Health Data

OSHA (PEL):	H ₄ S	10 ppm TWA, 15 ppm STEL
	CH ₄	None
	CO	50 ppm
	O ₂	None
	N ₂	None
ACGIH (TLV):	H ₄ S	20 ppm TWA
	CH ₄	None
	CO	25 ppm
	O ₂	None
	N ₂	None

ANIMAL TOXICITY

LDLO unr-man:	N/A
LD50: Oral - rat	N/A
LC50: Inhalation - rat	1807 ppm / 4 H (CO) 673 ppm / 1 H (H ₄ S)
Carcinogenicity:	No

EFFECTS OF EXPOSURE

Acute Effects

Ingestion:	N/A
Skin Contact:	May cause irritation.
Eye Contact:	May cause irritation.
Inhalation:	Depending on exposure, inhalation can cause headache, nausea, dizziness, weakness, convulsions, heart palpitations, suffocation, unconsciousness, and death. Inhalation of hydrogen sulfide gas can result in the cessation of smell.
Medical Conditions, if any, aggravated by the chemical:	Blood disorders.
Other health hazards:	None.
Most likely routes of entry:	Inhalation and contact with the skin and eyes.



Section 5 - Health Data (continued)

Chronic Effects

Ingestion: N/A
Skin Contact: Skin disorders may be aggravated by repeated over exposure to this gas.
Eye Contact: Severe cases of over exposure can result in permanent damage to the eyes.
Inhalation: Chronic exposures to low levels of carbon monoxide may result in elevated carboxyhemoglobin levels and decrease oxygen content in the blood. Tissue most affected are the brain and heart. Severe over exposure to hydrogen sulfide may result in memory loss, paralysis of facial muscles, nerve tissue damage and death.
Other:

EMERGENCY AND FIRST AID PROCEDURES

Ingestion: None Required.
Skin Contact: Remove contaminated clothing and flush skin with warm water. Seek immediate medical attention.
Eye Contact: Flush eyes with water. Seek immediate medical attention.
Inhalation: Rescue personnel should be equipped with self-contained breathing apparatus. Victims should be removed to fresh air. Monitor breathing and pulse. Keep victim warm and comfortable while awaiting professional medical care. Prompt medical attention is mandatory in all cases of overexposure.

Section 6 - Reactivity

Incompatibility: All flammable materials. Components of this gas are are incompatible with strong oxidizers. Carbon monoxide is mildly corrosive to nickel and iron and hydrogen sulfide is corrosive to most metals.
Hazardous Decomposition Products: Oxides of sulfur.
Stability: Stable.
Hazardous Polymerization: Will not occur.
Other: Keep away from heat, sparks open flames and other ignition sources.

Section 7 - Environmental Information

RCRA Code: N/A
TSCA Registered: N/A
Spill and Leak Procedures: Remove all personnel from affected areas. Use appropriate protective equipment. Attempt to stop release. Ventilate area thoroughly and do not enter without breathing equipment unless areas has been pronounced safe. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs.
Waste Disposal: Do not attempt to dispose of residual waste or unused quantities. Return in the shipping container *properly labeled and with any valve plugs or caps secured as well as valve protection cap in place.*



Section 8 - Protection Information

Ventilation Requirement: Ensure adequate ventilation to comply with applicable exposure limits.
Respiratory Protection: Positive pressure air line with mask and escape bottle or self-contained breathing apparatus should be available for emergency use.
Protective Gloves: Gloves made of suitable material.
Eye/Face Protection: Safety goggles.

Section 9 - Special Precautions

Handling and Storage: Use only in well ventilated areas. Be aware of any signs of dizziness or fatigue. Exposures to fatal concentrations of this gas could occur without any significant warning symptoms. Do not drag, slide or roll cylinders. Always use a suitable hand truck for moving cylinders. Valve protection caps must remain in place unless container is secured with valve protection outlet piped to use point. When removing the plug to connect the cylinder to your system, face the outlet away from you and wear appropriate protective equipment. Store and handle in accordance with all current regulations and standards.
Other Precautions: Do not heat cylinder by any means. Cylinder temperature should never exceed 50°C. (122° F.). Store cylinders upright and firmly secured to prevent falling or being knocked over. Protect cylinders from physical damage. Eye wash stations and safety showers should be near areas where this product is used or stored.

Section 10 - Transportation Information - U.S. Department of Transportation

Proper Shipping Name: Compressed gases, n.o.s. (Nitrogen, Hydrogen Sulfide)
Hazardous Class: 2.2
UN#: 1956.
Shipping label: Nonflammable Gas
Reportable Quantity: Hydrogen Sulfide 100 lbs.
Other:

Section 11 - Comments

This data is offered in good faith as typical values and not as a product specification. No warranty, either expressed or implied, is hereby made. The recommended industrial hygiene and safe handling procedures are believed to be generally applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.