

MATERIAL SAFETY DATA SHEET

Five Part Reactive Mixture



File No.: 1004

Five Part Reactive Mixture:**(Hydrogen Sulfide / Carbon Monoxide / Pentane / Oxygen / in a Nitrogen or Air Balance Gas)****Hydrogen Sulfide / Carbon Monoxide / Pentane / Oxygen / Nitrogen****1. Chemical Product and Company Identification**

SpecAir Specialty Gases, Chemicals & Technology
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PRODUCT NAME: Five Part Reactive Mixture

CHEMICAL NAME: Pentane, Carbon Monoxide, Hydrogen Sulfide, Oxygen in Nitrogen or Air

COMMON NAMES/ SYNONYMS: None

TDG (Canada) CLASSIFICATION: 2.2

WHIMIS CLASSIFICATION: A

2. Composition / Information on Ingredients

	% VOLUME	PEL-OSHA2	TLV-ACGIH3	LD50 OR LC50 Route/Species
Hydrogen Sulfide Formula: H2S CAS: 7783-06-4 RTECS#: MX1225000	0.0005% to 0.01% 5 PPM to 100 PPM	20 PPM Ceiling Concentration	10 PPM TWA 15 PPM STEL	LC50 712 PPM Inhalation/Rat 1 Hr.
Pentane Formula: C5H12 CAS: 0109-66-0 RTECS#: RZ9450000	0.0001% to .75%	TWA 100 PPM	600 PPM TWA	LC50 123,000 PPM Inhalation/Rat 4 Hr.
Carbon Monoxide Formula: CO CAS: 0630- 08-0 RTECS#: FG3500000	0.0001% to 0.1%	TWA 50 PPM	25 PPM TWA	LC50 1807 PPM / 4 Hr. (Rat)
Oxygen Formula: O2 CAS: 7782-44-7 RTECS#: RS206000	2.0% to 23.5%	None	None	Not Available
Nitrogen Formula: N2 CAS: 7727-37-9 RTECS#: QW9700000	74.39% to 98.0%	None Established	None Established Simple Asphyxiant	Not Available

3. HAZARDS IDENTIFICATION**EMERGENCY OVERVIEW**

This product is a colorless gas, which has a rotten-egg odor. The odor cannot be relied on as an adequate warning of the presence of this product, because olfactory fatigue occurs after over-exposure to hydrogen sulfide. Hydrogen sulfide and carbon monoxide are toxic to humans in relatively low concentrations. Over-exposure can cause skin or eye irritation, nausea, dizziness, headaches, collapse, unconsciousness, coma, and death.

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ROUTE OF ENTRY:

Skin Contact	Skin Absorption	Eye Contact	Inhalation	Ingestion
Yes	No	Yes	Yes	No

CARCINOGENICITY:

NTP: No

IARC: No

OSHA: No

EYE EFFECTS:

Hydrogen sulfide can cause eyes to become scratchy, irritated and even teary. Above 50 ppm of hydrogen sulfide, there is an intense tearing blurring of vision, and pain when looking at light.

SKIN EFFECTS:

Over-exposure to carbon monoxide can be indicated by the lips and fingernails turning bright red. High concentrations of hydrogen sulfide may also be irritating to the skin.

INGESTION EFFECTS:

Ingestion unlikely. Gas at room temperature.

INHALATION EFFECTS:

Due to the small size of this cylinder, no unusual health effects from over-exposure are anticipated under routine circumstances of use. Over-exposure to hydrogen sulfide can cause dizziness, headache, and nausea. At 12- 16% Oxygen, breathing and pulse rate is increased, muscular coordination is slightly disturbed.

NFPA Hazard Codes

Health:	4
Flammability:	0
Reactivity:	0

HMIS Hazard Codes

Health:	4
Flammability:	0
Reactivity:	0

Rating System

0=	No Hazard
1=	Slight Hazard
2=	Moderate Hazard
3=	Serious Hazard
4=	Severe Hazard

4. FIRST AID MEASURES**EYES:**

Exposure to 20 to 50 ppm hydrogen sulfide will cause eye irritation. Low to moderately high concentrations may cause painful conjunctivitis, photophobia, lacrimation and corneal opacity. Exposure to 50 – 100 ppm hydrogen sulfide has resulted in temporary damage to the corneal epithelium in dogs, cats, rabbits, and guinea pigs. Contact with rapidly expanding gas near the point of release may cause frostbite.

SKIN:

Contact with hydrogen sulfide in this product may cause severe pain, itching and erythema. Contact with rapidly expanding gas near the point of release may cause frostbite with redness, skin color change to gray or white, and blistering.

INGESTION:

Contact Poison Control. Seek Medical Attention

INHALATION:

Nitrogen acts as a simple asphyxiant displacing the oxygen content in the air necessary for life. The following effects of asphyxiation are representative and it is possible that none of these symptoms may occur: loss of balance or dizziness; tightness in the frontal area of the forehead; tingling of the tongue, fingertips or toes; weakened speech leading to the inability to utter sounds; rapid reduction in the ability to perform movements; reduced consciousness of surroundings; loss of tactile sensations; and heightened mental activity.

Hydrogen sulfide toxic effects depend on the amount inhaled and duration of exposure. Lethal concentrations of hydrogen sulfide cause respiratory paralysis and breathing stops. Life threatening pulmonary edema is common following prolonged exposure to concentrations between 250 and 600 ppm. Edema has been reported following prolonged exposure at concentrations as low as 50 ppm.

Sense of smell becomes rapidly fatigued and cannot be used as warning of exposure. Symptoms may include irritation, difficulty breathing, conjunctivitis, nervousness, cough, nausea and headache.



5. FIRE-FIGHTING MEASURES

These containers hold gas under pressure, with no liquid phase. If involved in a major fire, they should be sprayed with water to avoid pressure increases, otherwise pressures will rise and ultimately they may distort or burst to release the contents. The gases will not add significantly to the fire, but containers or fragments may be projected considerable distances - thereby hampering firefighting efforts.

6. ACCIDENTAL RELEASE MEASURES

In terms of weight, these containers hold very little contents, such that any accidental release by puncturing etc. will be of no practical concern.

7. HANDLING AND STORAGE

Suck back of water into the container must be prevented. Do not allow back feed into the container. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Use only in well-ventilated areas. Do not heat cylinder by any means to increase rate of product from the cylinder. Do not allow the temperature where cylinders are stored to exceed 130°F (54°C).

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Use adequate ventilation for extended use of gas.

9. PHYSICAL AND CHEMICAL PROPERTIES

PARAMETER:	VALUE:
Physical state	: Gas
Evaporation point	: N/A
pH	: N/A
Odor and appearance	: Colorless gas with a rotten-egg odor

10. STABILITY AND REACTIVITY

Stable under normal conditions. Expected shelf life 12 months.

11. TOXICOLOGICAL INFORMATION

Inhalation:

Inhalation of 1000-3000 ppm (dogs) was lethal. Respiration ceased after several breaths at 3000 ppm and death occurred within 15-20 minutes at concentrations of 1000 ppm.

Skin and Eye:

Concentrations of 50-500 ppm cause eye and respiratory irritation. Ocular toxicity has been reported at hydrogen sulfide concentrations ranging from 5-30 ppm.

Other:

Hydrogen sulfide is not considered a cumulative poison; however, headaches, fatigue, dizziness, irritability and loss of libido have been reported following chronic exposure. It is unclear whether low level exposures, repeated unmeasured acute exposures or preexisting neurological disease are responsible for the above symptoms.



12. ECOLOGICAL INFORMATION

Environmental Fate:

Hydrogen sulfide does not absorb solar radiation and therefore does not undergo photolysis or photochemical reaction with oxygen. Primary chemical transformation of hydrogen sulfide in the atmosphere is oxidation via oxygen containing radicals. The persistence of hydrogen sulfide in the atmosphere is dependent on season, latitude, and atmospheric conditions, ranging from 1 to 40 days with decreased temperatures and decreased levels of hydroxide in northern regions increasing residence time.

In soil and water, hydrogen sulfide is oxidized to elemental sulfur by microorganisms via oxidation-reduction reactions, which form part of the global sulfur cycle.

Ecotoxicity:

Product does not contain Class I or Class II ozone depleting substances. Data indicates that hydrogen sulfide is toxic to a variety of life forms including both domestic and wild animals, fish, birds, insects and plants.

13. DISPOSAL INFORMATION

Do not attempt to dispose of waste or unused quantities in returnable cylinders. Return in the shipping container, properly labeled, with any valve outlet plugs or caps secure and valve protection cap in place, to Maine Oxy / SpecAir for proper disposal. Non-refillable containers should be vented in a well-ventilated area then disposed of in accordance with local regulations, or returned to Maine Oxy / SpecAir.

14. TRANSPORT INFORMATION

	<u>United States DOT</u>	<u>Canada TDG</u>
Proper Shipping Name:	Compressed Gas N.O.S. (Hydrogen Sulfide, Nitrogen)	Compressed Gas N.O.S. (Hydrogen Sulfide, Nitrogen)
Hazard Class:	2.2	2.2
Identification Number:	UN1956	UN1956
Shipping Label:	Non-Flammable Gas	Non-Flammable Gas

15. REGULATORY INFORMATION

SARA Title III Notification and Information:

SARA Title III – Hazard Classes:

- Acute Health hazard
- Sudden Release of Pressure Hazard

Sara Title III – Section 313 Supplier Notification:

This product contains hydrogen sulfide (CAS No. 7783-06-4), subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act (EPCRA) of 1986 and of 40 CFR 372.

Hydrogen sulfide is listed as an Extremely Hazardous Substance (EHS) subject to state and local reporting under Section 304 of SARA Title III (EPCRA) with a reportable quantity (RQ) of 100 pounds.

The presence of hydrogen sulfide in quantities in excess of the Threshold Planning Quantity (TQP) of 500 pounds requires certain emergency planning activities to be conducted.

Hydrogen sulfide is listed under the accident prevention provisions of section 112(r) of the Clean Air Act (CAA) with a threshold quantity (TQ) of 10,000 pounds.

16. OTHER INFORMATION

This MSDS has been prepared in accordance with the Chemicals (Hazard Information and Packaging for Supply (Amendment) Regulation 1996. The information is based on the best knowledge of SpecAir Specialty Gases and its advisors and is given in good faith, but we cannot guarantee its accuracy, reliability or completeness and therefore disclaim any liability for loss or damage arising out of use of this data. Since conditions of use are outside the control of the Company and its advisors we disclaim any liability for loss or damage when the product is used for other purposes than it is intended.