
SAFETY DATA SHEET

Version 1.0
Revision Date 28.01.2016

SDS Number 300000020393
Print Date 08.06.2017

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Mixture of Gases

Product Use Description : General Industrial

Manufacturer/Importer/Distributor : Air Products and Chemicals, Inc
7201 Hamilton Blvd.
Allentown, PA 18195-1501
GST No. 123600835 RT0001
QST No. 102753981 TQ0001

Telephone : 1-610-481-4911

Emergency telephone number (24h) : 800-523-9374 USA
+1 610 481 7711 International

2. HAZARDS IDENTIFICATION

GHS classification

Gases under pressure - Compressed gas.

GHS label elements

Hazard pictograms/symbols



Signal Word: Warning

Hazard Statements:

H280:Contains gas under pressure; may explode if heated.

Precautionary Statements:

Storage : P403:Store in a well-ventilated place.

Other hazards which do not result in classification

Use a back flow preventative device in the piping.
Use equipment rated for cylinder pressure.
Close valve after each use and when empty.
Read and follow the Safety Data Sheet (SDS) before use.
Distinctive rotten egg odor.
Olfactory fatigue may lead to loss of this warning property.
Extended exposure to gas reduces the ability to smell sulfides.
High pressure gas.
Can cause rapid suffocation.
Self contained breathing apparatus (SCBA) may be required.

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Environmental Effects

Not harmful.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/Mixture : Mixture

Components	Chemical formula	CAS Number	Concentration (Volume)
Hydrogen sulphide	H ₂ S	7783-06-4	25 PPM
Carbon monoxide	CO	630-08-0	100 PPM
Methane	CH ₄	74-82-8	2.5 %
Oxygen	O ₂	7782-44-7	18 %
Nitrogen	N ₂	7727-37-9	> 79.48%

Concentration is nominal. For the exact product composition, please refer to Air Products technical specifications.

4. FIRST AID MEASURES

- General advice : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
- Eye contact : Not applicable.
- Skin contact : Not applicable.
- Ingestion : Ingestion is not considered a potential route of exposure.
- Inhalation : Remove to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen.
- Symptoms : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness.

Notes to physician

- Treatment : Hyperbaric oxygen is the most efficient treatment of carbon monoxide and dramatically reduces the biological half-life of carboxyhemoglobin. Although less effective, 100% oxygen by mask is useful if hyperbaric facilities are not available. Stimulant drugs are not indicated. Central nervous system toxicity may cause respiratory paralysis requiring assisted ventilation. Irritation of the deep lung may cause chemical pneumonitis and pulmonary edema.

5. FIRE-FIGHTING MEASURES

- Suitable extinguishing media : All known extinguishing media can be used.
- Specific hazards : Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Product is nonflammable and does not support combustion. Move away from container and cool with water from a protected position. Keep containers and surroundings cool with water spray.
- Special protective equipment : Wear self contained breathing apparatus for fire fighting if necessary. Standard

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for fire-fighters protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. Standard EN 469 - Protective clothing for firefighters. Standard - EN 659: Protective gloves for firefighters.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Evacuate personnel to safe areas. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Monitor oxygen level. Ventilate the area.
- Environmental precautions : Do not discharge into any place where its accumulation could be dangerous. Prevent further leakage or spillage if safe to do so.
- Methods for cleaning up : Ventilate the area.
- Additional advice : If possible, stop flow of product. Increase ventilation to the release area and monitor oxygen level. If leak is from cylinder or cylinder valve, call the Air Products emergency telephone number. If the leak is in the user's system, close the cylinder valve and safely vent the pressure before attempting repairs.

7. HANDLING AND STORAGE

Handling

Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C (122°F). Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Use an adjustable strap wrench to remove over-tight or rusted caps. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented. Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Close valve after each use and when empty. Replace outlet caps or plugs and container caps as soon as container is disconnected from equipment. Do not subject containers to abnormal mechanical shock. Never attempt to lift a cylinder by its valve protection cap or guard. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Do not smoke while handling product or cylinders. Never re-compress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. When returning cylinder install valve outlet cap or plug leak tight. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C (122°F).

Storage

Full containers should be stored so that oldest stock is used first. Containers should be stored in a purpose build compound which should be well ventilated, preferably in the open air. Stored containers should be periodically

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checked for general condition and leakage. Observe all regulations and local requirements regarding storage of containers. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Keep containers tightly closed in a cool, well-ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C (122°F). Return empty containers in a timely manner.

Technical measures/Precautions

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance with local regulations. Keep away from combustible material.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures

Provide natural or mechanical ventilation to prevent oxygen deficient atmospheres below 19.5% oxygen.

Personal protective equipment

- Respiratory protection : Self contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmosphere.
Air purifying respirators will not provide protection. Users of breathing apparatus must be trained.
- Hand protection : Wear working gloves when handling gas containers.
Standard EN 388 - Protective gloves against mechanical risk.
- Eye protection : Safety glasses recommended when handling cylinders.
Standard EN 166 - Personal eye-protection.
- Skin and body protection : Safety shoes are recommended when handling cylinders.
Standard EN ISO 20345 - Personal protective equipment - Safety footwear.
- Special instructions for protection and hygiene : Ensure adequate ventilation, especially in confined areas.

Exposure limit(s)

Hydrogen sulphide	Time Weighted Average (TWA): EH40 WEL	5 ppm	7 mg/m ³
Hydrogen sulphide	Short Term Exposure Limit (STEL): EH40 WEL	10 ppm	14 mg/m ³
Hydrogen sulphide	Time Weighted Average (TWA): EU SCOELS	5 ppm	7 mg/m ³
Hydrogen sulphide	Short Term Exposure Limit (STEL): EU SCOELS	10 ppm	14 mg/m ³
Carbon monoxide	Time Weighted Average (TWA): EH40 WEL	30 ppm	35 mg/m ³
Carbon monoxide	Short Term Exposure Limit (STEL): EH40 WEL	200 ppm	232 mg/m ³
Carbon monoxide	Time Weighted Average (TWA): EU SCOELS	20 ppm	23 mg/m ³
Carbon monoxide	Short Term Exposure Limit (STEL): EU SCOELS	100 ppm	117 mg/m ³

Remarks : Simple asphyxiant.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Compressed gas. Colorless.
- Odor : Not determined.

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Odor	: Mixture contains one or more component(s) which have the following odor: No odor warning properties. Rotten eggs.
Odor threshold	: No data available.
pH	: Not applicable.
Melting point/range	: No data available.
Boiling point/range	: No data available.
Flash point	: Not applicable.
Evaporation rate	: Not applicable.
Flammability (solid, gas)	: Refer to product classification in Section 2
Upper/lower explosion/flammability limit	: No data available.
Vapor pressure	: No data available.
Water solubility	: No data available.
Relative vapor density	: No data available.
Relative density	: 0.9814 (air = 1) Lighter or similar to air.
Partition coefficient (n-octanol/water)	: Not applicable.
Auto-ignition temperature	: No data available.
Decomposition temperature	: No data available.
Viscosity	: Not applicable.
Molecular Weight	: 28.42 g/mol

10. STABILITY AND REACTIVITY

Chemical Stability	: Stable under normal conditions.
Conditions to avoid	: No data available.
Reactivity/Incompatible Materials	: No data available.
Hazardous decomposition products	: Sulphur compounds. Hydrogen.
Possibility of hazardous reactions	: No data available.

11. TOXICOLOGICAL INFORMATION

Likely routes of exposure

Effects on Eye : No adverse effect.

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- Effects on Skin : No adverse effect.
- Inhalation Effects : In high concentrations may cause asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves.
- Ingestion Effects : Ingestion is not considered a potential route of exposure.
- Symptoms : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness.

Acute toxicity

- Acute Oral Toxicity : No data is available on the product itself.
- Inhalation : No data is available on the product itself.
- Inhalation - Components
- | | | |
|-------------------|-----------------------|----------------|
| Hydrogen sulphide | LC50 (1 h) : 712 ppm | Species : Rat. |
| Carbon monoxide | LC50 (1 h) : 3760 ppm | Species : Rat. |
- Acute Dermal Toxicity : No data is available on the product itself.
- Serious eye damage/eye irritation : No data available.
- Sensitization. : No data available.

Chronic toxicity or effects from long term exposures

- Carcinogenicity : No data available.
- Reproductive toxicity : No data is available on the product itself.
- Germ cell mutagenicity : No data is available on the product itself.
- Specific target organ systemic toxicity (single exposure) : No data available.
- Specific target organ systemic toxicity (repeated exposure) : No data available.
- Aspiration hazard : No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

- Aquatic toxicity : No data is available on the product itself.
- Toxicity to other organisms : No data available.

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Persistence and degradability

Biodegradability : No data is available on the product itself.
Mobility : No data available.
Bioaccumulation : No data is available on the product itself.
Bioaccumulation - Components
Carbon monoxide Does not bioaccumulate.

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products : Contact supplier if guidance is required. Return unused product in original cylinder to supplier. Refer to the EIGA code of practice Doc. 30 "Disposal of Gases", downloadable at <http://www.eiga.org> for more guidance on suitable disposal methods. List of hazardous waste codes: 16 05 05: Gases in pressure containers other than those mentioned in 16 05 04.
Contaminated packaging : Return cylinder to supplier.

14. TRANSPORT INFORMATION

ADR

UN/ID No. : UN1956
Proper shipping name : COMPRESSED GAS, N.O.S., (Nitrogen, Oxygen)
Class or Division : 2
Tunnel Code : (E)
Label(s) : 2.2
ADR/RID Hazard ID no. : 20
Marine Pollutant : No

IATA

UN/ID No. : UN1956
Proper shipping name : Compressed gas, n.o.s., (Nitrogen, Oxygen)
Class or Division : 2.2
Label(s) : 2.2
Marine Pollutant : No

IMDG

UN/ID No. : UN1956
Proper shipping name : COMPRESSED GAS, N.O.S., (Nitrogen, Oxygen)
Class or Division : 2.2
Label(s) : 2.2
Marine Pollutant : No
Segregation Group: : None

RID

UN/ID No. : UN1956
Proper shipping name : COMPRESSED GAS, N.O.S., (Nitrogen, Oxygen)
Class or Division : 2

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Label(s) : 2.2
Marine Pollutant : No

Further Information

Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact an Air Products customer service representative.

15. REGULATORY INFORMATION

Occupational Safety and Health Act 1994 and Regulations

Use and Standards of Exposure of Chemical Hazardous to Health Regulation 2000

Occupational Safety and Health (Classification, Labeling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on Inventory.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
Japan	ENCS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.

16. OTHER INFORMATION

Ensure all national/local regulations are observed.

Prepared by : Air Products and Chemicals, Inc. Global EH&S Product Safety Department

For additional information, please visit our Product Stewardship web site at
<http://www.airproducts.com/productstewardship/>