

INDUSTRIAL SCIENTIFIC

Oxygen (0 - 19%), Pentane (0 - 0.75%), Carbon Monoxide (0.0005-0.09%), Hydrogen Sulfide (0.001-0.025%) in balance Nitrogen

Safety Data Sheet 50214

according to Federal Register / Vol. 77, No. 59, Monday, March 26, 2012 / Rules and Regulations
Date of Issue: 08/15/2014 Revision date: 08/15/2014 Version: 1.0

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Mixture
Product name : Oxygen (0 - 19%), Pentane (0 - 0.75%), Carbon Monoxide (0.0005-0.09%), Hydrogen Sulfide (0.001-0.025%) in balance Nitrogen

1.2. Relevant identified uses of the substance/mixture and uses advised against

Replaces ISC MSDS No. 1810-9155, 1810-9157, 1810-9158, 1810-9181, 1810-9191, 1810-9194, 1810-2187, 1810-2343, 1810-3586, 1810-3587, 1810-5403, 1810-5589, 1810-8077, 1810-9103

1.3. Details of the supplier of the safety data sheet

U.S. Supplier: Industrial Scientific Corporation

1 Lie Way

Pittsburgh, PA 15205-7500

Phone (412) 788-4353

TOLL-FREE 800-DTECTS

Fax (412) 788-8353

MANUFACTURER: CALGAZ

821 Chesapeake Drive

Cambridge, MD 21613

1.4. Emergency telephone number

: CHEMTREC: 1-800-424-9300
Internationally: 1-703-527-3887

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (GHS-US)

Compressed gas H280

2.2. Label elements

GHS-US labeling

Hazard pictograms (GHS-US)



GHS04

Signal word (GHS-US)

Hazard statements (GHS-US)

Precautionary statements (GHS-US)

- : Warning
- : H280 - Contains gas under pressure; may explode if heated
- : OSHA-H01 - May displace oxygen and cause rapid suffocation
- : P202 - Do not handle until all safety precautions have been read and understood
- : P271 - Use only outdoors or in a well-ventilated area
- : P280 - Wear eye protection
- : P303+P360+P353 - If inhaled: Remove person to fresh air and keep comfortable for breathing
- : P304+P340 - If inhaled: Remove person to fresh air and keep comfortable for breathing
- : P305+P351+P338 - Rinse eyes abundantly with water. Hold open eyelids. Remove contact lenses, if available and do not delay rinsing.
- : P307+P362+P353 - In case of contact with skin, wash with plenty of water. Remove contaminated clothing and shoes.
- : P308+P313 - Following inhalation, call a physician or get medical advice.
- : P309+P312 - Following ingestion, call a physician or get medical advice.
- : P403 - Store in a well-ventilated place

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SECTION 3: Composition/information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

Name	Product Identifier	%	Classification (GHS-US)
Nitrogen	(CAS No) 7727-37-6	80.1575 - 99.9985	Compressed gas, H280
Oxygen	(CAS No) 7782-44-7	0 - 19	Ox. Gas 1, H270 Compressed gas, H280
Pentane	(CAS No) 109-66-0	0 - 0.75	Flam. Liq. 2, H225 STOT SE 3, H336 Asp. Tox. 1, H304
Carbon monoxide	(CAS No) 630-08-0	0.0005 - 0.09	Flam. Gas 1, H220 Compressed gas, H280 Acute Tox. 3 (inhalation-gas), H331 Explosive, H280 STOT RE 1, H372
Hydrogen sulfide	(CAS No) 7783-06-4	0.001 - 0.0025	Flam. Gas 1, H220 Liquified gas, H280 Acute Tox. 2 (inhalation-gas), H330 STOT SE 3, H336

SECTION 4: First aid measures

4.1. Description of first aid measures

- First-aid measures after inhalation
 - : Remove to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.
 - : Adverse effects not expected from this product.
 - : Adverse effects not expected from this product.
 - : Ingestion is not considered a potential route of exposure.
- First-aid measures after ingestion
 - : Adverse effects not expected from this product.
 - : May displace oxygen and cause rapid suffocation.
 - : Adverse effects not expected from this product.
 - : Adverse effects not expected from this product.
 - : Ingestion is not considered a potential route of exposure.
 - : Not known.

4.2. Most important symptoms and effects, both acute and delayed

- Symptoms/injuries after inhalation
 - : Adverse effects not expected from this product.
 - : May displace oxygen and cause rapid suffocation.
 - : Adverse effects not expected from this product.
 - : Adverse effects not expected from this product.
 - : Symptoms/injuries after eye contact
 - : Symptoms/injuries after ingestion
 - : Symptoms/injuries upon intravenous administration
- Chronic symptoms
 - : Adverse effects not expected from this product.

4.3. Indication of any immediate medical attention and special treatment needed

If you feel unwell, seek medical advice. If breathing is difficult, give oxygen.

SECTION 5: Firefighting measures

5.1. Extinguishing media

- Suitable extinguishing media
 - : Use extinguishing media appropriate for surrounding fire.
 - : Do not use water jet.
- Unsuitable extinguishing media

5.2. Special hazards arising from the substance or mixture

- Fire hazard
 - : The product is not flammable.
 - : Product is not explosive. Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries
- Explosion hazard
 - : None known.
- Reactivity

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5.3. Advice for firefighters

- Firefighting instructions
- : In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire.
 - : Standard protective clothing and equipment (e.g. Self Contained Breathing Apparatus) for the fighters. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- : Ensure adequate ventilation.

6.1.1. For non-emergency personnel

- : Wear protective equipment consistent with the site emergency plan.
- : Escape the danger area by the closest safe route. Close doors and windows of adjacent premises. Keep containers closed. Mark the danger area. Seal off low-lying areas. Keep upwind.

6.1.2. For emergency responders

- : Standard protective clothing and equipment (e.g. Self Contained Breathing Apparatus) for the fighters. Equip cleanup crew with proper protection.
- : Evacuate and limit access. Ventilate area.

Emergency procedures

6.2. Environmental precautions

- : Try to stop release if safe to do so.

6.3. Methods and material for containment and cleaning up

- : Try to stop release if safe to do so.
- : Dispose of this material and its container in accordance with local regulations.

6.4. Reference to other sections

See also Sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- : Additional hazards when processed
- : Pressurized container: Do not pierce or burn, even after use. Use equipment rated for cylinder pressure.
- : Do not handle until all safety precautions have been read and understood. Use only outdoors or in a well-ventilated area.
- : Do not eat, drink or smoke when using this product.

Hygiene measures

7.2. Conditions for safe storage, including any incompatibilities

- : Technical measures
- : Comply with applicable regulations.
- : Storage conditions
- : Do not expose to temperatures exceeding 52°C (125°F). Keep container closed when not in use.
- : Protected cylinder from physical damage. Store in well ventilated area.
- : Incompatible products
- : None known.
- : Incompatible materials
- : None known.

7.3. Specific end use(s)

Test gas/Calibration gas.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Pentane (109-66-0)			
USA ACGIH	ACGIH TWA (ppm)	600 ppm	
USA OSHA	OSHA PEL (TWA) (mg/m³)	2360 mg/m³	
USA OSHA	OSHA PEL (TWA) (ppm)	1000 ppm	
Carbon monoxide (530-08-0)			
USA ACGIH	ACGIH TWA (ppm)	25 ppm	
USA OSHA	OSHA PEL (TWA) (mg/m³)	55 mg/m³	

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Carbon monoxide (530-08-0)

USA OSHA	OSHA PEL (TWA) (ppm)	50 ppm
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Hydrogen sulfide (7783-06-4)

USA ACGIH	ACGIH TWA (ppm)	1 ppm
USA ACGIH	ACGIH STEL (ppm)	5 ppm
USA OSHA	OSHA PEL (Ceiling) (ppm)	20 ppm

Nitrogen (7727-37-9)

8.2. Exposure controls

Appropriate engineering controls

- : Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly checked for leaks. Ensure exposure is below occupational exposure limits. Consider work permit system e.g. for maintenance activities.
- : Hand protection
- : Eye protection
- : Skin and body protection
- : Respiratory protection
- : Thermal hazard protection
- : Environmental exposure controls

Other information

- : Wear safety shoes while handling containers. 29 CFR 1910.136: Foot Protection.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

- : Physical state
- : Molecular mass
- : Color
- : Odor
- : Odor threshold
- : pH
- : Relative evaporation rate (butyl acetate=1)
- : Relative evaporation rate (ether=1)
- : Melting point
- : Freezing point
- : Boiling point
- : Flash point
- : Auto-ignition temperature
- : Decomposition temperature
- : Flammability (solid, gas)
- : Vapor pressure
- : Relative vapor density at 20 °C
- : Relative density
- : Relative gas density
- : Solubility
- : Log Pow
- : Log Kow
- : Viscosity, kinematic
- : Viscosity, dynamic
- : Explosive properties
- : Oxidizing properties
- : Explosive limits
- : Gas
- : Not applicable for gas-mixtures.
- : Colorless
- : Rotten eggs
- : No data available
- : Not applicable for gas-mixtures.
- : No data available
- : No data available
- : No data available
- : No data available
- : No data available
- : No data available
- : No data available
- : Not applicable - not flammable
- : Not applicable.
- : No data available
- : Heavier than air.
- : Water: Solubility in water of component(s) of the mixture:
 - : : 39 mg/l
 - : : < 1 mg/l
 - : : Insoluble
 - : : 20 mg/l
 - : : 3960 mg/l
- : Not applicable for gas-mixtures.
- : Not applicable.
- : Not applicable.
- : Not applicable. Not applicable - not flammable.
- : None.
- : Not applicable - not flammable

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8.2. Other information

Additional information : Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

SECTION 10: Stability and reactivity

10.1. Reactivity

None known.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None known.

10.4. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials

None known.

10.6. Hazardous decomposition products

Under normal conditions of storage and use hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

Oxygen (7782-44-7)	
LC50 inhalation rat (ppm)	400000 ppm/4h

Pentane (109-66-0)	
LD50 dermal rabbit	3000 mg/kg
LC50 inhalation rat (mg/l)	364 g/m ³ (Exposure time: 4 h)

LC50 inhalation rat (ppm)	123390 ppm/4h
ATE US (dermal)	3000.00000000 mg/kg body weight
ATE US (gases)	123390.00000000 ppm/4h

ATE US (vapors)	364.00000000 mg/l/4h
ATE US (dust, mist)	364.00000000 mg/l/4h

Carbon monoxide (530-08-0)	
LC50 inhalation rat (ppm)	1860 ppm/4h
ATE US (gases)	1860.00000000 ppm/4h

Hydrogen sulfide (7783-06-4)	
LC50 inhalation rat (mg/l)	0.69 mg/l (Exposure time: 1 h)
LC50 inhalation rat (ppm)	369 ppm/4h

ATE US (gases)	366.00000000 ppm/4h
ATE US (vapors)	0.99000000 mg/l/4h
ATE US (dust, mist)	0.99000000 mg/l/4h

Nitrogen (7727-37-9)	
LC50 inhalation rat (ppm)	410000 ppm/4h

Skin corrosion/irritation

: Not classified

Serious eye damage/irritation

pH: Not applicable for gas-mixtures.
Not classified

Respiratory or skin sensitization

pH: Not applicable for gas-mixtures.
Not classified

Germ cell mutagenicity

: Not classified
: Not classified

Carcinogenicity

: Not classified

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Reproductive toxicity

Specific target organ toxicity (single exposure)

: Not classified
: Not classified

Specific target organ toxicity (repeated exposure)

: Not classified
: No known effects from this product.

Aspiration hazard

: Not classified

Symptoms/injuries after inhalation

: Not applicable for gases and gas-mixtures.
: May displace oxygen and cause rapid asphyxiation.

Symptoms/injuries after skin contact

: Adverse effects not expected from this product.

Symptoms/injuries after eye contact

: Adverse effects not expected from this product.

Symptoms/injuries upon intravenous administration

: Ingestion is not considered a potential route of exposure.
: Not known.

Chronic symptoms

: Adverse effects not expected from this product.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

Pentane (109-66-0)

LC50 fish 1	9.87 mg/l (Exposure time: 96 h - Species: <i>Onchorhynchus mykiss</i>)
EC50 Daphnia 1	9.74 mg/l (Exposure time: 48 h - Species: <i>Daphnia magna</i>)

LC50 fish 2	11.58 mg/l (Exposure time: 96 h - Species: <i>Pimephales promelas</i>)
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Hydrogen sulfide (7783-06-4)

LC50 fish 1	0.0446 mg/l (Exposure time: 96 h - Species: <i>Lepomis macrochirus</i> (flow-through))
EC50 Daphnia 1	0.022 mg/l (Exposure time: 96 h - Species: <i>Gammarus pseudolimnensis</i>)

LC50 fish 2	0.016 mg/l (Exposure time: 96 h - Species: <i>Pimephales promelas</i> (flow-through))
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12.2. Persistence and degradability

Oxygen (0 - 19%), Pentane (0 - 0.75%), Carbon Monoxide (0.0005-0.09%), Hydrogen Sulfide (0.001-0.025%) in balance Nitrogen
Persistence and degradability : No data available.

Oxygen (7782-44-7)

Persistence and degradability : No ecological damage caused by this product.

Carbon monoxide (530-08-0)

Persistence and degradability : Will not undergo hydrolysis. Not readily biodegradable. Not applicable for inorganic gases.

Hydrogen sulfide (7783-06-4)

Persistence and degradability : Not applicable for inorganic gases.

Nitrogen (7727-37-9)

Persistence and degradability : No ecological damage caused by this product.

12.3. Bioaccumulative potential

Oxygen (0 - 19%), Pentane (0 - 0.75%), Carbon Monoxide (0.0005-0.09%), Hydrogen Sulfide (0.001-0.025%) in balance Nitrogen
Log Pow : Not applicable for gas-mixtures.

Log Pow : Not applicable for gas-mixtures.

Log Kow : Not applicable for gas-mixtures.

Log Pow : Not applicable for gas-mixtures.

Oxygen (7782-44-7)

Log Pow : Not applicable for inorganic gases.

Log Pow : No ecological damage caused by this product.

Pentane (109-66-0)

Log Pow : 3.39

Carbon monoxide (530-08-0)

Log Pow : 1.78

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Carbon monoxide (630-08-0)	Not expected to bioaccumulate due to the low log Kow (log Kow < 4). Refer to section 8.
Bioaccumulative potential	
Hydrogen sulfide (7783-06-4)	
BCF fish 1	(no bioaccumulation expected)
Log Pow	Not applicable for inorganic gases.
Bioaccumulative potential	No data available.
Nitrogen (7727-37-9)	
Log Pow	Not applicable for inorganic gases.
Bioaccumulative potential	No ecological damage caused by this product.
12.4. Mobility in soil	
Oxygen (0 - 19%), Pentane (0 - 0.75%), Hydrogen Sulfide (0.001-0.025%) in balance Nitrogen	
Mobility in soil	No data available.

Oxygen (7782-44-7)	
Ecology - soil	No ecological damage caused by this product.
Carbon monoxide (630-08-0)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
Hydrogen sulfide (7783-06-4)	
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.
Nitrogen (7727-37-9)	
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects
Effect on ozone layer : None.
Effect on the global warming : Contains greenhouse gas(es) not covered by 84/22006/EC.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Waste treatment methods : Contact supplier if guidance is required. May be vented to atmosphere. Do not discharge into any place where its accumulation could be dangerous. Ensure that the emission levels from local regulations or operating permits are not exceeded.
Waste disposal recommendations : Refer to the CGA Pamphlet P-63 "Disposal of Gases" available at www.cganet.com for more guidance on suitable disposal methods.

SECTION 14: Transport information

In accordance with DOT
Transport document description : UN1956 Compressed gas, n.o.s. (Oxygen, Nitrogen)
UN-No. (DOT) : 1956
DOT NA no. : UN1956
DOT Proper Shipping Name : Compressed gas, n.o.s.
Hazard labels (DOT) : 2.2 - Non-flammable gas



DOT Synbole : G - Identifies PSN requiring a technical name
DOT Packaging Exceptions (49 CFR 173.3xx) : 305,307
DOT Packaging Non Bulk (49 CFR 173.3xx) : 302,305
DOT Packaging Bulk (49 CFR 173.3xx) : 314,315
DOT Quantity Limitations Passenger aircraft/rail : 75 kg
(49 CFR 173.27)

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DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75)	150 kg
DOT Vessel Stowage Location	A - The material may be stowed "on deck" or "under deck" on a cargo vessel and on a passenger vessel.

Additional information

Other information : No supplementary information available.
Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential risks of the load and knows what to do in the event of an accident or an emergency. Before transporting the containers - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Cylinder valve is closed and not leaking. - Ensure valve outlet cap nut or plug (where provided) is correctly fitted. - Ensure valve protection device (where provided) is correctly fitted.

ADR

Transport document description :
Transport by sea :
UN-No. (IMDG) : 1956
Proper Shipping Name (IMDG) : COMPRESSED GAS, N.O.S.
Class (IMDG) : 2.2 - Non-flammable, non-toxic gases
Air transport :
UN-No. (IATA) : 1956
Proper Shipping Name (IATA) : COMPRESSED GAS, N.O.S.
Class (IATA) : 2

SECTION 15: Regulatory information

15.1 US Federal regulations

Pentane (109-66-0)	Listed on the United States TSCA (Toxic Substances Control Act) Inventory
EPA TSCA Regulatory Flag	T - T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.
Hydrogen sulfide (7783-06-4)	Listed on the United States TSCA (Toxic Substances Control Act) Inventory
Listed on the United States TSCA (Toxic Substances Control Act) Inventory	Listed on the United States TSRA, Section 302
Listed on United States TSRA, Section 313	TSRA, Section 302 Threshold Planning Quantity (TPQ)
Quantity (TPQ)	500
TSRA, Section 313 - Emission Reporting	1.0 %

15.2 International regulations

CANADA

Oxygen (7782-44-7)	Listed on the Canadian DSL (Domestic Substances List)
WHMIS Classification	Class A - Compressed Gas
WHMIS Classification	Class C - Oxidizing Material
Pentane (109-66-0)	Listed on the Canadian DSL (Domestic Substances List)
WHMIS Classification	Class B Division 2 - Flammable Liquid
Carbon monoxide (630-08-0)	Listed on the Canadian DSL (Domestic Substances List)
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects Class D Division 2 Subdivision A - Very toxic material causing other toxic effects

