

SECTION: 1. Product and company identification

1.1. Product identifier

Product form : Mixture
Product name : PTG-4146
Formula : (0.0001 - 1.05 %) n-Pentane, (19.5 - 23.5 %) Oxygen in Nitrogen.

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

Use of the substance/mixture : Industrial use; Use as directed.
Restrictions on use : No additional information

1.3. Details of the supplier of the safety data sheet

Manufactured For:
Scientific Gas Australia Pty Ltd.
Unit 10, 12 Anderson Street
Banksmeadow NSW, 2019 - Australia
T PH 1300 880 531

By:
PortaGas (Praxair, Inc.)
1202 E Sam Houston Pkwy S
Pasadena, TX 77503
T 281-928-6477

New Zealand:
Airtanks Limited Unit 3,
5/343 Church Street, Onehunga,
Auckland 1061, New Zealand
Phone: +64 9 930 6360

1.4. Emergency telephone number

Emergency number : Australian Poison Information Centre: 13 11 26;
Australian Fire Brigade: 000
Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Classification (GHS-AU)
Press. Gas (Comp.) H280

2.2. Label elements

GHS AU labelling

Hazard pictograms (GHS AU) :



GHS04

Signal word (GHS AU) : WARNING
Hazard statements (GHS AU) : H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
CGA-HG24 - SUPPORTS COMBUSTION.
Precautionary statements (GHS AU) : P403 - Use and store only outdoors or in a well-ventilated place.
CGA-PG27 - Read and follow the Safety Data Sheet (SDS) before use.
CGA-PG21 - Open valve slowly.
CGA-PG12 - Do not open valve until connected to equipment prepared for use.
CGA-PG11 - Never put cylinders into unventilated areas of passenger vehicles.
CGA-PG10 - Use only with equipment rated for cylinder pressure.

CGA-PG06 - Close valve after each use and when empty.
 CGA-PG05 - Use a back flow preventive device in the piping.
 CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F).

2.3. Other hazards

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/Information on ingredients

3.1. Substance

Not applicable

3.2. Mixture

| Name | Product identifier | % |
|-----------|--------------------|---------------|
| Nitrogen | (CAS No) 7727-37-9 | 75.45 – 100 |
| Oxygen | (CAS No) 7782-44-7 | 19.5 – 23.5 |
| n-Pentane | (CAS No) 109-66-0 | 0.0001 – 1.05 |

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Adverse effects not expected from this product. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical attention.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

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

Symptoms/injuries : Effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Prolonged exposure to low concentrations of carbon monoxide can kill.

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

None.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

HazChem code : 2TE.

5.2. Special hazards arising from the substance or mixture

Reactivity : No reactivity hazard other than the effects described in sub-sections below.

5.3. Advice for firefighters

Firefighting instructions : Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L—Fire Protection.

Hazchem Code : 2TE

Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas containers to rupture. Cool endangered containers with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems.
- Stop flow of product if safe to do so.
- Use water spray or fog to knock down fire fumes if possible.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Evacuate area. Ensure adequate air ventilation. Wear self-contained breathing apparatus when entering area unless atmosphere is proven to be safe. Stop leak if safe to do so.

6.1.1. For non-emergency personnel

- Emergency procedures : Evacuate unnecessary personnel.

6.1.2. For emergency responders

6.2. Environmental precautions

None.

6.3. Methods and material for containment and cleaning up

6.4. Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. 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. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions

: Store only where temperature will not exceed 125°F (52°C). Post “No Smoking/No Open Flames” signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

7.3. Specific end use(s)

None.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

| Oxygen (7782-44-7) | | |
|----------------------|-----------------|------------------------|
| ACGIH | Not established | |
| USA OSHA | Not established | |
| Nitrogen (7727-37-9) | | |
| ACGIH | Not established | |
| USA OSHA | Not established | |
| n-Pentane (109-66-0) | | |
| ACGIH | ACGIH OEL TWA | 1000 ppm |
| USA OSHA | OSHA PEL TWA | 2950 mg/m ³ |
| USA OSHA | OSHA PEL TWA | 1000 ppm |
| AU SWA TWA PPM | OES TWA | 600 ppm |
| AU SWA TWA MGM3 | OES TWA | 1770 mg/m ³ |
| AU STEL PPM | OES STEL | 750 ppm |
| AU SWA STEL MGM3 | OES STEL | 1770 mg/m ³ |

8.2. Exposure controls

Appropriate engineering controls

: Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages. Provide adequate general and local exhaust ventilation. Consider work permit system e.g. for maintenance activities.

Personal protective equipment

: Gloves. Safety glasses.



| | |
|---------------------------------|--|
| Hand protection | : Wear working gloves when handling gas containers. |
| Eye protection | : Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder changeout or whenever contact with product is possible. Select eye protection in accordance with AS/NZS 1336 and AS/NZS 1337. |
| Skin and body protection | : Wear work gloves and metatarsal shoes for cylinder handling. Protective equipment where needed. Select in accordance with AS/NZS 2161, AS/NZS 2210.1, and AS/NZS 4503. |
| Respiratory protection | : When workplace conditions warrant respirator use, follow a respiratory protection program that meets AS/NSZ 1715, AS/NSZ 1716, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA). |
| Thermal hazard protection | : Wear cold insulating gloves when transfilling or breaking transfer connections. |
| Environmental exposure controls | : None necessary. |
| Other information | : Wear safety shoes while handling containers. |

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

| | |
|---|----------------------------|
| Physical state | : Gas |
| Color | : Colorless |
| Odor | : No data available |
| Odor threshold | : No data available |
| pH | : Not applicable. |
| Relative evaporation rate (butyl acetate=1) | : No data available |
| Relative evaporation rate (ether=1) | : Not applicable. |
| Melting point | : No data available |
| Freezing point | : No data available |
| Boiling point | : No data available |
| Flash point | : No data available |
| Auto-ignition temperature | : No data available |
| Decomposition temperature | : No data available |
| Flammability | : No data available |
| Vapor pressure | : Not applicable. |
| Relative vapor density at 20 °C | : No data available |
| Relative density | : No data available |
| Solubility | : Water: No data available |
| Partition coefficient n-octanol/water (Log Pow) | : Not applicable. |
| Partition coefficient n-octanol/water (Log Kow) | : Not applicable. |
| Viscosity, kinematic | : Not applicable. |
| Viscosity, dynamic | : Not applicable. |
| Explosive properties | : Not applicable. |
| Oxidizing properties | : None. |
| Explosion limits | : No data available |

9.2. Other information

SECTION 10: Stability and reactivity

10.1. Reactivity

No reactivity hazard other than the effects described in sub-sections below.

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

None.

10.4. Conditions to avoid

None.

10.5. Incompatible materials

None.

10.6. Hazardous decomposition products

None.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Not classified

| n-Pentane (109-66-0) | |
|----------------------------|---|
| LD50 oral rat | > 2000 mg/kg |
| LD50 dermal rabbit | 3000 mg/kg |
| LC50 inhalation rat (mg/l) | 364 g/m ³ (Exposure time: 4 h) |
| LC50 inhalation rat (ppm) | 246702 ppm/1h |
| ATE US (dermal) | 3000 mg/kg body weight |
| ATE US (gases) | 123351 ppmV/4h |
| ATE US (vapors) | 364 mg/l/4h |
| ATE US (dust, mist) | 364 mg/l/4h |

Skin corrosion/irritation : Not classified
pH: Not applicable.

Serious eye damage/irritation : Not classified
pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : Not classified

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not applicable

SECTION 12: Ecological information

12.1. Toxicity

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

| n-Pentane (109-66-0) | |
|----------------------|---|
| LC50 - Fish [1] | 9.87 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss) |
| EC50 - Crustacea [1] | 9.74 mg/l (Exposure time: 48 h - Species: Daphnia magna) |
| LC50 - Fish [2] | 11.59 mg/l (Exposure time: 96 h - Species: Pimephales promelas) |

12.2. Persistence and degradability

| PTG-4146 | |
|-------------------------------|--|
| Persistence and degradability | No ecological damage caused by this product. |

| | |
|-------------------------------|---|
| Oxygen (7782-44-7) | |
| Persistence and degradability | No ecological damage caused by this product. |
| Nitrogen (7727-37-9) | |
| Persistence and degradability | No ecological damage caused by this product. |
| n-Pentane (109-66-0) | |
| Persistence and degradability | May cause long-term adverse effects in the environment. |

12.3. Bioaccumulative potential

| | |
|---|--|
| PTG-4146 | |
| Partition coefficient n-octanol/water (Log Pow) | Not applicable. |
| Partition coefficient n-octanol/water (Log Kow) | Not applicable. |
| Bioaccumulative potential | No ecological damage caused by this product. |
| Oxygen (7782-44-7) | |
| Partition coefficient n-octanol/water (Log Pow) | Not applicable. |
| Partition coefficient n-octanol/water (Log Kow) | Not applicable. |
| Bioaccumulative potential | No ecological damage caused by this product. |
| Nitrogen (7727-37-9) | |
| Partition coefficient n-octanol/water (Log Pow) | Not applicable. |
| Partition coefficient n-octanol/water (Log Kow) | Not applicable. |
| Bioaccumulative potential | No ecological damage caused by this product. |
| n-Pentane (109-66-0) | |
| Partition coefficient n-octanol/water (Log Pow) | 3.39 |

12.4. Mobility in soil

| | |
|-----------------------------|--|
| PTG-4146 | |
| Mobility in soil | No data available. |
| Oxygen (7782-44-7) | |
| Mobility in soil | No data available. |
| Ecology - soil | No ecological damage caused by this product. |
| Nitrogen (7727-37-9) | |
| Mobility in soil | No data available. |
| Ecology - soil | No ecological damage caused by this product. |

12.5. Other adverse effects

Effect on ozone layer : None.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste treatment methods : May be vented to atmosphere in a well ventilated place. May be vented to atmosphere. Consult supplier for specific recommendations. Do not discharge into any place where its accumulation could be dangerous. Contact supplier if guidance is required.

Product/Packaging disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

SECTION 14: Transport information

Transport of Australian Dangerous Goods

UN-No. (ADG) : UN1956

Proper Shipping Name (ADG) : COMPRESSED GAS, N.O.S.

Class (ADG) : 2.2 - 2.2 - Class 2.2 - Non-flammable compressed gas

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Danger labels (ADG) : 2.2 - Non-flammable, non-toxic gases



Special provision (ADG) : 274

In accordance with DOT

Transport document description : UN1956 Compressed gas, n.o.s., 2.2
 UN-No.(DOT) : UN1956
 Proper Shipping Name (DOT) : Compressed gas, n.o.s.
 Class (DOT) : 2.2 - 2.2 - Class 2.2 - Non-flammable compressed gas
 Hazard labels (DOT) : 2.2 - Non-flammable gas



DOT Symbols : G - Identifies proper shipping name (PSN) requiring the addition of technical name(s) in parentheses following the PSN.

Additional information

Emergency Response Guide (ERG) Number : 126
 HazChem code : 2TE.
 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 hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers:
 - Ensure there is adequate ventilation. - Ensure that containers are firmly secured. - Ensure 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.

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
 Limited quantities (IMDG) : 120ml
 EmS-No. (1) : F-C
 MFAG-No : 620
 EmS-No. (2) : S-V

Air transport

UN-No. (IATA) : 1956
 Proper Shipping Name (IATA) : COMPRESSED GAS, N.O.S.
 Class (IATA) : 2 - Gases
 Instruction "cargo" (ICAO) : 200
 Instruction "passenger" (ICAO) : 200
 Instruction "passenger" - Limited quantities (ICAO) : FORBIDDEN

SECTION 15: Regulatory information

15.1. US Federal regulations

| | |
|---|--|
| n-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 final TSCA section 4 test rule. |

15.2. International regulations

CANADA

| |
|---|
| Oxygen (7782-44-7)> |
| Listed on the Canadian DSL (Domestic Substances List) |

| |
|---|
| Nitrogen, Medipure Nitrogen, Extendapak Nitrogen (7727-37-9)> |
| Listed on the Canadian DSL (Domestic Substances List) |

| |
|---|
| n-Pentane (109-66-0)> |
| Listed on the Canadian DSL (Domestic Substances List) |

EU-Regulations

15.2.2. National regulations

No additional information available

15.3. US State regulations

| | |
|---|----|
| PTG-4146() | |
| U.S. - California - Proposition 65 - Carcinogens List | No |
| U.S. - California - Proposition 65 - Developmental Toxicity | No |
| U.S. - California - Proposition 65 - Reproductive Toxicity - Female | No |
| U.S. - California - Proposition 65 - Reproductive Toxicity - Male | No |

| | | | | |
|---|---|---|---|-----------------------------------|
| Oxygen (7782-44-7) | | | | |
| U.S. - California - Proposition 65 - Carcinogens List | U.S. - California - Proposition 65 - Developmental Toxicity | U.S. - California - Proposition 65 - Reproductive Toxicity - Female | U.S. - California - Proposition 65 - Reproductive Toxicity - Male | Non-significant risk level (NSRL) |
| No | No | No | No | |

| | | | | |
|---|---|---|---|-----------------------------------|
| Nitrogen, Medipure Nitrogen, Extendapak Nitrogen (7727-37-9) | | | | |
| U.S. - California - Proposition 65 - Carcinogens List | U.S. - California - Proposition 65 - Developmental Toxicity | U.S. - California - Proposition 65 - Reproductive Toxicity - Female | U.S. - California - Proposition 65 - Reproductive Toxicity - Male | Non-significant risk level (NSRL) |
| No | No | No | No | |

| | | | | |
|---|---|---|---|-----------------------------------|
| n-Pentane (109-66-0) | | | | |
| U.S. - California - Proposition 65 - Carcinogens List | U.S. - California - Proposition 65 - Developmental Toxicity | U.S. - California - Proposition 65 - Reproductive Toxicity - Female | U.S. - California - Proposition 65 - Reproductive Toxicity - Male | Non-significant risk level (NSRL) |



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| n-Pentane (109-66-0) | | | | |
|----------------------|----|----|----|--|
| No | No | No | No | |

| Oxygen (7782-44-7) |
|---|
| U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List |

| Nitrogen, Medipure Nitrogen, Extendapak Nitrogen (7727-37-9) |
|---|
| U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List |

| n-Pentane (109-66-0) |
|---|
| U.S. - Massachusetts - Right To Know List U.S. - New Jersey - Right to Know Hazardous Substance List U.S. - Pennsylvania - RTK (Right to Know) List |

SECTION 16: Other information

Other information : When you mix two or more chemicals, you can 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 evaluate the end product. Before using any plastics, confirm their compatibility with this product.

Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

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

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SDS Australia - Praxair

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