

### SECTION 1: Product and company identification

#### 1.1. Product identifier

Product form : Mixture  
 Product name : PTG-4047  
 Formula : (3.2 - 99 %) Hydrogen in Argon.

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

Use of the substance/mixture : Industrial use  
 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

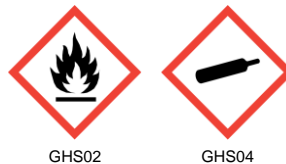
##### Classification (GHS-AU)

Flam. Gas 1 H220  
 Press. Gas (Comp.) H280  
 Simple asphyxiant SIAS

#### 2.2. Label elements

##### GHS AU labelling

Hazard pictograms (GHS AU) :



Signal word (GHS AU) :

DANGER

Hazard statements (GHS AU) :

H220 - **EXTREMELY FLAMMABLE GAS**  
 H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED  
 OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION

Precautionary statements (GHS AU) :

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
 P377 - LEAKING GAS FIRE: Do not extinguish, unless leak can be stopped safely.

P381 - Eliminate all ignition sources if safe to do so.  
 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 | %        |
|----------|--------------------|----------|
| Argon    | (CAS No) 7440-37-1 | 1 – 100  |
| Hydrogen | (CAS No) 1333-74-0 | 3.2 – 99 |

## 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 not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

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

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

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

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

None.

## SECTION 5: Firefighting measures

### 5.1. Extinguishing media

Suitable extinguishing media : Carbon dioxide, Dry chemical, Water spray or fog. Use extinguishing media appropriate for surrounding fire.

HazChem code : 2SE.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard : **EXTREMELY FLAMMABLE GAS.** If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device.

Explosion hazard : **EXTREMELY FLAMMABLE GAS.** Forms explosive mixtures with air and oxidizing agents.

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 : 2SE
- Protection during firefighting : **DANGER! FLAMMABLE, HIGH PRESSURE GAS..**
- Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.
- Other information : Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.).

**SECTION 6: Accidental release measures**

**6.1. Personal precautions, protective equipment and emergency procedures**

- General measures : **DANGER: Flammable, liquefied gas.** FORMS EXPLOSIVE MIXTURES WITH AIR. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if safe to do so. Reduce vapors with fog or fine water spray, taking care not to spread liquid with water. Shut off flow if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable vapors may spread from leak and could explode if reignited by sparks or flames. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device.

**6.1.1. For non-emergency personnel**

**6.1.2. For emergency responders**

**6.2. Environmental precautions**

Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements.

**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 : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment.
- 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.

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.

**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.

### 7.3. Specific end use(s)

None.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

| Hydrogen (1333-74-0) |                 |                   |
|----------------------|-----------------|-------------------|
| ACGIH                | Remark (ACGIH)  | Simple asphyxiant |
| USA OSHA             | Not established |                   |
| Argon (7440-37-1)    |                 |                   |
| ACGIH                | Not established |                   |
| USA OSHA             | Not established |                   |

### 8.2. Exposure controls

Appropriate engineering controls : Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. **MECHANICAL (GENERAL): Inadequate - Use only in a closed system.** Use explosion proof equipment and lighting. Provide adequate general and local exhaust ventilation. Ensure exposure is below occupational exposure limits (where available).

Personal protective equipment : Gloves. Safety glasses.



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.  |

**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**

No additional information available

**10.4. Conditions to avoid**

Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

**10.5. Incompatible materials**

No additional information available

### 10.6. Hazardous decomposition products

No additional information available

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

|  |   |                                       |
|--|---|---------------------------------------|
| Acute toxicity                                     | : | Not classified                        |
| Skin corrosion/irritation                          | : | Not classified<br>pH: Not applicable. |
| Serious eye damage/irritation                      | : | Not classified<br>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.

### 12.2. Persistence and degradability

| PTG-4047                      |  |
|-------------------------------|--|
| Persistence and degradability | No ecological damage caused by this product. |
| Hydrogen (1333-74-0)          |  |
| Persistence and degradability | No ecological damage caused by this product. |
| Argon (7440-37-1)             |  |
| Persistence and degradability | No ecological damage caused by this product. |

### 12.3. Bioaccumulative potential

| PTG-4047  |  |
|---|--|
| 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. |
| Hydrogen (1333-74-0)                            |  |
| BCF - Fish [1]                                  | (no bioaccumulation expected)                |
| 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. |
| Argon (7440-37-1)                               |  |
| 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. |

### 12.4. Mobility in soil

| PTG-4047         |                    |
|------------------|--------------------|
| Mobility in soil | No data available. |

| Hydrogen (1333-74-0) |  |
|----------------------|--|
| Mobility in soil     | No data available.                           |
| Ecology - soil       | No ecological damage caused by this product. |
| Argon (7440-37-1)    |  |
| 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

Product/Packaging disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

## SECTION 14: Transport information

Transport of Australian Dangerous Goods

UN-No. (ADG) : UN1954  
 Proper Shipping Name (ADG) : COMPRESSED GAS, FLAMMABLE, N.O.S.  
 Class (ADG) : 2.1 - Class 2.1 - Flammable gas  
 Danger labels (ADG) : 2.1 - Flammable gases



Special provision (ADG) : 274

In accordance with DOT

Transport document description : UN1954 Compressed gas, flammable, n.o.s., 2.1  
 UN-No.(DOT) : UN1954  
 Proper Shipping Name (DOT) : Compressed gas, flammable, n.o.s.  
 Class (DOT) : 2.1 - Class 2.1 - Flammable gas  
 Hazard labels (DOT) : 2.1 - 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 : 115  
 HazChem code : 2SE.  
 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) : 1954  
 Proper Shipping Name (IMDG) : COMPRESSED GAS, FLAMMABLE, N.O.S.  
 Class (IMDG) : 2.1 - Flammable gases  
 Limited quantities (IMDG) : None.  
 EmS-No. (1) : F-D  
 MFAG-No : 620  
 EmS-No. (2) : S-U

### Air transport

UN-No. (IATA) : 1954  
 Proper Shipping Name (IATA) : COMPRESSED GAS, FLAMMABLE, N.O.S.  
 Class (IATA) : 2 - Gases  
 Instruction "cargo" (ICAO) : 200  
 Instruction "passenger" (ICAO) : FORBIDDEN  
 Instruction "passenger" - Limited quantities (ICAO) : FORBIDDEN

## SECTION 15: Regulatory information

### 15.1. US Federal regulations

No additional information available

### 15.2. International regulations

#### CANADA

##### Hydrogen (1333-74-0)>

Listed on the Canadian DSL (Domestic Substances List)

##### Argon (7440-37-1)>

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-4047()

|   |    |
|---|----|
| 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                   | No |





# PTG-4047

## Safety Data Sheet PTG-4047

Prepared in accordance with the model Work Health and Safety Regulations

Date of issue: 05/11/2015 Revision date: 05/24/2024 Supersedes: 09/25/2019 Version: 1.3

|                   |  |
|-------------------|--|
| <b>PTG-4047()</b> |  |
| Toxicity - Male   |  |

|   |   |   |   |                                   |
|---|---|---|---|-----------------------------------|
| <b>Hydrogen (1333-74-0)</b>                           |   |   |   |                                   |
| 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  |                                   |

|   |   |   |   |                                   |
|---|---|---|---|-----------------------------------|
| <b>Argon (7440-37-1)</b>                              |   |   |   |                                   |
| 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  |                                   |

|  |  |  |  |  |
|--|--|--|--|--|
| <b>Hydrogen (1333-74-0)</b>                                |  |  |  |  |
| 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             |  |  |  |  |

|  |  |  |  |  |
|--|--|--|--|--|
| <b>Argon (7440-37-1)</b>                                   |  |  |  |  |
| 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

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*