# Hydrogen, Compressed

Issue date March 1, 2015

Reviewed date November 1, 2023

## Safety Data Sheet

## SDS ID# 3015

## Section 1. IDENTIFICATION

### 1.1. Product identifier

Product form : Pure

Product name : Hydrogen, Compressed

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

Product use : Calibration gas/Bumptest gas/Function test gas

### 1.3. Details of the supplier of the safety data sheet

Intermountain Specialty Gases
21913 Cobalt Ave.
Caldwell, Idaho 83605
Telephone 1-208-585-5829 or Toll free 1-800-552-5003
www.isgases.com

### 1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300

## Section 2. HAZARDS INDENTIFICATION

### 2.1. Classification of the substance or mixture

**Classification** FLAMMABLE GASES - Category 1
: GASES UNDER PRESSURE - Compressed gas
: SIMPLE ASPHYXIANTS - YES

### 2.2. Label elements

**Hazard pictograms**

**Signal word** : DANGER

**Hazard statements** : H220 - EXTREMELY FLAMMABLE GAS
: H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
: OSHA-H01 - MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
: CGA-HG04 - MAY FORM EXPLOSIVE MIXTURES WITH AIR
: CGA-HG-08 - BURNS WITH INVISIBLE FLAME
: OSHA - PG01 - DO NOT REMOVE THIS PRODUCT LABEL

**Precautionary statements**

[General] : Read and follow all Safety Data Sheets (SDS's) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have a product container or label at hand. Use equipment rated for cylinder pressure.

[Prevention] : P202 - Do not handle until all safety precautions have been read and understood
: P210 - Keep away from heat/sparks/open flames/hot surfaces - No smoking.
: P271+P403- Use only outdoors or in a well-ventilated area
: CGA-PG05 - Use a back flow preventive device in the piping.
: CGA-PG10 - Use only with equipment rated for cylinder pressure.
: CGA-PG12 - Do not open valve until connected to equipment prepared for use.
: CGA-PG06 - Close valve after each use and when empty.
: CGA-PG27 - Read and follow the Safety Data Sheet (SDS) before use.

[Response] : P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
: P381 - Eliminate all ignition sources if safe to do so.
: P304+P340+P313 - IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.

[Storage] : CGA-PG02 - Protect from sunlight when ambient temperature exceeds 52°C (125°F)

[Disposal] : Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

### 2.3. Other hazards

No additional information available

### 2.4. Unknown acute toxicity

No data available

## Section 3. COMPOSITION/INFORMATION ON INGREDIENTS

### 3.1. Substance

Not applicable

### 3.2. Mixture

| Name | Product Identifier | % |
|---|---|---|
| Hydrogen | (CAS No) 1333-74-0 | 100 |
| | | |

## Section 4. FIRST AID MEASURES

### 4.1. Description of first aid measures

General : IF exposed or concerned: Get medical advice/attention.

Inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If breathing has stopped, give artificial respiration or oxygen by trained personnel. If victim feels unwell, seek medical advice.

| | |
|---|---|
| Skin contact | : Immediately flush with copious amount of water for at least 15 minutes. |
| Eye contact | : Immediately flush with copious amount of water for at least 15 minutes. |
| Ingestion | : Ingestion is not considered a potential route of exposure, refer to the inhalation section. |

### 4.2. Most important symptoms/effects, acute and delayed

**Acute**

| | |
|---|---|
| Inhalation | : May displace oxygen and cause rapid suffocation. |
| Skin contact | : Contact with rapidly expanding gas may cause burns or frostbite. |
| Eye contact | : Contact with rapidly expanding gas may cause burns or frostbite. |
| Ingestion | : Ingestion is not considered a potential route of exposure, refer to the inhalation section. |
| Frostbite | : Thaw frosted parts with lukewarm water. Do not rub affected areas. Get immediate medical advice/attention. |
| Self-protection of the first aider | RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS. Remove all sources of ignition. |
| Symptoms | : Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<=18%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury |
| Chronic symptoms | : Adverse effects not expected from this product. |
| Delayed | : Adverse effects not expected from this product. |

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

If victim feels unwell, seek medical advice. If breathing is difficult, give artificial respiration or oxygen by trained personnel.

## Section 5. FIREFIGHTING MEASURES

### 5.1. Extinguishing media

| | |
|---|---|
| Suitable extinguishing media | : Dry chemical or CO2. Water spray (fog). DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED. |
| Unsuitable extinguishing media | : None known. |

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

| | |
|---|---|
| Fire hazard | : This product is flammable. |
| Explosion hazard | : Heat may build pressure, rupturing closed containers, spreading fire and increasing risk of burns and injuries. |
| Reactivity | : None known. |

### 5.3. Advice for fire-fighters

| | |
|---|---|
| Firefighting instructions | : In case of fire: Evacuate all personnel from the danger area. Stop the leak and flow of gas before extinguishing fire, if safe to do so. If this is not possible, withdraw from area and allow fire to burn. Fight fire remotely due to the risk of explosion. Use water spray or fog for cooling exposed containers. Let the fire burn. Avoid inhalation of |

material or combustion by-products. Stay upwind and keep out of low areas. Exercise caution when fighting any chemical fire.

Protection during firefighting : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus, SCBA) for fire 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

General measures : Ensure adequate ventilation.

**6.1.1. For non -emergency personnel**

Protective equipment : Wear protective equipment consistent with the site emergency plan.

Emergency procedures : ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). 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.

**6.1.12. For emergency responders**

Protective equipment : Standard protective clothing and equipment (e.g., Self Contained Breathing Apparatus) for fire fighters. Equip cleanup crew with proper protection.

Emergency procedures : Evacuate and limit access. Ventilate area. See information above "For non-emergency personnel".

### 6.2. Methods and material for containment and cleaning up

For containment : Immediately contact emergency personnel. Try to stop gas leak if safe to do so.

Methods for cleaning up :Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

## Section 7. HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Precautions for safety handling : 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. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Protect cylinders from physical damage; do not drag, roll, slide, or drop.

Hygiene measures : Do not eat, drink or smoke when using this product.

### 7.2. Conditions for safe storage, including any incompatibilities

Technical measures : None known.

Storage conditions : Do not expose to temperatures exceeding 52°C (125°F). Store locked up. Keep containers closed when not in use. Protect cylinder from physical damage. Store and use away from heat, sparks, open flame or any other ignition source. Store in well ventilated area.

Incompatible products : None known.

Incompatible materials : Oxidizing agents.

## Section 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Hydrogen (1333-74-0)**

| OSHA PEL | | Cal/OSHA PEL | NIOSH REL | ACGIH 2015 TLV |
|---|---|---|---|---|
| | | (as of 4/26/13) | (as of 4/26/13) | |
| ppm | $mg/m^3$ | 8-hour TWA<br>(ST) STEL<br>( C ) Ceiling | up to 10-hour TWA<br>(ST) STEL<br>( C ) Ceiling | 8-hour TWA<br>(ST) STEL<br>( C ) Ceiling |
| *There are no specific exposure limits for Nitrogen. Nitrogen is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.* | | | | Simple asphyxiant |

### 8.2. Appropriate engineering controls

Engineering measures/controls : Provide adequate general and local exhaust ventilation. Systems under pressure should be regularly check for leakages. Ensure exposure is below occupational exposure limits. Oxygen detectors should be used when asphyxiating gases may me released. Consider work permit system e.g. for maintenance activities.

### 8.3. Individual protection measures

Hand protection : Wear working gloves when handling gas containers. 29CFR 1910.138: Hand Protection.

Eye protection : Wear safety glasses with side shields. 29 CFR 1910.133: Eye and Face Protection.

Skin and body protection : Wear suitable protective clothing, e.g.-Lab coats, coveralls or flame resistant clothing.

Respiratory protection : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Thermal hazard protection : None necessary during normal and routine operations.

Environmental exposure controls : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

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

## Section 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Exposure controls

Appearance : Clear, colorless gas.

Physical state : Gas

Color : Colorless

Odor : No data available

Odor threshold : No data available

pH : No data available

Melting point : -259.2 °C

Freezing point : No data available

Flash point : No data available

Evaporation rate : No data available

Flammability (solid, gas) : Extremely flammable

Upper flammability : 75%

Lower flammability : 4%

Relative density : No data available

Solubility : No data available

Partition coefficient : No data available

Auto-ignition temperature : 570 °C
Decomposition temperature : No data available
Viscosity : Not applicable

| | Hydrogen | | | | |
|---|---|---|---|---|---|
| Molecular weight (grams) | 1.00 | | | | |
| Boiling point | -252.8 °C | | | | |
| Vapor pressure | Above critical temperature | | | | |
| Vapor density at 20°C | 0.007 | | | | |
| Relative gas density | 0.083 @ 20 °C | | | | |
| Critical Temperature | -240 °C | | | | |

## Section 10. STABILITY AND REACTIVITY

### 10.1. Reactivity

No reactivity hazard other than the effects described below.

### 10.2. Chemical stability

Stable under normal conditions.

### 10.3. Possibility of hazardous reactions

May form explosive mixtures wit air. May react violently with oxidizers.

### 10.4. Conditions to avoid

Avoid all possible sources of ignition (spark or flame). Flammable or explosive when mixed with chlorine or other oxidizing materials. Fluorine and hydrogen react at -418 °F when impurities are present. Chlorine/hydrogen mixtures explode if exposed to light. Lithium metal will burn in a hydrogen atmosphere. Do not pressurize, cut, weld, braze, solder, drill, grind or expose container to heat or sources of ignition. Storage in poorly ventilated areas.

### 10.5. Incompatible materials

Extremely reactive or incompatible with the following: oxidizing agents.

### 10.6. Hazardous decomposition products

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

## Section 11. TOXICOLOGICAL INFORMATION

### Acute toxicity

**Hydrogen (1333-74-0)**

LC50 inhalation rat (ppm) >15,000 ppm/1h

### 11.1. Information on routes of exposure

Inhalation : This product is a simple asphyxiant.
Skin contact : Adverse effects not expected from this product

| | |
|---|---|
| Eye contact | : Adverse effects not expected from this product |
| Ingestion | : Ingestion is not considered a potential route of exposure |

### 11.2. Symptoms related to physical, chemical and toxicological characteristics

| | |
|---|---|
| Symptoms | Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<=18%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury |

### 11.3. Delayed and immediate effects

| | |
|---|---|
| Skin corrosion/irritation | : Contact with rapidly expanding gas may cause burns or frostbite. |
| Serious eye damage/irritation | : Contact with rapidly expanding gas may cause burns or frostbite. |
| 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 classified<br>Not applicable for gases and gas-mixtures |

### 11.4. Carcinogenic effects

The components of this material are not found on the following lists: FEDERAL OSHA Z LIST, NTP AND IARC; therefore, they are not considered to be, nor suspected to be, cancer-causing agents by these agencies.

## Section 12. ECOLOGICAL INFORMATION

### 12.1. Aquatic Toxicity

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

### 12.2. Persistence and degradability

No information available for the product

### 12.3. Bioaccumulative potential

No information available for the product

### 12.4. Mobility in soil

No information available for the product

### 12.5. Other

No information available for the product

## Section 13. DISPOSAL CONSIDERATIONS

### 13.1. Disposal methods

Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

## Section 14. TRANSPORATION INFORMATION

| | US DOT | TDG | IMDG | IATA |
|---|---|---|---|---|
| **UN #** | UN 1049 | UN 1049 | UN 1049 | UN 1049 |
| **Proper shipping name** | Hydrogen, compressed | Hydrogen, compressed | Hydrogen, compressed | Hydrogen, compressed |
| **Transport hazard class(es)** | 2.1   | 2.1   | 2.1   | 2.1   |
| **Packing group** | - | - | - | - |
| **Environment** | No. | No. | No. | No. |

## Section 15. REGULATORY INFORMATION

### 15.1. US Federal regulations

**SARA 311/312 hazard categories**

| | |
|---|---|
| Acute Health | : No |
| Chronic Health | : No |
| Fire | : Yes |
| Pressure | : Yes |
| Reactive | : No |

SARA Title III Notifications and Information: Hydrogen is Listed under the accident prevention provisions of section 112 ® of the Clean Air Act (CAA) with a threshold quantity (TQ) of 10,000 pounds.

This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

| | |
|---|---|
| SARA 311/312 | Sudden Release of Pressure Hazard |

### 15.2. US State regulations

| Hydrogen (1333-74-0) |
|---|
| 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

**Date of issue/Date of revision** 11/1/2023

**Revision Note**

## Hazardous Material Information System (USA)

| | |
|---|---|
| Hazard Scale | : 0 = Minimal/ 1 = Slight/ 2 = Moderate/ 3 = Serious/ 4 = Severe |
| **Health** | : 0 |
| **Fire** | : 4 |
| **Physical hazards** | : 3 |

## Key/Legend

| | |
|---|---|
| SARA | Superfund Amendments and Reauthorization Act |
| OSHA | Occupational Safety and Health Administration |
| DOT | Department of Transportation |
| TSCA | Toxic Substance Control Act |
| NTP | National Toxicology Program |
| ACGIH | American Conference of Governmental Industrial Hygienists |
| PEL | Permissible Exposure Limit |
| STEL | Short Term Exposure Limit |
| TLV | Threshold Limit Value |
| TDG | Transportation of Dangerous Goods |
| CAS | Chemical Abstracts Service |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| IATA | International Air Transport Association |
| IMDG | International Maritime Dangerous Goods |
| TWA | Time Weighted Average |
| Prop | Proposition |
| ATE | Acute Toxicity Estimate |

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