

Chengdu Taiyu Industrial Gases Co.,Ltd
No.2375,Chengluo Avenue, Longquan
District,Chengdu City, China
610106

Phone:
Fax:
Emergency:

MATERIAL SAFETY DATA SHEET

Product Name:

(86) 28 88455212
(86) 28 88455212
(1) 0800 156 516

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Revision:



IDENTIFICATION

Chemical Name: Hydrogen (H₂)
Synonyms: None
UN Number: 1049

Use: Combustion, reducing atmospheres (e.g. steel industry), hydrogenation of oils and fats, laboratory as a carrier gas

HAZARDS IDENTIFICATION

Dangerous Goods Class and Subsidiary Risk: 2.1
HSNO Classification: 2.1.1A

Hazard Statement: Extremely flammable gas.
Explosive; fire, blast or projection hazard.

Precautionary Statements: Read before label before use.
Read material safety data sheet before use.
Keep away from heat, sparks, open flames and hot surfaces.
No smoking.
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources if safe to do so.
Store in a well ventilated place.
Do not subject to any rough handling (grinding/shock/friction/banging).
Explosion risk in case of fire.
Fight fire with normal precautions from a reasonable distance.
Take precautionary measures against static discharges.
Wear protective gloves and eye protection.

COMPOSITION

Ingredients
Chemical Entity CAS Number
Hydrogen 1333-74-0

Contains no other components or impurities that will influence the classification of the product.

HYDROGEN, Compressed (H₂) Issued:

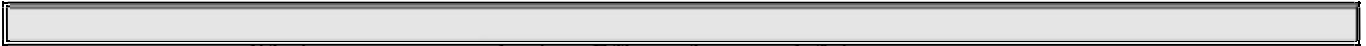
FIRST AID MEASURES

Health Effects

Acute
Swallowed: Not applicable to gases
Eye: Not irritating to the eye
Skin: Not irritating to the skin



Inhaled:



support life; it can act as an asphyxiant. Effects of oxygen deficiency are:
16%: breathing and pulse rate increased, impaired thinking and attention, reduced coordination;
14%: Abnormal fatigue upon exertion, emotional upset, faulty coordination, poor judgement;
12.5%: Very poor judgement and coordination, impaired respiration that can cause permanent hearing damage, nausea and vomiting;
below 10%: Inability to perform various movements, loss of consciousness, convulsions, and death.

Chronic

Long term exposure to argon based mixtures has no known health effects. Prolonged exposure to an oxygen deficient atmosphere (below 19% oxygen in air) may affect the heart and nervous system.

First Aid

Inhalation:

In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Remove victim to uncontaminated area whilst wearing self contained breathing apparatus. Victim may not be aware of asphyxiation. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.

Advice to Doctor

Advise doctor that victim has been exposed to an oxygen deficient atmosphere.

General:

Rescuers should not enter an oxygen deficient atmosphere without using self-contained full face positive pressure breathing equipment.

Rescue personnel should be aware of extreme fire hazard associated with hydrogen rich atmospheres.

FIRE FIGHTING MEASURES

Flammability:

Highly flammable. Spontaneously flammable in air. Avoid all ignition sources.

Fire/Explosion Hazard:

Hydrogen is highly flammable and burns with almost invisible flame.

Exposure to fire may cause container to rupture/explode. Cylinders involved in a fire/explosion may rocket. Move cylinders from vicinity of fire if safe to do so. Cool cylinders by spraying flooding quantities of water from a

protected location. If unable to keep cylinders cool, evacuate area, minimum distance 200 meters. Do not extinguish a leaking gas flame unless absolutely necessary.

Extinguish any other fire.

Extinguishing Media:

Water fog or fine water spray. Cool cylinders with water if possible.

Hazchem Code:

2SE

Recommended Protective Clothing:

In confined space use self-contained breathing apparatus.

Issued:

ACCIDENTAL RELEASE MEASURES

Personal Protection:

Personnel engaged in the movement of cylinders shall be provided with safety footwear, safety glasses and leather or PVC gloves. Full cover overalls are recommended. In areas where equipment failure may cause an immediate high concentration of hydrogen, ensure adequate ventilation and have approved self-contained, full face respiratory equipment readily available for emergencies.

Spills and Disposal:

Ventilate area. Stop leak if it can be done without risk. Allow gas to dissipate to atmosphere. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

Reference Guide:

Standard SNZ HB 76:2008 Dangerous Goods – Initial Emergency Response Guide.

AS/NZS 1337 – Eye Protection for Industrial Applications

AS/NZS 2161.1 – Occupational Protective Gloves – Selection, use and maintenance

AS/NZS 1715 – Selection, Use and Maintenance of Respiratory Protective Devices

AS/NZS 1716 – Respiratory Protective Devices

General:

Only experienced and properly instructed personnel should handle compressed gases. Open valve slowly to avoid pressure shock. Cylinder contents and identification labels provided by the supplier must not be removed or defaced. Colour coding should not be the only criterion used for content identification.

HANDLING AND STORAGE

Handling

Flammability:

Highly flammable. Spontaneously flammable in air. Avoid all ignition sources.

General:

Only experienced and properly instructed personnel should handle compressed gases. Open valve slowly to avoid pressure shock. Cylinder contents and identification labels provided by the supplier must not be removed or defaced. Colour coding should not be the only criterion used for content identification.

Approved Handlers:

Approved handlers are required if more than 100 m³ is stored on site.

Storage:

Storage of compressed gas cylinders shall be in compliance with New Zealand HSNO Regulations.

Cylinders will be kept away from ignition sources (including static discharges).

Cylinders shall be stored in a cool, dry, well ventilated area out of direct sunlight and away from heat and ignition sources.

No part of cylinders shall be exposed to temperatures above 50°C.

Cylinders shall be stored upright on a level, fireproof floor, secured in position and protected from damage.

Full cylinders shall be stored separately from empties.

Cylinders should be moved by hand-truck or cart designed for that purpose.

Separation:

Avoid any contact with oil or grease particularly to the cylinder valve.

Keep hydrogen cylinders a minimum of 5 meters away from ignition sources and from incompatible materials (e.g. HSNO classes 1, 3, 4 and 5).

Keep hydrogen cylinders a minimum of 5 meters away from edge of the controlled zone.

A controlled zone is an area surrounding a hazardous substance location, beyond the controlled zone members of the public are provided with reasonable protection from adverse events.

Issued:

Spills and Disposal:

Ventilate area. Stop leak if it can be done without risk. Allow gas to dissipate to atmosphere. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Standards:

Simple asphyxiant.

Engineering Controls:

Provide adequate local exhaust and dilution (general) ventilation and supply sufficient replacement air to maintain oxygen concentration above 19%.

Personal Protection:

Personnel engaged in the movement of cylinders shall be provided with safety footwear, safety glasses and leather or PVC gloves. Full cover overalls are recommended. In areas where equipment failure may cause an immediate high concentration of hydrogen, ensure adequate ventilation and have approved self-contained, full face respiratory equipment readily available for emergencies.

Reference Guide:

AS/NZS 1337 – Eye Protection for Industrial Applications

AS/NZS 2161.1 – Occupational Protective Gloves – Selection, use and maintenance

AS/NZS 1715 – Selection, Use and Maintenance of Respiratory Protective Devices

AS/NZS 1716 – Respiratory Protective Devices

PHYSICAL AND CHEMICAL PROPERTIES

Physical Properties

Appearance:

Boiling Point:

Vapour Pressure:

Other Properties

Relative Density (at 15°C)

(Air = 1):

Molecular Weight:

STABILITY AND REACTIVITY

Flammability:

Highly flammable. Spontaneously flammable in air. Avoid all ignition sources.

Materials Compatibility:

Hydrogen is non-corrosive and can be used with all commonly used, non-reactive metals at room temperature and low pressure. At higher pressures, hydrogen causes embrittlement of some materials, particularly cold worked ferritic steels. Most elastomers are compatible with hydrogen.

TOXICOLOGY INFORMATION

No known toxicological effects from this product.

ECOLOGICAL INFORMATION

No known ecological damage caused by this product.

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DISPOSAL CONSIDERATIONS

Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor. Do not discharge into any place where its accumulation could be dangerous.

TRANSPORT INFORMATION

UN Number:
Proper Shipping Name:
Dangerous Goods Class and Subsidiary Risk:
Packing Group:
Hazchem Code:

Other Information: Avoid transport on vehicles where the load 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 that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure there is adequate ventilation.
- Compliance with applicable regulations.

REGULATORY INFORMATION

ERMA Register Approval No:

HSNO Controls:

Hazardous Substances (Disposal) Regulations 2001.
Hazardous Substances (Personnel Qualifications) Regulations 2001.
Hazardous Substances (Emergency Management) Regulations 2001.
Hazardous Substances (Identification) Regulations 2001.
Hazardous Substances (Compressed Gases) Regulations 2004.
Hazardous Substances (Tank Wagon and Transportable Containers) Regulations 2004.
Schedule 10 of the Hazardous Substances (Dangerous Goods and Scheduled Toxic Substances) Transfer Notice 2004.
Schedule 12 of the Hazardous Substances (Dangerous Goods and Scheduled Toxic Substances) Transfer Notice 2004.

Approved Handlers: Approved handlers are required if more than 100 m³ is stored on site.

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OTHER INFORMATION

Compressed Hydrogen is supplied in high pressure cylinders.

Cylinder Colour:
Cylinder Valve Outlet:

References:

