



Hydrogen gas

Version 1

Revision Date 05/12/2010

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SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Hydrogen gas
 Product code :
 MSDS Number : 10000013
 Synonyms : none
 Chemical Family : Element
 Molecular formula : H₂
 Product Use Description : Chemical intermediate, hydrogenation, welding

Company

Olin Chlor Alkali Products 490 Stuart Road, NE Cleveland, Tennessee 37312	Pioneer Americas, LLC d/b/a Olin Chlor Alkali Products 490 Stuart Road, NE Cleveland, Tennessee 37312	PCI Chemicals Canada Company d/b/a Olin Chlor Alkali Products 2020 University, Suite 2190 Montreal, Quebec H3A 2A5
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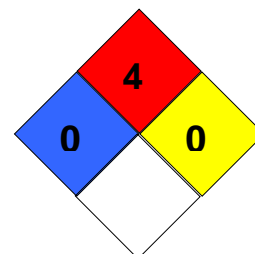
Emergency Phone Number : **US: 1-800-424-9300 - CHEMTREC**
CANADA: 1-800-567-7455

SECTION 2. HAZARDS IDENTIFICATION

HMIS Classification : Health Hazard: 0
 Flammability: 4
 Physical hazards: 0

HMIS	
Health Hazard	0
Flammability	4
Physical hazards	0

NFPA Classification : Health Hazard: 0
 Fire Hazard: 4
 Reactivity Hazard: 0



Emergency Overview

OSHA Hazards : FLAMMABLE GAS, COMPRESSED GAS
 Immediately Dangerous to Life or Health : Simple asphyxiant. From the physiological point of view, the only limiting concentration factor is given by the available air oxygen, which must be at least 18%.

Potential Health Effects

Primary Routes of Entry : Inhalation
 Aggravated Medical Condition : None known.
 Inhalation : Simple asphyxiant
 Skin : No skin irritation
 May cause frostbite (liquid).
 Eyes : No eye irritation



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May cause frostbite (liquid).

Ingestion : Not a likely route of exposure.

Chronic Exposure : None known.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

ACGIH: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components

Component	CAS-No.	Weight %
hydrogen	1333-74-0	99.00 - 100.00

SECTION 4. FIRST AID MEASURES

First aid procedures

Eye contact : • May cause frostbite (liquid).

Skin contact : • Wash off with soap and water.
• Wash frost-bitten areas with plenty of water. Do not remove clothing.

Ingestion : • Not a likely route of exposure.

Inhalation : • Move to fresh air.
• If breathing is difficult oxygen may be beneficial if administered by trained personnel.
• Call a physician or poison control center IMMEDIATELY.

Notes to physician

Comments : • Treat symptomatically and provide supportive therapy as indicated.

SECTION 5. FIRE-FIGHTING MEASURES

Flammable properties

Flash point : < -58 F (< -50 C)

Lower explosion limit : 4 %(V)

Upper explosion limit : 74 %(V)

Fire fighting



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- Suitable extinguishing media : • Carbon dioxide (CO₂)
 • Dry chemical
 • Water spray
 • Leaking gas fire: do not extinguish, unless leak can be stopped safely.
 • On large fires, use water in flooding quantities as fog.
- Further information : • Cool containers / tanks with water spray.

Protective equipment and precautions for firefighters

- Specific hazards during fire fighting : • compressed liquefied gas
 • Explosive mixtures
- Special protective equipment for fire-fighters : • In the event of fire, wear self-contained breathing apparatus.
 • Additional protective clothing must be worn to prevent personal contact with this material. Those items include but are not limited to: boots gloves, hard hat, splash-proof goggles, full face shield and impervious clothing, i.e. chemically impermeable suit.
 • Compatible materials for response to this material are neoprene and butyl rubber.
 • Contains refrigerated gas; may cause cryogenic burns or injury.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Immediately evacuate personnel to safe areas.
 Keep people away from and upwind of spill/leak.
 Restrict access to affected area.
 Use personal protective equipment.
 Use NIOSH approved respiratory protection.
 In the case of hazardous fumes, wear self contained breathing apparatus.
- Methods for containment /
 Methods for cleaning up : Remove all sources of ignition.
 Do not use sparking tools.
 Ensure all equipment is electrically grounded before beginning transfer operations.
 Allow to evaporate if safe to do so.
 Prevent product from entering drains.
 Prevent further leakage or spillage if safe to do so.
 Inform the responsible authorities in case of gas leakage, or of entry into waterways, soil or drains.
 Suppress (knock down) gases/vapours/mists with a water spray jet.
- Additional advice : • Dispose of as hazardous waste in compliance with local, province, state and federal regulations.
 • You are requested to contact the emergency numbers listed below before beginning any such operation.

FOR ALL ACCIDENTS, CALL CHEMTREC AT 800-424-9300 OR CANADA AT 1-800-567-7455.

SECTION 7. HANDLING AND STORAGE

Handling



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Handling : Personnel working with this chemical should be trained on its hazards.
Gas reduces oxygen available for breathing.

Advice on protection against fire and explosion : Ensure all equipment is electrically grounded before beginning transfer operations.
Will explode if mixed with oxygen or air.
Use explosion-proof equipment.

Storage

Requirements for storage areas and containers : Do not store together with explosives, oxidizing agents or organic peroxides.
Store at temperatures not exceeding : 100 F (38 C)

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

Contains no substances with occupational exposure limit values.

Engineering measures

Engineering measures : Use local exhaust explosion proof ventilation to maintain levels below lower explosion limit

Personal protective equipment

Skin and body protection : Contains refrigerated gas; may cause cryogenic burns or injury. Wear protective gloves/clothing.

Respiratory protection : Simple asphyxiant. From the physiological point of view, the only limiting concentration factor is given by the available air oxygen, which must be at least 18%. In case of insufficient ventilation, wear suitable respiratory equipment. Preferably a compressed airline breathing apparatus.

Suitable material

Boots.

- Neoprene

Gloves

- Neoprene

Protective suit

- Neoprene

The listed materials are guidelines only and there are numerous PPE alternatives depending on the site specifics of where the chemical is used. You should always consult with your PPE supplier for the correct tested material.

Before using this chemical you should be aware of its hazards and be knowledgeable of emergency procedures in the event of a spill.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Form : gaseous
Color : colourless
Odor : none

Safety data

Flash point : < -58 F (< -50 C)
Lower explosion limit : 4 %(V)
Upper explosion limit : 74 %(V)

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Autoignition temperature	: 986 - 1,094 F (530 - 590 C)
Molecular Weight	: 2.02 g/mol
pH	: not applicable
Melting point/range	: -434 F (-259 C)
Boiling point/boiling range	: -424 F (-253 C)
Vapor pressure	: not applicable
Bulk density	: Liquid - 0.07 g/mg at -253 °C (-435 °F)., Gas - 0.0695 compared to air at 32 °F and 1 atmosphere.
Evaporation rate	: no data available

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	: <ul style="list-style-type: none">• Avoid temperatures above 60°C, direct sunlight and contact with sources of heat.• Take precautionary measures against static discharge.
Materials to avoid	: <ul style="list-style-type: none">• Oxygen, Oxidizing agents, Bromine, Chlorine, Fluorine, Interhalogen compounds, some catalysts in the presence of air, active metals such as lithium
Hazardous decomposition products	: none
Thermal decomposition	: Stable under normal conditions.
Hazardous polymerization	: Does not occur.

SECTION 11. TOXICOLOGICAL INFORMATION**Human Threshold Response**

Odor threshold	: no data available
Irritation Threshold	: no data available
Immediately Dangerous to Life or Health	: Simple asphyxiant. From the physiological point of view, the only limiting concentration factor is given by the available air oxygen, which must be at least 18%.

Animal Toxicology

Acute oral toxicity	: LD50 not applicable
Acute dermal toxicity	: LD50 not applicable
Acute inhalation toxicity	: LC50 no data available

SECTION 12. ECOLOGICAL INFORMATION

Additional ecological information : This product has no known eco-toxicological effects.

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SECTION 13. DISPOSAL CONSIDERATIONS

- Waste Classification : If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have the following: D001
- Further information :
- If this product becomes a hazardous waste, it will be a hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly.
 - Dispose of as hazardous waste in compliance with local, province, state and federal regulations.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, PROVINCE, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NON HAZARDOUS WASTES.

SECTION 14. TRANSPORT INFORMATION

DOT	Proper shipping name	: Hydrogen, Compressed
	UN-Number	: UN1049
	Class	: 2.1
	Hazard Labels/Placard	: 2.1
	Emergency Response	: 115
	Guidebook Number	
TDG CLR	Proper shipping name	: Hydrogen, Compressed
	UN-Number	: UN1049
	Class	: 2.1
	Hazard Labels/Placard	: 2.1
IATA	UN-Number	: UN1049
	Description of the goods	: Hydrogen, Compressed
	Class	: 2.1
	ICAO-Labels	: 2.1
IMDG	UN-Number	: UN1049
	Description of the goods	: Hydrogen, Compressed
	Class	: 2.1
	IMDG-Labels	: 2.1
	Marine pollutant	: no

IATA: FORBBIDEN ON PASSENGER AIRCRAFT

See regulations for further information.

FOR ALL ACCIDENTS, CALL CHEMTREC AT 800-424-9300 OR CANADA AT 1-800-567-7455.

SECTION 15. REGULATORY INFORMATION**CANADIAN CLASSIFICATION**

Canadian National Pollutant Release Inventory (NPRI): No component is listed on NPRI.

This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the



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information required by the CPR.

US CLASSIFICATION

- OSHA Hazards** : Flammable Gas, Compressed Gas
- SARA 311/312 Hazards** : Fire Hazard
Sudden Release of Pressure Hazard

US STATE REGULATIONS

- Massachusetts Right To Know Components** : Hydrogen 1333-74-0
1991-07-01
- Pennsylvania Right To Know Components** : Hydrogen 1333-74-0
1991-07-01
- New Jersey Right To Know Components** : Hydrogen 1333-74-0
1991-07-01
- California Prop 65 Components** : This product is not listed, but it may contain elements known to the State of California to cause cancer or reproductive toxicity as listed under Proposition 65 State Drinking Water and Toxic Enforcement Act. For additional information, contact Olin Technical Services (800-299-6546).

GLOBAL INVENTORIES

The components of this product are reported in the following inventories:

- EINECS** : On the inventory, or in compliance with the inventory
- TSCA** : On TSCA Inventory
- AICS** : On the inventory, or in compliance with the inventory
- DSL** : All components of this product are on the Canadian DSL list.
- ENCS** : Not in compliance with the inventory
Hydrogen 1333-74-0
- KECI** : On the inventory, or in compliance with the inventory
- PICCS** : On the inventory, or in compliance with the inventory
- IECSC** : On the inventory, or in compliance with the inventory
- NZIoC** : On the inventory, or in compliance with the inventory

SECTION 16. OTHER INFORMATION

Further information



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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Prepared by: : ORC MSDS Control Group
Olin Chlor Alkali Products
1186 Lower River Rd.
P.O. Box 248
Charleston, TN 37310
Phone Number: (888) 658-MSDS (6737)