Safety Data Sheet

Argon/Hydrogen, mixture

US Cylinder Gas
Alsip, IL

Section 1: Product and Company Identification

US Cylinder Gas
Alsip, IL

Product Code: **Argon/Hydrogen Mix**
Part Number: Argon/Hydrogen Mix

Synonyms: Ar/H2 Mix, H-5, H-2
Recommended Use: Industrial use. Use as directed.
Usage Restrictions:

Section 2: Hazards Identification

Warning

Hazard Classification:	Gases Under Pressure, H280 Simple Asphyxiant, OSHA-H01
Hazard Statements:	H280: Contains gas under pressure; may explode if heated CGA-HG08: BURNS WITH INVISIBLE FLAME. OSHA-H01: MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION.
Precautionary Statements	
	P202: Do not handle until all safety precautions have been read and understood. P271+P403: Use and store only outdoors or in a well-ventilated place. CGA-PG02: Protect from sunlight when ambient temperature exceeds 52C (125F). CGA-PG05: Use a back flow preventive device in the piping. CGA-PG06: Close valve after each use and when empty. CGA-PG10+CGA-PG20: Use only with equipment of compatible materials of construction and rated for cylinder pressure. CGA-PG12: Do not open valve until connected to equipment prepared for use. CGA-PG27: Read and follow the Safety Data Sheet (SDS) before use.

Section 3: Composition/Information on Ingredients

	CAS #	Concentration
Hydrogen	1333-74-0	0 – 5.5%
Argon	7440-37-1	Balance

	Chemical Substance	Chemical Family	Trade Names
Hydrogen	HYDROGEN	Inorganic gases	HYDROGEN GAS; HYDROGEN COMPRESSED; HYDROGEN (H2); DIHYDROGEN; UN 1049; H2
Argon	ARGON, COMPRESSED	Inorganic gases	ARGON; UN 1006; AR

Section 4: First Aid Measures

	Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
Hydrogen	Wash exposed skin with soap and water.	Flush eyes with plenty of water.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.
Argon	Not applicable route of exposure	Flush eyes with plenty of water.	Not applicable route of exposure	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.

Section 5: Fire Fighting Measures

	Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters
Hydrogen	Carbon dioxide, regular dry chemical Large fires: Flood with fine water spray.	None known	▪ Any self-contained breathing apparatus with a full facepiece. ▪ Any self-contained breathing apparatus with a full facepiece.
Argon	Non-flammable gas	Not applicable	▪ N/a ▪ N/A

Section 6: Accidental Release Measures

	Personal Precautions	Environmental Precautions	Methods for Containment
Hydrogen	Keep unnecessary people away, isolate hazard area and deny entry. Do not touch spilled material. Ventilate closed spaces before entering.	Avoid heat, flames, sparks and other sources of ignition.	Reduce vapors with water spray. Remove sources of ignition.
Argon	Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.	None known.	Stop leak if possible without personal risk.

	Methods for Cleanup	Other Information
Hydrogen	Stop leak if possible without personal risk.	None
Argon	Leaks may be detected by a soapy-water solution.	

Section 7: Handling and Storage

	Handling	Storage
Hydrogen	Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.
Argon	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.	Avoid using in confined spaces.

Section 8: Exposure Controls/Personal Protection

	Exposure Guidelines
Hydrogen	HYDROGEN: ACGIH (simple asphyxiant)
Argon	ARGON, COMPRESSED: ARGON: ACGIH (simple asphyxiant)

Engineering Controls

Handle only in fully enclosed systems.

	Eye Protection	Skin Protection	Respiratory Protection
Hydrogen	Eye protection not required, but recommended.	Protective clothing is not required. Wear appropriate chemical resistant gloves.	Any self-contained breathing apparatus with a full facepiece.
Argon	Eye protection not required, but recommended.	Protective clothing is not required. Wear appropriate chemical resistant gloves.	N/a

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

Section 9: Physical and Chemical Properties

	Physical State	Appearance	Color	Change in Appearance	Physical Form	Odor
Hydrogen	Gas	Colorless	Colorless	N/A	Gas	Odorless
Argon	Gas	Colorless	Colorless	N/A	Gas	Odorless

	Taste	Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits
Hydrogen	Tasteless	Flammable gas (burns at all ambient temperatures)	Not available	Not available	752 F (400 C)	0.75
Argon	Tasteless	Not flammable			Nonflammable	Nonflammable

	Lower Explosive Limits	Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity
Hydrogen	0.04	-423 F (-253 C)	-434 F (-259 C)	760 mmHg @ -253 C	0.07 (Air=1)	Not applicable
Argon	Nonflammable	-303 F (-186 C)	-308 F (-189 C)	500 mmHg @ -190 C	1.38 (Air=1)	Not applicable

	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity	Molecular Weight
Hydrogen	1.82% @ 20 C	Not applicable	Not available	Not applicable	0.008957 cP @ 26.8 C	2

	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity	Molecular Weight
Argon	3.36% @ 20 C	Not applicable	Not available	Not applicable	0.0225 cP @ 25 C	39.948

	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
Hydrogen	H2	0.08987 g/L @ 0 C	Not available	Not available	Not applicable	Soluble : Not available
Argon	AR	1.784 g/L @ 0 C	Not available	100%	Not applicable	Soluble : Organic solvents

Section 10: Stability and Reactivity

	Stability	Conditions to Avoid	Incompatible Materials
Hydrogen	Stable at normal temperatures and pressure.	Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat.	Metals, oxidizing materials, metal oxides, combustible materials, halogens, metal salts, halo carbons, nitrogen triflouride, oxygen diflouride, magnesium and calcium carbonate, sodium, potassium
Argon	Stable at normal temperatures and pressure.	Protect from physical damage and heat. Containers may rupture or explode if exposed to heat.	No data available.

	Hazardous Decomposition Products	Possibility of Hazardous Reactions
Hydrogen	Miscellaneous decomposition products	Will not polymerize.
Argon	No data available.	Will not polymerize.

Section 11: Toxicology Information

Acute Effects

	Oral LD50	Dermal LD50	Inhalation
Hydrogen	Not available	Not available	Nausea, vomiting, difficulty breathing, irregular heartbeat, headache, fatigue, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, convulsions, unconsciousness, coma
Argon	Not established	Not established	Nausea, vomiting, difficulty breathing, irregular heartbeat, headache, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma

	Eye Irritation	Skin Irritation	Sensitization
Hydrogen	Not irritating	Not irritating	Difficulty breathing
Argon	No information on significant adverse effects	No information on significant adverse effects	

Chronic Effects

	Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
Hydrogen	Not available	Not available	Not available	No data
Argon	Not established	Not established	Not established	No data

Section 12: Ecological Information

Fate and Transport

	Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
Hydrogen	Fish toxicity: Not available Invertibrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available
Argon	Fish toxicity: Not available Invertibrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available

Section 13: Disposal Considerations

Hydrogen	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Argon	Dispose in accordance with all applicable regulations.

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

DOT Information For This Mixture

Shipping Name	Compressed gas, n.o.s. (Hydrogen, Argon)
UN Number	UN1956
Hazard Class	2.2
Hazard Information	NonFlammable Gas

Individual Component Information

	Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requirements	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Description
Hydrogen	Hydrogen, compressed	UN1049	2.1	Not applicable	2.1	Forbidden	150 kg	None
Argon	Argon, compressed	UN1006	2.2	Not applicable	2.2	75 kg or L	150 kg	N/A

Canadian Transportation of Dangerous Goods

	Shipping Name	UN Number	Class	Packing Group / Risk Group
Hydrogen	Hydrogen, compressed	UN1049	2.1	Not applicable
Argon	Argon, compressed	UN1006	2.2	Not applicable

Section 15: Regulatory Information

U.S. Regulations

	CERCLA Sections	SARA 355.30	SARA 355.40
Hydrogen	Not regulated.	Not regulated.	Not regulated.
Argon	Not regulated.	Not regulated.	Not regulated.

SARA 370.21

	Acute	Chronic	Fire	Reactive	Sudden Release

Hydrogen	Yes	No	Yes	No	Yes
Argon	Yes	No	No	No	Yes

SARA 372.65

Hydrogen	Not regulated.
Argon	Not regulated.

OSHA Process Safety

Hydrogen	Not regulated.
Argon	Not regulated.

State Regulations

	CA Proposition 65
Hydrogen	Not regulated.
Argon	Not regulated.

Canadian Regulations

	WHMIS Classification
Hydrogen	A, B1.
Argon	A

National Inventory Status

	US Inventory (TSCA)	**TSCA 12b Export Notification**	**Canada Inventory (DSL/NDSL)**
Hydrogen	Listed on inventory.	Not listed.	Listed on inventory.
Argon	Listed on inventory.	Not listed.	Listed on inventory.

Section 16: Other Information

	NFPA Rating
Hydrogen	HEALTH=0 FIRE=4 REACTIVITY=0
Argon	HEALTH=0 FIRE=0 REACTIVITY=0 SPECIAL=SA

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard