Acetylene

SDS No.: HKO-001G Revision date: 23/11/2022 Version no.: 03

SECTION 1: Identification of the substance or mixture and of the company

1.1 Product Identifier

Product name	:	Acetylene, dissolved
Chemical name	:	Acetylene (ethyne)
Chemical formula	:	C_2H_2
CAS no.	:	74-86-2

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

Identified uses	:	Industrial and professional. Fuel gas for welding, cutting, heating, brazing and soldering applications. Use as a fuel. Use for electronic component manufacture. Using gas alone or in mixtures for the calibration of analysis equipment. Using gas as feedstock in chemical processes. Formulation of mixtures with gas in pressure receptacles. Metal coating by spray gun. Lubrication of moulds for the manufacture of glass bottles. Consumer use. Fuel gas for welding, cutting, heating, brazing and soldering applications. It is the responsibility of the end user to ensure that the product as supplied is suitable for its intended use.

1.3 Details of the supplier of the safety data sheet

Supplier name	:	Linde HKO Limited
Address	:	12 Chun Yat Street, Tseung Kwan O Industrial Estate, Tseung Kwan O, Kowloon, Hong Kong
Phone no.	:	(852) 2372-2288
Fax no.	:	(852) 2372-2508

1.3 Emergency telephone number

Emergency no.	:	(852) 2661 0920 (24 hours)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

Flammable gas (Category 1)	:	H220: Extremely flammable gas.
Chemically unstable gases (Category A)	:	H230: May react explosively even in the absence of air.
Gases under pressure (Dissolved gas)	:	H280: Contains gas under pressure; may explode if heated.

2.2 Label Elements

Pictograms :

Signal word : Danger

Hazard statements : H220: Extremely flammable gas.

: H230: May react explosively even in the absence of air.

: H280: Contains gas under pressure; may explode if heated.

Precautionary statements

General : None

Prevention : P202: Do not handle until all safety precautions have been read and understood.

: P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response : P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

: P381: In case of leakage, eliminate all ignition sources.

Storage : P403: Store in a well-ventilated place.

Disposal : P501: Dispose of cylinder via gas supplier only; cylinder contains a porous material which in some cases contains asbestos.

2.3 Other hazards

For safety reasons, acetylene is dissolved in a solvent, either acetone (CAS No, 67-64-1) or N,N-dimethylformamide (DMF) (CAS No. 68-12-2). A small quantity of the solvent (as an impurity) may be carried over with the acetylene as it is used. The concentration of the solvent in the gas is below the limit which could affect the classification of the acetylene.

SECTION 3: Composition/ information on ingredients

3.1 Substances

Chemical name : Acetylene (ethyne)
Chemical formula : C_2H_2
CAS no. : 74-86-2
EC no. : 200-816-9
INDEX no. : 601-015-00-0
REACH registration number : 01-2119457406-36-0041, UK-01-3758468859-4-0001

Ingredient(s)	CAS No.	EC no.	Purity
Acetylene (ethyne)	74-86-2	200-816-9	≥98.5%

3.2 Mixtures

Not Applicable

SECTION 4: First Aid Measures

4.1 Description of first aid measures

Inhalation : In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
Eye contact : Adverse effects not expected from this product.
Skin Contact : Adverse effects not expected from this product.
Ingestion : Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed

Respiratory arrest.

4.3 Immediate medical attention and special treatment needed

None

SECTION 5: Firefighting Measures

5.1 Extinguishing media

Suitable extinguishing media : Water Spray or Fog Dry powder. Foam.

Unsuitable extinguishing media : Carbon dioxide

5.2 Special hazards arising from the substance or mixture

Fire or excessive heat may produce hazardous decomposition products. When involved in a fire, acetylene can begin to decompose, breaking down into its constituent elements of hydrogen and carbon. The decomposition reaction is exothermic and produces heat. Acetylene cylinders are designed to contain and inhibit decomposition of acetylene, however, if left unchecked decomposition could lead to cylinder failure. Acetylene may continue to be a hazard after an external fire has been extinguished, due to the decomposition of the acetylene within the cylinder, and requires specific operational procedures.

Hazardous Combustion Products : If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: carbon monoxide.

5.3 Advice for firefighters

Special fire fighting procedures : In case of fire: Stop leak if safe to do so. Do not extinguish flames at leak because possibility of uncontrolled explosive re-ignition exists. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out. Acetylene cylinders that have been heated, damaged by fire or subjected to a flash back must not be moved until it has been demonstrated that there is no decomposition of the acetylene within the cylinder. Acetylene cylinders should be cooled with a water spray and a hazard zone designated around them. Water cooling should be continued for at least one hour. After a minimum of one hour of water cooling the cylinder's temperature should be checked to see if it has been effectively cooled. Effectively cooled means bringing the cylinder shell temperature down to ambient temperature. The "Wetting test" and/or thermal imaging equipment should be used to ascertain if the cylinder shell has been effectively cooled. When effective cooling of the cylinder shell has been achieved, water cooling should be stopped. The cylinder should still not be moved for a further one hour, during this time temperature checks of the

cylinder shell should be made every 15 minutes. If any increase in temperature is observed a further one-hour of continuous water cooling should be applied to the cylinder before its temperature is re-checked. When the cylinder shell temperature remains at ambient temperature for one hour without being water cooled, and is not leaking, the cylinder may be moved.

Special protective equipment for firefighters : Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and Self-Contained Breathing Apparatus (SCBA).

SECTION 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Evacuate area. Provide adequate ventilation. Consider the risk of potentially explosive atmospheres. In case of leakage, eliminate all ignition sources. Monitor the concentration of the released product. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus (SCBA) when entering area unless atmosphere is proved to be safe.

6.2 Environmental Precautions

Prevent further leakage or spillage if safe to do so.

6.3 Methods and material for containment and cleaning up

Provide adequate ventilation. Eliminate sources of ignition.

6.4 Reference to other sections

See also sections 8 and 13.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling

Only experienced and properly instructed persons should handle gases under pressure. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Purge air from system before introducing gas. Containers, which contain or have contained flammable or explosive substances, must not be inerted with liquid carbon dioxide. Assess the risk of a potentially explosive atmosphere and the need for suitable equipment i.e. explosion-proof. Take precautionary measures against static discharges. Keep away from ignition sources (including static discharges). Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres. Use non-sparking tools. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Ensure the complete system has been (or is regularly) checked for leaks before use. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Secure cylinders in an upright position at all times, close all valves when not in use. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow backfeed into the container. Avoid suckback of water, acid and alkalis. Keep container below 50°C in a well ventilated place. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with local/regional/national/international regulations. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Damaged valves should be reported immediately to the supplier. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to repair or modify container valves or safety relief devices. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminates particularly oil and water. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to transfer gases from one container to another. Container valve guards or caps should be in place. Avoid suckback of water, acid and alkalis. Solvent may accumulate in piping systems. For maintenance use appropriately chemically resistant gloves and goggles. Only equipment fitted with suitable means of preventing a ‘flash back’ should be fitted to the cylinders. Mechanical shock alone to a cold acetylene cylinder cannot initiate decomposition.

7.2 Conditions for safe storage, including any incompatibilities

All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere. Segregate from oxidant gases and other oxidants being stored. Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material. Acetylene cylinders should be stored vertically. If a cylinder has been transported horizontally, it should be stood upright for a minimum of 1 hour prior to use. This will allow the acetone to evenly re-distribute within the cylinder and prevent acetone being carried into the flame during use causing a 'flame thrower' effect.

7.3 Specific end uses

None

SECTION 8: Exposure Controls/Personal Protection

8.1 Control parameters

Occupational Exposure Limits	:	No exposure limits have been established for this product.
Biological limits	:	No biological limits have been established for this product.

8.2 Exposure controls

Appropriate engineering controls	:	Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below lower explosion limits. Gas detectors should be used when quantities of flammable gases or vapours may be released. Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Systems under pressure should be regularly checked for leakages. Product to be handled in a closed system. Use only permanent leak tight installations (e.g. welded pipes). Take precautionary measures against static discharges.

Individual protection measures, such as personal protective equipment.

Eye protection	:	Wear safety glasses.
Hand Protection	:	Wear leather or cotton gloves.
Body protection	:	Wear coveralls and safety boots.
Respiratory Protection	:	If using product in a confined area, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator.

SECTION 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance		
Physical state	:	Gas
Form	:	Dissolved gas
Colour	:	Colorless
Odour	:	Garlic-like odor
Odour Threshold	:	No data available.
pH	:	No data available.
Melting Point	:	-80.7 °C
Boiling Point	:	-84.7 °C (101.3 hPa)
Sublimation Point	:	No data available.
Critical Temp. (°C)	:	35.0 °C
Flash Point	:	No data available.
Evaporation Rate	:	No data available.
Flammability (solid, gas)	:	Flammable gas
Flammability limit - upper (%)	:	99.99 %(V)
Flammability limit – lower (%)	:	2.3 %(V)
Vapour pressure	:	4,535 kPa (22 °C)
Vapour density (air=1)	:	0.91 (AIR=1)
Relative density	:	0.377 (25 °C)
Solubility (in Water)	:	1,200 mg/l (25 °C)
Partition coefficient (n-octanol/water)	:	0.37
Autoignition Temperature	:	305 °C
Decomposition Temperature	:	635 °C
Viscosity		
Kinematic viscosity	:	No data available.
Dynamic viscosity	:	0.011 mPa.s
Explosive properties	:	No data available.
Oxidising Properties	:	No data available.

9.2 Other information

Additional information	:	None

SECTION 10: Stability and Reactivity

10.1 Reactivity

No reactivity hazard other than the effects described in sub-section below.

10.2 Chemical Stability

Stable under normal conditions.

10.3 Possibility of Hazardous Reactions

Can form a potentially explosive atmosphere in air. May react violently with oxidants. Forms explosive acetylides with copper, silver and mercury. Do not use alloys containing more than 65% copper.

10.4 Conditions to Avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. High temperature High pressure May decompose violently at high temperature and/or pressure or in the presence of a catalyst.

10.5 Incompatible Materials

Air and oxidisers. Avoid contact with pure copper, mercury, silver and brass with greater than 65% copper.
Do not use alloys containing more than 43% silver.

10.6 Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced. If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: The following decomposition products may be produced: carbon monoxide.

SECTION 11: Toxicological Information

11.1 Information on toxicological effects

Acute toxicity		
Oral	:	Based on available data, the classification criteria are not met.
Inhalation	:	Based on available data, the classification criteria are not met.
Dermal	:	Based on available data, the classification criteria are not met.
Skin Corrosion/Irritation	:	Based on available data, the classification criteria are not met.
Serious Eye Damage/Eye Irritation	:	Based on available data, the classification criteria are not met.
Respiratory or Skin Sensitisation	:	Based on available data, the classification criteria are not met.
Germ Cell Mutagenicity	:	Based on available data, the classification criteria are not met.
Carcinogenicity	:	Based on available data, the classification criteria are not met.
Reproductive toxicity	:	Based on available data, the classification criteria are not met.
Specific Target Organ Toxicity		
Single Exposure	:	Based on available data, the classification criteria are not met.
Repeated Exposure	:	Based on available data, the classification criteria are not met.
Aspiration Hazard	:	Not applicable to gases and gas mixtures.

SECTION 12: Ecological Information

12.1 Toxicity

No ecological damage caused by this product.

12.2 Persistence and Degradability

Not applicable.

12.3 Bioaccumulative Potential

The subject product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment.

12.4 Mobility in Soil

Because of its high volatility, the product is unlikely to cause ground or water pollution.

12.5 Other Adverse Effects

No ecological damage caused by this product.

SECTION 13: Disposal Considerations

13.1 Waste treatment methods

Disposal method : Do not discharge into any place where its accumulation could be dangerous. Cylinders should be returned to the supplier for disposal of contents.

SECTION 14: Transport Information

ADR/RID

14.1 UN Number : UN 1001
14.2 UN proper shipping name : ACETYLENE, DISSOLVED
14.3 Transport Hazard Class(es)
Class : 2
Label(s) : 2.1: Flammable gases
Classification Code : 4F
Hazard No. : 239
14.4 Packaging group : None
14.5 Environmental hazards : Not Applicable
14.6 Special precautions for user : None

IMDG

14.1 UN Number : UN 1001
14.2 UN proper shipping name : ACETYLENE, DISSOLVED
14.3 Transport Hazard Class(es)
Class : 2.1
Label(s) : 2.1: Flammable gases
14.4 Packaging group : None
14.5 Environmental hazards : Not Applicable
14.6 Special precautions for user : None

IATA

14.1 UN Number	:	UN 1001
14.2 UN proper shipping name	:	ACETYLENE, DISSOLVED
14.3 Transport Hazard Class(es)		
Class	:	2.1
Label(s)	:	2.1: Flammable gases
14.4 Packaging group	:	None
14.5 Environmental hazards	:	Not Applicable
14.6 Special precautions for user	:	None
Other information		
Passenger and cargo aircraft	:	Forbidden
Cargo aircraft only	:	Allowed

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code

Not Applicable

14.8 Additional information

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 that they are firmly secured. Ensure that the container valve is closed and not leaking. Container valve guards or caps should be in place. Ensure adequate air ventilation.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Local legislation : Dangerous Goods Ordinance (Chapter 295)

: Factories And Industrial Undertakings (Dangerous Substances) Regulation (Chapter 59AB)

SECTION 16: Other Information

Other information	:	Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national/local regulations are observed. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.
Revision date	:	23/11/2022
Disclaimer	:	The above information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

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