ACETYLENE

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier : ACETYLENE

CAS No. : 74-86-2

Chemical formula : C2H2

Synonyms : Acetylene (dissolved), Ethyne, welding gas

REACH Registration Number : 01-2119457406-36

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

Use of the substance/mixture : General Industrial and Professional use. Perform risk assessment prior to use.

Restriction on Use : None

Details of the supplier of the safety data sheet

Physical address : Air Products South Africa (Pty) Ltd.
Silver Stream Business Park, 1st Floor, Building 3,
10 Muswell Road South,
Bryanston, 2191

Telephone : +27 (0)11 570 5000 (Head Office)
+27 (0)11 977 6444 (Customer Care Cylinders)
0800 023 298 (Engineering / Bulk Services)

Emergency telephone number (24h) : 0800 650 315

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

Flammable gases – 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.

Label elements

Hazard pictograms/symbols

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:

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: Eliminate all ignition sources if safe to do so.

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

Other hazards

High pressure gas.

Can cause rapid suffocation.

Extremely flammable.

May form explosive mixtures in air.

Immediate fire and explosion hazard exists when mixed with air at concentrations exceeding the lower flammability limit (LFL).

High concentrations that can cause rapid suffocation are within the flammable range and should not be entered.

Avoid breathing gas.

Self-contained breathing apparatus (SCBA) may be required.

Environmental Effects

Not harmful.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Substances

Components	EINECS/ELINCS Number	CAS Number	Concentration (Volume)
Acetylene	200-816-9	74-86-2	100%

Components	Classification (CLP)	REACH Reg.#
Acetylene	Flam. gas 1; H220 Chem. Unst. Gas A; H230 Press. Gas (Diss.); H280	01-2119457406-36

Refer to section 16 for full text of each relevant hazard statement (H)

Concentration is nominal. For exact composition, please refer to Air Products specifications. For safety reasons, the acetylene is dissolved in acetone (Flam. Liq 2, Eye Irrit. 2, STOT SE 3). Vapour of the solvent is carried away as impurity when the acetylene is extracted from the gas receptacle. The concentration of the solvent vapour in the gas is lower than the concentration limits to change the classification of the acetylene. The applicable information from the exposure scenarios for this product are contained in the main body of the SDS.

Mixtures : Not applicable

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice : Move 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 : In case of direct contact with eyes, seek medical advice

Skin contact : Adverse effects not expected from this product. IF exposed or concerned: Get medical advice/attention.

Ingestion : Ingestion is not considered a potential route of exposure.

Inhalation : In case of shortness of breath, give oxygen. Move to fresh air. If breathing has stopped or is laboured, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Seek medical advice.

Most symptoms and effects, both acute and delayed

Symptoms : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness.

Indication of any immediate medical attention and special treatment

Treatment : If exposed or concerned: Get medical attention/advice.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media : Water spray or fog. Dry powder

Shutting off the source of the gas is the preferred method of control. Be aware of the risk of formation of static electricity with the use of CO2 extinguishers and do not use them in places where a flammable atmosphere maybe present

Extinguishing media which must not be used for safety reasons : Do not use water jet to extinguish.

Special hazards arising from the substance/mixture

Incomplete combustion may form carbon monoxide. Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Keep containers and surroundings cool with water spray. Extinguish fire only if gas flow can be stopped. If possible, shut off the source of gas and allow the fire to burn itself out. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire. Move away from container and cool with water from a protected position. Keep adjacent cylinders cool by spraying with large amounts of water until fire burns itself out. If flames are accidentally extinguished, explosive re-ignition may occur; therefore, appropriate measures should be taken (e.g., total evacuation to protect persons from cylinder fragments and toxic fumes should a rupture occur).

Advice for fire-fighters : In confined areas use self-contained breathing apparatus. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. Standard EN 137 – Self-contained open-circuit compressed air breathing apparatus with full face mask. Standard EN 469 – Protective clothing for fire-fighters. Standard EN 659 – Protective gloves for fire-fighters

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Evacuate personnel to safe areas. Remove all sources of ignition. Never enter a confined space or other area where the flammable gas concentration is greater the 10% of its lower flammable limit. Ventilate the area.

Environmental precautions : Do not discharge into any place where its accumulation could be dangerous. Should not be released into the environment. Prevent further leakage or spillage if safe to do so.

Methods and materials for containment and cleaning up

Ventilate the area. Approach suspected leak areas with caution.

Additional advice : Increase ventilation to the release area and monitor concentrations. If leak is from cylinder or cylinder valve, call the Air Products emergency telephone number. If the leak is in the user's system, close the cylinder valve, safely vent the pressure, and purge with an inert gas before attempting repairs.

Reference to other sections : For more information refer to section 8 and 13.

SECTIONS 7: HANDLING AND STORAGE

Precautions for safe handling

Acetylene cylinders are heavier than other cylinders because they are packed with a porous filler material and acetone. Never use acetylene in excess of 15 psig pressure. Cylinders should be stored up right with valve protection guard in place and firmly secured to prevent falling or being knocked over. Use equipment rated for cylinder pressure. Ensure adequate ventilation. Solvent may accumulate in piping systems. For maintenance activities use appropriate resistant gloves, assess the necessity to us a respiratory filter device (specific gloves and filters for acetone use), wear safety goggles. Avoid breathing in vapour of the solvent. Provide adequate ventilation. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C. Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Do not remove valve guards. Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials. Before connecting the container for use, ensure that back feed from the system into the container is prevented.

Flashback arrestors: The use of flashback arrestors is crucial in fuel cutting operations, it is used as a safety device preventing dangerous flashbacks that can cause explosions and equipment damage. Flashback arrestors work by stopping the reverse flow of gas and extinguishing any flames that might travel back towards the gas source.

Ensure the complete gas system is compatible for pressure rating and materials of construction. Ensure the complete gas system has been checked for leaks before use. Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container. Never insert an object (e.g., wrench, screwdriver, pry bar, etc) into valve openings. Doing so may damage valve, causing a leak to occur.

Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact 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. Damaged valves should be reported immediately to the supplier. Close valve after each use and when empty. Do not subject containers to abnormal mechanical shocks which may cause damage to their valve or safety devices. Never attempt to lift a cylinder by its valve protection cap or guard. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Do not smoke while handling product or cylinders. Never recompress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. Purge air from system before introducing gas. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C. Prolonged periods of cold temperature below -30°C should be avoided. Ensure equipment is adequately earthed.

Conditions for safe storage, including any incompatibilities

Containers should be stored in a purpose-built compound which should be well ventilated, preferably in the open air. Observe all regulations and local requirements regarding storage of containers. Stored containers should be periodically checked for general condition and leakage. Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Keep containers tightly closed in a cool, well-ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C. Smoking should be prohibited within storage areas or while handling product or containers. Display "No Smoking or Open Flames" signs in the storage areas. The amounts of flammable or toxic gases in storage should be kept to a minimum. Return empty containers in a timely manner.

Technical measures/Precautions

Containers should be segregated in the storage area according to the various categories (e.g., flammable, toxic, etc.) and in accordance with local regulations. Keep away from combustible material. All electrical equipment in the storage areas should be compatible with flammable materials stored. Containers containing flammable gases should be stored away from other combustible materials.

Where necessary containers containing oxygen and oxidants should be separated from flammable gases by a fire-resistant partition.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control parameters

DNEL: Derived no effect level (Workers)
Acute - systemic effects : 2675 mg/m3
Inhalation

Long-term - systemic effects : 2675 mg/m3
Inhalation

PNEC: predicted no effect concentration: None established.

Exposure controls

Engineering measures

Provide natural or explosion-proof ventilation that is adequate to ensure flammable gas does not reach its lower explosive limit.

Personal protective equipment

Respiratory protection	:	High concentrations that can cause rapid suffocation are within the flammable range and should not be entered.
Hand protection	:	Wear work gloves when handling cylinders. Standard EN 388- Protective gloves against mechanical risk. The breakthrough time of the selected glove(s) must be greater than the intended use period.
Eye/face protection	:	Safety glasses recommended when handling cylinders. Standard EN 166-Personal eye-protection.
Skin and body protection	:	Consider the use of flame resistant anti-static safety clothing. Standard EN ISO 14116- Limited flame spread materials. Standard EN ISO 1149-5 Protective clothing: electrostatic properties. Safety shoes are recommended when handling cylinders. Standard EN ISO 20345 - Personal protective equipment-Safety footwear. Wear as appropriate: Flame retardant protective clothing.
Special instructions for protection and hygiene	:	Ensure adequate ventilation, especially in confined areas.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form	:	Dissolved gas.
Colour	:	Colourless gas
Odour	:	Poor warning properties at low concentrations. Garlic-like.
Molecular Weight	:	26.04 g/mol
Relative vapour density	:	0.899 (air = 1) Lighter or similar to air.
Vapour pressure	:	44.00 bar (638.14 psia) at 20 °C
Density	:	0.0011 g/cm^3 at 21 °C Note: (as vapour)
Relative density	:	Not applicable
Specific Volume	:	0.9221 m^3/kg at 21 °C
Boiling point/range	:	-84.2 °C
Critical temperature	:	35.6 °C
Melting point/range	:	-80.8 °C
Flash point	:	-18 °C
Auto-ignition temperature	:	305 °C
Upper flammability limit	:	100 %(V)
Lower flammability limit	:	2.3 %(V)
Water solubility	:	1.185 g/l
Partition coefficient n-octanol/water [log Kow]	:	0.37
pH	:	Not applicable
Viscosity	:	No reliable data available
Particle characteristics	:	Not applicable
Decomposition temperature	:	780°C

Other information

Explosive properties	:	Not applicable
Oxidizing properties	:	Not applicable
Odour threshold	:	Odour threshold is subjective and inadequate to warn of overexposure
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Refer to production classification in section 2

SECTION 10: STABILITY AND REACTIVITY

Reactivity : No reactivity hazard other than the effects described in sub-sections below

Chemical Stability : Stable under normal conditions.

Possibility of hazardous reactions : Unstable. Stable as shipped. Do not use at pressure above 1.03 Bar.

Conditions to avoid : Cylinders should not be exposed to sudden shock or sources of heat. Heat, flames, and sparks. May form explosive mixtures with air and oxidizing agents.

Incompatible Materials : Oxygen, Oxidizing agents. Under certain conditions, acetylene can react with copper, silver, and mercury to form acetylides, compounds which can act as ignition sources. Brasses containing less than 65% copper in the alloy and certain nickel alloys are suitable for acetylene service under normal conditions. Acetylene can react explosively when combined with oxygen and other oxidizers including all halogens and halogen compounds. The presence of moisture, certain acids, or alkaline materials tends to enhance the formation of copper acetylides.

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

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Likely routes of exposure

Effects on Eye : In case of direct contact with eyes, seek medical advice.

Effects on Skin : Adverse effects not expected from this product.

Inhalation effects : May cause anaesthetic effects. In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves.

Ingestion effects : Ingestion is not considered a potential route of exposure.

Symptoms : Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness.

Acute toxicity

Acute oral toxicity : No data available on the product itself

Acute inhalation toxicity : No data available on the product itself

Acute dermal toxicity : No data available on the product itself

Skin corrosion/irritation : No data available

Serious eye damage / irritation : No data available

Sensitization : No data available

Chronic toxicity or effects from long term exposure

Carcinogenicity : No data available

Reproductive toxicity : No data available on the product itself

Germ cell mutagenicity : No data available on the product itself

Specific target organ systemic toxicity (single exposure) : No data available

Specific target organ systemic toxicity (repeated exposure) : No data available

Aspiration hazard : No data available

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity : LC50 (96h): 545mg/l Species: Fish.
EC50 (48h): 242mg/l Species: Daphnia magna.
EC50 (72h): 57mg/l Species: Algae

Toxicity to other organisms : No data available.

Persistence and degradability

No data available

Bio accumulative potential : No data is available on the product itself.

Mobility in soil : No data available.

Other adverse effects

This product has no known eco-toxicological effects.

Effect on the ozone layer : No known effects from this product.

Ozone Depleting Potential : None

Effect on global warming : No known effects from this product.

Global Warming Potential : None

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods : Contact supplier if guidance is required. Return unused product in original cylinder to supplier. 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.

Contaminated packaging : Return cylinder to supplier.

SECTION 14: TRANSPORT INFORMATION

ADR

UN/ID No.	:	UN1001
Proper shipping name	:	ACETYLENE, DISSOLVED
Class or Division	:	2
Tunnel Code	:	(B/D)
Label(s)	:	2.1
ADR/RID Hazard ID no.	:	239
Marine Pollutant	:	No

IATA

UN/ID No.	:	UN1001
Proper shipping name	:	Acetylene, dissolved
Class or Division	:	2.1
Label(s)	:	2.1
Marine Pollutant	:	No

IMDG

UN/ID No.	:	UN1001
Proper shipping name	:	ACETYLENE, DISSOLVED
Class or Division	:	2.1
Label(s)	:	2.1
Marine Pollutant	:	No
Segregation Group	:	None

RID

UN/ID No.	:	UN1001
Proper shipping name	:	ACETYLENE, DISSOLVED
Class or Division	:	2
Label(s)	:	2.1
Marine Pollutant	:	No

Further Information

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. Ensure compliance with applicable regulations.

Before transporting product containers ensure that they are firmly secured and: Cylinder valve is closed and not leaking, valve outlet cap nut or plug (where provided) is correctly fitted and the valve protection device (where provided) is correctly fitted.

The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact an Air Products customer service representative. Cylinders must be kept upright to prevent acetone movement in the cylinder.

SECTION 15: REGULATORY INFORMATION

OHS Act	:	Occupational Health and Safety Act 85 of 1993 (and Regulations)
SANS 11014	:	Safety data sheet for chemical products- Content and order of sections
SANS 10234	:	Globally Harmonized System of classification and labelling of chemicals (GHS)
SANS 10265	:	The classification and labelling of dangerous substances and preparations for sale and handling
SANS 10019	:	Transportable containers for compressed, dissolved and liquefied gases – Basic design, manufacture, use and maintenance.
SANS 1518	:	Transport of dangerous goods – Design, construction, testing, approval and maintenance of road vehicles and portable tanks
SANS 10228	:	The identification and classification of dangerous goods for transport
SANS 10229-1&2	:	Transport of dangerous goods – Packaging and large packaging for road and rail transport Part 1: Packaging / Part 2: Large Packaging
SANS 10263-2	:	The warehousing of dangerous goods Part 2: The storage and handling of gas cylinders

NB: Refer to latest edition

SECTION 16: OTHER INFORMATION

Ensure all national/local regulations are observed.

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.

Indication of Method

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

Abbreviations and acronyms

ATE – Acute Toxicity Estimate

CLP – Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008

REACH – Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006

EINECS – European Inventory of Existing Commercial Chemical Substances

ELINCS – European List of Notified Chemical Substances

CAS# - Chemical Abstract Service number

PPE – Personal Protective Clothing

Kow – octanol-water partition coefficient

LC50- Lethal Concentration to 50% of a test population

LD50 – Lethal Dose to 50% of a test population (Median Lethal Dose)

OEL – Occupational Exposure Limit

PBT – Persistent Bioaccummulative and Toxic

vPvB - Very Persistent and Very Bioaccummulative

STOT – Specific Target Organ Toxicity

EN – European Standard

UN – United Nations

ADR – European Agreement concerning the International Carriage of Dangerous Goods by Road

IATA – International Air Transport Association

IMDG – International Maritime Dangerous Goods

RID – Regulations concerning the International Carriage of Dangerous Goods by Rail

Note: In accordance with SANS 10234 Air Products South Africa's Safety data sheets will be periodically reviewed every 5 years or whenever new or significant information becomes available for our products.

(Reference www.airproducts.com:- Air Products PLC Acetylene MSDS Number 300000000002 / Version 2.1 / Revision Date 24.03.2020)