

## Chemical Safety Data Sheet MSDS / SDS

## Acetylene

Revision Date:2024-12-21 Revision Number:1

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

## Product identifier

Product name : Acetylene  
CBnumber : CB7442566  
CAS : 74-86-2  
EINECS Number : 200-816-9  
Synonyms : acetylene,C2H2

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

Relevant identified uses : For R&D use only. Not for medicinal, household or other use.  
Uses advised against : none

## Company Identification

Company : Chemicalbook  
Address : Building 1, Huihuang International, Shangdi 10th Street, Haidian District, Beijing  
Telephone : 400-158-6606

## SECTION 2: Hazards identification

## Classification of the substance or mixture

Gases under pressure: Compressed gas  
Flammable gases, Category 1A, Flammable gas

## Label elements

## Pictogram(s)

☐

Signal word : Danger

## Hazard statement(s)

H220 Extremely flammable gas

## Precautionary statement(s)

## Prevention

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**

P410+P403 Protect from sunlight. Store in a well-ventilated place.

P403 Store in a well-ventilated place.

**Disposal**

none

**Other hazards**

no data available

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## SECTION 3: Composition/information on ingredients

**Substance**

Product name	: Acetylene
Synonyms	: acetylene,C2H2
CAS	: 74-86-2
EC number	: 200-816-9
MF	: C2H2
MW	: 26.04

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## SECTION 4: First aid measures

**Description of first aid measures****If inhaled**

Fresh air, rest. Artificial respiration may be needed. Refer for medical attention.

**Following skin contact**

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

**Following eye contact**

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

**Following ingestion**

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

**Most important symptoms and effects, both acute and delayed**

Headache, dizziness and loss of consciousness may occur. Death from "smothering" may occur if oxygen content of the air is severely reduced by dilution with acetylene. (USCG, 1999)

**Indication of any immediate medical attention and special treatment needed**

Immediate first aid: Ensure that adequate decontamination has been carried out. If patient is not breathing, start artificial respiration, preferably with a demand valve resuscitator, bag-valve-mask device, or pocket mask, as trained. Perform CPR if necessary. Immediately flush contaminated eyes with gently flowing water. Do not induce vomiting. If vomiting occurs, lean patient forward or place on the left side (head-down position, if possible) to maintain an open airway and prevent aspiration. Keep patient quiet and maintain normal body temperature.

Obtain medical attention. Aliphatic hydrocarbons and related compounds

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## SECTION 5: Firefighting measures

### Extinguishing media

Stop flow of gas before extinguishing fire. Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Fight fire from protected location or maximum possible distance. Use water spray, dry chemical, form, or carbon dioxide. Acetylene, dissolved

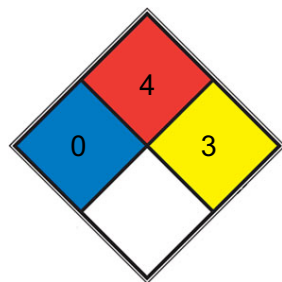
### Specific Hazards Arising from the Chemical

Behavior in Fire: May explode in fire (USCG, 1999)

### Advice for firefighters

Shut off supply; if not possible and no risk to surroundings, let the fire burn itself out. In other cases extinguish with powder, carbon dioxide. In case of fire: keep cylinder cool by spraying with water.

### NFPA 704



HEALTH 0 Poses no health hazard, no precautions necessary and would offer no hazard beyond that of ordinary combustible materials

FIRE 4 Will rapidly or completely vaporize at normal atmospheric pressure and temperature, or is readily dispersed in air and will burn readily. Includes pyrophoric substances. Flash point below room temperature at 22.8 °C (73 °F). (e.g. acetylene, propane, [hydrogen gas](#))

REACT 3 Capable of detonation or explosive decomposition but requires a strong initiating source, must be heated under confinement before initiation, reacts explosively with water, or will detonate if severely shocked (e.g. [ammonium nitrate](#), cesium, hydrogen peroxide)

SPEC.  
HAZ.

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## SECTION 6: Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation.

### Environmental precautions

Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: self-contained breathing apparatus. Ventilation.

## Methods and materials for containment and cleaning up

Evacuate danger area! Consult an expert! Ventilation. Remove all ignition sources. (Extra personal protection: self-contained breathing apparatus).

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## SECTION 7: Handling and storage

### Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Prevent build-up of electrostatic charges (e.g., by grounding). Use non-sparking handtools. Flame arrester to prevent flash-back from burner to cylinder. Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

### Conditions for safe storage, including any incompatibilities

Fireproof. See Chemical Dangers. Cool. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Segregate from oxidizing materials. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 degC (125 degF).

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## SECTION 8: Exposure controls/personal protection

### Control parameters

#### Occupational Exposure limit values

TLV

#### Biological limit values

no data available

### Exposure controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

### Individual protection measures

#### Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

#### Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

#### Respiratory protection

Use ventilation, local exhaust or breathing protection.

#### Thermal hazards

no data available

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## SECTION 9: Physical and chemical properties

### Information on basic physicochemical properties

Physical state	Gaseous.
Colour	Colourless.
Odour	Not unpleasant odor unless impure (due to phosphine)
Melting point/freezing point	-80.7 °C. Atm. press.:Not reported. Remarks:(triple point).
Boiling point or initial boiling point and boiling range	-85 °C.
Flammability	Flammable Gas
Lower and upper explosion limit/flammability limit	Lower flammable limit: 2.5% by volume; Upper flammable limit: 100% by volume
Flash point	-18°C
Auto-ignition temperature	305 °C. Atm. press.:1 013.5 hPa.
Decomposition temperature	no data available
pH	no data available
Kinematic viscosity	no data available
Solubility	2 % (NIOSH, 2016)
Partition coefficient n-octanol/water	log Pow = 0.37. Temperature:25 °C.
Vapour pressure	3.04 X 104 mmHg (~40 atmospheres) at 16.8 °C
Density and/or relative density	0.38 g/cm3. Temperature:25 °C.
Relative vapour density	0.91 (Air = 1)
Particle characteristics	no data available

## SECTION 10: Stability and reactivity

### Reactivity

The substance may polymerize. Decomposes on heating and increasing pressure. This generates fire and explosion hazard. The substance is a strong reducing agent. It reacts violently with oxidants and fluorine or chlorine under influence of light. This generates fire and explosion hazard. Reacts with copper, silver, mercury and their salts. This produces shock-sensitive compounds (acetylides).

### Chemical stability

Stability during transport: Stable as shipped.

### Possibility of hazardous reactions

Very dangerous fire hazard when exposed to heat or flame ...The gas mixes well with air, explosive mixtures are easily formed.ACETYLENE reacts with alkali metals, forming hydrogen gas. Acetylene can react explosively with bromine [Von Schwartz 1918. p.142]. Acetylene forms a sensitive acetylide when passed into an aqueous solution of mercuric nitrate [Mellor 4:933. 1946-47]. It reacts with silver, copper and lead to form sensitive, explosive salts. Since acetylene is endothermic and effectively a reducing agent, its reaction with oxidants can be very violent (examples: calcium hypochlorite, nitric acid, nitrogen oxide, ozone, trifluoromethyl hypofluorite, etc.). Contact of very cold liquefied gas with water may result in vigorous or violent boiling of the product and extremely rapid vaporization, due to the large temperature differences involved. If the water is hot, there is the possibility that a liquid "superheat" explosion may occur. Pressures may build to dangerous levels if

liquid gas contacts water in a closed container [Handling Chemicals Safely 1980]. Acetylene and ammonia can form explosive silver salts in contact with Ag. (Renner, Hermann, Gunther Schlamp. "Silver, Silver Compounds, and Silver Alloys." Ullmann's Encyclopedia of Industrial Chemistry. Wiley-VCH Verlag GmbH & Co. KGaA. 2001.).

### Conditions to avoid

no data available

### Incompatible materials

Mixture with air containing between 3-82% gas is explosive. Contact with /bleaching powder/ may lead to formation of explosive chloroacetylenes. Finely divided /cobalt/ metal decomposes and polymerizes acetylene on contact, becoming incandescent. Copper metal forms explosive compounds with acetylene. If warmed in air or oxygen, or on impact, copper acetylides may explode in subsequent contact with acetylene. Interaction with /halogens/ can be violent or explosive. Contact of acetylene with concentrated nitric acid in presence of mercury forms explosive trinitromethane or tetranitromethane if sulfuric acid is subsequently added. Mixture with /nitric oxide products/ will ignite at +30-50 deg C. Mixtures with /oxygen/ are very explosive even at very low oxygen concentrations (<2.5%). Molten /potassium/ ignites in acetylene, then explodes. /Silver/ forms explosive compounds with acetylene. Interaction with /trifluoromethyl hypofluorite/, in absence of nitrogen as diluent, is explosive on mixing.

### Hazardous decomposition products

Acetylene/, the extremely endothermic gas ... may decomposed explosively in absence of air ... /and/ readily escalates to detonation in tubular vessels. This type of explosive decomposition has been experienced in a 7 mile acetylene pipeline system ... Accidental local heating to 185 deg C or above of part of the wall (as little as 6 sq cm may be enough) of a cylinder containing acetylene may lead to the development of an extremely dangerous situation. At this temperature, exothermic and self-sustaining decomposition of (endothermic) acetylene may set in, and if not stopped by rapid and effective cooling (large volume water spray), the cylinder may explode without warning. Flame flash-back into a cylinder from a wrongly adjusted and/or damaged welding or cutting torch can cause the same effect ...

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## SECTION 11: Toxicological information

### Acute toxicity

- Oral: no data available
- Inhalation: LC50 - dog - > 850 000 ppm.
- Dermal: no data available

### Skin corrosion/irritation

no data available

### Serious eye damage/irritation

no data available

### Respiratory or skin sensitization

no data available

### Germ cell mutagenicity

no data available

### Carcinogenicity

no data available

### **Reproductive toxicity**

no data available

### **STOT-single exposure**

Asphyxiation.

### **STOT-repeated exposure**

no data available

### **Aspiration hazard**

On loss of containment this substance can cause suffocation by lowering the oxygen content of the air in confined areas.

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## **SECTION 12: Ecological information**

### **Toxicity**

Toxicity to fish: LC50 - Fish - 545 mg/L - 96 h.

Toxicity to daphnia and other aquatic invertebrates: LC50 - Daphnids - 242 mg/L - 48 h.

Toxicity to algae: EC50 - Green algae - 57 mg/L - 96 h.

Toxicity to microorganisms: no data available

### **Persistence and degradability**

AEROBIC: Acetylene, present at 1.6 mg/L, reached 0% of its theoretical BOD in 28 days using an activated sludge inoculum in the Japanese MITI test(1).

### **Bioaccumulative potential**

An estimated BCF of 3 was calculated in fish for acetylene(SRC), using a log Kow of 0.37(1) and a regression-derived equation(2). According to a classification scheme(2), this BCF suggests the potential for bioconcentration in aquatic organisms is low(SRC).

### **Mobility in soil**

The Koc of acetylene is estimated as 2(SRC), using a log Kow of 0.37(1) and a regression-derived equation(2). According to a classification scheme(3), this estimated Koc value suggests that acetylene is expected to have very high mobility in soil. Less than 1 ppm of gas acetylene was absorbed to dry soil and a maximum of 90 ppm of acetylene was absorbed to moist soil samples taken from 6 soil samples from Oregon, Iowa and Saskatchewan, Canada(4).

### **Other adverse effects**

no data available

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## **SECTION 13: Disposal considerations**

### **Disposal methods**

#### **Product**

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

#### **Contaminated packaging**

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

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## SECTION 14: Transport information

### **UN Number**

ADR/RID: UN1001 (For reference only, please check.)

IMDG: UN1001 (For reference only, please check.)

IATA: UN1001 (For reference only, please check.)

### **UN Proper Shipping Name**

ADR/RID: ACETYLENE, DISSOLVED (For reference only, please check.)

IMDG: ACETYLENE, DISSOLVED (For reference only, please check.)

IATA: ACETYLENE, DISSOLVED (For reference only, please check.)

### **Transport hazard class(es)**

ADR/RID: 2.1 (For reference only, please check.)

IMDG: 2.1 (For reference only, please check.)

IATA: 2.1 (For reference only, please check.)

### **Packing group, if applicable**

ADR/RID: (For reference only, please check.)

IMDG: (For reference only, please check.)

IATA: (For reference only, please check.)

### **Environmental hazards**

ADR/RID: No

IMDG: No

IATA: No

### **Special precautions for user**

no data available

### **Transport in bulk according to IMO instruments**

no data available

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## SECTION 15: Regulatory information

### **Safety, health and environmental regulations specific for the product in question**



### **European Inventory of Existing Commercial Chemical Substances (EINECS)**

Listed.

### **EC Inventory**

Listed.

### **United States Toxic Substances Control Act (TSCA) Inventory**

Listed.

### **China Catalog of Hazardous chemicals 2015**

Listed.

### **New Zealand Inventory of Chemicals (NZIoC)**

Listed.

### **PICCS**

Listed.

### **Vietnam National Chemical Inventory**

Listed.

### **IECSC**

Listed.

### **Korea Existing Chemicals List (KECL)**

Listed.

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## **SECTION 16: Other information**

### **Abbreviations and acronyms**

CAS: Chemical Abstracts Service

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

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

### **References**

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: [http://www.echemportal.org/echemportal/index?pagelD=0&request\\_locale=en](http://www.echemportal.org/echemportal/index?pagelD=0&request_locale=en)

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

### **Other Information**

Piping material for this gas must not contain over 63% of copper. Check oxygen content before entering area. After use for welding, turn valve off; regularly check tubing, etc., and test for leaks with soap and water. The technical product may contain impurities which alter the health effects; for further information see ICSC0694 Phosphine.

#### **Disclaimer:**

The information in this MSDS is only applicable to the specified product, unless otherwise specified, it is not applicable to the mixture of this product and other substances. This MSDS only provides information on the safety of the product for those who have received the appropriate professional training for the user of the product. Users of this MSDS must make independent judgments on the applicability of this SDS. The authors of this MSDS will not be held responsible for any harm caused by the use of this MSDS.