Chemical Safety Data Sheet MSDS / SDS

Acetylene SDS

Revision Date:2024-04-25 Revision Number:1

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

Product identifier

Product name: Acetylene

CAS: 74-86-2

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.in

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SECTION 2: Hazards identification

Classification of the substance or mixture

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

GHS label elements, including precautionary statements

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 which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name: Acetylene

Common names and synonyms: Acetylene

CAS number:	74-86-2
EC number:	200-816-9
Concentration:	100%

SECTION 4: First aid measures

Description of necessary 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/effects, 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 immediate medical attention and special treatment needed, if necessary

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

SECTION 5: Firefighting measures

Suitable 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)

Special protective actions for fire-fighters

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.

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).

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).

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV

Biological limit values

no data available

Appropriate engineering 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, such as personal protective equipment (PPE)

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

SECTION 9: Physical and chemical properties and safety characteristics

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:	4 535 kPa. Temperature: 22 °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 ...

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.

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

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.

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

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.

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?pageID=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.