

Global Product Strategy (GPS) Safety Summary

Acetylene

This GPS Safety Summary is a high-level summary intended to provide the general public with an overview of product safety information on this chemical substance. It is not intended to provide emergency response, medical or treatment information, nor to provide an overview of all safety and health information. This summary is not intended to replace the Safety Data Sheet. For detailed guidance on the use or regulatory status of this substance, please consult the Safety Data Sheet.

Chemical Identity

Name: acetylene

Brand names: acetylene, vinylene, ethine, narylene.

Chemical name (IUPAC): acetylene, ethyne

CAS number: 74-86-2

EC number: 200-816-9

Molecular formula: C₂H₂

Uses and Applications

Acetylene is manufactured as a co-product in the production of ethylene.

Acetylene is mainly used as a raw material for the production of other chemicals such as acetylene black and carbon fibres, usually as a carbon source. Other chemicals derived from acetylene include 1,4-butanediol, acetylenic alcohols, vinyl fluoride, ethyl and methyl vinyl ethers, and N-vinyl-2-pyrrolidone.

Acetylene is also used as the fuel in oxyacetylene torches for welding and cutting of metal.

Physical / Chemical Properties

At ambient temperature and pressure, acetylene is a colorless gas with a pungent odor.

Acetylene can be liquefied and solidified, however, in both liquid and solid states acetylene is shock sensitive and explodes violently. For this reason acetylene is only sold and distributed in cylinders with a porous mass as a gas dissolved in a solvent, primarily acetone.

Containers holding acetylene under pressure may explode if heated. It is stable under recommended storage conditions and no decomposition may occur if stored and applied as directed.

The boiling point and freezing point of acetylene are -84.7°C (-120.5°F) and -80.7°C (-113.3 °F), respectively.

Acetylene is extremely flammable. At concentrations above its lower flammable limit (2.5%) acetylene becomes a fire and explosion hazard. Acetylene reacts with oxidizing materials, copper compounds, halogen compounds, silver, strong acids, and strong inorganic bases.

Acetylene has been classified as hazardous under the Globally Harmonized System (GHS) for its extreme flammability.

Health Effects

The most likely route of exposure is inhalation as acetylene is a gas at standard temperature and pressure.

The table below gives an overview of the health effects assessment results for acetylene

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	This substance is of low acute toxicity by the inhalation route of exposure. This substance is a simple asphyxiant, reducing the amount of oxygen available.
Irritation / corrosion Skin / eye/ respiratory tract	No known irritation from exposure to gas
Sensitization	No known sensitization from exposure to gas.
Toxicity after repeated exposure Oral / inhalation / dermal	This substance is a low concern to health following prolonged inhalation exposures
Genotoxicity / Mutagenicity	Not mutagenic/genotoxic
Carcinogenicity	Not considered to be a human cancer concern.
Toxicity for reproduction	No evidence of reproductive effects from human experience.

Environmental Effects

Following any release, acetylene will be present in the environment as a gas (release into surface waters will be followed by rapid volatilization). Therefore, water contamination and aquatic toxicity are not expected.

The table below gives an overview of the environmental assessment results for acetylene.

Effect Assessment	Result
Aquatic Toxicity	Not expected to be toxic to aquatic life

Fate and behaviour	Result
Biodegradation	This substance is expected to be inherently biodegradable.
Bioaccumulation potential	This substance is considered unlikely to bioaccumulate.
PBT / vPvB conclusion	Not considered to be either PBT nor vPvB

PBT = Persistent, Bio-accumulative and Toxic in the environment.
vPvB = very Persistent and very Bio-accumulative in the environment.

Exposure

Human health

Exposure to acetylene of personnel in manufacturing facilities is considered very low because the process, storage and handling operations are enclosed. However, worker exposure can potentially happen during operations like product transfer operations, product sampling, or maintenance/repair activities on product containing systems. The risk of accidental exposure should be controlled and mitigated by selecting and applying the appropriate Risk Management Measures.

Environment

Acetylene is manufactured in a closed and automated process. Transfer operations (such as loading and transport) are realized with dedicated equipment and under recommended Safe Use guidance to reduce the risk of release to the environment.

Risk Management Measures

For detailed guidance on the use of acetylene, the Safety Data Sheet and the Product Stewardship Bulletin should be consulted.

Acetylene should be handled only by knowledgeable and trained personnel.

For potential exposure during welding operations, please follow the recommendations of welding gas suppliers.

Flammability

Because of its flammability potential, acetylene should not be handled or stored near heat, sparks or flame. It is highly recommended to store containers/ cylinders below 50°C (122°F) and handle empty containers with care; vapor/residue may be flammable. Metal containers involved in the handling and storage of this material should be grounded and bonded.

While moving a cylinder, always keep in place the removable valve cover. Securely chain cylinders when in use and protect against physical damage.

Human health

When using chemicals make sure that there is adequate ventilation. Always use appropriate chemical-resistant gloves to protect your hands and skin, always wear eye protection, such as chemical goggles, and always wear flame-retardant clothing. Do not eat, drink, or smoke where chemicals are handled, processed, or stored. Wash hands and skin following contact. If the substance gets into your eyes, rinse eyes thoroughly for at least 15 minutes with tap water and seek medical attention.

In the case of transfer or maintenance operations, always clear transfer lines prior to decoupling, and flush/drain to a closed system for recycle prior to opening equipment.

In cases where engineering controls cannot maintain airborne substance concentrations below exposure limits, or in cases with a risk of accidental exposure, additional risk management measures may be necessary for safe use, such as the use of a complete suit protecting against chemicals and supplied air, a self-contained breathing apparatus or respirator.

Environmental

In case of accidental release or spill, do not allow the product to enter sewers, surface or ground water.

Regulatory Information / Classification and Labeling

This substance has been registered under REACH by relevant companies of LyondellBasell in the European Union.

For a detailed overview of the regulatory status of this substance, please refer to the Product Stewardship Bulletin which is available from the LyondellBasell corporate website.

Under GHS (Globally Harmonized System on Classification and Labeling) substances are classified according to their physical, health and environmental hazards. The hazards are communicated via specific labels on the product packaging and the Safety Data Sheet. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use.

For a detailed overview of the classification and labeling of this substance, please refer to the regional Safety Data Sheet, which can be found on the LyondellBasell corporate website.

Conclusion Statements

- Acetylene is used in the production of acetylene black and carbon fibers. It is also an intermediate in the production of various chemicals. It is used in oxyacetylene torches for welding and cutting of metal.
- Acetylene has been classified as hazardous. It is extremely flammable and forms explosive mixtures with air.
- Acetylene is considered as a simple asphyxiant at elevated concentrations.
- Exposure risk to humans and the environment is considered low as acetylene manufacturing process, storage and handling operations are enclosed.

Contact Information within Company

For further information on this product in general, please consult the LyondellBasell corporate website (www.lyb.com).

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Disclaimer

Before using a product sold by a company of the LyondellBasell family of companies, users should make their own independent determination that the product is suitable for the intended use and can be used safely and legally. SELLER MAKES NO WARRANTY; EXPRESS OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR ANY WARRANTY) OTHER THAN AS SEPARATELY AGREED TO BY THE PARTIES IN A CONTRACT.

LyondellBasell prohibits or restricts the use of its products in certain applications. For further information on restrictions or prohibitions of use, please contact a LyondellBasell representative.

Users should review the applicable Safety Data Sheet before handling the product.

Acetylene is a product of Basell Polyoléfines France SAS and Equistar Chemicals, LP.