



Acetylene

General Information

Key Points

Fire

- Extremely flammable
- Reacts with air, heat and open flames explosively. Reacts violently with oxidants, fluorine and chlorine
- Decomposes on heating causing fire and explosion hazard. Emits hydrogen gas, carbon monoxide and carbon dioxide when heated to decomposition.
- In the event of a fire involving acetylene, use fine water spray and normal fire kit with breathing apparatus

Health

- Toxic by inhalation
- CHIP classification: extremely flammable
- Inhalation may cause excitement, slurred speech, dizziness, nausea and vomiting and headache
- Exposure to high concentrations can lead to difficulty breathing, high blood pressure, fits and abnormal heart rhythms

Environment

- Avoid release into the environment
- Inform Environment Agency of substantial incidents

Background

Acetylene is a colourless, odourless gas. When contaminated with impurities it has a garlic-like odour. It is extremely flammable in the presence of open flames, sparks and heat. Other names for acetylene include ethine and ethyne.

Acetylene is a simple asphyxiant. It reduces the amount of oxygen available in the air.

Inhalation may cause excitement, slurred speech, dizziness, nausea and vomiting and headache. Exposure to high concentrations can lead to difficulty breathing, high blood pressure, fits and heart abnormal rhythms.



Acetylene is used in industry as a raw material in the production of other chemicals such as acetaldehyde and vinyl chloride. It is also used in oxy-acetylene welding and in the production of plastics, synthetic rubbers and modern drugs.



Exposure to acetylene is most likely to occur in an occupational setting where it is produced and used. Acetylene is not used domestically therefore exposure in the home is very unlikely.



Production and Uses

Key Points

- The primary use of acetylene is as a raw material in the chemical industry
- Acetylene is used as a fuel for oxy-acetylene welding
- Small amounts of acetylene are used for lighting purposes in buoys and beacons

Acetylene is primarily produced by either the partial oxidation of natural gas or as a co-product from the steam cracking of ethylene. It is also produced by reacting calcium carbide with water.

The primary use of acetylene is as a raw material in the production of chemicals such as trichloroethylene, vinyl chloride, perchloroethylene, acrylonitrile, acetic acid and acetaldehyde. It is also used as a fuel for oxyacetylene welding, cutting and soldering metals.

Small amounts of acetylene are used for lighting purposes in buoys and beacons and as a fuel in atomic absorption instruments. Acetylene is also used to ripen fruits and to mature trees and flowers. Other uses of acetylene include manufacture of plastics, synthetic rubbers and modern drugs.

In the past acetylene was used as an anaesthetic.

Frequently Asked Questions

What is acetylene?

Acetylene is a colourless, odourless, extremely flammable gas. Its main use is as a raw material in the chemical industry. Acetylene is also used in oxy-acetylene welding.

How does acetylene get into the environment?

Acetylene may be released into the air following its production and use.

How will I be exposed to acetylene?

Exposure is most likely to occur in the workplace where it is made or used.

If there is acetylene in the environment will I have any adverse health effects?

The presence of acetylene in the environment does not always lead to exposure. Clearly, in order for it to cause any adverse health effects you must come into contact with it. You may be exposed by breathing, eating, or drinking the substance or by skin contact. Following exposure to any chemical, the adverse health effects you may encounter depend on several factors, including the amount to which you are exposed (dose), the way you are exposed, the duration of exposure, the form of the chemical and if you were exposed to any other chemicals.

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Can acetylene cause cancer?

There are no data available to assess the carcinogenicity of acetylene

Does acetylene affect children or damage the unborn child?

There are no data available to assess the reproductive and developmental effects of acetylene. Exposure to acetylene during pregnancy should be avoided because of its general toxic effects.

What should I do if I am exposed to acetylene?

It is very unlikely that the general population will be exposed to a level of acetylene high enough to cause adverse health effects.

This document has been created by the PHE Centre for Radiation, Chemical and Environmental Hazards. The information contained in this document is correct at the time of its publication.