



Ethylene Oxide

General Information

Key Points

- also known as oxirane and dimethylene oxide
- extremely flammable, colourless gas with a sweet odour
- released into the environment from its production or use; natural sources include volcanoes, waterlogged soil, manure and sewage
- exposure to general public may occur by breathing in air contaminated with ethylene oxide or from cigarette smoking
- inhalation of ethylene oxide causes irritation to the eyes and nose, coughing, burning sensation in the mouth and breathlessness; exposure to high concentrations can cause lung damage
- skin contact with ethylene oxide can cause redness, blistering and ulceration
- headache, stomach upset, fitting, coma and heart problems can also occur following inhalation or skin contact
- eye contact may cause irritation and inflammation
- ethylene oxide may be harmful to the unborn child
- ethylene oxide has been classified being able to cause cancer in humans

Public Health Questions

What is ethylene oxide?

Ethylene oxide is extremely flammable, colourless gas with a sweet odour.

What is ethylene oxide used for?

Ethylene oxide is used as a chemical intermediate in the production of various products including antifreeze, detergents, fibres and bottles. It is also used to sterilise medical equipment. In the past, ethylene oxide was also used as an insecticide.

How does ethylene oxide get into the environment?

The majority of ethylene oxide released into the environment is from industries that produce or use it. Natural sources of ethylene oxide in the environment are volcanoes, waterlogged soil, manure and sewage.

How might I be exposed to ethylene oxide?

Exposure for the general public may occur by breathing in air contaminated with ethylene oxide or from cigarette smoking.

Exposure to ethylene oxide is more likely to occur in an occupational setting. Safe levels are enforced to protect the health of workers. Such levels are below those that are thought to cause harmful effects.

If I am exposed to ethylene oxide how might it affect my health?

The presence of ethylene oxide in the environment does not always lead to exposure. In order for it to cause any adverse health effects you must come into contact with it. You may be exposed to ethylene oxide by breathing or drinking the substance, or by skin contact with it. 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.

Inhalation of ethylene oxide can cause irritation of the eyes and nose, coughing, burning sensation in the mouth and breathlessness. In severe cases lung damage can occur. Ethylene oxide can be absorbed into the body via inhalation or skin contact causing headache, stomach upset, fitting, coma and heart problems. Skin contact also causes redness, blistering, ulceration and allergic contact dermatitis. Eye contact with ethylene oxide can cause irritation and inflammation.

Ingestion of liquefied ethylene oxide can cause stomach upset and pain.

Can ethylene oxide cause cancer?

The International Agency for Research on Cancer (IARC) has classified ethylene oxide as being able to cause cancer in humans.

Short term exposure to ethylene oxide is likely to be associated with a very small increase in the risk of cancer.

Does ethylene oxide affect pregnancy or the unborn child?

There is limited evidence to suggest that ethylene oxide may be toxic to the reproductive system and the unborn child.

Information on exposure to chemicals during pregnancy can be found at the following website: <http://www.medicinesinpregnancy.org/About-Us/>

How might ethylene oxide affect children?

Children exposed to ethylene oxide would be expected to display similar effects to those seen in exposed adults.

What should I do if I am exposed to ethylene oxide?

If you have any health concerns regarding exposure to ethylene oxide seek guidance from your GP or contact NHS 111.

Additional sources of information

NHS Choices - Poisoning <http://www.nhs.uk/Conditions/Poisoning/Pages/Introduction.aspx>

NHS Choices – How do I deal with minor burns? <http://www.nhs.uk/chq/Pages/1047.aspx>

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

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