

Methanol

General information

Key Points

Fire

- Flammable; burns with a non-luminous, bluish flame.
- May explode upon mixing with air
- In the event of a fire involving methanol, use alcohol resistant foam or fine water spray and liquid-tight chemical protective suit with breathing apparatus

Health

- Absorbed via ingestion, inhalation and skin exposure
- Toxic
- Short-term exposure may result in drowsiness, headache, confusion, sickness and abdominal pain, possibly within 30 minutes of exposure
- Coma, shock and kidney failure may occur following substantial exposures
- Short-term exposure may be irritating to the eyes, causing burning, stinging and watering
- Long-term effects may include blindness, and following more substantial exposures, permanent damage to the central nervous system may occur
- Long-term inhalation exposure to methanol may cause headaches and eye irritation
- Methanol is not thought to cause cancer in humans
- Methanol is not considered to affect human reproduction or cause damage to the unborn child

Environment

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

Background

Methanol is a clear, colourless, flammable liquid with slightly alcoholic odour. Methanol can be made by reacting hydrogen with carbon monoxide or carbon dioxide. Historically, it was made from distilling wood, and has therefore also been called wood alcohol.

There are many uses for methanol including the manufacture of other chemicals and in the production of paints, solvents, varnishes, paint thinners, certain cleaning solutions such as windscreen wash and some antifreeze solutions. Methanol is also used in certain fuel blends with petrol, and may be more used more as new fuels are sought. Because it is widely used, exposure may occur in a number of situations.



Exposure may occur in the workplace although safe limits are enforced to protect the employees. Such levels are below those that are thought to cause harmful effects.

In the home, methanol may be used in antifreeze and for powering small model engines. Methanol burns with a clear, almost invisible bluish flame. Methanol is also added in small quantities to alcohol to make methylated spirits or "meths"; this makes the alcohol unsuitable for human consumption.

Methanol is not a persistent chemical and is broken down in the environment.

Methanol is more harmful than ethanol (alcohol) and drinking it can be very dangerous. Drinking methanol may cause serious health effects including blindness and can cause death. Methanol is an irritant and splashes in the eyes may cause

stinging. Children may be more sensitive to the effects of methanol due to their smaller size.



Methanol may cause harm to the unborn child if the mother is exposed to large amounts. Exposure to small amounts of methanol is unlikely to have effects on the unborn child.

Methanol or its solutions are not classified as carcinogens; methanol is not considered to be a cancer causing agent

Production and Uses

Key Points

- Methanol can be made industrially by reacting hydrogen with carbon monoxide or carbon dioxide
- Methanol is used in the production of many chemicals and used in paints, varnishes, solvents and antifreeze
- Methanol can also occur naturally at low levels in fresh fruit and vegetables

Methanol may be produced by reacting hydrogen with either carbon monoxide or carbon dioxide at high temperature and pressure over a catalyst. Methanol may also be produced from the partial oxidation of hydrocarbons. Historically, it was made from distilling wood, and has, therefore, also been called wood alcohol. Industrial production of methanol is substantial; over 30 million tonnes were produced globally in 2003.

Small amounts of methanol are produced naturally in the human body, in animals and in plants and bacteria. Methanol also occurs in small amounts in fresh fruit and vegetables.

Methanol has good solvent properties and is used widely in paints, varnishes, paint thinners and cleaning products such as vehicle wind-screen wash. Windscreen wash may contain 10-20% methanol by volume. Because it is flammable, methanol has been used as a fuel in some racing cars and small model engines. Methanol may see increased use as alternatives to conventional vehicle fuels, such as petrol, are sought. Methanol burns with a clear, almost invisible bluish flame. A number of chemicals are made using methanol including formaldehyde and acetic acid.

Methanol has been identified in exhaust fumes from petrol and diesel engines and in tobacco smoke.

Methanol is added in small amounts (~5%) to ethanol (alcohol) to make Industrial Methylated Spirit (IMS) or "meths". The addition of methanol renders the product unsuitable for human consumption. As methanol is toxic; a dye may also be added (frequently purple or blue) to clearly identify it together with a bitter chemical to discourage ingestion.

Frequently Asked Questions

What is methanol?

Methanol is a clear, colourless, flammable liquid with a slightly alcoholic odour.

How does methanol get into the environment?

Methanol may enter the environment from industrial sources, such as factory effluent.

How will I be exposed to methanol?

Exposure to methanol may occur if it is used at your work or if you use methanol containing products at home. Low level exposure also occurs from the diet due to the small amount naturally present in fruit and vegetables.

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

The presence of methanol 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.

Methanol is not persistent and it is quickly broken down in the environment. It is unlikely that environmental contamination will have any adverse health effects.

Can methanol affect my health?

Drinking even small amounts of methanol is dangerous and can cause serious health effects including coma, convulsions, and blindness and may even cause death. Methanol is also toxic by inhalation; deliberately inhaling methanol is dangerous, can permanently damage eyesight and could cause death. Methanol is an irritant and splashing it in the eyes could cause stinging, though this should not lead to permanent damage.

Can methanol cause cancer?

Methanol or its solutions are not classified as carcinogens; they are not considered to be cancer-causing chemicals.

Does methanol affect children or damage the unborn child?

Methanol may affect children in the same way as adults, but they may more sensitive due to their smaller size. Methanol stored at home should therefore be kept out of the reach of children and in an appropriate container.

Methanol can cause harm to the unborn child if the mother is exposed to large amounts. Exposure to low levels of methanol is unlikely to have effects on the unborn child.

What should I do if I am exposed to methanol?

You should remove yourself from the source of exposure.

If you have got methanol on your skin, remove soiled clothing, wash the affected area with lukewarm water and soap for at least 10 – 15 minutes and seek medical advice.

If you have got methanol in your eyes, remove contact lenses, irrigate the affected eye with lukewarm water for at least 10 – 15 minutes and seek medical advice.

If you have inhaled or ingested methanol seek medical advice.

This document will be reviewed not later than 3 years or sooner if substantive evidence becomes available.