



Toluene

General information

Key Points

Fire

- Flammable
- Toluene vapour is explosive when exposed to heat or flame
- Emits acrid smoke and irritating fumes when heated
- In the event of a fire involving toluene, use normal foam and normal fire kit with breathing apparatus

Health

- Toxic following inhalation or ingestion
- Harmful and irritant
- Irritating to the eyes, throat, lungs and skin
- Inhalation or ingestion can cause dizziness, drowsiness, sickness, headache, slurred speech, slow movements, hallucinations, heart problems and coma
- A possible reproductive toxin
- Long term inhalation of toluene can cause permanent damage to the nervous system
- There is no convincing evidence that toluene can cause cancer in humans

Environment

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

Background

Toluene is clear, colourless flammable liquid with a sweet, pungent odour. Toluene is a very important chemical worldwide and many millions of tons of toluene are made globally each year.

Toluene occurs naturally in crude oil and is made during the process of refining oil into petrol and other products.

There are many uses for toluene including the manufacture of other chemicals; in car and aeroplane fuels; in paints, varnishes, explosives, glues and pharmaceutical products; and in cosmetic products.



Toluene may enter the environment after being released from fuels and from evaporation of toluene-containing products such as paint and paint thinners, adhesives and nail polish. Toluene may also enter surface and ground water after spills but it does not persist in the environment.

Toluene is widely used, therefore exposure may occur from a number of sources, including drinking water, food, air and cosmetic products. People may breathe in small amounts of toluene when using products such as paint, paint thinners, adhesives and nail polish, or by breathing in emissions from motor vehicles and aircraft exhausts. Smoking also increases the exposure to toluene.



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

If people breathe in toluene it can cause irritation to the eyes, throat and lungs. Ingesting toluene can cause stomach upsets and sickness. Exposure to toluene can also cause drowsiness, dizziness, headache, sickness and memory problems.

Deliberately breathing high levels of toluene (e.g. glue-sniffing) can cause permanent damage to the nervous system, heart problems, coma and in some cases death.

Children may be more sensitive to the effects of toluene due to their smaller size. Toluene may cause harm to the unborn child if the mother is exposed to large amounts, such as from solvent abuse. There is evidence of these effects from studies in animals, which showed an increased numbers of babies born with birth defects following exposure to toluene.

Toluene is not classified as a carcinogen.

Production and Uses

Key Points

- Toluene occurs naturally in crude oil
- It is used as a fuel additive, solvent and to make many items including nylon, plastic, dyes, explosives, pharmaceuticals and cosmetics.

Toluene occurs naturally in crude oil and is produced in the process of refining oil into petrol and other fuels. It is also a by-product of the process of making coke from coal.

Toluene is used as a fuel additive to increase octane ratings and as a solvent in paints, paint thinners, adhesives, inks, resins, cleaning agents and inks. It is also used in the synthesis of many organic chemicals including benzene, phenol and xylene and as a raw material in the production of explosives.

Toluene is used to manufacture polymers that are used to make nylon, plastic soda bottles, and polyurethanes and for pharmaceuticals, dyes and cosmetic products. Additionally, toluene has been used in the past as a treatment for hookworms and roundworms.

Frequently Asked Questions

What is toluene?

Toluene is a clear, colourless, flammable liquid with a sweet, pungent odour. Toluene is used in many industries. For example, it is used in the production of other chemicals, as an additive in car and aeroplane fuel and in paints, varnishes, explosives and glues.

How does toluene get into the environment?

Most toluene enters the environment as a result of its use in vehicle and aircraft fuels. Release also occurs from the evaporation of toluene used as a solvent.

How will I be exposed to toluene?

Exposure to toluene may occur if it is used at your work or if you use it at home. Glue sniffing is a potential source of exposure to toluene.

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

The presence of toluene 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.

Toluene can cause irritation to the eyes, throat, lungs and skin. Breathing in toluene vapours can cause drowsiness, dizziness, headache, sickness and memory problems. Deliberately breathing large amounts of toluene (e.g. from glue-sniffing) can cause permanent damage to the nervous system, coma, heart problems and even death.

Can toluene cause cancer?

There is no evidence to suggest that exposure to toluene would cause cancer in humans.

Does toluene affect children or damage the unborn child?

If children breathe, ingest or touch toluene they will have similar effects as in adults, although children may be more sensitive due to their smaller size.

Toluene can cause harm to the unborn child if the mother is exposed to large amounts, such as during glue sniffing. There is evidence of these effects from studies in animals, which showed an increased number of babies born with birth defects when the mother has been exposed to toluene.

What should I do if I am exposed to toluene?

You should remove yourself from the source of exposure.

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

If you have inhaled or ingested toluene seek medical advice.

This document from the HPA Centre for Radiation, Chemical and Environmental Hazards reflects understanding and evaluation of the current scientific evidence as presented and referenced in this document.