

Toluene - ToxFAQs™

CAS # 108-88-3

This fact sheet answers the most frequently asked health related questions (FAQs) regarding exposure to toluene. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important that you understand this information because this substance may harm you, or your family. The health effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Exposure to toluene occurs from breathing contaminated workplace air, automobile exhaust, or by using products such as paints, paint thinners, fingernail polish, lacquers, and adhesives. Toluene affects the nervous system. Toluene has been found in at least 1,012 of the 1,699 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is toluene?

Toluene is a clear, colorless liquid with a distinctive smell. It is a good solvent (a substance that can dissolve other substances). Toluene occurs naturally in crude oil and in the tolu tree. It is produced in the process of making gasoline and other fuels from crude oil and in making coke from coal.

Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber and in some printing and leather tanning processes. Toluene is also used in the manufacture of other chemicals, nylon, and plastics. It is also added to gasoline along with benzene and xylene to improve octane ratings.

What happens to toluene when it enters the environment?

- Toluene enters the environment when you use materials that contain it. It can also enter surface water and ground water from spills of solvents and petroleum products as well as leaking underground storage tanks at gasoline stations and other facilities.
- When toluene-containing products are placed in landfills or waste disposal sites, toluene can enter the soil or water near the waste site.
- Toluene in subsurface water can be degraded by anaerobic microorganisms.
- Toluene in surface water or soil will readily evaporate to the air or be degraded by bacteria.
- Toluene does not usually stay in the environment long.

How might I be exposed to toluene?

- Breathing contaminated workplace air or automobile exhaust.
- Individuals who work with gasoline, paint, lacquer, or dyes have greater exposures to toluene, as do individuals who smoke or intentionally inhale products containing toluene for its euphoric effects or to get high.
- Living near uncontrolled hazardous waste sites containing toluene products.
- Toluene is not frequently detected in drinking water or food.

How can toluene affect my health?

Toluene may affect the nervous system. Low to moderate levels can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, and loss of appetite. These symptoms usually disappear when exposure stops.

Long-term daily inhalation exposure to toluene in the workplace may cause some hearing and color vision loss. Repeatedly breathing toluene from glue or paint thinners may permanently damage the brain.

The effects of toluene in animals are similar to those seen in humans.

How likely is toluene to cause cancer?

Studies in workers and animals exposed to toluene generally indicate that toluene is not carcinogenic

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The International Agency for Research on Cancer (IARC) determined that toluene is not classifiable as to its carcinogenicity in humans. The EPA determined there is inadequate information to assess the carcinogenic potential of toluene. The National Toxicology Program (NTP) has not considered the carcinogenic potential of toluene.

How can toluene affect children?

The effects of toluene on children have not been studied very much, but toluene seems to produce the same types of effects in children as it does in adults.

Some older children and adolescents who have repeatedly breathed large amounts of toluene to get high have developed loss of muscle control, loss of memory, poor balance, and decreased mental abilities. Some of these changes may last for a long time after toluene has left the body.

Some mothers who breathed large amounts of toluene during pregnancy to get high have had children with birth defects, including retardation of mental abilities and growth.

How can families reduce the risk of exposure to toluene?

- Families can reduce their risk of exposure to toluene by using consumer products containing the chemical (such as paints, glues, inks, and stain removers) in well-ventilated areas and reading the labels of the products.
- When not in use, toluene-containing products should be tightly covered to prevent evaporation into the air.
- Household chemicals should be stored out of the reach of young children to prevent accidental poisonings.
- Always store household chemicals in their original labeled containers. Never store household chemicals in containers that children would find attractive to eat or drink from, such as old soda bottles.
- Use bottled water if you have concerns about the presence of toluene in your tap water.

- Prevent children from eating or playing in the dirt if you live near a waste site that has been contaminated with toluene.
- Talk with children about the dangers of sniffing chemicals.

Is there a medical test to show whether I've been exposed to toluene?

Toluene and its breakdown products (metabolites) can be measured in blood and urine. However, the detection of toluene or its metabolites cannot predict the kind of health effects that might develop from that exposure. Because toluene and its metabolites leave the body fairly rapidly, the tests need to be conducted within days after exposure. The tests are not routinely available at the doctor's office because they require special equipment.

Has the federal government made recommendations to protect human health?

The EPA has recommended a drinking water limit of 1 mg/L for toluene.

The Occupational Safety and Health Administration (OSHA) has set a legal limit for workers of 200 ppm for toluene in air averaged over an 8 hour workday.

The National Institute for Occupational Safety and Health (NIOSH) has set a recommended limit of 100 ppm for toluene in air averaged over a 10-hour workday.

References

This ToxFAQs™ information is taken from the 2015 Toxicological Profile for Toluene (Draft for Public Comment) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636.

ToxFAQs™ on the web: www.atsdr.cdc.gov/toxFAQs

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.