

This fact sheet answers the most frequently asked health questions (FAQs) about 1,3-butadiene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. This information is important because this substance may harm you. The 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.

SUMMARY: Exposure to 1,3-butadiene occurs mainly from breathing contaminated air. Effects on the nervous system and irritations of the eyes, nose, and throat have been seen in people who breathed contaminated air. This chemical has been found in at least 7 of 1,416 National Priorities List sites identified by the Environmental Protection Agency.

What is 1,3-butadiene?

(Pronounced 1,3-byoo'tə-dī'en')

1,3-Butadiene is a chemical made from the processing of petroleum. It is the 36th highest volume chemical produced in the United States. It is a colorless gas with a mild gasoline-like odor.

About 75% of the manufactured 1,3-butadiene is used to make synthetic rubber. Synthetic rubber is widely used for tires on cars and trucks.

1,3-Butadiene is also used to make plastics including acrylics. Small amounts are found in gasoline.

What happens to 1,3-butadiene when it enters the environment?

- It quickly evaporates to the air as a gas from leaks during production, use, storage, transport, or disposal.
- It breaks down quickly in air by sunlight; in sunny weather, half of it breaks down in about 2 hours.
- When not sunny, it takes a few days for about half of it to break down in the air.
- It evaporates very quickly from water and soil.
- Since it evaporates so easily, it is not expected to be found in water or soil, but adequate tests are not available to measure the amounts.

- 1,3-Butadiene may be broken down by microorganisms in the soil.
- It is not expected to accumulate in fish.

How might I be exposed to 1,3-butadiene?

- Breathing urban and suburban air, but these levels are generally very low except in polluted cities or near chemical, plastic, and rubber facilities that use it.
- Breathing contaminated workplace air where it is manufactured or used.
- Breathing contaminated air from car and truck exhaust, waste incineration, or wood fires.
- Breathing cigarette smoke.
- Drinking contaminated water near production or waste sites.
- Ingesting foods contained in plastic or rubber food containers, but levels are generally very low or not present at all.
- Skin contact with gasoline, but levels are low.

How can 1,3-butadiene affect my health?

Most of the information on the health effects of 1,3-butadiene comes from studies where the exposure was from breathing contaminated air.

ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html>

Breathing very high levels of 1,3-butadiene for a short time can cause central nervous system damage, blurred vision, nausea, fatigue, headache, decreased blood pressure and pulse rate, and unconsciousness. There are no recorded cases of accidental exposures at high levels that caused death in humans, but this could occur.

Breathing lower levels may cause irritation of the eyes, nose, and throat.

Studies on workers who had longer exposures with lower levels have shown an increase in heart and lung damage, but these workers were also exposed to other chemicals. We don't know for sure which chemical (or chemicals) caused the effects. We also do not know what levels in the air will cause these effects in people when breathed over many years.

Animal studies show that breathing 1,3-butadiene during pregnancy can increase the number of birth defects. Other effects seen in animals that breathed low levels of 1,3-butadiene for one year include kidney and liver disease, and damaged lungs. Some of the animals died.

There is no information on the effects of eating or drinking 1,3-butadiene. Skin contact with liquid 1,3-butadiene can cause irritation and frostbite.

How likely is 1,3-butadiene to cause cancer?

The Department of Health and Human Services has determined that 1,3-butadiene may reasonably be anticipated to be a carcinogen. This is based on animal studies that found increases in a variety of tumor types from exposure to 1,3-butadiene.

Studies on workers are inconclusive because the workers were exposed to other chemicals in addition to 1,3-butadiene.

Is there a medical test to show whether I've been exposed to 1,3-butadiene?

There is currently no reliable medical test to determine whether you have been exposed to 1,3-butadiene. However, scientists are working on methods to measure it in the blood.

Has the federal government made recommendations to protect human health?

The Environmental Protection Agency (EPA) requires that discharges or spills into the environment of 1 pound or more of 1,3-butadiene be reported.

The Occupational Safety and Health Administration (OSHA) has set an occupational exposure limit of 1,000 parts of 1,3-butadiene per million parts of air (1,000 ppm).

The National Institute for Occupational Safety and Health (NIOSH) recommends that 1,3-butadiene be kept to the lowest feasible concentration because of its potential to cause cancer.

Glossary

Carcinogen: A substance that can cause cancer.

Ingesting: Taking food or drink into your body.

ppm: Parts per million.

Tumor: An abnormal mass of tissue.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 1992. Toxicological profile for 1,3-butadiene. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaq.html> 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.

