

NITROBENZENE

What is nitrobenzene?

Nitrobenzene is an oily yellow to yellow-brown liquid that smells like bitter almonds or shoe polish. Nitrobenzene dissolves only slightly in water and easily in other chemicals. It is man-made.

Where can nitrobenzene be found and how is it used?

Very low levels of nitrobenzene may be found in air and/or water. Levels remain low even near sites where nitrobenzene is made or used. Nitrobenzene is rarely found in drinking water. Industries manufacture nitrobenzene to make a chemical called aniline, to produce oil for motors and machines, dyes, drugs, pesticides, and rubber.

How can people be exposed to nitrobenzene?

The most common exposure is at workplaces that use nitrobenzene to produce dyes, drugs, pesticides, and some types of rubber. Exposure can occur through the air you breathe or through touch.

You could be exposed to nitrobenzene through:

- **Breathing** it in air at work, or near factory sites where nitrobenzene is used or made. You could also breathe it near hazardous waste sites.
- **Drinking** water with nitrobenzene in it. This can occur near hazardous waste sites.
- **Touching** materials made with nitrobenzene.
- **Eye Contact** by splashing the chemical in your eyes if you work where nitrobenzene is used.

How does nitrobenzene work?

Sunlight breaks down nitrobenzene in water. Nitrobenzene does not seem to build up in fish or other animals found in water. It can become a vapor and go into the air, or bacteria can break it down. In soil, nitrobenzene can move into the groundwater or be taken up by plants.

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How can nitrobenzene affect my health?

Nitrobenzene causes many harmful health effects. Direct skin or eye contact may cause mild irritation. Repeated exposures to a high level of nitrobenzene can cause methemoglobinemia, which affects the ability of the blood to carry oxygen.

After direct contact with nitrobenzene, the skin may turn a bluish color and people can experience an upset stomach, vomiting, or breathing problems. Other symptoms of exposure include headache, grouchiness, dizziness, weakness, or sleepiness. If a person is exposed to very high levels of nitrobenzene, they can go into a coma and possibly face death unless they quickly receive medical care. Drinking alcoholic beverages during exposure may increase the harmful effects.

In animal studies, a single dose of nitrobenzene fed to male rats damaged testicles and decreased levels of sperm, suggesting that fertility problems may occur in humans. There is very little information available about nitrobenzene's long-term effects on humans or animals. It is not known if exposure to nitrobenzene can cause cancer.

How is nitrobenzene poisoning treated?

No information was found about treatments for nitrobenzene poisoning.

What should I do if exposed to nitrobenzene?

- **If you breathe nitrobenzene**, get fresh air and rest. Get medical help.
- **If you get nitrobenzene on your skin**, remove your clothes. Wash with lots of soapy water. Get medical attention.
- **If you get nitrobenzene in your eyes**, remove contact lenses if you can do it easily. Rinse with clean water for at least 15 minutes. Get medical help.

What factors limit use or exposure to nitrobenzene?

Worker safety methods are very important because nitrobenzene easily passes into the skin and can also go into the body easily through breathing or eating.

To limit exposure at work, a source of fresh air should be provided. A system should be provided that stops air containing nitrobenzene from getting into breathing zones. If this cannot be done, wear a respirator.

If there is a danger of splashing nitrobenzene, wear protective clothing. It should also be worn if you have continued contact with nitrobenzene. Protective clothing should be made of a chemical-resistant material. Wear gloves or face shields.

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

Tests can show if you were recently exposed to nitrobenzene. Some tests can determine whether there was long-term exposure. The presence of nitrobenzene's breakdown products (p-nitrophenol and p-aminophenol) in the urine indicates nitrobenzene exposure. These tests cannot tell if harmful effects will occur.

Technical information for nitrobenzene

CAS Number: 98-95-3

Chemical Formula: C₆H₅NO₂

Carcinogenicity (EPA): classified as "likely to be carcinogenic to humans" by any route of exposure.

MCL (Drinking Water): There is no MCL for nitrobenzene.

OSHA Standards: 5 milligrams per cubic meter of air; (1 ppm)

NIOSH Standards: 10 Hr. Time-Weighted Avg.: 1 ppm air.

IDLH: 200 ppm

ACGIH: 8 hr. Time-Weighted Avg. (TWA): 1 ppm

Resources

Agency for Toxic Substances and Disease Registry (ATSDR). 1990. *Toxicological Profile for Nitrobenzene*. Atlanta, GA: U.S. Department of Health and Human Services. <https://wwwn.cdc.gov/TSP/ToxFAQs/ToxFAQsDetails.aspx?faqid=531&toxid=95>

American Conference of Governmental Industrial Hygienists (ACGIH). 2003. *Guide to Occupational Exposure Values*. Cincinnati, OH.

NIOSH Pocket Guide to Chemical Hazards. 2003. Atlanta, GA: U.S. Department of Health and Human Services.

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