

This fact sheet answers the most frequently asked health questions (FAQs) about aniline. 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. It is important you understand this information 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.

HIGHLIGHTS: Aniline is a manufactured chemical used by a number of industries. Significant exposure may occur only if you work with aniline. The main effect of aniline by any route of exposure is a blood disorder in which oxygen delivery to the tissues is impaired. This may have mild to severe consequences depending on the duration and amount of exposure. Acute exposure to high amounts of aniline may lead to coma and death. Aniline has been found in at least 59 of the 1,585 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is aniline?

Aniline is a clear to slightly yellow liquid with a characteristic odor. It does not readily evaporate at room temperature. Aniline is slightly soluble in water and mixes readily with most organic solvents.

Aniline is used to make a wide variety of products such as polyurethane foam, agricultural chemicals, synthetic dyes, antioxidants, stabilizers for the rubber industry, herbicides, varnishes and explosives.

What happens to aniline when it enters the environment?

- Aniline in air will be broken down rapidly by other chemicals and by sunlight. It will be broken down within a few days.
- Aniline in water can stick to sediment and particulate matter or evaporate to the air. Most of it will be broken down by bacteria and other microorganisms.
- Aniline will partially stick to the soil. Small amounts may evaporate into air or pass through the soil to groundwater. Most of the aniline in soil will be broken down by bacteria and other microorganisms.
- Aniline does not accumulate in the food chain.

How might I be exposed to aniline?

- The general population may be exposed to aniline by eating food or drinking water containing aniline, but these amounts are usually very small.
- If you work in a place that makes products like dyes, varnishes, herbicides, and explosives, you may be exposed to aniline.
- Aniline has also been detected in tobacco smoke, so people who smoke or breath in second-hand smoke may also be exposed to aniline.
- People living near uncontrolled hazardous waste sites may be exposed to higher than normal levels of aniline.

How can aniline affect my health?

Aniline can be toxic if ingested, inhaled, or by skin contact. Aniline damages hemoglobin, a protein that normally transports oxygen in the blood. The damaged hemoglobin can not carry oxygen. This condition is known as methemoglobinemia and its severity depends on how much you are exposed to and for how long. Methemoglobinemia is the most prominent symptom of aniline poisoning in humans, resulting in cyanosis (a purplish blue skin color) following acute high exposure to aniline. Dizziness, headaches, irregular heart beat, convulsions, coma, and

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death may also occur. Direct contact with aniline can also produce skin and eye irritation.

Long-term exposure to lower levels of aniline may cause symptoms similar to those experienced in acute high-level exposure. There is no reliable information on whether aniline has adverse reproductive effects in humans. Studies in animals have not demonstrated reproductive toxicity for aniline.

How likely is aniline to cause cancer?

The available studies in humans are inadequate to determine whether exposure to aniline can increase the risk of developing cancer in people. Rats that ate food contaminated with aniline for life developed cancer of the spleen.

The International Agency for Research on Cancer (IARC) determined that aniline is not classifiable as to its carcinogenicity to humans. The EPA has determined that aniline is a probable human carcinogen.

How can aniline affect children?

There are no studies on the health effects of children exposed to aniline. It is likely that the health effects seen in children exposed to aniline will be similar to the effects seen in adults. Newborn infants are more susceptible than adults to development of methemoglobinemia caused by exposure to aniline.

We do not know if exposure to aniline will result in birth defects or other developmental effects in people. The studies on developmental effects in animals are not conclusive.

How can families reduce the risk of exposure to aniline?

- Most families will not be exposed to significant levels of aniline.
- Children should avoid playing in soils near uncontrolled hazardous waste sites where aniline may have been discarded.

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

Aniline can be measured in the urine. This test shows that you have been exposed to aniline but not to how much or how recently. A breakdown product of aniline in the body, p-aminophenol, also can be measured in the urine; however, this breakdown product is not specific for aniline exposure.

Methemoglobin can be measured in the blood, but exposure to many other chemicals also increase methemoglobin levels in the blood. Methemoglobin levels in blood can be used to determine the appropriate treatment that exposed individuals should receive. These tests are not routinely done in a doctor's office.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) sets a limit of 5 parts of aniline per million parts of air (5 ppm) in workplace air in any 8-hour shift, 40-hour workweek.

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 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.

