

This fact sheet answers the most frequently asked health questions (FAQs) about ammonia. 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: Ammonia is a gas that occurs naturally in the environment and is also manmade. Liquid ammonia is found in many household cleaners. Ammonia is irritating to the skin, eyes, nose, throat, and lungs. Exposure to high concentrations can cause serious burns. Ammonia has been found in at least 134 of the 1,613 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is ammonia?

Ammonia is a colorless gas with a very sharp odor. It is made both by humans and by nature. It dissolves easily in water and evaporates quickly. It is commonly sold in liquid form.

The amount of ammonia produced by humans every year is almost equal to that produced by nature. Ammonia is produced naturally in soil by bacteria, decaying plants and animals, and animal wastes. Ammonia is essential for many biological processes.

Most of the ammonia produced in chemical factories is used to make fertilizers. The remaining is used in textiles, plastics, explosives, pulp and paper production, food and beverages, household cleaning products, refrigerants, and other products. It is also used in smelling salts.

What happens to ammonia when it enters the environment?

- Because ammonia occurs naturally, it is found throughout the environment in soil, air, and water.
- Most of the ammonia in water changes to ammonium, an odorless liquid. Ammonia and ammonium can change back and forth in water.
- Ammonia is recycled naturally in the environment as part of the nitrogen cycle. It does not last very long in the environment.

- Plants and bacteria rapidly take up ammonia from soil and water.
- Some ammonia in water and soil is changed to nitrate and nitrite by bacteria.
- Ammonia released to air is rapidly removed by rain or snow or by reactions with other chemicals.
- Ammonia does not build up in the food chain, but serves as a nutrient source for plants and bacteria.

How might I be exposed to ammonia?

- Everybody is regularly exposed to low levels of ammonia in air, food, soil, and water.
- Ammonia has a strong irritating odor that people can easily smell before it may cause harm.
- If you use ammonia cleaning products at home, you will be exposed to ammonia released to the air and through contact with your skin.
- If you apply ammonia fertilizers or live near farms where these fertilizers have been applied, you can breathe ammonia released to the air.
- You may be exposed to ammonia from leaks and spills from production plants, storage facilities, pipelines, tank trucks, and rail cars.

How can ammonia affect my health?

Exposure to high concentrations of ammonia in the air may cause severe burns to your skin, eyes, throat, and lungs. In

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

extreme cases, blindness, lung damage, or death could occur. Breathing lower concentrations will cause coughing and nose and throat irritation.

If you swallow ammonia, you could suffer burns in your mouth, throat, and stomach. Concentrated ammonia spilled on the skin will cause burns. Animal studies show effects similar to those observed in people. We do not know if ammonia affects reproduction in humans.

How likely is ammonia to cause cancer?

We do not know whether ammonia can cause cancer in humans or in laboratory animals. The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified ammonia for carcinogenicity.

How can ammonia affect children?

Children are less likely to be exposed to concentrated ammonia because most exposures of that kind occur in occupational settings. Children can still be exposed the same way as adults to ammonia gas from spills or leaks from ammonia tanks or pipelines, especially on farms where it is used as a fertilizer. Children can also be exposed to dilute ammonia solutions from household cleaners containing ammonia.

The effects of ammonia on children are likely to be the same as for adults. We do not know if exposure to ammonia causes birth defects, or if it can pass to the fetus across the placenta or to infants via breast milk.

How can families reduce the risk of exposure to ammonia?

- Keep products containing ammonia out of the reach of children.

- Maintain adequate room ventilation when using cleaners containing ammonia and wear proper clothing and eye protection.
- Prevent children from entering a room where ammonia is being used.
- Never store cleaning solutions in containers that may be attractive to children, such as soda bottles.
- Avoid entering fields when ammonia fertilizer is being applied.

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

There are tests that can detect ammonia in blood and urine. However, these tests cannot definitely determine if you have been exposed because ammonia is normally found in the body.

If you were exposed to harmful amounts of ammonia you would notice it immediately because of the strong, unpleasant smell and strong taste. Your skin, eyes, nose, and throat would also be irritated.

Has the federal government made recommendations to protect human health?

The Occupational Safety and Health Administration (OSHA) has set a limit of 25 parts of ammonia per million parts of air (25 ppm) in the workplace during an 8-hour shift and a short-term limit (15 minutes) of 35 ppm.

References

Agency for Toxic Substances and Disease Registry (ATSDR). 2002. Toxicological Profile for Ammonia (Draft for Public Comment). 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.

