

Ammonia

What is ammonia?

Ammonia (NH₃) is a colorless gas with a pungent odor. The gas is often liquefied under pressure for transportation and storage (e.g., tanker trucks, rail cars, ships). If a container of compressed ammonia develops a leak, the liquid will rapidly escape and produce a dense, white-looking cloud that will remain close to the ground. An ammonia vapor leak will have an odor, but will not produce a visible cloud. Ammonia dissolves in water. Liquids containing ammonia can release ammonia gas.

What are the common uses of ammonia?

- Industrial applications include the production of plastics, pesticides, fabrics, dyes and other chemicals
- Industrial refrigerant for cold storage or meat-packing
- Fertilizer production and application
- Industrial and household cleaning solutions

How can people be exposed to ammonia?

A person can be exposed to ammonia through:

- inhalation (breathing it in),
- direct contact with skin or eyes, or
- ingestion (intentionally or unintentionally eating or drinking products containing ammonia).

Ammonia has a strong, irritating odor that is easily detectable at lower concentrations. If you cannot smell ammonia, it is probably not present in the air at a high enough concentration to be harmful.

What are the possible effects of exposure?

The extent of signs and symptoms of ammonia exposure will vary based on the amount, route and duration of the exposure. Elderly people, children, and people with lung diseases such as asthma or chronic obstructive pulmonary disease may be especially sensitive to irritant chemicals, including ammonia.

See table below showing the relationship between exposure route, level of concentration, and symptoms.

Exposure Route	Symptoms
Short-term, low level inhalation of gas	Irritation of nose, throat, and lungs; burning sensation; discomfort or difficulty in breathing, or coughing
Short-term, high level inhalation of gas	Burning sensation, coughing, gagging, chest pain, fluid in lungs, suffocation
Direct contact (eyes, skin)	Irritation and burns, watering of eyes
Ingestion	Burns in mouth, throat, stomach

How can people reduce the risk of exposure?

- If there is a large ammonia release, follow the instructions given to you by local emergency response personnel.
- Never enter agricultural or industrial areas that may contain high levels of ammonia without appropriate training and protection.
- Store cleaning supplies out of reach of young children or pets.
- Follow the manufacturer's instructions when using strong cleaners (increased ventilation may be necessary).
- Never mix household cleaners.

What should I do if I think I have been exposed to ammonia?

- If there is a strong ammonia odor outdoors and you suspect an industrial spill or release, seek fresh air and move to high ground.
- Call 911 and follow the instructions given to you by your local emergency personnel.
- If strong ammonia odors are present in your home, identify the source and ventilate the area or remove the ammonia-containing product.
- Seek fresh air if ammonia odor persists.
- If you have direct skin or eye contact with ammonia or an ammonia-containing solution, quickly wash skin with soap and water, and flush eyes with large amounts of water. Remove clothing as quickly as possible.
- If someone swallows an ammonia-containing liquid, seek immediate medical attention and do not induce vomiting.

If you experience health effects similar to those mentioned in the table above, seek medical attention. Prolonged monitoring may be necessary with severe exposures as some effects may be delayed.

References:

www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=2 (Agency for Toxic Substances and Disease Registry)

www.cdc.gov/niosh/npg/npgd0028.html (Centers for Disease Control)

www.nlm.nih.gov/medlineplus/ency/article/002759.htm (National Library of Medicine/National Institutes of Health)