



Ammonia

General information

Key Points

Fire

- Non-flammable, but mixtures of ammonia and air may explode when ignited
- Chemically stable under normal conditions
- Emits poisonous fumes when heated to decomposition
- Use fine water spray and liquid-tight protective clothing with breathing apparatus

Health

- Exposure by any route may be dangerous
- Secondary contamination may occur
- Toxic and corrosive
- Short-term Inhalation may result in irritation of eyes and nose with sore throat, cough, chest tightness, headache and confusion
- Short term ingestion of ammonia solutions may result in burns to the mouth and throat
- Short-term skin exposure may result in deep burns
- Short-term eye exposure may cause swelling, watering and sensitivity to light
- Long-term inhalation has been associated with increased cough, phlegm production, wheeze and asthma
- Ammonia is not considered to be carcinogenic to humans
- Ammonia is not considered to be cause damage to the unborn child

Environment

- Dangerous for the environment
- Inform Environment Agency of substantial release incidents

Background

Ammonia is a colourless, reactive gas that is lighter than air (approximately half as heavy) which dissolves readily in water. Ammonia has a strong smell, similar to urine, which can be detected by most people even in small amounts. Ammonia gas is non-flammable, but because some mixtures with air could explode if ignited, it is treated as flammable. Solutions of ammonia are alkali and concentrated solutions are corrosive. Names for these solutions include ammonium hydroxide, aqueous ammonia and ammonia solution.

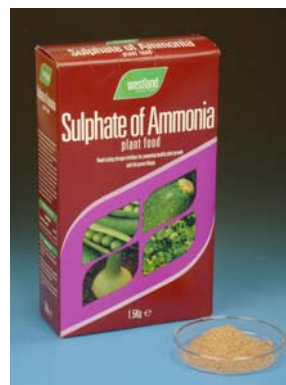


Ammonia is a very important industrial chemical, with over one million tons produced in the UK annually. Ammonia gas is produced industrially by reacting hydrogen and nitrogen at high temperature and pressure. This reaction is known as the Haber-Bosch process.

There are many uses for ammonia including the production of fertilisers, plastics, synthetic fibres, dyes, explosives and pharmaceuticals. Because it is widely used, exposure may occur in a number of situations.

Exposure may occur in the workplace although safe levels allowed are enforced to protect the employees. Such levels are below those that are thought to cause harmful effects.

In the home, ammonia is used in certain cleaning products or garden fertilisers.



Ammonia occurs naturally at low levels throughout the environment, as it is released from the natural breakdown of organic waste matter. Intensive agricultural practices may increase local levels, e.g. from lots of animal waste (slurry).



As with all chemicals, the health effects are generally related to the amount you are exposed to.

At low concentrations, ammonia may cause eye irritation, coughing or a sore throat. Inhaling high concentrations of ammonia may cause burns, swelling of the airway and lung damage and can be fatal. Ammonia solutions may cause serious burns if splashed on skin or if swallowed. Splashes in the eye may cause damage which may be irreversible in some cases and lead to loss of sight.

Children may be more sensitive to the effects of ammonia due to their smaller size.

Ammonia is unlikely to cause harm to the unborn child.

Ammonia is not considered to be a cancer-causing chemical.

Production and Uses

Key Points

- Ammonia is an important industrial chemical and over 1 million tonnes are produced in the UK each year
- The main use of ammonia is in the production of fertilisers
- Ammonia is also used in the manufacture of plastics, synthetic fibres, dyes, explosives and pharmaceuticals
- Ammonia is used as an industrial refrigerant and in some industrial and domestic cleaning products

Ammonia is produced from a variety of biological and industrial processes. Around 99% of atmospheric ammonia is considered to be as consequence of the natural breakdown of organic waste matter.

Ammonia is produced industrially using the Haber-Bosch process in which nitrogen and hydrogen are combined at high pressure over a catalyst. As an industrial chemical, ammonia is one of the most widely produced, with global production capacity estimated at approximately 160 million tonnes in 2004. Over 1 million tonnes of ammonia are manufactured in the UK each year.

The key use for ammonia is in the production of fertilisers including ammonium sulphate and ammonium nitrate. Other uses include the manufacture of plastics, synthetic fibres, dyes, explosives and pharmaceuticals. Ammonia is also used as an industrial refrigerant and is found in some household and industrial cleaning agents as the ammonium ion. Ammonium salts (liberating ammonia) have been used as “smelling salts”.

Synonyms include ammonia gas, anhydrous ammonia, and liquid ammonia. Aqueous solutions are referred to as aqueous ammonia, ammonia solution, and ammonium hydroxide.

Frequently Asked Questions

What is ammonia?

Ammonia is a colourless, irritant, reactive gas that is lighter than air (approximately half as heavy). It dissolves readily in water and has a characteristic pungent odour similar to urine.

What is ammonia used for?

The main use of ammonia is in the manufacture of fertilisers including ammonium nitrate and ammonium sulphate, and also to produce plastics, synthetic fibres, dyes, pharmaceuticals, explosives and some household and industrial cleaning products.

How does ammonia get into the environment?

Ammonia is mainly released into the environment from the natural breakdown of organic matter and elevated levels can be generated by intensive farming practices. Environmental ammonia may also be released from some industrial process or from accidents during transportation.

How will I be exposed to ammonia?

Ammonia is produced from the natural breakdown of organic matter and so exposure to ammonia will occur at very low levels throughout the environment. Exposure to ammonia may also occur if it is used at your work or if you use it at home.

If there is ammonia in the environment will I have any adverse health effects?

The presence of ammonia in the environment does not always lead to exposure. Clearly, in order for it to cause any adverse health effects you must come into contact with it. You may be exposed by breathing, eating, or drinking the substance or by skin contact. Following exposure to any chemical, the adverse health effects you may encounter depend on several factors, including the amount to which you are exposed (dose), the way you are exposed, the duration of exposure, the form of the chemical and if you were exposed to any other chemicals.

Ammonia and ammonia solutions are irritant and corrosive. Minor exposures may result in a burning sensation of the eyes and throat and more substantial exposure may cause coughing or breathing difficulties. A one-off exposure (sufficient to cause mild lung or eye irritation) is unlikely to result in long-term health effects. Exposure to high concentrations of ammonia may be potentially fatal.

Can ammonia cause cancer?

Exposure to ammonia has not been linked to the development of cancer. In other words, ammonia is not thought to be carcinogenic.

Does ammonia affect children or damage the unborn child?

There is no evidence to suggest that ammonia, at concentrations that do not affect the mother, can affect the health of the unborn child.

What should I do if I am exposed to ammonia?

You should remove yourself from the source of exposure.

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If you have got ammonia on your skin, remove soiled clothing, wash the affected area with lukewarm water and soap for at least 10 – 15 minutes and seek medical advice.

If you have got ammonia in your eyes, remove contact lenses, irrigate the affected eye with lukewarm water for at least 10 – 15 minutes and seek medical advice.

If you have inhaled or ingested ammonia, seek medical advice.

This document will be reviewed not later than 3 years or sooner if substantive evidence becomes available.