

Product safety summary

Ammonium Sulfate

CAS number

7783-20-2

Chemical formula $(\text{NH}_4)_2\text{SO}_4$ **Introduction**

DSM produces ammonium sulfate as a by-product in the manufacture of caprolactam. Caprolactam is the raw material for Nylon-6 that is a highly versatile material used to make textile, floor coverings, industrial yarns, engineering plastics and films.

What is ammonium sulfate?

Ammonium sulfate is a light-colored, water-soluble, crystalline solid. It is an inorganic salt which is formed by the neutralization of sulfuric acid with ammonia. Sulfuric acid is used as a catalyst in the reaction mechanism (also known as Beckmann rearrangement) of cyclohexanone oxime to form caprolactam.

Use, storage and transport of ammonium sulfate

Ammonium sulfate is used in a variety of applications including fertilizers, leather tanning, textile dyeing, cellulose and fiberglass insulation, fire extinguisher chemicals, and fermentation processes.

It should be stored in an inside dry area, away from strong oxidizers and other incompatible materials. The substance is transported as bulk solid or packaged light colored crystals or granules. Transport from the manufacturing site is by trucks or railcars; overseas shipments are by ocean freight. Ammonium sulfate is not classified and regulated as a chemical that is hazardous for transportation by the various global agencies that regulate transportation.

Physical/chemical properties

Ammonium sulfate is a light-colored, water-soluble, crystalline solid. It has a molecular weight of 132.16 and is odorless. Decomposition starts at 235°C. It is highly soluble in water (77 g/100g at 20°C).

The substance should not be mixed with oxidizers such as potassium nitrate, potassium nitrite and potassium chlorate to prevent any explosive risks. The substance is not flammable.

An independent laboratory determined that there is no risk of a dust explosion.

Health information

Ammonium sulfate has a low hazard profile. Ammonium and sulfate, the dissociation products of ammonium sulfate, naturally occur in the body.

Ammonium sulfate has been tested for several toxicological endpoints (for example, acute toxicity, irritation, repeated dose toxicity). Based on experimental data for analogue substances, no additional adverse health effects are anticipated for the ammonium sulfate

It should be noted that the substance decomposes at high temperatures (ca. 235°C). Toxic vapors of ammonia gases and sulfur oxides will be released.

Environmental effects

If spilled in lakes or streams, ammonium sulfate may increase the biological oxygen demand (BOD) of aquatic organisms. DSM has measured the BOD and the chemical oxygen demand (COD) of its ammonium sulfate.

BOD = 0.26 grams oxygen per kilogram

COD = 1.2 grams oxygen per kilogram

Ammonium sulfate has a low bioaccumulating potential. It has been tested for ecotoxicity. Based on these tests there is no need to classify this substance.

Exposure potential

- Workplace exposure

Workplace exposure may occur by inhalation (dust), eye or skin contact from clearing equipment, taking and analyzing samples and during loading and unloading of product shipments.

- Consumer exposure to products containing ammonium sulfate

Small, incidental exposure to consumers of ammonium sulfate is possible via agricultural applications. Exposure to consumers in these applications is expected to be low.

- Environmental releases

Ammonium sulfate is used as a fertilizer in agricultural applications.

Spills of ammonium from incidental leaks from manufacturing or during loading, packaging, and transport are recovered.

Risk management

The main risks in using ammonium sulfate (dust) are irritation of the eyes, skin and the respiratory system. Risk management is achieved by preventive maintenance programs and using personal protective equipment and procedures.

Exposure of consumers to ammonium sulfate is controlled by regulations dependent on the application, e.g. environmental regulations.

Contact information

For further information on ammonium sulfate or product safety summaries in general, please contact: info.gps@dsm.com

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This product safety summary is intended to give general information about the chemical or categories of chemical addressed. It is not intended to provide an in-depth analysis of health and safety information. Additional information is available through the chemical's applicable Material Safety Data Sheet, which should be consulted before use of the chemical. This product safety summary does not supply or replace required regulatory and/or legal communication documents. All information contained herein is presented on an 'as is' basis and state of technology as per the issue date. The internet disclaimer is applicable (http://en.dsm.mobi/pda/terms_eng.html).