

Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Aminonitrile

CAS No.: 13893-53-3

GHS symbols:



GHS06

Acute toxicity

Signal word: Danger

Hazard statements:

H301 Toxic if swallowed.
H311 Toxic in contact with skin.
H331 Toxic if inhaled.

Overview

- Aminonitrile contains free cyanide and can cause acute poisoning.
- There is no significant danger from contact with patients who have only been exposed to aminonitrile vapors. However, a patient who is wet with liquids containing aminonitrile, or whose clothing is wet with such liquids, may endanger other people through direct contact or through evaporating aminonitrile. Immediate cleaning of the skin and hair with water is crucial.
- Aminonitrile poisoning can be fatal within minutes. If the presence of aminonitrile-containing material is suspected and there are signs of severe oxygen deficiency, aminonitrile poisoning should be assumed, even if there is no blue-red discoloration of the lips and nail beds.
- If aminonitrile poisoning is suspected, immediate administration of pure oxygen is crucial. If the patient shows signs of poisoning, the recommended antidotes (e.g. 4-DMAP) should be used.

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1. Information about the substance

2-Amino-2,3-dimethylbutyronitrile, CAS 13893-53-3

Synonym: Aminonitrile

The composition is as follows: 2-amino-2,3-dimethylbutyronitrile (~ 80%) CAS 13893-53-3 and toluene (~ 20%). The liquid is colorless to yellowish brown, oily and has a musty smell of toluene. A small proportion decomposes under normal conditions to form free cyanide (HCN), both in the pure liquid and in the non-reactive toluene-containing solution. Hydrogen cyanide is in equilibrium with 2-amino-2,3-dimethylbutyronitrile and can be easily expelled by heating 2-amino-2,3-dimethylbutyronitrile. Significant amounts of hydrogen cyanide are produced during the thermal decomposition of 2-amino-2,3-dimethylbutyronitrile. In the body, metabolic breakdown of 2-amino-2,3-dimethylbutyronitrile can form cyanides, which lead to cyanide poisoning. The smell of cyanide does not provide sufficient warning of dangerous exposure. The product is flammable.

2. Exposition

2.1. Inhalation

Gaseous aminonitrile is rapidly absorbed through the lungs. Intensive exposure to toluene can cause severe irritation of the lungs.

2.2. Skin/eye contact

Aminonitrile is rapidly absorbed through the skin and mucous membranes and causes poisoning. Although the onset of poisoning symptoms may be slightly delayed in the case of skin exposure, a potentially lethal dose is possible even if only a very small area of skin is wetted with aminonitrile. Exposure to aminonitrile may cause mild skin and eye irritation.

2.3. Ingestion

Accidental ingestion of aminonitrile is unlikely. Aminonitrile is immediately absorbed in the gastrointestinal tract. Ingestion can lead to serious poisoning.

3. Acute health effects

Low concentration can cause headaches, dizziness, weakness, nausea and vomiting after inhalation. Exposure to higher concentrations can lead to severe breathing difficulties, irregular heartbeat, seizures, loss of consciousness and ultimately death. In general, the more severe the exposure, the more pronounced the symptoms. If poisoning by inhalation of aminonitrile/cyanides is suspected, the first treatment is to administer pure oxygen. Patients with significant symptoms require treatment with antidotes (e.g. 4-DMAP) and must be admitted to hospital.

Skin contact may cause skin redness, rapid pulse, shortness of breath, headaches and dizziness. Ultimately, this can lead to agitation, immobility, unconsciousness, respiratory arrest, seizures, slow pulse, drop in blood pressure and death. Burning sensations in the mouth and throat and redness of the eyes may occur.

A single, short-term exposure to low concentrations of acrylonitrile vapors, from which the affected person recovers quickly, does not normally cause delayed or lasting damage to health. Permanent damage to the heart or brain has been reported after severe exposure.

4. Measures

4.1. Self-protection of first aiders

If there is a suspicion that the area the helper must enter contains aminonitrile, a self-contained breathing apparatus and a chemical protection suit must be worn. Contaminated equipment should not be used. It must be assumed that cyanide is present. If respiratory protection is necessary, skin protection is also necessary. A patient who is wet with liquids containing acrylonitrile, or whose clothing is wet with such liquids, may endanger other people through direct contact or through evaporating cyanide.

Acrylonitrile is present in a toluene solution, so the precautions for handling flammable liquids should be strictly observed.

4.2. Rescue

Patients should be removed from the danger zone immediately. If they are unable to walk unaided, they should be removed from the danger zone quickly using appropriate means, taking care to protect yourself. The "A, B, C procedure" then takes absolute priority.

- A) Clear the airways** (check for blockages caused by the tongue or foreign objects)
- B) Ventilation** (check the patient's breathing, if necessary, begin ventilation with adequate self-protection, e.g. breathing mask)
- C) Circulation** (begin resuscitation for any person who does not respond to verbal commands and is not breathing normally)

4.3. Cleaning

Patients suspected of having contact with cyanide-containing solutions such as acrylonitrile must be cleaned. Protective measures should be observed when cleaning persons or objects (e.g. wearing butyl rubber or Viton®gloves, safety goggles, etc.). Contaminated equipment should not be used. The equipment used should be carefully cleaned afterwards.

If possible, patients should assist in their own cleaning. Contaminated clothing should be removed as quickly as possible, securely wrapped and disposed of, while affected skin and hair areas should be rinsed with water for 15 minutes. This should be followed by further cleaning with soap and water. The patient's eyes should be protected during the cleaning of skin and hair areas.

Exposed or irritated eyes should be rinsed with water or neutral saline solution for 15 minutes. Eye rinsing should be continued during other rescue measures or transport. Contact lenses should be removed, if possible, without additional risk to the eye.

4.4. Further measures

Speed is crucial. If the patient shows signs of poisoning, treat them with 100% oxygen until specific antidotes are available. Treatment should be carried out simultaneously with cleaning. Do not induce vomiting after ingestion. If possible, administer activated charcoal immediately.

Anyone who may have been exposed to amine nitrile should seek medical attention immediately.

Patients who are conscious and able to swallow should receive 50 g of activated charcoal (or 1 g/kg body weight for children weighing up to 50 kg) within two hours of exposure. Repeated administration of activated charcoal is possible at any time to complete decontamination if there are signs or suspicion of ongoing absorption.

For multiple doses, start with the single-dose amount mentioned above, followed by the same dose every four hours or half the dose every two hours. Avoid inhaling the product.

Gastric lavage fluid and vomitus must be isolated, as they may release cyanides.

4.5. Instructions for further rules of conduct

Consult your family doctor or the emergency department of the nearest hospital if any abnormalities or symptoms occur within the next 24 hours, in particular:

- Headache, dizziness, confusion, weakness, nausea, vomiting
- Pain or tightness in the chest, irregular heartbeat, difficulty breathing or shortness of breath

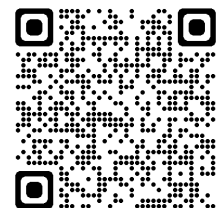
5. References

- Agency for Toxic Substances and Disease Registry (ATSDR). Toxicological profile for cyanide. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service, 1997 (available by Internet at this address: <http://www.atsdr.cdc.gov/toxprofiles/tp8.html>).
- Berufsgenossenschaft der chemischen Industrie, Hrsg. Cyanide. Heidelberg: Jedermann-Verlag, 1989. (Merkblätter für gefährliche Arbeitsstoffe; M 002.)
- Borak J. Pharmacologic Mechanism of Antidotes in Cyanide and Nitrile Poisoning. *J Occup Environ Med* 1995; 37: 793-794.
- Dauderer M, Theml H, Weger N. Behandlung der Blausäurevergiftung mit 4-Dimethylaminophenol (4-DMAP). *Med Klin* 1974; 69: 1626-1631.
- Deskin R. 2-Amino-2,3-Dimethylbutyronitrile – 80 % Material Safety Data: MSDS No. 5618. CYTEC, 19 March 2001.
- Eyer P. Gasförmige Verbindungen: Cyanverbindungen. In: Marquardt H, Schäfer SG, Hrsg. Lehrbuch der Toxikologie. Mannheim: BI-Wissenschaftsverlag, 1994: 555-563.
- Goldfrank LR, Flomenbaum NE, Lewin NA, Weisman RS, Howland MA, Hoffman RS. Toxicologic Emergencies. 6th ed. Norwalk: Appleton & Lange, 1998: 1564-1565, 1569-1576, 1583-1585.
- Heinemeyer G. Cyanidantidote. *Notfallmedizin* 1989; 15: 709-711.
- Johnson MC, Fischer JE. Effectiveness of Sodium Nitrite, Amyl Nitrite and Sodium Thiosulfate against Acute Ocular Intoxication with AC 94,149 (2-amino-2,3-dimethyl-butyronitrile) in Albino Rabbits. *Annals of the New York Academy of Science*, Nov. 1983: 283-285.
- Kläui H, Russi E, Baumann PC. Cyanid-Intoxikation. *Schweiz Med Wschr* 1984; 114: 983-989.
- Meredith TJ, Jacobsen D, Haines JA, Berger JC, van Heijst ANP. IPCS (International Programme on Chemical Safety) / CEC (Commission of the European Communities) 'Evaluation of Antidotes Series' Volume 2: Antidotes for Poisoning by Cyanide. Cambridge: University Press, 1993 (EUR 14280 EN).
- United States Environmental Protection Agency. Fifth Modification of Consent Order, Premanufacture Notice Number P83-603 (DCN: 000724628T), 7 Jan. 1999.
- Olasveengen TM, Semeraro F, et. Al: European Resuscitation Council Guidelines 2021: Basic Life Support. *Resuscitation* 2021, 161: 98-114
- Hoegberg, L. C. G., Gosselin, S., Buckley, N. A., Wood, D. M., Shepherd, G., Hanley, J., ... Hoffman, R. S. (2026). Recommendations from the Clinical Toxicology Recommendations Collaborative on the administration of activated charcoal in acute oral overdose. *Clinical Toxicology*, 1–127. <https://doi.org/10.1080/15563650.2025.2609807>

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