
Information and recommendations for first responders

- Before approaching the patient, the first responder must make sure that he does not risk exposing himself to aminonitrile. Aminonitrile contains free cyanide and can cause acute poisoning.
 - Patients exposed only to aminonitrile vapor do not pose a significant risk of secondary contamination. Patients whose clothing or skin is contaminated with aminonitrile-containing liquids may secondarily contaminate rescue and medical personnel by direct contact or through evaporation of aminonitrile or evolution of cyanide. Immediate skin and hair decontamination with water is crucial.
 - Aminonitrile poisoning may lead to death within minutes. Given reason to believe that aminonitrile-containing material is present, severe hypoxic signs in the absence of cyanosis suggest the diagnosis.
 - In case of suspected aminonitrile poisoning, immediate administration of 100% oxygen is crucial. If the patient is symptomatic/overexposed, obtain the cyanide antidotes and prepare them for use.
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1. Substance information

2-amino-2,3-dimethylbutyronitrile

Synonym: aminonitrile;

This product is composed of 2-amino-2,3-dimethylbutyronitrile (~ 80%) CAS 13893-53-3 and Toluene (~ 20%) CAS 108-88-3. It is colorless to amber oily liquid with a musty toluene odor. A small fraction dissociates to free cyanide (as HCN) under ambient conditions, whether as the neat (100%) liquid or in solution with non-reactive organic solvents such as toluene. HCN is in equilibrium with the aminonitrile and can be driven off simply by heating aminonitrile. Thermal decomposition of aminonitrile has been demonstrated, and it is known that the smoke from burning aminonitrile contains significant HCN. Within the body, metabolic processes can generate cyanide from the aminonitrile and cause cyanide toxicity. The odor of cyanide compounds does not provide adequate warning of hazardous concentrations. Toluene as solvent is flammable.

2. Routes of exposure

Inhalation

Airborne aminonitrile is readily absorbed via the lung. Intense exposure to airborne toluene is capable of significant irritation to the lungs.

Skin/eye contact

Aminonitrile is readily absorbed through skin or mucous membranes and causes systemic toxicity. Although the onset of toxic symptoms may be slightly delayed for skin exposure, a potentially lethal dose may occur from contamination of a very small area of skin by the aminonitrile. Exposure to aminonitrile may result in mild skin and eye irritation.

Ingestion

Unintentional ingestion of aminonitrile is unlikely. Aminonitrile is immediately absorbed from the gastrointestinal tract. Ingestion can lead to severe systemic toxicity.

3. Acute health effects

Initially the patient may experience flushing, tachycardia, shortness of breath, headache, and dizziness. This then may progress to agitation, stupor, coma, apnea, generalized seizures, bradycardia, hypotension and death. Burning sensation of the mouth and throat and also redness of the eyes may occur.

4. Actions

Rescuer self-protection

If the zone which has to be entered by the rescuer is suspected of containing aminonitrile, pressure-demand, self-contained breathing apparatus and recommended chemical-protective clothing shall be worn; do not use equipment that is contaminated itself. The environmental presence of HCN is immediate. Where respiratory protection is required, skin protection is also required. Patients whose clothing or skin is contaminated with aminonitrile-containing liquids may secondarily contaminate rescue and medical personnel by direct contact or through liberation of HCN gas. Aminonitrile is a solution in toluene, so observe prudent precautions for handling a flammable liquid.

Patient recovery

Patients should be removed from the contaminated zone immediately. Patients who are unable to walk may be removed on backboards or stretchers; if these are not available, carefully remove/transport patients with appropriate action to a safe zone, taking into account your self-protection.

Immediate priorities must follow the “**A, B, C’s**” of resuscitation:

- A) Airway** (make sure the airway is not blocked by the tongue or by a foreign body)
- B) Breathing** (check to see if the patient is breathing, provide ventilations with use of appropriate barrier devices, e.g. with a pocket face mask, if breathing is absent)
- C) Circulation** (start CPR in any unresponsive person with absent or abnormal breathing)

Speed is critical. For symptomatic patients, provide treatment - 100% oxygen - and prepare specific antidotes, if within permitted scope of practice. Treatment should be given simultaneously with decontamination procedures. If trained and allowed, first responders should administer amyl nitrite as the first step of antidote administration. Note: In some countries, 0.2-0.4 ml amyl nitrite inhalant ampule (perle) is available and its administration is recommended while waiting for the intravenous treatment to commence. The victim should be lying down in case the nitrite lowers his blood pressure. Break an amyl nitrite perle in a cloth and hold lightly under the nose for 15-30 seconds. Administer oxygen for 15-30 seconds. Repeat amyl nitrite and oxygen administration alternatively. A new perle should be used every 3 minutes. Provide 100% oxygen alone when antidote is administered intravenously. In case of ingestion do not induce emesis, but if possible, immediately administer a slurry of activated charcoal.

Decontamination

All patients with suspected exposure to cyanide-containing solutions such as aminonitrile require decontamination. Do not decontaminate personnel or items without recommended protective gear including butyl rubber or Viton® gloves, chemical splash proof goggles, etc. Decontaminate equipment with 5.25% hypochlorite.

Patients who are able and cooperative may assist with their own decontamination. Rapidly remove and double-bag contaminated clothing while flushing exposed skin and hair with plain water for 5 minutes, then use soap and water for further decontamination. Protect patient’s eyes during flushing of skin and hair.

Irrigate exposed or irritated eyes with plain water or saline for 5 minutes. Continue eye irrigation during other basic care or transport. Remove contact lenses if present and easily removable without additional trauma to the eye.

Further actions

All patients should be transported to a hospital/emergency department. Each possibly exposed person should seek immediate medical advice and treatment.

In this document BASF has made a diligent effort to ensure the accuracy and currency of the information presented but makes no claim that the document comprehensively addresses all possible situations related to this topic. This document is intended as an additional resource for first responders in assessing the condition and managing the treatment of patients exposed to aminonitrile. It is not, however, a substitute for the judgement of a first responder and must be interpreted in the light of specific information regarding the patient available to such a first responder and in conjunction with other sources of authority.

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