Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Aniline

CAS No: 62-53-3

GHS symbols:

GHS05
Corrosive

GHS06
Acute toxicity

GHS08
Health hazard

Signal word: Danger

Hazard statements:

H317	May cause allergic skin reactions.
H318	Causes serious eye damage
H341	May cause genetic defects.
H351	May cause cancer.
H372	Damages organs through prolonged or repeated exposure.
H301+H311+H331	Toxic if swallowed, in contact with skin or if inhaled.

Overview

- A patient who is covered in Aniline or whose clothing is covered in Aniline may endanger other people through direct contact or through evaporating Aniline.
- Aniline is rapidly absorbed after inhalation, ingestion and even through intact skin.
- Aniline can damage or destroy red blood cells (erythrocytes). This leads to reduced oxygen transport in the blood. In severe cases of poisoning, central nervous system functions may also be impaired. In the worst case, cardiovascular arrest may occur.
- Immediate treatment for Aniline exposure consists of maintaining cardiovascular function and injecting the antidote toluidine blue. If toluidine blue is not available, methylene blue can be used.

Table of Contents

1. Information about the substance

Aniline ($C_6H_5NH_2$), CAS 62-53-3
Synonyms: 1-aminobenzene, phenylamine
At room temperature, Aniline has low vapor pressure and is a clear to slightly yellowish oily liquid that turns brownish upon contact with air. Aniline is moderately soluble in water. Aniline has a sweetish to fishy odor. Aniline is obtained by reducing nitrobenzene with hydrogen or by ammonolysis of phenol. It is used in the synthesis of a variety of products such as polyurethane foams, photographic chemicals, rubber chemicals, dyes and pesticides.

2. Exposition

2.1. Inhalation

When inhaled, Aniline is rapidly absorbed by the lungs and can then have toxic effects throughout the body. Usually, the smell of Aniline provides sufficient warning of dangerous concentrations. As Aniline vapors are heavier than air, there is a risk of suffocation in poorly ventilated, low-lying or enclosed spaces.

2.2. Skin/eye contact

Contact with liquid Aniline generally causes only slight eye irritation. However, liquid Aniline or Aniline vapors are easily absorbed through the skin and can then affect the entire body.

2.3. Ingestion

Accidental ingestion of Aniline is unlikely. Toxic effects occur rapidly after ingestion.

3. Acute health effects

After absorption through the skin, via the respiratory tract or after ingestion, Aniline can cause changes in the red blood cells or their destruction, which impairs the transport of oxygen to the body's cells. Aniline can cause changes in red blood cells or their destruction; the blood may take on a brownish color, and the body's cells will no longer receive sufficient oxygen. Headaches, weaknesses, dizziness and shortness of breath may occur.

The effects of Aniline can occur after absorption through intact skin. The skin, lips and nail beds often take on a grey blue color. Severe exposure can be acutely life-threatening.

Irregular heartbeat, acute oxygen deficiency in various organs and cardiovascular failure may occur. Early signs of systemic Aniline exposure include a grey-blue skin color, headaches, dizziness, rapid heartbeat and shortness of breath. Aniline generally causes only mild irritation of the eyes, nose or throat.

A single, short-term exposure to low concentrations of Aniline, from which the affected person recovers quickly, does not normally cause delayed or lasting damage to health.
Severe exposure can cause permanent damage to the brain, heart, liver or kidneys.

4. Measures

4.1. Self-protection of first aiders

If there is a suspicion that the area the helper must enter may be exposed to dangerous concentrations of Aniline vapors (10ppm or more) or contact with liquid Aniline, a self-contained breathing apparatus and a chemical protection suit must be worn. Contaminated equipment should not be used.
Adequate protective gloves must be worn, e.g. butyl rubber or latex gloves with a thickness of more than 1mm (not the thinner gloves generally used by medical personnel). For acute rescue measures, exposure to Aniline concentrations below 10ppm without protective measures may be acceptable for a short period of time. A patient who is covered in Aniline or whose clothing is covered in Aniline may endanger other people through direct contact or through evaporating Aniline.

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 themselves. The "A, B, C procedure" then has 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

Unlike all other patients, those who have only been exposed to Aniline vapors and show no signs of eye irritation do not require any special cleaning measures.
If possible, patients should assist with their own cleaning. If liquid Aniline has contaminated clothing, it must be removed and securely wrapped.
If the eyes have been exposed to Aniline or if there is eye irritation, rinse with water or neutral saline solution for 15 minutes. Remove any contact lenses, if possible, without additional risk to the eye. Other important first aid measures must be continued during this time.
Rinse affected skin and hair with water for at least 15 minutes. Protect the eyes during rinsing. Continue other important first aid measures in the meantime.

4.4. Further measures

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

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:

- Breathing difficulties or shortness of breath
- Pain or tightness in the chest
- Irregular arrhythmic heartbeat
- Stomach pain or vomiting
- Blood in the urine (brown or bronze-colored urine)
- Blue, brownish or grey discoloration of the skin, lips or nail beds

5. References

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Administrative Information

Document Type	Chemical Emergency Medical Guideline
Number of Version	DE.1.0.0
Initial Publication	01.01.2026
Next Revision	2029
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