

Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Styrene

CAS No.: 100-42-5

GHS symbols:



GHS06

Acute toxicity



GHS07

Acute toxicity



GHS08

Health hazard

Signal word: Danger

Hazard statements:

H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H372	Damages organs (hearing) through prolonged or repeated exposure.
H361d	May cause harm to the unborn child.

Overview

- There is no danger from contact with patients who have only been exposed to styrene vapors. A patient who is wet with liquid styrene (boiling point 145°C) or whose clothing is wet with liquid styrene may endanger other persons through direct contact or through evaporating styrene.
- Styrene irritates the skin, eyes and respiratory tract and can cause headaches, nausea, dizziness, weakness, confusion and unconsciousness. Disorders of the central and peripheral nervous system have been observed.
- There is no known specific antidote. Treatment depends on the extent of exposure and the symptoms.

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1. Information about the substance

Styrene (C₈H₈), CAS 100-42-5

Synonyms: Vinylbenzene

At room temperature (boiling point 145°C), styrene is a clear to slightly yellowish, oily liquid. The vapor and liquid are flammable. Styrene has a sweet, pungent odor. The odor threshold is 0.017 to 1.9 ppm, with a rapid habituation effect. It is slightly soluble in water but highly soluble in alcohol, ether and acetone and polymerizes spontaneously. Combustion produces carbon monoxide.

Styrene is an organic solvent with low vapor pressure and is used in the manufacture of polystyrene, surface coatings, polyester resins, copolymers with acrylonitrile and butadiene, and as a chemical intermediate. Styrene-butadiene rubber is the most widely used synthetic rubber.

2. Exposition

2.1. Inhalation

Exposure to styrene occurs mainly through inhalation. Styrene is rapidly absorbed through the lungs.

2.2. Skin/eye contact

Styrene is absorbed through the skin and can lead to general symptoms of poisoning.

2.3. Ingestion

Styrene is absorbed through the gastrointestinal tract. However, ingestion is rare in the workplace. If swallowed, it can enter the respiratory tract.

3. Acute health effects

Styrene irritates the upper respiratory tract. Local exposure to liquid styrene can cause skin irritation. Local exposure to liquid styrene or high vapor concentrations can cause eye irritation with redness, burning, tearing or spasmodic eyelid closure.

Styrene can cause general symptoms of poisoning such as headache, nausea, dizziness, weakness, confusion and loss of consciousness. Exposure to high concentrations may cause signs of upper respiratory tract irritation, followed by oxygen deficiency, muscle weakness, cardiac arrhythmia, coma and respiratory arrest. Central and peripheral nervous system disorders and liver enzyme changes have been observed with chronic exposure.

Single, short-term exposure to styrene, from which the affected person recovers quickly, does not normally cause delayed or lasting health damage.

Disorders of the central and peripheral nervous system (coordination and concentration disorders, memory disorders, sensory disturbances in the limbs, reduced nerve conduction velocity), elevated liver enzymes and hearing damage have been observed in chronically exposed workers. After inhaling relevant amounts of styrene, permanent respiratory disorders and increased susceptibility to lung infections have been described.

4. Measures

4.1. Self-protection of first responders

If there is a suspicion that the area the helper must enter contains styrene, a self-contained breathing apparatus and a chemical protection suit must be worn. Contaminated equipment should not be used.

There is no danger from contact with patients who have only been exposed to styrene vapors. A patient who is wet with liquid styrene or whose clothing is wet with liquid styrene may endanger other people through direct contact or through evaporating styrene.

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 who have only been exposed to styrene vapors show no signs of skin or eye irritation do not require any special cleaning measures, unlike all others.

If possible, patients should assist with their own cleaning. If liquid styrene has been exposed and clothing is contaminated, it must be removed and securely wrapped.

If the eyes have been exposed to styrene or if there is eye irritation, they must be rinsed with water or a neutral saline solution for 15 minutes. Contact lenses must be removed, if possible, without causing additional danger to the eye. Other important emergency measures must be continued during this time.

Rinse affected skin and hair with water for at least 15 minutes. Protect eyes while rinsing. Continue other important first aid measures during this time.

Avoid vomiting; this may cause irritation of the esophagus and styrene to enter the lungs.

4.4. Further measures

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

Patients who are conscious and able to swallow should, if possible, be given 50 g of activated charcoal (or 1 g/kg body weight for children weighing up to 50 kg). Activated charcoal may be administered repeatedly 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.

Do not induce vomiting under any circumstances; this may cause irritation of the esophagus and may lead to styrene entering the lungs.

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:

- Coughing, wheezing or whistling breath
- Difficulty breathing or shortness of breath
- Increased pain or abnormalities in the affected skin areas or eyes
- Headache, nausea, dizziness

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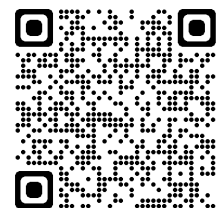
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Administrative Information

Document Type	Chemical Emergency Medical Guideline
Number of Version	DE.2.0.0
Initial Publication	01.01.2026
Next Revision	2029
Responsible Unit (Author)	ESG/CH ESG/AS
Contact	ESG/CH: Dr. M. Conzelmann, T. Schröck ESG/AS: Dr. D. Frambach

BASF SE
Corporate Health Management
Carl-Bosch-Straße 38
67056 Ludwigshafen
Germany



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