
Information and recommendations for first responders

- Patients whose clothing or skin is contaminated with liquid formic acid can cause secondary contamination of rescue and medical personnel by direct contact or through evaporation of formic acid. Patients exposed only to formic acid vapor do not pose a significant risk of secondary contamination.
 - Formic acid is rapidly corrosive to all tissues. Eye contact may cause severe burns and loss of vision. Contact with the skin may cause severe burns which may be delayed in onset. Formic acid vapor is irritating to the skin, eyes, nose, throat and respiratory tract, causing irritation, coughing, chest pain and dyspnea. Swelling of the throat and accumulation of fluid in the lungs (shortness of breath, cyanosis, expectoration, cough) may occur.
 - There is no antidote to be administered to counteract the effects of formic acid. Treatment consists of supportive measures.
-

1. Substance information

Formic acid (HCOOH), CAS 64-18-6

Synonyms: formic acid, hydrogen carboxylic acid, methanoic acid. At room temperature, formic acid is a colorless, fuming liquid with a pungent, penetrating odor. Formic acid is used in the dyeing and finishing of textiles and paper, treatment of leather, electroplating and brewing, silvering glass, as a feed additive, and as an intermediate in the chemical industry.

2. Routes of exposure

Inhalation

Exposures may occur by inhalation. Formic acid's odor and upper respiratory tract irritant properties generally provide adequate warning of hazardous concentrations.

Skin/eye contact

Most exposures occur by direct contact of the skin and the eyes with liquid formic acid. Contact with the skin and the eyes causes severe burns which may be delayed in onset.

Ingestion

Ingestion is rare in occupational settings.

3. Acute health effects

Respiratory

Formic acid exposure usually causes mucous membrane irritation, sore throat, and coughing. Rapid development of respiratory distress with chest pain, dyspnea, swelling of the throat and accumulation of fluid in the lungs (shortness of breath, cyanosis, expectoration, cough) may occur. Lung injury may progress over several hours. Formic acid poisoning may cause respiratory failure. Systemic absorption in humans is rare since both the liquid and vapor are irritating or corrosive.

Skin

Deep burns of the skin and mucous membranes are caused by direct contact with liquid formic acid; disfiguring scars may result. Contact with less concentrated formic acid vapor or mist can cause burning pain, redness, inflammation, and blisters.

Eye

Eye contact with liquid formic acid causes severe burns and loss of vision. Contact with less concentrated vapor or mist cause burning discomfort, spasmodic blinking or involuntary closing of the eyelids, redness, and tearing.

Ingestion

Nausea and vomiting are frequently reported. Ingestion causes severe corrosive injury of the mucous membranes of the throat and esophagus.

4. Actions

Rescuer self-protection

If the zone which has to be entered by the rescuer is suspected of containing formic acid, pressure-demand, self-contained breathing apparatus and chemical-protective clothing shall be worn; do not use equipment that is contaminated itself.

Patients exposed only to formic acid vapor do not pose a significant risk of secondary contamination. Patients whose clothing or skin is contaminated with liquid formic acid or formic acid mist may secondarily contaminate rescue and medical personnel by direct contact or through evaporation of formic acid.

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 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)

Decontamination

Patients exposed only to formic acid vapor or mist who have no evidence of skin or eye irritation do not need decontamination. All others require decontamination.

Patients who are able and cooperative may assist with their own decontamination. If the exposure involved liquid formic acid and if clothing is contaminated, **remove immediately** and double-bag the clothing.

Irrigate exposed or irritated eyes with plain water or saline for at least 15 minutes. Remove contact lenses if present and easily removable without additional trauma to the eye. Continue other basic care during flushing.

Flush exposed skin and hair with plain water for at least 15 minutes. Protect eyes during flushing of skin and hair. Continue other basic care during flushing.

After ingestion do not induce emesis. Each potentially exposed person should seek immediate medical advice and treatment.

Further actions

Each potentially 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 formic acid. 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.

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

BASF Corporation
Medical Department
100 Campus Drive, M/S F 221
Florham Park, NJ 07932
USA