

Material Safety Data Sheet

Formic acid



1. CHEMICAL PRODUCT and EMERGENCY TELEPHONE CONTACT

Product Name:	Formic acid
Formula:	CH ₂ O ₂
Synonyms:	Formic Acid
EMERGENCY TELEPHONE NUMBER:	0491-2566889

2. COMPOSITION/INFORMATION ON INGREDIENTS

Name	% by Weight
Formic acid	85
Water	15

3. HAZARDS IDENTIFICATION EMERGENCY OVERVIEW

Potential Acute Health Effects: Very hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Hazardous in case of skin contact (corrosive, permeator), of eye contact (corrosive). Liquid or spray mist may produce tissue damage particularly on mucous membranes of eyes, mouth and respiratory tract. Skin contact may produce burns. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.

Potential Chronic Health Effects: Hazardous in case of skin contact (irritant), of ingestion, of inhalation. **CARCINOGENIC EFFECTS:** Not available. **MUTAGENIC EFFECTS:** Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. **TERATOGENIC EFFECTS:** Not available. **DEVELOPMENTAL TOXICITY:** Not available. The substance may be toxic to kidneys, mucous membranes, skin, teeth. Repeated or prolonged exposure to the substance can produce target organs damage. Repeated p. 2 or prolonged contact with spray mist may produce chronic eye irritation and severe skin irritation. Repeated or prolonged exposure to spray mist may produce respiratory tract irritation leading to frequent attacks of bronchial infection.

POTENTIAL HEALTH EFFECTS

Primary Routes of Entry: Inhalation, skin contact/absorption, eye contact, and ingestion.

General Acute Exposure: Liquid, mist, or vapours can cause eye, skin, and respiratory tract irritation and Central Nervous System (CNS) depression.

Inhalation:

Acute Exposure: Short-term exposure to high concentrations may cause CNS depression. Symptoms may include headache, weakness, drowsiness, light-headedness, nausea, difficult breathing, drunkenness, eye irritation, blurred vision, blindness, loss of consciousness, vertigo, fatigue, convulsions, and possibly death, depending on exposure. Victims may improve and then get worse again up to 30 hours later.

Skin:

Acute Contact: Upon prolonged or repeated contact, absorption through the skin may occur and produce toxic effects similar to those resulting from inhalation exposure. Repeated or prolonged skin contact may cause drying, cracking, and inflammation of the skin due to the defatting action of the product.

Eye:

Acute Contact: Eye irritation may occur upon short-term exposure, including a burning sensation, tearing, redness, or swelling. Upon direct contact with liquid, conjunctivitis and corneal burns may occur. The primary toxic effect is exerted upon the nervous system, particularly the optic nerves and possibly the retina. The condition can progress to permanent blindness.

Ingestion: Ingestion may cause serious poisoning with effects similar to those of inhalation and absorption through the skin. Toxic effects are more common after ingestion. Death from as little as one ounce has been reported.

Neurologic:

Acute Exposure: Central Nervous System (CNS) depression may occur upon exposure.

Summary of Chronic Exposure: It is slowly eliminated from the body; hence repeated exposures may result in toxic levels in the blood and tissues. Due to its slow elimination, it should be regarded as a cumulative poison. Though single exposures to fumes may cause no harmful effect, daily exposure may result in the accumulation of sufficient amount in the body to cause illness.

Note to the Physician: Coma resulting from massive exposures may last as long as 2-4 days. In the body, products formed by its oxidation are formaldehyde and formic acid.

Medical Conditions Aggravated by Exposure: Personnel with pre-existing CNS disease, skin disorders, impaired liver or kidney function, GI tract disorders or chronic respiratory diseases should avoid exposure.

4. FIRST AID MEASURES

First Aid for Eyes: Immediately flush eyes with copious amounts of tepid water for at least 15 minutes. The patient should be seen in a health care facility and referral to an ophthalmologist considered.

First Aid for Skin: Immediately flush exposed area with copious amounts of tepid water for at least 15 minutes while removing contaminated clothing and shoes, followed by washing area thoroughly with soap and water. The patient should be seen in a health care facility if irritation or pain persists or if symptoms of toxicity develop. Wash contaminated clothing and shoes before reuse.

First Aid for Inhalation: Move patient to fresh air and keep warm and at rest. Monitor for respiratory distress. If difficulty in breathing develops or if breathing has stopped, administer artificial respiration and seek medical attention. If trained to do so administer supplemental oxygen with assisted ventilation as required. Caution: Administration of mouth-to-mouth resuscitation may expose the first aid provider to chemical within the victim's lungs or vomit.

First Aid for Ingestion: If patient is conscious, immediately give two glasses of water and induce vomiting. Do not make an unconscious person vomit. Get medical attention immediately.

5. FIRE FIGHTING MEASURES

Flammability of the Product	Combustible.
Auto-Ignition Temperature	The lowest known value is 539°C (1002.2°F) (Formic acid)
Flash Points	The lowest known value is OPEN CUP: 69°C (156.2°F). (Formic acid)
Flammable Limits	The greatest known range is LOWER: 18% UPPER: 57% (Formic acid)
Products of Combustion	These products are carbon oxides (CO, CO ₂).

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat. Slightly flammable to flammable in presence of metals. Nonflammable in presence of shocks, of oxidizing materials, of reducing materials, of combustible materials, of organic materials, of acids, of alkalis, of moisture.

Explosion Hazards in Presence of Various Substances: Explosive in presence of oxidizing materials. Slightly explosive in presence of organic materials, of metals. Non-explosive in presence of open flames and sparks, of shocks.

Fire Fighting Media and Instructions: SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use water spray, fog or foam. Do not use water jet.

Special Remarks on Fire Hazards: Decomposes more rapidly under fire conditions, forming carbon monoxide. Aluminum reduces formic acid (itself a reductant) with incandescence. (Formic acid)

Special Remarks on Explosion Hazards: Formic acid forms explosive reactions with the following: Furfuryl alcohol, Hydrogen Peroxide + organic matter; Nitromethane, P₂O₅, Thallic nitrate trihydrate +vanillin, and oxidizing agents Explosive decomposition of Formic Acid on clean nickel. (Formic acid)

6. ACCIDENTAL RELEASE MEASURES

Spill or Leak Measures: Stop leak if you can do it without risk. Keep unnecessary people away and deny entry. Isolate spill or leak area immediately for at least 330 to 660 feet in all directions. Stay upwind, out of low areas, and ventilate closed spaces before entering. Eliminate all ignition sources. Do not touch or walk through spilled material. Prevent entry of product into waterways, sewers, basements, or confined spaces. A vapour suppressing foam may be used to reduce vapours. All equipment used when handling the product must be grounded and/or spark resistant. Water spray may reduce vapours but may not prevent ignition in closed spaces. Fully encapsulating, vapour protective clothing should be worn for spills and leaks with no fire.

Determining Spill Size: Generally, a small spill is one that involves a single, small package (i.e. up to a 55 gallon drum), small cylinder, or a small (non-continuing) leak from a large container.

Large Spill:

- a. Dike far ahead of liquid spill for later disposal.
- b. Follow local emergency protocol for handling.
- c. Water spray may reduce vapor; but may not prevent ignition in closed spaces.

Small Spill:

- a. Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
- b. Use clean non-sparking tools to collect absorbed material.

7. HANDLING AND STORAGE

Precautions: Keep locked up.. Keep container dry. Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/vapor/spray. Never add water to this product. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, organic materials, acids, alkalis.

Storage: Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

Skin Protection Requirements: Equipment should prevent repeated or prolonged skin contact with the product. This may include rubber boots, resistant gloves, and other impervious and resistant clothing. Compatible materials may include butyl rubber, natural rubber, neoprene, nitrile rubber, viton and others. Review the equipment manufacture's compatibility data.

Eye Protection Requirements: Use chemical (indirectly vented) goggles when there is a potential for contact with product, including vapour. A full-face shield may be worn over goggles for additional protection, but not as a substitute for goggles.

Other Protective Equipment: Safety shower and eyewash fountain should be provided. Proper fire extinguishment equipment must be kept in the handling area.

9. PHYSICAL AND CHEMICAL PROPERTIES

pH (1% soln/water)	Acidic.
Critical Temperature	Not available
Vapor Pressure	The highest known value is 4.7 kPa
Vapor Density	The highest known value is 1.59
Boiling Point	The lowest known value is 100°C
Melting Point	May start to solidify at 8.4°C
Odor Threshold	The highest known value is 0.625 ppm

10. REACTIVITY

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources, incompatible materials Incompatibility with various substances: Highly reactive with oxidizing agents. Reactive with organic materials, metals, acids, alkalis.

Corrosivity: Highly corrosive in presence of copper. Corrosive in presence of stainless steel. Non-corrosive in presence of glass, of aluminum, of stainless steel.

Special Remarks on Reactivity: Formic acid is a strong reducing agent. Decomposes slowly during storage! Vent Container At Least Monthly. Formic acid may react with alkalis and oxidizing materials such as peroxides, nitric acid, and chromic acid. It is also incompatible with concentrated Sulfluric Acid, Nitromethane, finely powdered metals, permanganates, strong bases, oxidizing agents. (Formic acid)

Special Remarks on Corrosivity: Corrosive to metals

Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals: Acute oral toxicity (LD50): 729 mg/kg (Mouse) (Calculated value for the mixture).

Chronic Effects on Humans: MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. [Formic acid]. Mutagenic for bacteria and/or yeast. [Formic acid]. May cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes, central nervous system (CNS).

Other Toxic Effects on Humans: Extremely hazardous in case of inhalation (lung corrosive). Very hazardous in case of skin contact (irritant), of eye contact (corrosive), of ingestion, . Hazardous in case of skin contact (corrosive, permeator).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: May affect genetic material (mutagenic)

12. ECOLOGICAL INFORMATION

Ecotoxicity: Not available.

BOD5 and COD: Not available.

Products of Biodegradation: Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Waste must be disposed of in accordance with federal, state and local environmental control regulations

14. TRANSPORTATION INFORMATION

Not classified as dangerous in the meaning of transport regulation

15. REGULATORY INFORMATION

Federal and State Regulations: New York release reporting list: Formic acid Rhode Island RTK hazardous substances: Formic acid Pennsylvania RTK: Formic acid Florida: Formic acid Minnesota: Formic acid Massachusetts RTK: Formic acid New Jersey: Formic acid TSCA 8(b) inventory: Formic acid; Water SARA 313 toxic chemical notification and release reporting: Formic acid CERCLA: Hazardous substances.: Formic acid: 5000 lbs. (2268 kg);

Other Regulations: OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).

Other Classifications:

WHMIS (Canada): CLASS B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F). CLASS E: Corrosive liquid

16. OTHER INFORMATION

Preparation Date : 18-06-2015

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Disclaimer: The information above is believed to be accurate and represents the best information currently available to us. Users should make their own investigations to determine the suitability of the information for their particular purposes. This document is intended as a guide to the appropriate precautionary handling of the material by a properly trained person using this product.