

Safety Data Sheet

Formic Acid 95%

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1. Identification

Product identifier used on the label

Formic Acid 95%

Recommended use of the chemical and restriction on use

Recommended use*: for industrial use only

* The "Recommended use" identified for this product is provided solely to comply with a US Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

BASF CORPORATION
100 Park Avenue
Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300
BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Molecular formula: CH₂(O₂)
Synonyms: FORMIC ACID 95%

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

Flam. Liq.	3	Flammable liquids
Acute Tox.	3 (Inhalation - vapour)	Acute toxicity
Acute Tox.	4 (oral)	Acute toxicity
Skin Corr./Irrit.	1A	Skin corrosion/irritation
Eye Dam./Irrit.	1	Serious eye damage/eye irritation

Label elements

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Pictogram:



Signal Word:
Danger

Hazard Statement:

H226 Flammable liquid and vapour.
H331 Toxic if inhaled.
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.

Precautionary Statements (Prevention):

P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P260 Do not breathe mist or vapour.
P260 Do not breathe dust or mist.
P243 Take precautionary measures against static discharge.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P264 Wash with plenty of water and soap thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P242 Use only non-sparking tools.
P240 Ground/bond container and receiving equipment.

Precautionary Statements (Response):

P310 Immediately call a POISON CENTER or doctor/physician.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P303 + P361 + P352 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Wash with plenty of soap and water.
P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P370 + P378 In case of fire: Use... to extinguish.

Precautionary Statements (Storage):

P403 + P235 Store in a well-ventilated place. Keep cool.
P233 Keep container tightly closed.
P405 Store locked up.

Precautionary Statements (Disposal):

P501 Dispose of contents/container to hazardous or special waste collection point.

Hazards not otherwise classified

No applicable information available.

Labeling of special preparations (GHS):

Corrosive to the respiratory tract.

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According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Emergency overview

DANGER:
CORROSIVE.
COMBUSTIBLE LIQUID.
Corrosive to eyes.
Corrosive to the skin.
RISK OF SERIOUS DAMAGE TO EYES.
HARMFUL IF SWALLOWED.
INGESTION MAY CAUSE GASTRIC DISTURBANCES.
CAUSES RESPIRATORY TRACT IRRITATION.
Avoid contact with the skin, eyes and clothing.
Avoid inhalation of mists/vapours.
Use with local exhaust ventilation.
Wear a NIOSH-certified (or equivalent) acid gas/organic vapour respirator.
Wear NIOSH-certified chemical goggles.
Wear full face shield if splashing hazard exists.
Wear chemical resistant protective gloves.
Wear protective clothing.
Eye wash fountains and safety showers must be easily accessible.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Content (W/W)</u>	<u>Chemical name</u>
64-18-6	>= 75.0 - <= 100.0 %	Formic Acid

According to Regulation 1994 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

<u>CAS Number</u>	<u>Content (W/W)</u>	<u>Chemical name</u>
64-18-6	95.0 %	Formic Acid
7732-18-5	5.0 %	Water

4. First-Aid Measures

Description of first aid measures

General advice:

Remove contaminated clothing. Avoid contact with the skin, eyes and clothing.

If inhaled:

Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.

If on skin:

Flush with copious amounts of water for at least 15 minutes. Immediate medical attention required.
Remove contaminated clothing.

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If in eyes:

In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. Immediate medical attention required.

If swallowed:

Do not induce vomiting due to the product ingredients. Rinse mouth and then drink plenty of water. Obtain medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: Overexposure may cause: vomiting, aspiration pneumonia, circulatory collapse, death, acidosis, abdominal cramps, shortness of breath, hypotension, nausea, diarrhea, salivation
Hazards: No applicable information available.

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
water spray, dry powder, carbon dioxide, foam

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
No particular hazards known.

Advice for fire-fighters

Protective equipment for fire-fighting:
Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

No applicable information available.

Impact Sensitivity:

Remarks: Based on the chemical structure there is no shock-sensitivity.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Extinguish sources of ignition nearby and downwind. Ensure adequate ventilation. Wear acid-resistant boots. Use personal protective clothing.

Environmental precautions

Substance/product is RCRA hazardous due to its properties. Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

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For large amounts: Neutralize with soda or slaked lime. Pump off product. Pick up with suitable appliance and dispose of.
Spills should be contained and placed in suitable containers for disposal.

7. Handling and Storage

Precautions for safe handling

Wear suitable gloves and eye/face protection. Handle and open container with care.

Protection against fire and explosion:
Avoid all sources of ignition: heat, sparks, open flame.

Conditions for safe storage, including any incompatibilities

Segregate from bases. Segregate from oxidizing agents.

Further information on storage conditions: Avoid extreme heat. Keep away from sources of ignition - No smoking.

8. Exposure Controls/Personal Protection

Components with occupational exposure limits

Formic Acid	OSHA PEL	PEL 5 ppm 9 mg/m ³ ; TWA value 5 ppm 9 mg/m ³ ;
	ACGIH TLV	TWA value 5 ppm ; STEL value 10 ppm ;

Advice on system design:

Provide local exhaust ventilation to control vapours/mists.

Personal protective equipment

Respiratory protection:

Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator. Do not exceed the maximum use concentration for the respirator facepiece/cartridge combination. For emergency or non-routine, high exposure situations, use a NIOSH-certified full facepiece pressure demand self-contained breathing apparatus (SCBA) or a full facepiece pressure demand supplied-air respirator (SAR) with escape provisions. Observe OSHA regulations for respirator use (29 CFR 1910.134).

Hand protection:

Chemical resistant protective gloves, Consult with glove manufacturer for testing data.

Eye protection:

Tightly fitting safety goggles (chemical goggles) and face shield.

Body protection:

Impermeable protective clothing

General safety and hygiene measures:

Eye wash fountains and safety showers must be easily accessible. Wear protective clothing as necessary to prevent contact.

9. Physical and Chemical Properties

Form: liquid

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Odour:	acetous	
Odour threshold:		No applicable information available.
Colour:	colourless	
pH value:	2	(10 g/l)
Melting point:		No applicable information available.
Boiling point:	approx. 105 °C	(760 mmHg)
Sublimation point:		No applicable information available.
Flash point:	56 °C	(DIN 51755)
Flammability:	Flammable liquid and vapour.	
Lower explosion limit:	14.3 %(V)	(47 °C)
Upper explosion limit:	34 %(V)	
Autoignition:	480 °C	(DIN 51794)
Vapour pressure:	approx. 32 mmHg	(20 °C)
Density:	1.2 g/cm ³	(20 °C)
Relative density:	1.2195	(20 °C) (OECD Guideline 109)
Bulk density:	1.2 g/cm ³	(20 °C)
Vapour density:		No applicable information available.
Partitioning coefficient n-octanol/water (log Pow):	-2.1	(23 °C) (Directive 92/69/EEC, A.8)
	-1.9	(23 °C) (Directive 92/69/EEC, A.8)
	-2.3	(23 °C) (Directive 92/69/EEC, A.8)
Self-ignition temperature:		not self-igniting
Thermal decomposition:	No applicable information available.	
Viscosity, dynamic:	1.8 mPa.s	(20 °C) (calculated (from kinematic viscosity))
	1.22 mPa.s	(40 °C) (calculated (from kinematic viscosity))
Viscosity, kinematic:	1.47 mm ² /s	(20 °C) (OECD 114)
	1.02 mm ² /s	(40 °C) (OECD 114)
Particle size:		The substance / product is marketed or used in a non solid or granular form.
Solubility in water:		(20 °C) miscible
Solubility (quantitative):		No applicable information available.
Solubility (qualitative):	No applicable information available.	
Molar mass:	46.03 g/mol	
Evaporation rate:		Value can be approximated from Henry's Law Constant or vapor pressure.

10. Stability and Reactivity

Reactivity

No applicable information available.

Corrosion to metals:

Corrosive effect on metals.

Formation of flammable gases: Remarks:

Forms no flammable gases in the presence of water.

Chemical stability

No applicable information available.

Possibility of hazardous reactions

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The product is chemically stable.

Conditions to avoid

Avoid all sources of ignition: heat, sparks, open flame.

Incompatible materials

oxidizing agents, bases

Hazardous decomposition products

Decomposition products:

Hazardous decomposition products: carbon monoxide, carbon dioxide, nitrogen oxides

Thermal decomposition:

No applicable information available.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity

Assessment of acute toxicity: Of moderate toxicity after single ingestion. Of pronounced toxicity after short-term inhalation. The toxicity of the product is based on its corrosivity.

Information on: Formic Acid

Oral

Type of value: LD50

Species: rat

Value: 730 mg/kg

Moderately toxic.

Inhalation

Type of value: LC50

Species: rat (male/female)

Value: 7.85 mg/l (BASF-Test)

Exposure time: 4 h

Dermal

Study scientifically not justified.

Assessment other acute effects

Assessment of STOT single:

Based on the available information there is no specific target organ toxicity to be expected after a single exposure.

Irritation / corrosion

Assessment of irritating effects: Contact may cause burns and permanent injury.

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Skin

Species: rabbit
Result: Corrosive.
Method: OECD Guideline 404
Literature data.

Eye

Study scientifically not justified.

Sensitization

Assessment of sensitization: Skin sensitizing effects were not observed in animal studies.

Buehler test

Species: guinea pig
Result: Non-sensitizing.
Method: OECD Guideline 406

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: No other known chronic effects.

Information on: Formic Acid

Genetic toxicity

Assessment of mutagenicity: No mutagenic effect was found in various tests with bacteria and mammalian cell culture.
Genetic toxicity in vitro: Ames-test
No mutagenic effects reported.

Carcinogenicity

Assessment of carcinogenicity: In long-term studies in rats and mice in which the substance was given by feed, a carcinogenic effect was not observed. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Reproductive toxicity

Assessment of reproduction toxicity: The results of animal studies gave no indication of a fertility impairing effect. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Teratogenicity

Assessment of teratogenicity: No indications of a developmental toxic / teratogenic effect were seen in animal studies. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Symptoms of Exposure

Overexposure may cause: vomiting, aspiration pneumonia, circulatory collapse, death, acidosis, abdominal cramps, shortness of breath, hypotension, nausea, diarrhea, salivation

Medical conditions aggravated by overexposure

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Data available do not indicate that there are medical conditions that are generally recognized as being aggravated by exposure to this substance/product. See MSDS section 11 - Toxicological information.

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

The product gives rise to pH shifts.

Toxicity to fish

LC50 (96 h) 46 - 100 mg/l, *Leuciscus idus* (static)

Slightly toxic.

Aquatic invertebrates

EC50 (48 h) 34.2 mg/l, *Daphnia magna* (static)

Slightly toxic.

Aquatic plants

EC50 (72 h) 26.9 mg/l, algae

Slightly toxic.

Chronic toxicity to fish

Study scientifically not justified.

Chronic toxicity to aquatic invertebrates

No observed effect concentration (21 d) \geq 100 mg/l, *Daphnia magna* (OECD Guideline 211, semistatic)

The statement of the toxic effect relates to the analytically determined concentration. The product will cause changes in the pH value of the test system. The result refers to a neutralized sample. No effects at the highest test concentration.

Assessment of terrestrial toxicity

Study scientifically not justified.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms

bacteria (17 h): 46.7 mg/l

Slightly toxic.

Persistence and degradability

Assessment biodegradation and elimination (H₂O)

Readily biodegradable (according to OECD criteria).

Elimination information

100 % DOC reduction (9 d) (OECD 301E/92/69/EEC, C.4-B) (aerobic, municipal sewage treatment plant effluent)

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Assessment of stability in water

According to structural properties, hydrolysis is not expected/probable.

Information on Stability in Water (Hydrolysis)

$t_{1/2} > 5$ d (50 °C, pH value 4)

$t_{1/2} > 5$ d (50 °C, pH value 7)

$t_{1/2} > 5$ d (50 °C, pH value 9)

Bioaccumulative potential

Assessment bioaccumulation potential

Significant accumulation in organisms is not to be expected.

Mobility in soil

Assessment transport between environmental compartments

The substance will not evaporate into the atmosphere from the water surface.
Adsorption to solid soil phase is not expected.

Additional information

Sum parameter

Biochemical oxygen demand (BOD) Incubation period 5 d: 86 mg/g

13. Disposal considerations

Waste disposal of substance:

Incinerate or dispose of in a RCRA-licensed facility. Do not discharge into waterways or sewer systems without proper authorization. Dispose of in accordance with national, state and local regulations.

Container disposal:

Empty containers with less than 1 inch of residue may be landfilled at a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers. If containers are not empty, they must be disposed of in a RCRA-licensed facility.

RCRA: U123

14. Transport Information

Land transport

USDOT

Hazard class:	8
Packing group:	II
ID number:	UN 1779
Hazard label:	8, 3
Proper shipping name:	FORMIC ACID

Sea transport

IMDG

Hazard class:	8
Packing group:	II

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ID number: UN 1779
Hazard label: 8, 3
Marine pollutant: NO
Proper shipping name: FORMIC ACID

Air transport

IATA/ICAO

Hazard class: 8
Packing group: II
ID number: UN 1779
Hazard label: 8, 3
Proper shipping name: FORMIC ACID

15. Regulatory Information

Federal Regulations

Registration status:

Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Acute;

EPCRA 313:

<u>CAS Number</u>	<u>Chemical name</u>
64-18-6	Formic Acid

<u>CERCLA RQ</u>	<u>CAS Number</u>	<u>Chemical name</u>
5000 LBS	64-18-6	Formic Acid

State regulations

<u>State RTK</u>	<u>CAS Number</u>	<u>Chemical name</u>
MA, NJ, PA	64-18-6	Formic Acid

NFPA Hazard codes:

Health : 3 Fire: 2 Reactivity: 0 Special: C

HMIS III rating

Health: 3 Flammability: 2 Physical hazard: 0

Assessment of the hazard classes according to UN GHS criteria (most recent version):

Skin Corr./Irrit.	1A	Skin corrosion/irritation
Flam. Liq.	3	Flammable liquids
Eye Dam./Irrit.	1	Serious eye damage/eye irritation
Acute Tox.	4 (oral)	Acute toxicity
Acute Tox.	3 (Inhalation - vapour)	Acute toxicity

16. Other Information

SDS Prepared by:

BASF NA Product Regulations
SDS Prepared on: 2015/01/29

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