

Safety Data Sheet

Formic acid 85%

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(30056217/SDS_GEN_US/EN)

1. Identification

Product identifier used on the label

Formic acid 85%

Recommended use of the chemical and restriction on use

Recommended use*: industrial chemicals

* The "Recommended use" identified for this product is provided solely to comply with a 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: CH_2O_2
Chemical family: carboxylic acid

2. Hazards Identification

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

Classification of the product

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

Label elements

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Pictogram:



Signal Word:
Danger

Hazard Statement:

| | |
|------|------------------------------------------|
| H227 | Combustible liquid. |
| 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. |
| P261 | Avoid breathing vapours. |
| P260 | Do not breathe mist or vapour. |
| P210 | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. |
| P260 | Do not breathe dust or mist. |
| P270 | Do not eat, drink or smoke when using this product. |
| P264 | Wash with plenty of water and soap thoroughly after handling. |

Precautionary Statements (Response):

| | |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------|
| P305 + P351 + P338 | IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| P310 | Immediately call a POISON CENTER or doctor/physician. |
| P304 + P340 | IF INHALED: Remove person to fresh air and keep comfortable for breathing. |
| 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. |
| P301 + P312 | IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. |
| P330 | Rinse mouth. |
| P370 + P378 | In case of fire: Use alcohol-resistant foam, carbon dioxide, dry powder or water spray for extinction. |

Precautionary Statements (Storage):

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

Precautionary Statements (Disposal):

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

Hazards not otherwise classified

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

Labeling of special preparations (GHS):

Corrosive to the respiratory tract.

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3. Composition / Information on Ingredients

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

| <u>CAS Number</u> | <u>Weight %</u> | <u>Chemical name</u> |
|-------------------|--------------------|----------------------|
| 64-18-6 | >= 85.0 - <= 86.0% | Formic Acid |

4. First-Aid Measures

Description of first aid measures

General advice:

First aid personnel should pay attention to their own safety. If the patient is likely to become unconscious, place and transport in stable sideways position (recovery position). Immediately remove contaminated 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:

Wash affected areas with water while removing contaminated clothing. Immediate medical attention required.

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:

Rinse mouth and then drink plenty of water. Do not induce vomiting. Never induce vomiting or give anything by mouth if the victim is unconscious or having convulsions. Immediate medical attention required.

Most important symptoms and effects, both acute and delayed

Symptoms: The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11.

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, alcohol-resistant foam, carbon dioxide

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Special hazards arising from the substance or mixture

Hazards during fire-fighting:
carbon monoxide,

The substances/groups of substances mentioned can be released if the product is involved in a fire.

Advice for fire-fighters

Protective equipment for fire-fighting:

Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Keep people away and stay on the upwind side.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Breathing protection required. Avoid contact with the skin, eyes and clothing.

Environmental precautions

Do not empty into drains.

Methods and material for containment and cleaning up

Contain spills and cover with absorbent material. Place into appropriately labeled waste containers. Remove containers to a safe place, cover loosely, and allow to stand for 24 to 48 hours before sealing and disposing.

7. Handling and Storage

Precautions for safe handling

Ensure thorough ventilation of stores and work areas. Sealed containers should be protected against heat as this results in pressure build-up.

Protection against fire and explosion:

Sources of ignition should be kept well clear.

Conditions for safe storage, including any incompatibilities

Segregate from alkalis and alkalizing substances.

Suitable materials for containers: Stainless steel 1.4571, Stainless steel 1.4404, High density polyethylene (HDPE), Low density polyethylene (LDPE), glass

Storage stability:

Storage temperature: < 30 °C

Storage duration: <= 36 Months

From the data on storage duration in this safety data sheet no agreed statement regarding the warrantee of application properties can be deduced.

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 | STEL value 10 ppm ; TWA value 5 ppm ; |

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Advice on system design:

Provide adequate exhaust ventilation to control work place concentrations.

Personal protective equipment

Respiratory protection:

Wear a NIOSH-certified (or equivalent) organic vapour respirator. Observe OSHA regulations for respirator use (29 CFR 1910.134).

Hand protection:

chloroprene rubber (Neoprene), butyl rubber, Protective glove selection must be based on the user's assessment of the workplace hazards., Consult with glove manufacturer for testing data.

Eye protection:

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

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. head protection, apron, protective boots, chemical-protection suit.

General safety and hygiene measures:

Contact with eyes and skin must be avoided. Avoid inhalation of vapour. Remove contaminated clothing immediately and dispose of safely. When using, do not eat, drink or smoke.

9. Physical and Chemical Properties

| | | |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Form: | liquid | |
| Odour: | pungent odour | |
| Odour threshold: | not determined | |
| Colour: | colourless to yellow | |
| pH value: | 2.2 (10 g/l, 20 °C) | |
| Melting point: | -13 °C | |
| Boiling point: | 107.3 °C | |
| Sublimation point: | No applicable information available. | |
| Flash point: | 65 °C | (DIN 51755) |
| Flammability: | Combustible liquid. | |
| Lower explosion limit: | 14.9 %(V) 14.9 %(V) (57 °C) | |
| Upper explosion limit: | 47.6 %(V) | |
| Autoignition: | 500 °C | (DIN 51794) |
| Vapour pressure: | 24.2 hPa (20 °C) 112.5 hPa (50 °C) | |
| Density: | 1.195 g/cm ³ (20 °C) 1.201 g/cm ³ (15 °C) 1.173 g/cm ³ (40 °C) 1.161 g/cm ³ (50 °C) 1.15 g/cm ³ (55 °C) | |

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| | |
|-----------------------------------------------------|------------------------------------------------------------------------------|
| Relative density: | No applicable information available. |
| Vapour density: | No applicable information available. |
| Partitioning coefficient n-octanol/water (log Pow): | -1.9 (23 °C) |
| Thermal decomposition: | No applicable information available. |
| Viscosity, dynamic: | 1.70 mPa.s (20 °C) 0.92 mPa.s (55 °C) |
| Viscosity, kinematic: | 1.42 mm2/s (20 °C) 0.8 mm2/s (55 °C) |
| Miscibility with water: | miscible in all proportions |
| Solubility (quantitative): | No applicable information available. |
| Solubility (qualitative): | miscible solvent(s): organic solvents, |
| 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 hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:

No corrosive effect on metal.

Chemical stability

Slow decomposition possible.

Possibility of hazardous reactions

Reacts with alkalis. Reacts with amines. Exothermic reaction.

Conditions to avoid

Temperature: > 30 degrees Celsius

Incompatible materials

bases, non-coated metals, base metals

Hazardous decomposition products

Decomposition products:

carbon dioxide, carbon monoxide

Thermal decomposition:

No applicable information available.

11. Toxicological information

Primary routes of exposure

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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.

Oral

Type of value: LD50
Species: rat (male/female)
Value: 730 mg/kg (OECD Guideline 401)

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: Highly corrosive! Damages skin and eyes.

Skin

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

Eye

As the product corrodes the skin, it can be expected to have a similar effect on the eyes also.

Sensitization

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

Buehler test

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

Aspiration Hazard

No aspiration hazard expected.

Chronic Toxicity/Effects

Repeated dose toxicity

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Assessment of repeated dose toxicity: After repeated administration the prominent effect is the induction of corrosion.

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 with and without metabolic activation negative

Cytogenetic assay with and without metabolic activation negative

Literature data.

Carcinogenicity

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

Reproductive toxicity

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

Teratogenicity

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

Symptoms of Exposure

The most important known symptoms and effects are described in the labelling (see section 2) and/or in section 11.

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. Inhibition of degradation activity in activated sludge is not to be anticipated during correct introduction of low concentrations.

The product gives rise to pH shifts.

Toxicity to fish

LC50 (96 h) 130 mg/l, Brachydanio rerio (OECD 203; ISO 7346; 92/69/EEC, C.1, static)

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

LC50 (96 h) 68 mg/l, Leuciscus idus (DIN 38412 Part 15, static)

The details of the toxic effect relate to the nominal concentration. After neutralization, it is no longer toxic.

Aquatic invertebrates

EC50 (48 h) 365 mg/l, Daphnia magna (OECD Guideline 202, part 1, static)

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition. The statement of the toxic effect relates to the analytically determined concentration.

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EC50 (48 h) 32.19 mg/l, Daphnia magna (Directive 79/831/EEC, static)

The details of the toxic effect relate to the nominal concentration. The product will cause changes in the pH value of the test system. The result refers to an unneutralized sample.

Aquatic plants

EC50 (72 h) 1,240 mg/l (growth rate), Selenastrum capricornutum (OECD Guideline 201, static)

The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

EC50 (72 h) 32.64 mg/l (growth rate), Scenedesmus subspicatus (DIN 38412 Part 9, static)

The details of the toxic effect relate to the nominal concentration. The product will cause changes in the pH value of the test system. The result refers to an unneutralized sample.

Chronic toxicity to aquatic invertebrates

No observed effect concentration (21 d) \geq 102 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.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms

other aerobic

activated sludge, domestic, non-adapted/EC10 (13 d): 72 mg/l

DIN EN ISO 8192 aerobic

activated sludge, industrial/EC20 (0.5 h): > 1,000 mg/l

The details of the toxic effect relate to the nominal concentration. The product will cause changes in the pH value of the test system. The result refers to an unneutralized sample.

DIN 38412 Part 8 aerobic

bacterium/EC50 (17 h): 46.7 mg/l

The details of the toxic effect relate to the nominal concentration. The product will cause changes in the pH value of the test system. The result refers to an unneutralized sample.

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)

Bioaccumulative potential

Bioaccumulation potential

No significant accumulation in organisms is expected as a result of the distribution coefficient of n-octanol/water (log Pow).

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.

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13. Disposal considerations

Waste disposal of substance:

Dispose of in accordance with national, state and local regulations. Do not discharge into waterways or sewer systems without proper authorization.

Container disposal:

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

RCRA: U123

This product is regulated by RCRA.

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
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

Feed TSCA, US released / exempt

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EPCRA 311/312 (Hazard categories): Acute; Chronic; Fire

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; 64-19-7 | Formic Acid; Acetic acid |

NFPA Hazard codes:

Health : 3 Fire: 2 Reactivity: 0 Special:

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

| | | |
|-------------------|-------------------------|-----------------------------------|
| Skin Corr./Irrit. | 1B | Skin corrosion/irritation |
| Flam. Liq. | 4 | 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: 2017/07/31

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

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