

# Safety data sheet

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BASF Safety data sheet according to Regulation (EC) No. 1907/2006

Date / Revised: 13.10.2009

Version: 6.0

Product: **Formic acid 94%**

(30192634/SDS\_GEN\_EU/EN)

Date of print 25.04.2010

## 1. Substance/preparation and company identification

### Formic acid 94%

Chemical name: formic acid

Use: Intermediate

Company:

BASF SE

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GERMANY

Operating Division Intermediates

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International emergency number:

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## 2. Hazard identification

**According to REGULATION (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures**

Label elements and precautionary statement:

Pictogram:



Signal Word:

| Danger

**Hazard Statement:**

Causes severe skin burns and eye damage. Flammable liquid and vapour.

**Precautionary Statements (Prevention):**

Wear protective gloves/clothing and eye/face protection. Wear protective gloves and eye/face protection. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. Do not breathe dust or mist. Take precautionary measures against static discharge. Use explosion-proof electrical/ventilating/lighting/equipment. Wash with plenty of water and soap thoroughly after handling. Keep container tightly closed. Use only non-sparking tools. Ground/bond container and receiving equipment.

**Precautionary Statements (Response):**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/physician. IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower. IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing. IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Wash contaminated clothing before reuse. Specific treatment (see on this label). In case of fire: Use extinguishing powder, foam or CO2 for extinction.

**Precautionary Statements (Storage):**

Store locked up. Store in a well-ventilated place. Keep cool.

**Precautionary Statements (Disposal):**

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

**Classification of the substance and mixture:**

Flammable liquids: Cat. 3

Skin corrosion/irritation: Cat. 1A

**Possible Hazards**

Causes severe burns.

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### 3. Composition/information on ingredients

Chemical nature

formic acid (Content (W/W): 94 %)

CAS Number: 64-18-6

EC-Number: 200-579-1

INDEX-Number: 607-001-00-0

water (Content (W/W): 6 %)

CAS Number: 7732-18-5

EC-Number: 231-791-2

Hazardous ingredients

according to Directive 1999/45/EC

formic acid

Content (W/W): 94 %  
CAS Number: 64-18-6  
EC-Number: 200-579-1  
INDEX-Number: 607-001-00-0  
Hazard symbol(s): C  
R-phrase(s): 10, 35

The wording of the hazard symbols and R-phrases is specified in chapter 16 if dangerous ingredients are mentioned.

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## 4. First-Aid Measures

General advice:

Immediately remove contaminated clothing. If danger of loss of consciousness, place patient in recovery position and transport accordingly. Apply artificial respiration if necessary. First aid personnel should pay attention to their own safety.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention.

On skin contact:

Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

On contact with eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:

Rinse mouth immediately and then drink plenty of water, seek medical attention.

Note to physician:

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote. Pulmonary odema prophylaxis. Medical monitoring for at least 24 hours.

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## 5. Fire-Fighting Measures

Suitable extinguishing media:

water, dry extinguishing media, alcohol-resistant foam, carbon dioxide

Specific hazards:

carbon monoxide

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

Special protective equipment:

Wear self-contained breathing apparatus and chemical-protective clothing.

Further information:

Collect contaminated extinguishing water separately, do not allow to reach sewage or effluent systems.

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## 6. Accidental Release Measures

### Personal precautions:

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

### Environmental precautions:

Do not empty into drains.

### Methods for cleaning up or taking up:

For large amounts: Pump off product.

For residues: Pick up with suitable absorbent material (e.g. acid binder). Dispose of absorbed material in accordance with regulations.

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## 7. Handling and Storage

### 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.

### Storage

Segregate from alkalis and alkalizing substances.

Further information on storage conditions: Danger of bursting when sealed gastight.

### Storage stability:

Storage temperature: < 30 °C

Storage duration: 24 Months

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## 8. Exposure controls and personal protection

### Components with workplace control parameters

64-18-6: formic acid

### Personal protective equipment

#### Respiratory protection:

Suitable respiratory protection for lower concentrations or short-term effect: Gas filter for gases/vapours of organic compounds (boiling point >65 °C, e. g. EN 14387 Type A) Suitable respiratory protection for higher concentrations or long-term effect: Self-contained breathing apparatus.

**Hand protection:**

Chemical resistant protective gloves (EN 374)

Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN 374):

chloroprene rubber (CR) - 0.5 mm coating thickness

butyl rubber (butyl) - 0.7 mm coating thickness

Manufacturer's directions for use should be observed because of great diversity of types.

Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

**Eye protection:**

Tightly fitting safety goggles (cage goggles) (e.g. EN 166) and face shield.

**Body protection:**

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

**General safety and hygiene measures:**

Avoid contact with the skin, eyes and clothing. Avoid inhalation of vapour.

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## 9. Physical and Chemical Properties

Form:	liquid	
Colour:	colourless to yellow	
Odour:	pungent odour	
pH value:	2.2 (10 g/l, 20 °C)	
pKA:	3.70 (20 °C)	(OECD Guideline 112)
Melting point:	-2 °C	
Boiling point:	103 °C	
Flash point:	56 °C	(DIN 51755)
Flammability:	Flammable.	
Lower explosion limit:	13.9 %(V)	
Upper explosion limit:	38.1 %(V)	
Ignition temperature:	480 °C	(DIN 51794)
Vapour pressure:	36 mbar (20 °C) 148 mbar (50 °C)	

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Density: 1.21 g/cm<sup>3</sup>  
(20 °C)  
1.2185 g/cm<sup>3</sup>  
(15 °C)  
1.188 g/cm<sup>3</sup>  
(40 °C)

Miscibility with water: miscible in all proportions

Solubility (qualitative) solvent(s): organic solvents  
miscible

Partitioning coefficient n-octanol/water (log Pow): -0.54  
(25 °C)

Surface tension: 71.5 mN/m (OECD-Guideline 115)  
(20 °C; 1 g/l)

Viscosity, dynamic: 1.6 mPa.s  
(20 °C)

Grain size distribution: The substance / product is marketed or used in a non solid or granular form.

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## 10. Stability and Reactivity

Hazardous reactions:

Exothermic reaction. Reacts with alkalies. Reacts with amines.

Possible thermal decomposition products:

carbon monoxide

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## 11. Toxicological Information

### Acute toxicity

Assessment of acute toxicity:

The inhalation of a highly enriched/saturated vapor-air-mixture represents a severe acute hazard. Of moderate toxicity after short-term inhalation. Of moderate toxicity after single ingestion.

Experimental/calculated data:

LD50 rat (oral): 730 mg/kg (OECD Guideline 401)

LC50 rat (by inhalation): 7.4 mg/l 4 h (BASF-Test)

rat (by inhalation): 3 min (IRT)

Mortality within the stated exposition time as shown in animal studies.

### Irritation

Assessment of irritating effects:

Highly corrosive! Damages skin and eyes. May cause severe damage to the eyes.

Experimental/calculated data:

Skin corrosion/irritation rabbit: Corrosive. (OECD Guideline 404)

Literature data.

Serious eyes damages/irritation: As the product corrodes the skin, it can be expected to have a similar effect on the eyes also.

### **Respiratory/Skin sensitization**

Assessment of sensitization:

Skin sensitizing effects were not observed in animal studies.

Experimental/calculated data:

Buehler test guinea pig: Non-sensitizing. (OECD Guideline 406)

### **Germ cell mutagenicity**

Assessment of mutagenicity:

No mutagenic effect was found in various tests with bacteria and mammalian cell culture.

Experimental/calculated data:

Ames-test

negative

Cytogenetic assay

negative

Literature data.

### **Developmental toxicity**

Assessment of teratogenicity:

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

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## **12. Ecological Information**

### **Ecotoxicity**

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 products of a similar structure and 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:

LC50 (48 h) 32.19 mg/l, *Daphnia magna*

Aquatic plants:

EC50 (72 h) 26.9 mg/l, *Scenedesmus subspicatus*

Microorganisms/Effect on activated sludge:

EC50 (17 h) 46.7 mg/l, *Pseudomonas putida*

EC20 > 1,000 mg/l, activated sludge (DIN EN ISO 8192-OECD 209-88/302/EEC,P. C)

The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Chronic toxicity to fish:

No data available regarding toxicity to fish.

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.

### **Persistence and degradability**

Assessment biodegradation and elimination (H<sub>2</sub>O):

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)

> 90 % DOC reduction (OECD 301E; 84/449/EEC, C.3) Readily biodegradable.

### **sum parameter**

Chemical oxygen demand (COD): 348 mg/g

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

### **Bioaccumulation potential**

Bioaccumulation potential:

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.



## 13. Disposal Considerations

Incinerate in suitable incineration plant, observing local authority regulations.

Contaminated packaging:

Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

## 14. Transport Information

### Land transport

ADR

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

RID

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

### Inland waterway transport

ADNR

Hazard class: 8  
Packing group: II  
ID number: UN 1779  
Hazard label: 3, 8, N3  
Proper shipping name: FORMIC ACID

### Sea transport

IMDG

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

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**Air transport**

IATA/ICAO

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

**15. Regulatory Information****Regulations of the European union (Labelling) / National legislation/Regulations**

EC-Number: 200-579-1

Directive 1999/45/EC ('Preparation Directive'):

Hazard symbol(s)

C Corrosive.

R-phrase(s)

R35 Causes severe burns.

S-phrase(s)

S23.5 Do not breathe vapour.

S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

Hazard determining component(s) for labelling: FORMIC ACID

**Other regulations**

as in Annex I of Directive 67/548/EEC

**16. Other Information**

Recommended use: dyes, pesticides, industrial chemicals, initial product for chemical syntheses

flue gas desulphurization rubber industry textile industry leather industry

Full text of hazard symbols and R-phrases if mentioned as hazardous components in chapter 3:

C	Corrosive.
10	Flammable.
35	Causes severe burns.

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Vertical lines in the left hand margin indicate an amendment from the previous version.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. The data do not describe the product's properties (product specification). Neither should any agreed property nor the suitability of the product for any specific purpose be deduced from the data contained in the safety data sheet. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.