

MATERIAL SAFETY DATA SHEET

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Version 1.5

Section 1 - Product and Company Information

Product Name	FORMIC ACID 98-100 %, R. G., REAG.
	ACS, REAG. PH. EUR.
Product Number	33015
Brand	RIEDEL
Company	Sigma-Aldrich
Street Address	3050 Spruce Street
City, State, Zip, Country	SAINT LOUIS MO 63103 US
Technical Phone:	314 771 5765
Emergency Phone:	414 273 3850 Ext. 5996
Fax:	800 325 5052

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
FORMIC ACID >=90%	64-18-6	Yes
Formula	CH2O2	
Synonyms	Acide formique (French) * Acido formico (Italian) * Ameisensaure (German) * Aminic acid * Formic acid (ACGIH:OSHA) * Formic acid * Hydrogen carboxylic acid * Kwas metaniowy (Polish) * Kyselina mravenci (Czech) * Methanoic acid * Mierenzuur (Dutch) * RCRA waste number U123	
RTECS Number:	LQ4900000	

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Combustible (USA) Flammable (EU). Corrosive.
Harmful by inhalation. Harmful if swallowed. Causes severe burns.
Possible sensitizer. Target organ(s): Liver. Kidneys.

HMIS RATING

HEALTH: 3*
FLAMMABILITY: 2
REACTIVITY: 1

NFPA RATING

HEALTH: 3
FLAMMABILITY: 2
REACTIVITY: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is

conscious. Call a physician. Do not induce vomiting.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of skin contact, flush with copious amounts of water for at least 15 minutes. Remove contaminated clothing and shoes. Call a physician.

EYE EXPOSURE

In case of contact with eyes, flush with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Call a physician.

Section 5 - Fire Fighting Measures

EXPLOSION LIMITS

Lower: 18 % Upper: 57 %

AUTOIGNITION TEMP

540 °C

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: Carbon dioxide, dry chemical powder, or appropriate foam.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Specific Hazard(s): Emits toxic fumes under fire conditions. Combustible liquid.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Cover with dry lime or soda ash, pick up, keep in a closed container, and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed. Keep away from heat and open flame.

SPECIAL REQUIREMENTS

Vent periodically. May develop pressure. Open carefully.
Hygrosopic.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use only in a chemical fume hood.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Government approved respirator.

Hand: Compatible chemical-resistant gloves.

Eye: Chemical safety goggles.

Other: Faceshield (8-inch minimum).

GENERAL HYGIENE MEASURES

Wash contaminated clothing before reuse. Discard contaminated shoes. Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	STEL	10 PPM
USA	ACGIH	TWA	5 PPM
USA	MSHA Standard-air	TWA	5 PPM (9 MG/M3)
USA	OSHA.	PEL	8H TWA 5 PPM (9 MG/M3)
New Zealand	OEL		
Remarks: check ACGIH TLV			
USA	NIOSH	TWA	5 PPM

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	5 MG/M3
Poland		NDSch	15 MG/M3
Poland		NDSP	-

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Liquid Color: Colorless	
Property	Value	At Temperature or Pressure
Molecular Weight	46.03 AMU	
pH	2.2	20 °C Concentration: 2.2 g/l
BP/BP Range	100.8 °C	760 mmHg
MP/MP Range	8.5 °C	
Freezing Point	7 °C	
Vapor Pressure	44.8 mmHg	20 °C
Vapor Density	1.6 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	1.2 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	N/A	
Viscosity	1.8 Pas	20 °C
Surface Tension	38 mN/m	15 °C
Partition Coefficient	Log Kow: -0.54	
Decomposition Temp.	N/A	

Explosion Limits	Lower: 18 % Upper: 57 %
Flammability	N/A
Autoignition Temp	540 °C
Refractive Index	1.3721
Optical Rotation	N/A
Miscellaneous Data	N/A
Solubility	Solubility in Water: Miscible. Other Solvents: VERY SOLUBLE IN ACETONE MISCIBLE WITH ALCOHOL, ETHER

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions to Avoid: Moisture.

Materials to Avoid: Strong oxidizing agents, Strong bases, Finely powdered metals.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes burns.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes burns.

Inhalation: Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be harmful if inhaled.

Ingestion: May be harmful if swallowed.

SENSITIZATION

Sensitization: Prolonged or repeated exposure may cause allergic reactions in certain sensitive individuals.

TARGET ORGAN(S) OR SYSTEM(S)

Kidneys. Liver. Central nervous system. Blood.

SIGNS AND SYMPTOMS OF EXPOSURE

Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin.

Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, and pulmonary edema.

Symptoms of exposure may include burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, and vomiting.

TOXICITY DATA

Oral

Woman

2.44 mg/kg

LDLO

Remarks: Vascular: Shock. Blood: Other hemolysis with or without anemia. Nutritional and Gross Metabolic: Changes in: Metabolic

acidosis.

Oral

Rat

1100 mg/kg

LD50

Remarks: Behavioral:Somnolence (general depressed activity).
Lungs, Thorax, or Respiration:Dyspnea.

Inhalation

Rat

15,000 mg/m3

LC50

Remarks: Behavioral:Somnolence (general depressed activity).
Lungs, Thorax, or Respiration:Dyspnea.

Oral

Mouse

700 mg/kg

LD50

Remarks: Behavioral:Somnolence (general depressed activity).
Lungs, Thorax, or Respiration:Dyspnea.

Inhalation

Mouse

6,200 mg/m3

LC50

Remarks: Behavioral:Somnolence (general depressed activity).
Lungs, Thorax, or Respiration:Dyspnea.

Intraperitoneal

Mouse

940 MG/KG

LD50

Intravenous

Mouse

145 MG/KG

LD50

Oral

Dog

4000 mg/kg

LD50

IRRITATION DATA

Skin

Rabbit

Remarks: Severe irritation effect

Skin

Rabbit

610 mg

Remarks: Open irritation test

Eyes

Rabbit

122 mg

Remarks: Severe irritation effect

CHRONIC EXPOSURE - MUTAGEN

Species: Human
Dose: 10 MMOL/L
Cell Type: lymphocyte
Mutation test: Sister chromatid exchange

Species: Hamster
Dose: 10 MMOL/L
Cell Type: ovary
Mutation test: Cytogenetic analysis

Section 12 - Ecological Information

PHYSICAL PROPERTIES AFFECTING ECOTOXICITY

COD: 34.8 %
BOD after 5 Days: 8.6 %

ACUTE ECOTOXICITY TESTS

Test Type: EC50 Algae
Time: 72 h
Value: 26.9 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 48 h
Value: 34.2 mg/l

Test Type: LC50 Fish
Species: Leuciscus idus
Time: 96 h
Value: 46 - 100 mg/l

ELIMINATION

Elimination: > 90 %

ADDITIONAL RESULTS/DATA FROM RELEVANT SCIENTIFIC EXPERIMENTS

Avoid contamination of the environment

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Observe all federal, state, and local environmental regulations. This combustible material may be burned in a chemical incinerator equipped with an afterburner and scrubber.

Section 14 - Transport Information

DOT

Proper Shipping Name: Formic acid
UN#: 1779
Class: 8
Packing Group: Packing Group II
Hazard Label: Corrosive
PIH: Not PIH

IATA

Proper Shipping Name: Formic acid
IATA UN Number: 1779
Hazard Class: 8

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: C

Indication of Danger: Corrosive.

R: 35

Risk Statements: Causes severe burns.

S: 23 26 45

Safety Statements: Do not breathe vapor. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Combustible (USA) Flammable (EU).

Corrosive.

Risk Statements: Harmful by inhalation. Harmful if swallowed. Causes severe burns.

Safety Statements: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Wear suitable protective clothing, gloves, and eye/face protection.

US Statements: Possible sensitizer. Target organ(s): Liver. Kidneys.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes

DEMINIMIS: 1 %

NOTES: This product is subject to SARA section 313 reporting requirements.

TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

DSL: Yes

NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of invoice or packing slip for additional terms and conditions of sale. Copyright 2004 Sigma-Aldrich Co. License granted to make unlimited paper copies for internal use only.