

Chemical Safety Data Sheet MSDS / SDS

Ethyl formate SDS

Revision Date:2024-04-25 Revision Number:1

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SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product identifier**

Product name: Ethyl formate

CAS: 109-94-4

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

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SECTION 2: Hazards identification**Classification of the substance or mixture**

Flammable liquids, Category 2

Acute toxicity - Category 4, Oral

Eye irritation, Category 2
Acute toxicity - Category 4, Inhalation
Specific target organ toxicity - single exposure, Category 3

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H225 Highly flammable liquid and vapour
H302 Harmful if swallowed
H319 Causes serious eye irritation
H332 Harmful if inhaled
H335 May cause respiratory irritation

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P280 Wear protective gloves/protective clothing/eye protection/face protection/hearing protection/...
P264 Wash ... thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P271 Use only outdoors or in a well-ventilated area.

Response

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse affected areas with water [or shower].
P370+P378 In case of fire: Use ... to extinguish.
P301+P317 IF SWALLOWED: Get medical help.
P330 Rinse mouth.
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.
P317 Get medical help.
P319 Get medical help if you feel unwell.

Storage

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

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Ethyl formate
Common names and synonyms:	Ethyl formate
CAS number:	109-94-4
EC number:	203-721-0
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Fresh air, rest. Refer for medical attention.

Following skin contact

Remove contaminated clothes. Rinse skin with plenty of water or shower.

Following eye contact

First rinse with plenty of water for several minutes (remove contact lenses if easily possible), then refer for medical attention.

Following ingestion

Rinse mouth. Do NOT induce vomiting. Refer for medical attention .

Most important symptoms/effects, acute and delayed

Inhalation of vapor causes slight irritation of the eyes and rapidly increasing irritation of the nose. High concentrations cause deep narcosis within a few minutes followed by death within a few hours. Contact with liquid causes moderate irritation of eyes and mild irritation of skin. Ingestion causes irritation of mouth and stomach; may cause deep narcosis and death if not treated. (USCG, 1999)

Indication of immediate medical attention and special treatment needed, if necessary

Formates can be metabolized to formic acid. hence treatment as for methanol should be considered.

SECTION 5: Firefighting measures**Suitable extinguishing media**

Dry chemical, ... carbon dioxide.

Specific hazards arising from the chemical

Behavior in Fire: Vapor is heavier than air and may travel long distance to a source of ignition and flash back. (USCG, 1999)

Special protective actions for fire-fighters

Use powder, alcohol-resistant foam, water spray, carbon dioxide. In case of fire: keep drums, etc., cool by spraying with water.

SECTION 6: Accidental release measures**Personal precautions, protective equipment and emergency procedures**

Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: filter respirator for organic gases and vapours of low boiling point adapted to the airborne concentration of the substance. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Environmental precautions

Remove all ignition sources. Evacuate danger area! Consult an expert! Personal protection: filter respirator for organic gases and vapours of low boiling point adapted to the airborne concentration of the substance. Ventilation. Collect leaking liquid in sealable containers. Absorb remaining liquid in sand or inert absorbent. Then store and dispose of according to local regulations.

Methods and materials for containment and cleaning up

1. remove all ignition sources. 2. ventilate area of spill or leak. 3. for small quantities, absorb on paper towels. evaporate in a safe place (such as a fume hood). allow sufficient time for evaporating vapors to completely clear the hood ductwork. burn the paper in a suitable location away from combustible materials. large quantities can be collected and atomized in a suitable combustion chamber. ethyl formate should not be allowed to enter a confined space, such as a sewer, because of the possibility of an explosion.

SECTION 7: Handling and storage

Precautions for safe handling

NO open flames, NO sparks and NO smoking. Closed system, ventilation, explosion-proof electrical equipment and lighting. Do NOT use compressed air for filling, discharging, or handling. Prevent build-up of electrostatic charges (e.g., by grounding). Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Fireproof. Separated from strong oxidants. Cool. KEEP TIGHTLY CLOSED & PREFERABLY IN CONTACT WITH CALCIUM CHLORIDE.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

TLV: 100 ppm as STEL; A4 (not classifiable as a human carcinogen). MAK: 310 mg/m³, 100 ppm; peak limitation category: I(1); skin absorption (H); pregnancy risk group: C

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)**Eye/face protection**

Wear safety goggles.

Skin protection

Protective gloves.

Respiratory protection

Use ventilation, local exhaust or breathing protection.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Ethyl formate is a clear colorless liquid with a pleasant odor. Flash point -4°F. Less dense than water. Vapors heavier than air.
Colour:	MOBILE LIQUID
Odour:	Fruity odor.
Melting point/freezing point:	-80°C(lit.)
Boiling point or initial boiling point and boiling range:	52-54°C(lit.)

Flammability:	Class IB Flammable Liquid: Fl.P. below 73°F and BP at or above 100°F.
Lower and upper explosion limit/flammability limit:	Lower flammable limit: 2.8% by volume; Upper flammable limit: 16.0% by volume
Flash point:	-19°C
Auto-ignition temperature:	851°F
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	9 % at 64° F (NIOSH, 2016)
Partition coefficient n-octanol/water:	0.23
Vapour pressure:	15.16 psi (55 °C)
Density and/or relative density:	0.921g/mL at 20°C(lit.)
Relative vapour density:	2.5 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Reacts with strong oxidants. This generates fire and explosion hazard.

Chemical stability

UNSTABLE

Possibility of hazardous reactions

Burning Rate: 3.6 mm/min. The vapour is heavier than air and may travel along the ground; distant ignition possible. ETHYL FORMATE is an ester. Esters react with acids to liberate heat along with alcohols and acids. Strong oxidizing acids may cause a vigorous reaction that is sufficiently exothermic to ignite the reaction products. Heat is also generated by the interaction of esters with caustic solutions. Flammable hydrogen is generated by mixing esters with alkali metals and hydrides. This compound is incompatible with the following: Nitrates; strong oxidizers, alkalis & acids [Note: Decomposes slowly in water to form ethyl alcohol and formic acid.] (NIOSH, 2016).

Conditions to avoid

no data available

Incompatible materials

Nitrates; strong oxidizers, alkalis & acids [Note: Decomposes slowly in water to form ethyl alcohol & formic acid].

Hazardous decomposition products

Toxic gases and vapors (such as carbon monoxide) may be released in a fire involving ethyl formate.

SECTION 11: Toxicological information

Acute toxicity

Oral: LD50 Rat oral 4.29 g/kg

Inhalation: no data available

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

no data available

Reproductive toxicity

no data available

STOT-single exposure

The substance is irritating to the eyes and respiratory tract. The substance may cause effects on the central nervous system. Exposure far above the OEL could cause lowering of consciousness.

STOT-repeated exposure

The substance defats the skin, which may cause dryness or cracking.

Aspiration hazard

A harmful contamination of the air can be reached rather quickly on evaporation of this substance at 20°C.

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

No information was found about biodegradation of ethyl formate in natural media and ethyl formate's chemical hydrolysis and volatility would complicate biodegradability testing. 33% of its theoretical BOD was realized after 10 days in a laboratory screening test using a culture originally derived from settled sewage that was >1 yr old(1). Ethyl formate is predicted to biodegrade rapidly according to a mathematical model based on group contributions(2) and the structurally similar chemical, ethyl acetate, is readily degradable on the basis of screening tests(3-7) as are other low molecular weight aliphatic esters(8).

Bioaccumulative potential

Ethyl formate did not bioconcentrate in rainbow trout(1). Using a reported log octanol/water partition coefficient of 0.23(2), a BCF of 0.88 is estimated using a regression equation giving additional indication that ethyl formate should not bioconcentrate in aquatic organisms.

Mobility in soil

Using a reported water solubility of 88.25 g/L(1) for ethyl formate, an estimated Koc of 8 was calculated using a regression equation(2, SRC). A Koc of 4 was estimated from molecular structure(3). According to a suggested classification scheme(3), this estimated Koc suggests that ethyl formate will be highly mobil in soil (SRC).

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN1190 (For reference only, please check.)

IMDG: UN1190 (For reference only, please check.)

IATA: UN1190 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: ETHYL FORMATE (For reference only, please check.)

IMDG: ETHYL FORMATE (For reference only, please check.)

IATA: ETHYL FORMATE (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 3 (For reference only, please check.)

IMDG: 3 (For reference only, please check.)

IATA: 3 (For reference only, please check.)

Packing group, if applicable

ADR/RID: II (For reference only, please check.)

IMDG: II (For reference only, please check.)

IATA: II (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

RID: Regulation concerning the International Carriage of Dangerous Goods by Rail

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

Other Information

The odour warning when the exposure limit value is exceeded is insufficient. Do NOT take working clothes home.

Disclaimer: 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. We as supplier shall not be held liable for any