We create chemistry

Safety Data Sheet
Methyl chloroformate

1. Identification

Product identifier used on the label

Methyl chloroformate

Recommended use of the chemical and restriction on use

Recommended use*: Only to be used as intermediate according to the REACH Regulation (EC) No 1907/2006, art. 18
Recommended use*: Chemical

* 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:	C2 H3 O2 Cl
Chemical family:	chloroformates
Synonyms:	Carbonochloridic Acid, Methyl Ester
	Chloroformic Acid Methyl Ester

2. Hazards Identification

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

Classification of the product

Flam. Liq.	2	Flammable liquids
Acute Tox.	1 (Inhalation - vapour)	Acute toxicity
Acute Tox.	2 (oral)	Acute toxicity

Acute Tox.	4 (dermal)	Acute toxicity
Skin Corr./Irrit.	1B	Skin corrosion/irritation
Eye Dam./Irrit.	1	Serious eye damage/eye irritation
Aquatic Acute	2	Hazardous to the aquatic environment - acute

Label elements

Pictogram:

Signal Word:
Danger

Hazard Statement:

H225	Highly flammable liquid and vapour.
H312	Harmful in contact with skin.
H330	Fatal if inhaled.
H300	Fatal 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.
P260	Do not breathe mist or vapour.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243	Take action to prevent static discharges.
P284	In case of inadequate ventilation wear respiratory protection.
P260	Do not breathe dust or mist.
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 and 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.
P301 + P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P330	Rinse mouth.
P301 + P330 + P331	IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P361 + P364	Take off immediately all contaminated clothing and wash it before reuse.
P370 + P378	In case of fire: Use dry powder, alcohol-resistant foam or carbon dioxide for extinction.

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

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.

3. Composition / Information on Ingredients

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

CAS Number	Weight %	Chemical name
74-87-3	>= 0.01 - <= 0.1%	chloromethane
79-22-1	>= 99.0 - <= 100.0%	methyl chloroformate
7647-01-0	>= 0.01 - <= 0.1%	hydrochloric acid

4. First-Aid Measures

Description of first aid measures

General advice:
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:
Remove contaminated clothing. After contact with skin, wash immediately with plenty of water. 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: Overexposure may cause:, dyspnea, coughing

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, administer corticosteroid dose aerosol to prevent pulmonary odema. Medical monitoring for at least 24-48 hours.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
dry powder, alcohol-resistant foam, carbon dioxide

Unsuitable extinguishing media for safety reasons:
water

Additional information:
The product is sparingly soluble in water and is only covered.

Special hazards arising from the substance or mixture

Hazards during fire-fighting:
Hydrogen chloride, carbonyl chloride, nitrogen oxides, carbon oxides, halogenated compounds
The substances/groups of substances mentioned can be released in case of 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:
Suppress gases/vapours/mists with water spray jet. Fire debris must be disposed of in accordance with offical regulations.

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

6. Accidental release measures

Further accidental release measures:
The product is irritating to eyes even at low concentrations in the air.

Personal precautions, protective equipment and emergency procedures

Wear a self-contained breathing apparatus. Keep people away and stay on the upwind side. Avoid contact with the skin, eyes and clothing.

Environmental precautions

Substance/product is RCRA hazardous due to its properties.

Methods and material for containment and cleaning up

Spills should be contained, solidified, and placed in suitable containers for disposal.

7. Handling and Storage

Precautions for safe handling
Ensure thorough ventilation of stores and work areas. Protect against moisture. Use only in enclosed systems. Adequate extraction of the vapours is necessary when working with open containers. In case of insufficient ventilation, wear suitable respiratory equipment.

Protection against fire and explosion:
Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities
Segregate from alkalies and alkalizing substances.

Suitable materials for containers: enamelled, High density polyethylene (HDPE), glass, Individual coatings after separate release.

Further information on storage conditions: Protect from direct sunlight. Protect against heat. Keep only in the original container. Keep container tightly closed and dry; store in a cool place. Frequently check condition of drums (increase in pressure, bulging, rust). Product has to be immediately consumed or disposed of, if signs of pressure increase or bulging are being detected at a drum.

Storage stability:
Storage temperature: < 20 °C
Storage duration: 12 Months
If the stated storage temperature is exceeded the shelf life can be reduced.
From the data on storage duration in this safety data sheet no agreed statement regarding the warrantee of application properties can be deduced.
Improper storage may result in a pressure build-up in the storage containers.
Keep only in the original container in a cool, dry, well-ventilated place away from ignition sources, heat or flame.
Storage stability is based upon ambient temperatures and conditions described.

8. Exposure Controls/Personal Protection

Components with occupational exposure limits

chloromethane	OSHA PEL	TWA value 50 ppm 105 mg/m3 ; STEL value 100 ppm 210 mg/m3 ; TWA value 100 ppm ; max. conc. 300 ppm ; CLV 200 ppm ;
	ACGIH TLV	STEL value 100 ppm ; TWA value 50 ppm ; Skin Designation ; The substance can be absorbed through the skin.
hydrochloric acid	OSHA PEL	CLV 5 ppm 7 mg/m3 ; CLV 5 ppm 7 mg/m3 ;
	ACGIH TLV	CLV 2 ppm ;

Advice on system design:
Provide local exhaust ventilation to control vapours/mists.

Personal protective equipment

Respiratory protection:
Breathing protection if gases/vapours are formed. 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, butyl rubber, Consult with glove manufacturer for testing data.

Eye protection:
Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.

Body protection:
Impermeable protective clothing

General safety and hygiene measures:
Avoid contact with the skin, eyes and clothing. Do not breathe vapour/spray. When using, do not eat, drink or smoke. Hands and/or face should be washed before breaks and at the end of the shift. Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks). Take off immediately all contaminated clothing. Wash contaminated clothing before reuse. Store work clothing separately.

9. Physical and Chemical Properties

Form:	liquid	
Odour:	pungent odour	
Odour threshold:	Not determined since toxic by inhalation.	
Colour:	colourless to yellowish	
pH value:	not soluble	
Melting point:	-61 °C	
Boiling point:	71 - 72 °C	
Flash point:	4.5 °C	(DIN 51755)
Flammability:	Highly flammable liquid and vapour.	
Lower explosion limit:	7.8 %(V)	
Upper explosion limit:	23.3 %(V)	
Autoignition:	485 °C	(DIN 51794)
Vapour pressure:	138 hPa (20 °C) 486 hPa (50 °C)	
Density:	1.237 g/cm3 (15 °C)	
Relative density:	1.223 (20 °C) Literature data.	
Vapour density:	not determined	
Information on: Methanol		
Partitioning coefficient n-octanol/water (log Pow):	-0.77 (20 °C) Literature data.	(measured)

Self-ignition temperature:	504 °C not self-igniting	
Thermal decomposition:	> 200 °C (DTA)	
Viscosity, dynamic:	0.48 mPa.s (20 °C)	

Particle size:	The substance / product is marketed or used in a non solid or granular form.
Solubility in water:	(20 °C) of low solubility, slow decomposition
Molar mass:	94.50 g/mol
Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.

10. Stability and Reactivity

Reactivity

Corrosion to metals:
Corrodes metals in the presence of water.

Oxidizing properties:
Based on its structural properties the product is not classified as oxidizing.

Reactions with water/air:	Reaction with:	air
	Flammable gases:	no
	Reaction with:	water
	Flammable gases:	no
	Toxic gases:	yes
	Which toxic gases:	hydrogen chloride (HCl)
	Corrosive gases:	yes
	Which corrosive gases:	hydrogen chloride (HCl)
	Smoke or fog:	yes
	Type of smoke or fog:	Hydrochloric acid
	Which Peroxides:	
Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.

Chemical stability
Even when products are stored appropriately a slowly decomposition reaction takes place. If the storage conditions and duration are taken into account, no hazard is caused by the product.

Possibility of hazardous reactions
At elevated temperatures gas forming exothermic decomposition reaction may occur. The formation of gaseous decomposition products builds up pressure in tightly closed containers if the product is greatly overheated. Evolution of corrosive gases/vapours. Reacts with water and basic components to generate heat. Reacts with activated carbon. Reacts with alkalies and metals. Reacts with alcohols, amines, aqueous acids and alkalies. Reacts with water and moisture, with formation of hydrogen chloride. Partly very violent reactions with bases and numerous organic classes of substances such as alcohols and amines. Impurities promote decomposition. Energy is released when reacting with e.g. acids, alkaline reacting substances, amines or catalysts. ppm traces of heavy metals reduce the onset temperature and lead to instability and exothermic product release with gas formation. Vapours may form ignitable mixture with air.

Conditions to avoid
Temperature: > 39 degrees Celsius

Avoid all sources of ignition: heat, sparks, open flame. Avoid direct sunlight. Avoid electro-static charge. Avoid humidity. Avoid heat. Disregard of the conditions mentioned may result in undesirable decomposition reactions. Avoid excessive temperatures. Avoid contamination.

Incompatible materials
alkaline reactive substances, alcohols, bases, amines, iron compounds, heavy metal salts, water

Hazardous decomposition products

Decomposition products:
Hazardous decomposition products: chloromethane, Hydrogen chloride, carbon dioxide, Methanol

Thermal decomposition:
> 200 °C (DTA)

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 very high toxicity after single ingestion. Of very high toxicity after short-term inhalation. Of moderate toxicity after short-term skin contact.

Oral
Type of value: LD50
Species: rat (male/female)
Value: 40 mg/kg (OECD Guideline 401)

Inhalation
Type of value: LC50
Species: rat (male/female)
Value: 0.06 mg/l (OECD Guideline 403)
Exposure time: 4 h
The vapour was tested.

Dermal
Type of value: LD50
Species: rat
Value: > 3,038 mg/kg
The European Union (EU) has classified this substance as 'harmful'.

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: Corrosive! Damages skin and eyes.

Skin
Species: rabbit
Result: Corrosive.
Method: BASF-Test

Eye
Species: rabbit
Result: Risk of serious damage to eyes.
Method: BASF-Test

Sensitization
Assessment of sensitization: Study scientifically not justified.

Study scientifically not justified.

Aspiration Hazard
No aspiration hazard expected.

Chronic Toxicity/Effects

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

Genetic toxicity
Assessment of mutagenicity: The substance was not mutagenic in bacteria. A mutagenicity test using mammalian cells yielded equivocal results. However, structurally related substances were not mutagenic.

Carcinogenicity
Assessment of carcinogenicity: In long-term studies in rats and mice in which the substance was given by inhalation, 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: Repeated inhalative uptake of the substance did not cause damage to the reproductive organs. The product has not been tested. The statement has been derived from substances/products of a similar structure or composition.

Teratogenicity
Assessment of teratogenicity: The potential to cause toxicity to development cannot be excluded when given in high doses. 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:, dyspnea, coughing
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:

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

Toxicity to fish
LC50 (96 h) 4.53 mg/l, Leuciscus idus (DIN 38412 Part 15)
The product has low solubility in the test medium. An aqueous dispersion has been tested. The details of the toxic effect relate to the nominal concentration.

LC50 (96 h) > 15,400 mg/l, Lepomis macrochirus (Fish test acute)
The product has not been tested. The statement has been derived from the properties of the hydrolysis products. Literature data.

Aquatic invertebrates
EC50 (48 h) > 10,000 mg/l, Daphnia magna (DIN 38412 Part 11, static)
Literature data. Nominal concentration. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.

Aquatic plants
EC50 (10 d) 28,440 mg/l, Chlorella pyrenoidosa (Growth Inhibition Test)
The product has not been tested. The statement has been derived from the properties of the hydrolysis products. Literature data.

Toxic limit concentration (192 h) 8,000 mg/l (biomass), Scenedesmus quadricauda (Growth Inhibition Test)
Literature data. Nominal concentration. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.

Assessment of terrestrial toxicity
No data available concerning terrestrial toxicity.

Microorganisms/Effect on activated sludge

Toxicity to microorganisms
OECD Guideline 209 activated sludge, domestic/EC20 (0.5 h): > 1,000 mg/l
Nominal concentration.

OECD Guideline 209 activated sludge, domestic/EC50 (180 min): > 1,000 mg/l
The details of the toxic effect relate to the nominal concentration. The product has not been tested. The statement has been derived from the properties of the hydrolysis products. Literature data.

Persistence and degradability

Assessment biodegradation and elimination (H2O)
Readily biodegradable (according to OECD criteria). The product has not been tested. The statement has been derived from the properties of the hydrolysis products. Literature data.

Elimination information

76 % BOD of the ThOD (5 d) (municipal sewage treatment plant effluent)

Information on Stability in Water (Hydrolysis)
$t_{1/2}$ 8.6 min (25 °C), (OECD Guideline 111, pH 7)
In contact with water the substance will hydrolyse rapidly.

Bioaccumulative potential

Bioaccumulation potential

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected. The product has not been tested. The statement has been derived from the properties of the hydrolysis products.

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.

13. Disposal considerations

Waste disposal of substance:
Incinerate in a RCRA-licensed facility. Do not discharge into waterways or sewer systems without proper authorization.

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: U156

14. Transport Information

Land transport
USDOT

Hazard class:	6.1
Packing group:	I
ID number:	UN 1238
Hazard label:	6.1, 3, 8
Proper shipping name:	METHYL CHLOROFORMATE

Sea transport
IMDG

Hazard class:	6.1
Packing group:	I
ID number:	UN 1238
Hazard label:	6.1, 3, 8
Marine pollutant:	NO
Proper shipping name:	METHYL CHLOROFORMATE

Air transport
IATA/ICAO

Hazard class:	6.1
Packing group:	I
ID number:	UN 1238
Hazard label:	6.1, 3, 8
Proper shipping name:	METHYL CHLOROFORMATE

Further information
Air transport not allowed.

15. Regulatory Information

Federal Regulations

Registration status:
Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Refer to SDS section 2 for GHS hazard classes applicable for this product.

EPCRA 313:

CAS Number	Chemical name
79-22-1	methyl chloroformate

CERCLA RQ	CAS Number	Chemical name
5000 LBS	67-56-1; 7647-01-0	Methanol; hydrochloric acid
1000 LBS	79-22-1	methyl chloroformate
100 LBS	74-87-3; 616-38-6	chloromethane; dimethyl carbonate

Reportable Quantity for release: 1,000 lb

Safe Drinking Water & Toxic Enforcement Act, CA Prop. 65:

WARNING: This product can expose you to chemicals including METHANOL, which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov.

NFPA Hazard codes:
Health: 4 Fire: 3 Reactivity: 2 Special:

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

Aquatic Acute	2	Hazardous to the aquatic environment - acute
Flam. Liq.	2	Flammable liquids
Skin Corr./Irrit.	1B	Skin corrosion/irritation
Eye Dam./Irrit.	1	Serious eye damage/eye irritation
Acute Tox.	1 (Inhalation - vapour)	Acute toxicity
Acute Tox.	4 (dermal)	Acute toxicity
Acute Tox.	2 (oral)	Acute toxicity

16. Other Information

SDS Prepared by:
BASF NA Product Regulations
SDS Prepared on: 2018/10/02

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operations on society and the environment during production, storage, transport, use and disposal of our products.

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