



SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 08/04/2014

Version 2.0

SECTION 1. Identification

Product identifier

| | |
|----------------|--|
| Product number | 102444 |
| Product name | Chloroform for liquid chromatography LiChrosolv® |
| Synonyms | TCM |
| CAS-No. | 67-66-3 |

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

| | |
|-----------------|--|
| Identified uses | Solvent, Analytical and preparative chromatography |
|-----------------|--|

Details of the supplier of the safety data sheet

| | |
|---------|--|
| Company | EMD Millipore Corporation 290 Concord Road, Billerica, MA 01821, United States of America General Inquiries: +1-978-715-4321 Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5) |
|---------|--|

| | |
|---------------------|--|
| Emergency telephone | 800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week |
|---------------------|--|

SECTION 2. Hazards identification

GHS Classification

Acute toxicity, Category 4, Oral, H302
|| Acute toxicity, Category 3, Inhalation, H331
Skin irritation, Category 2, H315
Eye irritation, Category 2, H319
Carcinogenicity, Category 2, H351
Reproductive toxicity, Category 2, H361d
Specific target organ systemic toxicity - repeated exposure, Category 1, Liver, Kidney, H372
For the full text of the H-Statements mentioned in this Section, see Section 16.

GHS-Labeling

Hazard pictograms



Signal Word

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Danger

Hazard Statements

H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H331 Toxic if inhaled.
H351 Suspected of causing cancer.
H361d Suspected of damaging the unborn child.
H372 Causes damage to organs (Liver, Kidney) through prolonged or repeated exposure.

Precautionary Statements

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.
P304 + P340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P310 IF exposed or concerned: immediately call a POISON CENTER or doctor/ physician.

OSHA Hazards

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200). This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS and may deviate from the GHS information.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

| | |
|------------|--------------------------|
| Formula | CHCl ₃ (Hill) |
| Synonyms | TCM |
| Molar mass | 119.38 g/mol |

Hazardous ingredients

Chemical Name (Concentration)

CAS-No.

Chloroform (>= 90 % - <= 100 %)

67-66-3

Exact percentages are being withheld as a trade secret.

SECTION 4. First aid measures

Description of first-aid measures

General advice

First aider needs to protect himself.

Inhalation

After inhalation: fresh air. If breathing stops: immediately apply artificial respiration, if necessary oxygen. Immediately call in physician.

Skin contact

After skin contact: wash off with plenty of water. Remove contaminated clothing.

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Consult a physician.

Eye contact

After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist.

Ingestion

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Call a physician immediately. Subsequently administer: activated charcoal (20 - 40 g in 10% slurry). In case of spontaneous vomiting: Risk of aspiration. Pulmonary failure possible. Call in physician.

Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

irritant effects, Cough, Shortness of breath, respiratory arrest, Dizziness, narcosis, agitation, spasms, inebriation, Nausea, Vomiting, Stomach/intestinal disorders, cardiovascular disorders, Headache, ataxia (impaired locomotor coordination)
Drying-out effect resulting in rough and chapped skin.

Indication of any immediate medical attention and special treatment needed

Laxative: Sodium sulfate (1 tablespoon/1/4 l water).

SECTION 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media

For this substance/mixture no limitations of extinguishing agents are given.

Special hazards arising from the substance or mixture

Not combustible.

Ambient fire may liberate hazardous vapors.

Fire may cause evolution of:

Hydrogen chloride gas, Phosgene

Advice for firefighters

Special protective equipment for fire-fighters

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

Further information

Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

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Environmental precautions

Do not empty into drains.

Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent material (e.g. Chemisorb®). Dispose of properly. Clean up affected area. Do not inhale vapors.

SECTION 7. Handling and storage

Precautions for safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapors/aerosols.

Observe label precautions.

Conditions for safe storage, including any incompatibilities

Tightly closed. Protected from light. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.

Store at +15°C to +25°C (+59°F to +77°F).

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Ingredients

| Basis | Value | Threshold limits | Remarks |
|---------------------------|-----------------------------------|---------------------------------|---------|
| <i>Chloroform 67-66-3</i> | | | |
| ACGIH | Time Weighted Average (TWA): | 10 ppm | |
| NIOSH/GUIDE | Short Term Exposure Limit (STEL): | 2 ppm 9.78 mg/m ³ | |
| OSHA_TRANS | Ceiling Limit Value: | 50 ppm 240 mg/m ³ | |
| Z1A | Time Weighted Average (TWA): | 2 ppm 9.78 mg/m ³ | |

Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

Individual protection measures

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled. The chemical resistance of the protective equipment should be inquired at the respective supplier.

Hygiene measures

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

Eye/face protection

Safety glasses

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Hand protection

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Other protective equipment:

protective clothing

Respiratory protection

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

SECTION 9. Physical and chemical properties

| | |
|-----------------------------|---|
| Physical state | liquid |
| Color | colorless |
| Odor | characteristic |
| Odor Threshold | No information available. |
| pH | No information available. |
| Melting point | -63 °C |
| Boiling point/boiling range | 142 °F (61 °C) at 1,013 hPa |
| Flash point | Method: DIN 51755 Part 1 does not flash |
| Evaporation rate | No information available. |
| Flammability (solid, gas) | No information available. |
| Lower explosion limit | not applicable |
| Upper explosion limit | not applicable |
| Vapor pressure | 211 hPa at 68 °F (20 °C) |
| Relative vapor density | 4.25 |
| Density | 1.47 g/cm ³ at 68 °F (20 °C) |
| Relative density | No information available. |

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| | | |
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| | |
|--|--|
| Water solubility | 8 g/l at 68 °F (20 °C) |
| Partition coefficient: n-octanol/water | log Pow: 2 (25 °C) (experimental) (IUCLID) Bioaccumulation is not expected. |
| Autoignition temperature | No information available. |
| Decomposition temperature | No information available. |
| Viscosity, dynamic | 0.56 mPa.s at 68 °F (20 °C) |
| Explosive properties | Not classified as explosive. |
| Oxidizing properties | not applicable |
| Ignition temperature | not combustible |

SECTION 10. Stability and reactivity

Reactivity

See below

Chemical stability

heat-sensitive
Sensitivity to light

Stabilizer

2-methyl-2-butene

methanol

Possibility of hazardous reactions

Risk of explosion with:

Ammonia, Amines, nitrogen oxides, bases, Oxygen, alkali amides, organic nitro compounds, Alcohols, alkali hydroxides, strong alkalis, Fluorine, peroxi compounds, Alkaline earth metals, Alkali metals, Powdered metals

Methanol, with, alcoholates

Iron, in powder form

various alloys, sensitive to shock

Methanol, with, Sodium hydroxide

magnesium, in powder form

Oxygen, with, alkali compounds

Aluminum, in powder form

Acetone, with, alkali compounds

Potassium, sensitive to shock

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sodium, sensitive to shock

Violent reactions possible with:

phosphines, bis(dimethylamino)dimethyl tin, nonmetallic hydrogen compounds, Powdered metals, Light metals, Ketones

Conditions to avoid

Strong heating.

Incompatible materials

rubber, various plastics

Hazardous decomposition products

in the event of fire: See section 5.

SECTION 11. Toxicological information

Information on toxicological effects

Likely route of exposure

Inhalation, Eye contact, Skin contact

Target Organs

Liver

Kidneys

Heart

Eyes

Skin

Central nervous system

Acute oral toxicity

LD50 rat: 695 mg/kg (RTECS)

LDLO human: 2,514 mg/kg (RTECS)

Symptoms: Nausea, Vomiting, Risk of aspiration upon vomiting., Aspiration may cause pulmonary edema and pneumonitis.

absorption

Acute inhalation toxicity

Acute toxicity estimate: 0.5 mg/l

Symptoms: Cough, Shortness of breath, Possible damages:, mucosal irritations

absorption

Acute dermal toxicity

LD50 rabbit: > 3,980 mg/kg

(IUCLID)

absorption

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Skin irritation

rabbit

Result: slight irritation

(IUCLID) (Regulation (EC) No 1272/2008, Annex VI)

Drying-out effect resulting in rough and chapped skin.

Causes skin irritation.

Eye irritation

rabbit

Result: slight irritation

(IUCLID) (Regulation (EC) No 1272/2008, Annex VI)

Causes serious eye irritation.

CMR effects

Carcinogenicity:

Suspected of causing cancer.

Teratogenicity:

Suspected of damaging the unborn child.

Specific target organ systemic toxicity - single exposure

The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ systemic toxicity - repeated exposure

Target Organs: Liver, Kidney

Causes damage to organs through prolonged or repeated exposure.

Aspiration hazard

Regarding the available data the classification criteria are not fulfilled.

Carcinogenicity

| | |
|-------|--|
| IARC | Group 2B: Possibly carcinogenic to humans Chloroform 67-66-3 |
| OSHA | No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA. |
| NTP | Anticipated carcinogen. Chloroform 67-66-3 |
| ACGIH | Confirmed animal carcinogen with unknown relevance to humans. Chloroform 67-66-3 |

Further information

Systemic effects:

After absorption:

Dizziness, inebriation, agitation, spasms, narcosis, respiratory arrest

After long-term exposure to the chemical:

drop in blood pressure, Headache, ataxia (impaired locomotor coordination), Stomach/intestinal disorders, cardiovascular disorders

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Damage to:

Liver, Kidney, Cardiac

Effect potentiated by: ethanol

Handle in accordance with good industrial hygiene and safety practice.

SECTION 12. Ecological information

Ecotoxicity

Toxicity to fish

LC50 *Lepomis macrochirus* (Bluegill sunfish): 18 mg/l; 96 h (IUCLID)

Toxicity to daphnia and other aquatic invertebrates

EC50 *Daphnia magna* (Water flea): 79 mg/l; 48 h (IUCLID)

EC5 *E. sulcatum*: > 6,560 mg/l; 72 h (IUCLID) (maximum permissible toxic concentration)

Toxicity to algae

IC5 *Scenedesmus quadricauda* (Green algae): 1,100 mg/l; 8 d (IUCLID) (maximum permissible toxic concentration)

Toxicity to bacteria

EC5 *Pseudomonas putida*: 125 mg/l; 16 h (IUCLID) (maximum permissible toxic concentration)

EC50 activated sludge: 1,010 mg/l; 3 h

OECD Test Guideline 209

Persistence and degradability

Biodegradability

0 %; 14 d

OECD Test Guideline 301C

Not readily biodegradable.

Bioaccumulative potential

Partition coefficient: n-octanol/water

log Pow: 2 (25 °C)

(experimental)

(IUCLID) Bioaccumulation is not expected.

Mobility in soil

Distribution among environmental compartments

Adsorption/Soil

log Koc: 1.72

(experimental)

Mobile in soils

Other adverse effects

Henry constant

14084 Pa·m³/mol

Method: (experimental)

(IUCLID) Distribution preferentially in air.

Additional ecological information

Discharge into the environment must be avoided.

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SECTION 13. Disposal considerations

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

SECTION 14. Transport information

Land transport (DOT)

| | |
|---------------------------|------------|
| UN number | UN 1888 |
| Proper shipping name | CHLOROFORM |
| Class | 6.1 |
| Packing group | III |
| Environmentally hazardous | -- |

Air transport (IATA)

| | |
|------------------------------|------------|
| UN number | UN 1888 |
| Proper shipping name | CHLOROFORM |
| Class | 6.1 |
| Packing group | III |
| Environmentally hazardous | -- |
| Special precautions for user | no |

Sea transport (IMDG)

| | |
|------------------------------|------------|
| UN number | UN 1888 |
| Proper shipping name | CHLOROFORM |
| Class | 6.1 |
| Packing group | III |
| Environmentally hazardous | -- |
| Special precautions for user | yes |
| EmS | F-A S-A |

SECTION 15. Regulatory information

United States of America

OSHA Hazards

Harmful if swallowed.

Skin irritant

Eye irritant

Carcinogen

Target organ effects

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

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SARA 311/312 Hazards

Acute Health Hazard

Chronic Health Hazard

SARA 313

The following components are subject to reporting levels established by SARA Title III, Section 313:

Ingredients

| | | |
|------------|---------|-----------|
| Chloroform | 67-66-3 | 99.9751 % |
|------------|---------|-----------|

SARA 302

The following components are subject to reporting levels established by SARA Title III, Section 302:

Ingredients

| | |
|------------|---------|
| Chloroform | 67-66-3 |
|------------|---------|

Clean Water Act

The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:

Ingredients

Chloroform

The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:

Ingredients

Chloroform

DEA List I

Not listed

DEA List II

Not listed

US State Regulations

Massachusetts Right To Know

Ingredients

Chloroform

Pennsylvania Right To Know

Ingredients

Chloroform

New Jersey Right To Know

Ingredients

Chloroform

California Prop 65 Components

WARNING: This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.

Ingredients

Chloroform

methanol

California Prop 65 Components

WARNING: this product contains a chemical known in the State of California to cause cancer.

Ingredients

Chloroform

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Notification status

TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

SECTION 16. Other information

Training advice

Provide adequate information, instruction and training for operators.

Full text of H-Statements referred to under sections 2 and 3.

| | |
|-------|---|
| H302 | Harmful if swallowed. |
| H315 | Causes skin irritation. |
| H319 | Causes serious eye irritation. |
| H331 | Toxic if inhaled. |
| H351 | Suspected of causing cancer. |
| H361d | Suspected of damaging the unborn child. |
| H372 | Causes damage to organs through prolonged or repeated exposure. |

Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at www.wikipedia.org.

Revision Date 08/04/2014

The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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