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

Revision Date 07/11/2019 Version 1.1

SECTION 1.Identification

Product identifier

Product number	CX1054
Product name	Chloroform For HPLC, Spectrophotometry and Gas Chromatography OmniSolv®
CAS-No.	67-66-3

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

Identified uses	Reagent for analysis

Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation | 400 Summit Drive | Burlington | Massachusetts 01803 | United States of America | General Inquiries: +1 800-645-5476 | Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5) MilliporeSigma is a business of Merck KGaA, Darmstadt, Germany.
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 2A, H319
Carcinogenicity, Category 2, H351
Reproductive toxicity, Category 2, H361
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
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.
H361 Suspected of damaging fertility or the unborn child.
H372 Causes damage to organs (Liver, Kidney) through prolonged or repeated exposure.

Precautionary Statements
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P260 Do not breathe dust/ fume/ gas/ mist/ vapors/ spray.
P264 Wash skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ eye protection/ face protection.
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.
P311 Call a POISON CENTER/doctor.
P321 Specific treatment (see supplemental first aid instructions on this label).
P330 Rinse mouth.
P332 + P313 If skin irritation occurs: Get medical advice/ attention.
P337 + P313 If eye irritation persists: Get medical advice/ attention.
P362 Take off contaminated clothing and wash before reuse.
P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P501 Dispose of contents/ container to an approved waste disposal plant.

Other hazards

None known.

SECTION 3. Composition/information on ingredients

Formula	$CHCl_3$ (Hill)
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. Immediately call in physician. If breathing stops: immediately apply artificial respiration, if necessary also oxygen.

Skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Consult a physician.

Eye contact
After eye contact: rinse out with plenty of water. Call in ophthalmologist. Remove contact lenses.

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

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)
irritant effects

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.

Environmental precautions

Do not let product enter 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 carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

SECTION 7. Handling and storage

Precautions for safe handling

Observe label precautions.

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

Conditions for safe storage, including any incompatibilities

Protected from light.

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

Store at room temperature.

SECTION 8. Exposure controls/personal protection

Exposure limit(s)

Components

Basis	Value	Threshold limits	Remarks
Chloroform 67-66-3			
ACGIH	Time Weighted Average (TWA):	10 ppm	
NIOSH/GUIDE	Short Term Exposure Limit (STEL):	2 ppm 9.78 mg/m³	
OSHA_TRANS	Ceiling Limit Value:	50 ppm 240 mg/m³	
Z1A	Time Weighted Average (TWA):	2 ppm 9.78 mg/m³	

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

Hand protection
full contact:

Glove material:	Viton (R)
Glove thickness:	0.70 mm
Break through time:	> 480 min

splash contact:

Glove material:	butyl-rubber
Glove thickness:	0.7 mm
Break through time:	> 10 min

The protective gloves to be used must comply with the specifications of EC Directive 89/686/EEC and the related standard EN374, for example KCL 890 Vitoject® (full contact), KCL 898 Butoject® (splash contact).
The breakthrough times stated above were determined by KCL in laboratory tests acc. to EN374 with samples of the recommended glove types.
This recommendation applies only to the product stated in the safety data sheet and supplied by us as well as to the purpose specified by us. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN374 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

Other protective equipment:
protective clothing

Respiratory protection
required when vapors/aerosols are generated.
Recommended Filter type: Filter AX (EN 371)
The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are performed according to the instructions of the producer.
These measures have to be properly documented.

SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	characteristic
Odor Threshold	No information available.

pH	No information available.
Melting point	-81 °F (-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/cm3 at 68 °F (20 °C)
Relative density	No information available.
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	none
Ignition temperature	not combustible

SECTION 10. Stability and reactivity

Reactivity
See below

Chemical stability
heat-sensitive
Sensitivity to light

Stabilizer
Pent-2-ene

Possibility of hazardous reactions
Risk of explosion with:
Ammonia, Amines, nitrogen oxides, bases, Oxygen, alkali amides, organic nitro compounds, strong alkalis, Fluorine, peroxi compounds, Alkaline earth metals, Alkali metals, Powdered metals
Methanol, with, alcoholates
Methanol, with, strong alkalis
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
sodium, sensitive to shock
Violent reactions possible with:
phosphines, bis(dimethylamino)dimethyl tin, nonmetallic hydrogen compounds, Powdered metals, Light metals, Ketones, mineral acids, Strong oxidizing agents, semimetallic hydrogen compounds

Conditions to avoid
no information available

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)

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

Acute inhalation toxicity
Acute toxicity estimate: 0.5 mg/l; dust/mist
Expert judgment

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

Acute dermal toxicity
LD50 Rabbit: > 3,980 mg/kg
(IUCLID)

absorption

Skin irritation
Rabbit
Result: slight irritation
(IUCLID)

Drying-out effect resulting in rough and chapped skin.
Causes skin irritation.

Eye irritation

Causes serious eye irritation.

Genotoxicity in vitro
Ames test
Salmonella typhimurium
Result: negative
Method: OECD Test Guideline 471

CMR effects
Carcinogenicity:Suspected of causing cancer.
Teratogenicity / Reproductive toxicity: Suspected of damaging fertility or 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
Causes damage to organs through prolonged or repeated exposure.
Target Organs: Liver, Kidney

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 component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.	
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
Damage to:
Liver, Kidney, Cardiac
Effect potentiated by: ethanol
Other dangerous properties can not be excluded.
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.

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

SARA 313

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

Components

Chloroform	67-66-3	*99.978 %*

SARA 302

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

Components

Chloroform	67-66-3

Clean Water Act
The following Hazardous Substances are listed under the U.S. CleanWater Act, Section 311, Table 116.4A:
Components
Chloroform
The following Hazardous Chemicals are listed under the U.S. CleanWater Act, Section 311, Table 117.3:
Components
Chloroform

DEA List I
Not listed

DEA List II
Not listed

US State Regulations

Massachusetts Right To Know
Components
Chloroform
Pennsylvania Right To Know
Components
Chloroform
New Jersey Right To Know
Components
Chloroform
California Prop 65 Components
WARNING: this product contains a chemical known in the State of California to cause cancer.
Components
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.
Components
Chloroform

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.

Labeling
Hazard pictograms

Signal Word
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.
H361 Suspected of damaging fertility or the unborn child.
H372 Causes damage to organs through prolonged or repeated exposure.

Precautionary Statements
Response
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.

For use in industrial installations only.

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.
H361	Suspected of damaging fertility or 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 Date07/11/2019

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