1. PRODUCT AND COMPANY IDENTIFICATION

Product name: Chloroform
Product Number: 372978
Brand: Sigma-Aldrich
Supplier: Sigma-Aldrich
3050 Spruce Street
SAINT LOUIS MO 63113
USA
Telephone: +1 800-255-5692
Fax: +1 800-255-5692
Emergency Phone # (For
bath supplier and manufacturer)
Preparation Information: Sigma Aldrich Corporation
Product Safety - Americas Region
1-800-521-8950

2. HAZARDS IDENTIFICATION

Emergency Overview
OSHA Hazards
Carcinogen, Target Organ Effect, Harmful by ingestion, Inhale
Target Organs
Central nervous system, Blood, Liver, Cardiovascular system, Kidney Cardiovascular system, Central nervous system, Blood, Liver, Kidney

GHS Classification
Acute toxicity, Oral (Category 4)
Skin irritation (Category 2)
Eye irritation (Category 2)
Carcinogenicity (Category 2)
Specific target organ toxicity - repeated exposure (Category 2)
Acute aquatic toxicity (Category 3)

GHS Label elements, including precautionary statements

Pictogram

Signal word: Warning

Hazard statement(s)
H302 Harmful if swallowed.
H318 Causes skin irritation.
H319 Causes serious eye irritation.
H335 Suspected of causing cancer.
H317 May cause damage to organs through prolonged or repeated exposure.
H410 Harmful to aquatic life.

Precautionary statement(s)
P261 Use personal protective equipment as required.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Trichloromethane
Methyltrichloroacetic acid

Formula: CHCl₃
Molecular Weight: 119.38 g/mol

Component
CAS-No. 67-66-3
EC-No. 200-663-8
Index-No. 602-005-00-4

4. FIRST AID MEASURES

General advice
Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

If inhaled
If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.

In case of skin contact
Wash off with soap and plenty of water. Consult a physician.

In case of eye contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

If swallowed
Never give anything by mouth to an unconscious person. Rinse mouth with water. Consult a physician.

5. FIREFIGHTING MEASURES

Conditions of flammability
Not flammable or combustible.
Suitable extinguishing media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.
Special protective equipment for firefighters
Wear self-contained breathing apparatus for fire fighting if necessary.

Hazardous combustion products
Carbon oxides, Phosgene, Chlorine

Hazardous decomposition products formed under fire conditions
Carbon oxides, Hydrogen chloride gas
6. ACCIDENTAL RELEASE MEASURES

Personal precautions
Use personal protective equipment. Avoid breathing vapors, mist or gas. Ensure adequate ventilation. Evacuate personnel to safe areas.

Environmental precautions
Prevent further leakage or spillage if safe to do so. Do not let product enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up
Seek up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal.

7. HANDLING AND STORAGE

Precautions for safe handling
Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.

Conditions for safe storage
Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully sealed and kept upright to prevent leakage.

8. EXPOSURE CONTROLS/PERSOAL PROTECTION

Components with workplace control parameters

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No.</th>
<th>Value</th>
<th>Control parameters</th>
<th>Basis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chloroform</td>
<td>67-66-3</td>
<td>TWA</td>
<td>10 ppm</td>
<td>USA. ACGIH Threshold Limit Values (TLV)</td>
</tr>
<tr>
<td>RemarKs</td>
<td>Central Nervous System impairment. Liver damage. Embryofetal damage. Confirmed animal carcinogen with unknown relevance to humans.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TWA</td>
<td>2 ppm</td>
<td>9.78 mg/m³</td>
<td>USA. OSHA - TABLE Z-1 Limits for Air Contaminants - 1910.1000</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>5 ppm</td>
<td>140 mg/m³</td>
<td>USA. Occupational Exposure Limits (OSHA) - Table Z-1</td>
<td></td>
</tr>
<tr>
<td>The value in mg/m³ is approximate. Ceiling limit is to be determined from breathing air samples.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST</td>
<td>2 ppm</td>
<td>9.78 mg/m³</td>
<td>USA. NIOSH Recommended Exposure Limits</td>
<td></td>
</tr>
<tr>
<td>Potential Occupational Carcinogen See Appendix A</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Personal protective equipment

Respiratory protection
Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type A9PEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Hand protection
Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Immersion protection
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Breakthrough time: > 480 min
Material tested: Vitoject® (Althorich Z677668, Size M)

Splash protection
Material: Fluorinated rubber
Minimum layer thickness: 0.7 mm
Breakthrough time: > 480 min
Material tested: Vitoject® (Althorich Z677668, Size M)

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Form liquid, clear
Colour colourless

Safety data
pH no data available
Melting point/freezing point no data available
Boiling point 60.5 - 61.5 °C (140.9 - 142.7 °F)
Flash point no data available
Ignition temperature no data available
Auto/ignition temperature no data available
Lower explosion limit no data available
Upper explosion limit no data available
Vapour pressure 213.3 kPa (160.0 mmHg) at 20.0 °C (68.0 °F)
Density 1.492 g/ml at 25 °C (77 °F)
Water solubility no data available
 Partition coefficient octanol/water no data available
Relative vapour density no data available
Odeur no data available
Odeur Threshold no data available
Evaporation rate no data available

10. STABILITY AND REACTIVITY

EYE PROTECTION
Face shield and safety glasses. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166 (EU).

SKIN AND BODY PROTECTION
Complete suit protecting against chemicals. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

HYGIENE MEASURES
Handle in accordance with good industrial hygiene and safety practice. Wash hands before breaks and at the end of workday.
Chemical stability
Stable under recommended storage conditions.

Possibility of hazardous reactions
no data available

Conditions to avoid
no data available

Materials to avoid
Strong oxidizing agents, Strong bases, Magnesium, Sodium/sodium oxides, Lithium

Hazardous decomposition products
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Phosgene, Chlorine
Hazardous decomposition products formed under fire conditions. - Carbon oxides, Hydrogen chloride gas
Other decomposition products - no data available

Contains the following stabilizer(s):
2-Methyl-2-butanone (>0.001 - <0.015 %)

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Oral LD50
LD50 Oral - rat - 695.0 mg/kg

Inhalation LC50
LC50 Inhalation - rat - 4 h - 47,702 mg/m3

Dermal LD50
LD50 Dermal - rabbit - > 20,000 mg/kg

Other information on acute toxicity
no data available

Skin corrosion/Irritation
Skin - rabbit - Mild skin irritation - 24 h

Serious eye damage/eye irritation
Eyes - rabbit - Irritating to eyes - 24 h

Respiratory or skin sensitization
no data available

Germ cell mutagenicity
Laboratory experiments have shown mutagenic effects.

Carcinogenicity
Carcinogenicity - rat - Oral
Tumorigenicity/Carcinogenicity by RTECS criteria. Leukemia

The National Cancer Institute (NCI) has found clear evidence for carcinogenicity.

IARC: 2B - Group 2B: Possibly carcinogenic to humans (Chloroform)

NTP: Reasonably anticipated to be a human carcinogen (Chloroform)

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA

Reproductive toxicity
no data available

Teratogenicity
no data available

Specific target organ toxicity - single exposure (Globally Harmonized System) no data available

Specific target organ toxicity - repeated exposure (Globally Harmonized System) May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard
no data available

Potential health effects

Inhalation
May be harmful if inhaled. Causes respiratory tract irritation.

Ingestion
Harmful if swallowed.

Skin
Harmful if absorbed through skin. Causes skin irritation.

Eyes
Causes eye irritation.

Signs and Symptoms of Exposure
Vomiting, Gastrointestinal disturbance. Exposure to and/or consumption of alcohol may increase toxic effects. To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Synergistic effects
no data available

Additional Information
RTECS: F59100000

12. ECOLOGICAL INFORMATION

Toxicity

Toxicity to fish
LC50 - Leuciscus idus (Goldfish) - 162 mg/l - 48 h
LC100 - Leuciscus idus (Goldfish) - 220 mg/l - 48 h
LC50 - other fish - 97 mg/l - 96 h
LC50 - Danio rerio (zebra fish) - 151 mg/l - 96 h
NOEC - Oryzias latipes - 122 mg/l - 10 d
NOEC - Oncorhynchus mykiss (rainbow trout) - 24 mg/l - 99 h

Toxicity to daphnia and other aquatic invertebrates
EC50 - Daphnia magna (Water flea) - 78.00 mg/l - 24 h

Immobilization EC50 - Daphnia magna (Water flea) - 51.6 mg/l - 48 h
NOEC - Daphnia magna (Water flea) - 120 mg/l - 11 d

Toxicity to algae
EC50 - No information available - 500.00 mg/l - 24 h

Persistence and degradability
no data available

Bioaccumulative potential
Bioaccumulation
Lepomis macrochirus (Bluegill) - 14 d
Bioconcentration factor (BCF): 6

Mobility in soil
no data available

PBT and vPvB assessment
no data available

Other adverse effects
no data available
An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. 
Harmful to aquatic life.

13. DISPOSAL CONSIDERATIONS

Product
Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

Contaminated packaging
Dispose of as unused product.

14. TRANSPORT INFORMATION

DOT (US)
UN number: 1888  Class: 6.1  Packing group: III
Proper shipping name: Chloroform
Reportable Quantity (RQ): 10 lbs
Marine pollutant: No
Poison Inhalation Hazard: No

IMDG
UN number: 1888  Class: 6.1  Packing group: III
EMS-No: F-A, S-A
Proper shipping name: CHLOROFORM
Marine pollutant: No

IATA
UN number: 1888  Class: 6.1  Packing group: III
Proper shipping name: Chloroform

15. REGULATORY INFORMATION

OSHA Hazards
Carcinogen, Target Organ Effect, Harmful by ingestion, Irritant

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

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<thead>
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SARA 313 Components
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SARA 311/312 Hazards
Acute Health Hazard, Chronic Health Hazard

Massachusetts Right To Know Components

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Pennsylvania Right To Know Components

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New Jersey Right To Know Components

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California Prop. 65 Components

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Chloroform

California Prop. 65 Components
WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

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Further Information
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