

SAFETY DATA SHEET



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CHLOROFORM WITH ETHANOL

SDS No. M0043

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Chloroform with ethanol

Synonyms: Trichloromethane; Methyl trichloride; Methane trichloride

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION



Classification:

Acute Toxicity, Inhalation: GHS Category 3

Acute Toxicity, Oral: GHS Category 3

Skin Irritation: GHS Category 2

Eye Irritation: GHS Category 2A

Carcinogenicity: GHS Category 2

Reproductive Toxicity: GHS Category 2

Specific Target Organ Toxicity, Single Exposure: GHS Category 3

Specific Target Organ Toxicity, Repeated Exposure: GHS Category 1

Acute Aquatic Toxicity: GHS Category 3

Label Elements:

Signal Word: WARNING!

Hazard Statements:

H302 – Harmful if swallowed.

H315 – Causes skin irritation.

H319 – Causes serious eye irritation.

H331 – Toxic if inhaled.

H336 – May cause drowsiness or dizziness.

H351 – Suspected of causing cancer.

H361 – Suspected of causing damage to fertility or the unborn child.

H372 – Causes damage to organs (liver, kidney) through prolonged or repeated exposure.

Clear focus. Consistent results. Complete confidence.

H402 – Harmful to aquatic life

Precautionary Statements:

P243 – Take precautionary measures against static discharge.

P280 – Wear protective gloves/protective clothing/eye protection/face protection

P284 – Wear respiratory protection.

P303+P361+P353 – IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304+P341 – IF INHALED: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing.

P305+P351+P338 – IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing.

Emergency Overview:

Harmful if swallowed, inhaled, or absorbed through the skin. Affects central nervous system, liver, cardiovascular system, and blood. Causes irritation to skin, eyes, and respiratory tract. May cause cancer. May cause cardiac disturbances. Causes adverse reproductive and fetal effects in animals. Decomposes over time. Decomposition products are hazardous. Possible static electrical hazard. Target Organs: Kidneys, heart, central nervous system, liver, eyes, reproductive system, and skin.

HMIS Rating:

Health – 2* Flammability – 0 Physical Hazard – 0 PPE – User supplied

NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Chloroform	67-66-3	>98%	Yes
Ethanol	64-17-5	<2%	Yes

4. FIRST-AID MEASURES

Inhalation: Get immediate medical aid. If inhaled, remove to fresh air. If breathing is labored or with coughing, give 100% supplemental oxygen. If not breathing, begin artificial respiration.

Ingestion: Do not induce vomiting. If victim is conscious and alert, give 2-4 cupfuls of milk or water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention.

Eye Contact: Check for and remove contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

Notes to Physician: Causes cardiac sensitization to endogenous catecholamines which may lead to cardiac arrhythmias. Do not use adrenergic agents such as epinephrine or pseudo epinephrine. Persons with liver, kidney, or central nervous system diseases may be at increased risk from exposure to this product. Alcoholic beverage consumption may enhance the toxic effects of this substance. Effects may be delayed.

5. FIRE FIGHTING MEASURES

Flammability: Not expected to be a fire hazard.

Auto-ignition Temperature: Not available.

Flash Point: Not available.

Flammable Limits: Not available.

Products of Combustion: May decompose into toxic and corrosive gases (hydrogen chloride, phosgene, chlorine, carbon monoxide and carbon dioxide) under fire conditions.

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Vapors may be heavier than air and can spread along the ground and collect in low or confined spaces. Approach fire from upwind to avoid vapors and decomposition products.

Specific Explosion Hazards: None

Fire Fighting Media: Use extinguishing media most appropriate to the surrounding fire.

National Fire Protective Association: Health - 2, Flammability - 0, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Provide ventilation to the affected area. Avoid run-off into storm sewers and ditches that lead to waterways. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Avoid contact with eyes, skin, and clothing. Do not ingest or inhale. Remove contaminated clothing and wash before reuse. Keep container tightly closed. Use only under a fume hood.

Storage: Do not store in direct sunlight. Keep away from acids, strong mineral acids, and alkaline substances. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Protect from moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Facilities storing or using the material should be equipped with eyewash station and a safety shower. Always use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits. Product should be used only under a fume hood.

Personal Protection: Wear protective chemical goggles or appropriate eye protection. Use appropriate protective gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 166 approved respirator when necessary.

Exposure Limits (Chloroform):

ACGIH – 10 ppm TWA

NIOSH – 500 ppm IDLH

OSHA Final PELs – 50 ppm ceiling; 240 mg/m³ ceiling

OSHA Vacated PELs: 2 ppm TWA, 9.78 mg/m³ TWA

Exposure Limits (Ethanol):

ACGIH – 1000 ppm TWA

NIOSH – 1000 ppm TWA; 1900 mg/m³ TWA, 3300 ppm IDLH

OSHA Final PELs – 1000 ppm TWA; 1900 mg/m³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Sweet, fruity, ethereal odor

Odor Threshold: 85-307 ppm

Molecular Formula: CHCl_3

Molecular Weight: 119.38

Auto-ignition Temperature: Not available.

Flash Point: Not available.

Flammable Limits: Not available.

pH: Not available.

Boiling Point: 60.5-61.5° C

Freezing/Melting Point: -63° C

Decomposition Temperature: Not available

Specific Gravity: 1.492 (Water=1)

Vapor Density (Air=1): 4.12

Vapor Pressure: 160 mm Hg @ 20° C.

Evaporation Rate (Butyl acetate = 1): 11.6

Viscosity: 0.58 cps @ 20° C

Solubility: Slightly soluble

Conductivity: Semiconductive; Conductivity = <10,000 pS/m; Dielectric Constant = 4.806; Relaxation Time Constant = $>4.3 \times 10^{-3}$ seconds

10. STABILITY AND REACTIVITY

Stability: Stable at room temperature in closed containers under normal storage and handling conditions. Light sensitive. Hygroscopic (absorbs moisture or water from the air).

Conditions to Avoid: High temperatures, incompatible materials, light.

Incompatibility With Various Substances: Strong oxidizers, strong bases, magnesium, sodium/sodium oxides, lithium.

Hazardous Decomposition Products: Hydrogen chloride, phosgene gas, chlorine, carbon monoxide, carbon, dioxide.

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Inhalation of high concentrations may cause central nervous system effects characterized by nausea, headache, dizziness, unconsciousness, and coma. May cause cardiac sensitization and possible failure. Inhalation of large amounts may cause respiratory stimulation, followed by respiratory depression, convulsions, and possible death due to respiratory paralysis. May be absorbed through the lungs. Causes irritation of the mucous membrane and upper respiratory tract.

INGESTION HAZARD: Causes gastrointestinal distress with nausea, vomiting, and diarrhea. May cause cardiac disturbances. Aspiration into the lungs may cause chemical pneumonitis, which may be fatal. May cause hallucinations and distorted perceptions.

SKIN CONTACT HAZARD: Causes mild skin irritation. May be absorbed through skin in harmful amounts. Absorption through intact skin is possible and may cause systemic poisoning if contact with liquid is prolonged.

EYE CONTACT HAZARD: Causes moderate eye irritation. Contact causes immediate burning pain, tearing, and reddening of the conjunctiva.

Chronic Exposure Hazards: Possible cancer hazard based on tests with laboratory animals. Prolonged or repeated contact with skin may cause dermatitis. May cause reproductive and fetal effects. Toxicity may be increased by exposure to alcohol, steroids, and ketones. Prolonged exposure may cause liver, kidney, and heart damage.

Animal Toxicity for Chloroform:

Draize test, rabbit, eye: 20 mg/24H Moderate

Draize test, rabbit, skin: 500 mg/24H Mild

Inhalation, rat: LOEC = 500 ppm/6H;

Oral, rat: LD50 = 908 mg/kg;

Skin, rabbit: LD50 = >20,000 mg/kg;

Animal Toxicity for Ethanol:

Draize test, rabbit, eye: 500 mg; Severe
 Draize test, rabbit, eye: 500 mg/24H Mild
 Draize test, rabbit, skin: 20 mg/24H Moderate
 Inhalation, mouse: LC50 = 39 g/m³/4H;
 Inhalation, rat: LC50 = 20,000 g/m³/610H;
 Oral, mouse: LD50 = 3450 mg/kg;
 Oral, rat: LD50 = 6300 mg/kg;
 Oral, rat: LD50 = 7060 mg/kg;
 Skin, rabbit: LD50 = 9000 mg/kg;

Carcinogenicity (Chloroform):

ACGIH: A3- Confirmed animal carcinogen with unknown relevance to humans
 California: carcinogen, initial date 10/1/87
 NIOSH: occupational carcinogen
 NTP: suspect carcinogen
 IARC: Group 2B carcinogen

Carcinogenicity (Ethanol): No information available.Epidemiology: No information available.Teratogenicity:

Oral, rat: TDLo = 1260 mg/kg (Female 6-15 days after conception) Effects on Embryo or Fetus – fetotoxicity (except death e.g. stunted fetus) Specific developmental abnormalities – musculoskeletal system:
 Inhalation, rat: TCLo = 100 ppm/7H (female 6-15 days after conception) Specific developmental abnormalities – gastrointestinal system and homeostasis;
 Inhalation, mouse: TCLo = 100 ppm/7H (female 8-15 days after conception) Specific developmental abnormalities – craniofacial (including nose and tongue)

Reproductive Effects:

Inhalation, rat: TCLo = 30 ppm/7H (female 6-15 days after conception) Fertility - other measures of fertility;
 Inhalation, rat: TCLo = 300 ppm/7H (female 6-15 days after conception) Fertility - female fertility index (e.g. # females pregnant per # sperm positive females; # females pregnant per # females mated) and post implantation mortality (e.g. dead and/or resorbed implants per total implants).

Mutagenicity:

DNA Inhibition: Human HeLa cell = 19 mmol/L;
 Sister Chromatid Exchange: Human, Lymphocyte = 10 mmol/L;
 Micronucleus Test: Oral, rat = 4 mmol/kg;
 Unscheduled DNA Synthesis: Oral, rat = 1 g/kg;
 Sister Chromatid Exchange: Hamster, embryo = 100 mmol/L;

Neurotoxicity: No information available.**12. ECOLOGICAL INFORMATION**Ecotoxicity:

Fish: Channel catfish: LC50 = 75 ppm, 96H, Unspecified;
 Fish: Rainbow trout: LC50 = 43.8 mg/L, 96H, Static bioassay
 Fish: Fathead minnow: LC50 = 129.0 mg/L, 96H, Static bioassay (pH 7.6-8.3);
 Fish: Bluegill/sunfish: LC50 = 100.0 mg/L, 96H, Static bioassay
 Water flea: Daphnia: EC50 = 28.9 mg/L, 48H; Static bioassay

Environmental Fate: Chloroform will not be expected to bioconcentrate in the food chain but contamination of food is likely due to its use as an extractant and its presence in drinking water.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use or contamination of this product may change the waste management options. Waste generators must

decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements. This material is a "U" listed waste under 40 CFR 261.33 (U044).

14. TRANSPORT INFORMATION

US DOT

Proper Shipping Name: RQ, Chloroform
Hazard Class: 6.1
UN Number: UN1888
Packing Group: III

IMDG

Proper Shipping Name: RQ, Chloroform
Hazard Class: 6.1
UN Number: UN1888
Packing Group: III

IATA

Proper Shipping Name: RQ, Chloroform
Hazard Class: 6.1
UN Number: UN1888
Packing Group: III

15. REGULATORY INFORMATION

TSCA: Chloroform CAS# 67-66-3 and Ethanol CAS# 64-17-5 are listed on the TSCA Inventory.
Health and Safety Reporting List: Chloroform CAS# 67-66-3 effective date: 6/1/1987; Sunset date: 6/1/1997
Chemical Test Rules: Chloroform CAS# 67-66-3 and Ethanol CAS# 64-17-5 are not listed.
Section 12b: Chloroform CAS# 67-66-3 and Ethanol CAS# 64-17-5 are not listed.
TSCA Significant New Use Rule: Chloroform CAS# 67-66-3 does not have an SNUR under TSCA.
CERCLA Hazardous Substances: Chloroform CAS# 67-66-3 – 10 lb final RQ; 4,54 kg final RQ
SARA Section 302: Chloroform CAS# 67-66-3 – 10,000 lb TPQ
SARA Codes: Chloroform CAS# 67-66-3 – immediate, delayed; Ethanol CAS# 64-17-5 – immediate, delayed, fire
Section 313: Chloroform CAS# 67-66-3 is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.
Clean Air Act: Chloroform CAS# 67-66-3 is listed as a hazardous air pollutant (HAP). It is not a Class 1 Ozone Depleter. It is not a Class 2 Ozone Depleter.
Clean Water Act: Chloroform CAS# 67-66-3 is listed as a Hazardous Substance. It is listed as a Priority Pollutant. It is a Toxic Pollutant.
OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

Chloroform CAS# 67-66-3 is on the following state right-to-know lists: California, Florida, New Jersey, Pennsylvania, Minnesota, and Massachusetts
Ethanol CAS# 64-17-5 is on the following state right-to-know lists: California, Florida, New Jersey, Pennsylvania, Minnesota, and Massachusetts

The following statement is made in order to comply with the California State Drinking Water Act: WARNING: This product contains Chloroform, a chemical known to the state of California to cause cancer. California No Significant Risk Level = 20 ug/day NSRL (oral); 40 ug/day NSRL (inhalation).

Canada:

DSL/NDSL: Chloroform CAS# 67-66-3 and Ethanol CAS# 64-17-5 are listed on Canada's DSL list.

WHMIS: This product has a WHMIS classification of D2A, D2B, D1B. This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and this MSDS contains all the information required by those regulations..

16. OTHER INFORMATION

Originally Prepared: 3/23/2006

Last Revised: 12/20/2017 – Updated hazard categories, hazard statements, and precautionary statements and pictograms. Section 11, updated ethanol toxicology. Section 15 updated ethanol regulations.

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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