

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Chloroform
Catalog Number: 1445817

Hach Company
P.O.Box 389
Loveland, CO USA 80539
(970) 669-3050

Emergency Telephone Numbers:
(Medical and Transportation)
(303) 623-5716 24 Hour Service
(515)232-2533 8am - 4pm CST

MSDS Number: M00190
Chemical Name: Methane, trichloro-
CAS Number: 67-66-3
Additional CAS No. (for hydrated forms): Not applicable
Chemical Formula: CHCl₃
Chemical Family: Halogenated Hydrocarbons
Intended Use: Laboratory Use

2. HAZARDS IDENTIFICATION

GHS Classification:

Hazard categories: Carcinogenicity: Carc. 2 Acute Toxicity: Acute Tox. 4-Orl Specific Target Organ Toxicity - Repeated Exposure: STOT RE. 2 Skin Corrosion/Irritation: Skin Irrit. 2 Serious Eye Damage/Eye Irritation: Eye Irrit. 2A Specific Target Organ Toxicity - Single Exposure: STOT SE 3 Hazardous to the Aquatic Environment: Aquatic Acute 3

GHS Label Elements:

WARNING



Hazard statements: Suspected of causing cancer. May cause damage to organs through prolonged or repeated exposure. Suspected of causing cancer by inhalation. Harmful if swallowed. Causes skin irritation. Causes serious eye irritation. May cause drowsiness or dizziness. H402: Harmful to aquatic life.

Precautionary statements: Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Do not breathe dust/fume/gas/mist/vapours/spray. Do not eat, drink or smoke when using this product. Take off contaminated clothing and wash before reuse. IF exposed or concerned: Get medical advice/attention. Wash thoroughly after handling. IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell. Dispose of contents/container according to state, local, federal or national regulations. Wear protective gloves / protective clothing / eye protection / face protection. IF ON SKIN: Wash with plenty of soap and water. P321 Specific treatment (see supplemental first aid instructions on this label). . IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. Obtain special instructions before use. Avoid breathing dust/fume/gas/mist/vapours/spray. Use only outdoors or in a well-ventilated area. IF INHALED: Remove victim/person to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or doctor/physician if you feel unwell. Handle environmental release according to local, state, federal, provincial requirements.

HMIS:

Health: 3

Flammability: 0

Reactivity: 0

Protective Equipment: X - See protective equipment, Section 8.

NFPA:

Health: 2

Flammability: 0

Reactivity: 0

Symbol: Not applicable

WHMIS Hazard Classification: Class D, Division 2, Subdivision A - Very toxic materials (other toxic effects)

WHMIS Symbols: Other Toxic Effects

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Components according to GHS:

Chloroform

CAS Number: 67-66-3

Chemical Formula: CHCl₃

GHS Classification: Acute Tox. 4 -Orl, H302; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Acute Tox. 4-Inh, H332; STOT Single 3, H336; Muta. 2, H341; Carc. 2, H351; Repr. 2, H361; STOT Rep. 2, H373; Aquatic Acute 3, H402

Percent Range: 100.0

Percent Range Units: weight / weight

PEL: Ceiling: 50 ppm (240 mg/m³)

TLV: 10 ppm (49 mg/m³)

WHMIS Symbols: Other Toxic Effects

4. FIRST AID MEASURES

General Information: In the event of exposure, show this Material Safety Data Sheet and label (where possible) to a doctor.

Advice to doctor: Treat symptomatically.

Eye Contact: Immediately flush eyes with water for 15 minutes. Call physician.

Skin Contact (First Aid): Wash skin with soap and plenty of water.

Inhalation: Remove to fresh air. Give artificial respiration if necessary. Call physician.

Ingestion (First Aid): Do not induce vomiting. Call physician immediately.

5. FIRE FIGHTING MEASURES

Flammable Properties: Material will not burn. During a fire, corrosive and toxic gases may be generated by thermal decomposition.

Fire Fighting Instruction: As in any fire, wear self-contained breathing apparatus pressure-demand and full protective gear. Evacuate area and fight fire from a safe distance. Water runoff can cause environmental damage. Dike and collect water used to fight fire.

Extinguishing Media: Carbon dioxide Alcohol foam. Dry chemical.

Extinguishing Media NOT To Be Used: Not applicable

Fire / Explosion Hazards: May react violently with: alkali metals aluminum / aluminum compounds strong bases

Hazardous Combustion Products: This material will not burn.

6. ACCIDENTAL RELEASE MEASURES

Spill Response Notice:

Only persons properly qualified to respond to an emergency involving hazardous substances may respond to a spill according to federal regulations (OSHA 29 CFR 1910.120(a)(v)) and per your company's emergency response plan and guidelines/procedures. See Section 13, Special Instructions for disposal assistance. Outside of the US, only persons properly qualified according to state or local regulations should respond to a spill involving chemicals.

Containment Technique: Releases of this material may contaminate the environment. Absorb spilled liquid with non-reactive sorbent material. Stop spilled material from being released to the environment. Dike the spill to contain material for later disposal.

Clean-up Technique: If permitted by regulation, Cover with an inert material, such as sand. Sweep up material. Incinerate material at a government approved hazardous waste facility. Decontaminate the area of the spill with a soap solution. Otherwise, Pick up spill for disposal and place in a closed container. Dispose of in accordance with local, state and federal regulations or laws.

Evacuation Procedure: Evacuate general area (50 foot radius or as directed by your facility's emergency response plan) when: any quantity is spilled. Deny access to unnecessary and unprotected personnel. If conditions warrant, increase the size of the evacuation.

DOT Emergency Response Guide Number: 151

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes skin clothing. Do not breathe mist or vapors. Wash thoroughly after handling. Use with adequate ventilation. Maintain general industrial hygiene practices when using this product.

Storage: Protect from: light air. Store in a cool, well-ventilated place. Keep away from: alkali metals alkalies

Flammability Class: Not applicable

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls: Have an eyewash station nearby. Have a safety shower nearby. Use a fume hood to avoid exposure to dust, mist or vapor. Maintain general industrial hygiene practices when using this product.

Personal Protective Equipment:

Eye Protection: chemical splash goggles

Skin Protection: lab coat pva (polyvinyl alcohol) gloves

Inhalation Protection: laboratory fume hood

Precautionary Measures: Avoid contact with: eyes skin clothing. Do not breathe: mist/vapor. Wash thoroughly after handling. Use with adequate ventilation. Keep away from: alkali metals alkalies

TLV: 10 ppm (49 mg/m³)

PEL: Ceiling: 50 ppm (240 mg/m³)

For Occupational Exposure Limits (OEL) for ingredients, see section 3 - Composition/Information on Ingredients.:

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear, colorless

Physical State: Liquid

Molecular Weight: 119.38 g/mol

Odor: Ether-like

Odor Threshold: 200 ppm

pH: Not determined.

Metal Corrosivity:

Corrosivity Classification: Not applicable. Not classified as corrosive to metals according to GHS criteria.

Steel: Not determined.

Aluminum: Not determined.

Specific Gravity/ Relative Density (water = 1; air = 1): 1.49

Viscosity: Not available

Solubility:

Water: 1 mL in 200 mL water @ 25 °C (77 °F)

Acid: Not determined.

Other: Alcohol, Benzene, Ether, Carbon Tetrachloride, Carbon Disulfide.

Partition Coefficient (n-octanol / water): 1.97

Coefficient of Water / Oil: Not applicable

Melting Point: -64 °C (-83.2 °F)

Decomposition Temperature: Not available

Boiling Point: 61 °C (142 °F)

Vapor Pressure: 159 mm Hg @ 20 °C (68 °F)

Vapor Density (air = 1): 4.1 (at boiling point of chloroform).

Evaporation Rate (water = 1): The evaporation rate where: (ether=1) = 0.6; (butyl acetate=1) = 11.6.

Volatile Organic Compounds Content: 100%.

Flammable Properties: Material will not burn. During a fire, corrosive and toxic gases may be generated by thermal decomposition.

Flash Point: Not applicable

Method: Not applicable

Flammability Limits:

Lower Explosion Limits: Not applicable

Upper Explosion Limits: Not applicable

Autoignition Temperature: Not applicable

Explosive Properties:

Not applicable Not classified according to GHS criteria.

Oxidizing Properties:

Not applicable Not classified according to GHS criteria.

Reactivity Properties:

Not applicable Not classified as self-reactive, pyrophoric, self-heating or emitting flammable gases in contact with water according to GHS criteria.

Gas under Pressure:

Not classified according to GHS criteria.

Not applicable

10. STABILITY AND REACTIVITY

Chemical Stability: Stable when stored under proper conditions.

Mechanical Impact: None reported

Static Discharge: None reported.

Reactivity / Incompatibility: Incompatible with: alkali metals alkalis aluminum caustics coatings (such as paint, varnish, wax, lacquer, etc.) plastics rubber

Hazardous Decomposition: Heating to decomposition releases toxic and/or corrosive fumes of: phosgene chlorides carbon monoxide

Conditions to Avoid: Exposure to air. Exposure to light. Extreme temperatures Heating to decomposition.

11. TOXICOLOGICAL INFORMATION

Toxicokinetics, Metabolism and Distribution:

A specific liver enzyme converts chloroform into toxic metabolites resulting in hepatotoxicity.

Toxicologically Synergistic Products: Exposure to and/or consumption of alcohol may increase toxic effects of this product.

Acute Toxicity: Toxicological Testing Route Data Given Below

Oral Rat LD50 = 300-695 mg/kg

Skin Rabbit LD50 > 20 g/kg

Inhalation Rat LC50 = 47702 mg/m³/4 hr; Inhalation Rat LC50 = 6000 mg/m³/6hr

Specific Target Organ Toxicity - Single Exposure (STOT-SE): Target Organs Central nervous system Respiratory Tract
Summary of findings reported in the literature follow.

Inhalation Human TCLo = 5000 mg/m³/5 min/Hallucinations, distorted perceptions; Oral Human LDLo = 2514 mg/kg/Muscle contraction, acute renal failure, tubular necrosis; Unreported Route Human TDLo = 6.3 mg/kg/Gastritis, necrotic changes

Specific Target Organ Toxicity - Repeat Exposure (STOT-RE): Target Organs Central nervous system Kidneys Liver
Respiratory Tract Summary of findings reported in the literature follow.

Inhalation Human TCLo = 10 mg/m³/1 yr/Anorexia, vomiting; Inhalation Rat TCLo = 90 ppm/13 wk/Hepatitis, acute renal failure, tubular necrosis, weight loss; Oral Rat TDLo = 540 mg/kg/3 days/Acute renal failure, tubular necrosis

Skin Corrosion/Irritation: Irritating to skin.

Skin rabbit 10 mg/24 hr open irrit. test = MILD; skin rabbit 500 mg/24 hr = MILD.

Eye Damage: Irritating to eyes.

Eye rabbit 148 mg; Eye rabbit 20 mg/24 hr = MODERATE.

Sensitization: Based on classification principles, the classification criteria are not met.

CMR Effects/Properties (carcinogenic, mutagenic or toxic to reproduction): Listed Carcinogen Data supporting mutagenicity was found. Reproductive toxicity has been reported.

Listed on IARC and NTP as class 2B carcinogen - possibly carcinogenic to humans.

IARC Group 2B: Experimental Carcinogen

Chloroform
NTP Listed Group 2B: Experimental Carcinogen
Chloroform
O.S.H.A. Listed: Yes
Chloroform

Symptoms/Effects:

Ingestion: Harmful Causes: central nervous system depression kidney damage liver damage

Inhalation: Causes: central nervous system depression kidney damage liver damage

Skin Absorption: May be absorbed through skin. Causes central nervous system depression Causes kidney damage
Causes liver damage

Chronic Effects: Chronic overexposure may cause liver damage kidney tumors brain damage cancer impaired
fertility harm to unborn child

Medical Conditions Aggravated: Pre-existing: Central nervous system diseases Kidney conditions Liver conditions

12. ECOLOGICAL INFORMATION

Product Ecological Information: 96 hr Pimephales promelas LC50 = 71 mg/L; 96 hr Oncorhynchus mykiss LC50 = 18 mg/L; 96 hr Lepomis macrochirus LC50 = 18 mg/L; 96 hr Poecilia reticulata LC50 = 300 mg/L; 48 hr Daphnia magna EC50 = 29 mg/L; 48 hr Desmodemus subspicatus EC50 = 560 mg/L.

Do not place in landfill. Recycle appropriately. Do not release into the environment. Rapidly biodegradable. No bioaccumulation potential Mobility in soil: Moderate to High

CEPA Categorization: Persistent and inherently toxic to non-human organisms (PiT).

Ingredient Ecological Information: --

Not applicable

13. DISPOSAL CONSIDERATIONS

EPA Waste ID Number: U044

Special Instructions (Disposal): Dispose of material in an E.P.A. approved hazardous waste facility.

Empty Containers: Rinse three times with an appropriate solvent. Dispose of empty container as normal trash.

NOTICE (Disposal): These disposal guidelines are based on federal regulations and may be superseded by more stringent state or local requirements. Please consult your local environmental regulators for more information. In Europe: Chemical and analysis solutions must be disposed of in compliance with the respective national regulations. Product packaging must be disposed of in compliance with the country-specific regulations or must be passed to a packaging return system.

14. TRANSPORT INFORMATION

D.O.T.:

D.O.T. Proper Shipping Name: Chloroform

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Hazard Class: 6.1

Subsidiary Risk: NA

ID Number: UN1888

Packing Group: III

T.D.G.:

Proper Shipping Name: Chloroform

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Hazard Class: 6.1

Subsidiary Risk: NA

UN Number/PIN: 1888

Packing Group: III

I.C.A.O.:

I.C.A.O. Proper Shipping Name: Chloroform

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Hazard Class: 6.1

Subsidiary Risk: NA

ID Number: UN1888

Packing Group: III

I.M.O.:

Proper Shipping Name: Chloroform

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Hazard Class: 6.1

Subsidiary Risk: NA

ID Number: UN1888

Packing Group: III

Additional Information: There is a possibility that this product could be contained in a reagent set or kit composed of various compatible dangerous goods. If the item is NOT in a set or kit, the classification given above applies. If the item IS part of a set or kit, the classification would change to the following: UN3316 Chemical Kit, Class 9, PG II or III. If the item is not regulated, the Chemical Kit classification does not apply.

15. REGULATORY INFORMATION

U.S. Federal Regulations:

O.S.H.A.: This product meets the criteria for a hazardous substance as defined in the Hazard Communication Standard. (29 CFR 1910.1200)

E.P.A.:

S.A.R.A. Title III Section 311/312 Categorization (40 CFR 370): Immediate (Acute) Health Hazard Delayed (Chronic) Health Hazard

S.A.R.A. Title III Section 313 (40 CFR 372): This product contains a chemical(s) subject to the reporting requirements of Section 313 of Title III of SARA.

Chloroform

302 (EHS) TPQ (40 CFR 355): Chloroform 10,000 lbs.

304 CERCLA RQ (40 CFR 302.4): Chloroform 10 lbs.

304 EHS RQ (40 CFR 355): Chloroform - RQ 10 lbs.

Clean Water Act (40 CFR 116.4): Chloroform - RQ 10 lbs.

RCRA: Contains RCRA regulated substances. See Section 13, EPA Waste ID Number.

State Regulations:

California Prop. 65: WARNING - This product contains a chemical known to the State of California to cause cancer.

Identification of Prop. 65 Ingredient(s): Chloroform

California Perchlorate Rule CCR Title 22 Chap 33: Not applicable

Trade Secret Registry: Not applicable

National Inventories:

U.S. Inventory Status: TSCA Listed: Yes

CAS Number: 67-66-3

Canadian Inventory Status: DSL Listed: Yes

EEC Inventory Status: EINECS Listed: Yes

Australian Inventory (AICS) Status: Listed

New Zealand Inventory (NZIoC) Status: Listed

Korean Inventory (KECI) Status: Listed

Japan (ENCs) Inventory Status: Listed

China (PRC) Inventory (MEP) Status: Listed

16. OTHER INFORMATION

References: Vendor Information. TLV's Threshold Limit Values and Biological Exposure Indices for 1992-1993. American Conference of Governmental Industrial Hygienists, 1992. The Merck Index, 11th Ed. Rahway, New Jersey: Merck and Co., Inc., 1989. Technical Judgment. Sax, N. Irving. Dangerous Properties of Industrial Materials, 7th Ed. New York: Van Nostrand Reinhold Co., 1989. Sixth Annual Report on Carcinogens, 1991. U.S. Department of Health and Human Services. Rockville, MD: Technical Resources, Inc. 1991. NIOSH/OSHA Occupational Health Guidelines for Chemical Hazards. Cincinnati: Department of Health and Human Services, 1981. List of Dangerous Substances Classified in Annex I of the EEC Directive (67/548) - Classification, Packaging and Labeling of Dangerous Substances, Amended July 1992. IARC Monographs on the Evaluation of the Carcinogenic Risks to Humans. World Health Organization (Volumes 1-42) Supplement 7. France: 1987. Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National Fire Protection Fire Protection Guide on Hazardous Materials, 10th Ed. Quincy, MA: National

Fire Protection Association, 1991. CCINFO RTECS. Canadian Centre for Occupational Health and Safety. Hamilton, Ontario Canada: 30 June 1993. Cassaret and Doull's Toxicology, 3rd Ed. New York: Macmillan Publishing Co., Inc., 1986. Air Contaminants, Federal Register, Vol. 54, No. 12. Thursday, January 19, 1989. pp. 2332-2983. 29 CFR 1900 - 1910 (Code of Federal Regulations - Labor). EU Occupational Exposure Limits On Line.

Complete Text of H phrases referred to in Section 3: H351 Suspected of causing cancer. H302 Harmful if swallowed. H373 May cause damage to organs through prolonged or repeated exposure. H315 Causes skin irritation.

Revision Summary: . Substantial revision to comply with EU Reg 1272/2008, Reg 1907/2006 and UN GHS (ST/SG/AC.10/36/Add.3).

Date of MSDS Preparation:

Day: 09

Month: June

Year: 2014

MSDS Prepared: MSDS prepared by Product Compliance Department extension 3350

CCOHS Evaluation Note: It is offered under the interim policy that was established by Health Canada permitting use of GHS-formatted safety data sheets in Canada prior to revision of CPR to GHS. This product has been classified and labeled in accordance with the requirements of GHS (ST/SG/AC.10/36/Add.3).

Legend:

NA - Not Applicable	w/w - weight/weight
ND - Not Determined	w/v - weight/volume
NV - Not Available	v/v - volume/volume

USER RESPONSIBILITY: Each user should read and understand this information and incorporate it in individual site safety programs in accordance with applicable hazard communication standards and regulations.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

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