clean air for all CAFA now!

www.cafanow.org

Intel Chemical of the Month April 2025

Trichloromethane (Methylchloroform)

Note: This material is compiled from a website of the National Institutes of Health (NIH), National Library of Medicine. It has been edited slightly for continuity's sake. Some of the text has been repositioned and some sentences have been linked together. Minor changes to the text are highlighted in italics.

Description and Uses

Trichloroethane is a synthetic chemical that does not occur naturally in the environment. It also is known as **methylchloroform**, methyltrichloromethane, trichloromethylmethane, and trichloromethane.

Trichloroethane is used in many consumer products. It is a colorless liquid with a mild sweet odor and is used as a cleaning solvent, as a chemical intermediate to produce vinylidene chloride, and as a propellant in aerosol cans. The EPA lists it as an inert pesticide ingredient, approved for nonfood use only. ***In semiconductor production, trichloroethane is primarily used as a solvent for cleaning, degreasing, and removing residual resins. It helps remove contaminants from silicon chips and other electronic components.***

Health Hazards / Toxicity / Associated Diseases

Effects reported in humans due to acute (short-term) inhalation exposure to methylchloroform include hypotension, mild hepatic effects, and central nervous system (CNS) depression. Cardiac arrhythmia and respiratory arrest may result from the depression of the CNS. Symptoms of acute inhalation exposure include dizziness, nausea, vomiting, diarrhea, loss of consciousness, and decreased blood pressure in humans. After chronic (long-term) inhalation exposure to methylchloroform, some liver damage was observed in mice and ventricular arrhythmias in humans. EPA has classified methylchloroform as a Group D, not classifiable as to human carcinogenicity.

For the general population, the most likely sources of exposure are home consumer products, building products, and contaminated food and water. TCA was used as a general anesthetic. Inhalation abuse of TCA can result in sudden sniffing death from cardiac dysrhythmias. Cardiac sensitization and low hepatotoxic potential have been documented in animal studies.

Methylchloroform is in the list of volatile substances which may be abused by inhalation published on the web site of the U.N. International Drug Control Programme, indicating its potential to cause narcosis in workers. A mild skin, eye, and respiratory tract irritant, inhalation of high concentrations can cause CNS depression and cardiac arrhythmias, *and* may cause smarting and reddening

of skin if spilled and allowed to remain on clothes. High vapor concentrations may cause mild smarting of eyes and respiratory system. Inhalation may cause loss of equilibrium, incoordination, and unconsciousness. *It is* an irritant and CNS depressant and may cause liver and kidney injury.

Symptoms range from loss of equilibrium and incoordination to loss of consciousness. *A* high concentration can be fatal due to simple asphyxiation combined with loss of consciousness . . . especially in closed or confined areas.

Ingestion produces effects similar to inhalation and may cause some feeling of nausea.

Treating Exposure / First Aid

EYES:
First check the victim for contact lenses and remove if present. Flush victim's eyes with water or normal saline solution for 20 to 30 minutes while simultaneously calling a hospital or poison control center. Do not put any ointments, oils, or medication in the victim's eyes without specific instructions from a physician. ***Immediately*** transport the victim after flushing eyes to a hospital even if no symptoms (such as redness or irritation) develop.

SKIN:
Immediately flood affected skin with water while removing and isolating all contaminated clothing. Gently wash all affected skin areas thoroughly with soap and water. If symptoms such as redness or irritation develop, ***immediately*** call a physician and be prepared to transport the victim to a hospital for treatment.

INHALATION:
Immediately leave the contaminated area; take deep breaths of fresh air. If symptoms (such as wheezing, coughing, shortness of breath, or burning in the mouth, throat, or chest) develop, call a physician and be prepared to transport the victim to a hospital. Provide proper respiratory protection to rescuers entering an unknown atmosphere. Whenever possible, Self-Contained Breathing Apparatus (SCBA) should be used; if not available, use a level of protection greater than or equal to that advised under Protective Clothing.

INGESTION:
DO NOT INDUCE VOMITING. Volatile chemicals have a high risk of being aspirated into the victim's lungs during vomiting which increases the medical problems. If the victim is conscious and not convulsing, give 1 or 2 glasses of water to dilute the chemical and ***immediately*** call a hospital or poison control center. ***Immediately*** transport the victim to a hospital. If the victim is convulsing or unconscious, do not give anything by mouth, ensure that the victim's airway is open and lay the victim on his/her side with the head lower than the body. ***DO NOT INDUCE VOMITING. Immediately*** transport the victim to a hospital. (NTP, 1992)

Fire Fighting

Fire may produce irritating and/or toxic gases. Runoff from fire control or dilution water may cause environmental contamination.

SMALL FIRE: Dry chemical, CO2 or water spray.

LARGE FIRE: Dry chemical, CO2, alcohol-resistant foam or water spray. If it can be done safely, move undamaged containers away from the area around the fire. Dike runoff from fire control for later disposal.

FIRE INVOLVING TANKS, RAIL TANK CARS OR HIGHWAY TANKS: Fight fire from maximum distance or use unmanned master stream devices or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ***Always*** stay away from tanks in direct contact with flames. (ERG, 2024)

In case of fire in the surroundings, use appropriate extinguishing media.

If material is involved in fire, cool all affected containers with flooding quantities of water. Apply water from as far a distance as possible. Extinguish fire using agent suitable for type of surrounding fire. (Material itself does not burn or burns with difficulty.) Keep run-off water out of sewers and water sources. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and will collect in low areas. Storage containers and parts of containers may rocket great distances, in many directions.