CALEDON LABORATORY CHEMICALS

# MATERIAL SAFETY DATA SHEET

# TRICHLOROACETIC ACID

PRODUCT CODE NUMBER(S): 8860-1

## PRODUCT IDENTIFICATION

**Chemical Name and Synonyms:** *Trichloroacetic acid; Trichloroethanoic acid*
**Chemical Family:** *Halogenated aliphatic carboxylic acid*
**Chemical Formula:** *$CCl_3COOH$*
**Product Use:** *Laboratory reagent*
**Manufacturer's Name and Address:**
*Caledon Laboratories Ltd.*
*40 Armstrong Avenue*
*Georgetown, Ontario L7G 4R9*
**Telephone No:** *(905) 877-0101*
**Fax No:** *(905) 877-6666*
**Emergency Telephone No:** *CANUTEC (613) 996-6666*

## HAZARDOUS INGREDIENTS OF MATERIALS

| *Ingredients* | *%* | *TLV Units* | *CAS No.* |
|---|---|---|---|
| *Trichloroacetic acid* | *99* | *1 ppm* | *76-03-9* |

## PHYSICAL DATA

**Physical State:** *Solid*
**Odour and Appearance:** *Colourless to slightly yellow crystals; sharp, pungent odour; deliquescent.*
**Odour Threshold (ppm):** *0.24 to 0.375 ppm (recognition) Not reliable warning properties, threshold close to TLV.*
**Vapour Pressure (mm Hg):** *1 (mm Hg) at 51°C*
**Vapour Density (Air = 1):** *5.6*
**Evaporation Rate:** *Not available*
**Boiling Point (°C):** *197.5°C*
**Melting Point (°C):** *58°C*
**pH:** *1.2 (0.1M solution)*
**Specific Gravity:** *1.62 @ 25°C*
**Coefficient of Water/Oil distribution:** *LogP(oct)=0.10 to 1.96 (calculated)*

## SHIPPING DESCRIPTION

**UN:** *1839*
**T.D.G. Class:** *8*
**Pkg. Group:** *II*

## REACTIVITY DATA

**Chemical Stability:** *Normally stable. Decomposes above boiling point. Deliquescent; absorbs moisture from air to form wet solid.*
**Incompatibility with other substances:** *Reacts violently with strong bases, producing heat and pre ssure, releasing chloroform, $CO_2$. Reacts violently and explosively with DMSO, copper wool, strong oxidizers. Reacts with active metals (Al, Zn) to produce flammable/explosive hydrogen gas. Solutions in water can react with metals to liberate hydrogen gas. Solutions decompose forming chloroform and $CO_x$. Corrodes stainless steel, cast iron, brass, bronze, aluminum, zinc, lead.*
**Reactivity:** *Avoid elevated temperatures, ignition sources, sparks, flames, moisture, generation of dust or mist.*
**Hazardous Decomposition Products:** *Hydrochloric acid, carbon monoxide, carbon dioxide and chloroform*

## FIRE AND EXPLOSION DATA

**Flammability:** *Not combustible. Does not burn or support combustion. Decomposes when heated, releasing corrosive and toxic gases. Closed containers may explode during fire.*
**Extinguishing Media:** *Use any means suitable for extinguishing surrounding fire. Avoid extinguishers with basic components (chemical powder) which may react violently. Use water in flooding quantities to cool containers, flush material away from fire, and disperse toxic fumes. Fight fire from upwind, from a safe distance. FIrefighters must wear NIOSH approved positive-pressure, full face-piece self-contained breathing apparatus,and encapsulating chemical splash suit (Bunker gear will not be adequate). Containers may explode in heat of fire; withdraw immediately in case of rising sound from vent or discoloration of tank.*
**Flash Point (Method Used):** *Not combustible*
**Autoignition Temperature:** *Not combustible*
**Upper Flammable Limit (% by volume):** *Not combustible*
**Lower Flammable Limit (% by volume):** *Not combustible*
**Hazardous Combustion Products:** *Hydrogen chloride gas, phosgene,CO,$CO_2$. Solutions decompose to form chloroform and $CO_x$.*
**Sensitivity to Impact:** *None identified*
**Sensitivity to Static discharge:** *None identified*

## TOXICOLOGICAL PROPERTIES AND HEALTH DATA

***Toxicological Data:***

**$LD_{50}$:** *(oral, rat) 400 mg/kg*
**$LC_{50}$:** *Not available*

***Effects of Acute Exposure to Product:***

**Inhaled:** *Not likely to pose an inhalation hazard because it readily absorbs moisture from air, forming a heavy, caked solid. If inhalation should occur, could cause severe irritation to nose and throat. Extreme exposures could cause pulmonary edema which may be fatal. Symptoms (shortness of breath, cyanosis) may not appear until several hours after exposure.*
**In contact with skin:** *Corrosive. No human and limited animal information available. Contact with solution or dust may cause severe burns to skin, with permanent scarring. Severity of effects depends on degree and duration of exposure.*
**In contact with eyes:** *Corrosive. Contact with solution or dust causes severe irritation to the eyes with possible permanent damage and blindness.*
**Ingested:** *Corrosive. Causes severe burning of mouth, throat and gastrointestinal tract. May cause bloody vomiting, severe pain, possible perforation of stomach, shock and even death. Ingestion is not a typical route of industrial exposure.*

***Effects of Chronic Exposure to Product:***

*No specific information available. Long term skin exposure can probably cause dermatitis. Prolonged or repeated inhalation may cause shortness of breath, cough, chest pain, redness and burning of eyes. In animal testing, prolonged exposure caused damage to liver, heart, lungs, changes in white blood cell count, skeletal muscle atrophy, impaired sperm formation.*

**Carcinogenicity:** *Limited evidence of carcinogenicity by NTP, IARC, or OSHA. Animal testing has shown increased incidence of liver tumours.*

**Teratogenicity:** *No human information available. Some evidence of developmental effects in animal testing but only at maternally toxic doses.*

**Reproductive Effects:** *No human information available. Some evidence of effects on sperm in animal testing but by direct injection into body cavity, a route not considered relevant for occupational exposure.*

**Mutagenicity:** *No human information available. Some animal studies showed mutagenic results, but they are thought to be due to pH rather than the chemical. Negative in Ames test, but positive in bacterial test when combined with DMSO*

**Synergistic Products:** *DMSO has been shown to have effects on mutagenicity.*

## PREVENTIVE MEASURES

**Engineering Controls:** *Corrosion-resistant ventilation system, isolated from other exhaust ventilation systems.*

**Respiratory Protection:** *Dust/mist mask. Up to 10x TLV, or the maximum use specified by the respirator supplier, whichever is lowest, NIOSH approved half- face high-efficiency dust/mist filter respirator. Up to 50x TLV, or the maximum use specified by the respirator supplier, whichever is lowest, NIOSH approved full face-piece high-efficiency dust/mist filter respirator. Higher or unknown concentrations, or for fire or spill conditions, self-contained breathing apparatus, or full face-piece, positive-pressure supplied-air respirator.*

**Eye Protection:** *Chemical safety goggles and face shield.*

**Skin Protection:** *Viton /butyl rubber, TrellchemHPS gloves, impervious coveralls, boots and and other clothing sufficient to prevent skin contact.*

**Other Personal Protective Equipment:** *Safety shower and eyewash in work area.*

**Leak and Spill Procedure:** *Evacuate area. Ventilate area. Eliminate all ignition sources. Cleanup personnel must be thoroughly trained in the hazards of this chemical and its safe use, and must wear protective equipment and clothing sufficient to prevent inhalation and contact. Isolate from incompatible materials. Do not touch spilled material. Prevent from entering sewers or waterways. Stop leak if you can do it without risk. Mix with inert absorbent material and collect in suitable, labelled containers. Flush area of spillage with copious amounts of running water.*

**Waste Disposal:** *Follow all federal, provincial and local regulations for disposal.*

**Handling Procedures and Equipment:** *TOXIC, CORROSIVE. Persons working with this material must be thoroughly trained in its hazards and its safe use, and must wear appropriate protective equipment and clothing. Use the smallest amount possible for the purpose, in designated areas with adequate ventilation. When diluting, always add acid to water, stirring constantly. Avoid generating dust. Avoid all contact and inhalation. Do not use near sources of ignition; although this compound is not flammable, it may release flammable gases under certain conditions. Wash thoroughly after handling. Caution: empty containers may contain hazardous residues.*

**Storage Requirements:** *Store below 35°C. Store in suitable, labelled containers, away from seeds, fertilizers and foodstuffs, and in a cool, dry, well-ventilated area, away from incompatible materials or ignition sources. Walls, floors, shelving, lighting and ventilation systems should be made of corrosion resistant materials (teflon, glass, ceramic-lined steel). Keep containers tightly closed. Protect from damage, and inspect frequently for damage or leaks.*

## FIRST AID MEASURES

***Specific Measures:***

**Eyes:** *Immediately flush eyes with gently running water for thirty to sixty (30-60) minutes, holding eyelids open during flushing. Take care not to flush contaminated water into unaffected eye. Wear protective gloves to avoid contact during first aid procedures. Obtain medical attention Immediately. Flushing may be continued while casualty is transported to medical facility.*

**Skin:** *Under running water, remove contaminated clothing (including shoes, belts, watches and rings). Drench skin with gently running water for at least thirty (30) minutes. Wear protective gloves to avoid contact during first aid procedures. Get medical attention . Decontaminate clothing before reuse, or discard.*

**Inhalation:** *Remove from exposure, rest and keep warm. GIve oxygen and get medical attention for any breathing difficulty. Symptoms of pulmonary edema (shortness of breath, cyanosis) may not appear until several hours after exposure; monitor for 48 hours, and if symptoms appear, get medical attention immediately.*

**Ingestion:** *If victim is alert and NOT convulsing, wash out mouth thoroughly with water and give 2 to 4 glasses of water to drink followed by milk of magnesia. DO NOT INDUCE VOMITING. Get medical attention Immediately.*

## REFERENCES USED

*CCINFO disc: Cheminfo*

*Budavari: The Merck Index, 12th ed., 1997*

*Royal Society of Chemistry: Chemical Safety Data Sheets, Vol. 3, 1990*

*Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987*

*Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979*

*Suppliers' Materials Safety Data Sheets*

## ADDITIONAL INFORMATION

**Date Issued:** *March 10, 1989*

**Revision:** *November 2010*

**MSDS:** *8860-1*

**Proposed WHMIS Designation:** *D1B; E*

*Prepared by: Caledon Laboratories Ltd. (905) 877-0101*