

MATERIAL SAFETY DATA SHEET**1-CHLOROBUTANE**

PRODUCT CODE NUMBER(S): 2901-2

PRODUCT IDENTIFICATION**Chemical Name and Synonyms:** 1-Chlorobutane; Butyl chloride; n-Propylcarbonyl chloride**Chemical Family:** Chlorinated hydrocarbon**Chemical Formula:** C₄H₉Cl**Product Use:** Laboratory solvent**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.
1-Chlorobutane	>99	0.5 mg/m ³ (incl. skin exp.)	109-69-3

PHYSICAL DATA**Physical State:** Liquid**Odour and Appearance:** Clear, colourless, with sharp, unpleasant, chlorinated hydrocarbon odour**Odour Threshold (ppm):** Not available**Vapour Pressure (mm Hg):** 80 mm Hg @ 20°C**Vapour Density (Air = 1):** 3.19**Evaporation Rate (BuAc=1):** ~10**Boiling Point (°C):** 78.4°C**Freezing Point (°C):** -123°C**pH:** Not applicable**Specific Gravity:** 0.886 @ 20°C**Coefficient of Water/Oil distribution:** Not available**SHIPPING DESCRIPTION****UN:** 1127**T.D.G. Class:** 3**Pkg. Group:** II**REACTIVITY DATA****Chemical Stability:** Very volatile; forms explosive mixtures in air.**Incompatibility with other substances:** Reacts hazardously with aluminum. DO NOT use aluminum equipment. Avoid contamination with moisture; can react with water to form hydrochloric acid. Avoid strong oxidizing agents and strong bases.**Reactivity:** Avoid heat, sparks, flame, static electricity, all ignition sources, and all incompatible materials. Prevent generation of mist.**Hazardous Decomposition Products:** Burning may produce hydrogen chloride, phosgene, CO_x**FIRE AND EXPLOSION DATA****Flammability:** Extremely flammable liquid and vapour. Vapours form flammable/explosive mixtures with air at or above -9°C. Vapour is heavier than air and may travel considerable distance to source of ignition and flash back. Concentrated solutions in water may be flammable. Liquid can float on water and may spread fire. Can accumulate in confined spaces and cause flammability or toxicity hazard. Closed containers may rupture violently when heated.**Extinguishing Media:** Alcohol or polymer foam, dry chemical powder, carbon dioxide. Water is ineffective for fighting fire, but as spray or fog can be used to cool containers and disperse vapours or flush spills away from ignition sources. Fight fire from safe distance and from upwind. Firefighters must wear NIOSH/MSHA approved full face-piece, positive-pressure self-contained breathing apparatus and chemical splash suit or full Bunker Gear. Containers may explode in heat of fire; withdraw immediately in case of rising sound from vent or discoloration of tank.**Flash Point (Method Used):** -9°C (TCC)**Autoignition Temperature:** 240°C**Upper Flammable Limit (% by volume):** 10.1%**Lower Flammable Limit (% by volume):** 1.8%**Hazardous Combustion Products:** Emits hydrogen chloride, phosgene, CO_x under fire conditions**Sensitivity to Impact:** Not available**Sensitivity to Static discharge:** Mixtures of vapour and air at concentrations in the flammable range may be ignited by static discharge of sufficient energy. Liquid may be ignited by static discharge.**TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD₅₀:** (oral, rat) 2,670 mg/kg**LC₅₀:** (rat) 8,000 ppm/4h**Effects of Acute Exposure to Product:****Inhaled:** Irritating to upper respiratory tract, causing sore throat, coughing, choking. Overexposure may cause central nervous system depression with dizziness, disorientation, headache, excitation, drowsiness, incoordination, anaesthesia, respiratory and cardiac effects. Severe overexposure may cause unconsciousness and death.**In contact with skin:** May cause irritation with mild local redness. Prolonged contact may cause severe irritation, with marked redness and local swelling.**In contact with eyes:** Causes mild irritation with redness, tearing, pain, and possible temporary conjunctiva swelling.**Ingested:** Irritating; may be harmful. May cause nausea, vomiting, abdominal discomfort and diarrhea. May be absorbed, causing central nervous system depression with

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dizziness, disorientation, headache, excitation, drowsiness, incoordination.

Effects of Chronic Exposure to Product:

Carcinogenicity: No evidence of carcinogenicity (NTP)

Teratogenicity: No information available

Reproductive Effects: Studies inconclusive (EPA)

Mutagenicity: No information available

Synergistic Products: None known

PREVENTIVE MEASURES

Engineering Controls: Non-sparking, grounded ventilation system, separate from other ventilation systems, and electrical equipment that does not provide a source of ignition.

Respiratory Protection: NIOSH/MSHA approved powered air-purifying respirator equipped with organic vapour cartridges or continuous-flow supplied-air respirator. High or unknown concentrations, as in fire or spill conditions: full face-piece, positive-pressure self-contained breathing apparatus or positive-pressure, full face-piece supplied-air respirator with auxiliary positive-pressure self-contained breathing apparatus.

Eye Protection: Chemical safety goggles/face shield.

Skin Protection: PVC-coated gloves. Chemical apron, coveralls, boots, other protective clothing sufficient to prevent contact.

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

Leak and Spill Procedure: Eliminate all sources of ignition. Evacuate area. Cleanup personnel must be thoroughly trained in the hazards of this chemical and must wear protective equipment and clothing sufficient to prevent inhalation of vapours or mists and contact with skin and eyes. Stop or reduce discharge if safe to do so. Contain spill with inert absorbent (sand, earth). Prevent from entering sewers or waterways. Recover product and collect contaminated soil for disposal. For small spills, contain by applying inert absorbent. Collect waste for disposal. Contaminated absorbent may pose the same hazards as the spilled product. Flush area of spill with running water.

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

Handling Procedures and Equipment: EXTREMELY FLAMMABLE LIQUID & VAPOUR. Eliminate all sources of ignition and have all engineering controls operating before handling. Personnel working with this chemical must be thoroughly trained regarding its hazards, and its safe use, and must wear appropriate protective equipment and clothing. Ground and bond all equipment to prevent static charge accumulation. Use non-sparking tools. Post "No Smoking" signs. Sudden release of hot vapours may result in ignition; published autoignition values may not be valid in some chemical processes; actual process conditions must be analysed to establish safe operating temperatures. Use smallest amount possible for the purpose in a designated area with appropriate ventilation. Avoid generating vapour or mist. Avoid all contact with eyes, skin or clothing. Keep containers closed when not in use.

Storage Requirements: Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight and away from all sources of ignition and incompatible or combustible materials. Keep tightly closed when not in use. Protect from damage and inspect regularly for signs of leaking or damage. Keep storage area clear of combustible materials. Ground and bond equipment and containers to

prevent a static charge buildup. Use spark-resistant tools and avoid splash filling of containers. Storage facilities should be made of fire-resistant materials, and should have raised sills and trenches to drain to a safe area. Use drums on a first in, first out basis.

FIRST AID MEASURES**Specific Measures:**

Eyes: Immediately flush eyes with warm, gently running water for fifteen (15) minutes, holding eyelids open while flushing. Take care not to flush contaminated water into unaffected eye. Get medical attention immediately.

Skin: Immediately remove contaminated clothing (including rings, watches, belts and shoes). Flush exposed area with large amounts of warm running water and non-abrasive soap until no evidence of chemical remains. If irritation persists, get medical attention. Decontaminate clothing before reuse, or discard.

Inhalation: IMMEDIATELY remove casualty from contaminated area to fresh air (caution must be used by rescuers to avoid exposure to contaminating fumes). Eliminate ignition sources. Give oxygen and get medical attention for any breathing difficulty. If breathing has stopped give artificial respiration. If breathing and pulse are absent give CPR. Stay with casualty until medical assistance is reached.

Ingestion: DO NOT INDUCE VOMITING. If the casualty is alert and not convulsing, give 2 to 4 glasses of water to drink to dilute the material. If spontaneous vomiting occurs, have casualty lean forward to avoid breathing in of emesis. Rinse mouth and administer more water. If breathing has stopped give artificial respiration. If breathing and pulse are absent give CPR. Get medical attention immediately.

REFERENCES USED

CCINFO disc: MSDS's, May 2007

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

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

Royal Society of Chemistry, Chemical Safety Data Sheets, Vol. 1, 1992

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: March 1, 1989

Revision: May 2010

MSDS: 2901-2

Proposed WHMIS Designation: B2

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