

MATERIAL SAFETY DATA SHEET**HYDROCHLORIC ACID**

PRODUCT CODE NUMBER(S): 6025-1, 6025-8, 6026-2, 6027-2, CAL 1265

PRODUCT IDENTIFICATION**Chemical Name and Synonyms:** *Hydrochloric acid; Muriatic acid; Chlorohydric acid***Chemical Family:** *Inorganic acids***Chemical Formula:** *HCl***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**

<i>Ingredients</i>	<i>%</i>	<i>TLV Units</i>	<i>CAS No.</i>
<i>Hydrochloric acid</i>	<i>36-40</i>	<i>2 ppm</i> <i>(ceiling exposure, ACGIH)</i>	<i>7647-01-0</i>

PHYSICAL DATA**Physical State:** *Liquid***Odour and Appearance:** *Clear, colourless to slightly yellow fuming liquid with a sharp, irritating, very pungent odour***Odour Threshold (ppm):** *1-5 ppm (detection); 10 ppm (irritation)***Vapour Pressure (mm Hg):** *100 mm Hg at 20°C***Vapour Density (Air = 1):** *For hydrogen chloride gas: 1.27***Evaporation Rate:** *Not available***Boiling Point (degrees C):** *108.6°C***Freezing Point (degrees C):** *-35°C***pH:** *1.1 (0.1N)***Specific Gravity:** *1.18 (35%)***Coefficient of Water/Oil distribution:** *Not available for aqueous hydrochloric acid***SHIPPING DESCRIPTION****UN:** *1789***T.D.G. Class:** *8***Pkg. Group:** *II***REACTIVITY DATA****Chemical Stability:** *Stable***Incompatibility with other substances:** *Contact with most metals corrodes them and forms flammable hydrogen gas.**Contact of vapour or liquid with any alkali or active metal may develop enough heat to cause fire in adjacent combustible material. Reaction with aldehydes, epoxides may cause violent polymerization, generating heat and pressure. Reaction with reducing agents, oxidizing agents, acetylides, borides, carbides, silicides, sulphides, or cyanides produces heat, flammable and/or corrosive gases.***Reactivity:** *Avoid high temperatures, incompatible materials, generation of mist. Releases large amounts of heat when mixed with water or organic solvents.***Hazardous Decomposition Products:** *Toxic and corrosive gas and vapour (hydrogen chloride) may be released by decomposition. When reacting with metals, the material will give off flammable hydrogen gas.***FIRE AND EXPLOSION DATA****Flammability:** *Will not burn. However, reacts with most metals to produce flammable/explosive hydrogen gas.***Extinguishing Media:** *Use media compatible with acids appropriate to extinguish surrounding fire. Use water as a spray or fog to cool containers and disperse vapours, but prevent direct contact with acid. Fight fire from safe distance and protected location. Firefighters must wear protective equipment (full face-piece, positive-pressure self-contained breathing apparatus) and clothing (chemical splash suit) sufficient to prevent inhalation of dusts or vapours, and contact with skin and eyes.***Flash Point (Method Used):** *Not applicable***Autoignition Temperature:** *Not applicable***Upper Flammable Limit (% by volume):** *Not applicable***Lower Flammable Limit (% by volume):** *Not applicable***Hazardous Combustion Products:** *Toxic and corrosive gas and vapour (hydrogen chloride).***Sensitivity to Impact:** *None identified***Sensitivity to Static discharge:** *None identified***TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD₅₀:** *(oral, rabbit) 900 mg/kg***LC₅₀:** *(mouse) 3,100mg/m³/30 min (388 mg/m³ aerosol/4h)***LC_{Lo}:** *(human) 1,300 ppm/30min***Effects of Acute Exposure to Product:****Inhaled:** *Corrosive. Severe irritant to eyes, nose, throat and upper respiratory tract, causing coughing and choking (50 -100 ppm). Severe exposure (1,000 to 2,000 ppm), even for a few minutes, may lead to ulceration of the oral and nasal mucosa, pulmonary edema and possible death. Symptoms may be delayed for several hours after exposure.***In contact with skin:** *Corrosive. Causes severe skin burns, blisters. Prolonged or repeated contact to dilute solutions may cause irritation and dermatitis. Skin covered by perspiration or damp clothing may also be affected.***In contact with eyes:** *Corrosive. Low concentrations, 10-35 ppm, can cause immediate irritation, redness, pain, tearing. Concentrated vapour, mist or liquid can cause severe burns, watering, conjunctivitis, permanent damage, possible blindness.***Ingested:** *Corrosive. Causes severe burns to mouth, throat, esophagus and stomach, nausea, vomiting. Risk of stomach perforation, convulsions, coma and death. Aspiration of small amounts into the lungs, which can occur during ingestion or vomiting, can cause chemical pneumonitis, pulmonary edema, with severe lung damage, even death.***Effects of Chronic Exposure to Product:***Prolonged exposure causes dental erosion with brown discoloration of the teeth and damage to the enamel. Pro-*

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longed inhalation may cause bleeding of the nose and gums, gastritis, decreased lung function, possible bronchitis. Prolonged or repeated exposure to dilute solutions may cause irritation, redness, pain, drying and cracking of the skin..

Carcinogenicity: Not classifiable as human carcinogen (IARC), (ACGIH), (NTP).

Teratogenicity: No human information available. Developmental effects in animal studies at levels toxic to mother.

Reproductive Effects: No information available

Mutagenicity: No human information available. Questionable positive results in some short-term tests. Negative results in *in vitro* mammalian tests.

Synergistic Products: None known

PREVENTIVE MEASURES

Engineering Controls: Local, corrosion-proof, exhaust ventilation required.

Respiratory Protection: Up to 50 ppm: chemical cartridge respirator with cartridges to protect against hydrogen chloride, or gas mask with canister to protect against hydrogen chloride. For higher or unknown concentrations, or for fire or spill conditions, positive pressure, full facepiece self contained breathing apparatus or positive pressure, full facepiece supplied-air respirator with auxiliary positive pressure self contained breathing apparatus.

Eye Protection: Chemical goggles and/or face shield

Skin Protection: Hydrochloric acid <30% for up to 8 hours; no information available for higher concentrations, use with caution, or follow glove manufacturer's instructions: butyl, natural, nitrile or neoprene rubber, Viton, Viton /butyl rubber, Tychem BR/LV, Tychem SL, Tychem TK, Responder, Trelchem HPS. Other impervious protective clothing sufficient to prevent contact.

Other Personal Protective Equipment: Safety showers and eye wash fountains in storage and handling areas.

Leak and Spill Procedure: If spill is significant, notify appropriate government authorities. Do not touch spilled material. Evacuate area. Ventilate area. Eliminate all sources of ignition. Cleanup personnel must be thoroughly trained in the handling of hazardous substances, and must wear protective equipment and clothing sufficient to prevent inhalation of mists or fumes and contact with skin, eyes and clothing. Ventilate and evacuate area. Stop and contain leak or spill. Do not get water on spilled material. Cover with dry sand, ashes or gravel. Trained personnel should neutralize carefully, and collect in polyethylene containers for transfer to disposal company. Contaminated absorbent may pose the same hazards as the spilled product; treat with caution. After cleanup is complete, flush area thoroughly with copious amounts of running water.

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

Handling Procedures and Equipment: TOXIC, CORROSIVE MATERIAL. Workers handling this material must be thoroughly trained in its hazards and its safe use and must wear appropriate protective equipment and clothing. Avoid all contact and inhalation. Handle with extreme care. Use smallest amount possible for the purpose in a designated area with adequate ventilation. When diluting, always add acid to water, slowly, while stirring carefully. Suitable materials for equipment and containers include: glass, rubber lined steel, polyethylene, polyester, FRP, PVC, polypropylene, teflon or Kynar.

Storage Requirements: Store in suitable, closed containers (see "Handling procedures . . ." above), in a cool, dry well-ventilated area, away from heat and ignition sources, and incompatible materials. Storage facilities (shelves, floors) should be constructed of corrosion-resistant materials (rubber-lined steel, Havel, Hastelby and tantalum are the most common), and should have raised sills to contain material in

case of leaking. Inspect containers frequently for signs of damage, leaking or corrosion. Drums should be vented weekly, by trained personnel. Keep containers upright. Treat empty containers with caution - they may contain hazardous residues.

FIRST AID MEASURES

Specific Measures:

Eyes: IMMEDIATELY flush eyes with gently running water for at least thirty (30) minutes, holding eyelids open while flushing. Take care not to flush contaminated water into unaffected eye. Wear protective gloves to avoid contact during first aid procedures. Get MEDICAL ATTENTION immediately. Flushing may be continued while casualty is transported to medical facility.

Skin: Remove contaminated clothing (including shoes, watches, belts, and rings). IMMEDIATELY flush the exposed area with large amounts of running water for at least twenty (20) minutes. Wear protective gloves to avoid contact during first aid procedures. Get medical attention immediately.

Inhalation: IMMEDIATELY remove to fresh air (caution must be used by rescuers to avoid exposure to the contaminating fumes). Give oxygen for breathing difficulty. If breathing has stopped give artificial respiration. If breathing and pulse are absent, give CPR. Immediately contact a physician. Stay with casualty until medical help arrives.

Medical Management: If severe exposure is suspected hospitalization and observation for 72 hours for delayed onset of pulmonary edema is advised.

Ingestion: DO NOT INDUCE VOMITING. If casualty is alert and not convulsing; rinse mouth with water and give 2 cups of water or milk to dilute material. IMMEDIATELY OBTAIN MEDICAL ATTENTION. If spontaneous vomiting occurs; have casualty lean forward with head down to avoid breathing in of vomitus. Rinse mouth and administer more water or milk.

REFERENCES USED

CCINFO disc: Cheminfo

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

Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979
Royal Society of Chemistry, Chemical Safety Data Sheets, Vol. 3, 1990

Bretherick: Hazards in the Chemical Laboratory, 3rd ed., 1981
Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: March 10, 1989

Revision: October 2011

MSDS: 6025-1, 6025-8, 6026-2, 6027-2, CAL 1265

Proposed WHMIS Designation: D1A; E

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