

MATERIAL SAFETY DATA SHEET**ACETONITRILE**

PRODUCT CODE NUMBER(S): 1400-1, 1400-2, 1400-3, 1400-30, 1401-2, 1401-7, 1402-7, 1403-2, 1403-7, CAL 105, CAL1336

PRODUCT IDENTIFICATION**Chemical Name and Synonyms:** Acetonitrile; methyl cyanide; ethyl nitrile; cyanomethane**Chemical Family:** Saturated aliphatic nitrile**Chemical Formula:** CH₃CN**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.
Acetonitrile	>99	(TWA) 20 ppm (includes skin expo-sure)	75-05-8

PHYSICAL DATA**Physical State:** Liquid**Odour and Appearance:** Clear, colourless, volatile liquid with an ether-like odour**Odour Threshold (ppm):** 42 ppm (poor warning properties, detectable level > TLV)**Vapour Pressure (mm Hg):** 74 mm Hg @ 20°C**Vapour Density (Air = 1):** 1.42**Evaporation Rate (n-butyl acetate =1):** 5.79**Boiling Point (°C):** 81.6°C**Freezing Point (°C):** -46°C**pH:** Probably ~ neutral; nitriles are very weak acids**Specific Gravity:** 0.786 @ 20°C**Coefficient of Water/Oil distribution:** logP (oct) = -0.34**SHIPPING DESCRIPTION****UN:** 1648**T.D.G. Class:** 3**Pkg. Group:** II**REACTIVITY DATA****Chemical Stability:** Stable. Will decompose on heating.**Incompatibility with other substances:** Can react violently or explosively with strong oxidizers, strong acids, diphenyl sulfoxide, trichlorosilane, N-fluoro compounds. Can react violently with reducing agents or strong bases. Not corrosive to common metals, carbon steel, cast iron, many stainless steels, aluminum, nickel based alloy, tantalum. Attack many types of plastics and coatings (ABD, CPVC, PVC), but does not attack nylon, Teflon, other fluorocarbons, polypropylene; elastomers.**Reactivity:** Reacts with water or steam to form toxic and flammable vapours. Avoid heat, sparks and open flames, generation of mist or vapour, all incompatible materials.**Hazardous Decomposition Products:** Hydrogen cyanide, NO_x, CO_x.**FIRE AND EXPLOSION DATA****Flammability:** Flammable liquid and vapour. Vapours form flammable/explosive mixtures with air at or above 5.6°C Vapour is heavier than air and may travel considerable distance to source of ignition and flash back. 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. Vapour and decomposition products can be extremely flammable and toxic.**Extinguishing Media:** Alcohol or polymer foam, dry chemical powder, carbon dioxide. DO NOT USE WATER. Product reacts with water to form toxic, flammable gases. Water can be used, with great care, to cool containers. Fight fire from upwind, from a protected location at a safe distance. Firefighters must wear NIOSH/OSHA approved positive-pressure, full face-piece self-contained breathing apparatus, and full-body, 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):** 2°C (CC); 6°C (OC)**Autoignition Temperature:** 524°C**Upper Flammable Limit (% by volume):** 16.0**Lower Flammable Limit (% by volume):** 3.0**Hazardous Combustion Products:** Hydrogen cyanide, NO_x, CO_x**Sensitivity to Impact:** None identified**Sensitivity to Static discharge:** Mixtures of vapour and air at concentrations in the flammable range may be ignited by electrostatic or other high-voltage spark, or other ignition source. Liquid has high electrical conductivity and will not accumulate static charge.**TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD₅₀:** (oral, mouse) 269 mg/kg; (oral, adult rat) 2,460 mg/kg;

(oral, 14 day old rat) 157 mg/kg; (dermal, rabbit) 980 mg/kg

LC₅₀: (male rabbit) 2,828 ppm/4h; (mouse) 2,693 ppm/1h**Effects of Acute Exposure to Product:****Inhaled:** Irritating and toxic. Readily vaporizes at room temperature, presenting serious inhalation hazard. Readily absorbed through lungs, causing cyanide poisoning. Symptoms include anxiety and excitement, weakness, headache, nausea, vomiting, metallic taste, chest tightness, facial flushing, drowsiness, dizziness, irritation of the eyes, nose and throat, rapid breathing, a rise in blood pressure and a decrease in pulse, followed by laboured breathing, falling blood pressure, rapid, weak irregular heartbeat, unconsciousness, convulsions, and death. May also cause severe irritation and life-threatening pulmonary edema. Symptoms of both cyanide poisoning and pulmonary edema may be delayed for several hours.**In contact with skin:** Mild irritant. May be absorbed through unbroken skin causing poisoning as in "Inhaled".**In contact with eyes:** Lachrymator; causes increased flow of tears. Liquid, vapour and mist are irritating. May cause burns, and reversible corneal damage.**Ingested:** Irritating and toxic. See "Inhaled".

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Effects of Chronic Exposure to Product:

Symptoms of long-term, low-level exposure to cyanides, are enlargement of the thyroid gland, harmful effects on the nervous system (weakness, giddiness, headache, nausea), respiratory and gastrointestinal systems, (abdominal pain, changes in taste, smell), and changes in blood chemistry.

Carcinogenicity: Inadequate data on which to classify as human or animal carcinogen.

Teratogenicity: Does not appear to cause developmental toxicity at doses below those causing significant maternal toxicity.

Reproductive Effects: No reproductive effects were observed in inhalation studies with rats and mice.

Mutagenicity: There is no human information available. Mixed results in other testing.

Synergistic Products: Acetone, acetophenone and dioxane appear to increase toxicity. Carbon tetrachloride decreased the toxic effects.

PREVENTIVE MEASURES

Engineering Controls: Non-sparking, explosion-proof, grounded exhaust, separate from other ventilation systems.

Respiratory Protection: Up to 200 ppm; NIOSH/OSHA approved chemical cartridge respirator or supplied-air respirator. Up to 500 ppm; continuous-flow supplied-air respirator or powered air-purifying respirator with organic vapour cartridges, or full face-piece chemical cartridge respirator with organic vapour cartridges. Higher or unknown concentrations or for fire or spill conditions; positive pressure, full face-piece 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: Butyl rubber, Viton™/butyl rubber, Barrier (PE/PA/PE), Silver Shield/4H™ (polyethylene/ethylene vinyl alcohol), Responder™, Trelchem™HPS, Tychem™BR/LV, Tychem™TK gloves and protective clothing such as coveralls, boots, sufficient to prevent skin contact.

Other Personal Protective Equipment: Safety shower and eye-wash fountain in work area.

Leak and Spill Procedure: Evacuate area, provide maximum ventilation and shut off all sources of ignition. Do not touch spilled material. Cleanup personnel must be thoroughly trained in the handling of hazardous materials, and be aware of the dangers associated with this material, and must wear protective equipment and clothing sufficient to prevent inhalation of mists and vapours, and contact with skin, eyes and clothing. Contain spill and collect using inert absorbent such as earth or dry sand. Prevent from entering sewers or waterways. Collect in clean, dry, labelled containers and cover. Arrange collection by approved disposal agency. Contaminated absorbent may pose the same hazards as the chemical; treat with caution. Wash site of spill thoroughly with detergent and water.

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

Handling Procedures and Equipment: TOXIC, FLAMMABLE, IRRITANT. Never work alone with this chemical. Workers must be thoroughly trained in its hazards and its safe use, equipped for and trained in rescue, and must wear appropriate protective equipment and clothing. Keep away from flame, sparks, heated surfaces, all combustible or incompatible materials, sparks, heated surfaces or sunlight. Post "No Smoking" signs. Ground & bond all equipment, containers. Use spark-resistant tools & avoid splash filling of containers. Use the smallest possible amount for the purpose, in designated areas with adequate ventilation. Avoid all contact and inhalation. Use the smallest amount possible in designated areas with adequate ventilation. Treat empty containers with caution as they will contain hazardous residues.

Storage Requirements: Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight and away from all sources of heat and ignition, and incompatible or combustible materials. Keep containers tightly closed. Storage facilities should be made of fire-resistant materials, with raised sills and trenches to drain to a safe area. Protect from damage, and inspect frequently for signs of

leaking. Treat empty containers with caution, as they may contain hazardous residues. Post "NO SMOKING" signs. Have appropriate fire extinguishers and spill cleanup equipment near the storage area.

FIRST AID MEASURES

Specific Measures:

Get medical attention after ANY exposure. Onset of acetonitrile toxicity can be delayed several hours.

Speed of treatment is essential. Get immediate medical attention. Administration of oxygen is the most useful initial treatment for any type of cyanide exposure. Someone on the premises should be trained to administer oxygen. Rescuers must wear protective clothing and equipment to avoid exposure.

Eyes: Immediately flush eyes with gently running water for at least twenty (20) minutes, or until no trace of chemical remains. Hold eyelids open and away from eyeball while flushing to ensure thorough rinsing. Take care not to flush contaminated water into unaffected eye. Wear gloves to avoid contact. Continue as in "Inhalation".

Skin: Remove contaminated clothing (including rings, watches, belts and shoes). Immediately flush exposed area with large amounts of warm running water for at least twenty (20) minutes, or until no trace of chemical remains. Continue as in "Inhalation".

Inhalation: IMMEDIATELY remove to fresh air (rescuers must use caution to avoid exposure to contaminating fumes). Eliminate all ignition sources. Give oxygen and transport to medical facility IMMEDIATELY. If breathing has STOPPED, use equipment such as bag and mask to give artificial respiration; do not use mouth to mouth resuscitation without a mouth protector. If breathing and PULSE are absent give CPR. Stay with casualty until medical assistance is reached.

Ingestion: DO NOT INDUCE VOMITING. DO not give anything by mouth. Treat as in "inhalation".

Note: Amyl nitrite, which can be used as a first aid measure, is antidotal to cyanide toxicity. Consult with a doctor familiar with cyanide toxicity to determine the appropriateness of using amyl nitrite as first aid measure in your workplace and to arrange training for first aiders who may be required to administer amyl nitrite

REFERENCES USED

CCINFO disc: Cheminfo

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

Health and Safety Executive, May 1997

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

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

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

Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: November 1, 1988

Revision: November 2011

MSDS: 1400-1, 1400-2, 1400-3, 1400-30, 1401-2, 1401-7, 1402-7, 1403-2, 1403-7, CAL 1050, CAL 1336

Proposed WHMIS Designation: B2; D1A; D2B

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