

**2-PROPANOL****PRODUCT IDENTIFICATION****Chemical Name and Synonyms:**

2-Propanol; Isopropyl alcohol; Isopropanol; Propan-2-ol, 'IPA'

**Chemical Family:**

Secondary aliphatic alcohol

**Chemical Formula:**

CH<sub>3</sub>CHOHCH<sub>3</sub>

**Product Use:**

Laboratory solvent

**Manufacturer's Name and Address:**

Caledon Laboratories Ltd.  
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**HAZARDOUS INGREDIENTS OF MATERIALS**

Ingredients	%	TLV Units	CAS No.
2-Propanol	50-99	400 ppm	67-63-0

**PHYSICAL DATA****Physical State:**

Liquid

**Odour and Appearance:**

Clear, colourless with sharp, musty, alcoholic odour

**Odour Threshold (ppm):**

Reports vary widely: 3.3 to 610 ppm (detection); 7.6 to 49 ppm (recognition). Good warning properties, TLV ~10x mean odour threshold.

**Vapour Pressure (mm Hg):**

33 mm Hg at 20°C

**Vapour Density (Air = 1):**

2.07

**Evaporation Rate:**

1.5 (n-Butyl acetate = 1)

**Boiling Point (degrees C):**

82.3°C

**Freezing Point (degrees C):**

-88.5°C

**pH:**

Weak acid

**Specific Gravity:**

0.79 @ 15.5°C

**Coefficient of Water/Oil distribution:**

Log(P)=0.05

**SHIPPING DESCRIPTION****UN:**

1219

**T.D.G. Class:**

3

**Pkg. Group:**

II

**REACTIVITY DATA****Chemical Stability:**

Normally stable. May form explosive peroxides on standing, slowly in the dark, more rapidly in daylight. Presence of traces of ketones (e.g. 2-butanone) greatly increases the possibility of peroxide formation.

**Incompatibility with other substances:**

Increased risk of fire and explosion with strong oxidizing agents, Lewis or mineral acids, acid anhydrides, crotonaldehyde, phosgene, potassium t-butoxide. Mixtures with any of, barium perchlorate, chlorine, dioxygenyl tetrafluoroborate, hypochlorous acid, ethylene oxide, hexamethylene diisocyanate and other isocyanates, nitrogen tetroxide, permonosulphuric acid, tri-isobutyl aluminum, may explode. Reaction with alkali or alkaline earth metals releases flammable/explosive hydrogen gas. Forms explosive mixture with H<sub>2</sub>O<sub>2</sub>. Not corrosive to steel, stainless steel, cast iron, copper and bronze at normal temperatures. Attacks aluminum. 2-Propanol containing water may rust steel. May attack some forms of plastics, rubber, coatings.

**Reactivity:**

Avoid heat, sparks, hot surfaces, all ignition sources, all incompatible materials, generation of mist.

**Hazardous Decomposition Products:**

CO<sub>x</sub>

**FIRE AND EXPLOSION DATA****Flammability:**

Flammable liquid and vapour. Can release vapours that form explosive mixtures with air at, or above, 11.7°C. Vapour is heavier than air and may travel considerable distance to source of ignition and flash back. Closed containers may rupture violently when heated.

**Extinguishing Media:**

CO<sub>2</sub>, dry chemical powder, alcohol-resistant foam. Water spray or fog may be used to cool containers, disperse vapours, and flush material away from fire, but will be ineffective for fighting fire. Fight fire from upwind, from a safe distance. Firefighters must wear protective equipment (full face-piece, positive-pressure self-contained breathing apparatus) and clothing (full Bunker gear) sufficient to prevent inhalation of fumes or vapours and contact with skin and eyes. Containers may explode in heat of fire; withdraw immediately in case of rising sound from vent or discoloration of tank.

**Flash Point (Method Used):**

11.7°C (CC)

**Autoignition Temperature:**

399°C

**Upper Flammable Limit (% by volume):**

12%

**Lower Flammable Limit (% by volume):**

2.0%

**Hazardous Combustion Products:**

CO<sub>2</sub>, CO

**Sensitivity to Impact:**

None identified

**Sensitivity to Static discharge:**

Mixtures of vapour and air at concentrations in the flammable range may be ignited by static discharge. Liquid has high electrical conductivity and will probably not accumulate static charge.

**TOXICOLOGICAL PROPERTIES AND HEALTH****DATA****Toxicological Data:****LD<sub>50</sub>:**

(oral, rat) 4,720 mg/kg; (dermal, rabbit) 12,800 mg/kg

**LC<sub>50</sub>:**

(rat) 12,000 ppm/8h

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

### **Inhaled:**

No reports of harmful effects from occupational exposure. In human volunteers, exposure to 400 ppm for 3 to 5 minutes produced mild irritation; 800 ppm was not tolerated. Based on animal information, and information about related alcohols, exposure to high vapour concentrations may cause respiratory tract irritation, headache, dizziness, nausea, incoordination, drowsiness and eventual loss of consciousness and death.

### **In contact with skin:**

May cause irritation, with burning and stinging. May be absorbed through intact skin, but not likely to be absorbed in amounts sufficient to cause toxicity.

### **In contact with eyes:**

Moderate to severe eye irritant based on animal testing. In human volunteers, 400 ppm for 3 to 5 minutes produced mild eye irritation; 800 ppm was not tolerated.

### **Ingested:**

Ingestion causes symptoms of central nervous system, depression, nausea, vomiting, narcosis, unconsciousness. Probable human oral lethal dose 240 mL (2,696 mg/kg), but ingestion of only 20 mL (224 mg/kg) has caused poisoning. Aspiration, which can easily occur during ingestion or vomiting, can result in severe, life-threatening lung damage, chemical pneumonitis, or pulmonary edema.

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

Prolonged and repeated contact with skin can cause defatting and drying of the skin resulting in skin irritation and dermatitis. In animal testing, long-term exposure by inhalation or ingestion has caused decreased body weight, signs of CNS depression, kidney damage, increased liver weight, increased motor activity, and incoordination.

### **Carcinogenicity:**

Not classifiable as carcinogenic to humans, designation A4.

### **Teratogenicity:**

Fetotoxicity observed in rats in the absence of maternal toxicity in one study. Other studies show no effects. However, the incidence of fetal alcohol syndrome in humans would indicate teratogenic effects.

### **Reproductive Effects:**

Not established, but caution is advised.

### **Mutagenicity:**

Both positive and negative results obtained in cultured mammalian cells; results inconclusive.

### **Synergistic Products:**

Alcohols may react synergistically with chlorinated solvents (e.g. carbon tetrachloride, chloroform) or dithiocarbamates (e.g. disulphiram, thioacetamide)

## **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:**

Up to 2,000 ppm: NIOSH approved supplied-air respirator operated in continuous-flow mode, or full face-piece chemical cartridge respirator equipped with organic vapour cartridges. Higher or unknown concentrations, as in fire or spill conditions: positive-pressure, full face-piece self-contained breathing apparatus, or positive-pressure, full face-piece with an auxiliary positive-pressure self-contained breathing apparatus.

### **Eye Protection:**

Chemical safety goggles and/or face shield.

## **Skin Protection:**

Use >8h: butyl or nitrile rubber, Viton™, Barrier (PE/PA/PE) Silver Shield/4H™ (polyethylene/ethylene vinyl alcohol), Responder™ gloves; use>4h: neoprene rubber. Other protective clothing, coat, coveralls, sleeves, boots, sufficient to prevent contact

## **Other Personal Protective Equipment:**

Safety shower and eye bath located close to chemical exposure area.

## **Leak and Spill Procedure:**

Evacuate area, and provide maximum ventilation. Eliminate all sources of ignition (sparks, flames, hot surfaces). Do not touch spilled material. Cleanup must be thoroughly trained in handling hazardous chemicals and must wear protective equipment and clothing sufficient to prevent inhalation of mists or vapours and any contact with skin and eyes. Dike and soak up spilled material with inert absorbent. Prevent from entering sewers or waterways. Put contaminated material in suitable, labelled, closed containers for collection by disposal agency. Contaminated absorbent may pose the same hazards as the product, so handle with caution. Flush area of spill thoroughly with copious amounts of running water.

## **Waste Disposal:**

Follow all federal, provincial, and local regulations.

## **Handling Procedures and Equipment:**

FLAMMABLE . TERATOGEN, SEVERE EYE IRRITANT. Before working with this product, ensure that engineering controls are operating and that proper protective clothing and equipment is being used. Workers must be thoroughly trained regarding the hazards of this chemical and its safe use, and must wear appropriate protective equipment and clothing. Avoid any contact with eyes, skin and clothing, and inhalation of mists or vapours. Keep away from heat, sparks, flame and all sources of ignition. Bond or ground during liquid transfer. Use non-sparking tools. Use the smallest amount possible for the purpose, in an area with adequate ventilation. Keep work area clean and free of extraneous, particularly flammable, materials. Treat empty containers with caution; they may contain hazardous residues.

## **Storage Requirements:**

Store in suitable, labelled containers, in a cool, dry, well-ventilated area, away from all sources of ignition and incompatible or combustible materials. Keep containers tightly closed. Protect from damage, and inspect frequently for signs of damage. Post "NO SMOKING" signs. Have appropriate fire extinguishers and spill cleanup equipment near the storage area. Storage facilities should be made of fire-resistant materials, and have raised sills or ramps, with trenching to a safe area.

## **FIRST AID MEASURES**

### **Specific Measures:**

#### **Eyes:**

IMMEDIATELY flush eyes with warm gently running water for at least twenty (20) minutes, holding eyelids open while flushing. Take care not to flush contaminated water into unaffected eye. Get medical advice immediately.

#### **Skin:**

Remove contaminated clothing (including rings, watches, belts and shoes). Immediately flush exposed area with large amounts of gently running water for five to ten (5 to 10) minutes. If irritation persists, get medical advice. Decontaminate clothing before reuse, or discard.

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**Inhalation:**

*Flammable, possible reproductive hazard. Take precautions to ensure your own safety before attempting rescue; remove sources of ignition and wear appropriate protective equipment. Remove victim to fresh air immediately. Obtain medical attention.*

**Ingestion:**

*DO NOT INDUCE VOMITING. Danger of aspiration with vomiting. If the casualty is alert and NOT convulsing give 1 to 2 glasses of water to drink to dilute the material. Get medical attention immediately. If spontaneous vomiting occurs, have casualty lean forward to avoid breathing in of emesis. Rinse mouth and administer more water.*

**REFERENCES USED**

*CCINFO disc: Cheminfo*

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

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

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

*Suppliers' Material Safety Data Sheets*

**ADDITIONAL INFORMATION****Date Issued:**

*November 1, 1988*

**Revision:**

*June 2012*

**MSDS:**

*8600-1, 8600-2, 8600-4, 8600-6, 8601-2, 8601-7, 8600-30, 8608-1, CAL 1274*

**Proposed WHMIS Designation:**

*B2; D2A (fetotoxicity); D2B (irritant)*

*Prepared by: Caledon Laboratories Ltd. (905)*

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