

**MATERIAL SAFETY DATA SHEET****4-METHYL-2-PENTANONE**

PRODUCT CODE NUMBER(S): 7600-1, 7600-4, 7601-2

**PRODUCT IDENTIFICATION****Chemical Name and Synonyms:** 4-Methyl-2-pentanone; Methyl isobutyl ketone; MIBK; Hexanone; Hexone**Chemical Family:** Saturated aliphatic ketone**Chemical Formula:**  $CH_3COCH_2CH[CH_3]_2$ **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.
4-Methyl-2-pentanone	>99	50 ppm	108-10-1

**PHYSICAL DATA****Physical State:** Liquid**Odour and Appearance:** Clear, colourless liquid with a sweet, camphor-like odour**Odour Threshold (ppm):** 0.10 to 7.8 ppm (detection); 0.27 to 16 ppm (recognition). Not reliable warning properties, values vary widely.**Vapour Pressure (mm Hg):** 6 mm Hg at 20°C**Vapour Density (Air = 1):** 3.45**Evaporation Rate (Bu ac = 1):** Not available**Boiling Point (degrees C):** 116.2°C**Freezing Point (degrees C):** -80°C**pH:** Probably neutral**Specific Gravity:** 0.8017 at 20°C**Coefficient of Water/Oil distribution:**  $\text{Log}P(\text{oct})=1.38$ **SHIPPING DESCRIPTION****UN:** 1245**T.D.G. Class:** 3**Pkg. Group:** II**REACTIVITY DATA****Chemical Stability:** Stable. May form explosive peroxides when heated in air.**Incompatibility with other substances:** Reacts violently, with risk of fire and explosion, with strong oxidizing agents, reducing agents, strong bases. MIBK vapours ignite after 3 minutes on contact with potassium t-butoxide. Probably not corrosive to common metals. Attacks many plastics.**Reactivity:** Avoid heat, sparks, open flame, all other sources of ignition, incompatible materials, generation of mist.**Hazardous Decomposition Products:** Explosive peroxides, CO, CO<sub>2</sub>**FIRE AND EXPLOSION DATA****Flammability:** Flammable liquid and vapour. Vapours forms explosive mixtures with air at, or above 13°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:** 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 upwind, from a safe distance. 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):** 13°C (CC)**Autoignition Temperature:** 448°C**Upper Flammable Limit (% by volume):** 8**Lower Flammable Limit (% by volume):** 1.2**Hazardous Combustion Products:** Explosive peroxides, CO<sub>x</sub>**Sensitivity to Impact:** Probably not sensitive**Sensitivity to Static discharge:** Liquid will probably not accumulate static charge by flow or agitation. Mixtures of vapour and air at concentrations in the flammable range may be ignited by a static discharge of sufficient energy.**TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD<sub>50</sub>:** (oral, rat) 2,080 mg/kg; (oral, male mouse) 1,200 mg/kg; (dermal, rabbit) >3,000 mg/kg**LC<sub>50</sub>:** (rat) 2,000 to 4,000 ppm/4h**Effects of Acute Exposure to Product:****Inhaled:** Vapours are irritating to the eyes, nose, throat and respiratory tract, causing burning sensation, coughing, shortness of breath. May cause central nervous system depression, with fatigue, nausea, vomiting. Exposure to 100 ppm/4h causes irritation, headache, and nausea, but no psychomotor impairment; 200 ppm/15 min. - nose, throat and eye irritation.**In contact with skin:** No human information available. Mild irritant, based on animal testing. May cause defatting, drying and cracking of the skin. May be absorbed through intact skin, causing symptoms as in "Inhaled".**In contact with eyes:** No human information available. Liquid and vapour may cause mild to moderate irritation, lachrymation and conjunctivitis based on animal evidence.**Ingested:** No reports of acute human ingestion. May cause irritation and burning of the mouth and throat, abdominal pain, headache, dizziness, incoordination and other signs of CNS depression. If aspirated, during ingestion or vomiting, MIBK can cause severe lung irritation, and possibly pulmonary edema, respiratory failure, cardiac arrest and death.

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**Effects of Chronic Exposure to Product:**

Prolonged or repeated exposure may result in drying or flaking of the skin. Inhalation may cause weakness, loss of appetite, nausea, vomiting, sore throat, fatigue, enlarged liver or colitis, liver or kidney damage.

**Carcinogenicity:** No human or animal information available

**Teratogenicity:** No human information available; teratogenic in animal tests only at doses which are toxic to the mother.

**Reproductive Effects:** Some effects demonstrated in one animal test. No human information available

**Mutagenicity:** No human information available. Most animal and bacterial tests negative.

**Synergistic Products:** May increase the toxicity of ethanol, haloalkanes (carbon tetrachloride, chloroform, 1,2-dichlorobenzene) and methyl ethyl ketone.

**PREVENTIVE MEASURES**

**Engineering Controls:** Local exhaust ventilation required. Use grounded, non-sparking ventilation system and electrical equipment that does not provide a source of ignition.

**Respiratory Protection:** To 500 ppm: NIOSH/MSHA approved powered air-purifying respirator equipped with organic vapour cartridges or continuous-flow supplied-air respirator, or self-contained breathing apparatus. Higher 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.

**Skin Protection:** Barrier (PE/PA/PE), Silver Shield/4H (polyethylene/ethylene vinyl alcohol), Responder, Tychem BR/LV, Tychem TK gloves. Other impermeable protective clothing, apron, coveralls, boots, sufficient to prevent contact.

**Other Personal Protective Equipment:** Eye wash and safety shower in work area.

**Leak and Spill Procedure:** Evacuate area. Ventilate area before re-entering. Eliminate all ignition sources. Cleanup personnel must be thoroughly trained in the hazards of this chemical and must wear protective equipment and clothing sufficient to prevent inhalation of mist of vapours and contact with skin, eyes and clothing. Do not touch spilled material. Prevent from entering sewers and waterways. Stop or reduce discharge if safe to do so. Contain spill with inert absorbent (sand, earth). Transfer to container for removal by disposal company. Contaminated absorbent may pose the same hazards as the spilled product; treat with caution. Use water spray to disperse vapours or to flush liquid spill away from fire exposure. Wash site of spill thoroughly with water.

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

**Handling Procedures and Equipment:** 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. May form explosive peroxides when heated in air. Do not distill if test shows more than 0.05% peroxides present; these may ex-

plode upon concentration by distillation. 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 a cool, well-ventilated area out of sun and away from all ignition sources. Keep storage area free of combustible materials and incompatible materials such as strong oxidizers. Storage facilities should be made of fire-resistant materials, and have raised sills and be trenched to safe location. Keep containers tightly closed. Use drums on a first in, first out basis. Protect from damage. Inspect frequently for signs of damage or leaking.

**FIRST AID MEASURES****Specific Measures:**

**Eyes:** Immediately flush eyes with gently running water for at least twenty (20) minutes, holding eyelids open during flushing. Take care not to flush contaminated water into unaffected eye. Get medical attention.

**Skin:** Remove contaminated clothing (including rings, watches, belts, and shoes). Flush exposed area with large amounts of warm running water for 5 to 10 (5 to 10) minutes, or until no evidence of chemical remains. If irritation persists, or if exposure was excessive, get medical attention.

**Inhalation:** Immediately remove casualty to fresh air (caution must be used by rescuers to avoid exposure to contaminating fumes). Eliminate ignition sources. Give oxygen for breathing difficulty. Give artificial respiration only if breathing has STOPPED. If breathing AND pulse are ABSENT give CPR. IMMEDIATELY obtain medical attention. 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. Get medical attention.

**REFERENCES USED**

Budavari: The Merck Index, 12th ed., 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 Chemicals, 5th ed., 1979  
Suppliers' Material Safety Data Sheets

**ADDITIONAL INFORMATION**

**Date Issued:** November 1, 1988

**Revision:** May 2010

**MSDS:** 7600-1, 7600-4, 7601-2

**Proposed WHMIS Designation:** B2

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