

MATERIAL SAFETY DATA SHEET**N-METHYL-2-PYRROLIDONE**

PRODUCT CODE NUMBER(S): 7500-1, 7500-4, 7501-2, 7502-2

PRODUCT IDENTIFICATION**Chemical Name and Synonyms:** *n*-Methyl-2-pyrrolidone; 1-Methyl-2-pyrrolidone; *m*-Pyrol**Chemical Family:** *Cyclic amide***Chemical Formula:** C_5H_9NO **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**

<i>Ingredients</i>	<i>%</i>	<i>TLV Units</i>	<i>CAS No.</i>
<i>n</i> -Methyl-2-pyrrolidone	>99	Not established	872-50-4

PHYSICAL DATA**Physical State:** *Liquid***Odour and Appearance:** *Colourless to pale yellow; amine odour***Odour Threshold (ppm):** *Not available***Vapour Pressure (mm Hg):** *0.29 mm Hg at 20°C***Vapour Density (Air = 1):** *3.4***Evaporation Rate (Butyl acetate = 1):** *0.06***Boiling Point (degrees C):** *203°C***Freezing Point (degrees C):** *-23°C***pH:** *7.7 to 8.0(10%, aqueous)***Specific Gravity:** *1.028 at 25°C***Coefficient of Water/Oil distribution:** *Not available.***SHIPPING DESCRIPTION****UN:** *Not regulated***T.D.G. Class:** *Not regulated***Pkg. Group:** *Not regulated***REACTIVITY DATA****Chemical Stability:** *Stable under normal conditions. Hygroscopic; absorbs water from air. Slowly oxidizes on exposure to air, with the formation of hydroperoxides; process is accelerated by sunlight.***Incompatibility with other substances:** *May ignite spontaneously with oxidizing agents. Strong acids or strong bases can cause hydrolysis. Incompatible with many types of rubber or plastic. Can form peroxides on storage in the presence of air and sunlight. However, the peroxides formed from related chemicals are readily degradable and do not accululate to a hazardous level (Bretherick, 1985).**There are no reports of explosions or fires caused by peroxides in NMP.***Reactivity:** *Avoid temperatures above 86°C, moisture, heat, sparks, flame, and all ignition sources or incompatible materials. Avoid generation of mist.***Hazardous Decomposition Products:** *Fumes of CO_x and NO_x when heated to decomposition***FIRE AND EXPLOSION DATA****Flammability:** *Combustible liquid; Can form explosive mixtures with air at or above 93°C.***Extinguishing Media:** *Water spray, alcohol or polymer foam, dry chemical, or CO₂. Water may cause frothing, however, with a gentle spray or fog the froth will blanket and extinguish the fire. Use water spray to cool containers, disperse vapours, and flush spills away from fire area. Fight fire from upwind, from a safe distance. Firefighters must wear protective equipment (NIOSH/OSHA approved self-contained breathing apparatus) and clothing (Bunker Gear) sufficient to prevent inhalation of mist 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):** *93°C (CC)***Autoignition Temperature:** *270°C***Upper Flammable Limit (% by volume):** *9.5***Lower Flammable Limit (% by volume):** *1.3***Hazardous Combustion Products:** *CO_x and NO_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 static discharge.***TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD₅₀:** *(oral, rat) 4,150 mg/kg; (dermal, rat) 7,000 mg/kg***LC₅₀:** *(rat) >6.0 mg/L/4h***Effects of Acute Exposure to Product:****Inhaled:** *Irritating to respiratory tract. May be harmful. May cause headache, giddiness, fatigue, mental confusion, shortness of breath. No human information available; results were reported on animal testing.***In contact with skin:** *Non-irritating in 24-hour patch test on 50 human subjects.***In contact with eyes:** *Mist or vapour may be irritating to eyes. Liquid is very irritating and will cause burning or stinging of eyes and lids, watering of the eyes, inflammation of conjunctiva, clouding of cornea, possible permanent damage. No human information is available; these results were reported on animal testing.***Ingested:** *No human information available. Ingestion may cause irritation and burning of the mouth and throat, abdominal pain and central nervous system depression. Aspiration*

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of the liquid into the lungs during ingestion or vomiting may cause severe lung irritation or damage, chemical pneumonitis, pulmonary edema and even death.

Effects of Chronic Exposure to Product:

Studies with animals showed effects on liver, kidney, bone marrow, thymus, spleen and lymphatic system. Prolonged or repeated skin contact can cause severe dermatitis.

Carcinogenicity: Not listed as carcinogenic

Teratogenicity: No human information available. Developmental abnormalities in animal studies.

Reproductive Effects: No human or animal information available.

Mutagenicity: Negative in Ames test (salmonella).

Synergistic Products: May enhance skin penetration of other substances; used in pharmaceutical applications.

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: Use only in a fume hood. NIOSH/OSHA approved air-purifying respirator with organic vapour cartridges or full face-piece chemical cartridge respirator with organic vapour cartridges for concentrations that cannot be controlled by exhaust ventilation. For higher or unknown concentrations, as in fire or spill conditions, positive-pressure, full face-piece self contained breathing apparatus, or full face-piece supplied-air respirator with an auxiliary positive-pressure self contained breathing apparatus.

Eye Protection: Chemical goggles and/or face shield

Skin Protection: Butyl rubber gloves. Other impervious protective clothing (apron, lab coat, coveralls, etc.) sufficient to prevent contact.

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

Leak and Spill Procedure: Evacuate area, provide maximum ventilation and eliminate all sources of ignition. Cleanup personnel must be thoroughly trained in the handling of hazardous material, and must wear protective equipment and clothing sufficient to prevent inhalation of vapours or mists, and contact with skin and eyes. Do not touch spilled material. Contain spill and cover with inert absorbent material. Prevent from entering sewers or waterways. Collect and transfer to suitable, labelled, covered container for disposal. Flush area of spill with running water.

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

Handling Procedures and Equipment: COMBUSTIBLE LIQUID. Workers must be thoroughly trained in the hazards of this material and its safe use, and must wear appropriate protective equipment and clothing. Bond and ground during liquid transfer. Keep away from heat, sparks and open flame. Use non-sparking tools. Post "No Smoking" signs. Use smallest amount possible for the purpose in a designated area with appropriate ventilation. Keep work area clean and free of extraneous materials. Avoid generating vapour or mist. Avoid all contact with eyes, skin or clothing. Keep away from all incompatible and combustible materials. Open containers with extreme caution; do not attempt to open if containers are of unknown age, or if solid particles have formed, or if contamination is suspected.

Storage Requirements: Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight

and away from heat, and all ignition sources. Keep away from incompatible materials. Protect from damage, and inspect regularly for signs of leaking. Limit quantity of material in storage, and dispose of old material. Storage area should have raised sills or ramps to contain leaks and/or conduct them to a safe area.

FIRST AID MEASURES

Specific Measures:

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

Skin: Remove contaminated clothing (including watches, rings, belts, and shoes). Immediately flush skin with running water for five to ten (5-10) minutes, or until no trace of chemical remains. If irritation persists, get medical attention. Decontaminate clothing before re-use, or discard.

Inhalation: Remove to fresh air. Give oxygen and get medical attention for any breathing difficulty. If breathing has stopped, begin artificial respiration immediately. If breathing and pulse are absent, begin CPR. Get medical attention immediately.

Ingestion: If person is conscious and not convulsing, rinse mouth thoroughly with water and give 1 to 2 glasses of water to drink to dilute. DO NOT INDUCE VOMITING. If spontaneous vomiting occurs, have person lean forward to avoid breathing of vomitus, rinse mouth and give more water to drink. Get medical attention immediately.

REFERENCES USED

CCINFO disc

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 Materials, 5th ed., 1979

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

ADDITIONAL INFORMATION

Date Issued: November 13, 1991

Revision: October 2009

MSDS: 7500-1, 7500-4, 7501-2, 7502-2

Proposed WHMIS Designation: B3; D2B (eye irritation)

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