

MATERIAL SAFETY DATA SHEET**FORMALDEHYDE**

PRODUCT CODE NUMBER(S): 5300-1, 5300-4

PRODUCT IDENTIFICATION

Chemical Name and Synonyms: Formaldehyde; Formalin; Formic aldehyde; Formaldehyde solution; Formaldehyde 37% solution

Chemical Family: Saturated aliphatic aldehyde

Chemical Formula: CH₂O, CH₃OH in H₂O

Product Use: Laboratory chemical

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.
Formaldehyde	>37	0.3 ppm	50-00-0
Methanol	10 - 15	200 ppm	67-56-1

PHYSICAL DATA

Physical State: Liquid

Odour and Appearance: Colourless liquid, pungent odour

Odour Threshold (ppm): 1 ppm (recognition). Poor warning properties, threshold above TLV; olfactory fatigue may also occur.

Vapour Pressure (mm Hg): 52 mm Hg at 37°C

Vapour Density (Air = 1): 1.03

Evaporation Rate (n-Bu ac = 1): 1.8 Formaldehyde evaporates from solution, leaving water behind.

Boiling Point°C: 97°C

Freezing Point°C: -118°C, at low temperatures, paraformaldehyde may form

pH: 2.8 to 4.0

Specific Gravity: 1.098 (37% formaldehyde, 7% methanol)

Coefficient of Water/Oil distribution: LogP (oct) 0.00

SHIPPING DESCRIPTION

UN: 1198

T.D.G. Class: 3 (8)

Pkg. Group: III

REACTIVITY DATA

Chemical Stability: Stable. Can be oxidized slowly in air to produce formic acid.

Incompatibility with other substances: May react violently or explosively with strong oxidizing agents. Incompatible with carbon steel. Reaction with strong bases may release CO₂, which can rupture containers. Pure formaldehyde will polymerize to form trimer (polymerization is not hazardous). Runaway reactions have occurred with phenols.

Reactivity: Minimum storage temperature is 15°C to prevent polymer formation. Avoid all ignition sources, all incompatible materials, generation of mist.

Hazardous Decomposition Products: CO, CO₂

FIRE AND EXPLOSION DATA

Flammability: Flammable liquid and vapour under fire conditions. Gas can form flammable/explosive mixtures with air. Vapors can travel to a source of ignition and flash back.

Extinguishing Media: CO₂, dry chemical, alcohol or polymer foam or water spray. Use water as spray or fog 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 (full face-piece positive-pressure self-contained breathing apparatus) and clothing (encapsulating, chemical resistant splash suit) sufficient to prevent inhalation of mist or fumes, 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): 50°C (CC) 37% formaldehyde with 15% methanol.

Autoignition Temperature: 300°C; gas 430°C

Upper Flammable Limit (% by volume): 73

Lower Flammable Limit (% by volume): 7

Hazardous Combustion Products: CO and CO₂, irritating gases

Sensitivity to Impact: None identified

Sensitivity to Static discharge: Mixtures of methanol vapour and air at concentrations in the flammable range may be ignited by static discharge. Liquid will probably not accumulate static charge.

TOXICOLOGICAL PROPERTIES AND HEALTH DATA**Toxicological Data:**

LD₅₀: Formaldehyde: (oral, mouse) 42 mg/kg, (dermal, rabbit) 270 mg/kg; Methanol: (oral, rat) 5,628 mg/kg, (dermal, rabbit) 20 mL/kg

LC₅₀: Formaldehyde: (rat) 250 ppm/2h; Methanol (rat) 64,000 ppm/4h.

Irritation: Formaldehyde (skin, rabbit) 50 mg/24h, moderate); (eye, rabbit) 750 mg/24h, severe

Effects of Acute Exposure to Product:

Inhaled: Toxic and irritating. Formaldehyde vapour at 2-3 ppm can cause irritation to the nose and throat. 4-5 ppm can be tolerated for about 30 minutes, after which sore throat and shortness of breath increase. Concentrations >10 ppm are severely irritating, with burning sensation of the nose and throat, coughing, shortness of breath. >50 ppm can cause lung damage, pulmonary edema, pneumonitis, which may be fatal. Symptoms can be delayed several hours after exposure. Inhalation of methanol may cause CNS depression, headache, drowsiness, loss of consciousness, loss of vision.

In contact with skin: Toxic and irritating. Formaldehyde may cause tingling, drying, redness and skin sensitization. Both formaldehyde and methanol may be absorbed through the skin, causing systemic effects with symptoms paralleling ingestion exposure.

In contact with eyes: Lachrymator. Vapour and solutions are irritating. Irritation may occur at 0.2 ppm of vapour; tearing begins at 4-5 ppm; pain, redness, burns, and/or blurred vision may occur above 10 ppm. Concentrated solutions may cause severe irritation and permanent eye damage.

CODE: 5300-1, 5300-4

Ingested: Toxic and irritating. Ingestion of solutions can cause severe pain in the mouth, throat and abdomen. May cause dizziness, depression, coma, lowered body temperature, jaundice, hematuria. Ingestion of even small amounts of methanol can cause CNS depression, headache, drowsiness, loss of consciousness, loss of vision, damage to kidneys, liver, heart.

Effects of Chronic Exposure to Product:

Chronic exposure to formaldehyde liquid or vapour may cause respiratory irritation, impaired lung function, respiratory or dermal sensitization, nasopharyngeal cancer (IARC). Repeated skin exposure may cause skin discoloration and thickening and nail decay.

Prolonged or repeated exposure to methanol may cause systemic poisoning, brain disorders, impaired vision or blindness. May adversely affect persons with chronic disease of the central nervous system, skin, gastrointestinal tract, and/or eyes. Prolonged or repeated skin exposure may cause dermatitis.

Carcinogenicity: Formaldehyde is listed as suspected human carcinogen, IARC (Group 1), NTP, ACGIH (Group 2A), OSHA.

Teratogenicity: No effects in animal studies with formaldehyde. Methanol has caused effects at doses toxic to mother.

Reproductive Effects: In testing with formaldehyde: one report of menstrual disorders and sterility in women, spermatogenesis and other effects on male reproductive organs in animal studies. Reproductive effects cited for methanol.

Mutagenicity: Formaldehyde was mutagenic in bacterial test, and in isolated human and animal cells (RTECS No. LP8925000)

Synergistic Products: Methanol may react synergistically with chlorinated solvents.

PREVENTIVE MEASURES

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

Respiratory Protection: At concentrations above the NIOSH REL (0.016 ppm, TWA; 0.1 ppm/ 15 min). or at any detectable concentration: NIOSH/OSHA positive pressure, full-facepiece self-contained breathing apparatus; or positive pressure, full-facepiece supplied-air respirator with an auxiliary positive pressure self-contained breathing apparatus.

Eye Protection: Chemical safety goggles and/or face shield.

Skin Protection: Butyl or nitrile rubber, Viton™, Saranex™, Barricade™, CPF3™ gloves. Other impervious protective clothing, apron, boots, sufficient to prevent contact.

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

Leak and Spill Procedure: Evacuate area. Eliminate all ignition sources. Ventilate area. Cleanup personnel must be thoroughly trained in the hazards of this chemical and its safe use, and must wear protective equipment and clothing sufficient to prevent inhalation of mist or fumes, and contact with skin and eyes. Prevent from entering sewers and waterways. Contain spill with inert absorbent material. Collect in suitable, labelled, covered containers for disposal. Contaminated adsorbent may pose the same hazards as the product; treat with caution. Flush area of spill with large amounts of running water.

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

Handling Procedures and Equipment: TOXIC; COMBUSTIBLE. Workers using this chemical must be thoroughly

trained in its hazards and its safe use, and must wear appropriate protective equipment and clothing. Keep away from all ignition sources. Ground and bond equipment and containers to prevent a static charge buildup. Use spark-resistant tools and avoid splash filling of containers. Avoid generating mists or vapours. Avoid all contact and inhalation. Use the smallest possible amount for the purpose, in designated areas with adequate ventilation. Keep containers closed when not in use and when empty. Do not return contaminated material to the original containers. Treat empty containers with caution as they may contain hazardous residues.

Storage Requirements: Store in suitable, labelled containers, between 15 and 30°C to prevent polymerization, in a dry, well-ventilated area, out of direct sunlight and away from all incompatible materials. Store away from heat, sources of ignition. Keep containers tightly closed when not in use and when empty. 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. Protect from damage, and inspect frequently for signs of 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. Wear protective gloves to avoid contact during first aid procedures. Get medical attention immediately.

Skin: Remove contaminated clothing, including watches, rings, belts, and shoes. Wear protective gloves to avoid contact. Flush affected areas with running water for at least twenty (20) minutes. Get medical attention. Decontaminate clothing before reuse, or discard.

Inhalation: IMMEDIATELY remove to fresh air (caution must be used by rescuers to avoid exposure to contaminating fumes). Give oxygen and get medical attention immediately for any breathing difficulty. If breathing has STOPPED give artificial respiration. If breathing AND pulse are ABSENT give CPR. IMMEDIATELY OBTAIN MEDICAL ATTENTION. Stay with casualty until medical assistance is reached.

Ingestion: If victim is alert and NOT convulsing, give 1 to 2 glasses of water to drink to dilute material. DO NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Obtain 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, Vol. 3, 1990

Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987
Suppliers' Material Safety Data Sheets

ADDITIONAL INFORMATION

Date Issued: November 1, 1988

Revision: November 2009

MSDS: 5300-1, 5300-4

Proposed WHMIS Designation: B3; D2A; E

Prepared by: Caledon Laboratories Ltd. (905) 877-0101
Caledon Laboratories Ltd. believes the information contained herein is reliable and accurate. Caledon makes no warranty with respect thereto and expressly disclaims all liability for reliance thereon. Such information is solely for your consideration, investigation, and verification.