

1. PRODUCT INFORMATION

Product Name: METHANOL (CH₃OH)

Trade Name/Synonyms: Methyl Alcohol, Methyl Hydrate, Wood Spirit, Methyl Hydroxide

WHMIS Classification: B2, D1A

UN Number: 1230

TDG Classification: TDG Class 3 (6.1) Packing Group II

Product Use: Solvent, fuel, feedstock

Manufacturer: Methanex Corporation,

1800 Waterfront Centre 200 Burrard St., Vancouver, BC V6C 3M1

Emergency Phone Number: 1-403-528-1346 (24 hours)

2. HAZARDOUS COMPONENTS

Methyl Alcohol

Wt.%: 99.85% CAS No.: 67-56-1

LD50: 5.6-13.0 g/kg (Oral/rat); 20 ml/kg (dermal/rabbit) LC50: 64,000 ppm (rat/inhale)

3. POTENTIAL HEALTH EFFECTS

Skin Contact: Irritant Skin Absorption: Yes Eye Contact: Moderate irritant

Ingestion: Yes Inhalation: Yes

Exposure Limits

Methyl Alcohol: ACGIH TLV-TWA = 200 ppm, STEL = 250 ppm, Skin notation

OSHA PEL = 200 ppm, STEL = 250 ppm, Skin notation

Irritancy of Product

1000 ppm in air may cause irritation of mucous membrane

Sensitization: No

Synergism with other chemicals: Not available

Short Term Effects

Swallowing even small amounts of methanol may cause blindness or death. Effects of sub lethal doses may be nausea, headache, abdominal pain, vomiting and visual disturbances ranging from blurred vision to light sensitivity. Inhalation of high airborne concentrations can also irritate mucous membranes, digestive and visual disturbances and death. NOTE: The odor threshold of methanol is several times higher than the TLV-TWA. High vapor concentration of liquid contact with eyes causes irritation, tearing and burning. May be absorbed through the skin in toxic or lethal amounts.

Long Term Effects

Repeated exposure by inhalation or absorption may cause systemic poisoning, brain disorders, impaired vision and blindness. Inhalation may worsen conditions such as emphysema or bronchitis. Repeated skin contact may cause dermal irritation, dryness and cracking.

Reproductive Effects: Reported to cause birth defects in rats exposed to 20,000 ppm

Teratogenicity: No

Mutagenicity: No

Carcinogenicity: Not listed with IARC, NTP, ACGIH, or OSHA as a carcinogen.

4.
5. FIRST AID INFORMATION

Skin

Remove contaminated clothing; wash under shower with soap and water for 15 minutes. Seek medical attention if irritation occurs.

Eye

Flush immediately with gently running water for a minimum of 15 minutes, ensuring all surfaces and crevices are flushed by lifting lower and upper lids. Obtain medical attention.

Inhalation

Remove to fresh air, restore or assist breathing if necessary, obtain medical attention immediately.

Ingestion

Swallowing methanol is life threatening. Onset of symptoms may be delayed for 18 to 24 hours after ingestion. If conscious and medical aid is not immediately available, do not induce vomiting. Transport to medical attention.

6. FIRE AND EXPLOSION HAZARD

Flammable/Combustible: Yes

If yes, under what conditions? In the presence of an ignition source.

Extinguishing Media

Small fires: Dry chemical, CO₂, water spray.

Large fires: Water spray, AFFF(R) (Aqueous Film Forming Foam (alcohol resistant)) type with either a 3% or 6% foam proportioning system.

Special Fire Fighting Instructions

Methanol burns with a clean clear flame that is almost invisible in daylight. Stay upwind, isolate and restrict area access. Concentrations of greater than 25% methanol in water can be ignited. Use fine water spray or fog to control fire spread and cool adjacent structures or containers. Contain fire control water for later disposal. Fire fighters must wear full face, positive pressure, self-contained breathing apparatus or airline and appropriate protective clothing. Protective fire fighting structural clothing is not effective protection from methanol. Do not walk through spilled product.

Flashpoint and Method: 11°C (52°F) (TCC) ; 15.6°C (60°F) (TOC)

Lower Explosive Level: 6%

(percent volume)

Upper Explosive Level: 36% (NFPA 1978) 36.5% (Ullmann 1975)

(percent volume)

Auto ignition Temp.: 385°C (NFPA 1978) 470°C (Kirk-Othmer 1981; Ullmann 1975)

Sensitivity to Static Discharge: Low

Hazardous Combustion Products: Toxic gases and vapors; oxides of carbon and formaldehyde.

7.
8. REACTIVITY DATA

Chemically Stable: Yes

If no, under what conditions? Not applicable

Incompatible with other substances: Yes

If yes, which ones? Strong oxidizers, strong acids, strong bases. May be corrosive to lead and aluminum.

Conditions of Reactivity: Presence of incompatible materials and ignition sources

Hazardous Decomposition Products: Formaldehyde, carbon dioxide and carbon monoxide.

9. SPILL AND LEAK RESPONSE

Spill or Leak Response

Flammable liquid. Release can cause an immediate fire/explosion hazard. Eliminate all ignition sources, stop leak and use absorbent materials. If necessary, contain spill by diking. Fluorocarbon alcohol resistant foams may be applied to spill to diminish vapor and fire hazard. Maximize methanol recovery for recycling or reuse. Collect liquid with explosion proof pumps. For small spills, collect with a non-combustible sorbent. Recover methanol or dilute with water to reduce fire hazard. Prevent spilled methanol from entering sewers, confined spaces, drains or waterways. Restrict access to unprotected personnel. Full-face, positive pressure self-contained breathing apparatus or airline and protective clothing must be worn. Protective fire fighting structural clothing is not effective protection from methanol. Do not walk through spilled product as it may be on fire and not visible.

Waste Disposal

Incineration is the recommended disposal method. Biological treatment may be used on dilute aqueous waste methanol. Methanol wastes are not suitable for underground injection. Waste materials must be disposed of in accordance with your municipal, state, provincial and federal regulations. Contact the proper authorities for specific instructions or contact the 24 HOUR EMERGENCY NUMBER: (403) 528-1346.

Degradability/Aquatic Toxicity

Biodegrades easily in water. Methanol in fresh or salt water may have serious effects on aquatic life. A study on methanol's toxic effects on sewage sludge bacteria reported little effect on digestion at 0.1% while 0.5% methanol retarded digestion. Methanol will be broken down to carbon dioxide and water.

10. EXPOSURE CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT

Engineering Controls

In confined areas, local and general ventilation should be provided to maintain airborne concentrations below permissible exposure limits. Ventilation systems must be designed according to approved engineering standards.

Gloves

Butyl and nitrile rubbers are recommended. Check with glove manufacturer.

Respiratory

NIOSH approved supplied air respirator when airborne concentrations exceed exposure limits.

Eye

Face shield and chemical splash goggles when transferring is taking place.

Footwear

Chemical resistant.

Clothing

Wear chemical resistant pants and jackets, preferably butyl or nitrile rubber. Check with manufacturer.

NOTE:

PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean, fit and use. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers to ensure adequate protection.

11. STORAGE AND HANDLING REQUIREMENT

Storage

Store in totally enclosed equipment, designed to avoid ignition and human contact. Tanks must be grounded and vented and should have vapor emission controls. Tanks must be diked. Avoid storage with incompatible materials. Anhydrous methanol is non-corrosive to most metals at ambient temperatures except lead and magnesium. However coatings of

copper (or copper alloys), zinc (including galvanized steel) or aluminum are unsuitable for storage as they are attacked slowly. Storage tanks of welded construction are normally satisfactory. They should be designed and built in conformance with good engineering practice for the material being used. Mild steel is the recommended construction material. Tanks built with copper alloys (including coatings of copper), zinc (including galvanized steel), aluminum or plastics are not suitable.

Handling

No smoking or open flame in storage, use or handling areas. Use explosion proof electrical equipment. Ensure proper electrical grounding procedures are in place.

Shipping Information

All shipments of methanol must be properly classified, described, packaged, marked and labeled to conform with regulations set by Transport Canada, Transportation of Dangerous Goods Regulations and U.S. Department of Transport (DOT), Bureau of Explosives and Hazardous Materials Regulations.

12. PHYSICAL DATA

Physical State: Liquid

Odor: Slight alcohol odor

Odor Threshold: 2000 ppm, (irritation at 1000 ppm, poor olfactory warning properties)

Appearance: Clear, colorless

Specific Gravity: 0.792 (H₂O=1)

Freezing Point: -97.8°C (-144°F)

Boiling Point: 64.5°C (148°F) at 760 mm Hg

Vapor Pressure: 96 mm Hg at 20°C (68°F)

Vapor Density (air=1): 1.105 at 15°C (59°F)

Evaporation Rate: 2.1

(n-Butyl acetate=1)

Molecular Weight: 32.04

Volatile, Percent by Volume: 100%

Solubility in Water at 20°C: Soluble

PH: Not applicable

Water/Oil Distribution: Readily soluble in water, separates from oil.

Coefficient

13.

14. REGULATORY INFORMATION

Transportation

Canadian TDG: Methanol, Flammable Liquid, 3 (6.1), UN 1230, PG II

USA DOT: Methyl Alcohol (RQ 5000/2270), Flammable Liquid, UN 1230 PGII

WHMIS-Canada: B2, D1A

OSHA – USA: Hazardous according to 29 CFR 1910.1200

EPA:

Hazardous according to the Clean Water Act 40 CFR 116-117

Emergency Planning and Notification- CFR 355 Appendices A and B

SARA Title III Section 131, Specific Toxic Chemical Listings – 40 CFR 372

CERCLA Hazardous Substances List; Designation, Reportable Quantities, Notification – 40 CFR 302

Notification – 40 CFR 302

Other:

OSHA 20 CFR 1910.1200; Hazardous

NFPA Rating: Health =1, Fire=3, Reactivity=0

15. SUPPLEMENTAL INFORMATION

NOTE TO PHYSICIAN: Acute exposure to methanol, either through ingestion or breathing high airborne concentrations can result in symptoms appearing between 40 minutes and 72 hours after exposure. Symptoms and signs are usually limited to CNS, eyes and gastrointestinal tract. Because of the initial CNS's effects of headache, vertigo, lethargy and confusion, there may be an impression of ethanol intoxication. Blurred vision, decreased acuity and photophobia are common complaints. Treatment with Ipecac or lavage is indicated in any patient presenting within two hours of ingestion. A profound metabolic acidosis occurs in severe poisoning and serum bicarbonate levels are a more accurate measure of severity than serum methanol levels. Treatment protocols are available from most major hospitals and early collaboration with appropriate hospitals is recommended.

16. PREPARATION INFORMATION

Prepared by

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References Used

American Conference of Governmental Industrial Hygienists, Documentation of Threshold Limit Values, 1994-1995

Hazardous Substances Data Base, 1996 Microtech; #1.93 Revised 1995.05.2

Hazard Management Data Base, 1996 Microtech; Revised 1995.05.2

RTECS, 1995

NIOSH Pocket Guide, 1995

Reproductive Effects Data Base; 1996 Microtech, Revised 1995.05.2

Medical Management Data Base; 1996 Microtech, Revised 1995.05.2

Dangerous Goods Initial Emergency Response Guide 1992, Transport Canada

For additional copies of this MSDS, please call (604) 661-2600