

SAFETY DATA SHEET



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METHYL ALCOHOL

SDS No. M0144

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Methyl Alcohol

Synonyms: Methanol, Wool Alcohol, Carbinol

Recommended Use: This product is recommended for laboratory and manufacturing use only. It is not recommended for drug, food or household use.

2. HAZARDS IDENTIFICATION



Classification:

Flammable Liquids: GHS Category 2

Acute Toxicity, Inhalation: GHS Category 3

Acute Toxicity, Dermal: GHS Category 3

Acute Toxicity, Oral: GHS Category 3

Eye Effects: GHS Category 2

Specific Target Organ Toxicity (single exposure): GHS Category 1

Label Elements

Signal Word: DANGER!

Hazard Statements:

H225 – Highly flammable liquid and vapor.

H301 + H311 + H331 – Toxic if swallowed, in contact with skin or if inhaled.

H370 – Causes damage to organs.

Precautionary Statements:

Prevention

P210 – Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P233 – Keep container tightly closed.

P241 – Use explosion proof electrical/ventilation/lighting/equipment.

P243 – Take precautionary measures against static discharge.

P261 – Avoid breathing dust/fumes/gas/mist/vapor/spray.

P270 – Do not eat, drink, or smoke while using this product.

P280 – Wear protective gloves/protective clothing/eye protection/face protection.

Clear focus. Consistent results. Complete confidence.

Response

P301 + P310 – IF SWALLOWED: Call a POISON CENTER or a doctor/physician.

P303 + P361 + P353 – If on skin or hair: Remove/take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340 – IF INHALED: remove victim to fresh air and keep at rest in a position comfortable for breathing

Storage

P403 – Store in a well-ventilated place.

Disposal

P501 – Dispose of contents and container in accordance with all local, regional, national and international regulations.

Emergency Overview

Poison! May be fatal or cause blindness if swallowed. Cannot be made non-poisonous. May be harmful if inhaled or absorbed through the skin. May cause irritation to eyes, skin, and respiratory tract. Highly flammable liquid and vapor.

Target Organs: Liver, central nervous system, and optic nerve.

HMIS Rating:

Health – 2* Flammability – 3 Physical Hazard – 0 PPE – User supplied

NOTE: HMIS ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. These ratings are based on the inherent properties of this chemical under expected conditions of normal use and are not intended to be used in emergency situations. PPE is determined by the user based on their needs and conditions.

3. COMPOSITION AND INFORMATION ON INGREDIENTS

<u>Ingredient</u>	<u>CAS No</u>	<u>Percent</u>	<u>Hazardous</u>
Methyl Alcohol	67-56-1	>99%	Yes

4. FIRST-AID MEASURES

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Ingestion: Get medical help immediately. Do not induce vomiting unless directed by medical personnel. If vomiting occurs naturally, have victim lean forward. Never give anything by mouth to an unconscious person.

Skin Contact: Remove any contaminated clothing. Wash skin with soap or mild detergent and water for at least 15 minutes. Get medical attention.

Eye Contact: Check for and remove contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention.

Notes to Physician: Effects may be delayed. Ethanol may inhibit methyl alcohol metabolism.

5. FIRE FIGHTING MEASURES

Flammability: Highly flammable liquid and vapor (GHS Category 2)

Auto-ignition Temperature: 455° C (851° F)

Flash Point: 12° C (53.6° F)

Flammable Limits: Lower Limit – 6.0 vol %, Upper Limit – 31.0 vol %

Products of Combustion: May decompose into irritating and highly toxic gases under fire conditions (formaldehyde, carbon monoxide, carbon dioxide).

Specific Fire Hazards: As in any fire, always wear self-contained breathing apparatus in pressure-demand (MSA/NIOSH approved or equivalent), and full protective gear. Methyl alcohol is lighter than water, so water may be ineffective and spread the fire. Use water spray to keep fire exposed containers cool. Approach fire from upwind to avoid hazardous vapors and toxic decomposition products. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Specific Explosion Hazards: None

Fire Fighting Media: For small fires, use dry chemical, carbon dioxide, water spray, or alcohol-resistant foam. Water may be ineffective. For larger fires, use water spray, fog, or alcohol-resistant foam. Do not use straight streams of water.

National Fire Protective Association: Health - 1, Flammability - 3, Reactivity - 0

NOTE: NFPA ratings use a numbering scale that ranges from 0 - 4 to indicate the degree of hazard. A value of zero means the chemical presents no hazard while a value of four indicates a high hazard. They are for use by emergency personnel to address the hazards that are presented by short term, acute exposure to this product under fire, spill, or similar emergencies. Ratings involve data and interpretations that may vary from company to company.

6. ACCIDENTAL RELEASE MEASURES

Use water spray to reduce vapors. Water spray may reduce vapors but still not prevent ignition in closed spaces. Absorb spilled liquid with sorbent pads, socks, or other inert material such as vermiculite, sand, or earth. Do not use sawdust or any combustible material. Use spark-proof tools. Provide ventilation to the affected area and remove all ignition sources. Approach the spill from upwind and pick up absorbed material and place it in a suitable container. Always use proper personal protective equipment as described in section 8.

7. HANDLING AND STORAGE

Precautions: Always use proper personal protective equipment as described in section 8. Wash thoroughly after handling. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Remove contaminated clothing and wash before reuse. Empty containers contain product residue (liquid and vapor) and can be dangerous. Keep container tightly closed and away from heat, spark, and flame. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, or open flames. Use with adequate ventilation. Avoid breathing vapor or mist.

Storage: Keep in a flammables area away from all sources of ignition and oxidizing materials. Keep in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Protect from moisture.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls: Use explosion-proof ventilation equipment. Facilities storing or using the material should be equipped with eyewash station and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

Personal Protection: Wear protective chemical goggles or other appropriate eye protection. Use butyl rubber gloves and protective clothing to prevent skin exposure. A respiratory protection program that meets OSHA 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever possible. Always use a NIOSH or European Standard EN 149 approved respirator when necessary.

Exposure Limits:

ACGIH – 200 ppm TWA; 250 ppm STEL; Skin – potential significant contribution to overall exposure by cutaneous route
NIOSH – 200 ppm TWA; 260 mg/m³ TWA; 6000 ppm IDLH
OSHA Final PELs – 200 ppm TWA; 260 mg/m³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Alcohol-like, weak odor

Odor Threshold: Highly variable, reported at 10 ppm to 20,000 ppm

Molecular Formula: CH³OH

Molecular Weight: 32.04

Auto-ignition Temperature: 455° C (851° F)

Flash Point: 12° C (53.6° F)

Flammable Limits: Lower Limit – 6.0 vol %, Upper Limit – 31.0 vol %

pH: Not available.

Boiling Point: 64.7° C @ 760 mm Hg

Freezing/Melting Point: -98° C

Decomposition Temperature: Not available

Specific Gravity: 0.7910 g/cm³

Vapor Density (Air=1): 1.11

Vapor Pressure: 128 mm Hg @ 20° C.

Viscosity: 0.55 cP 20° C

Solubility: Miscible

Conductivity at 18°C: Conductive; Conductivity = 4.4×10^7 pS/m; Dielectric Constant = 32.7; Relaxation Time Constant = 6.6×10^{-6} seconds

10. STABILITY AND REACTIVITY

Stability: Stable under normal temperatures and pressures.

Conditions to Avoid: Ignition sources, excess heat, confined spaces.

Incompatibility with Various Substances: Oxidizing agents, reducing agents, acids, alkali metals, potassium, sodium, powdered metals (e.g. hafnium, raney nickel), acid anhydrides, acid chlorides, powdered aluminum, powdered magnesium.

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

Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Inhalation is the most common route of exposure. Methyl alcohol is toxic and readily forms high vapor concentrations at room temperature. Toxic effects exerted upon nervous system, particularly the optic nerve. Symptoms of central nervous system overexposure may include headache, drowsiness, nausea, vomiting, blurred vision, blindness, coma, and death. Victims may show no signs of overexposure for up to 24 hours followed by metabolic acidosis and visual effects, such as reduced reactivity, over sensitivity, blurred, double or snowy vision, or blindness. Depending on exposure and promptness of medical treatment, victims may fully recover or experience permanent damage.

INGESTION HAZARD: May be fatal or cause blindness if swallowed. Methanol is an aspiration hazard and cannot be made non-poisonous. May cause gastrointestinal irritation with nausea, vomiting, and diarrhea. May cause system toxicity with acidosis. May cause central nervous system depression with excitement followed by headache, drowsiness, nausea, and vomiting. Advanced stages may cause collapse, unconsciousness, coma, and possible death. May cause cardiopulmonary system effects.

SKIN CONTACT HAZARD: Methyl alcohol is a mild skin irritant that may cause skin to become dry and cracked. Prolonged contact can cause defatting or dermatitis. Skin absorption can occur with symptoms similar it inhalation exposure.

EYE CONTACT HAZARD: May cause painful sensitization to light. Mild to moderate eye irritant. Continued exposure may cause eye lesions. Inhalation, ingestion, or absorption of methyl alcohol can cause reduced vision, including blindness.

Chronic Exposure Hazards: Chronic exposure to methyl alcohol may cause symptoms similar to acute exposure. Methyl alcohol is eliminated from the body very slowly and should be regarded as a cumulative poison. Marked impairment of vision and enlargement of the liver has been reported. Repeated or prolonged exposure may cause dermatitis and defatting of skin. Persons with pre-existing skin disorders or eye problems or impaired liver or kidney function may be more susceptible to the effects of the substance. Methyl alcohol has produced fetotoxicity in rates and teratogenicity in mice exposed by inhalations to high concentrations that did not produce significant maternal toxicity.

Animal Toxicity:

Draize test, rabbit, eye: 40 mg Moderate;
 Draize test, rabbit, eye: 100 mg/24 hr Moderate;
 Draize test, rabbit, skin: 20 mg/24 hr Moderate;
 Inhalation, rabbit: LC50 = 81000 mg/m³/14 hr;
 Inhalation, rat: LC50 = 64000 ppm/4 hr;
 Oral, mouse: LD50 = 7300 mg/kg;
 Oral, rabbit: LD50 = 14200 mg/kg;
 Oral, rat: LD50 = 5600 mg/kg;
 Skin, rabbit: LD50 = 15800 mg/kg;
 Skin, monkey LDLo = 393 mg/kg;

Human Toxicity:

Inhalation, human: TCLo = 300 ppm caused visual field changes and headache;

Oral, human: LDLo = 143 mg/kg;

Oral, human: LDLo = 428 mg/kg;

Methanol is significantly less toxic to most experimental animals than to humans, because most animal species metabolize methanol differently. Non-primate species do not ordinarily show symptoms of metabolic acidosis or the visual effects that have been observed in primates and humans.

Carcinogenicity: Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65

Epidemiology: Methanol – has been shown to produce fetotoxicity in the embryo of laboratory animals. Specific developmental abnormalities include cardiovascular, musculoskeletal, and urogenital systems.

Teratogenicity: No human information is available. Based on animal data, methyl alcohol is considered a potential developmental hazard. Animal studies have shown fetotoxic and teratogenic effects without maternal toxicity.

Reproductive Effects: No information is available on the reproductive or developmental effects of methanol in humans. Developmental effects have been observed in the offspring of rats and mice exposed to methanol by inhalation. These included skeletal, cardiovascular, urinary system, and central nervous system (CNS) malformations in rats and increased resorptions and skeletal and CNS malformations in mice.

Mutagenicity: Mutagenic effects have been observed in yeast, bacteria, and mammalian somatic cells.

Neurotoxicity: ACGIH cites neuropathy, vision, and central nervous system under TLV basis.

12. ECOLOGICAL INFORMATIONEcotoxicity:

Fish: Fathead minnow: 29.4 mg/L; 96 Hr; LC50 (unspecified)

Fish: Goldfish: 250 ppm for 11 hours resulted in death;

Fish: Rainbow trout: 8000 mg/L; 48 Hr; LC50 (unspecified);

Fish: Rainbow trout: LC50 = 13-68 mg/L; 96 Hr; 12° C;

Fish: Fathead minnow: LC50 = 29,400 mg/L; 96 Hr; 25° C;

Bacteria, Phytobacterium phosphoreum: EC50 = 51,000-320,000 mg/L; 30 minutes;

Environmental Fate: Dangerous to aquatic life in high concentrations. Aquatic toxicity rating: TLM 96>1000 ppm. May be dangerous if enters water intakes. Methyl alcohol is expected to biodegrade very rapidly in soil and water. Will show high soil mobility and degrade in ambient atmosphere by reaction with photochemically produced hydroxyl radicals with an estimated half-life of 17.8 days. Bioconcentration factor for fish (golden ide) <10. Based on low Kow of -0.77, the BCF value for methyl alcohol can be estimated at 0.2.

13. DISPOSAL CONSIDERATIONS

Material that cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Processing, use, or contamination of this product may change the waste management options. Waste generators must decide if discarded material is a hazardous waste. State and local disposal regulations may differ from federal disposal definitions found in 40 CFR 261.3. Dispose of container and unused contents in accordance with federal, state and local requirements. This material is a "U" listed waste (U154 – ignitable waste).

14. TRANSPORT INFORMATIONUS DOT

Proper Shipping Name: Methanol

Hazard Class: 3

UN Number: UN1230

Packing Group: II

IMDG

Proper Shipping Name: Methanol

Hazard Class: 3, 6.1

UN Number: UN1230
Packing Group: II

IATA

Proper Shipping Name: Methanol
Hazard Class: 3, 6.1
UN Number: UN1230
Packing Group: II

15. REGULATORY INFORMATION

US Federal Regulations:

CERCLA Hazardous Substances: CAS# 67-56-1 – 5000 lb final RQ; 2270 kg final RQ
SARA Section 302: Does not have a TPQ
SARA Codes: CAS# 67-56-1 – immediate, fire
Section 313: Methyl alcohol (CAS# 67-56-1) is subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.
Clean Air Act: CAS# 67-56-1 is listed as a hazardous air pollutant (HAP).
OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

CAS# 67-56-1 is on the following state right-to-know lists: California, New Jersey, Pennsylvania, Minnesota and Massachusetts.
California Prop 65: WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

16. OTHER INFORMATION

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The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use and disposal of these materials and the safety and health of employees and customers and the protection of the environment.

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