

SAFETY DATA SHEET



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All non-emergency numbers should be directed
to Customer Service at 800-PURITY1

ALCOHOL, ANYHDROUS, REAGENT

SDS No. M0008

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: Alcohol, Anhydrous, Reagent

Synonyms: Reagent Alcohol, Anhydrous

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, Oral: GHS Category 3

Skin Irritation: GHS Category 4

Eye Irritation: GHS Category 2

Reproductive Toxicity: GHS Category 1A

Specific Target Organ Toxicity for single exposure: GHS Category 3

Label Elements

Signal Word: DANGER!

Hazard Statements:

H225 – Highly flammable liquid and vapor.

H302 – Harmful if swallowed.

H312 – Harmful in contact with skin.

H319 – Causes serious eye irritation

H332 – Harmful if inhaled.

Precautionary Statements:

P210 – Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

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

P301+P310 – IF SWALLOWED: Immediately call 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.

Clear focus. Consistent results. Complete confidence.

Emergency Overview

Poison! Harmful if inhaled or absorbed through the skin. May be harmful if swallowed. Affects central nervous system. Causes severe eye irritation and irritation to the respiratory tract. May affect liver, kidneys, and heart. Causes adverse reproductive and fetal effects in humans. Highly flammable liquid and vapor! Target Organs: Kidneys, heart central nervous system, liver, eyes, 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>
Ethyl Alcohol	64-17-5	89-91%	Yes
Methyl Alcohol	67-56-1	4-6%	Yes
Isopropyl Alcohol	67-63-0	4 - 6%	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. If vomiting occurs naturally, have victim lean forward. If victim is conscious and alert, give 2-3 cupfuls of milk or water. 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: Treat symptomatically and supportively.

5. FIRE FIGHTING MEASURES

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

Auto-ignition Temperature: 362° C (685° F)

Flash Point: 13.9° C (57° F)

Flammable Limits: Lower Limit – 3.3 vol %, Upper Limit – 19 vol %

Products of Combustion: May decompose into irritating and highly toxic gases under fire conditions (carbon monoxide and 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. Vapors may form explosive mixtures with air. 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: May form explosive peroxides.

Fire Fighting Media: Water may be ineffective. Do not use straight streams of water. For small fires, use dry chemical, carbon dioxide, water spray, or alcohol-resistant foam. For larger fires, use water spray, fog, or alcohol-resistant foam. Cool containers with flooding quantities of water and well after fire is out.

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 direct sunlight and 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. Keep from contact with oxidizing materials.

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 (Ethanol):

ACGIH – 1000 ppm TWA;
 NIOSH – 1000 ppm TWA; 1900 mg/m³ TWA; 3300 ppm IDLH
 OSHA Final PELs – 1000 ppm TWA; 1900 mg/m³ TWA
 OSHA Vacated PELs: 1000 ppm TWA; 1900 mg/m³ TWA

Exposure Limits (Methanol):

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
 OSHA Vacated PELs: 200 ppm TWA; 260 mg/m³ TWA

Exposure Limits (Isopropanol):

ACGIH – 200 ppm TWA; 400 ppm STEL
 NIOSH – 400 ppm TWA; 980 mg/m³ TWA; 2000 ppm IDLH
 OSHA Final PELs – 400 ppm TWA; 980 mg/m³ TWA
 OSHA Vacated PELs: 400 ppm TWA; 980 mg/m³ TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State and Appearance: Clear, colorless liquid.

Odor: Aromatic odor

Odor Threshold: 100 ppm

Molecular Formula: C₂H₅OH

Molecular Weight: 46.07

Auto-ignition Temperature: 362° C (685° F)

Flash Point: 13.9° C (57° F)

Flammable Limits: Lower Limit – 3.3 vol %, Upper Limit – 19 vol %

pH: Not available.

Boiling Point: 78.5° C @ 760 mm Hg

Freezing/Melting Point: -90° C

Decomposition Temperature: Not available

Specific Gravity: 0.7905 g/cm³

Vapor Density (Air=1): 1.6

Vapor Pressure: 40.9 mm Hg @ 20° C.

Evaporation Rate (Butyl acetate = 1): 2.0

Viscosity: Not available

Solubility: Soluble in water

Conductivity (Ethyl Alcohol at 25°C): Conductive; Conductivity = 1.35x10⁵ pS/m; Dielectric Constant = 24.55; Relaxation Time Constant = 1.6x10⁻³ seconds

10. STABILITY AND REACTIVITY

Stability: Stable under normal temperatures and pressure.

Conditions to Avoid: Incompatible materials, ignition sources, excess heat, oxidizers.

Incompatibility With Various Substances: Strong oxidizing agents, acids, alkali metals, ammonia, hydrazine, peroxides, sodium, acid anhydrides, calcium hypochlorite, chromyl chloride, nitrosyl perchlorate, bromine pentafluoride, perchloric acid, silver nitrate, mercuric nitrate, potassium tert-butoxide, magnesium perchlorate, acid chlorides, platinum, uranium hexafluoride, silver oxide, iodine heptafluoride, acetyl bromide, disulfuryl difluoride, tetrachlorosilane+water, acetyl chloride, permanganic acid, ruthenium (III) oxide, uranyl perchlorate, potassium dioxide.

Hazardous Decomposition Products: Carbon monoxide, carbon dioxide, irritating and toxic fumes.

Hazardous Polymerization: Has not been reported.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Inhalation, skin absorption, skin contact

Acute Exposure Hazards:

INHALATION HAZARD: Inhalation of high concentrations may cause central nervous effects characterized by nausea, headache, dizziness, unconsciousness, and coma. May cause narcotic effects in high concentrations. Inhalation of vapors may cause drowsiness and dizziness.

INGESTION HAZARD: Causes gastrointestinal irritation with nausea, vomiting, and diarrhea. May cause systemic 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.

SKIN CONTACT HAZARD: Causes moderate skin irritation. May cause cyanosis of the extremities. Skin absorption of methanol can cause systemic effects, including disturbances in vision.

EYE CONTACT HAZARD: Causes severe eye irritation and possible chemical conjunctivitis and/or corneal damage. May cause transient corneal injury. May cause painful sensitization to light. Inhalation, ingestion, or skin absorption of methanol can cause significant disturbances in vision, including blindness.

Chronic Exposure Hazards: May cause reproductive and fetal effects. Laboratory experiments have resulted in mutagenic effects. Animal studies have reported the development of tumors. Repeated or prolonged exposure may cause liver, kidney, and heart damage.

Animal Toxicity for Ethanol:

Draize test, rabbit, eye: 500 mg Severe;

Draize test, rabbit, eye: 500 mg/24 hr Mild;

Draize test, rabbit, skin: 20 mg/24 hr Moderate;

Inhalation, mouse: LC50 = 39 g/m³/4 hr;

Inhalation, rat: LC50 = 2000 ppm/10 hr;

Oral, mouse: LD50 = 3450 mg/kg;

Oral, rabbit: LD50 = 6300 mg/kg;

Oral, rat: LD50 = 7060 mg/kg;

Oral, rat: LD50 = 9000 mg/kg;

Animal Toxicity for Methanol:

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 for Methanol:

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.

Animal Toxicity for Isopropanol:

Draize test, rabbit, eye: 100 mg Severe;

Draize test, rabbit, eye: 10 mg Moderate;

Draize test, rabbit, eye: 100 mg/24 hr Moderate;

Draize test, rabbit, skin: 500 mg Mild;

Inhalation, mouse: LC50 = 53,000 mg/m³;

Inhalation, rat: LC50 = 16,000 ppm/8 hr;

Inhalation, rat: LC50 = 72,600 mg/kg;

Oral, mouse: LD50 = 3600 mg/kg;

Oral, mouse: LD50 = 3600 mg/kg;

Oral, rabbit: LD50 = 6410 mg/kg;

Oral, rat: LD50 = 5045 mg/kg;

Oral, rat: LD50 = 5000 mg/kg;

Skin, rabbit: LD50 = 12,800 mg/kg;

Carcinogenicity: Ethanol, methanol, and isopropanol are not listed as carcinogens by ACGIH, IARC, NTP, or CA Prop 65

Epidemiology: Ethanol - has been shown to produce fetotoxicity in the embryo or fetus of laboratory animals. Prenatal exposure to ethanol is associated with a distinct pattern of congenital malformations that have been collectively termed "fetal alcohol syndrome." Methanol - has been shown to produce fetotoxicity in the embryo of laboratory animals. Specific developmental abnormalities include cardiovascular, musculoskeletal, and urogenital systems. Isopropanol - Experimental teratogenic and reproductive effects have been reported. Early epidemiological studies have suggested an association between the strong acid manufacture of isopropyl alcohol and paranasal sinus cancer in workers.

Teratogenicity:

Oral, human - woman: TDLo = 41 g/kg (female 41 weeks after conception) Effects on newborn - Apgar score (human only) and Effects on newborn - other neonatal measures or effects and Effects on newborn - drug dependence.

Methanol - 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. Isopropanol - A rat and rabbit developmental toxicity study showed no teratogenic effects at doses that were clearly toxic to the mother. In a separate rate study, no evidence of developmental neurotoxicity was associated with gestational exposures to isopropanol up to 1200 mg/kg/d.

Reproductive Effects: Intrauterine, human - woman: TDLo = 200 mg/kg (female 5 days pre-mating) Fertility - female fertility index e.g. # females pregnant per # sperm positive females; # female pregnant per # females mated).

Mutagenicity: DNA Inhibition, human, lymphocyte = 220 mmol/L; Cytogenetic analysis: human, lymphocyte = 1160 g/L; Cytogenetic analysis: human, fibroblast = 12,000 ppm; Cytogenetic analysis: human, leukocyte = 1 pph/72H (continuous); Sister chromatid exchange, human, lymphocyte = 500 ppm/72H (continuous).

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

Other Studies: Isopropanol - Standard Draize test – administration onto the skin (rabbit) = 500 mg (Mild); Standard Draize test – administration into the eye (rabbit) = 100 mg (Moderate); Standard Draize test – administration into the eye = 10 mg (Moderate); Standard Draize test – administration into the eye (rabbit) = 100 mg/24H (Moderate)

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Fish: Rainbow trout: LC50 = 12,900-15,300 mg/L, 96H, flow-through at 24-24.3° C

Fish: Rainbow trout: LC50 = 11,200 mg/L, 24H, fingerling (unspecified)

Bacteria: *Phytobacterium phosphoreum*: EC50 = 34,900 mg/L, 5-30M, Microtox test

When spilled on land, it is apt to volatilize, biodegrade, and leach into the ground water, but no data on the rates of these processes could be found. Its fate in ground water is unknown. When released into water it will probably volatilize and biodegrade. It would not be expected to adsorb to soil or bioconcentrate in fish.

Environmental Fate: No information available.

Physical: THOD: 2.40 g oxygen/g; COD: 2.23 g oxygen/g; BOD-5: 1.19-1.72 g oxygen/g

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. Methyl alcohol is a "U" listed waste (U154 – ignitable waste).

14. TRANSPORT INFORMATION

US DOT, IATA, IMO

Proper Shipping Name: Ethanol Solution

Hazard Class: 3

UN Number: UN1170

Packing Group: II

Canada TDG

Additional Information: No information available.

15. REGULATORY INFORMATION

US Federal Regulations:

TSCA: All components of this material are listed on the TSCA Inventory.

Health and Safety Reporting List: CAS# 67-63-0 Effective 12/15/86, Sunset 12/15/96.

Chemical Test Rules: CAS# 67-63-0: 40 CFR 799.2325

Section 12b: Not listed.

TSCA Significant New Use Rule: Does not have an SNUR under TSCA.

CERCLA Hazardous Substances: CAS#67-56-1 – 5000 lb, 2270 kg final RQ

SARA Section 302: Does not have a TPQ

SARA Codes: CAS# 64-17-5 – immediate, delayed, fire; CAS# 67-56-1 – immediate, fire; CAS# 67-63-0 – acute, chronic, flammable

Section 313: Methanol (CSA# 67-56-1) and Isopropanol (CAS# 67-63-0) are subject to SARA Title III Section 313 and 40 CFR 373 reporting requirements.

Clean Air Act This material contains no hazardous air pollutants (HAP). This material contains no Class 1 Ozone Depleters. This material contains no Class 2 Ozone Depleters.

Clean Water Act: This material contains no Hazardous Substances. This material contains no Priority Pollutants. It has no Toxic Pollutants.

OSHA: Not considered highly hazardous by OSHA.

US State Regulations:

All components can be found on the following state right-to-know lists: California, New Jersey, Pennsylvania, Minnesota, and Massachusetts

California Prop 65: This product contains ethanol, a chemical known to the state of California to cause developmental reproductive toxicity. California No Significant Risk Level: Not listed

Canada:

DSL/NDSL: All components are listed on Canada's DSL list.

WHMIS: This product has a WHMIS classification of B2, D1A, D2B. This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and this MSDS contains all the information required by those regulations.

Ingredient Disclosure List: All components are listed on Canada's Ingredient Disclosure List.

DSCL (EEC):

Hazard Symbols: Xn; F

Risk Phrases: R11 – Highly Flammable; R20/21/22 – Harmful by inhalation, in contact with skin, and if swallowed; R68/20/21/22 – Possible irreversible effects through inhalation, in contact with skin, and if swallowed.

Safety Phrases: S7 – Keep container tightly closed, S16 – Keep away from sources of ignition-no smoking; S36/37 – Wear suitable protective clothing and gloves; S45 – In case of accident, or if you feel unwell, seek medical advice immediately (show label where possible).

WGK (Water Danger/protection): CAS# 64-17-5: 0; CAS# 67-56-1: 1; CAS# 67-63-0: 1

16. OTHER INFORMATION

Originally Prepared: 5/21/2007

Last Revised: 4/1/2013 – Updated blend information.

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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