

MATERIAL SAFETY DATA SHEET

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Version 2.2

Section 1 - Product and Company Information

Product Name 2-PROPANOL, 99.9%, PRA GRADE
Product Number 324086
Brand ALDRICH

Company Sigma-Aldrich
Address 3050 Spruce Street
SAINT LOUIS MO 63103 US

Technical Phone: 800-325-5832
Fax: 800-325-5052
Emergency Phone: 314-776-6555

Section 2 - Composition/Information on Ingredient

Substance Name	CAS #	SARA 313
2-PROPANOL	67-63-0	Yes

Formula C3H8O
Synonyms Alcool isopropilico (Italian) * Alcool isopropylique (French) * Alcojel * Alcosolve * Avantin * Avantine * Combi-schutz * Dimethylcarbinol * Hartosol * 2-Hydroxypropane * Imsol A * Isohol * Isopropanol * Isopropyl alcohol (ACGIH:OSHA) * Iso-propylalkohol (German) * IPS 1 (alcohol) * Lutosol * 1-Methylethanol * 1-Methylethyl alcohol * Petrohol * PRO * 2-Propanol * i-Propanol (German) * n-Propan-2-ol * sec-Propyl alcohol * 2-Propyl alcohol * i-Propylalkohol (German) * Spectrar * Sterisol hand disinfectant * Takineocol * Virahol * isopropanol

RTECS Number: NT8050000

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Flammable (USA) Highly Flammable (EU). Irritant.
Irritating to eyes and skin. Vapors may cause drowsiness and dizziness.
Target organ(s): Nerves. Kidneys.

HMIS RATING

HEALTH: 2*
FLAMMABILITY: 3
REACTIVITY: 1

NFPA RATING

HEALTH: 2
FLAMMABILITY: 3
REACTIVITY: 1

*additional chronic hazards present.

For additional information on toxicity, please refer to Section 11.

Section 4 - First Aid Measures

ORAL EXPOSURE

If swallowed, wash out mouth with water provided person is conscious. Call a physician.

INHALATION EXPOSURE

If inhaled, remove to fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen.

DERMAL EXPOSURE

In case of contact, immediately wash skin with soap and copious amounts of water.

EYE EXPOSURE

In case of contact, immediately flush eyes with copious amounts of water for at least 15 minutes.

Section 5 - Fire Fighting Measures

FLAMMABLE HAZARDS

Flammable Hazards: Yes

EXPLOSION HAZARDS

Vapor may travel considerable distance to source of ignition and flash back. Container explosion may occur under fire conditions.

FLASH POINT

53 °F 12 °C Method: closed cup

EXPLOSION LIMITS

Lower: 2.5 % Upper: 12 %

AUTOIGNITION TEMP

399 °C

FLAMMABILITY

N/A

EXTINGUISHING MEDIA

Suitable: For small (incipient) fires, use media such as "alcohol" foam, dry chemical, or carbon dioxide. For large fires, apply water from as far as possible. Use very large quantities (flooding) of water applied as a mist or spray; solid streams of water may be ineffective. Cool all affected containers with flooding quantities of water.

FIREFIGHTING

Protective Equipment: Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
Specific Hazard(s): Flammable liquid. Emits toxic fumes under fire conditions.
Specific Method(s) of Fire Fighting: Use water spray to cool fire-exposed containers.

Section 6 - Accidental Release Measures

PROCEDURE TO BE FOLLOWED IN CASE OF LEAK OR SPILL

Evacuate area. Shut off all sources of ignition. Use nonsparking

tools.

PROCEDURE(S) OF PERSONAL PRECAUTION(S)

Wear self-contained breathing apparatus, rubber boots, and heavy rubber gloves.

METHODS FOR CLEANING UP

Cover with dry-lime, sand, or soda ash. Place in covered containers using non-sparking tools and transport outdoors. Ventilate area and wash spill site after material pickup is complete.

Section 7 - Handling and Storage

HANDLING

User Exposure: Do not breathe vapor. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure.

STORAGE

Suitable: Keep tightly closed. Keep away from heat, sparks, and open flame. Store in a cool dry place. Handle and store under nitrogen.

SPECIAL REQUIREMENTS

Handle and store under inert gas. Hygroscopic.

Section 8 - Exposure Controls / PPE

ENGINEERING CONTROLS

Safety shower and eye bath. Use nonsparking tools. Mechanical exhaust required.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory: Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU). Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator.
Hand: Compatible chemical-resistant gloves.
Eye: Chemical safety goggles.

GENERAL HYGIENE MEASURES

Remove and wash contaminated clothing promptly. Wash thoroughly after handling.

EXPOSURE LIMITS, RTECS

Country	Source	Type	Value
USA	ACGIH	STEL	400 PPM
USA	ACGIH	TWA	200 PPM
USA	MSHA Standard-air	TWA	400 PPM (980 MG/M3)
USA	OSHA.	PEL	8H TWA 400 PPM (980 MG/M3)
New Zealand	OEL		
Remarks:	check ACGIH TLV		
USA	NIOSH	TWA	400 PPM
		STEL	500 PPM

EXPOSURE LIMITS

Country	Source	Type	Value
Poland		NDS	900 MG/M3
Poland		NDSch	1200 MG/M3

Section 9 - Physical/Chemical Properties

Appearance	Physical State: Liquid Color: Colorless	
Property	Value	At Temperature or Pressure
Molecular Weight	60.1 AMU	
pH	N/A	
BP/BP Range	81.0 - 83.0 °C	
MP/MP Range	- 89.5 °C	
Freezing Point	- 88.0 °C	
Vapor Pressure	33 mmHg	20 °C
Vapor Density	2.1 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.785 g/cm3	
Bulk Density	N/A	
Odor Threshold	N/A	
Volatile%	N/A	
VOC Content	N/A	
Water Content	N/A	
Solvent Content	N/A	
Evaporation Rate	3	
Viscosity	0.003 Pas	20 °C
Surface Tension	20.8 mN/m	25 °C
Partition Coefficient	Log Kow: 0.05	
Decomposition Temp.	N/A	
Flash Point	53 °F 12 °C	Method: closed cup
Explosion Limits	Lower: 2.5 % Upper: 12 %	
Flammability	N/A	
Autoignition Temp	399 °C	
Refractive Index	1.378	
Optical Rotation	N/A	
Miscellaneous Data	N/A	
Solubility	Solubility in Water: Complete	

N/A = not available

Section 10 - Stability and Reactivity

STABILITY

Stable: Stable.

Conditions of Instability: May form peroxides of unknown stability.

Materials to Avoid: Oxidizing agents, Acids, Acid anhydrides, Halogens, Aluminum.

HAZARDOUS DECOMPOSITION PRODUCTS

Hazardous Decomposition Products: Carbon monoxide, Carbon dioxide.

HAZARDOUS POLYMERIZATION

Hazardous Polymerization: Will not occur

Section 11 - Toxicological Information

ROUTE OF EXPOSURE

Skin Contact: Causes skin irritation.

Skin Absorption: May be harmful if absorbed through the skin.

Eye Contact: Causes eye irritation.

Inhalation: May be harmful if inhaled. Material may be

irritating to mucous membranes and upper respiratory tract.
Ingestion: May be harmful if swallowed.

TARGET ORGAN(S) OR SYSTEM(S)

Nerves. Kidneys. Cardiovascular system. G.I. System.
Overexposure may cause mild, reversible liver effects.

SIGNS AND SYMPTOMS OF EXPOSURE

To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated. Drowsiness. Narcotic effect. Nausea, headache, and vomiting. Prolonged exposure can cause: Can cause CNS depression.

TOXICITY DATA

Oral

Man

5272 mg/kg

LDLO

Remarks: Lungs, Thorax, or Respiration:Chronic pulmonary edema. Vascular:BP lowering not characterized in autonomic section. Behavioral:Coma.

Oral

Human

3570 mg/kg

LDLO

Remarks: Behavioral:Coma. Lungs, Thorax, or Respiration:Respiratory depression. Gastrointestinal:Nausea or vomiting.

Oral

Rat

5045 mg/kg

LD50

Remarks: Behavioral:Somnolence (general depressed activity). Behavioral:Altered sleep time (including change in righting reflex).

Inhalation

Rat

16,000 ppm

LC50

Intraperitoneal

Rat

2735 MG/KG

LD50

Intravenous

Rat

1088 MG/KG

LD50

Oral

Mouse

3600 mg/kg

LD50

Remarks: Behavioral:Altered sleep time (including change in righting reflex). Behavioral:Somnolence (general depressed activity).

Intraperitoneal
Mouse
4477 MG/KG
LD50

Intravenous
Mouse
1509 MG/KG
LD50

Oral
Rabbit
6410 mg/kg
LD50

Skin
Rabbit
12800 mg/kg
LD50

Intraperitoneal
Rabbit
667 MG/KG
LD50

Intravenous
Rabbit
1184 MG/KG
LD50

Intraperitoneal
Guinea pig
2560 MG/KG
LD50

Intraperitoneal
Hamster
3444 MG/KG
LD50

IRRITATION DATA

Skin
Rabbit
500 mg
Remarks: Mild irritation effect

Eyes
Rabbit
100 mg
Remarks: Severe irritation effect

Eyes
Rabbit
10 mg
Remarks: Moderate irritation effect

Eyes
Rabbit
100 mg
24H
Remarks: Moderate irritation effect

CHRONIC EXPOSURE - CARCINOGEN

Result: This product is or contains a component that is not classifiable as to its carcinogenicity based on its IARC, ACGIH, NTP, or EPA classification.

IARC CARCINOGEN LIST

Rating: Group 3

CHRONIC EXPOSURE - TERATOGEN

Species: Rat
Dose: 8 GM/KG
Route of Application: Oral
Exposure Time: (6-15D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 32400 UG/KG
Route of Application: Oral
Exposure Time: (26W PRE)
Result: Effects on Embryo or Fetus: Fetal death.

Species: Rat
Dose: 3500 PPM/7H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Effects on Embryo or Fetus: Fetotoxicity (except death, e.g., stunted fetus).

Species: Rat
Dose: 7000 PPM/7H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Specific Developmental Abnormalities: Musculoskeletal system.

CHRONIC EXPOSURE - MUTAGEN

Species: Rat
Route: Inhalation
Dose: 1030 UG/M3/16W-I
Mutation test: Cytogenetic analysis

CHRONIC EXPOSURE - REPRODUCTIVE HAZARD

Species: Rat
Dose: 11340 MG/KG
Route of Application: Oral
Exposure Time: (45D PRE)
Result: Maternal Effects: Menstrual cycle changes or disorders.

Species: Rat
Dose: 5040 MG/KG
Route of Application: Oral
Exposure Time: (1-20D PREG)
Result: Effects on Fertility: Litter size (e.g.; # fetuses per litter; measured before birth).

Species: Rat

Dose: 3500 GM/KG
Route of Application: Oral
Exposure Time: (MULTIGENERATION)
Result: Effects on Fertility: Mating performance (e.g., # sperm positive females per # females mated; # copulations per # estrus cycles).

Species: Rat
Dose: 10000 PPM/7H
Route of Application: Inhalation
Exposure Time: (1-19D PREG)
Result: Effects on Embryo or Fetus: Fetal death. Effects on Fertility: Post-implantation mortality (e.g., dead and/or resorbed implants per total number of implants). Effects on Fertility: Pre-implantation mortality (e.g., reduction in number of implants per female; total number of implants per corpora lutea).

Species: Rabbit
Dose: 6240 MG/KG
Route of Application: Oral
Exposure Time: (6-18D PREG)
Result: Maternal Effects: Other effects.

Section 12 - Ecological Information

ACUTE ECOTOXICITY TESTS

Test Type: LC50 Fish
Species: Pimephales promelas (Fathead minnow)
Time: 96 h
Value: 9,640 mg/l

Test Type: EC50 Daphnia
Species: Daphnia magna
Time: 24 h
Value: 5,102 mg/l

Test Type: EC50 Algae
Species: Scenedesmus subspicatus
Time: 72 h
Value: > 2,000 mg/l

Test Type: EC50 Algae
Time: 24 h
Value: > 1,000 mg/l

Section 13 - Disposal Considerations

APPROPRIATE METHOD OF DISPOSAL OF SUBSTANCE OR PREPARATION

Contact a licensed professional waste disposal service to dispose of this material. Burn in a chemical incinerator equipped with an afterburner and scrubber but exert extra care in igniting as this material is highly flammable. Observe all federal, state, and local environmental regulations.

Section 14 - Transport Information

DOT

Proper Shipping Name: Isopropanol [or] Isopropyl alcohol
UN#: 1219

Class: 3
Packing Group: Packing Group II
Hazard Label: Flammable liquid
PIH: Not PIH

IATA

Proper Shipping Name: Isopropanol
IATA UN Number: 1219
Hazard Class: 3
Packing Group: II

Section 15 - Regulatory Information

EU DIRECTIVES CLASSIFICATION

Symbol of Danger: F-Xi
Indication of Danger: Highly Flammable. Irritant.
R: 11-36-67
Risk Statements: Highly flammable. Irritating to eyes. Vapors may cause drowsiness and dizziness.
S: 7-16-24/25-26
Safety Statements: Keep container tightly closed. Keep away from sources of ignition - no smoking. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

US CLASSIFICATION AND LABEL TEXT

Indication of Danger: Flammable (USA) Highly Flammable (EU). Irritant.
Risk Statements: Irritating to eyes and skin. Vapors may cause drowsiness and dizziness.
Safety Statements: Keep container tightly closed. Keep away from sources of ignition - no smoking. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
US Statements: Target organ(s): Nerves. Kidneys.

UNITED STATES REGULATORY INFORMATION

SARA LISTED: Yes
DEMINIMIS: 0.1 %
NOTES: This product is subject to SARA section 313 reporting requirements.
TSCA INVENTORY ITEM: Yes

CANADA REGULATORY INFORMATION

WHMIS Classification: This product has been classified in accordance with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.
DSL: Yes
NDSL: No

Section 16 - Other Information

DISCLAIMER

For R&D use only. Not for drug, household or other uses.

WARRANTY

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Inc.,

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