



SIGMA-ALDRICH

Material Safety Data Sheet

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Section 1 - Product and Company Information

Product Name ETHER, ANHYDROUS, 99.8%
Product Number 296082
Brand Aldrich Chemical

Company Sigma-Aldrich
Street Address 3050 Spruce Street
City, State, Zip, Country St. Louis, MO 63103 US
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Section 2 - Composition/Information on Ingredient

Substance Name
DIETHYL ETHER

CAS #
60-29-7

SARA 313
No

Formula C₄H₁₀O
Synonyms Aether, Anaesthetic ether, Anesthesia ether, Anesthetic ether, Diaethylaether (German), Diethyl ether (DOT:OSHA), Diethyl oxide, Dwuetylowy eter (Polish), Etere etilico (Italian), Ether, Ether ethylique (French), Ethoxyethane, Ethyl ether (ACGIH:OSHA), Oxyde d'ethyle (French), RCRA waste number U117, Solvent ether

Section 3 - Hazards Identification

Emergency Overview

Flammable (USA) Extremely Flammable (EU). Harmful.
Harmful if swallowed. Irritating to eyes, respiratory system, and skin. May form explosive peroxides.
Target organ(s): Central nervous system. Kidneys.

HMIS Rating

Health: 1 Flammability: 4 Reactivity: 3

NFPA Ratings

Health: 1 Flammability: 4 Reactivity: 3

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

Explosion Hazards

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

Flash Point:	-104 °F	-40 °C
Explosion Limits:	Lower: 1.8 %	Upper: 48 %
Autoignition Temp:	160 °C	Flammability: N/A

Extinguishing Media

Suitable

Carbon dioxide, dry chemical powder, or appropriate foam.

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.

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. Refrigerate.

Section 8 - Exposure Controls / PPE

Engineering Controls

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

Personal Protective Equipment

Respiratory

NIOSH/MSHA-approved 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

<u>Country</u>	<u>Source</u>	<u>Type</u>	<u>Value</u>	<u>Remarks</u>
USA	ACGIH	STEL	1520 MG/M3 (500 PPM)	
USA	ACGIH	TWA	1210 MG/M3 (400 PPM)	
USA	MSHA Standard-air	TWA	400 PPM (1200 MG/M3)	
USA	OSHA.	PEL	8H TWA 400 PPM (1200 MG/M3)	
New Zealand	OEL			check ACGIH TLV

Section 9 - Physical/Chemical Properties

Appearance

Physical State

Liquid

Color

Colorless

Molecular Weight: 74.12 AMU

Property

Value

At Temperature or Pressure

pH	N/A	
BP/BP Range	34.6 °C	760 mmHg
MP/MP Range	-116 °C	
Freezing Point	N/A	
Vapor Pressure	442.552 mmHg	20 °C
Vapor Density	2.6 g/l	
Saturated Vapor Conc.	N/A	
SG/Density	0.71 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	N/A	
Viscosity	N/A	
Partition Coefficient	N/A	
Decomposition Temp.	N/A	
Flash Point °F	-104 °F	
Flash Point °C	-40 °C	
Explosion Limits	Lower: 1.8 % Upper: 48 %	
Autoignition Temp	160 °C	
Refractive Index	1.353	
Solubility	N/A	

Section 10 - Stability and Reactivity

Stability

Conditions of Instability

May form peroxides of unknown stability.

Conditions to Avoid

Sensitive to light. Sensitive to air. Sensitive to heat.

Materials to Avoid

Oxidizing agents, Strong acids.

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 is irritating to mucous membranes and upper respiratory tract.

Ingestion

Harmful if swallowed.

Target Organ(s) or System(s)

Central nervous system. Kidneys. Liver. G.I. System. Skeletal muscle.

Signs and Symptoms of Exposure

Contact with eyes can cause redness, tearing, and blurred vision. Prolonged or repeated contact with skin can cause defatting and dermatitis. Exposure can cause: Coughing, chest pains, difficulty in breathing.

RTECS Number: KI5775000

Toxicity Data

Oral - Man: 260 mg/kg (LDLO)

Oral - Rat: 1,215 mg/kg (LD50)

Inhalation - Mouse: 31,000 ppm (LC50)

Remarks: Behavioral: Convulsions or effect on seizure threshold.

Intraperitoneal - Mouse: 2420 MG/KG (LD50)

Intravenous - Mouse: 996 MG/KG (LD50)

Skin - Rabbit: >20 ML/KG (LD50)

Irritation Data

Eyes - Human: 100 ppm

Skin - Rabbit: 360 mg

Remarks: Open irritation test

Eyes - Rabbit: 100 mg

Remarks: Moderate irritation effect

Skin - Guinea pig: 50 mg 24H

Remarks: Severe irritation effect

Chronic Exposure - Mutagen

<u>Species</u>	<u>Dose</u>	<u>Cell Type</u>	<u>Mutation test</u>
Mouse	2850 MG/L	Embryo	DNA inhibition
Hamster	1 PPH	fibroblast	Other mutation test systems

Chronic Exposure - Reproductive Hazard

Result: Overexposure may cause reproductive disorder(s) based on tests with laboratory animals.

Section 12 - Ecological Information

Section 13 - Disposal Considerations

Appropriate Method of Disposal of Substance or Preparation

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: Diethyl ether [or] Ethyl ether

UN#: 1155

Class: 3

Packing Group: Packing Group I

PIH: Not PIH

IATA

Proper Shipping Name: ETHYL ETHER

IATA Number: 1155

Hazard Class: 3

Packing Group: I

Section 15 - Regulatory Information

EU Directives Classification

Symbol of Danger: F+

Indication of Danger

Extremely Flammable.

Risk Statements **R:** 12 19

Extremely flammable. May form explosive peroxides.

Safety Statements **S:** 9 16 29 33

Keep container in a well-ventilated place. Keep away from sources of ignition - no smoking. Do not empty into drains. Take precautionary measures against static discharges.

US Classification and Label Text

Indication of Danger

Flammable (USA) Extremely Flammable (EU). Harmful.

Risk Statements

Harmful if swallowed. Irritating to eyes, respiratory system, and skin. May form explosive peroxides.

Safety Statements

Keep away from sources of ignition - no smoking. Keep container tightly closed in a cool well-ventilated place. Do not empty into drains. Take precautionary measures against static discharges. Wear suitable gloves and eye/face protection.

US Statements

Target organ(s): Central nervous system. Kidneys.

Handling and Storage

Refrigerate.

United States Regulatory Information

SARA 313 Listed: No

TSCA Inventory Item: Yes

Section 16 - Other Information

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. Sigma-Aldrich Inc., shall not be held liable for any damage resulting from handling or from contact with the above product. See reverse side of

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