

SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS, 10th Edition

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METHYL ETHER

DPIM: MJW500 Hazard Rating: 3

CAS: 115-10-6

DOT Number: UN 1033

M Formula: C₂H₆O M Weight: 46.08

Properties:

Colorless gas; ether odor. Melting point: -138.5°, boiling point: -23.7°, lower explosive limit: 3.4%, upper explosive limit: 27%, flash point: -42°F (CC), autoignition temperature: 662°F, vapor density: 1.617, density: 0.661 (air = 1). Soluble in alcohol, water, ether.

Synonyms:

DIMETHYL ETHER (DOT)

OXYBISMETHANE OXYBISMETHANE

WOOD ETHER WOOD ETHER

TOXICITY DATA with REFERENCE

Inhalation-Rat LC₅₀:308 g/m³ Toxicologist. (Soc. of Toxicology, Inc., 475 Wolf Ledge Parkway, Akron, OH 44311) V.1- 1981-TOXID9 1,79,81

Inhalation-Mouse LC₅₀:386,000 ppm/30M European Journal of Toxicology and Environmental Hygiene. (Paris, France) V.7-9, 1974-76. For publisher information, see TOERD9EJTXA 8,287,75

Inhalation-Rat TCLO:2 pph/6H/30W-I Toxicology. (Elsevier Scientific Pub. Ireland, Ltd., POB 85, Limerick, Ireland) V.1- 1973-TXCYAC 11,65,78

Consensus Reports:

Reported in EPA TSCA Inventory.

Standards and Recommendations

DFG MAK: 1000 ppm (1900 mg/m³)

DOT Classification: 2.1; Label: Flammable Gas

SAFETY PROFILE:

Slightly toxic by inhalation. Very dangerous fire hazard when exposed to heat, flame, or oxidizers. Dangerous explosion hazard when exposed to flame, sparks, etc. Violent reaction with AlH₃ and LiAlH₂. Keep in closed container away from heat and open flame. To fight fire, stop flow of gas. When heated to decomposition it emits acrid smoke and irritating fumes. See also ETHERS and ETHYL ETHER.

Class: Standards or Recommendations

ETHYL ETHER

DPIM: EJU000Hazard Rating: 3

CAS: 60-29-7

DOT Number: UN 1155

M Formula: C₄H₁₀O M Weight: 74.14

Structure: CH₃CH₂OCH₂CH₃

Properties:

A clear, volatile liquid; sweet, pungent odor. Melting point: -116.2°, boiling point: 34.6°, Underwriters Laboratory Classification: 100, lower explosive limit: 1.85%, upper explosive limit: 36%, flash point: -49°F, density: 0.7135 @ 20°/4°, autoignition temperature: 320°F, vapor pressure: 442 millimeter @ 20°, vapor density: 2.56. Soluble in H₂SO₄; slightly soluble in H₂O; miscible in most organic solvs.

Synonyms:

AETHER

ANAESTHETIC ETHER ANAESTHETIC ETHER

ANESTHESIA ETHER ANESTHESIA ETHER

ANESTHETIC ETHER ANESTHETIC ETHER

DIAETHYLAETHER (GERMAN) DIAETHYLAETHER GERMAN

DIETHYL ETHER (DOT) DIETHYL ETHER DOT

DIETHYL OXIDE DIETHYL OXIDE
 DWUETYLOWY ETER (POLISH) DWUETYLOWY ETER POLISH
 ETERE ETILICO (ITALIAN) ETERE ETILICO ITALIAN
 ETHER ETHER
 ETHER ETHYLIQUE (FRENCH) ETHER ETHYLIQUE FRENCH
 ETHOXYETHANE ETHOXYETHANE
 1,1'-OXYBISETHANE 1 1 OXYBISETHANE
 OXYDE dETHYLE (FRENCH) OXYDE ETHYLE FRENCH
 RCRA WASTE NUMBER U117 RCRA WASTE NUMBER U117
 SOLVENT ETHER SOLVENT ETHER
 TOXICITY DATA with REFERENCE
 Eye effects-Human 100 ppm Journal of Industrial Hygiene and Toxicology. (Baltimore, MD/New York, NY) V.18-31, 1936-49. For publisher information, see AEHLAUJIHTAB 25,282,43
 Skin-Rabbit, adult 360 mg open Mild irritation effects Union Carbide Data Sheet. (Industrial Medicine and Toxicology Dept., Union Carbide Corp., 270 Park Ave., New York, NY 10017)UCDS** 4/5/73
 Eye effects-Rabbit, adult 100 mg Moderate irritation effects Federation Proceedings, Federation of American Societies for Experimental Biology. (9650 Rockville Pike, Bethesda, MD 20014) V.1- 1942-FEPRA7 35,729,76
 Skin-Guinea Pig, adult 50 mg/24H Severe irritation effects Hifu. Skin. (Nihon Hifuka Gakkai Osaka Chihokai, c/o Osaka Daigaku Hifuka Kyoshitsu, 3-1, Dojima Hamadori, Fukushima-ku, Osaka 553, Japan) V.1- 1959-HIFUAG 22,373,80
 DNA Repair-Escherichia coli 50 mL/well/16H Chemico-Biological Interactions. (Elsevier Publishing, P.O. Box 211, Amsterdam C, Netherlands) V.1- 1969-CBINA8 15,219,76
 dyt-Saccharomyces cerevisiae 100 mmol/tube Hereditas. (J.L. Toernqvist Book Dealers, S-26122 Landskrona, Sweden) V.1- 1947-HEREAY 33,457,47
 oms-Hamster:fibroblast 1 pph Anesthesiology. (J.B. Lippincott Co., Keystone Industrial Park, Scranton, PA 18512) V.1- 1940-ANESAV 43,21,75
 Oral-Man LDLo:260 mg/kg "Poisoning; Toxicology, Symptoms, Treatments" Arena, J.M. 2nd ed., Springfield, IL, C. C. Thomas, 197085DCAI 2,73,70
 Oral-Human LDLo:420 mg/kg "Handbook of Poisoning: Diagnosis and Treatment" Dreishach, R.H, 8th ed., Los Altos, CA Lange Medical Publications, 197432ZWAA 8,275,74
 Inhalation-Human TCLo:200 ppm:NOSE Journal of Industrial Hygiene and Toxicology. (Baltimore, MD/New York, NY) V.18-31, 1936-49. For publisher information, see AEHLAUJIHTAB 25,282,43
 Oral-Rat LD50:1215 mg/kg Toxicology and Applied Pharmacology. (Academic Press, 111 5th Ave., New York, NY 10003) V.1- 1959-TXAPA9 19,699,71
 Inhalation-Rat LC50:73,000 ppm/2H Toxicology and Applied Pharmacology. (Academic Press, 111 5th Ave., New York, NY 10003) V.1- 1959-TXAPA9 17,275,70
 Inhalation-Mouse LC50:6500 ppm/99M Toxicology and Applied Pharmacology. (Academic Press, 111 5th Ave., New York, NY 10003) V.1- 1959-TXAPA9 17,275,70
 Intraperitoneal-Mouse LD50:2420 mg/kg Proceedings of the Western Pharmacology Society. (Univ. of California, Dept. of Pharmacology, Los Angeles, CA 94122) V.1- 1958-PWPSA8 27,511,84
 Subcutaneous-Mouse LDLo:8 mg/kg "Abdernalden's Handbuch der Biologischen Arbeitsmethoden." (Leipzig, Germany)HBAMAK 4,1295,35
 Intravenous-Mouse LD50:996 mg/kg Journal of Pharmaceutical Sciences. (American Pharmaceutical Association, 2215 Constitution Ave., N.W., Washington, DC 20037) V.50-1961-JPMSAE 67,566,78
 Inhalation-Dog, adult LCLo:76,000 ppm "Abdernalden's Handbuch der Biologischen Arbeitsmethoden." (Leipzig, Germany)HBAMAK 4,1294,35
 Inhalation-Rabbit, adult LCLo:106,000 ppm "Abdernalden's Handbuch der Biologischen Arbeitsmethoden." (Leipzig, Germany)HBAMAK 4,1294,35
 Intraperitoneal-Guinea Pig, adult LDLo:2000 mg/kg American Industrial Hygiene Association Journal. (AIHA, 475 Wolf Ledges Pkwy., Akron, OH 44311) V.19- 1958-AIHAAP 35,21,74
 Subcutaneous-Frog, adult LDLo:24 g/kg "Abdernalden's Handbuch der Biologischen Arbeitsmethoden." (Leipzig, Germany)HBAMAK 4,1295,35
 Consensus Reports:

IARC Cancer Review: Animal No Adequate Data IMEMDT 7,93,87. Reported in EPA TSCA Inventory. EPA Genetic Toxicology Program.

Standards and Recommendations

OSHA PEL: TWA 400 ppm; STEL 500 ppm

ACGIH TLV: TWA 400 ppm; STEL 500 ppm

DFG MAK: 400 ppm (1200 mg/m³)

DOT Classification: 3; Label: Flammable Liquid

SAFETY PROFILE:

Moderately toxic to humans by ingestion. Poison experimentally by subcutaneous route.

Moderately toxic by intraperitoneal and intravenous routes. Mildly toxic by inhalation. Human systemic effects by inhalation: olfactory changes. Mutation data reported. A severe eye and moderate skin irritant. Ethyl ether is not corrosive or dangerously reactive. It must not be considered safe for individuals to inhale or ingest. It is a depressant of the central nervous system and is capable of producing intoxication, drowsiness, stupor, and unconsciousness. Death due to respiratory failure may result from severe and continued exposure.

A very dangerous fire and explosion hazard when exposed to heat or flame. A storage hazard. It auto-oxidizes to form explosive polymeric 1-oxy-peroxides. Explosive reaction with boron triazide, bromine trifluoride, bromine pentafluoride, perchloric acid, uranyl nitrate + light, wood pulp extracts + heat. Violent reaction or ignition on contact with halogens (e.g., bromine, chlorine), interhalogens (e.g., iodine heptafluoride), oxidants (e.g., silver perchlorate, nitrosyl perchlorate, nitryl perchlorate, chromyl chloride, fluorine nitrate, permanganic acid, nitric acid, hydrogen peroxide, peroxodisulfuric acid, iodine(VII) oxide, sodium peroxide, ozone, and liquid air), sulfur and sulfur compounds (e.g., sulfur when dried with peroxidized ether, sulfuryl chloride). Can react vigorously with acetyl peroxide, air, bromoazide, ClF₃, CrO₃, Cr(OCI)₂, LiAlH₂, NOClO₄, O₂, NClO₂, (H₂SO₄ + permanganates), K₂O₂, [(C₂H₅)₃Al + air], [(CH₃)₃Al + air]. To fight fire, use alcohol foam, CO₂, dry chemical. Used in production of drugs of abuse. When heated to decomposition it emits acrid smoke and irritating fumes. See also ETHERS.

Analytical Methods: For occupational chemical analysis use NIOSH: Ethyl Ether, 1610.

Class: Mutagen; Primary Irritant; Standards or Recommendations; Questionable Carcinogen

n-BUTYL ETHER

DPIM: BRH750 Hazard Rating: 3

CAS: 142-96-1

DOT Number: UN 1149

M Formula: C₈H₁₈O M Weight: 130.26

Properties:

Colorless liquid. Melting point: -98°, boiling point: 142°, flash point: 77°F, density: 0.784 @ 0°/4°, autoignition temperature: 382°F, vapor density: 4.48, lower explosive limit: 1.5%, upper explosive limit: 7.6%.

Synonyms:

1-BUTOXYBUTANE

BUTYL ETHER (DOT) BUTYL ETHER DOT

DI-n-BUTYL ETHER (DOT) DI BUTYL ETHER DOT

DIBUTYL OXIDE DIBUTYL OXIDE

ETHER BUTYLIQUE (FRENCH) ETHER BUTYLIQUE FRENCH

1,1'-OXYBIS(BUTANE) 1 1 OXYBIS BUTANE

TOXICITY DATA with REFERENCE

Eye effects-Human 200 ppm/15M Journal of Industrial Hygiene and Toxicology.

(Baltimore, MD/New York, NY) V.18-31, 1936-49. For publisher information, see

AEHLAUJIHTAB 28,262,46

Skin-Rabbit, adult 100 mg/24H Moderate irritation effects "Prehled Prumyslove

Toxikologie; Organické Latky" Marhold, J., Prague, Czechoslovakia, Avicenum, 198685JCAE -250,86

Eye effects-Rabbit, adult 500 mg open AMA Archives of Industrial Hygiene and Occupational Medicine. (Chicago, IL) V.2-10, 1950-54. For publisher information, see

AEHLAUAMIHBC 10,61,54

Eye effects-Rabbit, adult 500 mg/24H Mild irritation effects "Prehled Prumyslove Toxikologie; Organické Latky" Marhold, J., Prague, Czechoslovakia, Avicenum, 198685JCAE -250,86

Inhalation-Human TCLo:200 ppm:NOSE, Eye effects Journal of Industrial Hygiene and Toxicology. (Baltimore, MD/New York, NY) V.18-31, 1936-49. For publisher information, see AEHLAUJIHTAB 28,262,46

Oral-Rat LD50:7400 mg/kg AMA Archives of Industrial Hygiene and Occupational Medicine. (Chicago, IL) V.2-10, 1950-54. For publisher information, see AEHLAUAMIHBC 10,61,54

Inhalation-Rat LCLo:4000 ppm/4H AMA Archives of Industrial Hygiene and Occupational Medicine. (Chicago, IL) V.2-10, 1950-54. For publisher information, see AEHLAUAMIHBC 10,61,54

Skin-Rabbit, adult LD50:10 g/kg AMA Archives of Industrial Hygiene and Occupational Medicine. (Chicago, IL) V.2-10, 1950-54. For publisher information, see AEHLAUAMIHBC 10,61,54

Consensus Reports:

Reported in EPA TSCA Inventory.

Standards and Recommendations

DOT Classification: 3; Label: Flammable Liquid

SAFETY PROFILE:

Mildly toxic by inhalation, ingestion, and skin contact. Human systemic effects by inhalation: conjunctiva irritation and unspecified nasal effects. An experimental skin and human eye irritant. See also ETHERS. Dangerous fire hazard when exposed to heat, flame, or oxidizers. Incompatible with NCl3 and oxidizing materials. To fight fire, use alcohol foam, dry chemical. When heated to decomposition it emits acrid smoke and fumes.

Class: Primary Irritant; Standards or Recommendations

sec-BUTYL ETHER

sec-BUTYL ETHER BUTYL ETHER

DPIM: BRH760 Hazard Rating: 3

CAS: 6863-58-7

M Formula: C8H18O M Weight: 130.26

Synonyms:

BIS(2-BUTYL)ETHER

BUTANE, 2,2'-OXYBIS-(9CI) BUTANE 2 2 OXYBIS 9CI

DI-sec-BUTYL ETHER DI BUTYL ETHER

2,2'-OXYBISBUTANE 2 2 OXYBISBUTANE

TOXICITY DATA with REFERENCE

Inhalation-Mouse LC50:130 mg/m3/15M Anesthesiology. (J.B. Lippincott Co., Keystone Industrial Park, Scranton, PA 18512) V.1- 1940-ANESAV 11,455,50

Consensus Reports:

Reported in EPA TSCA Inventory.

Standards and Recommendations

DOT Classification: 3; Label: Flammable Liquid

SAFETY PROFILE:

Poison by inhalation. A flammable liquid. When heated to decomposition it emits acrid smoke and irritating vapors.

Class: Standards or Recommendations