

**Diethyl ether**

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**SECTION 1: Identification of the substance/mixture and of the company/undertaking****1.1 Product identifier**

Trade name: Diethyl ether  
Chemical name: Diethyl ether  
Index number: 603-022-00-4  
REACH registration number: 01-2119535785-29-0001  
Other names or synonyms: Ether  
Ethyl ether  
Ethoxyethane  
1,1'-Oxydiethane

**1.2 Relevant identified uses of the substance or mixture and uses advised against****1.2.1 Relevant identified uses**

Chemical industry.  
Pharmaceutical industry.  
Laboratory chemicals.  
Solvent and extraction agent in various industrial sectors.

**1.2.2 Uses advised against**

They are not known.

**1.3 Details of the supplier of the safety data sheet**

Synthesia, a.s.  
Semtín 103  
530 02 Pardubice  
Czech Republic

Telephone: + 420 466 821 111  
Fax: + 420 466 821 020  
E-mail: [synthesia@synthesia.eu](mailto:synthesia@synthesia.eu)

**E-mail address of competent person:** [sds@synthesia.cz](mailto:sds@synthesia.cz)

**1.4 Emergency telephone number****Manufacturer:**

Telephone: +420 466 824 402  
Fax: +420 466 824 448

**Poison Center:**

Toxikologické informační středisko, Na Bojišti 1, 120 00 Praha 2, Czech Republic  
Telephone: +420 224 919 293, +420 224 915 402

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**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture**

**Classification according to Regulation (EC) No 1272/2008:**

## Diethyl ether

Flam. Liq.1, H224  
 Acute Tox.4, H302  
 STOT SE 3, H336

Full text of H-statements: see section 16.

**The most important adverse physical, human health and environmental effects:**

Extremely flammable liquid. Harmful if swallowed. May cause drowsiness and dizziness.

### 2.2 Label elements



**Signal word:**

Danger

**Hazard statements:**

Extremely flammable liquid and vapour. (H224)  
 Harmful if swallowed. (H302)  
 May cause drowsiness or dizziness. (H336)

**Precautionary statements:**

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. (P210)  
 Take action to prevent static discharges. (P243)  
 Wear protective gloves/protective clothing/eye protection/face protection. (P280)  
 Keep container tightly closed. (P233)  
 Store in a well-ventilated place. Keep cool. (P403+P235)

**Supplemental hazard information:**

May form explosive peroxides. (EUH019)  
 Repeated exposure may cause skin dryness or cracking. (EUH066)

### 2.3 Other hazards

Vapours forms the explosive mixture with air.  
 May form explosive mixtures with air at room temperature.  
 Form highly explosive peroxides when standing in air, especially in the presence of light.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Chemical name			
Index number CAS number EC number REACH registration number	Content [wt. %]	Classification according to Regulation (EC) No 1272/2008	Specific concentration limit, multiplying factor, acute toxicity estimate
Diethyl ether			
603-022-00-4 60-29-7 200-467-2	100	Flam. Liq.1, H224 Acute Tox.4, H302 STOT SE 3, H336	

**Diethyl ether**

01-2119535785-29-0001

EUH019

EUH066

The full text of H-phrases, hazard class and hazard category code is given in section 16.

**3.2 Mixtures**

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**SECTION 4: First aid measures****4.1 Description of first aid measures**

In all cases keep the victim at physical and mental rest and warm. In all serious events and always in case of eye contact, get medical advice.

**4.1.1 Following inhalation**

Break off the exposition, move the victim to fresh air. In all cases if inhalation causes the symptoms (for instance cough) avoid walk. Even if symptoms stopped and victim feels well, do not allow to go home without the medical control.

**4.1.2 Following skin contact**

Take off immediately contaminated clothing and flush affected area with plenty of water (preferably lukewarm) and soap.

**4.1.3 Following eye contact**

Rinse with plenty of water for at least 15 minutes. Immediately call in ophtalmologist.

**4.1.4 Following ingestion**

Rinse the mouth with clean water, do not induce vomiting, give activated charcoal (5 crushed tablets in a small amount of water), seek medical advice.

**4.2 Most important symptoms and effects, both acute and delayed**

Narcotic effects. Ingestion causes drunkenness much faster than alcohol. Symptoms of chronic toxicity are unspecific difficulties, lost of appetite, sick stomach, headache, drowsiness, on other hand searcefully undrowsiness, intolerance to alcohol. The affect on blood creation is very problematic.

**4.3 Indication of any immediate medical attention and special treatment needed**

Caution if victim vomits: risk of aspiration.

**SECTION 5: Firefighting measures****5.1 Extinguishing media****5.1.1 Suitable extinguishing media**

Foam, water mist, carbon dioxide, dry powders.

**5.1.2 Unsuitable extinguishing media**

They are not known.

**5.2 Special hazards arising from the substance or mixture**

Combustible.

Vapour are havier than air.

Forms explosive mixture with air at ambient temperatures.

Development of hazardous combustion gases or vapours possible in the event of fire.

**5.3 Advice for firefighters**

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In the event of fire, wear self-contained breathing apparatus (EN 137) and clothing protective against chemicals.  
Cool the tanks containing the product with a water jet from a safe distance, in case of fire.  
Prevent fire extinguishing water from contaminating surface water or the ground water system.

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**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures****6.1.1 For non-emergency personnel**

Avoid inhaling of product vapours.  
Avoid contact with skin and eyes.  
Storing spaces must be sufficiently ventilated.  
Eliminate all sources of ignition. No smoking. Keep away from open flame.

**6.1.2 For emergency responders**

Use suitable personal protective equipment.  
Use only non sparking tools.

**6.2 Environmental precautions**

Do not allow to enter sewerage system, risk of explosion!

**6.3 Methods and material for containment and cleaning up**

Soak up with inert absorbent material (e.g. sand, Chemizorb), sweep up. Keep in suitable, designated, closed containers for disposal.

**6.4 Reference to other sections**

Disposal - see section 13. Using of personal protective equipment - see section 8.

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**SECTION 7: Handling and storage****7.1 Precautions for safe handling**

Do not breathe exhalations.  
Use personal protective equipment (see section 8).  
Keep away from sources of ignition. No smoking.  
Take precautionary measures against static discharges.  
Do not empty into drains.

Advice on general occupational hygiene:

Do not eat, drink or smoke during the work and observe the personal hygiene principles.  
Wash with water and soap after working with substances.

**7.2 Conditions for safe storage, including any incompatibilities**

Store in a tightly closed container.  
Store in accordance with national regulations.  
Keep away from sources of ignition and heat.  
Warehouse facilities must be equipped with ventilation system of sufficient capacity.  
Protect from light.  
Protect from air.

**7.3 Specific end use(s)**

See exposure scenario (annex to the safety data sheet).

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**SECTION 8: Exposure controls/personal protection****8.1 Control parameters**

## Diethyl ether

### Occupational exposure limit values:

Exposure limit values [ Diethyl ether] (CAS: 60-29-7)				
Country	Long-term		Short-term	
	mg/m <sup>3</sup>	ppm	mg/m <sup>3</sup>	ppm
CZ	300		600	
EU	308	100	616	200

### DNEL:

Workers, inhalation, acute effects - 616 mg/m<sup>3</sup>  
 Workers, inhalation, long-term effects - 308 mg/m<sup>3</sup>  
 Workers, dermal, long-term effects - 44 mg/kg bw/day  
 Consumers, inhalation, long-term effects - 54.5 mg/m<sup>3</sup>  
 Consumers, dermal, long-term effects - 15.6 mg/kg bw/day  
 Consumers, oral, long-term effects - 15.6 mg/kg bw/day

### PNEC:

Aqua (freshwater) - 2 mg/l  
 Aqua (marine water) - 0.2 mg/l  
 Aqua (intermittent releases) - 1.65 mg/l  
 Sediment (freshwater) - 9.14 mg/kg  
 Sediment (marine water) - 0.914 mg/kg  
 Soil - 0.66 mg/kg  
 STP (Sewage treatment plant) - 4.2 mg/l

## 8.2 Exposure controls

### 8.2.1 Appropriate engineering controls

Use process enclosures, local exhaust, general ventilation.  
 Ensure good ventilation or use local exhaust ventilation to maintain ambient vapour concentrations below the exposure limit.  
 If technical exhaust or ventilation measures are not possible or insufficient, respiratory protection must be worn.

### 8.2.2 Individual protection measures, such as personal protective equipment

Protective clothing should be selected specifically for the workplace, depending on concentration and quantity of the hazardous substances handled.  
 The chemical resistance of the protective equipment should be enquired at the respective supplier.  
 Ensure that eyewash stations and safety showers are close to the workstation.  
 All used personal protective equipment must be in accordance with Regulation (EU) 2016/425.

Respiratory protection:	protective mask with filter AX against organic vapour
Hand protection:	rubber gloves
Eye/face protection:	tight protective goggles
Body protection:	antistatic protective clothing, boots with antistatic sole, cap

Thermal hazards: not applicable

### 8.2.3 Environmental exposure controls

Do not empty into drains.  
 Avoid uncontrolled release of the substance/mixture to the environment.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

**Diethyl ether**

Physical state:	liquid
Colour:	colourless
Odour:	sweetish to fruity
Melting point/freezing point:	-116.3 °C
Boiling point:	34.6 °C
Flammability:	extremely flammable
Lower explosion limit:	1.85 % (in the gaseous state)
Upper explosion limit:	36.5 % (in the gaseous state)
Flash point:	-45 °C
Auto-ignition temperature:	175 °C
Decomposition temperature:	not available
pH:	not available
Kinematic viscosity:	not available
Solubility:	miscible to any relations with ethanol, chloroform, benzene and other organic solvents
Solubility in water:	64.9 g/l (20 °C)
Partition coefficient n-octanol/water:	log Pow = 1.05 (20 °C)
Vapour pressure:	71.60 kPa, 25 °C
Density or relative density:	0.71 g/cm <sup>3</sup>
Relative vapour density:	2.6
Particle characteristics:	not applicable

**9.2 Other information**

Dynamic viscosity: 0.235 mPa.s (20 °C)

Organic solvents content: 100 %

**SECTION 10: Stability and reactivity****10.1 Reactivity**

Reacts with strong oxidants for rapid evolution of heat.

Risk of explosion at uncontrolled reaction.

Rapid evolution of heat in reaction with acids.

**10.2 Chemical stability**

Stable under recommended storage and handling conditions (see section 7).

**10.3 Possibility of hazardous reactions**

Easy evaporates at the air, vapours form with air the explosive mixture.

Air (particularly with sunlight) cause the selfoxidation forming peroxides.

**10.4 Conditions to avoid**

Heat, open flame, electrostatic discharges.

**10.5 Incompatible materials**

Oxidizing agents. Acids and bases.

**10.6 Hazardous decomposition products**

Carbon oxides, peroxides.

**SECTION 11: Toxicological information****11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008****Acute toxicity:**LD<sub>50</sub>, oral, rat (mg/kg):

1200

OECD Test Guideline 401

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LD<sub>50</sub>, dermal, rat or rabbit (mg/kg): > 2 000 (rabbit)  
OECD Test Guideline 402

LC<sub>50</sub>, inhalation, rat (gas and vapour) (mg/m<sup>3</sup>): 97 000 (4 h)

**Skin corrosion/irritation:**

Not irritating (rabbit).  
OECD Test Guideline 404

**Serious eye damage/irritation:**

Not irritating (rabbit).  
OECD Test Guideline 405

**Respiratory or skin sensitisation:**

Not sensitising to skin (mouse).  
OECD Test Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)

**Germ cell mutagenicity:**

Ames test and in vitro mammalian cell test negative.  
OECD Test Guideline 471 (Bacterial Reverse Mutation Assay)  
OECD Test Guideline 476 (In Vitro Mammalian Cell Gene Mutation Test)

**Carcinogenicity:**

No data available.

**Reproductive toxicity:**

Based on available data, the classification criteria are not met.

**STOT-single exposure:**

May cause drowsiness and dizziness.

**STOT-repeated exposure:**

NOAEL (oral, rat): 500 mg/kg bw/day  
(U.S. Environmental Protection Agency)  
NOAEC (inhalation, rat): 1 500 ppm  
OECD Test Guideline 413 (90-Day Subchronic Inhalation Toxicity Study)

**Aspiration hazard:**

No data available.

**Symptoms related to the physical, chemical and toxicological characteristics****Following ingestion:**

Harmful. Ingestion causes intoxication more promptly as alcohol, its lasting is but shorter. Death caused by ingestion of about 25 to 50 ml. Risk of gastric distension due to vapor pressure.

**Following eye contact:**

May cause irritation.

**Following inhalation:**

Acute inhalation poisoning is similar to drunkenness.

**11.2 Information on other hazards****11.2.1 Endocrine disrupting properties**

Substance is not identified as having endocrine disrupting properties according to Regulation (EU) 2017/2100.

**11.2.2 Other information**

Information is not available.

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**SECTION 12: Ecological information****12.1 Toxicity****12.1.1 Acute (short-term) aquatic toxicity**

LC<sub>50</sub>, 96 h, fish (mg/l): 2560 (Pimephales promelas)  
EC<sub>50</sub>, 48 h, crustacea (mg/l): 165 (24 h, Daphnia magna)  
EC<sub>50</sub>, 72 h, algae (mg/l): > 100 (Desmodesmus subspicatus)

**12.1.2 Chronic (long-term) aquatic toxicity**

NOEC (21 d, Daphnia magna): 100 mg/l

**12.1.3 Toxicity for other organisms**

EC<sub>50</sub>, 5 min, microorganisms (mg/l): 3 536

**12.2 Persistence and degradability**

The substance is not biodegradable in water.

**12.3 Bioaccumulative potential**

No bioaccumulation potential.  
BCF: 2 (QSAR)

**12.4 Mobility in soil**

No data available.

**12.5 Results of PBT and vPvB assessment**

Substance does not meet the criteria for PBT or vPvB.

**12.6 Endocrine disrupting properties**

Substance is not identified as having endocrine disrupting properties according to Regulation (EU) 2017/2100.

**12.7 Other adverse effects**

Concentration of 0.3 mg/l do not affects the ecotoxicity of water streams.  
Concentration of 1000 mg/l is mortal for the fish.

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**SECTION 13: Disposal considerations****13.1 Waste treatment methods****13.1.1 Product disposal**

Remains absorb with wooden sawdust or sand and then burn in waste incineration plant.

**13.1.2 Packaging disposal**

Rinse with suitable solvent or incinerate at a reserved place in accordance with local environmental regulations.

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**SECTION 14: Transport information****Land transport ADR/RID:**

Class/Classification code/Packing group:	3 / F1 / I
UN number:	1155
Proper shipping name:	DIETHYL ETHER (ETHYL ETHER)
Environmental hazards:	no
Hazard label:	3

**Sea transport IMDG Code:**



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Class/Packing group:	3 / I
UN number:	1155
Proper shipping name:	DIETHYL ETHER
Marine pollutant:	no
Additional information:	EmS: F-E, S-D
Hazard label:	3

**Air transport ICAO-TI /IATA-DGR:**

Class/Packing group:	3 / I
UN number:	1155
Proper shipping name:	DIETHYL ETHER
Hazard label:	Flammable liquid

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**SECTION 15: Regulatory information****15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**

Regulation (EC) No. 1272/2008

Regulation (EC) No. 1907/2006

Water hazard class (Germany): WGK 1 - low hazard to waters.

Directive 2012/18/EU (Seveso III Directive): yes

**15.2 Chemical safety assessment**

Chemical safety assessment has been carried out for this substance.

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**SECTION 16: Other informationn****Indication of changes:**

Update according to Commission Regulation (EU) 2020/878.

**List of abbreviations:**

CAS - Chemical Abstracts Service

EC number - EINECS (European Inventory of Existing Commercial Chemical Substance), ELINCS (European List of Notified Chemical Substances) or NLP (No-Longer-Polymers)

LD50 - lethal dose, 50%

LC50 - lethal concentration, 50%

EC50 - effective concentration, 50%

IC50 - inhibitory concentration, 50%

PBT - persistent, bioaccumulative and toxic

vPvB - very persistent and very bioaccumulative

BCF - bioconcentration factor

COD - chemical oxygen demand

BOD - biochemical oxygen demand

DNEL - derived no-effect level

PNEC - predicted no-effect concentration

NOAEL - no observed adverse effect level

NOAEC - no observed adverse effect concentration

NOEC - no observed effect concentration

ADR - Agreement concerning the International Carriage of Dangerous Goods by Road

RID - Regulations concerning the International Carriage of Dangerous Goods by Rail

IMDG - International Maritime Dangerous Goods

ICAO - International Civil Aviation Organisation

IATA - International Air Transport Association

**Key literature references and sources for data:**

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Legislation, chemical databases and tables, tests.  
Chemical safety report.

**Relevant information for classification of the product:**

List of harmonised classification and labelling of hazardous substances.

**Relevant hazard statements:**

Flam. Liq. 1, H224 Flammable liquids, Category 1  
Acute Tox.4, H302 Acute toxicity (oral), Category 4  
STOT SE 3, H336 Specific target organ toxicity - Single exposure, Category 3, Narcosis  
H224 Extremely flammable liquid and vapour.  
H302 Harmful if swallowed.  
H336 May cause drowsiness or dizziness.  
EUH019 May form explosive peroxides.  
EUH066 Repeated exposure may cause skin dryness or cracking.

**Training advice:**

In compliance with safety data sheet.

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*The above information corresponds to the current level of our knowledge and experience. The data merely describe the product with respect to safety and cannot be construed as guaranteed parameters. The user is responsible for handling in compliance with the existing laws and regulations.*