

# safety data sheet

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



**Diethyl ether ≥99,5 %, for synthesis, stab.**

article number: **5920**  
Version: **1.0 en**

date of compilation: 2015-12-07

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1 Product identifier

Identification of the substance	<b>Diethyl ether</b>
Article number	5920
Registration number (REACH)	01-2119535785-29-xxxx
Index No	603-022-00-4
EC number	200-467-2
CAS number	60-29-7

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

**Identified uses:** laboratory chemical

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

Carl Roth GmbH + Co KG  
Schoemperlenstr. 3-5  
D-76185 Karlsruhe  
Germany

**Telephone:** +49 (0) 721 - 56 06 0

**Telefax:** +49 (0) 721 - 56 06 149

**e-mail:** [sicherheit@carlroth.de](mailto:sicherheit@carlroth.de)

**Website:** [www.carlroth.de](http://www.carlroth.de)

Competent person responsible for the safety data sheet : Department Health, Safety and Environment

**e-mail (competent person)** : [sicherheit@carlroth.de](mailto:sicherheit@carlroth.de)

### 1.4 Emergency telephone number

Emergency information service **Poison Centre Munich: +49/(0)89 19240**

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 (CLP)

Classification acc. to GHS			
Section	Hazard class	Hazard class and category	Hazard statement
2.6	flammable liquid	(Flam. Liq. 1)	H224
3.10	acute toxicity (oral)	(Acute Tox. 4)	H302
3.8D	specific target organ toxicity - single exposure (narcotic effects, drowsiness)	(STOT SE 3)	H336

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## Supplemental hazard information

Code	Supplemental hazard information
EUH019	may form explosive peroxides
EUH066	repeated exposure may cause skin dryness or cracking

### Remarks

For full text of Hazard- and EU Hazard-statements: see SECTION 16.

## The most important adverse physicochemical, human health and environmental effects

Narcotic effects.

## 2.2 Label elements

### Labelling according to Regulation (EC) No 1272/2008 (CLP)

#### Signal word

**Danger**

#### Pictograms



#### Hazard statements

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

#### Precautionary statements

##### Precautionary statements - prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.  
P243 Take precautionary measures against static discharge.

##### Precautionary statements - storage

P403+P233 Store in a well-ventilated place. Keep container tightly closed.

#### Supplemental hazard information

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

#### Labelling of packages where the contents do not exceed 125 ml

Signal word: **Danger**

Symbol(s)



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H224	Extremely flammable liquid and vapour.
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P243	Take precautionary measures against static discharge.
EUH019	May form explosive peroxides.
EUH066	Repeated exposure may cause skin dryness or cracking.

### 2.3 Other hazards

There is no additional information.

## SECTION 3: Composition/information on ingredients

### 3.1 Substances

Name of substance	Diethyl ether
Index No	603-022-00-4
Registration number (REACH)	01-2119535785-29-xxxx
EC number	200-467-2
CAS number	60-29-7
Molecular formula	C <sub>4</sub> H <sub>10</sub> O
Molar mass	74,12 g/mol

#### Impurities and additives, classification acc. to EU regulation

##### Stabiliser:

Name of substance	Identifier	Classification acc. to 1272/2008/EC
2,6-di-tert-butyl-p-cresol	CAS No 128-37-0  EC No 204-881-4	Acute Tox. 4 / H302 Skin Irrit. 2 / H315 Eye Irrit. 2 / H319 Aquatic Chronic 4 / H413

## SECTION 4: First aid measures

### 4.1 Description of first aid measures



#### General notes

Take off contaminated clothing.

#### Following inhalation

Provide fresh air. If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. IF exposed or concerned: Call a doctor.

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## **Following skin contact**

Rinse skin with water/shower. Preventive skin protection (barrier creams/ointments) is recommended.

## **Following eye contact**

Rinse cautiously with water for several minutes. In all cases of doubt, or when symptoms persist, seek medical advice.

## **Following ingestion**

Rinse mouth with water (only if the person is conscious). Do NOT induce vomiting. Aspiration hazard. Call a doctor.

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

Dizziness, Unconsciousness, Headache, Circulatory collapse, Vomiting, Drowsiness, Vertigo, Irritant effects

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

none

## **SECTION 5: Firefighting measures**

### **5.1 Extinguishing media**

#### **Suitable extinguishing media**

Co-ordinate fire-fighting measures to the fire surroundings  
water spray, foam, dry extinguishing powder, carbon dioxide (CO<sub>2</sub>)

#### **Unsuitable extinguishing media**

water jet

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

Combustible. Vapours are heavier than air, spread along floors and form explosive mixtures with air. Vapours can form explosive mixtures with air.

#### **Hazardous combustion products**

In case of fire may be liberated: carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>)

### **5.3 Advice for firefighters**

Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

## **SECTION 6: Accidental release measures**

### **6.1 Personal precautions, protective equipment and emergency procedures**

#### **For non-emergency personnel**

Wearing of suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. Avoid contact with skin, eyes and clothes. Do not breathe vapour/spray. Avoidance of ignition sources.

### **6.2 Environmental precautions**

Keep away from drains, surface and ground water. Explosive properties.

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## 6.3 Methods and material for containment and cleaning up

### Advices on how to contain a spill

Covering of drains.

### Advices on how to clean up a spill

Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).

### Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

### Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8.

Incompatible materials: see section 10. Disposal considerations: see section 13.

## SECTION 7: Handling and storage

### 7.1 Precautions for safe handling

Provision of sufficient ventilation.

#### • Measures to prevent fire as well as aerosol and dust generation



Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge. Due to danger of explosion, prevent leakage

of vapours into cellars, flues and ditches.

#### • Handling of incompatible substances or mixtures

#### • Keep away from

oxidisers

### Advice on general occupational hygiene

Wash hands before breaks and after work. Keep away from food, drink and animal feedingstuffs.

When using do not smoke.

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

Store in a well-ventilated place. Keep container tightly closed.

### Incompatible substances or mixtures

Observe hints for combined storage.

#### • Control of effects

#### • Protect against external exposure, such as

direct light irradiation, contact with air/oxygen

### Consideration of other advice

Ground/bond container and receiving equipment.

#### • Ventilation requirements

Use local and general ventilation.

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- **Specific designs for storage rooms or vessels**

Recommended storage temperature: 15 - 25 °C.

### 7.3 Specific end use(s)

No information available.

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

#### National limit values

#### Occupational exposure limit values (Workplace Exposure Limits)

not relevant

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m <sup>3</sup> ]	STEL [ppm]	STEL [mg/m <sup>3</sup> ]	Source
EU	diethyl ether (ether)	60-29-7	IOELV	100	308	200	616	2000/39/EC
GB	diethyl ether	60-29-7	WEL	100	310	200	620	EH40/2005

#### Notation

STEL Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period unless otherwise specified

TWA Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average

#### Relevant DNELs/DMELs/PNECs and other threshold levels

- **human health values**

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	616 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	acute - systemic effects
DNEL	44 mg/kg	human, dermal	worker (industry)	chronic - systemic effects
DNEL	308 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	chronic - systemic effects

- **environmental values**

Endpoint	Threshold level	Environmental compartment	Exposure time
PNEC	2 mg/l	freshwater	short-term (single instance)
PNEC	0,2 mg/l	marine water	short-term (single instance)
PNEC	4,2 mg/l	sewage treatment plant (STP)	short-term (single instance)
PNEC	9,14 mg/kg	freshwater sediment	short-term (single instance)
PNEC	0,914 mg/kg	marine sediment	short-term (single instance)
PNEC	0,66 mg/kg	soil	short-term (single instance)
PNEC	1,65 mg/l	water	continuous

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## 8.2 Exposure controls

### Individual protection measures (personal protective equipment)



#### Eye/face protection

Use safety goggle with side protection.

#### Skin protection

- **hand protection**

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

- **type of material**

FKM: fluoro-elastomer

- **material thickness**

0,7mm.

- **breakthrough times of the glove material**

>30 minutes (permeation: level 2)

- **other protection measures**

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Flame-retardant protective clothing.

#### Respiratory protection

Respiratory protection necessary at: Aerosol or mist formation. Type: AX (gas filters and combined filters against low-boiling point organic compounds, colour code: Brown).

Observe the wear time limits according GefStoffV in combination with the rules for using respiratory protection apparatus (BGR 190).

#### Environmental exposure controls

Keep away from drains, surface and ground water.

## SECTION 9: Physical and chemical properties

### 9.1 Information on basic physical and chemical properties

#### Appearance

Physical state	liquid (fluid)
Colour	colourless
Odour	mild sweet
Odour threshold	No data available

#### Other physical and chemical parameters

pH (value)	This information is not available.
Melting point/freezing point	-116 °C
Initial boiling point and boiling range	34,58 - 34,59 °C at 1.013 hPa
Flash point	-40 °C (closed cup)
Evaporation rate	no data available
Flammability (solid, gas)	not relevant (fluid)

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### Explosive limits

- lower explosion limit (LEL) 1,7 vol%
- upper explosion limit (UEL) 39 vol%

Explosion limits of dust clouds not relevant

Vapour pressure 589,6 hPa at 20 °C  
716 hPa at 25 °C  
1.702 hPa at 50 °C

Density 0,71 g/cm<sup>3</sup> at 20 °C

Vapour density 2,56 air = 1

Bulk density Not applicable

Relative density Information on this property is not available.

### Solubility(ies)

Water solubility 64,9 g/l at 20 °C

### Partition coefficient

n-octanol/water (log KOW) 1,19 (pH value: 7, 25 °C) (ECHA)

Soil organic carbon/water (log KOC) 0,987 (ECHA)

Auto-ignition temperature 175 °C - ECHA

Decomposition temperature no data available

### Viscosity

- dynamic viscosity 0,23 mPa s at 20 °C

Explosive properties none

Oxidising properties none

## 9.2 Other information

Refractive index 1,353

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

risk of ignition. Vapours can form explosive mixtures with air.

### 10.2 Chemical stability

The material is stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.

### 10.3 Possibility of hazardous reactions

Danger of explosion: Azides, Perchlorates, Nitric acid, Strong oxidiser

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## 10.4 Conditions to avoid

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Direct light irradiation. Contact with air/oxygen.

## 10.5 Incompatible materials

different plastic and rubber

## 10.6 Hazardous decomposition products

Peroxides

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Exposure route	Endpoint	Value	Species	Source
oral	LD50	1.215 mg/kg	rat	TOXNET

#### Skin corrosion/irritation

Shall not be classified as corrosive/irritant to skin.

#### Serious eye damage/eye irritation

Shall not be classified as seriously damaging to the eye or eye irritant.

#### Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

#### Summary of evaluation of the CMR properties

Shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant

#### • Specific target organ toxicity - single exposure

May cause drowsiness or dizziness.

#### • Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

#### Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

#### Symptoms related to the physical, chemical and toxicological characteristics

##### • If swallowed

data are not available

##### • If in eyes

data are not available

##### • If inhaled

narcosis, vertigo, headache, slightly irritant, unconsciousness

##### • If on skin

repeated exposure may cause skin dryness or cracking

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## Other information

Liver and kidney damage, Circulatory collapse, Inebriation

## SECTION 12: Ecological information

### 12.1 Toxicity

acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.

#### Aquatic toxicity (acute)

Endpoint	Value	Species	Source	Exposure time
ErC50	>100 mg/l	algae	ECHA	72 hours

#### Aquatic toxicity (chronic)

Endpoint	Value	Species	Source	Exposure time
EC50	>100 mg/l	aquatic invertebrates	ECHA	21 d
NOEC	100 mg/l	aquatic invertebrates	ECHA	21 d
LOEC	>100 mg/l	aquatic invertebrates	ECHA	21 d

### 12.2 Process of degradability

Not readily biodegradable.

Theoretical Oxygen Demand: 2,59 mg/mg

Theoretical Carbon Dioxide: 2,375 mg/mg

### 12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.

n-octanol/water (log KOW)

1,19 (pH value: 7, 25 °C)

BCF

2,29 (ECHA)

### 12.4 Mobility in soil

The Organic Carbon normalised adsorption coefficient

0,987

### 12.5 Results of PBT and vPvB assessment

Data are not available.

### 12.6 Other adverse effects

Slightly hazardous to water.

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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

#### Sewage disposal-relevant information

Do not empty into drains.

#### Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

### 13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

### 13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

## SECTION 14: Transport information

14.1	UN number	1155
14.2	UN proper shipping name	DIETHYL ETHER
	Hazardous ingredients	Diethyl ether
14.3	Transport hazard class(es)	
	Class	3 (flammable liquids)
14.4	Packing group	I (substance presenting high danger)
14.5	Environmental hazards	none (non-environmentally hazardous acc. to the dangerous goods regulations)
14.6	<b>Special precautions for user</b>	
	Provisions for dangerous goods (ADR) should be complied within the premises.	
14.7	<b>Transport in bulk according to Annex II of MARPOL and the IBC Code</b>	
	The cargo is not intended to be carried in bulk.	
14.8	<b>Information for each of the UN Model Regulations</b>	
	• <b>Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)</b>	
	UN number	1155
	Proper shipping name	DIETHYL ETHER
	Particulars in the transport document	UN1155, DIETHYL ETHER, 3, I, (D/E)
	Class	3
	Classification code	F1
	Packing group	I
	Danger label(s)	3

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Excepted quantities (EQ)	E3
Limited quantities (LQ)	500 ml
Transport category (TC)	1
Tunnel restriction code (TRC)	D/E
Hazard identification No	33

• **International Maritime Dangerous Goods Code (IMDG)**

UN number	1155
Proper shipping name	DIETHYL ETHER
Particulars in the shipper's declaration	UN1155, DIETHYL ETHER, 3, I, -40°C c.c.
Class	3
Packing group	I
Danger label(s)	3



Special provisions (SP)	-
Excepted quantities (EQ)	E3
Limited quantities (LQ)	-
EmS	F-E, S-D
Stowage category	E

## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

#### Relevant provisions of the European Union (EU)

- **Regulation 649/2012/EU concerning the export and import of hazardous chemicals (PIC)**  
Not listed.
- **Regulation 1005/2009/EC on substances that deplete the ozone layer (ODS)**  
Not listed.
- **Regulation 850/2004/EC on persistent organic pollutants (POP)**  
Not listed.



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## SECTION 16: Other information

### Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
2000/39/EC	Commission Directive establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC
Acute Tox.	acute toxicity
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
Aquatic Chronic	hazardous to the aquatic environment - chronic hazard
BCF	BioConcentration Factor
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
CMR	Carcinogenic, Mutagenic or toxic for Reproduction
DMEL	Derived Minimal Effect Level
DNEL	Derived No-Effect Level
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EH40/2005	EH40/2005 Workplace exposure limits, Table 1: List of approved workplace exposure limits ( <a href="http://www.nationalarchives.gov.uk/doc/open-government-licence/">http://www.nationalarchives.gov.uk/doc/open-government-licence/</a> )
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
Eye Dam.	seriously damaging to the eye
Eye Irrit.	irritant to the eye
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IMDG	International Maritime Dangerous Goods Code
index No	the Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008
IOELV	indicative occupational exposure limit value
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
PNEC	Predicted No-Effect Concentration
ppm	parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
Skin Corr.	corrosive to skin
Skin Irrit.	irritant to skin

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Abbr.	Descriptions of used abbreviations
STEL	short-term exposure limit
TWA	time-weighted average
VOC	Volatile Organic Compounds
vPvB	very Persistent and very Bioaccumulative
WEL	workplace exposure limit

### Key literature references and sources for data

- Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU
- Regulation (EC) No. 1272/2008 (CLP, EU GHS)

### List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
H224	extremely flammable liquid and vapour
H302	harmful if swallowed
H315	causes skin irritation
H319	causes serious eye irritation
H336	may cause drowsiness or dizziness
H413	may cause long lasting harmful effects to aquatic life

### Disclaimer

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.