



# MATERIAL SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Revision Date 08/23/2013

Version 1.1

## SECTION 1. Identification

### Product identifier

Product number	802892
Product name	Dibutyl ether for synthesis

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

Identified uses	Chemical for synthesis
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### Details of the supplier of the safety data sheet

Company	EMD Millipore Corporation   290 Concord Road, Billerica, MA 01821, United States of America   SDS Phone Support: +1-978-715-1335   General Inquiries: +1-978-715-4321   Monday to Friday, 9:00 AM to 4:00 PM Eastern Time (GMT-5)
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Emergency telephone	800-424-9300 CHEMTREC (USA) +1-703-527-3887 CHEMTREC (International) 24 Hours/day; 7 Days/week
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## SECTION 2. Hazards identification

### GHS Classification

Flammable liquid, Category 3, H226  
Eye irritation, Category 2, H319  
Specific target organ systemic toxicity - single exposure, Category 3, H335  
Skin irritation, Category 2, H315  
Chronic aquatic toxicity, Category 3, H412  
For the full text of the H-Statements mentioned in this Section, see Section 16.

### GHS-Labeling

#### *Hazard pictograms*



*Signal Word*  
Warning

#### *Hazard Statements*

H226 Flammable liquid and vapor.  
H319 Causes serious eye irritation.  
H335 May cause respiratory irritation.

# MATERIAL SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number 802892  
Product name Dibutyl ether for synthesis

---

Version 1.1

H315 Causes skin irritation.

H412 Harmful to aquatic life with long lasting effects.

## *Precautionary Statements*

P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

P273 Avoid release to the environment.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

## **OSHA Hazards**

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

## **Other hazards**

None known.

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## **SECTION 3. Composition/information on ingredients**

Formula	(CH <sub>3</sub> CH <sub>2</sub> CH <sub>2</sub> CH <sub>2</sub> ) <sub>2</sub> O	C <sub>8</sub> H <sub>18</sub> O (Hill)
CAS-No.	142-96-1	
Molar mass	130.23 g/mol	

## **Hazardous ingredients**

*Chemical Name (Concentration)*

CAS-No.

1,1'-Oxybis(butane) (>= 90 % - <= 100 % )

142-96-1

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## **SECTION 4. First aid measures**

### **Description of first-aid measures**

#### *Inhalation*

After inhalation: fresh air. Consult doctor if feeling unwell.

#### *Skin contact*

After skin contact: wash off with plenty of water. Remove contaminated clothing.

#### *Eye contact*

After eye contact: rinse out with plenty of water. Call in ophthalmologist.

#### *Ingestion*

After swallowing: caution if victim vomits. Risk of aspiration! Keep airways free. Consult a physician.

Never give anything by mouth to an unconscious person.

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

irritant effects, Cough, Shortness of breath, Dermatitis, narcosis, Headache  
Drying-out effect resulting in rough and chapped skin.

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

Subsequently administer: activated charcoal (20 - 40 g in 10% slurry).

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MATERIAL SAFETY DATA SHEET  
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number 802892  
Product name Dibutyl ether for synthesis

---

Version 1.1

---

**SECTION 5. Fire-fighting measures**

**Extinguishing media**

*Suitable extinguishing media*

Carbon dioxide (CO<sub>2</sub>), Foam, Dry powder

*Unsuitable extinguishing media*

For this substance/mixture no limitations of extinguishing agents are given.

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

Combustible.

Vapors are heavier than air and may spread along floors.

Pay attention to flashback.

Forms explosive mixtures with air at elevated temperatures.

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

**Advice for firefighters**

*Special protective equipment for fire-fighters*

Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

*Further information*

Prevent fire extinguishing water from contaminating surface water or the ground water system.

Cool closed containers exposed to fire with water spray.

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**SECTION 6. Accidental release measures**

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

Advice for non-emergency personnel: Avoid substance contact. Do not breathe vapors, aerosols.

Keep away from heat and sources of ignition. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.

Advice for emergency responders: Protective equipment see section 8.

**Environmental precautions**

Do not empty into drains. Risk of explosion.

**Methods and materials for containment and cleaning up**

Cover drains. Collect, bind, and pump off spills.

Observe possible material restrictions (see sections 7 and 10).

Take up with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

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**SECTION 7. Handling and storage**

**Precautions for safe handling**

Observe label precautions.

*Advice on protection against fire and explosion*

Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

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

MATERIAL SAFETY DATA SHEET  
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number 802892  
Product name Dibutyl ether for synthesis

---

Version 1.1

Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Protected from light.

Store below +15°C (+59°F).

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## SECTION 8. Exposure controls/personal protection

### Exposure limit(s)

Contains no substances with occupational exposure limit values.

### Engineering measures

Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

### Individual protection measures

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 inquired at the respective supplier.

#### *Hygiene measures*

Immediately change contaminated clothing. Apply skin- protective barrier cream. Wash hands and face after working with substance.

#### *Eye/face protection*

Safety glasses

#### *Hand protection*

Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

#### *Other protective equipment:*

Flame retardant antistatic protective clothing

#### *Respiratory protection*

required when vapors/aerosols are generated.

Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

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## SECTION 9. Physical and chemical properties

Physical state	liquid
Color	colorless
Odor	fruity
Odor Threshold	0.068 - 462 ppm
pH	5.2 at 0.2 g/l 68 °F (20 °C)
Melting point	-95 °C

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**MATERIAL SAFETY DATA SHEET**  
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number	802892	Version 1.1
Product name	Dibutyl ether for synthesis	

---

Boiling point/boiling range	284 - 289 °F (140 - 143 °C) at 1,013 hPa
Flash point	77 °F (25 °C) Method: c.c.
Evaporation rate	No information available.
Flammability (solid, gas)	No information available.
Lower explosion limit	0.9 %(V)
Upper explosion limit	8.5 %(V)
Vapor pressure	6.4 hPa at 68 °F (20 °C)
Relative vapor density	4.5
Relative density	0.769 g/cm <sup>3</sup> at 68 °F (20 °C)
Water solubility	10 g/l at 68 °F (20 °C)
Partition coefficient: n-octanol/water	log Pow: 3.21 (experimental) (Lit.) Bioaccumulation is not expected (log Pow <1).
Autoignition temperature	No information available.
Decomposition temperature	No information available.
Viscosity, dynamic	0.69 mPa.s at 68 °F (20 °C)
Explosive properties	Not classified as explosive.
Ignition temperature	347 °F (175 °C)

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**SECTION 10. Stability and reactivity**

**Reactivity**

Vapor/air-mixtures are explosive at intense warming.

**Chemical stability**

Sensitivity to light  
Sensitive to air.

**Possibility of hazardous reactions**

Exothermic reaction with:

MATERIAL SAFETY DATA SHEET  
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number 802892  
Product name Dibutyl ether for synthesis

---

Version 1.1

Oxidizing agents, Strong acids

Risk of explosion with:  
nitrogen trichloride

**Conditions to avoid**

Heating.

A range from approx. 15 Kelvin below the flash point is to be rated as critical.

**Incompatible materials**

various plastics

**Hazardous decomposition products**

Peroxides

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**SECTION 11. Toxicological information**

**Information on toxicological effects**

*Likely route of exposure*

Inhalation, Eye contact, Skin contact

*Acute oral toxicity*

LD50 rat: 3,200 mg/kg (RTECS)

Symptoms: Irritations of mucous membranes in the mouth, pharynx, oesophagus and gastrointestinal tract., Risk of aspiration upon vomiting., Pulmonary failure possible after aspiration of vomit.

*Acute inhalation toxicity*

LC50 rat: 21.66 mg/l; 4 h (RTECS)

Irritating to respiratory system.

Symptoms: mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract

*Acute dermal toxicity*

LD50 rabbit: 7,640 mg/kg  
(External MSDS)

*Skin irritation*

Drying-out effect resulting in rough and chapped skin. Dermatitis  
Causes skin irritation.

*Eye irritation*

Causes serious eye irritation.

*Genotoxicity in vitro*

Ames test

Salmonella typhimurium

Result: negative

(National Toxicology Program)

*Specific target organ systemic toxicity - single exposure*

May cause respiratory irritation.

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## MATERIAL SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number 802892  
Product name Dibutyl ether for synthesis

---

Version 1.1

### *Specific target organ systemic toxicity - repeated exposure*

The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

### *Aspiration hazard*

Regarding the available data the classification criteria are not fulfilled.

### **Carcinogenicity**

IARC	No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.
OSHA	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.
NTP	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
ACGIH	No ingredient of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by ACGIH.

### **Further information**

After absorption of large quantities:

Headache, narcosis

Toxic effect on:

Liver, Kidney

Handle in accordance with good industrial hygiene and safety practice.

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## **SECTION 12. Ecological information**

### **Ecotoxicity**

#### *Toxicity to fish*

LC50 *Lepomis macrochirus* (Bluegill sunfish): 24.7 mg/l; 96 h (ECOTOX Database)

#### *Toxicity to daphnia and other aquatic invertebrates*

EC50 *Daphnia magna* (Water flea): 21 mg/l; 48 h (External MSDS)

#### *Toxicity to algae*

IC5 *Scenedesmus quadricauda* (Green algae): > 50 mg/l(Lit.) (maximum permissible toxic concentration)

#### *Toxicity to bacteria*

EC50 Sewage sludge: > 1,000 mg/l; 30 min (External MSDS)

### **Persistence and degradability**

#### *Biodegradability*

5 %; 28 d

OECD Test Guideline 301D

Not readily biodegradable.

### **Bioaccumulative potential**

MATERIAL SAFETY DATA SHEET  
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number 802892  
Product name Dibutyl ether for synthesis

---

Version 1.1

*Partition coefficient: n-octanol/water*

log Pow: 3.21

(experimental)

(Lit.) Bioaccumulation is not expected (log Pow <1).

**Mobility in soil**

No information available.

**Other adverse effects**

*Henry constant*

607 Pa·m<sup>3</sup>/mol

Method: (calculated)

(Lit.) Distribution preferentially in air.

*Additional ecological information*

Discharge into the environment must be avoided.

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**SECTION 13. Disposal considerations**

The information presented only applies to the material as supplied. The identification based on characteristic(s) or listing may not apply if the material has been used or otherwise contaminated. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal methods in compliance with applicable regulations. Disposal should be in accordance with applicable regional, national and local laws and regulations.

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**SECTION 14. Transport information**

**Land transport (DOT)**

UN number	UN 1149
Proper shipping name	DIBUTYL ETHERS
Class	3
Packing group	III
Environmentally hazardous	--

**Air transport (IATA)**

UN number	UN 1149
Proper shipping name	DIBUTYL ETHERS
Class	3
Packing group	III
Environmentally hazardous	--
Special precautions for user	no

**Sea transport (IMDG)**

UN number	UN 1149
Proper shipping name	DIBUTYL ETHERS
Class	3
Packing group	III
Environmentally hazardous	--
Special precautions for user	yes



MATERIAL SAFETY DATA SHEET  
according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number 802892  
Product name Dibutyl ether for synthesis

---

Version 1.1

EmS F-E S-D

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**SECTION 15. Regulatory information**

**United States of America**

**OSHA Hazards**

Flammable Liquid  
Skin irritant  
Eye irritant  
Respiratory irritant

This information is based on 29 CFR 1910.1200 criteria prior to adoption of the GHS, and may deviate from the GHS information on the label and in section 2.

**SARA 311/312 Hazards**

Fire Hazard  
Acute Health Hazard

**SARA 313**

SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**SARA 302**

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

**Clean Water Act**

This product does not contain any Hazardous Substances listed under the U.S. CleanWater Act, Section 311, Table 116.4A.

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

**DEA List I**

Not listed

**DEA List II**

Not listed

**US State Regulations**

**Massachusetts Right To Know**

*Ingredients*  
1,1'-Oxybis(butane)

**Pennsylvania Right To Know**

*Ingredients*  
1,1'-Oxybis(butane)

**New Jersey Right To Know**

*Ingredients*  
1,1'-Oxybis(butane)

**California Prop 65 Components**

This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

# MATERIAL SAFETY DATA SHEET

according to the (US) Hazard Communication Standard (29 CFR 1910.1200)

Product number 802892  
Product name Dibutyl ether for synthesis

---

Version 1.1

## Notification status

TSCA: All components of the product are listed in the TSCA-inventory.

DSL: All components of this product are on the Canadian DSL.

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## SECTION 16. Other information

### Training advice

Provide adequate information, instruction and training for operators.

### Full text of H-Statements referred to under sections 2 and 3.

H226	Flammable liquid and vapor.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H335	May cause respiratory irritation.
H412	Harmful to aquatic life with long lasting effects.

### Key or legend to abbreviations and acronyms used in the safety data sheet

Used abbreviations and acronyms can be looked up at [www.wikipedia.org](http://www.wikipedia.org).

Revision Date 08/23/2013

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The information contained herein is based on the present state of our knowledge. It characterizes the product with regard to appropriate safety precautions. It does not represent a warranty of any product properties and we assume no liability for any loss or injury which may result from the use of this information. Users should conduct their own investigations to determine the suitability of the information.

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